

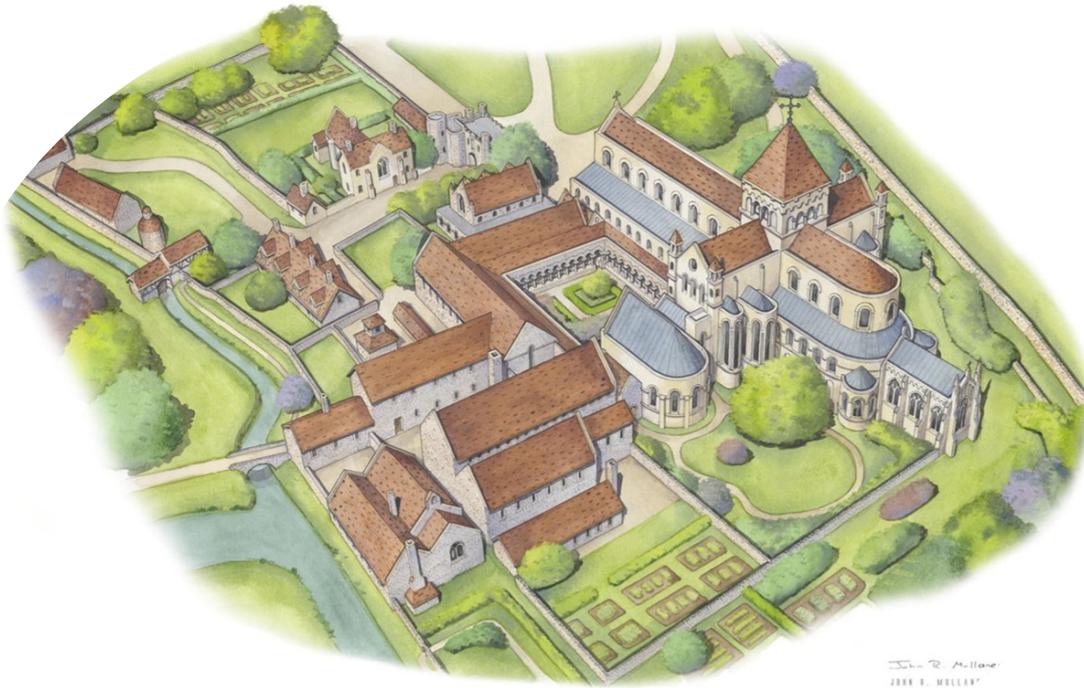
NOTES ON READING ABBEY'S TOWERS

John Mullaney Aug 2018



Below: Illustration of how Reading Abbey may have looked with its central and transept towers but without any at the west end.

Illustration © John R Mullaney SAI



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THE FOUNDING AND DESIGN OF READING ABBEY

In order to understand what the tower, or towers, at Reading Abbey may have been like, it is necessary to look at when and how the monastery was founded. This will give some idea of its architectural style as well as how it may have developed.

The Abbey was founded by Henry I in 1121. The first head of the newly formed Reading community was Peter, Prior of Cluny Abbey in Burgundy. He brought with him some fellow monks and others from the Cluniac Priory of Lewes joined them. They were engaged by Henry to build his royal abbey.

Following the death of King Alfonso VI of Spain in 1109, Henry had been the main sponsor and benefactor of Cluny III, arguably the most prestigious abbey in 12th century Europe, with the largest church of its time. Henry was also a frequent visitor to Cluny and admired its life and architecture. It is therefore most likely that Reading was built in the image of Cluny, its builders initially being guided by Cluniac architects and masons, in the tradition of Gunzo and Hézelon of Liege. Whether its sculpture was influenced by the great masters such as Gislebertus, the Avenas Master or the Perrrecy Master is a matter which I am examining, but which does not concern us here.

So, when we think about the overall architectural design of Reading, and specifically its great central tower, we should bear in mind its connections with Cluny. However there was also developing in England a new architectural style. Fifty years had passed since the Norman invasion and an Anglo-Norman genre was emerging. We may reasonably assume, therefore, that Reading would have resembled Cluny, but on a smaller scale, with its sculpture and architecture also reflecting this developing English style. For instance most of the stone used at Reading came from the Taynton quarry, west of Oxford, not Caen in Normandy as is often wrongly stated. Moreover many of its sculptures share much in common with other English Romanesque designs such as the billet rolls found in Bromsgrove and Bockleton. Yet the existence of some Caen stone capitals, attributed to Reading, does indicate a continued Norman connection for specialist work and the carvings show both Norman and English influences. Nor should we think of Reading Abbey as a static architectural entity, firmly fixed in the Romanesque period. The 12th century was a major transitional time in architectural techniques which, simply put, saw the emergence of the new Pointed, or Gothic, design, as exemplified in Paris by Abbot Suger's St Denis. It would be difficult to imagine that Reading was isolated from these, and later, developments. Certainly we know that in 1314 a Lady Chapel in the Decorated style was added to its east end.

