

# SANITATION MANUAL

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## Policies and Procedures for the Orientation and Training of Sanitarian Interns

No later than the second week of employment with the Environmental Health Division of Guilford County Department of Public Health, the sanitarian intern shall be enrolled in a State approved orientation program for new sanitarians.

Upon successful completion of the State approved orientation program, the sanitarian intern will begin a planned course of intensive on-the-job training. The successful completion of this phase of training requires that the sanitarian intern demonstrate a satisfactory mastery of technical application in field situations and an understanding of department policy and procedures.

Upon the successful completion of this phase of training the sanitarian intern will be evaluated by the Division of Health Services for temporary certification.

Within 60 days of employment the sanitarian intern will make application to the NC State Board of Sanitarian Examiners for registration as a sanitarian intern.

Within the first two years of employment the sanitarian intern shall be required to successfully complete the following in-service training courses:

1. CDC Homestudy Course 3010-G (or its equivalent as approved by the Division.
2. North Carolina State University Food Protection Short Course  
and/or
3. Sanitation Branch Soil Workshop.

Within the first three years of employment the sanitarian intern must successfully complete the required in-service training and become registered by NC State Board of Sanitarian Examiners.

Policies and Procedures for the Continued Training of Sanitarians

Within the first five years of employment a sanitarian shall be required to successfully complete the following in-service training courses:

1. CDC Homestudy Course 3013-G
2. Public Health Law Course
3. One other continuing education course or an approved course offered by a college or university

After five years of employment sanitarians must continue in-service training by attending a minimum of 10 instructional clock hours per year as approved by the Director of Environmental Health.

S A N I T A T I O N    M A N U A L

LETTER NO. 1

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Organization of Sanitary Engineering Section

In order to provide information relative to the responsibilities of the various Branches of the Sanitary Engineering Section, Division of Health Services, Department of Human Resources, the following is a brief description of the organization of the Sanitary Engineering Section:

1. The Engineering Planning Branch is a multi-unit Branch. The Plan Review Unit reviews plans and specifications and develops design standards for water systems, sewage treatment systems (as specified in G.S. 130), swimming pools, commercial food-handling equipment, hospitals and institutions. The Water Supply Grants Unit deals with those units of government that make applications for water system construction grants. The third unit, known as the Regional Water Supply Planning Unit, deals with the planning of area, county, or regional water supply systems. A copy of all documents receiving approval or processing by these units is kept on permanent file.
2. The Sanitation Branch is also a multi-unit Branch. The Milk Sanitation and Shellfish Sanitation Units have responsibility for those programs respectively. This Branch also has responsibility for food, lodging, private and state institutional, migrant labor camp, vending, and child day care sanitation; and promotes protection of

private water supplies, environmental surveys, rural sanitation; and renders assistance to local health departments on problems involving the enforcement of sewage disposal regulations as specified in Chapter 130 of the General Statutes. This Branch has responsibility for evaluation of local environmental health programs, orientation, training, and authorization of local sanitarians. In many instances, the district sanitarians exercise technical supervision over the work of the local sanitarians.

3. The Solid Waste and Vector Control Branch is responsible for the development of standards for the establishment, location, operation, maintenance, use and discontinuance of solid waste disposal sites and facilities and the enforcement of such standards. Technical assistance and recommendations for the control of mosquitoes, flies, fleas, rats, and other disease vectors of public health significance are provided to the local health departments through the Salt Marsh Mosquito Control and Vector Control Programs. The administration and enforcement of the Bedding Law is a responsibility of this Branch.
4. The Water Supply Branch is concerned with public water supply - source, treatment, and distribution - sewage treatment as specified in G.S. 130, engineering investigations, swimming pools, maintenance of water treatment records, inventory data, consultation and assistance to local health departments with any other problems relating to public health engineering.

## SANITATION MANUAL

LETTER NO. 2

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Interpretation of Requirements and a Discussion of Restaurant Sinks. Item 13 of Restaurant Regulations

### INTRODUCTION

Since the original edition of this letter, February 25, 1948, there have been several changes in the restaurant regulations, including elimination of the Satisfactory Compliance material. Numerous developments in dishwashing machines have created an entirely new area of concern. The topic of dishwashing machines will be presented in a separate letter entitled "Mechanical Dishwashing." This letter has been developed in order to identify the types of restaurant sinks which will adequately serve the restaurant operation and satisfy the "Rules and Regulations Governing the Sanitation of Restaurants and Other Foodhandling Establishments."

### DISHWASHING SINK

#### a. General Sink Requirements

The "Rules and Regulations Governing the Sanitation of Restaurants and Other Foodhandling Establishments" state that hand dishwashing shall consist of an approved heavy gauge three compartment sink of adequate size and depth, with hot and cold water service for each vat, splash

back protection continuous with the sink and drainboards on each end of ample size to accommodate the number of eating and drinking utensils involved.

