LOW-RENTAL HOUSING FOR PRIVATE INVESTMENT

FEDERAL HOUSING ADMINISTRATION

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FOR PRIVATE INVESTMENT

Complete information regarding the rental housing program and the procedure to be followed in filing an application may be obtained at the nearest office of the Federal Housing Administration. A complete list of the offices is printed on the inside back cover of this booklet

FEDERAL HOUSING ADMINISTRATION
STEWART McDONALD, *Administrator*
WASHINGTON, D. C.

FOREWORD

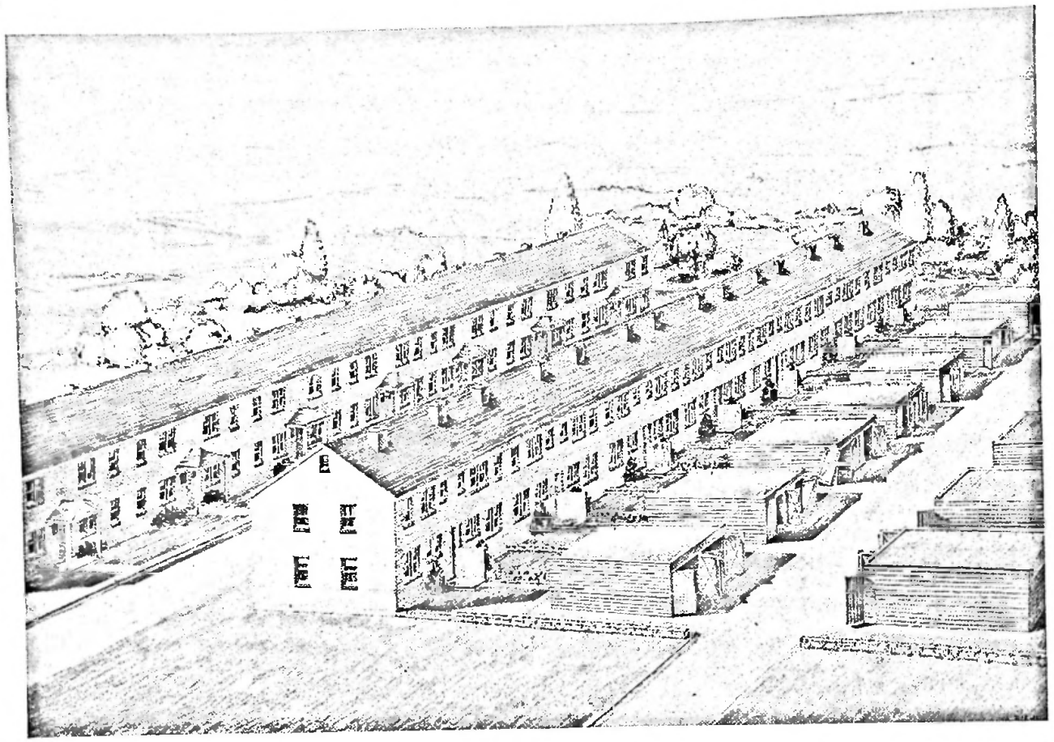
The rental housing program of the Federal Housing Administration has been directed toward encouraging the production of housing accommodations so planned, so constructed, and so financed that they may be rented at rates which fall within the rent paying capacity of a large portion of the renting families in the community—the wage earning and low-salaried families. This policy is grounded on the principle that profitable production in any field, whether it be consumption goods, or, as in the case of housing, capital goods designed to render the service of shelter, must be adjusted to the demands of the broadest market in which the goods or the services are to be sold.

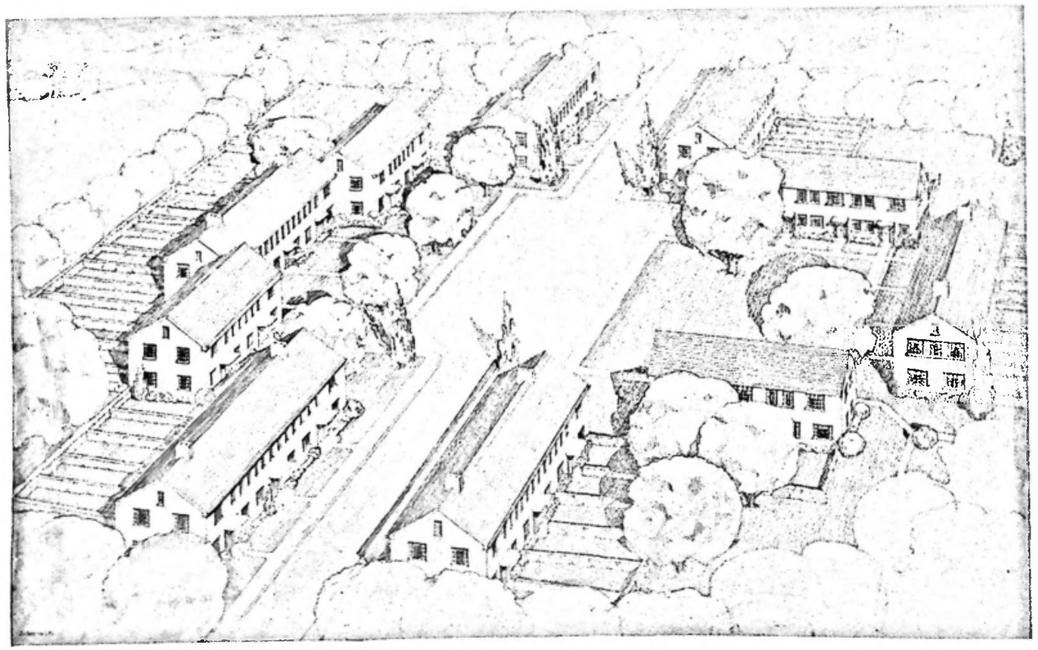
Examination of hundreds of proposals for rental housing projects presented to the Federal Housing Administration has demonstrated that whenever a proposed rental places a project in a restricted or highly competitive market, the buildings must offer services, amenities, and sometimes luxuries that would not be necessary were the rentals in a lower price range. The added costs involved in producing buildings for the high-rental market, the manifold management services and special facilities demanded by tenants in the higher income brackets, the increasing narrowness of the market as the rentals rise in the scale, and the rapidity with which such buildings become out of date due to changes in fashion, constitute serious investment hazards.

Basic family needs are not subject to the same rapid change as are luxury demands. They can be met at far less cost than can the requirements of the small fraction of tenancy which can afford high rentals. The greatest need for rental housing lies in the lower price levels. It is a range in which private enterprise can operate successfully and profitably.

Conclusions drawn from over 4 years of operation in rental housing are recapitulated in this booklet. It is presented as a guide to persons interested in low-rental housing as a field for investment.

Stewart McDonald.
Administrator.





ON FACING PAGE, TOP, is shown an example of low-rental housing as it has been usually developed. It represents an extravagant and monotonous use of land. Such thoughtless planning is one of the major causes of blight in our urban centers. See also figure 13 A, page 17.

With slight modifications, monotony can be avoided and a livable grouping of buildings obtained, as shown in the illustration at bottom of page. Garages, in rental projects, can be located in compounds screened from public view. Parking bays along the street, as shown in the drawing, add to convenience and also reduce traffic congestion.

PART I

LOW-RENTAL HOUSING—A SOUND INVESTMENT

There is a positive demand for increased construction of low-rental housing. There are also great reserves of investment funds which might be profitably employed either as mortgage capital or as equity capital in the low-rental housing field. Mortgage lending institutions have already participated extensively in the rental housing program of the Federal Housing Administration, and mortgage funds are readily available at low interest rates. On the equity side, however, investors have not fully realized the possibilities of profitable capital investment inherent in low-rental housing.

The National Housing Act requires among other things that in order to be eligible for mortgage insurance by the Federal Housing Administration, rental projects must be economically sound. Economic soundness means that the project must offer assurances of income producing capacity sufficient not only to pay the cost of operation, insurance, taxes, and to service the mortgage debt, but also to provide for a fair and continuing return on the equity investment.

This booklet is directed particularly to the attention of potential equity investors—owners of land suitable for development in rental housing projects; owners or trustees of funds seeking safe and profitable investment in income producing property; contractors, architects, and engineers; and all other persons who may be in a position to make real and substantial subscriptions to equity.

The rental housing program of the FHA is flexible and readily adaptable to the specific requirements of practically any community. As of December 31, 1939, mortgages totaling $109,249,750 had been insured on 218 projects valued at $142,049,102. These projects provide housing accommodations for 28,352 families. The largest single project, valued at $3,845,000 and containing 1,102 family units, was financed by an FHA-insured mortgage of $3,000,000. The largest community development, composed of six closely integrated projects, contains 1,402 family units. The total valuation is $6,748,500, and the six FHA-insured mortgages amount to a total of $5,050,000. The smallest project contains only five family units. It is valued at $29,000, with mortgage financing of $18,700. The projects range in type from multi-story, fully fireproof elevator projects in the metropolitan areas to detached frame houses in a small southern town. By far the greatest number of projects fall in the two-story, walk-up apartment class.

It is obvious that a small city cannot absorb a very large project. A large city, on the other hand, may readily absorb large projects and, in addition, there may be within the city and its environs many small plots of land which are suitable for the development of small projects. In processing, each project is carefully tailored to meet the demands of the community in which it is located and to fit the requirements peculiar to the site on which it is to be built.

The Rental Housing Market

Rental property is analogous to durable capital goods—it is constructed to render the service of shelter. Its economic value to the investor therein is determined by its capacity to produce fair returns over a period of years. Stability and continuity of earnings throughout the period is the goal to be sought. Wide fluctuations of earnings are not conducive to security in investment. This is particularly true if the financial structure of the undertaking embodies funded debt, with the attendant burden of annual debt service charges. In order to assure the greatest possible degree of stability and continuity of earning power, housing should be designed to meet the requirements of the broadest rental market.

In housing, the community in which the building operation is undertaken alone constitutes the market. Houses are not transportable and an oversupply of the market in one locality cannot be relieved or equalized by the fact that a shortage in housing exists elsewhere. Thus instead of one general market, the housing field is made up of many markets. Each city, or metropolitan area, sometimes even divisions or sections of that city or area, constitutes practically an independent market. There is, however, in each one of these many markets, a relatively low rental price range which is much broader than the rest of the market.

The Broadest Market Lies in the Lower Rentals

A recent summary of real property inventories conducted by the Works Progress Administration (see table, page 6), covering 203 cities and embracing over 5,500,000 tenant occupied housing units, indicates that over 54 percent of these families pay rents which range from $20 to $50 per month, and only 10.8 percent of these families pay rent of $50 or more. If New York City is eliminated from the total, for the 3,798,000 families in the remaining 202 cities, the $20 to $50 brackets will show 50.2 percent whereas only 6.4 percent pay $50 and up. Further inspection of this tabulation shows that rents vary from city to city, and from one section of the country to another. A relatively low rent in one city may be a relatively high rent in another city. The broad market for each city is determined by the rental pattern existing in that city, and any new rental projects must conform to that pattern if the maximum degree of safety is sought for equity investments.

MONTHLY RENTAL OF DWELLING UNITS IN 203 CITIES BY GEOGRAPHICAL REGIONS

Monthly rental	Total	Subtotal (ex. N. Y. C.)	New York City	Northeast	Southeast	Northwest	Southwest	California
	RENTAL DWELLING UNITS (Tenant-occupied and vacant)							
No. of places reporting..	203	202	1	135	21	35	8	3
No. of units reported....	5,505,879	3,797,959	1,707,920	2,541,264	408,508	597,167	132,052	118,968
	PERCENT DISTRIBUTION OF UNITS							
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
$9.99 or less.....	8.0	10.8	1.9	5.9	36.6	12.9	21.2	12.0
$10.00–$19.99.....	26.9	32.6	14.2	30.7	34.5	38.0	36.1	37.7
$20.00–$29.99.....	26.2	28.1	21.9	30.7	14.8	25.7	23.4	26.1
$30.00–$49.99.....	28.1	22.1	41.7	25.0	11.0	19.2	15.9	19.9
$50.00–$74.99.....	7.8	5.0	13.8	6.0	2.5	3.4	2.7	3.5
$75.00 or more.....	3.0	1.4	6.5	1.7	0.6	0.8	0.7	0.8

SOURCE: Urban Housing—A summary of real property inventories conducted as work projects, 1934–36, Works Progress Administration, Division of Social Research, page 24.

