

An aerial photograph of a large tourist establishment, possibly a resort or a large hotel complex, featuring numerous small, uniform, rectangular buildings arranged in a grid-like pattern. The entire image is overlaid with a semi-transparent orange filter.

# **GUIDE TO SANITATION IN TOURIST ESTABLISHMENTS**

**J A SALVATO**

**WORLD HEALTH ORGANIZATION**

# GUIDE TO SANITATION IN TOURIST ESTABLISHMENTS

JOSEPH A. SALVATO, Jr

*Sanitary and Public Health Engineer,  
Troy, NY, USA*



WORLD HEALTH ORGANIZATION  
GENEVA 1976

ISBN 92 4 154054 0

© World Health Organization 1976

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. For rights of reproduction or translation of WHO publications, in part or *in toto*, application should be made to the Division of Publications and Translation, World Health Organization, Geneva, Switzerland. The World Health Organization welcomes such applications.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The author alone is responsible for the views expressed in this publication.

PRINTED IN SWITZERLAND

## Contents

---

	Page
Preface . . . . .	9
Chapter 1. Introduction . . . . .	13
Public health aspects of tourism . . . . .	14
Economic implications . . . . .	16
Administration . . . . .	17
Staffing and supervision . . . . .	17
Regulations . . . . .	19
Chapter 2. Site selection and planning . . . . .	22
Location . . . . .	22
Area requirements . . . . .	23
Planning considerations . . . . .	24
Chapter 3. Water supply . . . . .	28
Water sources . . . . .	28
Storage and distribution . . . . .	33
Maintenance and operation . . . . .	34
Chapter 4. Sewage and excreta disposal . . . . .	36
Temporary latrines . . . . .	37
Sewerage systems . . . . .	38
Septic tanks . . . . .	38
Sewage treatment works . . . . .	40
Chapter 5. Shelter . . . . .	42
Responsibilities of owners and occupants . . . . .	42
Equipment and facilities . . . . .	42
Lighting and ventilation . . . . .	43
Heating . . . . .	44
Safety and comfort . . . . .	44
Space . . . . .	44
Bedding, linen, and towels . . . . .	45
Laundering . . . . .	45
Air pollution, noise, and vibrations . . . . .	46
Hazardous materials . . . . .	46
Seasonal operations . . . . .	47
Facilities for employees . . . . .	49

Chapter 6. Toilet and bath facilities . . . . .	50
Basic plumbing principles . . . . .	51
Backsiphonage and backflow . . . . .	52
Fixtures . . . . .	54
Comfort stations . . . . .	55
Chapter 7. Refuse handling and disposal . . . . .	58
Storage . . . . .	58
Collection . . . . .	59
Disposal . . . . .	61
Chapter 8. Insect and rodent control . . . . .	65
Mosquitos . . . . .	66
Flies . . . . .	67
Cockroaches . . . . .	67
Bedbugs . . . . .	68
Fleas, lice, ticks, and chiggers . . . . .	68
Scorpions, spiders, and wasps . . . . .	69
Rodents . . . . .	69
General . . . . .	70
Chapter 9. Food sanitation . . . . .	72
Prevention of foodborne illnesses . . . . .	72
Health examinations and inspections . . . . .	74
Sanitation in food establishments . . . . .	74
Compliance with and enforcement of sanitary regulations . . . . .	81
Chapter 10. Swimming and bathing facilities . . . . .	83
Natural outdoor bathing places . . . . .	83
Swimming pools . . . . .	86
Toilet and shower facilities . . . . .	89
Prevention of ringworm infections . . . . .	89
Life-saving and accident prevention . . . . .	90
Chapter 11. Caravan camps (travel trailer parks) and camping sites . . . . .	92
Site . . . . .	92
Spacing of tents and trailers . . . . .	92
Service buildings . . . . .	93
Water supply . . . . .	93
Sewerage system . . . . .	95
Disposal of sink wastes . . . . .	97
Sanitary stations for caravans (travel trailers) . . . . .	97