The following is recommended as a minimum sink for dishwashing purposes: three compartment 18" (width), 21" (front to back) and 14" (depth), 14 gauge stainless steel, all joints and seams smooth, easily cleanable, legs with adjustable bullet feet, rolled or otherwise smooth edges, lever operated drains, and similar qualities of good workmanship. Drainboards of sufficient size (minimum 2' length) to accommodate at least two dish baskets should be provided on each end of the sink. An adequately sized booster heater (see d) must be provided, and an appropriate thermometer must be included.

b. Compartment Size

How wide should each compartment be? There must be ample room to allow easy movement of the dish baskets and also ample room to avoid lacerations of the dish washer's knuckles through contact with the sink partitions. The 18" width compartment is a minimum, since the available basket sizes (14" x 14" x 8", 14" x 16" x 8", 15" x 15" x 8", 16" x 16" x 8") allow little room to spare.

What should be the front to back dimension? The space necessary for the installation of the combination supply faucet generally requires approximately 3", thus if a 21" minimum front to back dimension is required, approximately 18" will be available for dish basket clearance.

What should be the depth of each compartment? The minimum depth of 14" seems realistic in that this depth permits the filling of the

compartment with an adequate amount of water (12" depth) to completely submerge all dishes without splashing water overboard.

c. Drainboard Dimensions

Since the dimension of drainboards vitally affect the effectiveness of the dishwashing procedure, much consideration should be given to what is meant by "drainboards of sufficient size to accommodate the dishes." Too frequently, this consideration has been overlooked.

The drainboard for dirty dishes should be sized to adequately accommodate dirty multi-use utensils during the period of greatest demand. If the space is inadequate, dishes are needlessly broken, leftover food falls into the wash compartment, and space is not available to locate the basket receiving the recently washed dishes. Understandably, ineffective dishwashing is the result. A restaurant with even a reasonable amount of business requires 4' to 6' and more drainboard space for dirty dishes.

The length of the drainboard necessary for clean dishes may be less than that for dirty dishes. Realistically, in all cases except the smallest of foodhandling establishments, space is necessary to accommodate two to four dish baskets. Additional space is needed for the sorting and stacking of clean dishes. Based on the predetermined 4' to 6' dishboard for dirty dishes, a 3' to 6' drainboard for clean dishes would be satisfactory.

d. Booster Heaters

A booster heater that will maintain water at 170° F. or above must be located in the third compartment of the dishwashing sink. For a sink with compartments measuring 18" x 21" x 14", a 6 KW electric



immersion-type heater, or a 6 KW electric side-arm heater, a 30,000 BTU gas side-arm heater, or water heated by steam under pressure has been determined to be effective. Due to poor circulation of adequately heated water (170° F.) by some side-arm heaters, the immersion-type heater is more efficient.

e. Suggested Manual Dishwashing Procedure

The procedure recommended for washing dishes normally is as follows:

1. After a thorough scrapping, wash in warm water (110-120° F.) plus detergent in first compartment.
2. Stack dishes in a draining position in a long handle immersion type dish basket which is situated on the drainboard for dirty dishes (usually left hand drainboard).
3. After the basket is filled, then rinse dishes by several up and down movements in the relatively clean hot water (120-140° F.) in the second compartment.
4. After rinsing, completely submerge dishes by placing basket in the clean hot water (not less than 170° F.) for at least one minute in the third compartment.
5. Remove basket with dishes from the third compartment and place on the drainboard for clean dishes (usually right hand drainboard).
6. Allow dishes to remain in dish basket until dishes have had adequate time to drain and air dry.

### GLASS WASHING SINKS

A limited number of glasses can be effectively washed in the three compartment sink utilized for the washing of dishes and silverware; however, in larger restaurants and institutions, separate facilities are required. Bottlenecks and ineffective cleaning of glasses and eating utensils can be readily noted when a restaurant with a large volume of business attempts to wash glasses and eating utensils in a single three compartment sink. Three compartment sinks utilized for glass washing should conform to the same construction requirements as three compartment sinks utilized for dish washing. In all situations, some type of glass brush must be provided.

If a cold water glass washing machine (which washes and sanitizes) is utilized for glass washing, at least a single compartment sink must be provided. An adequate drainboard for the operation of the machine and an additional drainboard for the racking and drying of glasses must be provided.

### POT AND PAN WASHING SINKS

Pot and pan washing sinks are required in restaurants. Pot and pan washing sinks must conform with construction standards previously mentioned, and they must have at least two compartments, each of sufficient size to accommodate the largest utensil to be washed therein. Drainboards, sufficient in length to accommodate at least several utensils, must be provided.

For large food service operations, especially for institutions such as hospitals, large nursing and rest homes, sanitariums, sanatoriums, orphanages, and educational institutions, adequate facilities must be provided for the washing, rinsing, and sanitizing of utensils used in the preparation and storage of salads made of meat, poultry, potatoes, fish, shellfish, or eggs and other potentially hazardous foods.

### VEGETABLE PREPARATION SINKS

When the type of business justifies, vegetable preparation sinks are required. Construction standards are the same as for other types of sinks; therefore, stainless steel is preferable. Two compartment sinks with a drainboard on both ends and/or installed as an acceptable unit in a work table are recommended.

## SINKS FOR SINGLE SERVICE ESTABLISHMENTS

The "Rules and Regulations Governing the Sanitation of Restaurants and Other Foodhandling Establishments" state "when only single-service eating and drinking utensils are used, at least a single vat sink of adequate size with sufficient drainboard space on each end shall be provided." It should be emphasized that the single-compartment sink is not acceptable if any multi-use spoons, forks, or coffee cups are used. Under such circumstances, dishwashing facilities complying fully with the regulations must be provided unless the type of service is changed to 100% single service. It should also be emphasized that the modern foodhandling establishment utilizes a few pots and pans, thus creating the requirement for a pot and pan washing sink instead of a single vat sink.

