BS EN 13798:2010

BSI Standards Publication

Hydrometry — Specification for a reference raingauge pit

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee CPI/113, Measuring instruments and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Hydrometry - Specification for a reference raingauge pit

Hydrométrie - Spécification pour une fosse de référence d'installation d'un pluviomètre

Hydrometrie - Spezifikation für eine Grube für Referenz-Regenmesser

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Foreword

This document (EN 13798:2010) has been prepared by Technical Committee CEN/TC 318 “Hydrometry”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2010, and conflicting national standards shall be withdrawn at the latest by December 2010.

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Introduction

A raingauge pit consists of a pit, normally square in plan and of suitable depth, and a grating, normally of galvanised sheet steel or plastic. Such a pit can contain any suitable type of raingauge. The pit gauge may be used in its own right for improved measurement of rainfall, for wind effects evaluation or for comparison purposes against other reference raingauges.

1 Scope

This European Standard specifies the design of a reference raingauge pit. The reference raingauge pit is designed for the liquid precipitation only. The specified details of the pit and the grating, are purposely kept to a minimum in order to allow each raingauge operator latitude in their construction and to suit local conditions.

2 Design and construction of the reference raingauge pit

Figures 1 to 6 show the design of the pit, including the required dimensions of the pit and the grating, and the method of installation of the raingauge. The specified dimensions are not critical, but shall be used whenever possible. Variations are acceptable within the indicated tolerances.

The pit shall preferably be sited on level ground to avoid possible surface runoff into it during prolonged heavy rain. However, in mountainous areas, this may not be possible or desirable and adequate drainage shall be provided in such cases.

The sides of the pit shall be formed of brick, concrete, corrugated iron, plastic, preserved wood or other suitable material. They shall be supported to prevent collapse.

Supports shall be provided around the edges, or at the corners of the pit, on which to rest the grating. The grating shall either be strong enough to walk on, or be made in two sections to allow half to be lifted, to give access to the raingauge.

The base of the pit shall be adapted and deep enough to allow the correct installation of the raingauge and the levelling. The base of the pit shall also allow water to drain.

For drainage an overlay of gravel or other suitable material may be used but for high precipitation rate places a suitable pumping system may be used. It may be located in a central recess (extra depth).

Plastic sheeting laid over bare soil shall not be used if it does not permit water to drain quickly away. Weed growth shall be prevented either by weeding or by periodic application of weed killer. The surrounding grass should be maintained well and kept without weed. The maximum height of the grass should not exceed 2 cm. The gratings shall be kept free of debris, (cut) grass and leaves.

The pit shall be at least 300 mm deep.

3 Design and construction of the grating

The grating shall be constructed from material sufficiently strong to maintain its shape without distortion. The strips of the grating shall be not more than 5 mm thick, to prevent splashing from their top surfaces. The top of the grating shall equalize the level of the soil or grass. Grating distance shall be (125 ± 5) mm.

NOTE 1 Thickness will depend partly, however, on the material used, such that in the case of galvanised steel, 2 mm will probably be sufficient.

NOTE 2 The grating should preferably be of galvanised sheet steel, but can be of plastic or wood or other suitable material. Aluminium could be a good compromise.

NOTE 3 Rounding off the top surface of the grating will decrease splashing.

4 Installation of raingauges

The orifice of the raingauge shall be level with the top of the grating and centred.

To prevent in splash from the grating, the side of the central square space of the grating shall be approximately between 200 mm and 300 mm larger than the diameter of the raingauge collector. In order to match this requirement, the square space of the grating shall be adapted according to the raingauge collector's diameter.

