

CITY OF FORTUNA, CALIFORNIA

Community Development Department

Building and Safety Division

621 11th street - Fortuna, California 95540

Phone: 707-725-7600 - Fax: 707-725-7610

May 1, 2009

RESIDENTIAL BUILDING WORKBOOK



The following information and/or details are for information and reference purposes only, and are not a substitute for accurate drawings prepared for each proposed construction project.

Before You Design

Research your parcel! Many plan review issues center around planning considerations such as building setbacks, area coverage, building height, drainage easements, and flood zones. Obtain a copy of the *Subdivision Map, Parcel Map, or Record of Survey*. Contact the Planning Department, and give them your Assessor's Parcel Number (APN) to learn the *zoning, setback and lot coverage requirements, road easements, etc.* (you can find your APN on your property tax bill). Note that these restrictions generally apply to buildings of all types: Single and Multi family residences, garages, barns, etc. Consider the physical characteristics of the land and the (above) restrictions prior to finalizing the design and placement of your structure. Check the *design criteria* needed for your building. Depending on the type of structure, you will need some or all of the following information: seismic category, wind speed, exposure, soil bearing capacity, flood zone, and climate zone.

Design Criteria

CURRENT CODES

2007 California Building Code; 2007 California Plumbing Code; 2007 California Mechanical Code; 2007 California Electrical Code; 2007 California Energy Code.
All California Codes are available for purchase from ICC at www.iccsafe.org

WIND DESIGN

Per Chapter 16 of CBC-2007, and ASCE 7-05

85 mph wind speed (based on 3 second gust). Exposure Category is site specific and based on Surface Roughness Category.

Most structures in Fortuna are in **Exposure Category C**

SEISMIC DESIGN

Permissible structural systems, limitations on height and irregularity, permitted lateral force procedure, and required level of strength and seismic detailing are based on Seismic Design Category (SDC). SDC must be determined in accordance with Chapter 16 of CBC-2007, and ASCE 7-05. **City of Fortuna is in SDC E.**

FOUNDATION DESIGN VALUES

Soil Site Class "D" with Allowable Bearing Pressure of 1500 psf, or as specified in a Soils report. Unless an approval is requested in writing and granted by the building official, a Soils report is required for all new buildings and additions. The design of footings/foundations should be based on the recommendations in the Soils Reports.

- Minimum depth of footings: 12" into undisturbed natural grade
- Minimum width of footings – 12" for one story, 15" for two story buildings
- Minimum width of foundation wall – 7.5"
- Allowable Bearing Pressure = 1500 psf
- Allowable Lateral Bearing Pressure (Passive) = 200 psf/ft
- Allowable Friction Coefficient = 0.35

CLIMATE

City of Fortuna is in Climate zone #1

CONVENTIONAL LIGHT-FRAME CONSTRUCTION

- An engineered lateral design is required for irregular portions of structures. Irregularities are described in CBC 2308.12.6.
 - Conventional construction is limited to one story in SDC E, except that detached one and two family dwellings may be 2 stories.
(CBC 2308.11 and 2308.12)
 - Cripple walls with studs exceeding 14" are considered a story for the purposes of applying braced wall requirements.
(2308.2, 2308.9.4.1, 2308.12.4)
 - Professional design is required when bearing wall floor-to-floor height exceeds 10'. (CBC 2308.2)
 - Spacing between interior and exterior braced wall lines shall not exceed 25'.
(CBC 2308.12.3)
 - Braced wall lines must be supported by continuous foundations.
(CBC 2308.3.4)
 - *Exception: Structures with a maximum plan dimension of 50' may be supported with continuous foundations at exterior walls only.*
 - Openings in floor and roof diaphragms are restricted to not more than 50% of the distance between braced wall lines or an area not more than 25% of the area between orthogonal pairs of braced wall lines. (CBC 2308.12.6 #6)
 - Professional design is required when trusses or rafters exceed 40' between points of vertical support. (CBC 2308.2 #5)
 - Professional design is required when combined roof and ceiling dead loads exceed 15 psf. (CBC 2308.2 #3)
 - Professional design is required when dead loads of exterior walls, floors and partitions exceed 15 psf. (CBC 2308.2 #5)
- Exceptions are provided for stone and masonry veneer. (CBC 2308.2 #3.1)
- Minimum lengths of wall bracing are required per each 25 linear feet of braced wall line in SDC D and E. (CBC Table 2308.12.4)
 - "Alternate" Braced wall panels constructed in accordance with CBC 2308.9.3.1 or CBC 2308.9.3.2 will be credited 4' for purposes of applying the total length required by 2308.12.4.
 - Height to width ratios of braced wall panels in SDC D and E shall not exceed 2:1. (CBC Table 2308.12.4) "Alternate" Braced wall panels constructed in accordance with CBC 2308.9.3.1 or CBC 2308.9.3.2 are exempt from the 2:1 h/w ratio requirement.

For more details about conventional construction and conventional bracing, see the Handout, provided by the Building Department

IMPORTANT QUESTIONS AND ANSWERS!!!

Why do I need a building permit?

The purpose of the building permit is to provide minimum standards to safeguard the public life, health, safety and general welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures within this jurisdiction.

Generally, any new construction, or addition, alteration, repair to an existing building (including re-roof, fireplaces, windows, carports, etc.) requires a Building Permit.

What Work Does Not Require a Building Permit?

Building permit:

A building permit is not needed for the following:

(CBC, Volume 2, S. 105.2/p. 611)

- One story detached accessory building used as a tool, a storage shed, a playhouse, or a similar use, provided that the projected roof area does not exceed **120 square feet**.
- Fences not over six feet high.
- Retaining walls, which are not over four feet in height, measured from the bottom of the footing to the top of the wall, unless it is used to support a surcharge, **or impounds Class I, II or III A liquids**.
- Sidewalks/driveways not more than 30" above adjacent grade if not over any basement or story below, **and if not part of an accessible route**.
- Painting, papering, **tiling** and similar finish work.
- Window awnings supported by an exterior wall of a residential home when projecting not more than **54" from the exterior wall**.
- Prefabricated swimming pools accessory **to an R-3 residence** in which the pool walls are entirely above the adjacent grade, the capacity does not exceed 5,000 gallons, **and are less than 24" deep**.
- **Oil derricks**
- **Water tanks supported directly on grade if the capacity does not exceed 5, 000 gallons, and the ratio of height to diameter or width does not exceed 2:1.**
- **Temporary motion picture, television, and theatre stage sets and scenery.**
- **Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.**
- **Swings or other playground equipment accessory to detached one and two family dwellings.**

Plumbing Permit:

A plumbing permit is not needed for the following:

- The stopping of leaks in drains, soil, waste or vent pipe, provided if any concealed trap, drainpipe, soil, waste or vent pipe become defective and it becomes necessary to remove and replace them with new materials, the work shall be considered new and a permit needs to be obtained and an inspection is needed at completion.
- The clearing of stoppage or the repairing of leaks in pipes, valves or fixtures, nor for the removal and reinstallation of water closets (toilet), provided the repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Electrical Permits:

An electrical permit is not needed for the following:

- Temporary decorative lighting.
- Repair or replacement of current-carrying parts of any switch, contractor or control device. Repair or replacement of any over-current device (fuse or circuit breaker) of the required capacity in same location.
- Removal of electrical wiring.

Mechanical Permit:

- Portable heating appliances.
- Portable ventilating equipment.
- Portable cooling unit.
- Portable evaporative cooler.
- **Steam, hot or chilled water piping within any heating or cooling equipment.**
- **Self-contained refrigeration system, containing 10 pounds or less of refrigerant, and actuated by motors of one horsepower or less.**
- **Replacement of any part that does not alter approval, or make it unsafe.**

Who can obtain a permit?

- Property owners
- Licensed contractors
- Certified Agents with a Letter of Authorization signed by the owner

When a permit is issued, the signature and identity of the applicant must be verified. Contractors are required to have a current City of Fortuna business license and State of California Contractor's license. If employees are to be used, Workers Compensation Insurance Company and policy # must be supplied.

What happens if I build without a permit?

Any person who commences any work for which a permit is required, such as, but not limited to: grading, demolition, building a structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits, shall be subject to a Stop-Work-Order fee, in addition to the required permit fees. Double Building Permit Fees will apply at a minimum of \$500.00 for each violation where a building permit should have been issued.

The Stop-Work-Order will be placed on the Construction site, and you will be required to apply for permit(s). Stop-Work-Order fee of \$105.00 shall be paid before a project can be submitted or issued by the Building Department. After the permit has been properly issued, you will then be required to uncover any work which has been covered so that it may be inspected prior to the release of the Stop Work Order. In some cases, regulations or codes may not permit the type of construction that has been done. In this case, you may be required to replace or restore the area to its original condition prior to your construction

How Long Does It Take to Approve My Building Permit?

Building permit applications are processed on a “first in, first out” basis. The time frame for a residential plan check is two weeks; commercial plan checks may require a longer amount of time.

Do I need an architect or engineer to prepare my plans?

All structures or buildings classified in Occupancy Groups A, B, E, F, H, I, M, R (**including Single Family Residences**) , S and U (**including garages**) shall be designed by an architect or civil/structural engineer, licensed/registered in the State of California. All plans will be deemed to have complied with the requirements of this Section, provided that they are prepared in accordance with sections 6731, 6737, 6737.1 of the Business and Professions Code.

The Building Official **may** consider a waiver of this requirement when a California licensed General Contractor can show the building department that he/she is capable of providing the necessary information (on the plans), and constructing the project without having a project be designed by an architect or civil/structural engineer, licensed/registered in the State of California.

Can I do the work myself?

Property owners are allowed to work on their own property, but certain regulations must be followed. Among them: If the property owners hire anyone, they need to purchase Workers' Compensation Insurance. Proof of this insurance will need to be provided to the Building Division.

