TYPICAL SINGLE- STORY FRAMING DETAILS

**Roof**
- Rafters
  - 45° min
- 2x ridge not less in depth than the cut end of the rafters
- 1x4 minimum rafter ties at 48" o.c. maximum
- R-30 insulation (or as per energy calculations)

**Purlins and braces per the Conventional Construction Provisions. Purlins must be the same size as the roof rafters.**

**Ceiling Joists**
- 7'-6" min ceiling height (7'-0" at kitchen, halls, and bathrooms)

**Floor Joists**
- Joist under and parallel to bearing partitions shall be double with max offset depth of joist.
- 6" min
- 8" to floor girders
- 18" min to floor joists
- Positive connection with tie at splice required
- R-19 min

**Floor Girder**
- Undisturbed Natural Grade
- 6" min
- Pressure-treated Sill Plate

**Cripple walls less than 14" shall be framed of solid blocking.**

**ALLOWABLE SPAN FOR DR#2 HEADERS**

<table>
<thead>
<tr>
<th>SIZE OF HEADER</th>
<th>MAXIMUM SPAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 X 4</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>4 X 6</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>4 X 8</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>4 X 10</td>
<td>10'-0&quot;</td>
</tr>
<tr>
<td>4 X 12</td>
<td>12'-0&quot;</td>
</tr>
<tr>
<td>4 X 12 DF#1</td>
<td>May be used over 16'-0&quot; garage door opening on one-story attached or detached garages</td>
</tr>
</tbody>
</table>
TYPICAL ROOF-CEILING FRAMING DETAILS

1. Roof sheathing shall be of 3/8" in thickness and have a panel span rating of not less than 24/0.
2. All plywood edges shall be nailed with 6d nails for plywood thickness at 1/2" or less; or with 8d nails for plywood of greater thickness at 6" o.c. At all panel edges supported by roof framing members and at 12" o.c. at intermediate supports.
3. Top plates shall be end nailed in studs with 2-16d nails.
4. Double top plates shall be face nailed with 16d nails with 16d nails at 16" o.c.
5. Top plate laps and intersections shall be faced nailed with 2-16d nails.
6. Roof rafters and ceiling joists shall be toe nailed to the top plate with 3-8d nails.
7. Ceiling joists shall be face nailed to roof rafters with minimum 3-16d nails.
8. Ceiling joists laps over partitions shall be face nailed with 3-16d nails.
MECHANICAL VENTILATION
compartments, laundry rooms, and similar rooms. [1203.3]
with an area of not less than 1/20 of the floor area of such rooms with a
provided with natural ventilation by means of openable exterior openings
formed by the stair treads. [509]

LIGHT AND VENTILATION
GENERAL. For the purpose of determining the light and/or ventilation
requirements, any room may be considered as a portion of an adjoining
room when half of the area of the common wall is open and unobstructed
and provides an opening of not less than 1/10 of the floor area of the
interior room of 25 sq. ft., whichever is greater. Required windows may
open into a roofed porch where the porch cover has a height of not less
than 7' and has the longer side at least 65 percent open and unobstructed.
[1203.1]
NATURAL LIGHT. All habitable rooms within a dwelling shall be provided
with natural light by means of exterior glazed openings with an area not
less than 1/10 of the floor area of such rooms with a minimum of 10 sq. ft.
[1203.2]
NATURAL VENTILATION. All habitable rooms within a dwelling shall be
provided with natural ventilation by means of openable exterior openings
with an area of not less than 1/20 of the floor area of such rooms with a
minimum of 5 sq. ft. or a minimum 1-1/2 sq. ft. in bathrooms, water closet
compartments, laundry rooms, and similar rooms. [1203.3]
MECHANICAL VENTILATION. In lieu of required exterior openings for
natural ventilation in bathrooms containing a bathtub or shower or
combination thereof, and similar rooms, a mechanical ventilation system
connected directly to the outside capable of providing five air changes per
hour shall be provided. The point of discharge of exhaust air shall be
at least 3' from any opening into the building. Bathrooms which contain
only a water closet or lavatory or combination thereof, and similar rooms
may be ventilated with an approved mechanical recirculating fan or similar
device designed to remove odors from the air. [1203.3]

