

A Historic Building Survey at St Nicholas' Church, Deptford, London Borough of Lewisham

Central National Grid Reference: TQ 3740 7775

Written and researched by Victoria Osborn and Alex Rose-Deacon

Pre-Construct Archaeology Ltd November 2006

Project Managers: Ken Sabel and Gary Brown

Commissioning Client:

Austin Winkley & Associates for the Vicar, Churchwardens & PCC of St Nicholas' Church, Deptford

Contractor:

**Pre-Construct Archaeology Ltd
Unit 54, Brockley Cross Business Centre
96 Endwell Road
Brockley
London
SE4 2PD**

**Tel: 020-7639 0439
Fax: 020-7639 9588**

Pre-Construct Archaeology Ltd

November 2006

The material contained herein is and remains the sole property of Pre-Construct Archaeology Ltd and is not for publication to third parties without prior consent. Whilst every effort has been made to provide detailed and accurate information, Pre-Construct Archaeology Ltd cannot be held responsible for errors or inaccuracies herein contained.

CONTENTS

1.	Non-technical summary	5
2.	Introduction & planning background	7
3.	Method	9
4.	Archaeological & historical background	10
5.	Description of the tower	14
6.	Detailed description of the tower	19
6.1	Detailed description of the interior features of the 15 th to mid 16 th century parts of the tower	19
6.2	Detailed description of the exterior of the 15 th to mid 16 th century parts of the tower	24
6.3	Detailed description of the interior features of the early 20 th century parts of the tower	27
6.4	Detailed description of the exterior of the early 20 th century parts of the tower	29
7.	The historic sequence	32
8.	Discussion & conclusion	42
9.	Acknowledgment	43
10.	Bibliography	44
Appendix 1:	Architectural key and glossary of technical terms	
Appendix 2:	Internal features of the tower	
Appendix 3:	Moulding profiles	
Appendix 4:	Plans, sections and elevations of the tower	
Appendix 5:	Photograph list	

ILLUSTRATIONS

Figure 1	Site location	6
Figure 2	Site plan showing St Nicholas' Church & tower	8
Figure 3	1623 map of Deptford	11
Figure 3a	1745 Roque map	14
Figure 4	View of the interior of St Nicholas' Church	16
Figure 5	View of the roof and south elevation of the stair turret	17
Figure 6	View of the 'E.E.J. FITCH 1877' graffiti	20
Figure 7	View of the 18 th century graffiti	21
Figure 8	View of the first floor beams and joists from beneath	22
Figure 9	Timber frames on the first floor	24
Figure 10	View of the independent two-tier bell frame and bells	29
Figure 11	View of the conservation works to the east opening on the second floor showing the construction of the 1901 – 1903 walls	30
Figure 12	Detail of the second floor opening tracery	32
Figure 13	St Nicholas' Church, 17 th century drawing	37
Figure 14	St Nicholas' Church, 19 th century etching	39
Figure 15	View of the southeast buttress showing the Kentish ragstone set in Portland cement-based mortar	41

Appendix 1

Figure 16	Key to ceramic building material, mortar and stone type
Figure 17	Illustrated glossary of technical terms

Appendix 2

Figure 18	View of the west timber frame on the first floor
Figure 19	View of the south timber frame on the first floor
Figure 20	View of the east timber frame on the first floor
Figure 21	View of the north timber frame on the first floor

Appendix 3

Figure 22	Moulding profiles of the parapet, turret and stringcourses
Figure 23	Moulding profiles of the windows
Figure 23a	Moulding profiles of the west door and openings
Figure 23b	Moulding profiles of the interior ground floor
Figure 23c	Moulding profiles of the arch and first floor

Appendix 4

Figure 24	Ground floor plan of St Nicholas' Church
Figure 25	Upper ground floor plan of St Nicholas' Church
Figure 26	First floor plan of St Nicholas' Church
Figure 27	Second floor plan of St Nicholas' Church
Figure 28	Roof plan of St Nicholas' Church
Figure 29	Section A – A1 / B – B1 through St Nicholas' Church
Figure 30	Section C – C1 / D – D1 through St Nicholas' Church
Figure 31	West elevation – pre-conservation survey
Figure 32	West elevation – historic building survey
Figure 33	West elevation – architectural drawing
Figure 34	West elevation – post-conservation drawing
Figure 35	South elevation – pre-conservation survey

