

= Cow Tower , Norwich =

The Cow Tower is an artillery tower by the River Wensum in Norwich , Norfolk , England . Built between 1398 and 1399 by the city authorities in response to the threat from France and indigenous English rebels , the tower was intended to defend the north @-@ eastern approach to Norwich with hand cannons and bombards . It stood apart from the main city walls , close to the river where its height would have allowed it to fire onto the higher ground opposite the city . The tower was designed to hold a garrison when required and was well furnished , probably using different floors for dining and sleeping .

It was maintained throughout the 15th century , and played a role in Kett 's Rebellion of 1549 , when the rebels attacked Norwich , deploying artillery and damaging the tower 's parapets . Repairs to the tower 's walls in the late 19th century inadvertently caused long @-@ term damage , and in 1953 it was taken into the guardianship of the Ministry of Works , who stabilised its condition in a five @-@ year conservation project . In the 21st century , Cow Tower is managed by English Heritage and Norwich City Council ; the tower is now only a shell , however , as the floors and the roof of the building have been lost .

The circular tower is 11 @.@ 2 metres (37 ft) across , 14 @.@ 6 metres (48 ft) high and divided into three storeys . Its walls are 1 @.@ 8 metres (5 ft 11 in) thick at the base , with a core of flint stone , faced on the inside and outside with brick ; the archaeologist T. P. Smith considers it to feature some " of the finest medieval brickwork " in England . The walls have gunports for the smaller pieces of artillery and the roof would have supported the heavier bombards , with wide embrasures giving the weapons adequate firing space . The Cow Tower was specially designed to support the use of gunpowder artillery , making it a very rare structure in England for this period : the only close equivalents are God 's House Tower in Southampton , and the West Gate at Canterbury .

= = History = =

= = = 14th century = = =

Cow Tower is an artillery tower that was built in the city of Norwich , Norfolk , England , between 1398 and 1399 . Norwich was a prosperous city in the late 14th century , with a population of around 5 @,@ 000 involved in key medieval industries and forming a centre for international trade . Between 1297 and 1350 the city had erected a circuit of defensive stone walls and ditches , both to impress upon outsiders the status of Norwich as a great city , but also to defend against invasion or civil disorder .

Fears grew about the threat of French raids across England from the 1380s onward . The citizens of Norwich were particularly concerned about the potential of a French raid on the city , drawing parallels between the position of Norwich and the experience of Southampton , another trading city that had been devastated by a French attack in 1338 . This threat , combined with the recent events of the Peasant Revolt of 1381 when the rebels had looted the city , encouraged the local government to improve the city 's defences .

Gunpowder weapons had begun to be introduced into England in the early 14th century , initially being used as offensive siege weapons but rapidly being adapted for defensive purposes during the 1360s . Although they were expensive , by the 1380s their potential value in defending castles and city walls was well understood and specialised facilities had begun to be built . Norwich had acquired gunpowder weapons and a team of gunners by 1355 , and by 1385 had fifty gunpowder pieces for use along its city walls . Typically , these would have been small guns called hand cannons , rather than the heavier pieces termed bombards .

The tower was built on one of the approaches to Norwich in a bend in the River Wensum , in a meadow called Cowholme , from where it acquired its current name . When first built , however , it was initially called the Dungeon , and then the " tower in the Hospital meadows " , as the

surrounding land was part of the St Giles Hospital . It was intended to function as a specialised artillery tower , housing gunpowder weaponry capable of suppressing attackers on the far side of the river . The Wensum was quite narrow at this point , however , and the tower 's defences would have been of relatively limited value if the enemy successfully crossed over .

There are fragmentary historical references to an earlier tower in the area , responsible for collecting tolls and acting as a prison , but it is unclear if this was on the same site as the Cow Tower , or refers to a different tower in the area . The Cow Tower was one of several fortifications along this stretch of the river , with the gatehouse of Bishop Bridge lying just to the south , followed by two boom towers that controlled access to the waterway a further 1 kilometre (0 @. @ 62 mi) down @- @ river , and with another tower positioned 300 metres (980 ft) up @- @ river to the north . Although the Cow Tower was not directly part of the city walls , a protective timber palisade linked the tower with the line of the city wall to the north @- @ west , and ran south to meet Bishop Bridge .

The city 's accounts show the details of the payments for the construction of the tower between 1398 and 1399 , including charges for 36 @, @ 850 bricks , stone , sand , lime , a hoist and various equipment . At least 170 cartloads of stone are mentioned , and the bricks may have been brought to the site along the river by boat , while some of the timber was brought from Great Yarmouth . The total cost of the building from these records , including labour , came to around £ 36 . The number of bricks used in the tower , however , was probably twice the listed number purchased , and the city may therefore already have stockpiled some bricks on the location before the build .

