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The Spur, Dover Castle, Kent
Architectural Investigation Report

Allan Brodie and Geraint Franklin

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THE SPUR
DOVER CASTLE
KENT

ARCHITECTURAL INVESTIGATION REPORT

Allan Brodie and Geraint Franklin

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SUMMARY

The Spur at the north-west tip of Dover Castle was created in the 1220s to remedy weaknesses in the defences highlighted by the sieges of 1216 and 1217. The site of the original castle gate was reconstructed as the Norfolk Towers and a tunnel was excavated linking this structure to St John's Tower, which was constructed in the ditch below. Beyond this tower, a masonry bridge gave access to three tunnels set within a bulbous earthwork known as the Spur. The outworks were designed to allow defending soldiers to sally forth to harass besieging forces. Small towers may have been constructed at the ends of these tunnels.

The complex underwent repairs and possibly adaptations in the 1580s. Further alterations took place in the 1750s, particularly the reshaping of the Spur earthwork. At the turn of the 19th century, the Spur was again remodelled and a redan constructed above it. The casemated wing caponiers and the counterscarp galleries of the redan also belong to this phase. The bridge was transformed into a caponier and a separate passage to the Spur was created beneath it. The entrance to the northern defences from the outer bailey was reconfigured.

CONTRIBUTORS

Fieldwork and research were undertaken by Allan Brodie and Geraint Franklin. Unless otherwise indicated, photography is by Chris Redgrave. The line illustrations were prepared by Sharon Soutar and Figure 13 is the work of John Vallender. The report was edited by Rebecca Lane. The authors have benefited from access to specialist reports by Francesca Gherardi (characterisation of stones and mortars), Jefferson Consulting Ltd (petrographic analysis), Catherine Hassall (paint analysis) and Robert Howard (dendrochronology).

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ARCHIVE LOCATION

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DATE OF SURVEY AND RESEARCH

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INTRODUCTION

This research report on the architectural history of the Spur was commissioned by the English Heritage Trust as part of an information gathering exercise to inform the presentation of the complex for its reopening to the public after extensive conservation works have taken place. It has been informed by an analysis of the mortar used in St John's Tower conducted by Historic England's scientists and analysis of the stone in the same building, commissioned by Historic England.[1] English Heritage commissioned a report on the paints employed in the complex.[2] Historic England also commissioned a dendrochronological assessment from Nottingham University but the sampled timbers failed to date.[3]

The subject of this report is the northern defences of Dover Castle, a complex of earthworks, buildings and tunnels between the outer bailey and the Spur (Figures 1-3). The castle, prominently situated on the east cliff at Dover, may have originated as an Iron Age hillfort. The later additions of a Roman lighthouse and the late-Saxon church of St Mary in Castro attest to the site's continuing strategic importance. A concentric castle was built in the late 12th century by Henry II and was completed by King John, comprising a keep defended by a double circuit of curtain walls.

The sieges of 1216 and 1217 by Prince Louis and his French army precipitated the major strengthening of the castle's defences by Hubert de Burgh under Henry III, including the construction of a new western entrance (Constable's Gate), the rebuilding of the old gateway as the Norfolk Towers and the construction of Fitzwilliam Gateway and the extensive defensive complex at the north western tip of the castle. The latter comprised a substantial outwork known as the Spur, defended by a detached tower, known as St John's Tower, which was constructed in the ditch. A tunnel led from the inner bailey under the Norfolk Towers to St John's Tower. From there a covered bridge give access to a complex of vaulted tunnels within the Spur.

The northern defences were repaired and consolidated in the 1580s and again in the 1750s when the Spur outwork was remodelled. Further alterations took place about 1800, when the Spur was again reshaped and a redan built above it. Within the redan was constructed a defensive complex including a guard room and sally port. The covered bridge between St John's Tower and the Spur was remodelled into a two-storeyed caponier, flanked by a pair of casemated wing caponiers. The entrance to the northern defences from the outer bailey was also reconfigured.

The northern defences are orientated approximately south east to north west but for the sake of simplicity compass north west is referred to in this report as north.

Figure 1 Location map. The study area is highlighted in red. [Based on Ordnance Survey data © Crown Copyright and database right 2022, Ordnance Survey licence number 100024900.]

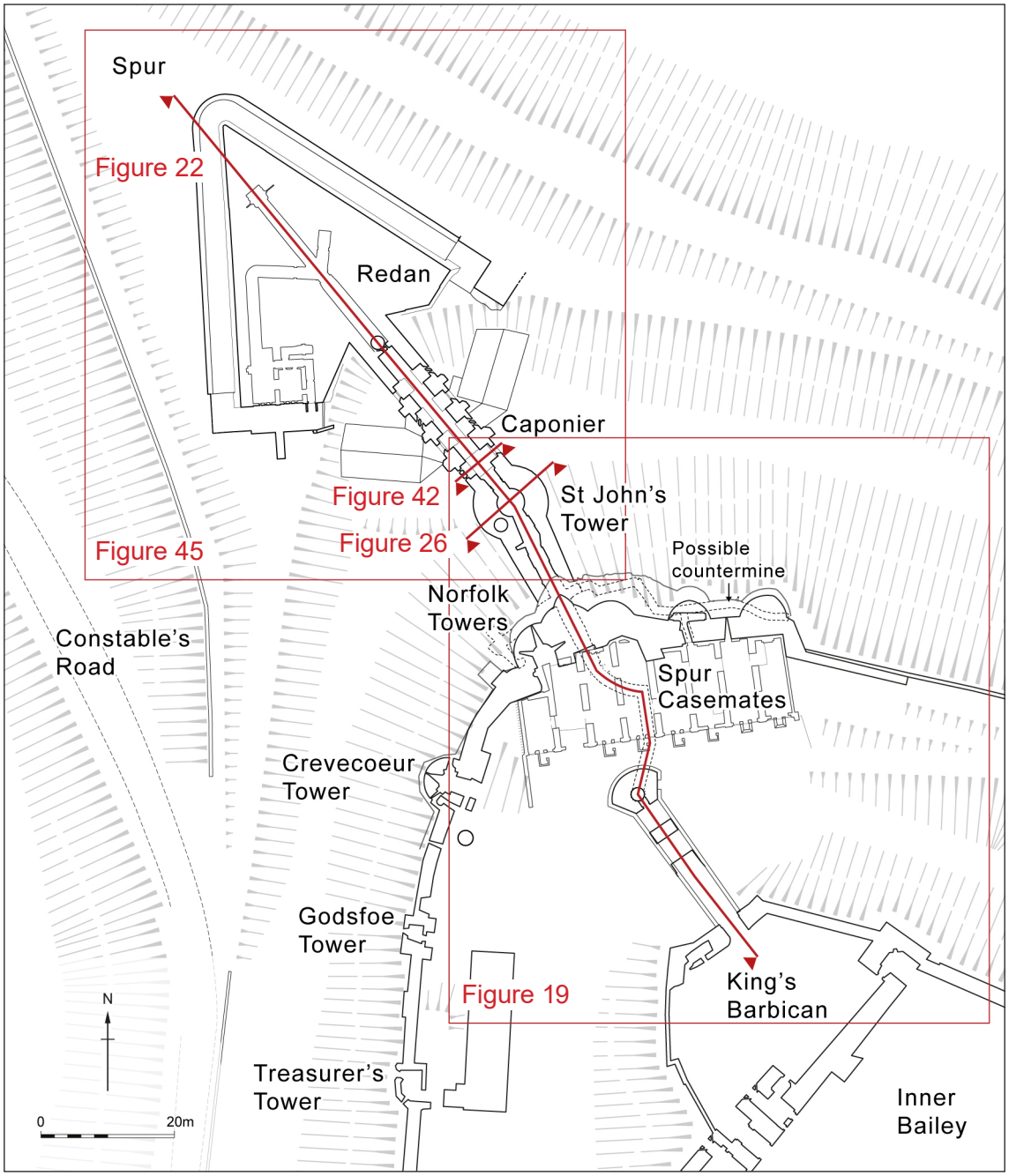

Figure 2 Overview of northern defences of Dover Castle, showing position of plans and sections in this report

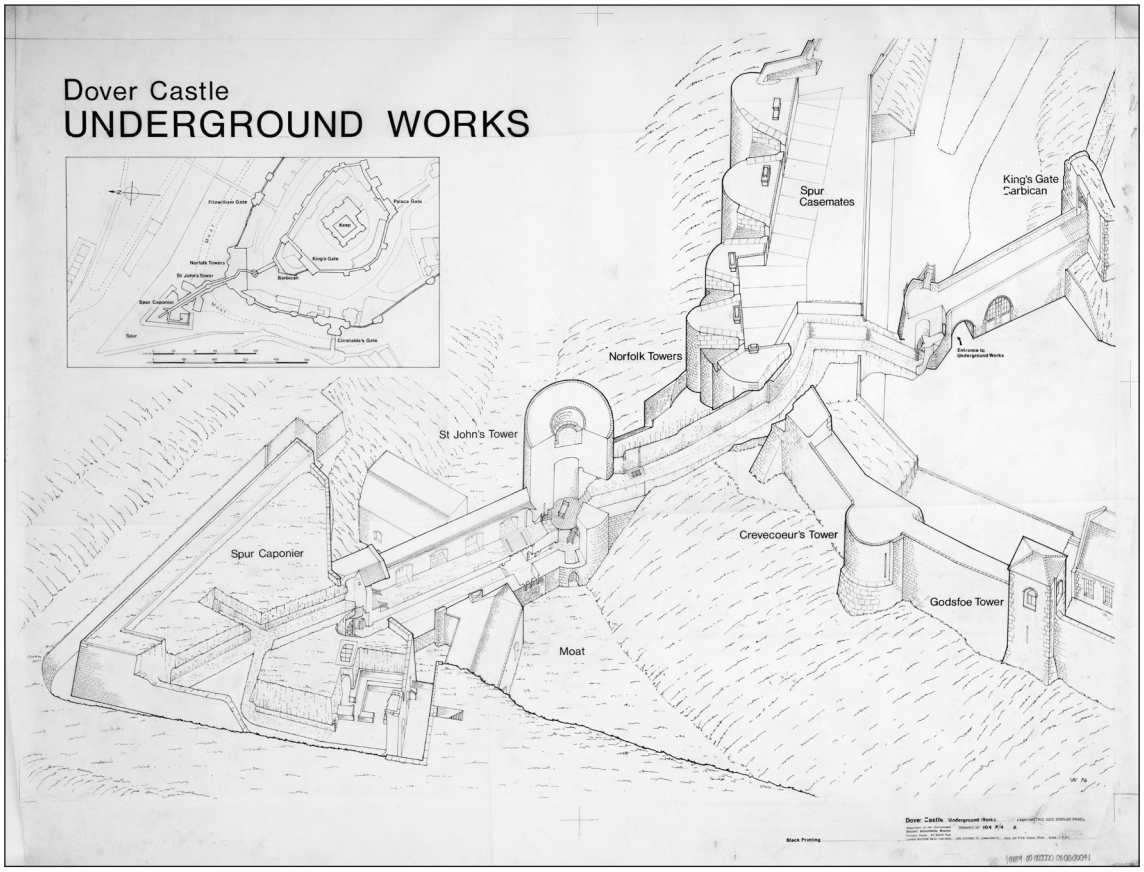

Figure 3 A 1976 drawing of the location and layout of the Spur. [HE Archive: MP/DOV2158]

HISTORY

The following section provides a short historical summary of the development of the northern defences at Dover Castle. The history of the castle as a whole has been the subject of several comprehensive studies, including *The History of the King's Works*, edited by H. M. Colvin and published in six volumes between 1963 and 1982; Jonathan Coad's *Dover Castle*, first published in 1995, and most recently Pattison, Brindle and Robinson's *The Great Tower of Dover Castle*, published in 2020. Other relevant works on the site can be found in the bibliography to this report.

The 13th Century Campaign

By the end of King John's reign, the northern and western perimeter of the outer curtain wall appears to have been completed, including the main gate located at the north-west tip of the castle.[4] This structure consisted of a pair of semi-circular towers flanking the gateway and was protected to the north by a large earth and timber barbican with an oak palisade and wide ditch.[5] It was constructed probably in the years after 1200, when King John appointed Hubert de Burgh as the castle's custodian.[6]

In 1216, Prince Louis, eldest son of the French king Philip II Augustus (later King Louis VIII), landed in England with a force to support the barons who were rebelling against King John.[7] Initially bypassing Dover to capture Rochester and then London, by late July 1216, the Dauphin's forces were besieging Dover Castle.[8] The siege lasted until 14 October 1216, four days before King John died.[9] During this period, the castle's gate suffered significant damage and over the winter it appears to have been patched up. A second siege began on 2 May 1217; this lasted until August, by which time Prince Louis' intervention in English baronial politics had proved unsustainable.

The sieges revealed that Dover Castle had two major weaknesses. Firstly, the location of the gate in the northern curtain wall meant that it was overlooked by high ground where Louis' troops camped, allowing him to deploy his siege engines to bombard the castle.[10] As a result, it apparently suffered substantial damage and would be replaced by the Constable's Gate on the less vulnerable west side of the castle. Until this new gate was completed, which had certainly occurred by 1227, the old gate presumably remained in use as an access to the Outer Bailey, if not as a practical element of the castle's fortifications.

The second problem was that the castle was built on soft chalk, and therefore it proved easy for Louis' forces to undermine its defences. His miners initially dug through the soft chalk to undermine the barbican's timber palisade in front of the old gate. Thereafter, they began to try to undermine one of the castle's main gate-towers.[11] A low tunnel exists running from the east end of the Norfolk Towers to the west end of this complex, a feature that appears to serve no purpose except perhaps to have acted as a countermine, dug by the garrison to try and prevent Louis' attempt to undermine the castle's gate (Figure 4).[12] The main tunnel from the Norfolk Towers to St John's Tower cuts across this putative countermine approximately 1.5m below

Figure 4 Possible countermine to left and right of main tunnel. At the end of the tunnel is the entrance to St John's Tower . [Geraint Franklin © Historic England HE0129/P1]

its floor level, suggesting that the two tunnels are probably not contemporary. There appears to be no evidence of the French mine and this absence of evidence makes it tempting to suggest that its route may have been incorporated into the substantial tunnel built following the sieges to link the Outer Bailey to St John's Tower.

The damage incurred in 1216-17 prompted a major building campaign at the north-west tip of the castle. Between Michaelmas 1217 and Easter 1221, Hubert de Burgh earl of Kent (*c.*1170-1243) spent £4,865 on the castle. Subtracting the wages of the garrison and the purchase of stores, it appears that around £1365 was devoted to building costs. This would be consistent with the level of recorded expenditure on works between 1221 and 1225, which amounted to £1290, an average of about £320 a year.[13] The works carried out between 1217 and Easter 1221 were accounted for by de Burgh in person. In December 1200, the king had made him custodian of two important royal castles: Dover and Windsor.[14] De Burgh was a constable of Dover Castle from 1202 to 1232 although his tenure appears to have been discontinuous.[15] After 1221, he delegated the duties of constable, though not the title; until 1230 the administration of the works at Dover was entrusted to the constable and two or more keepers of the works, principally Richard of Narford and Jocelyn de Oye.[16]

The vulnerability of the original gate led to the construction of the Constable's Gate as a new main entrance on the western side of the Outer Bailey (Figure 5). In the records of works carried out during the early years of Henry III's reign, a few explicitly mention the 'New Gate'.[17] Large quantities of stone were transported by boat from Folkestone, and up to a dozen masons were employed. During the period from August 1220 to December 1221, payments mention deliveries of stone and timber work, including centrings for arches and vaults, fittings and timber for the gate and drawbridge and an item that suggests the roofing of the structure was

Figure 5 Constable's Gate, inserted into the earlier Outer Bailey wall. [DP187450, photographer Patricia Payne]

Figure 6 Inner Bailey of Château Gaillard at Les Andelys in France. [Photograph by Binche, Wikimedia Commons, Creative Commons Attribution-Share Alike 3.0 Unported]

underway by 1221: ' to Hugh of Mailing for 22 long joists, each 30 feet long and some longer, to lay in the tower above the New Gate, 70s.'[18]

Once the new Constable's Gate had been completed, the site of the damaged northern gate was blocked and substantial towers were built to fill the gap next to the surviving western gate-tower.[19] The result of this part of the construction programme was the complex now known as the Norfolk Towers, a series of mural towers reminiscent of the rippling arrangement of towers surrounding the Inner Bailey of Richard the Lionheart's Château Gaillard at Les Andelys in France (Figure 6).

From the Norfolk Towers there was access to the substantial underground tunnel leading to St John's Tower in the ditch outside (Figure 7). The original entrance to the tunnel has been destroyed or buried (probably around 1800 when the present entrance was constructed) but the course and inclination of the southern section of surviving medieval tunnel suggests that it may have taken the form of a spiral stair located south of the Norfolk Towers, in the vicinity of casemate four or five of the Spur Casemates (*see* Figure 3).[20]

The medieval tunnel led to St John's Tower, a circular tower with enormously thick walls. It served as both a gate managing access into the main body of the castle and to allow archers on top to fire on enemy forces while the

Figure 7 St John's Tower in foreground with Norfolk Towers behind. [HE Archive: 27479/025]

men from the garrison exited from tunnels further to the north. This is probably its key function, though a lack of arrow slits around its circumference seems surprising. A wide firing position (now partially blocked) was located at second-floor level in the northern face of the tower; it would have provided covering fire for friendly troops passing from the tower over the bridge to reach the underground tunnels to the north. Although there is evidence for floors within the tower, they do not appear to have served any function apart from providing access to the arrow slit in the north side of the tower and the spiral stair in the south west.

The tunnel from the Norfolk Towers joined St John's Tower at first-floor level; adjoining the opposite (north) side was a buttressed masonry bridge, access to which was controlled by a covered drawbridge (Figure 8). Beyond was constructed the Spur, a bulbous earthwork defended by an outer ditch. The bridge led to a tunnel complex within the Spur, part of which is preserved within the later Redan. A main vaulted tunnel forked into three passages, each equipped with gates. Due to later alterations it is unclear how these passages terminated but at least one of them may have led to a sally port or tower. This subject is discussed below.

