APPENDICES

APPENDIX XII.

SANITATION OF CAMPS AND MAZDORS' LINES.

Measure to be adopted for preserving the health of the workers.

The essential requirements for the maintenance of the health of workers are housing and ventiltaion, food, water and conservancy.

2. *Housing and ventilation* :—In the first place the selection of a suitable site s of the greatest importance. This should always be done in consultation with the Director of Public Health. High and dry ground having a natural slope is the ideal site for houses and ought to be chosen wherever possible. The neighbourhood of jungle, rank grass or vegetation and places, having a high sub-soil water-level should particularly be avoided as they are likely to be malarious. When naturally high and dry ground cannot be procured, special attention should be paid to surface drainage, and if necessary, to the sub-soil drainage of the site.

After the site is selected, the lay-out should be prepared in consultation with the Director of Public Health. Roads and house-plots should be carefully marked out. Main roads should have a minimum width of 25 feet (7.5 m) at intervals of every 300 feet (90 m), secondary roads having a minimum width of 20 feet (6 m.) should be provided. The object of providing main and secondary roads is to secure free perflation of air. Stagnation of water should be prevented by providing drains of proper gradient on the sides of the roads. The waste water including sullage and sewage should be disposed of properly as for example, by irrigation on suitable land and then discharging the effluent if any, into a water course not used for drinking purposes.

Huts can easily be constructed at small expenses in most parts of the country and will be sufficient for the accommodation of the workers. They should be constructed in regular lines facing the main and secondary roads. Back-to-back huts must never be permitted. It is very important that there should be no overcrowding. As in large works of a permanent or semipermanent nature, the work people usually migrate with their families, the huts should be of a sufficient size for the occupation of a family. Ordinarily, a hut should consist of a room not less than 12 feet x 10 feet with a front and rear verandah having a minimum width of 5 feet, the eaves being not less than 5 feet from the level of the basement. A portion of the baek verandah may be partly enclosed by a honey-combed wall in order that it might be used as a kitchen. The main room should be provided with two windows not less than 3 feet x 2 feet each. It woulds be advantageous to have one or two cupboards in the walls for keeping articles of food; this will also help to keep the huts free from rats. In camps which are expected to be occupied for a considerable period, the structural detaile can be improved. Every possible care should be taken to see that the huts ars kept clean and in proper order.

In projects where large number of women labour are engaged crehes should be provided for the children of working women. Temporary buildings may be constructed at situable points in the work site. A female attendant is to be incharge of the creche and the Panchayat Union should see to the payment and upkeep of the creches.

3. *Food* .. In most parts of the State no difficulty will be experienced in getting a sufficient supply of good food. No special arrangements need be made in the case of camps where the workers can obtain their food supplies without difficulty from a neighbouring market. Where no such facilities exist, it is necessary to establish a bazaar and to provide for the sale of wholesome food in sufficient quantity. Besides the ordinary articles of diet such as rice dhall, oil, condiments, etc., a sufficient variety of other foodstuffs such as meat, flesh, eggs, milk and fresh vegitables should be available.

The croping up of mushroom tea stalls on the road side nearly the camd should not be allowed. Even while the layout of the camp is prepared arrangements should be made for locating hotels, tea stalls etc., for the selling of foodstuffs under hygenic conditions for the use of labourers within the easy approach and at the same time, the stall should be so iocated that they do not prove a nuisance to the residents of the camp. Type design buildings for such hotels and tea stalls may be built and leased out for carrying on such trades. A suitable number of such buildings at various points in the protected area to serve the needs of the labourers in different points of the camp should be thought of Fifteen metres alround eating establishments, should be kept scrupulously clean. This work and the supply of protected water supply to such establishment should be provided at the project.

4. *Water* : The provision of a good and pure drinking water-supply is of the utmost importnace in maintaining the health of the work people. All proposals and plans relating to drinking water-supplies should be submitted to the Director of Public Health and the works started only after his approval is obtained

The best sources of drinking water-supplies are deep wells. Failing these, tube-wells are next best. Shallow wells, tanks and rivers are dangerous sources on account of their liability to pollution and should as far as possible be avoided.