Hazards of High-Rental Market

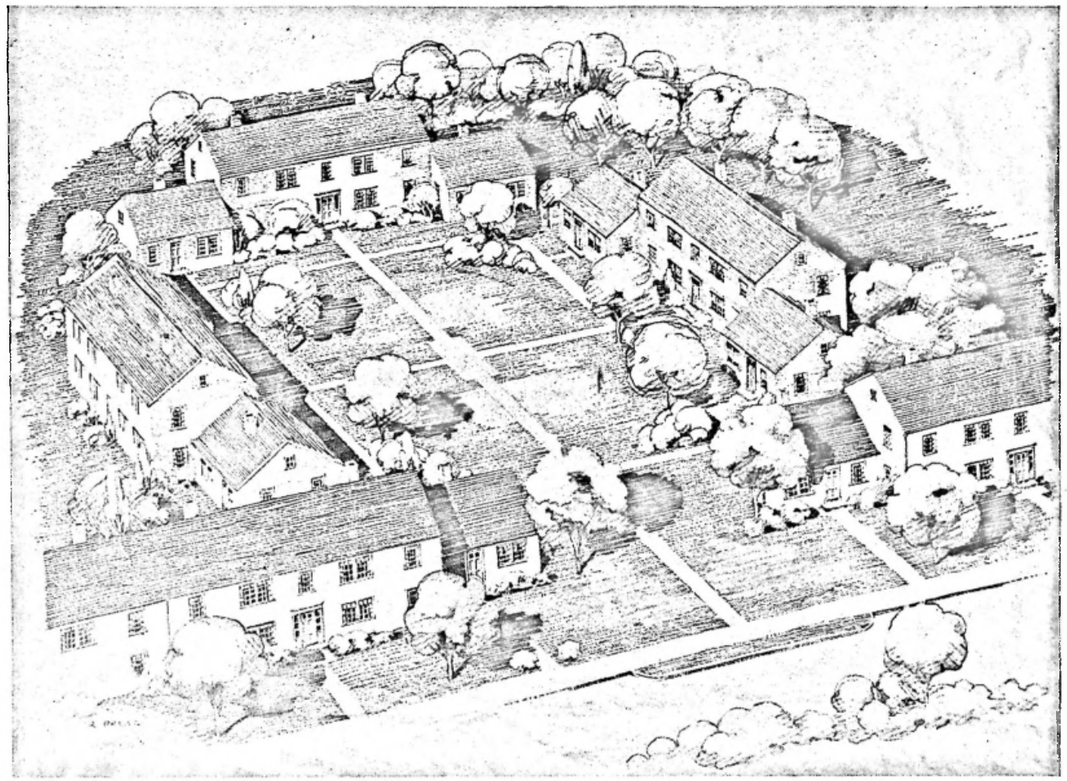
1. *Competitive Overbuilding.*

From the same data, the weaknesses inherent in the high rental market may be demonstrated. High-rental property is extremely vulnerable to competitive overbuilding. Excluding New York City, an average of the 202 cities embracing approximately 3,798,000 families gives a composite city containing approximately 18,800 families. If the same percentages of distribution be followed, approximately 28 percent, or 5,280 families, will fall in the $20 to $30 brackets, whereas only 1.4 percent, or 263 families, will fall in the brackets above $75. It is obvious that construction of new accommodations is going to affect the existing market. The addition of 100 housing units to the $20 to $30 rental group would increase existing facilities in that group only 1.9 percent. If the 100 units be added in the $30 to $50 group, the increase would still be only 2.4 percent. If added in the $50 to $75 group, the increase would be 10.6 percent. But if added to the highest group—$75 per month and up—the increase would be 38 percent. Thus it is obvious that the higher divisions of the rental market are much more sensitive to overbuilding. Oversupply in the higher brackets forces such properties to operate with large vacancies at high-rental schedules, or to drop to lower rental levels.

2. *Economic Depression.*

A reversed view of these figures more strikingly demonstrates the weakness inherent in the high-rental market in terms of a loss of renting families, even though there has been no overbuilding in the high-rental section of the housing market. This concept does not necessarily mean that the families move out of the city; it more often means that families in seeking lower rents move from higher to lower rental properties, or that families suffering drastic reduction or total loss of income "double up" with relatives or friends; it may also mean that property owners reduce rents in order to hold or to obtain occupancy. A loss of 100 renting families in the $20 to $30 brackets would result in an oversupply of 1.93% in that section of the rental market; a similar loss in the $30 to $50 bracket would result in an oversupply of 2.47%; a loss of an equal number of families in the $50 to $75 group would cause a 11.9% oversupply; and in the highest rental group—$75 per month and up—the decrease in demand would reflect an oversupply of 61.35%.

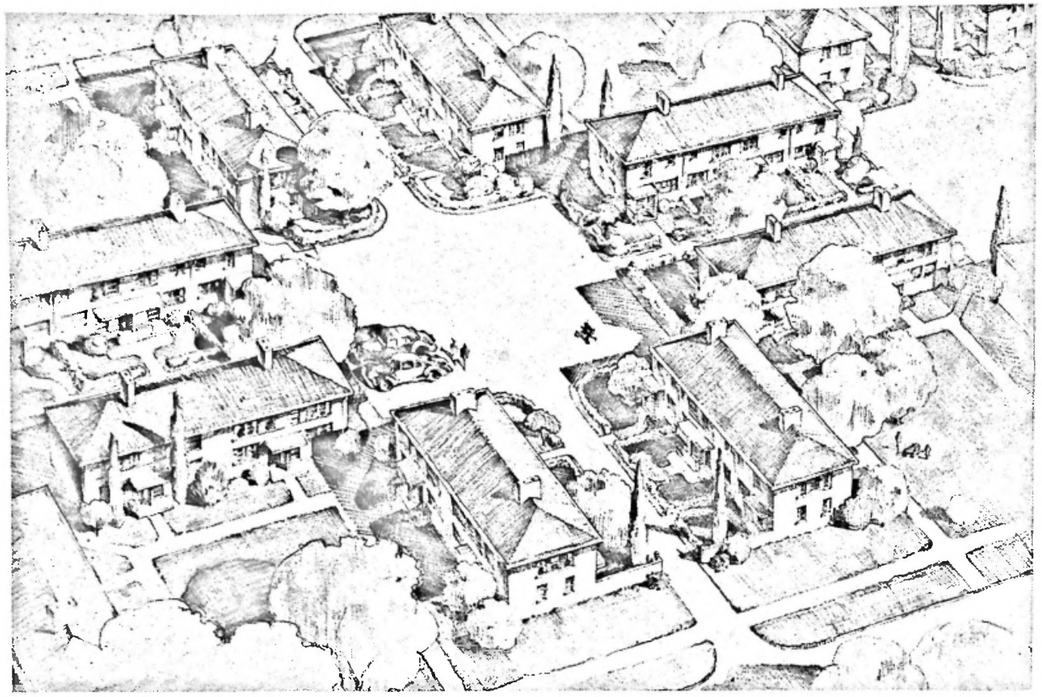
In this connection it may be well to point out that in periods of economic depression many families which had been paying relatively high rents will move to less costly houses, thus replacing in the lower-rental brackets those families which have been forced to seek even lower rents. These replacements assure a great stability in the middle brackets. On the other hand, excessive vacancies in the high-rental properties will enforce reductions in rent which will bring these properties down into lower rental groups. The result in most such cases would be financial distress and loss of income, if not loss of principal, to the investors in the property. Projects planned for the low-rental market offer greater assurance of continued earning power, hence greater security of investment, than do properties which are built for the high-rental market.



Further development of the general principles shown on page 4 is shown above. Wherever the site has considerable depth, indentation of the perimeter is not only advisable but also economical. The above plan assumes a walk from the street to all dwellings without immediate access for vehicles. Franklin Terrace in Princeton, N. J., Powell & Morgan, architects, shown at the right, is a practical demonstration of this method of planning.

3. *Changing Demands of High Income Families.*

In addition to the hazards arising from competitive overbuilding and the dangers which are characteristic of periods of economic depression, high-rental property suffers from the transitory character of the high-rental market itself. Renting families in the higher income groups tend constantly to seek accommodations in new buildings, located in currently more desirable neighborhoods, wherein the latest innovations and most modern luxuries may be enjoyed. Likewise, renting families in the higher income groups, being financially better able to make their demands effective, are much more likely to build or to purchase houses of their own. High-rental properties, abandoned by high-income tenants for new rental properties or for houses of their own, by the very narrowness of the high-rental market, are forced down to lower rental levels. Thus, forces both economic and social in character have the effect ultimately of pulling high-rental properties down toward the general rental levels which the great majority of renting families in the community can afford to pay.



Portion of a city block developed with interior parking areas served by cross-drives. Principal entrances of dwellings face garden courts.

High Rents or Net Profits?

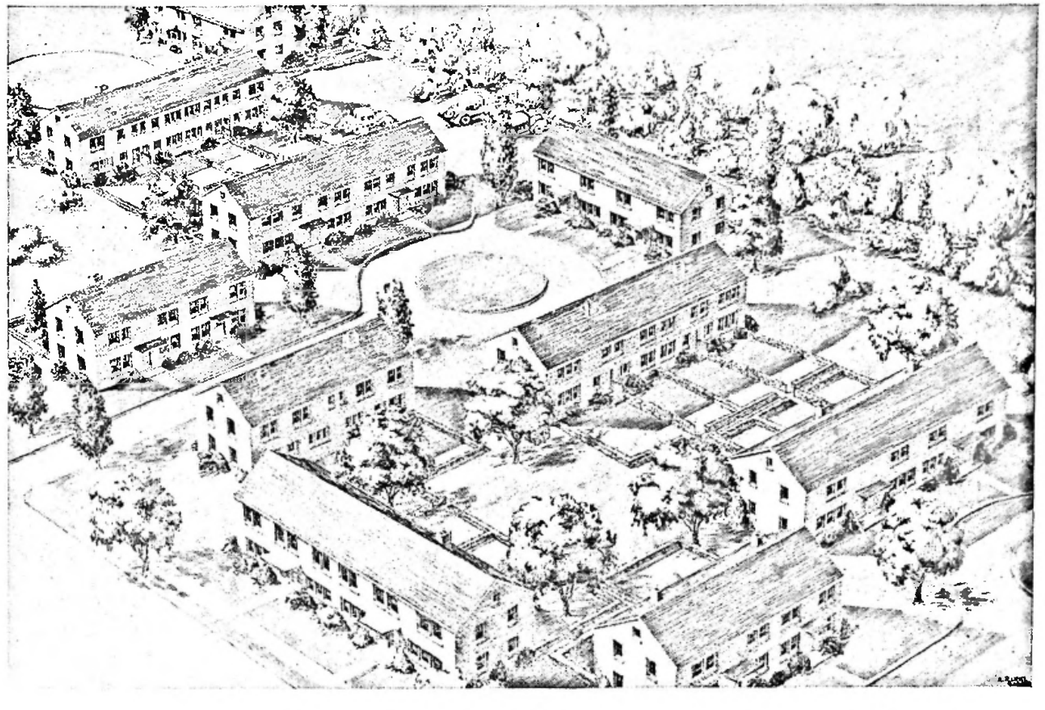
It has been the general practice of builders of rental housing to seek to obtain the highest possible rents and to predicate the financial structure of the housing venture upon an income expectancy which rental experience has not sustained. It is the desire of every producer of goods or services to get the best possible price for his product, but the best possible price is not necessarily the highest price. Net profits, not nominal top prices, are the measure of success in any business.

Properties built for the high-rental market tend to lose their appeal to the higher-income families after a period of time, with the result that ultimately rentals fall to lower levels. As a rule such buildings, somewhat depreciated and somewhat obsolescent, having been planned for the higher-income families, are not readily adaptable to the economical operation which lower rentals entail. Likewise the lower rentals will not produce income sufficient for adequate maintenance. The result is a more rapid rate of depreciation with an accelerated decline of rental appeal. The declining income will not sustain a financial structure predicated on high rents, and the value of the investments in the property declines with the falling income.

Planning For Low Rentals

Very little housing of acceptable standards has been built to rent at relatively low rates. Families in the lower-income groups have to a large extent been forced to accept accommodations in buildings which have been abandoned by higher income families. Such new housing as was supplied in the low-rental brackets has generally been ill planned, poorly constructed and substandard in basic amenities.

Planning, although primarily a technical problem, has its positive financial aspects in that the success of a project is dependent largely upon the rental appeal of the facilities offered. Construction, the principal capital cost of the project, is also a matter of financial concern. An over-specified job resulting in unnecessarily high capital costs requires a higher rental to provide a fair return on investment. Poorly constructed property may admit of lower original costs, but such property will probably involve operating costs and maintenance charges disportionately high. The greatest degree of investment security is found in property that is well planned and economically constructed and operated—property which affords the maximum amenities of living at a rental rate which falls within the broad market.



Cul-de-sac development with turn-around driveway also used as service-way. Note interior parking space and play area. See also figure 10 B, page 15.

The Major Portion of New Housing Must Be Designed For the Low-Rental Market

Practically every city in the country (even small cities of 10,000 population or less) is a potential market for new rental property. The social and economic background of the population in a given community fairly well determines the desirable types of new housing, particularly with reference to the accommodations to be offered and the rents to be charged. Family income data should be analyzed to determine what rents the majority can economically afford to pay, and the proposed housing should be designed for that specific market. A given city may possibly absorb a small amount of high-rental housing, but the saturation point would soon be reached; that same city would probably absorb a much larger amount of low-rental housing; but in any city or in all cities, the greater portion of new construction must fall immediately or ultimately into the relatively low-rental brackets. Property planned immediately for the broad low-rental market offers greater assurances of continuing security than property which, although designed for the narrow high-rental market, must ultimately sustain itself on lower rents in competition with property which is less costly to build and to operate.

Financial Security and Stability of Income

It is generally recognized as a principle of financial investment that maximum security inheres in businesses which demonstrate stable and continued earning power. In the rental market the greatest assurance of stable earnings is found in the moderately low rental brackets for the reason that many more families are able to avail themselves of the accommodations offered. Furthermore, these lower middle brackets are not so subject to the financial hazards that beset high-rental properties during years of economic adversity, nor are they so sensitive to the decline in marginal values due to speculative overbuilding, or the transitory moods of fashion.

