



# **MALAYSIAN STANDARD**

**MS 2526-11:2014**

## **Urban stormwater management - Part 11: Water quality ponds and wetlands**

**ICS: 93.025**

Descriptors: urban stormwater management, design fundamental, water quality ponds, wetlands

**© Copyright 2014**

**DEPARTMENT OF STANDARDS MALAYSIA**

## DEVELOPMENT OF MALAYSIAN STANDARDS

The **Department of Standards Malaysia (STANDARDS MALAYSIA)** is the national standards and accreditation body of Malaysia.

The main function of STANDARDS MALAYSIA is to foster and promote standards, standardisation and accreditation as a means of advancing the national economy, promoting industrial efficiency and development, benefiting the health and safety of the public, protecting the consumers, facilitating domestic and international trade and furthering international cooperation in relation to standards and standardisation.

Malaysian Standards (MS) are developed through consensus by committees which comprise balanced representation of producers, users, consumers and others with relevant interests, as may be appropriate to the subject at hand. To the greatest extent possible, Malaysian Standards are aligned to or are adoption of international standards. Approval of a standard as a Malaysian Standard is governed by the Standards of Malaysia Act 1996 [Act 549]. Malaysian Standards are reviewed periodically. The use of Malaysian Standards is voluntary except in so far as they are made mandatory by regulatory authorities by means of regulations, local by-laws or any other similar ways.

For the purposes of Malaysian Standards, the following definitions apply:

**Revision:** A process where existing Malaysian Standard is reviewed and updated which resulted in the publication of a new edition of the Malaysian Standard.

**Confirmed MS:** A Malaysian Standard that has been reviewed by the responsible committee and confirmed that its contents are current.

**Amendment:** A process where a provision(s) of existing Malaysian Standard is altered. The changes are indicated in an amendment page which is incorporated into the existing Malaysian Standard. Amendments can be of technical and/or editorial nature.

**Technical corrigendum:** A corrected reprint of the current edition which is issued to correct either a technical error or ambiguity in a Malaysian Standard inadvertently introduced either in drafting or in printing and which could lead to incorrect or unsafe application of the publication.

NOTE: Technical corrigenda are not to correct errors which can be assumed to have no consequences in the application of the MS, for example minor printing errors.

STANDARDS MALAYSIA has appointed **SIRIM Berhad** as the agent to develop, distribute and sell Malaysian Standards.

For further information on Malaysian Standards, please contact:

**Department of Standards Malaysia**  
Ministry of Science, Technology and Innovation  
Level 1 & 2, Block 2300, Century Square  
Jalan Usahawan  
63000 Cyberjaya  
Selangor Darul Ehsan  
MALAYSIA

OR **SIRIM Berhad**  
(Company No. 367474 - V)  
1, Persiaran Dato' Menteri  
Section 2, P. O. Box 7035  
40700 Shah Alam  
Selangor Darul Ehsan  
MALAYSIA

Tel: 60 3 8318 0002  
Fax: 60 3 8319 3131  
<http://www.standardsmalaysia.gov.my>  
E-mail: [central@standardsmalaysia.gov.my](mailto:central@standardsmalaysia.gov.my)

Tel: 60 3 5544 6000  
Fax: 60 3 5510 8095  
<http://www.sirim.my>  
E-mail: [msonline@sirim.my](mailto:msonline@sirim.my)

## Contents

	<b>Page</b>
Committee representation .....	ii
Foreword.....	iii
Introduction.....	v
1 Scope.....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Design considerations and requirements .....	2
5 Design criteria.....	4
Bibliography .....	10

## **Committee representation**

The Industry Standards Committee on Building, Construction and Civil Engineering (ISC D) under whose authority this Malaysian Standard was developed, comprises representatives from the following organisations:

Association of Consulting Engineers Malaysia  
Construction Industry Development Board Malaysia  
Department of Irrigation and Drainage Malaysia  
Department of Standards Malaysia  
Dewan Bandaraya Kuala Lumpur  
Federation of Malaysian Manufacturers  
Jabatan Bomba dan Penyelamat Malaysia  
Jabatan Kerajaan Tempatan  
Jabatan Kerja Raya Malaysia  
Malaysian Timber Council  
Malaysian Timber Industry Board  
Master Builders Association Malaysia  
Pertubuhan Arkitek Malaysia  
Projek Lebuhraya Utara-Selatan Berhad  
Real Estate and Housing Developers' Association Malaysia  
SIRIM Berhad (Secretariat)  
Suruhanjaya Perkhidmatan Air Negara  
The Cement and Concrete Association of Malaysia  
The Institution of Engineers, Malaysia  
Universiti Sains Malaysia  
Universiti Teknologi Malaysia

The Technical Committee on Planning and Design of Urban Stormwater Management Facilities which developed this Malaysian Standard is managed by the Department of Irrigation and Drainage Malaysia in its capacity as an authorised Standards-Writing Organisation and consists of representatives from the following organisations:

Association of Consulting Engineers Malaysia  
Construction Industry Development Board Malaysia  
Department of Environment  
Department of Irrigation and Drainage Malaysia (Secretariat)  
Department of Town and Country Planning  
Jabatan Kerja Raya Malaysia  
Master Builders Association Malaysia  
Ministry of Housing and Local Government  
National Landscape Department  
Pertubuhan Arkitek Malaysia  
Real Estate and Housing Developers' Association Malaysia  
SIRIM Berhad  
The Institution of Engineers, Malaysia

### **Co-opted members:**

Department of Irrigation and Drainage Malaysia  
PWM Associates Sdn Bhd

## Foreword

This Malaysian Standard was developed by the Technical Committee on Planning and Design of Urban Stormwater Management Facilities under the authority of the Industry Standards Committee on Building, Construction and Civil Engineering. Development of this standard was carried out by Department of Irrigation and Drainage Malaysia which is the Standards-Writing Organisation (SWO) appointed by SIRIM Berhad to develop standards for urban stormwater management.

This Malaysian Standard on Urban Stormwater Management is part of a series of standards developed for stormwater management design practices in Malaysia. The series from Parts 1 to 20 cover the majority of stormwater facilities, from quantity design to erosion and sediment control. However, Parts 1 to 3 of these standards set the general criteria, common to all facilities, needed to design for either stormwater quantity or quality control. Parts 4 to 20 set the specific criteria for the design of the individual facility or Best Management Practices (BMP).

These standards are derived mainly from the *Urban Stormwater Management Manual for Malaysia, 2nd Edition (MSMA 2nd Edition)*, which already contains extensive explanatory material as well as detailed technical guides, including work examples. As such, these standards do not replicate the design manual. Rather, they summarise the pertinent aspects of the manual which the user must comply with as minimum requirements in designing stormwater facilities.

It is hoped that with these standards, stormwater management in the country can be properly implemented and regulated in minimising the present haphazard flash floods as well as deterioration in water quality resulting from developing and developed catchment areas.

A Malaysian Standard does not purport to include all the necessary provisions of a contract. Users of Malaysian Standards are responsible for their correct application.

MS 2526 consists of the following parts, under the general title, *Urban Stormwater Management*:

*Part 1: Design acceptance criteria*

*Part 2: Quantity design fundamentals*

*Part 3: Quality design fundamentals*

*Part 4: Roof and property drainage*

*Part 5: On-site detention*

*Part 6: Rainwater harvesting*

*Part 7: Detention ponds*

*Part 8: Infiltration facilities*

## **MS 2526-11:2014**

### **Foreword (continued)**

*Part 9: Bioretention systems*

*Part 10: Gross pollutant traps*

*Part 11: Water quality ponds and wetlands*

*Part 12: Erosion and sediment control*

*Part 13: Pavement drainage*

*Part 14: Drains and swales*

*Part 15: Pipe drains*

*Part 16: Engineered channels*

*Part 17: Bioengineered channels*

*Part 18: Culverts*

*Part 19: Gate and pump*

*Part 20: Hydraulic structures*

Compliance with a Malaysian Standard does not in itself confer immunity from legal obligations.