

Open-file Report 382

Figures 87–102 only

From
NMBMMR Circular 188

by
E. W. Smith

CODES—Local, state, and national codes in effect at the site of the work shall be observed during all phases of the work.

WEATHER CONDITIONS—Discontinue adobe-masonry construction when the ambient temperature is below 40° F (4° C) or when the probability of such conditions could occur within 48 hrs. Special conditions for cold-weather laying shall be subject to prior approval by the architect or building official. Do not build upon frozen materials. Remove any work that has become frozen prior to resuming construction. In hot weather, protect concrete and cement mortar from drying too rapidly.

TESTING—The adobe manufacturer shall attest by certificate or otherwise guarantee that the adobes furnished meet or exceed the physical requirements stated in the building code adopted by the state of New Mexico.

Materials

SEMISTABILIZED ADOBES—Nominal 4 × 14 × 10-inch units shall be made from adobe clay soil that shall contain not less than 25% and not more than 45% clay/silt material passing a no. 200 sieve. The soil shall contain sufficient clay to bind the particles together and shall contain not more than 0.2% water-soluble salts. Each adobe unit shall contain from 2 to 4% asphaltic emulsion stabilizer. The remainder of materials shall be a combination of fine sands and silts containing no particles larger than 3/8 inch and shall be free of large organic objects. The water used to mix the material shall be potable (drinkable). All units shall be formed in standard wood or metal molding forms. No units shall be used that are less than 30 days old.

TRADITIONAL ADOBES—Nonstabilized adobe shall be made in the same manner as the semistabilized units with the exception that the asphalt shall be deleted, and small quantities of straw can be used as a binder in the mix.

STABILIZED ADOBES—Stabilized units shall be made in the same manner as the semistabilized units except that the adobe asphalt content shall be 5–8%.

STABILIZERS—Type CSS-1 or CSS-1h asphaltic emulsion or the following cement, lime, and sand mixture—*portland cement*, ASTM C-150 Type II-2500 psi; *hydrated lime*, ASTM C-207 Type S; *sand*, clean sharp, ASTM C-144; *water*, clean, nonalkali, and potable; and *joint reinforcing*, ASTM A-82, Truss Type 9 gauge.

ANCHORS AND TIES—Galvanized, 20 gauge minimum, and of approved design or expanded metal, 3.4 lbs/yard². All metals shall be free of loose rust or scale.

GRINGO BLOCKS OR WOOD SLEEPERS—Wood blocks in the same shape as the adobe unit shall be made of 2 × 4-ft stock material and treated with an approved wood preservative.

MORTAR—Mortar shall be mixed as follows—1 part cement, 1 part lime, and not more than 6 parts sand with adequate water to produce a workable mix.

ADOBE MORTAR—Adobe mortar where allowed by the building official shall be mixed of the same materials as the adobe units. Mortar joints should be waterproof to prevent

expansion and contraction as a result of moisture variations and should be about 1/2 inch thick (California Research Corporation, 1963). Soil found suitable for use in mortar is best mixed in a small powered plaster or cement mixer. Usually approximately 1/2–3/4 gal of stabilizer (asphalt emulsion) per ft³ of dry loose soil is required. To produce a 5–8% mix use a 55-gal oil drum, pour in 5–5 1/2 gal of asphalt emulsion, fill the drum with water, stir, and then add the mixture into the plaster or concrete mixer with soil in the ratio mentioned above to make a workable adobe mortar.

The proportions suggested by the Hans Sumpf Company (personal communication, 1980) are as follows: 1 part cement, 2 parts adobe soil, 3 parts sand, and 1 1/2 gal emulsified asphalt per sack of cement used in the mortar mix.

ALTERNATIVE MORTAR—The alternative mortar proportions suggested by the Hans Sumpf Company (personal communication, 1980) shall be 1 part cement and 2 1/2 parts sand into which emulsified asphalt shall be incorporated at a ratio of 1 1/2 gal to each sack of cement.

Execution

WALL CONSTRUCTION—The contractor shall inspect the foundation for suitability for laying of the adobes. Do not proceed if the earth is within 6 inches of the first course of adobe or if any other condition exists that would be detrimental to the adobe.

Mix cement mortar in a mechanical mixer for at least 10 mins, not more than 2 1/2 hrs before it is to be used. Retempering (rewetting) of cement mortar shall not be allowed.

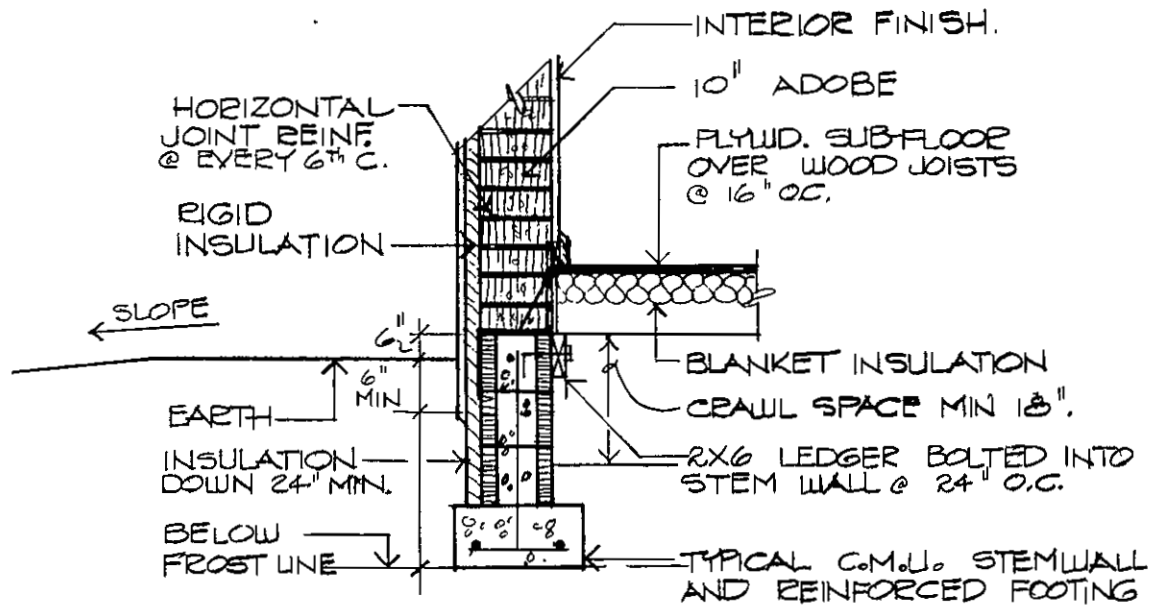
Lay adobe units in running bond with a minimum 4-inch overlap of the vertical joints between the bricks of adjacent courses. Mortar joints shall be flush with a 1/2–3/4-inch maximum thickness. Tool mortar joints slightly concave on interior surfaces scheduled for an exposed finish. Rub with burlap prior to subsequent finishing. Any unit that has been disturbed after the mortar has stiffened shall be removed and relaid in fresh mortar.

Install horizontal joint reinforcements as indicated on drawings, or if not called for, place reinforcements in every sixth course and in the first joint above lintels. Extend reinforcements 2 ft on both sides of all openings. Lap reinforcement 6 inches minimum at all splices and maintain a 5/8-inch mortar coverage on the weather side of the joint.

Install built-in items such as wood sleepers, blocking, door frames, anchors, lintels, or other framing members as required as the work progresses. Space around frames and anchors shall be filled solidly with mortar.

Step back unfinished walls for joining with new work. Cover all partially completed work with a waterproof material and anchor securely. Protect surfaces of walls from damage and keep free of excess mortar. Walls may be channeled to embed pipes or conduit up to 1/2 inch maximum diameter. Adobe walls may be thickened to embed larger diameters. Pipes or conduits may pass through the walls.

CLEAN UP—Remove all debris created by the work in this section from the job site.



10' STEM WALL-JOIST FLOOR

NOTE: ALL FOOTINGS AND FOUNDATION WALLS ARE SHOWN FOR AVERAGE SOIL AND LOADING CONDITIONS. ALL FOOTINGS SHOULD BE DESIGNED FOR THE SPECIFIC CONDITIONS OF EACH PROJECT.

