

Residential Plan Review Guidelines

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Introduction

The following guidelines, *while not all-inclusive*, are intended to help you prepare residential plans that are essentially “complete”. A complete set of plans allows us to (hopefully) approve them, but even if corrections are needed, a complete plan usually only requires a single set of revisions.

We recommend that you print or copy these guidelines for your use. Comments or questions regarding this document are welcome and will be used to expand and improve the next version.

Before You Design

□ Research your parcel! Many plan review issues center around planning considerations such as building setbacks, building height, drainage easements, airport safety districts, or flood zones. Obtain a copy of the *Subdivision Map*, *Parcel Map*, or *Record of Survey*, as well as the *Grant Deed*. Contact the Planning Dept. and give them your Assessor’s Parcel Number (APN) to learn the *zoning* of the parcel, and the *setback requirements* from property lines and road easements (you can find your APN on your property tax bill). Note that these restrictions generally apply to buildings of all types: dwellings, garages, barns, etc.

□ Consider the physical characteristics of the land and the (above) restrictions prior to finalizing the design and placement of your structure. Even if your parcel is forty acres far from town, or a lot in an established subdivision, proper research *in advance* can save a significant amount of time and money down the road. It is easier to design a building to fit the land than it is to modify the building, move large amounts of earth, or build expensive retaining walls to accommodate a Astock@ plan - the

finished product is usually more desirable as well.

Collect the *design criteria* needed for your building. Depending on the type of structure you are planning, you will need some or all of the following information: seismic (earthquake) zone, wind speed and exposure, soil bearing capacity; snow load, flood zone, and climate zone. Click on [Building Design Criteria](#).

What Should The Plans Look Like?

– The site plan

Minimum scale is *1"=20 feet*.

Show the *entire parcel* - if you have a very large parcel, you may use a reduced scale such as 1:50 or 1:100 as long as the *grading portion* of the site plan is *no smaller than 1:20 scale* (this method would require two drawings).

– The Building Plan

Minimum scale is *1/4" per foot*. Use *ink only* (no pencil on submitted plans).

Provide a *Title Block* on each page that includes the following: *owner=s name and mailing address, job site address, APN (Assessor's Parcel Number), name and (wet) signature of the person preparing the plans* [plans requiring design by a *California-registered Architect or Engineer* must bear the (wet signature) stamp and license number with current expiration date and signature].

The first page of the plans must include a summary of the square footage for each occupancy type (for example: dwelling/1850 s.f.; garage/480 s.f.; deck/240 s.f.; covered porch/48 s.f.)

The first page of the plans must contain a statement that the construction will comply with the [codes in effect](#) at the time your application is accepted.

A California-registered Architect or Engineer is required to prepare, stamp and sign structural calculations and drawings that pertain to the engineered design of a structure.

What Does The Plan Reviewer Look For?

– The Site Plan

Show all *recorded easements* located on the parcel. Show *distances from the proposed structure(s) to all property lines (or nearest edge of road easements)*. Show to scale all *existing or proposed structures* on the property (such as a garage, well, shed, swimming pool, or HVAC equipment). Also show the *septic system location*.

- Show *existing site topography* (prior to grading) using contour lines at 1', 2', or 5' vertical increments. The contour lines must extend a minimum of 20 feet beyond the building site, driveway, or other disturbed area.
- Show the *proposed grading*. This is generally done by using one of two methods: darker, thicker contour lines that overlay the (lighter) existing contour lines; or darker, thicker lines that show cut and fill slopes to scale (the slopes are plotted using a scale). Due to the technical nature of this aspect of the building plans, we recommend that you have a professional (ie: civil engineer, architect, or landscape architect) assist with this portion of your plan preparation.
- Show how storm run-off will be controlled around the proposed structure. If the building site is relatively level, provide *control elevations* along drainage swales, showing that a minimum 1% slope will exist. Note that drainage swales should be located a minimum of five feet from the foundation where practicable, and be rock-lined where the slope exceeds a 1:10 slope (10%).
- Provide a fully-dimensioned driveway profile that includes the following: *elevations* at road edge or top of curb, garage floor, and at each grade break; *percentage of slope* between grade breaks; and *distance* between grade breaks.
- Show how the [California Fire Safe Regulations](#) will be met. Basically, these rules require that driveways be a minimum of *ten feet wide, paved* where the slope exceeds 16%, have *turnouts and turnarounds* at certain locations for fire trucks and other vehicles in the event of a fire. A summary of the Fire Safe Residential Driveway Regulations* can be found in the footnotes at the end of this document.

– The Building Plan

Energy Package

- Determine whether the parcel is in [Climate Zone 12 or 16](#).
- Provide information showing compliance with the *Title 24 Energy Regulations*. Include Form CF-1R and the Mandatory Measures Checklist. The author of the energy documents must sign the package.
- *Window orientation and area* on the energy analysis must match the floor plan (a common error).
- Square footage of the *conditioned area* must match the energy analysis.
- Show all *required energy conservation features* on the plans, or attach the “Mandatory Energy Conservation Requirement” list to the plans
- Show the *R-value* of the floor, walls and ceilings.

