

Sanitary Services and Practices for Low-Rent Housing Developments

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INTRODUCTION



This is a study of refuse-disposal practices in low-rent housing developments prepared by a sanitation expert. It was undertaken last year when the shortage of materials was not yet acute and when standard sanitary equipment was still available. Present-day shortages of metal for garbage and rubbish containers make it difficult, however, if not impossible in some instances, to obtain the recommended standard equipment. For this reason certain recommendations made in the study cannot be followed at the present time.

From the viewpoint of management, however, this survey contains much of value, for it relates the establishment of a satisfactory refuse-disposal program to the maintenance of morale and well-being of project tenants.

The discussion of sanitary standards and the need for controlling wastes, recommendations for preparing various types of wastes for disposal, and for gaining tenant cooperation to maintain an effective refuse-disposal program, will prove valuable to housing managers and maintenance staffs in all types of public housing developments.

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FIGURE 1.-Untidy, littered grounds show neglect in controlling refuse.



FIGURE 2.- Project grounds kept free of litter.

I. Standards of Cleanness for Housing Developments

A. Requirements for Health and Sanitation

In public housing developments, as in all housing, high standards of cleanliness must be maintained.

The external appearance of a project, its cleanness and neatness, are generally an indication of the care with which it is maintained in other particulars. It is unusual for a project which is dirty out-of-doors to be clean indoors or otherwise well managed.

Walks and drives, lawns and gardens, outdoor stairways and yards must be kept clean. No part of a project should be permitted to remain dirty. If waste material is allowed to remain or collect, it will give the project a dirty and slovenly appearance.

General standards of cleanness require the elimination of all dirt. Dirt may be defined as waste matter in the wrong place.

B. The Cardinal Law of Sanitation

The cardinal law of sanitation that applies here requires that all wastes be kept under control from the time they are produced until they are removed and permanently disposed of.

Papers ought not to be dropped upon the ground, but if they are, they should be picked up as promptly as possible. The same is true of garbage, tin cans, bottles, cartons, old toys, and other discarded objects.

Such materials are commonly referred to as "waste" or "refuse" and are considered valueless to those who produce them. Properly collected and transported to a suitable place, they may be sorted and sold or utilized in some useful manner. In housing projects, it is the temporary storage and removal of waste material rather than its utilization which is of importance.

In a well-ordered project, as in a factory, shop, or ship, there is a place for everything and everything should be in its proper place. If refuse is where it belongs, it is under control. If it flows out, tumbles out, is blown out, or is not put in the proper place in the beginning, it is not under control.

C. Question of Infection

The problem of infection is an important aspect in the management of the solid wastes of projects. Refuse is dangerous to health. Although communicable diseases do not originate in garbage or rubbish, disease-carrying germs find their way into accumulations of these materials.

The excretions of persons having communicable diseases are frequently collected in cloths or papers, or even paper cups. These are put in with the easily combustible rubbish and garbage. Tenants often consider this a better way of disposing of the material than throwing it down the water closet, for they are cautioned against throwing objects which may stop up the plumbing into water closets.

Because of their possibly infectious nature, if for no other reason, garbage and other refuse should be dealt with carefully from the time they are produced. They should be placed where they will not be accessible to rats, dogs, children, or insects of any kind; where they cannot be dispersed by the wind; and where persons popularly called "ragpickers" or "scavengers," but more properly termed "salvagers," cannot get at them.

The practice of emptying the contents of garbage receptacles into burlap bags or squares, and bundling this material so that it can be removed to a street or service drive, is neither a sanitary nor satisfactory method of disposing of solid wastes. If, however, this method must be used, the burlap should be washed frequently.

D. Standards of Cleanness

Broadly speaking, cleanliness is a relative term, and the standard of cleanness which obtains in a particular case depends upon the object referred to and its location. Standards applicable to a glass window, for example, are beyond what is required for a floor, and what is suitable for a lawn is different from what is necessary for either a window or a floor.

There is an appropriate standard of cleanliness for every object and place. It is sometimes difficult to state this standard in specific terms, but it is none the less definite.



FIGURE 3. Tenant carelessness causes unnecessary disorder



FIGURE 4. --Management supervision encourages order

II. Tenant Cooperation

The proper handling of the solid wastes of a project involves a series of closely coordinated, but entirely separate steps. To achieve maximum efficiency and economy, it is imperative that careful attention be given to each of these steps, and that they be fitted together accurately.

A. A System for Getting Rid of Solid Wastes

In the design of a system for getting rid of solid wastes the method used for final disposition should exercise a predominant influence. This method may be incineration by the project or by the city, hog feeding, salvaging, open dumping, burying, or fill. The collection from the project and delivery to the point of final disposition may be by vehicles operated by the city, by a contractor, or by the project management.

The directions issued by the collectors or by the manager of the development must specify in what manner the refuse is to be separated: for example, whether garbage and rubbish are to be separated or put together, and whether empty cans and bottles are to be included with the rubbish.

Articles of rubbish which cannot be put into an incinerator or a receptacle which is normally kept outside must be kept in the dwelling until the time of collection. They must be placed neatly wherever the manager or superintendent indicates.

B. Cooperation Necessary for Successful Operation

No system, however perfect, could dispense with the personal care required at every step. If the system is properly devised, the cooperation necessary for its successful operation is by no means onerous. Proper attention to each step of the procedure will reduce the labor and cost involved, as well as greatly improve the appearance of the project.

1. *Compulsion and Education—How is the Necessary Cooperation Obtained?*—It is obtained by a system of compulsion combined with education, which teaches the tenant that it is to his interest to comply with regulations governing refuse re-

moval. Success in accomplishing this object is the mark of a good manager. If he lacks the ability to induce the tenants to cooperate in the sanitary removal of waste materials, he is not a competent manager.

When a tenant moves into a project there are a great many things he must agree to, and perhaps learn to do, and among these are certain procedures essential to the health and sanitation of the project. He must learn, first of all, that he is a member of a community, each member of which depends on the rest for his welfare.

2. *Methods of Instruction.*—Some of this instruction is given in the terms of his lease, some in the oral explanation which accompanies it. Instructions about the proper handling of garbage and rubbish should be printed on a card which is required to be hung in the kitchen.

Some large developments have trained personnel who visit the tenants and give personal advice on various details of housekeeping, including sanitation. These visits, in which the caller becomes well acquainted with the tenant, also often reveal the presence of insects and insanitary conditions which the tenants would prefer to hide. Yet, when the premises are made cleaner, neater, and more orderly the gratitude of the tenants is invariably won.

Short addresses at community meetings provide another means of enlisting cooperation. A few pointed and perhaps entertaining remarks by the manager or one of the tenants, encouraging the group to greater efforts in maintaining the project at a high sanitary level, are certain to be attentively listened to.

3. *Offenses Against Sanitary Rules.*—When a tenant is found wilfully violating a sanitary rule he may be warned by letter against a repetition of the offense, or he may be called to the manager's office. He should be treated gently or severely, depending on the circumstances. Tenants who have been unwilling to do their part in maintaining proper sanitary conditions have been put out of developments.

The monthly periodical published by the tenants

furnishes a useful method of instruction. A few tactful paragraphs inserted in this publication from time to time may be helpful, especially since the admonitions come from the tenants themselves.