THE THICKNESS OF INSULATION REQUIRED BY ENERGY CODES VARIES WITH PROJECT, SITE, CLIMATE AND THE R-VALUE OF THE INSULATION TO BE USED.

FIGURE 87—TYPICAL FOUNDATION FOR 10-INCH ADOBE WALL.

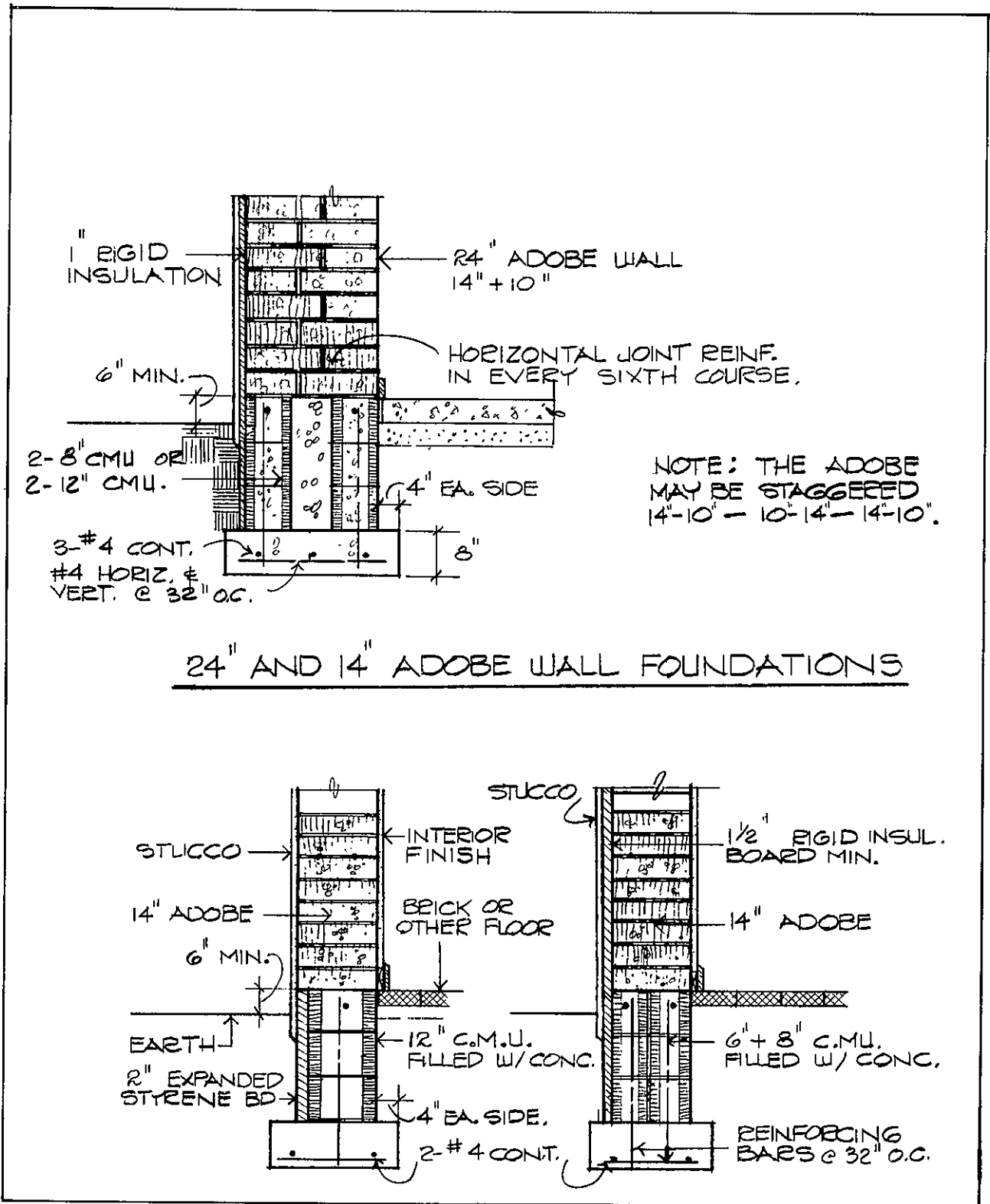
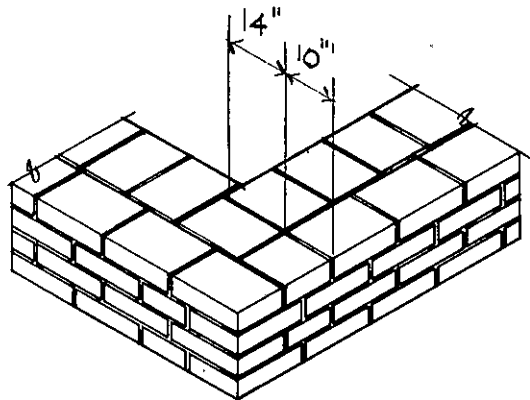
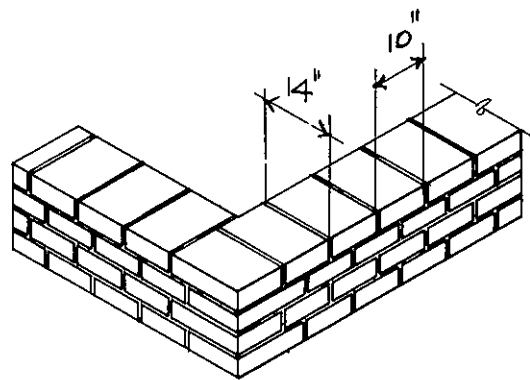


FIGURE 88—TYPICAL FOUNDATIONS FOR 14-INCH AND 24-INCH WALLS.

24" WALL

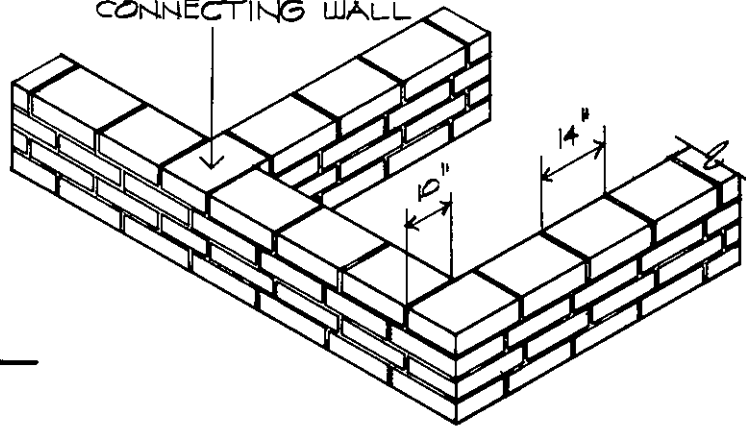


14" WALL



KEY WALL INTO
CONNECTING WALL

10" WALL



STANDARD ADOBE WALLS

FIGURE 89—STANDARD ADOBE-WALL THICKNESSES.

