Minimum Construction Requirements for New Dwellings Located in the State of New Mexico

Federal Housing Administration

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MINIMUM CONSTRUCTION REQUIREMENTS
FOR
NEW DWELLINGS
LOCATED IN THE
STATE OF NEW MEXICO

EFFECTIVE SEPTEMBER 15, 1938

FEDERAL HOUSING ADMINISTRATION
SANTA FE, NEW MEXICO
MINIMUM CONSTRUCTION REQUIREMENTS

FOR

NEW DWELLINGS

LOCATED IN THE STATE OF NEW MEXICO

THE SANTA FE UNDERWRITING OFFICE

INTRODUCTION

1. The requirements contained herein provide a Minimum Standard of Construction and shall apply to all new construction on which the mortgage is insured by the Federal Housing Administration. They are considered necessary to produce a well-constructed dwelling which will serve as sound security for a long-term mortgage loan. Since these requirements are essentially minimum, they are not to be built down to but form a basis from which to build up. This Administration will recognize and give credit to all construction that exceeds these Minimum Construction Requirements.

2. The Federal Housing Administration has used the recommendations of the National Bureau of Standards, U. S. Department of Commerce; the Forest Products Laboratory, U. S. Department of Agriculture; and the Public Health Service, U. S. Treasury Department, as a basis for these requirements.

3. No attempt has been made to make these Minimum Construction Requirements comply with local building code regulations because of the variation, generally, in building code requirements. However, strict compliance with the local building code requirements and sanitary regulations will be required in all cases where such requirements and regulations provide for a higher standard than these minimum requirements. The highest requirement, whether in the building code, these Minimum Construction Requirements, or the plans and specifications, shall govern.

NOTE.—These requirements do not eliminate the necessity of providing complete specifications in connection with new construction.

4. When special or unforeseen conditions such as water conditions in excavation arise during construction, which require additional precautions, the Chief Architectural Supervisor of the Santa Fe Underwriting Office may require extra work necessary to correct these conditions before the mortgage is endorsed for insurance.

SPECIAL NOTE.—If such conditions arise and the Construction Contract makes no provision for the performance by the Contractor of the required necessary work, the Mortgagor shall require the Contractor to perform such necessary work, adjusting the contract price if necessary.
5. The requirements contained herein apply only to conventional types of construction. Plans and specifications calling for methods of construction at variance with, but equal to these Minimum Construction Requirements must be approved by the Chief Architectural Supervisor of the Santa Fe Underwriting Office, and it is preferred that they be prepared by a competent architect licensed to practice in the State of New Mexico.

6. The substitution of materials equal to or better than those called for in these requirements or in the specifications will be permitted when the intent and objectives of these requirements are attained by such substitution.

7. Dwellings of special types, such as prefabricated houses, will be treated as special cases and each individual property will be considered on its own merits.

EXCAVATION

1. Excavation for all foundations shall extend to solid ground. If, upon excavation, other than solid ground is encountered, the footings shall be redesigned and details of same shall be submitted to the Chief Architectural Supervisor for approval.

2. Depth of excavation for trench walls and piers shall be as provided by local building code regulations. In the absence of a specific regulation, they shall be carried below the frost line prevailing in the neighborhood.

3. All debris, such as stumps, roots, vegetation, and wood scraps occurring within the building area shall be removed. The ground level in unexcavated portions shall be at least 18 inches from the bottom of floor joists and girders.

4. Rough and finished grading shall be brought to levels shown on the drawings. Finish grade shall slope to drain the water away from the building. All backfilling adjacent to the building shall be placed in layers approximately 12 inches in thickness. Each layer shall be puddled and tamped before additional layers are placed.

MASONRY

A. General.

1. **Poured concrete** mixture shall be as follows:

   (a) For plain concrete—1 part portland cement, 3 parts sand, 5 parts gravel or crushed stone; or 1 part portland cement, 7 parts pit run aggregate.

   (b) For reinforced concrete—1 part portland cement, 2 parts sand, 4 parts gravel or crushed stone.

   (c) Water content shall be not more than 7 gallons of water per bag of cement.

   (d) All materials shall be clean and free from loam and other foreign matter.

   **NOTE.**—Stones may be embedded in footings and foundation walls of plain concrete provided that every stone is completely surrounded with not less than 2 inches of concrete.

   2. When concrete is not poured in one operation, the top surface of the previous pour shall be cleaned, scored and wetted before continuing the pour. Vertical joints shall be keyed.
3. In extremely hot and dry weather, the concrete shall be kept wet for at least 3 days.

4. In freezing weather the concrete mix at the time of pouring shall have a temperature of at least 40 degrees Fahrenheit, but not more than 120 degrees Fahrenheit, and shall be maintained at a temperature above freezing until concrete has thoroughly set. Integral compounds shall not be used in lieu of maintaining the above required temperature.

5. *Floor finish.*—Topping, except for integral finish, shall be 1 part portland cement and 3 parts sand.

6. *Mortar mixture* shall be as follows:
   
   (a) For all masonry below grade—1 part portland cement, 3 parts sand by volume. Lime equal to not more than 15 percent of the cement by volume may be added.
   
   (b) For all other masonry work—1 part portland cement, 1 part lime putty, 6 parts sand by volume; or a prepared mortar mixed and used according to manufacturer's directions.

7. Retempering of mortar will not be permitted.

8. *Joints* between masonry units shall be not over 3/4 inch thick. In walls built of solid masonry units, all joints shall be filled solid. When hollow units are used, the units shall be laid with no through mortar joints. All joints shall be pointed solid with mortar on both sides of the wall. All outside and exposed inside joints shall be weathered or tooled unless approved otherwise by the Chief Architectural Supervisor.

9. *Materials* for masonry walls shall be hard-burned brick, stone, poured concrete, thoroughly cured concrete units, or *hard-burned load-bearing structural clay tile*. The use of other masonry materials, including masonry veneer materials less than 4 inches thick, less hard-burned brick, second-hand brick, and less hard-burned load-bearing structural clay tile shall be approved by the Chief Architectural Supervisor.

10. *Forms.*—All forms for concrete shall be tight, straight, and plumb and shall be rigidly braced to properly support the concrete until set. Forms shall not be removed until concrete has thoroughly set. Loads shall not be placed on concrete until sufficient strength has developed to support such loads.

11. *Reinforcing.*—The reinforcing for concrete shall be mild steel, new billet or rerolled deformed bars which meet the recommendations of the American Society for Testing Materials, placed in correct position and wired so that displacement will not occur when concrete is poured. Reinforcing shall be bent around all corners and lapped not less than 30 diameters. Laps shall be securely wired.

**B. Footings.**

1. All footings shall bear on undisturbed soil and be designed to distribute sufficiently the superimposed load to the particular type of soil upon which they bear.

2. Where soil conditions prevent sharp-cut trenches for footings, side forms shall be used.

3. Footings will not be required under foundation walls 18 inches or more in thickness where the soil is hardpan or well-drained, firm
and undisturbed soil. In all other cases, footings of poured concrete will be required.

4. The minimum dimensions of footings shall be as follows:
   (a) Under foundation walls and trench walls of all frame dwellings and 1-story masonry dwellings: thickness 8 inches; projection 4 inches on each side of wall.

   Note.—The requirements for frame dwellings shall also apply to masonry veneered frame dwellings.

   (b) Under foundation walls of masonry dwellings more than 1 story in height: thickness 12 inches; projection 6 inches on each side of wall. Footings may be same as in (a) if reinforced with not less than two \( \frac{3}{4} \)-inch bars continuous in footing and spaced not to exceed 8 inches o. c.

   (c) Under masonry piers: thickness 12 inches; projection each side 6 inches; area 4 square feet.

   (d) Under posts and columns: thickness 12 inches; size 2 by 2 feet.

