

PACIFIC SOUTHWEST Forest and Range Experiment Station

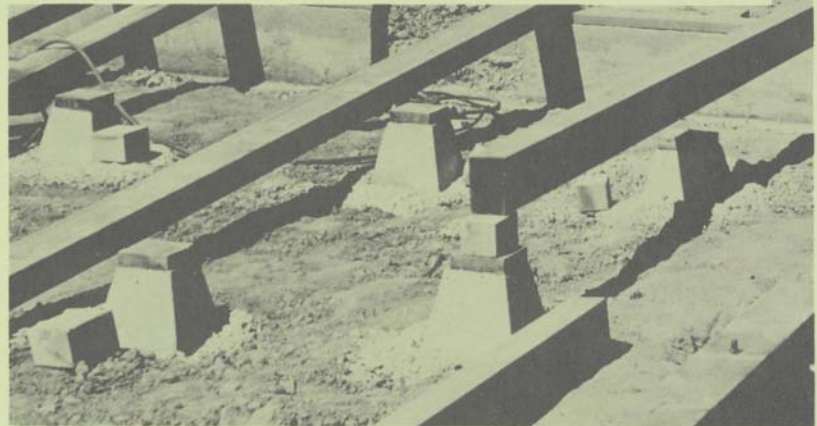
FOREST SERVICE
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FLOOR FOUNDATIONS: preferences of new home buyers in six Southwestern United States markets

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The largest new home market in the United States is in the Southwest. In California alone nearly twice as many permits are issued annually for single-family homes as in Texas, which ranks second, and in Florida, which ranks third (U.S. Bureau Census 1968).

The volumes and types of wood products used in single-family home construction are influenced by the structural designs used. Among the important design components which make up the home is the floor foundation. The amount of lumber and plywood used in a home may vary by about 20 percent, depending on whether a wood or concrete floor is used (Zaremba 1959).

To provide information that will help improve the quality of wood floor construction, the Forest Service has been studying the types of floor foundation used in single-family homes. This research has concentrated on the problems associated with both wood and concrete floors used primarily in warm climate areas of the United States, from Florida to California. The preferences and attitudes of new home buyers and of builders and architects in selected markets were surveyed.

This paper reports one phase of the study—the preferences and opinions among new home buyers in six markets in the Southwestern United States. We asked buyers to cite advantages and disadvantages of the concrete slab and the wood crawl-space floor construction. We asked them which type of floor foundation they preferred, and compared their preferences with the type in the homes they bought. And we asked for their opinions about a new design that combines a low-profile wood floor with an underfloor plenum.

To estimate annual average number of new home buyers in each of the six markets, we collected data

on single-family housing permits for the years 1963 through 1967.¹ On the basis of the estimates, we selected sample populations from county records that identified the original buyers of homes built since 1963.

The six markets we studied were the counties in which these cities are located: California—Fresno, Los Angeles, Oakland-Martinez, Sacramento, and San Diego; in Arizona—Phoenix (*fig. 1*). The estimated number of new home buyers ranged from 17,774 in Los Angeles County to 1,918 in Fresno County. The total sample consisted of 898 new home buyers. The sample size ranged from 163 in Fresno County to 188 in Los Angeles County. Questionnaires were mailed to the sample in each market. Responses ranged from a high of 57 percent in Maricopa County (Phoenix) to a low of 48 percent in Los Angeles County (*table 1*).

We conducted followup telephone calls and personal interviews in each market to identify any important characteristics that might have been overlooked in the questionnaires. In evaluating the responses, we considered their aggregation from each market to be representative of the whole population. Weighted estimates for the "Southwest" were based on estimates of the annual average number of new home buyers in each market.

Besides wanting to determine preferences in the six markets, we wanted to know the type of floor foundation used in homes owned by new home buyers. More than half of the respondents reported concrete slab foundation; nearly a third reported crawl-space floor (*table 2*).

¹ Significant changes in single-family housing activity have occurred in the Phoenix and Los Angeles markets since 1967. In 1969, between 12 and 13 thousand single-family building permits were issued for each of these market areas (U.S. Bureau of the Census 1970).