Successful operation in the low-rental field is demonstrated by the histories of organizations such as the City and Suburban Homes Company, of New York, The Washington Sanitary Improvement Company and The Washington Sanitary Housing Company, of Washington, D. C., and the Cincinnati Model Homes Company, which were deliberately organized to provide housing for the low income groups in their respective cities. Although to some extent affected with philanthropic interests, the social aspects of their operations have not prevented

AT LEFT: A good illustration of increased privacy and livability compensating for inconvenience of access to a roadway. Meadville Housing Corporation, Meadville, Pa., E. A. and E. S. Phillips, architects.

AT RIGHT: Residential character can be obtained without great expense in two-story developments. This character is more difficult to achieve in higher buildings. In the project shown, a domestic quality has been created through a proper relationship between building and landscaping and through effective window treatment. Tracy Gardens, Englewood, N. J., George Swiller, architect.

them from being business successes. These companies represent investments of private capital in housing properties which are operated as private enterprises. Each has paid its full share of local, State, and Federal taxes. From the financial point of view, the outstanding characteristic of these corporations is the record of regular and consistent dividend payments which each one has established. When it is recalled that the older organizations, operating over a period of 40 years, have gone through such trying times as the panic of 1907, the war period of 1914 to 1918, the depression of 1921, the inflation and prosperity of the later 1920's, the economic collapse of the 1930's, and have paid dividends each year, the stability of their earning power is indeed remarkable.

Equity Investment In Federal Housing Administration Low-Rental Projects

The experience of the Federal Housing Administration in its rental housing operations over the past 4 years leads to the conclusion that well planned and properly located projects designed for a broad rental market are quickly absorbed by the renting population of the community in which they are located. These properties, consciously planned for lower income families, offer accommodations and amenities not usually found in existing low-rental properties. Those in operation long enough to provide a fair test have demonstrated income producing capacity sufficient not only to meet the requirements on account of operation and maintenance expenses, taxes, interest on the mortgage debt, amortization payments, and corporation reserves, but also to pay dividends at the agreed rate on the capital stock and, in some instances, to make prepayments on the mortgage.

Equity investors in such properties may expect a fair return annually on their investment during the life of the FHA-insured mortgage, and at the end of the 25 to 30 years amortization period they should realize a well maintained, income producing property free and clear of mortgage debt.

From the foregoing considerations, the following conclusions may be summarized:

1. Substantially increased investments in land and buildings are required annually to meet the normal demands for new rental housing if present standards of housing are to be maintained. Improvement of present conditions will call for more extensive investments.

2. By far the largest part of this amount must be invested in housing which can be operated profitably at less than $50 per unit per month.

3. Housing planned to meet the basic requirements and to provide the necessary amenities for low income families is less costly to build and more economical to operate than housing designed for families in the higher income groups.

4. Housing planned to rent at moderately low rates falls in the broadest rental market and consequently is assured of greater stability of income.

5. The greatest degree of financial security is found in undertakings which give evidence of stable earning power.

6. Investors interested in safety of principal and continuity of earning power should examine the investment merits of low-rental housing.

PART II

SITE SELECTION AND PLANNING FOR LOW RENTALS

In planning a low-rental housing project a careful study and analysis of all the factors that eventually determine rentals must be made. Land costs, building costs, operating and maintenance expenses, taxes, insurance rates, interest rates, and all other items which enter into the cost of producing the rental property and maintaining the services of shelter for which it is planned, must sum up to a figure consistent with the rental income expectancy of the completed property.

In order to be acceptable for mortgage insurance by the FHA, a rental housing project must meet certain fundamental requisites with respect to location and planning. First, the project should be located in or near a city or town where there is definite prospect of continuing demand for housing at the proposed rental rates; it should be located in a neighborhood where the possibilities of future deterioration are at the minimum; and the site itself should be suitable for the development of a project of the type and magnitude contemplated. Second, the plans of the entire development should embody qualities of design and construction in terms of open space, lawns and planting, light and air, convenience and privacy of the dwelling units, and other amenities of family living, to the end that rental appeal may be enhanced and the factors of obsolescence may be minimized.

Rental income expectancy, to a great extent limited by the conditions prevailing in the rental market, is the controlling factor in the planning of a project. A fair return on the investment is assured only when costs, both construction and operating, are geared to the rental income expectancy. Planning affects not only the original cost of construction, but also, and equally important, the cost of operating and maintaining the property. But planning alone cannot be relied upon as the sole means of attaining low rentals, nor is it to be inferred that, under varying conditions and circumstances, a given plan will result in the same rental rate. Experience has indicated however that, under similar conditions of land costs, financing costs, and taxes, certain types of planning permit lower rentals than do other types. When the fullest possible advantage is taken of economies of layout and construction, less rental income is required to sustain a given project.

In the search for methods of reducing building and operating costs there are certain essentials which must not be sacrificed. Substantial, well-built structures, located in good residential neighborhoods, with adequate space and equipment must be provided. A garden environment with play space for children is desirable, and ordinarily will be required. Plans must provide for light and ventilation, and each unit should incorporate the highest attainable degree of privacy and other amenities of family living. There must be adequate provision for automobiles either in garages or parking spaces. Due attention must be given to the problem of servicing the dwelling units and the removal of waste.

On the other hand, elaborate finish and expensive entrance halls or vestibules should be eliminated. Savings can also be realized by planning units that are simple to construct and that permit the use without waste of stock sizes of lumber and other materials. Complicated plans involving many exterior and interior breaks should also be avoided.

The selection of the community in which to build is the first problem confronting the sponsor of a project. To be acceptable, a project must be located in or near a city or town where there are adequate sources of employment, preferably in diversified occupations rather than in one or a few principal industries. Above all it must be located in an economically stable community where there is evidence of a definite and continuing demand for housing at rentals sufficient to cover the requirements of the project as a sound business enterprise.

Within a given community, a location meriting approval should be readily accessible to places of employment and satisfactory transportation facilities should be available. It should be conveniently situated with respect to schools, churches, shopping centers, and the recreational facilities of the community. The site must be suitable for residential development, free from the hazards of floods, subsidence, fog, smoke, noxious odors, nuisance industries, and the like. It must be located in a neighborhood where zoning or other types of protective regulation will permit the sort of development contemplated, and it must conform with city, county, or regional planning where such planning is in force.

On the following pages of this booklet certain principles are presented as guides to planners for use insofar as they are applicable in the study of their particular problems. It is not to be assumed that merely by the use of certain types of plans low rentals can be obtained, nor that the plans illustrated herein are universally applicable to all sections of the United States or to all classes of tenancy.

A. *Choice of the Site.*

In high-rental projects the character of the neighborhood and its likelihood to persist as a favored residential area are the principal considerations in selecting a site.

For low-rental housing, site selection requires careful consideration of cost factors. It may be well to consider some of the site characteristics which affect cost favorably or adversely, and which consequently have an influence on necessary rental. In this connection, it should be remembered that avoidable costs of development do not increase rental value. It is not to be expected that any one site will be most favored with respect to all the criteria that enter into its choice. The final selection will usually be a compromise based on judgment. Here, then, are some of the important considerations affecting the choice of a site for low-rental housing. The list is not complete, but it will serve to illustrate some of the factors affecting site development costs that may present themselves.

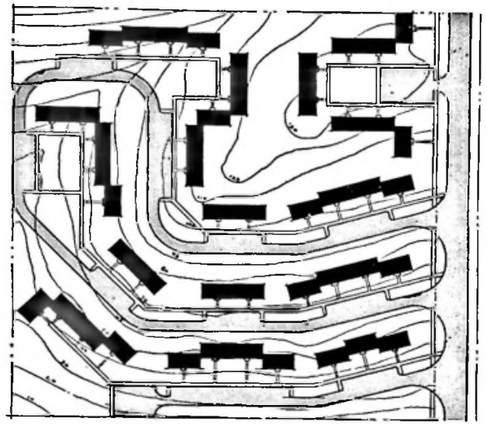


FIGURE 1

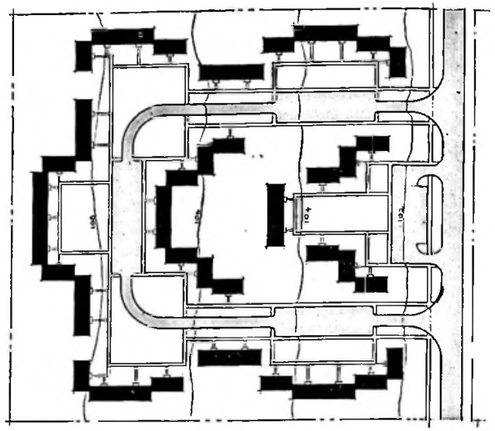


FIGURE 2.

1. *A gently sloping site is preferable to one presenting serious topographical difficulties.* This will be apparent by an examination of figures 1 and 2 in which the same area has been assumed in both cases, the same access streets, and the same number of dwelling units, but with different topography. A study of these plans will make it evident that in figure 1 there is a greater likelihood of expensive cut and fill. The steep slope also requires added provision for surface drainage to prevent heavy accumulation of rain water. Culverts and large-sized storm sewers may be required to remove it.

If the buildings are on a steep slope, they may be more costly because of added exterior walls (figure 3). This is especially true where basements are omitted.

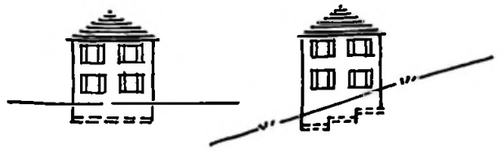


FIGURE 3.

Where a long building runs perpendicular to the contours, it may be necessary to vary the floor and roof levels (figure 4). This means added costs of roof and finishing the stepped gable ends.

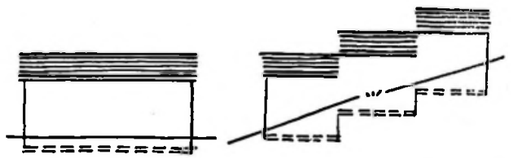


FIGURE 4.

A comparison of the two plans in figures 1 and 2 will also demonstrate the added flexibility of planning in the level site due to the unrestricted possibilities of placing the buildings. The difference in length and cost of road improvements to produce similar ease of access will also be apparent.

2. *Sites containing soft ground, heavy uncompacted fill, or outcroppings of rock should be avoided* (figure 5). Preparation of the site to obviate these objectionable features is expensive and adds nothing to rental value.

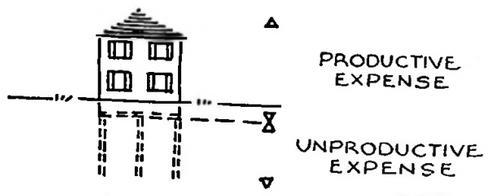
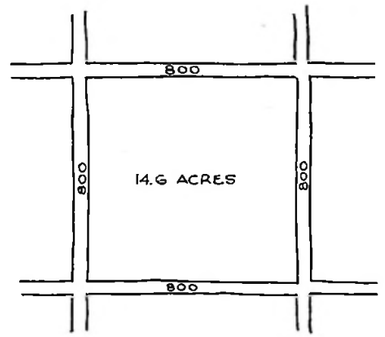


FIGURE 5.

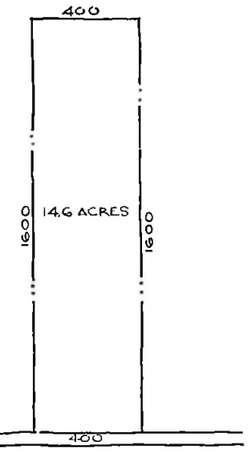
3. *Choose a site where heavy duty road construction will not be required.* The traffic tributary to the average housing development is not heavy and comparatively light hard surfaced roads of moderate widths will suffice. If the needs of urban or through traffic require the construction of heavy duty roads, either boundary or internal, at the expense of the project, an unproductive burden of cost is saddled on the enterprise.

4. *Sites remote from public roads and utilities are less desirable than those where these facilities are immediately available.* If roads and utilities must be brought from a great distance, low priced land may prove to be prohibitive in final cost.

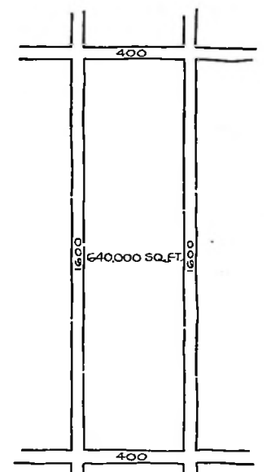
It will be evident from figure 6 that case "A" will afford frontages toward which the building units may be faced, and little road development inside the site will be necessary. Case "B," with a narrow frontage and a depth of almost one-third of a mile, will of necessity require interior roads.



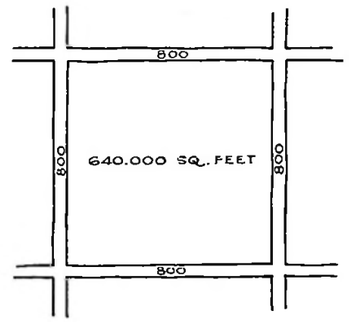
3200 FT. OF EXISTING PAVED FRONTAGE.
FIGURE 6 A.



400 FT. OF EXISTING PAVED FRONTAGE
FIGURE 6 B.



4,000 FT. OF ROAD FRONTAGE



3200 FT. OF ROAD FRONTAGE
FIGURE 7.

In this connection, it may be stated as a general principle that the narrow and deep site presents problems of site planning similar to the difficulties encountered in planning a single dwelling unit on a narrow and deep lot.