For more information about owner-builder permits, see the owner/builder handout, or ask the Building Department

When my building permit will expire?

Every permit issued shall expire two years from the date of issuance. Every permit shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within 180 days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of more than 180 days. Once a building permit has expired, work can be recommenced only after that permit is renewed or a new permit is issued. The fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work; and provided further that such suspension or abandonment has not exceeded one year. In order to renew action on a permit expired, suspended or abandoned by over one year, the permittee shall pay a new full permit fee. The new permit will be issued and also inspected utilizing the codes that are adopted and in force at that moment.

What are the Procedures for Issuing Building Permits?

To obtain a permit, the applicant shall first file an application on a form furnished by the Department of Building Safety. Such application shall:

1. Identify and describe the work to be covered by the permit
2. Describe the land on which the work is to be done, including street address.
3. Indicate the use and occupancy for which the proposed work is intended.
4. Be signed by the applicant, or the applicant's authorized agent.
5. The application should be accompanied by construction documents and other data for plan check and approval, including:
 - Site plan; Exterior building elevations; Foundation plan; Floor plan; Floor framing plan; Roof/Ceiling framing plan; Section drawings; Structural details; Electrical, Mechanical, Plumbing plans; Energy calculations; Soils report.
 - Additional documents, such as structural calculations and manufactured truss calculations shall be submitted if needed. What needs to be shown on these plans is discussed below and examples are shown at the end of the Handout.

PLANS REQUIRED:

Site/Plot Plan

Drawn to scale and showing:

Owner's Name; Designer's name; Project address/ APN;	Dimensions of property; property lines	Street grades and proposed finished grades.
North Orientation Arrow	Lot coverage calculations	Flood hazard areas; Flood elevation
Location/dimensions of new and existing buildings/structures	Underground lines - gas, sewer, water, electrical, etc.	Landscaping, off-site improvements (paving, curb/gutter, etc.).
Driveways/Walkways; Easements; Parking	Required setbacks from PL/structures	Septic tank and leach field location
Existing site topography	Street/Road adjacent to the property	Drainage patterns and swales - 5% slope min

PAY ATTENTION:

- ***As per Fortuna Municipal Code, for new construction, all lots will require a Topographic Survey, prepared by a California licensed land surveyor. The Building official may waive the requirement, based on a written request and a determination that the topographic information is not necessary for the proposed project.***
- ***As per Fortuna Municipal Code, for new construction, all lots will require a Boundary Survey, prepared by a California licensed Land surveyor. The Building official may consider a waiver of the requirement if a licensed contractor can show all corner markers identified on an existing survey.***

Exterior Building Elevations

- Provide *four* exterior elevations (side views) of the proposed structure (North, South, East and West).
- Show the proposed grade as it will be *after final grading*.
- *For additions*, you may show elevations affected by the addition only.
- ***Elevations shall show: Siding; Veneer; Roof pitch; Chimney clearances***

Foundation Plans

Foundation plans shall show:

- Type and size of continuous foundation areas
- Slab location and dimension; type of slab reinforcement; vapor barrier
- Interior pier locations; footing size and depth
- Foundation details references
- Hold down location and size, hold-down schedule.
- Under floor ventilation calculations
- For sites steeper than 10 %, stepped footing details shall be provided.
- Provide a cross-section showing typical footing/stem wall or footing/slab dimensions, including placement and size of reinforcement.
- Specify foundation bolt size and spacing.
- Indicate height and location of retaining walls; provide retaining wall design.

Floor framing plan - *Floor framing could be shown on the foundation plan*

The floor framing plan shall show: Structural elements of the floor framing including joists size and spacing, girder size and spacing, hangers and connections, possibly the under-floor access

Floor Plan

Provide a fully-dimensioned floor plan for each building level, showing:

- The layout of all rooms - *Identification and dimensions of all rooms/spaces*
- Fire wall/fire separation locations
- Door and window type and size
- Floor ceiling penetrations such as fireplaces, dump waiters, elevators, shafts, laundry chutes
- The location of section cuts should be referenced on the floor plan

Roof/ceiling framing plan:

The roof/ceiling framing plan shall show:

- The type of roof covering and roof sheathing
- *Hardware used to fasten truss to top plates;* References to roof to wall connections
- Nailing size and spacing
- Attic ventilation calculations/details
- Structural elements, including bearing beams, header sizes, joists size and spacing, hangers and connectors, doubled members at openings to roof, etc.

Building Cross-Section Elevations

Section drawings shall show:

- Roof, wall and under floor insulation values
- The type of wall bracing (let-ins are not allowed)
- Exterior wall coverings
- Weep screeds, if applicable
- Eave blocking
- Floor sheathing; top and bottom plates

Detail sheets

The detail sheets shall show:

- All of the specific details that were referenced throughout the plans
- Window and door schedule
- Shear transfer details;
- Shear wall schedule/or Braced wall panels schedule
- Nailing schedule

Electrical, mechanical and plumbing plans

The electrical, mechanical and plumbing plans may be included on the floor plan if sufficient clarity is maintained. Sizing of gas and DWV plumbing systems (provide schematic for each one) as well as sizing for electrical service and electrical feeders will be required.

Energy Calculations

Two complete sets are required, including for additions and alterations.

Soils Report

Two complete sets are required, including for additions and alterations.

What Does The Plan Reviewer Looks For?

Type of plans	What does the plan reviewer look for?
<p style="text-align: center;">Site plan</p> <p>Plan check includes address and Vicinity map check, site visit, Parcel Quest information, Topographic and Boundary Surveys check, if applicable</p>	<ul style="list-style-type: none"> • Scope of work: Identify and/or describe the work to be covered by the permit for which application is made. • Description of the land on which the proposed work is to be done by street address, AP #, or similar description. • North Orientation Arrow and Vicinity map. • Occupancy classification; Type of construction • Floor area and Lot coverage calculations • Information for owner, drafter, engineer, architect, etc. • All recorded easements located on the parcel • All existing or proposed structures on the property (<i>such as garage, well, shed, pool, HVAC equipment, etc.</i>); septic system location, if applicable. • Distances from proposed structures to all property lines • Existing site topography (<i>prior to grading</i>). • Proposed grading - <i>Due to the technical nature of this aspect of the plans, we recommend that you have a licensed professional assist with this portion of plans.</i> • Details, showing how storm run-offs will be controlled around the proposed structure: <ol style="list-style-type: none"> 1. Show drainage patterns and swales; maintain 5% minimum slope away from the building. 2. If the building site is relatively level, provide control elevations along drainage swales, showing 2% minimum slope. Note that drainage swales should be located 5' minimum from the foundation where practicable. • Fully-dimensioned driveway profile or enough details for the proposed driveway.
<p>Details for BMP's</p> <p>Details for Winterization (between October 15 and May 1)</p> <p>Erosion prevention plan</p>	<ul style="list-style-type: none"> • Information for the required BMP's shall be provided with the Site plan. • The weather condition is a factor in Fortuna between October 15 and May 1; winterization measures shall be installed on the job site, and information shall be provided with the Site plan. • Erosion plan may be omitted for small projects if: <ol style="list-style-type: none"> 1. The Soils report includes recommendations for grading, site stability, erosion prevention or adequate BMP's. 2. A General Contractor can show that he/she is capable of maintaining the required BMP's on the job site.

<p style="text-align: center;">Soils report</p>	<p>Reason for detailed Soils Report check: Discrepancies between Soils reports and foundation designs are common error.</p>
<p style="text-align: center;">Foundation Plans</p> <p>Foundation plan-check includes:</p> <ul style="list-style-type: none"> • Comparison with the Soils report • Pier (concrete pads) calculations • Truss calculations check for potential concrete pads (for girder trusses) • Under floor ventilation calculations • Retaining wall/foundation calculations • Hardware (including hold downs, anchor bolts, straps, etc.) specifications and installation requirements • Foundation plan may include floor framing plan 	<ul style="list-style-type: none"> • Type and size of continuous foundation areas • Slab location and dimension; type of slab reinforcement; vapor barrier • Interior pier locations; footing size and depth • Foundation details references • Hold down location and size, hold-down schedule. <i>All hold-downs shall be fastened in place prior to foundation inspection</i> • Foundation bolt size and spacing – 5/8", 6' o.c. minimum. • For building sites steeper than 10 %, stepped footing details (cross section) shall be provided. • Be sure that the reinforcement type installed matches the plan engineering (a common error). • The type/size of the foundation shall be based on the Soils report • Be certain that properly-sized <i>piers shall be located under concentrated loads (posts or trimmers) supporting load bearing members (beams, girder trusses, etc.)</i>. If posts are located at an exterior footing, it should be widened to the same dimension as the required pier. The omission of piers is the most common error found on plans and during inspections. • Indicate <i>height and location</i> of retaining walls. Note that walls exceeding 48" from the bottom of the footing to the top of the wall must be engineered. • Be careful about the size of the footings/foundation wall. California Building Code 2007 requires minimum 7.5" width of the foundation wall, even for one story building.
<p style="text-align: center;">Exterior Elevations</p>	<ul style="list-style-type: none"> • <i>Four exterior elevations of the proposed structure. For additions, you may show elevations affected by the addition only.</i> • Proposed grade as it will be <i>after final grading</i>. For example, if the foundation will be stepped to match existing slope, this must be shown on each elevation. • <i>Also, the elevation plan shall show: Exterior siding; Veneer; Roof pitch; Chimney clearances; stair/guardrail details, top-plate height etc.</i> • <i>Discrepancies between site plan topography and elevations is a common error.</i>