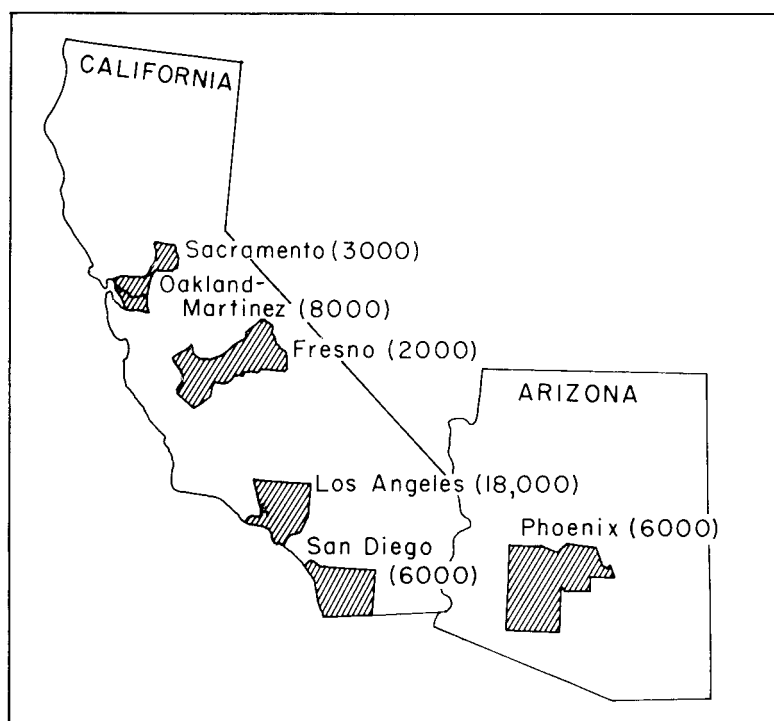


Figure 1—The six markets surveyed for new home buyers' preferences in floor construction consisted of one or more counties corresponding to the cities shown. Numbers in parenthesis (in thousands) show the average annual number of one-unit housing permits issued from 1963 through 1967.

Table 1—Estimated annual average number of single-family new home buyers, sample size selected, and response for six housing markets in the southwestern United States surveyed in 1969

Housing markets ¹	Estimated new home buyers ²	Sample size	Responses
	<i>Number</i>		
California:			
Oakland-Martinez	8,112	113	56
Sacramento	3,261	158	83
Fresno	1,918	162	65
Los Angeles	17,774	188	90
San Diego	5,780	155	84
Arizona:			
Phoenix	4,745	122	69

¹The corresponding counties for the cities listed.

²Based on annual average number of single-family housing permits recorded in 1963 through 1967 (U.S. Bureau of Census 1966a, 1966b, 1967, 1968).

Table 2—Type of floor foundations used in homes owned by new home buyers surveyed in 1969 in six markets in the southwestern United States

Foundations	Markets ¹						
	Oakland - Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest 2 —
	Percent						
Concrete Slab	9	15	26	68	94	99	58
Crawl-space	71	55	66	19	2	0	30
Split Level	16	28	8	12	4	0	11
No response	0	1	0	0	0	0	0
All other	4	1	0	1	0	1	1
Total	100	100	100	100	100	100	100

¹Number of respondents shown in parentheses.

²Weighted on the basis of estimated annual average number of new home buyers in each market.

COMPARISON OF FLOOR FOUNDATIONS

Each new home buyer was asked to indicate the three most important advantages and disadvantages he or she associated with using concrete slab (*fig. 2*) and wood crawl-space floor (*fig. 3*) foundation. Regardless of the type of floor construction used in their homes new home buyers shared certain attitudes

about concrete slab and crawl-space floors. A high percentage of new home buyers in all six markets thought that good access to piping was an advantage of crawl-space design (*table 3 in Appendix*). Under-foot comfort, warm floors, and the attractive appearance of hardwood floors were other advantages that