5. *Where surrounding roads must be constructed and paid for directly or by assessment, the site most nearly square is preferable.* This is a simple matter of geometry and is illustrated by figure 7.

6. *Utilities.* The knowledge that utilities are available to a given site is insufficient evidence on which to proceed. The adequacy of such utilities to bear the added loads that will be created by the proposed project must be satisfactorily determined. If water mains and sewers must be replaced, they might as well not be there.

Where access to a sewerage system is not possible and septic tanks are resorted to, the site should be carefully studied to determine that:

(*a*) There will be an available disposal field of adequate area.

(*b*) The soil will absorb the outflow water from the tanks.

(*c*) Public authorities will approve such installation.

7. *Fire Protection.* Careful investigation should be made of the rate of fire insurance. If nonfireproof structures have been contemplated, the sponsors should investigate whether a differential in insurance cost would warrant the adoption of fireproof construction, or whether a different site should be chosen.

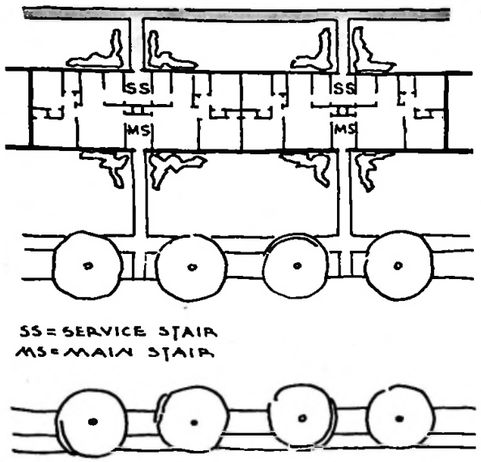


FIGURE 8 A.

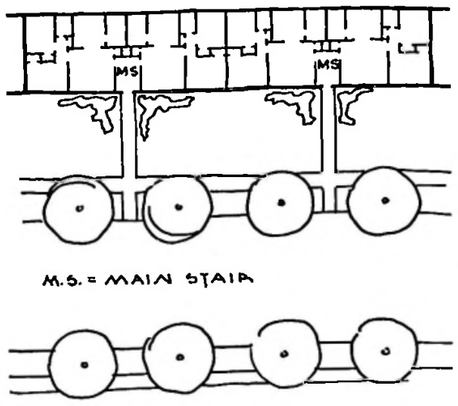


FIGURE 8 B.

B. *Site Planning.*

In planning for low-rental projects, the general principles of economical site planning are especially applicable. As in the planning of the buildings themselves, there are minor sacrifices of convenience that tenants will readily accept in low-rental projects and which result in economies of first cost and maintenance, which may not be applicable for higher-rental projects.

It will be found that even the comparatively minor differences in living requirements result in a somewhat different planning technique for low-rental housing.

It is impossible to discuss these differences at length, but a few simple comparisons of planning for higher and for lower rentals will serve to illustrate the technique.

Figure 8 is a comparison of walk-up apartments. In "A," a higher rental is assumed and separate service stairs and walks are shown (shaded). In "B," it is assumed that the tenants are prepared to accept certain compromises in consideration of a low rental. The tenants in "B" will probably not employ domestic help. They will be largely "cash and carry" customers in their shopping and will be prepared to have the occasional deliveries made by the front stairs and to accept the inconveniences of waste removal in the same manner.

Figure 9 A represents the case of higher rentals and it is assumed that a maximum acceptable walking distance of 150 feet has been established. In "B," the presumptive maximum has been doubled, because of an assumed rental differential. Comparing the two plans, we find that "B" permits the development of a greater depth of the property without accessory roads and results in a smaller road frontage per family housed.

The distance that tenants are willing to walk from the nearest drive to their own entrance is a variable which cannot be reduced to a mathematical certainty. At a given rental level, it will be influenced by the climate and living habits of different regions. In a given community, the comparative rental level will affect the distance assumed as a maximum and this difference will influence the planning with consequent economies in the lower rental brackets.

Figure 10 illustrates even more forcefully the difference between the requirements of higher- and lower-

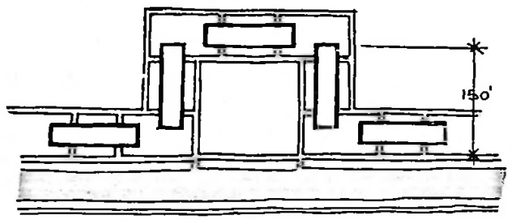


FIGURE 9 A.

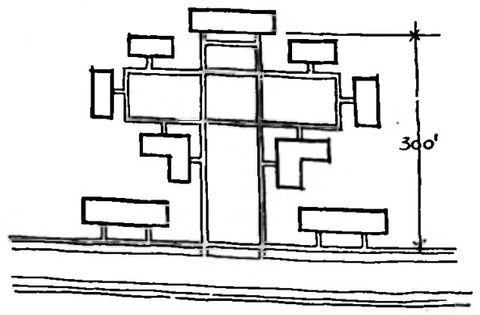


FIGURE 9 B.

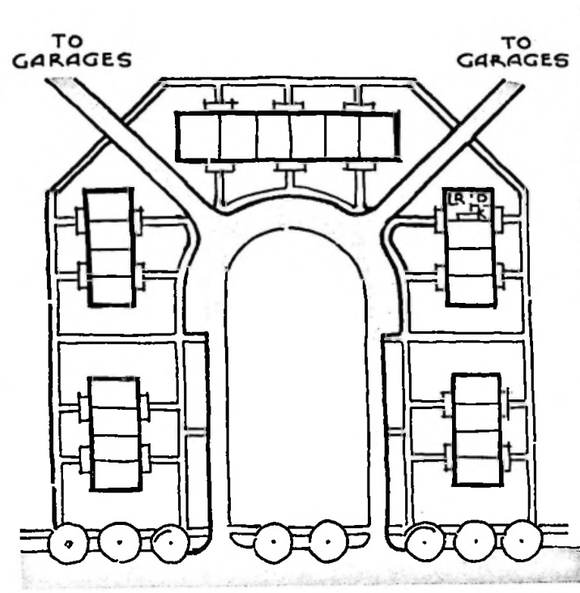


FIGURE 10 A.

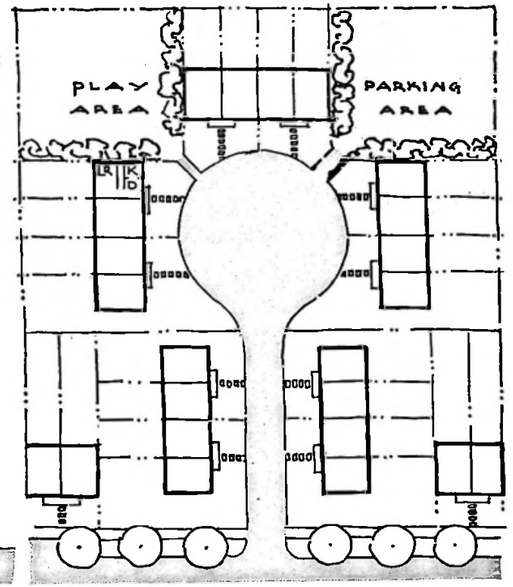


FIGURE 10 B.

rental projects. Both cases "A" and "B" present a court arrangement of group houses, two stories high.

In "A," it is required that service circulation be separate from "front door" circulation. The element of "swank" demand is present. Naturally, the kitchen must be on the service side and consequently the living portion of the plan is toward the driveway. The driveway must touch all frontages and a sidewalk paralleling the drives becomes an essential.

Figure 10 B is a picture of low-rental housing. The savings in development costs are evident from a comparison with "A." Here the roadway has become a minimum service convenience, with no pretense of special social appeal. As it is the only means of access to the dwellings, the kitchens may, as a matter of convenience, be nearest the roadway; and the living space, on the opposite side of the building, comes into intimate contact with the garden spaces, with consequent privacy and quiet. In this diagram, the arrangement permits a large share of the grounds to be placed in the care of the individual tenant (indicated by broken lines). An additional advantage of "B" is the fact that its development requires less frontage on the principal highway for an equivalent number of dwelling units, and consequently less cost per dwelling.

In developing site plans for low-rental housing, careful study should be given to economy of utility layout. From this angle, isolated individual dwelling units are seldom justified. Assembling them in groups or in larger building units will usually reduce utility costs. For instance, in a group of duplex houses, the supply and drainage lines can be run under the first floor construction with one trench and soil line to the main trunks.

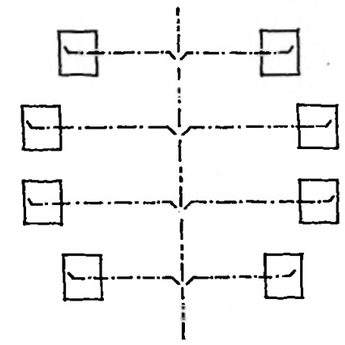


FIGURE 11 A.

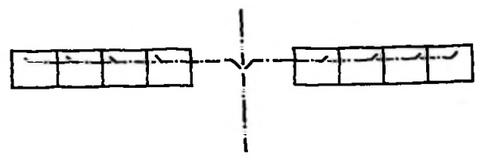


FIGURE 11 B.

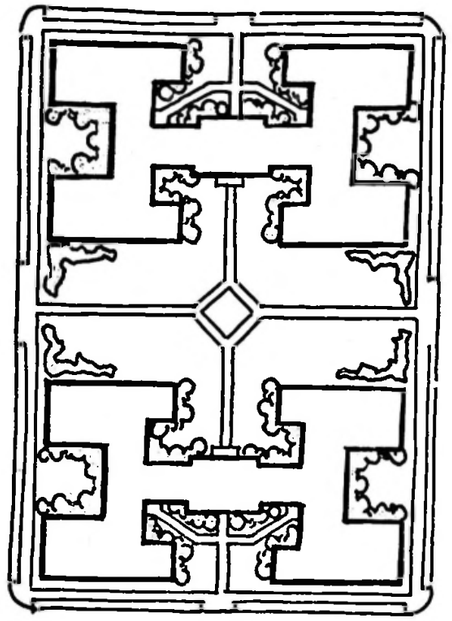


FIGURE 12 A.

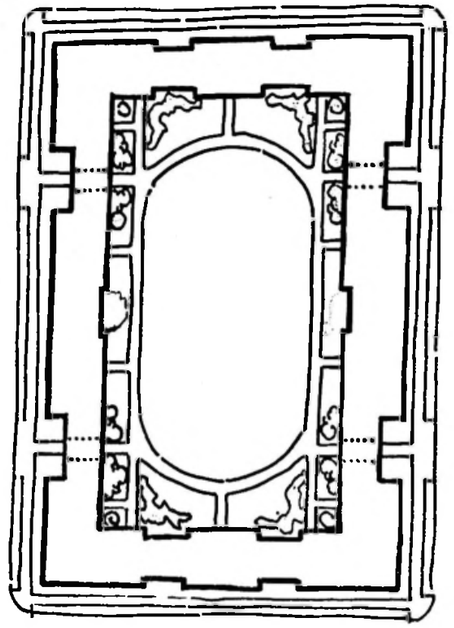


FIGURE 12 B.

Economy in landscape work for a garden development does not mean that all planting may be omitted, nor that it must be skimped. It does mean that all plant material used must serve its purpose in the most effective way. No view in a garden project should be devoid of planting. Consequently, the simpler the layout of the plan, the less will be the cost of adequate planting.

This is illustrated by figure 12. The complexity of the building shapes in "A" has created a great number of separate vistas into small courtyards, each one of which must have planting if it is not to have a barren appearance. Consequently, the lawn areas are small and the total of plant material is large. In the large court of plan "B," the planting groups will enter effectively into the view in every direction. In both first cost and maintenance, "B" is more economical than "A."

Economies are also possible in the choice of plant materials. Again this is not a question of skimping, but of wise selection. The use of trees, shrubs, and vines that are native in the region and consequently hardy is desirable. Trees of sufficient size to offer shade and break up the view of extensive wall areas are of first importance; shrubs and vines are second. If necessary, flowers can be omitted and flowering shrubs and trees relied on for color. Native material is less expensive and more appropriate, for the aim should always be to make the setting for the project harmonious with the region itself.

Above all, it should be remembered that planting is an essential adjunct of the buildings, the more so when the economics of the project require the simplest kinds of structure. It must not be an afterthought, or be regarded as something to be added if there is available money when all other costs are provided for. The planting scheme must be studied in intimate conjunction with the architectural layout and adequate funds must be provided for its execution.

The examples cited above will be sufficient to illustrate the type of reasoning that must be applied to site planning for lower rentals. The whole tendency must be toward directness and simplicity, but the process must not be carried to the extreme of rigidity and monotony where all charm is lost and the effect becomes as deadening as the worst that thoughtless planning has produced. Economical planning need not be monotonous if careful study and skill are brought to its service.

C. *Building Units.*

What simplifications can appropriately be adopted in low-rental projects in order to reduce costs which may be compromises in convenience and amenity, but in no way affect the essential soundness of the planning? Here are a few of them.

1. Special service stairs should be avoided. If building codes require secondary stairs for a given type of building, some other type should be used where the lowest possible rental is sought.

2. The lighting, cleaning, and redecoration of public halls is an important element of operating cost. The public hall should therefore be eliminated where possible.

3. Basements can be omitted to a large extent, except where storage, laundry, and heating requirements make them imperative.