There are some documentary references that may relate to the medieval phase of construction and tunnelling, though the survival of records is inevitably patchy. Additionally, there can be uncertainty over whether a specific mention relates to this work on the Spur; the nearby, near contemporary Constable's Gate; Peverell's Gate, on the western side of the Outer Bailey; or the Fitzwilliam Gate, on the north side of the Outer Bailey. An account of work taking place between 12 May 1226 and 22 March 1227 mentions:

> And in the work of the new tower in the ditch next Peverell's Gate and in purchases of timber and lead and for the carriage of sand and water, stones and lime bought and many other necessaries for the same work, and for the wages of the keepers of the work and the masons and other workmen in the ditch, 699 marks and 13s. 0½d. [£466. 13s. 0½d,] And they are quit.[21]

In 1227, there is a reference to: '22 short joists for the tower in the ditch outside Peverell's Gate, 28s.'[22] There is no tower in the ditch next to, or outside, Peverell's Gate; the only tower that could match this description is St John's Tower.[23] There is also reference to an underground gate: 'And for timber for the underground gate begun towards the east, to make centers [sic], 4s 3d'. This might refer to the medieval north-eastern tunnel in the Spur, but perhaps it is more plausible that it is referring to the Fitzwilliam Gate that was further to the east from the earlier entry (Figure 9). In the same year there is another, intriguing reference to timber in use at the castle:

> For an old ship bought in the town of Dover to plank the said tower, 42s. For guarding that ship on the shore for 8 nights before it could be broken up, 14d.[24]

Figure 8 Detail from 1756 Board of Ordnance map. In the inset key, C is described as 'The Main Guard-house'; I as 'An advanced Work finished in July 1756'; and Q as 'A Guard room, for a Sergeants Guard, now erecting on the Sally port into the advanced Work'. Three tunnels are marked in dotted lines within the circular mound on the terreplein. [HE Archive: MP/DOV0030]

Again, this appears more plausibly to be for work on the Fitzwilliam Gate. Between 22 March and 11 November 1227, there is a reference that may relate to the Spur: 'And in the work of the same castle during the said time, that is in walls, ditches, gates and underground passages, £449 10s 7d'. Two years later, between 19 May and 9 October 1229 payment was made for 'making one vault to go out of the castle towards the field, £100'.[25]

Documents of the 1220s mention two master masons; Master Adam, was apparently in charge from March to May 1227 at 3d a day, and Master William Chancellor, whose wages were 3½d a day, was paid from 31 May to 22 July. Master William the carpenter received 4d a day on the site, but 6d a day when 'travelling far from the castle with his horse on the king's business', presumably sourcing timber.[26] The work on the ditch, and presumably including work below ground, appears to have been led by Ralph of Popes Hall, the master ditch-digger, who was paid 3d a day and was responsible for a workforce of 200–300 diggers.[27] Some of their work may have been the creation of the substantial earthwork around the Church of St Mary in Castro (in the southern part of the Outer Bailey), as well as at the north-west tip of the castle.

The works on the Spur appear to date to the 1220s, as would be expected in response to the damage of 1216-17, but there are later references to the excavation of underground passages. The Liberate Rolls for 1233 include orders 'to cause arches to be made [...] in the entrance and exit of the tunnels', and 'to build a gate leading out into the great barbican of Dover Castle, and a drawbridge [literally 'turning bridge'], and a causeway of stone and lime, suitable for the use of those on foot and those on horseback to enter and leave [the castle] as need arises'.[28] The *History of*

Figure 9 Fitzwilliam Gate. [HE Archive: 27479/026]

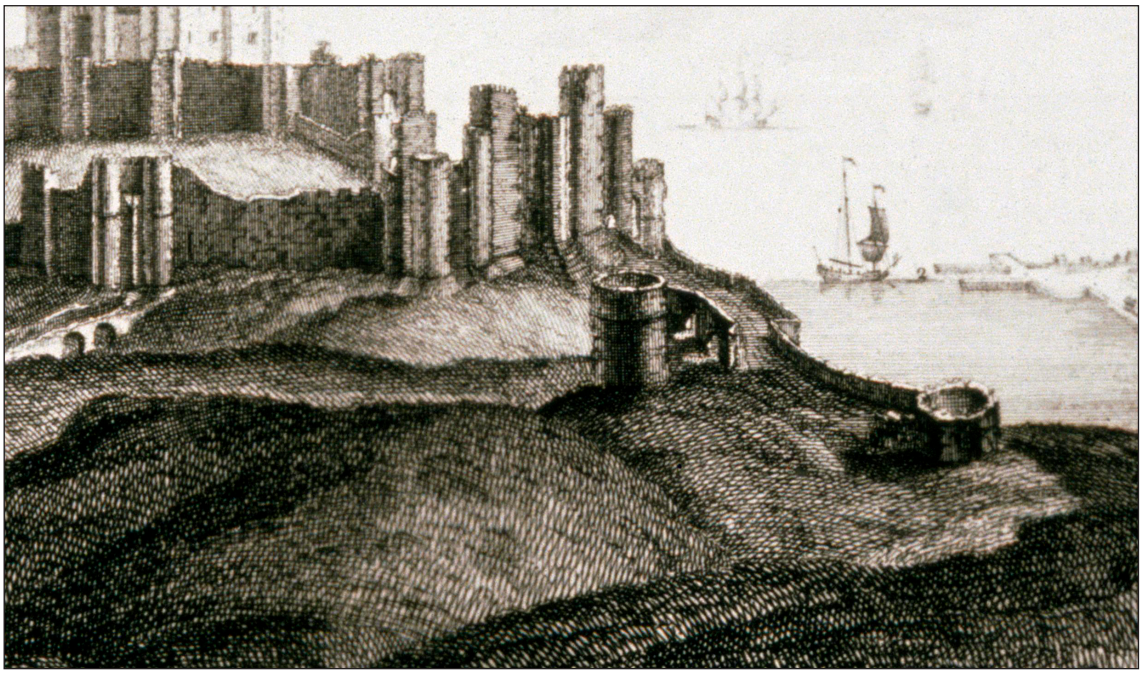

Figure 10 Detail from 1735 engraving by Samuel and Nathaniel Buck. The bridge-like structure to the right is Constable's Gateway. To the left is St John's Tower, and the tower complex on the curtain wall above is the Norfolk Towers; note the beaked central tower. At bottom right Castle Hill Road skirts the Spur. The mysterious circular feature between St John's Tower and the road may be a lost postern tower providing an exit from the medieval tunnel complex within the Spur. [HE Archive: PLB/M901287].

the Kings Works states that 'in 1234-5 two new towers were made at the exit of 'the new tunnel', while another tunnel was covered with lead, presumably at a point where it emerged above ground'.[29] The Liberate Rolls for 1242 include instructions to 'repair Dover Castle and strengthen it where there is most need'. The following year, the constable was directed to 'make a ditch round the barbican of Dover Castle'.[30] A degree of ambiguity surrounds these early 13th-century references to a barbican, which might alternatively apply to that outside Constable's Gate.[31]

Many early plans of the Castle omit the northern defences, presumably because they were based on observation and their creators had limited access to the extramural works.[32] William Eldred's view of the castle, produced in 1641, does include these defences although it appears to be less reliable than the later Board of Ordnance plans. It depicts the medieval Spur as a circular earthwork bounded by a ditch; to the rear is a crenelated tower, presumably St John's Tower. [33] The complex is labelled 'The Barbican', a term which, as will be seen, continued to be used for the northern defences into the 19th century.

A 1735 engraving of the castle from the north by Samuel and Nathaniel Buck shows the northern defensive complex from a viewpoint on Castle Hill Road. It appears to depict a squat, circular tower located between St John's Tower and the northern tip of the Spur (Figure 10). The existence of a tower to the north of St John's Tower is corroborated by 16th-century building accounts (see below) and by *A Brief History of Dover Castle* (1787), possibly written by John Lyon, which states that:

> The branch on the right hand going out of the Castle had a tower, at, or near the opening; the remains of which are still to be seen in the side of the works [...]: this was probably intended to cover the men, in case they should have been pursued by the enemy, upon their return to the Castle, after a sally.[34]

Lyon, writing in 1814, recalled that:

> The eastern branch [of the three medieval tunnels] had a circular tower in the parapet of this out-work, close by the opening, to protect the men while entering, in case they were repulsed. When the alterations were made at this place, a few years since, the tower was either demolished or buried.[35]

Several reliable maps created in the mid-18th century by the Board of Ordnance provides further evidence for the medieval defensive works.[36] However, they do not show the single postern tower that appears in the 1735 Buck engraving and are ambiguous (perhaps for reasons of security) about the precise arrangement of the trifurcating tunnels at the north-west tip of the complex. One of them, undated but

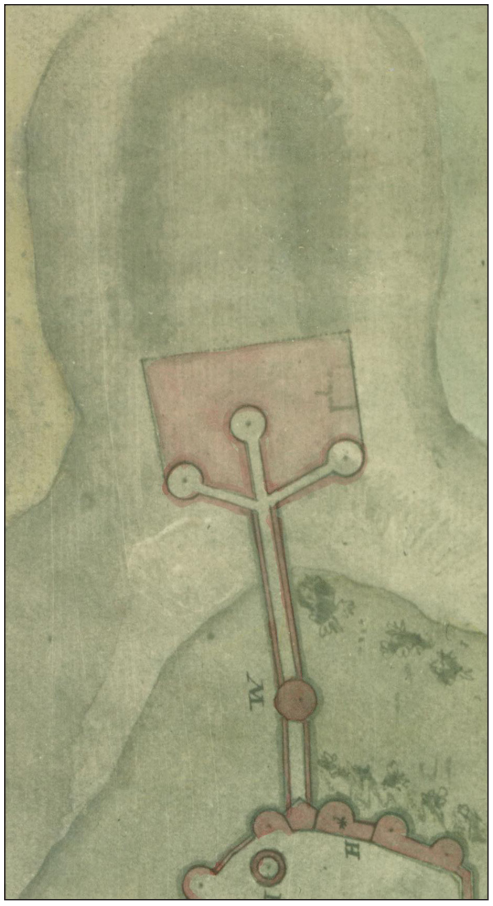

Figure 11 Detail from an undated Board of Ordnance plan, probably of the 1730s, showing trifurcating tunnels terminating in circular features and set within a rectangular structure. [HE Archive: MP/DOV0033]

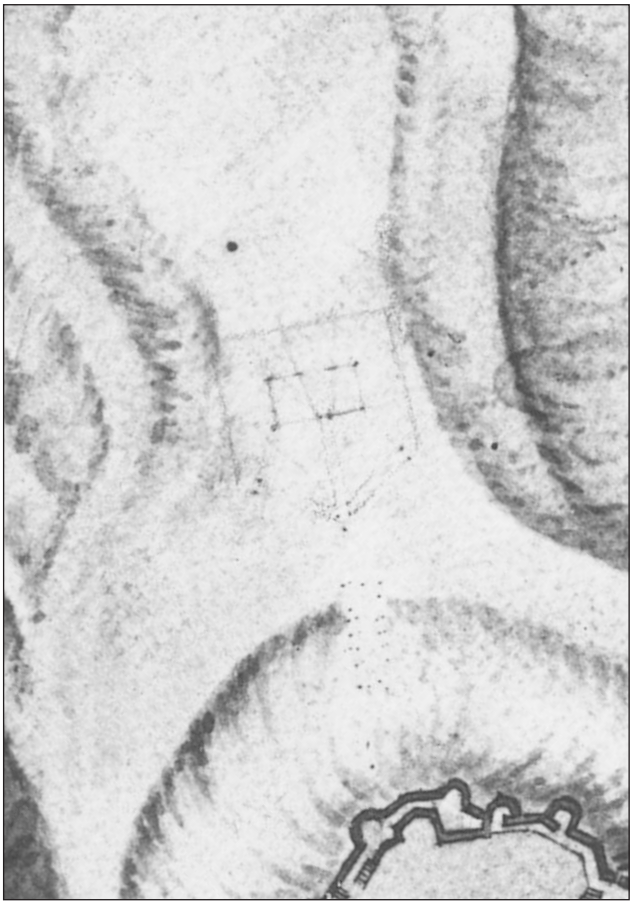

Figure 12 Detail from an undated Board of Ordnance plan, probably of the 1730s. The outlines of the butressed bridge and the tunnel complex are shown as dots or pin pricks, while the rectangular feature within the Spur is indicated in faint pencil. [HE Archive: MP/DOV0029]

probably of the 1730s, shows three tunnels of roughly equal length each terminating in a circular feature, perhaps a tower, with a central dot, a convention that may indicate a central spiral stair. The tunnel complex is positioned within the bulbous Spur outwork that extends beyond it (Figure 11). The north-western and north-eastern tunnels appear to emerge at the corner of a rectangular structure while the central northern tunnel is set fully within it.[37] The rectangular feature is shaded, a convention that may suggest a masonry structure.

A plan of 1737 shows the medieval main tunnel emerging from the bridge that became the caponier with the north-western and north-eastern tunnels ending with no circular features and the central northern tunnel ending in a rectangular shape.[38] Both tunnels and the mysterious rectangular feature are dotted, a convention that generally indicates a subsurface structure. Another undated but contemporaneous plan shows the relation between the central northern tunnel and the rectangular feature in more detail, albeit in faint pencil (Figure 12). Here, the tunnel appears to terminate not in a circular feature but in an inner rectangle within the larger rectangle, possibly a strongpoint or a place of arms. The inner and outer rectangles appear to be cut by a splayed opening.[39]

It is likely that the three tunnels provided exits onto the Spur, enabling defensive forces to sally forth and harass a besieging army, as is suggested by William Darrell's 16th century account: 'From the tower there are some secret openings, or passages, called by other people Barbicans, which have a communication with the country, and thereby afford an opportunity of detaching more to attack the enemy without'.[40] But precisely how each of the tunnels originally terminated is unclear. Might there have been small postern towers at the end of one or more of the tunnels as Lyon appears to suggest, or just a sallyport, perhaps taking the form of a simple entrance or hatch integrated into the earthwork? The function of the rectangular feature that appears in some early maps is also uncertain. It may represent a defensive position such as a platform or redoubt from which the perimeter of the Spur and the surrounding country could be commanded.

While the medieval tunnels to the north were intended to enhance the castle's defensive capabilities, there was a danger that enemy infantry could seize them and therefore gain access to the inner bailey. To prevent this happening there were a series of security measures in the Middle Ages. Holes for pintles surviving beside the arches giving access to two of the three tunnels indicate the presence of substantial doors and the 1787 history of Dover Castle noted that:

> There were several gates in different parts of this barbican, secured with strong bolts, and bars, to prevent or retard an enemy from proceeding into the Castle, if they happened to force the entrance; which indeed was hardly practicable, the whole being so well defended by towers.[41]

Lyon stated a few years later that: 'At each of these openings, there were originally strong gates, to check the progress of the enemy, if they had driven the archers from the ramparts, and they were obliged to retire into the Castle.'[42] The arch into the central tunnel has subsequently been removed.

Presumably there would have been some similar arrangement between the underground section of the tunnels and the above-ground bridge (later adapted into a caponier). John Lyon's 1814 history states that: 'They had also another gate in the caponnier [sic], where the three passages united in one, which was secured with strong bolts and bars. The communication between the souterrain and the caponnier was through the round tower, in the ditch; and there were strong gates, and a draw-bridge, to prevent the enemy from entering the tower, if they had forced their way to it'.[43] This refers to the substantial door at the north entrance to St John's Tower and the drawbridge in front that would have been raised if an enemy had entered the medieval tunnels. In the base of the firing position at second-floor level there were openings allowing defending soldiers to fire down on any enemy force that might have made it to the door into St John's Tower.

The separation of the Spur from the enceinte by a ditch can be compared with the outer bailey at Château Gaillard, although the latter was triangular on plan and bounded by stone curtain walls and towers. The 13th-century tunnel system at Dover appears to be largely without parallel, apart from perhaps the Fitzwilliam Gate just 90m to the south-east of the Spur. In both cases, it was the chalk subsoil upon which the castle stands that made it both easy to mine and safe from subsidence. A similar arrangement exists beneath the castle of Arques-la-Bataille in Normandy, a location with a geology similar to Dover, but it is difficult to find any English parallel for these elaborate tunnels, complete with underground doors and gates (Figure 13).[44] Equally singular is the location of a detached tower in the outer ditch, its functional justification being the control of access to and the defence of the outworks beyond.

Figure 13 Conjectural reconstruction of the northern defences as they may have appeared in the mid-13th century.

Late 16th century work under John Symans

Extensive repairs were undertaken to Dover Castle during the second half of Queen Elizabeth I's reign. In August 1573, the Queen stayed at the Castle as the guest of William Brooke, Lord Cobham, as Constable. Surveys undertaken over the following years record the decayed state of portions of the castle, some providing estimates of the costs of remedial works.[45] A comprehensive programme of fabric renewal was undertaken in the 1580s under the direction of John Symans (d.1597), who was associated with the Office of Works and who in a later document is described as surveyor of Dover Castle.[46] Lambarde observed that in 1596 'our gracious Queene Elizabeth hath beene at great charge' in repairing the castle.[47] The documentary evidence suggests that these were chiefly works of repair or renewal of existing fabric; there is little evidence for additions or alterations of novel design.

Symans's account books survive for the years 1580 and 1582, and record wide ranging works within the present study area, although it is sometimes difficult to locate specific references.[48] Accounts for the period between May and September 1850 record extensive 'worke uppon the Duck of Norfolk tower and loging called the olde sally and 3 other towrs ther to agoin'. This included the replacement of hardstone quoins and ragstone walling; repointing and roughcasting exterior walls; renewing lead roofs and guttering; the insertion of a window; relaying floorboards in the outer chamber and making a new door for the old bedchamber.[49] Total expenditure in the 1580 season was £199 17s 3d.

The surveyor's estimate for 1582 highlighted:

> one tower standing one the northe side of the Castell called Seinones [St John's] tower the stoneworke therof beinge muche decayed one the owte syde, beinge covered with leade the which moste be taken up and new laied, and some of the leade new cast, and some supply of timber, the which wyll cost by estimation £30.[50]

The 1582 season lasted from 18 May to 15 September and £199 14s 9d was spent.[51] Repairs to the exterior of St John's Tower included the clearance of ivy, replacement of quoins in hardstone and freestone, repairing decayed stonework and ashlar work, repointing and roughcasting the ragstone walling and renewal of leadwork. The stonework was undertaken from a cradle by three roof layers, each working for 18 days, and assisted by four apprentices and four labourers.