The sites for the sinking of wells should be selected with care. They should be kept free from any chance of contamination by sewage or other filth. The natural slope of the ground will assist in determining the sites for wells.

The sites having been chosen, the question whether the construction of a deep well, a tube-well or a shallow well is feasible and whether the soil yields portable water, should be decided by a preliminary inspection of existing wells in the locality or by boring operations ;

Provided conditions are favourable, preference should always be given to deep wells. If this is not possible, tube-wells should be sunk. Only when conditions for the sinking of deep wells or tube-wells are unfavourable should shallow wells be constructed. If on account of the saline nature of the soil, wells yielding fresh water cannot be constructed, tanks and rivers should be resorted to as the last alternative. Bathing or washing should be completely prohibited in the case of tanks set apart for drinking purposes. Where river water has to be used. tube-wells sunk in the banks are often successful. It must be recognized that river water is always polluted water and before using it some method of purification is essential

Wells, deep or shallow, should always be lined with masonry or cutstone and the inner surface of the lining should be impervious. The wells should have a parapet wall of not less than 3 feet in height and have a masonry cemented platform to a minimum width of 6 feet all round. Suitable drains with proper gradient for the disposal of waste water should also be provided, the spill water being disposed of in a garden laid out for the purpose in the neighbourhood of the well or in filter trenches situated at a distance of not less than 100 feets from the well. Bathing or washing should not be allowed in or near any drinking water well. A separate well may if necessary, be provided for these purpose In the case of tube-wells platforms and drains are also necessary. Directions given for the prevention of bathing and washing equally apply to tube-wells.

The best method of distributing drinking water from wells, tanks and rivers is to raise the water by means of pump driven by an oil engine, gas engine, steam engine or electric motor, as may be most convenient, to a high level reservior or from tank of sufficient size from which pipes with delivery taps can be laid to all parts of the camp. The arrangements should be adopted especially in the case of large camps. The next best alternative for obtaining water from these sources is by means of hand pumps or water elevators similar to those described in G. O. Ms. No. 248, P. H., dated 5th February 1926. As a tecnnical staff is always attached to works of any considerable size. skilled labour will always be available to look after the pumps, and no difficulty need therefore be anticipated about their upkeep and repair. If, for any reason. power pumps, hand pumps or water elevators cannot be used, the source must be chlorinated before water is distributed. Wells should be provided with pulleys and the water drawn by means of public buckets and ropes the use of private vessels being strictly prohibited. The removal of water by these method should be adopted even in the case of tanks and rivers; this may be done by constructing one or more revetments on which the pumping installation or scaffolsding for pulleys may be erected.

The object of these arrangements is to prevent as far as possible the contamination of drinking water and the spread of water borne disease.

As a general precaution the people living in the camps should be advised to boil all drinking water before it is used. This remarks applies with special force to water derived from tanks, rivers and shallow wells.

5. *Conservancy* —The camps and their vicinity should be kept clean at all times. For sweeping roads and pathways, menials should be employed at the rate of one sweeper for 750 people. In the case of larger camps, maistris should be employed to supervise the work of menials at the rate of one maistri for every 12 menials. For smaller caspm at least one maistri should be employed in any case. One Sanitary Inspector should be appointed for every 3,000 persons living in a camp.

Public dust-bins should be provided at intervals of every 300 feet for the temprary storage of road-sweepings and domestic rubbish pending their removal by conservancy carts. Hand-carts or bullock-carts should be employed for the removal of refuse to a central dumping ground. The best method of disposal of sweepings at the rubbish is by burning. Cheap incinerators similar in design to the ordinary lime kiln will serve this purpose. If incineration is not feasible and if there is a demand for refuse, it may be sold on condition that it is removed at once. Otherwise it should be covered over with a layer of 12-18 inches of dug earth in order to prevent nuisance and the breeding of flies. Promiscuous dumping of rubbish should not be permitted on any account.