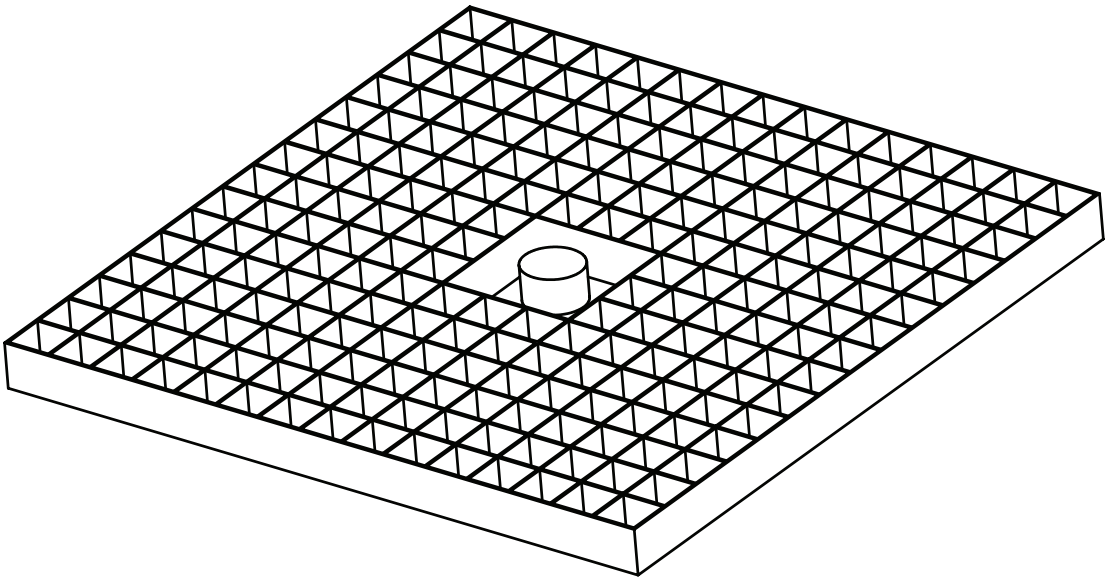
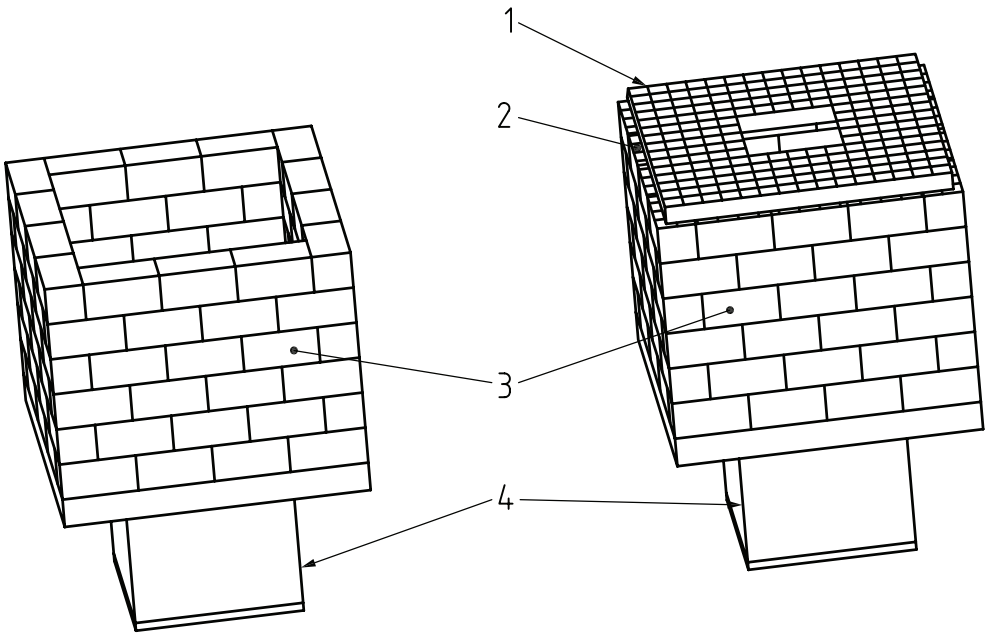


Figure 1 — General arrangement of raingauge pit and its grating as appearing at ground level