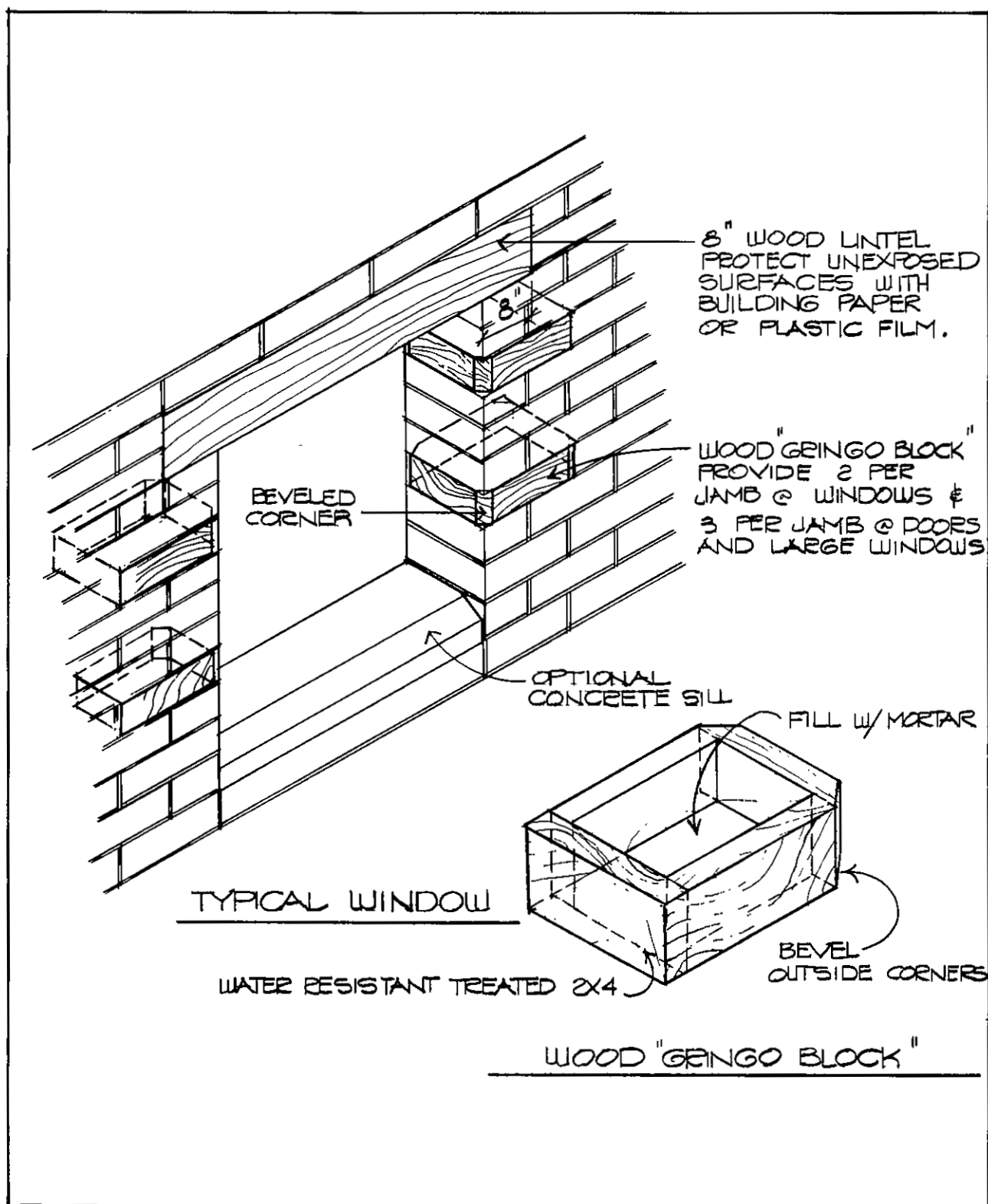


FIGURE 90—WOOD "GRINGO" BLOCKING DETAIL.

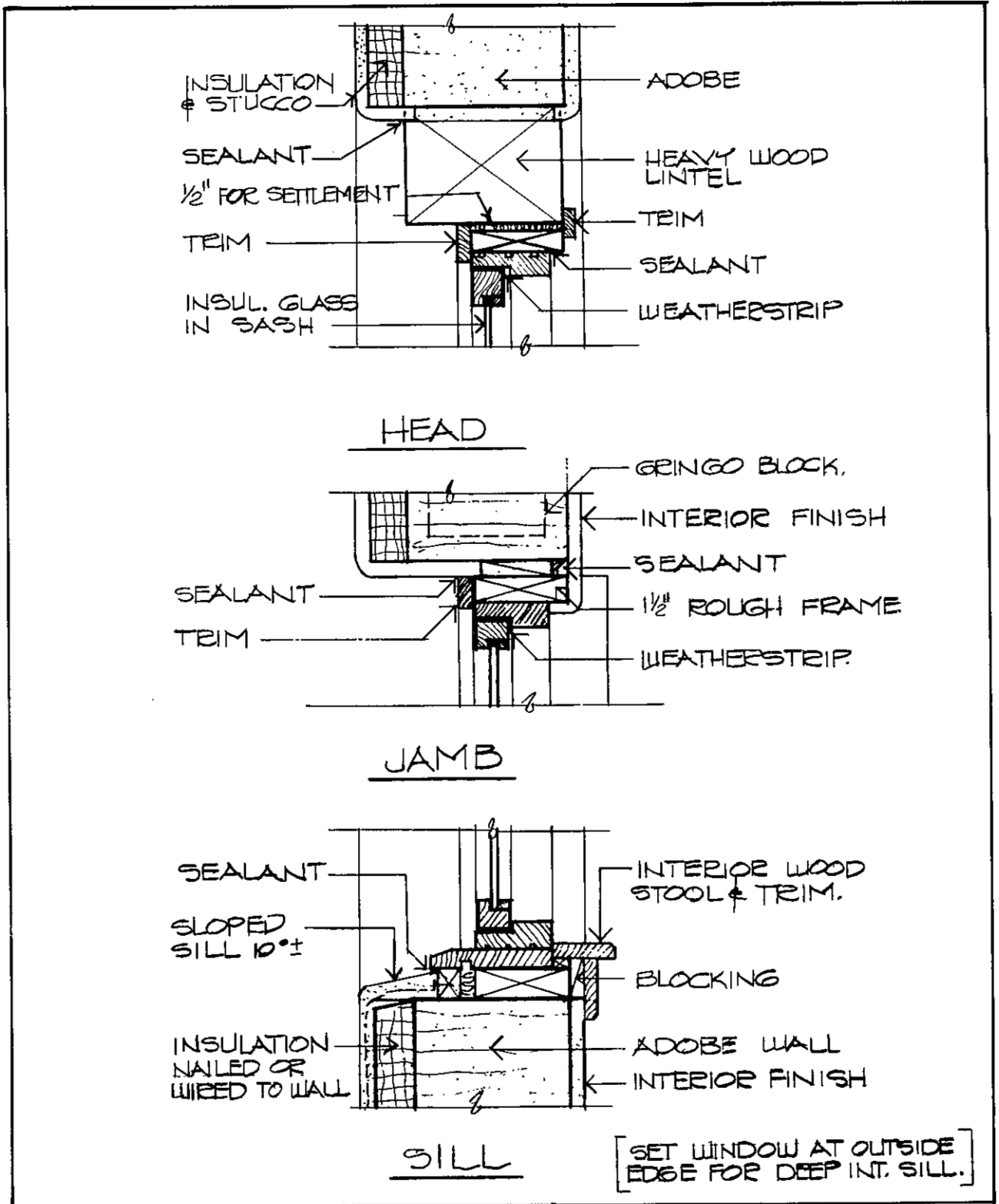


FIGURE 91—TYPICAL WOOD WINDOW DETAIL IN ADOBE WALL.