4. *Crusades Against Litter*.—A crusade against litter is an effective way to promote interest in the outdoor cleanliness of a project and, in fact, to arouse general interest in health and sanitation. If tenants are taught to keep a project clean and free from paper and debris, their interest in other sanitary subjects may be more easily aroused. Every means must be employed to help make them understand the value of maintaining their project in a sanitary, orderly fashion.

There will be a great deal to undo in the way of carelessness and indifference. The goal is a state of mind on the part of the tenants and every employee of the project which makes the sight of a littered and dirty development repugnant to the observer, and a neat, clean, and well-kept one attractive. Cleanliness must be regarded as an important and admirable attribute; the efforts of those who strive to achieve it must be rewarded with appropriate praise.

Children's organizations formed for the purpose of collecting litter and putting it in litter baskets, boxes, or easily carried bags, are of various types and may be appropriately named. It is suggested that litter pick-up be combined with other special

tasks which are related to the upkeep and appearance of the grounds and which appeal to the imagination of children. Clubs of this type may be called "Junior Citizens" or "G Men" the "G" standing for garbage, gardens, and grounds.

As in all work with children, instruction must be painstaking, and good work must be amply rewarded. Children must be taught that anyone who scatters or drops litter about is harming his home and that anybody who helps to keep it free of litter is beautifying the home.

The educational work concerned with outdoor cleanliness entails no great difficulty, provided that those charged with the work are fully alive to its importance.

The object of the educational program should be to develop an understanding of health and sanitation among the tenants. If this is done, tenant cooperation is assured. It is the manager's job to make each tenant feel that he lives in a fine and healthy home, and that it is finer and healthier because he helped to make it so.

A well-kept housing development may exercise a beneficial influence upon the part of the city in which it is located and lead to a cooperative effort which will be mutually helpful. A project should not be a social island. It should be a radiating force benefiting all who live near it and all who know about it.

III. Composition and Quantity of Refuse

A. Classification of Wastes

Municipal wastes may be divided into three classifications: gaseous, liquid, and solid. The first includes smoke, the gaseous emanations of industrial plants, and foul effluvia from sewers. Reliance is placed upon natural diffusion and dilution with the atmosphere to carry off these wastes. The troublesomeness of gas and smoke depends largely on whether prevailing winds carry them toward or away from a housing development or other place of human occupancy.

Liquid wastes include house sewage, storm water from roofs, streets, and other outdoor surfaces, and drainage from industrial works. Housing developments provide for the removal of liquid wastes from their points of origin by means of plumbing and sewerage systems. These carry away waste material with the help of the water associated with them. Liquid wastes always contain some waste matter in solid or semisolid form. This is put into the pipes purposely, sometimes as a secret means of getting rid of it. Its presence is not harmful, provided the particles are neither too heavy nor too large to pass through the pipes, traps, and connections and provided that there is plenty of water to keep them moving along.

The solid wastes, collectively called refuse, consist of a great variety of materials. To facilitate collection and disposal they are commonly divided into a number of classes.

B. Classes of Solid Wastes

These classes, with some of their subdivisions and leading characteristics, largely determine the methods and cost of handling.

By general agreement among city officials who handle solid wastes, these materials have specific names. Chief among these are "garbage," "rubbish," and "ashes." The words "trash" and "swill," although current in some parts of the country, are not generally used.

1. *Garbage*.—Kitchen wastes consisting of animal and vegetable matter are called garbage. Empty

tin cans, small bottles, pieces of paper, and other objects connected with the preparation of food are frequently mixed with it.

2. *Rubbish, Combustible and Noncombustible*.—Rubbish forms the great bulk of the solid wastes of housing projects and of cities. It is not heavy. It is troublesome chiefly because it is space consuming and consists of large pieces. Some European cities crush and grind their rubbish to facilitate its final disposition.

Rubbish is often divided into combustible and incombustible solid wastes. Paper, rags, excelsior, cartons, floor sweepings, boxes and the like are combustible. Cut grass, branches of trees, trimmings of plants, wood furniture and bedding constitute a separate category of combustible rubbish, for their collection, transportation and final disposition require that special provision be made for them.

The noncombustible elements of rubbish include metals, glass, crockery and dirt. Bottles and empty tin cans fall into this category.

3. *Ashes*.—The third major category of solid wastes is called ashes and consists almost entirely of the burnt product of coal and material taken from incinerators.

Other classifications of solid wastes are used in municipal practice, but have little application to low-rent housing. These include dead animals, abandoned automobiles and industrial refuse.

Of the three classifications—garbage, rubbish and ashes—ashes are the least troublesome. They are chiefly objectionable when scattered by the wind. Their total quantity is not relatively great and the material, if well burnt, can be used to raise the level of low-lying land. Ashes produced by incinerators which do not attain a high temperature may contain animal matter which has been only partly burnt; when this occurs, the material may become highly offensive.

Rubbish is troublesome both because of its amount and its great bulk. Garbage is troublesome chiefly because of the grease which it contains and because of its readiness to decompose. Depending on the



weather and the length of time it is kept, it may become offensive in itself and render offensive other waste that is mixed with it.

C. Causes of Variation in Quantity and Composition

The quantity of each of these three classes of solid wastes produced by a project varies with the location of the project, the season, the day of the week, and the weather. It is also partially determined by the habits and customs of the tenants. The quantity of solid wastes is not generally considered controllable by the project management. However, when a popular movement to save paper was initiated in the spring of 1942, a reduction of over 20 percent in the total amount of refuse was reported by some cities.

D. Need of Data From Housing Developments

The problem of managing the solid wastes of low-rent housing developments efficiently from the standpoints of health, appearance and economy, is not peculiar to housing projects. It is similar to the problem of waste disposal in cities, but has certain distinctive characteristics which must be considered.

The experience of cities is helpful, but must not be followed blindly, for no great accuracy can be claimed for any figures given. Figures supposedly representing the same conditions sometimes differ widely. A knowledge of the volume of solid wastes produced by project tenants is a necessary preliminary to the provision of adequate receptacle, incinerator, or truck capacity; but since there has been no extensive compilation of such figures thus far, data collected from cities must be utilized.

E. Data From a Study of American Cities

In 1939 the American Public Works Association made a study of solid wastes in American cities, and obtained the following data:

When a negligible quantity of ashes is collected, the rubbish represents roughly 55 percent by weight, and 75 percent by volume, of the total household garbage and rubbish. The average rubbish for 15 cities was 327 pounds per person per year, or 0.9 pound per person per day. The normal range in

rubbish was from 0.6 pound per day to 1.2 pounds per day per person. The average volume was 0.26 cubic yard per day per person.

The figures indicate that garbage sometimes weighs as little as 798 pounds per cubic yard, or as much as 1,540 pounds per cubic yard, with 936 pounds per cubic yard as the median. This is 29.6 pounds per cubic foot, 57 pounds per cubic foot, and 34.6 pounds per cubic foot, or, reduced to gallons, 3.9 pounds per gallon, 7.6 pounds per gallon, and 4.6 pounds per gallon.

Special interest attaches to the weight of garbage and rubbish when mixed together, for they are generally collected in a combined form at low-rent housing developments. The minimum weight in the cities studied was 200 pounds per cubic yard, the maximum 800 pounds per cubic yard, and the median 440 pounds per cubic yard.

The volume of waste, whether garbage, rubbish, or a mixture of the two, of a project in actual operation can be estimated easily and fairly accurately if the material is deposited in cans by the housekeepers. Knowing the capacity of the cans and when they were last emptied, an investigator would remove the covers to see how full they were. By ascertaining the number of days since the can was last emptied, and the number of persons using it, the total volume per person per day could be computed readily. In one such investigation in New York State, the figures were: Garbage, 0.368 gallon per person per day, and rubbish 0.813 gallon per person per day.