<p>Floor framing plan</p> <p>Floor framing plan-check includes:</p> <ul style="list-style-type: none"> • Manufactured joists specifications check • Hardware (hangers, straps, connectors, etc.) specifications check <p><i>Floor framing details could be shown on the foundation plan.</i></p>	<ul style="list-style-type: none"> • Structural elements of the floor framing including joists and girder size and spacing; hangers and connections. • If manufactured joists are used, show manufacture's specifications, including information for spans, joist <i>series</i> and live-load deflection used. • Possibly the under-floor access – 18"x24" minimum. • Under floor ventilation of 1 sf per 150 sf of floor area. • Minimum <i>18" clearance</i> from grade to the bottom of floor joists, and minimum 12" for girders. • Floor joists must be spaced no further than 16" o.c. when the underside forms part of a fire separation, such as between a garage and a living space above. • Show the thickness and span rating of the floor sheathing (for example: 3/4", 20/40 plywood). • Provide additional support under concentrated loads such as bearing walls/partitions, brick hearths, rock work, wood stoves, gas stoves, etc.
<p>Floor Plan</p> <p>Floor plan-check includes:</p> <ul style="list-style-type: none"> • Structural calculations • Shear wall/brace wall panel calculations • Calculations for light and ventilation area • Area (foot print) calculations • Comparison of the proposed conditioned area vs. conditioned area in Title 24 report • Penetration area (doors and windows) vs. the penetration area from the energy calculations. • Emergency exits and rescue openings 	<ul style="list-style-type: none"> • Provide dimensioned floor plan for each building level; label each room/area with its proposed use; show all doors and windows with nominal sizes. • Fire wall/fire separation locations, including the required separation between a garage and adjacent living space. <i>(Details on page35)</i> • Floor ceiling penetrations such as fireplaces, dump waiters, elevators, shafts, laundry chutes • Locations of section cuts should be referenced on the floor plan • In habitable rooms, the window area must be at least 8% of the floor area (one-half openable for ventilation). • <i>Mechanical ventilation shall be provided for bathrooms.</i> • Sleeping rooms shall have a window or exterior door for emergency escape. <i>(Details on page 23)</i> • Safety glazing in hazardous locations <i>See CBC, Section 2406 for detailed information.</i> • For additions, show the existing rooms adjacent to the addition, including door and window sizes. • Landing (minimum of 36" x 36") on each side of stairs and exterior doorways. • Minimum 22" x 30" access to attic areas • Minimum <i>42" high guardrail</i> for walking surfaces more than 30" above adjacent grade. • <i>Handrail (34-38")</i> installed on one side of each flight of stairs. A stairway is defined as <i>four or more risers</i> (three treads plus an upper floor level).

<p>Framing Details</p>	<ul style="list-style-type: none"> • All header/beam locations and sizes - <i>Beam sizes must match the project engineering (common error).</i> • Show method of bracing the structure. Provide fastener size and spacing for shear walls or braced wall panels. • Provide one or more typical <i>cross-sections</i> to clearly show how the structure will be constructed. • If a deck is to be built, provide a <i>deck framing plan</i> with a typical cross-section.
<p>Building Cross-Section Elevations</p>	<ul style="list-style-type: none"> • Roof, wall and under floor insulation values • Type of wall bracing (let-ins are not allowed) • Exterior wall covering; Eave blocking; Weep screeds, if applicable • Floor sheathing
<p>Roof/ceiling framing plan:</p> <p>Plan check includes:</p> <ul style="list-style-type: none"> • Truss calculations • Attic ventilation calculations • Structural engineered calculations • Hardware (mechanical clips, hangers, straps, etc.) specifications check 	<ul style="list-style-type: none"> • References to roof to wall connections. • For <i>engineered trusses</i>, show hardware used to fasten truss to top plate (toe-nailing not permitted). • Nailing size and spacing • Structural elements of ceiling, including bearing beams, header and joists size/spacing, hangers, etc. • Attic access opening • <i>If engineered trusses are used, provide two sets of wet-stamped and signed truss drawings. If there is an Engineer/Architect of Record, he/she must review the drawings and state (in writing) that trusses are compatible with the building design (common error).</i> • Show minimum attic ventilation (1 sf per 150 sf of attic area. Eave vents must be greater than or equal to the area of the ridge or gable vents. • For non-engineered roofs, show rafter size, grade, and spacing. Show wall ties (not collar ties) min. 48" o.c.
<p>Detail sheets</p>	<ul style="list-style-type: none"> • All of the specific details referenced throughout the plans • Window and door schedule; Nailing schedule • Shear transfer details • Shear wall schedules/or Braced wall panels schedule
<p>Energy Calculations</p>	<ul style="list-style-type: none"> • Window/door orientation and area shall match floor plan. • Square footage of the conditioned area from the floor plan shall match the energy calculations. • Show the R-value of the floor, walls and ceilings. • Type of HVAC system and Water heaters on the energy calculations must match the details on the plans. • The location of the HVAC ducts shall match the floor plan

<p style="text-align: center;">Electrical plan</p> <p>Electrical plan check includes:</p> <ul style="list-style-type: none"> • Service and feeders load calculations • Title 24 Report (Energy calculations) check for lighting energy requirements <p><i>The electrical plan</i> may be included on the floor plan if sufficient clarity is maintained</p>	<ul style="list-style-type: none"> • Sizing for electrical service and electrical feeders • Location and size of grounding electrode • Location of the <i>service panel</i> and its rating (100 A min.) • All <i>outlets, switches, and light fixtures</i> (label any 220-volt outlets). • Label all required <i>GFCI</i> outlets. • <i>Locations</i> of all required <i>smoke detectors</i>. • Outlets must be located in such a manner that no point along a wall is more than <i>six feet</i> from an outlet • All kitchen counter top outlets must be GFCI-protected and be spaced no more than 4' apart. • Outlets located in the following locations must be GFCI: garages, carports, under floor areas, bathrooms, exterior locations, kitchen countertops, wet bar counter tops, 6' from laundry sink. • <i>Three-way light switches</i> must be located at the top and bottom of each stairway.
<p style="text-align: center;">Mechanical/Plumbing Plan</p> <p>PAY ATTENTION: Pipe-sizing can be complex – we require that your licensed installer or other qualified professional calculate the gas piping sizes. Note that undersized piping can create an unsafe condition.</p> <p><i>Mechanical/Plumbing plans may be included on the floor plan if sufficient clarity is maintained</i></p>	<ul style="list-style-type: none"> • Show all gas appliance <i>locations</i> with the <i>rated BTU</i> of each device; location of HVAC units and compressors • Show all plumbing fixtures. • Show where the gas/water piping enters the building • <i>Length</i> and <i>size</i> of all piping. • Specify the <i>type of gas</i> to be used (propane or natural). • Show how gas appliances in confined spaces will receive <i>combustion air</i>. Note the <i>size</i> and <i>location</i> of the openings. <i>Under sizing combustion air openings can create an unsafe condition.</i> • Show <i>size/ location</i> of vent (flue) from each appliance. • If a water heater is located in the garage, show the burner assembly located a minimum of <i>18" above the floor</i>. Gas water heaters <i>cannot be located in a bedroom or bathroom</i>, or gain access through that room. • In addition, provide (2) copies of natural gas schematic drawings, as well as schematics for all water supply and DWV systems. The schematic must be completed by a licensed plumber, must indicate length of all pipes, BTU rating of all appliances, Fixture units, and size of all pipes. • If mechanical/plumbing details are not provided during plan check, and some issues arise during inspections, it will be contractor's responsibility (and expenses) to make the plumbing system to comply with the Codes.

**Structural details
summary**

- Place details of continuous load path from top of roof to bottom of foundation.
- Provide a roof plan and/or truss layout complete.
- Detail the roof rafter connections to the exterior wall plates. Show all connections to plates.
- Critical bearing connections must be detailed, with hardware specified.
- Shear walls and brace walls must be clearly identified and specified. All nailing shall be called out.
- Show rafter ties or bearing ridge beam. Detail splices.
- Specify garage door header; provide lateral details and/or calculations if wall returns are less than 4'.
- Specify ceiling joists: direction, size and spacing.
- Roof rafters: show direction, size and spacing.
- Posts: detail base and top connections; provide manufacture's specifications.
- Headers and Beams: specify size, species and grade. Note: some beams may require calculations.
- Roof sheathing: specify type, size and nailing.
- If using T1-11 for shear wall, provide nailing detail at the vertical joint. T1-11 and other grooved siding should be nailed through the full panel thickness and on both side of joints, not just throw the overlapping piece.
- Provide signed truss layout and calculations, including design for attic equipment and other special loads. Include bracing criteria, and gable end truss designs. Truss calculations with handwritten information will require wet-signature.
- Provide a signed statement by the building designer that she/he "has reviewed the truss submittal, and all loading and design criteria have been met."
- Provide masonry fireplace details, including vertical steel and building ties.
- Provide HVAC suspension details, including seismic restraints.
- Require gable end truss verticals to align with T1:11 edge joints.
- Specify gable end truss verticals at 16" o.c. if using hardboard siding.
- All details, nailing, etc., must be transferred to the plans. Provide wet signed and stamped structural calculations, if applicable.

***For more details about plan check requirements, see the
RESIDENTIAL PLAN COMMENT & CORRECTION LIST***

What are the Procedures for Inspecting my Work?