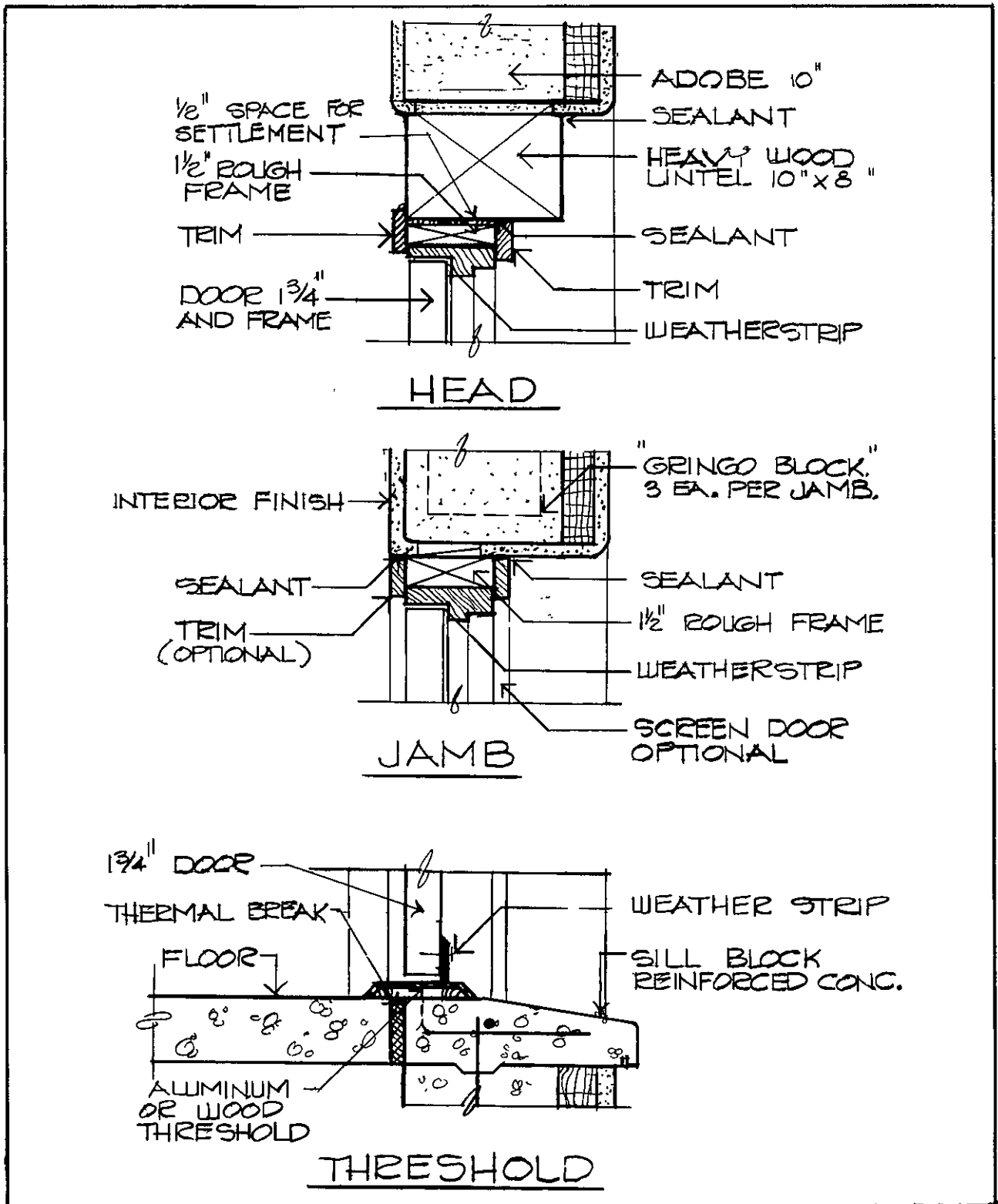
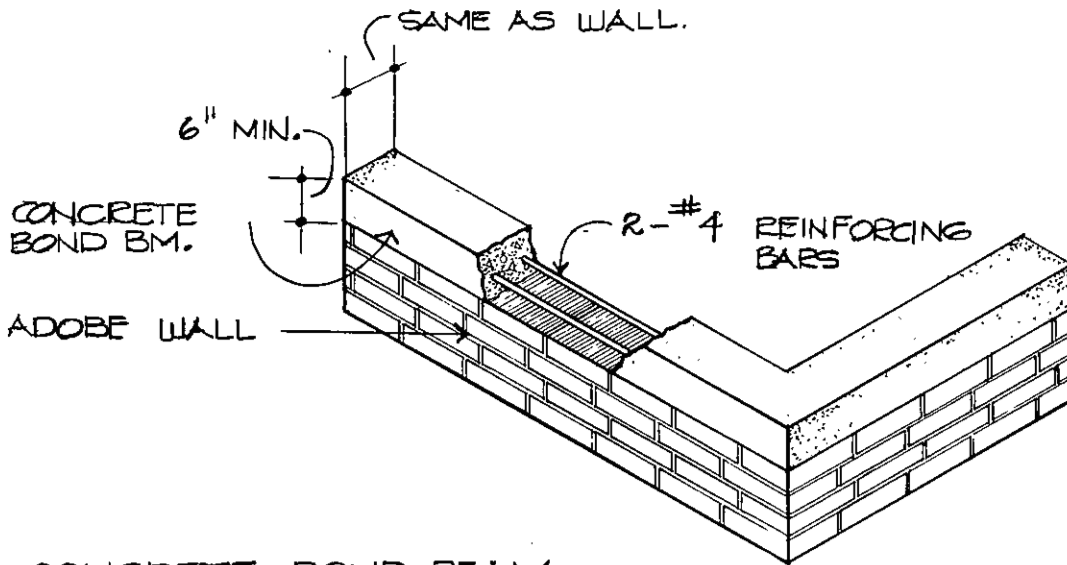
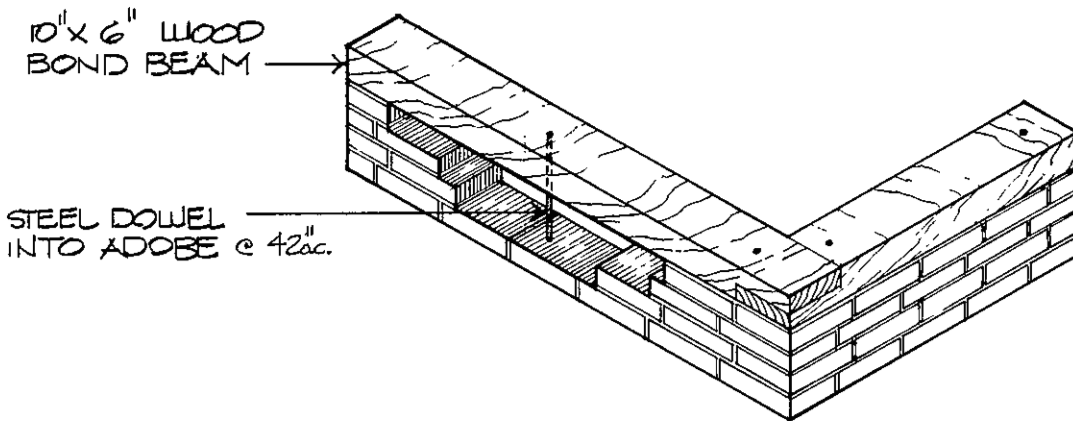


FIGURE 92—TYPICAL EXTERIOR WOOD DOOR DETAILS.