Floor Plan

- Provide a fully-dimensioned floor plan for each building level. Label each room or area with its *proposed use* and *dimensions*. Show all doors and windows with *nominal sizes*.

- Show the *fire separation wall* between a garage and adjacent living space. Show a minimum *1-3/8" solid-core, self-closing* door between the two areas. Show sheetrock on the garage side of the fire wall, and type-X on the ceiling of the garage if there is living space above.
- In habitable rooms, the *window area* must be at least *10% of the floor area* (one-half, openable for ventilation), with a minimum of ten square feet. Kitchens may use artificial light.
- In bathrooms and toilet rooms without sufficient natural ventilation, show *mechanical ventilation* that provides a minimum of five air changes per hour.
- Sleeping rooms shall have a window or exterior door for emergency escape. Window sill height shall not exceed *44 inches above floor level*. The window shall have a minimum net openable area of 5.7 feet, with a minimum net *openable width* of 20 inches and a minimum net *openable height* of 24 inches.
- Show *safety glazing in hazardous locations*, such as (generally): any door if the glazing is within 60 inches of the floor; within 24 inches of a door if the bottom of the glass is less than 60 inches above the floor; within 60 inches of the standing surface or drain in a tub or shower enclosure (includes walls); in window panels that are larger than nine square feet and within 18 inches of the floor; any window within five feet of a stairway or landing. [Note that this information has been simplified - the actual *hazardous location section* of the code is *complex* and requires *careful consideration* during the design of the building. See California Residential Code for detailed information].
- *For additions*, show the *existing rooms adjacent to the addition*, including door and window sizes. The plan examiner must determine if the existing room will have sufficient egress, light and ventilation.
- Show a minimum 36" x 36" landing on *each side* of an exterior doorway. Landings must be within 71/2" of the opposing floor surface. Any door (interior or exterior) *must always swing over a floor or landing* (the bottom of the door must be within *one inch* of the landing). Exception: a door may open at the top of an interior stairway, provided the door does not swing over the top step.
- Show a minimum 22" x 30" access to attic areas that have 30" of headroom.
- Show a minimum *42" high guardrail* for walking surfaces, including stairs, more than 30" above the adjacent floor level or grade. Openings in the guardrail cannot allow the passage of a *4" sphere*.
- Show a *handrail* installed on one side of each flight of stairs. A stairway is defined as *four or more risers* (three treads plus an upper floor level equals four risers).

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 example, if the building foundation will be stepped to match an existing slope, this must be shown on each elevation. *Discrepancies between the site plan topography and plan elevations will result in a correction*

comment (a common error).

- For *additions*, you may show elevations affected by the addition only.

Structural - Foundation Plan

- Attach a *Soils Engineering Report* by a licensed Geo-technical Engineer to the approved plans when foundation is to be constructed on disturbed (fill) material.
- Provide a North arrow that matches the building orientation on the site plan.
- Be certain that (properly-sized) *piers are located under concentrated loads such as posts or trimmers supporting load bearing members such as beams or girder trusses*. If the posts are located at an exterior footing, the footing should be widened to the same dimension as the required pier. Note: the omission of piers is the *most common structural error* found on plans and during framing inspections, and is a serious oversight.
- If there are *hold-downs* (seismic anchors), provide a *hold-down schedule* on foundation plan.
- Note on plan that all hold-downs are to be fastened in place *prior* to foundation inspection.
- For building sites steeper than a 1:10 slope (10%), provide a *stepped footing detail* (cross section).
- Show all foundation elements in plan view, including interior footings and piers, if applicable.
- 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. Note that walls exceeding *48 inches* from the bottom of the footing to the top of the wall must be engineered, *and* designed or approved by the Engineer or Architect of Record, if applicable.
- For slab-on-grade construction, show *type* of slab reinforcement. Also show *vapor barrier* if it is a habitable area. Be sure that the reinforcement type installed matches the plan engineering (a common error).

Structural - Floor-framing Plan

- Show minimum underfloor ventilation of 1 sq. ft. per 150 sq. ft. of floor area with *cross-ventilation*.
- Show minimum *18" clearance* from grade to the bottom of floor joists (minimum 12" for girders).
- Show the *type, size, and spacing* of girders and floor joists. If manufactured joists are used, show

the joist *series* and live-load deflection used. Note that floor joists must be spaced no further apart 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 brick hearths, rock work, wood stoves, gas stoves, and so forth.

Structural - Framing Plan

- Show all header/beam locations and sizes. Note that beam sizes must match the project engineering (a common error).
- Show method of bracing the structure. Provide fastener size and spacing for shear walls or braced wall panels.
- Provide one or more typical *cross-sections* clearly showing how the structure will be constructed. Provide *close-up details* to clarify specific connections or other special framing.
- If a deck is to be built, provide a *deck framing plan* with a typical cross-section.

