

United States Shipping Board Emergency
Fleet Corporation, Dept. of Health
and Sanitation

STANDARDS

OF THE

DEPARTMENT OF HEALTH AND SANITATION

OF THE

UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION

1918

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INTRODUCTION

A healthy and energetic force of workmen is as essential to the speedy construction of the ships as a well-laid-out yard, prompt delivery of materials, labor-saving machinery or efficient methods of work.

The building and operation of ships by the U. S. Shipping Board Emergency Fleet Corporation is the greatest industrial task ever undertaken, and being a governmental activity, the hygienic and sanitary standards under which this work is carried on should be worthy of adoption by private industry.

The health of the workers also has a very direct influence upon the cost of building ships, for a dollar's worth of work should be obtained for every dollar paid in wages. This is not possible with employees in ill health or with lowered vitality.

To obtain such conditions it is necessary that the principles of industrial sanitation as established by actual practice shall be clearly understood and strictly conformed to.

This requires the expenditure of funds, but experience has clearly demonstrated that the investment pays dividends.

The enormous increase in the shipbuilding industry to meet war needs has caused a constant influx of workmen into the shipyards who are unused to the rigor and exposure of shipbuilding. This condition demands unusual care to safeguard their vitality.

The above conditions have been the guiding principles in the preparation of this bulletin, and it is hoped that the closest possible cooperation may be obtained between the shipyard managers and the Department of Health and Sanitation of the United States Shipping Board Emergency Fleet Corporation, whereby these problems may be met and worked out in a mutual spirit of purpose to speedily build ships.

HEALTH OF WORKERS

GENERAL

1. The health of the worker may be considered from two stand-points: (1) That which considers the hygiene of the workman, the sanitation of the plant at which he is employed and the habitation in which he is housed. (2) That which considers the adoption of selective measures, whereby only persons fitted for their work are permitted to enter the employ of the shipyard and who, through medical care, are enabled to keep themselves in a condition of bodily vigor.

EXAMINATION OF WORKERS

2. Many employers have found it advisable to determine the condition of health of a worker at the time he enters the employ of the company and at intervals afterwards. This procedure benefits both the employer and the workman. Physical examinations properly carried out will bring to the attention of the examining physician any communicable disease with which the applicant might be afflicted and which might be communicated to his fellow-workmen. Applicants for employment suffering from minor ailments or condition of ill health should not necessarily be excluded from employment, but should be given work for which they are best suited.

Physical examination of workers provides also for the early detection of conditions which, untreated, might become serious, and the examiner is given the opportunity to indicate to those persons in which these conditions are found the remedy which will restore them to a condition of health.

Whenever physical examinations are carried on it is advisable to provide and maintain especially arranged quarters for this purpose. Such arrangement should include individual dressing rooms for applicants and other facilities necessary for the proper conduct of this work.

The Department of Health and Sanitation will upon request send to yard authorities a floor plan showing the convenient arrangement of rooms and facilities for the proper carrying out of physical examinations in an industrial establishment. The adoption of the following examination form is strongly recommended, which should be printed on an 8 by 10½-inch card and ruled conveniently:

CORPORATION

PHYSICAL EXAMINATION FOR EMPLOYMENT

Name	Address	Date
Check No.	Dept.	Age
Nationality	Color	

CHECK ITEMS APPLICANT HAS HAD

MEDICAL HISTORY Scarlet Fever, Diphtheria, Typhoid, Malaria, Pneumonia, Tonsilitis, Rupture, Asthma, Habitual Cough, Pleurisy, Spitting of Blood, Dizziness, Epilepsy, Paralysis, Discharge of Bladder, Kidney Disease, Syphilis, Gonorrhoea, Cancer.

Remarks:

GENERAL EXAMINATION	Height	Weight
EYES	Vision Distance Right Vision Distance Right 20 ft. Left 1 ft. Left Eye Diseases	

EARS	Hear Watch Tick Right ft. Disease Left ft.	
-------------	---	--

NOSE

THROAT

TONGUE

TEETH

NECK

SKIN	Identification Marks	Disease
-------------	----------------------	---------

CIRCULATION	Blood Examination if necessary	Blood Pressure
--------------------	--------------------------------	----------------

HEART	Defects	Compensation
--------------	---------	--------------

CHEST	Girth	Full Insp. Full Exp
--------------	-------	--------------------------

LUNGS	Right	Left
--------------	-------	------

ABDOMEN—Girth	Stomach	Liver
----------------------	---------	-------

	Intestines	Kidneys Bladder
--	------------	----------------------

INGUINAL REGION

GENITALIA

URINE	Color	React.	Sp. Grav.	Albumin	Sugar
--------------	-------	--------	-----------	---------	-------

SEVERE INJURIES OR OPERATIONS

NERVOUS SYSTEM

GENERAL INTELLIGENCE

ALCOHOLISM OR DRUG HABITS

ACCEPTED REJECTED
RECOMMENDED FOR

Examining Physician

DISEASES

COMMUNICABLE DISEASE

3. The management of the shipyard should familiarize itself with the regulations of the local and State health authorities which concern the control of communicable disease, that no employee who has been ill with communicable disease shall return to his work until the danger of conveying infection has passed.

VENEREAL DISEASE

4. The Department of Health and Sanitation is prepared to give active assistance to any shipyard management desiring to control the prevalence of venereal disease among their employees. An inquiry into the amount of disability due to venereal disease should prompt employers of labor at shipyards to take all possible means to minimize the appearance of these diseases among their employees.

VACCINATION FOR SMALLPOX AND TYPHOID

5. Compulsory vaccination for smallpox and optional vaccination for typhoid and para-typhoid should be carried out. Typhoid vaccine can be secured from the Army Medical School, Washington, D. C., at five cents a cubic centimeter, and should be ordered direct.

MEDICAL TREATMENT

6. The neglect of minor ailments by workmen often leads to protracted sickness. In yards having a full-time physician, or where a physician regularly visits the yard, the worker should be given the opportunity to bring his ailment to the physician's attention. Immediate attention given these ailments should result in the saving of many working hours otherwise lost.

PREVENTION OF INFECTION

7. Workmen should be required to report for treatment all abrasions, cuts and scratches, no matter how slight. Too great stress cannot be placed upon the necessity of keeping infected hands, handkerchiefs and mouth away from wounds and abrasions. Injured persons should be taken to First Aid Station without touching wound unless bleeding is dangerous to life. Much unnecessary illness and loss of time can be prevented by the immediate treatment of injuries, whether serious or slight. The passage of infection and contagion from one person to another can be largely prevented by the installation of sanitary toilets, lavatories and drinking fountains.

TREATMENT OF WOUNDS

8. The surgical treatment of wounds with Dichloramine-T and Chlorcosane to prevent and remove infection and reduce the period of disability is strongly recommended. Technic outlined by Dr. Edward Martin, of Philadelphia, is given in Appendix "A."

STAFF

The following are considered minimum requirements for the proper treatment and care of employees in the shipyard plants.

FIRST AID ATTENDANTS AND DOCTORS ON CALL

9. Plants employing under one thousand men should have a first aid attendant or trained nurse for each shift and two doctors on call. First aid attendant should have taken a regular course in First Aid, and should have passed examination in same satisfactory to attending doctor.

