



YOLO COUNTY
Building Inspection Division

PLAN REVIEW GUIDELINES

FOR

SINGLE FAMILY DWELLINGS

AND

ADDITIONS TO DWELLINGS

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, 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 "stock" 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; flood zone, and climate zone.

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).
- 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) 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 sq. ft.; garage/480 sq. ft.; deck/240 sq. ft.; covered porch/48 sq. ft.)
- 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, *currently* the following: 2007 California Building Code;

2007 California Plumbing Code; 2007 California Mechanical Code; 2007 California Electrical Code; 2007 California Fire Code;

- 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 5% 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.

➤ The Building Plan

Energy Package

- Yolo County is in *Climate Zone 12*.
- Provide information showing compliance with the *Title 24 Energy Regulations*. Include Form CF- 1R and the Mandatory Measures Checklist. Additions may qualify for a short-form available from the Building Department. 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 1/2” type-x sheetrock on the garage side of the fire wall, 5/8” type “x” on the ceiling of the garage if there is living space above, or if the attic is continuous between the garage and adjacent living space.
- Required window area for natural light shall be not less than 8 percent of floor area of a room used for human habitation, or artificial light that is adequate to provide an average illumination of 10 foot candles over the area of the room at a height of 30 inches above the floor level. (CBC 1205.2 & 1205.3) 4 percent of the floor area in occupied spaces shall be able to open for ventilation (CBC 1203.4.1)
- Baths require openable windows 4 percent of the occupied area or mechanical ventilation to outside a minimum of 5 cubic feet per minute. (CMC 402.2.1 & T-4-1)
- Provide each bedroom and/or basement with a minimum of one exterior window with a 44” maximum sill height, 5.7 sq. ft. minimum clear openable area (minimum 5.0 sq. ft. at grade floor openings), 24” minimum clear openable height and 20” minimum clear width, or an openable exterior exit door (CBC 1026).
- The following areas shall have safety glazing: (CBC 2406.3)
Sliding /swinging glass doors
 - Glazing in shower/tub/sauna compartments less than 60 inches above the standing surface
 - Glazing within a 24” arc of a door that is less than 60 inches above the floor
 - Glazing where the exposed area is greater than 9 sq. ft., bottom is less than 18” and at least 36” above the floor, and adjacent to a walking surface
 - Within 60” of the bottom tread of a stairway and less than 60” above the floor
 - Glazing in guards and railings
 - Glazing adjacent to stairways, landings, and ramps within 36” horizontally of the walking surface less than 60” above the floor

- *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 7 ¾" as long as the door is not an egress door 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 20" x 30" access to attic areas that have 30" of headroom.
- Guards shall be 42" minimum height (unless acting as a handrail guards for a stairway; the guard height may be 34"-38" in height), with openings less than 4.375" clear (CBC 1013.2)
- Stairways with 3 or more risers shall have a handrail on one side 34" to 38" above the tread nosing (CBC 1012.2). Circular handrails shall have an outside diameter of 1.25"-2"; if not circular, it shall have a perimeter dimension of 4"-6.25" with a maximum cross sectional dimension of 2.25". (CBC 1012.3) A minimum clearance of 1.5" shall be maintained from the wall or other surface. (CBC 1012.6)

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.
- 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* to 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*. A summary of California Building Code Sec. 907.2.10.1.2 can be found in the footnotes at the end of this document.
- Note on the plans that *smoke detectors shall be audible in all sleeping areas* (for large or multistory 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.
- Outlets located in the bedrooms must be arc-fault protected.
- *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 interior and exterior 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*.
- 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:

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 Building Inspection Division.

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.

***Summary of California Building Code Sec. 907.2.10.1.2:*

Smoke alarms shall be installed (CBC 907.2.10.1.2):

- In each room used for sleeping purposes.
- Outside of each separate sleeping area in the immediate vicinity of bedrooms.
- In each story, including basements.
- Alterations, repairs, or additions exceeding 1,000 dollars. (may be battery operated)

An approved interior alarm device shall be installed and interconnected with all smoke detectors to be clearly audible in all bedrooms over background noise levels with all intervening doors closed. (CBC 907.2.10.3)

All smoke detectors in new construction shall be hardwired with a battery backup. (CBC 907.2.10.2)

Group R-3 occupancies shall have automatic sprinkler systems installed in accordance with NFPA standard 13D. An approved interior alarm device shall be installed and interconnected with all smoke detectors.