



MANUAL ON WATER SUPPLY AND TREATMENT

THIRD EDITION - REVISED AND UPDATED

Prepared by
THE EXPERT COMMITTEE

Constituted by
THE GOVERNMENT OF INDIA

**CENTRAL PUBLIC HEALTH
AND ENVIRONMENTAL ENGINEERING ORGANISATION**

**MINISTRY OF URBAN DEVELOPMENT, NEW DELHI
MAY, 1999**

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FOREWORD

Water is a basic need. The provision of safe and adequate drinking water to the burgeoning urban population continues to be one of the major challenging tasks. Lack of safe drinking water could undermine the health and well being of the people, particularly, the urban poor and economically weaker sections.

The Central Public Health & Environmental Engineering Organisation (CPHEEO) in this Ministry had brought out the 3rd edition of the Manual on Water Supply and Treatment in March, 1991 with a view to provide valuable guidelines to the Public Health Engineering Departments, Water Boards and municipal bodies on the basic norms, standards and latest developments in this field. Subsequent to the publication of the said Manual, the CPHEEO had received comments and suggestions from field practitioners and manufacturers for revising and updating certain aspects, such as water quality, per capita water supply norms, water conservation, metering and availability of various kinds of pipes. A two member Expert Committee was set up by this Ministry in November, 1997 to look into these aspects.

I am pleased to acknowledge the contribution made by the Expert Committee in further revising and updating the Manual, which I am sure would be of considerable help to the Public Health Engineers and field practitioners for proper planning, design and quality control of water supply systems.



(ASHOK PAWAR)
SECRETARY TO THE GOVERNMENT OF INDIA
MINISTRY OF URBAN DEVELOPMENT

PREFACE

The "Manual on Water Supply and Treatment" brought out by the Government of India in 1962 was revised and updated in the late seventies. However, in order to provide the field engineers with information about the latest development in this field during the intervening period, the then Ministry of Urban Development, Government of India constituted an Expert Committee towards the end of 1985 to further update the Manual. The composition of the Committee was:-

1. Shri V. Venugopalan - Chairman
Adviser(PHEE), Central Public Health
& Environmental Engineering Organisation,
Ministry of Urban Development, New Delhi
 2. Shri M.R. Parthasarathy, - Member
Deputy Adviser(PHE), Central Public
Health & Environmental Engineering
Organisation, Ministry of Urban Development,
New Delhi
 3. Shri S.D. Mundra - Member
Director, Geo-Miller & Co. Pvt. Ltd.,
New Delhi
 4. Shri B.P.C. Sinha, - Member
Chief Hydrogeologist & Member,
Central Ground Water Board, New Delhi
- Alternate
- Shri A.R. Bakshi,
Scientist, Central Ground Water Board,
New Delhi
5. Shri G. Raman - Member
Director(Civil Engineering),
Bureau of Indian Standards, New Delhi

Alternate

Shri A.K, Awasthi,
Deputy Director(Civil Engineering),
Bureau of Indian Standards,New Delhi

- | | | | |
|-----|--|---|--------|
| 6. | Shri R. Paramasivam
Scientist & Head,Water Engineering
Division, National Environmental Engineering
Research Institute, Nagpur. | - | Member |
| 7. | Dr. I.C. Agarwal,
Profesor, Deptt. of Civill Engineering,
Motional Nehru Regional Engineering College,
Allahabad | - | Member |
| 8. | Dr. A.G. Bhole,
Professor, Deptt. of Civil Engineering,
Visvesaraya Regional Engineering College,
Nagpur. | - | Member |
| 9. | Shri B.V. Rotkar
Member Secretary, Maharashtra Water
Supply & Sewerage Board, Bombay. | - | Member |
| 10. | Prof. V. Chandrashekar,
Chartered Engineer & Consultant,
Mysore. | - | Member |
| 11. | Dr. S.K. Biswas
Deputy Adviser(RWS),Department of
Rural Development, New Delhi. | - | Member |
| 12. | Shri S.A. Jagadeesan,
Engineering Director, Tamilnadu
Water Supply & Drainage Board,
Madras. | - | Member |