EXITS AND EMERGENCY ESCAPES
Every sleeping room shall have at least one operable window or door
approved for emergency escape or rescue which shall open directly into a
yard or exit court open to the sky. The window or door shall be operable
from the inside to provide a full clear opening without the use of separate
tools. All escape or rescue windows shall have a minimum net clear
operable area of 5.7 square feet. The minimum net clear operable height
dimension shall be 24". The minimum net clear operable width dimension
shall be 20". When windows are provided as a means of escape or
rescue, they shall have a finished sill height not more than 44" above the
floor. [310.4]

GUARDRAILS
All unenclosed floor and roof openings, open and glazed sides of landings
and ramps, balconies or porches which are more than 30" above grade or
floor below, and roofs used for other than service of the building shall be
protected by a guardrail. Guardrails shall be not less than 36" in height.
Open guardrail and stair railings shall have intermediate rails or an
ornamental pattern such that a sphere 4" in diameter cannot pass through,
except that a 6" diameter sphere may occur at the triangular portion
formed by the stair treads. [509]

DOORS
OPENING SIZE. At least one exit door shall be of a size as to permit the
installation of a door not less than 3'-0" in width and not less than 6'-8" in
height. [1003.3.1.3]
SWING REQUIREMENTS. When doors swing out over a landing, the
landing shall not be lower than 1" below that of the door threshold. A door
may open at the top step of an interior flight of stairs or at a landing which
is not more than 8" lower than the floor level, provided the door does not
swing over the top step of landing. When doors swing over a landing, the
landings shall have a dimension in the direction of travel of not less than
the width of the door or landing but need not exceed 36" (36" x 36" min).
[1003.3.1.6]
HEATING
Every dwelling shall be provided with heating facilities capable of
maintaining a room temperature of 70° Fahrenheit in all habitable rooms.
[310.11]

PROJECTIONS
Projections which extend into the 3' setback between the structure and
the property line, or other structures, including eaves, shall be 1-hour fire-
resistive construction. Eaves shall be not less than 24" from property
lines and eaves over required windows shall be not less than 30" from
property lines. [705]

STAIRS
GENERAL. Every stairway having two or more risers shall conform to the
following requirements:
WIDTH, RISE, RUN, AND HEADROOM. Stairways shall be not less than
36" in width. The rise of every step in a stairway shall be not less than 4"
or not greater than 8". The run shall be not less than 9". Every stairway
shall have a headroom clearance of not less than 6'-8". Such clearance
shall be measured vertically from a plane parallel and tangent to the
stairway tread nosing to the soffit above at all points. [303.3.3.3.3.4]
LANDINGS. Every stairway landing shall have a dimension measured in
the direction of travel equal to the width of the stairway, but need not
exceed 44" when the stair has a straight run. [303.3.3.5]
HANDRAILS AND GUARDRAILS. Interior and exterior stairways having
four or more risers shall have handrails on at least one side. Stairways
30" or less in height may have handrails on one side only. Stairways
open on one or both sides shall have guardrails on the open side or sides.
The handgrip portion of handrails shall be not less than 1-1/4" or more
than 2" in cross-sectional dimension. Handrails projecting from a wall
shall have a space of 1-1/2" between the wall and the handrail. The top
of handrails and guardrails at open sides of stairs shall be placed not less
than 34" or more than 38" above the nosing of treads and landings. Ends
shall be returned or shall terminate in newel posts or safety terminals.
[509, 1003.3.3.6]
MISCELLANEOUS. Enclosed usable space under stairs shall be
protected on the enclosed side, as required, for 1-hour fire-resistive
construction. [303.3.3.9]

DWELLING/GARAGE SEPARATION
Walls and ceilings completely separating the dwelling from an attached
garage or a carport enclosed on three or more sides may be limited to the
installation of materials approved for 1-hour fire-resistive construction
(5/8" Type "X" gyp-board or 7/8" stucco) on the garage side, openings into
dwelling shall have a self-closing, tight-fitting solid wood door 1-3/8" in
thickness, or a self-closing tight-fitting door having a fire protection rating
of not less than 20 minutes. Fire dampers need not be installed in air
ducts passing through the wall, floor, or ceilings separating Group R,
Division 3 occupancy from a Group U occupancy, provided such ducts
within the Group U occupancy are constructed of steel having a thickness
not less than 0.019". Under no circumstances shall a private garage have
any openings into a room used for sleeping purposes. [302.4, 312.4]
SMOKE DETECTORS