The Cluniac monks designed their monasteries as places to fulfil the onerous requirements of their elaborate liturgy, the *opus Dei* or *work of God*. The monks spent many hours each day both attending and saying Masses but most of all singing the Divine Office. This consisted of the psalms and readings from the Bible and other religious texts. When not so engaged the choir monks, and this may well have been the majority, would have spent many hours, according to one Cluniac horarium up to a further eight hours a day, studying and practising the music to be sung. Consequently a most important part of the Abbey church, second only to the High Altar, was the choir which lay to its west, under the great crossing of the church and the main tower. To either side of the choir, to its north and south, there were the transepts, and an ambulatory ran behind the high altar. This would have facilitated movement beyond the choir as well as around the sanctuary, otherwise known as the presbytery, or priests' area. Visitors could thereby circulate around the church without interfering with the monks and the *opus Dei*. The choir area would have been partitioned off from the body of the church so that, although visitors would have been able to hear the singing and experience some aspects of the liturgy, including the rising incense and the ringing of bells, they would not have been able to participate in these services.

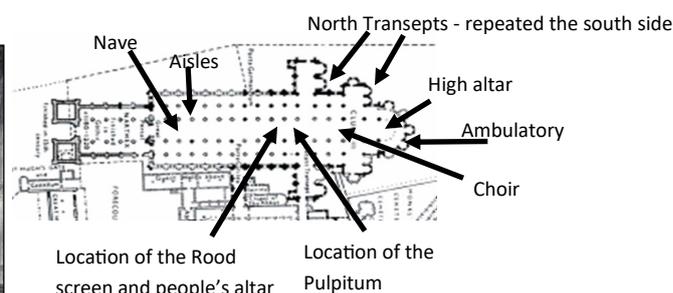
The second feature, and main purpose of the church nave and aisles, was to provide a place of worship for its visitors and pilgrims, as well as for the monks. Cluniac houses tended to be town centred. This contrasted with the monasteries of eremitic, or secluded, monks and communities such as the Cistercians. The church was a symbol of the Heavenly Jerusalem, the New Jerusalem, that was to come at the end of time. It was a place where it was expected that people would come to visit and to pray. Consequently the body of the church, the nave and aisles, were designed to engage with the visitors, and comprised by far the greater area of the whole building. As mentioned, the aisles and the ambulatory facilitated circulation of the visiting laity. Side chapels dedicated to various saints, maybe containing their relics or pictures, would be there for groups and individuals as they moved round the church, probably singing, chanting or making their private devotions.

The clerestory windows gave illumination for the visitors. The use of stained glass added extra symbolism to the overall spiritual dimension. Light, or better 'divine light', as interpreted through the various colours of the glass, was seen as yet another aspect of the New Jerusalem that was the Church. Most likely visitors would enter by the north aisle. They would be ushered to the larger chapels in the north transept, round the ambulatory behind the monks' choir and so to the south transept and thence out down the south aisle to exit at the west end. They may have moved into the main nave for a major service, procession or Mass which would have been said at the people's altar. This latter became more formalised in time with the erection of a rood screen. The rood, or image of the crucifixion, would have been mounted above the screen with an altar below and two openings, or doors, giving access to a space in front of the choir. It is possible that between the rood screen and the choir there would have been yet another screen known as a pulpitum. One 12th century Reading manuscript tells us that the Abbey's most sacred relic, the Hand of St James, was kept in a reliquary on the pulpitum. This would have had a single central opening through which the monks would process into the choir. The exact location of these screens was variable and often depended on the space required in the choir. At times, when there were large numbers of monks, the screens were erected further to the west in the nave, to allow more room for the monks in the choir. At other times, such as after the Black Death in the 14th century, when numbers dwindled, the extra space was not needed and the pulpitum was positioned at the westerly entrance to the choir area.

The following ground plan of Cluny III shows these features. The two photographs, on either side, show extant examples of a rood screen and a pulpitum.



Rood screen - St Albans



Ripon pulpitum with its central doorway

Just as the interior of the church was carefully designed to fulfil its liturgical needs, its exterior was of equal importance. In an age when most people would never have seen a building more than two storeys high, churches, such as that at Reading, were imposing 'skyscrapers'. They represented divine power as mediated by the Church, and this symbolism was not lost on the population. The outsides would have been highly decorated, and parts of them, especially the main entrances, would have been brightly painted in colours symbolic of their religious significance: blue for heaven, gold and red representing Divinity and green for creation.

Their towers, reaching heavenwards, were likewise a means of bearing the same message of the Church's connection with heaven. Bells would have been hung from some towers. The sound of the bell, for monks and people alike, was the voice of God. It was a sound that many believed banished the devil.

