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Code of Practice

# Fire Extinguishing installations and equipment on premises —

**Part 1: Hydrant systems, hose reels and  
foam inlets (Formerly CP 402.101)**

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Code drafting committee BLCP/43

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## Foreword

This British Standard code of practice is a revision of CP 402.101:1952 and as part of BSI's programme of metrication it is expressed in metric terms. For information on SI units reference should be made to BS 3763 "The International System of units (SI)".

The other parts of BS 5306 are:

- *Part 0: Guide for selection of installed systems and other fire extinguishing equipment;*
- *Part 2: Sprinkler systems;*
- *Part 3: Code of practice for selection, installation and maintenance of portable fire extinguishers;*
- *Part 4: Specification for carbon dioxide systems;*
- *Part 5: Halon systems;*
- *Section 5.1: Halon 1301 total flooding systems;*
- *Section 5.2: Halon 1211 total flooding systems;*
- *Part 6<sup>1)</sup>: Foam systems;*
- *Part 7<sup>2)</sup>: Powder systems.*

The revision has been made in the light of current progress in revising the CP 3: Chapter IV series, Code of basic data for the design of buildings: "precautions against fire", and in conjunction with the preparation of the new range of standards covering particular items of equipment for fixed fire fighting installations in buildings. Some of the information previously found in this code is now to be published in these new standards, notably that on hose reels (BS 5274 in course of preparation).

Since CP 402.101:1952 was prepared the practice of stowing long lengths of hose adjacent to landing valves has fallen out of favour, and this aspect of the subject has therefore been omitted from the revised code. It is nowadays the practice for hose to be brought to the site by the fire brigade.

It is recognized that recent projects such as shopping malls and town centre development and redevelopment schemes may be inaccessible to conventional fire appliances and may require special measures such as horizontal mains, but this code of practice does not give guidance on these special measures. Reference should be made to Fire Prevention Guide No. 1 "Fire precautions in town centre development" (published by HMSO). The fire authority should also be consulted.

In England and Wales, the provision of hydrant systems is largely a matter of voluntary good practice. In Scotland these are mandatory requirements in the Building Standards (Scotland) Regulations 1981 and 1982, and amendments thereof or additions thereto relating to the provision of fire mains do not necessarily coincide with the requirements of this code of practice.

<sup>1)</sup> In preparation.

<sup>2)</sup> In preparation.

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

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

#### **Summary of pages**

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 27 and a back cover.

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Sidelining in this document indicates the most recent changes by amendment.

# Section 1. General

## 0 Introduction

It is important that the fire protection of a building should be considered as a whole. Hydrant systems, hose reels and foam inlets form only part, although an important part, of such facilities and it should not be assumed their provision entirely obviates the need for portable fire extinguishers, other appliances or other fixed fire suppression systems. Wet and dry rising mains are intended for use by fire brigade or other trained personnel and provide a readily available means of delivering considerable quantities of water to extinguish or to prevent the spread of fire. Hose reels, although delivering smaller quantities of water, are capable of operation by untrained persons who may be in the vicinity when the fire is discovered, and thus can be more rapidly brought into action to tackle a fire in its early stage of development. They may also be required for use by the fire brigade on arrival at the scene. They provide a continuous and easily controlled water jet and thus are generally more effective than portable fire extinguishers and less damaging than larger jets. Foam inlets have a more specialized role in dealing with oil fires and with fires involving electrical apparatus where a quantity of oil is involved.

It should not be assumed that the provision of efficient hydrant systems and hose reels entirely obviates the need for portable fire extinguishers and other hand appliances. On the contrary, these items may provide the best means of rapidly extinguishing a small fire before it has taken hold and before even a hose reel can be brought into action. Therefore consideration should always be given to supplementing hydrant systems and hose reels with hand appliances. Moreover portable fire extinguishers may be required for certain special risks. Advice on such matters can always be obtained from the fire authorities, H.M. Factory Inspectorate and the fire insurance companies. In addition, reference should be made as necessary to other parts of this code of practice.