RESIDENT PHYSICIAN

10. In plants employing over one thousand men a resident physician should be employed and should be furnished with such assistance as the size of the plant and work to be done demands. In plants where a dispensary is required it is desirable to have a physician resident in the dispensary. Plant physicians must have a license to practice medicine in the State in which the plant is located.

First aid treatments may be rendered by nurses or attendants. All redressings should be overseen by licensed physician and first aid treatment should be whenever possible.

TREATMENT FACILITIES

Three types of facilities for the treatment of injuries and illness at shipyards are discussed in this bulletin:

FIRST AID STATION

11. The First Aid Station is the unit recommended for plants employing up to one thousand men. In no case should first aid treatment be given in the yard office. A specially assigned room should always be provided for first aid treatment.

DISPENSARY

12. A dispensary is necessary for plants employing from 1,000 to 2,500 men. A First Aid Station located at a convenient point within the grounds should supplement the dispensary for each 2,500 men employed.

HOSPITAL

13. The need of a plant hospital depends largely upon available hospital facilities in the vicinity. A plant employing a relatively small number of men, and in a situation remote from adequate hospital facilities would be much more dependent upon its own resources than a plant employing many more men, but with nearby hospital facilities immediately available. With this consideration in mind each plant should make adequate provision for the hospital care of its injured employees.

STRETCHERS

14. Stretchers should be placed in various parts of the yard to insure the rapid removal and immediate care of the injured.

AMBULANCE

15. Plants should own or have at their disposal a sufficient number of ambulances to insure quick transportation of patients to dispensary or hospital.

HEAT PROSTRATION

16. Arrangements should be made on or near the shipways in advance for the treatment of heat prostration. A tent with fly in which is kept a tub of cold water, ice, etc., is recommended. Tent should open at both ends and have sides that roll up. Several of these should be provided in the larger yards. This applies to yards located in parts of the country where heat prostration occurs.

MUNICIPAL AND PRIVATE HOSPITALS

17. It is extremely important that definite arrangements be made in advance with the hospital management as to available accommodations and charges for same. Arrangements should also be made with members of the staff in regard to charges to be made for standard operations and treatments.

FIRST AID STATIONS

LOCATION

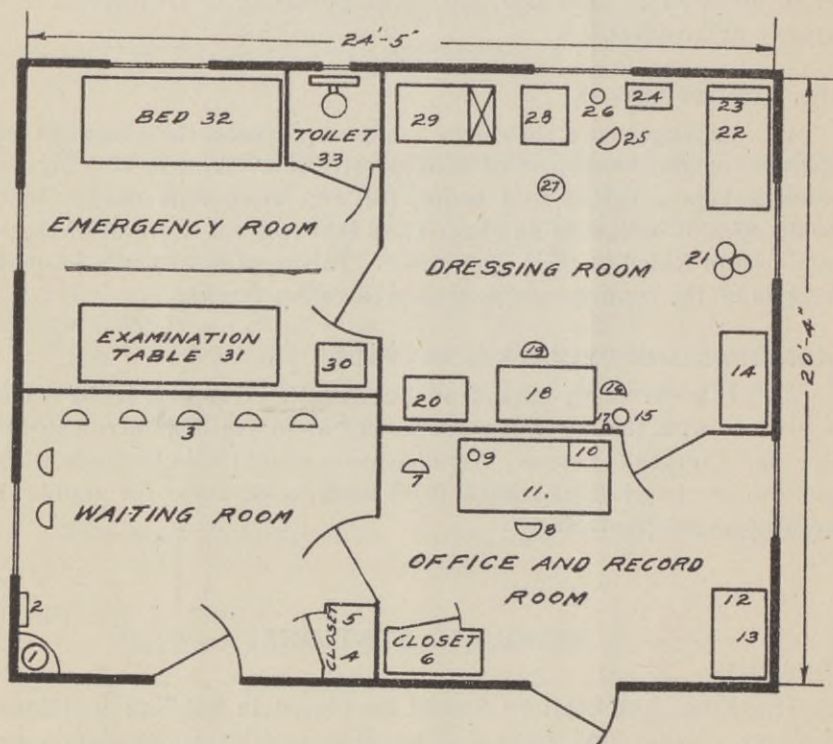
18. First Aid Stations should be placed in existing buildings whenever possible and when not possible, small stations should be constructed and centrally located for this purpose. One of these stations should be equipped with resuscitating apparatus, and one or more such pieces of apparatus should be close to the shipways. Several men should be available who have been trained in the prone-pressure method of resuscitation.

PLANS

19. First Aid Stations with two rooms and with four rooms are described. The two-room station combines the waiting with the office and record rooms, and the emergency with the dressing room, shown in plans for four-room stations. The two-room station is recommended for plants employing from 200 to 500 men; the four-room station for plants employing 500 to 1,000 men. The equipment of the two-room station should include as much as space will permit of that outlined for the four-room station.

The following floor plans are recommended for the four-room station:

FIRST AID STATION
DEPT. OF HEALTH AND SANITATION
U.S. SHIPPING BOARD-EMERGENCY FLEET CORPORATION

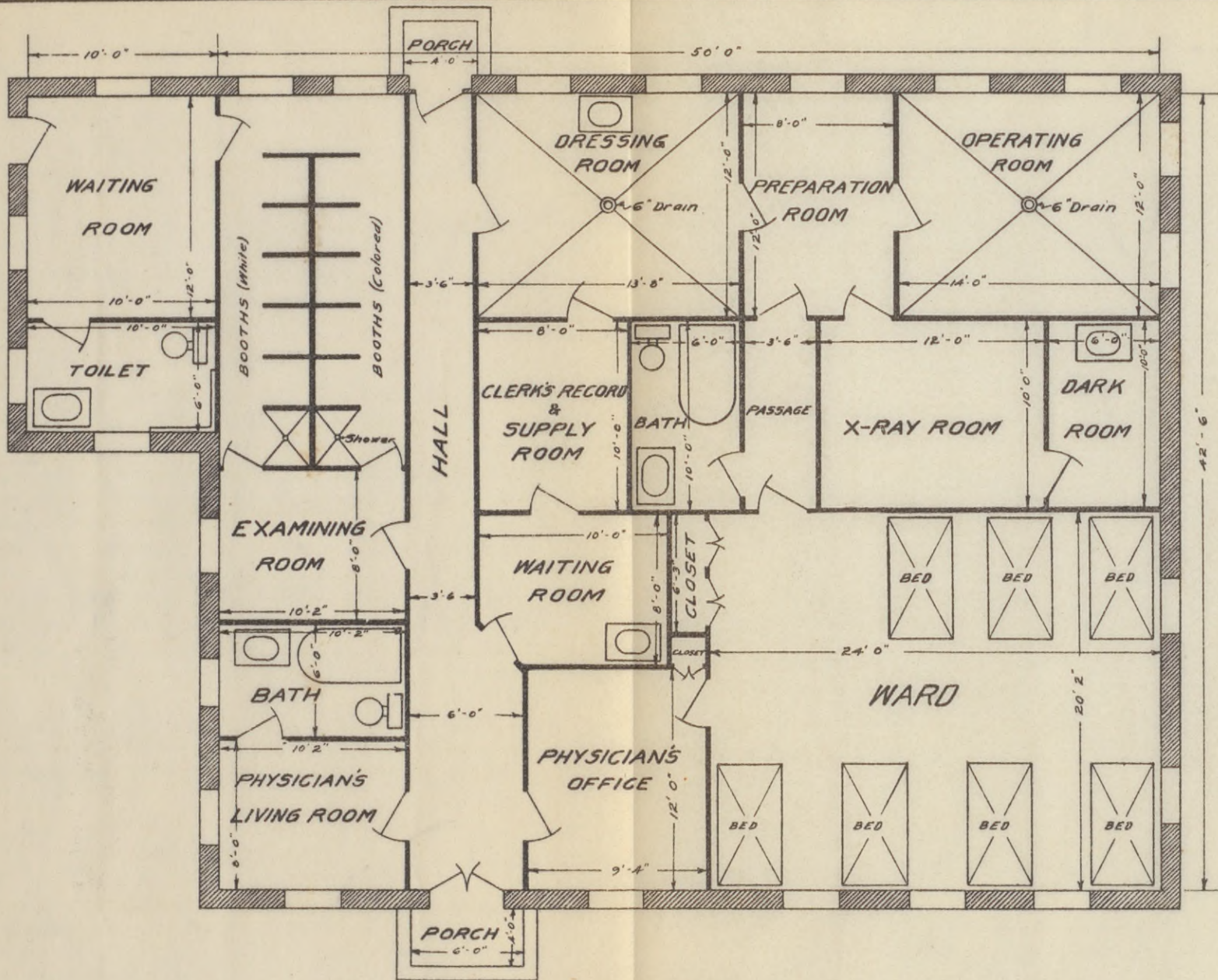


EQUIPMENT

20. The following equipment is suggested as the minimum desired: Waiting room should contain eight chairs or equivalent, wash bowl and closet for stretchers. Attendant's supply room and office should contain one desk, one wardrobe, two chairs, one filing cabinet, one typewriter with stand and adequate shelving for supplies. Emergency room should contain one toilet, one bed, one examining table and one glass-top stand. Treatment room should contain two dressing tables, one lavatory or sink, one small sterilizer, one cabinet, one three-basin stand, one sanitary waste can, two small glass-top tables, three chairs and two stools.

SUPPLIES

21. A list of instruments, dressings, drugs and other supplies that are considered adequate will be furnished on application.



DISPENSARY
 DEPT. HEALTH & SANITATION
 U.S. SHIPPING BOARD - EMERGENCY FLEET CORPORATION

DISPENSARY

LOCATION

22. The building in which the dispensary is located should be inside the yard and of convenient access. Where plants make physical examinations of their employees, a dispensary should be conveniently located with reference to the service or employment department of the plant.

PLANS

23. The dispensary should contain adequate facilities for first aid and emergency work and should, in general, include the provisions shown in the following diagram:

EQUIPMENT

24. The completeness of dispensary equipment should be governed considerably by available hospital accommodations.

The physical examination section should consist of a waiting room, a toilet room, with wash bowl, six to ten dressing booths, two shower baths, an examining room, and a physician's living room with bath adjoining. The dispensary proper should include a waiting room, a physician's office, a ward of from two to ten beds, a diet kitchen, if patients are to be retained in the ward, a bath room for patients, a clerk's record and supply room, a treatment room, a preparation room, an operating room, an X-ray room and a dark room. The complete equipment recommended for any or all of the above rooms will be furnished upon request to the Department of Health and Sanitation.

SUPPLIES

25. Complete drug, dressing and laboratory supply lists will be furnished upon request to the Department of Health and Sanitation.

YARD HOSPITAL

LOCATION

26. Whenever it is considered necessary to build hospitals they should be located outside of the plants.

PLANS AND EQUIPMENT

27. Plans for hospitals of all sizes can be furnished by the Department of Health and Sanitation, as well as complete lists of equipment needed and estimate on cost of the same. Sample plans of hospital already constructed are available.

SANITATION

WATER SUPPLY

An ample supply of clean pure water properly distributed throughout the yard for drinking and washing purposes is absolutely essential to the maintenance of health.

SOURCE

28. Surface water from streams or lakes should never be used without thorough purification, except from uninhabited drainage areas. When shipyards are near a town or city having a water supply of established purity, and it is practical to obtain connections from the public mains, it is advisable to do so. Where it is necessary for the yard to provide a new or additional water supply, local conditions will govern the selection of the best source, and upon request the Department of Health and Sanitation will furnish advice as to the best and most economical procedure to be adopted.

If shallow wells are used as the source of water supply a location should be selected where there is a positive assurance that there is no danger of soil or surface contamination within influence upon the well. The upper part of the well should be lined with tight walls which should be carried above the surface of the ground, which should be graded to carry surface water away from the well. The well should be protected with a water-tight cover.

If artesian wells are used, they should be driven to a sufficient depth to insure a supply of uncontaminated ground water. Artesian wells may become contaminated through soil pollution of the drift overlying the water-bearing rock, or by pollution entering the well along the exterior surface of the well-casing. These conditions should be protected against in an adequate manner.

If purified water from streams or lakes be determined upon as the source of water supply, the Department of Health and Sanitation will furnish advice upon request, as to the best type of purification plant to install in each particular instance.

QUALITY

29. The water should at all times be free from contamination (presence of disease germs), pollution (presence of organic matter), or not contain an undue amount of mineral matter (such as "hardness," sulphur, iron or mineral salts).

This condition may be obtained by selection of a proper source of supply and exercising eternal vigilance in every process of purification used and in piping the water direct to the point where it is actually used.

The quality of the water should be determined at regular intervals by bacteriological and chemical analyses made by reputable laboratories.

In many cases state or local Boards of Health are able to do this work. Copies of analyses should be sent to the Department of Health and Sanitation of the United States Shipping Board Emergency Fleet Corporation.

The water should also be clear and cool and without taste or odor.

Industrial or fire protection water, not of drinking water quality, should not be used for washing purposes, for experience has clearly demonstrated that warning notices do not deter thirsty men from drinking such water.

PRESSURE

30. By means of pumping to a standpipe or elevated tank and the use of amply large piping, a pressure sufficient to deliver water to the highest parts of the yard and building should be maintained.

DISTRIBUTION

31. No matter how much care is exercised in obtaining a pure water supply, if it is not properly distributed to the workmen the expense of purifying the water is wasted. The real test of purity is the quality of water actually drunk and, therefore, the water should never be exposed in open containers in such a manner as to become contaminated.

The distribution of water by bucket and common drinking cup is insanitary and one of the most direct means for transmission of disease. This method should not be permitted in the shipyards. The water supply should be distributed through a system of pipes and bubbling fountains of approved type installed at frequent and convenient locations about the yard. The fountains should have an inclined jet so that the water does not fall back on itself and provided with a housing to prevent the lips of the drinker from touching the outlet pipe.

At such times or in such places where drinking water must be carried to the workmen a closed container, provided with a closed lid and a spout, should be used and the men supplied with individual flat paper cups.

In those yards, where in summer the water would be warm and unpalatable, there should be provided immediately before each bubbler a coil in the water pipe, on which ice should be kept in a suitable protected box. Such fountains should be provided with a self-closing valve or foot lever to avoid waste of cooled water.