TOWERS IN THE ROMANESQUE AND EARLY GOTHIC PERIOD

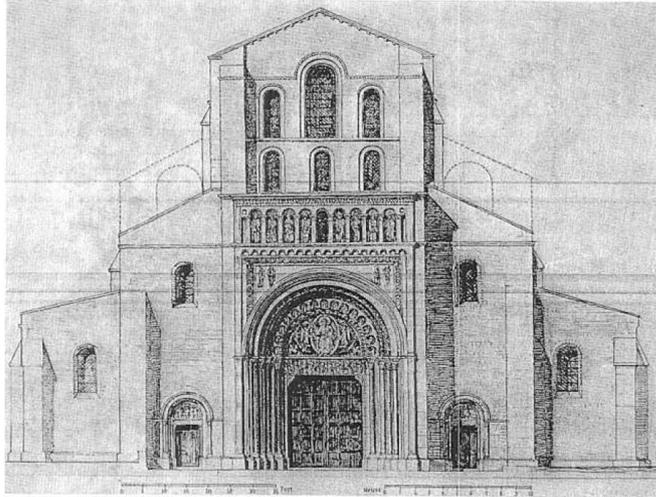
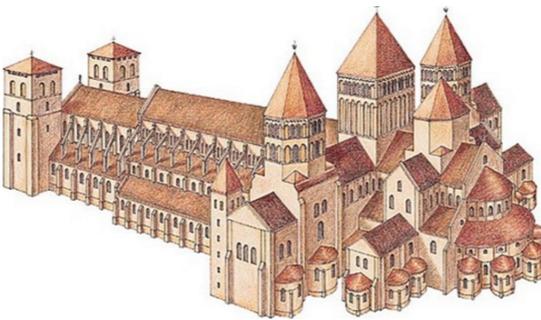


Fig. 17. — Façade of Cluny III, c. 1106-20 (before construction of Narthex), K.J.C. inv. et del.

The above drawing of Cluny III, by Kenneth Conant, shows its western end before the narthex and towers were added. Originally the church had been 440ft (134m) long. Its imposing presence can be seen from the following reconstruction. The eastern end and the nave, as far as the western smaller extension with its towers, is contemporaneous with the start of the campaign to build Reading Abbey. When the west end and towers were added in the late 12th and early 13th centuries, the church was lengthened to 600ft, (183m).



Many churches dating from the 11th and 12th centuries, that we see today, have towers. These are most often over the choir area and sometimes at the ends of the transepts, as well as at the west end, as shown in the illustration.

In fact many of these west end towers were added at a later stage in the construction of the churches. This is to be expected since the presbytery and choir were the first areas to be built. These were followed by the transepts, reflecting the cruciform nature of the earliest churches. Expansion down the nave followed next. As architectural styles, along with building techniques, evolved, it is not surprising to find these were reflected in the appearance of the nave as one moves towards the west end. It should be said that, although we may be able to discern a style we can call 'pilgrim' or 'Cluniac', there was no rigid prescriptive pattern. Even

monasteries founded directly by Cluniacs allowed for local variations in design and materials. What can be said is that there is a Cluniac spirit which encompasses many influences but focuses on the two main precepts of their interpretation of St Benedict's rule: namely the life of the monks and provision for the traveller, especially the pilgrim.

Consequently there is a great variety of towers and spires. This is true not just between different countries of Europe but even within smaller regions. Towers could be attached, detached or semi-detached. They could also be round, square or polygonal. What is common to most is the small pyramidal, round or polygonal spire, as shown in the photographs below. The church at Paray-le Monial in fact has both pyramidal and polygonal spires.



Paray-le-Monial, France



Poitiers, France



Trani, Italy

Today it is appreciated that the division between what we today call the Romanesque and Gothic styles is an arbitrary one and what occurred was an evolutionary process with no defining break. The beginning of the Gothic style is usually dated to the second half of the 12th century. However the pointed arch and ribbed vault, which are often considered to define the 'Gothic', may be found in late 11th and early 12th century buildings such as Durham in England, Cluny in France and Monte Cassino in Italy.

READING ABBEY CHURCH AND ITS TOWERS

The conservation of Reading Abbey Ruins, leading to their reopening in the summer of 2018, triggered a great deal of interest in the architecture of the Abbey. Alongside the conservation project another was launched to assess its size and architectural style. The Hidden Abbey Project (HAP) set out to determine these aspects of the monastery. This was a joint venture of the main landowners of the Abbey area, namely Reading Borough Council, the Catholic Diocese of Portsmouth and the Ministry of Justice. The latter had closed Reading Gaol with a view to disposing of the site and, as such, undertook archaeological investigations conducted by MOLA (Museum of London Archaeology).

The HAP group commissioned a geophysics investigation (Ground Penetrating Radar survey or GPR) of the church area. The results of this are available from Reading Borough Council and some of the analysis is on the website www.readingabbeyhistory.com. The easterly section is reproduced later in this paper.

Several aspects of the Abbey were highlighted by this renewed interest and by these preliminary investigations. One such concerned the Abbey's tower or towers. Since the building of the Blade in Reading, alongside the site of the great Abbey church, comparisons had been made between the heights of the two structures

The following is an assessment of the evidence which may help determine the nature of the Abbey's towers, both their style and height.

We know that by 1208 the Abbey had a central tower. Its existence is recorded in the Annals of that year. We do not know if, at this point in time, there were any towers at the western end. As we shall see, however, it would have been usual for these to be added at some point in the Abbey's history.