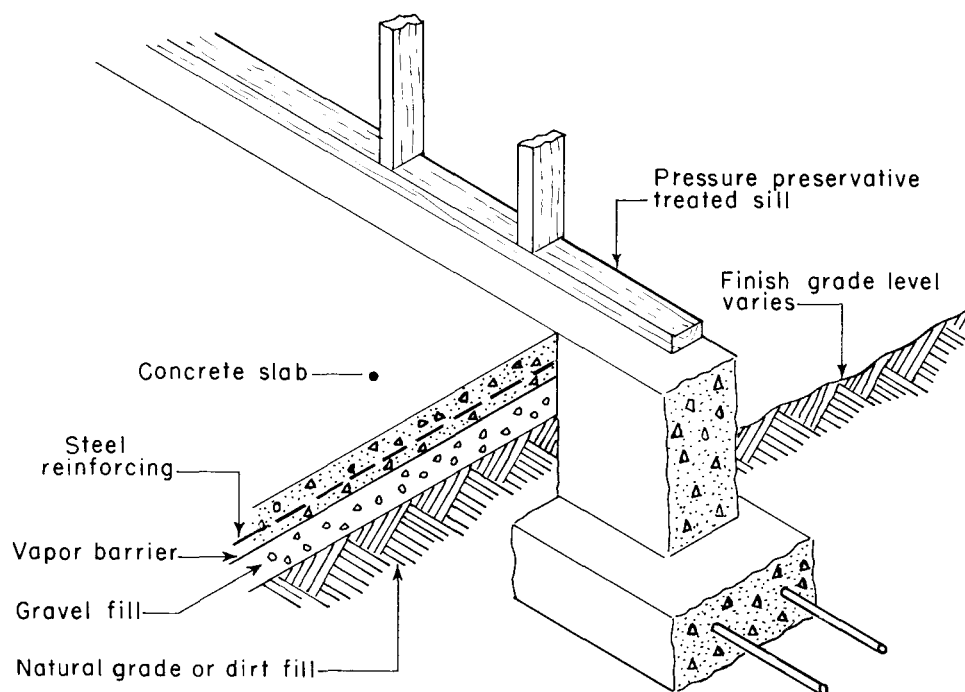


Figure 2—The concrete slab floor is often used in homes in the Southwestern United States.

new home buyers often associated with crawl-space construction (*table 4 in Appendix*).

In citing the disadvantages of using crawl-space construction new home buyers were apprehensive about the threat of termites and protection from other insects (*table 4 in Appendix*). The steps that are usually required from outdoor grade levels to the inside floor level of crawl-space construction were also frequently cited as a disadvantage of using crawl-space construction. Furthermore, many new home owners reported that they thought wood lacked "permanence."

Low cost was frequently cited as an important advantage of using concrete slab floor construction (*table 5 in Appendix*). Opinions were surprisingly consistent among respondents in six different markets. The highest variation in response was whether or

not low-profile appearance and indoor-outdoor convenience were advantages. A high percentage of new home buyers in the Phoenix and San Diego markets cited these two characteristics as important advantages. But much less importance was placed on them by new home buyers in the Fresno, Los Angeles, Sacramento, and Oakland-Martinez markets.

Attitudes also varied between markets as to whether cold floors were a disadvantage of having concrete slabs during winter. New home owners in the warmer climates of the Fresno, Phoenix, and San Diego markets did not cite cold floors as a disadvantage as often as those in other areas with typically cooler climates (*table 6 in Appendix*). Many new home buyers indicated that other disadvantages of having concrete-slab construction were because of poor access to piping, and because concrete floors were more tiring to walk on.