Refuse handling . . . . .	100
Miscellaneous . . . . .	100
Chapter 12. Mass gatherings . . . . .	101
Planning guidelines . . . . .	101
Engineering and operational report . . . . .	102
Public liability and property damage insurance . . . . .	105
Additional responsibilities of a permit holder . . . . .	106
Coordination . . . . .	106
Chapter 13. Medical and first-aid services . . . . .	107
Emergency medical services . . . . .	107
On-site facilities and supplies . . . . .	107
Physical examinations for staff members . . . . .	108
Chapter 14. Other facilities and services . . . . .	109
Fire protection . . . . .	109
Fuel supply and storage . . . . .	112
Picnic areas and transportation terminals . . . . .	112
Chalet, bungalow, and cabin colonies . . . . .	112
Maintenance . . . . .	113
Marine sanitation . . . . .	113
Annex 1. Consolidated check list for the evaluation of tourist camps, motels, hotels, and picnic and rest areas . . . . .	118
Annex 2. Emergency water treatment . . . . .	125
Annex 3. Soil percolation test and interpretation . . . . .	128
References . . . . .	133
Reviewers . . . . .	135
Index . . . . .	137

An aerial photograph of a densely packed tourist establishment, likely a resort or a large hotel complex. The image shows numerous small, uniform, rectangular buildings arranged in a grid-like pattern, with some larger, more complex structures interspersed. The overall color is a warm, orange-brown, suggesting a vintage or historical photograph. The buildings are surrounded by what appears to be paved areas and some greenery, though the details are somewhat obscured by the high angle and the color of the image.

# **GUIDE TO SANITATION IN TOURIST ESTABLISHMENTS**

**J A SALVATO**

**WORLD HEALTH ORGANIZATION**

WHO publications may be obtained, direct or through  
booksellers, from:

MONGOLIA	see India, WHO Regional Office.
MOROCCO	Editions La Porte, 281 avenue Mohammed V, RA
NEPAL	see India, WHO Regional Office.
NETHERLANDS	N.V. Martinus Nijhoff's Boekhandel en Uitgevers Voorhout 9, THE HAGUE.
NEW ZEALAND	Government Printing Office, Government Bookshops Street, P.O. Box 5344, AUCKLAND; 130 Oxford Terrace, P.O. Box 1721, CHRISTCHURCH; Alma Street, P.O. Box 857, HAMILTON; Princes Street, P.O. Box 1104, DUNEDIN; Mulgrave Street, Private Bag, WELLINGTON — R. Hill & Son Ltd, Ideal House, 111 Gilles Avenue & Fern Street, Newmarket, AUCKLAND S.E. 1.
NIGERIA	University Bookshop Nigeria, Ltd, University of Ibadan, Ibadan.
NORWAY	Johan Grundt Tanum Bokhandel, Karl Johansgt. 43, OSLO.
PAKISTAN	Mirza Book Agency, 65 Shahrah Quaid-E. Azam, P.O. Box 122, LAHORE 3.
PARAGUAY	Agencia de Librerías Nizza S.A., Estrella No. 721, ASUNCIÓN.
PERU	Distribuidora Inca S.A., Apartado 3115, Emilio Althaus 470, LIMA.
PHILIPPINES	World Health Organization, Regional Office for the Western Pacific, P.O. Box 2932, MANILA — The Modern Book Company Inc., P.O. Box 632, 926 Rizal Avenue, MANILA.
POLAND	Składnica Księgarska, ul. Mazowiecka 9, WARSAW (except periodicals) — BKWZ Ruch, ul. Wronia 23, WARSAW (periodicals only).
PORTUGAL	Livraria Rodrigues, 186 Rua Aurea, LISBON.
REPUBLIC OF KOREA	The WHO Representative, Central P.O. Box 540, SEOUL.
SINGAPORE	The WHO Representative, 144 Moulmain Road, G.P.O. Box 3457, SINGAPORE 1.
SOUTH AFRICA	Van Schaik's Bookstore (Pty) Ltd, P.O. Box 724, PRETORIA.
SPAIN	Comercial Athenaeum S.A., Consejo de Ciento 130-136, BARCELONA 15; General Moscató 29, MADRID 20 — Librería Díaz de Santos, Lagasca 95, MADRID 6.
SRI LANKA	see India, WHO Regional Office.
SWEDEN	Aktiebolaget C.E. Fritzes Kungl. Hovbokhandel, Fredsgatan 2, STOCKHOLM 16.
SWITZERLAND	Medizinischer Verlag Hans Huber, Langgass Strasse 76, 3012 BERNE 9.
THAILAND	see India, WHO Regional Office.
TUNISIA	Société Tunisienne de Diffusion, 5 avenue de Carthage, TUNIS.
TURKEY	Librairie Hachette, 469 avenue de l'Indépendance, ISTANBUL.
UGANDA	see address under KENYA.
UNITED KINGDOM	H.M. Stationery Office: 49 High Holborn, LONDON WC1V 6HB; 13a Castle Street, EDINBURGH EH2 3AR; 109 St Mary Street, CAR- DIFF CF1 1JW; 80 Chichester Street, BELFAST BT1 4JY; Brazennose Street, MANCHESTER M60 8AS; 238 Broad Street, BIRMINGHAM B1 2HE; 50 Fawcett Street, BRISTOL BS1 3DE. All mail orders should be sent to P.O. Box 569, London SE1 9NH.
UNITED REP. OF TANZANIA	see address under KENYA.
UNITED STATES OF AMERICA	Single and bulk copies of individual publications (not subscriptions): Q Corporation, 49 Sheridan Avenue, ALBANY, NY 12210. Subscrip- tions: Subscription orders, accompanied by check made out to the Chemical Bank, New York, Account World Health Organization, should be sent to the World Health Organization, P.O. Box 5284, Church Street Station, New York, NY 10249. Correspondence concerning subscrip- tions should be forwarded to the World Health Organization, Distribution and Sales Service, 1211 GENEVA 27, Switzerland. Publi- cations are also available from the United Nations Bookshop, NEW YORK, NY 10017 (retail only).
USSR	For readers in the USSR requiring Russian editions: Komsomolskij pros- pekt 18, Medicinskaja Kniga, Moscow — For readers outside the USSR requiring Russian editions: Kuzneckij most 18, Mezhdunarodnaja Kniga, Moscow G-200.
VENEZUELA	Editorial Interamericana de Venezuela C.A., Apartado 50785, CARACAS — Librería del Este, Av. Francisco de Miranda 52, Edificio Galipán; CARACAS.
YUGOSLAVIA	Jugoslovenska Knjiga, Terazije 27/II, BELGRADE.

Orders from countries where sales agents have not yet been appointed  
may be addressed to: World Health Organization, Distribution and Sales Service,  
1211 Geneva 27, Switzerland, but must be paid for in pounds sterling,  
US dollars, or Swiss francs.

\$21.602

# GUIDE TO SANITATION IN TOURIST ESTABLISHMENTS

JOSEPH A. SALVATO, Jr

*Sanitary and Public Health Engineer,  
Troy, NY, USA*



WORLD HEALTH ORGANIZATION  
GENEVA 1976

ISBN 92 4 154054 0

© World Health Organization 1976

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. For rights of reproduction or translation of WHO publications, in part or *in toto*, application should be made to the Division of Publications and Translation, World Health Organization, Geneva, Switzerland. The World Health Organization welcomes such applications.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The author alone is responsible for the views expressed in this publication.