Having seen the connection between Reading and Cluny, it would be useful to look at what we know of Cluny's towers. Most of the information is taken from K J Conant's works on Cluny.

CLUNY Main crossing tower - height - 218ft (66.44m) Internal crossing width 44ft (13.5m)
Overall length of Cluny church; 440ft (134m). A western end with towers was later added making it 600ft, (183m), in length.
Cluny did not acquire its two western towers until 1324 and 1342.

For several hundred years Cluny III was the largest church in western Europe. Although it had been begun in what we may call the High Romanesque period, at the end of the 11th and beginning of the 12th century, its completion took several decades, mainly under the notorious Abbot Pons. Consequently much of it was constructed during the later transitional period linking the Romanesque with the emergence of the so called Gothic or German, style. This latter, exemplified by Abbot Suger's church of St Denis, developed the pointed arch and rib vaulting techniques, already found in several churches around Europe, such as Durham and Cluny itself. These improvements in building methods allowed for taller, more stable, buildings which did not have to rely on the sheer mass of masonry to sustain their integrity. As a result of these technical advances additions, such as raising the heights of towers, could be made to existing structures. We shall see whether it is possible to ascertain the likely height of Reading's central tower at the time when it was first built, and what it may have been like when it was rebuilt after the storm and fire of 1208. It is also possible to speculate about the nature and the size of other towers, be they at the west end or on the transepts. Turning to the question about the comparison between Reading's central tower and the Blade it is necessary to look at the latter's statistics. As the time of writing the tallest residential building in Reading, the Verto on the old King's point site, is under construction.

READING BLADE Pinnacle height agl 282ft (86m). **VERTO** 150ft (55M)
Top floor height agl 193ft (59m).

(Sources internet – the Blade site <http://www.skyscrapernews.com/buildings.php?id=1910> - the Verto building <http://www.verto-reading.com/>)

SOME ROMANESQUE BUILDINGS

The following is a list of some Romanesque buildings, or those begun in the late 11th and early 12th centuries, showing their tower heights. I have relied on various internet sites, usually the official sites of the places mentioned, for this data. I then cross referenced this information with other architectural sources. The data in *Table A* is not by any means comprehensive, but is intended to demonstrate the range of building statistics in England's main medieval churches. It will be readily seen that many were rebuilt, or added to, throughout this time frame. Nevertheless it is clear that there is a certain consistency and conformity to be found across the range. It will also be noted that the highest towers belong to the end of the period.

Measurements for the crossing/transepts and lengths come from Bannister Fletcher 'A History of Architecture' and from various online plans.

My source for Reading Abbey is the current OS map and Baxter, 'The Royal Abbey of Reading', p184.

TABLE A

	Tower height	Date / Style	Crossing width	Transept length across	Length of church
<u>ELY</u>	<u>216ft 66m</u>	1189 transitional, restored GG Scott 19th c.	70ft 20m	200ft 60m	325ft 100m
WINCHESTER	150ft 45.7m	originally 1374 rebuilt 15th c	100ft 30m	225ft 68.5m	350ft 106m
<u>DURHAM</u>	<u>216ft 66m</u>	originally 13th c. rebuilt 15c	110ft 33.5m	200ft 60m	350ft 106m
PETERBOROUGH	144ft 44m	Norman tower replaced 1350-80	74ft 22.8m	200ft 60m	380ft 116m
<u>WORCESTER</u>	<u>203ft 62m</u>	1374	100ft 30.5m	140ft 42.6m	400ft 121m
TEWKESBURY	148ft 45.1m	12th c second half .	80ft 24.38m	122ft 37.2m	306ft 93.2m
ST ALBANS	144ft 44m	Only 11th century crossing tower standing	74ft 22.8m	200ft 60m	300ft 91m
<u>READING</u>	?		85ft 26m	205ft 62.5m	?

Different overall lengths for Reading Abbey church have been given by various people. The earliest, 420 ft (128m), was by Englefield in 1779, and the most recent, 417ft (127m), by Baxter in 2016. It cannot be stressed enough that the length, and so overall size, of Reading Abbey is unknown. Any estimates are speculative, as Baxter points out, as no survey has ever been undertaken which definitively determined the siting of the west end of the nave and so the length of the church. Tower heights similar to that at Cluny are underlined.

OTHER TALL STRUCTURES DATING TO THE MEDIEVAL ERA

There are other well known buildings which stand outside these parameters. Notable among these are:

CANTERBURY 235 ft 76m

Note: this tower is not Romanesque but was built in the 1500s and was tall for its day.

WESTMINSTER 225ft 68m

SALISBURY 403ft 123m The tall spire is 180ft 5ins (55m) above the tower, making the original tower 223ft (68m) high and so comparable with the tallest of other Romanesque towers. Salisbury's spire was added in the early 14th century. Its architect had been working on the new Lady Chapel at Reading before being called by the Bishop of Salisbury to work on the Cathedral.