Sinks for single-service establishments must meet the same construction standards as dishwashing sinks but may vary in size. The compartments should be of sufficient size to accommodate the largest utensil washed therein; thus eliminating the acceptability of shallow porcelain enamel sinks for this type establishment. Likewise, the drainboards must be long enough to accommodate several utensils. Also, in most situations, the provision of a two compartment rather than a single-compartment sink has more than justified the additional cost.

S A N I T A T I O N   M A N U A L

LETTER NO. 3

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Interpretation of Requirements and a Discussion of Mechanical Dishwashing Equipment

The present day necessity for good food service establishments, the tremendous numbers of multi-use eating and drinking utensils and the ever-increasing difficulty in employing help willing to perform the extremely important but laborious task of washing eating and drinking utensils by hand have all served to stimulate the continued technological advancements in the design of dishwashing machines. The food industry and voluntary and regulatory agencies, likewise, have realized the need for mutual cooperation and effort in order to more fully utilize the results of their continuous advancements. As a result of a meeting of industrial and public health workers in 1944, the National Sanitation Foundation was established as a clearinghouse through which industry, business, and voluntary and regulatory health agencies could work cooperatively together. As a result of this cooperative effort, restaurant equipment (including dishwashing machines) has been and continues to be evaluated according to various mutually acceptable standards developed by the National Sanitation Foundation.

APPROVAL OF MECHANICAL DISHWASHING MACHINES

The "Rules and Regulations Governing the Sanitation of Restaurants and Other Foodhandling Establishments" require that "dishwashing and glasswashing equipment shall be constructed and operated in accordance with the National

Sanitation Foundation Standards or equal." In order to determine compliance with this provision of the regulations, NSF Standard Number 3, "Commercial Spray-Type Dishwashing Machines" must be used as a guide to evaluate each dishwashing machine. (Copies of this publication can be obtained from the National Sanitation Foundation, Testing Laboratory, NSF Building, 3475 Plymouth Road, Ann Arbor, Michigan, 48106.)

#### PRE-WASH FACILITIES

According to the regulations, some provision for pre-cleaning, pre-flushing, or pre-soaking multi-use eating and drinking utensils shall be provided for all types of dishwashing machines; however, this pre-wash facility may or may not be an integral part of the design of the machine.

For under the counter type machines, the minimum requirement for a drink stand is the provision of at least a single compartment sink with hot and cold running water and a combination supply faucet, and adequate dish table space conveniently located in the immediate area of the dishwashing machine to accommodate the storage of dirty dishes and clean dishes. Of course, modifications of this minimum arrangement to include a goose neck rinse apparatus at the pre-wash sink and a garbage disposal (food waste disposer) would be most advantageous.

Single tank machines fitted with drainboards on each side must be provided with at least a countersunk sink including hot and cold running water and a combination supply faucet as a minimum installation for pre-washing or pre-soaking dirty multi-use eating and drinking utensils.

The more complex machines, such as the multi-tank conveyor or multi-tank flight types, which are designed to accommodate larger volumes of multi-use eating utensils, may include a pre-washing section prior to the washing section; however, not all of the larger more complex machines include this pre-washing

feature as a part of the basic design. Therefore, pre-wash facilities which are at least comparable to those required for a single tank type machine must be provided. Also, even though a pre-wash section has been included in the basic design, field applications and experience have demonstrated that a sink for rinsing multi-use eating utensils to remove "stubborn" food particles must be included in the mechanical dishwashing arrangement.

#### SELECTION OF ADEQUATE SIZE MACHINE

During the planning of food service establishments utilizing multi-use eating and drinking utensils, one of the primary considerations must be the selection of an adequately sized dishwashing machine to accommodate the number of dirty multi-use utensils which develop. In order to select the proper machine, the number of dishes that must be washed during any one-hour period must be determined.

For a restaurant, determine the number of seats and stools provided and multiply that number by two. This will be the estimated number of customers that would normally be served during any one-hour period. To estimate the number of dishes that will be utilized, multiply the total number of customers by four. For example:  $100 \text{ seats} \times 2 = 200$  and  $4 \times 200 = 800$  dishes per hour.

Upon considering a rest home or nursing home, determine the authorized resident capacity, add the total number of the staff and multiply the accumulated total by four. This will provide a good estimate of the number of soiled dishes which may be accumulated during any one meal.

In order to determine the number of dishes utilized in a hospital, determine the number of beds and number of employees. These figures will indicate the estimated number to be supported. Multiply this total number by four to five and consider this as a workable figure for the total number of dishes to be washed after lunch. Generally the total number of soiled dishes will be less for

breakfast and dinner; however, the capacity of a dishwashing machine must be based on the maximum work load for lunch.

Assurance that dishwashing machines have the desired or required capacity is very important. Capacity ratings for machines shown in catalogs are determined by utilizing a skilled dishwasher for testing. When a dish machine is tested in a realistic restaurant setting, an achievement of approx. 70% of the capacity shown in the catalog can be anticipated.