PRINTED IN SWITZERLAND

## Contents

---

	Page
Preface . . . . .	9
Chapter 1. Introduction . . . . .	13
Public health aspects of tourism . . . . .	14
Economic implications . . . . .	16
Administration . . . . .	17
Staffing and supervision . . . . .	17
Regulations . . . . .	19
Chapter 2. Site selection and planning . . . . .	22
Location . . . . .	22
Area requirements . . . . .	23
Planning considerations . . . . .	24
Chapter 3. Water supply . . . . .	28
Water sources . . . . .	28
Storage and distribution . . . . .	33
Maintenance and operation . . . . .	34
Chapter 4. Sewage and excreta disposal . . . . .	36
Temporary latrines . . . . .	37
Sewerage systems . . . . .	38
Septic tanks . . . . .	38
Sewage treatment works . . . . .	40
Chapter 5. Shelter . . . . .	42
Responsibilities of owners and occupants . . . . .	42
Equipment and facilities . . . . .	42
Lighting and ventilation . . . . .	43
Heating . . . . .	44
Safety and comfort . . . . .	44
Space . . . . .	44
Bedding, linen, and towels . . . . .	45
Laundering . . . . .	45
Air pollution, noise, and vibrations . . . . .	46
Hazardous materials . . . . .	46
Seasonal operations . . . . .	47
Facilities for employees . . . . .	49

Chapter 6. Toilet and bath facilities . . . . .	50
Basic plumbing principles . . . . .	51
Backsiphonage and backflow . . . . .	52
Fixtures . . . . .	54
Comfort stations . . . . .	55
Chapter 7. Refuse handling and disposal . . . . .	58
Storage . . . . .	58
Collection . . . . .	59
Disposal . . . . .	61
Chapter 8. Insect and rodent control . . . . .	65
Mosquitos . . . . .	66
Flies . . . . .	67
Cockroaches . . . . .	67
Bedbugs . . . . .	68
Fleas, lice, ticks, and chiggers . . . . .	68
Scorpions, spiders, and wasps . . . . .	69
Rodents . . . . .	69
General . . . . .	70
Chapter 9. Food sanitation . . . . .	72
Prevention of foodborne illnesses . . . . .	72
Health examinations and inspections . . . . .	74
Sanitation in food establishments . . . . .	74
Compliance with and enforcement of sanitary regulations . . . . .	81
Chapter 10. Swimming and bathing facilities . . . . .	83
Natural outdoor bathing places . . . . .	83
Swimming pools . . . . .	86
Toilet and shower facilities . . . . .	89
Prevention of ringworm infections . . . . .	89
Life-saving and accident prevention . . . . .	90
Chapter 11. Caravan camps (travel trailer parks) and camping sites . . . . .	92
Site . . . . .	92
Spacing of tents and trailers . . . . .	92
Service buildings . . . . .	93
Water supply . . . . .	93
Sewerage system . . . . .	95
Disposal of sink wastes . . . . .	97
Sanitary stations for caravans (travel trailers) . . . . .	97

Refuse handling . . . . .	100
Miscellaneous . . . . .	100
Chapter 12. Mass gatherings . . . . .	101
Planning guidelines . . . . .	101
Engineering and operational report . . . . .	102
Public liability and property damage insurance . . . . .	105
Additional responsibilities of a permit holder . . . . .	106
Coordination . . . . .	106
Chapter 13. Medical and first-aid services . . . . .	107
Emergency medical services . . . . .	107
On-site facilities and supplies . . . . .	107
Physical examinations for staff members . . . . .	108
Chapter 14. Other facilities and services . . . . .	109
Fire protection . . . . .	109
Fuel supply and storage . . . . .	112
Picnic areas and transportation terminals . . . . .	112
Chalet, bungalow, and cabin colonies . . . . .	112
Maintenance . . . . .	113
Marine sanitation . . . . .	113
Annex 1. Consolidated check list for the evaluation of tourist camps, motels, hotels, and picnic and rest areas . . . . .	118
Annex 2. Emergency water treatment . . . . .	125
Annex 3. Soil percolation test and interpretation . . . . .	128
References . . . . .	133
Reviewers . . . . .	135
Index . . . . .	137



## Preface

---

*Tourist accommodation in different countries varies over a wide range, from sophisticated establishments prepared to satisfy every whim of the tourist to those in remote areas where only basic facilities are available. Over the years, however, there has been an improvement in local standards and a strengthening of local tourist industries, with concurrent economic benefit to the community. There remains a need for an international guide to sanitation that will help promote acceptable standards of hygiene in tourist establishments in all countries, as foreseen by a United Nations conference on international travel and tourism (1). The present work has been written to meet that need.*

