

DESCRIPTION OF RESIDENTIAL PLANS

Purpose:

The purpose of the following information is to give a general idea of what should be on a set of residential plans and what types of items should be or can be on each portion of a set of plans. There are several types or items of information that can be presented on the plans at different places and in different ways and still be acceptable. Also, some of these items will not be applicable or necessary to put on some sets of plans. The following information is meant only to be a basic guide for plan preparation.

General

Plans and specifications shall be drawn to scale and submitted upon substantial paper, and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of the current codes and all relevant laws, ordinances, rules and regulations.

The owner's name and complete address should be on the plans.

North should be referenced on the plans. At a minimum a North arrow should be shown on the sheet(s) with the floor plan(s).

The person responsible for the plans should sign all plan sheets included with each set of plans. Any sheets that have documentation for which an architect or engineer is responsible shall have the wet stamp and signature of the architect or engineer.

A complete set of plans consists of a plot plan, Title 24 energy compliance documents, a floor plan, an electrical plan (on the floor plan or separately), a foundation plan and foundation details, floor framing (except where the floor is a slab), wall framing, ceiling framing, roof framing, elevations, cross sections as needed, and construction details.

The sizes, grades, and species of all lumber should be indicated on the plans.

Initially, 3 complete sets of plans must be submitted with a permit application. If revisions are required only two sets of revised plans need to be resubmitted.

Plot Plan

A plot plan for a residential submittal should include any of the following items that are applicable: 1) The property owner's name, the site address and the Assessor's parcel number. 2) The legal parcel configuration clearly shown with all property boundaries, dimensions and acreage. 3) Adjacent streets, both public and private, and any access easements. 4) The distance from the centerline of any public/private roadway to the property line. 5) A north arrow. 6) The scale of the plan if possible. 7) All existing structures labeled for their use, with their sizes shown, and their distances from property lines shown. 8) The proposed structure, addition, or work should be identified, and its distances from property lines and buildings should be shown. 9) Driveways and parking areas. 10) Existing and/or proposed septic systems and wells, and their distances from the proposed work. 11) Fences. 12) Retaining walls. 13) Lakes, ponds, or streams and set back(s) to any watercourse. 14) The location of any flood plane or floodway.

Title 24 Energy Compliance Documents

Conditioned (heated or cooled) residential space, and residential lighting is required to meet the current California Energy Efficiency Standards for residential buildings (Title 24 energy requirements). There are requirements for the envelope of the building, which includes the energy efficiency of the windows, insulation, etc. There are requirements for heating and/or cooling, water heating, and lighting for the house, or space under consideration. For residential compliance the primary forms required for plan submittal are the Certificate of Compliance (CF-1R form) and the Mandatory Measures Checklist (MF-1R form). A WS-5R form may also be required for kitchen

lighting if the lighting in the kitchen is not all fluorescent or another type of high efficacy lighting. Other forms may be required however based on the nature of the project. We require that copies of the forms be submitted in an 8 ½ x 11 format separately from the plans, and the forms should also be printed onto plan sheets and included within each set of plans. Typically these documents are done by an energy analyst or energy consultant and are done by the performance method (Done on a computer with California Energy Commission (CEC) approved software.). It is also possible to find information and download forms from the CEC website and do compliance forms yourself by meeting set prescriptive package requirements, however it can be quite challenging if you are not familiar with the process.

We also require that one copy of a CF-6R form be submitted. This is basically an installation certificate for the installation of all applicable items relating to the Title 24 energy compliance documents. The installer fills out each applicable section of the form when an applicable item is installed. The form is then presented to the building inspector prior to the final inspection. Another form that is sometimes required is the CF-4R form, which is required only if it is determined that HERS certification is required. This is for special circumstances, which require testing of ducts, cooling equipment, etc.

All information specified in the Title 24 energy documents should be shown on the plan sheets and the information should be consistent with the energy documents.

General Notes

Putting a list of general notes on a set of plans is an excellent way to specify many code requirements and keep the individual plans less cluttered and easy to read.