All dishwashing machines must be equipped to sanitize eating utensils. Numerous types are designed to utilize hot water (180° F.), and others are designed to use a chlorine solution for sanitizers. However, prior to installing a machine equipped with a chlorotizer, an analysis of the water (private or public) must be made to insure that the use of this chemical will not produce undesirable results (precipitates) in the dishwashing operation.

Another important area that is often overlooked is the necessity for facilities to adequately wash drinking glasses. Restaurants, hospitals, and rest homes with a capacity of twenty or more residents which utilize glasses must have a motor driven brush for maximum efficiency. In some instances, the volume of glasses will necessitate a separate dishwashing machine for washing glasses.

#### HOT WATER REQUIREMENTS

In many instances, the planned capacity of the hot water system is not large enough to provide the required hot water demand. To determine the adequate capacity of a hot water system for a rest home or restaurant, the following methods may be used:

From the plan, determine the volume of the sinks in cubic feet. Multiply this figure by 7.5 gallons. This will provide the number of gallons required to fill all sinks. In order to account for garbage can wash facilities,



lavatories, bath tubs, showers, janitors' closets and utility rooms, add an additional 30% to the total.

For example: A three compartment dishwashing sink (18" x 21" x 14" deep) and a two compartment pot washing sink (24" x 24" x 14" deep), each compartment with a 12" water depth, will have a total volume of 15.9 cubic feet.

Multiply  $15.9 \times 7.5$  gallons = 119.3 gallons.

The additional 30% yields a total requirement of 155.1 gallons of hot water.

Hot water requirements for dishwashing machines are stated in the catalogs.

In order to determine the required capacity for the establishment, this volume must be included in the total hot water requirement.

Hospital plans are normally prepared by architects and hospital consultants. As a result, the hot water capacities shown on the plans and described in the specifications will as a general rule be adequate.

#### CLEANING PROCEDURES FOR COMMERCIAL SPRAY-TYPE DISHWASHING MACHINES

Just as it is impossible to provide clean wholesome food to the consumer unless it has been prepared in clean utensils; likewise, it is impossible to provide clean and sanitized multi-use eating and drinking utensils unless they have been washed and sanitized in a clean dishwashing machine which is functioning properly. The following is a guide which can be used for the daily cleaning of many dishwashing machines.

## "DAILY CLEANING OF DISHWASHER"

1. Turn machine off.
2. Turn off heat to wash tank or wash and rinse tanks.
3. Wash down dish tables with a detergent and rinse with fresh water. Be sure to leave scrap trays in the machine during this operation.
4. Remove curtains and scrub in sink and then hang them up to dry. They can be re-installed in the dishwasher to dry, but it is best to hang them somewhere else, so the dishwasher will dry more thoroughly.
5. Remove spray pipes and clean them in a sink using an appropriate wire cleanout brush.
6. Check and clean final rinse nozzles as necessary. If hard water deposits tend to form on the nozzles, they should be dismantled and placed in a deliming solution.
7. Remove scrap trays, empty them, and clean them in a sink using a scrub brush.
8. Drain water from tank or tanks.
9. Every two or three days remove tank drain strainer or strainers and clean to insure rapid draining of tank or tanks.
10. Hose and scrub inside of machine.
11. Put the clean wash or wash and rinse pipes back into their position in the machine.
12. Leave scrap trays, curtains, and drain strainers on dish table overnight. This will give the machine a chance to dry more thoroughly.
13. Clean and refill detergent dispenser.

S A N I T A T I O N    M A N U A L

LETTER NO. 4

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Policy Regarding Enforcement of State Sanitation Laws; Rules and Regulations Relating to Inspection, Grading, and Placarding of Establishments; State Law and State Rules and Regulations Relating to Sewage Disposal; Solid Waste Management; and Delegation of Authority to Local Sanitarians

Following are the policies and procedures regarding the delegation of authority to local sanitarians:

1. The responsibility for enforcement of the State laws relating to sanitation is delegated to the Sanitary Engineering Section with instructions for this Section to work through and with the local health departments in enforcing laws as required by G.S. 130-11.
2. It is the policy of the Division of Health Services that the sanitarians and sanitation technicians in local health departments, who are under the general administrative supervision of local Health Directors, shall, whenever qualified to do so and when the local Health Director agrees or requests it, be given authority to enforce State sanitary laws, rules, and regulations under the technical supervision of the Sanitary Engineering Section.
3. In determining the qualifications of local sanitarians and sanitation technicians to enforce State laws, rules, and regulations, the following shall be observed:

- (a) Before a local sanitarian or sanitation technician will be authorized to represent the Division of Health Services and issued an identification card, a representative of the Sanitary Engineering Section must have worked with him, observed his work, and made a report to his local Health Director and to the Chief of the Sanitary Engineering Section. The Chief of the Section will, if the report is favorable and upon recommendation of the local Health Director, request the issuance of an authorization and an identification card by the Director of the Division of Health Services.
- (b) Once authorization has been issued, the local sanitarian or sanitation technician will have the authority to act as an agent of the Department of Human Resources in enforcing State sanitary laws, rules and regulations, and will be required to follow the policies and procedures as outlined by the Sanitary Engineering Section and to perform the duties of his position in an efficient manner and in a way that will reflect credit upon the local health department, and the Division of Health Services, Department of Human Resources.
- (c) When a sanitarian or sanitation technician has been issued an identification card authorizing him to enforce State laws and regulations relative to sanitation, every effort shall be made by the representatives of the Sanitary Engineering Section to assist the sanitarian or sanitation technician in the correct and efficient performance of his duties. Should it become necessary, because of unsatisfactory work or conduct on the part of the sanitarian or sanitation technician to rescind the authorization granted, the local Health Director and the Chairman

of the Local Board of Health will be advised, and if no other authorized local sanitarian or sanitation technician is then available, the Sanitary Engineering Section will assume the responsibility of enforcing the appropriate State laws, rules, and regulations in that particular health jurisdiction on an interim and/or emergency basis.