NORWICH 315ft 96m The tower parapet is 146ft (44.5m). (Source, Phil Thomas, Norwich Cathedral Estates Manager 2001.) This puts it very much in the same range as for other pre tall-spire Romanesque churches

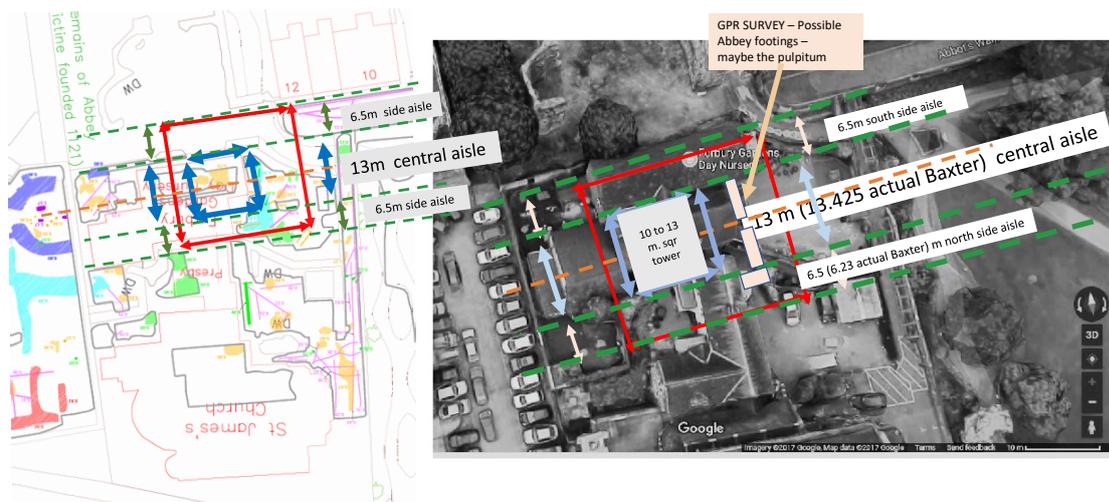
LINCOLN 520ft 160m The tower is 272ft (83m). It was raised to this height between 1307 - 1311. The Cathedral tower and the spire, the latter now lost, underwent so many changes following earthquakes and fire and re-building that it can not be used for comparison purposes. However it is interesting that the crossing is 43ft (13m) sqr, i.e. within the same parameters of the internal crossing widths, as listed in *Table B*.

ESTIMATING TOWER HEIGHTS FROM CROSSING MEASUREMENTS

Is it possible to estimate the tower height from the crossing measurement? As the tower depended on the supporting pillars for its stability, the key measurement is the internal crossing, The list in *Table A* comprises the existing dimensions of various buildings. This is raw data; that is I have not subjected it to any analysis but merely present the basic figures for the reader. *Table B* presents further differentiating analysis.

One caveat is that the supporting crossing pillars are by necessity very robust, with extensive footprints. They are typically oblong and their dimensions vary from between 15 x 20ft (4.6 x 6.1m) to 8 x 15ft. (2.4 x 4.6m). This means that when taking measurements, especially 'internal crossing width', it is possible to use different points of reference. This may be from one of the external edges, from a centre point, or any point within this framework. I have attempted to use the centre point when estimating the internal crossing width. Of the buildings listed, Tewkesbury is the nearest comparable one to Reading.

The following two illustrations show, on the left, the Ground Penetrating Radar survey with the measurements for the aisles superimposed. The right shows the same area and markings on a modern aerial photograph, along with the possible pulpitum outlined. Unfortunately none of the internal pillar bases is extant, but we can estimate, from the other remains, that the measurement would have been at the very least 32ft 9ins (10m), but more probably nearer to 42ft 8ins (13m). This is in line with the other tower and crossing bases evidenced in *Table B*, below.



↓ Note the direction of North

TABLE B This table looks more closely at three sets of statistics: 1. tower heights, 2. the size of the crossing pillar bases which supported the columns for the tower, and 3. the width of the crossing from a central point on these bases. I have used the official websites of the places concerned, or their guide books, and compared these with plans, making my own measurements. In all cases the figures correspond, or are very close indeed, so as to make little, if any, difference. Any comments particular to the building are made below the statistics.

	Tower height		Crossing pillar bases		Internal crossing width	
TEWKESBURY	148ft	45.1m	18 x 8ft	5.5 x 2.4m	40ft	12.19m
ST ALBANS	144ft	44m	15 x 12ft	4.5 x 3.6m	40ft	12.19m
ELY West tower	216ft	66m	15 x 15ft	4.6 x 4.6m	38ft	11.6m
Central tower	170ft	51.8m	15 x 15ft	4.6 x 4.6m	70ft	21.6m

The central octagonal tower replaced the original central tower which collapsed in 1322. The nearest, in time and style, for comparison purposes, is the west tower. This was restored by GG Scott in the 19th century.