Floor Plan

There should be one floor plan that corresponds to each floor or level, including a basement. A floor plan should show/have the following: 1) The location of all walls and the thickness of all walls to scale. 2) The locations and sizes of windows, skylights, and sliding glass doors. 3) The locations, sizes, types, and swings of all doors. 4) The location of the garage, porches, decks, exterior landings, etc. 5) Overall dimensions, and dimensions that locate all walls, openings and features. 6) The location of all rooms, stairs and steps, stair openings, closets, spaces, and features, all labeled for their uses. 7) The locations and sizes of any flues, duct chases, or chimney chases. 8) Kitchen counters, built in cabinets and shelves, etc. 9) All appliances should be shown, i.e. clothes washers, clothes dryers, dishwashers, refrigerators, stoves, cook-tops, garbage compactors, etc. 10) Plumbing fixtures and bathing facilities, i.e. showers, bathtubs, toilets, sinks, whirlpools, hot tubs, etc. 11) The location and type of any water heater, and the method for providing combustion air to any water heater. 12) The location and type of the HVAC system, furnace, or other heating system, if within one of the spaces on the floor plan. The method for providing combustion air to the unit should be shown if applicable. If a furnace or other unit will be in the attic, it can be shown on the floor plan or the roof/ceiling-framing plan. 13) The location of handrails and guards. 14) Often attic accesses are shown on a floor plan; and sometime under floor accesses are shown on the floor plan when access is from the living space. 15) Header sizes can be shown on the floor plan at each opening. They should be shown somewhere on the plans. 16) Window types, i.e. slider, single hung, casement, etc. are either shown on the floor plan or a reference is made for each window on the floor plan with the window type shown in a window schedule. 17) Tempered windows are also shown on the floor plan or in a window schedule. 18) Sometimes beams above openings that support construction above are shown on the floor plan. 19) Sometimes posts that support beams above are shown on the floor plan. 20) Hold-downs and structural straps can sometimes be shown on a floor plan. 21) References to cross section drawings and or other details are often put on the floor plan.

The electrical plan is often included on the floor plan, but is also often done separately for clarity.

Electrical Plan

An electrical plan should show the following (See Article 210 of the current California Electrical Code, or of the current NEC for receptacles and lighting.): 1) The location and size in amps of the Main electrical service, and the location of any sub-panels. 2) The location of all indoor and outdoor lights and lighting controls. The types of lights and lighting controls should comply with the "Lighting Mandatory Measures" in current California Energy

Efficiency Standards shown In the Title 24 energy compliance documents. 3) All indoor and outdoor receptacles. 3) Voltages for any receptacles that are specific to an appliance or other specific use. 4) Receptacles that are required to be protected by Ground Fault circuit breakers (GFI) should be shown as such. (Outdoor receptacles should be shown as waterproof (WP and GFI). 5) All electrical circuits (all outlets including lighting, smoke detectors, receptacles, etc.) in bedrooms should be shown protected by Arc Fault circuit breakers (AFCI). 6) Receptacles should be spaced and located appropriately per code. 7) Smoke detectors at all required locations. 8) Exhaust fans in bathrooms or in a laundry rooms.

Elevations

An elevation is basically a drawing that is to scale that shows what the outside of the structure looks like on a particular side. Elevations are typically labeled for the side of the building that they are on, i.e. East Side. Sometimes labels like Front, Back, Right Side, etc, are used as well. Typically 4 Elevations are provided, one for each direction. Many elevations may be necessary if the building is a more complicated shape. Elevations should show the following: 1) All exterior openings, doors, windows, skylights, gable end vents, other roof vents, etc. (Some times the window and exterior door types are shown on the elevations.) 2) Siding types and roofing types. 3) All porches, decks, balconies, exterior stairs, guardrails, breezeways, etc. 4) Chimneys and chimney heights, if applicable. 5) The approximate contour of the foundation along the grade of the lot. 6) Roof lines for the particular side represented. 7) Roof pitches. 8) Sometimes finish floor levels or things like Base Flood Elevations are shown on the elevations. 9) Sometimes under floor vents and/or under floor accesses are shown.

Some plans will have interior elevations too, but these do not tend to be critical in terms of getting a permit, unless they are used to show some critical code requirement(s).