DUAL CONNECTIONS

32. As the purity of the water supply is absolutely essential to health, there should not be any connection between the mains or pipes carrying drinking water and those carrying unpurified water used for industrial purposes or for fire protection.

In case unusual conditions indicate necessity for dual connections and if such be authorized by the Department of Health and Sanitation and approved by local and state health officials having lawful jurisdiction in the premises the same shall consist of two check valves, three pressure gauges and two blow-offs, installed in a manhole of ample size for convenient operation provided with a drain to carry away water blown off during tests.

The specifications for these check valves must require the seat ring, disc, holding ring and screws, disc stud, arm hinge pin and bushings to be of bronze; disc to be faced with medium hard rubber, and that liberal clearances shall be left around clapper and arm in all positions.

This type of "fire service connection" is shown in diagrammatic illustration. Normally, indicator post gate valves M and N are open and test valves D and E are closed. At monthly intervals a test should be made of the tightness of the check valves, and at intervals of about three months the bonnets of the check valves should be removed and the checks and their bearing seats carefully cleaned. To facilitate removal of bonnets, manilla paper packing, soaked in machine oil, should be used and bolts greased with heavy oil and graphite. To make test of tightness of check valves, close valve M and open valve D. Pressure on gauge A should fall to zero and on gauge B hold. Valve E should now be opened and pressure on gauge B should fall to zero and on gauge C hold. The principle of this test will be clearly seen by examining figure 3 of the drawing. After test is completed valves M and N must be left open to permit flow through the connection.

GENERAL

TOILETS

33. The exposure of fecal matter has repeatedly resulted in the development of typhoid fever and kindred diseases through the direct transmission by flies of intestinal disease germs to food stuffs. Sanitary means for the disposal of the excreta of the workers at the shipyard are essential for health, comfort and decency. Suitable toilets should, therefore, be provided at convenient locations in the yard and connected with a sewer system.

At least one seat or water closet should be provided for each 25 workers.

Urinals should be provided in a ratio of one for each 40 workers. Two feet of wall or trough urinals shall be considered as equivalent to one urinal.

It is most important that toilets should be kept clean. A janitor or other employee should be definitely assigned for this purpose and held responsible for their maintenance.

Compound solution of cresol (as described under "Cleaning and Disinfectants") should be used in cleaning.

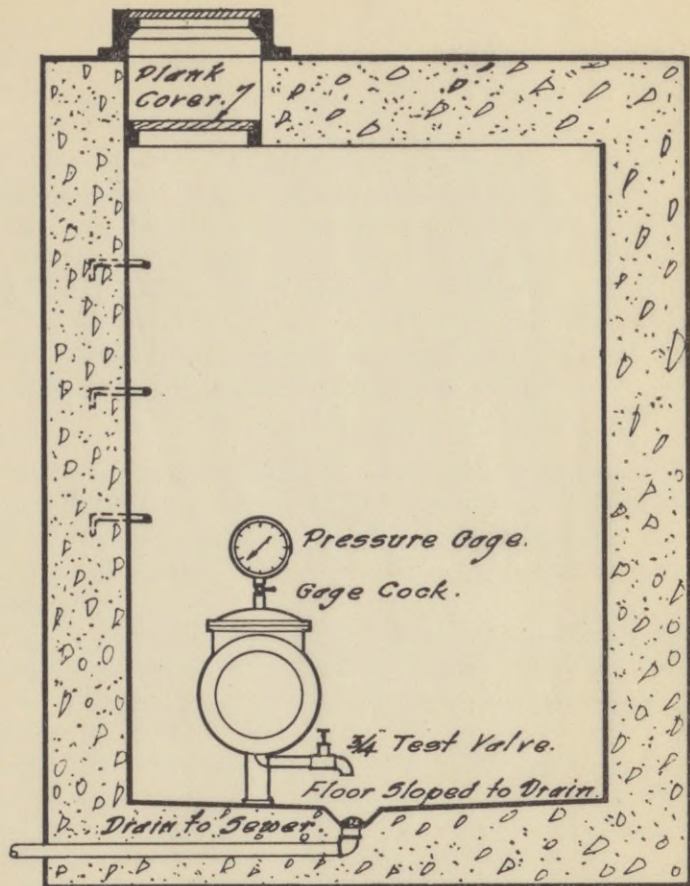


FIG. 1. SECTION THROUGH "A-B".

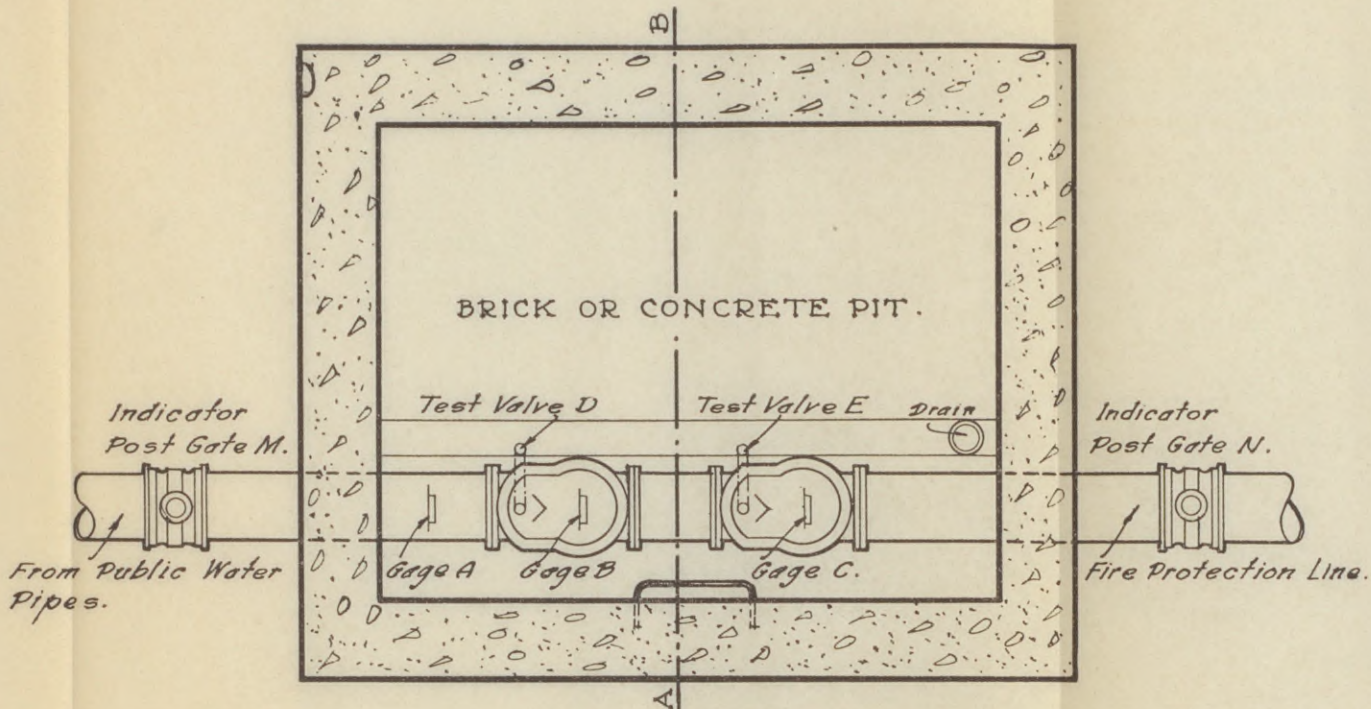


FIG. 2. PLAN.