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|-----|--|---|---------------------|
| 13. | Dr. D.M. Mohan,
Superintending Engineer, Hyderabad
Metro Water Supply & Sewerage Board,
Hyderabad. | - | Member |
| 14. | Dr. R. Pitchai,
Professor & Head, Centre for Environmental
Studies, Anna University,
Guindy, Madras. | - | Member |
| 15. | Shri A.R. Mir,
Secretary, Irrigation & Public Health
Engineering Department,
Government of Jammu & Kashmir | - | Member |
| 16. | Shri S.L. Abhayankar,
Technical Adviser, Indian Pump Manufacturers
Association, Bombay. | - | Member |
| 17. | Shri V.B. Rama Prasad,
Deputy Adviser(PHE),
Central Public Health
& Environmental Engineering Organisation,
Ministry of Urban Development, New Delhi | - | Member |
| 18. | Shri B.B. Uppal,
Assistant Adviser(PHE)
Central Public Health
& Environmental Engineering Organisation,
Ministry of Urban Development, New Delhi | - | Member |
| 19. | Dr. S.R. Shukla
Deputy Adviser(PHE),
Central Public Health
& Environmental Engineering Organisation,
Ministry of Urban Development, New Delhi | - | Member
Secretary |

The Committee held 11 meetings under the Chairmanship of Shri V. Venugopalan between April 1986 and August, 1989, and has drawn freely from all available literature, in finalising the revision of the Manual. The Committee wishes to thank the Union Ministry of Urban Development for rendering all the help needed for successfully revising and updating the Manual. The Committee also wishes to thank National Environmental Engineering Research Institute, Nagpur and the Maharashtra Water Supply & Sewerage Board for the arrangements made for the meetings of the Committee outside Delhi.

The Committee wishes to place on record their deep sense of appreciation for the unsparing and diligent efforts of Shri M.R. Parthasarthy and Dr. S.R. Shukla who ensured that the meetings were held regularly to enable the Committee to complete its work in spite of their heavy normal duties. The Committee also places on record its appreciation of the services rendered by the various officers and staff of Central Public Health and Environmental Engineering Organisation and Public Health Engineering Section of the Ministry without whose cooperation and active participation the enormous task assigned to the Committee could not have been accomplished.

A Sub-Committee for editing the draft Manual was constituted comprising of the Members Dr. I.C. Agarwal, Shri M.R. Parthasarathy and Dr. D.M. Mohan. The Sub Committee finalised the editing of the draft Manual in four sittings between September and December, 1989. The Committee also wishes to thank the Members of the Editing Sub Committee for the devoted and sincere work without which the final draft of the Manual would not have been completed.

The 3rd edition of the Manual was brought out by the CPHEEO in March, 1991 for the benefit of Public Health Engineers, Consultants, Water Supply Departments/Boards, Local Bodies, Educational Institutions. However, subsequent to the publication of the said Manual, a few suggestions, observations and comments have been received from various product manufacturers, field engineers, consultants, etc. for revising and updating certain aspects, such as, water quality guidelines, per-capita water supply norms, water conservation measures, metering, availability of various pipes, selection of pipes under different field conditions, etc.

Accordingly, a two member Expert Committee, comprising Dr. I.C. Agarwal, Director, Bundelkhand Institute of Engineering and Technology, Jhansi, Uttar Pradesh and Dr. D.M. Mohan, Retired Director (Technical), Hyderabad Metropolitan Water Supply & Sewerage Board, was set up by the Ministry in February, 1998 with definite terms of reference to update certain chapters by including latest developments in the field of water supply, treatment and distribution.

Both the Expert Committee Members had completed their job to the satisfaction of the Ministry. The draft Manual (revised portion) was discussed thoroughly in the Chief Engineers' Conference held in November, 1998 at Chandigarh. The Expert Committee had reviewed the suggestions made by the Chief Engineers' Conference and modified the draft Manual accordingly so as to make it comprehensive and more useful to the user agencies dealing with water supply sector. The contribution made by Shri V.B. Rama Prasad, Shri R. Sethuraman, Shri B.B. Uppal, Deputy Advisers, Shri M. Sankaranarayanan, Shri M. Dhinadhayalan, Shri N.N. Hotchandani, Assistant Advisers and Shri Sukanta Kar, Scientific Officer, for successful completion of the task is duly appreciated. The services extended by Dr. I.C. Agarwal, Director, Dr. Rajiv Srivastava, Shri Pankaj Rana and other staff of Bundelkhand Institute of Engineering & Technology, Jhansi, for computerising the said manual is duly acknowledged.

Last but not the least, the whole-hearted cooperation of the Ministry in completing this exercise is greatly acknowledged.

Dr. S.R. Shukla,
Adviser (PHEE)
C.P.H.E.E.O.
Ministry of Urban Development
Government of India

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New Delhi

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