4. Three types of authorization will be issued:

Comprehensive Authorization - Includes inspection and grade placarding activities, sewage disposal and solid waste activities (Sanitarian I minimum classification).

Sewage Disposal Authorization - Sewage disposal activities only.

Solid Waste Disposal Authorization - Solid waste disposal activities only.

PROCEDURE FOR COMPREHENSIVE AUTHORIZATION

1. Orientation will be arranged by the Sanitation Branch, Sanitary Engineering Section, for all newly-employed sanitarians. Upon the completion of this orientation, the District Sanitarian will work with the newly-employed sanitarian and determine whether or not he should be issued temporary authorization to enforce State sanitary laws, rules, and regulations relative to inspection, grading, and placarding of establishments. Temporary authorization is issued in the form of a letter addressed to the sanitarian through his Health Director. Local sanitarians are not permitted to enforce State laws or regulations without proper authorization and identification.
2. After the sanitarian has successfully completed orientation and the appropriate training courses, the District Sanitarian will again work

with him and make a report with recommendations to the Chief of the Sanitary Engineering Section relative to the issuance of an identification card, as required by G.S. 128-14.

- (a) If it is determined by the Sanitary Engineering Section that the local sanitarian is qualified, a letter will be written to his Health Director from the Raleigh office requesting him to notify this office whether or not he agrees with the recommendations.
- (b) If the Health Director agrees, authorization and identification folder is issued to the sanitarian.
- (c) If authorization is to be withheld, the local Health Director will be notified from the Raleigh office with reasons given.

#### PROCEDURE FOR SEWAGE DISPOSAL AUTHORIZATION

1. Orientation for each newly-employed sanitarian or sanitation technician will be provided, or arranged for, by the employing department. After this, the District Sanitarian will work with the sanitarian or sanitation technician to determine whether he should be given temporary authority to enforce sewage disposal regulations as specified in G.S. 130. If the local Health Director wants the sanitarian or sanitation technician to have this authority and requests it, arrangements will be made for temporary authorization. Temporary authorization is issued in the form of a letter addressed to the sanitarian or sanitation technician through his Health Director.
2. After the sanitarian or sanitation technician has been on the job for at least six months and if his work has been satisfactory, the District Sanitarian will work with him again and make a report with recommendations to the Sanitary Engineering Section relative to the issuance of an identification card, as required by G.S. 128-14.

3. Upon recommendation of the District Sanitarian and the local Health Director, authorization and identification folder will be issued.

#### PROCEDURE FOR SOLID WASTE DISPOSAL AUTHORIZATION

1. Orientation for each newly-employed sanitarian or sanitation technician will be provided, or arranged for, by the employing department. After this, the District Sanitarian (Solid Waste and Vector Control Branch) will work with the sanitarian or sanitation technician to determine whether he should be authorized, as specified by G.S. 128-14, to represent the Division of Health Services in the enforcement of State solid waste disposal laws, G.S. 130-166.16, and the Rules and Regulations Providing Standards for Solid Waste Disposal, for which this Division is responsible.
2. Upon recommendation of the District Sanitarian (Solid Waste and Vector Control Branch) and the local Health Director, authorization and identification folder will be issued.
3. If authorization is to be withheld, the local Health Director will be notified from the Raleigh office with reasons given.

S A N I T A T I O N    M A N U A L

LETTER NO. 5

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Inside wall finishes acceptable as compliance with the "Rules and Regulations Governing the Sanitation of Restaurants and Other Foodhandling Establishments."

Since the previous draft of this letter was issued (Sanitation Manual Letter No. 7 dated June 10, 1948), the sanitation regulations for restaurants have been revised several times, and Item 2 has been worded in a more clear and direct manner. Sanitarians should read Item 2 carefully so that it will be applied uniformly in making inspections and in discussing plans for new construction or remodeling.

It will be seen that Item 2 is divided into four paragraphs, each dealing with specific areas of the restaurant.

The first paragraph provides that walls and ceilings shall be kept clean and in good repair in all rooms in which food is stored, prepared or served. Obviously, this means that walls and ceilings of all kitchens, storage rooms, dining rooms, etc., shall be kept clean and in good repair.

The second paragraph deals with walls and ceiling of kitchens and other rooms used for the preparation of and storage of food and the washing of utensils. As stated, these shall be smooth, washable and light colored. However, acoustical ceiling material is satisfactory where effective ventilation is provided so that grease fumes and vapor are exhausted through metal grease filters in the hood to the outside air rather than deposited on the ceiling and walls. In other words, when acoustical ceiling are installed, in order to



make working conditions less noisy, ventilation equipment that provides for effectively filtered exhaust must also be installed.