4. In warm climates, central heating may not be a necessity. In many regions it is an extravagance and dwelling units may be heated individually. In such cases the nature of the fuel must be considered. Hauling coal or wood upstairs and carrying ashes down involve not only hard labor but dust and dirt.

5. Domestic hot water may be produced by individual small units, eliminating the operating waste of unlimited central supply.

6. Service of garbage and trash collection can be simplified either by outdoor underground receptacles for each tenant or by central collection points to which the tenant brings waste matter.

7. Portions of the outdoor area adjacent to dwelling units can be allocated to the care of the tenant.

Considering the factors mentioned above, the picture of the low-rental unit begins to shape itself. It is a one- or two-story structure, simple in layout and construction, largely self-contained in its operation and requiring little service of the management other than repairs and redecoration.

In the experience of the Administration, the four principal unit types that meet these requirements are the two-story group or row house, the two-story flat without public halls, the one-story group house, and the single-family home. It is these types only that are the concern of this presentation.

Two-story Group Houses.—This is a well established type of housing, particularly in the east. The dwellings are simple, economical in construction, and can readily be planned to be well ventilated, provided they are not more than two rooms deep. They afford an opportunity for private garden space both in the front and the rear. Called the "row house," it has in a measure fallen into disrepute because, where it has been widely used, developers have built it in long monotonous rows in order to squeeze as many as possible on the available land. The deadening effect thus obtained is a fault of the method of land development and does not in the least detract from the value of the unit when used with judgment. Arranged in groups of four or more dwelling units with simple architectural treatment, it can be one of the most attractive modes of housing development.

The disadvantages of this type of dwelling are that it is not particularly economical where large groupings are served by a central heating plant and that, lending itself best to a two-bedroom dwelling, it is not of special advantage where smaller or larger units are required. This latter limitation can be obviated by arranging units interlocking on the bedroom floor as shown in figure 17. The need for smaller units will usually be met more successfully by using the two-story flat building or the one-story row unit.

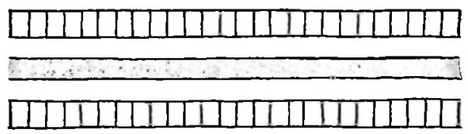


FIGURE 13 A.—Abuse of the row house.

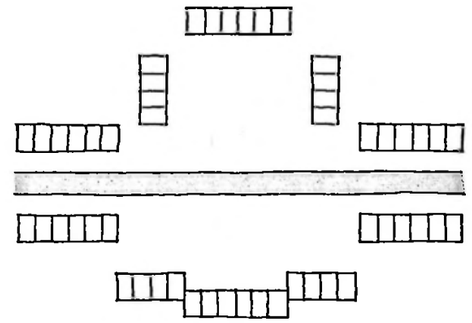
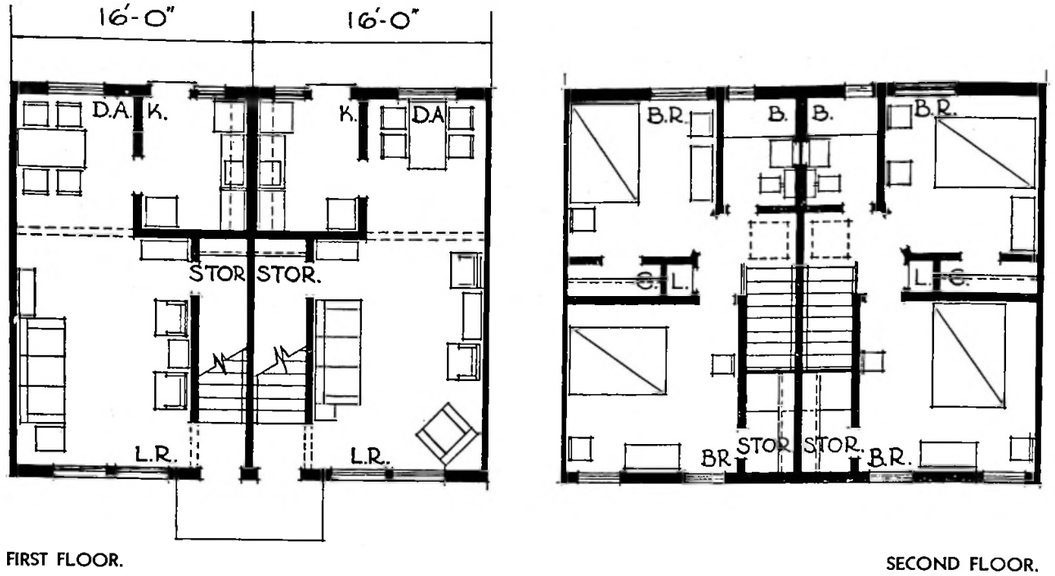


FIGURE 13 B.—Rational grouping of row houses.



FIRST FLOOR.

SECOND FLOOR.

FIGURE 14.—Two-story group house, narrow frontage, stairs along dividing walls.

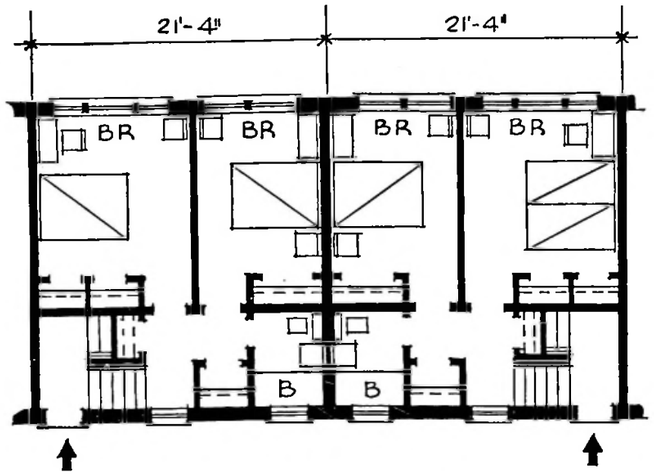
Figure 14 shows the most usual row type. It affords good closet space and excellent through ventilation. On the other hand, the staircase uses valuable frontage on both floors (about 20 percent of the total frontage) and the main bedroom and the living room are narrow.

Although the type shown in figure 15 is not as good as the previous with respect to first floor ventilation and closet space, it has obvious advantages. Framing is of the simplest, and where the dining-kitchen is used, partitions are reduced almost to a minimum. Living room and principal bedroom enjoy the entire frontage. (Compare with figure 14.) If an open-string stair is used, the living room appears to be more spacious.

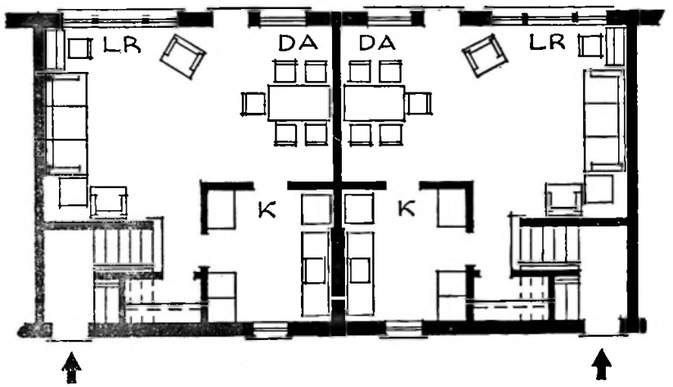
FIRST FLOOR.

SECOND FLOOR.

FIGURE 15.—Two-story group house, narrow frontage, stairs parallel to outside walls.

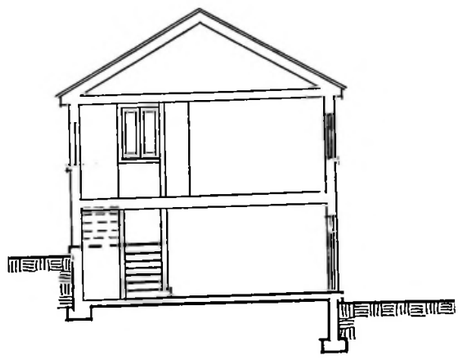


SECOND FLOOR.



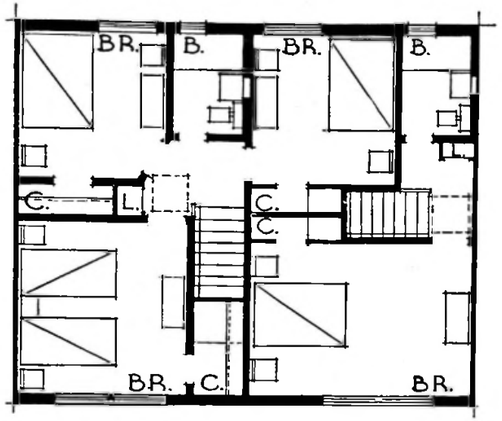
FIRST FLOOR.

FIGURE 16.—Group house plan for a sloping site.

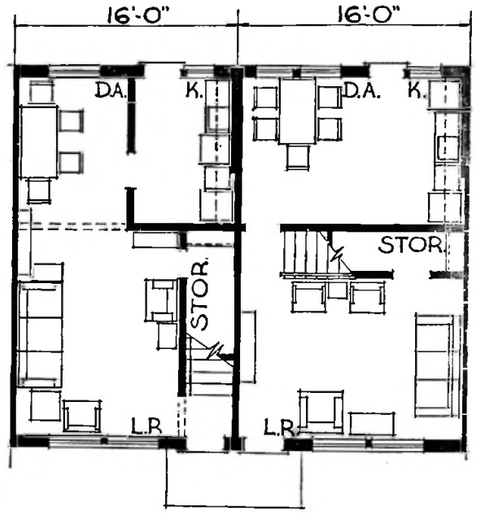


SECTION.

Figure 16 illustrates one method of adapting the group house to a hilly site. The entrance is at a level between the first and second floors. The lower and upper floors are reached by a half flight of stairs. In using a plan of this type, the lighting of the kitchen is an important consideration and consequently the lower floor must not be so far below the higher grade level that the kitchen window becomes a mere slit. It may be presumed that the most favorable view in this case is down-hill, hence, all of the living and bedroom space is on the down-hill side of the building.



SECOND FLOOR.

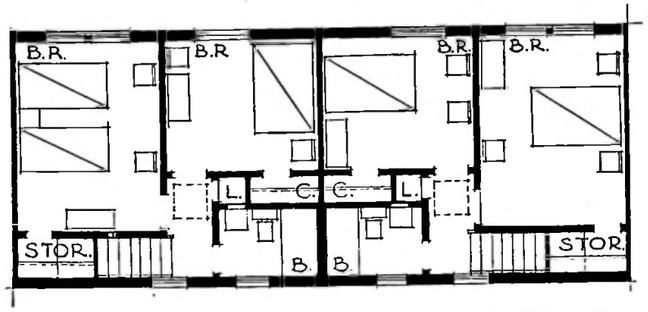


FIRST FLOOR.

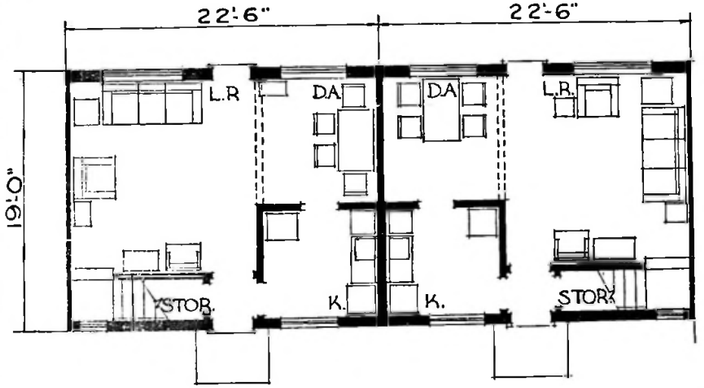
FIGURE 17.—Interlocking row house.

Figure 17 shows one of several methods by which one- and three-bedroom houses can be introduced into buildings in which two-bedroom houses predominate, retaining the same structural articulation.

It will be noted that one of the pair of houses shown has the same plan as that shown in figure 14 and the other is similar to figure 15 except that the secondary bedroom has been opened into the adjacent unit. Where a preponderance of units having less than two bedrooms is desired, this arrangement is open to question as it produces one three-bedroom unit for each single-bedroom unit.



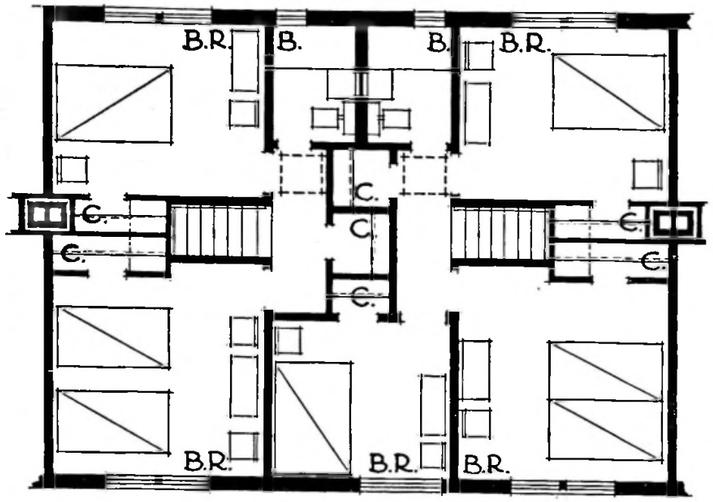
SECOND FLOOR.



FIRST FLOOR.

