TR 114:2023
(ICS 11.020.99; 91.040.10)

TECHNICAL REFERENCE

Mechanical, electrical and plumbing (MEP) design for healthcare facilities

Singapore Standards Council

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Foreword

This Technical Reference (TR) was prepared by the Working Group on Mechanical, Electrical and Plumbing (MEP) Design for Healthcare Facilities set up by the Technical Committee on Architectural Works under the purview of the Building and Construction Standards Committee.

This TR has been contextualised to the local setting, taking into account the unique nature of healthcare delivery in Singapore including local codes and regulations, tropical design requirements, international healthcare design guidelines and specifications, and drawing on best practices worldwide.

To ensure the quality of delivery and adoption of new healthcare trends, there is a need to develop a set of design guidelines relating to healthcare facilities. The objective of this TR is to support new healthcare facility projects in Singapore. The provisions in this TR aim to not only benefit project consultants responsible for building new and retrofitting existing facilities but also support healthcare operators in their maintenance and addition and alteration works to enhance the quality and safety of healthcare services.

This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

In preparing this standard, reference was made to the following publications:

1. Code for environmental sustainability of buildings
2. Code for environmental sustainability measures for existing buildings
3. Code of practice for fire precautions in buildings
4. Code of practice for info-communication facilities in buildings
5. Code of practice on environmental health
6. Code of practice on sewerage and sanitary work
7. Code on accessibility in the built environment
8. Handbook for application for electricity connection
9. Handbook on application for water supply
10. Handbook on gas supply (City Energy)
11. SCDF Evacuation planning guidelines
12. SCDF General guidelines for Emergency Response Plan

Permission has also been sought from the following organisations for the reproduction of materials from their publications into this standard:

1. Centers for Disease Control and Prevention – Biosafety in Microbiological and Biomedical Laboratories – Table 1: Summary of Laboratory Biosafety Levels (BSLs)

2. International Organization for Standardization – ISO 9170-1:2017 Terminal units for medical gas pipeline systems – Part 1: Terminal units for use with compressed medical gases and vacuum. ISO standards can be purchased from Enterprise Singapore.

3. National Health Service (NHS), England

   - HTM 03-01 (2021) Specialised ventilation of healthcare premises: Part A – The concept, design, specification, installation and acceptance testing of healthcare ventilation systems
   - HTM 02-01 (2006) Medical gas pipeline systems: Part A – Design, installation, validation and verification

Acknowledgement is made for the use of information from the above publications.

It is presupposed that in the course of their work, users will comply with all relevant regulatory and statutory requirements. Some examples of relevant regulations and acts are listed in the Bibliography. The Singapore Standards Council and Enterprise Singapore shall not be responsible for identifying all of such legal obligations.

Attention is drawn to the possibility that some of the elements of this TR may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "mature standards". Mature standards will not be subject to further review unless there are requests to review such standards.*

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Mechanical, electrical and plumbing (MEP) design for healthcare facilities

1 Scope

This TR outlines the provisions to develop a set of MEP design requirements and recommendations for healthcare facilities by harnessing and consolidating the best design practices, innovations, technologies and standards in engineering systems for healthcare developments. This TR provides the application of engineering to healthcare design.

This TR can benefit engineers, facility planning managers, design managers, contractors and developers involved in healthcare design, and hospital maintenance staff. This TR can also allow project design architects and engineering consultants coming on board to start a project from an experienced and competent level.

Aligning understanding and communication, this TR can increase productivity and reduce deliberation downtime. This TR is supported with design information briefs, checklists, and necessary technical information to ensure that a higher platform of quality is achieved in the design of healthcare facilities. Additionally, this TR can drive consistency and quality in the design and delivery of engineering systems within healthcare developments.

This TR is intended for engineers with a technical understanding of general building services, healthcare development and as appropriate, detailed discipline-specific technical knowledge.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

HTM 06-01	Electrical services supply and distribution
IEC 60364-7-710	Low-voltage electrical installations – Part 7-710: Requirements for special installations or locations – Medical locations
ISO 60079 series	Explosive atmosphere
CP 52	Code of practice for automatic fire sprinkler system
SS 152	Specification for identification of contents of industrial gas cylinders
SS 530	Code of practice for energy efficiency standard for building services and equipment
SS 546	Code of practice for emergency voice communication systems in buildings
SS 550	Code of practice for installation, operation and maintenance of electric passenger and goods lifts
SS 551	Code of practice for earthing
SS 553	Code of practice for air-conditioning and mechanical ventilation in buildings

SS 555 series	Code of practice for protection against lightning
SS 568	Code of practice for confined spaces
SS 575	Code of practice for fire hydrant, rising mains and hose reel system
SS 578	Code of practice for the use and maintenance of portable fire extinguishers
SS 608	Code of practice for gas installation
SS 626	Code of practice for design, installation and maintenance of escalators and moving walks
SS 636	Code of practice for water services
SS 638	Code of practice for electrical installations
SS 645	Code of practice for the installation and servicing of electrical fire systems