POWER SOURCE. In new construction, required smoke detectors shall receive their primary power from the building wiring when such wiring is served from a commercial source and shall be equipped with a battery backup. The detector shall emit a signal when the batteries are low. The wiring shall be permanent and without a disconnecting switch other than those required for over current protection. Smoke detectors may be battery operated when installed in existing construction in buildings which undergo alterations, repairs, or additions or in buildings without commercial power. [310.9.1.3]

LOCATION WITHIN DWELLING UNITS. In dwelling units, a detector shall be installed in each sleeping room and at a point centrally located in the corridor or area giving access to each separate sleeping area. When the dwelling has more than one story and in dwellings with basements, a detector shall be installed on each story and in the basement. In dwelling units where a story or basement is split into two or more levels, the smoke detector shall be installed on the upper level, except that when the lower level contains a sleeping area, a detector shall be installed on each level. When sleeping rooms are on an upper level, the detector shall be placed at the ceiling of the upper level in close proximity to the stairway. In dwelling units where the ceiling height of a room open to the hallway serving the bedrooms exceeds that of the hallway by 24" or more, smoke detectors shall be installed in the hallway and in the adjacent room. Detectors shall sound an alarm audible in all sleeping areas of the dwelling unit in which they are located. [310.9.1.4]

ACCESS OPENINGS

UNDERFLOOR AREAS. Accessible underfloor areas shall be provided with a minimum 18" by 24" access opening unobstructed by pipes ducts and similar construction. All underfloor access openings shall be effectively screened or covered, pipes, ducts, and other construction shall not interfere with accessibility to or within under floor areas. [2306.3]

ATTIC WARM-AIR FURNACE. An attic space in which a warm-air furnace is installed shall be accessible by an opening and passageway as large as the largest piece of the furnace and in no case less than 30" by 30" continuous from the opening to the furnace and its controls. The distance from the passageway access to the furnace shall not exceed 20' measured along the centerline of the passageway. The passageway shall be unobstructed and shall have continuous solid flooring not less than 24" wide from the entrance opening to the furnace. [UMC 307.3, 4]

ROOFING [UBC Chapter 15]

ASPHALT SHINGLES. Asphalt shingles require a minimum roof slope of 4:12 and one layer of Type 15 felt underlayment. The slope may be reduced to 2:12 provided the shingles are an approved self-sealing type or are hand-sealed and installed over two layers of Type 15 felt underlayment applied shingle fashion. Wood Shingles. Wood shingles require a minimum slope of 3:12.

WOOD SHAKES. Wood shakes require a minimum roof slope of 4:12, but the slope may be reduced to 3:12 when installed over Type 15 felt underlayment.

SLATE SHINGLES. Slate shingles require a minimum roof slope of 2:5:12. Where the slope is less than 3:12, 3-ply minimum built-up roofing is required as underlayment. When the slope is 3:12 or greater, one layer of Type 30 felt underlayment or one layer of heavy-duty felt underlayment is required.

CLAY OR CONCRETE TILE. Clay or concrete roofing tile require a minimum slope of 4:12 with one layer of Type 30 felt underlayment.

ROOF DRAINS. Unless roofs are sloped to drain over roof edges or are designed to support accumulated water, roof drains shall be installed at each low point of the roof. Roof drains shall be adequate in size to convey the water tributary to the roof drains. Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2" above the top point of the roof, or overflow scuppers having three times the size of the roof drains may be installed in adjacent parapet walls with the inlet flow line located 2" above the low point of the adjacent roof and having a minimum opening height of 4". Overflow drains shall be connected to drain lines independent from the roof drains. [1506.2, 3] Note: Class "A" roof required in high fire exposure zones. All roofs shall be class "C" minimum.