Lay in ceilings are acceptable in food preparation and utensil washing areas provided:

- (1) The material is non-absorbent.
- (2) The room surface is smooth and there are no openings greater than 1/32 inch.
- (3) The individual lay in blocks are clipped in place so as to render the surface sturdy enough to withstand normal cleaning.
- (4) Ceilings are a light color.
- (5) Effective ventilation is installed so as to preclude the possibility of grease and moisture absorption.

Continuing our discussion of the second paragraph of Item 2 applying to kitchens and other rooms used for the preparation and storage of food and the washing of utensils, it will be seen that acceptable wall materials "including light colored glazed tile and smooth, painted plaster or metal". Although many will be finished with white enamel paint or epoxy, it must be remembered that there are other light colored finishes besides white enamel paint.

Item 2 goes on to say that brick, cinder blocks, slag blocks, and concrete blocks are acceptable if plastered or filled so as to provide a smooth, easily cleanable surface and painted in a light color. One way to make block walls smooth is to trowel on a skim coat of Portland cement paste; another is to finish the joints flush and apply sufficient coats of suitable filler before the application of the enamel or epoxy.

The third paragraph of Item 2 deals with walls and ceilings of all food storage rooms and provides that they shall be "finished in a light color". Again, "light color" does not mean only white enamel paint, and common sense and good judgment should be used in applying this requirement.

The fourth paragraph of Item 2 deals with walls and ceilings in dining rooms and other food serving rooms. It will be seen that walls and ceilings in dining rooms are not required to be smooth, washable, or light-colored. They are required to be of sound construction and free of excessive decoration. Also, of course, they must be kept clean and in good repair, as required in the first paragraph of Item 2; this applies to all of the areas discussed above.

We emphasize that the word smooth relates that there is no indentation in a surface greater than 1/32 inch.

S A N I T A T I O N   M A N U A L

LETTER NO. 6

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Kitchen Ventilation

The problem of kitchen exhaust ventilation and range hoods has confronted sanitarians for a long time. The following information will furnish some overall data and pertinent facts regarding kitchen ventilation. When the need arises, we will be most pleased to assist on the specific ventilation problems.

Kitchen ventilation may be accomplished in a good many ways. This article is being prepared to give you information in a nontechnical manner.

Hoods must be designed so that they will overhang the cooking equipment on all sides. In no case should the overhang be less than 6 to 12 inches; the overhang being determined by the amount of grease and vapor which will be generated by the cooking equipment. The depth of the hood is important in capturing sudden clouds of steam, vapor or smoke. A hood must be of the proper depth to act as a reservoir so that the smoke, vapor or steam will be contained until the exhaust system is able to remove it. A minimum of 24 inches is the acceptable depth. Generally, it is best if operations involving a large amount of grease and fumes, such as deep fat frying or broilers, are located near the center of the hood. The distance between the bottom of the hood and the top of the cooking equipment must be as short as possible but sufficient so as not to interfere with the cook at work. Normally, the distance between the bottom of the hood and the floor will be 6'3" to 6'6" and never more than 7'.

The number of ducts for a hood and their location is very important. The ducts must be spaced so as to distribute evenly the suction available from the exhaust fan. For hoods up to 11'11" in length, one duct is generally sufficient and must be placed in the center of the hood. As a general rule, ducts must be approximately six feet on center. Thus for a twelve foot hood, there must be two ducts; one three feet from either end, and there will be six feet between the center lines of the two ducts.

The amount of air exhausted through a hood depends upon the size of the hood. Generally, with one side of the hood against the wall, 100 cubic feet of air per minute per square foot of hood opening shall be exhausted. If a hood is open on all four sides, this amount of air shall be 150 cubic feet per minute per square foot of hood opening. If there are cross drafts, these figures must be increased considerably. Also, if a large amount of deep fat frying is done, it may be necessary to increase the amount of air mentioned above. If the dimensions of a hood are ten feet long and four feet wide with one side against the wall, the amount of air to be exhausted would be 4,000 (10 x 4 x 100) cubic feet per minute.

The size of the duct from the hood is determined by the amount of air to be moved. In order to keep any grease from being deposited on the sides of the duct, a velocity of approximately 2,000 feet per minute must be maintained. Thus, if we are to exhaust 4,000 cubic feet of air per minute, the area of the duct should be two square feet ( $\frac{4,000}{2,000}$ ). This would give a duct of 19 inches in diameter. In practice, an 18" duct would be used which would give a velocity of 2,200 feet per minute. If a rectangular duct were used, the size would be 1'0" x 2'0". Generally, a round duct is preferred to a rectangular one as a more uniform air movement is obtained through such a duct.

Grease filters shall be used in the hood to prevent the collecting of grease and other cooking by-products on the sides of the duct, on the blade of the exhaust fan, and on the building walls, or any surfaces close to the exhaust opening.