F. Grounds Refuse a Special Problem

Only a limited amount of leaves, grass, plants, and shrubs is ordinarily collected with household refuse, although some cities do not object to the mixture of a certain amount of grass and rakings with other refuse. Where leaves are so numerous as to make an excessively bulky mass, and where there is a good deal of other grounds refuse to be removed, it seems only reasonable that the project management should provide and pay for special collections. If the city collects from other neighborhoods, however, it may not object to collecting from the project, providing the grounds refuse is conveniently placed for removal by the city trucks.

IV. Litter

A. What Is Litter?

Litter is scattered refuse. It may occur in large or small amounts.

Litter is particularly difficult to control, yet it must be controlled. Even a small quantity is noticeable, and produces a slovenly effect.

B. Where It Comes From

Litter may come from many sources. The wind may carry it from neighboring streets and property, and it may be dropped from passing vehicles.

Improper use of the litter basket is a common source of litter. The basket is often filled to overflowing. It is generally used for papers and other materials which tend to escape easily and go rolling over the ground.

By far the most common underlying cause of litter is carelessness. Frequently insufficient care is exercised in placing refuse in cans. Either it is dropped alongside or on top of a can already filled to capacity, or it is spilled in transit by collectors who carry the material to the trucks. Papers, fruit skins, or other small pieces of waste are frequently dropped on the pavement by thoughtless passers-by. Newspapers and other debris are often scattered on the ground by people sitting on benches.

C. Prevention Through Education and Provision of Litter Receptacles

The total quantity of litter produced at a development varies with the degree of education in communal living possessed by the tenants, and with the training and diligence of the manager. Litter can be prevented only by providing suitable receptacles, and by informing tenants, maintenance men, refuse collectors, and visitors that carelessness in scattering debris about will not be tolerated.

The experience of many developments has shown that education is an important factor in keeping a project free from litter.

D. Description of Standard Type of Litter Basket

Receptacles in which debris may be deposited are of various kinds. A standard form of litter basket has been adopted by the FPHA and, if available, is recommended for general use.

Its height is 34 inches, the circular top is 22 inches in diameter, and the bottom 18 inches in diameter. It has a frame consisting of four horizontal rings, eight vertical reinforcing rods and one angle iron reinforcing ring at the bottom. The vertical rods are offset and welded to the two intermediate rings and to the angle iron ring at the bottom. A bottom tray of 20-gage steel plate fits the inside taper of the frame and mesh and is securely welded to the frame at several points.

The basket is of wire mesh, fastened to the frame which has just been described. It is made of No. 8-gage steel wire approximately 1½-inch square mesh pattern. The horizontal members are lap welded to form rigid rings and are spot welded to every second vertical rod of the mesh. The points of welding are arranged to alternate from one vertical rod to another. The vertical members are turned completely around the top and bottom members of the frame and spot welded to one intermediate horizontal ring.

The litter basket or refuse receptacle described above should be carefully painted with two coats of black asphaltum paint regardless of whether or not it is galvanized.

E. Location of Litter Baskets

Litter baskets should be placed where they will offer maximum service. General rules cannot be made for the proper location of litter baskets since conditions vary with each development. Each case should be given individual study in order to determine where baskets will be most useful. The distance between them may range from 50 to 200 feet.



FIGURE 5. Careless use of litter basket



FIGURE 6.--Litter basket conveniently located and properly used.

F. Standard Can Recommended for Special Situations

The use of cans is recommended in instances when snow or rain tend to render the servicing of an open basket difficult. They should consist of a stock type of corrugated steel ash or garbage can of 27 or 33 gallons capacity, with a special hooded cover containing a door which closes by gravity. The swinging door may be omitted if preferred.

The can should be of not less than 24-gage sheet steel, corrugated, lock seamed and electrically welded. The corrugations should be of the rolling type, deep, well-rounded and closely pitched. The bottom should be raised completely from the ground and concave so that the center is nearer to the ground. It should be reinforced at the top and bottom with one-piece electrically welded $\frac{1}{8}$ -inch by $2\frac{1}{4}$ -inch steel bands riveted on the outside. As an alternative the top reinforcement may consist of a heavy wire welded loop over which the can metal has been formed.

The sidehandles should be ample, and constructed of 11/32-inch material. Handle clips should be of 14-gage steel riveted to the body with four rivets each.

The sheet steel cover should be of the same gage as the body of the can. It must fit snugly over the top of the can, but be readily removable. The hinged door in the cover should close snugly by gravity and open freely with slight pressure.

After being galvanized, the interior and exterior surfaces of the can should be covered carefully with black asphalt paint.

This type of can costs slightly more than the basket type of litter receptacle. Both can be obtained from a number of manufacturers in normal times.

G. Servicing of Receptacles

To serve their functions properly, litter baskets or cans must be well serviced. They should never be allowed to become more than two-thirds full.

H. Hand Collection of Litter

It is sometimes impossible to avoid the scattering of occasional pieces of litter on the grass plots, paths and driveways of housing developments, but they should not be allowed to remain there. A system should be instituted for picking up litter as soon as it appears. Methods for doing this have been suggested in the discussion of tenant cooperation.

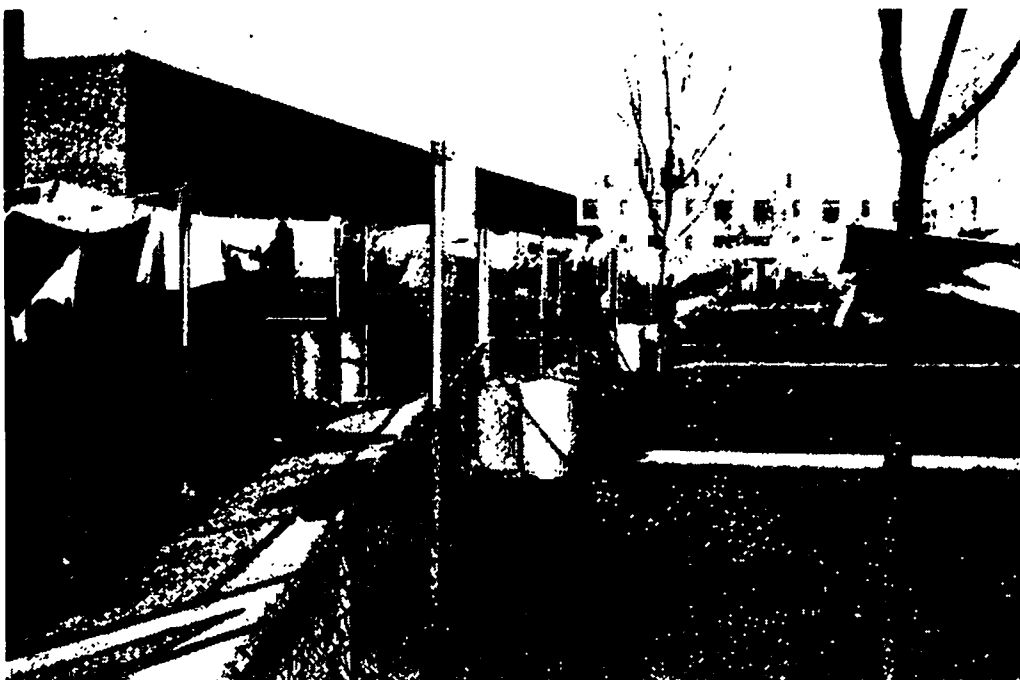


FIGURE 7.—Adequate cans rightly placed encourage tenants to keep yards clean.