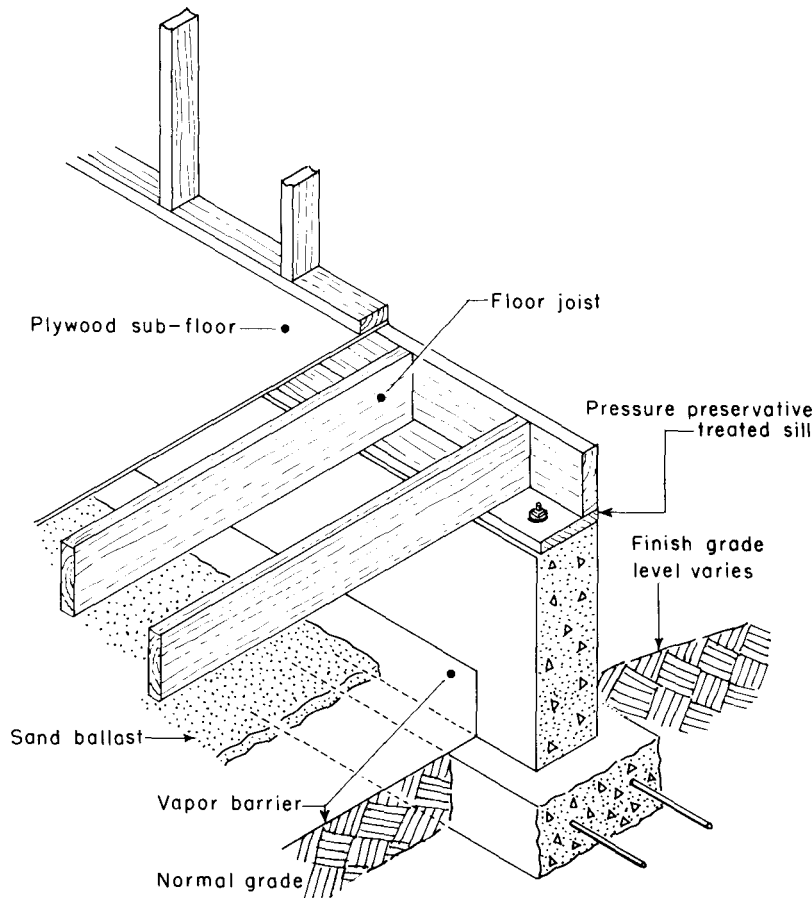


Figure 3—The crawl-space floor is the most common floor design used in the Southwest, where terrain and soil conditions present technical problems.

PREFERENCES AMONG NEW HOME BUYERS

New home buyers were asked which type of floor-foundation construction they would prefer in their home; i.e., concrete slab or wood crawl-space. Responses varied to extremes between different markets. But nearly 60 percent of the new home buyers in six markets replied that they preferred wood crawl-space construction. The percent, by market, was:

Oakland-Martinez	88
Sacramento	82
Fresno	74
Los Angeles	62
San Diego	33
Phoenix	19

Comparisons of new home buyers' preferences with the type of floors in the homes they bought (*table 2*) point up conspicuous differences. Many new home buyers preferred wood crawl-space floors, but purchased homes with concrete slab foundation. For example, in the Los Angeles market, 62 percent of the new home buyers said they preferred a crawl-space floor, but only 19 percent had purchased homes with such construction.

On the basis of preferences either for crawl-space

or for concrete slab respondents were asked to cite the three most important factors that influenced their choice. Variations between markets in climate, topography, customs, and other non-structural aspects appeared to influence the importance new home buyers placed upon different structural factors. Factors that were thought to be important in influencing a choice in preference for concrete slab construction were, for example, better protection from termites, ants, and other insects, predominant use in area, and comfortableness for the local climate (*table 7 in Appendix*).

New home buyers who preferred wood crawl-space construction frequently indicated that a prior knowledge of this type of floor and comfortableness for the local climates were factors that influenced their final choice. Also, new home buyers reported other important influences, such as the predominant use of crawl-space construction in their local area, and the impression that a home with this type of floor would be easier to sell (*table 8 in Appendix*). Thus, the new home buyer's attitude that his home is an investment influences his preference for type of floor construction.

ATTITUDES TOWARD A NEW DESIGN

A new design that combines a low-profile wood floor with underfloor plenum appears to be a good alternative to concrete slab and crawl-space floor-foundations (*fig 4*). This type of construction includes most of the characteristics cited as important advantages of both crawl-space and concrete slab floor-foundations; that is, warm floors, adaptability to sloping sites, ability to achieve a close indoor-outdoor relationship, and low ground-hugging appearance (*fig 5*).

The underfloor area is used as a plenum to distribute conditioned air to each room in a house—eliminating the need for ductwork. The height of the plenum (height of the floor framing above the ground vapor barrier) can be varied to meet design preferences or building code requirements. Floor framing does not have to differ from that normally used for wood crawl-space construction; although, some experimentation has been done with floor framing and prefinished floor panels over a plenum only 4 inches deep (Stout 1960).

In Fresno, we found that underfloor plenums had

been used in about 1,300 homes. Home owners who were contacted indicated that they thought the plenum was especially superior in terms of underfoot comfort. Because conditioned air is in continuous contact with the underside of the floor, the floor itself becomes an agent of heat transfer—creating warm or cool floors with the underfoot resiliency typical of crawl-space floor construction. One problem encountered in the Fresno market has been with sites where hard pan soil can create water drainage problems under and around some houses. Inadequate drainage can cause accumulations of water in the plenum area. Poor drainage can also lead to the flooding of crawl-space areas as well as concrete-slab construction. Regardless of the type of floor construction used, housing sites need to be carefully selected.