FIGURE 18.—Two-story group house, broad frontage.

Figure 18 shows one of the most desirable types of group houses, which can be used wherever the somewhat added cost of exterior walls is balanced by savings. It has many advantages. It fits admirably when arranged parallel with the contours on a sloping site. In fact, where the slope is marked, the narrow and deep house may require so much additional wall vertically that its horizontal advantage is offset. In this plan, it is presumed that the garden is on the side opposite the entrance. Living room, dining alcove, and both bedrooms enjoy the amenity and quiet of this side of the house. This plan is also excellent where prevailing summer winds create a preferential exposure.



SECOND FLOOR.

FIRST FLOOR.

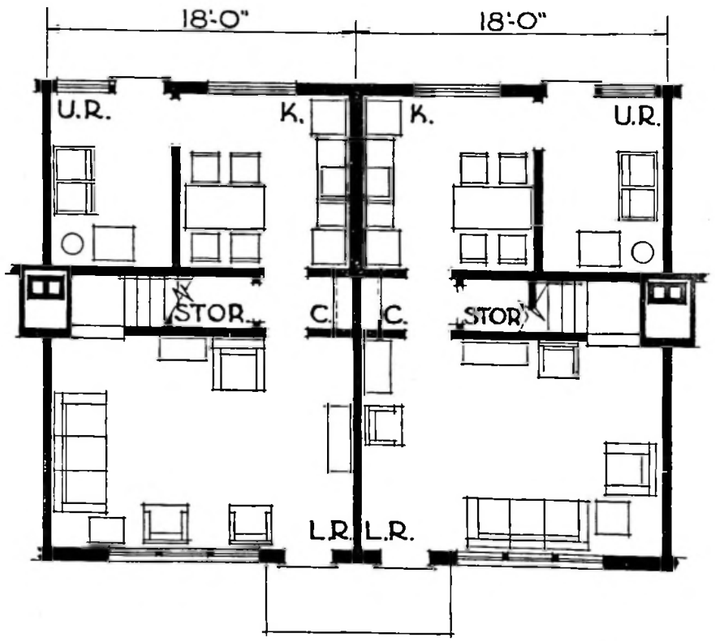
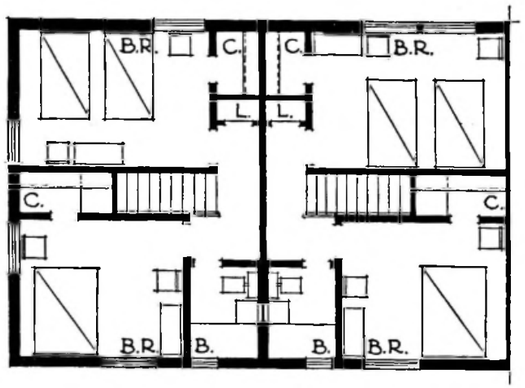


FIGURE 19.

Two-story group houses with individual heating and utility room

The plans discussed thus far do not illustrate the cases where a utility room is necessary. These special cases present no essential planning difficulties other than the inclusion of the necessary space.

Figure 19 gives one solution of this problem. Advantage has been taken of the added width to obtain a third bedroom in one of each pair of dwelling units.



SECOND FLOOR.

FIRST FLOOR.

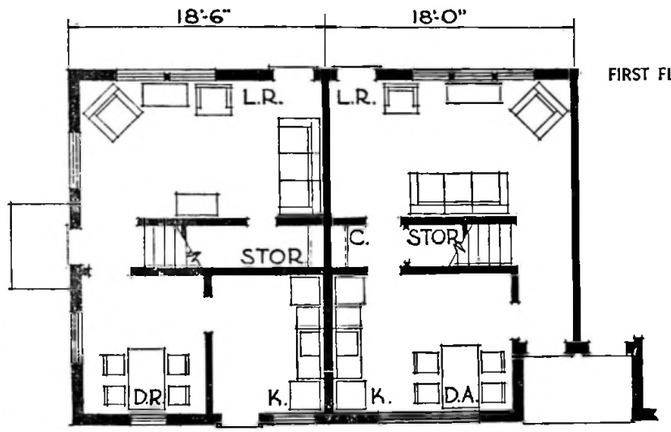


FIGURE 20.

House with main entrance on kitchen side.

Figure 20 is presented to illustrate a type of dwelling plan appropriate to situations where the main entrance is on the side of the kitchen, and the living room and principal bedroom are afforded a view of a rear garden.

The end units of a group dwelling, having three exposures, offer an opportunity for economical variants of typical plans which should not be neglected. Thus, the bathroom which uses valuable frontage in the middle units can frequently be placed on the end wall.

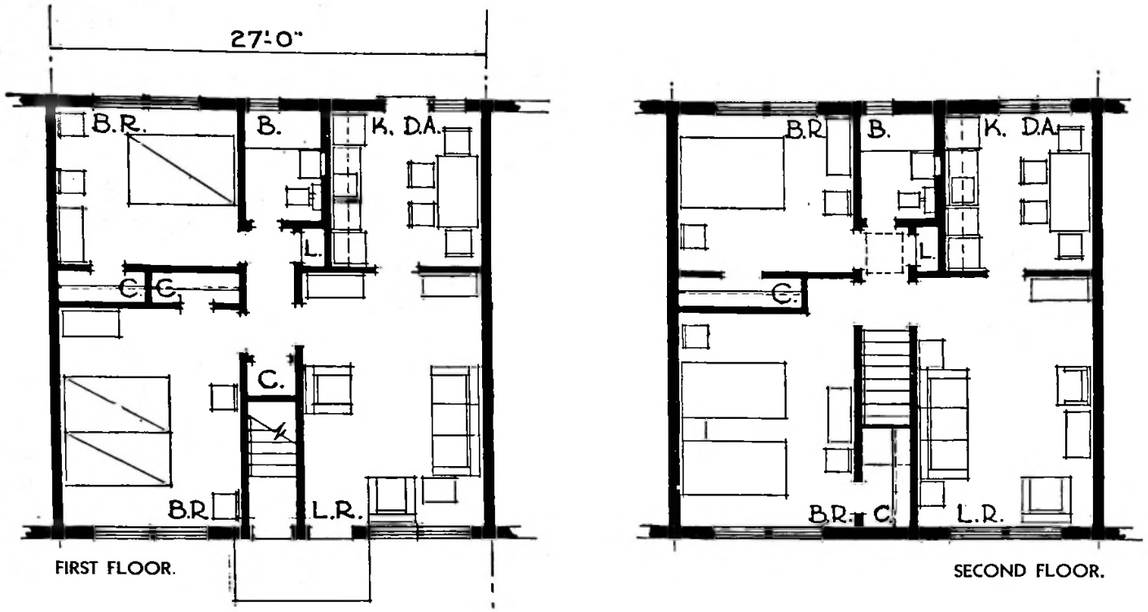


FIGURE 21.—Two-story flats with two bedrooms.

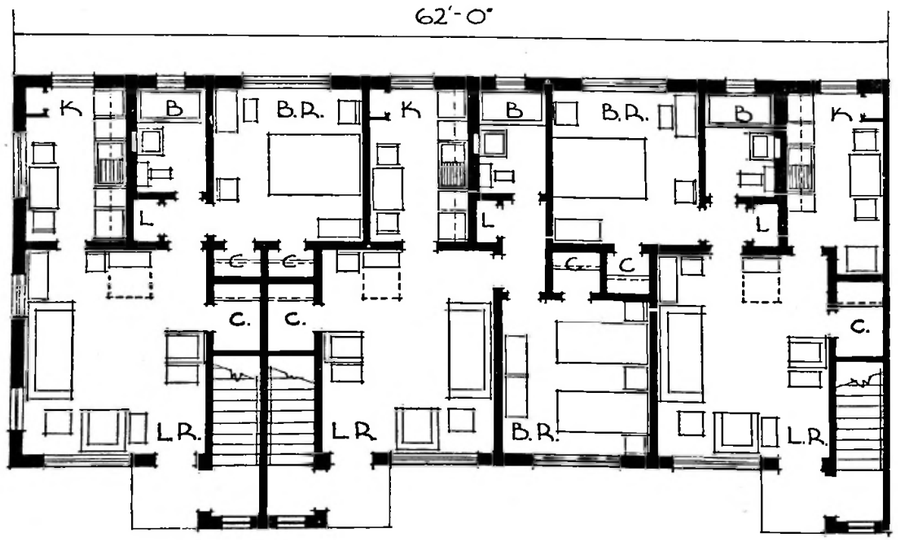
Two-story Flats.—This inexpensive type of building is particularly adaptable when the preponderance of dwelling units will have only one bedroom. As compared with the apartment building, it has the important advantage of eliminating the public hall which must be cleaned and lighted by the management of the project. The flat is a desirable type where heat is furnished the tenant or where clean fuels having no residue are available. Varied layouts are possible, of which a few are indicated.

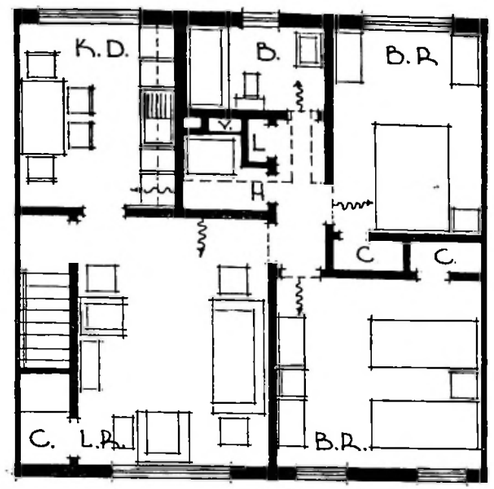
Figure 21 is a conveniently arranged flat building with two bedrooms in each unit. By bringing the stairs to the middle of the plan, the second floor unit is so disposed that the living room as well as the bedroom can be used for sleeping with proper privacy. Plumbing is arranged in an economical manner and there are adequate closets.

Figure 22 shows an arrangement of one-bedroom units, in which the bedrooms interlock. Planning need not be rigidly set between parallel dividing walls. The outside walls are inflexible, but within this framework a great variety of arrangement can be found.

FIGURE 22.

Two-story flats, one bedroom, using interlocking bedroom plan.





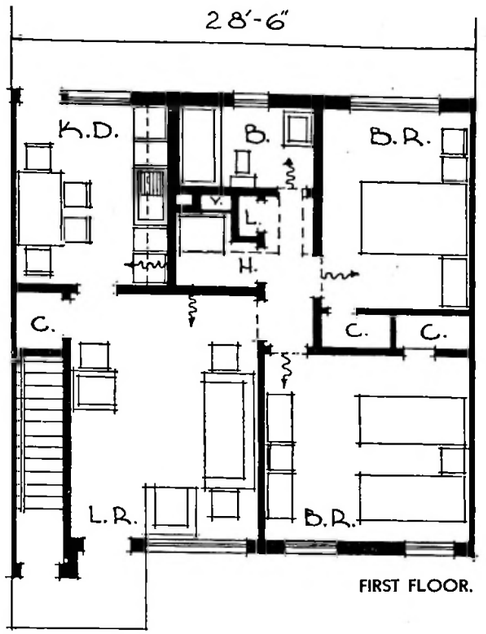
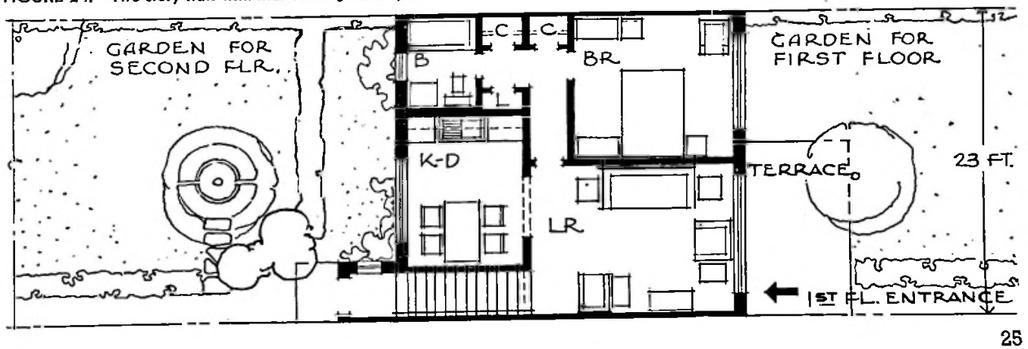


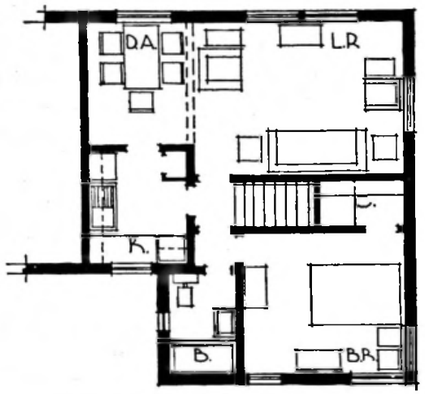
FIGURE 23.—Two-story flat, two bedrooms, individual heating.