FIGURE 8.—Well-kept old cans will not detract from the yard's appearance.

V. Waste Receptacles and Their Use

A. Storage and Removal of Garbage and Rubbish

Admittedly the problems of removing garbage and rubbish in a satisfactory manner as well as of handling liquid wastes have not yet been solved in cities. Liquid wastes are removed in the following way. Interior water closets, wash tubs, hand basins, bath tubs, and kitchen sinks discharge into hidden plumbing systems, and these into underground sewers which carry the material to some distant point where the mass may be purified and the water part discharged into a river or lake or arm of the sea.

Attempts have been made to mix garbage with sewage in order to dispose of the decomposable part of the solid waste, and there are machines which grind up kitchen waste to prepare it for its journey through the pipes. This is a practical procedure, but the cost of grinding equipment is too high for low-rent housing developments.

B. Receptacles

In cities, receptacles are customarily employed to receive and hold refuse prior to its removal and final disposition. Many cities specify the kind or kinds of receptacles to be used, what should be put into them, and where they should be placed. Some cities supply covered cans and bags which are removed and cleaned every few days.

Frequently the rules are not enforced, with the result that in some large cities receptacles of all kinds in every conceivable stage of decrepitude are used. In slum districts solid wastes are often deliberately thrown on the ground, contributing in no small measure to the filth and squalor of the neighborhood.

C. Pits, Boxes, and Masonry Chambers

Pits, boxes, and masonry chambers, designed to keep the material from scattering, provide one solution to the refuse problem. They are usually rectangular and may or may not be covered. They may be of wood, metal, or masonry. They are generally open at the top to permit the reception and

removal of waste materials. Sometimes there is a door at the bottom of one side to facilitate removal. To guard against ragpickers, covers and doors are sometimes provided and locked, hoppers being supplied for the reception of the wastes.

Receptacles of the large box type, when accessibly located, would appear an acceptable means of storing waste material between collections. This system, however, generally proves a failure chiefly because it is almost impossible to control the tenants, so that they will put into these receptacles only what they are intended to hold. Thus, every conceivable kind of refuse, filthy and otherwise, is likely to be dumped into them, with small chance that the persons who do this will be detected.

D. Garbage and Rubbish Cans

Steel cans, usually galvanized, with tight-fitting covers, are the most satisfactory receptacles for the temporary storage of garbage and garbage-and-rubbish between the visits of collectors.

Although they look very much alike when new, the familiar "garbage can," or "ash can," as it is sometimes called, varies considerably in details of design and construction. The suitability of any particular can depends a great deal upon the use it is put to and still more upon the care it receives.

The average life of a garbage can in a city is generally estimated at three years, but long before then the can has acquired a dilapidated appearance approached by no other piece of sanitary equipment. Its sanitary function has been seriously impaired. The cover has been lost or distorted so that it will not fit on tightly, and as a consequence insects gain free access to the interior. The can itself has become dented and the coating of zinc which originally covered it has become discolored and chipped, exposing the steel, which has consequently become rusted and corroded. It has begun to leak, and if set in a wet place, as frequently happens, it allows water to enter and add to the objectionable character of the contents.

1. *Proper Use and Care.*—The difficulties enumerated may be overcome and the life of the can at least

doubled by reasonable care. This means, first, that the can must be kept dry inside and out. Wet garbage must not be put into it, and need not be if the housekeeper will drain and wrap the garbage in relatively small bundles and tie them with string or fasten them with adhesive paper tape obtainable at any five-cent store. The can should not be allowed to stand in water or on the wet ground, but should have a stand or concrete slab provided for it.

Every can should be identified in a uniform way by having the number of the house or station to which it belongs stenciled neatly on the side and lid. Whether or not he owns it, the name or initials of the tenant using the can should not be painted on the can. The interior and exterior of the can should be cleaned and inspected, and defects and injuries repaired, at least once every two months.

The men who empty the cans must be instructed to handle them carefully. They must be taught that the can is an article of sanitary equipment indispensable to health and welfare. This is of vital importance during wartime.

The familiar corrugated garbage can differs from other first-rate sanitary equipment in that it is difficult to keep it clean. The corrugations, which strengthen the can, also prevent brushes and cloths from readily and effectively cleaning it. Live steam or scalding water constitute the best method of cleaning. Grease yields readily to this treatment which does not harm the metal. After cleansing, the can should be thoroughly drained and dried before it is used again.

The inside of a can which is used for garbage or garbage-and-rubbish mixtures can be protected to some extent by the use of paper. Where the can is kept dry either by lining it with paper or preparing the garbage by draining and packaging it tightly, it is not only protected, but its obvious cleanness will repay the labor involved.

2. Description of Standard Types.—Cans for garbage, for mixed refuse and for ashes are essentially the same in general design and construction although they may vary in detail, in size and in weight. The heavyweight can is the most desirable for all purposes. All cans are galvanized after construction by the hot dip process. The smallest type suitable for low-rent housing developments has a capacity of 5 gallons. Its diameter is 11 inches, its height is 12 inches and its weight is 7 pounds with the lid. The proper gage of metal before galvanizing is 25.

One of the most desirable sizes of can for mixed

garbage and rubbish or rubbish alone, which combines useful capacity with moderate weight and convenience in handling, has a diameter of 18 inches, an inside height of $24\frac{3}{8}$ inches, a weight with lid of $31\frac{1}{2}$ pounds, and a capacity of $24\frac{1}{2}$ gallons. The gage of the body and lid is 23 after galvanizing; that of the bottom is 21.

The largest can which is likely to prove desirable has an inside diameter of $20\frac{1}{2}$ inches, an inside height of $24\frac{3}{8}$ inches, a weight of 36 pounds with lid, a gage of 23 in the body and lid and 21 in the bottom after galvanizing. Its capacity is 34 gallons.

Cans are sometimes made smaller at the bottom than at the top, a form which has the advantage of being capable of nesting for transportation. A much lower freight rate is charged when cans are nested than when they are not. Some persons also claim that a can that is smaller at the bottom permits the contents to be emptied more readily.

The bottom should be raised, so that the weight of the can and contents does not rest directly on it, but on the sides.

3. Covers.—Covers are frequently the source of considerable inconvenience. They are sometimes lost or stolen or taken away by children. The cover must never be removed from the can except when material is put into or taken out of it. Cans should have covers whether they are used for garbage only, for garbage and rubbish, or for ashes. There is no way to fasten a cover to a can so that it will not interfere with the emptying. Sometimes the cover is chained to the wire fence in the rear of the house to which it belongs, thus assuring its availability when the can is replaced after being emptied.

The problem of lost or missing covers can be reduced by having all the cans of the same make and size, so that covers are interchangeable.

Garbage cans may be painted instead of galvanized, or they may be painted after they are galvanized; the latter process provides additional protection to the metal and improves the can's appearance.

4. Number and Location.—The number of cans required by a project depends upon the size of the cans, the number of persons to be served, frequency of collection, and the separation of wastes, if such separation is required. It depends also upon the geographical location of the project and the season of the year.

The location of the cans for maximum service with a minimum expenditure of labor on the part



FIGURE 9. -Cans improperly located and carelessly used.