The location mentioned in some other references is less certain. In July 1582 repair work was undertaken upon 'a great decayed tower standing on the uttar waulle of the north syde of second ward agoining on the Est syde next to Bygots tower Duck of Norfolck' and also '2 curtaine waulles standing on either syd of a decayed tower betwene the lord St Johns tower and this decayed tower now repaired agoining near to Bygots tower'. The first tower referred to probably formed one of the eastern towers of what are today known as the Norfolk Towers (named after Hugh Bigod, Earl of Norfolk *c*.1220-1266).[52] The location of the second tower is uncertain, but the

reference to adjoining curtain walls raises the possibility that it formed another of the Norfolk Towers although not named as such.

Later in the building season, repairs were undertaken to a 'a decayed tower and 2 certaine wauleles standing on the west syde of St John tower'. This may relate to a now-lost tower on the west side of the Spur, although the reference to curtain walls again highlights the possibility that Symans was referring to the Norfolk or Crevecoeur towers without identifying them as such. This work, carried out from both scaffolding and cradles, involved the replacement of quoins and 'skews' (angled stones), repairs to two internal stone stairs, renewal of 'vamures' (walkways), walls, loops and crests and roughcasting the interior.[53]

The final account book for 1582, covering the period between 26 August and 15 September includes a reference to work:

> uppon a decayed olld tower standing on the nort syd of St John tower and uppon the vamier waulles lowpes and crest of the same tower And 2 paier of staiers of stone serving to that same tower and ruffkasting the iner parts of the same tower into the castell And repairing the owt syd of the 2 straight cortain waulles standing on either syd of this tower and ruffkasting the same.[54]

This may refer to a postern tower adjoining the Spur, which communicated with one of the three forked medieval tunnels north of St John's Tower. Such a feature is shown on the 1735 engraving by Samuel and Nathaniel Buck (*see* Figure 10). The reference to straight lengths of curtain walling adjoining is confusing, however, as the medieval Spur is presumed to have been an earthwork. Carpenters also carried out repairs to one of the Norfolk Towers, including the renewal of timber floors and roof repairs.

Mid-18th century alterations under Captain Desmaretz

In the mid-18th century, against a background of political volatility and conflict on the continent, the defences of Dover Castle and fortifications around Dover Harbour were strengthened. From 1745, several buildings within the Inner Bailey were fitted up as barracks for an enlarged garrison, and in 1747-8 a guardhouse was erected behind the Norfolk Towers.[55] The latter is described on drawings and in publications as the principal or main guardroom, perhaps a fitting place from where to access the underground tunnel. In 1755-6, the military engineer Captain John Peter Desmaretz (*c.* 1686–1768) oversaw a programme of defensive works which included two new gun batteries, two guardrooms and the improvement of the northern defences.[56] Its total cost was £3,334 8s 9d.[57] The latter included the remodelling of the 13th-century Spur to adapt the earlier bridge to provide a covered way, protected by an earthwork parapet. On Boxing Day 1755, Desmaretz reported to the Lieutenant-General of the Ordnance:

> I arrived here the 21st since which time I have traced on the Ground the Capital Lines of the intended Covert way upon the Barbican [Spur outwork],

> on the North Side of this Castle; and to prevent any Mistakes when on my Duty at Chatham, we are now employed in forming (as a Model) a small Length of the said Covert way with its Banquettes [firing step], Parapet and the proper Talus's [slope], for the Instruction of the Overseers [...][58]

The earthworks were executed by 50 garrison troops, supplemented by skilled labour carried out by masons, bricklayers, carpenters and smiths employed and contracted by the Ordnance Board.[59] The work was supervised by Desmaretz's overseer of works at Dover, John Bates, who in January 1756 informed him that:

> They have removed a great quantity of earth. That parapet to the Round Tower which was begun when you was here is nearly completed and the earth removed level to the first Banquette, and I am continuing that section through to the outer Ditch of the Castle; the Rest of the soldiers employed withoutside are removing the earth to form the Terreplein betwixt the East and West Parapets of the Barbican towards the exterior point next the Deal Road [...][60]

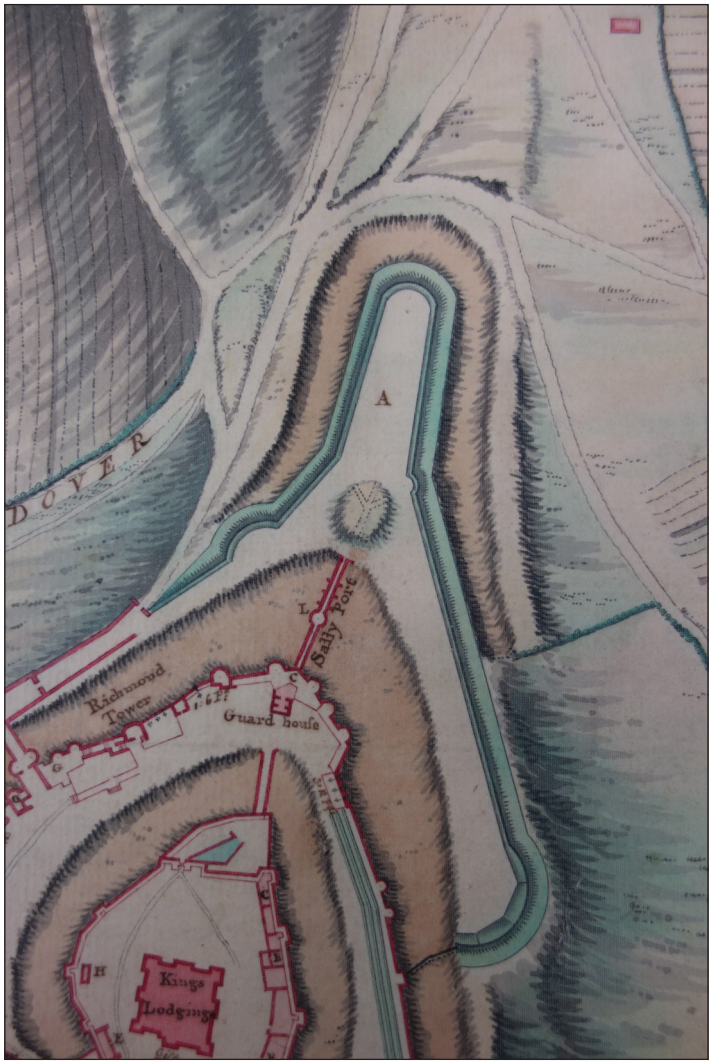

Figure 14. Detail from a 1766 plan showing Desmaretz's alterations to the northern defences, including A ('an advanced work finished in July 1756') and L ('A Guard Room for a Serjeant Guard now erecting on the Sally Port into the Advanced Work'). The small curved projection on the eastern flank may relate to the remains of a medieval postern tower. The buttressed passage between St John's Tower and the tunnel complex is presumably the medieval bridge, which provided direct access at first-floor level. [TNA: MPHH 1/101. Reproduced with permission.]

The 'round tower' probably refers to St John's Tower. The rampart was set with fraises, horizontal palisades set in the escarp to counter infantry attack. In early February 1756, Desmaretz wrote to the master carpenter to the Ordnance, requesting a total of 4,000 palisades for use at Dover Castle.[61] The works concluded in July 1756, when Bates reported that he had 'finished the Parapet on the North of the Castle and just enclosed it at both ends with a Palisade as directed, the Gates are hung at both Sally Ports as also the Entrance to the Castle'.[62]

Ordnance plans of December 1756 and 1766 depict the completed outwork formed within the medieval footprint of the Spur, from which it was separated by a narrow ditch (Figure 14).[63] It extended from the barbican of Constable's Gate to the west to Fitzwilliam Gate to the east. According to this and later 18th century Ordnance surveys, the earthwork tapered to a shallow projection with a rounded tip. Its outer face was protected by a double parapet.[64] Several contemporaneous plans also show a small, sub-circular mound raised on the terreplein, directly over the junction of the three medieval tunnels and possibly intended to shield them from aerial bombardment.

A small, curved projection in the eastern re-entrant may correspond to the position of a sally port or postern tower emerging from the east branch. References in Bates's reports to 'the West Sally Port of the Barbican' and 'the old sally port' suggest that the faces of the reformed Spur incorporated in situ medieval structures or, alternatively, new openings to truncated tunnels.[65] As we have seen, *A Brief History of Dover Castle* (1787) states that 'the branch on the right hand going out of the Castle had a tower, at, or near the opening; the remains of which are still to be seen in the side of the [present] works'.[66]

It is unclear to what extent the mid-18th century phase involved alterations to St John's Tower. While some accounts have interpreted Bates's reference to the completion of a parapet to the 'Round Tower' as relating to St John's Tower, it may alternatively correspond to a retained postern tower.[67] In November 1756, Desmaretz supplied an estimate to fit out two guardrooms, including £60 for 'the proposed guardroom in the Barbican for a Serjeant's Party to be erected close to the Tower on the Passage leading to the advanced work'.[68] The key to the 1756 plan confirms that St John's Tower was the location of 'a guardroom for a Serjeant's guard, now erecting on the Sallyport into the advanced work'.[69] On 22 November 1756, Charles Tarrant, the practitioner engineer at Dover Castle, consulted Desmaretz on the partitions of the guardroom that he proposed 'to be done with quartering [studwork], as it takes up less space than any other way'.[70] It is possible that the guardroom occupied the space previously occupied by the drawbridge adjoining the north entrance, now floored with timber.

Late 18th and early 19th century work by Lieutenant Colonel Twiss

On the outbreak of war with revolutionary France in 1793, resources were again directed towards the defence of Dover Castle. Between about 1794 and 1805, an extensive programme of works to the value of approximately £68,000 was superintended by Lieutenant Colonel William Twiss (1744/5–1827), a Royal

Engineer who trained under Desmaretz at the Ordnance Office.[71] His resident engineer was Captain William Henry Ford (d.1829), best known for his contribution to the design and construction of a chain of Martello Towers along the coast of Kent and Sussex.[72]

Twiss's improvements to the northern defences of Dover Castle were extensive (Figure 15). The mid-18th century Spur was again remodelled into a ravelin, a triangular outwork with a steep scarp and flank extending from the barbican of Constable's Gate to Fitzwilliam Gate. On it was erected a redan, complete with ditch and revetment, to command the northern defences. Whatever remained of any medieval sally ports or posterns would have been cleared in the process. Within the south-western flank of the redan was constructed a defensive complex that included a guardroom and sally port. The covered passageway between St John's Tower and the Spur was remodelled into a two-storeyed caponier, with an upper gallery with firing positions above a brick-lined tunnel secured by a wooden portcullis controlled from the upper level. The caponier was flanked by a pair of casemated wing

Figure 15 Detail from an undated, possibly 1806 Board of Ordnance plan copied by Thomas Peckham and E.B. Metcalf. It shows the alterations carried out under Twiss, including caponier, casemated wing caponiers (with drop ditches), Spur Casemates and emplacements and the new entrance from Outer Bailey. The redan is indicated in faint pencil. [TNA: MR 1/845. Reproduced with permission].

caponiers to provide flanking fire across the outer ditch. The counterscarp galleries of the redan with which they communicate also belong to this phase. The top of St John's Tower was rebuilt with a bombproof vault and a parapet for infantry to defend the redan and caponier.

Lastly, Twiss provided a new entrance to the complex, in the form of a spiral stair incorporated into the abutment of the bridge leading to the north barbican of the Inner Bailey and King's Gate. From this stair was excavated a brick-lined tunnel which joined the medieval stretch of tunnel to the north. This may have been necessitated by the erection of the Spur Casemates against the inner face of the Norfolk Towers, a structure which replaced the 1740s guardhouse.

The precise chronology of these works remains unclear due to the paucity of primary documentation. Some late 19th century accounts of the castle's defences date the remodelling of the Spur to 1795-6, a period in which substantial sums were spent on improving the castle's defences.[73] It is likely that the work on the caponier and St John's Tower dates from this period also (a graffito on the door to the tower parapet contains the date 1798). Akers' account of 1887, which evidently draws upon Ordnance records, states:

> In this year [1795] a covered communication to the detached works [was] made, and the advanced works called the Spur was re-modelled. In this year extensive alterations were made to the old works at the Spur, and by the end of the following year they were brought into much the same state in which they now exist.[74]

This is corroborated by the diary of Thomas Pattenden of Dover, who observed that:

> During the years 1795, 1796 and 1797 there has been great repairs of the outer walls alterations within and many additional works making for the defence of Dover Castle. [...] The year 1796 most of the new sally ports at the back of the Castle were constructed.[75]

In a letter of August 1801 to William Pitt, Lord Warden of the Cinque Ports, Twiss set out what remained to be done:

> After studying the Defences of Dover Castle, it appears evident the weakest part is that called the Spur, and early this War we raised within it a sort of Redan, which seems to answer many good purposes, and this year we have further improved this Redan by sinking a small Ditch in front of it but still as this Work is not reveted, it is liable to be stormed, which is the more to be dreaded from its being much exposed to that species of attack, as well as from the probability of its being defended by inexperienced Troops.
>
> I must therefore earnestly recommended that this work should be reveted though as the seasons is too far advanced to do it this year, I would at present only propose to cut down its Escarp, to as steep a slope as it will stand at, during the ensuing Winter and then very early in the Spring complete the

> Revetement [...] I have only further to solicit your Lordship's approbation, to insert in the Estimate for 1802 the sum of £2,500 for the object of reveting this Redan, constructing in it a Bomb Proof Guard Room, and Passages, and Hanging Doors, with a proper Draw Bridge for its security – and this Sum I am fully persuaded will pay for such a construction.[76]

In June 1803, amidst heightened concerns of a French invasion, Twiss reiterated the importance of finishing these works:

> The works which appears to me most necessary to be proceeded on for the defence of Dover Castle are finishing the Redan in the Spur with a reveted counterscarp and Bomb Proof defences before each shoulder. Building a Bomb Proof Guard House before the New Entrance. These services being provided for in the Estimates granted are going on as fast as we can'.[77]

It is likely that all these works were largely complete by spring 1804, when resources were diverted to the improvement of the fortifications at the Western Heights and expenditure at the Castle virtually ceased.[78]

The works overseen by Twiss also included the truncation of the Norfolk Towers and the construction of the Spur Casemates against their inner face.[79] The casemates may have been erected in the late 1790s; they are depicted on plans of 1806 and 1811.[80] Originally configured as two-storeyed barracks, the upper floors were removed in the later 19th century and by 1897 accommodated 86 men.[81]

1850s and later

Documentary evidence for post-Twiss interventions to the northern defences is scant, although fabric analysis suggests that the scope of later phases was in any case limited. In 1856, amid growing concern about the military power of the French Empire, the Commanding Royal Engineer proposed an extensive but unrealised programme of improvements to the defences at Dover Castle. Drawings of proposed alterations to the Spur caponier and St John's Tower, dated April 1856, were signed by Lieutenant M.C. Molesworth, Captain B.H. Martindale and Colonel C.O. Streatfeild, Commanding Royal Engineer.[82] They include the modification of openings and embrasures, the insertion of direct communication between the lower caponier passage and wing caponiers, the reinforcement of the former drawbridge pit with an arch and the installation of a central spiral stair between the ground and first floors of St John's Tower (Figure 16).[83] Few if any of the recommended works appear to have been implemented. The Spur Casemates underwent several phases of alteration, including the addition of porches in the mid -19th century.[84] In 1924, the casemates were converted to workshops, quartermasters' stores and garages.[85]

While an extensive programme of defensive works were carried out at Dover Castle during the Second World War, the northern defences were little altered.[86] A line of 'dragon's teeth' anti-tank obstacles were mounted at the tip of the Spur, descending down its western scarp. A shuttered concrete lining was applied to a number of the tunnel vaults to improve their resistance to bombardment; a plan of 1942 distinguishes between 'bombproof' and 'splinterproof' sections of tunnel.[87]

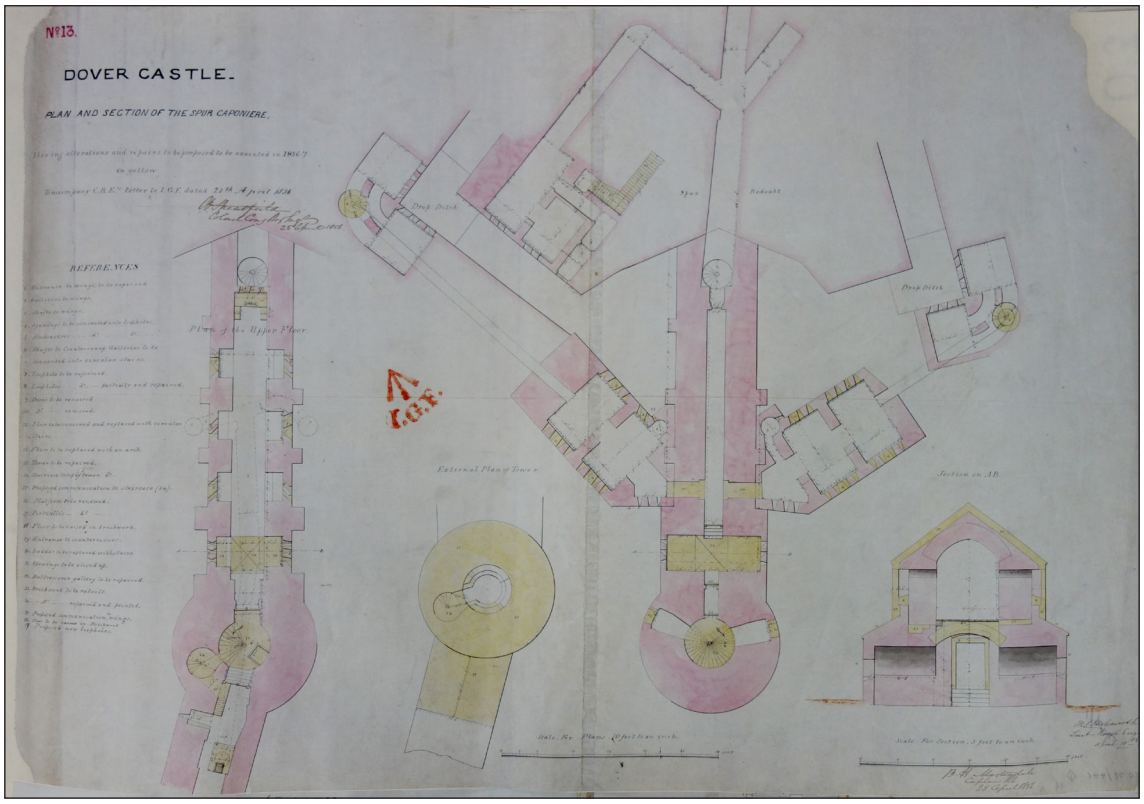

Figure 16 Plan of alterations and repairs proposed to be carried out in 1856-7 but not executed. The extent of the proposed works is indicated in yellow and described in the left-hand key. [TNA: MR 1/1235/1. Reproduced with permission.]

