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FEDERAL WORKS AGENCY

~~UNITED STATES HOUSING AUTHORITY~~

TECHNICAL DIVISION

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DESIGN OF LOW RENT HOUSING PROJECTS:

ARCHITECTURAL PLANNING AND DESIGN

CHECKING LIST

NOTE:

This checking list has been prepared to assist Architects and Engineers of local housing authorities. It presents in outline the important considerations in the architectural design of projects and the preparation of drawings and specifications; it is in no sense mandatory. The recommendations made herein are based on broad experience gained in the design, construction and management of housing projects and on trends indicated by the Project plans submitted for review.

The design, as well as the materials used, should reflect the lowest cost at which sound construction practice and low maintenance and operating expense can be obtained. These considerations must be governed by local conditions.

AUGUST 1939

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ARCHITECTURAL PLANNING AND DESIGN  
CHECKING LIST

GENERAL NOTE

See USHA Policy and Procedure Bulletin No. 17 (Revised January 31, 1939) for room sizes, and Bulletins No. 2 and No. 12 for additional information regarding planning and design.

Refer to booklet on "Unit Plan Suggestions for Dwelling Arrangements for Low-Rent Housing," and subsequent plans issued serially.

Check local codes and requirements in all cases. The United States Housing Authority has no power to grant exceptions to such requirements. Consult the proper local authorities for the purpose of obtaining favorable modification, where possible, of any requirements which appear to be unnecessarily restrictive.

ROOMSSCHEDULE OF ROOM AREAS (in square feet)

No. of Bed- rooms	Room Count	Living Room	Kitchen	Net Aggregate Area of Living Rm. & Kitchen	Prin- cipal Bed- room(a)	Add'l. Bedrooms for Two Person Occu- pancy	Add'l. Bedrooms for One Person Occu- pancy
1	2½	150-180	Equipment space	150-180+	120-130		
1	3	150-180	50-100	Equip. space 200-250	120-130		
2	4-4½	150-200	50-110	240-280(b)	120-130	100-110(c)	
3	5½	150-210	70-120	260-390(b)	120-130	100-110	65-80(d)
4	6½	150-220	80-130	280-300(b)	120-130	100-110	65-80(e)

- (a) The arrangement of the principal bedroom should be such as to accommodate an infant's crib as well as other furniture required.
- (b) There will be cases, generally in row houses and three-story combination buildings, where the exigencies of the plan impose a greater aggregate net area.
- (c) Two-bedroom units may be composed of a principal bedroom and one two-person bedroom, or of a principal bedroom and one one-person bedroom, depending on the space requirements determined by composition of the families to be housed.
- (d) Three-bedroom units may be composed of a principal bedroom and two two-person bedrooms, or of a principal bedroom, one two-person bedroom, and one one-person bedroom, depending on the space requirements determined by composition of the families to be housed.
- (e) Four-bedroom units may be composed of a principal bedroom and three two-person bedrooms, or of a principal bedroom, two two-person bedrooms, and one one-person bedroom, depending on the space requirements determined by composition of the families to be housed.

A. LIVING ROOM

1. If planned with privacy for sleeping, its usefulness is increased.
2. Should have access to bathroom without passing through a bedroom.
3. Study the arrangement of essential furniture in connection with the location of doors, windows, radiators, steamrises, electric outlets, and closets.

B. DINING SPACE

1. Should be planned as part of living room or kitchen. Space for dining table, when in living room, should be adjacent to the kitchen.
2. Separate rooms for dining purposes are not necessary in low-rent housing.

C. KITCHEN AND EQUIPMENT

1. For good arrangement and economy, equipment should be concentrated, preferably against partition containing plumbing stack of bathroom or kitchen equipment of adjacent unit.
2. A convenient equipment arrangement is: range, sink with drainboard next to range, base cabinet, refrigerator.
3. When range (particularly gas range) is placed adjacent to an outside wall and near a window, the window jamb should be at least 12" in front of range, or range should be 18" or more from face of exterior wall. This will increase heating efficiency and prevent extinguishing of flame or pilot light when window is open, and reduce fire hazard to curtains.
4. Refrigerator may be electric, gas, or ice, depending on utility rate resulting in the lowest rent.