   (e) Under chimneys for 1-story dwellings: thickness 8 inches; projection on all sides 4 inches.

   (f) Under chimneys for dwellings more than 1 story: thickness 12 inches; projection on all sides 6 inches.

   Note.—All footings shall be adequately reinforced where they cross and bear on filled trenches or other similar disturbed soil conditions.

5. Where differences in the level of adjacent footings occur by reason of sloping sites or part basements, footings shall be stepped or abutting walls shall be reinforced and anchored in a manner approved by the Chief Architectural Supervisor. The tops and bottoms of footings shall be level.

6. Modifications of the above requirements may be made if such modifications are fully detailed and noted on drawings and are approved by the Chief Architectural Supervisor.

7. Footing drain tile may be required by the Chief Architectural Supervisor where water conditions exist and soil is not porous. When required, tile shall be covered with 12 inches of porous material such as gravel, etc. with provision for draining water away from the building by connecting with tight-joint glazed tile to dry well, sewer, or by other means.

C. Foundations.

1. In no case shall the foundation wall thickness be less than that of the wall supported.

2. The following minimum requirements for foundation wall thickness shall apply:

   (a) 6-inch thickness: for poured concrete, supporting 1-story wood frame structures without basement; and for shelf basement walls provided such walls are not nearer than 3 feet 6 inches to the main foundation wall.

   (b) 8-inch thickness: for all other poured concrete walls.

   (c) 8-inch thickness: for masonry unit walls which extend not more than 7 feet below outside finished grade. Maximum total height of the foundation wall and wall supported, 35 feet.
(d) 12-inch thickness: for masonry unit walls which extend more than 7 feet below outside finished grade.

SPECIAL NOTE.—The Chief Architectural Supervisor may, at his discretion, because of special or unforeseen soil conditions, require that the allowable depth of the foundation wall below outside finished grade be reduced; that the wall be adequately reinforced; or that the thickness be increased to resist lateral forces. The National Bureau of Standards, U. S. Department of Commerce, in its publication entitled "Recommended Minimum Requirements for Small Dwelling Construction," recommends a maximum depth of 5 feet below outside finished grade for 8-inch-thick foundation walls constructed of masonry units. It is recognized that in many cases, because of the nature of the soil, it is safe to extend the foundation walls to the depths permitted in these Minimum Construction Requirements. It must not be construed, however, that the permissible depths contained in these Minimum Construction Requirements will be applicable in all cases.

3. If in the opinion of the Santa Fe Underwriting Office, soil conditions make it necessary, because of the presence of alkaline salts which may be destructive to the foundation wall, the foundation wall shall be plastered on the exterior with at least 1/4 inch of portland cement plaster over which shall be applied a heavy coat of undiluted hot tar or asphalt. This treatment shall extend from the adjoining outside finished grade to the outside edge of the footing. (See detail 4.)

NOTE.—When masonry units are used for foundation walls, particular attention shall be paid to Paragraphs 6 and 9 under Masonry—A. General.

4. When foundation walls are built of hollow masonry units, the top course shall be of solid masonry units or solid masonry material and shall be not less than 4 inches in height. (See details 1 and 2.)

5. Foundation walls and basement bearing partitions, when constructed of structural clay tile, shall have all corners and intersections of partitions with foundation walls constructed of vertical cell corner blocks, or of solid brick.

6. Pilasters not less than 4 by 12 inches shall be constructed to form piers under the ends of all girders framing into 8-inch-thick foundation walls built of masonry units and poured concrete walls less than 8 inches in thickness and shall be bonded into the wall. Pier construction shall be as follows:

(a) When the foundation walls are of hollow concrete block construction, the top 8 inches of the pier shall be of solid masonry material.

(b) When the foundation walls are of load-bearing structural clay tile, the pier shall be constructed of brick extending from footing to girder.

7. Foundation walls supporting masonry veneered stud frame walls shall be of sufficient thickness that neither the veneer nor the stud frame projects beyond the outer or inner faces of the foundation wall.

8. Foundation walls supporting frame construction shall extend not less than 8 inches above the adjoining outside finish grade.

9. All masonry chimneys shall have foundations of masonry or concrete (see detail 19) which shall extend down to the level of the foundation wall footing surrounding the area where the chimney is located, and where chimneys occur in outside walls or inside bearing walls, the footing shall be bonded with the wall footing.
10. Dwellings constructed on concrete slabs on the ground will be acceptable when approved by the Chief Architectural Supervisor. The preparation of the slab bed and the construction of the slab shall be in accordance with requirements established by the Chief Architectural Supervisor.

11. An opening of not less than 18 by 24 inches shall be installed in the foundation wall or first floor to provide access for inspection and repair in each unexcavated space under wood and metal floor construction, and under concrete slabs where piping, duct work, etc. requiring periodic inspection or repair are located.

12. Foundation wall vents proportioned on a basis of 1 square foot for each 50 lineal feet or major fraction thereof of exterior wall shall be installed for ventilating all unexcavated spaces and each such space shall have at least two vents. Noncorrodible screening of not over $\frac{1}{4}$-inch mesh shall be installed in each opening.

13. Area walls and foundation walls for porches, steps, and terraces shall be adequately bonded or anchored to main walls.

D. Exterior Masonry Walls.

**Note.**—“Salmon” or soft brick will not be accepted for use as facing on outside surfaces of exterior walls.

1. Masonry walls shall have a thickness of not less than 8 inches for a height not to exceed 35 feet. When two or more units are used to make up the thickness of the wall, the inner and outer courses shall be bonded by at least one header course in every six courses, or by one full-length header in every 72 square inches of wall surface.

2. Masonry veneer applied to masonry walls shall be tied to the wall by full-length headers or noncorrodible metal wall ties spaced every fifth course or 15 inches vertically and not more than 32 inches o. c. horizontally.

**Note.**—Veneer shall not be considered a part of the required wall thickness unless bonded as required in Paragraph 1 above.

3. Proper provision shall be made for adequate bonding and anchoring together of all intersecting concrete and masonry walls.

4. The ends of girders framing into walls constructed of hollow masonry units shall bear upon solid masonry construction at least 8 inches in depth or upon other suitable bearing securely anchored to masonry walls. In such walls, all floor joists shall bear upon solid masonry not less than 4 inches in depth, and lintels over openings shall be supported upon solid masonry material equivalent in depth to at least two courses of brick.

5. Masonry veneer applied to wood frame walls shall have a thickness of not less than 3$\frac{3}{4}$ inches and a height of not more than 35 feet; and veneer shall be anchored to the wood frame with noncorrodible metal ties spaced every fifth course or 15 inches vertically and not more than 32 inches o. c. horizontally. Provide a 1-inch space between the veneer and the wood construction. (See detail 2.) In all cases the veneer shall be backed up with waterproof building paper or saturated asphalt felt which shall extend down and under the bottom course of veneer.

6. Party walls shall be not less than 8-inch-thick masonry construction; when flat roofs occur, the wall shall extend from footing to 8 inches above the roof and be capped with stone, corrosion-resisting sheet metal, portland cement, or terra cotta coping; when pitched roofs
occur, the wall shall extend from footing to under side of roof boards at all points to form fire stops.

7. Adequate lintels or properly designed masonry arches will be required in the heads of all openings in masonry and masonry veneered walls.

E. Chimneys.

1. All masonry chimneys, except those with solid brick walls 8 inches or more thick, shall be lined throughout with fireclay flue lining. (See details 21 and 22.) Minimum flue sizes: for heating plants, 8½ by 8½ inches; for fireplaces, 8½ by 13 inches; or circular flues of equivalent effective area.

Note.—The interior of chimneys shall be smooth when flue lining is not installed.