Figure 23 presents another type of planning for two-bedroom flats. It will be noted in this plan that individual heating by the tenants has been assumed and special space allocated to heating equipment adjacent to the bedroom-bath hall, the upper part of which is used as a duct for the distribution of heat. In this and the other plans of flats shown here, the kitchen is reached by traversing the living room, a compromise which would not be appropriate to higher rental housing. The framing of this building is simple and economical. There is only one entrance walk for four dwelling units

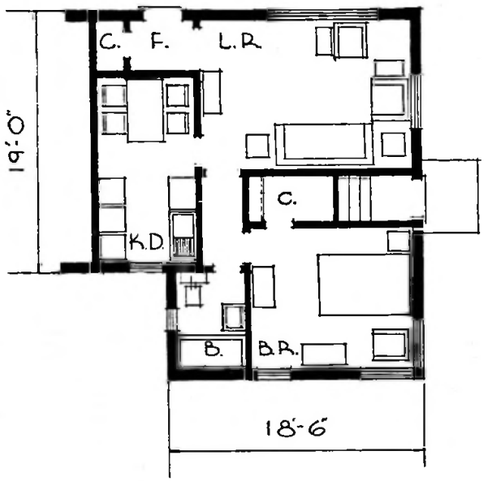
In figures 22, 23, and 25, the entrances to all units are on the same side of the building. This type of entrance reduces the length of access paths. On the other hand, it has the disadvantage that the tenants of the upper floors cannot have an outdoor sitting space. Figure 24 is designed to meet this objection. In this case, the second floor tenant and the first floor occupant enter the building on opposite sides and it is possible to afford each the enjoyment of a garden which is also allocated to his care. As has been pointed out, this end is more readily accomplished in group houses.

FIGURE 24.—Two-story flats with individual garden space.



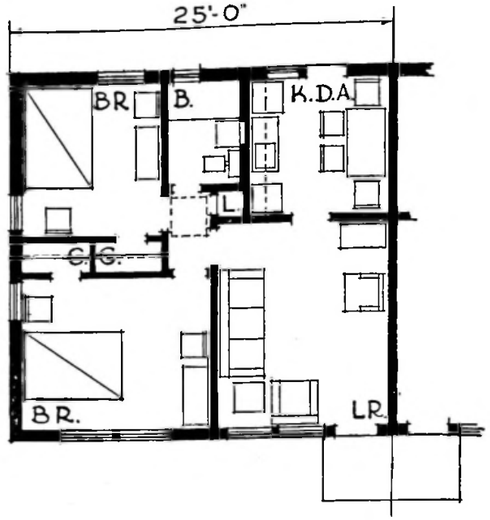


SECOND FLOOR.



FIRST FLOOR.

FIGURE 25.—A special end unit.



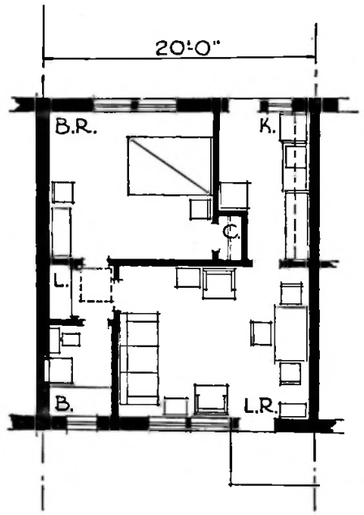


FIGURE 26.—Units adaptable to one-story construction.

It has been stated that the end unit of a group presents an opportunity for special planning. Figure 25 is a case in point. Here it is assumed that the center units are of the broad and shallow type. The ends are turned, not only reducing the total length of the building but also offering a pleasing variation in exterior appearance.

One-story Group Houses.—The advantages of having all rooms of a dwelling on a single floor are obvious. When to these are added freedom from noise by neighbors below or above, intimate contact with the land and garden space, the validity of this type of housing is patent. It can also be used in conjunction with other types, either in separate groupings or in the same building, as shown in figure 29.

The one-story unit is not economical if cellars are required, but it is an excellent type where it can be built on piers, on shallow foundation walls, or on a flat concrete slab.

The few examples which follow will give an idea of the variety of solution it offers.

Figure 26 shows a three-room unit and a four, both of which can be used as repeating units in a grouping. They are good livable family dwellings of restricted area.

One-story units are also susceptible to interlocking arrangements. Two of these are shown in figures 27 and 28. The latter is somewhat the more expensive of the two, but has the added advantages of separate dining space and of offering a variety of accommodation.

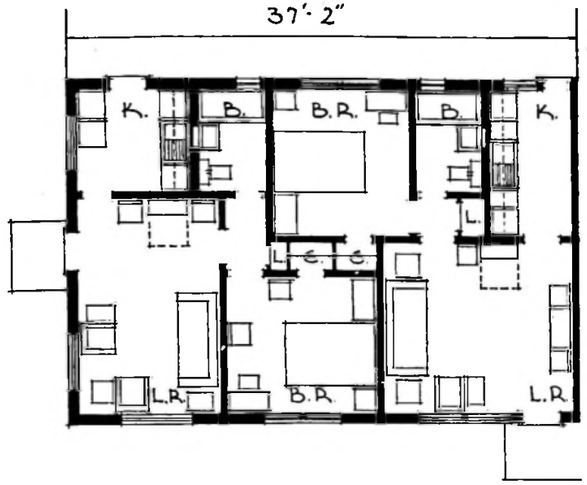


FIGURE 27.—One-story units with interlock.

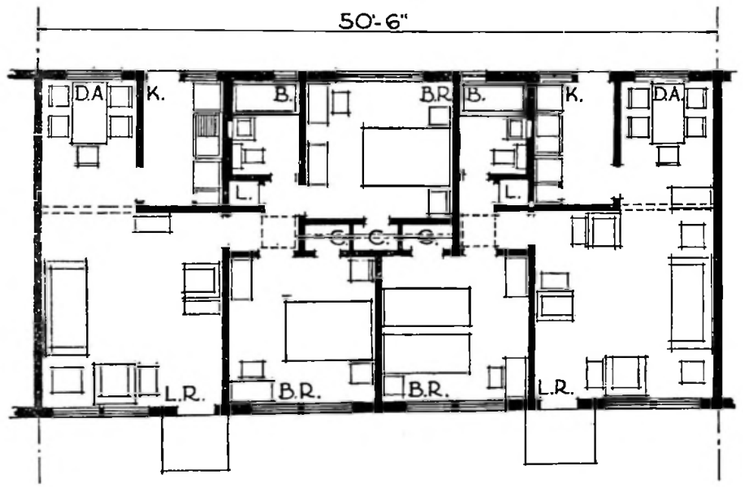
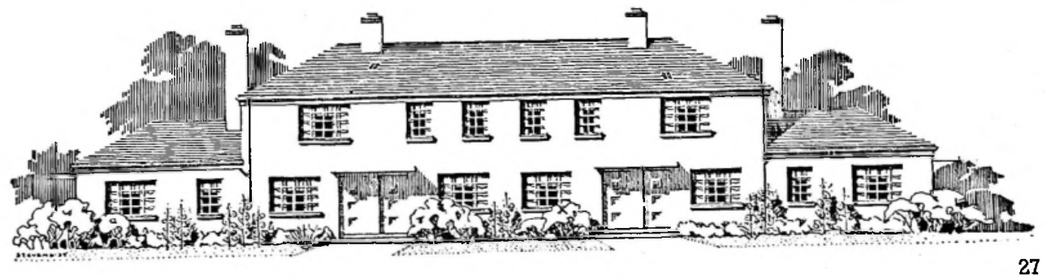


FIGURE 28.—One-story units with interlock.

FIGURE 29.—One- and two-story units combined.



Single-family Houses.—In suburban or rural locations, rental housing projects may consist of single-family houses or such houses in combination with other types. The basic principles of site selection and development set forth in this pamphlet are equally applicable to this type of development. The principal advantages of single-family developments for rent as compared with those for sale lie in the field of site development costs. The absence of rigid separation of premises by lot lines, the absence of the requirement that each house have a street frontage, the unification of garages, garage drives, and utility lines all tend toward savings in development costs.

For the planning of inexpensive single-family houses, the reader is referred to other FHA publications.

In the lower-rental market, the essentials of environment, light and air, privacy, and adequately planned and equipped quarters must not be sacrificed. However, many things which must be provided to meet competition in higher rental ranges are not necessary in distinctly low-rental housing.

The following suggestions are offered as guides, in addition to those that have already been mentioned in the discussion of site and unit planning.

Building Shapes.—From the point of view of economical construction, the simple rectangular building is obviously best and, as exterior wall construction is one of the more expensive elements of cost, the building which will enclose a given area and cubage in the least perimeter, that is to say square in plan, offers the ultimate of economy in outside wall cost. It is not necessary or advisable that structures be box-like in appearance and devoid of architectural form; but the considerations mentioned above should put us on our guard against excessive breaks in plan, complicated forms, and the arbitrary breaking up of wall surfaces for "architectural effect." A great deal of interest and variety can be given to a group of building units by judicious arrangement of simple building masses; e. g., one- and two-story elements in the same structure. Especially where sloping roofs are used, a complicated plan is likely to create a complicated and costly roof.

Narrow Front Planning.—One means of saving in the necessary length of perimeter wall is what is known as "narrow front planning." In this type of planning, the narrower dimensions of rooms are predominantly parallel with the exterior walls. Thus, a room 11 by 14 feet will have the 11-foot dimension along the wall, requiring 3 feet less of building length than the converse arrangement. The latter is unquestionably the more agreeable arrangement but may be sacrificed in the interest of economy. Nevertheless, rooms must not be disproportionately narrow and deep, especially where ceiling heights are restricted. Thus, a room 10 feet wide and 20 feet deep is not of an acceptable shape.

Interior Arrangement.—As in the case of the exterior walls, economy demands simplicity in the arrangement of dwelling interiors. A complicated plan is difficult to lay out on the job. It requires added time and labor, and frequently creates a multiplicity of corners and angles which add to the cost of interior finish. If bearing partitions are used, they should be planned where possible to go from wall to wall or end to end in order to simplify the floor framing.

Private Foyer.—A private foyer or vestibule at the entrance of an apartment or a house is a great convenience on many occasions, but it is not an essential except for outside entrances in extremely cold climates. Its elimination will save space and money and it can usually be omitted in low-rental housing.

Dining Space.—Here is another element of amenity that can usually be omitted when rentals are sufficiently low. Of course, if there is no separate dining space, some provision for dining must be made either in the kitchen or living room. The habits of the proposed tenancy are the best guide in determining which it shall be, but in either case the room used for dining must be larger than if no provision had to be made for it.

Room Sizes.—For low-rental housing, smaller room dimensions than those mentioned in "Architectural Planning and Procedure for Rental Housing" are acceptable. Whatever reduction in room sizes may be adopted, the rooms must nevertheless be livable spaces, capable of accommodating the necessary furniture in an acceptable arrangement with adequate open space between. It is a mistake to assume that low rentals can be attained through the sole medium of reducing room area. As compared with other building unit costs, a few additional square feet of floor area is not a major item. Real economy can be exercised if room sizes are such that the room can be spanned in one direction by floor joists of standard lengths without cutting to waste.

In almost all cases, bedrooms should be at least large enough to accommodate a double bed, a chest of drawers, one or two chairs, and, if possible, a small table or desk. In rare cases, smaller bedrooms may be in order, but when they are used, the general living quarters should be correspondingly large to avoid overcrowding.

Bathrooms.—Bathrooms may be slightly smaller than is usual in higher-rental properties, but not much can be gained by reducing the size 5 or 7 square feet. As the 5-foot bathtub has become a standard stock size throughout the country, the 5 by 7-foot bathroom can usually be reduced only on the long dimension and the space saved is hardly worth while.

The arrangement of bathtubs under windows has the advantage of permitting the most economical arrangement of piping and is acceptable in low-rental structures.

Where possible, the bathroom should be entered from a private hall. In some cases, there may be a saving in providing a bathroom with double access from two adjacent bedrooms, but this device should not be resorted to where there is a likelihood that the living room will also be used for sleeping. A bathroom whose sole access is through a single bedroom is not acceptable.

Plumbing Stacks.—Unification of plumbing stacks serving more than one room is economical and is usually possible without destroying good room arrangement. Where one stack serves two adjacent rooms, the rooms should by preference be the kitchen and bath of a single dwelling unit, because of the transmission of sound through the pipes.

Incinerators.—There will be few cases in which the cost of installation of local incinerators will be justified in a low-rental project. This does not always preclude the use of central incinerators serving entire projects.

Garages.—Types of garage accommodations are discussed in "Architectural Planning and Procedure for Rental Housing." Suffice it to repeat here that the common storage garage, whether under or above ground, is not appropriate for the type of project we are considering. It is too expensive to build and service properly.

D. *Equipment and Finish.*

It has been stated above that, regardless of rental level, the buildings must be of substantial construction. Economies in specification will therefore lie largely in the field of equipment and finish.

This does not mean that the construction must be expensive, for there is an inherent economy in the scope of low-rental buildings as we have defined it; namely, one- and two-story structures. For buildings of this height, the Administration has always accepted less expensive construction than is required for higher structures, regardless of rental level. This is not a sacrifice of structural soundness but the dictate of rational engineering.

To illustrate the point, there are listed below the principal differences that result in savings in one- and two-story buildings as compared with a six-story semi-fireproof elevator apartment.

1. Foundation walls thinner.
2. No fireproof first floor required.
3. Exterior walls above ground, if of masonry and furred, need be only 8 inches thick. Frame and brick veneer walls acceptable.
4. Columns and girders of incombustible materials may sometimes be required below the first floor, but not above.
5. Roofing may be of nonfireproof materials if number of living units in each building is small.
6. No requirement of dual exits from dwelling units.
7. No requirement of fireproof stairs.
8. No metal doors required.
9. No elevator needed.
10. Expensive mail boxes and house phone unnecessary.
11. Plumbing supply and waste lines may be smaller.
12. If central heat is used, risers will be smaller.
13. Gas and electric connections to meters less expensive.
14. Erection less expensive as materials can be ramped and need not be hoisted.