For one- and two-bedroom dwelling units - 4 cubic feet.

For three-bedroom dwelling units - 6 cubic feet.

5. Shelving may be hung on wall or suspended from ceiling. Width to be approximately 12". Should extend to ceiling, with bottom not less than 22" above drainboard of sink, to allow proper head-room when occupant leans forward. A shallow shelf, approximately 5½" deep, hung approximately 8" below bottom of 12" shelf above, should be provided.

For one-bedroom dwelling unit provide a minimum of 22 lineal feet of 12" shelving.

C. KITCHEN AND EQUIPMENT (Continued)

For two-bedroom dwelling unit, provide a minimum of 28 lineal feet of 12" shelving.

For three-bedroom dwelling unit, provide a minimum of 35 lineal feet of 12" shelving.

Approximately 25 per cent of the shelving should be enclosed with cabinet doors for storage of food, etc. It is not desirable to place shelving above range because excessive heat and steam result in high maintenance costs for painting. Where electric refrigerators are used, a minimum of 4" should be allowed from the top of the refrigerator to the bottom of the lowest shelf to provide for air circulation. Where gas refrigerators are used, a minimum of 12" should be allowed; this distance may be reduced to 4" if the shelves above the refrigerator are hung 2" away from the back wall, and create a vent flue which opens into the top shelf area for circulation.

6. A broom closet or space is desirable unless a utility room is provided.
7. Consider wall space for small kitchen work table owned by tenant. (Note: This table should not be confused with base cabinet to be furnished by the project.)
8. It is desirable to enclose separately pipes extending below ceiling from fixtures above rather than to enclose them in kitchen cabinets.
9. When kitchen opens fully on living room, kitchen equipment should be shielded with a stub partition.

D. BATHROOM

1. Placement of all fixtures along partition wall in the order of water closet, lavatory, and tub (the latter parallel to exterior wall) is an economical layout for space, soil, and vent pipes.
2. Wood wainscot rail, 3-5/8" x 5/8"; 4' -0" above floor allows tenant to add hooks and towel bars without injury to walls.
3. A medicine cabinet is desirable.
4. Where masonry walls form finish of bathroom, a water-tight closure is essential between edge of tub and face of wall.
5. The bathroom door latch should be designed to permit release from without in order to prevent the accidental locking in of children.

E. BEDROOMS

1. Should have access to bathroom and living room without passing through another bedroom.
2. Study the arrangement of essential furniture in connection with the location of doors, windows, radiators, steamrises, electric outlets, and closets.

F. CLOSETS AND STORAGE SPACE

1. One closet should be provided in each bedroom, with 24" minimum depth, no front, two shelves, hanging pole, hook rail, hooks, and curtain rod.
2. Linen closet with clothes hamper space below, shelves above, and closed off with a door, should be provided. Upper door extending to ceiling is desirable.
3. One coat closet convenient to living room, with door and key, two shelves, hook rail, hooks and hanging pole, should be provided. (Note: This is the only "keyed" closet).
4. It is desirable to provide doors for closets which open into living room.
5. Storage space within the dwelling unit should be provided in basement or utility closet. A minimum of 20 square feet per family is desirable. (See also under "Tenant Storage Space.")
6. An extra closet in the three- and four-bedroom units is desirable.

DWELLING UNITSA. UNIT ARRANGEMENT

1. Repeat plan types wherever possible.
2. Minimize variations of dwelling unit types containing the same number of rooms.
3. Use simple span framing and avoid the use of headers.
4. Use full stock lengths of wood framing members.

B. ROOM AND HALL ARRANGEMENT

1. Plan each room for appropriate privacy by use of adequate halls and doors.
2. Omit unnecessary partitions and doors.



B. ROOM AND HALL ARRANGEMENT (Continued)

3. A 3' -0" minimum width for halls and stairs is desirable. Avoid winders. Provide handrail, and where handrail occurs against wall, the ends of rails should be returned to the wall to avoid catching clothing. Railings should be designed so that they may be cleaned and painted easily, but should not contain openings large enough to permit accident to children.

