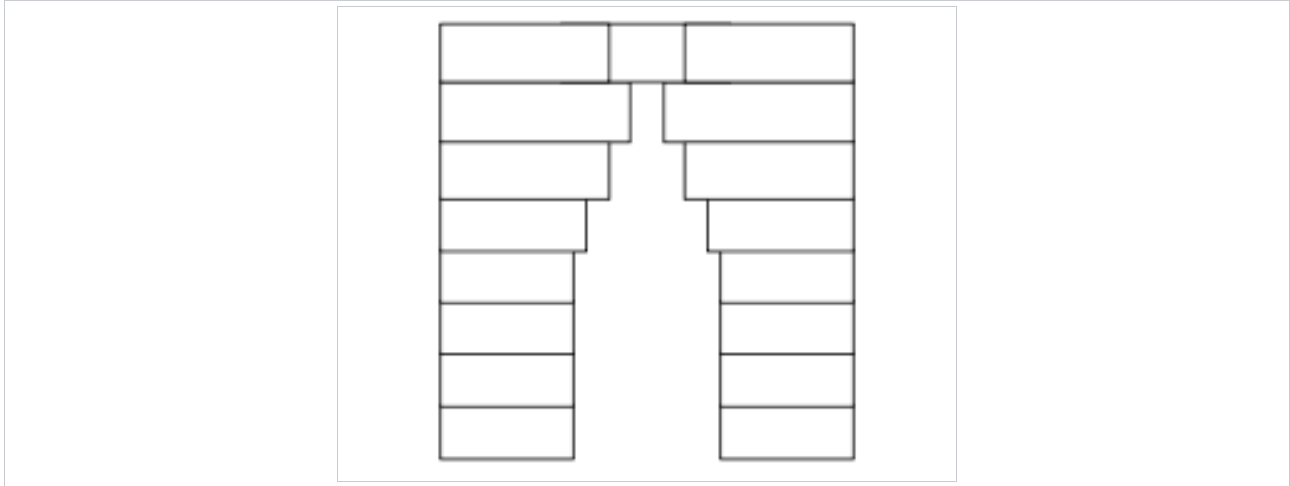
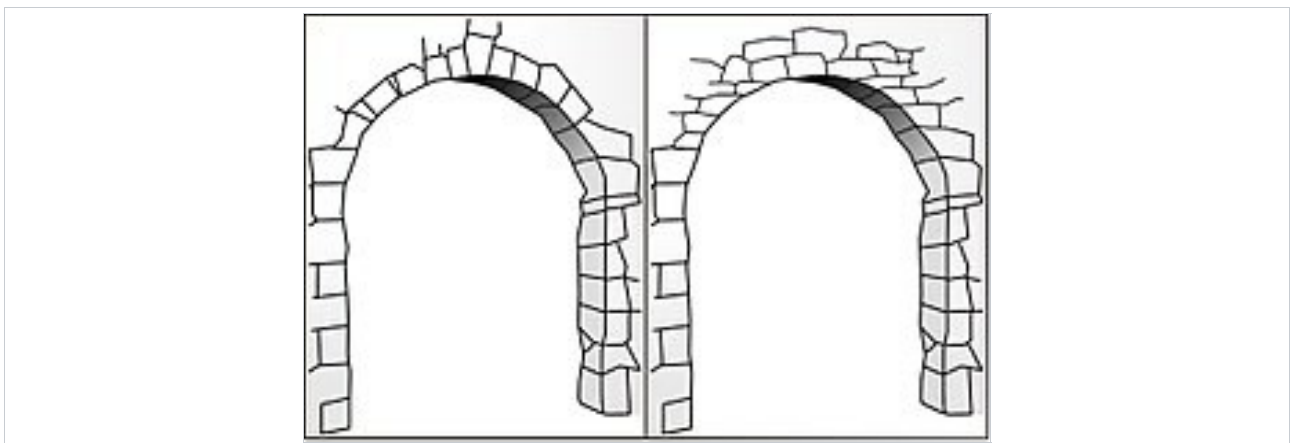


Corbel arch

From Wikipedia, the free encyclopedia



Basic principle of corbeled arch design.



Comparison of a generic "true" stone *arch* (left) and a *corbel arch* (right).

A **corbel arch** (or **corbeled** / **corbelled arch**) is an *arch*-like construction method that uses the *architectural* technique of *corbeling* to span a space or void in a structure, such as an entranceway in a wall or as the span of a bridge. A **corbel vault** uses this technique to support the superstructure of a building's roof.

A corbel arch is constructed by offsetting successive courses of stone (or brick) at the springline of the walls so that they project towards the archway's center from each supporting side, until the courses meet at the apex of the archway (often, the last gap is

bridged with a flat stone). For a corbeled vault covering the technique is extended in three dimensions along the lengths of two opposing walls.