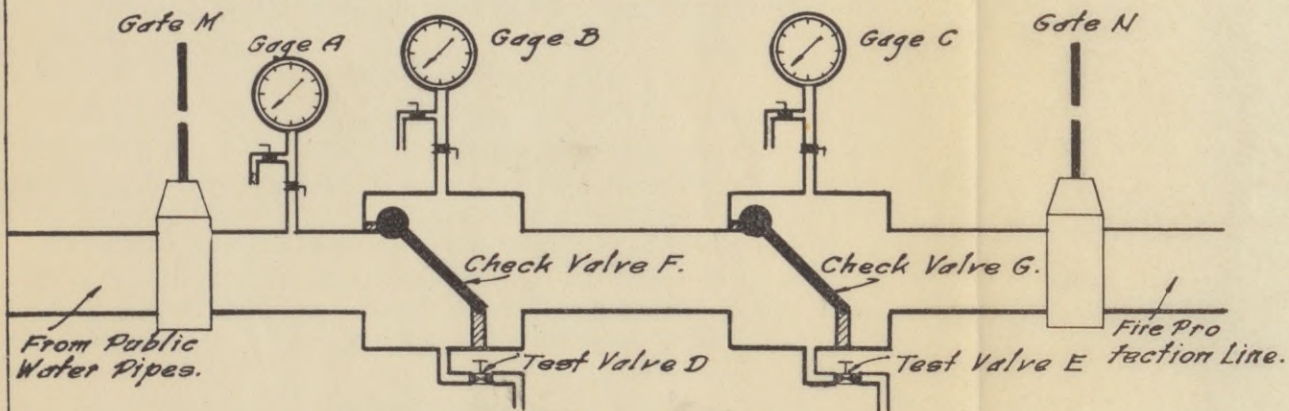


FIG. 3. ARRANGEMENT DIAGRAM OF VALVES.

APPROVED FIRE SERVICE CONNECTION
USING TWO "TYPE F.M." CHECK VALVES.

ADAPTED FROM DRAWING OF
ASSOCIATED FACTORY MUTUAL FIRE INS. CO'S.,
BOSTON, MASS.
JUNE, 1918.

U. S. SHIPPING BOARD
EMERGENCY FLEET CORPORATION,
DEPARTMENT OF HEALTH AND SANITATION.

WATER CLOSETS AND URINALS

34. In toilets containing water closets and urinals there should be at least 10 square feet of floor space and 60 cubic feet of air space per seat or urinal. Ventilation should be direct to the outside air by windows or other suitable openings, properly screened. Natural light should be ample so that all parts of the toilet are easily visible. The floors and side walls for a height of at least 12 inches should be constructed of materials impervious to moisture and should have a smooth surface. Wood is not a satisfactory material. The seats should be of the open front type as a protection against transmission of venereal diseases. Urinals should be made of non-corrosive materials. If of metal they should be lined with enamel.

PRIVIES

35. If conditions are such that, in the opinion of the Department of Health and Sanitation, privies may be considered, the following general principles shall be used, but it is distinctly stated that privies are considered as temporary expedients only and should as soon as possible be abandoned.

Greatest care must be exercised that privies shall never be located within influence upon any source of water supply. They should also be located as far as practicable from any place where food is stored, prepared, exposed for sale or eaten.

They should be so constructed and maintained that they will be cleanly, prevent fly-breeding or fly-transmission of disease, pollution of sources of water supplies, development of odors or any other insanitary condition or nuisance. Privies containing seats should also always be provided with urinals, as it is practically impossible to maintain clean seats otherwise.

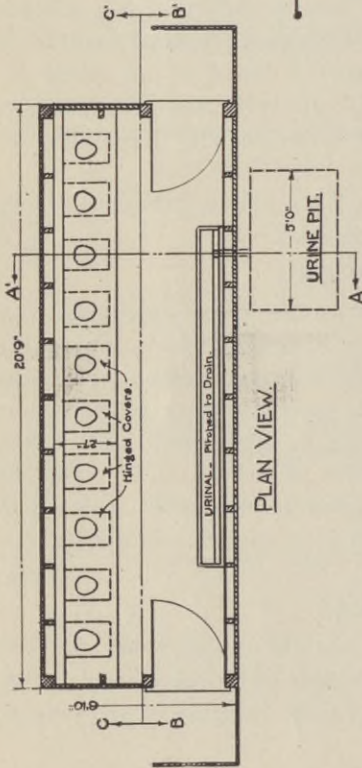
The attached drawings are suggested for privies where they are allowed.

SEWAGE DISPOSAL

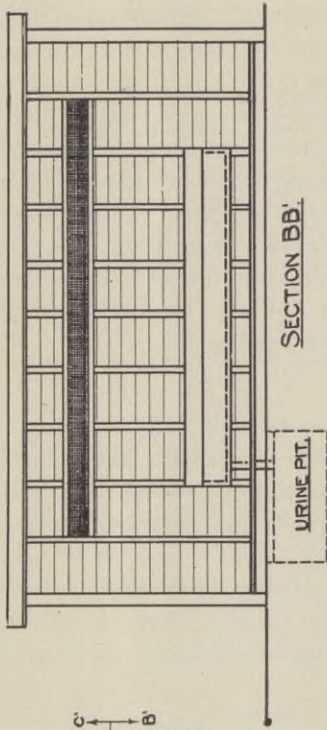
36. When excreta from toilets or wastes from sinks, etc., are carried away by the spent water supply in sewers, pollution of the receiving body of water will be caused unless proper means for sewage disposal are adopted. This may cause local nuisance or endanger water supplies or shell-fish beds, according to local conditions. Most states have legislation controlling disposal of sewage which must be complied with. The Department of Health and Sanitation will, upon request, advise as to proper procedure in each specific instance.

WASH ROOMS

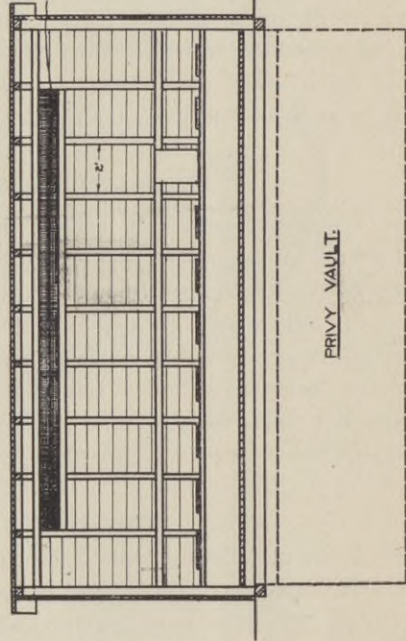
37. A suitable room for washing should be provided for employees. If practical it is desirable that this privilege should be extended to all, but it is only justice and in the interest of self-respect



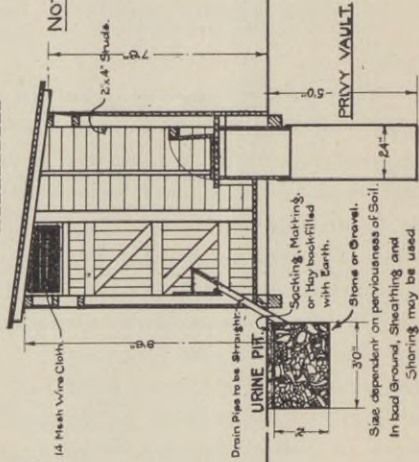
PLAN VIEW.