Stairs used by one family only may have 8" risers and 9" treads if necessary to save space.

The suggested stair-rail which has proven both practical and easy to maintain follows: On the railing side of dual run metal stairs, provide a wide (approximately 21") metal plate stringer; parallel to and approximately 8" over top of stringer, and secured to newels, provide a channel or rectangular tubular section having a handrail attached. The channel or tubular section may be continued to form the newel.

4. Arrange halls and entrances to rooms for easy handling of furniture.
5. Avoid swing of interior doors against furniture, where doors are likely to be continually open.
6. Proper light, air, and ventilation are essentials and require special study. For this purpose:
  - a. Every habitable room must have a window.
  - b. Window heads should be placed close to ceiling with sills approximately 30" above floor.
  - c. Ceiling height should not be less than 7' -10".

C. PLANNING TO EFFECT PLUMBING ECONOMIES

1. Arrange plan so that plumbing slots will run parallel with slab reinforcing in concrete slab construction, and parallel to joists in wood floor construction.
2. In adjoining dwelling units, arrange two bathrooms, two kitchens, or bathroom and kitchen back to back.
3. In two-story row houses, and in flats and apartment buildings, arrange kitchens and baths over each other, using same plumbing stack without offset.
4. In one-story units arrange bathroom and kitchen of each dwelling unit back to back when possible.

D. ROOFS

1. Consider the following items when designing pitched roofs:
  - a. Proper cross ventilation of all attic spaces. Particular attention is directed to this item when unpierced fire walls are used.
  - b. The use of incombustible roof covering.
2. Consider the following items when designing flat roofs:
  - a. Insulation between ceilings of habitable rooms and roof covering.
  - b. If hanging gutter is used, a slight slope of roof to gutter is desirable.

E. MISCELLANEOUS

1. Provide roller shade and bracket, and curtain rod brackets to take a standard rod.
2. Considerable economy may be achieved in wood millwork if consideration is given to standard thicknesses and widths of lumber in detailing frames, doors, windows, interior trim, etc. For instance, frames, detailed 8" inside, must be cut from 10" stock; when the same frame is detailed 7 1/2" wide, it may be cut from 8" stock. Door rails, detailed as solid stock 5-1/2" on the flat plus sticking must be cut from 8" stock; when the same rail, detailed 5" on the flat, it may be cut from 6" stock. Note: intermediate rails and stiles have sticking on both edges. Trim is recommended to be 5/8" x 2-5/8"; base 5/8 x 3-5/8".
3. Provide street numbers for front and rear entrances, so placed as to be visible at all times (not behind screen doors). Contact the responsible local department and/or the local post office for the designation of each street or postal address number. Stock metal numbers are less expensive to maintain than painted numbers.
4. If street, court, or direction signs are not provided by the city, they should be included in the construction contract.
5. In accordance with post office regulations, provide unobstructed facilities for the prompt delivery of mail for each dwelling unit, and as otherwise required. It is advisable to provide each row house and flat with either an exterior mail box or a mail slot in both the screen and entrance doors. Gang type mail boxes should be used inside the entrance to the apartment stair hall and this entrance should not be locked.

E. MISCELLANEOUS (Continued)

6. If the first floor entrance door leading to second floor flats is locked, hand operated mechanical bells should be provided at the exterior of the first floor door.
7. Wherever ramps are provided, slopes should not be steeper than 1 to 8, and the surfaces should be non-slip. Combination stairs and ramps are not recommended. Ramps should be provided with hand-rails. Window sash swinging over ramps should allow full headroom clearance.
8. For cement filled stair treads and landings, non-slip aggregate should be used, plus a hardener to prevent dusting.
9. Linoleum and asphalt tile stair treads are not recommended. Linoleum requires frequent replacement. Asphalt tile is slippery when wet.
10. When concrete slab construction is used, cement floors with integral hardener, and perhaps color, are generally satisfactory.
11. Asphalt tile floor is not recommended for use in kitchens and bathrooms.
12. Maintenance expense will be reduced if glazed or semi-glazed tile, or other easily cleaned, hard surface, is used for apartment stair hall walls.
13. Do not place built-in ladders to roof scuttles in locations which are readily accessible to children.
14. Chain link fences are recommended in place of pipe rails for retaining walls, or other places dangerous to children because of differences in levels.