FIGURE 10. -Tenant interest and good planning in the yards attractive



FIGURE 11.—Sunken garbage cans remain uncovered until refuse is collected.



FIGURE 12 — Rubbish boxes are insanitary and attract ragpickers.

of the tenants and those who service the cans, varies with each particular locality.

Cans must be conveniently placed, for otherwise tenants will find other means of getting rid of their wastes, such as dropping their wrapped garbage in litter baskets or leaving it on street curbs.

In considering where cans should be placed, preference should be given to what is practical and economical over what is aesthetic. Cans which are obviously well kept and arranged in an orderly fashion have a less unpleasant appearance than might be expected.

Cans may be placed at the rear doorsteps of project dwellings, or at the ends of yards where a gate leads out upon a common walk. They may be placed outside of the rear fence, provided that locations are uniform and cans in good condition and properly covered.

5. *Transportation: City Men, Project Force, Hand-Trucks.*—The placement of cans depends upon the circumstances of collection. Some cities insist that cans be placed along the curb of a street well in advance of the arrival of the collecting truck. Other cities send their men into the property to bring the material out. In some cases cans are emptied into wash boilers or bags on the premises, and their contents are then carried out to the truck by the city men, or by members of the project force.

Sometimes hand trucks are used to facilitate the transportation of refuse. They should have ball bearings and rubber tires, so that they can be pushed along with as little labor as possible. They should accommodate a half-dozen garbage cans of average size, or a smaller number of steel drums of greater capacity. The trucks are stock articles, and in normal times can be readily obtained in any large city.

E. Sunken Cans

Sunken cans, or underground garbage receivers, as they are sometimes called, have long been used for isolated rural and suburban dwellings, and are sometimes employed at low-rent housing projects.

1. *Description.*—The typical underground receiver consists of (1) a shell or cylinder set permanently into the ground; (2) the can itself, which fits inside the shell, and may be raised or lowered by means of a wire handle which fits beside the top of the can when the cover is in place; and (3) the cover. The principal cover is hinged to the shell and is not raised except when the can is to be removed. It has an orifice in the center with a cover

of its own that is hinged to the cover of the shell. This inside cover is opened for the deposit of refuse by means of a foot lever, which is also hinged. When not in use the foot lever rests horizontally along the top.

The capacities of sunken cans range from 8 to 25 gallons. They are made by many manufacturers, and vary somewhat in details of design.

Shells are ordinarily made of metal, preferably 15-gage galvanized steel. They may also be made of concrete. They are always open at the bottom, and are generally provided with a broken stone or gravel base to afford drainage.

Sometimes clusters of cans are set in concrete pits, and in such cases provision is made for drainage to more or less porous earth or to a sewer.

A single pit may contain from 2 to 8 cans, and must be provided with a suitable cover, with openings for the cans, and with a rack which raises them from the bottom.

2. *Advantages.*—Their advocates claim that sunken cans are out of sight, and cannot be overturned; that their contents are inaccessible to dogs, rats, and vermin, and will neither putrefy in summer nor freeze fast to the metal in winter.

3. *Disadvantages.*—The most important disadvantage of sunken garbage cans for low-rent housing developments is the difficulty of keeping the can pits clean. Garbage may be spilled between the sides of the pit and the can. Water, garbage, and other debris may cover the bottom of the pit, resulting in smelly, insanitary conditions, and causing the sides, if of metal, to rust. When the cans are taken out for collection, water and refuse easily collect in the pit. The fact that the cans are underground, and that the bottoms of the pits are usually composed of broken stone or gravel, makes tenant cleaning excessively difficult.

The sunken can, moreover, is unsuitable in places where the ground water is high, or likely to become so after rain. In such cases, the can not only becomes wet, but, if the water rises sufficiently, pushes off the cover and thrusts its top out of the ground. Cans have been known to rise a foot or more in this way. They usually remain exposed until the level of the ground water falls enough to allow them to resume their proper positions.

Pumping out the shells is unsatisfactory. Probably the best plan when ground water floats the can is to raise the can entirely out of the shell, and set it on the ground until the water subsides. Dur-

ing this time it must be provided with a cover which fits snugly.

The typical cover of a submerged can has three hinges; water collects in these during the winter, and may freeze, damaging the hinges, and making it difficult to raise the covers. Moving parts constitute an element of weakness, since they must be kept painted, and the hinges greased, or they will rust and get out of order.

Since covers are usually made of cast iron, they are easily broken. Occasionally covers are too heavy to be operated by the children who carry out the garbage.

In place of regulation covers, some developments have provided covers of their own. These are of various types; they usually omit unnecessary refinements, and supply a top which covers both the can and shell. They are operated entirely by hand.

4. *Not Recommended for Housing Developments.*—Because of the many difficulties involved, submerged cans are not recommended for housing developments.

F. Stations

Stations are collections of cans used for garbage, rubbish, or mixtures of these solid wastes. Located at convenient points, they serve to accumulate and store refuse from all the dwellings in the immediate vicinity until it can be removed from the project.

1. *Merits.*—Stations vary greatly in design, and are potentially one of the most satisfactory methods of removing solid wastes. One of their greatest advantages lies in the fact that they can be arranged so as to be both inoffensive and inconspicuous. They leave doorsteps and dwelling yards free from the unaesthetic spectacle of individual accumulations and collections.

2. *Disadvantages of Poor Design and Careless Maintenance.*—In order to obtain satisfactory results, stations must be well designed and carefully maintained; when they are not, they tend to become extremely insanitary devices. The spilling of garbage outside the can is always greater when stations or collections of cans are used rather than individual cans. Children are frequently assigned the task of emptying household refuse into outdoor receptacles. They are, naturally, less responsible than adults. A child, moreover, knowing that there is little likelihood of spillage being detected when cans are located some distance from his home, is apt to be far more careless in emptying refuse into cans placed in a

station than in emptying it into an individual can close to his home. An excess of refuse deposited in the can or sheer carelessness may prevent the cover from being replaced properly.

a. *Accumulations.*—Infrequent collections by the city or contractor may result in excessive accumulations; this drawback is, of course, not confined to stations alone. Then too, heat may lead to the putrefaction of organic matter more rapidly in stations than in isolated cans, since the former offer little opportunity for breezes to exercise a cooling effect.

b. *Types of stations.*—There are many types of stations. Sometimes they are nothing more than rows of cans stretching in single file along a curbstone. Generally there is no attempt to conceal them although they are often placed in unfrequented driveways. Long lines of cans in the back alleys of most American cities are a familiar and unpleasing sight. The cans and the immediate area are not ordinarily clean and orderly. Owing to spillage, they are visited by flies and other insects; by stray dogs, cats, and rats.

Sometimes groups of cans are merely placed as far from neighboring dwellings as is practicable. Abuses of various kinds have attached to this system. The cans have been stuffed way beyond their capacity and have been set on fire.

Tenants in some projects have resorted to bonfires and crude incinerators. These are makeshift, unsatisfactory stations, and serious evils have resulted from their use. Children have been burned; foul odors, smoke, and the appearance of a slum neighborhood have invariably resulted.

Attempts to screen stations with bushes have only rarely proved successful. In most parts of the United States bushes appropriate for this purpose are leafless during a large part of the year and give the station a neglected aspect.

Vines cultivated on high wire fences around stations provide a sort of camouflage. They are as unsatisfactory, however, as bush screens except that they render the cans slightly less accessible to ragpickers, dogs, and rodents.