It is essential that fire extinguishing equipment should be carefully maintained to ensure instant readiness when required. This routine is frequently tedious and liable to be overlooked or given insufficient attention by supervisors. It is however neglected at peril to the lives of occupants of the premises and at the risk of crippling financial loss. Its importance cannot be too highly emphasized.

## 1 Scope

This code of practice covers good practice in matters affecting the planning, installation, testing and upkeep of fire hydrant systems including wet and dry rising mains, hose reels and foam inlets on premises.

Although statutory fire hydrants need to be considered when co-ordinating all fire fighting systems in a locality, the scope of this code of practice does not include them and if information is required concerning them reference should be made to the fire authority.

## 2 References

The titles of the British Standards publications referred to in this standard are listed on the inside back cover.

## 3 Definitions

For the purposes of this standard the following definitions apply. They are the same as the terms adopted for general use in BS 4422-4 except that certain additional definitions have been included. These additional definitions are marked with an asterisk.

### 3.1

#### **coupling\***

a device for connecting lengths of hose so as to secure continuity from the source of a water supply to the delivery point

### 3.2

#### **fire hydrant (underground fire hydrant)**

an assembly contained in a pit or box below ground level and comprising a valve and outlet connection from a water supply main

### 3.3

#### **fire hydrant, pillar**

a fire hydrant whose outlet connection is fitted to a vertical component projecting above ground level

**3.4****foam inlet**

fixed equipment consisting of an inlet connection, fixed piping and a discharge assembly, enabling firemen to introduce foam into an enclosed compartment

**3.5****hydrant outlet**

the component of fire hydrant to which the standpipe is connected

**3.6****hose reel**

fire fighting equipment, consisting of a length of tubing fitted with a shut-off nozzle and attached to a reel, with a permanent connection to a pressurized water supply

**3.7****landing valve**

an assembly comprising a valve and outlet connection from a wet or dry riser

**3.8****ring fire main system\***

a water main which encircles a building or series of buildings or other associated fire risks and which feeds fire hydrants, internal rising mains etc.

**3.9****rising main, dry (dry riser)**

a vertical pipe installed in a building for fire fighting purposes, fitted with inlet connections at fire brigade access level and landing valves at specified points, which is normally dry but is capable of being charged with water usually by pumping from fire service appliances

**3.10****rising main, wet (wet riser)**

a vertical pipe installed in a building for fire fighting purposes and permanently charged with water from a pressurized supply, and fitted with landing valves at specified points

**3.11****shut-off nozzle\***

a device which is coupled to the outlet end of hose reel tubing and by means of which the jet of water or spray is controlled

## Section 2. Provision and siting of hydrants and risers

### 4 Fire hydrants, general

**4.1** When they are considered to be necessary, private fire hydrants should be provided within the confines of the site after consultation with the local water and fire authorities. Their installation should conform generally to this code of practice and also to any specific requirements of these authorities or the insurance company.

**4.2** Fire hydrants should be positioned in such a way that the parking, loading and unloading of vehicles is unlikely to obstruct them, and in choosing locations for them regard should be paid to the availability of statutory hydrants in public thoroughfares nearby.

### 5 Fire hydrants, external

**5.1** Where fire hydrants are to be installed, they should be included as part of a ring fire main system (see 9.7) and be positioned not more than 70 m from an entry to any building on the site and not more than 150 m apart. They should preferably be sited immediately adjacent to road-ways or hard-standing facilities provided for fire brigade appliances. They should normally be not less than 6 m from the building or from the risk so that they remain usable during a fire.

**5.2** For underground fire hydrants which unavoidably have to be sited in roadways care should be taken that the surface box frame and cover (which should be in accordance with BS 750) are capable of bearing the heaviest vehicle which may use the roadway.

**5.3** Underground fire hydrants should be in accordance with BS 750 and be installed in pits, examples of which are shown in Figure 1 and Figure 2. Each fire hydrant should be clearly indicated by a plate in accordance with BS 3251 affixed nearby in a conspicuous position. The preferred distance, when installed, between the hydrant outlet and the finished ground level is 300 mm.

**5.4** Where pillar hydrants are installed care should be taken to protect them from mechanical damage and from damage by frost.