	Tower height	Crossing pillar bases	Internal crossing width
WINCHESTER	150ft 45.7m	18 x 13ft 5.5 x 4m	40ft 12.19m
DURHAM	216ft 66m	20 x 15ft 6 x 4.6m	45ft 13.7m
PETERBOROUGH	144ft 44m	10 x 8ft 3 x 2.4m	45ft 13.7m
WORCESTER	203ft 62m	15 x 8ft 4.6 x 2.4m	45ft 13.7m

The central tower was damaged by lightning and replaced in two stages in the 15th century. So, although the internal measurements are comparable with Norman churches, the tower height is not original and is now higher, facilitated by technological advances in building techniques.

In 1175 the original central tower collapsed and the present tower was not completed until 1374. Clearly the builders of the new tower that we see today were restricted by the original footings and pillars but were able to build to a higher level because of advances in building technology.

Is it possible to extrapolate, from the above, the height of Reading's central tower?

What is clear is that all the above share remarkably similar measurements. The exception is Ely's much later central tower which, owing to its polygonal shape and later construction, must be considered outside the scope of this examination. Nevertheless it should be noted that its pillars share the same dimensions as seen elsewhere. From the above evidence it would be reasonable to suggest that Reading's original central tower would have been within the following range, as written in red.

	Tower height	Crossing pillar bases	Internal crossing width *
<u>READING</u>	144ft to 216ft 44m to 66m	None surviving	44ft 13.25m

** The width of Reading's internal crossing, c. 44ft (13.25m), is based on Baxter p213 and the plans as detailed above.*

We should recall that Cluny's crossing tower height was 218ft (66.44m) and its internal crossing width 44ft+ (13.5m) sqr at the pillar's central point.

COMMENTS

In so far as conclusions may be reached at all, it would seem that the original tower at Reading may have been between 144ft (44m), as at St Alban's, and 216ft (66m) as at Ely and Cluny. It should be remembered that, in common with most Cluniac and Romanesque towers, it would most probably have had a small pyramidal spire if square, or a similarly small polygonal spire if the tower was also polygonal.

It is also quite probable that some additions and changes were made to the central tower over Reading Abbey's long history, as is the case for most of the towers on today's cathedrals. Some, such as Salisbury, had tall spires added. It is therefore possible that a larger spire, wooden or otherwise, was added at a later date, between the 14th and 16th centuries. If this was the case then the tower would have been significantly higher. However there is no record of this and the only diagram we have, Speed's map of 1610, shows what looks like a pyramidal spire. His map was drawn some 70 years after the Abbey's dissolution, and there are records showing that the spire had been removed sometime previously. It is most likely that Speed's map was intended to be more figurative or representational, rather than architecturally correct.

Over the course of time some towers fell down. Many were rebuilt following some disaster or another. This may have been the case at Reading. On the 12th March 1208 a whirlwind and lightning struck the Abbey around the tower, setting fire first to the north and then the south transept. This probably necessitated rebuilding the tower, which by that date would imply that it may have been in the Early English, rather than Romanesque, style. One could speculate from the figures above that it is possible that the original tower was at the lower end of the heights given, about 44 metres high, whereas the second tower may have been higher at c. 65 metres high. There are scorch marks on the standing flints of the north transept. It is tempting to speculate that these date to the 13th century fire, but perhaps one should not read too much into this.

The above figures and analysis are preliminary and partial, but form a basis for further discussion. I am not drawing any definite conclusion as to the tower's height in relation to the Blade except to say that it would have been unusual and unique had the tower (without a tall spire) been the same height as the pinnacle of the Blade. It would, however, be reasonable to speculate that Reading Abbey's central tower may have reached, or slightly exceeded, a level equivalent to the top floor of the Blade.

THE WEST END TOWERS

Many Romanesque churches had towers, often twin towers, at the west end. It was usual for these to be added, as at Cluny III and Ely, after the main body of the church was completed. There is no way of knowing when, or even if, Reading had such towers added. The GPR survey was inconclusive in this respect and without excavations to see if there are foundations, which would substantiate their presence, there is no way of knowing this. As the area has been extensively dug over and changed over the intervening centuries since the Dissolution, it is quite possible that even if such archaeology did take place, no further evidence would come to light. One may reasonably speculate that such a prestigious Abbey would have had an elaborate west end, maybe with a narthex or galilee chapel, and with towers added at some point: but this is by no means certain.

TRANSEPT TOWERS

It is most likely that the gables of the transepts would have had towers with pinnacles, as seen in the photograph of Worcester Cathedral. These would have been smaller than the central or west end towers and acted as end buttresses. As AWN Pugin noted, pinnacles had a functional role in medieval architecture. Their downward thrust aided the stabilisation of the building. It is therefore most likely that Reading Abbey would have had such towers and/or pinnacles, but there is little chance that their size and design can be determined from existing remains.