*The level of control exercised by government agencies varies widely. A review of the data on this subject (2) indicates a fairly high level of control over hotels and catering establishments. In many cases this extends to the licensing, classification, and rate setting of the hotel. Such control is desirable from the standpoint of the tourist since it enables him to choose the type of accommodation he wishes, and the situation could be further improved by the establishment of international classification standards. There is less control over tourist camps and related facilities, which may even pose health problems. This has been recognized in the report of a special committee of the Pan American Health Organization (3) dealing with the preparation of a manual on recommended sanitation standards for tourist facilities.*

*A basic level of health protection must be afforded the tourist—foreign or domestic. The criteria developed in this guide relate primarily to the food people eat, the water they drink, the wastes they generate, the facilities and shelter provided, and the surroundings in which a place is located. All factors having a direct and immediate relationship to the health, safety, comfort, and wellbeing of the tourist should be considered. The criteria developed here may be used as bases for regulatory standards. Although the criteria are generally applicable to all types of tourist accommodation, they are intended primarily for places outside major cities, such as travel trailer (caravan) and tent camping sites, motels, hotels, tourist homes and boarding houses, youth hostels, ski resorts, and children's camps. Also included would be chalet, bungalow, and other holiday cottage colonies, rest homes, agricultural fairs, tourist attractions, labour camps, mountain huts and shelters, and automobile and bus rest areas. Attention is also given to eating establishments, swimming pools, and bathing beaches operated in conjunction with tourist places.*

*While the criteria for water supply, sewage disposal, and refuse disposal and those relating to camping sites and mass gatherings are not intended to be*

*applied to hotels and similar establishments in large cities provided with established municipal services, much of the remaining material is applicable.*

*This guide has been designed for operators of tourist establishments. Its primary value will be to provide them with background information on health and sanitation criteria, which will enable them to cooperate more effectively with health professionals and tourist agencies in upgrading their facilities. Additional information on specific problems is available from local publications and from the references listed at the end of the book.*

*Public health professionals will also find much of the material a useful guide, to be adapted to local conditions where appropriate. In developing areas of the world some of the suggested criteria may be considered unattainable or unpractical at present. In such instances the public health intent should be achieved by the application of experienced professional judgement. In other areas where the criteria are or can be readily met they should be considered minimal, particularly where higher local standards exist.*

#### Definition of selected terms

*Chalet, bungalow, cottage, or cabin colonies—structures for seasonal use with or without certain common facilities, utilities and services. These may include vacation, leisure and holiday camps.*

*Hotel, lodge, tourist home, pension, or motel—a facility providing accommodation with or without meals for a night or for one or more days.*

*Mass gathering—one that is likely to attract 5000 people or more and continue for 24 hours or more.*

*Sanitary station—a facility for removing and disposing of wastes from travel trailer (caravan) holding tanks.<sup>a</sup>*

*Service building—a structure housing toilet, lavatory and such other facilities as may be required.<sup>a</sup>*

*Travel trailer—a vehicular, portable structure built on a chassis, designed as a temporary dwelling for travel, recreation and vacation, having body width not exceeding 8 feet (2.4 m) and body length not exceeding 32 feet (9.75 m).<sup>a</sup> This term is synonymous with caravan.*

*Travel trailer parking area—a parcel of land in which two or more spaces are occupied or intended for occupancy by trailers for transient dwelling purposes.<sup>a</sup>*

*Tourist—a visitor staying at least 24 hours (or one night) in the country visited for one of the following reasons: (a) leisure, recreation, holiday, health, study, pilgrimage; (b) business, family, mission, meeting.<sup>b</sup>*

<sup>a</sup> Definition from: US Public Health Service (4).

<sup>b</sup> Definition recommended by the International Union of Official Travel Organizations (now the World Tourism Organization).

## Measurements

*Throughout the guide values expressed in British/US units (in parentheses) following metric numerical values should be regarded as working equivalents rather than as accurate conversions.*

---