Over the 20th century, the role and status of Dover Castle gradually shifted from a military site to an ancient monument in the care of the state. As early as 1907, responsibility for the maintenance of much of the castle was transferred from the War Office to the Office of Works.[88] Post-war interventions to the northern defences for which evidence survives include the timber staircase at the base of St John's Tower, which was installed in 1949, replacing a trap door and ladder arrangement.[89] In the late 1950s, the northern defences were surveyed by the Ministry of Works, possibly in advance of the vacation of the castle by the War Department. [90] This anticipated a programme of conservation and stabilisation works that included remedial work to St John's Tower and the underpinning and reinforcement of the tip of the redan in response to subsidence and the insertion of a brick-lined access shaft.[91] Further underpinning works were undertaken in this area in the early 1990s.[92] This appears to have been the last major phase of conservation undertaken at the northern defences until the programme of work commenced in 2021.

Around 1986 there was an unrealised proposal to erect a public viewing platform at the tip of the redan, accessed via a new spiral staircase inserted into the existing access shaft.[93] The Spur Casemates were mostly used for storage in the late 20th century, with the exception of casemates seven and eight which were converted to female and male public toilets in 1961 and refurbished in 1996.[94]

DESCRIPTION

The Norfolk Towers, Spur Casemates and Spur Battery

The Norfolk Towers were created from the remnants of the old north gateway and adjacent walls that were badly damaged in the sieges of 1216 and 1217 (Figures 17-19). The five hollow mural towers forming the complex are closely grouped and of varying form. The second tower from the west is of beaked form with a battered base and occupies the former position of the gateway; it is flanked by two round

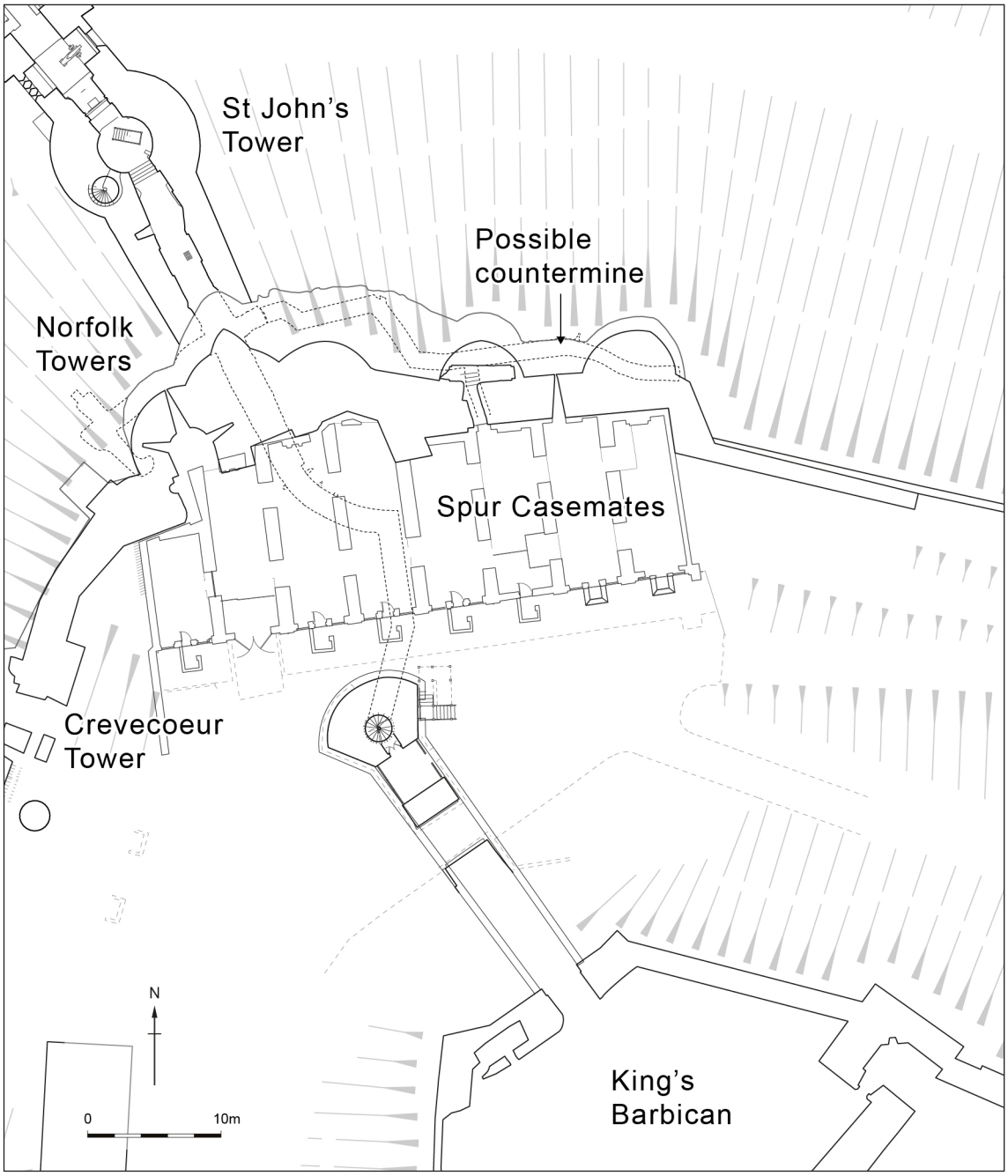

Figure 17 Plan of St John's Tower, Norfolk Towers, Spur Casemates and the tunnel leading from St John's Tower to the Outer Bailey

Figure 18 The Spur from the north weSt From left to right can be seen: Norfolk Towers, St John's Tower, the Caponier and Redan. [HE Archive: 26028/009]

Figure 19 Norfolk Towers photographed from the Spur in 2021. [DP289563]

Figure 20 The Spur Casemates, with gun emplacements above. Above, note the different alignments of the redan and the Spur on which it is constructed [Geraint Franklin © Historic England HE 0129/P2]

Figure 21 Canon's Gate, Dover Castle. [Allan Brodie © Historic England HE0129/P3]

towers also with battered bases. To the east are a further pair of round towers, the first having a tall battered plinth and an offset and the easternmost tower larger in size with a low plinth and offset. The Norfolk Towers were truncated and their upper stages rebuilt to form gun emplacements around 1800 (Figure 20). On the inner face of the Norfolk Towers, a section of the original gate passage has been partially unblocked and the soffit of the rear arch is exposed. This can be seen in a void beyond the north walls of casemates two and three. Little of the internal face of the medieval towers can be seen due to the creation of the Spur Casemates in about 1800.

Examining the external face of the Norfolk Towers in more detail it is difficult to distinguish between original, pre-siege fabric and the repairs and additions of the 1220s. One indicator may be the size and character of the stones used in the construction of the battered base of each tower. The base of the beaked tower and the irregular-shaped tower to the east is entirely faced in ashlar, whereas the adjacent circular towers, which may be part of the pre-siege gate, have coursed rubble at the base and then ashlar above. However, the easternmost tower of the complex is circular and its base is faced in ashlar. The westernmost circular tower has an ample supply of arrow slits, whereas they are rare features in other parts of the Norfolk Towers. This tower appears to be similar in character to the nearby Crevecoeur Tower, built around 1200, with its neat masonry and plentiful arrow slits, and a well-made batter to the base of the tower faced with small stones.

The Spur Casemates comprise a structure of a variegated brick ranging in hue between buff-yellow and plum. Eight vaulted bays are expressed on the south elevation as a series of segmental arches of a paler brick, into which is set a recessed brick wall incorporating two storeys of openings. Most of the bays have a central entrance flanked by sash windows at ground-floor level; and above is typically a central sash flanked by fixed lights with glazing bars. The interior of each casemate comprises a full-height bay with barrel vault and cross wall of brick. The rear (north) walls are lined in brick and plaster, though in places the lining has been removed or more permanent openings created to expose the inner walls of the Norfolk Towers.[95] In character, the Spur Casemates are similar to the guardroom at Canon's Gate, known to have been constructed in 1797 (Figure 21).[96] They have similar brickwork, the same treatment of arches and similar window openings.

The reduction of the Norfolk Towers and the erection of the Spur Casemates permitted the provision of four gun emplacements above it, later known as the Spur Battery (*see* Figure 20). The plan of 1806 shows that the flat roof of the casemates formed a terreplein behind the parapet of the Norfolk Towers, into which were set curved racer tracks on which the gun carriages were traversed (*see* Figure 15). In the 1850s the parapet was renewed in brick with ashlar-lined embrasures for cannons.

Tunnel to South of St John's Tower

The current access to the Spur Tunnels was constructed at the turn of the 19th century; a spiral staircase was created in front of casemates four and five to descend to a brick-lined tunnel that joins the 13th-century tunnel where it curves round to

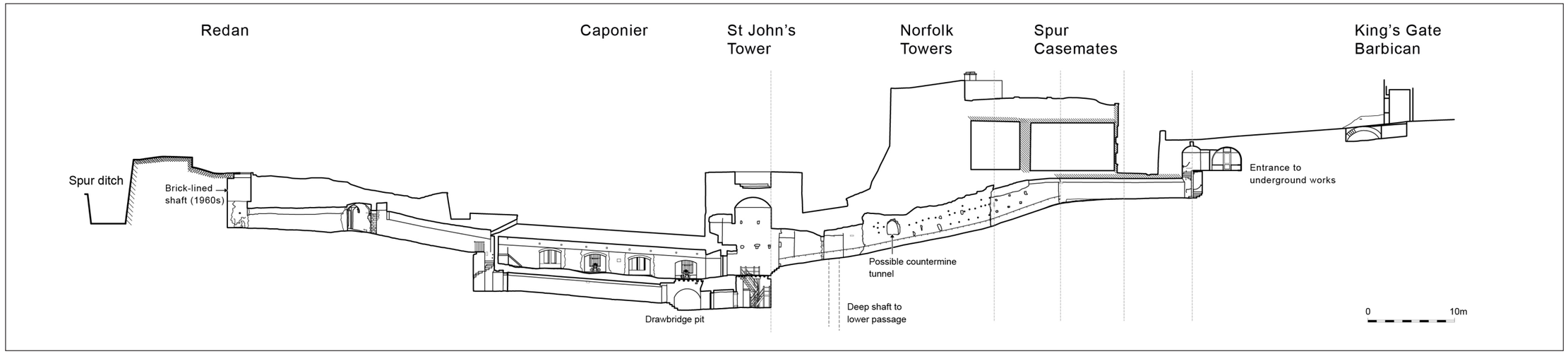

Figure 22 Longitudinal section through redan, caponier, St John's Tower, Norfolk Towers, spur casemates, King's Gate Barbican and tunnel complex.

the east. This was necessary due to the construction of the Spur Casemates blocking the original access. It is clear from the plan of the tunnel that it originally curved and ran broadly parallel to the inside face of the Norfolk Towers through to at least the site where the westernmost casemates were constructed.

Figure 23 Tunnel immediately south of St John's Tower. Note the junction between the foreground section of tunnel, which has been hewn out of the surrounding rock, and the constructed section beyond. [DP289569]

Figure 24 Possible countermine tunnel – western section [Geraint Franklin © Historic England HE0129/P4]

Figure 25 Possible countermine tunnel – eastern section. [Geraint Franklin © Historic England HE0129/P5]

The southern tunnel comprises a series of types of construction (Figure 22). It begins with the brick-lined tunnel constructed at the turn of the 19th century and described above. This leads to the inclined medieval tunnel, the first section of which is lined with rubble. The ceiling is constructed as a semi-circular barrel vault and appears to have been partially reinforced with shuttered concrete. Beyond is a passage which has been excavated directly out of the surrounding chalk; the walls taper inwards and are irregular in texture, with wick marks. This part is approximately 15m long, 2.25m wide and cuts the transverse tunnel (the putative countermine) entered from the Spur Casemates. The final section before the entrance to St John's Tower is constructed of stone and has a stone vault.

The significance of the three medieval stages of tunnels between the Norfolk Towers and St John's Tower relates to the topography of the site (Figure 23 and *see* Figure 22). North of the later access, which is entirely underground, the first part of the medieval tunnel was created beneath and inside the Norfolk Towers. The second, fully excavated section results from cutting through the chalk slope beneath the mural towers and on the exterior, it can be seen to have extended as far as that slope existed. Internally, there is an abrupt end to the excavated part, matching the end of the natural slope. The final section is a built tunnel to join to the site of St John's Tower; this is obvious on the exterior where this construction was reroofed in brick at the turn of the 19th century. This section of the tunnel has a pointed barrel-shaped

roof with evidence of shuttering in it. It also contains a small window in the west side. The window has a groove in its sill and to some extent in its jambs, presumably designed for inserting a board to prevent intruders getting into the tunnel. This is the only indication of natural lighting in this tunnel complex.

One feature that apparently predates the creation of the Norfolk Towers and the main underground passage is a smaller, transverse tunnel (Figures 24 and 25; *see* Figure 19). This is a low tunnel in terms of head height and far less substantial than the 1220s tunnel. It is entered from casemate six, turns a short distance to the east extending to the eastern end of the Norfolk Towers. This tunnel also turns to the west, descends a short distance and then turns again heading westwards broadly a short distance to where it is blocked. This is undoubtedly the other side of the small section of tunnel that can be seen in the east wall in the main tunnel linking through to St John's Tower. On the opposite side of the main tunnel, in the west wall this original small tunnel continued westwards before turning to the north. The floor level of this tunnel is approximately 1.5m higher than the main tunnel, suggesting that they are not contemporary. The purpose of this tunnel is unclear; the most likely explanation is that it was created during the sieges to allow some countermining or for sallying forth against Prince Louis' troops. If Louis had attempted to undermine the gate, his tunnel is likely to have taken the route of the current main tunnel between the Norfolk Towers and St John's Tower, which runs under the old gate, directly beneath the gate passage.

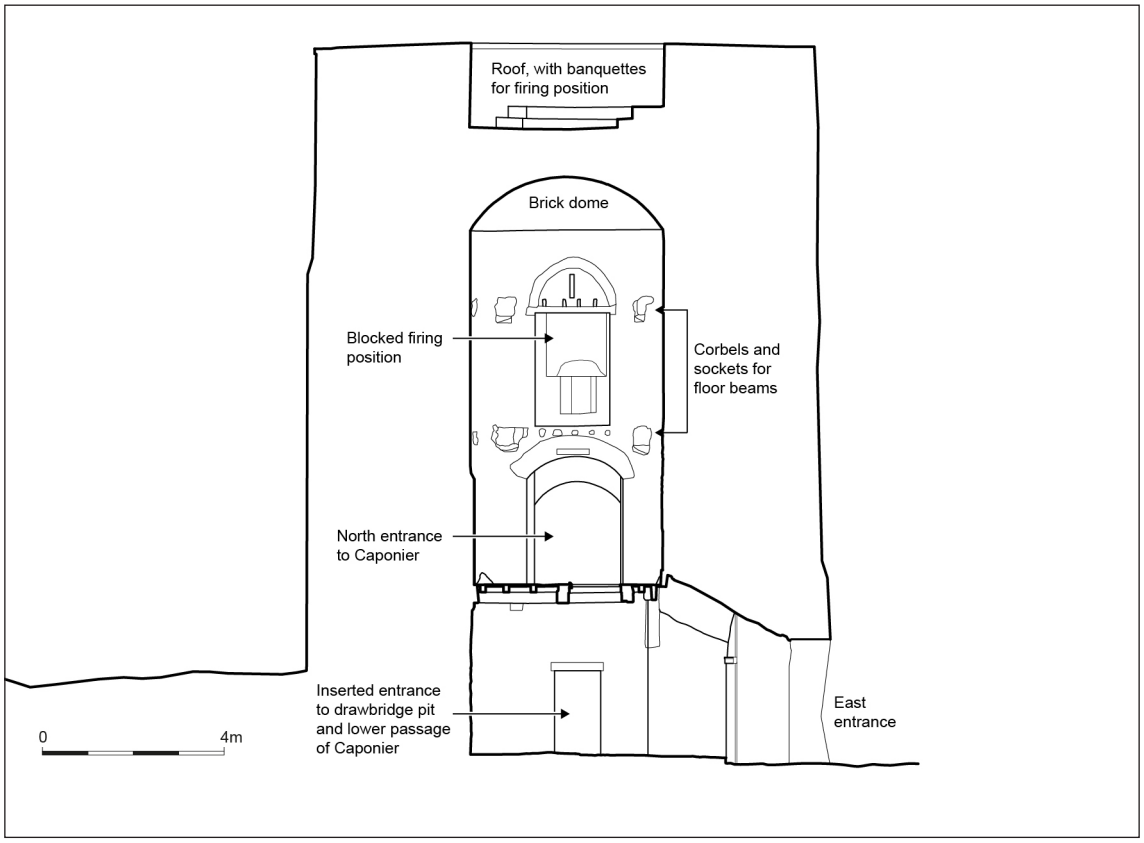

Figure 26 West-east cross section through St John's Tower

St John's Tower

St John's Tower is at the heart of the medieval complex of tunnels. At its current first-floor level, it linked the main tunnel from the Norfolk Towers to the tunnel complex to the north, which now consists of the caponier and the complex of medieval tunnels beyond. It is 11.25m in diameter and has walls of 3.60m thickness, sufficiently thick to accommodate a spiral stair in its south-western quadrant and a deep firing position in the north. The floor area created within the tower is small, the room diameters being only 4.15m (Figure 26). There are four floor levels within the tower although, as will be described, none of these apart from the first floor can have performed any practical function beyond providing secure shelter and internal access. The tower is unheated and has no garderobe, and therefore was not presumably expected to be occupied for prolonged periods of time.