- The holder of the building permit or their agent shall assume the responsibility for calling for inspection 24 hours in advance. Excluding unforeseen circumstances, request for inspection called in before 5:00 p.m. will be made during the following business day.
- ***To schedule an inspection, please call our 24-hour inspection line at 725-7640. The inspection line is checked twice a day - 8AM and 1PM.***
- Permits expire by limitation and become null and void if work authorized is not commenced within 180 days from the date of the permit, or if the work authorized is suspended or abandoned at any time after the work is commenced for a period of 180 days.
- **The Building official is authorized to grant, in writing, one or more extensions, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.**

Important Facts

- The issuance of a permit based upon plans and specifications shall not prevent the Building Division from thereafter requiring the correction of errors in said plans and specifications or from preventing building operations being carried on there under when in violation of this Code of any other ordinance of the City of Fortuna.
- **Codes currently enforced are the 2007 edition of the California Building Code, 2007 edition of the California Plumbing Code, 2007 edition of the California Mechanical Code, and the 2007 edition of the California Electrical Code.**
- Any changes to the plans, after a permit has been issued, must be approved by the Building Official/Building Inspector
- If your construction project requires any kind of Planning Division approval such as development review, use permit, design review, you must submit the appropriate planning application, either prior to or concurrently with your application for a building permit.
- You can contact the Building Division between 8:00 a.m. and 5:00 p.m. at 725- 7600.

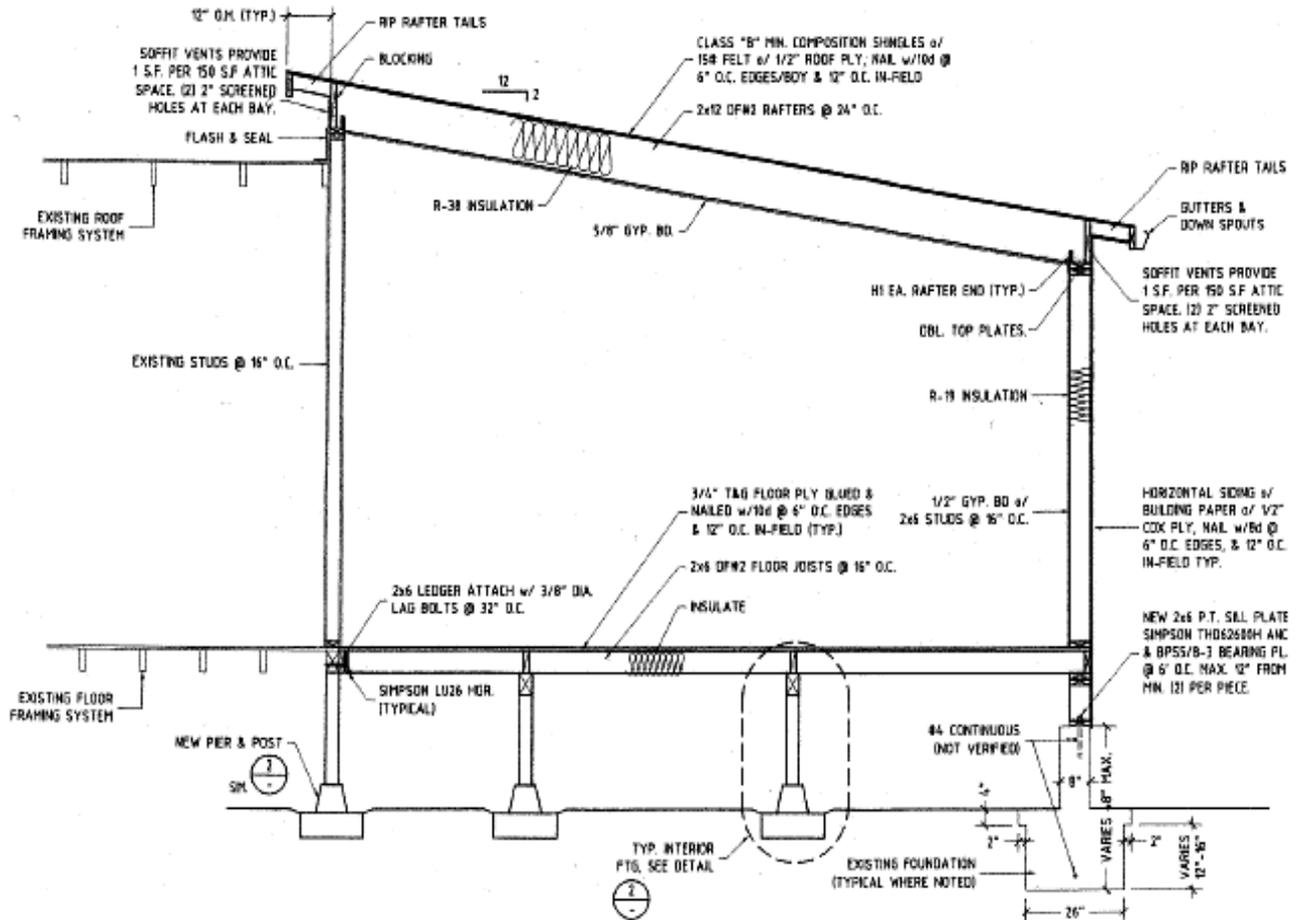
INSPECTIONS

Type of Inspection	Time of Inspection
<p style="text-align: center;">Site preliminary inspection</p> <p><i>Reason: Discrepancies between site plan topography, Soils Reports, elevations, and existing grade are common error.</i></p>	<p>To be made prior the approval of the building plans. This inspection is necessary to verify existing conditions that impact the plan review and permit approval. During the inspection, the building inspector shall check the existing grade, existing structures on the property (if there are some), potential storm run-off's, required BMP's, foundation possibilities, etc.</p>
<p style="text-align: center;">Foundation excavations, soils inspection</p> <p><i>Reason: Discrepancies between Soils reports and type/size of the footings (or type of soils) are a common error</i></p>	<p>To be made after footings are excavated, but prior the placement of any forms, re-bars, concrete or fill material.</p> <p>This inspection can be avoided if:</p> <ol style="list-style-type: none"> 1. A letter from the engineer of record, conforming that the foundation plan have been reviewed and that it has been determined that the recommendations in the soils report are properly incorporated into the construction documents, is provided with construction plans, and 2. All excavations are inspected by the engineer of record/soils engineer, and a letter, conforming that the foundation excavations conform to the soil report, is provided prior the foundation inspection.
<p style="text-align: center;">Footing/Foundation inspection</p>	<p>To be made after footings are excavated, forms are erected; anchor bolts, hold-downs, reinforcement in place. The Building Inspector will inspect the foundation location, concrete pads locations, setbacks, forms, anchor bolts, hold-downs, reinforcement, etc.</p>
<p style="text-align: center;">Under-floor inspection (Under-floor Framing/ Plumbing)</p>	<p>After in-slab/under-floor reinforcing, building service equipment, conduit, piping (water, gas, drainage), and other equipment are in place, but before any concrete is placed, or floor sheathing installed. No plumbing or drainage system shall be covered until inspected and approved. Drain lines shall be filled with water equal to ten foot head.</p> <p><i>During this inspection the Building inspector shall inspect the soil and any required under slab drainage, waterproofing materials, as well as reinforcing steel, conduit, piping and other service equipment embedded in or installed below a floor system</i></p>

<p>Roof Sheathing</p>	<p>After roof sheathing is placed and nailed. If the house has a shear wall design, the (boundary) nailing pattern and adequacy of the straps/mechanical connectors of the roof and floor diaphragms also shall be inspected.</p>
<p>Exterior shear</p>	<p>After wall sheathing is placed and nailed. All braced wall panels or shear walls shall be completed per plans and shall match the structural calculations. Also, the required hold-downs and mechanical connectors for the brace wall panels/shear walls shall be inspected. Don't conceal work until inspection has been approved.</p>
<p>Interior shear</p>	<p><i>Usually the interior shear walls/brace wall panels require additional inspection. It could be made in the same time with the exterior shear inspection, but on case by case basis, depends on the status of the project.</i></p>
<p>Rough Framing Includes truss installation</p>	<p>To be made after: Roof sheathing, all framing, fire blocking, and bracing (including shear walls) are in place; pipes, chimneys, and vents are complete. All rough plumbing, mechanical and electrical shall be approved prior the framing inspection, or are in place, ready for inspection.</p>
<p>Rough Plumbing/Mechanical</p>	<p>To be made prior/or during the rough framing inspection. Inspection includes gas and water pipe size check</p>
<p>Rough Electrical</p>	<p>To be made prior/or during the rough framing inspection.</p>
<p>Energy efficiency (insulation) inspection</p>	<p>To be made after framing inspection has been approved. Do not conceal work until approval.</p> <p><i>Shall include inspections for: envelope insulation R and U-values; fenestration U-value (windows); duct system R value; HVAC and water heating equipment efficiency.</i></p>
<p>Lath and gypsum board inspection Includes: Fire resistant penetrations, and interior sheet rock brace wall panels inspection</p>	<p>To be made after lathing and gypsum board is in place, nailing/screwing is completed, but before any plastering is applied, or gypsum board joints and fasteners are tapped.</p> <p>Protection of joints and penetrations in fire resistance-rated assemblies shall be inspected before they become concealed</p>
<p>Gas Service / Pressure test</p>	<p>Shall be made after all piping is installed, and before any fixture, gas appliance, or gas meter are connected.</p>

Electrical Service	Shall be made when the entire electrical installation is completed and safe - from the utility's electric supply lines to the fixture outlets, including complete service entrance, subpanels, all outlets, fuses, circuit breakers, switches, and plug receptacles and fixtures.
Temporary Power	Inspection (and approval) of temporary power is possible, if the contractor can demonstrate that the public health, safety and welfare will not be endangered. The temporary TAG (approval) shall expire at a time to be stated therein, and shall be revocable by the building inspector for cause. The temp. 20 A GFI outlet shall be installed below/near the panel.
Sewer hookup	Could be made at any time, depends of the status of the project. Water test of the system shall be made in addition to inspections of trenches, proper pipes, fitting, etc.
Final	To be made after building is completed and ready for occupancy. Requirements by other departments shall be completed or bonded at this time. <i>By the California Law and California Building Codes: Any building/structure covered by the building permit issued could not be occupied/or used until the final inspection is made, and a temporary or permanent Certificate of Occupancy is issued.</i>
Temporary Certificate of Occupancy (if applicable)	Request for Temporary Certificate of Occupancy will add additional time for Permanent Certificate of Occupancy preparation and another final inspection
Permanent Certificate of occupancy	As per the California Building Code – 2007, Certificate of Occupancy is required for SF Residence