Some attempts have been made to screen stations with wooden lattice work, but it is not sufficiently durable nor does it successfully conceal the cans.

3. *Suggestions for Design and Placement.*—Correct design and placement of a station may contribute to its successful operation in numerous ways. The following suggestions may prove helpful.

The station should have a concrete platform to hold the cans and its entrances should be wide



FIGURE 13. Careless disposal of rubbish at stations.

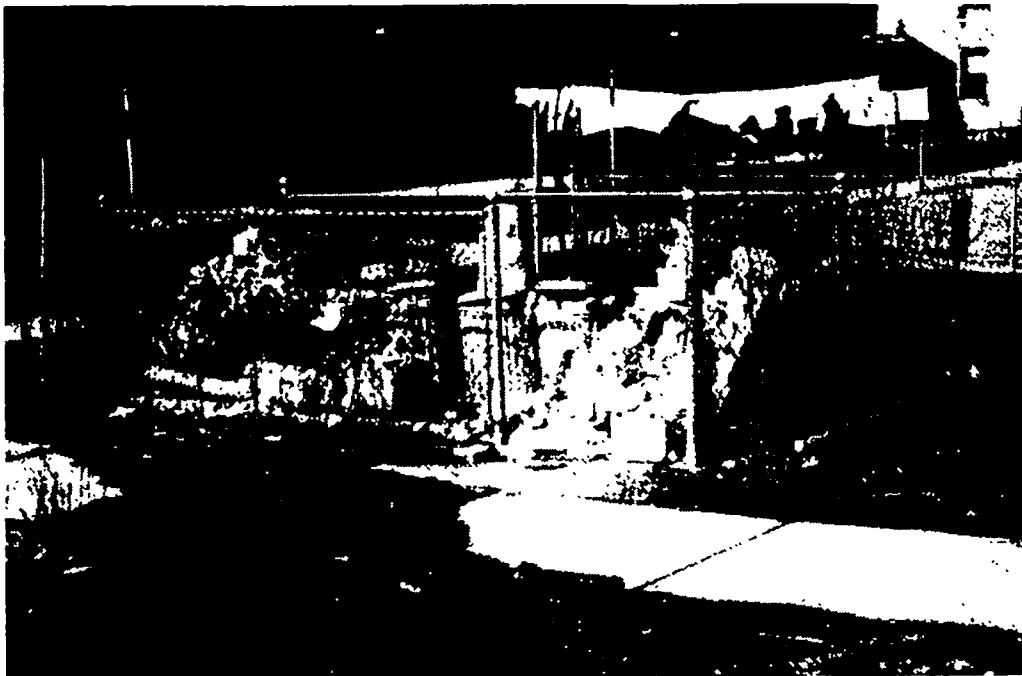


FIGURE 14.-- Tenant education and cooperation needed to utilize stations properly.



FIGURE 15.—Adequate stations are necessary to insure against overloading.

enough to permit the cans to be moved in and out easily. Masonry sides should be sufficiently high to conceal the cans from passers-by.

A permissible alternative to masonry sides is a close-built fence of split cedar covered with vines.

The size of the station depends on the number of cans to be accommodated, and this in turn depends on the amount of waste they are expected to hold. The quantity of waste varies with the number of families served, the frequency with which cans are emptied, and the separation of the refuse, if any, which is required. Some of the best kept stations at low-rent housing developments contain more than 20 cans of 30 gallons capacity each. Where practicable, cans should be arranged around the walls in a single row, so that they are easily accessible.

Stations are usually rectangular. They may, however, be circular or any other shape.

Properly designed stations facilitate neat maintenance and thorough cleansing with a minimum expenditure of labor. Platforms should slope to a screened outlet communicating with the sewerage system and having a grease trap. Water connections and hot water should be supplied for cleansing purposes.

4. *Care and Use of Stations.*—The care of stations

may be assigned to tenants. Stations should be under the frequent inspection and supervision of the project management regardless of who is responsible for their actual care and cleansing.

Cans are generally removed from the enclosure by the management, taken to the point where they are emptied into the collecting truck, and then returned. While the cans are out of the station, any debris which has been spilled can be cleaned up and the enclosure flushed or scrubbed out.

5. *Number and Location.*—Stations should be readily accessible to both tenants and collecting trucks.

The number and location of stations is partly determined by a consideration of tenant convenience. Two hundred feet from doorstep to station is considered maximal. Anything more than that is inconvenient for the housewife, who consequently tends to delay carrying out the family refuse to the station. A distance of more than 200 feet between dwelling and station is, moreover, particularly difficult for children, especially in bad weather.

In some cases it may be desirable to place the station against the end of the house, providing there are no windows above it. It is less conspicuous in this position than if separated from the building.

VI. Household Management of Refuse

A. Final Disposition Determines Method of Household Management

The moment that food enters the pail or bucket it changes its identity to garbage. It is no longer edible and the housewife's only concern is to get rid of it. If a little thought and care are devoted to the preparation of kitchen wastes for disposal, the offensive character of garbage can be greatly minimized.

1. *Preparation for Hog Feeding or Grease Extraction.*—Treatment of the material in the household is largely determined by a consideration of its final disposition. If it is to be used for hog feeding or the extraction of grease, nothing but the garbage itself, after being drained and somewhat compressed, should be put into the pail or can.

2. *Draining and Wrapping.*—In all other cases the proper kitchen preparation of garbage requires that it be drained of all surplus liquid, cut into small pieces, wrapped in paper and firmly tied with string into a strong, tight package. Three thicknesses of newspaper will suffice. The size of the paper limits the size of the package. There may be as many packages as necessary; they should be tied securely with string or adhesive paper tape. If the garbage is thus packaged decomposition will be delayed and the can will remain dry and clean.

a. *City requirements for draining and wrapping.*—The draining and wrapping of garbage is not a theoretical procedure, but a practical operation that has been employed for many years. In Trenton, N. J., for example, no domestic garbage which is not well drained and packaged will be collected. The packaging of garbage although not always insisted upon, is specified in many municipal ordinances. Thus, one city ordinance states that "No garbage shall be placed in the garbage can until all foreign matter has been removed and all water and other liquids thoroughly drained from said garbage, and such drained garbage has been securely wrapped in strong paper." The ordinance declares that the garbage "will neither smell badly in hot weather, nor freeze and stick to the can in cold weather," if these rules are complied with.

b. *Advantages and practicability.*—Cans need not be used if garbage is prepared in this fashion. The packages may be placed on the sidewalk immediately before the city collectors arrive to take them to the incinerator. This system eliminates flies, vermin and smells.

Housekeepers seldom object to the slight inconvenience of preparing garbage in this way after having experienced the resultant advantages. Once the custom is adopted it becomes popular. In fact, in some cities where this method has been enforced, and where garbage is now wanted for hog feeding or reduction for the recovery of grease, it has been found difficult to induce housekeepers to stop wrapping their garbage in paper.

B. How to Prepare Combustible Refuse

Combustible rubbish requires more attention than it generally receives.

1. *Newspapers.*—Newspapers should always be folded and laid flat in a separate bundle. If the bundle is large it may be tied with heavy string.