This combination of features raises the question of the purpose of St John's Tower. It was apparently built to allow archers on top to fire on enemy forces while the men from the garrison exited from the tunnels further to the north. If so, why is there a lack of arrow slits within the body of the tower? As will be described, there is a substantial firing position in the north face of the tower, but there appear to be no others within the structure except for two narrow slits lighting the stair. However, as will be discussed, the door positions on the ground floor may have originally been the site of smaller openings for firing on enemies in the ditch.

Figure 27 St John's Tower in centre with caponier, former bridge, to right and tunnels from Norfolk Towers to the left. [HE Archive 26028/010]

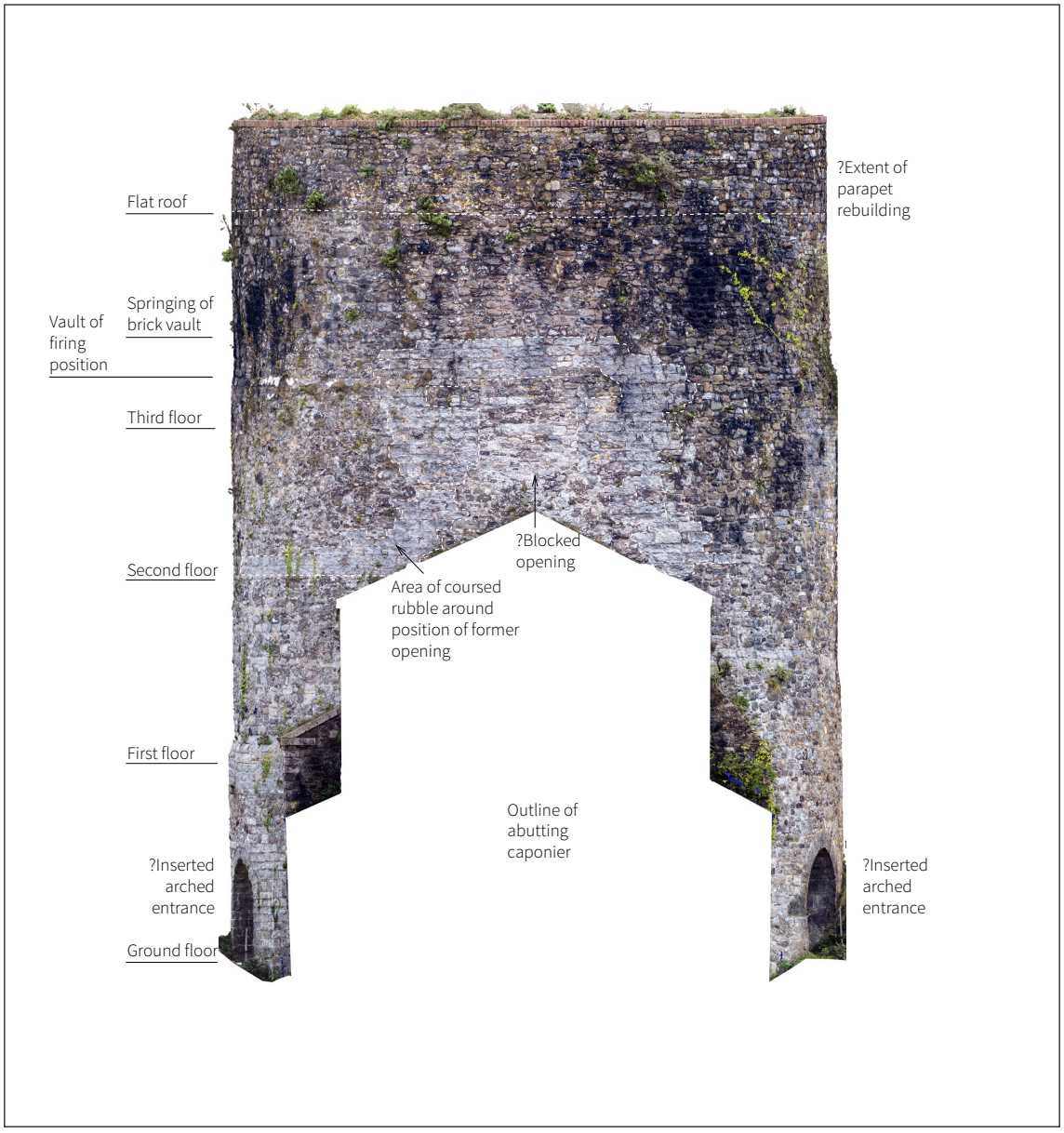

Figure 28 North elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

Access between the tower and the southern tunnel and northern bridge was originally at the current first-floor level through substantial chamfered arches in the north and south elevations that would have originally contained solid wooden doors. The access to the tunnel beneath the caponier was inserted around 1800 and is lined in brick rather than stone. There are also now a pair of doorways in the east and west elevations of St John's Tower that appear to be inserted and are not of 13th-century character. These are discussed below.

St John's Tower, exterior

St John's Tower is cylindrical in shape and is now 15.70m in height from the ground floor to the highest point of the parapet, although it may originally have been taller (Figure 27). It is constructed of squared and semi-coursed rubble stonework of

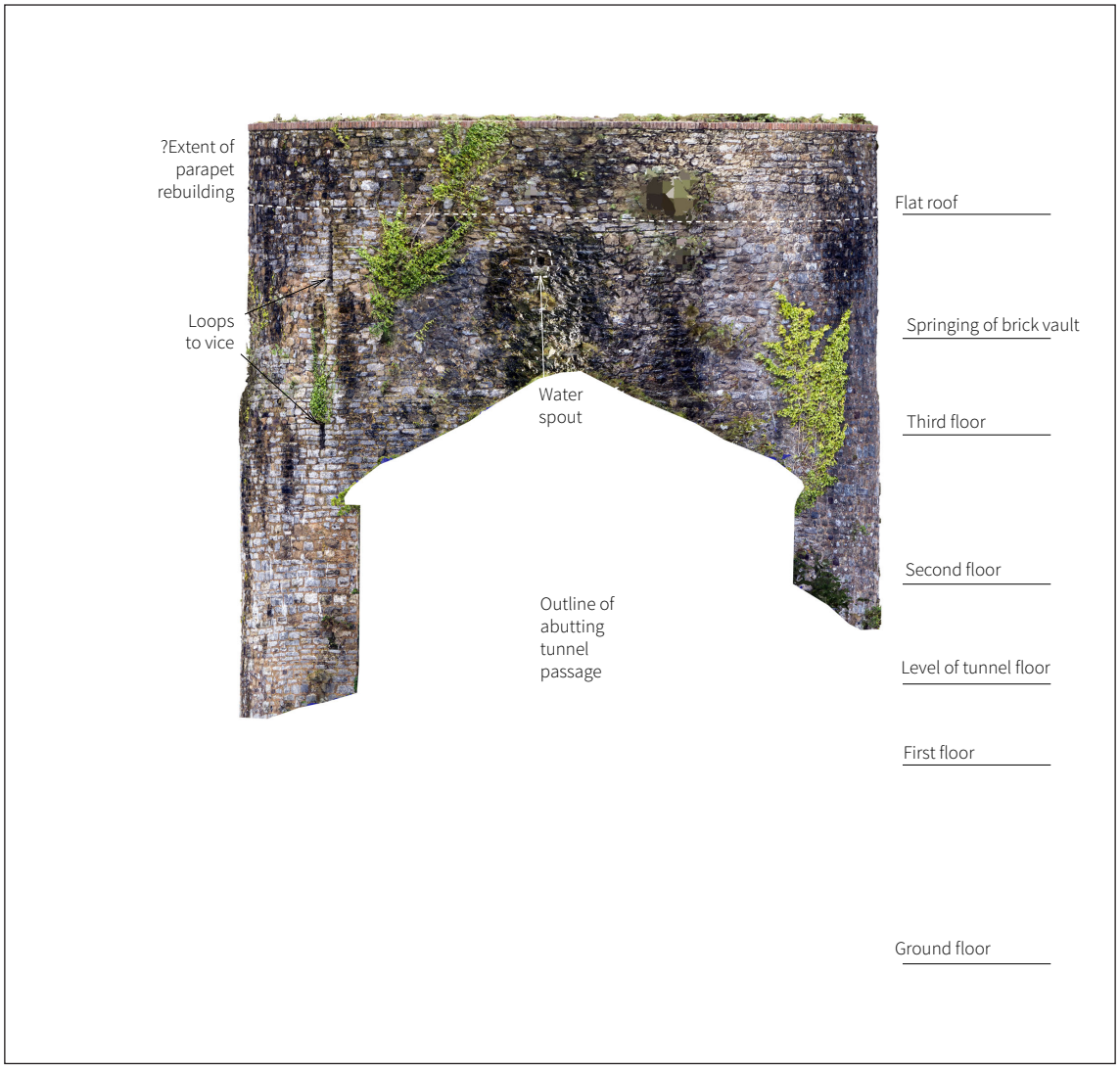

Figure 29 South elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

variegated character. The majority of the facing stone is Kentish Rag, while also present are Folkestone stone, Reigate stone, *Paludina* Limestone and flint nodules.[97] The heterogenous character of the masonry, together with differential weathering and vegetation growth, impedes attempts to identify later phases of repair and alteration (Figures 28-31), although significant alterations to the top of the tower are clear from the use of brick to form the extant roof.

The first floor of the tower connects two covered passageways that provide access from the castle to the northern defences. On its south face is a short, constructed section of tunnel that emerges from the outer ditch underneath the Norfolk Towers. To the north of the tower is the two-storey caponier structure, a remodelling of the medieval bridge structure undertaken around 1800. The arched entrance, with its portcullis and drawbridge, is set not into the curved body of the tower but instead into a two-storeyed rectangular projection. This projection is therefore an integral part of the tower (rather than the abutting bridge structure).

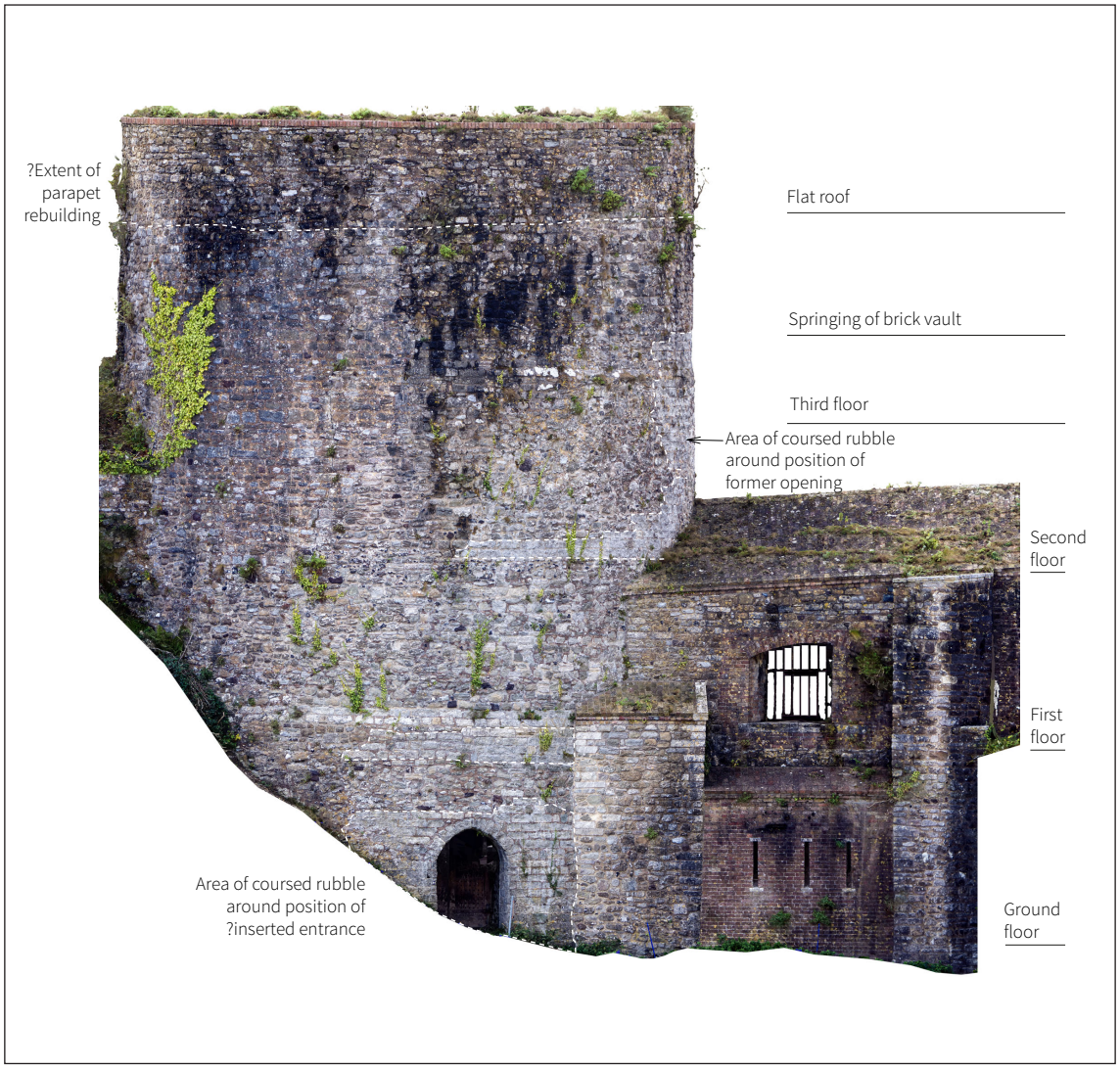

Figure 30 East elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

The returns of the tower projection align with the buttresses of the medieval bridge (later remodelled into the caponier). Their upper off-sets taper into the curve of the tower at the apex of the arched entrance. Their side elevations are different in character to one another: that to the east is of coursed rubble with square quoins of similar character to the caponier stonework (*see* Figures 30 and 31). The off-set is rebuilt in brick and in fact the whole feature may be a later rebuild. The western side has a steep rubble off-set and the top half is clearly a rebuild of heterogeneous stone. However, the lower half appears medieval in character and is consistent with the rubble masonry of the curved tower walls. Unlike the rebuilt sections there is no clear straight joint, and some of the rubble courses align with those of the curved wall of the tower.

Aside from the access points to the adjoining covered passageways, the tower is characterised by its lack of openings or other architectural features. Set into the east and west faces of the tower are a pair of arched entrances which provide direct access to the outer ditch (*see* Figures 30 and 31). They are of contrasting character to

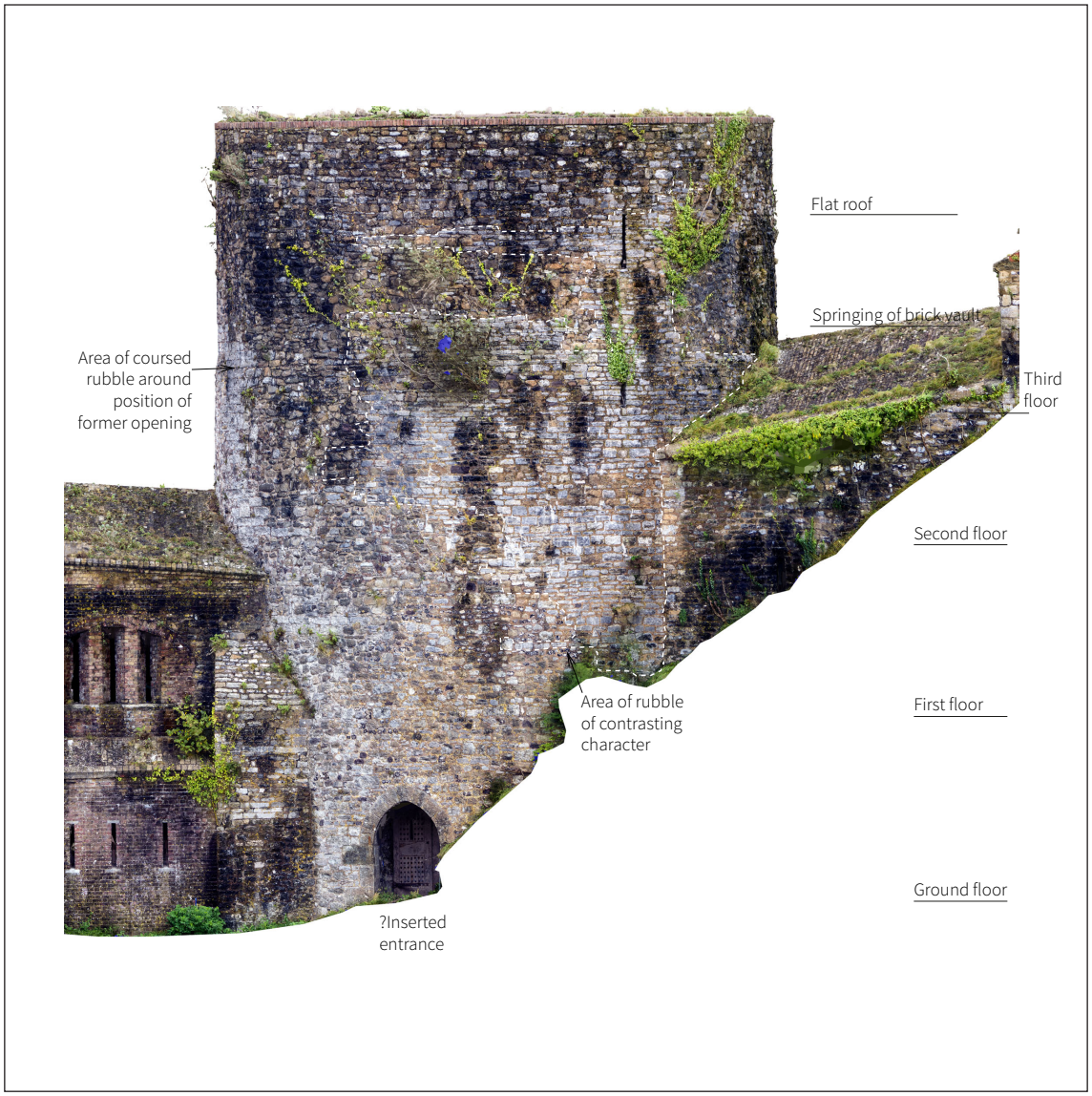

Figure 31 West elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

the medieval openings which survive elsewhere in the tower and its wider defensive complex, being unchamfered and formed not of ashlar but of the same dressed rubble as the surrounding walling. The entrances, which are here interpreted as being later insertions, are further discussed in the section below. Off-sets can be identified at first-floor level and approximately 0.75m above third-floor level. Two narrow loops in the south western quadrant, facing the outer face of the Outer Bailey, are not of defensive character and are primarily to light the intramural spiral stair in this position. In the southern face is a limestone waterspout, perhaps of around 1800, which discharges water from the flat roof (*see* Figure 29).