BUILDING/WALL SECTION



PARTIAL BUILDING SECTION

1/4"=1'-0"

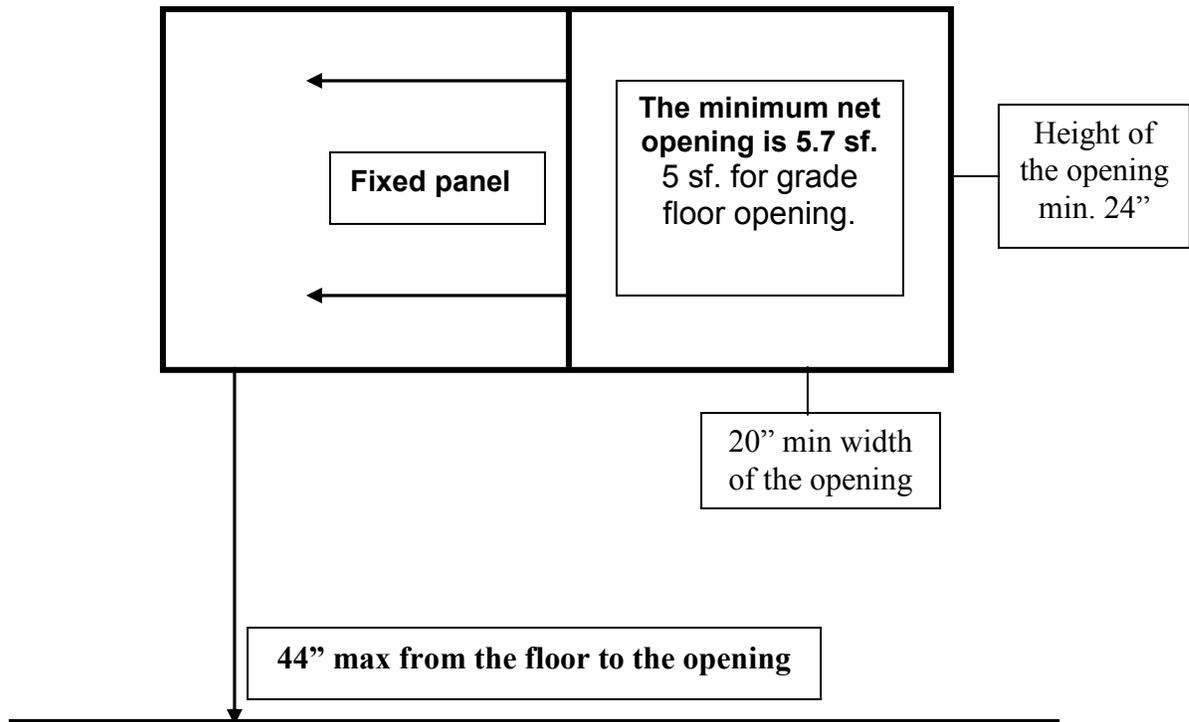
The wall section should show/describe, minimum, the following:

1. Location of bearing walls and size of supports.
2. Size and spacing of girders and beams used for supports.
3. Under-floor ventilation and access.
4. Earth to wood separation: minimum six inches to siding; 8 inches to framing members and wood sheathing.
5. Floor sheathing size and panel index number.
6. Size and spacing of studs.
7. Wall and ceiling covering.
8. Size and spacing of ceiling joists.
9. Size and spacing of roof members. (If using manufactured trusses, provide two detail sheets from suppliers.)
10. Rafter ties: size, spacing and minimum 48" on center.
11. Attic ventilation and access.
12. Roof sheathing: size, panel index, type of covering, felt weight and roof slope.
13. Insulation: type, location, and "R" factor.
14. Top Plates.
15. Exterior wall covering and sheathing: type, size and vapor barrier.
16. Shear bracing: type, location, and size.
17. Earth to wood clearances: 18" minimum to joists, 12" minimum to girders/beams.
18. Floor joists: size and spacing.
19. Header size.

Provide all dimensions, Include the grade and species of all framing lumber and materials. If the project is a room addition, provide detail sheet for point of attachment.

EMERGENCY ESCAPE AND RESCUE OPENINGS

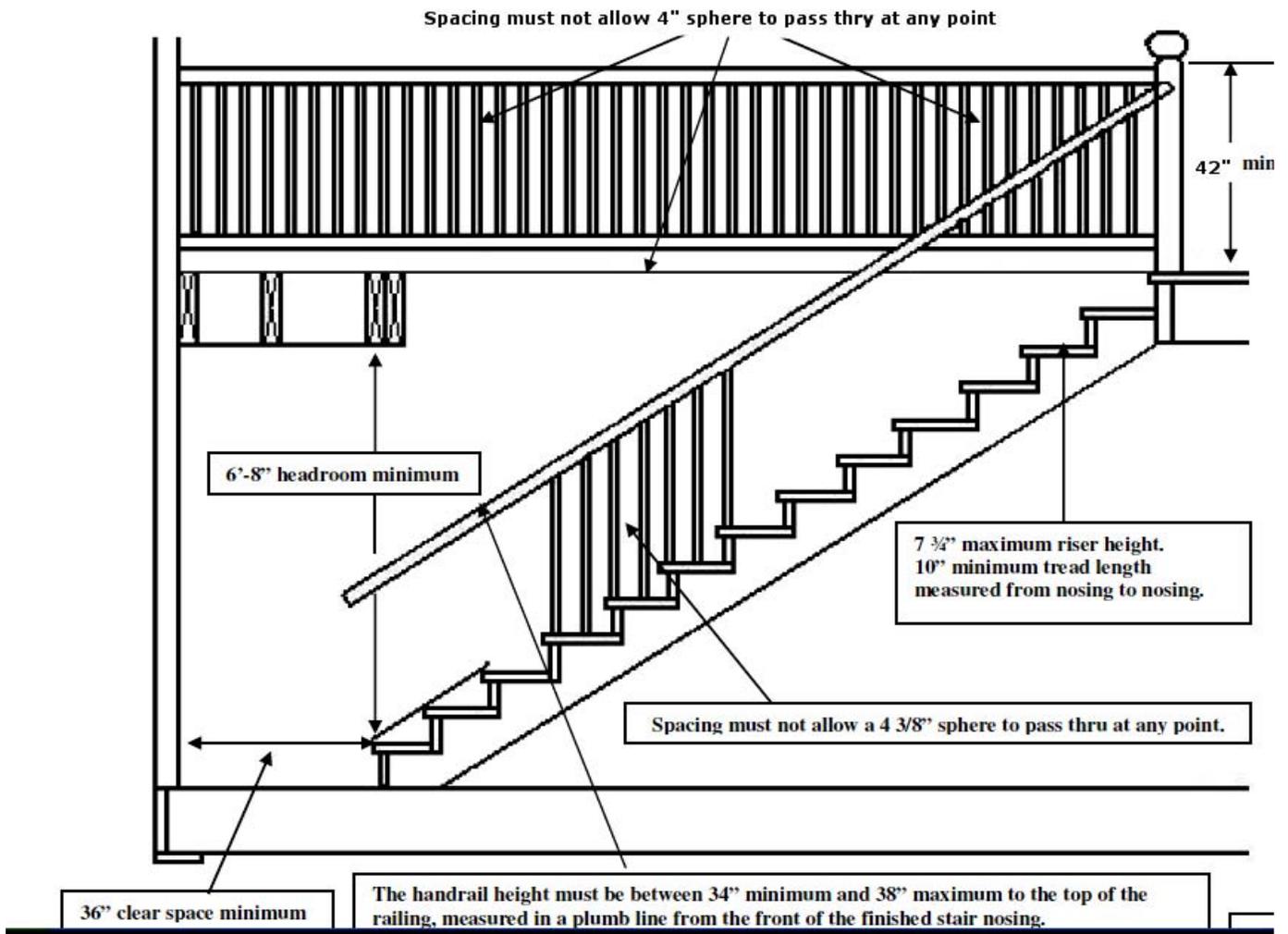
Bedrooms and basements in dwelling unit shall have at least one exterior emergency escape and rescue opening (Window or door), and shall meet the following requirements:



NOTE:

The minimum height of 24 inches and minimum width of 20 inches only create an opening of 3.33 sf. It is not enough because the required area of emergency escape and rescue opening is 5.7 sf.

STAIRWAYS AND HANDRAILS



Stairway details should show/describe at least the following items:

1. Minimum headroom clearance 80" measured vertically from a line connecting the edge of the nosing.
2. Stair riser heights shall be 7 3/4" max and 4" min; stair tread depths shall be 10" minimum. The largest riser height shall not exceed the smallest by more than 3/8".
3. Handrails: 34 inches to 38 inches max, measured from the nosing of the tread to the top of the rail.
4. Guardrails: 42 inches min height, with an intermediate pattern such that a sphere 4" in diameter cannot pass through.
5. Every landing shall have dimension measured in the direction of travel equal to the width of the stairway, minimum 36" in width.
6. Stairway width: 36 inches minimum.