### 6 Rising mains

#### 6.1 General

**6.1.1** Rising mains should be installed in buildings where any floor is higher than 18 m (see note) above ground level. Where there are no floors higher than 60 m above ground level, wet or dry rising mains may be installed. Where there are floors higher than 60 m above ground level, wet rising mains are necessary owing to the pressures required to provide adequate water supplies at the landing valves at upper floors and also to ensure that water is immediately available at all floor levels.

NOTE The Building Standards (Scotland) Regulations 1981 and 1982 specify 11 m in respect of buildings of occupancy subgroup A2 (Regulation E22 (1) (a) (i)).

**6.1.2** Each rising main should be provided with landing valves sited:

- a) within a ventilated lobby of a lobby approach stairway, where this is provided, or
- b) in a stairway enclosure, or
- c) in such other position as may be agreed with the fire authority.

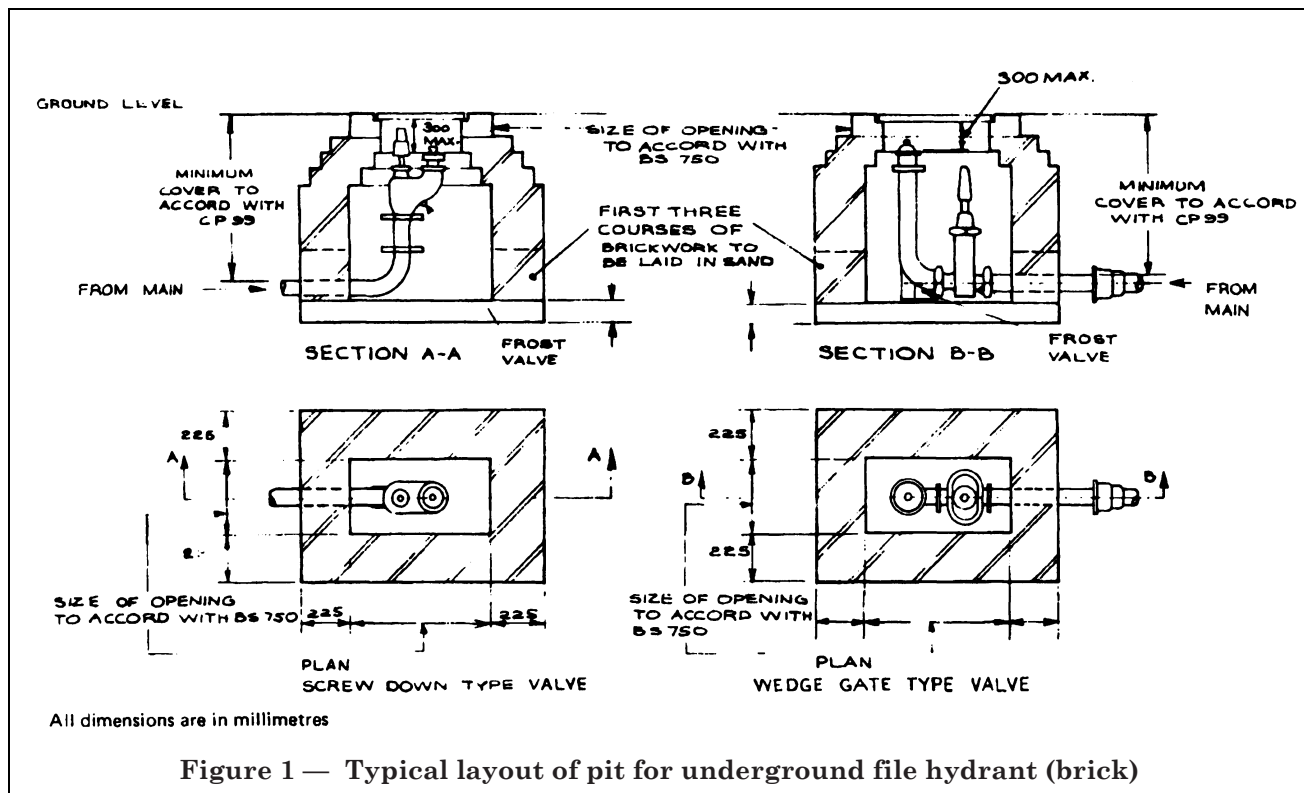
**6.1.3** In some cases a simple single cable and plug telephone system may be recommended by the fire authority to assist communication between the ground floor and the floor at which a landing valve is in use.