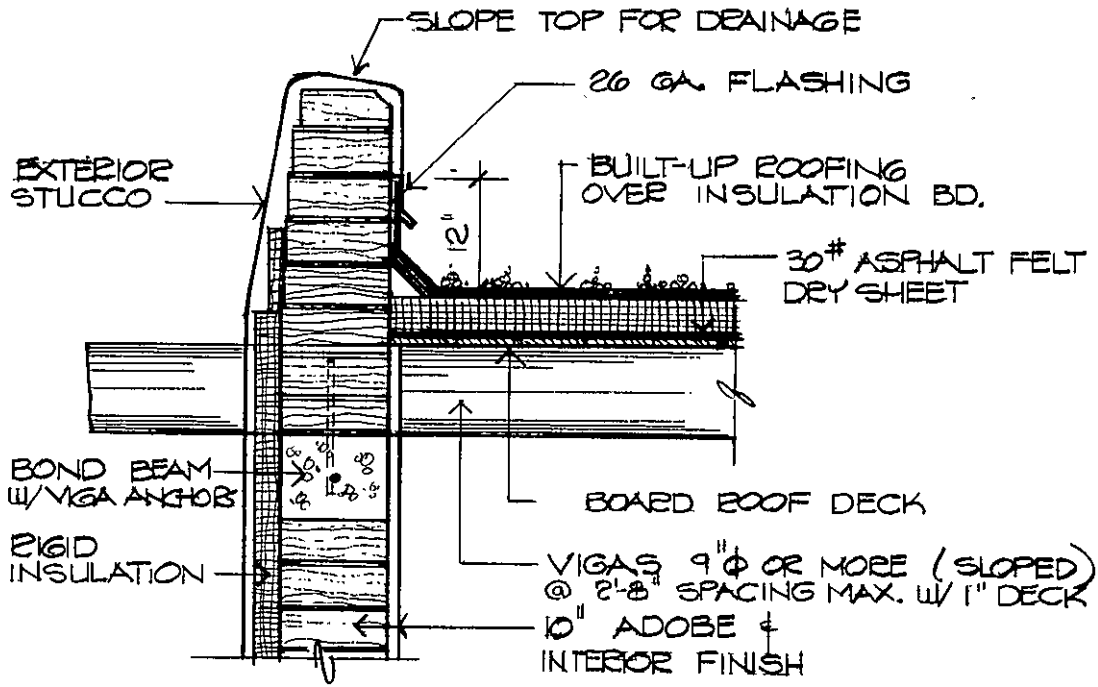
CONCRETE BOND BEAM



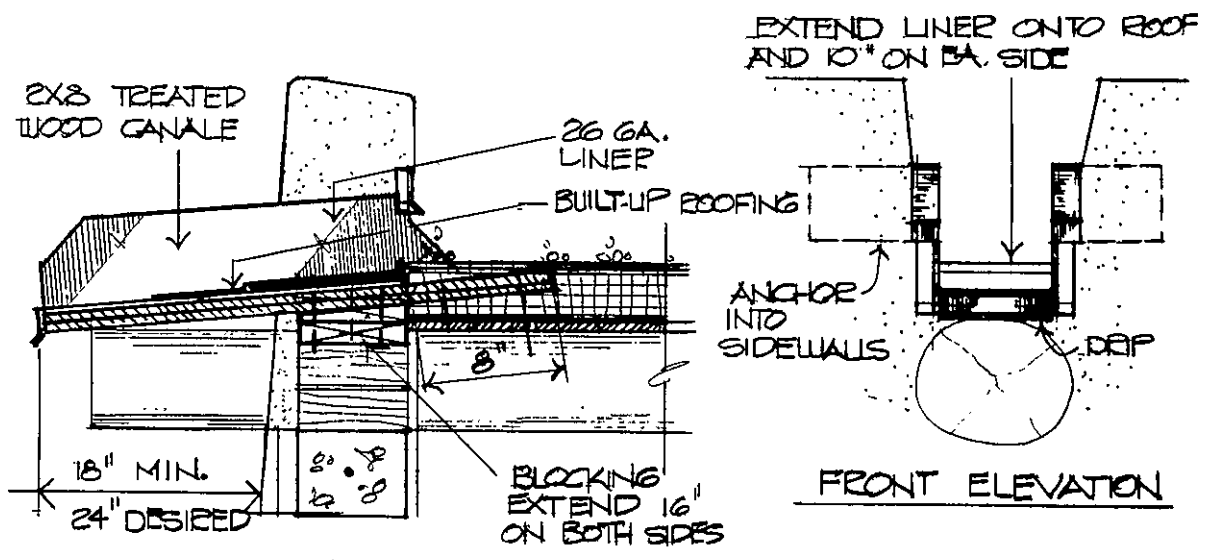
WOOD BOND BEAM

BOND BEAMS AS REQUIRED BY CODE

FIGURE 93—BOND BEAMS AS REQUIRED BY CODE, WOOD TIMBER AND CONCRETE



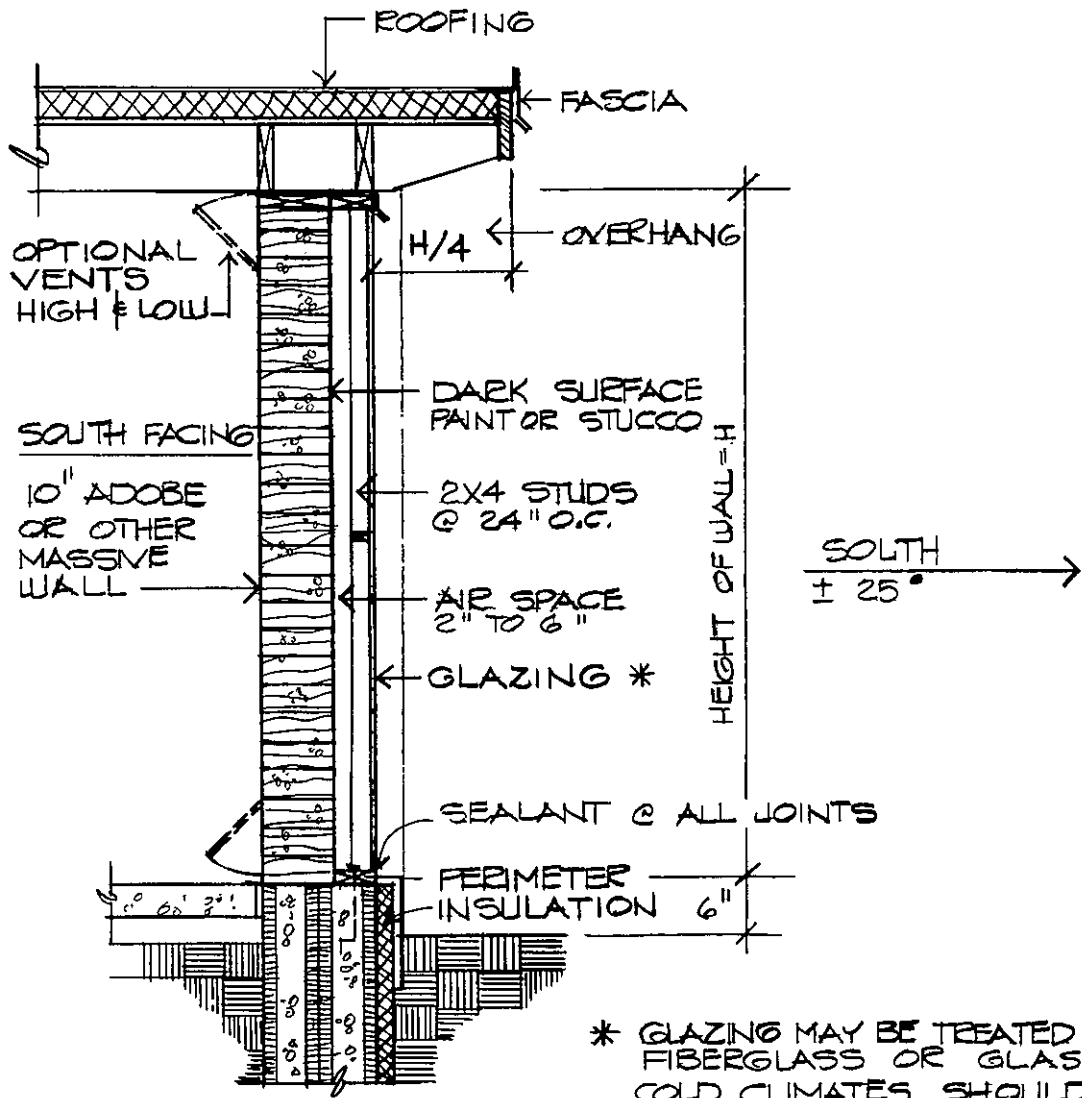
PARAPET WALL DETAIL



CANALE DETAILS

FIGURE 94—ROOF PARAPET AND CANALE DETAIL.