Public latrines should be of the sanitary type with water seal squatting slabs and pucca septic tank as far as possible. Separate latrine accommodation should be provided for two sexes. The minimum requirement is one each for every 25 people. Scavengers should be in constant attendance to keep the latrine clean. The filths and rubbish should be disposed of as far as possible by composting. If due to unavoidable reasons dry earth latrines have to be provided the filths should be desposed of only composting under proper supervision and in consultation with the District Health Officer.

Separate latrine accommodation should be provided for the two sexes. In the case of large camps where they are expected to be in existence for some years, permanent masonry type design sanded latrines should be built. The minimum requirement is one seat for every 25 people. Scavengers should be in onstant attendance to keep the atrine clean. In the case of permanent or semi-permanent latrines, hand-carts with metal drums should be provided for removing the excreta to a trenching ground. Trenching ground should be selected with care and in consultation with the District Health Officer and should be situated at a considerable distance from the camps. The trenches should not be more than 18 inches in depth 12 inches wide and the length of the trenches should be ordinarily be 20 feet. A distance of 2 feet should intervene between adjacent trenches. Nights oil should be deposited in the trenches to a depth of not more than 6 inches andit should be immediately covered over with the earth previously removed from the tench. The trenches should not be disturbed for atleast six months or until such time as is necessary for the complete disintergration of the faecal matter. Ground which has been once used for trenching should be-suitably cult ivated before being again brought into use. Approximately one acre is required for every thousand persons. In the case of less permanent camps, shallow trenches enclosed by thatti screens are the best. The remarks previously made regarding the distance of latrines from drinking water sources apply specially to this type. Every morning one or more fresh trenches should be dug according to requirements.

The trenches should not be more than 18 inches deep and every time the trench is used, a quantity of earth should be thrown over the stool. At the closs of each day. the trenches should be completely filled in. Used trenches should be suitably marked in order that the ground may not be again opened up before complete decomposition has taken place.

6. The provision of lighting arrangements should not be lost sight of in constructing workmen's camps.

7. Medical Relief —Wherever any large body of workmen is collected, g small dispensary manned by a medical unit consisting of a Civil Assistant Surgeon, a compounder, a ward-boty and a toti are necessary. In project areas where a large number of women are employed, a female nurse and a mid-wife would also be included in the Medical unit.

In most cases, however central establishment will be sufficient for several miles of work. The dispensary should ordinarily be reserved for treating accidents and cases of a trifling nature in which early recovery is expected. As a rule, it is advisable to transfer person suffering from any serious illness to the nearest station where there is a well-equipped hospital. In this connection a motor ambulance will be found very useful especially when a large body of workers is employed.

8. The dispensary referred to in the previous paragraph is for the treatment of simple ailments. Diseases which are liable to become epdemic require separate and special consideration. Under this head, the following diseases have to be considered.

9. (i) *Cholera* :—The appearance of even a single case of cholera should receive immediat attention. The officer incharge should promptly notify the occurrence to the Health Officer. the Health Inspector and the Medical Officer. The following. precautions should be taken in connection with the patient :—

(a) He should be removed without delay to the Infectiou Diseases or Isolation Hospital, If no such hospital exists the patient should be isolated. in a separate hut or preferably in a shed specially put up for the purpose, and communication with the rest of the camp should be forbidden.

(b) The germs of cholera are excreted in the stools and vomit of the patient and are also present in soiled clothing. The discharge should be received in paddy husk or saw dust mixed with kerosene oil or cresol and then burned. If the discharges be voided upon the ground, straw should burned on the spot and a strong solution of cresol (1 in 200) should be subsequently poured over it. The earth should then be dug up and removed and fresh earth provided.

(c) All soiled bedding and mats, rags and clothing should be burnt. If, on account of the cost of the articles, burning is objected to, they should be soaked in a solution of cresol (1 in 400) and subsequently boiled in water for 15 minutes.