#### 6.2 Position of inlets

**6.2.1** In selecting positions for inlet connections for a dry rising main, regard should be paid to the positions of underground fire hydrants, the possibility of damage resulting from falling glass from windows and other possible occurrences during a fire. The position of inlets should be clearly indicated using the appropriate sign in accordance with BS 5499-1 and using a letter height of 50 mm.

**6.2.2** Inlet connections for a dry rising main should be installed in an external wall or in a boundary wall of a building as close as possible to the position of the main which they serve, and any run of connecting pipe between the inlet and the vertical run of the main should be kept to a minimum and should be given a fall towards the drain valve. Access to these inlet connections should be in accordance with clause 11.

- a) one is provided for every 900 m<sup>2</sup>, or any part thereof, of the floor area at each level other than the ground floor;
- b) rising mains are not more than 60 m apart in a horizontal direction;
- c) no part of a floor area is more than 60 m distant from a landing valve: the distance to be measured along a route suitable for hose lines, including any distance up or down a stairway.



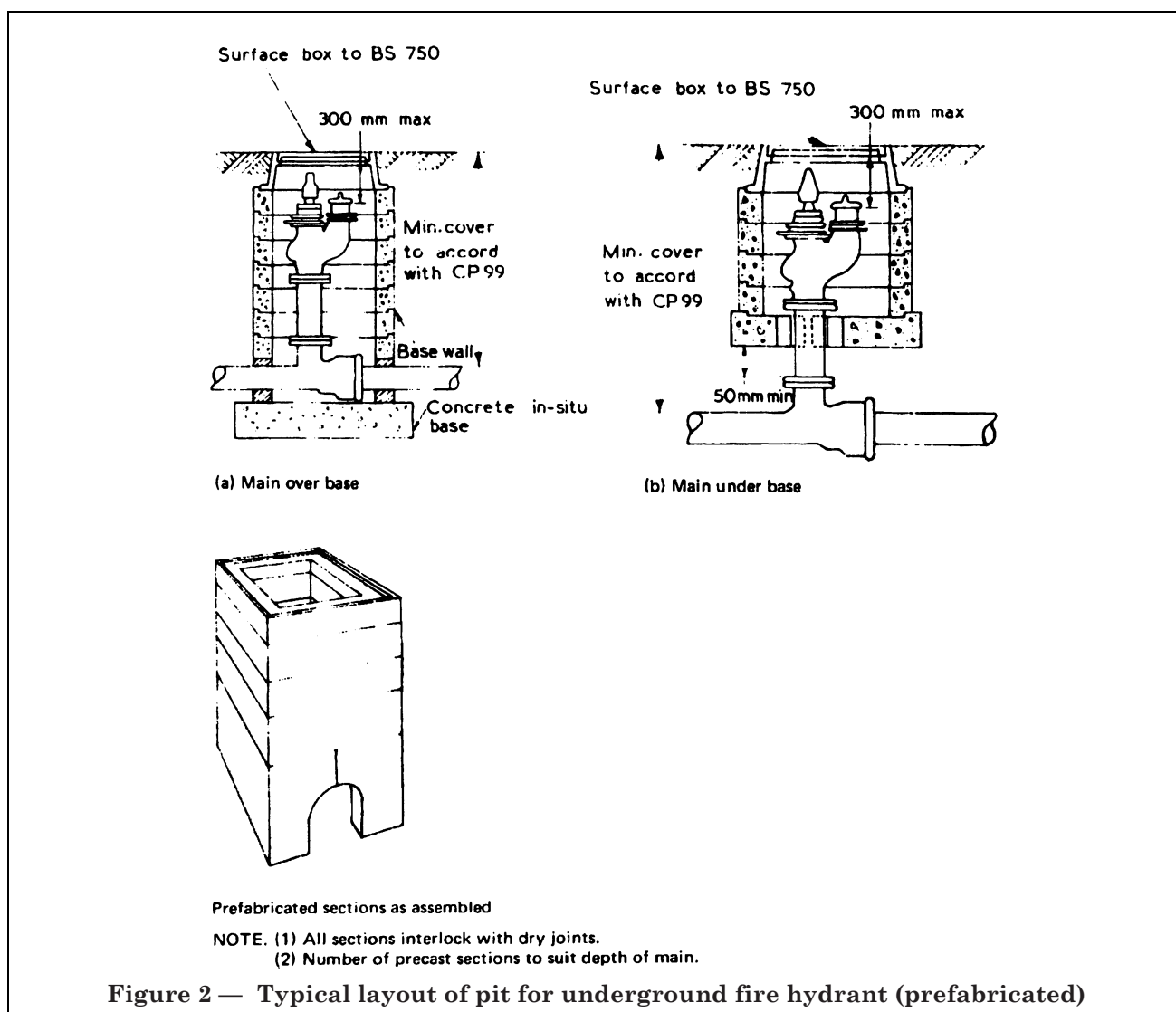


Figure 2 — Typical layout of pit for underground fire hydrant (prefabricated)

7.1.2 Landing valves are desirable on every floor above the ground floor in blocks of flats, and on every entrance floor above the ground floor of the block in blocks of maisonettes.

7.1.3 Landing valves should be protected against interference and attack by thieves and vandals as far as it is possible to do so without adversely affecting operational capability. Recommendations for effecting this are given in Appendix A.

7.1.4 Normally one landing valve is provided at each level on each riser, but if, owing to the degree of fire risk, it is necessary to install two, the normal size of the riser should be increased in accordance with 8.1.2.

7.1.5 Landing valves for dry rising mains should comply with the requirements of BS 5041-2 and those for wet rising mains should comply with the requirements of BS 5041-1.

## 7.2 Recesses and enclosures for landing valves

7.2.1 In all cases a landing valve should be installed with its lowest point about 750 mm above floor level.

7.2.2 Landing valves for dry rising mains should preferably be protected by, and installed within, a box in accordance with BS 5041-4.