Worcester Cathedral
transept

CONCLUSION

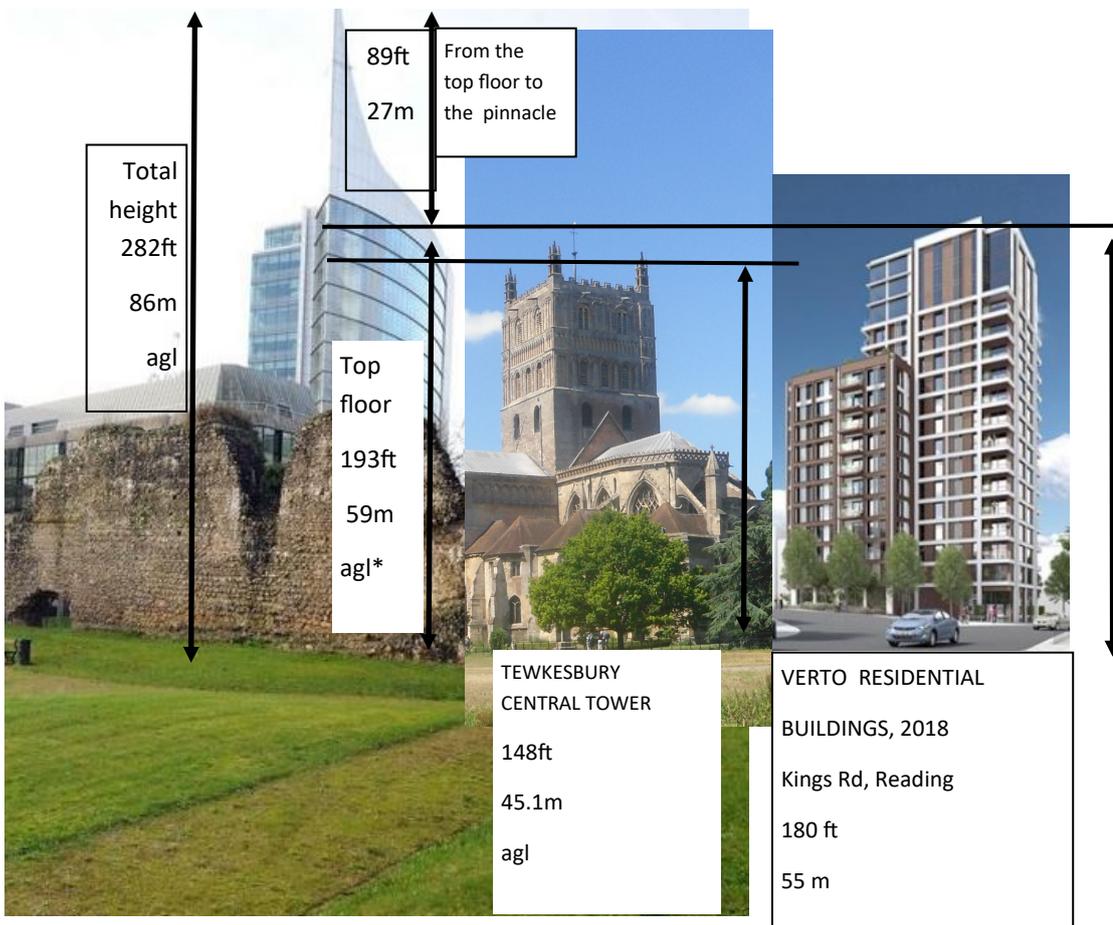
The above is based on some ongoing work I have been doing over the last couple of years, where I have been looking at Romanesque, and especially Cluniac, churches, not just in England but across Europe. As part of this research I have been examining the theory proposed by some (especially Kenneth Conant) that there is a proportional relationship between the various parts of Romanesque buildings. This appears to hold true with regards to some ground plans and some elevations. However, as can be seen in the sample *Table A*, there is a deal of disparity when it comes to comparing tower heights and other dimensions. It is possible that there are several reasons for this.

For instance there may be some benefit in examining the thickness of retaining walls. Lindy Grant comments on this aspect in her book 'Architecture and Society in Normandy 1120-1270'. As we do not have this information concerning Reading, I have been unable to make any analysis or do any calculations in this regard.

Another explanation is that existing towers and overall church dimensions are not as originally planned. Subsequent building work, demolitions, and the accretions of history, have significantly changed the proportional relations. This is demonstrated in several of the above examples - see *Tables B* and *C*.

It is also possible, as frequently occurred, that plans and their execution were changed over various building campaigns, so that the original plans and the subsequent elevations do not correspond.

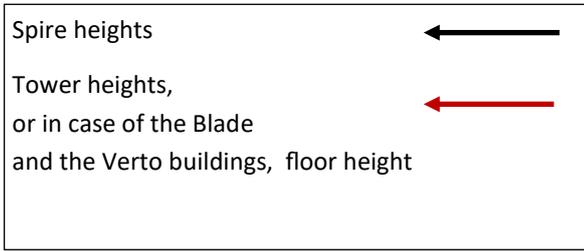
Finally I would like to point out that, as with all research, one hopes more evidence will be forthcoming. This may enhance, challenge or even totally negate some, or all, of one's previous hypotheses. If anyone reading this feels I have overlooked or misinterpreted evidence, I genuinely would most be grateful if they contacted me, so that I may look at what they have to say and, if appropriate, change what I have written. Some of the measurements differ in various sources but I have tried to verify these by taking my own measurements where possible or using the official plans. Even where there are disparities the differences are not significant and so I felt do not negate the overall tenor of this paper.