BUILDINGSA. PLAN ARRANGEMENT

1. Grouping of units into buildings having a maximum length of approximately 200 feet will decrease the number of buildings, thereby minimizing end walls and utility distribution lines. Buildings over 200 feet long should be avoided, owing to the possibility of cracks from settlement, expansion and contraction. Long walls may be provided with offsets to break the continuity of masonry, but such offsets should be kept to the minimum necessary to avoid cracks, and not used for aesthetic effect.

A. PLAN ARRANGEMENT (Continued)

2. One-story units are generally not economical and their use should be kept to a minimum unless comparative cost studies favor their use. Where used, it is more economical not to group them with higher buildings, because of the additional initial and maintenance expense for flashings, etc., where roof abuts the higher wall, and for the support of the latter.

The grouping of units having the same overall height will also lessen the possibility of wall cracks due to unequal settlement of buildings.

3. Placing of two-story flats at ends of two-story row house groups makes possible the use of land at the end of row for a private garden for the upstairs tenant. The end unit may be designed with a side entrance for the upstairs flat.
4. It is economical to repeat the same building type as often as possible.

B. BUILDING DESIGN

1. The omission of parapet walls is economical and reduces maintenance costs.
2. Avoid excessive use of cornices and other exterior wood trim, thereby reducing maintenance costs.
3. Provide handrail for stairs, areas, ramps, also platforms more than 24 inches above grade.
4. Avoid excessive slant to cement risers, which may cause chipping of concrete nosing. Metal nosings are desirable on all concrete stairs, particularly for area stairs to basements where ash cans and other heavy materials will be moved.
5. Arrange entrance doors in groups so as to save entrance platforms and walks.

C. BASEMENTS AND PIPE SPACES

1. Confine basement areas to as few buildings as possible.
2. Where basements occur, it is desirable to raise first floor level to enable basement windows to be placed above grade.
3. Where no basements occur, the following design recommendations should be considered for economy of initial and maintenance costs:
  - a. Provide pipe space with ample cross-ventilation and proper access door. Two 8" x 16" openings, with grille and screen, on opposite sides of each dwelling unit are desirable.

### C. BASEMENTS AND PIPE SPACES (Continued)

- b. In cold climates, provide shutters or doors in back of ventilating grilles to avoid cold floors and frozen pipes.
- c. Lower first floor level to within approximately 14" of finished exterior grade, unless a ground water condition which would allow water to stand in pipe spaces exists.
- d. In warm climates, consideration may be given to placing the first floor slab on a fill directly on grade, with adequate dampproofing.
- e. If first floor construction is of wood, it is essential that proper provision be made for protection against termites. This protection should consist of ample ventilation to pipe space (at least 2 square feet of opening in every 25'-0" of wall), termite shields and protected framing lumber.

The cost of this protection should be carefully weighed against cost of a concrete slab.

4. Insulation of habitable rooms from hot water generator rooms, boiler rooms, chimneys, and incinerator stacks is desirable. In some cases, however, suitable ventilation for boiler rooms and hot water generator rooms may be cheaper than ceiling insulation. Children's playrooms, when in building containing habitable rooms, should have sound deadening insulation.