SECTION BB'.



SECTION CC'.



SECTION AA'.

NOTES:-

The Construction is to be of such a Character as to insure against the entrance of Flies into Privy Vault.

All openings into Privy Structure should be screened and if Privy is not built of matched boards, all joints should be battened.

There should be 3 seats for each 100 men.

TEMPORARY PRIVY.

Scale. July 23, 1918.

that employees engaged in work causing them to become begrimed should not be required to travel to their homes in that condition.

If body bathing be provided for, shower baths are preferable.

DRESSING ROOMS

38. Facilities should be provided for employees to change and store their clothing. Employees exposed to extremes of temperature or whose work causes them to become dirty, are entitled to these conveniences, as necessities for healthful and decent living.

Lockers should be of substantial construction, preferably of steel, with provisions for ventilation and having a sloping top to prevent accumulating rubbish. They should be at least twelve inches by fifteen inches in plan, and four feet six inches in height, numbered and provided with locks. Low benches should be provided to afford convenience in changing shoes.

Workers should be required to keep the lockers in a clean condition, but a janitor or other designated employee should be given charge of the dressing room and held responsible for the maintenance of entire room in a clean condition.

Some establishments have met their locker problem by the use of wire baskets raised to and lowered from the ceiling of the dressing room by a cord and pulley arrangement.

CLEANING AND DISINFECTANT

39. Rooms should be kept clean. The first essential in order to bring about this condition is to develop in the workers a spirit of pride and interest in their surroundings and a sense of orderliness.

To discourage workers from expectorating on the floor, cuspidors should be provided and cleaned at frequent intervals.

Before floors are swept they should be sprinkled with moistened sawdust to lay the dust.

Where ordinary cleaning should be followed by a disinfectant, a three or four per cent. solution in water of liquor cresoils compound (commonly called compound solution of cresol) should be used. This consists of a saponified solution of cresol. It is not a proprietary article, although often sold under various trade names.

GARBAGE DISPOSAL

40. The garbage from shipyards will be derived principally from the restaurant or lunch rooms, and from dwelling houses if they are provided for employees with families. It should be collected in covered impervious containers to avoid fly-breeding and odor nuisance and collected at frequent intervals.

If the yard is near enough to a town or city having municipal collection arrangements may be made for disposal by municipal authorities.

MANURE DISPOSAL

41. A stable on or adjacent to the shipyard makes the sanitary care and disposition of the manure a matter of importance to prevent the development of flies with accompanying danger of disease transmission by them. When this condition is found outside the shipyard, the Department of Health and Sanitation will endeavor through proper channels to cause abatement of the nuisance.

Flies are bred in decomposing materials, such as manure, and not only feed upon that material, but also upon food stuffs for human consumption. This direct connection is not only revolting to the sense of decency, but by means of their hairy legs and mouth parts they convey disease germs from the excrement to the food.

Cleanliness in stables is, therefore, essential. The floors should be impervious to moisture. The manure should be frequently removed from the stalls and kept in fly-proof pits until final disposition. Such a pit should preferably be constructed with concrete bottoms and side walls and covered with fly-tight doors, so made as to exclude rain water, but so constructed as to facilitate filling and emptying the pit. Each time manure is placed in the pit, it should be sprinkled with a solution of powdered hellebore made with one-half pound of hellebore in ten gallons of water and applied in proportion of one gallon per one cubic foot of manure; or other approved insecticide. Such solutions will largely destroy fly larvae in the manure, but will not injure its fertilizing value.

The vessel in which the hellebore solution is kept should be covered to prevent horses drinking it, as it is poisonous.

The manure should be removed from the pit at least twice a week in the summer time, and may be used as fertilizer, preferably applying it to land in thin layers. After removal, the pit should be thoroughly cleaned and sprinkled with the hellebore solution or other approved insecticide to kill any eggs or larvae of flies remaining therein.

MISCELLANEOUS REFUSE

42. In the conduct of shipyards more or less refuse and rubbish accumulates. Such general refuse should be systematically collected and disposed of. If by burning, at locations not creating any fire hazard.

MOSQUITOES

INSECTS

43. It is an established fact that mosquitoes are the means of transmission of malaria, yellow fever, dengue and other diseases. The elimination of their breeding places and their exclusion from buildings are, therefore, essential to maintain workmen in a state of efficiency at shipyards, where mosquitoes are liable to be present. While some-

times breeding places are entirely local, it is generally found that extensive areas are involved as the cause of the trouble. The Department of Health and Sanitation will use its best efforts to enlist other officials and bodies to co-operate in plans for mosquito elimination in the territory about the shipyard and the dwellings of employees.

Low land on which water collects in stagnant pools should be filled in with ashes, earth excavated from adjacent high ground, material dredged from in front of the ways or other suitable inorganic material. This materially minimizes the menace.

Where not practical to fill in low land, drainage ditches should be made to carry the water away or connected with tide water to induce currents in the water in the ditches.

The surface of quiet water may also be oiled, which, if done efficiently and continuously will destroy the mosquitoes during their larva stage. Sufficient oil should be applied to cover the entire surface with a thin film. As the oil is volatile it will disappear in a few days or wind may destroy its efficacy. Frequent applications of oil are therefore necessary.

No body of water is too small for mosquito breeding. Street ditches with flat or uneven bottom form favorable breeding places for mosquitoes and should be avoided where possible. Rain water collecting in depressions in the ground or in empty cans, inlets to sewers, etc., and water stored in cisterns or barrels all form a mosquito menace. Water tanks should be protected with mosquito-tight covers or contents covered with oil.

To prevent mosquitoes gaining access to buildings all doors, windows and other openings should be thoroughly screened with at least No. 16 (16 meshes per inch) wire netting, excepting where the yellow fever mosquito may appear in which case at least No. 18 screens should be used.

FLIES

44. As has been stated above under "stable refuse," the fly is a serious menace to health. It affords a direct means of communication from excrement and other filth to food stuffs.

The principal measure required for fly elimination is cleanliness. All garbage, manure, and other decomposable matter should be protected from flies until final disposal in a sanitary manner.

Even where care is exercised to prevent fly breeding it is difficult to entirely eliminate them and hence fly traps should be provided at places where they may be found. The Department of Health and Sanitation will, upon request, furnish information concerning methods of making and baiting fly traps.

In cases where fly nuisance exists at shipyards and the cause appears to be on adjoining premises, the Department of Health and

Sanitation will use its best efforts to effect an elimination of the trouble by enlisting the interest of officials or other bodies.

RESTAURANTS AND LUNCH-ROOMS

GENERAL DESIGN

45. A well-lighted and ventilated building adequately equipped with necessary facilities and strict cleanliness of operation are of greatest importance in maintaining sanitary conditions in restaurants and eating-houses.