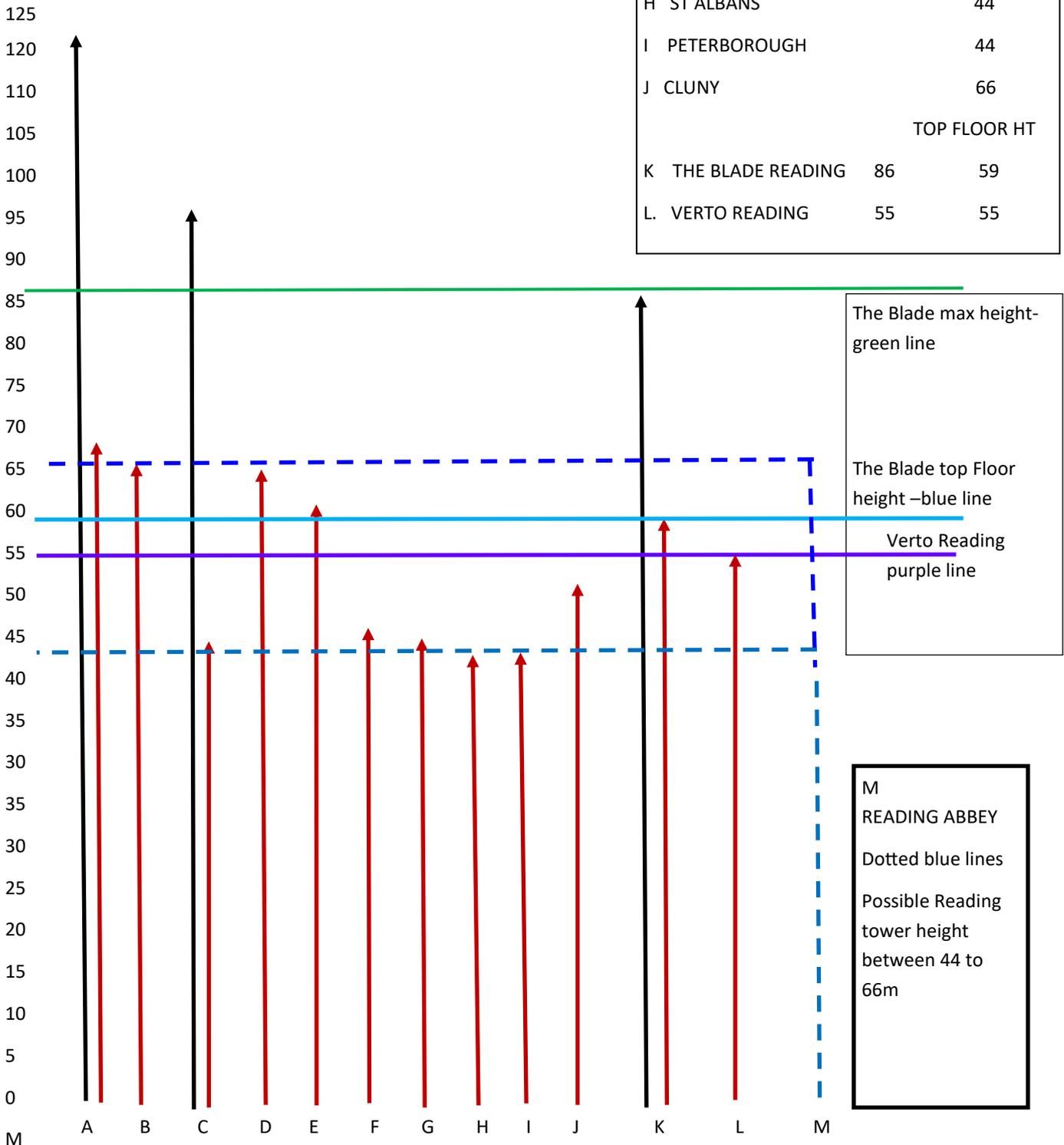
*agl. Above ground level

The above is a rough impression of the comparative heights of the building mentioned. It should be noted because of the angle of the photographs this comparative illustration is intended merely to give a guide to how towers of various heights would appear from ground level.

COMPARATIVE HEIGHTS OF SOME MEDIEVAL TOWERS AND SPIRES AND TWO MODERN READING BUILDINGS ALONG WITH POSSIBLE HEIGHT RANGE OF READING ABBEY'S CENTRAL TOWER.



		TO NEAREST FULL METRE	
		MAX HT	TOWER HT
A	SALISBURY	123	68
B	DURHAM		66
C	NORWICH	96	44
D	ELY		66
E	WORCESTER		62
F	WINCHESTER		46
G	TEWKESBURY		45
H	ST ALBANS		44
I	PETERBOROUGH		44
J	CLUNY		66
		TOP FLOOR HT	
K	THE BLADE READING	86	59
L	VERTO READING	55	55



The Blade max height-
green line

The Blade top Floor
height –blue line

Verto Reading
purple line

M
READING ABBEY
Dotted blue lines
Possible Reading
tower height
between 44 to
66m