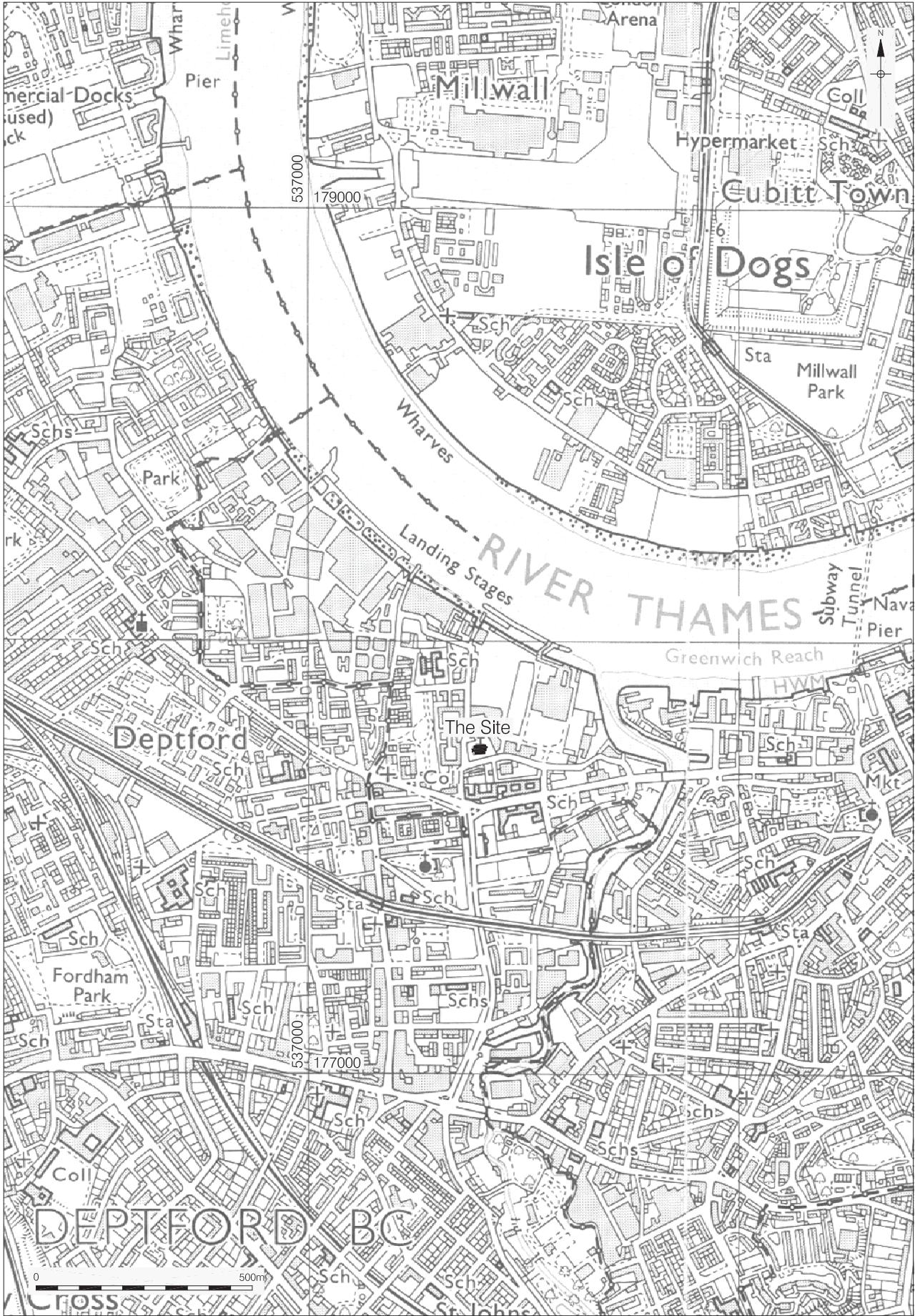
- Figure 36 South elevation – historic building survey
- Figure 37 South elevation – architectural drawing
- Figure 38 South elevation – post-conservation drawing
- Figure 39 East elevation – pre-conservation survey
- Figure 40 East elevation – historic building survey
- Figure 41 East elevation – architectural drawing
- Figure 42 East elevation – post-conservation drawing
- Figure 43 North elevation – pre-conservation survey
- Figure 44 North elevation – historic building survey
- Figure 45 North elevation – architectural drawing
- Figure 46 North elevation – post-conservation drawing
- Figure 47 Northwest buttress – pre-conservation survey
- Figure 48 Northwest buttress – historic building survey
- Figure 49 Northwest buttress – architectural drawing
- Figure 50 Northwest buttress – post-conservation drawing
- Figure 51 Southwest buttress – pre-conservation survey
- Figure 52 Southwest buttress – historic building survey
- Figure 53 Southwest buttress – architectural drawing
- Figure 54 Southwest buttress – post-conservation drawing
- Figure 55 Southeast buttress – pre-conservation survey
- Figure 56 Southeast buttress – historic building survey
- Figure 57 Southeast buttress – architectural drawing
- Figure 58 Southeast buttress – post-conservation drawing
- Figure 59 Northeast stair turret – pre-conservation survey
- Figure 60 Northeast stair turret – historic building survey
- Figure 61 Northeast stair turret – architectural drawing
- Figure 62 Northeast stair turret – post-conservation drawing