Key

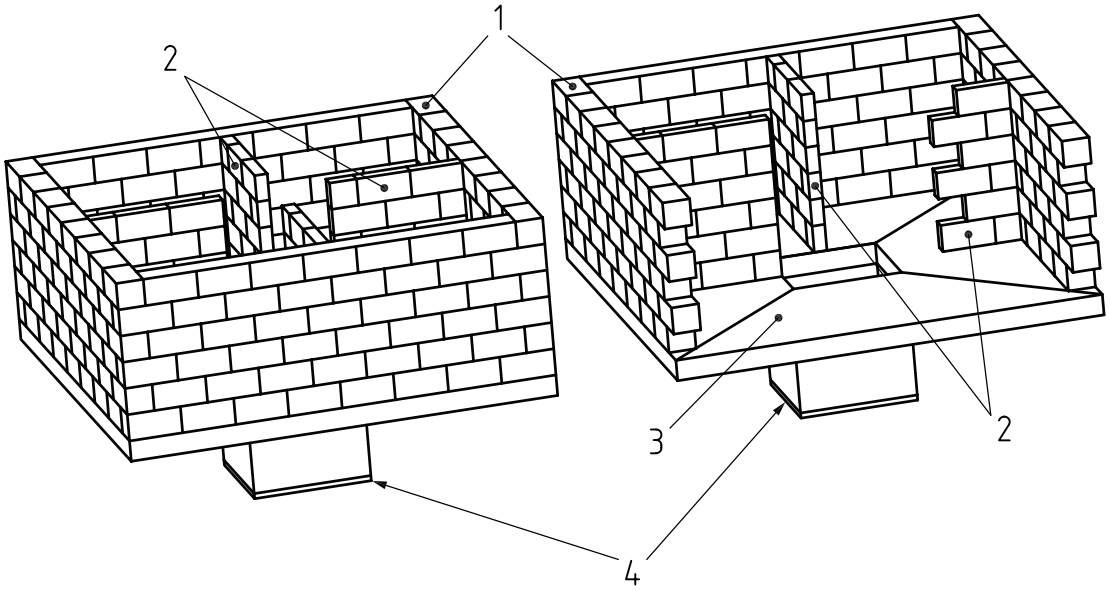
1 grating

2 ground level (soil and grass)

3 pits sides (bricks in this example)

4 pit recess – Additional recess for drainage

Figure 2 — 3D images of complete pit and its grating



Key

1 4-fold pit sides (bricks in this example)

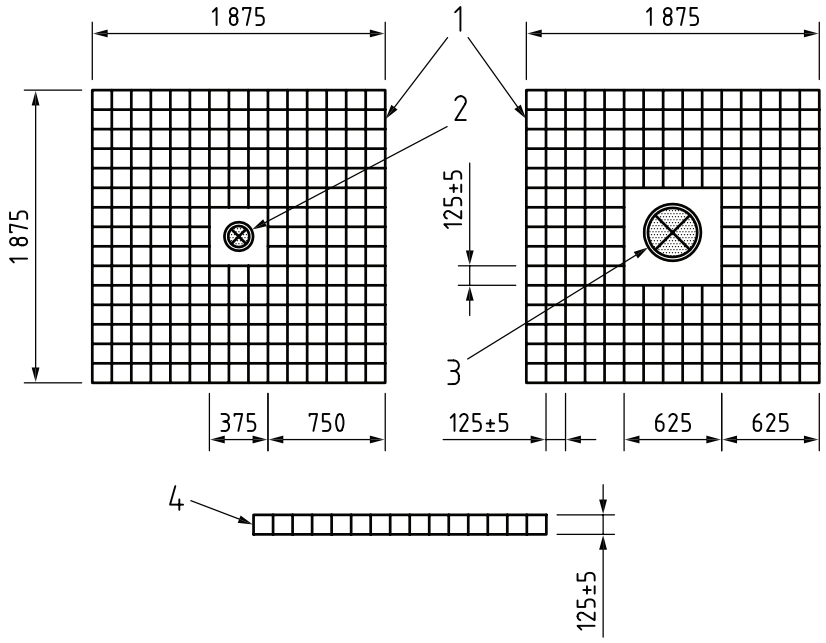
2 pits internal sides (bricks in this example)