The building should be located conveniently in or near the shipyard, and there should be an abundance of natural light from windows or skylights in the dining rooms and kitchen.

The rooms in which the groceries and provisions are stored should be well ventilated, dry and protected from vermin and there should be a sufficient number of shelves so that all such material may be stored in an orderly manner. All food should be securely protected from dust and dirt. No one should be permitted to live or sleep in a kitchen or dining room or other room of an eating place where food is prepared, served or stored.

In connection with all restaurants, lavatories supplied with soap and individual towels should be provided and maintained in a sanitary condition and all employees and others who handle or prepare food should wash their hands and arms thoroughly before commencing work or after visiting the toilet. Posters urging this practice should be conspicuously displayed in all toilets.

Cuspidors for use of workers and other persons should be placed wherever necessary and thoroughly emptied and washed daily with a disinfectant solution.

Convenient and adequate toilet rooms should also be provided as described herein. These rooms should be separate and apart from rooms where food is prepared or served. The floors should preferably be of non-absorbent material and should be kept clean and in a sanitary condition. The toilets and sinks should be properly connected to sewer pipes through trapped and ventilated plumbing fixtures. The sewage should be disposed of in an approved manner and not be permitted to discharge upon the surface of the ground or into adjoining open ditches. The Department of Health and Sanitation will furnish advice and assistance regarding suitable methods for the disposal of wastes such as sewage, garbage, etc.

HEALTH OF FOOD HANDLERS

46. Probably the greatest factor in the spread of disease from restaurants and eating-houses is the employee therein who is suffering from a communicable disease or who is a carrier of such infection.

For this reason, the yard physician should make an inspection of each such employee before he commences work and all persons affected with any venereal disease, tuberculosis, yellow fever, typhoid fever, dysentery, or any other infectious or contagious disease should not be permitted to work at the eating place.

KITCHEN

47. The kitchen should be given a central location, if possible, so that food may be served readily to wings on either side. Non-absorbent floors of concrete or composition are most easily kept clean, and, therefore, should be used; but wood floors may be permitted in small establishments if proper cleanliness is exercised.

Cleanliness demands that there should be an adequate supply of running hot and cold water for dishwashing and general cleaning purposes. Where a considerable number of persons are to be fed at one time, mechanical dishwashing machines have the advantage of reducing labor cost and permit a more sanitary handling of dishes, but if such equipment is not installed, the hand washing of dishes may be satisfactorily accomplished if proper facilities are provided. These should include sinks having proper provision for rinsing and drying the dishes.

FOODS

48. Great care must be taken to serve only wholesome food, as many cases of dysentery and other intestinal disturbances have been traced to spoiled food. If there is any doubt about the condition of meat or other food, it should not be served, but destroyed.

Inspected meats should be purchased, if they can be obtained. The Government annually spends several millions of dollars to inspect meats, but, unfortunately, all meats sold are not so inspected. Meat from local slaughterers, who do business entirely within the state, is not subject to this inspection.

Proper protection from tubercular infection demands that the milk supply should be pasteurized or be obtained from cows which have been tuberculin-tested within a year by a reliable veterinarian. Tuberculosis has been shown to be transmissible to man through milk infected with bovine tuberculosis and septic sore throat and diphtheria have also been traced to infected milk supplies. Pasteurization protects the consumer from such infection.

Adequate provision for refrigerating meats, milk, and other foods are essential. For this purpose, ice boxes, provided with a sanitary lining, preferably of enameled metal, and so located that the ice may be inserted without being carried through the kitchen, are desirable. These ice boxes should be thoroughly cleaned daily and a frequent inspection made to ascertain the condition of the food in them.

All food should be carefully protected from flies. Doors, windows, and other openings should be screened with wire, of not less than fourteen meshes to the inch, during the fly season. Screen doors should be self-closing and all screening should be maintained in good condition. Fly traps should be placed where flies congregate and should be properly baited as referred to hereinbefore under "Flies."

The water supply should be that used in the yard for drinking purposes, as described hereinbefore.

LUNCH-ROOM FACILITIES

49. Lunch-rooms should also be provided for the convenience of workers who bring their lunch with them. They should conform (in so far as applicable) to the requirements for restaurants given above.

In southern yards the open-side type of construction with openings screened is advisable, and in cold climates the room should be heated during cool weather.

Tables and benches should be provided for the workers' comfort. The provision of flat-top stoves permits the workers to heat coffee or other foods.

A janitor, or especially assigned employee, should be charged with the responsibility of maintaining the lunch-room in a clean condition.

If a location for the lunch-room be approved by the Advisory Engineer on Fire Protection and the Fire Marshal it is desirable to permit the men to smoke there at the lunch time.

LUNCH PERIOD

50. In accordance with recognized ideas on fatigue it is advisable that employees should have adequate time for a lunch period. The human body is a highly organized machine, and the more arduous the labor it performs the greater need for the rest period at lunch time in order that the meal eaten may furnish the maximum renewed strength for continued work.

HOUSING

GENERAL DESIGN

51. In the general design of housing facilities, whether hotels, cottages or barracks, the first consideration should be given to health and comfort of the occupants.

The standard of unit dimensions of sleeping rooms should be to provide not less than 500 cubic feet of air space, 50 square feet of floor space, 5 square feet of window opening for each occupant.

Sleeping rooms should preferably be of a size suitable for not more than two occupants and be equipped with single beds.

In and around shipyards, where mosquitoes are a menace, all windows and door openings should be provided with substantial screens of 16 meshes to the inch. The porches of all cottages and a liberal portion of the porches of hotels and barracks should be likewise screened.

SANITARY EQUIPMENT

52. The sanitary equipment should be amply sufficient for the number of occupants and installed in accordance with standard plumbing methods and the requirements given hereinbefore.

RECREATION FACILITIES

53. In hotels and barracks a suitable assembly and recreation room should be provided.

LAUNDRY

54. Laundry facilities (with standard type equipment) should be provided for all hotels and barracks where the service of a public laundry is not available.

Frequent airing of blankets, mattresses, etc., is advisable.

JANITOR SERVICE

55. The janitor and cleaning force should be sufficient to keep all hotels and barracks clean and in good order.

APPROVAL OF PLANS

56. The Department of Health and Sanitation invites the submission of proposed plans of housing facilities for its review and suggestions relating to dimensions, plans, water supply, sanitary equipment, ventilation, heating and lighting, sewage and drainage, methods of maintenance, and general plan of proposed industrial villages.

APPENDIX "A"
TECHNIC OF THE TREATMENT OF
INFECTIONS AND INFECTED WOUNDS
WITH DICHLORAMINE-T-CHLORCOSANE

PREPARED BY
DR. EDWARD MARTIN
UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA

THESE ARE THE CHARACTERISTICS OF A GOOD
SURGICAL DRESSING:

1. It is easily, quickly and painlessly applied.
2. It is easily and painlessly removed, without causing bleeding.
3. Its removal is not followed by discharge of retained exudates.

The following technic is suggested by a group of surgeons who have been intensively studying Dichloramine-T and who have clinically used it on more than fifteen thousand patients. The results are habitually better than those following the use of any other antiseptic agent.