2. All heating equipment shall connect into individual flues except as provided in Paragraph 4.

3. All chimneys shall be capped to form a wash from the flue to the outside edge of the chimney.

4. All gas-fired house heaters and built-in unit heaters shall be connected to flues constructed of masonry as described in Paragraph 1, or constructed of not less than 20-gauge corrosion-resisting sheet metal properly insulated with asbestos or other acceptable fireproofing material, which shall comply with the recommendations of the Underwriters' Laboratories, Inc. Such flues shall extend through the roof. Gas-burning hot-water heaters shall have vents which may connect into the house heating flue, provided the connection is below the breeching.

5. In masonry chimneys containing three or more flues, each group of two flues shall be separated from the other single or groups of two flues by brick withes not less than 3¾ inches wide. (See details 21 and 22.) Where two flues are grouped without withes, the joints in the respective flue linings shall be staggered.

6. All fireplaces except false fireplaces shall have hearths supported on fireproof construction. The hearths except for native type fireplaces shall project at least 16 inches measured from the chimney breast, and the width shall be not less than the width of the fireplace opening plus 16 inches. (See details 19 and 20.)

7. False fireplaces will be permitted provided that construction is of fire-resistant materials which have a one-hour rating by the Underwriters' Laboratories, Inc., for fire resistance.

8. Open fireplaces shall be constructed with smoke chambers and shall be lined with fire brick or other materials approved by the Chief Architectural Supervisor. The effective area of the flue shall be not less than ½ of the area of the fireplace opening. When an ash dump is provided, ashes shall empty into an enclosed chamber of fireproof material provided with a metal cleanout door. (See details 18 and 20.)

9. All chimneys shall extend not less than 2 feet above the highest ridge.

F. Cement Floors, Driveways, and Walks.

1. The garage, terrace, porch and interior floors, walks, and driveways, if of concrete construction, shall have a minimum thickness of
4 inches and shall be properly surfaced. The slabs shall be laid on a solid bed.

2. Garage floors shall be laid separately from the garage foundation walls and footings. (This does not apply to garages built on reinforced concrete slabs.) Provide an approved expansion joint between the driveway slab and the concrete apron at the garage door. Driveways over 30 feet in length shall have expansion joints not more than 30 feet o.c.

3. All outside brick steps shall be of hard-burned brick or approved paving brick. “Salmon” or soft brick will not be accepted for treads, platforms, terraces, or for exterior use.

4. Basement or cellar floor slabs shall be not less than 3-inch concrete if finished monolithic, otherwise 3-inch concrete and 1-inch topping.

5. All openings in basement floors shall have covers which shall be flush with the finish floor. Where floor drains occur, floor shall slope slightly to drain.

6. When the heating plant is located above the basement, the floor area where the heating plant is located shall be finished with concrete 3 inches thick, or with other noncombustible material approved by the Chief Architectural Supervisor. Chamfer tops of floor joists when concrete is let down below the top of the wood construction.

7. Tile floors supported on wood construction shall have concrete underfloor not less than 3 inches thick. Boarding supporting the underfloor may be let down between the joists but not to exceed 1 inch. Chamfer tops of joists.

8. All downspouts or leaders emptying on grade shall have splash blocks constructed of concrete or other approved material so located as to carry the rain water at least 3 feet from the building. Canales shall project at least 20 inches from the face of the exterior wall.

DAMPPROOFING

1. Cellar, basement, and furnace pit shall be constructed to be dry, and when they occur in localities where dampness exists or water penetration impends, shall have walls and floors waterproofed.

2. In cases where subsurface water exists under pressure, walls below grade, and floors shall be adequately designed, reinforced, and constructed to be watertight.

3. A dry basement shall be provided and where dampness or water conditions exist, walls and floors shall be made watertight before final acceptance.

ADOBE CONSTRUCTION

1. Adobe construction may be used not to exceed two stories or 30 feet in height. The adobes shall be made from adobe clay soil, practically free of gravel, loam, or other deleterious matter, except clean straw, and shall be not less than approximately 10 by 14 by 4 inches in size, and shall have an ultimate compression strength equal to 550 pounds per square inch. Adobes shall be thoroughly sun dried for a period of not less than 30 days before laying in the walls; 60 days is preferred.
2. Adobe walls shall have poured concrete or rubble stone masonry foundation walls, full thickness of the supported wall and resting upon poured concrete footings. Foundation walls of concrete or masonry shall extend above the finished grade not less than 8 inches.

3. All walls of adobe shall be not less than 10 inches thick. All adobes shall be laid up in adobe or lime mortar (adobe mortar preferred) with full slush joints. All adobes shall be bonded not less than 6 inches. For thick walls, adobes shall be bonded in both directions with special, long bricks if necessary. In structures over one story or 12 feet in height, the first story walls shall be not less than 20 inches thick and shall have a continuous 8-inch thick concrete belt course reinforced with two 5/8-inch bars in the bottom, over all the adobe walls directly under the second floor joists.

4. All openings in adobe walls shall be spanned with structural iron, steel, reinforced concrete or heavy timber lintels with a bearing at each end of not less than 12 inches; metal lintels to have bearing plates full width of wall. All joists, rafters, or vigas shall have at least an 8-inch bearing upon the concrete belt course, or on a 2 by 8 inch continuous wood plate embedded in the wall. Care is to be taken to keep adobe dry with waterproof paper under concrete lintels and beams while pouring concrete. Wood nailing blocks from 2 by 10's shall be provided for anchoring all frames, etc. Steel sash shall be set in wood subframes.

5. Adobes shall not be used for narrow isolated piers or columns. Wall sections less than 24 inches shall be considered as isolated piers, in which case the lintel shall be designed to span the distance of both openings and the pier. All chimneys in adobe shall be lined with fireclay flue linings and be enclosed in at least 8 inches of adobe.

6. Interior stud partitions shall be anchored to the adobe wall with not less than two bolts or perforated strap anchors with hooked ends embedded in the adobe wall.

7. All exterior adobe walls less than 14 inches thick shall be covered with a minimum 3/4-inch thickness of portland cement stucco applied over galvanized wire mesh not less than 20 gauge wire and not more than 1 inch mesh opening, stretched tight and thoroughly nailed to the adobe at least 12 inches each way, carried in vertical bands up and over the parapet walls down to the roof flashings.

8. Mud plaster or other approved treatments may be used on all interior adobe walls and on exterior adobe walls that are 14 inches or over in thickness. Mud plaster may be used on interior stud partitions over scratch and brown coats of hard plaster only.

9. All adobe hardeners, stabilizers, and other so-called preservatives shall be approved by the Chief Architectural Supervisor, but their use in adobes or adobe plaster will not in any way vary the above requirements as to wall thicknesses, exterior stucco, plaster, etc.

10. Flashings into adobe parapets shall carry through the wall.

STRUCTURAL STEEL AND IRON

1. When local building code does not cover requirements for structural steel and iron, the design shall comply with the recommendations of the American Institute of Steel Construction.

2. Connections shall be riveted, bolted, or welded, and shall be so designed as to fully develop the strength of the structural members.
Bearings of steel beams and girders on masonry walls shall extend at least 4 inches into the wall, and shall be solidly bedded in portland cement mortar. Bearing plates shall be designed to carry the load and shall have a minimum thickness of $\frac{3}{16}$ inch.

3. All steel or cast iron columns shall have flanged bases and caps. Column caps shall be anchored to beams or girders. Loose shims will not be acceptable. Bases of columns shall be securely anchored by anchor bolts, or by embedding in concrete.

**LUMBER**

1. All softwood lumber shall meet all the grading requirements of the Association recognized in the trade as covering the species and under whose grading rules it was produced. This requirement shall not apply to millwork or interior finish. (The word "softwood," as used herein, shall be interpreted to include Douglas Fir, White Fir, Cypress, Western Larch, West Coast Hemlock, California Redwood, Cedar, Eastern Hemlock, Tamarack, Sitka Spruce, Engelmann Spruce, Eastern Spruce, Southern Yellow Pine, Ponderosa Pine, Sugar Pine, Idaho White Pine, Northern White Pine.)