Structural - Roof-framing Plan

- If the roof consists of *engineered trusses*, provide *two sets of wet-stamped and signed truss drawings*. If there is an *Engineer or Architect of Record*, that individual must *review* the truss drawings and state (in writing) that the truss drawings are compatible with the building design (a common error).
- For *engineered trusses*, show hardware used to fasten truss to top plate (toe-nailing not permitted).
- Show the *thickness and span rating* of the roof sheathing (for example: 5/8" 24/16 plywood).
- Show minimum attic ventilation of 1 sq. ft. per 150 sq. ft. (1/150) of attic area.. If the ventilation is evenly-divided between high and low (eaves), the area may be reduced to 1/300.
- For conventional (non-engineered) site-built roofs, show rafter size, grade, and spacing. Show wall ties (not collar ties) a minimum of 48" on center.

Electrical Plan

- The electrical plan may be included on the floor plan if sufficient clarity is retained.
- The electrical plan must include the location of the *service panel* and its rated *ampacity* (ie- 125

amps, 200 amps, etc.). Show all *outlets, switches, light fixtures* and *smoke detectors*. Label any 220-volt outlets. Label all required *GFCI* (ground fault interrupter circuit) outlets. Low-voltage wiring and components such as phone jacks, TV, and security systems may be omitted.

- Show the *locations* of all required *smoke detectors*.
- Note on the plans that *smoke detectors shall be audible in all sleeping areas* (for large or multi-story structures, this normally requires *inter-connection* of the detectors so that all detectors activate during a fire). Smoke detectors shall receive their primary power from the building wiring and shall be equipped with battery back-up.
- Outlets must be located in such a manner that no point along a wall is more than *six feet* from an outlet (each doorway starts a new wall area). A wall is defined as an area *two feet* wide.
- All kitchen counter top outlets must be GFCI-protected and be spaced no more than *four feet* apart. Counter top spaces *12 inches* wide must have an outlet.
- Outlets located in the following locations must be GFCI-protected: garages, carports, underfloor areas, bathrooms, exterior locations, and at wet bar counter tops.
- Three-way light switches* must be located at the top and bottom of each stairway.
- To meet Title 24 Energy requirements, show that general use lighting in bathrooms and kitchens will be *high efficiency* (minimum 40 lumens per watt).

Mechanical Plan

- The mechanical plan may be included on the floor plan if sufficient clarity is maintained.
- Show all gas appliance *locations* with the *rated BTU* (input) of each device.
- Show where the gas piping enters the building and the *length* and *size* of all piping. Specify the *type of gas* to be used (propane or natural gas). Note that sizing gas piping can be complex - we recommended that your gas supplier, licensed installer, or other qualified professional calculate the gas piping sizes. Note that *undersized piping can create an unsafe condition*.
- Show how gas appliances in confined spaces will receive *combustion air*. Note the *size* and *location* of the openings. Again, *undersizing combustion air openings can create an unsafe condition*.
- Show the *size* and *location* of the vent (flue) from each appliance.
- If a water heater is located in the garage, show the burner assembly located a minimum of *18"* above the floor. Show approved *seismic bracing* for all water heaters. Note that gas water heaters *cannot be located in a bedroom or bathroom*, or gain access through that room.

Glossary:

Airport Safety District: The area identified by the *airport comprehensive land use plan* that is subject to airport safety regulations. Building projects located within these districts activate the requirement that an *aviation and noise easement* be granted to the county via the Planning Department. This easement grants the right of flight and the right to cause noise, light, and other effects associated with the operation above the subject property.

Conditioned Space: An area, room or space normally occupied and being heated and cooled by equipment for human habitation.

Easement: An interest granted by deed, or created by will, deed or prescription that is held by one person in land owned by another person. An easement entitles its holder to a specific, limited use or enjoyment - such as the right to cross the land.

Flood Zone: An area of special flood hazard as shown on the Flood Insurance Rate Map (FIRM) and subsequent maps modified by the Federal Emergency Management Agency (FEMA). Building projects located on parcels within or partially within a flood zone must comply with special requirements that are administered by the Planning Dept.

Habitable Space: An area used for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, hallways, storage spaces, and similar areas are not considered habitable space.

R-Value: The resistance of a material or building component to heat flow - the higher the number, the more slowly heat travels through the material. Also known as thermal resistance.

Setback: The open space required between a structure and a property line or road easement, as required by the county *zoning plan*. The distances vary depending on several factors, including: the *zone district*; the orientation to the road serving the parcel (ie: front, side or rear); and adjacent property zoning.

Topography: A graphic, detailed representation of the physical features (both natural and man-made) of the surface of the land.

Window Orientation: The direction the window faces. This is an important factor in calculating building *heat gain* during the summer months.

Zoning: Refers to the county's *zoning plan*, which consists of various districts within the unincorporated area of the county. This plan (basically) regulates the following: the type, height and size of buildings that may be erected, altered or maintained; the types of trades or occupations that may be carried on; certain uses of the land or buildings; and the creation and maintenance of certain open spaces around buildings.