Landing valves for wet rising mains may also be protected by boxes when special circumstances exist. Some types of these valves can be fitted in boxes complying with the requirements of BS 5041-4 and still leave the clearances required by that standard: in such cases a box complying with the requirements of BS 5041-4 should be used. The majority of these valves however cannot be accommodated in standard boxes and, in these cases, special boxes should be designed to ensure that the clearances recommended in 7.2.3 are assured.

**7.2.3** When a landing valve for a wet rising main is enclosed in a box, and when any valve is unenclosed in an open recess, or is located in a duct or alcove, the opening giving access to the landing valve should have not less than 150 mm clearance on both sides and not less than 230 mm below the centre line of the outlet of the landing valve and not less than 200 mm clearance above the handwheel. The depth of the opening should not be greater than is necessary, and in no case should the front edge of the female coupling of the landing valve be more than 75 mm behind the face of the wall. In addition, consideration should be given to allowing adequate space around the valve to permit maintenance and testing.

**7.3.4** If enclosure of the valve in a box is not desired or is impracticable owing to the main and the landing valves not being in a duct or alcove, each landing valve on a dry rising main should be strapped shut, the strap being secured by a locked padlock. If it is required that the landing valve be enclosed in a manner otherwise than in accordance with BS 5041-4, details of the proposal should be discussed with the fire authority before any work is put in hand.

**7.3 Notices.** A notice reading either “Dry riser” or “Wet riser” as appropriate, should be displayed either on the door of the box or recess in which the landing valve is mounted, or in an adjacent prominent position if a door is not provided. The sign should be rectangular with white letters on a red background, in accordance with BS 5499-1. The letters should be lower case except for the initial letter “D” or “W”, which should be upper case. The lower case letter height should be either not less than 50 mm, or of such smaller size only as may be necessary because of the size of the door.

**NOTE** Boxes for dry risers complying with BS 5041-4 as amended by Amendment No. 1 (1986) are required to be marked as recommended in this clause.