If at any rental the one- and two-story buildings offer economies, then all the stronger are the reasons for insisting on them where low rentals are imperative.

The following suggestions and comments concerning possible economies in finish and equipment are offered as guides. The list is not all-inclusive, nor is it probable that all of them will be applicable to a given project. The ingenuity of the architect and the contractor will doubtless suggest other items by which justifiable savings may be made.

The three principal rooms offering equipment for individual tenant use are the kitchen, the bathroom, and the laundry.

Kitchens.—The kitchen must be of sufficient size to contain equipment for the following: Food storage, dish and pan storage, dishwashing, broom storage, cooking, food preparation, and sometimes laundry work. Whereas there must be space for all of these, the nature and amount of equipment furnished to the tenant is a variable, depending on the rental level and the needs and habits of the tenant. If the tenant has simple cooking demands, if he is unlikely to possess many cooking utensils and dishes, if purchases of food are in small quantities, if he is willing to perform minor chores not customary in higher-rental groups, the kitchen equipment can be simpler and less expensive. These factors can be determined only after careful study by the sponsors and their architects.

The kitchen sink is an essential in every home. It should be ample in size and provided with at least one drainboard. Detachable drainboards may be used. In many cases, the combination sink and laundry tray with reversible drainboard cover may be advisable. Families of low income are likely to have at least part of their laundry work done at home, and such a fixture will meet this need, obviating the necessity of providing central laundry facilities. The space occupied is no greater than for a sink with single drainboard, and by using a swinging-spout faucet, the cost of plumbing roughing is not increased. Faucets should be of the best construction despite higher cost; cheap fittings are usually a poor investment.

Storage space for dishes, pots, and pans must be provided in closed cabinets. Only in very rare instances is the use of open shelving justifiable. The amount of such storage space is a variable, but in any event its design should be carefully studied, especially as to shelf spacing. There should be space for brooms and cleaning materials somewhere in the kitchen. This should preferably be in a cabinet, but where the utmost economy is imperative, a shelf and hook strip may be provided.

The kind of kitchen range used is another variable factor. Naturally, gas and electric ranges, being the most convenient types, are the most desirable. There may be cases, however, where the coal or wood range is justified by the fact that the proposed tenancy cannot afford to pay an extra amount for gas or electricity as fuel. This is most likely to be the case in communities where coal or wood is readily available and inexpensive. These fuels, of course, involve extra labor of hauling and ash removal, but tenants will sometimes be willing to assume this extra labor if the rental is sufficiently low. If coal or wood is used, there *must* be provision for adequate and convenient fuel storage. The often repeated story of coal in the bathtub is a proof that no one had the foresight to make proper provision for its storage elsewhere.

A mechanical refrigerator is usually the most costly piece of kitchen equipment. From the point of view of food preservation there is little question that the modern mechanical refrigerator is highly desirable and, where the tenants can afford the necessary charges for its first cost and its operation, there is no reason why it should not be used. Where not, less expensive substitutes may be imperative. The ice chest has much to say for itself and the old-fashioned cold closet is worthy of consideration. When either of these is used, it is best to locate it outside the kitchen in an unheated compartment. In most regions of the United States, this will obviate the necessity of special refrigerants during a number of months each year.

In many communities, it is the custom to furnish the tenant neither range nor refrigerator. In such cases, there is a reduction in first cost of the project. This suggests the possibility of omitting this equipment in low-rental projects, with a view of obtaining as low a basic rental as possible. Under these circumstances, the less affluent tenants may use less expensive ranges and refrigerators and those able to afford them obtain costlier equipment either by rental or purchase. Such a program requires that provision be made for alternate types of cooking fuel and means of refrigeration. If the project does not furnish ranges and refrigerators, it is important to plan the kitchen to receive the *largest* sized equipment that the tenant is likely to use. As with automobiles, large sizes of older models can be bought more cheaply.

Bathrooms.—An inexpensive three-fixture bathroom will cost a tenant a few dollars a month for capital charges. Sometimes this amount may be disproportionate to the total amount of rent he can afford to pay.

In such cases, we must face the problem: What is the minimum equipment that a home must have to be considered acceptable? This will consist of (1) a source of water supply, (2) a kitchen sink, (3) sanitary and bathing facilities, (4) a means of heating water, (5) a means of cooking food, (6) some means of heating the dwelling. The Administration considers these the minima that will conform with its mandate to improve housing conditions. Under certain circumstances, some of these features may be combined. Thus, in moderate climates, the kitchen stove may be adequate for general heating purposes. It may also be equipped with a water back as the source of hot water supply.

Usually, it will be possible to provide a bathroom with the three customary fixtures. A few comments looking toward economy are in order.

1. Expensive tubs with full aprons are not necessary. Excellent recessed tubs are made with a roll rim, enameled inside and outside. The use of leg tubs is questionable, since the bathroom must be larger than normal to permit cleaning around the tub.

2. If a tub is used, showers may be omitted to save the extra cost of valving and piping. It may also be possible to omit faucets at the bathtub by placing a diverting valve on the lavatory.

3. In some cases, especially where space saving is in order, the tub may be replaced by an inexpensive shower stall.

4. A lavatory is an essential. It need not be of an expensive type, but it is a mistake to choose one that is too small. The saving in cost is minor and the inconvenience of not having a place to set a tumbler or lay down a piece of soap is serious.

5. Bathroom accessories may be reduced to a minimum, but should not be ignored. If omitted, the tenant is likely to install his own and remove them when he leaves, with consequent damage to the walls. The equipment should comprise a toilet paper holder, towel bars, a medicine cabinet (not necessarily recessed), a grab-bar over the tub or in the shower stall, and one or two robe hooks.

Laundries.—The possibility of doing laundry work in the kitchen has been discussed. Where this plan is adopted, there should be some provision for air drying of clothes. A rack suspended from the ceiling is a device that is frequently used.

Where no central heating is provided, small dwelling units often are planned with a so-called "utility-room." This usually contains the heating equipment and fuel storage. With clean fuel, it offers a possible place for laundry work.

If no individual laundry facilities are offered, central laundries will usually be found necessary. If there is available space in an otherwise necessary basement, its use for laundry purposes is an obvious solution. If basement space must be specially created for the purpose, the advisability of a central wash house for the whole project should be considered. This solution is most likely to be feasible in outlying projects where land is cheap. The wash house should have an ample drying yard adjacent to it, and the yard should be enclosed by hedging. In densely settled urban centers, the basement laundry is appropriate. Here the question of drying space becomes acute. Either there must be a large drying room with through ventilation or mechanical dryers must be installed. This adds to the cost but may still be feasible if the project is of sufficient size.

Domestic Hot Water Supply.—Usually a central hot water supply system can be dispensed with in low-rental projects. It is costly to install and to operate. Where tenants are provided with an unlimited supply, there is likely to be considerable waste. There are many adequate devices on the market for individual heating of water, ranging from the old-fashioned coal stove to the modern insulated storage tank which heats water by electricity during the off-peak hours of current consumption.

Heating System.—No generalization can be made as to the advisable system to use in a given case. The solution of the problem will vary with rental level and climatic conditions and, as always, first cost and operating expense will be determinants. Where central systems are used, the amenity features of concealed risers and radiators can be dispensed with. In the search for economy of first cost, it does not pay to cheapen the essential working parts of a central system. Undersized boilers, piping and radiators, inadequate valving, and omission of necessary pipe covering are not economies.

Exterior Finish.—In the choice of exterior finish, maintenance cost is more important than first cost. There must be no compromise as to quality. On the other hand, the finishes that will discolor rapidly or require frequent renewal for other reasons should be avoided. It should be remembered that outside finish is not only a matter of agreeable appearance but of protection of the structure.

Interior Millwork.—In line with the simplification of interior finish, savings can be made in millwork without sacrifice of essential quality. Door and window casings may be simplified to avoid costs of fitting and mitering. Single-run stairs can be used between plastered partitions, saving the expense of exposed strings, of newels, and of balusters. Handrails, however, are always necessary. Baseboards may be plain, with a simple shoe mold. Ceiling and picture molds should be omitted. The number of doorways should be reduced to a minimum consistent with proper circulation and privacy. At very low rentals, bedroom closet doors may be omitted. In fact, the closet may consist of a recess with shelf, nook strip, and curtain rod. Where there is a vestibule or other recessed space, the coat closet may be supplanted by a shelf and hook strip. On the other hand, linen and general storage closets should have doors. It is also desirable to have a door between the kitchen and the remainder of the dwelling to prevent the spread of heat and cooking odors.

Interior finish.—As with exterior finish, substantial protective treatments are to be sought and those readily damaged or requiring expensive renewals are to be avoided. The substitution of light stains on woodwork, where paint or enamel would be imperative at higher rentals, is an acceptable saving, which may be applied even in kitchens and bathrooms.

Wall Finishes.—Many economies are possible here. If walls and ceilings are plastered, they may be finished with casein paint or papered. This does not apply to kitchens and bathrooms, where the walls and ceilings are subjected to moisture. Wallpapers are an effective and satisfactory means of decoration but should be stripped off the walls for sanitary reasons when renewals are made. This is less frequently necessary if a waterproof wallpaper is used. Such paper may be used in bathrooms if properly applied, but not around a shower.

Constant efforts are being made to develop methods of "dry wall construction." The advantages are obvious: less cost and avoidance of the delay and damage caused by plastering while it is drying. Few systems of dry wall construction have been developed to the point where perfectly true wall and ceiling surfaces can be created and maintained. This raises a question of the advisability of their use for higher-rental projects, whose tenants are likely to demand finishes approaching perfection. Since there is no *structural* objection to this type of finish that cannot readily be overcome, there is no reason why it should not be used where demands are less exacting. Obviously tile wainscots in kitchens and baths will usually be too expensive, but some water-resistant wall finish should be used.

Floor Finish.—In higher-rental properties, the range of possible floor finishes is comparatively limited. Except for ideas concerning kitchens and baths, there is no feature with respect to which the high-rental tenant is more likely to have preconceived notions than floor finish. At lower rentals, a wider range is possible. If the building is erected on a flat slab, a properly waterproofed and finished cement floor over the slab is frequently acceptable. Tile floors in baths are not necessary. Colored cement, linoleum, or well-laid hardwood offer possibilities.

Mastic tile may also be used provided the surface is firm enough to resist indentation by furniture. If wood is used, it need not be of the most expensive grades. In any event, a dense wood is preferable. No wood should be used for flooring that is subject to quick wear or to splintering.

Glass.—Window glass is graded as to thickness and freedom from defects affecting clarity of image. The choice of thickness lies in the field of engineering; the quality is a matter of amenity. For low-rental housing, there is no objection to the use of the less costly grades of window glass.

Hardware.—Insubstantial hardware should not be used, regardless of rental level. The replacement factor is too serious. On the other hand, the utmost simplification is in order. It is not necessary to have mortise locks or latches for all doors. Substantial rim latches, or thumb latches may be used in some cases. Door butts must be sturdy but compromises may be made as to finish. In most cases, it will be advisable to use cylinder locks for front entrance doors, with a master key system, in order to permit the management to enter the premises in the absence of the tenant. Cam fasts should be provided for double-hung windows.

Lighting Fixtures.—Electric fixtures can be replaced by base outlets for most rooms since the majority of tenants will have lamps. They should never be omitted from kitchens and bathrooms where electric service is available. Inexpensive and excellent stock fixtures are made for these two locations. The use of pull-chain fixtures should be avoided. The kitchen and bathroom lights are more frequently turned on and off than any others and the added cost of a wall switch will save considerable cost and nuisance in replacement of broken cords and chains.

E. *Rehabilitation.*

One means of attaining low rentals is the rehabilitation of existing buildings. All of our larger cities have areas containing buildings which are unprofitable and frequently uninhabited because of obsolescence. They are a drag on the community and usually delinquent in taxes. To their present owners they may be worse than useless since they may represent a growing debt rather than an income.

Under certain circumstances, they offer a field for development through rehabilitation. They suffer a cardinal disadvantage inasmuch as there are usually many owners, making it difficult to assemble a sufficient number of parcels to attempt to reconstruct an entire neighborhood. Nevertheless, rehabilitation projects can be and have been undertaken which offer a low rental to the tenant and a profit to the developer. We may ask, therefore, under what circumstances this can be done successfully. Evidently not if an excessive price, based on the values that existed when the neighborhood was flourishing and the buildings new, is paid for the land and the existing structures.

Worthwhile and successful rehabilitation which will offer low rentals is possible only where the following conditions are met:

1. The planning of the buildings must be such that they can be altered, without excessive demolition or new work, to produce dwellings with the essential living qualities of light, air, and proper arrangement that are the basis of reasonable planning standards.

2. Although the buildings may have suffered obsolescence, they must not be so far gone in physical deterioration that any of the basic structural elements, foundations, walls, floors, or roofs are unusable.

3. In order to overcome the influence of their neighborhood they must be acquired at a price below what it would cost to build the shell of comparable buildings on inexpensive land. This margin in the cost of acquisition is the measure of the possibility of producing rentals lower than those of new structures and on it hinges the validity of the effort.

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