2. *Small Pieces of Paper.*—Papers should not, under any circumstances, be thrown loosely into a can, basket, or incinerator hopper. Small pieces, the size of circulars, for example, should be crumpled or twisted; this not only makes them more manageable but also reduces the space they occupy. A can, basket, or truckload of closely crumpled paper is relatively compact; the pieces are not readily scattered by the wind, but if they do become scattered, they can be gathered more easily than flat sheets. The rule is to keep large pieces flat, but to keep little pieces crumpled.

3. *Paper Bags.*—Ordinarily paper bags are unsatisfactory as garbage containers, although they may be used to hold small pieces of paper. Bags used for this purpose can be laid on a table and flattened out, or folded, or otherwise put into compact form.

4. *Rags.*—Rags should be made into compact bundles and securely tied.

5. *Cartons.*—Cartons should be flattened and



FIGURE 16.—What sometimes happens when standard containers are not provided.



FIGURE 17.—Draining and wrapping garbage for collection may eliminate need for standard cans.

broken up unless they contain cans, bottles, or similar objects that must be separated from readily combustible materials.

6. *Bottles and Cans.*—All bottles and cans should be rinsed in hot water to clean out any particles of their former contents which might decompose or otherwise cause an unpleasant odor. If cleaned immediately after use, cans and bottles may be stored temporarily in cartons.

7. *Worn-Out Furniture and Toys.*—The systematic disposition of discarded or worn-out furniture and toys should be determined by the management of the particular development. Generally this kind of material is best kept indoors until shortly before

the call of the collector. It should never be left about the grounds.

C. Variations in City Collection of Refuse

As explained elsewhere in this account, a single or combined system of refuse collection may be used; each requires distinct equipment and methods of preparation. Rubbish, for example, may be collected once a week by the city, and garbage to be used for hog feed may be removed every day by appropriate collectors. Specific instructions to tenants on the management of refuse must take into account all the features of collection and disposal system used in the particular development.



FIGURE 18. Careless collectors leave disorder behind.



FIGURE 19 —Modern sanitary garbage truck eliminates usual spillage by collectors

VII. Collection by City or Contractor

A. Need for Long-Range Policy

From its inception, the design of every project should include a long-range policy for the collection and removal of refuse.

All pertinent factors and conditions, including collection by the city or contractors, must be carefully considered from the start, for once a system is installed, changes are expensive.

Upon superficial examination, collection by the city generally appears the more desirable method, for it seems entirely reasonable that the city should provide the same services for public housing projects as for private homes.

A contract is generally entered into which provides that the city will collect refuse from the project. It contains no details as to the manner, place, and frequency of collection, yet any of these factors may profoundly affect the design of the project. Therefore an enumeration of the principal advantages and disadvantages of collection by the city and by contractors will be made here.

B. Advantages and Disadvantages of City Collection

Increased convenience and lowered costs are the chief advantages of city collection. When the city agrees to collect the project's garbage and rubbish without charging a fee, the local authority and project management are relieved of the necessity of finding a suitable contractor and supervising his operations. Since city collections are made free of charge, the overwhelming advantage is one of cost. This may or may not represent a substantial saving.

In deciding the matter of costs, the amount of time spent by the project maintenance force in sweeping and picking up after the city collectors, and in moving the cans to and from collection points should be taken into account.

Damage to the cans represents a sizeable sum; and considerable time is wasted due to lack of coordination between city and project employees.

C. Operations of Contractors Easily Controlled

One of the advantages of having a contractor remove garbage and rubbish from a project is the fact that his operations can be controlled.

1. *Frequency and Time of Collection.*—Arrangements can be made with the contractor to make collections as frequently as necessary, whereas the city very possibly will collect refuse only once a week. This makes a great difference in the capacity required to absorb the daily refuse output of the numerous dwellings in a development.

The contractor will come on such days and at such hours as are required for the smooth operation of the can system. If, for example, he is hired to make his rounds from eight to eleven on Monday and Thursday mornings, he will adhere to this schedule. He will not keep the cans, and perhaps the tenants, waiting for him until the afternoon or the next day. Punctuality in collection is extremely important, but it cannot be controlled by the project management if collections are made by the city.

2. *Type of Collecting Truck Used.*—The project management has no voice in deciding the type of collecting truck used by the city. If it is an open truck, the tendency is to overload it with refuse. Then too, the contents are frequently improperly covered, with the result that refuse is scattered over the development. This, of course, results in added work for the maintenance men who must gather it up.

3. *Use and Abuse of Cans.*—The city collectors are frequently extremely careless in emptying the cans with the result that litter is scattered and cans damaged. Their carelessness greatly shortens the life of the cans, which become dented and deformed by the rough treatment they receive. In some cities the loaded and emptied cans are tossed through the air between the ground men and the men who stand inside the truck to empty the cans and trample their contents. In the process the cans are considerably

banged around. On the other hand the proper handling of cans greatly extends their period of usefulness.

D. Preparation of Refuse for Final Disposition by City

If the city collects, the system of final disposition dictates the way in which the tenants must prepare their solid wastes for collection. For example, the garbage may be sent to a reduction plant for the recovery of grease, the paper and other easily combustible rubbish taken to a municipal incinerator, and the incombustibles, including ashes, used to raise the level of low-lying land. In this case the tenants must possess appropriate ways of keeping the three types of refuse separate. They must have separate containers, and when the collecting day arrives these must be taken to the places designated by the city as the points from which it will collect the materials. Project labor may be needed to move the containers to the collecting points.

E. Insanitary Conditions Caused by Tardy Collection

Loosely scattered, uncovered refuse standing at the curb in cans, boxes, crates, baskets, barrels, cartons.

paper bags, and burlap bundles is, unfortunately, a familiar sight in many of our cities. The material may remain there for hours until it is picked up; and meanwhile it is picked over by persons popularly called "scavengers." It is also overhauled by children looking for playthings, and by dogs, rats, and other animals looking for food.

Such conditions are commonly associated with slums and blighted areas. They should never be allowed to exist, even for the briefest time and to the most limited extent, anywhere in or near a housing development.

F. Possibility of Free Collection Through Exchange System

In some instances garbage is removed without cost to the project by a contractor who feeds it to hogs. For example, there is a low-rent housing development at Nashville, where garbage is collected free of charge by a contractor. He makes his collections daily from individual housekeepers to whom he supplies clean, sterilized cans each day. The contractor provides these services gratis because of the value of the collected garbage as hog feed.

VIII. Incinerators

Incineration is one of the most satisfactory methods for the disposition of solid wastes. Incinerators are of various types. Their many advantages should be carefully considered when a development is being designed.

A. Advantages of Incineration

Incineration permits the project management to control the entire process of garbage and rubbish disposal. No adjustments need be made to the city collection system. Moreover, certain types of incineration eliminate the use of multitudinous cans as well as the labor involved in emptying, removing, and supervising them by tenants and maintenance force.

B. The Household Incinerator

Ideally, when a system of household incineration is in use, tenants deposit their solid wastes through a small chute with an automatically closing door. This is all they have to do. The chute leads to a combustion chamber and grate in the basement. The refuse is fired by an employee who removes the ashes. The need for cans, and the problems of transportation and intermediate storage are completely eliminated.

Incinerators of this type with intake chutes on each floor, have been built in thousands of high grade apartment houses. They are also frequently used in low-rent housing developments which contain apartment houses of three or more stories.

C. Neighborhood Incinerators

Some low-rent housing developments use neighborhood incinerators. These consist of a number of small incinerators constructed at the ends of buildings and having chutes with outdoor openings. Wastes are fired at regular intervals by maintenance men but can be put into the chutes at any time. This type of incinerator requires a basement below ground level and a chimney extending above the roof of the house.