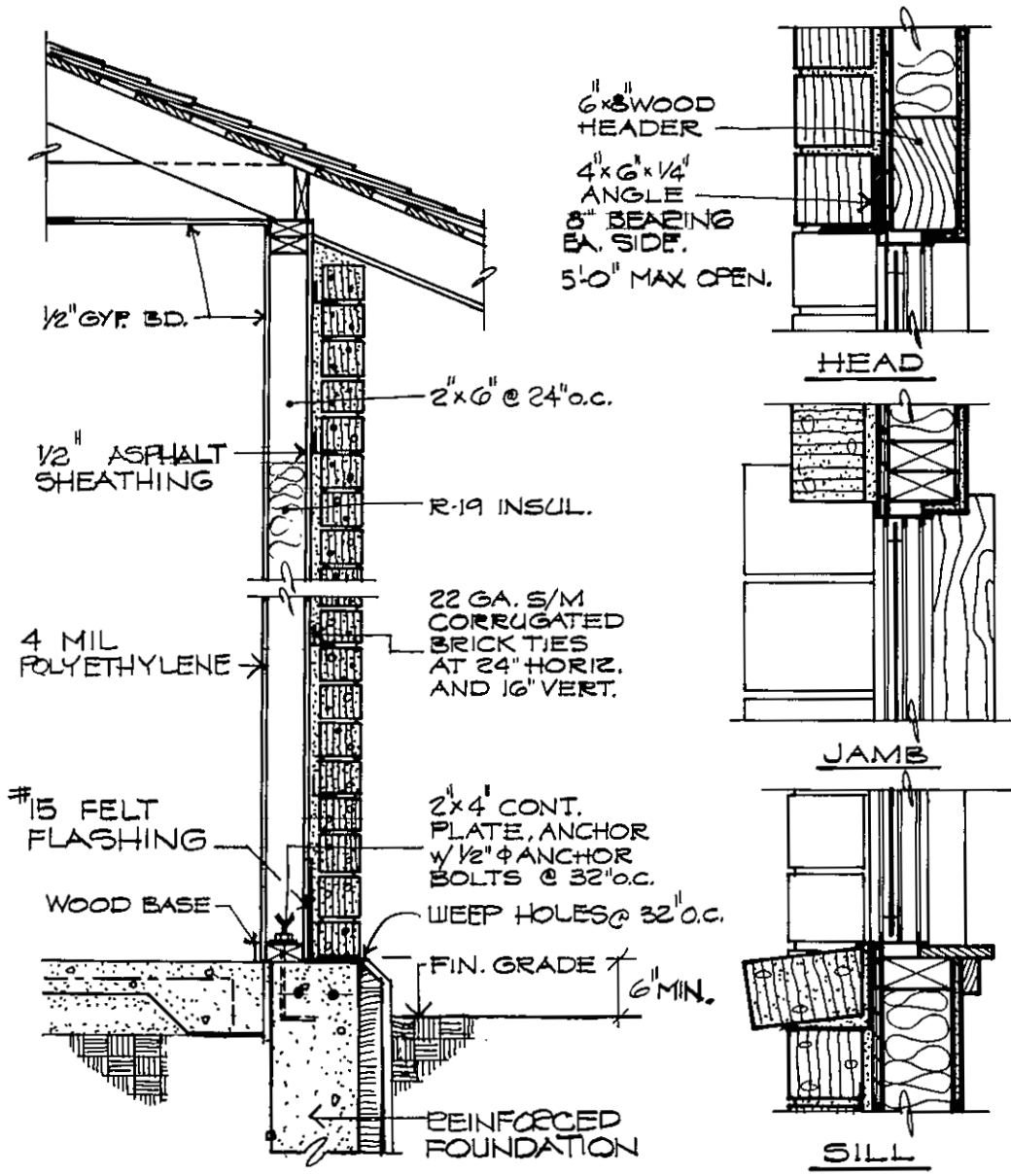
PASSIVE SOLAR ADOBE USE



* GLAZING MAY BE TREATED FIBERGLASS OR GLASS. COLD CLIMATES SHOULD USE TWO LAYERS OF GLAZING.

- TROMBE WALL

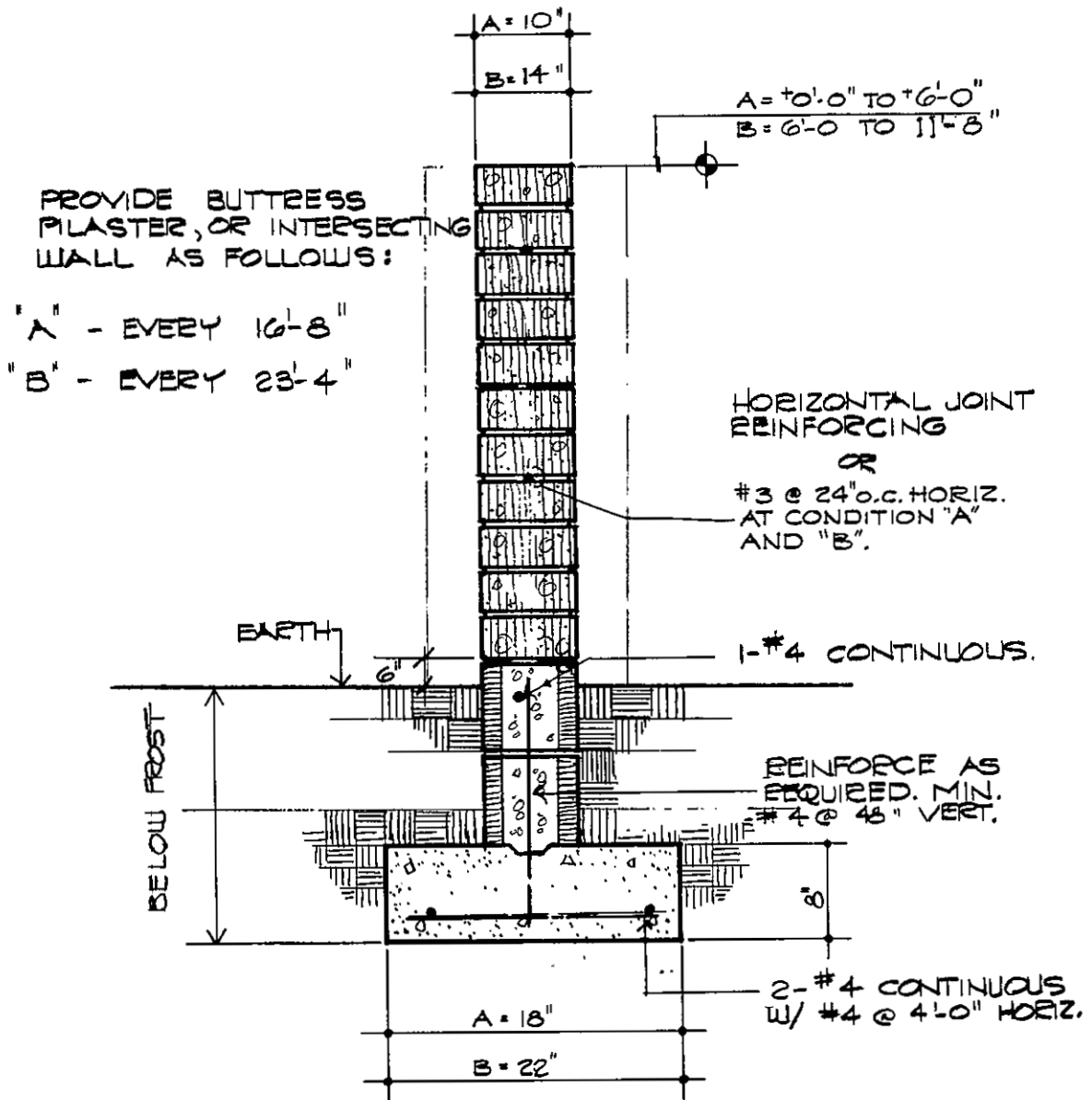
FIGURE 95—PASSIVE SOLAR TROMBE-WALL DETAIL.



TYP. WALL SECTION

ADOBE VENEER ON WOOD FRAME

FIGURE 96—ADOBE VENEER OVER STUD WALL SECTION.



GARDEN WALL DETAIL

FIGURE 97—GARDEN-WALL DETAIL.