On the north elevation, directly above the pitched roof of the caponier, is an area of rebuilt stonework which incorporates two straight joints (*see* Figure 28). These straight joints are only seven or eight courses high but their position corresponds with the position of the blocked opening on the second floor interpreted as a firing

position overlooking the medieval bridge. This area of disturbance can be interpreted as the blocking of this opening, possibly as part of the later remodelling of the bridge into the caponier.

Surrounding this putative blocking is a larger area of stonework of different character to the rest of the tower. It is formed of large, regular rectangular blocks of dressed Ragstone of bluish-grey appearance, laid in distinct courses with thin mortar joints. The area is irregular in outline and extends from the second-floor level to the springing of the brick vault. This area of walling could either be interpreted as a discrete phase of rebuilding or, alternatively, as an area of stonework of higher quality around an opening or other architectural feature.

St John's Tower, interior, ground floor

St John's Tower was originally of four storeys, although only the first is presently floored, with timber boards of probable 20th-century date. However, the interior walls incorporate stone corbels and sockets for beams and joists, suggesting timber floors (Figures 32-35). There is no evidence for vertical access between the ground floor, the main entrances at first-floor level and the second floor (where an intramural spiral stair ascends to the third floor and roof). It is presumed that timber ladders or stairs were integrated into the framed floor structures.

The ground floor of St John's Tower has three openings. In the north face is a brick-lined entrance to the former drawbridge pit and the lower passage of the caponier beyond. The doorway has a stone lintel. This entrance was inserted around 1800 when the bridge was converted into the two-tier caponier. This lower passage was necessary to gain access to the original medieval tunnels to the north where they were building the redan (the upper gallery of the caponier having no access to the northern tunnel complex for defensive reasons).

There is also a pair of arched openings in the east and west faces which are fitted with studded doors of 18th- or early 19th-century date. The openings are not positioned directly opposite one another, an arrangement which accommodates the sloping banks of the outer curtain wall which abut the tower. The external jambs and arches to the openings do not appear to be medieval in character, and certainly not of 13th-century date. They are square in profile with a pointed-arch head and the stone is different in character to that used in the principal first-floor openings. Those arches have small chamfers and are clearly of 13th century appearance (*see* Figures 32 and 34). The east and west openings, by contrast, do not appear to have the character of a substantial fortified structure and seem almost domestic in character.

Furthermore, the quoins of both east and west openings on the internal face of the tower appear to be situated within areas of rebuilt walling, suggesting that substantial sections of walling were removed before the quoins and reveals of the arched openings were then built up with coursed rubble (Figure 36; *see* Figures 32 and 35). However, the quoins approximately 2m above current ground level, along with the voussoirs, differ from the lower quoins in terms of the neater quality of their tooled finish and their stone. These upper parts appear older in character.

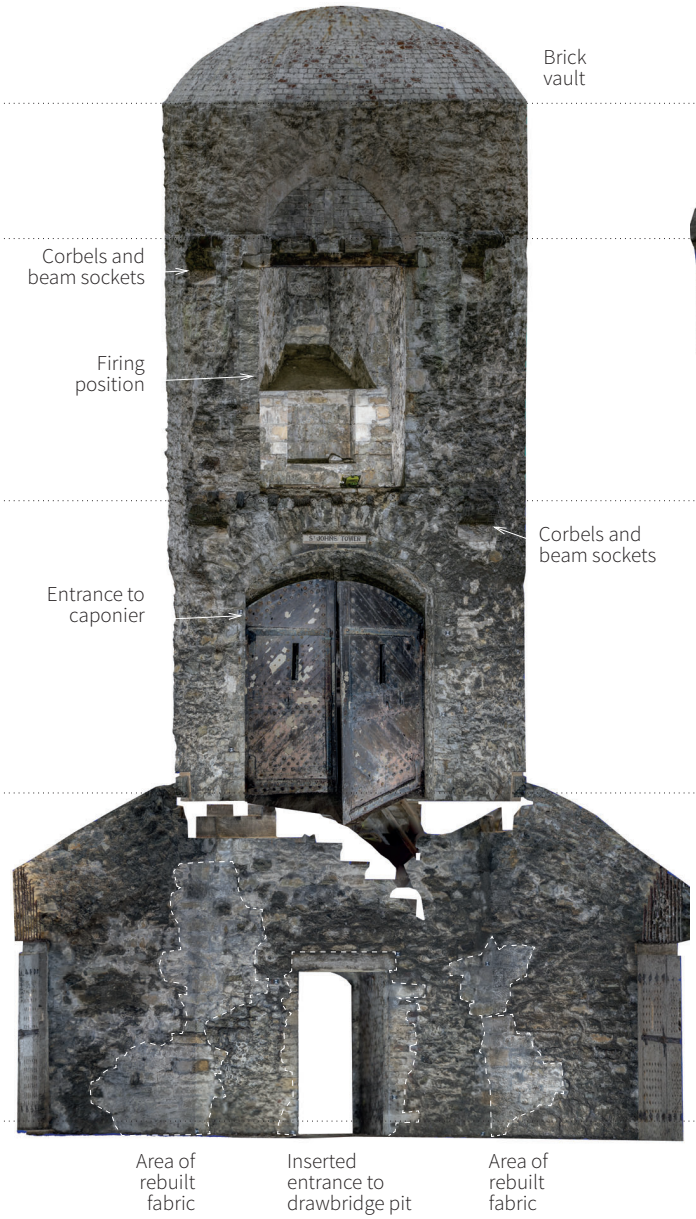

Figure 32 North elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

Figure 33 East elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

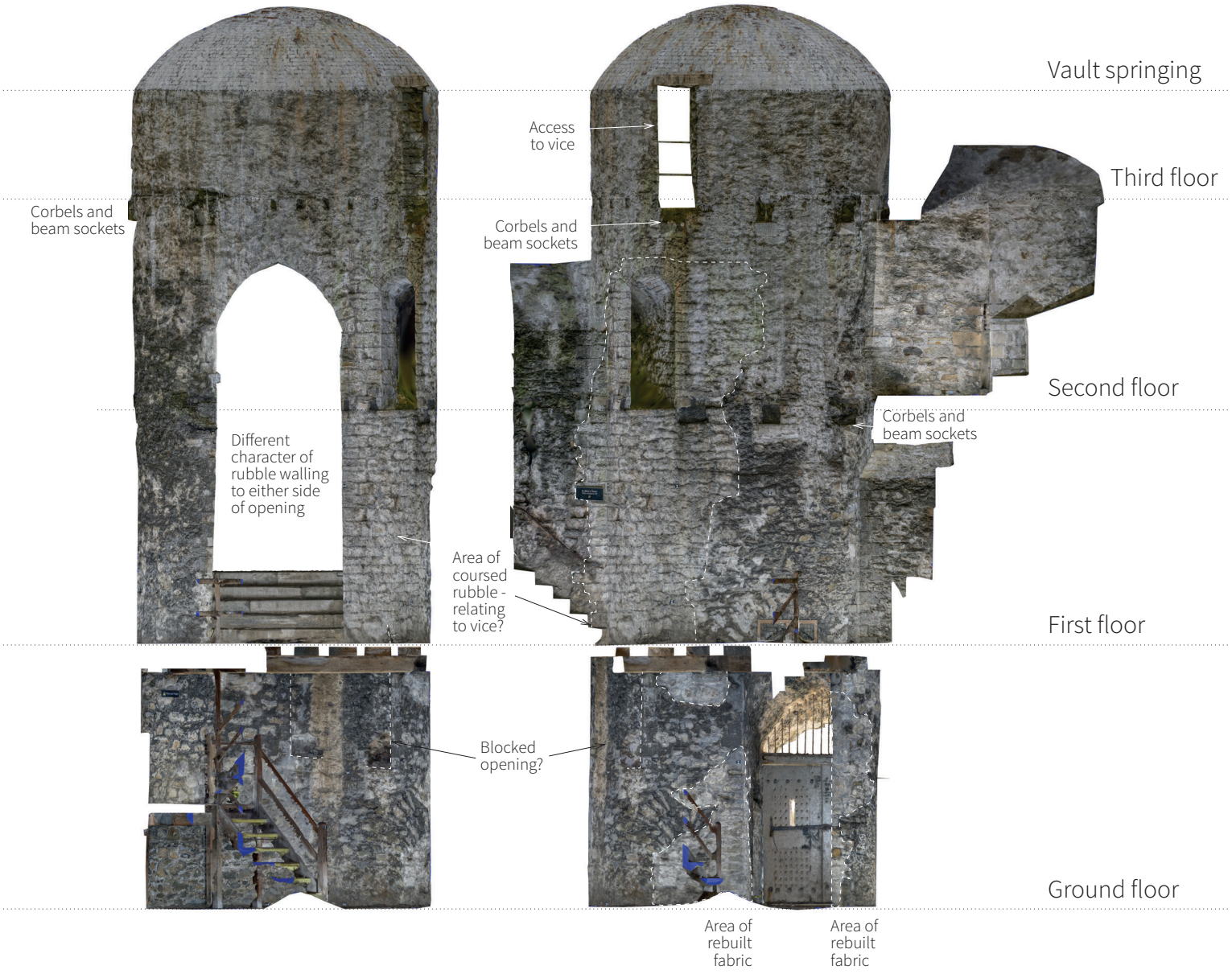

Figure 34 South elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

Figure 35 West elevation, St John's Tower (Photogrammetry courtesy of English Heritage)

Figure 36 Ground-floor southern reveal of west opening showing change in character of stone. Visible top left is the jamb to a blocked opening. [Courtesy of English Heritage]

One possibility is that the arched openings originally had sills at this higher level and may have functioned as firing positions for defending the adjacent sections of the ditch. These arched embrasures may have been enlarged into entrances at a later date. But this interpretation raises further questions. If it is accepted that the existing ground-floor entrances are later insertions, then the ground floor of St John's Tower would have had no major function in the 13th century beyond raising the principal entrances to first-floor level and therefore making them more secure. And if the entrances do not belong to the 13th century, when and why were they inserted? It is possible that they belong to the extensive works carried out in the 1580s. Yet this was a time when the castle appears to be being repaired and strengthened in anticipation of new conflicts. This appears at odds with opening two doors at the base of the tower, introducing new vulnerabilities to the defences, and their character is not obviously of that period.

The south-west face of the tower contains evidence for a blocked opening, extending from about 2m above ground-floor level to first-floor level (*see* Figures 34 and 36). This is 1.55m wide and is located partially beneath the south tunnel at first-floor level. On the right-hand side are the remains of an angled jamb with a straight jamb on the left-hand side. There is no evidence for an arch or lintel and the opening would have had limited clearance in relation to the first-floor joists. The intended purpose of this blocked opening is unclear; it cannot have been intended to provide light or have a defensive function as it faces the bank of the outer curtain wall. It is tempting to interpret the opening as a construction error. Was it intended to be the base of an intramural spiral stair which had to be abandoned when the linking tunnel from the Norfolk Towers arrived at St John's Tower? It can also be observed that the junction between the two types of finish to the door reveals occurs at

approximately same level as the base of the blocked opening. These features remain to be fully understood.

St John's Tower, interior, upper floors

The tower's original entrances were located on the first floor. The south face contains an entrance to the tunnel from the Norfolk Towers. On the north side of the tower is an entrance leading now to the upper gallery of the caponier, formerly the bridge to the medieval tunnels. The two doorways are described above.

In the north-west wall of St John's Tower at second-floor level, is a blocked opening, which originally provided a position for firing out at an enemy and covering fire along the top of the medieval bridge (now the caponier) leading to the tunnels to the north. This is a very substantial arrow slit; it occupies the full depth of the wall (3.1m to the blocking of the opening), is around 3.3m high and 1.68m wide (Figure 37; *see* Figures 32 and 33). At its present height, the firing position is elevated enough only to cover the redan and the bridging section, though not the Spur beyond (*see* Figure 22). In the floor of the firing position there were two murder holes (openings through which hot liquid could be poured on those below) and this room was where the portcullis for the door at first-floor level was operated from. The arrow slit would have provided the only source of natural light to the interior of the building when the doors were closed.

Figure 37 Firing position at second-floor level in north face of St John's Tower [DP289575]

The second floor is also the level from which the spiral stair is entered; it is set within the thickness of the tower's walls, rather than being within a projecting turret (Figure 38 and *see* Figure 35). The spiral stair is lit by narrow windows in the south face of the tower, away from the view of a possible enemy. Above third-floor level, there is a spur of five steps ascending

Clockwise from top left:

Figure 38 Spiral stair entrance at second-floor level and opening at third-floor level above where spur of five steps is located. [Courtesy of English Heritage]

Figure 39 Domed roof of St John's Tower. [Courtesy of English Heritage]

Figure 40 Upward view of north entrance of St John's Tower, showing (left to right) brick vault of the *c.*1800 caponier, chamfered outer arch, murder holes, portcullis slot and inner arch. [Courtesy of English Heritage]

from the spiral stair counter clockwise which is blocked. The spur curves back towards the tower void and the blocking is less than 0.5m from the inner wall face, approximately over the south entrance. This passage is between third floor and roof level (entered about eight steps up from the third-floor entry to the spiral stair; its top step is only 1.4m beneath the roof platform). It is therefore at the very top of the tower walls and may relate to a now-lost top floor. Its blocking may be associated with the truncation and rebuilding of the top of St John's Tower.

The top floor of the tower has a red brick dome which appears to date from around 1800; there is a clear joint between the medieval fabric of the walls of the tower internally and the brick dome (Figure 39; *see* Figure 26). Examination of the fabric on the exterior of the tower confirms that the upper courses of stonework have been rebuilt at this date. There is uniformity of coursing and the beds are set in grey mortar containing coal/charcoal.

All the floors used a similar form of construction. At the four corners there were rectangular corbels to carry the major timbers at either end of each floor and between there was a socket on each side to carry an intermediate beam. The floor levels accord with those in the spiral stair and the base of the arrow slit. However, the structure of the floor for the third floor of St John's Tower cuts across the top of the opening containing the arrow slit and at a later date, presumably around 1800, the arch was blocked with a lintel and brickwork, to fill the gap between the third floor and the top of the arch (*see* Figure 32). Nevertheless, this is an original floor level according to the location of the corbels and sockets. It is unclear when and why the floors were removed, although it may have been part of the alterations made around 1800.

Drawbridge

At the junction of St John's Tower with the former medieval bridge, now the caponier, there was originally a defensive entrance equipped with a portcullis and drawbridge. These features were intended to prevent enemy forces from accessing St John's Tower from the underground medieval tunnels on the Spur to the north-west. A fixed timber floor, probably inserted around 1800, now occupies the position of the former drawbridge. No evidence can be found for the drawbridge pulley mechanism; it is possible that it was counterbalanced with the portcullis mechanism.

The portcullis slot is incorporated into the inner arch of the northern entrance (Figure 40). Had an invader got to the drawbridge there are angled slots in the ceiling above to allow defenders to fire on them or drop liquids through from the floor of the arrow slit above to prevent them from entering the tower.

The extent of the drawbridge corresponds with the southernmost bay of the buttressed bridge (now caponier). Beneath it there is a drawbridge pit, spanned by a pair of broad, semi-circular arches (Figure 41). The arches are of rubble and their inner walls are faced with two courses of voussoirs of squared, pale-greyish Ragstone with galleted joints. The outer faces also have identically dressed voussoirs.

Figure 41 Dendrochronologists taking core samples from the timber ceiling occupying the position of the former drawbridge. To the left (south) is the inserted entrance to St John's Tower; to the right (north) is a set of steps ascending to the lower passage of the caponier, excavated *c.*1800. In the background is a brick blocking of *c.*1800 incorporating angled musket loops [DP289568]

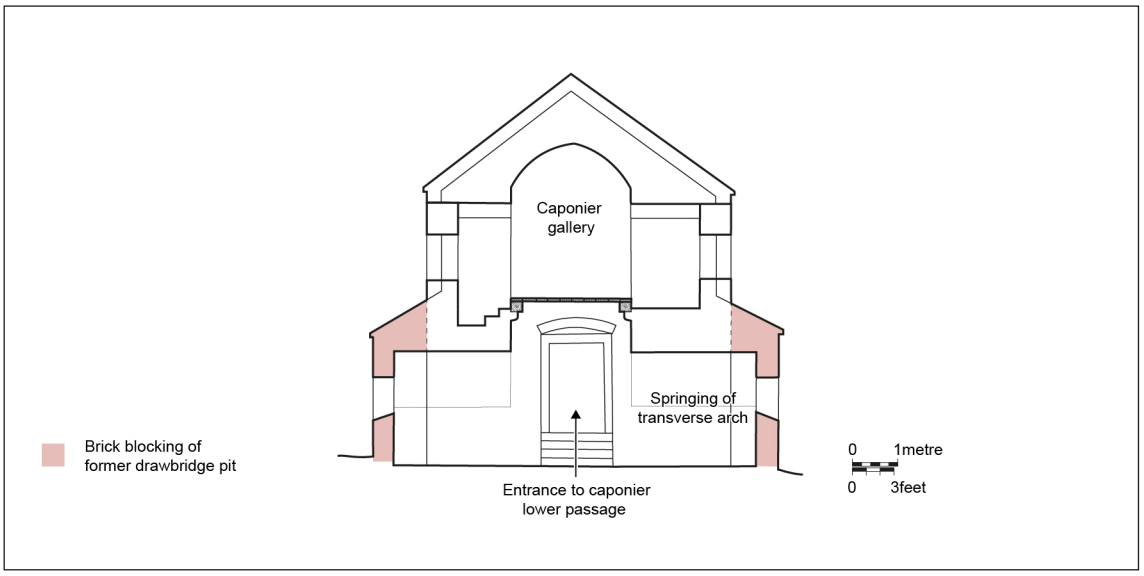

Figure 42 West-east cross section through southernmost bay of caponier (former drawbridge pit)

The beams supporting the later timber joists bear on inserted corbels springing from masonry directly above the arches.