DICHLORAMINE-T AND CHLORCOSANE ARE SOLD
SEPARATELY, IN BULK BY

THE ABBOTT LABORATORIES, Chicago, New York.

E. R. SQUIBB & SONS, New York.

MONSANTO CHEMICAL Co., St. Louis.

ROBERT McNEIL, Philadelphia.

BOOTS, London, England.

To the surface of wounds to prevent sticking either Parresined Lace-Mesh (Abbott), or wide meshed, good quality paraffined mosquito netting may be applied. The mosquito netting is cut in strips two inches wide and six inches long. Without removing the starch or sizing, it is sterilized; is then steeped in hot paraffine wax (melting point 45 degrees C.), is drained out so that the meshes are open; cooled; and wrapped, six in a package, in sterile, waxed (paraffined) paper, then in sterile gauze and so kept ready for use.

The preliminary washing of the skin is by sterile five per cent. Castile Soap Solution, or sterile neutral sodium soap solution. (Abbott).

PREPARATION OF DICHLORAMINE-T-CHLORCOSANE SOLUTION:

Put the Dichloramine-T in a perfectly dry mortar and add sufficient Chlorcosane, constantly triturating, to form a pasty mess. Then add the balance of Chlorcosane (with constant stirring) to complete mixture. When this is done, transfer to an amber colored, glass stoppered bottle, occasionally shaking, until a clear solution results. It is then ready for use. (Several hours).

Dispense in *perfectly dry dark amber bottles, glass-stoppered* and bearing the date of preparation on the label. Avoid exposure to direct sunlight. Providing it be kept in the dark, and does not come in contact with anything except the glass of the container in which it is dispensed, this solution may be kept for two months.

If a heavy white precipitate has formed at the bottom of the bottle, discard the contents, thoroughly cleanse the bottle with Chloroform, dry, and refill with fresh solution.

A slight precipitate need not be considered, but may well be removed by filtration through dry filter paper.

A chilled solution may become turbid, but clears on warming to 80 degrees C.; if the cloudiness and the deposit remain after this heating it denotes a decomposition and loss of strength of the Dichloramine.

Solutions poured out into open vessels for immediate use must not be returned to the stock bottle; nor should swabs, pipettes, or nozzles be introduced into any stock container. Decomposition once started progresses rapidly. Water and an excess of light or of heat are fatal to stock solutions.

SURFACE APPLICATION

The oily solution may be swabbed, dropped from medicine dropper or small bottle, or squirted from an all-glass syringe. If a spray be used it must be all-glass and to vaporize the heavy oily solution must be especially constructed. It is usually out of order.

All these implements must be strictly dry before being used and must be cleaned after use with chloroform.

Raw and granulating surfaces treated by Dichloramine-T-Chlorcosane are covered with strips of parresined lace-mesh or paraffined mosquito netting overlapping the surrounding sound skin. Over these strips is placed a thin gauze dressing held in place with as few turns of gauze bandage as will suffice to retain it, and make even moderate pressure.

DEEP APPLICATION

The solution may be swabbed, poured, dropped, or in the case of sinuses, injected by means of an all-glass syringe fitted to a 16 F. soft rubber catheter, or to a long glass pipette or nozzle.

If the wound be infected it should be kept open by a strip or strips of parresined lace-mesh or paraffined mosquito netting. This is cut to appropriate width and folded once cross-wise. The angle made by this fold is pressed to the deepest part of the wound, thus lining all raw surfaces. In the space enclosed by this lining is loosely laid sterile gauze, well soaked in Dichloramine-Chlorcosane. In this way the wound is kept widely open by a dressing which thoroughly drains and comes away without causing pain or bleeding.

All wounds call for:

- (a) CLEANLINESS.
- (b) AN ABUNDANT SUPPLY OF CONSTANTLY CHANGING BLOOD.
- (c) REST.

(A) CLEANLINESS

This is most essential in the deepest part of the wound, and is impossible to secure or maintain in the presence of dead tissue or foreign bodies.

A fresh wound (within six hours) is cleansed in the following manner: It is tightly packed with gauze soaked in Dichloramine-Chlorcosane; the surrounding skin is then rapidly and vigorously rubbed clean with gauze wet with sterile Castile (or neutral sodium soap) solution. This, in turn is scrubbed away with gauze wet with ether, a moment is allowed for this to evaporate, when the skin is finally swabbed with Dichloramine-Chlorcosane and wiped dry again with sterile gauze.

The tight Dichloramine-Chlorcosane packing is then removed from the wound and the latter is cleansed by swabbing with Dichloramine-Chlorcosane both before and after the removal of obvious dirt, and the excision of badly bruised or dead tissues.

Incised wounds, after cleansing, are closed by widely interrupted sutures going to the depth of the wound, and securing apposition of raw surfaces without suture tension. A blanched skin about a suture practically assures death. Pressure Necrosis.

Contused and lacerated wounds, after cleansing with Dichloramine-Chlorcosane, and resection of devitalized skin and deeper tissues (freely bleeding and clean, healthy surfaces being the signs of vitality) are also closed by widely placed, interrupted sutures going to the bottom of the wound, or by catgut layer sutures.

Such wounds are closed only when this can be accomplished without tension; otherwise they are kept open wholly or in part by a strip or strips of lace-mesh or of paraffined mosquito netting folded crosswise, the fold being carried to the deepest part of the wound and the angle made by it being lightly filled with the gauze soaked in Dichloramine-Chlorcosane.

Infections (boils, abscesses, carbuncles, etc.) are treated, after surface cleansing with sterile soap suds, ether and Dichloramine-Chlorcosane, by openings so placed and so free that more than twice the access deemed desirable is afforded. (An infection treated by too large an incision is a surgical rarity; one treated by too small a cut is the rule). These incisions should not include flexure creases of the palm and fingers.

The cavity is then flushed with Dichloramine-Chlorcosane and drainage provided by means of folded strips of parresined lace-mesh, or of paraffined mosquito netting, carried to the deepest part of the wound, the folds being lightly filled with gauze soaked in Dichloramine-Chlorcosane.

Large granulating surfaces, as from burns. The whole surface sprayed or swabbed or irrigated with Dichloramine-Chlorcosane. Then overlapped by a double layer of paraffined mosquito netting. Over this an absorbing dressing of gauze. Moderate and even pressure by bandage. Always splinting when applicable.

(B) AN ABUNDANT SUPPLY OF CONSTANTLY CHANGING BLOOD

This implies the avoidance of

1. Tension; as from sutures, too tight packing, or retained discharge.
2. Too tight bandaging.
3. Pressure on or over the wound or area of inflammation, as by a splint.

(C) REST

This implies the splinting of all wounds and inflammations, excepting the most superficial ones not in the region of joints. The splint should fix, should be comfortable, and should not be applied to the wounded surfaces.

REDRESSING

The surface dressing, a light one of sterile gauze, is changed when soiled with wound discharge.

Incised wounds which do well are redressed on the fifth day, when sutures are removed (one to two days on the face). Should infection develop, remove the sutures and dress daily as for infected wounds.

Contused and lacerated wounds. Treat as for incised, if primarily closed; if infected, daily dressing.

Boils, abscesses and carbuncles. Daily dressing. Twice daily if large sloughs. Surface wound kept open by paraffined lace-mesh drainage till the cavity is filled with healthy granulations.