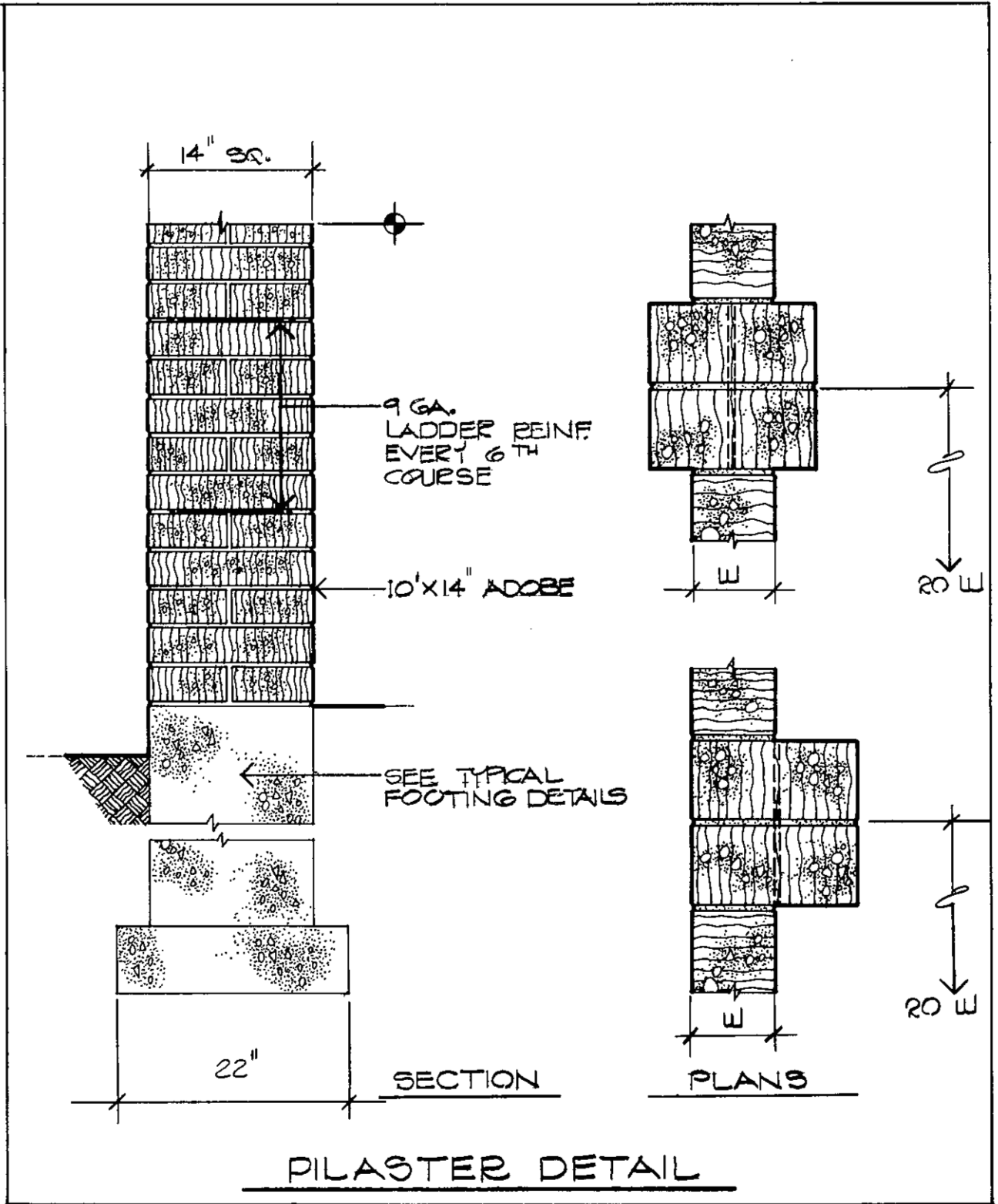


FIGURE 98—ADOBE POST OR PILASTER DETAIL.

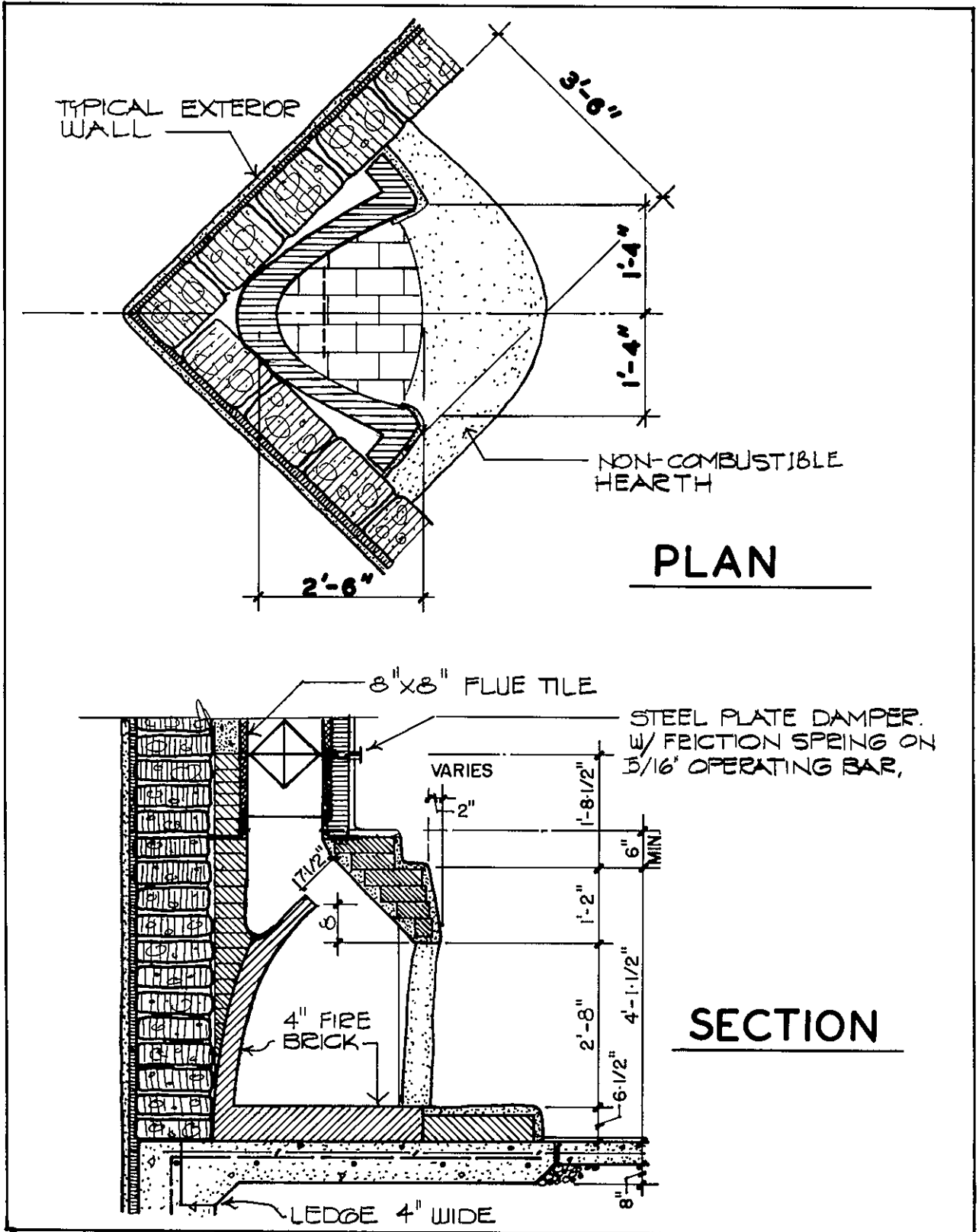
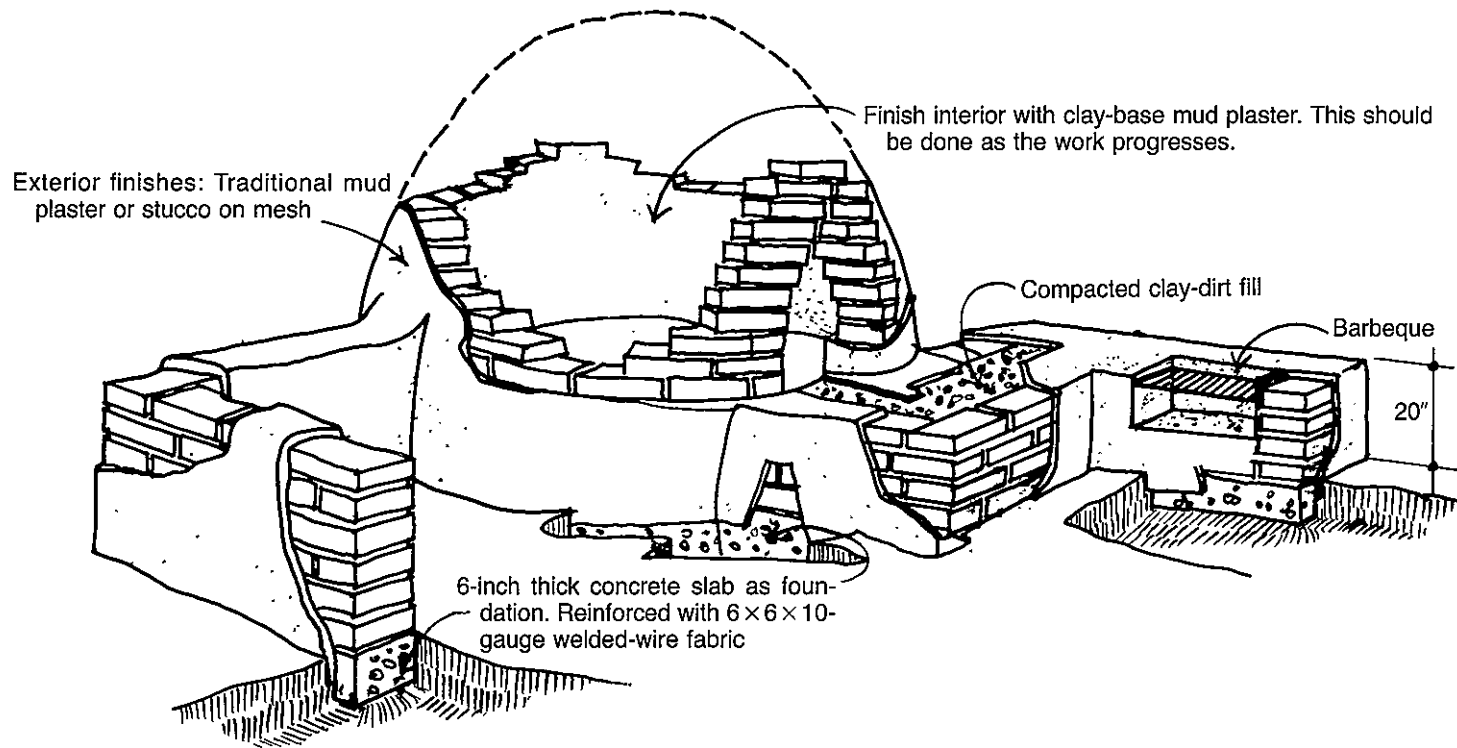