Royal Palace of Ugarit Entrance

Although an improvement in load-bearing efficiency over the [post and lintel](#) design, corbeled arches are not entirely self-supporting structures, and the corbeled arch is sometimes termed a "false arch" for this reason. Unlike "true" arches, not all of the structure's [tensile stresses](#) caused by the weight of the superstructure are transformed into [compressive stresses](#). Corbel arches and [vaults](#) require significantly thickened walls and an [abutment](#) of other stone or fill to counteract the effects of [gravity](#), which otherwise would tend to collapse each side of the archway

Use in historical cultures^{[\[edit\]](#)}



Arches at [Nuraghe Santu Antine](#), Sardinia, 19-18th centuries BC

Ireland^{[\[edit\]](#)}

The [Newgrange](#) passage tomb has an intact corbel arch (vault) supporting the roof of the main chamber, and the buildings of the monastery at [Skellig Michael](#) are constructed using this method.

Ancient Egypt[[edit](#)]

During the [Fourth Dynasty](#) reign of [Pharaoh Sneferu](#), the [Ancient Egyptian pyramids](#) used corbel vaults in some of their chambers. These [monuments](#) include the [Bent Pyramid](#) and the [Red Pyramid](#). The [Great Pyramid of Giza](#) uses corbel arches at the Grand Gallery.

Ancient Mediterranean[[edit](#)]

Corbel arches and vaults are found in various places around the ancient Mediterranean. In particular, corbelled burial vaults constructed below the floor are found in [Ebla](#) in Syria, and in [Tel Hazor](#), and [Tel Megiddo](#) in Israel.[1]

[Ugarit](#) also has corbelled constructions.

[Nuraghe](#) constructions in ancient [Sardinia](#), dating back to 1900 BC, use similar corbel techniques. The use of [Beehive tombs](#) on the [Iberian peninsula](#) and elsewhere around the Mediterranean, going back to 3000 BC, is also similar.

Anatolia[[edit](#)]



Corbelled chamber with hieroglyphs in [Hattusa](#)

The [Hittites](#) in ancient [Anatolia](#) were also building corbelled vaults. The earliest ones date to the 16th century BC.

Some similarities are found between the Hittite and Mycenaean construction techniques. Yet the Hittite corbelled vaults are earlier by about 300 years.[2]

Greece[[edit](#)]



The "Treasury of Atreus".

The ruins of ancient [Mycenae](#) feature many corbel arches and vaults, the "[Treasury of Atreus](#)" being a prominent example. The [Arkadiko Bridge](#) is one of four [Mycenaean](#) corbel arch bridges which are part of a former network of roads, designed to accommodate chariots, between [Tiryns](#) and [Epidauros](#) in the [Peloponnese](#), in [Greece](#). Dating to the Greek [Bronze Age](#) (13th century BC), it is one of the oldest arch bridges still in existence and use. The well-preserved [hellenistic Eleutherna Bridge](#) on [Crete](#) has an unusually large span of nearly 4 m.[3]

Maya civilization[edit]



Maya corbel arch at [Cahal Pech](#).

Corbeled arches are a distinctive feature of certain [pre-Columbian Mesoamerican](#) constructions and historical/regional architectural styles, particularly in that of the [Maya civilization](#). The prevalence of this spanning technique for entrances and [vaults](#) in [Maya architecture](#) is attested at a great many [Maya archaeological sites](#), and is known from structures dating back to the [Formative](#) or *Preclassic* era. By the beginning of the Classic era (ca. 250 [CE](#)) corbeled vaults are a near-universal feature of building construction in the central [Petén Basin](#) region of the central Maya lowlands.^[4]

India[edit]



A corbel arch at the tomb of Nasir ud din Mahmud, Ghori, [New Delhi](#).

Before the true arch was introduced in [Indo-Islamic architecture](#), the arches in Indian buildings were [trabeated](#) or corbelled. In North India in the state of Orissa, "the later temples at Bhubaneswar were built on the principle of corbelled vaulting, which is seen first in the porch of the Mukteswar [a temple said to epitomize North Indian architecture, circa 950 AD] and, technically speaking, no fundamental change occurred from this time onwards."^[5]

It took almost a century from the start of the [Delhi Sultanate](#) in 1206 for the true arch to appear. By around 1300 true domes and arches with [voussoirs](#) were being built; the ruined [Tomb of Balban](#) (d. 1287) in the [Qutb complex](#) in [Delhi](#) may be the earliest survival.^[6] The [Adhai Din Ka Jhonpra](#) mosque

in [Ajmer, Rajasthan](#) (begun 1190s) is an example of [Islamic architecture](#) drawing on Persia and [Central Asia](#), where builders were well used to the true arch, that prefers to stick with the corbelled arch that Indian builders were used to.^[7]

Indonesia^[edit]



Stone corbelled arches at [Borobudur](#) in Java, Indonesia. Note the "T"-shaped central stones.

The *candi* or temples of [Indonesia](#) which are constructed between 8th to 15th century, are made use of corbel arch technique to create a span opening for gate or inner chamber of the temple. The notable example of corbel arch in Indonesian classic temple architecture is the arches of [Borobudur](#). The interlocking andesite stone blocks creating the corbel arch, is notable for its "T" formed lock on the center top of the corbel arch.

Cambodia^[edit]



The corbel span of [Spean Praptos](#), 12th century Cambodia.

All the temples in [Angkor](#) made use of the corbel arch, between the AD 9th and 12th centuries.