

Typology 2 b: vertical capture shafts

Outcome of actions and vertical installations for the purposes of groundwater aquifer capture.

The term 'well' generally refers to an artificial tunnel with vertical axis. By extension, the term well also applies to the vertical tunnel of a natural cavity.

A well's purpose depends on the geological terrain within which it has been excavated, on the type of architecture used in its lining and above all to that which it connects. At first glance, the purpose of every well would seem to be that of collecting groundwater. However, after due exploration, it is often "revealed" that the well leads to an underground aqueduct or is in fact a cistern or a man-made structure which requires further investigation before its purpose can be ascertained. In use since antiquity, wells were manually excavated until at least the beginning of this century, despite the introduction of boring machines. Having explained that the ground may naturally release exhalation gases, Vitruvius recommends that a lit oil lamp be lowered into the well: should the flame go out, two lateral wells should be dug to release the gas from the soil. Once water has been reached, he recommends that the well be covered to avoid blocking the vein. If the purpose of the excavation is to reach a groundwater aquifer for drinking water or irrigation purposes, ordinary wells and artesian wells will be created.

By extension, the section surrounding the mouth is also known as well, or more appropriately as edge or parapet, or as puteal or well-curb. The external part of the well consists of a pedestal, on which the puteal rests. Sometimes made of stone and elegantly shaped, the well could be closed by a lid (or hatch). Wells sometimes had a lid support or an architrave, to which the water pulley, with its rope or chain and bucket were attached. Metallic arch-shaped elements had the same support function. All such elements could be found at the uppermost access of both wells and cisterns. The section, which widens just below the pedestal, at the beginning of the actual well, is known in Italian as "gola". There are sometimes beams or arches to support the puteal and the vault near the well's opening.

Stepped well: the structure's particular design, allowed deep spring water and gravitational water to be reached by means of a vaulted stairway. Sardinia (Italy) has various examples of stepped wells from the Nuragic period, some of which may have been used for religious purposes.

Artesian well

Vertical well for the capture of a pressurised underground groundwater aquifer; the well shaft can be circular, square, polygonal, elliptic etc.

Where water is contained in the permeable strata below impermeable strata, natural pressure sometimes causes the water to rise and flow to the piezometric surface, known as an artesian well. The name originates from "artésien", or rather from "de l'Artois", the region in France where the artesian well has been in use for a very long time.

Gauge well

Vertical perforation in the ground used for measuring water levels.

A gauge well is an ordinary well, which, thanks to the depth markings created inside it, was used for measuring water levels and predicting floods. The most famous example of such a well is the Egyptian Nilometer.

Ordinary radial well

Vertical shaft in the ground with one or more passages (branches) at or near the bottom.

If the well is not particularly deep or has been excavated in soil where water is scarce, one or more branches can be created to increase the well's water capture capacity. There are radial wells with one or more branches at or near their base, which link to a water table or drain even small aquifers.

Ordinary well

Vertical well for the capture of an underlying groundwater aquifer (filtering or groundwater well); the well shaft can be circular, square, polygonal, elliptic etc.

When an ordinary well comes into contact with a water table, water never rises above the natural ground level unless the well is near the site of groundwater discharge.