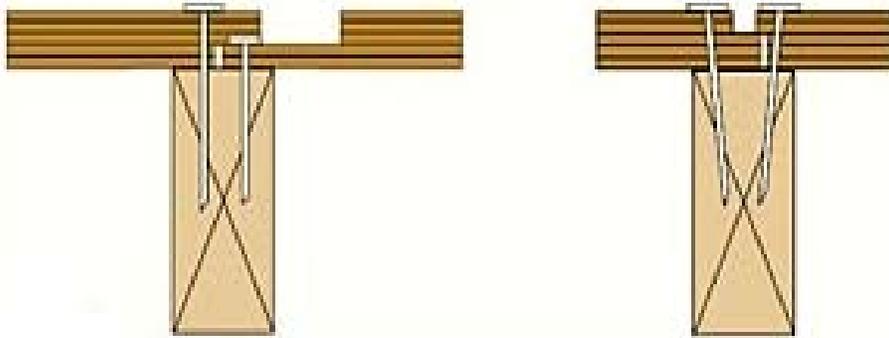
Handrails:

1. Handgrip: the handgrip portion of the handrail shall not be less than 1 1/4 inches or more than 2 inches in cross-sectional dimension.
2. Handrails projecting from a wall shall have a space of not less than 1 1/2 inches between the wall and the handrail.
3. Handrails shall be continuous the full length of the stairs.
4. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run.
5. At stairways where handrails are not continuous between flights, the handrails shall extend horizontally at least 12" beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser.
6. At ramps where handrails are not continuous between runs, the handrails shall extend horizontally above the landing 12" minimum beyond the top and bottom of ramp runs.

Shear wall values for grooved siding products

All three of the major model building codes and the International Building Code recognize the use of APA 303 Plywood Siding (such as T1-11) for use as shear walls. Panel siding products usually feature grooves and ship lap edges, which leads to the question: does differing thicknesses of the panel affect allowable shear wall values?

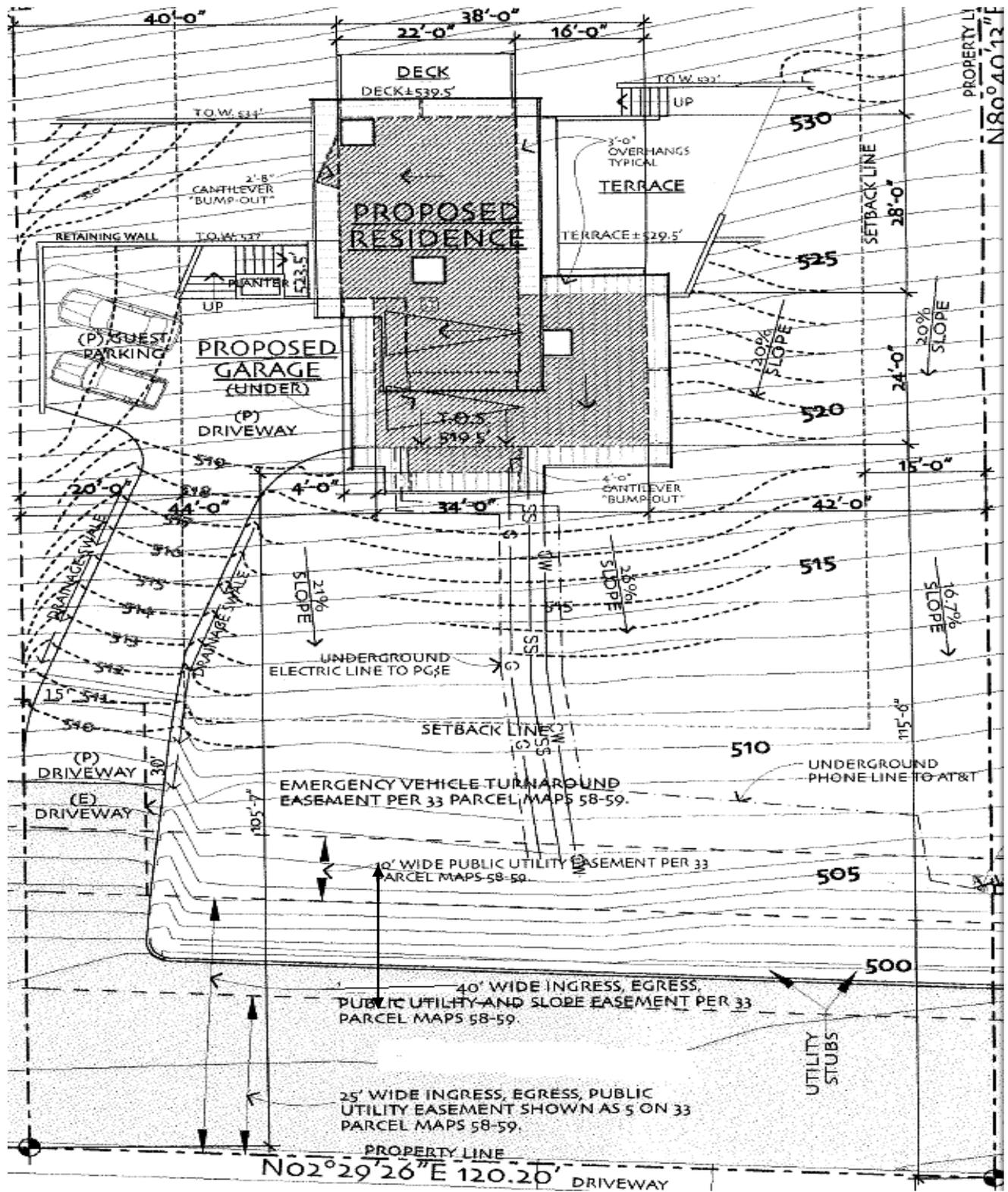
The design values for panel siding are based on the thickness at the point of nailing. For example, if under lap thickness is 5/16-inch, and the bottom nail is nailed through the under lap, then use 5/16-inch to calculate the allowable shear wall value (see left hand side of below figure). If the point of nailing is through the full panel thickness (see right hand side of below figure), then the full thickness of the panel may be utilized to resist shear the shear forces.



The shear values for APA 303 siding panels (also known as plywood panel siding) installed directly to studs or over gypsum sheathing are specified in Table 2306.4.1 in California Building Code. Siding has the same capacity as Sheathing grade wood structural panels of the same thickness **when similarly attached**.

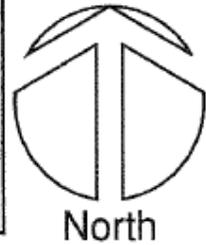
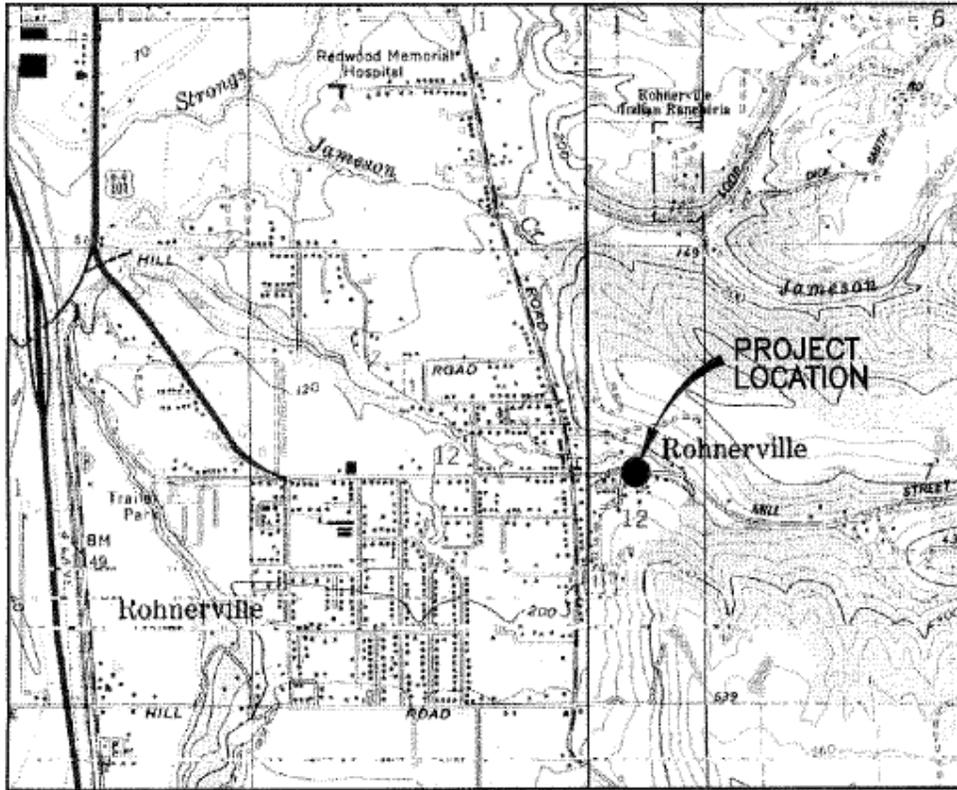
Even though grooves have been cut into the panel, in general, the governing issue for shear walls is the strength of the nailed panel to framing connection, and not the shear through thickness strength of panels.