MISCELLANEOUS

PROPERTY LINE CONSTRUCTION. Walls closer than 3'-0" to the property line shall be 1-hour fire-resistive construction and shall have no openings. A 30" high parapet is also required if the building floor area exceeds 1,000 square feet on any floor. Exterior garage and carport walls closer than 3'-0" to the property line may be protected on the exterior side only with materials approved for 1-hour fire-resistive construction. Exterior stairways shall not be located closer than 3'-0" to the property line. [T-5-A, 503.2.1, 705, 709.4, 1204]

SHOWERS. Showers shall have a smooth, hard, nonabsorbent surface such as ceramic tile or other approved material to a height of no less than 70" above the drain inlet. Glazing in shower and bathtub doors and enclosures shall be safety glazing. Hinged shower doors shall open outward. [UPC 408.6, 412.7]

WATER CLOSETS. Each water closet stool shall be located in a clear space not less than 30" in width and have a clear space in front on the water closet stool of not less than 24". [2904]

WATER HEATERS. No furnaces/water heater which depends on the combustion of fuel for warm-air furnaces/heat shall be installed in any room use door designed to be used for sleeping purposes, for a bathroom, for a clothes closet, or other confined space opening into any bathroom or bedroom. All water heaters shall be strapped for lateral support. [UPC 507.3, T-5-1, 509, 510.5, 511, UMC 303.1.3]

DOMESTIC CLOTHES DRYERS. Domestic clothes dryer shall be exhausted to the outside if in an area that is habitable or containing other fuel-burning appliances. Moisture exhaust ducts shall not terminate beneath the building or in the attic area, and shall not exceed a total combined horizontal and vertical length of 14'-0", including two 90 degree elbows. Two feet shall be deducted for each 90-degree elbow in excess of two. Duct shall be a minimum 4" diameter smooth metal. [UMC 504.3 & 908]

APPLIANCES INSTALLED IN GARAGES. Appliances installed in garages, or other areas where they may be subjected to damage shall be suitably guarded against such damage by being installed behind protective barriers or by being elevated or located out of the normal path of vehicles. Heating and cooling equipment located in a garage and which generates a glow, spark, or flame capable of igniting flammable vapors shall be installed with pilots and burners or heating elements and switches at least 18" above the floor level. [UMC 308, UPC 510, UBC 302.4]

GARAGE FLOOR. In areas where motor vehicles are stored or operated, floor surfaces shall be of noncombustible materials or asbestos paving materials. [312.5]

FIREPLACES. Every chimney shall be listed by an approved test agency and extend a minimum of 2'-0" above the highest point of the roof within 10'-0" of the chimney. Spark arrestors shall have a net opening a least four times that of the chimney. All terminations shall be manufacturer approved. [3102.3.6, T-31-B]

SAFETY GLAZING. All glazing in hazardous locations shall be identified with a permanent label for safety glazing. [2406.2]

WEATHER-RESISTIVE BARRIERS. All weather-exposed surfaces shall have a weather-resistant barrier to protect the interior wall covering. Building paper and felt shall be free from holes and breaks other than those created by fasteners and shall be applied over studs or sheathing of all exterior walls. Such felt or paper shall be applied weatherboard fashion, lapped not less than 2" at horizontal joints and not less than 6" at vertical joints. Plywood wall sheathing shall be covered by two layers of Grade "D" paper. [1402, 2506.4]

DRAINAGE. Provisions shall be made to ensure that all drainage from new impervious area is taken to an approved drainage course without draining on to or across adjacent properties. Drains into the public way shall be cast-iron and approved by the City Engineer. [1804.7]
INTERNAL VENTILATION. Under-floor areas shall be ventilated by opening not less than 1/150 of the space to be vented. Attic vents shall be provided with corrosion-resistant metal mesh (openings 1/4" max). Vents shall have openings at least 1/150 of the space to be vented.

CONVENTIONAL CONSTRUCTION PROVISIONS

FLOOR JOISTS. Joists shall not have less than 1-1/2" of bearing on wood or metal. Joists shall be supported laterally at the ends at each support by solid blocking, except where ends of joists are nailed to a header or rim joist. [2320.8]

FOUNDATION CRIPPLE WALLS. Cripple walls shall be secured with a minimum thickness of 3" with at least a 22" x 30" opening at a readily accessible location. [1505.1]

ACCESS VENTILATION. Access vents shall be provided with corrosion-resistant mesh (openings 1/4" max). Vents shall have openings at least 1/150 of the space to be vented.