### SERVICE AND FACILITIES FOR TENANTS

#### A. LAUNDRIES

1. Selection of the type of laundering facilities requires careful study in each project with special consideration of tenant habits. The most economical arrangement which is acceptable to the tenants is the most desirable arrangement.
2. Generally, a combination sink and laundry tray in the kitchens of each dwelling unit is advisable. (Note: This may not prove sufficient in every project.)
3. Central laundry facilities increase both initial and maintenance costs, and unless intensive use is anticipated will not prove economical.
4. It is desirable to locate central laundries in basements adjacent to the room containing hot water storage tanks, so that steam connection to drying rooms can be made from this point rather than from the heating system. This will allow for continued use of the drying rooms in summer when the heating system is not in use.

A. LAUNDRIES (Continued)

5. All dwelling units should have outside yard drying areas, unless tenant habits deem this requirement unnecessary.

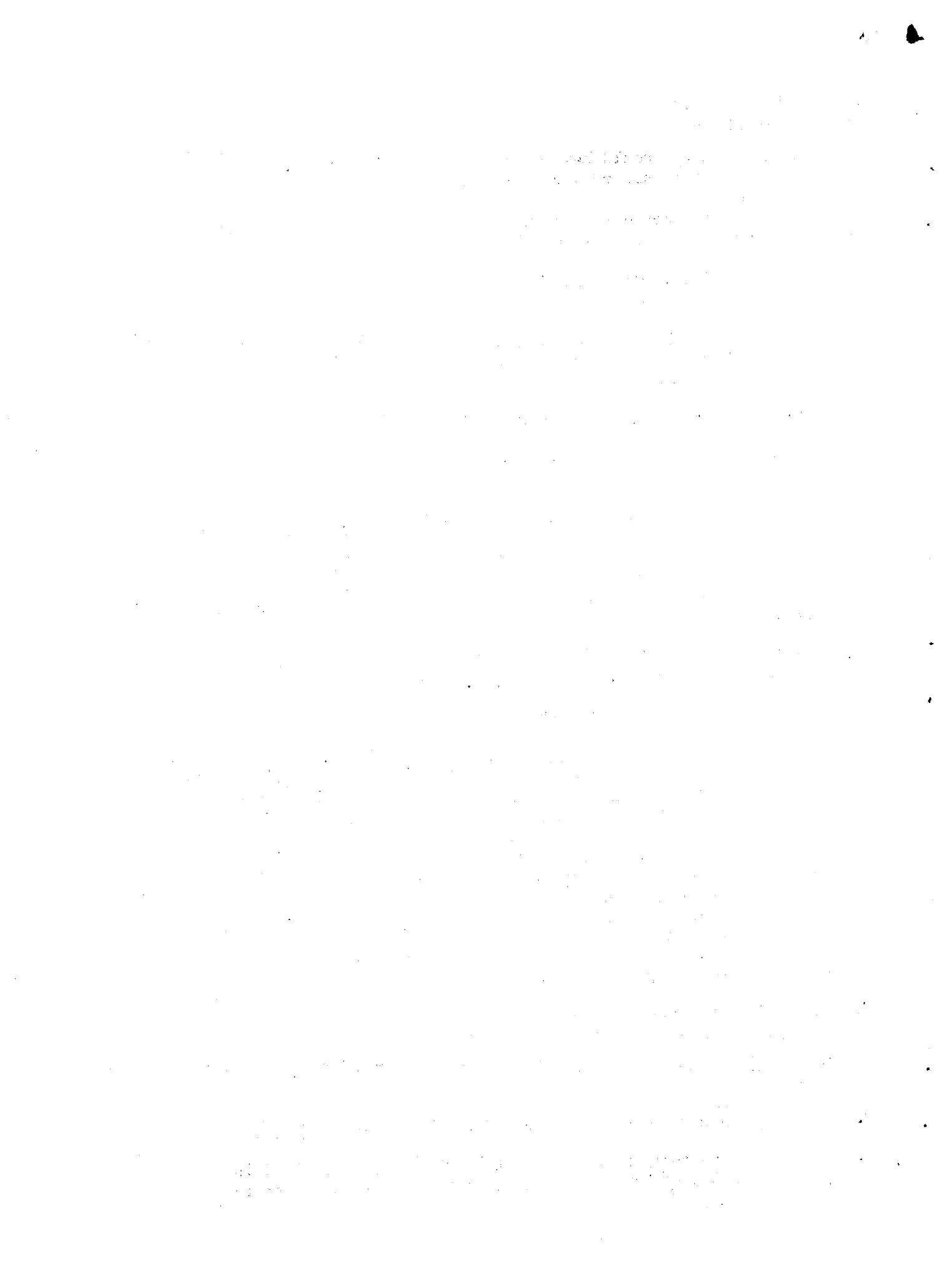
Private yards can serve for outside drying areas. Outside group drying areas should be provided for central laundries.