SAMPLE PLOT PLAN - SLOPE

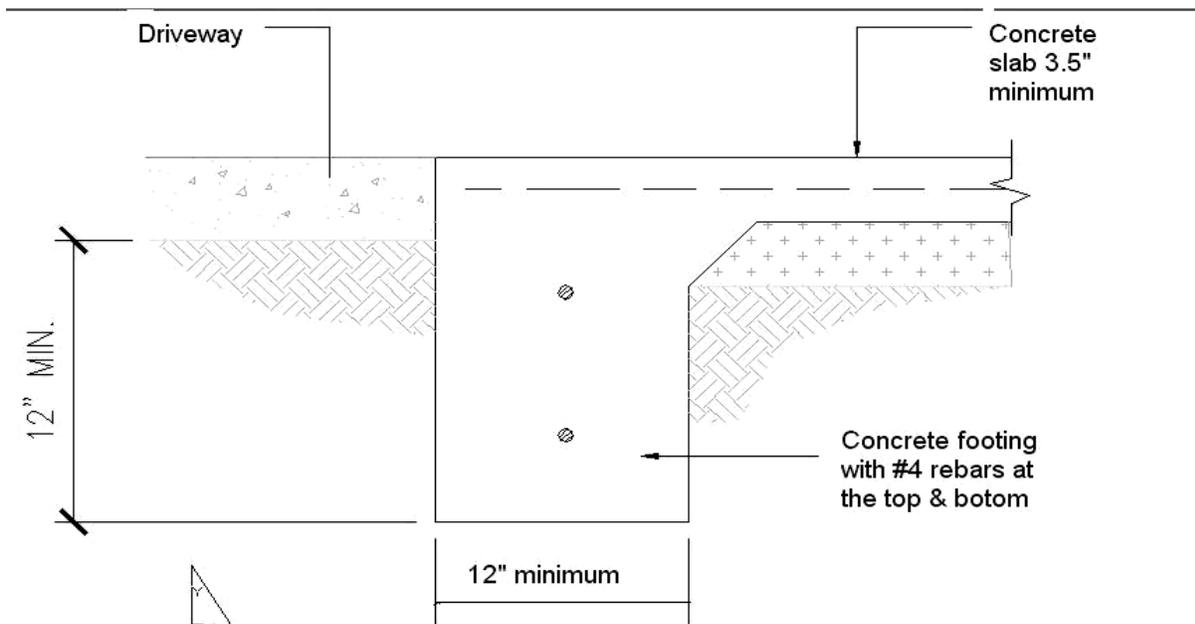


NOTE: Setback varies according to zoning district

VICINITY MAP



FOUNDATION DETAILS



NUMBER OF FLOORS SUPPORTED BY THE FOOTING ^f	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8 $\frac{3}{4}$

- The min. depth of footings **below undisturbed ground surface** shall be 12 “.
- Interior-stud-bearing walls are permitted to be supported by isolated footings. **The footing width and length shall be twice the width shown in this table** and footings shall be spaced not more than 6 feet on center.
- For plain concrete footings supporting Group R-3 occupancies, the edge thickness of the footings is permitted to be 6”, provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.
- The ground under the floor is permitted to be excavated to the elevation of the top of the footing.
- Footings are permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor
- There are additional requirements for footings of structures assigned to Seismic Design Category E. Check Section 1908 of California Building Code.

Concrete foundation walls shall comply with the following:

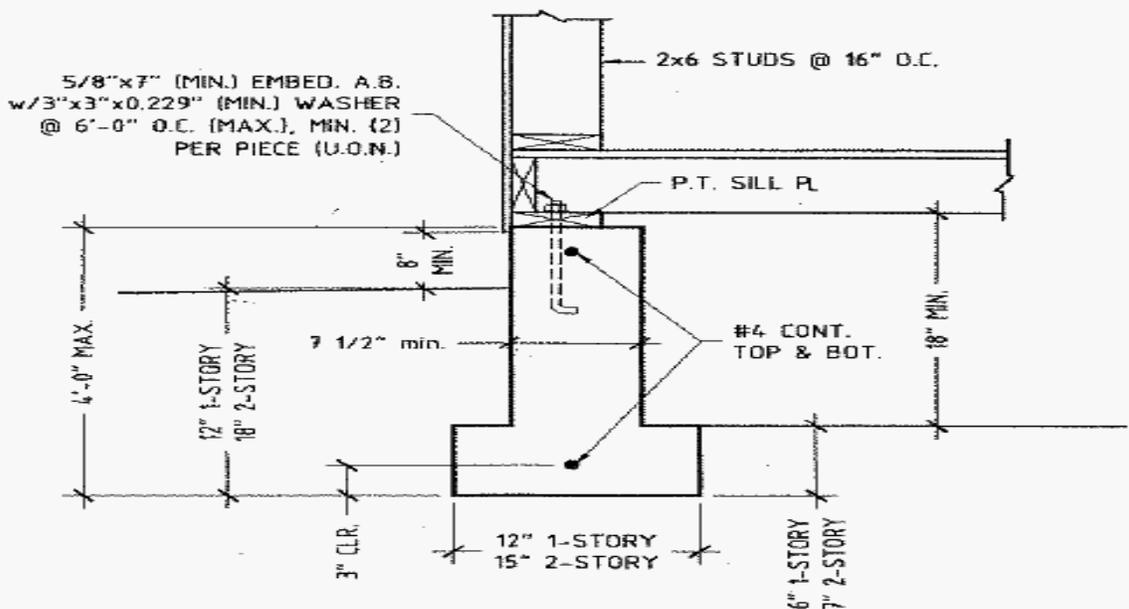
- Minimum width of foundation walls as per CBC-2007 is 7.5 inches. For more information see Section 1805.5.
- **Vertical reinforcement, when required, shall be placed nearest the inside face of the wall (a) with distance (d) from the outside face (soil side) of the wall. The distance (d) is equal to the wall thickness (t) minus 1.25 inches plus one-half the bar diameter (db)**
- **$[d = t - (1.25 + db / 2)]$.**
- The reinforcement shall be placed within a tolerance of $\pm 3/8$ inch where d is less than or equal to 8 inches or $\pm 1/2$ inch (12.7 mm) where d is greater than 8 inches.
- Concrete cover for reinforcement measured from the inside face of the wall shall not be less than 3/4 inch. Concrete cover for reinforcement measured from the outside face of the wall shall not be less than 1.5 inches for No. 5 bars and smaller and not less than 2 inches for larger bars.
- Concrete shall have a specified compressive strength of not less than 2,500 psi at 28 days.

For more information about concrete foundation walls see Section 1805.5.2.1

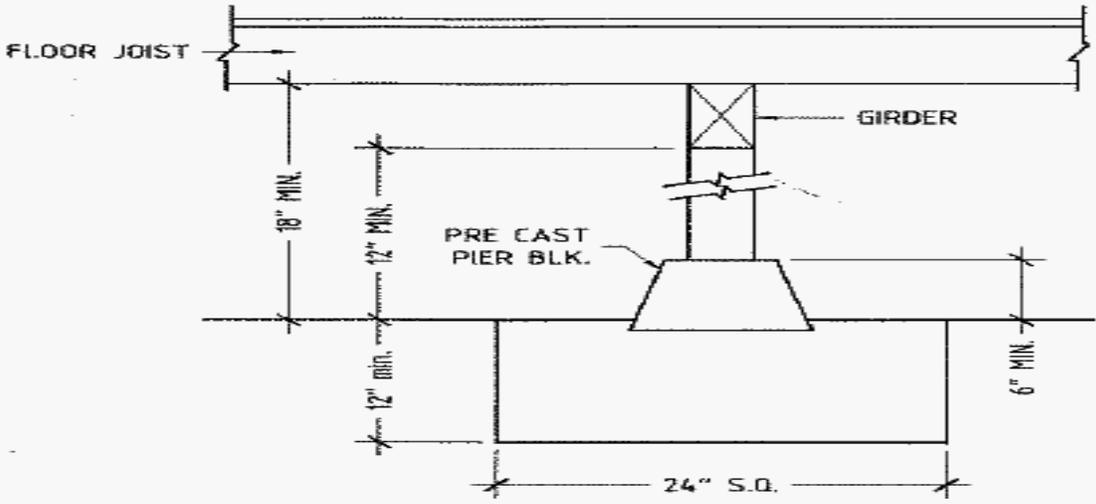
PAY ATTENTION:

- On graded sites, the top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12 inches plus 2 percent. Alternate elevations are permitted subject to the approval of the building official, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on the site.
- The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 % for a minimum distance of 10 feet measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5 % slope shall be provided to an approved alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 % where located within 10 feet of the building foundation. Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 % away from the building.

Typical Perimeter Footing



Typical Interior footing



Stepped footings

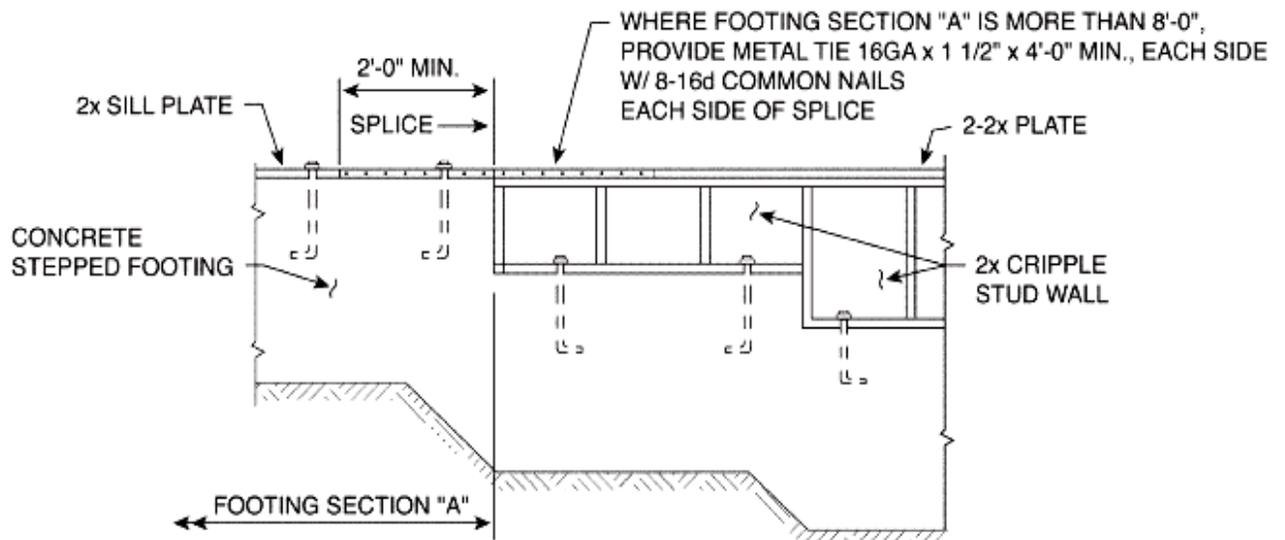
The top surface of footings shall be level. The bottom surface of footings is permitted to have a slope not exceeding 10 % slope. Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than 10 %.