GENERAL CONSTRUCTION REQUIREMENTS

UNDER-FLOOR CLEARANCE. When wood joists are located closer than 18" or wood girders are located closer than 12" to exposed ground in crawl spaces or unexcavated areas located within the periphery of the building foundations, the floor assembly, including posts, girders, joists, and subfloor, shall be approved wood of natural resistance to decay or treated wood. [2306.3]

FOUNDATION VENTILATION. Under-floor areas shall be ventilated by openings in the exterior foundations walls. Such openings shall have a net area of not less than 1 square foot for each 150 square feet of under-floor area. Openings shall be located as close to corners as practical and shall provide cross ventilation. The required area of such openings shall be approximately equally distributed along the length of at least two opposite sides. They shall be covered with corrosion-resistant wire mesh with mesh openings of 1/4" in dimension. [2306.7]

FOUNDATION PLATES AND SILLS BOLTING

Wood sill plates or sills shall be bolted to the foundation or foundation wall. Steel bolts with a minimum nominal diameter of 5/8-inch shall be embedded at least 7 inches into concrete or masonry and shall be spaced not more than 6 feet apart. There shall be a minimum of two bolts per piece with one bolt located not more than 12 inches or less than 7 bolt diameter from each end of the piece. [1806.6] Each anchor bolt shall be installed with a plate washer of a minimum 2-inch by 2 inch by 3/16 thick. [1806.6.1, No. 2]

GIRDERS ENTERING CONCRETE WALLS. Ends of wood girders entering concrete walls shall be provided with a 1/2" air space on tops, sides, and ends unless approved wood of natural resistance to decay or treated wood is used. [2306.6]

WOOD AND EARTH SEPARATION. Wood used in construction of permanent structures and located nearer than 6" to earth shall be treated wood or wood of natural resistance to decay. Where located on concrete slabs placed on earth, wood shall be treated wood or wood of natural resistance to decay. Where not subject to water splash or to exterior moisture and located on concrete having a minimum thickness of 3" with an impervious membrane installed between concrete and earth, the wood may be untreated and of any species. [2306.8]

POST-BEAM CONNECTIONS. Positive connection shall be provided to ensure against uplift and lateral displacement. [2314]

ATTIC ACCESS. Access shall be provided where the maximum vertical height exceeds 30" with at least a 22" x 30" opening at a readily accessible location. [1505.1]

GLASS DOORS. Swinging wooden doors which are operable from the inside without the use of a key shall be solid core construction not less than 1" in thickness or shall be of a construction having equivalent forced-entry resistance. Single swinging doors, the active leaf of a pair of doors, and the bottom leaf of Dutch doors shall be equipped with a dead bolt and a latch. If a key-locking feature is incorporated in the latching mechanism, a dead latch shall be used. The dead bolt and latch may be activated by one lock or by individual locks. In dwellings the dead bolt lock or locks shall be key operated from the exterior side of the door and engaged or disengaged from the interior side of the door by a device not requiring a key, tool, or excessive force. Non removable pins shall be used in pintype hinges which are accessible from the outside when the door is closed.

OVERHEAD AND SLIDING GARAGE DOORS. Metal or wooden overhead and sliding garage doors shall be secured with a dead bolt lock, paddlock with a hardened steel shackle, or equivalent where not otherwise locked by electric power operation. Locking devices, when installed at the jamb of metal or wooden overhead doors, shall be installed on both jambs when such doors exceed 9'-0" in width.

GLASS ADJACENT TO DOORS. Glass panels within 40" of a required locking device on a door when in the closed and locked position and operable from the inside without the use of a key shall be fully tempered glass; laminated glass of at least 1/4" thickness; approved burglary-resistant material; or guarded by metal bars, screens, or grilles in an approved manner.