2. Framing lumber for joists, sills, girders, and rafters shall be No. 1 Dimension (Common) or better.

3. All other framing lumber including studs, bridging, bracing and collar beams shall be No. 2 Dimension (Common) or better.

4. All board lumber for subflooring, sheathing, roof boarding, shingle lath, etc., shall be No. 3 Common or better.

**NOTE.**—Board lumber, No. 4 Common, of woods comparable to No. 3 Common grade in the other softwoods, will be acceptable, such as: White Fir, Engelmann Spruce, Eastern Spruce, Ponderosa Pine, Sugar Pine, Idaho White Pine, Northern White Pine.

5. Vigas or round beams shall be fall cut timber with all bark stripped.

6. All lumber shall be dry and well seasoned, and the moisture content shall not exceed 19 percent.

7. All rough lumber dimensions given under "Wood Framing" below are nominal sizes. Finished dimensions of all lumber shall comply with the American Lumber Standards.

**WOOD FRAMING**

**NOTE.**—Splicing of structural wood framing members between bearing points will not be permitted. In all cases, regardless of location, where the structural strength of framing members is definitely impaired by cutting, drilling, or by inherent defects, such members shall be replaced or reinforced as required by the Chief Architectural Supervisor.

A. Floors and Roofs.

1. All wood floor and roof framing shall be kept at least 2 inches away from the chimney masonry, except when 8 inches of masonry is used outside the flue lining, in which case the framing may be built flush with the chimney masonry. The 2-inch space between the chimney masonry and the floor framing shall be filled with fire-resistant material to form a fire stop. (See details 21 and 22.)

**NOTE.**—In no case shall wood framing members bear on the masonry of chimneys, except on piers which are built integral with the chimney masonry.
2. Girders may be structural steel, solid wood, built-up wood, or reinforced concrete.
3. All joints of solid and built-up wood girders shall be made over pier or column supports.
4. Wood posts, when used as columns in basements, shall bear on a cement base which shall extend not less than 3 inches above the finish floor. The base shall bear directly on the post footing.
5. The distance between supports under wood girders shall not exceed the following:

<table>
<thead>
<tr>
<th>Size in inches</th>
<th>Maximum clear span 1-story dwellings</th>
<th>1½ and 2-story dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 by 6</td>
<td>5 ft. 0 in.  4 by 10</td>
<td>6 ft. 0 in.  6 by 10</td>
</tr>
<tr>
<td>6 by 6</td>
<td>6 ft. 0 in.  5 ft. 0 in.  6 by 8</td>
<td>7 ft. 0 in.  7 ft. 0 in.</td>
</tr>
<tr>
<td>4 by 8</td>
<td>6 ft. 0 in.  5 ft. 6 in.  6 by 10</td>
<td>8 ft. 0 in.  8 ft. 0 in.</td>
</tr>
</tbody>
</table>

**Notes.**—The above spans are based on a minimum fiber stress of 1,200 pounds. When the allowable fiber stress of the species of wood used is other than 1,200 pounds, spans shall not exceed those determined by established engineering practice.

6. Where floor joists frame into the side of wood girders, the joists shall be supported on metal joist hangers or on a bearing strip or ledger board on the side of the girders. Size of ledger shall be at least 2 x 3 inches. The notch in the end of the joist shall not be more than 1/4 of the joist depth. (See detail 5.)

7. Ends of floor joists framing into masonry walls shall have not less than 4-inch bearing and shall have at least a 3-inch bevel or fire cut. The ends of floor joists and girders which frame into the masonry walls below outside finish grade shall receive a good brush coat of creosote.

8. Each fourth joist in wood floor construction framing into masonry walls shall have a metal strap anchor applied on the side and near the bottom of the joist and shall extend into the masonry wall. Masonry walls running parallel to the floor joists shall be tied to the floor construction with metal strap anchors spaced not over 6 feet apart and extending over and secured to at least 3 joists.

9. Floor joists shall be doubled under all partitions which run parallel to the floor joists. Doubled joists shall be separated and blocked at 4-foot intervals where piping or duct work occurs.

10. Headers and trimmers shall be doubled except that headers 4 feet or less in length may be of single thickness provided the header is supported in metal joist hangers or on not less than 2 x 3 inch ledger boards (see detail 5) and header is secured by spikes driven through one thickness of the trimmers into the ends of the header. Headers receiving more than 4 tail beams shall have ends supported in metal joist hangers.

11. Ends of lapped joists shall rest on girders or on bearing partitions and shall be securely nailed to plate and to each other.
12. Overhanging cantilevered construction: See details 16 and 17 for acceptable construction. Bay windows, overhanging second floors, and all projections carrying floor and roof loads which are not supported directly by a foundation shall be fully detailed on the drawings submitted with the application.

13. Floor (including attic floor) and flat roof joists shall be cross-bridged with not less than 1 x 3 inch bridging at intervals not to exceed 8 feet and securely nailed at each end. Metal bridging may be used when approved by the Chief Architectural Supervisor.

14. Maximum spans for all wood floor joists shall be as listed in the following table. The spans are figured for a maximum deflection of $\frac{1}{360}$ of the span, based on a total live and dead load of 50 pounds per square foot, uniformly distributed. The species of wood are grouped according to the allowable working stresses recommended by the Forest Products Laboratory, Madison, Wisconsin.

### Maximum spans for floor joists

Assumed live load, 40 pounds per square foot; dead load, 10 pounds per square foot

<table>
<thead>
<tr>
<th>Lumber size</th>
<th>Minimum fiber stress, 1,200 pounds</th>
<th>Minimum fiber stress, 1,000 pounds</th>
<th>Minimum fiber stress, less than 1,000 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>Spacing center to center</td>
<td>Douglas Fir (Coast Region and Inland Empire), Southern Yellow Pine, Western Larch</td>
<td>West Coast Hemlock, Cypress, Redwood, Tamarack</td>
</tr>
<tr>
<td>2 by 6</td>
<td>1% by 6%</td>
<td>16</td>
<td>9 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>10 0</td>
</tr>
<tr>
<td>2 by 8</td>
<td>1% by 7%</td>
<td>16</td>
<td>12 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>13 3</td>
</tr>
<tr>
<td>3 by 8</td>
<td>2% by 7%</td>
<td>16</td>
<td>14 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>15 4</td>
</tr>
<tr>
<td>2 by 10</td>
<td>1% by 9%</td>
<td>16</td>
<td>15 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>16 8</td>
</tr>
<tr>
<td>3 by 10</td>
<td>2% by 9%</td>
<td>16</td>
<td>17 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>19 3</td>
</tr>
<tr>
<td>2 by 12</td>
<td>1% by 11%</td>
<td>16</td>
<td>18 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>20 1</td>
</tr>
</tbody>
</table>

**Note.**—Where the spacing of floor joists exceeds 16 inches o. c., or where the allowable fiber stress of the species of wood used is in excess of 1,200 pounds, the size and span of the joists shall be determined on the same basis as used for this table.

The maximum spans for "native fir" and "native pine" shall be those listed under "All other softwoods" of this table. In cases where plaster ceilings are not to be installed, the above floor joists spans may be increased 1 foot 6 inches.