Two well anchored hooks should be provided in all kitchens for interior drying.

Private yards should be equipped with poles spaced not more than 25 feet apart for approximately 75 feet of clothes line for laundry drying purposes.

6. Plan arrangement for central laundries:

- a. Provide one double tray for every 10 to 12 families.
- b. Approximately 240 square feet of floor area per double tray provides adequate space for laundry and drying facilities. Steam heated cabinet dryers may prove most economical and desirable when steam is used for project heating. If cabinet dryers are used, the floor area may be reduced by an amount equal to the difference between the space required for drying rooms and the space required for cabinets.
- c. One ironing board and one hot plate for each double tray may be provided. Allow space for table.
- d. Provide toilet facilities.
- e. Outside drying areas should be provided with 150 feet of line for each double tray or 10 families using central laundry. In addition, provide drying rooms or cabinet dryers. The number of drying rooms should be one more than the number of double trays and the number of drying cabinets should equal the number of trays. Drying rooms should be approximately 6' x 19', separated by wire partitions and provided with 75 feet of galvanized clothes line wire and sufficient hooks so that the lines will be not closer than 10 inches. The hooks should be 6' - 6" from the floor and placed so that lines and hooks will not interfere with unit heater discharge or the operation of windows.
- f. Provision of one exhaust fan and one unit heater for each group of drying rooms is essential.
- g. Drying rooms should be separated from laundry with a solid partition.
- h. Provide direct access from laundry to outside drying yard.
- i. A room for storage of washing machines should be provided in projects where a high percentage of tenant-owned machines is anticipated.



B. TENANT STORAGE SPACE

1. Allow a total of 20 square feet minimum per family. Ten square feet per family is for storage of perambulators, bicycles, etc. Ten square feet per family is for storage of trunks, accessible only under management superintendence when in basements. A pipe rail for chaining perambulators and bicycles is desirable.
2. In row house and two-story flat developments, it is economical to include this space in a utility closet in each dwelling unit; however, in two-story flats the perambulator space would best be provided on the ground floor level.
3. In an apartment or combination three-story flat and two-story row house development, this space may be provided in basements.

C. MAINTENANCE AND REPAIR SPACE

1. For projects with central or group heating plants, the plan arrangement of this space is dependent largely on the type and location of the development. When allocating space for preliminary estimates, the following approximate figures may be used:

	<u>No. of Yard Stations</u>
Under 100 dwelling units - 300 square feet net area	
100 to 150 " " - 650 " " " "	
150 to 250 " " - 1400 " " " "	
250 to 350 " " - 2200 " " " "	1
350 to 500 " " - 2840 " " " "	2
500 to 750 " " - 3500 " " " "	3
750 to 1000 " " - 4025 " " " "	4
1000 to 1500 " " - 4300 " " " "	5

Larger projects should receive special study.

Each yard station, as indicated in the previous table, requires approximately 60 square feet of area and should be located to serve a particular area conveniently. The number of yard stations should be reduced in projects designed for high tenant maintenance.

2. Projects with individual dwelling unit heaters should be given special study and the space allotment above should be reduced.
3. In general, the space should be divided as follows:

a. General Repair Shop

Provide easy access, by ramp if in basement.

Provide electric power outlets.