Plenum floor construction would be a first choice of many new home buyers. The advantages that they anticipated would be in this design were provision for more efficient heating and cooling, attractive hardwood floors, no ductwork, and good access to piping

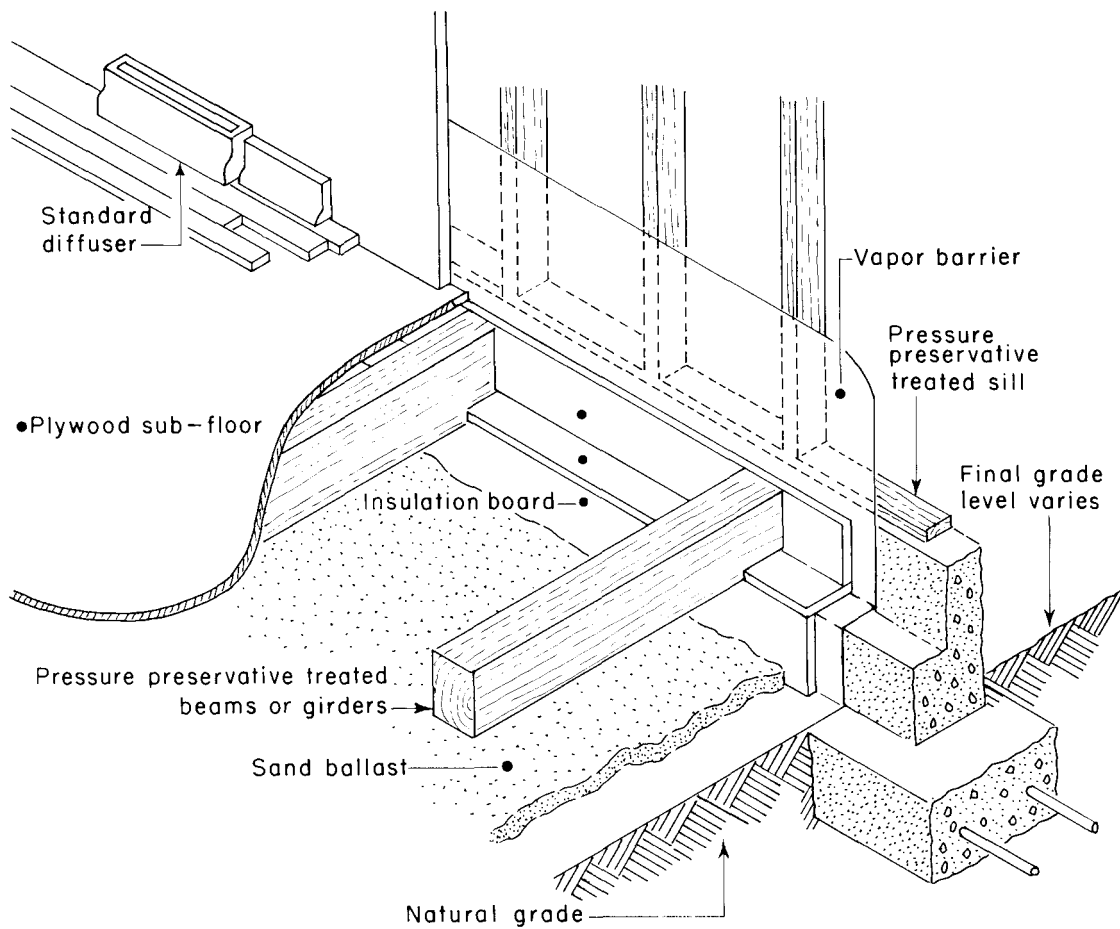


Figure 4—A wood floor construction has been designed for use in combination with an underfloor plenum.