15. The maximum spans for vigas or round beams for use as floor or flat roof joists shall be as listed below. The spans are figured on bending and are based on a fiber stress of 800 pounds per square
inch and a total live and dead load of 50 pounds per square foot, uniformly distributed.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Minimum Diameter</th>
<th>O.C.</th>
<th>Maximum Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 1/2</td>
<td>30 inches</td>
<td>9 ft</td>
<td>2 inches</td>
</tr>
<tr>
<td>6 1/2</td>
<td>24 inches</td>
<td>10 ft</td>
<td>5 inches</td>
</tr>
<tr>
<td>7 1/2</td>
<td>30 inches</td>
<td>11 ft</td>
<td>6 inches</td>
</tr>
<tr>
<td>7 1/2</td>
<td>24 inches</td>
<td>12 ft</td>
<td>9 inches</td>
</tr>
<tr>
<td>8 1/2</td>
<td>30 inches</td>
<td>13 ft</td>
<td>11 inches</td>
</tr>
<tr>
<td>8 1/2</td>
<td>24 inches</td>
<td>15 ft</td>
<td>6 inches</td>
</tr>
</tbody>
</table>

**NOTE:** Where the allowable fiber stress of the species of wood used is other than 800 pounds, or where dirt insulation is used, the size and span of the members shall be determined on the same basis as used for this table.

16. The cutting of floor joists to facilitate the installation of piping and duck work will be permitted with the following limitations:

(a) The top or bottom edges of joists may be notched not to exceed 1/6 of the joist depth. Notching the top or bottom edge of joists will not be permitted in the middle third of any joist span.

(b) If cutting of a floor joist more than 1/6 of its depth is found necessary, a header the full depth of the joist shall be cut in to support the end of the joist.

(c) Where location of pipes necessitates passing through the joists, holes shall be drilled to receive the pipes. The diameter of the holes shall be not more than 1/2 inch greater than the outside diameter of the pipe and in no case greater than 2 1/2 inches. The edge of the holes shall not be located nearer than 2 inches from the top or bottom edge of the joist.

17. All floor joists shall be covered with 1-inch subflooring not more than 10 inches in width. All subfloors shall be laid diagonally and ends shall be cut over joists. Boards over 8 inches wide shall be triple-nailed at each bearing point.

**NOTE:** End-matched (T. & G.) boards may be used for subflooring provided no two adjoining boards break joints over the same joist space, and each board shall bear on at least two joists.

18. All subflooring shall be covered with building paper or deadening felt before laying finish floor.

19. All finish flooring shall be not less than 1 3/4 inch thick T. & G.

20. Floor coverings of linoleum, composition or rubber tile on wood construction shall be applied over T. & G. wood flooring not less than 5/8 inch in thickness nor more than 4 inches in width, and either sanded or scraped smooth before covering is applied.

21. All attics and spaces between flat roofs and ceiling shall be ventilated by screened louvres or other means approved by the Chief Architectural Supervisor.

22. Ceiling joists shall, wherever possible, serve as ties for the rafters and shall be securely nailed to the rafters.

23. An adequate opening for access into each attic space shall be provided to allow for inspection and repair.

24. Maximum spans for ceiling joists shall be as listed in the following table. The spans are figured for a maximum deflection of 1/360 of the span, based on a dead load of 10 pounds per square foot (no live load), uniformly distributed.
### Maximum spans for ceiling joists

*Live load, none; dead load, 10 pounds per square foot*

<table>
<thead>
<tr>
<th>Lumber size</th>
<th>Maximum clearspan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum fiber stress, 1,200 pounds</td>
</tr>
<tr>
<td></td>
<td>Actual center to center</td>
</tr>
<tr>
<td>2 by 4</td>
<td>1½ by 3½</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2 by 6</td>
<td>1½ by 5½</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2 by 8</td>
<td>1½ by 7½</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.**—Where the attic space above ceiling joists is unfinished but is usable for storage space, or if the space is suitable for finishing into future habitable rooms, the spans for the ceiling joists shall be figured the same as for floor joists.

The maximum spans for "native fir" and "native pine" shall be those listed under "All other softwoods" of this table.

25. Collar beams of 1 x 6's or 2 x 4's shall be installed on at least each third pair of roof rafters and shall be securely nailed to the rafters. Maximum spacing of collar beams, 5 feet o. c.

26. Where ceiling joists serve as collar beams and occur above the midpoint of the rafter, adequate provision shall be made for tying the lower end of the rafter to the floor construction. When the installation of this tie is not possible because of structural conditions, the rafter size shall be increased sufficiently to support the roof load without thrust or undue bending in the lower end and the size of the collar beams shall be not less than that of the rafters.

27. In flat roof construction, when the ceiling is suspended from the roof, the spans for the roof joists shall be as required in the floor joist table. The ceiling joists shall be 2 x 4's of same spacing as roof joists and supported by 1 x 4 inch hangers spaced not more than 6 feet o. c. and securely nailed to sides of the roof and ceiling joists.

28. Clear rafter spans which exceed the maximum spans given in the table below shall have 2 by 4 inch braces installed at every third rafter extending down to a bearing partition. A continuous 2 by 4 inch purlin shall be placed at the upper end of the braces. In no case shall the braces bear on ceiling joists between supports unless the ceiling joists are sufficiently strengthened to receive the added load.

29. Rafters shall be securely spiked to the wall plate. Opposing rafters shall be framed directly opposite each other at the ridge. There shall be a ridge board at all ridges and a valley rafter at all valleys. The depth of the ridge board and valley rafter shall be not
less than the cut end of the abutting rafters. (See detail 10.) Valley rafters shall be not less than 2 inches thick for spans under 12 feet and not less than 4 inches thick for spans over 12 feet.

30. Maximum spans for wood roof rafters shall be as listed in the following table, and are based on a total live and dead load of 30 pounds per square foot, uniformly distributed. (The live load is considered as acting normal to the roof surface.)

**Maximum clear spans of rafters**

*For Wood and Asphalt Shingle Roofs*

(Rafters for slate, tile, or asbestos-cement (rigid) shingle roofs shall be of sufficient size to carry the load)

Assumed Total Live and Dead Load—30 lbs. per sq. ft.

(Clear span shall mean the distance measured horizontally from plate to a point directly beneath the ridge. The actual rafter length will depend on the roof slope and must be determined accordingly)

*For Roof with a Minimum Slope of 5 to 12*

<table>
<thead>
<tr>
<th>Lumber size</th>
<th>Minimum fiber stress, 1,200 pounds</th>
<th>Minimum fiber stress, 1,000 pounds</th>
<th>Minimum fiber stress, less than 1,000 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>Actual Spacing center to center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 by 4</td>
<td>1(\frac{1}{2}) by 3(\frac{3}{4})</td>
<td>24 inches 7 ft. 7 in. 7 ft. 0 in. 5 ft. 9 in.</td>
<td></td>
</tr>
<tr>
<td>2 by 6</td>
<td>1(\frac{1}{2}) by 5(\frac{3}{4})</td>
<td>24 inches 11 ft. 10 in. 10 ft. 8 in. 10 ft. 0 in.</td>
<td></td>
</tr>
<tr>
<td>2 by 8</td>
<td>1(\frac{1}{2}) by 7(\frac{3}{4})</td>
<td>24 inches 15 ft. 10 in. 14 ft. 5 in. 11 ft. 5 in.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes.—** Where the allowable fiber stress of the species of wood used is in excess of 1,200 pounds, increased spans will be permitted provided they are determined on the same basis as used for this table.

Rafters on roofs with slopes less than 5 to 12 shall be figured same as floor joists.

The maximum spans for “native fir” and “native pine” shall be those listed under “All other softwoods” of this table.

See Paragraph 15 above for use of Viga or round beams as flat roof joists.

31. All openings in roof construction for dormer windows which are not supported on partitions, shall be framed with doubled rafters and headers.

32. Requirements for headers and trimmers for roof framing around chimneys shall be same as required for floors except that for a sloping roof where headers are less than 4 feet in length and the chimney is either at the ridge or the eaves, the trimmers may be single.