WINDOWS. Locking devices installed on windows providing the emergency egress shall be operable from the inside without the use of a key, tool, or excessive force. Operable glass windows shall be provided with locking devices

CONVENTIONAL LIGHT-FRAMED CONSTRUCTION 2001 CALIFORNIA BUILDING CODE
BRACING, SHEATHING, AND FINISH MATERIALS

GENERAL. All exterior walls and main cross-stud partitions shall be effectively and thoroughly braced to resist wind and seismic forces by one of the methods listed below. Braces shall be located at each corner or as near thereto as possible (no more than 8’), and shall be installed so that there is no unbraced section along the wall exceeding 25’-0’. [2320.11.3]

A. Three-eighth inch plywood wall sheathing nailed to wall studs or blocking with 6d common, box, or casing nails at 6” o.c. around panel edges and 12” o.c. at intermediate supports. All panels’ edges shall occur over framing members or blocking.
B. One-half inch gypsum wallboard nailed with 5d cooler or wallboard nails. 5/8 inch gypsum wallboard shall be nailed with 6d cooler or wallboard nails. Nails shall not be spaced further than 7” o.c. Gypsum wallboard shall not be installed until weather protection for the installation is provided.
C. Portland cement plaster applied in not less than three coats having a combined minimum thickness of 7/8″. Expanded metal or woven wire lath shall be used with either No. 11 Ga. 1-1/8″ long nails having 7/16″ heads or No. 16 Ga., staples having ¼ legs. Fasteners shall be installed at a maximum spacing of 6”o.c. to all studs, top plates, bottom plates, and blocking. A minimum 4'-0” panel is required for method A and B. A minimum 8’-0” panel is required for method C.

An alternate 2’-8” wide panel (10’ high max) may be used in place of the 4’-0” panel. These panels must be nailed with 3/8” plywood w/6d @ 6” O.C. EW and 12” O.C. FN (common or box). Two anchor bolts each panel minimum with holdowns each end of panel capable of resisting 1800# of force connected to a 4X post. A #4 bar top and bottom is required at the footings. [2320.11.4]

Note: All shear walls and diaphragms shall maintain shear transfer. Shearwalls shall extend to the diaphragms.

REQUIRED INSPECTIONS. [108.5]

GENERAL. It shall be the duty of the applicant to cause the wall to remain accessible and exposed for inspection purposes. The jurisdiction shall not be liable for expense entailed in the removal or replacement of any material required to allow inspection.

FOUNDATION. To be requested after trenches are excavated and forms erected, any required reinforcing steel is in place, anchor bolts spaced not more than 6’-0” o.c. are in place, and all holdowns are in place.

UNDERFLOOR OR UNDERSLAB PLUMBING. To be requested after all drainage piping and venting is complete to above the level of the floor sheathing or above the top of floor slab and the plumbing is subjected to a pressure test of 10 psi for a minimum of 15 minutes. Gas piping with welded joints shall be subjected to a pressure test of 60 psi for 30 minutes.

FINAL INSPECTION. To be requested after finish grading and the building shell are complete and ready for occupancy.

ADDITIONAL INSPECTIONS. In addition to the inspections specified above, the building official may make or require any other inspection of any construction work to ascertain compliance with the provisions of the applicable codes.

ENERGY

PACKAGE REQUIREMENTS. Unless calculations are prepared by an energy consultant, the requirements listed in the Table for Package D Requirements shall be incorporated into the construction of new conditioned space. (See Page 7)

MANDATORY MEASURES. All openings in the building envelope must be caulked, gasketed, weather-stripped, or otherwise sealed: Insulation specified or installed meets California Energy Commission quality standards.

- Doors and windows between conditioned and unconditioned spaces designed to limit air leakage.
- Manufactured fenestration products have label with certified U-value, and infiltration certification.
- Exterior doors and windows weather-stripped; all joints and penetrations caulked and sealed.
- Masonry and factory-built fireplaces have:
  a. Closeable metal or glass door
  b. Outside air intake with damper and control
  c. Flue damper and control
  d. No continuous burning gas pilots allowed.
- HVAC equipment, water heaters, showerheads, and faucets certified by the Commission.
- Setback thermostat on all applicable heating systems.
- Indirect hot water tanks (e.g., unfired storage tanks or backup solar hot water tanks) have insulation blanket (R-12 or greater) or combined interior/exterior insulation (R-16 or greater).
- First 5 feet of pipes closest to water heater tank, non-recirculating systems, insulated (R-4 or greater).
- Ducts constructed, installed, and sealed to comply with UMC Section 603; ducts insulated to a minimum installed value of R-4.2 or ducts enclosed entirely within conditioned space.
- The use of building cavities as ducts is no longer allowed; ducts must be installed
- Exhaust fan systems have backdraft or automatic dampers.
- Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.
- Forty lumens/watt or greater for general lighting in kitchens and rooms with water closets (fluorescent fixture); and recessed ceiling fixtures IC (insulation cover) approved.