Whenever such deposits collect on the fan blades, they may unbalance the motor of the fan and cause the bearings to wear out. Grease filters are of two types: low velocity filters and high velocity filters. Low velocity filters are usually recommended for velocities of 200 - 300 feet per minute for their greatest efficiency, while high velocity filters are constructed so as to have their greatest efficiency at approximately 500 feet per minute. Both type filters are furnished in various sizes. In order to obtain good efficiency, the velocity of air through them must be at the approximate rate recommended by the manufacturer. Most types of grease filters can be cleaned and reused. The filters must be cleaned daily. It must be remembered that the operator must be taught that with clean filters the ventilation will work properly, with dirty filters the amount of exhaust ventilation is greatly reduced. Most filters can be cleaned by holding them under a live steam jet or stream of hot water or swishing the filters in a solution of hot soapy water or washing them in the dishwashing machine.

The propeller type fan consists of a group of blades either directly connected or V-belt driven by an electric motor. This fan is excellent for room ventilation where resistant pressure are not encountered. They are normally reasonably priced but they do have their limitations. They should never be used in conjunction with a duct system or on a range hood. The basic reason behind this is that any duct system offers resistance to a fan the same as a pipe offers resistance to the flow of water. The amount of resistance can be determined by curves from the side of the duct, length of the duct, number and type of elbows or bends, and the amount of air passing through the duct. This resistance is called static or resistance pressure and is measured in inches of water gauge. V-belt driven propeller fans should never be used where grease is encountered.

Static pressure is best overcome by means of a blower or axial fan. Both types are designed to deliver quantities of air against a wide range of static pressures, and for this reason should be used when hoods are exhausted through

ductwork. Of these two types of fans, the blower is preferred because of its quiet operation, ease of maintenance, and the drive motor is not located in the exhaust air stream. However, where space is restricted or if it is impossible to mount a blower satisfactorily, the axial flow fans may be used. This type of fan is mounted and self-contained in a section of the ductwork and can give essentially the same performance as the blowers. The weight of the fan is supported by the ductwork itself. The initial cost for this fan may be slightly higher than for blowers and probably should be considered only when the use of a blower is not practicable. Regardless of the type or make of fan used, periodic maintenance and cleaning is necessary for the best results. Centrifugal blowers will work equally well on a suction or discharge pressure.

Fan manufacturers supply information for various blowers giving the amount of air which the blower will exhaust at different static pressures. Thus, in the selection of a blower, both the amount of air to be exhausted and the total amount of resistance in the system is needed. The total amount of resistance in the system is made up of the following: hood entrance loss, resistance of grease filters, resistance of ductwork including elbows, straight duct and transitions, and wind pressure at the exhaust opening. With this information, it is possible to select an adequate blower from the tables prepared by the fan manufacturer for a specific purpose.

Another important thing that must be installed is the make-up air. If a fan is to exhaust a certain amount of air from a room, there must be provisions for replacing that air. The volume of make-up air must be no less than 90 to 99 percent of the total CFM being exhausted. The location of the inlets for make-up air is also important, for it is desirable to have a fairly uniform air movement throughout the kitchen. Only too often the make-up air is provided through open windows, doors and other openings. This is a poor practice because

during periods of undesirable weather, the employees will close these openings and cause the exhaust system to not function properly. It is practical that some of the make-up air be pulled from the dining room. This will help ventilate the dining room and prevent cooking odors from entering the dining room. In order that the make-up air will not interfere with the exhaust, the inlets for the make-up air must not be in the interior of the hood.

When shelf type cooking ventilation equipment is to be installed, the following must apply. The length of the metal grease filters must be the same as that of the cooking surface of the equipment. The capacity of the exhaust fan must equal 300 CFM per lineal foot of the cooking equipment. This exhaust is measured along the front edge of the appliances. The type metal grease filters and volume of make-up air required is the same as for the regular type hood.

SANITATION    MANUAL

LETTER NO. 7

January, 1974

Sanitary Engineering Section  
Marshall Staton, Chief

SUBJECT: Policy and Procedure Regarding Enforcement of Impounded Water  
Regulation

In 1968, the North Carolina State Board of Health (presently, Commission for Health Services) adopted "Regulations and Disease Control Measures Governing the Control of Communicable Diseases" that became effective on January 1, 1969. These regulations were a codification of the former Communicable Disease Regulations and included in this the original Regulation 32 entitled "Regulations on Control of Impounded Waters" but the codification has changed that to Regulation 14. This regulation requires that a permit be obtained.

As the responsibility for administering the law covering protection of public water supplies is vested in the Division of Health Services, we will handle, directly from this office, all procedures with regard to the inspection of proposed sites, granting of construction permits, making final inspections, and issuing impounding permits for impoundments created for public water supplies and for improvements made on existing reservoirs used for that purpose.

The following describes the procedure to be followed in the enforcement of this regulation with regard to impoundments other than public water supplies:



The Permit:

Before an impounding permit is issued by the Division of Health Services, the following must be complied with:

1. An application in triplicate, signed by the person proposing to impound water, must be submitted on a form provided by the Division of Health Services. An application for a pond with an area greater than ten acres shall be accompanied by an accurate plat of the area to be affected, showing the maximum and minimum water levels, the bottom drain, the fluctuating device, and other pertinent information.
2. A recommendation that the permit be granted must be made in writing by a representative of the local Health Department to the Division of Health Services.