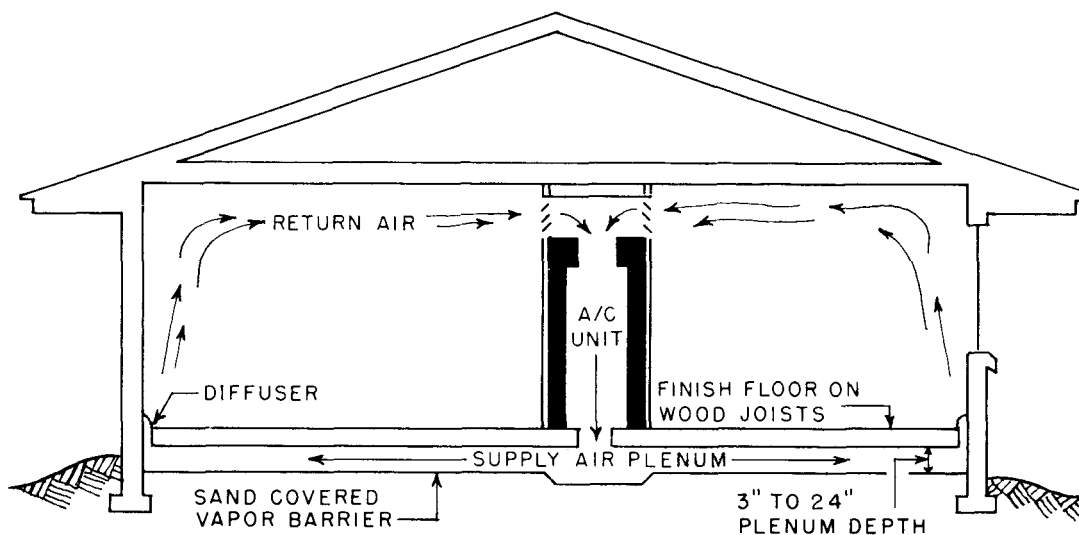


Figure 5—The low profile plenum floor foundation design illustrates a new concept for cool and warm air distribution. The underfloor plenum provides a supply of air. Underfloor ductwork is not necessary.

(table 9 in Appendix). In each of the six markets studied more than 60 percent of the respondents said they would consider buying a house with an under-floor plenum construction *even if it cost more than a house with concrete slab floor construction*. A Forest Service study on costs of plenum, slab, and crawl-space floor construction in these and other areas estimated that the cost of plenum floor construction would be competitive with that of slab construction (Dickerhoof and Lawrence 1971). A major reason was the savings in ductwork. A typical cost estimate for the installation of ductwork in a 1,680-square-foot house in the Southwest was \$425 in 1969.

Some respondents in each market said they would not consider buying a house with a plenum under-floor. The highest negative response—19 percent—was in the Phoenix market. Twenty-two percent of the respondents there thought insects—especially termites—would be a problem (table 10 in Appendix). (Termites can, of course, become a problem with any construction if proper chemical treatment is not used.) Some responses suggested apprehension about

the possibility of flooding in the plenum area, and the efficiency of heating and cooling with plenum. Both problems are potential to either wood crawl-space or concrete slab construction.

All testing and uses of the plenum design have shown that it is a potentially economical and desirable alternative to other types of floor foundation.

In 1966, the University of Florida in cooperation with the Forest Service began a study of plenum floor construction. A specially instrumented house was designed and built to test the use of a shallow plenum (about 6 inches between the floor joists and ground level) for both heating and cooling with a wood floor and floor frame (fig. 5) (Caldwell and Dickerhoof 1969). The moisture content in the wood floor framing maintained a seasonal range between 6 and 13 percent—a desirable range from a technical standpoint (Fasick and Dickerhoof 1970; Miller and Wagner 1969). These and other tests suggest that the plenum design can maintain a desirable environment—even in hot, cold, and humid climates (Talbot 1963; Stout 1960).

SUMMARY

Harpole, George B., and H. Edward Dickerhoof

1971. **Floor foundations: preferences of new home buyers in six Southwestern United States markets.** Berkeley, Calif., Pacific SW. Forest & Range Exp. Sta. 12 p., illus. (USDA Forest Serv. Res. Paper PSW-73)

Oxford: 833.11 –(079 .5):(79).

Retrieval Terms: floor foundations; buyer preference; concrete slabs; wood frame with crawl-space; wood floor (low-profile); Arizona; California.

The preferences and opinions of new home buyers among three types of floor foundations were studied in six markets in the Southwestern United States. The three types were: (a) concrete slab, (b) wood crawl-space, and (c) a new design that combines a low profile wood floor with underfloor plenum. Questionnaires were mailed to a selected sample totaling 898 new home buyers in counties in which these cities are located: in California—Fresno, Los Angeles, Oakland-Martinez, Sacramento, and San Diego; in Arizona—Phoenix. They were followed up by telephone calls and personal interviews.