Additional requirements for stepped footings in Seismic areas:

Where the height of a required braced wall panel extending from foundation to floor above varies more than 4 feet, the following construction shall be used:

1. Where the bottom of the footing is stepped and the lowest floor framing rests directly on a sill bolted to the footings, the sill shall be anchored.
2. Where the lowest floor framing rests directly on a sill bolted to a footing not less than 8 feet in length along a line of bracing, the line shall be considered to be braced. The double plate of the cripple stud wall beyond the segment of footing extending to the lowest framed floor shall be spliced to the sill plate with metal ties, one on each side of the sill and plate. The metal ties shall not be less than 0.058" (16 galvanized gage) by 1.5" wide by 48" with eight 16d common nails on each side of the splice location. The metal tie shall have a minimum yield of 33,000 psi.
3. Where cripple walls occur between the top of the footing and the lowest floor framing, the bracing requirements for a story shall apply.

STEPPED FOOTING CONNECTION DETAILS



NOTE: WHERE FOOTING SECTION "A" IS LESS THAN 8'-0" LONG IN A 25'-0" TOTAL LENGTH WALL, PROVIDE BRACING AT CRIPPLE STUD WALL

Placement of buildings on or adjacent to slopes

Building clearance from ascending slopes

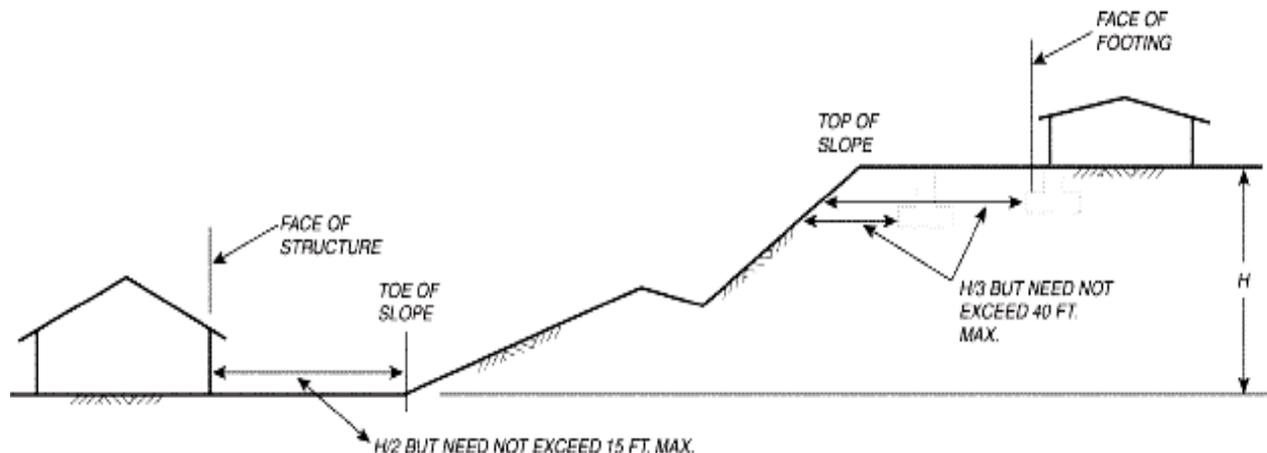
In general, buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Except as provided in the Figure below, the following criteria will be assumed to provide this protection:

Where the existing slope is steeper than 100 %, the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

Footing setback from descending slope surface

Footings on or adjacent to slope surfaces shall be founded in firm material with an embedment and set back from the slope surface sufficient to provide vertical and lateral support for the footing without detrimental settlement. Except as provided for in the Figure below, the following setback is deemed adequate to meet the criteria:

Where the slope is steeper than 1 unit vertical in 1 unit horizontal (100 % slope), the required setback shall be measured from an imaginary plane 45 degrees to the horizontal, projected upward from the toe of the slope.

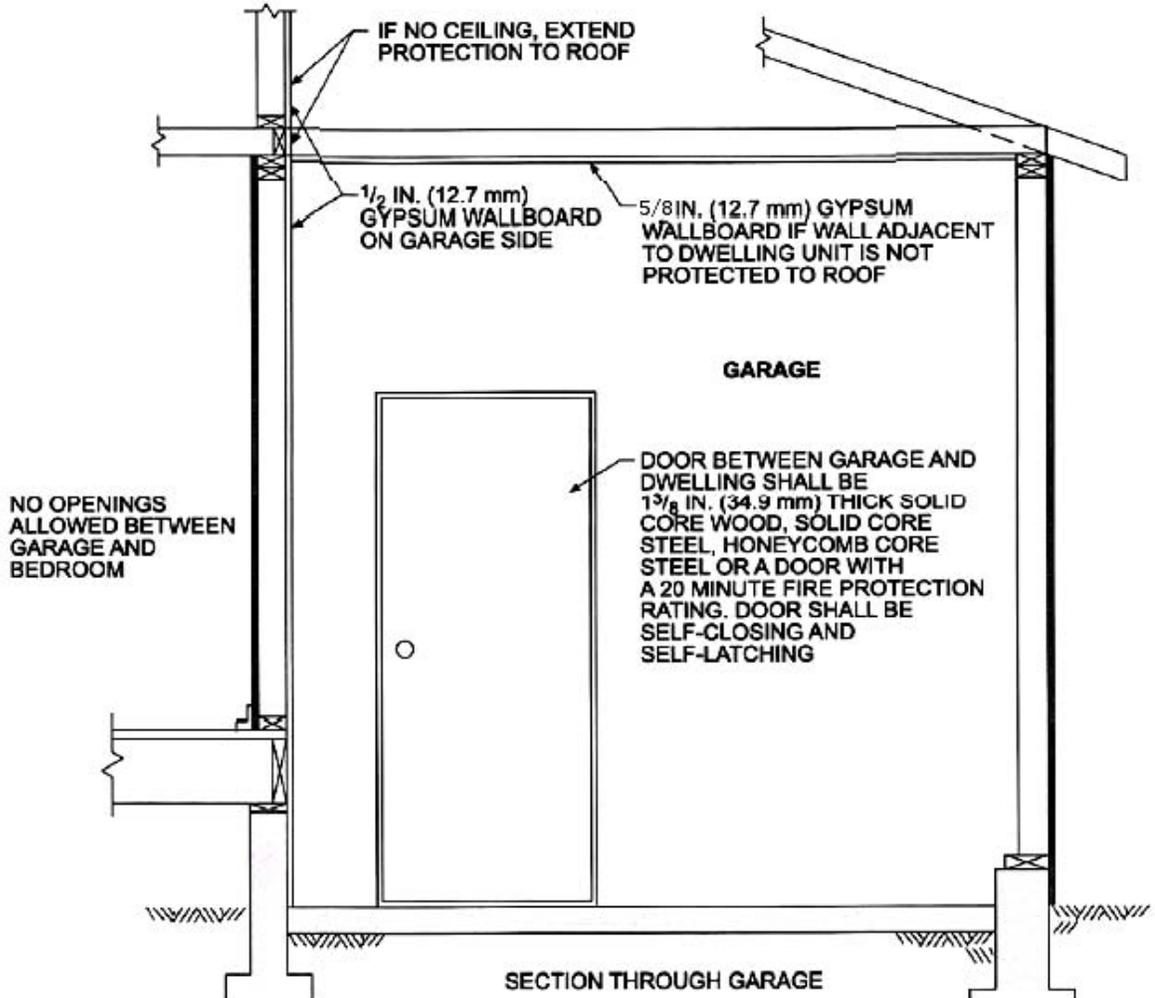


NOTE:

- Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is permitted to require an investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.
- More details for the placement of buildings and structures on or adjacent to slopes steeper than 33% could be found in CBC, Sections 1805.3.1 through 1805.3.5

SEPARATION BETWEEN GARAGE AND DWELLING

$\frac{5}{8}$ IN. (15.9 mm) TYPE X GYPSUM BOARD IS REQUIRED ON CEILING IF THERE IS HABITABLE SPACE ABOVE



Requirements for conventional construction and conventional bracing

The requirements for light-frame conventional construction, including bracing of the buildings and structures (California Building Code - 2007, Section 2308), are totally different than the requirements in the old Uniform Building Code, and seem to be more difficult for understanding. In addition, the terminology, the way for determining the Seismic Design Categories, and the limitations for applying a conventional construction, are not the same, and it makes the entire process (design, drafting and building) not only difficult, but much more expensive, if it is not done right.

Fortuna is in Seismic Design Category “E”, and based on the requirements in the Building Code, the most important for remembering limitation for conventional construction is the height/size of the building - up to two stories. Another important detail - cripple walls with a stud height greater than 14” are considered another story for bracing purposes. It means that two story building with a cripple wall below is considered three story building, and require design by engineer or architect.

Also, irregular structures, even one story, do not meet the requirements for conventional bracing, and need professional design by engineer or architect.

The basic guidelines:

- Show the location, type and length of each braced wall panel on the plans.
- Braced wall panels must start within 8’ of each end of a braced wall line and be spaced maximum of 25’ on center.
- Braced wall panels are a minimum of 4’ in width (one side) for wood or 4’ (both sides) for gypsum or stucco unless an alternate panel is installed.

Note: Height to width cannot exceed 2:1.

- Braced wall lines shall not be spaced more than 25’ (was 34’ in the UBC) on center both longitudinal and transverse directions.
- Braced wall lines shall be sheathed with one type of panel (example: all structural wood or gypsum board), and have the minimum length of sheathing.

For detailed information see the Handout:

“Requirements for conventional construction and conventional bracing”