= = = 15th ? 16th centuries = = =

Cow Tower formed part of the city defences during the 15th century , with the Crown occasionally issuing instructions that it should be repaired . In 1450 St Giles Hospital formally transferred any rights they had to the tower and the immediately surrounding land to the city . The population of Norwich grew significantly from 1500 onwards and the city continued to maintain the urban defences ; like other towers and gatehouses belonging to the city , however , by this period the Cow Tower was probably leased out to a merchant or craftsman when not in military use .

In 1549 , Robert Kett led an uprising in Norfolk ; marching on Norwich , his army camped on the north @- @ east side of the river , overlooking Cow Tower . Two rebel attacks were then made across the river into the Hospital meadows , in an attempt to take Bishop Bridge , which would have given them access to the city . Kett had brought artillery , which he turned on the Cow Tower , damaging the latter 's parapets . The rebellion failed , and the tower does not seem to have required extensive repairs .

= = = 17th ? 21st centuries = = =

Most of Norwich 's city walls , and all of the gatehouses , were demolished in the late 18th and 19th century as the city industrialised , but the Cow Tower avoided destruction . The tower was now owned by the Trustees of the Great Hospital , who carried out repairs to the structure in the late 19th century , and in 1904 , the British Army considered repairing the tower for use as an ammunition depot . The repairs in the 19th century had used modern concrete when patching the walls , and this , combined with erosion from the river , soon caused extensive damage : wide splits formed up and down the tower along its northern side .

The Ministry of Works took the tower into its guardianship in 1953 to address the problems , and promptly undertook an extensive sequence of repairs that lasted until 1958 . No archaeological investigation was carried out during these works , however , and a full architectural survey of the building was only carried out between 1985 and 1986 , by the Historic Buildings and Monuments Commission . In the 21st century , Cow Tower is managed by English Heritage and Norwich City Council ; the tower is now only a shell , however , as the floors and the roof have been lost . The tower is protected under UK law as a scheduled monument .

= = Architecture = =

Cow Tower is a three @-@ story circular building with a protruding turret , the main building being 11 @.@ 2 metres (37 ft) across and 14 @.@ 6 metres (48 ft) tall , tapering towards the top . Its walls , 1 @.@ 8 metres (5 ft 11 in) thick at the base , are made of a core of flint stone , faced on the inside and outside with brick , and various putlog holes can still be seen in the walls . The turret , which contained a spiral staircase , would originally have been higher than the parapets , forming a look @-@ out position . The walls rest on a stone plinth and several layers of mortared flint .

The bricks were probably made at the St Benet 's Abbey in Norfolk , with the stone coming from chalk pits near Norwich 's southern Conesford Gates . The brickwork , particularly on the stairwell , is particularly well executed , and archaeologist T. P. Smith considers the tower to feature some " of the finest medieval brickwork " in England . It is the earliest known use of brick in an external load @-@ capacity in Norwich . The use of brick in this sort of fortification was both prestigious and practical , as brick absorbed the impact of artillery fire better than stone . The river bends around about 1 metre (3 ft 3 in) from the bottom of the tower , and its base may have been underpinned with timber piles during its original construction .

The Cow Tower was deliberately designed to house gunpowder artillery when it was first built , making it a very rare form of defensive structure for its time : the only equivalents in England are God 's House Tower in Southampton , and the West Gate at Canterbury . The historians Oliver Creighton and Robert Higham go so far as to consider the building to be unique within Britain , as God 's House was an extension of an existing building , and the West Gate part of the city 's walled circuit . The concept of an isolated artillery tower was more common in France , where they were used as temporary and permanent defensive features during the Hundred Years War between the English and the French kings .

The quatrefoil gunports in the lower levels could have been used for both hand cannons and crossbows , with overlapping fields of fire . The roof was reinforced with large timber joints , and could have supported heavier bombards , possibly on wheeled carriages ; the tower 's considerable height would have allowed the bombards to reach across the river onto the higher ground overlooking the city . Getting the bombards onto the roof may have required them to be hoisted up on a winch ; one such hoist formed part of the accounts for the tower 's construction in 1398 and 1399 .

The tower 's gun installations were intended to be used to deal with an external threat approaching from the far side of the river . The parapet of the roof was crenellated with nine wide embrasures , and the embrasures facing out across the river were constructed flush with the floor of the roof , giving the bombards plenty of room to fire . The embrasures facing away from the river , however , had sloping cills rather than open positions , and the windows in the tower facing towards the city were rectangular and relatively unprotected . The entrance to the tower itself was not fortified , as the tower was not expected to be defended from a direct attack by land .

The tower was designed to be able to maintain a garrison when required and was well furnished . The ground floor and second floor had fireplaces , with the first and second floors also having garderobes . The ground floor may have formed a dining area , with the floors above being used for military purposes and sleeping accommodation . The walls of the ground floor have chasing and sockets cut into them . It is unclear what these were : theories include that they contained timbers to support brickwork that in turn supported the first floor ; that they were held timbers that supported the joists of the first floor ; or they are the remains of an ammunition store , retrofitted in the tower in the 16th century .