GAS TEST. To be requested after all gas piping is concealed in the walls and prior to installation of any fixtures, appliances, or shutoff valves. Gas piping with glued or screwed joints shall be subjected to a pressure test of 10 psi for a minimum of 15 minutes. Gas piping with welded joints shall be subjected to a pressure test of 60 psi for 30 minutes.

CONVENTIONAL LIGHT-FRAMED CONSTRUCTION 2001 CALIFORNIA BUILDING CODE
### OF RAFTER, CEILING JOIST, AND FLOOR JOIST SPAN TABLE FOR DOUGLAS-FIR LARCH No. 2

<table>
<thead>
<tr>
<th>Member Size</th>
<th>Member Spacing</th>
<th>Light Roofing</th>
<th>Heavy Roofing</th>
<th>Light Roofing</th>
<th>Heavy Roofing</th>
<th>Ceiling Joists</th>
<th>Floor Joists</th>
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<tr>
<td>2x8</td>
<td>12' o.c.</td>
<td>18'-5&quot;</td>
<td>17'-9&quot;</td>
<td>17'-5&quot;</td>
<td>16'-10&quot;</td>
<td>25'-8&quot;</td>
<td>14'-2&quot;</td>
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<tr>
<td></td>
<td>16' o.c.</td>
<td>16'-9&quot;</td>
<td>16'-2&quot;</td>
<td>15'-10&quot;</td>
<td>15'-4&quot;</td>
<td>23'-4&quot;</td>
<td>12'-10&quot;</td>
</tr>
<tr>
<td></td>
<td>24' o.c.</td>
<td>14'-7&quot;</td>
<td>14'-1&quot;</td>
<td>13'-9&quot;</td>
<td>13'-5&quot;</td>
<td>20'-5&quot;</td>
<td>11'-3&quot;</td>
</tr>
<tr>
<td>2x10</td>
<td>12' o.c.</td>
<td>23'-6&quot;</td>
<td>22'-8&quot;</td>
<td>22'-2&quot;</td>
<td>21'-6&quot;</td>
<td>26'-0&quot; Max.</td>
<td>18'-0&quot;</td>
</tr>
<tr>
<td></td>
<td>16' o.c.</td>
<td>21'-4&quot;</td>
<td>20'-7&quot;</td>
<td>20'-2&quot;</td>
<td>19'-7&quot;</td>
<td>16'-5&quot;</td>
<td>14'-4&quot;</td>
</tr>
<tr>
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<td>24' o.c.</td>
<td>18'-8&quot;</td>
<td>18'-0&quot;</td>
<td>17'-6&quot;</td>
<td>16'-9&quot;</td>
<td>-</td>
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<tr>
<td>2x12</td>
<td>12' o.c.</td>
<td>28'-7&quot;</td>
<td>27'-7&quot;</td>
<td>27'-0&quot;</td>
<td>26'-2&quot;</td>
<td>-</td>
<td>21'-11&quot;</td>
</tr>
<tr>
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<td>16' o.c.</td>
<td>26'-0&quot;</td>
<td>25'-1&quot;</td>
<td>24'-7&quot;</td>
<td>23'-10&quot;</td>
<td>-</td>
<td>19'-11&quot;</td>
</tr>
<tr>
<td></td>
<td>24' o.c.</td>
<td>22'-1&quot;</td>
<td>21'-0&quot;</td>
<td>20'-4&quot;</td>
<td>19'-5&quot;</td>
<td>-</td>
<td>17'-5&quot;</td>
</tr>
</tbody>
</table>

Values in this table may be interpolated. Girders and piers are based on 40 psf live load, 10 psf dead load, and live load deflection is limited to L/360. Pier areas are based on a 1000 psf allowable soil bearing pressure.