33. Roof rafters shall be covered with 1-inch roof sheathing not more than 10 inches in width, laid closed for tile, slate, asbestos-cement, or asphalt shingles; or 1 x 4 inch shingle lath for wood shingle roof, spaced according to shingle exposure. All roof sheathing and
shingle lath shall be securely nailed to rafters at each bearing. Boards over 8 inches wide shall be triple-nailed.

Note.—End-matched (T. & G.) boards may be used for roof sheathing provided no two adjoining boards break joints over the same rafter space, and each board shall bear on at least two rafters.

34. Crickets or chimney saddles shall be installed on the upper side of all chimneys that are not in contact with the ridge.

**B. Exterior Walls.**

1. Wood stud walls shall have corner posts built up using—
   
   (a) Two 2 x 4 pieces with a 2 x 6 member between (see detail 11); or
   
   (b) A 4 x 6 solid post with a 2 x 4 piece to form the interior lathing corner (see detail 12); or
   
   (c) Three 2 x 4 pieces arranged to form the interior lathing corner. (See detail 13.)

2. Studs shall be not less than 2 x 4’s spaced not more than 16 inches o. c.

3. All window and door openings shall have studs doubled on jambs. The inner stud shall be cut to receive the lintel or header over the opening and shall extend in one piece from lintel or header to bearing. (See detail 6.)

4. Lintels or headers over all openings shall be doubled and shall be set on edge. Spans for lintels or headers shall not exceed the following for the size given:

   - Spans up to 4 feet: two 2 x 4’s
   - Spans 4 feet to 5½ feet: two 2 x 6’s
   - Spans 5½ feet to 7 feet: two 2 x 8’s
   - Spans over 7 feet: two 2 x 10’s

In lieu of lintels, trussed construction may be used.

5. Sill construction: See details 1, 2 and 3 for suggested types of sill construction. Other approved methods of sill construction may be used but they must be fully detailed on the drawings submitted with the application.

6. All sills and all bearing plates for roof rafters framing into masonry walls shall be bolted to the masonry walls with ½-inch bolts bedded firmly in the masonry and spaced not more than 8 feet apart.

7. All sills and girders on top of foundation walls and piers shall be levelled, shimmed up with stone chips or brick, and thoroughly bedded in cement mortar.

8. Top plates shall be not less than doubled 2 x 4’s which shall lap at all corners and at all intersecting partitions. All such laps shall be securely spiked.

9. Wood sheathing, when laid diagonally on exterior walls, shall be applied at approximately 45 degrees and extend in opposite directions on each side adjoining at the corner, and corner bracing will not be required.

10. In all cases except where diagonal wood sheathing is used, all external corners shall have diagonal 1 x 4 inch braces let into the outside face of the studs at approximately 45 degrees and wherever possible, shall extend from sill to plate. Braces shall be securely nailed.
to each stud and to sill and plate. When openings occur near the corners, 1 x 4 inch knee braces let into the face of the studs shall be installed above and below the openings at approximately 45 degrees extending across not less than 3 stud spaces. (See detail 6.)

11. Wood sheathing boards shall be 1 inch thick, not more than 10 inches wide, laid closed with each board drawn up tight and securely nailed at each stud or bearing point. Boards over 8 inches wide shall be triple-nailed. Jointing shall occur over the center of and parallel to the studs.

Note.—End-matched (T. & G.) boards may be used for sheathing provided no two adjoining boards break joints over the same stud space, and each board shall bear on at least two studs.

12. Structures finished in stucco shall be sheathed. When wood sheathing is used, it shall be applied horizontally. See also the requirements in Paragraphs 10 and 15.

13. When shingles are applied over other than wood sheathing boards, 1 x 2 inch nailing strips shall be used, nailed to the studs over the building paper and spaced according to the shingle exposure.

14. Wood sheathing boards shall be installed and laid closed under rigid shingle siding where the shingle butt thickness is less than 3/8 inch.

15. All exterior finish shall be backed up with water-resistant building paper or saturated asphalt felt and shall be applied over all types of sheathing without exception. Each lap shall be not less than 4 inches with at least a 4-inch lap on the water-resistant material around openings. All exterior openings in frame walls shall have strips of water-resistant building paper or saturated asphalt felt installed behind the exterior trim.

16. Studs in exterior frame walls may run from sill to roof line provided they do not exceed 20 feet in length. Studs shall be in continuous lengths without splicing. Floor joists supported on exterior frame walls shall bear on 1 by 6 inch ribbons let into the inside face of the studs. Joists bearing on ribbons shall be securely nailed to the studs. Where the wall height exceeds 20 feet, a doubled 2 x 4 inch bearing plate shall be installed continuous at the second floor level. (See detail 6.)

C. Interior Partitions.

1. All bearing partition studs shall be not less than 2 x 4's spaced not more than 16 inches o. c. set the 4-inch way.

2. Nonbearing partition studs may be 2 x 4's spaced 16 inches o. c. set the 2-inch way for walls around closets and chimneys, for walls not exceeding 6 feet of unsupported length which contain openings, and for walls exceeding 6 feet provided they are devoid of openings.

3. All openings in interior bearing partitions shall have jambs and heads double-framed same as required for exterior openings. Jambs and heads of openings in nonbearing partitions shall be 2 x 4's doubled.

4. The top plates of all bearing partitions shall be doubled. All partition plates shall lap at all intersecting partitions and at outside walls, and shall be securely spiked.

5. When partitions frame on top of the joists or subfloor, the studs shall bear on a sole plate at least 2 inches thick.
6. Where nonbearing partitions run parallel to the second floor joists, a lathing member shall be placed above the partition plate and shall be wide enough to provide nailing surface for ceiling lath.

7. Wood bearing partitions when used in basements shall bear on a cement or masonry base which shall extend not less than 3 inches above the finish floor. The base shall bear directly on a footing. A sheet of noncorrodible sheet metal shall separate the wood construction from the cement or masonry base.

8. No stud shall be cut more than half its depth to receive piping and duct work. If more depth is required, the partition studs shall be increased accordingly. Where the running of piping and duct work necessitates the cutting of plates, proper provision, acceptable to the Chief Architectural Supervisor, shall be made for tying together and supporting all structural members affected by such cutting. (See details 7, 8, and 9.)

9. Corners for all rooms shall be framed solid for lath or other interior finish. (See details 11 to 15.)

10. All interior partitions connecting to masonry walls shall have the end stud anchored to the masonry with not less than three ½-inch bolts in each story height.

D. Stairs.

1. Main stairways shall have not less than 6 feet 8 inches continuous clear headroom measured vertically from the front edge of the tread to a line parallel to the stair run. Basement stairs shall have not less than 6 feet 6 inches clear head room.

2. In figuring the main stair run, the treads shall be not less than 9 inches wide, risers shall be not more than 8½ inches high, and tread shall be so proportioned to riser that an easy run is obtained. The width of tread, including the nosing, shall be not less than 10¼ inches.

3. The cutting and framing of all structural members such as stringers and landings shall be such that the development of their full strength will not be impaired. Stringers shall have solid bearing at top and bottom. The minimum effective depth of wooden stair stringers shall be 3½ inches.

4. If winders are used, the width of treads at 18 inches from the converging end shall be not less than the tread width on the straight stair run. All risers shall be the same height for each story.

5. Open basement stairs shall have stringers not less than 2 inches thick. If treads are less than 1½ inches thick, a third stringer shall be installed.

MISCELLANEOUS

1. Caulking will be required around all exterior openings in masonry, masonry veneer, adobe, and stucco walls and at other intersections of wood and these materials where considered necessary to make weathertight.

2. Fire stops shall be provided in partitions and outside stud walls at first floor and at attic, which shall cut off completely all openings. Approved masonry or wood blocks cut in solidly, or other approved methods will be acceptable.

3. Where showers occur over bathtubs, the walls above the tubs for a height of at least 6 feet from the bathroom floor shall be finished
with a waterproof material. Recessed bathtubs shall be supported at the rim on metal supports or wood blocks securely anchored to the stud frame.