Preferences for type of floor foundation varied between different markets. In the rapidly growing Phoenix market, 80 percent of the new home buyers

who responded indicated a preference for concrete slab. Martinez market preferred crawl-space construction. Many of these respondents, however, were found to have purchased homes with floor foundations that were not of their preference. For example, in the Los Angeles market, 62 percent of the new home buyers said they preferred crawl-space, but only 19 percent had purchased homes with this type of floor construction.

With both plenum and crawl-space construction, many new home buyers were concerned about the threat of termites. Some of these people may have experienced termite damage in previous homes. Others are apparently not aware that readily available chemical treatments can prevent termite attack to

wood floor and foundation construction.

More than 60 percent of the respondents in each of the six markets indicated that they would consider buying a new home with wood floor and underfloor plenum—even if this would cost more than concrete-slab construction. Cost estimates of plenum floor construction in these six markets have in fact, suggested that it would not cost more than concrete-slab construction.

Research in and actual use of underfloor plenum construction demonstrate that it does, in fact, offer

several advantages common to both concrete-slab and wood crawl-space construction while minimizing disadvantages. In this study, new home buyers especially liked the potential of an improved air distribution system in combination with a wood floor. The availability of hardwood floors was also often cited as an important advantage. Thus, an opportunity exists for wood products manufacturers, trade associations, and others to assist and advise local builders and architects in promoting the construction of homes with underfloor plenums.

LITERATURE CITED

- Caldwell, W. T., and H. E. Dickerhoof
1969. **Design of a test house to evaluate an underfloor air distribution system.** Forest Prod. J. 19(9): 56-61.
- Dickerhoof, H. Edward, and J. Dowel Lawrence
1971. **Wood floor system is cost-competitive with concrete slab.** Forest Prod. J. 20(2): 13-18.
- Fasick, Clyde A., and H. Edward Dickerhoof
1970. **An underfloor plenum system for heating and cooling.** Forest Prod. J. 20(1): 10-15.
- Miller, J. T., and W. G. Wagner
1969. **Underfloor plenum air distribution. A study of a residential heating and cooling system.** Univ. Fla. College of Architect. and Fine Arts, Bur. Res. Rep. 33, 48 p.
- Stout, G. J.
1960. **Plenum floor system for basementless houses.** Better Building Rep. 4, 22 p. Penn. State Univ, College of Eng. and Architect.
- Talbot, J. W.
1963. **Low-profile wood floor systems.** Washington State Univ. Inst. Tech. Div. Ind. Res., Bull. 277, 77 p.
- U. S. Bureau of the Census
1966a. **Housing construction statistics: 1889 to 1964.** Washington, D. C. 805 p.
- U. S. Bureau of the Census
1966b. **Construction reports—building permits, housing authorized in individual permit-issuing places, 1965.** Washington, D. C., 294 p.
- U. S. Bureau of the Census
1967. **Construction reports—housing authorized by building permits and public contracts, 1966.** Washington, D. C. 360 p.
- U. S. Bureau of the Census
1968. **Construction reports—housing authorized by building permits and public contracts, 1967.** Washington, D. C., 405 p.
- U.S. Bureau of the Census
1970. **Construction reports—housing authorized by building permits and public contracts, 1969.** Washington, D. C., 377 p.
- Zaremba, Joseph
1959. **The consumers' attitude toward wood in house foundations.** J. Forestry 57(5): 358-362.

APPENDIX: Survey Results

A sample of new home buyers in each six markets surveyed in the Southwestern United States were asked about the...

- Advantages and disadvantages in using wood crawl-space floor foundation (*tables 3,4*).
- Advantages and disadvantages in using concrete slab floor foundation (*tables 5,6*).
- Factors that influenced the choice in preferences

for concrete slab foundation or for wood crawl-space foundation (*tables 7,8*).

- Advantages or disadvantages anticipated by respondents of living in a home with low-profile wood floor with underfloor plenum (*tables 9,10*).

Each person queried was asked to cite as many advantages, disadvantages, or factors as he or she wanted. The tables below list only the answers most often given.