The ends of the drawbridge bay are built out at ground-floor level with a brick wall of around 1800 (Figure 42). This extends between the stone arches and the buttresses and incorporates angled musket loops of similar appearance to those on the wing caponiers. At the same time, a new brick access into the drawbridge pit was created at ground-floor level from St John's Tower. This required cutting through the stone wall of the tower to create a new brick-lined opening into the drawbridge pit.

What was the original appearance of this drawbridge pit as it was completed in the early 13th century? Was there a clear gap between the tower and the medieval bridge, open to the sky and spanned only by the lowered drawbridge? Such an arrangement is depicted in a 1995 conjectural reconstruction drawing of the castle as it may have appeared around 1300, undertaken by Terry Ball for English Heritage.[98] Alternatively, the covered bridge may have extended to the face of the tower with the drawbridge incorporated into its south bay. The side walls of the superstructure would have enclosed the drawbridge and its roof structure would have had sufficient clearance to permit the drawbridge to be raised and lowered. The masonry arches would have spanned the drawbridge pit and provided continuous communication around the outer ditch without access to St John's Tower or the northern defences (to which there was originally no access at ground-floor level). This arrangement is described by Lyons in 1814 (who uses the past tense because the arches were by then blocked):

> There was an arched passage, by the side of the tower, in the caponnier, to keep open a communication between the different sallyports, that they might assist each other, in clearing the ditch of an enemy, if they had forced their way to it.'[99]

This interpretation of the southern bay is supported by the plan of 1737, which clearly shows the bridge structure abutting the north face of St John's Tower.[100] Also relevant is Desmaretz's 1756 description of 'the proposed Guard Room in the Barbican for a Serjeant's Party to be erected close to the Tower on the Passage leading to the advanced Work'.[101] This implies that the bridge passage connected with the tower.

This was the case at the coeval Fitzwilliam Gate, where a vaulted passageway across the ditch was taken up to the face of the tower to enclose the entrance. A further parallel can be found at the early 13th century south gate of Trim Castle, County Meath, Ireland. Here the gate tower and a small forework are linked by a masonry bridge which encloses a drawbridge. The superstructure is now ruined but may originally have been roofed. A pair of semi-circular arches provide access to the drawbridge pit (Figure 43).[102]

Figure 43: The early 13th-century south gate at Trim Castle, County Meath, Ireland. A drawbridge is enclosed within the forework to the tower which incorporates round arches on either side of the drawbridge pit. The forework may originally have been roofed. This provides a possible parallel to the relationship between the medieval bridge, drawbridge and St John's Tower at Dover. [Photograph by William Murphy, Wikimedia Commons, Creative Commons Attribution-Share Alike 2.0 Generic]

Figure 44 General view of St John's Tower and caponier, taken from the east flank of the Spur during the conservation works of 2021. Note the buttresses to the caponier and the casemated wing caponiers. [DP289564]

Caponier

Linking St John's Tower to the medieval tunnels to the north is a two-tiered caponier that traverses the outer ditch, sloping upwards to the north (Figures 44 and 45; *see* Figure 22). This was created by Twiss at the turn of the 19th century by remodelling the medieval bridge from St John's Tower to the Spur Tunnels. The original form of the medieval structure is unclear but probably comprised an inclined and vaulted passage ascending from the north entrance of St John's Tower to the section of medieval tunnel immediately north of the caponier. It is likely that the passage was constructed on a solid masonry base and supported by pairs of buttresses. Buttresses

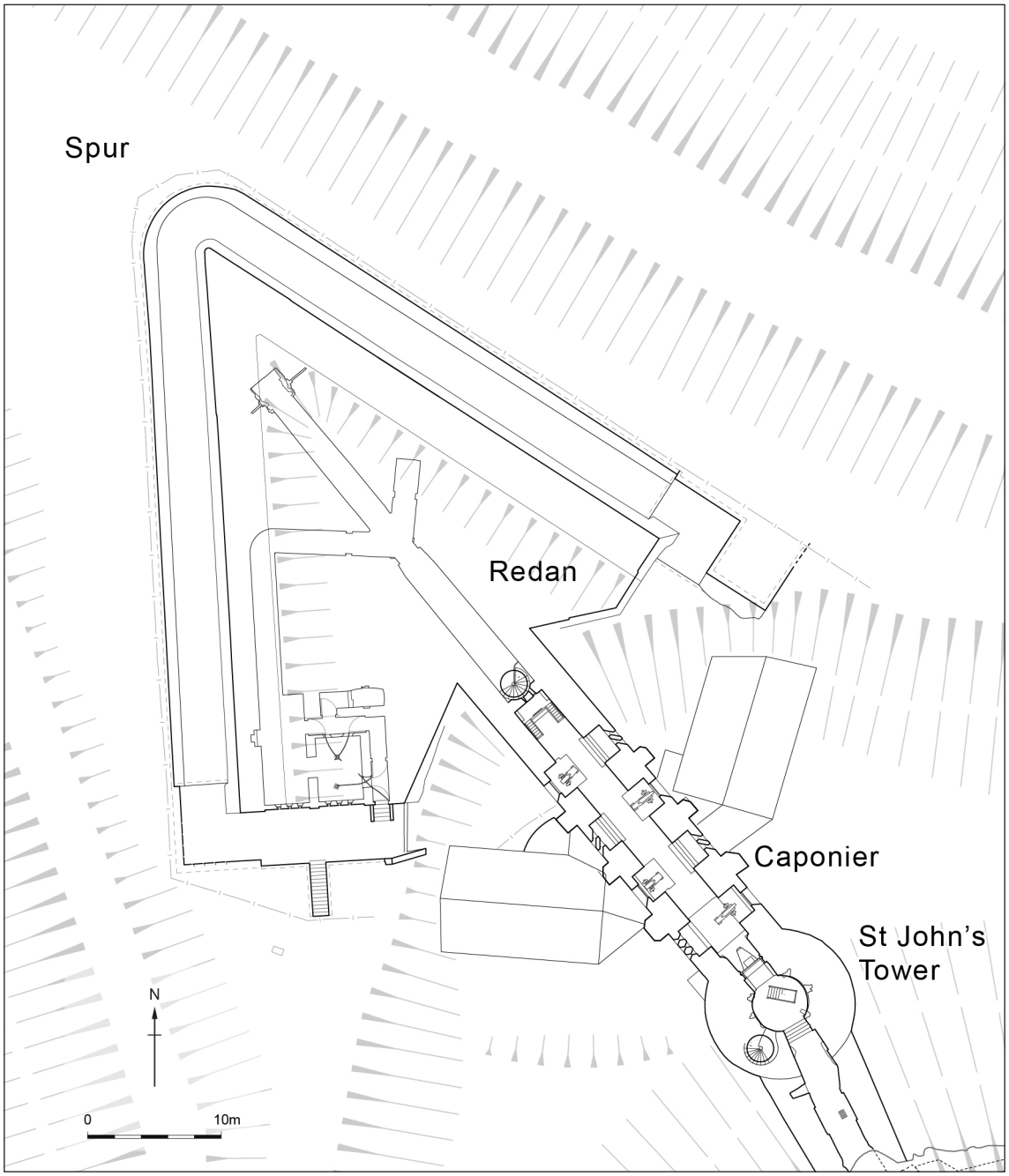

Figure 45 Plan of Spur, redan, caponier and St John's Tower.

Figure 46 View of upper gallery of the caponier from the north entrance of St John's Tower. Note the plank floor over the former drawbridge pit, modelled floor surface and gun embrasures. [DP289565]

are indicated on several 18th century plans; they were probably incorporated in a remodelled form into the present caponier.[103]

Twiss reconfigured the medieval bridge into a double-decker structure in which the end of the upper level gallery was blocked and a new brick-lined passage was created beneath to connect St John's Tower to the tunnels in the north. Such an arrangement had the advantage of providing flanking fire across the ditch without compromising a secure route between St John's Tower and the redan. The caponier is of four bays, each with an opening on either side and flanked by a buttress. It is constructed of coursed rubble, possibly remodelled or reused from the medieval bridge, with portions of the walls and buttresses heightened and rebuilt in stock brick. The roof is at a fairly shallow pitch and is also clad in brick.

The lower level, which corresponds to the exterior ground level of the ditch, comprises a brick-lined passage, approximately 1.6m wide, within an otherwise solid masonry base. The north end gives access to a spiral stair that ascends to the northern tunnels of the Spur. At the south end of the caponier is an opening inserted into the north wall of the drawbridge pit. It has stone quoins and jambs and a segmentally arched head of brick. The passage is lined with whitewashed red brick and has a segmental vaulted roof and a floor surfaced with dressed chalk. Its walls are slightly concave in section, possibly reflecting an attempt to strengthen the structure or enhance its resistance to artillery. At the north end of the passage is a small timber drop door that controls access to the spiral stair beyond. The drop door is set within a timber frame, which in turn sits within recesses let into the east and west walls. The door is released from a platform in the gallery above at the end of the caponier.

The upper level of the caponier consists of a vaulted gallery provided with four pairs of embrasures (Figure 46). Its interior walls are of exposed coursed rubble while the embrasures are formed of red brick with segmental arches. There is a catenary barrel vault of red brick into which are set timber beams. Inspection of the beams during the present project suggests that they are not tied into the external walls, suggesting that their structural role is minimal.[104]

Each pair of embrasures comprises opposing carronade and musket positions, which alternate to cover both directions. The gun floors are stone flags and the front wall of each carronade position had a timber beam against it to brake the recoil of the gun carriage by means of a breaching rope attaching the beam to the breaching loop at the rear of each carronade. They are provided with wide, arched openings fitted with replacement iron bars which incorporate firing openings. Fixings for earlier gratings are preserved in the jambs. The opposing embrasures are equipped with angled musket loops formed in brick; they have a lower floor level, reached by two stone steps.

The ramped floor of the upper gallery, renewed in cement, is modelled to provide level access to the gun floors, while the former drawbridge pit at the south end is floored over with oak planks. At the north end is a timber platform of around 1800 from which the drop door to the lower passage is operated. The pulley mechanism

Figure 47 North tip of revetted redan, looking south eaSt [Geraint Franklin © Historic England HE0129/P6]

Figure 48: A view of the gorge of the redan, looking north from St John's Tower and showing the brick roof of the caponier. To the left is the sally port. [Geraint Franklin © Historic England HE0129/P7]

and the door itself are housed in the central section, flanked by a pair of narrow steps leading to the platform. From the platform access is also obtained to two angled slots or firing ports, lined in softwood, which overlook the medieval tunnel in the Spur beyond.

The main caponier is flanked by a pair of single-storeyed wing caponiers, angled at 45° projecting to the northeast and northwest respectively. The superstructure is formed entirely of brick, including the roof covering, over a stone plinth (*see* Figure 44). Internal access is via a shaft in the salient angle which leads to a set of narrow tunnels, emerging at a corresponding shaft in the tunnel immediately adjoining St John's Tower. Each wing contains two intercommunicating casemates, lit by segmental arched windows. A set of openings at the re-entrant angle are provided with splayed loops to defend the base of the tower.

The Spur and the Redan

The northern defences terminate in the Spur, an earthwork that projects north west from the outer ditch (*see* Figure 45). In origin of early 13th-century date, it was successively remodelled in the mid-18th century by Desmaretz and again by Twiss at the turn of the 19th century, its final plan being that of a ravelin (triangular outwork). The earthwork scarps are surmounted by a parapet faced with brick. Within the Spur is a triangular redan, less acutely angled than the ravelin and on a slightly different alignment. It is surrounded by a flat-bottomed ditch and revetted with chalk blocks, faced with stock brick to form a battered wall (Figure 47 and 48).[105] Its salient faces are surmounted by a low rampart that slope gently outward from a brick parapet; the interior is otherwise flat and grassed. In the gorge of the redan, in the angles where the ditch turns into the salients, are counterscarp galleries, provided with angled musket loops and drop ditches. They communicate with the wing caponiers via underground shafts and tunnels.

Within the redan are preserved the complex of medieval tunnels to which the bridge, now the caponier, originally gave access. To access the medieval tunnels at the end of the complex today, it is necessary to descend to the ground floor of St John's Tower to enter the tunnel beneath the caponier. At the north end of the tunnel a spiral staircase leads up to the level of the main medieval tunnel, which was a continuation of the original bridge. This tunnel has a gentle upward slope and it narrows slightly from 2.6m where the stair is located to just over 2m at the crossing point of the subsidiary tunnels.

The main tunnel extends to a 13th-century arch marking the junction between it and the three subsidiary tunnels. This crossing has a rib vault with simple square sectioned and chamfered ribs (Figure 49). Two voussoirs of the ribs survive in two places at the west side of the vault (Figure 50).

The three subsidiary tunnels run to the north-west, north and north-east. These tunnels appear to be constructed on top of the bedrock. The north-west tunnel originally rose on an incline from the crossing up to around 1.4m-1.5m above the current floor level (Figure 51). At this point the fabric of the walls of the tunnel gives

Figure 49 The three tunnels trifurcating from a vaulted central crossing. To the left, the original incline of the north east tunnel can be seen in the wall, underbuilt in later brick. [DP289570]

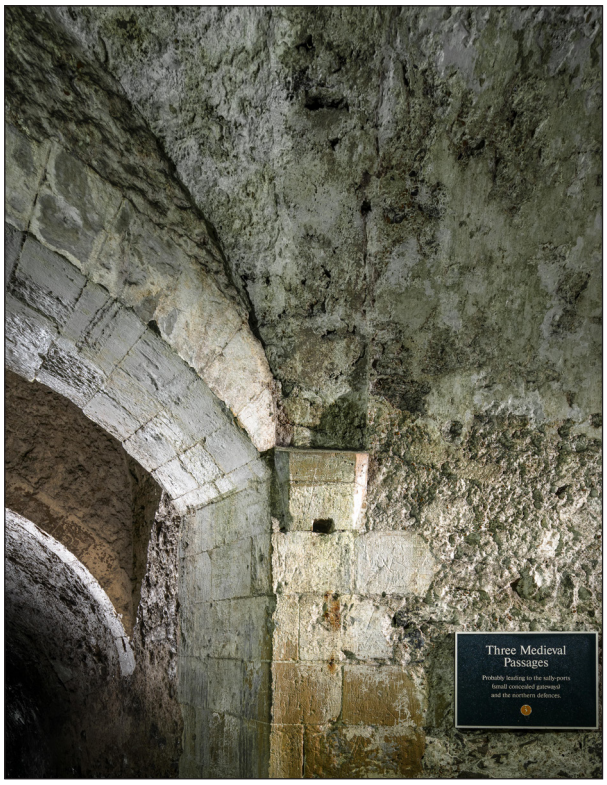

Figure 50 Remains of rib vault on south side of crossing. [DP289573]

Figure 51 West face of north-west tunnel, retaining evidence for original floor sloping upwards. [DP289572]

way to 19th-century brickwork before it turns towards the guardroom in the redan. The evidence of this incline is that the lower section of the walls on either side of the tunnel have sloping lines in them with 13th-century stone above and later brick below, indicating where the floor level of the tunnel has been lowered. The brick is the same character as the later section of the tunnel leading to the guardroom. This change of floor level is also demonstrated by the entrance arch into the medieval tunnel from the crossing. The original stonework of the arch ends above floor level and the medieval stone of the arch terminates with proper stops on three of the four corners, above the current floor level.

The north tunnel followed the same flat floor level as exists today but in the north-east tunnel the original steeper incline of its floor still exists, confirming the evidence found in the north-western tunnel. This tunnel is blocked a short distance (2.9m) from its entrance arch.

The north-west and north-east tunnels have arches on their inner side and there is evidence of pintles on the right-hand side, on the inner side of these arches. These are the locations of doors for securing the tunnels and there is a sign of the holes for drawbars. The arch of the north-west tunnel also seems to have the remains of holes for pintles on the left (south) side of the arch and a hint of a drawbar hole on the right-hand (north) side. There is no evidence for a door in the north tunnel but there is a modern repaired patch on both sides of the entrance.

The north tunnel has a rubble barrel vault that terminates in a neatly built, chamfered arch. This opens onto an irregularly shaped, rubble-walled chamber; the scar of a barrel vault can be seen over the arch (Figure 52). The chamber now forms the base of a reinforced, brick-lined shaft, erected in the 1960s to counter subsidence

Figure 52 Rubble-walled chamber at end of northern or central branch tunnel. Note chamfered arch to tunnel and scar of barrel vault above. [Geraint Franklin © Historic England HE0129/P8]

Figure 53 (top) Guard room within the Redan. The near doorway leads to the sally port complex, while the opening beyond gives access to a chamber from where the sally port doors were remotely operated. [DP047941; photographer Nigel Corrie]

Figure 54 Catenary-vaulted 'control room' within Redan, showing mechanism to remotely operate a pair of inner doors to the sally port. [DP047952; photographer Nigel Corrie]

and provide plant access. The opening of the shaft is set into the upper surface of the redan. The chamber is lined with uncoursed, mortar-rich rubble, which in parts is irregular and ragged and has the character of an exposed masonry core. Into its east and west walls are set an opposing pair of deep sockets, lined in precisely cut ashlar. These were probably for a drawbar to a pair of gates. The north wall is a 1960s blocking of squared ashlar blocks incorporating a doorway, now boarded over. Survey drawings indicate the existence of a short, tapering passage a short length beyond the 1960s blocking, approaching (and probably truncated by) the tip of the redan.[106]

Figure 55 View of sally port opening in counterscarp of redan ditch, with steps to Spur flank [Geraint Franklin © Historic England HE0129/P9]

The north-west tunnel was reused by Twiss around 1800 to provide access to a guardroom and sally port complex at the south western flank of the redan (*see* Figure 45). A downward-sloping passage was extended from the end of the medieval tunnel to give access to the guardroom, the first of a complex of vaulted chambers of lime-washed red brick with red brick floors. The room is heated by a segmental-headed fireplace set into the west wall; in the south wall there are three musket loops (Figure 53). Vaulted openings in the east wall lead to a 'control room' and a L-shaped corridor which runs around it. In the control room are two lever mechanisms that operate two sets of heavy doors, an inner pair to the north (Figure 54), and an outer pair to the east. By closing the innermost door, intruders could be diverted from the corridor into a small, brick-lined shaft overlooked by firing positions. This shaft also represented the sole means of access onto the terreplein of the redan. The outermost door secures a small sally port in the re-entrant face of the redan, which descends four steps into the redan ditch. A narrow flight of steps let into the counterscarp gives access to the Spur flank and Constable's Road beyond (Figure 55).