Foundation Plan and Foundation Details

The following is typical of what is shown on a foundation plan: 1) All continuous bearing footings with their locations and extent defined by dimensions. 2) The width of the continuous bearing footings should be indicated and should be appropriate for the number of floors and roof supported by the footings. 3) The size depth and locations of any pier pad footings supporting floor girders, or roof beams. 4) Any post base hardware. 5) The size, depth, and locations of any footing carrying point loads, from bearing posts for example. 6) If specific footing depths are required at specific locations per a soils report or for some other reason, these should be specified and their locations shown. 7) If stepped footings are required, their locations should be indicated. 8) Foundation details should be referenced. 9) The proper amount of under floor ventilation should be shown, and the method of providing the ventilation. 10) The location of any required 18" x 24" minimum foundation access(es) should be shown, and each individual section of the under floor area that is isolated by a footing or footings should be shown to have access. 11) The method of supporting the floor girders at the perimeter foundation. 12) The sizes and locations of floor girders and deck girders and their spans. 13) Areas with concrete slabs should be indicated, and the thickness and construction of the slab(s) noted. 14) Often a first floor framing plan is shown on the foundation plan. 15) The spacing of anchor bolts. 16) The location of any hold-downs if applicable. 17) For additions, the method of tying in the new footing to the existing footings should be noted. 18) The location of any retaining walls and or basement areas. Deck pier pad footings or any other footings supporting deck members should also be shown on the foundation plan. 19) Any grade beams if applicable.

The following types of foundation details should be shown on the plans corresponding to references made on the foundation plan. 1) Typical footing details for perimeter raised floor footings, and slab footings as applicable. 2) A typical interior pier pad footing detail. 3) Stem wall footing to slab transition details. 4) Post footing details. 5) Drilled pier footings and grade beams if applicable. 6) A typical stepped footing if applicable. This should show pony wall construction. 7) Retaining wall and or basement construction details if applicable (Retaining walls and basements should be engineered).

The following is typical of what is shown on foundation details: 1) The depth, width, and thickness of the footings. 2) The depth below grade of the footings. 3) The thickness of the stem wall. 4) The size, spacing and placement/location of reinforcing steel (rebar). 5) The diameter, the length, and the depth of embedment of the anchor bolts. 6) The size and type of wood for the mudsill. 7) The minimum height from earth to the girders (12") and the minimum height from earth to the joists (18"). 8) Post base hardware can be shown on post base footing

details, deck pier pad footing details, etc. 9) The construction of a slab and any materials below a slab should be part of the slab footing details.

Floor-Framing Plan (Except when the floor is a concrete slab.)

A floor-framing plan should be provided for each floor. The first floor framing plan can be included with the foundation plan. Each floor framing plan should contain the following: 1) The size, grade, and species of all joists, or the size type and model number of manufactured joists. 2) The layout of all joists. 3) The span of all joists should be clear. 4) Solid blocking should be shown over all interior girders, beams, or partitions. 4) Any beams associated with the floor system should be shown. 5) Any hardware used in the floor system should be specified, i.e. joist hangers, beam hangers, straps, etc. 6) Floor openings should be shown, i.e. stair openings, or access openings. 7) Some times the thickness and type of sub-floor is shown on the floor-framing plan, along with its nailing. 8) The framing of any cantilevered floor areas should be clear. 9) Sometimes the first floor roof framing is shown with the second floor-framing plan. 10) References can be made on the plan to construction details that are specific to the locations where the references are made. 11) Deck floor framing is also typically shown on a floor-framing plan.

Wall Framing

Wall framing can be described with notes, can be shown with typical or specific construction details, or shown on a cross section drawing or cross section drawings. The information that should be included on the plans for both interior and exterior walls is: 1) The size and layout of the studs. 2) Bottom plates. 3) Double top plates and the minimum lap of the bottom and top plates at splices (4 ft.). 4) The stud length should be clear or easily determined by looking at the plans. 5) The sizes of all headers over all openings should be specified, over doors, windows, garage doors, and any other types of openings.

Ceiling Framing

Ceiling heights for all rooms should be made clear on the plans. Ceiling framing can be shown on the roof framing plan, can be described with notes, can be shown with typical or specific construction details, or shown on a cross section drawing or cross section drawings. Sometimes the ceiling framing is the same as the upper floor framing. The information that should be included on the plans to describe the ceiling framing is: 1) The size and layout of the ceiling framing at each applicable location. 2) The span of all ceiling joist should be made obvious on the plans. 3) The direction that the ceiling joists run should be made obvious on the plans. 4) Any beams that are a part of the ceiling framing that are not conventionally spanned should be accompanied by engineering calculations justifying their span and their ability to carry the loads on them.