Table 3—Advantages cited most often for using wood crawl-space floor construction

Advantages cited	Market ¹						
	Oakland-Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest ² —
	<i>Percent</i>						
Good access to pipes	80	70	85	89	92	71	84
Less tiring to walk on	73	58	63	63	58	59	63
Warmer than concrete floors in winter	64	54	58	58	51	42	56
Attractive appearance of hardwood floors	39	43	29	43	55	51	44

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 4—Disadvantages most often cited for using wood crawl-space floor construction

Disadvantages cited	Market ¹						
	Oakland-Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest ² —
	<i>Percent</i>						
Less protection from termites	46	53	54	69	64	65	61
Steps up from ground are required	43	30	35	36	68	54	44
Less protection from ants, roaches and other insects	38	39	43	48	42	39	43
Wood lacks permanence	25	33	28	34	40	41	34

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 5—Advantages most often cited for using concrete-slab construction

Advantages cited	Market ¹						
	Oakland - Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest ² —
	<i>Percent</i>						
Low cost	75	77	62	64	67	75	69
Floors cooler than crawl-space	57	49	48	62	42	49	55
Indoor-outdoor convenience	48	29	40	42	65	68	49
Low profile appearance	27	29	35	41	46	45	38

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 6—Disadvantages most often cited for using concrete-slab construction

Disadvantages cited	Market ¹						
	Oakland- Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest —
	<i>Percent</i>						
Poor access to piping	61	57	68	68	86	68	68
Concrete floors are more tiring to walk on	64	59	62	61	57	58	61
Floors are too cold in winter	55	52	38	43	31	32	43
Chance of injury in fall	20	25	22	24	23	17	22

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 7—Factors cited most often that influenced a choice in preferences for concrete-slab construction

Factors cited	Market ¹						
	Oakland-Martinez (6)	Sacramento (12)	Fresno (16)	Los Angeles (32)	San Diego (56)	Phoenix (55)	Southwest ² —
	<i>Percent</i>						
Better protection from termites	33	33	50	69	68	67	65
Widely used in neighborhood	17	33	31	47	59	73	54
Better protection from ants, roaches & other insects	17	17	38	44	39	29	37
More comfortable for local climate	33	8	19	19	20	35	24

¹ Number of respondents who preferred concrete-slab construction shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 8—Factors cited most often that influenced a choice in preference for wood crawl-space construction

Factors cited	Market ¹						
	Oakland-Martinez (49)	Sacramento (68)	Fresno (48)	Los Angeles (56)	San Diego (28)	Phoenix (13)	Southwest ² —
	<i>Percent</i>						
Makes home easier to sell	65	69	48	54	36	38	56
Prior knowledge of this type of floor system	59	51	57	56	54	54	56
More comfortable for local climate	51	24	38	20	11	15	29
Widely used in area	43	43	35	41	32	46	41

¹ Number of respondents who preferred wood crawl-space construction shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 9—Anticipated advantages of living in a home with a low-profile plenum floor and foundation cited by new home buyers

Advantages cited	Market ¹						
	Oakland-Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest ² —
	<i>Percent</i>						
More efficient heating and cooling, better air distribution	20	40	28	43	45	51	38
Hardwood floors	5	7	2	14	23	25	14
No ducts	5	7	12	9	2	10	7
Easy access to pipes and wiring	2	1	3	2	8	10	4

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.

Table 10—Anticipated disadvantages of living in a home with a low-profile plenum floor and foundation as cited by new home buyers

Disadvantages cited	Market ¹						
	Oakland-Martinez (56)	Sacramento (83)	Fresno (65)	Los Angeles (90)	San Diego (84)	Phoenix (69)	Southwest ² —
	<i>Percent</i>						
Poor access	16	17	9	17	11	1	13
Insect threat especially termites	7	6	5	14	5	22	11
Inefficient heating and cooling	4	13	3	10	14	12	10
Water problems	7	7	11	7	4	6	7

¹ Number of respondents shown in parentheses.

² Weighted on the basis of estimated annual average number of new home buyers in each market.



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The Pacific Southwest Forest and Range Experiment Station

represents the research branch of the Forest Service in California and Hawaii.

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1971. **Floor foundations: preferences of new home buyers in six Southwestern United States markets.** Berkeley, Calif., Pacific SW. Forest & Range Exp. Sta. 12 p., illus. (USDA Forest Serv. Res. Paper PSW-73)

Mail questionnaires and follow-up interviews were used to determine preferences among three types of floor foundations: concrete slab, wood crawl-space, and a new design that combines a low-profile wood floor with underfloor plenum. More respondents from northern markets preferred the crawl-space floor than from the southern markets. Factors most often cited as influencing preference were protection from termites, expected ease of reselling a house, and previous knowledge of or experience with a type of floor construction.

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