### Table for Package D Requirements

<table>
<thead>
<tr>
<th>Climate Zone 6</th>
<th>Climate Zone 8</th>
<th>Climate Zone 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Package D</td>
<td>Alternate Package D</td>
<td>Basic Package D</td>
</tr>
<tr>
<td>Ceiling R-30</td>
<td>R-30</td>
<td>R-30</td>
</tr>
<tr>
<td>Wall R-13</td>
<td>R-13</td>
<td>R-13</td>
</tr>
<tr>
<td>Raised Floor R-19</td>
<td>R-19</td>
<td>R-19</td>
</tr>
<tr>
<td>Max. Glazing Area 20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Glazing U-Value 0.75</td>
<td>0.55</td>
<td>0.75</td>
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<tr>
<td>Glazing SHGC -</td>
<td>-</td>
<td>0.4</td>
</tr>
<tr>
<td>Roof RB</td>
<td>NR</td>
<td>RB</td>
</tr>
<tr>
<td>Duct Sealed</td>
<td>Sealed</td>
<td>NR</td>
</tr>
<tr>
<td>TXV TXV</td>
<td>NR</td>
<td>TXV</td>
</tr>
<tr>
<td>SEER Min.</td>
<td>Min.</td>
<td>Min.</td>
</tr>
</tbody>
</table>

Basic Package D requires third party inspection (HERS rater)

R= Required
NR= Not required
RB= Radiant Barrier at Roof
SEALED= Ducts to have less than 6% leakage (must be field verified by HERS rater).
TXV= Thermostatic Expansion Valve in split system air conditioner (must be field verified by HERS rater).
SEER= Air Conditioner Seasonal Energy Efficiency Ratio.
SHGC= Window Solar Heat Gain Coefficient.
8d TOENAILS AT 6" oc OR FRAMING ANCHORS AT 32" ARE REQUIRED

CONTINUOUS 2-2X4 TOP PLATES

WALL STUDS AT 16" oc TYPICAL.

4X4 END POSTS EACH SIDE

FN

EN

2X SILL PLATE

#4 REBARS

3" CLEAR (TYP.)

ANCHOR BOLTS - TWO 5/8" DIAMETER BOLTS, WITH 7" MINIMUM EMBEDMENT, WITH 2"X2"X3/16" SQUARE WASHER, AND PLACED AT PANEL QUARTER POINTS. (**)

ROOF OR FLOOR SHEATHING
3/8" STRUCTURAL PLYWOOD WITH 8d COMMON NAILS AT 6" oc AT PANEL EDGES (EN) AND 12"oc AT INTERMEDIATE MEMBERS (FN). PANEL SHALL BE 2'-8" MINIMUM IN LENGTH AND 10'-0" MAXIMUM IN HEIGHT. (**)

2 INCH MINIMUM BLOCKING TYPICAL

(\*) PANELS LOCATED ON THE FIRST STORY OF TWO STORY BUILDINGS SHALL CONFORM TO THE FOLLOWING:
1. PLYWOOD SHEATHING SHALL BE APPLIED ON BOTH SIDES.
2. TIE-DOWN OR HOLDOWN DEVICES SHALL HAVE UPLIFT CAPACITY OF NOT LESS THAN 3000 POUNDS.
3. THREE ANCHOR BOLTS SHALL BE PLACED AT ONE-FIFTH POINTS.

THE DISCRETION OF THE BUILDING DEPARTMENT BASED ON INDIVIDUAL CONDITIONS

APPROVED TIE-DOWN OR HOLDOWN DEVICE ON EACH END WITH AN UPLIFT CAPACITY OF NOT LESS THAN 1800 LB AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS (**)

STANDARD CONTINUOUS FOOTING WITH 1-#4 REBAR TOP AND 1-#4 REBAR BOTTOM MINIMUM

ROOF RAFTERS TYPICAL

2001 CALIFORNIA BUILDING CODE

8 OF 8
6/2001

[SECTION 2320.11.4]
1998 CALIFORNIA BUILDING CODE

ALTERNATE BRACED PANEL

CITY OF GOLETA
RESIDENTIAL SINGLE-STORY
CONVENTIONAL LIGHT-FRAMED CONSTRUCTION
2001 CALIFORNIA BUILDING CODE