Roof Framing

Typically roof framing is shown on a roof-framing plan. On two-story houses roof framing associated with the first story is often showed on the 2nd floor-framing plan. A roof-framing plan typically includes the following: 1) Any areas that will use engineered trusses should be designated on the plan, and the layout of the trusses should be specified. A note should also be put on the plans stating that the engineering for the trusses will be provided to the building inspector prior to the installation of the trusses. 2) The sizes and layout of all rafters should be shown on the plans. 3) The span of all rafters should be made clear on the plans. 4) Any roof framing that is not conventional such as beam roofs should be engineered, and be accompanied by engineering calculations. 5) Any beams that are a part of the roof framing that are not conventionally spanned should be accompanied by engineering calculations justifying their span and their ability to carry the loads on them. 6) The sizes of the ridge or ridges and valley rafters should be shown. 7) If valley and/or hip rafters are used, their sizes should be shown, and their locations made clear. 8) If there are any California fill areas (roof valleys framed over another roof plane) that are part of the roof framing, a typical California roof framing detail should be provided or the specific framing should be specified, including the sizes of the ridge(s), the rafters, and the sleepers. 9) The size of the overhangs should be made clear. 10) The roof pitches can be specified on the roof-framing plan, although this information can be shown on the elevations, cross sections, or elsewhere. 11.) Roof ventilation and attic access(es) are often shown/specified on the roof-framing plan. 12) For complicated roofs, the over all configuration of the roof should be made clear, either on the roof framing plans, or on a separate plan that just shows the ridges, valleys, hips and overhangs. 13) Often the

roof sheathing and the nail type and nailing pattern to fasten the roof sheathing are shown on the roof-framing plan. 14) Framed openings for skylights are also typically shown on the roof-framing plan. If skylights are used a typical skylight detail should be put on the plans as well.

Cross Sections

A cross section is a side view drawing of the structure along a plane that cuts through the structure. At least the floor plan (but often other plan drawing too) will have a reference that shows the location of the plane represented by the cross section, and the reference will refer you to the cross section that applies, and tell you what page it is on. The more complicated a structure gets, the more useful it is to have multiple cross section drawings. Cross section drawings are great places to show a lot of information. Also, for more complicated structures, they can be used to clarify structural transitions and changes in structural configurations, for example changes in ceiling heights, and floor levels. The following list of items gives examples of the types of information that can be shown on a cross section drawing, but should not be considered an all inclusive list or a required list. 1) A typical foundation detail. 2) Floor, wall ceiling, and roof framing members 3) Sub-floor type and nailing for the sub-floor. 4) Insulation in the floor, walls, and ceiling/roof. 5) The sizes and types of interior wall and ceiling surfaces like sheet rock, wood paneling, tongue and groove pine, etc. 6) Wall and roof sheathing materials, and nailing for the sheathing. 7) Siding and the required vapor barrier under the siding. 8) Mud sills, bottom plates, double top plates. 9) Blocking and venting at the eaves. 10) Roofing and roofing felt. 11) Post base connections at porches, decks or elsewhere. Post to beam connections at porches, decks or elsewhere. 12) A deck or porch construction detail can be included as part of a cross section. 13) Stair construction, stair handrails, and stair guards are sometimes shown on cross sections. 14) Fire blocking. 15) Blocking over girders, beams, or walls.

Construction Details

Construction details are just what they sound like, they provide more detailed picture and more information about the construction at a specific location. Construction details fall into two major categories, typical construction details and specific construction details. Typical construction details are details that represent typical construction per the current building codes, and that represent construction scenarios that are common to most or many projects. These details are also used to show common types of connections, for example post base connections, post to beam connections, etc. Specific construction details represent uncommon, or one of a kind construction scenarios at specific locations in a proposed structure. Any drawing or plan in the set of plans may have a reference at a specific location that refers to a detail, usually showing the detail number and the page on which the detail can be found. Sometimes there is a line to or through the location referenced and represented by the detail; or sometime the location is enclosed by a circle or oval. An arrow pointing to the location works well too.

Some examples of typical details are: 1) Stair construction detail, 2) Wall framing detail, 3) Skylight detail, 4) Eave detail, 5) Perimeter spread footing detail, 6) Perimeter slab footing detail, 7) Stepped footing detail, 8) Slab to spread footing detail. 9) A detail showing the support of a floor girder from the pier pad footing up to the post-to-floor girder connection. 10) Hold down installation.

Some examples of specific construction details are: 1) Site specific retaining walls or foundations. 2) Construction at floor, ceiling, or roof level changes or intersections that are specific to the structure. 3) Drilled pier and grade beam construction. 4) Details critical to the engineer's design that show connections and nailing for the path of load, or for shear transfer.

Some plans contain finish details too. These may be critical to the owner in terms of what the house looks like, but they do not tend to be critical in terms of getting a permit.