TERMITE PREVENTION

1. When protection against infestation by termites is necessary, it shall be attained by the following means which are listed in the order of their desirability.

(a) Continuous noncorrodible sheet metal termite shields with tight seams or soldered joints (see details 1, 2, and 3); or

(b) Lumber treated with wood preservatives for all wood construction in contact with foundation walls and all first floor framing. The following methods of treating lumber with preservatives are acceptable, listed in the order of their preference:

(1) Full-cell or empty-cell (vacuum-pressure) process.

(2) Hot-and-cold bath process.

The chemicals used as preservatives in both methods must be those which have withstood actual tests over a period of years and the methods of treatment shall be approved by the Chief Architectural Supervisor.

NOTE.—Brush coat, spraying, or dipping methods of treatment will not be acceptable.

2. In localities where, in the opinion of the Santa Fe Underwriting Office, full protection is necessary, protection shall be obtained by both (a) and one of the methods under (b) as listed in Paragraph 1 above.

3. When protection against termites is required, noncorrodible metal termite shields shall be installed around all pipes entering the ground and those which are less than 18 inches above the ground.

ROOF COVERINGS

1. Tile, slate, asbestos-cement and asphalt shingle roofs shall be installed according to the manufacturer's directions.

2. Roof sheathing shall be covered with saturated asphalt roofing felt of the following weights:

(a) Not less than 30-pounds per square under tile, asbestos-cement shingle or slate roofs.

(b) Not less than 30-pounds per square under asphalt shingles where less than double thickness occurs at any point.

(c) Not less than 15-pounds per square under asphalt shingles where double thickness is obtained at all points.

NOTE.—No felt will be required where triple thickness asphalt shingles is obtained at all points nor under wood shingles.

3. Asphalt shingles shall bear Fire Underwriters' Class "C" label, and shall be of the following minimum weight:

- Square butt strip shingles: 210 lbs. per square
- Individual shingles: 250 lbs. per square
- Hexagon strip shingles: 165 lbs. per square.

NOTE.—The minimum pitch for asphalt shingle roofs shall be 5 inches in 12 inches. A double starting row shall be used on shingle installations.
4. When slate is installed, exposure shall not exceed the following:
   - 14-inch slate—not over 5 1/2 inches to the weather.
   - 16-inch slate—not over 6 1/2 inches to the weather.
   - 18-inch slate—not over 7 1/2 inches to the weather.

5. Asbestos-cement shingles and tiles shall be applied with exposures as recommended by the manufacturers.

6. Built-up asphalt and tar and gravel coverings for flat roofs shall be applied according to manufacturer's directions and shall carry the regular manufacturer's guarantee for the type of roof used. The guarantee shall cover a period of not less than 10 years and shall include flashings.

7. Wood shingles shall be edge-grain tapered shingles, minimum thickness, 5 butts in 2 inches.

8. Wood shingle exposure to the weather shall not exceed the following:

   **Maximum wood-shingle exposures**

<table>
<thead>
<tr>
<th>Pitch of roof</th>
<th>Shingle length (in inches)</th>
<th>Side wall shingle exposure (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rise</td>
<td>Run 16 18 24</td>
<td>Thickness of courses 16 18 24</td>
</tr>
<tr>
<td>3 to 7</td>
<td>12 12 5 3/4 4 1/2 5 1/2</td>
<td>Single 7 3/4 8 1/4 11</td>
</tr>
<tr>
<td>7 to 18</td>
<td>12 5 3/4 4 1/2 5 1/2</td>
<td>Double 12 14 16</td>
</tr>
</tbody>
</table>

1 Exposed course shall be face-nailed.

   NOTE.-A double starting row shall be used on shingle installations.

Wood shingles on roofs with pitch of less than 4 to 12 shall be used on open porches only.

9. Other types of roof coverings such as sheet metal, canvas, etc., may be used when the type and weight of the material and methods of application are approved by the Chief Architectural Supervisor.

**SHEET METAL**

1. All built-in flashing and counterflashing over heads of openings, around chimneys, at intersections of roofs and walls, valleys, and at horizontal and vertical intersections of stucco with other material shall be of corrosion-resisting metal.

2. For valleys in connection with asphalt shingle roofs, two thicknesses of mineral surfaced roll-roofing material cut from rolls weighing not less than 85 pounds per square, may be used. Strips shall be not less than 18 inches wide.

3. All sheet metal shall be of the following minimum weight or gauge:

   (a) Copper: 14-ounce.
   (b) Tin: 40-pound block tin coating.
   (c) Galvanized sheet metal: 28-gauge sheets with 2-ounce zinc coating per square foot.
   (d) Zinc: As recommended by manufacturers.
   (e) Lead: Sheet lead—2 1/2 pounds per square foot.
4. Flashing and counterflashing at parapet walls in connection with flat roofs may be of same material as roof coverings. All flat roofs, except where metal base flashing is used, shall have a 45-degree cant strip at all roof intersections with parapet and vertical walls.

5. All chimneys shall have corrosion-resisting metal counterflashing built in on all sides at intersection with roof.

6. When gutters and leaders are installed, they shall be of corrosion-resisting metals. Solid wood gutters will be acceptable if inside surface is properly protected by two coats of pitch or three coats of lead and oil. Crickets shall be covered with corrosion-resisting sheet metal.

**LATHING**

1. Wood lath shall be 1/8-inch thick No. 1 lath, spaced not less than 1/4 inch nor more than 3/8 inch apart, nailed at each bearing, and joints shall be broken every 9th lath. Lath extending continuous behind intersecting partitions and walls will not be acceptable. (See details 14 and 15.)

2. Metal lath shall be not less than the following:
   - (a) Expanded metal lath—
     1. For stud walls, studs 16 inches o. c. or less: 2.5 pounds per square yard.
     2. For ceilings, joists spacing up to 20 inches: 3.4 pounds per square yard, or flat ribbed metal lath 2.75 pounds per square yard.
     3. For exterior stucco: 3.4 pounds per square yard. Note: Expanded metal lath used as base for interior plaster shall be either painted or galvanized.
   - (b) Woven galvanized wire lath not less than 20 gauge wire and not more than 1 inch mesh opening.
   - (c) Paper back galvanized wire lath: Maximum wire spacing 2 inches o. c.
     1. For interior plaster: Weight 2.3 pounds per square yard.
     2. For exterior stucco: Weight 3.1 pounds per square yard.

   Note.—All metal lath used as base for exterior stucco shall be cut from zinc-coated sheet metal or fabricated from zinc-coated wire.

3. All intersections of walls at corners and at ceilings shall be lathed with metal lath corner strips not less than 6 inches wide—3 inches on each surface. (See details 11 to 15.)

4. All metal lath and wire used as a base for stucco shall be held at least 3/8 inch away from sheathing by use of furring nails or self-furring lath.

5. Insulating fiber board lath and gypsum board lath shall not exceed 18 by 48 inches and shall be applied according to manufacturer's directions.

**PLASTER WORK**

1. All interior plaster when applied to lath base shall be not less than 2-coat work and shall have a minimum thickness of 1/2 inch over the lath base.
2. All plaster shall be mixed and applied exactly according to manufacturer's directions.
3. All lime used for plastering shall be thoroughly slaked.
4. If hydrated lime or patent plasters are used, they shall be mixed and applied according to manufacturer's directions.

STUCCO

Note.—See "Lathing" for application of stucco on metal lath.