Principal Requirements of Regulation:

1. That all trees, brush, and aquatic vegetation be either removed from the area to be inundated, or be covered by at least one foot of water when the pond level is at minimum elevation.
2. That bottom drains, or other approved means, be provided which will permit the removal of the impounded water at any time desired.
3. That means be provided for controlled fluctuation of the water level at any season of the year.
4. That the impoundment be maintained in a clean condition, free of vegetation.
5. That mosquito larviciding or other control measures be applied when necessary.

Recommended, but not required, is a deep shoreline; no water should be less than two feet deep.

Preimpoundment Procedure to be Followed by Local Health Department:

When a person planning to build a pond contacts the local Health Department, the individual designated by the local Health Director to supervise impounded water in the county should do the following in the sequence shown:

1. Give the applicant three application blanks, a copy of Regulation 14, and an appropriate explanation.
2. Visit the pond site and note its location on a map kept expressly for that purpose.
3. If the location and other physical features are found to be satisfactory, authority to proceed with the construction should be given in writing. This constitutes a construction permit.
4. Mail the application in triplicate to the Sanitary Engineering Section, Division of Health Services, which will in turn assign a number to the pond, and place the number on all three copies of the application. One copy will be sent to the local Health Department, and the other to the pond owner. The original will be kept in Raleigh.
5. After receiving a copy of the application, place the assigned number at the location of the pond on the map.
6. When construction is completed, inspect the pond before impoundment, and check compliance with the regulation.
7. If the construction is satisfactory, authorize the owner to impound. If the construction is unsatisfactory, point out the deficiencies to the owner, and inform him that the permit will be withheld until they are corrected.
8. If the construction is satisfactory, notify the Division of Health Services, in writing, giving the pond number, name and address of the

owner, and recommend that impounding permit be issued. Any waiver from the regulation permitted by you (such as permission to leave cypress trees in pond) should be noted and explained.

9. The Division of Health Services will then issue a "Permit for Impounding and Maintenance of Impounded Water" in triplicate. The original will be mailed to the owner, a copy sent to the local Health Department, and a copy retained in Raleigh.
10. When application forms are requested from the Division of Health Services by a person considering building a pond, forms will be sent to him with instructions to submit the application to his local Health Department. A copy of the letter of transmittal will be sent to the local Health Director.
11. When a completed application is mailed directly to the Division of Health Services from the person proposing to build a pond, a copy will be sent to the local Health Director and applicant. After receiving this copy, follow the procedure outlined above, omitting steps 1 and 4.

PROCEDURE AFTER IMPOUNDMENT:

1. The impoundment and maintenance permit can be revoked at any time, if the owner fails to maintain the pond in a satisfactory condition.
2. Periodic inspections should be made by the employee of the local Health Department who is responsible for impounded water supervision. On these inspections, he should look for vegetation growing in the pond, as well as the presence of drift and floatage.
3. Growth, such as cattails, rushes, or other aquatic plants should be removed at once before they become too well established. During the spring and summer months, drift or floatage should not be allowed to collect.

4. On inspections made during the mosquito-breeding season, a search should be made for larvae. Mosquito larvae or other arthropods will be identified by personnel of the Sanitary Engineering Section when sent in from the field.
5. Inspections should be made at least once each year, during the mosquito breeding season, of each pond within the jurisdiction of the local Health Director, and more often when necessary.

#### The U. S. Soil Conservation Service

A very large percent of the ponds being constructed are built in cooperation with the U. S. Soil Conservation Service. It is the policy of that agency to cooperate with the Sanitary Engineering Section to the fullest extent, and not participate in the construction of ponds, unless the Sanitary Engineering Section requirements are met. Working through the local representative of that agency will greatly facilitate your efforts. In 1950, the State Soil Conservation Office sent a memorandum to the local personnel in which they outlined their cooperative policy.

Personnel of the Solid Waste and Vector Control Branch of the Sanitary Engineering Section are available to assist you in connection with any problem you may have relating to mosquito control activities.

For your information, copies of the following are available:

Application Form

Regulation No. 14

Mosquitoes and Their Control, Bulletin No. 486

APPLICATION IS HEREBY MADE FOR A PERMIT

To be submitted in triplicate to:

N. C. Department of Human Resources  
Division of Health Services  
Sanitary Engineering Section  
Solid Waste & Vector Control Branch  
Raleigh, North Carolina 27602

(a) To impound water \_\_\_\_\_

(b) To raise the level of an existing pond \_\_\_\_\_

1. County \_\_\_\_\_ Township \_\_\_\_\_

2. Location in relation to two or more well-known landmarks:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Owner of pond \_\_\_\_\_

4. Address of owner \_\_\_\_\_

5. Purpose of the project \_\_\_\_\_

6. Approximate number of persons living within one mile of the proposed reservoir or pond \_\_\_\_\_

7. Approximate area to be covered by reservoir \_\_\_\_\_

8. Diameter of drain at bottom of dam \_\_\_\_\_

9. Description of device for fluctuating water level \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. Will sufficient money be available for maintaining pond after impoundage so that it will not produce mosquitoes? \_\_\_\_\_

11. Date when it is desired to start construction \_\_\_\_\_

12. Date when it is desired to impound water \_\_\_\_\_

In making this application, I agree to comply with the regulation governing impounded water and so maintain the pond that it will not produce mosquitoes and thereby become a nuisance dangerous to the public health.

Place \_\_\_\_\_ Date \_\_\_\_\_

Applicant's signature \_\_\_\_\_