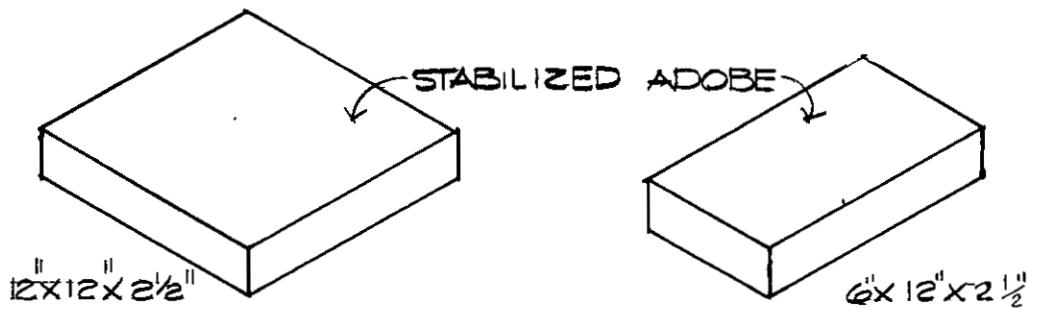
FIGURE 99—ADOBE CORNER FIREPLACE.



Adobe "horno" or Indian oven

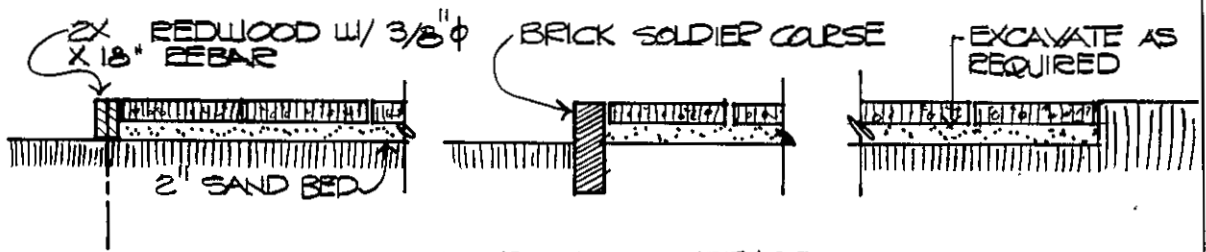
Note: All adobe fill should be allowed to dry out completely before finishing the work.

FIGURE 100—ADOBE HORNO OR INDIAN OVEN.

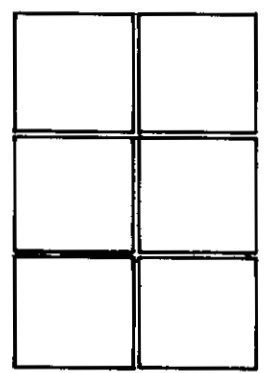


STANDARD PAVERS

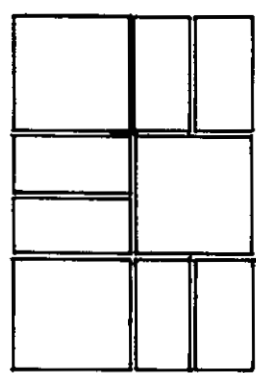
STANDARD 10"X14"X4" MAY BE USED WHEN PAVERS ARE UNAVAILABLE.



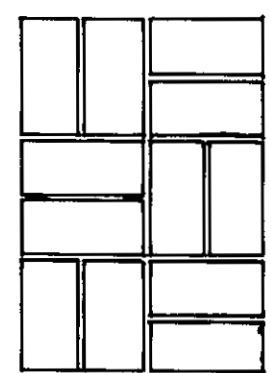
SOME PAVING METHODS



CHECKERBOARD







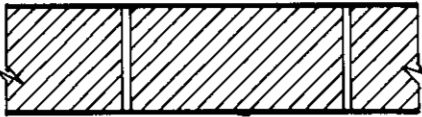
COMBINATION



BASKET WEAWE

PAVING PATTERNS

FIGURE 101—ADOBE-BRICK PAVING FOR WALKWAYS AND PATIOS.

Test no.	Construction	Weight lbs/ft ²	Sound transmission dBu	Class
1*	 <p>1/2-inch insulating board on 2x4 studs @ 16-inch on center</p>	3.8	32.2	Fair
2*	 <p>2x4 studs @ 16-inch on center with 3/8-inch gypsum lath and 1/2-inch plaster</p>	15.0	34.9	Fair to good
3*	 <p>2x4 studs @ 16-inch on center on a 2x6 plate with 3/4-inch insulating board. 1/2-inch insulating board loose between studs.</p>	6.2	42.8	Very good
4*	 <p>2x4 studs staggered 16 inches on center on 2x6 plate with 1/2-inch lath and plaster</p>	13.1	53.7	Excellent
5	 <p>10-inch thick adobe brick</p>	109	63	Excellent

Tests shown with () are results of tests sponsored by the Insulation Board Institute. From a report dated Sept. 14, 1956, Examination 308691, after Hans Sumpf Company, Inc.

FIGURE 102—SOUND-TRANSMISSION TEST RESULTS.

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Text in 10 pt. Times Roman, leaded one point
References in 7 pt. Times Roman, leaded one point
Display heads in 24 pt. Times Roman

Presswork: Miehle-Single Color Offset
Harris Single Color Offset

Binding: Smyth sewn

Paper: Cover on 65 lb. Carnival Putty
Text on 70 lb. white Matte

Ink: Cover—PMS 532
Text—Black

Quantity: 3000