1. Metal lath shall be wholly embedded in the stucco.
2. Stucco shall have a base of portland cement or other approved material.
3. First and second coats shall be composed of 1 part portland cement, 3 parts sand, and hydrated lime equal to 10 percent of cement. First coat shall be applied to a minimum thickness and scratched, kept damp for at least three days, then allowed to dry. After scratch coat is dry, moisten surface thoroughly and evenly, immediately apply the second coat at least \( \frac{1}{2} \)-inch thick. Keep second coat damp for at least three days and then allow to dry thoroughly.
4. Third coat shall be applied of sufficient thickness to obtain desired finish texture and shall be protected from too rapid drying for at least three days.
5. Exterior stucco applied to wood lath will not be acceptable.
6. No stucco shall be applied when the temperature is less than 40 degrees Fahrenheit.

PAINTING

1. All millwork shall receive prime coat before or immediately after installation. When wood siding is used, seal ends before erection.
2. All nail holes, cracks, etc., shall be puttied full and smooth. Putty shall be applied after the priming coats on surfaces which are to be painted or enameled. Putty shall be tinted to match woodwork on all stained and varnished finished. All knots, pitch pockets, and sap streaks shall be shellacked before paint is applied.
3. All exterior woodwork shall receive not less than 3 coats of paint including the prime coat. In lieu of this treatment, stain or penetrating oil may be used provided equal protection is obtained in a manner approved by the Chief Architectural Supervisor.
4. All masonry and concrete walls to be painted shall receive 2 brush coats of paint especially prepared for painting masonry or concrete surfaces.
5. Where varnish is used for exterior, the varnish shall be a good grade of spar varnish.
6. All exterior and interior structural iron work, and ornamental iron work if to be painted, shall have at least one coat of paint in addition to shop coat. Paint shall be lead and oil, graphite, or any specially prepared paint which is recommended by the manufacturers for painting iron work.
7. All interior trim and all sash shall be stained, painted, varnished, or waxed.
8. The following types of interior finish give in a general way the minimums which will be acceptable:

(a) Wood, if painted: 2 coats.
(b) Wood, if stained:
   (1) Stain and one coat of varnish.
   (2) Stain and one coat of wax.
(c) Natural wood, unstained:
   (1) Open grain wood: 1 coat filler, 2 coats varnish.
   (2) Close grain wood: 2 coats varnish.
   (3) 2 coats wax.
(d) Floors:
   (1) 2 coats wax or wax stain.
   (2) 1 coat filler, 1 coat shellac, varnish or lacquer, 1 coat wax.
   (3) 1 coat filler, 1 coat shellac, 1 coat varnish.
   (4) 1 coat filler, 2 coats varnish.
   (5) 2 coats floor paint (enamel), 1 coat wax.
   (6) Cement: 2 coats floor paint (enamel), 1 coat wax.
(e) Walls and ceilings if decorated:
   (1) 1 coat of size, 2 coats paint with oil or varnish base.
   (2) 1 coat of size, wall covering (paper, etc.).
   (3) 1 coat of size and 1 coat of prepared cold water paint.

9. The above requirements for exterior and interior finish may be modified when specially prepared materials are used as recommended by the manufacturers and approved by the Chief Architectural Supervisor.

PLUMBING

1. The installation of all plumbing work shall comply with all requirements of the applicable local code, or the State or local Board of Health regulations. Where no local or State regulations exist, the requirements contained in "Recommended Minimum Requirements for Plumbing," published by the National Bureau of Standards shall apply.

   NOTE.—When private water supply and sewage disposal systems are contemplated, they shall be in accordance with the recommendations of the State of New Mexico Bureau of Public Health, as indicated in their publications, "Plans Showing the Proper Construction of Three Types of Wells" and "Septic Tank for Homes and Small Institutions."

2. After final plumbing tests have been made, evidence showing approval by the local plumbing inspector will be required.

3. All materials shall be new sound stock, of quality and weight specified.

4. In localities where freezing weather occurs, all pipes located in exterior walls shall be thoroughly insulated.

5. When dry wells are provided for leader drainage, they shall be located at least 8 feet from the building wall.
6. Storage equipment for domestic hot water supply with capacity of not less than 20 gallons shall be installed for each family unit. For each additional bathroom over one for each family unit, the capacity shall be increased 10 gallons.

Note.—Automatic heaters of smaller storage capacity will be acceptable when, in the opinion of the Chief Architectural Supervisor, such heater will furnish an adequate supply of hot water to all fixtures.

7. Auxiliary heaters shall rest on concrete floor or other suitable fireproof base.

8. All piping, except drain lines and soil pipes, when located under concrete slabs on the ground, shall be installed to permit access for inspection and repair. Drain and soil lines shall have cleanouts at each turn of the pipe.

9. The specifications shall contain descriptions of all plumbing fixtures. Manufacturer’s name and catalog plate number will be considered adequate description.

HEATING

1. The installation of the heating system shall comply with all rules and regulations of the National Board of Fire Underwriters and with all applicable local laws and ordinances pertaining thereto. All work shall comply with such regulations and any work not conforming to those requirements shall be corrected.

2. All gas fired heating and domestic hot water equipment shall conform to the standards established by the American Gas Association.

3. Heating equipment shall be installed in accordance with manufacturer’s instructions except when these instructions conflict with local regulations.

4. All equipment and materials shall be of standard stock, in sound condition and shall be installed by experienced workmen familiar with the installation of the type of heating system to be used.

5. The heating system shall be of such capacity that under normal operation it will produce and maintain a temperature of not less than 70 degrees Fahrenheit within all habitable rooms when the outdoor temperature is 10 degrees above zero Fahrenheit.

ELECTRICAL WORK

A. General.

1. The installation of all electrical work including equipment shall comply with all laws applying to electrical installations in effect in the local community, or with the regulations of the National Electrical Code in the absence of such laws, and with the regulations of the electric utility company.

2. After completion of the work, evidence shall be furnished showing compliance with such laws and regulations.

3. All materials used shall be new and shall conform to the standards established by the Underwriters’ Laboratories, Inc.

B. Service

1. Wires from the outside service connection to the distribution panel shall be No. 8 gauge or larger.
C. Branch Circuits.
1. Minimum wire size shall be No. 14 gauge. Where the distance from the distribution panel to the outlets is great, or where any outlet or series of outlets on a circuit is likely to cause an excessive load, No. 12 gauge wire or a size adequate for the load to be carried shall be installed.
2. All convenience outlets located in kitchen, pantry, breakfast room, dining room and laundry shall be wired with not smaller than No. 12 gauge wire.

D. Appliance Circuits.
1. Where electric ranges, heaters, oil burners, stokers, or other “heavy duty” equipment is to be installed, wire shall be of adequate size for the load to be carried, with no reduction in size between the appliance and the distribution panel, and not less than as specified in the following table:

<table>
<thead>
<tr>
<th>Kind of appliance</th>
<th>Number of wires</th>
<th>Minimum size of wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>3</td>
<td>No. 8</td>
</tr>
<tr>
<td>Heater</td>
<td>2</td>
<td>No. 10</td>
</tr>
<tr>
<td>Oil burner or stoker</td>
<td>2</td>
<td>No. 12</td>
</tr>
<tr>
<td>Other small motors</td>
<td>2</td>
<td>No. 12</td>
</tr>
</tbody>
</table>

Note.—In solid masonry or adobe walls, rigid conduit shall be used.

GENERAL
1. No minimum requirements are applied to interior finish such as trim, flooring, tile work, etc. The choice of such materials will be left to the architect, owner, or builder. It is understood that the material and workmanship shall be of standard equal to the best practices for the type and kind of building being erected.
2. It must be thoroughly understood that the valuation and tentative rating of the property are based on the provisions of the specifications and drawings together with these Minimum Construction Requirements, and that any deviation from their provisions without first obtaining approval from the Santa Fe Underwriting Office may affect the amount of loan committed on, or affect the term of the mortgage and the final property rating.
These details indicate the methods of construction most generally used. Construction at variance with that indicated by these details will be acceptable when approved by the Chief Architectural Supervisor of the Santa Fe Underwriting Office.