(d) Vessels and other articles used by the patient should, before removal from the room, be soaked in disinfecting lotion and boiled in water for 15 minutes.

(e) The patient should be isolated for at least three weeks afterc convalescence, in the absence of proper bacteriological tests.

(f) Every infected hut and its contents should be treated with cresol

(g) No washing of clothes, utensils or persons, especially from a house in which a case of cholera has occurred should be allowed in or near any watter source or in any situation from which the washing water is likely to flow into such soureess.

(h) Care should be taken not to allow flies to settle upon the patient or his discharges as these insects readily convey the germs of cholera to milk and other foods, and spread infection.

(i) The number of attendants on the sick should be kept at a minimum They should be very careful about their personal cleanliness. Their clothes whenever soiled with cholera discharges should be at once disinfected. When leaving the patient, they should wash their hands in cressol lotion and then with soap and watter. They should not be allowed to prepare food either for themselves or for others.

(j) No food should be part taken on the sick room either by the attendants or by any body else. Chewing of betel leaves there is also dangerous.

(k) Early treatment is of the greatest importance. The best modicine or this purposes are Mistura Pro Diarrhoea (10 to 15 drops every 15-30 minutes till the diarrhoea stops) and Sulphaguandine tablets. This treatment should be continued until the arrival of the Medical Officer.

(l) The bodies of persons who have died of cholera should be carefully and throughly burned. If they have to be buried, this should be done at a considerable distance from wells, tanks and steams. Burials should not be permitted in ground sloping towards water supplies. Then men engaged in the removal and disposal of the corpse should disinfect their hands and clothes mmediately after their work is finished and before they take any food.

(m) There must be no funeral feastin the hut in which a death from cholerra has occurred.

As soon as a case of cholera occurs, the Health Officer should institute without delay careful and exhaustive enquiries in order to determine the soure of infection and and prevent firuther infection from the same source.

The following facts regarding the origin and spread of cholera and the means of its prevention should be remembered :—

(1) Water is the most usual means by which infection is conveyed. If the outbreak is of explosive violence, it is certain that the infection has been conveyed by the general water-supply. If the outbreak persists, the indication is that more than a single pollution of the water has occured. If the outbreak is more limited, it may be due to some less general vehicle, such as dirty pool from which only a certain number have drunk, or some contaminated food of which only a certain number have partaken. But there is always urgent danger of a subsequent contaimination of the general water-supply.

(2) The most minute attention should there fore be paid to the purity of water-supply. All wells should be chlorinated or treated with potassium permanganate daily until all danger has disappeared.

(3) If a well of other source appeals to be in the origin of infection it should if possible, be put of use for the time being and for long as long as any known source of pollution continues to act. A polluted well should not be, naken into use again until it has been emptied, cleaned out, and chlorinated ar disinfected with potassium permanganate.

(4) When a pure or disinfected water has been provided, every effort should be made to see that it is alone issued. Dirty or suspected pools, tanks, wells, etc., should be filled up or rendered inaccessible: or the water in them may be rendered underinkable by adding coal-tar, kerosene, or any other similar odorous non-poisonous substance which impairs its palatability.

(5) Cholera germs are easily killed by bolling. People should be advised to drink nothing but boiled iwater.

(6) Vessels used for cooking, eating, and drinking should be throughly scrubbed and washed with clean boilerd water.

(7) Cholera is frequently conveyed by flies which carry infection from filth to food. The dangers of fly infection should be pointed out to the people and they should be advised to keep all articles of food and drink properly covered up.

(8) All food should be eaten freshly cooked and hot and cold food cooked the previous day should be avoided. Such food is frequently very dangerous as flies may have carried cholera germs to it and infected it.

(9) Raw and unripe or over-ripe fruit predisposes to cholera nd therefore should be avoided when cholera is present or thereatens to appear

(10) It is a good arrangement. if possible, to have a separate bazaar for the camp in order to have proper control over the articles sold therein.