3 concrete base for reference rain gauge's installations

4 pit recess – Additional recess for pumping system and drainage

Figure 3 — 3D images of the realization of 4-fold Pit (4 reference raingauge pits) – Reference raingauge pits of WMO Field Intercomparison of rain intensity gauges (Vigna di Valle, Italy)

Dimensions in millimetres



Key

1 plan view (at ground level)

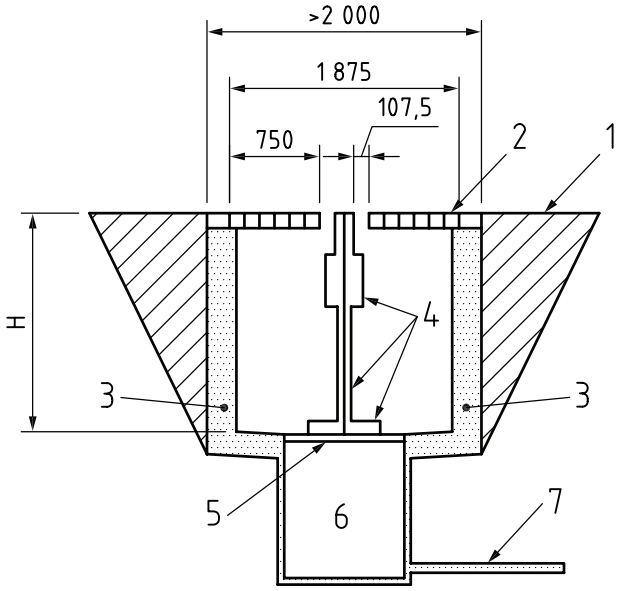
2 rain gauge at the centre of grating (first example: 160 mm diameter – 200 cm^2 surface)

3 rain gauge at the centre of grating (second example: 357 mm diameter – 1000 cm^2 surface)

4 side view

Figure 4 — Detail of grating, its central square and rain gauge

Dimensions in millimetres



Key

1 ground level (soil/grass)

2 grating

3 pit sides or support corners

4 rain gauge, mast and installation base

5 optional installation grating and water collector for drainage

6 optional additional recess for pumping system and drainage

7 drain pipe

H Height

Figure 5 — Vertical section through a raingauge pit and its grating

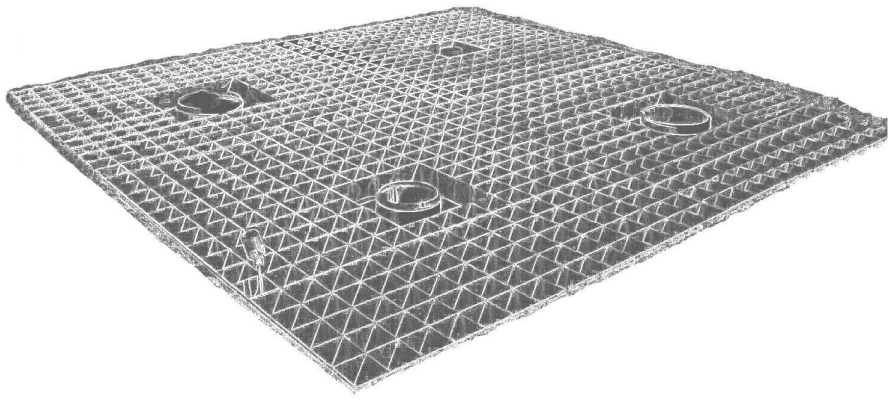


Figure 6 — Example of realization: 4-fold pit - Reference rain gauge pits of WMO Field Intercomparison of rain intensity gauges (Vigna di Valle, Italy, 2007)

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