One of the advantages of neighborhood incinerators

is the fact that they can be built after the rest of construction has been completed.

D. Central Incinerators

Large central incinerators are practicable for low-rent developments. They involve, however, the problem of transporting combustible waste from the dwellings. The distance from some of the dwellings to a centrally placed incinerator may be excessive for certain tenants.

If houses are located on fairly level ground, hand trucks (such as those described under "Waste Receptacles and Their Use," Section V) operated by maintenance men may be used to transport the cans to the incinerator. Three steel drums can be placed on the truck to receive the solid wastes emptied from household cans, but a removable box body fixed to the truck platform is preferable.

The central incinerator receives its rubbish on a floor where it is dumped by those who bring it. It is fed down to the furnace at a lower level by means of a special chute. A separate flue carries off the gases. This type of incinerator has a somewhat complicated furnace; there are chambers for drying out wastes, chambers where the main combustion takes place, and still other chambers where objectionable gases may be consumed after they have left the main chamber.

The temperature in a central incinerator may rise as high as 1,800° Fahrenheit. In the household type of incinerator, the temperature is generally much lower.

Incinerators, whether of household, neighborhood, or central type, can be constructed so that auxiliary fuel may be used if desired. When proper attention is exercised, however, added fuel is rarely necessary.

E. Other Devices Termed "Incinerators"

The term incinerator is commonly applied to many devices which burn refuse. One such device is an outdoor masonry chamber of approximately 60 cubic feet. It has neither a roof nor a chimney, and may

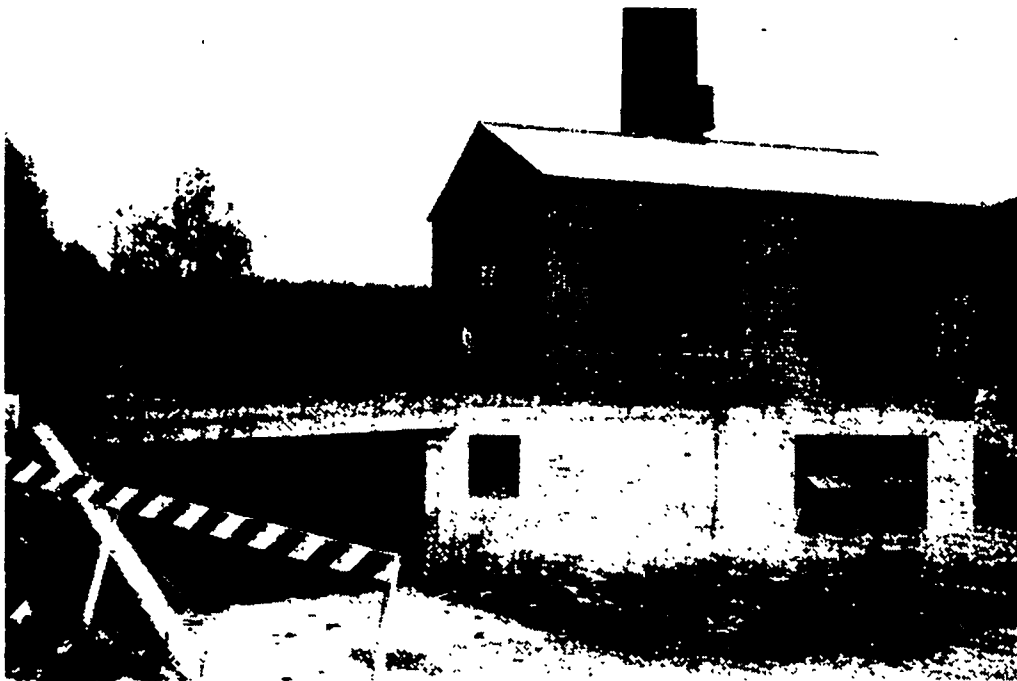


FIGURE 20.—Central incinerator plants effectively destroy refuse



FIGURE 21.—Household incinerators provide convenient method of waste disposal

be located at any convenient point in the development, and is used for burning cartons and other bulky and easily combustible accumulations. Since it occasionally produces considerable quantities of smoke, it should be located so that the prevailing breeze carries the odors away from, rather than toward the residential area.

An incinerator which is preferable to the above consists of a furnace with a chimney of moderate height. It is fed through a large door in front. A smaller door at the base facilitates the removal of ashes.

F. Importance of Correct Use of Incinerators

The prevention of odors, smoke, and fly ash is a problem connected with the use of all incinerators, regardless of their size and construction. The odor of burning garbage and household rubbish is exceedingly offensive, and may pervade an entire development. Smoke and fly ash, which consist chiefly of bits of burnt paper, are unpleasant visually; they are, also, a source of injury to household furnishings and to wash drying on clotheslines. Complete combustion and proper means for collecting fly ash prevent these objectionable products from pervading the atmosphere; but they inevitably tend to do so whenever incinerators are not skilfully built and operated.

1. *Complete Combustion.*—There are additional reasons for the need of complete combustion in the disposal of garbage. If food materials are not thoroughly burnt, the ash product may become offensive, attracting flies and other insects; ashes containing impurities cannot be kept over long periods, nor can they be used for the raising of low-lying land.

2. *Proper Methods of Feeding and Firing.*—The largest incinerators, such as those installed by cities, sometimes have a capacity of over 1,000 tons a day. Incinerators of this type can be designed so that they practically eliminate smoke; their stacks are high enough to dispose effectively of all gases and odors. Household, or flue-fed incinerators depend on simpler procedures. Cages must be placed on top of their chimneys to arrest solid particles, and these cages should be kept in good condition.

The amount of waste burned at any one time, and on a given grate, should not be excessive; it should be burned at a time when a minimum number of persons will be affected. There must be enough

combustible material to consume any garbage which may be present, and the temperature should be kept as high as possible.

Placing a large mass of wet, sloppy garbage upon a fire constitutes a misuse of the equipment. All garbage should be carefully prepared for incinerators by draining and packaging, as described in Section VIII, "Household Management of Refuse." No attempt should be made to burn grass clippings, green boughs, or bushes; these materials should be hauled to a dump.

G. Rules for Tenant Preparation of Incinerator Material

Where there are household or neighborhood incinerators, a set of simple rules for their proper use should be printed and hung in a conspicuous place in the tenants' kitchens. In addition to the draining and packaging of garbage, these rules should include the following:

Papers should not be disposed of in bulky masses, but should be bound into small, tight bundles. Loose pieces of paper tend to be drawn up the chimney by the draft, and to clog the screen at the top; they should be crumpled in the hands.

All packages should be made small enough to enter the hopper door without crowding. If packages are jammed into the hopper, they may expand when they fall into the flue, and thus clog it. This may stop the draft, and in the case of a household incinerator, cause the smoke to come out in the lower halls.

Cardboard must not be folded, but torn into small pieces before being put into the hopper.

Incinerators are not foolproof. Like any other kind of equipment, their successful functioning depends on the intelligence exercised in their construction and operation; they must be inspected regularly, and repaired when necessary. Their effectiveness depends largely on the intelligence with which they are handled.

H. Incinerator Companies

There are numerous companies engaged in the incinerator business. They supply the plans, specifications, and metal parts required for building incinerators of the household, flue-fed, and centrally located types. With their assistance, practically any architect or capable mason can build the structure required.