(11) Every one should be warned to report at once any diarrhoea, however slight it may be, so that it can be promptly treated. Even if the attack does not happen to be actual cholera, it is the most frequent precurs or of the disease and demands immediate treatment. As persons with apparently slight ailments do not always realize the improtance of going to the Medical Officer, it is a good plan to have pre-diarrhoea mixture, cholera pills, etc., in the hands of the more intelligent overseers and contractors for distribution to those who need them. But these men should be definitely instructed to keep the Medical Officer informed of what is going on.

(12) Careful attention should be paid to the general sanitary arrangements of the camp and of the houses. The more perfect they are, the less the risk of spread of infection by flies.

(13) It is absolutely necessary to have suitable latrine arrangements, and to see that every one uses the latrine, and does not resort to the banks of the streams or tanks, etc., for purposes of nature. The latrine should be kept clean at all times and disinfected at least once in 24 hours with cresol solution. The staff of latrine sweepers should be sufficient to ensure that every motion is immediately covered up with dry earth or disinfected and that the latrines are always kept clean and tidy. These instructions should be carried out with method and intelligence.

(14) As fatigue lowers resistance to disease, people should be encouraged to take proper sleep and rest and not spend the nights in singing, tom-toming and so forth.

(15) Great care should be taken to prevent the importation of the diseases from neighbouring infected villages. If it can be arranged, no food supplies should be brought in from such villages. Any supplies so received should be boiled or cooked before use.

(16) All persons coming or returning from infected villages should be kept under surveillance for ten days.

(17) In cases of necessity, additional medical aid should be called for without delay.

(18) The officer incharge should by his example show his men that he himself believes in the measures that he recommends.

(19) Every attempt should be made to protect the workers and their families with anti-cholera vaccine. Inoculation causes practically no pain or discomfort and it protects the indivitual against infection for some months. The vaccine may be obtained from the King Institute of Preventive Medicine, Guindy. The District Health Officer will make arrangements for obtaining the vaccine and carry out of the inoculations.

(20) In seasons of the year when cholera may be expected to breakout, although no cases may have occurred, it is wise to anticipate possible outbreaks by attending to the sanitary rules mentioned in the above paragraphs.

(21) A daily report of cholera and other infections diseases should be submitted in the annexed form by the Officer incharge of the camp to the Health Inspector, Medical Officer, District Medical Officer, the Director of Public Health, the Engineer superintending the works and the Chief Engineers.

Daily report of Cholera / Small pox / Plague / Relapsing fever — Camp / Village

Date	Attacks	Deaths.	Up to date of Attacks.	Up to date of Deaths	Remarks as to source of infection, preventive measures adopted etc.

Station ..

Dated ..

(Signature)

(Designation)

To

The Health Inspector.

The Medical Officer.

The District Health Officer.

The Director of Public Health, Madras

The Engineer incharge of the Works,.

The Chief Engineer.

(ii) *Small pox*:—As a rule, this does not occur in epidemic form among adult All new-comers to the camp should, however, be re-vaccinated without delay. When workmen bring their families with them, all children should be vaccinated or-re-vaccinated with as little delay as possible. On the appearance of a case of small-pox, no matter how slight it may be, the patient should be isolated in the manner indicated in the previous paragraph. All contacts should be re-vaccinated and kept under surveillance for a period of 14—18 days. Arrangements should be made for the attendance of the patients removed to the isolation shed. persons selected for this purpose should themselves be protected against small pox either by having had an attack of small pox previously or by recent re-vaccination. The Medical Officer of the camp should take all measures for the treatment of patients and the disinfection of infected materials. Conscents should be provided with new clothing. After convalescence or death, the patient's clothing and all other infected articles should be burnt. By strict attention to these instructions the changes of the disease assuming an epidemic form will be averted. In the event of an outbreak of small pox a vigorous vaccination and re-vaccination campaign should be undertaken under arrangements with the District Health Officer.