C. MAINTENANCE AND REPAIR SPACE (Continued)

b. Plumbing, Heating, and Electric Repair Shop

(Note: In small projects a) and b) may be combined)

c. Paint Shop

Provide fire-resistive walls and door.

d. Stock Room

For storing heavy materials, scaffolds, etc.

e. Superintendent's Office

f. Locker Room for Superintendent and Other Employees

Provide toilets and showers.

g. Janitor's Stations

In apartment projects, provide water connections or slop sinks in each public hall or stair, except that in buildings with basements for circulation such stations need not be at every stair.

4. In projects with a central or group heating plant, it is desirable and economical to have the maintenance and repair space designed in conjunction with the central heating plant or one of the group plants. This will allow the toilets and superintendent's office to be used in common for boiler room and maintenance crew.

D. SPACE FOR MANAGEMENT

1. The plan arrangement of this space will vary with size of project and with the extent to which management control is centralized. For allotment of space, the following approximate figures may be used:

100 or fewer dwelling units	-	250	square	feet	net	area
100 to 150	"	400	"	"	"	"
150 to 250	"	570	"	"	"	"
250 to 350	"	630	"	"	"	"
350 to 500	"	950	"	"	"	"
500 to 750	"	1250	"	"	"	"
750 to 1000	"	1380	"	"	"	"
1000 to 1500	"	1660	"	"	"	"
1500 to 2000	"	1780	"	"	"	"

2. Projects with more than 2,000 units, and projects in cities where more than one project is located, should be given special study.

D. SPACE FOR MANAGEMENT (Continued)

3. In general, the space should be divided as follows:

- a. Manager's Office
- b. Public Space ) May be combined in projects of
- c. General Work Space) 100 or fewer dwelling units.
- d. Book and Storage Vault in projects with more than 150 dwelling units.

Storage vault door and frame should have a one-half hour fire classification, but need not be a labeled door.

- e. Toilet Facilities
  - f. Rental Office in projects with more than 350 dwelling units.
4. Because the management office provides the point of contact between the public and the project, and serves as the rent payment office, its location on the site must receive careful study:
- a. It should be in the path of the greatest tenant flow, so that tenants will pass it when going to work, to adjacent shopping centers, and to public transportation arteries.
  - b. It should be visible from and near to the largest traffic street adjoining the project.

E. SOCIAL AND RECREATIONAL FACILITIES

(Includes health and educational facilities)

- 1. Every consideration should be given to possible use of existing social facilities adjacent to, and available to the tenants of, the projects in order to keep capital costs and rents low by avoiding duplication of facilities.
- 2. The following approximate areas are intended as rough guides in allotting space, estimating, and preliminary planning. These figures are predicated upon the assumption that all indoor facilities will be centralized in order to reduce maintenance and operating expense. They should be reduced according to findings of study as noted under E. 1. Projects with more than 900 dwelling units may be designed with decentralized social and recreational facilities.

E. SOCIAL AND RECREATIONAL FACILITIES (Continued)

Dwell- ing units	Meet- ing Rm. (Sq.Ft.)	Small Rooms		Kitchen (Sq.Ft.)	Storage (Sq.Ft.)	Coats (Sq.Ft.)	Toilets (Sq.Ft.)	TOTAL (Sq.Ft.)
			Area Sq.Ft.					
100	525	1	300	80	40	20	70	1035
300	1050	2	975	150	75	75	120	2445
450	1575	2 or 3	1500	175	100	100	180	3630
600	2100	3 or 4	2000	175	150	150	200	4775
750	2625	4 or 5	2400	200	150	150	260	5785
900	3500*	5 or 6	3000	250	200	200	350	7500

\* The maximum size for a single room to be provided in any project.

3. The plan and space allocation should be carefully studied in each project. Areas should be designed in such a way that they will serve dual or triple purposes in order to provide for a variety of activities in the allocated space.
4. Indoor facilities should be conveniently located:
  - a. Near population center but sufficiently removed from the nearest dwellings so that noise will not annoy tenants.
  - b. Adjacent to or near the Management Office.
  - c. Away from main traffic and service drives.
  - d. Accessible to playgrounds and parks.