CONCLUSION

The report closes with some recommendations for further research and investigation, whether it is planned in connection with future conservation works or an interpretation scheme. Documentary research on the early 13th-century reconstruction of the northern defences has the potential to clarify ambiguous references and enhance our understanding of the chronology of the Spur complex in the context of the wider building campaign. One possible starting point might be the investigation of the sources cited in the *History of the King's Works*, including pipe rolls, foreign accounts rolls, records of the King's Remembrancer and liberate rolls. Later sources, with the potential to shed light on 19th- and 20th-century phases, include the Garrison letter books at the Royal Engineers' Library at Brompton Barracks, Chatham and the 'Blue Albums' series at the Historic England Archives.[107]

Targeted fabric analysis, potentially in conjunction with scientific dating techniques, may provide new insights into the interpretative questions highlighted in this report. These include the transverse tunnel which is cut by the 13th century tunnel between the Norfolk Towers and St John's Tower; the phasing of the east and west entrances to St John's Tower; the blocked opening within the ground floor of the tower; the relationship between the 13th-century bridge and drawbridge north of St John's Tower; and surviving evidence for the original north gateway of the castle in the inner face of the Norfolk Towers.[108] A photographic survey of the interior of the casemated wing caponiers and the counterscarp galleries of the redan would be of use given the difficulties of internal accesss to these structures. Questions which might be addressed by future archaeological investigation, circumstances permitting, include the location of the original entrance to the tunnel complex from the Inner Bailey; the termination of the trifurcating tunnels within the Spur and the form and function of the enigmatic rectangular structure shown in this area on the mid-18th-century Board of Ordnance maps.

APPENDIX: SOME HISTORICAL ACCOUNTS OF THE NORTHERN DEFENCES

The northern defences of Dover Castle are described in a number of historical works from the 16th century onwards. In the third quarter of the 16th century, William Darell (d. in or after 1580) provided a succinct description of the medieval complex of tunnels, St John's Tower and the ditch:

> By this tower [the Earl of Norfolk's tower] there is a subterranean passage leading to a vault, defended by a moat and drawbridge, and so vastly large, that a considerable number of horse and foot might be concealed in it, ready to sally out upon and destroy an enemy that had got into the castle. Besides the moat, which is often a prodigious depth, and dry, the vault is also defended by a kind of round tower; so that it is altogether inaccessible to an enemy. From the tower there are some secret openings, or passages, called by other people Barbicans, which have a communication with the country, and thereby afford an opportunity of detaching more to attack the enemy without.[109]

The anonymous *Brief History of Dover Castle,* published in 1787 and possibly written by John Lyon, has a detailed description of this part of the castle:

> [Near Crevecoeur tower], you descend by a flight of stone steps, into the main sally port which is wide and lofty; and part of it is cut through the solid rock. Near the entrance of this passage, is a turning on the right hand, by which you proceed to a stone door case, near the foundation of the wall of the castle, where there is another flight of steps, by which you descend several feet lower, till you arrive at a passage, on the right hand, and on the left, in the bank without the wall. The passage to the right is nearly stopped up with rubbish, and it is not possible to crawl to the end of it; yet I have reason to believe, from the examinations I have made, that it never went further than the tower in the angle [...] on the right hand.
>
> On the left of the flight of steps, you proceed in a subterraneous vault, which forms several angles, and the direction was guided by the foundations of the towers. As the arch is stopped up, I have not traced it to the place where it originally opened; but if it did not lead into the main sally-port, at the side, it led into a tower near it. The tower in the ditch and the adjoining subterraneous works are supposed by some, to have been built by Hubert de Burgh, while the Castle was besieged by the Dauphine, in the reign of King John; but this I consider as impracticable; it cannot be supposed, that the besiegers, would have suffered the besieged to have carried up materials for the building of such a work, when they could so easily have prevented them. If this tower, and the barbican, were raised by Hubert de Burgh; it must have been in the interval of the Dauphine's quitting the siege, and returning to it again. That he might then erect them will appear indeed highlight probable, when we consider how indefatigable Hubert de Burgh was, in fortifying and

> defending this Castle for his sovereign. Lord St John had a grant of Burleigh, and Pising, in Kent; and Popeshall, in Herefordshire, to repair, and defend it.
>
> From St John's tower the sally-port was continued cross the ditch, and entered the bank on the opposite side, in a straight direction [...], where it divided into three branches.
>
> The branch on the right hand going out of the Castle had a tower, at, or near the opening; the remains of which are still to be seen in the side of the works [...]: this was probably intended to cover the men, in case they should have been pursued by the enemy, upon their return to the Castle, after a sally.
>
> How far the other two branches of this subterraneous work were continued, or whether they had any towers to guard their entrance next the country, like the other, cannot be determined by the present remaining works. It is certain they were continued further than they now are; and the middle passage descends, though the other two ascend, from the division [of the three passages].
>
> There were several gates in different parts of this barbican, secured by strong bolts and bars, to prevent, or retard, an enemy from proceeding into the Castle, if they happened to force the entrance; which indeed was hardly practicable, the whole being so well defended with towers.[110]

John Lyon writing at the beginning of the 19th century provided a longer description of the complex:

> He [Hubert de Burgh] added a considerable outwork before Magminot's tower. On the Spur, he raised a parapet of earth, after the manner of the Romans. In this Spur they could command the entrance into the Castle, and the side of the hill, down to the place where the Dauphine first broke ground, that he might not make a second attempt unmolested. As there was no communication between this Spur and the Saxon vallum, a very wide and lofty souterrain was made under Magminot's tower, with the entrance in the Saxon vallum. It was cut in the solid rock with a considerable descent, and it opened in the exterior ditch.
>
> On the right hand side of the main souterrain, there was a passage which led to a door nearly under the foundation of the exterior wall, where there was a passage, by a flight of stone steps, into a gallery in the bank of the ditch, which formed a communication between the tower in the angle, and a new one built in the ditch before the souterrain. These galleries were frequent in ancient fortifications; but the use which was made of them is very uncertain.
>
> In order to make a sally, and to secure a retreat from the Spur, they built a caponier across the ditch, from Saint John's tower, with a gradual ascent, until it opened in the surface, about the middle of the Spur, in three branches. The eastern branch had a circular tower in the parapet of this out-work, close by

the opening, to protect the men while entering, in case they were repulsed. When the alterations were made at this place, a few years since, the tower was either demolished or buried. At each of these openings, there were originally strong gates, to check the progress of the enemy, if they had driven the archers from the ramparts, and they were obliged to retire into the Castle.

They had also another gate in the caponnier [sic], where the three passages united in one, which was secured with strong bolts and bars. The communication between the souterrain and the caponnier was through the round tower, in the ditch; and there were strong gates, and a draw-bridge, to prevent the enemy from entering the tower, if they had forced their way to it.

There was an arched passage, by the side of the tower, in the caponnier, to keep open a communication between the different sallyports, that they might assist each other, in clearing the ditch of an enemy, if they had forced their way to it.'[111]

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ENDNOTES

1 Jefferson Consulting Limited 2021; Gherardi 2021.
2 Hassall 2021.
3 Howard 2021.
4 Allen Brown et al, 1963, II, 633; Humphrys 2007, 49; Brindle 2015, 23.
5 Humphrys 2007, 49.
6 ODNB Burgh, Hubert de, earl of Kent.
7 Poole 1975, 479; Roger of Wendover 1996, 357-8.
8 McGlynn 2015, 176; Roger of Wendover 1996, 364-5; ODNB Burgh, Hubert de, earl of Kent.
9 Warren 1978, 252; McGlynn 2015, 184.
10 Humphrys 2007, 51; Purton 2010, 325.
11 Humphrys 2007, 51.
12 Wiggins 2003, 15-16.
13 Allen Brown et al, 1963, II, 633-4.
14 ODNB Burgh, Hubert de, earl of Kent.
15 Bavington Jones 1916, 44-45.
16 Allen Brown et al, 1963, II, 635.
17 Colvin 1971, 31, 33, 35, 37, 53, 55.
18 Colvin 1971, 35.
19 Humphrys 2007, 55.
20 A tracing of an undated but probably 19th century drawing found at the Castle during works in 1957 appears to show a continuation of the medieval tunnel to the north east. It forms a junction to the north which descends, via a flight of steps, to the transverse tunnel in the cliff under the Norfolk Towers (HE Archive: MP/DOV0710). A plan of 1781 (TNA:MPHH 1/15, 'Guard House at Dover Castle') shows a vice situated in the angle between the guardhouse and the westernmost of the Norfolk Towers. *Pace* Pattison (2021, 5) this is unlikely to have descended to the Spur tunnel as it is located well to its west.
21 Colvin 1971, 85.
22 Colvin 1971, 67.
23 *The History of the King's Works* states that there is no evidence that the tower known as Peverell bore this name in the Middle Ages (Allen Brown et al, 1963, II, 636, n.1).
24 Colvin 1971, 71.
25 Colvin 1971, 85.
26 Allen Brown et al, 1963, II, 636; Colvin 1971, 67.
27 Allen Brown et al, 1963, II, 636.
28 PRO 1916, 201, 217. The original Latin is given in Hartshorne 1858, 85-6. With thanks to Jeremy Ashbee for the translation.
29 Allen Brown et al, 1963, II, 636.
30 PRO 1930, 176.
31 Allen Brown et al, 1963, II, 637, including n.9.
32 See, for example, the maps by Richard Cavendish (1541; British Library: Cotton Augustus I.i f.26); John Luckas (1575; Cotton Augustus I.ii f.9); and Thomas Digges (1581; British Library: Add MS. 118151).
33 KHLC: TR1380/11, William Eldred, 1641, 'The platt of Dover castel towne and harbor'.
34 Anon 1787, 68.
35 Lyon 1814, II, 144.
36 They include HE Archive MP/DOV0033, 'Plan of Dover Castle'; TNA: MPH 1/355, 1737 plan of the town, harbour and fortifications of Dover by H Foucquet; HE

Archive MP/DOV0030, 'A Plan of Dover Castle December 1756'. Pattison (2021, 1-2) suggests that MP/DOV0033 predates 1736 on the basis that it does not depict the Gunners' Barracks built by that date.
37 HE Archive MP/DOV0033.
38 TNA: MPH 1/355, 'Plan of the town harbour and fortifications of Dover, 1737'.
39 HE: MP/DOV0029.
40 ODNB Darell, William; Darell 1797, 29.
41 Anon 1787, 68.
42 Lyon 1814, II, 144.
43 Lyon 1814, II, 144.
44 Allen Brown et al, 1963, II, 635.
45 Colvin 1975, 244-5.
46 Summerson 1957, 209-16. There is some variation in the spelling of his surname. Summerson gives 'Symonds'. In contemporaneous documents his name is sometimes spelt Symons (e.g. Cecil Papers: August 158, pp.510-9, letter of 9 August 1582 from Richard Barrey to Lord Burghley: https://www.british-history.ac.uk/cal-cecil-papers/vol2/pp510-519; burial register entry: City of Westminster Archives Centre, parish registers: STM/PR/1/1).
47 Colvin 1975, 246.
48 While accounts for 1581 do not appear to survive, a transcription of a 1581 estimate of 'Nedeful reparacion to be done upon Dovor Castel' during this season indicates that the intended focus was buildings within the inner bailey and Fulbert de Dover ('Chyllam'), Hurst's and Pencester ('Mortimer's') towers (KHLC: Do/ZZ2/5/7, transcription of unidentified Lansdowne MS).
49 Do/ZCPW3/1, unpaginated building accounts of 23 May to 25 June 1580; 27 June to 24 July 1580; 25 July to 20 August; and 21 August – 11 September 1580.
50 KHLC: Do/ZZ2/5/7, transcription of BM: Lansdowne MS 34/75.
51 KHLC: Do/ZCPW3/2, a bound document containing four building accounts of 28 May to 30 June 1582; 1 to29 July 1582; 29 July to 25 August 1582 and 26 August to 15 September 1582. The pages making up the four account books have been bound, or re-bound, in the incorrect order, so that the document starts with the fourth instalment of accounts.
52 Darell 1786, 27. Hugh Bigod (b. in or before 1220, d. 1266), was Justiciar and Earl of Norfolk. He was granted custody of Dover Castle in 1258. ODNB, Bigod, Hugh; Page 1932, 284.
53 Skews are ashlars with a sloping cut surface, such as coping stones, buttress set-offs etc; A vamure is the walkway on the top of a wall protected by a parapet. A crest is the finishing or capping which surmounts a wall, including coping, battlement or ridge tiles. (Parker 1850, 428, 504, 149).
54 KHLC: Do/ZCPW3/2, building accounts of 26 August to 15 September 1582.
55 KHLC: U269/O100/7; Brodie & Higgott 2011, 21-6; Pattison 2021, n.6; TNA:MPHH 1/15, 'Guard House at Dover Castle', drawing of 1781 by William Bartlet.
56 Hots 2002.
57 TNA: WO 55/2275, estimate of 10 Nov 1756 by Desmaretz to the Office of Ordnance.
58 Ibid, letter of 26 December 1755 from Desmaretz to Sir John Ligonier.
59 Ibid, letter of 19 January 1756 from Bates to Desmaretz; Pattison 2021, 4.
60 Ibid.
61 Ibid, letter of 3 Feb 1756 from Desmaretz to Morris.
62 Ibid, letter of 6 July 1756 from Bates to Desmaretz.
63 HE Archives: MP/DOV0030; TNA:MPHH 1/101, copies of 1766 by William

Booth perhaps of an original plan of c.1756.
64 See, e.g. TNA:MR 1/1345, a plan of 1784.
65 TNA: WO 55/2275, letters of 13 Mar 1756 and 29 Apr 1756 from Bates to Desmaretz.
66 Anon 1787, 66.
67 E.g. Coad 1995, 64.
68 TNA: WO 55/2275, estimate of 10 Nov 1756 by Desmaretz to the Office of Ordnance.
69 An identical description can be seen on a related plan of 1766 by William Booth (TNA:MPHH 1/101).
70 TNA: WO 55/2275, letter of 22 Nov 1756 from Tarrant to Desmaretz.
71 Coad and Lewis 1982, 153-4; Hots 2002.
72 Ward 1949, 28-29. Ford died at Woolwich in April 1829; his remains were interred at his family vault at Hougham, near Dover (Kentish Chronicle, 14 Apr 1829, 4).
73 Akers 1887, 41; Statham 1899, 263. TNA:WO 55/779, 'An account of all expenses that have been incurred in erecting and repairing Fortifications in the Dover Division from the year 1793 to the present time [...]'. The authors are grateful to Paul Pattison for drawing their attention to this document.
74 Akers 1887, 41.
75 KHLC: Do/ZZ1/1, entry of 31 December 1797.
76 TNA: WO 55/778, letter of 18 August 1801 from Twiss to Pitt.
77 TNA: WO 55/778, letter of 26 June 1803 from Twiss to Pitt.
78 Coad and Lewis 1982, 160.
79 Allen Brown et al, 1963, II, 635.
80 TNA: MR 1/845; TNA: MR 1/1437/2.
81 Pattison 2021, 8; TNA: WO 78/2426/12.
82 Coad 1995, 73; TNA:MR 1/1235/1. HE Archive: MP/DOV2846 is a late 20th century photocopy of this drawing.
83 Coad (1982, 179) suggested that in the 1850s 'the Spur works were modified and improved by addition of two caponiers thrust out north of St John's Tower and designed to cover the bottom of the main moat on the east and west sides. Small passages from the ends of these led to counterscarp galleries giving additional protection to the Spur ditch itself'. The wing caponiers, however, are present on drawings of c.1806 (TNA:MR 1/845), while it is likely that the counterscarp galleries are coeval, relating to the 'reveted counterscarp and Bomb Proof defences before each shoulder' described by Twiss (TNA: WO 55/778, letter of 26 June 1803 from Twiss to Pitt).
84 £71 was provided for porches for the soldiers' quarters at Spur Barracks in the Ordnance Estimates for 1853-4. Anon 1853, 55.
85 HE Archive: MP/DOV1933.
86 For interventions associated with the Second World War see Coad 1995, ch 13.
87 HE Archive: MP/DOV0653.
88 Coad 1989, 61.
89 Dover Express, 11 March 1949, 7; HE Archive: MP/DOV1930.
90 Associated survey drawings were prepared in 1958 under Ministry of Works job number 104/69 (HE Archive: MP/DOV0731 et seq).
91 HE Archive: MP/DOV0880; MP/DOV0882; MP/DOV1037; MP/DOV2020; MP/DOV2284.
92 HE Archive: MP/DOV2284.
93 HE Archive: MP/DOV2237.
94 HE Archive: MP/DOV0862; MP/DOV2523.
95 Visible features of the inside walls of the Norfolk Towers are indicated on a 1958

survey drawing, HE Archive:MP/DOV0726.
96 Coad 1995, 70, 74.
97 Jefferson Consulting 2021; Gherardi 2021.
98 HE Archive: IC032/043
99 Lyon 1814, II, 143-4. Some later accounts of the northern defences (e.g. Batcheller 1828, 68-9) are based on this passage.
100 TNA: MPH 1/355, 'Plan of the town harbour and fortifications of Dover, 1737'.
101 TNA: WO 55/2275, letter of 10 November 1756 from Desmaretz to the Office of Ordnance.
102 McNeill 1997, 19-28. The authors are grateful to Roy Porter for drawing their attention to this comparative example.
103 KHLC: EK/U844/P1; TNA: MPH 1/355; TNA: MPHH 1/101.
104 Roy Porter, pers.comm., 31 January 2022.
105 HE Archive: MP/DOV2284: English Heritage survey of Redan, undertaken prior to underpinning in April 1992.
106 HE Archive: MP/DOV0880, 0882.
107 TNA: GB0894 MSS, catalogue of the Royal Engineers' Library; HE Archives: OWS01/01.
108 The latter is shown in outline in a 1957 measured drawing of Norfolk Towers (HE Archive: MP/DOV0726).
109 ODNB Darell, William; Darell 1797, 29.
110 Anon 1787, 66-8. This passage is duplicated with minor revisions in Horn 1819, 51-3.
111 Lyon 1814, II, 143-4. Some later accounts of the northern defences (e.g. Batcheller 1828, 68-9) are based on this passage.

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