(iii) *Plague*.—The occurence of plague in human being is invariably preceded by rat-falls and excessive mortality among rats. This is due to the fact that plague is chiefly a disease of rats. The rat-falls leave the rat when it dies of the disease and may bite man and infect him.

The occurrence of any rat-fall or of a case of plague should be reported immediately to the Health Inspector, Medical Officer and Health Officer. Rats can be excluded from the house by strong food grains properly and keeping the house and surroundings free from refuse and remains of food. Rat traps and poison baits shoals also can be used barium carbonate in the form of pills being the most efficient poison be used, barium carbonate in the form of pills being the most efficient poison to use. The importation of food granis from plague-infected areas should as far as posible be avoided. If, however, there is no other source of supply the grain bags must be opened up and the grain exposed to the sun before it is taken into the camp. As soon as plague occurs every person should be inoculated with anti-plague vaccine as soon as possible. The Health Officer will arrange to get the vaccine from the King Institute, Guindy and carryout the inoculation. Such persons as refuse to be inoculated should be segregated in a health camp specially consturcted for the purpose.

When plague cases have occurred in small houses or huts, the roofs should be removed and the interious exposed to the sun. Any rats found should be killed and put in boiling water or burned in kerosene oil. In the case of pakka buildings, the roof of which cannot easily be dismantled disinfection should be carriedout with kerosene oil emulsion which will be prepared and supplied by the Officers of the Public Health Department.

Detailed instructions for the prevention and control of plague will be found in the Madras Plague Regulations.

(iv) *Malaria.*—If the camp is situated in a water-logged area or any other locality where malaria is likely to be prevalent, special precautions are necessary to safeguard the health of the labourers, lest the efficiency of the operations in the works should suffer. Malaria is conveyed by mosquitoes which breed in the water of tanks and rivers and even in small collections such as are to be found in chattis, tins, old pots, etc., in and near the houses. Any tanks, wells, pools in or near the camps should be kept free from vegetation and should be oiled at least once a week. People should be instructed not allow water to collect in tins pots and such vessels in their huts or in the vicinity and any failure to carryout instructions should be severly dealt with.

When an undue prevalence of malaria is anticipated or is in existence a plentiful supply of quinine both for treatment and for prophylaxis should be maintained.

(v) *Relapsing fever*.—The germ which produces relapsing fever is spread by the bite of the louse. Personal cleanliness, especially that directed towards the destruction of lice, is the most important preventive measure. Persons barbouring lice should have their hair cropped. If there is any objection to cropping, kerosene oil or vinegar (kadi) should be rubbed into the hair, which should then be combed with a fine comb. The clothing should be immersed in boiling water for ten minutes and then dried in the sun. If an epidemic of relapsing fever occurs, a sufficient quantity of salvarsan should be obtained for the treatment of patients

10. The question of medical supervision has been referred to in paragraph 7 and 8 supra. It is advisable, as has already been stated, that a medical officer with a small dispensary should be attached to each large gang or set of gangs of workmen, A weekly report should be submitted by the Officer-incharge of the dispensary to the District Medical Officer who should effect regular supervision of the work done by the former.

11. Duties of the Superintending Engineer:—It will be the duty of the Superintending Engineer to see that all orders connected with the health of the camps are duly carried out. Contractors in charge of gangs of mazadoors should be compelled to see that all orders laid down by the Officers of the Medical and Public Health Departments are duly carriedout.

12. Cost of sanitary measures to be debited to Contingencies of Estimates:—Any reasonable outlay for such temporary shelter as may be needed for bodies of work people of considerable magnitude; and the marking out, clearing and draining of their temporary station; also for entertaining temporary establishments to lookafter the latrines, policemen and Hospital establishments, will be authorised by the State Government as forming part of the contingent outlay on the work under execution.

(*G. O. Ms. No.* 1333, *W., dated* 24*th September* 1926 *and No.* 129 *W., dated* 19*th January* 1927).