Appendix 5

Photograph list

1. NON TECHNICAL SUMMARY

- 1.1 This report was commissioned by Austin Winkley & Associates on behalf of the vicar, churchwardens & PCC of St Nicholas' Church Deptford, in part fulfilment of the conditions attached to the grant of Listed Building Consent and Scheduled Monument Consent for the repair and conservation to the western tower at St Nicholas' Church. It details the results of a historic building survey of the property. These results are intended as a record of the building. The site's location is illustrated in Fig. 1.
- 1.2 The National Grid Reference for the site is TQ 3740 7775.
- 1.3 The west tower was built between 1450 and 1558, although it is more likely to date to the late 15th century to early 16th century and was paid for by the congregation of St Nicholas' Church. The tower survives largely unaltered from the ground floor to the first floor stringcourse. Above the first floor stringcourse, the fabric bears evidence of a succession of general repairs and flint flush work added during the 18th century. These alterations were separate from the development of the main body of the church, which was rebuilt in a restrained Baroque style in 1697. After storm damage, there were further repairs 1901 – 1904, when the belfry and parapet were rebuilt and the stair turret extended higher than the parapet. The tower and parts of the walls and foundations of the main body of the church were the only parts of St Nicholas' to be retained in post-war rebuilding, after an incendiary bomb that hit the church during the Second World War.
- 1.4 Internally, the tower has retained its original spacing and circulation, a consequence of the tower continuing in use throughout its life as a practical space for the storage and ringing of bells. The architecture reflects the practical function of the tower through the Y tracery window, throwing light onto the upper ground floor platform/gallery and the gothic tracery openings transmitting the sound of the bells. The architecture of the nave arch and first floor squint focus attention on the altar in the chancel. A 17th century timber clock frame is preserved on the first floor, which may have been adapted to house an 18th century bell when the latter was moved further down the tower from the belfry. There is also a 19th century cast iron bell frame on the second floor, which replaced an earlier 18th century frame. Two of the original eight bells, the tenor and treble, are still hung in the frame. Original 15th to mid 16th century walls survive superficial damage from antiquated graffiti and the addition of later fixtures.
- 1.5 The architecture reflects the varying economic fortunes of the area, with the major work undertaken during periods of economic prosperity. There are two main phases of building. The original 15th – mid 16th century tower was built in a modest Perpendicular style with a plain nave arch, solid stone rubble wall and a timber-framed spire. During the second main phase of building, the early 20th century, the belfry of the tower was rebuilt. The lavish external decorative enrichment of the stringcourses and fenestration throughout the tower took place at this time, the craftsmanship displaying the influences of the Gothic Revival and the Arts and Crafts Movement. In times of less economic prosperity alterations were minimal or, in the case of the 18th century, limited to basic repairs. The tower's cupola, partly classicised the tower so that it contrasted less with the Baroque body of the church. All of these alterations reflected the changing economy and needs of the community and the development of liturgical practices.



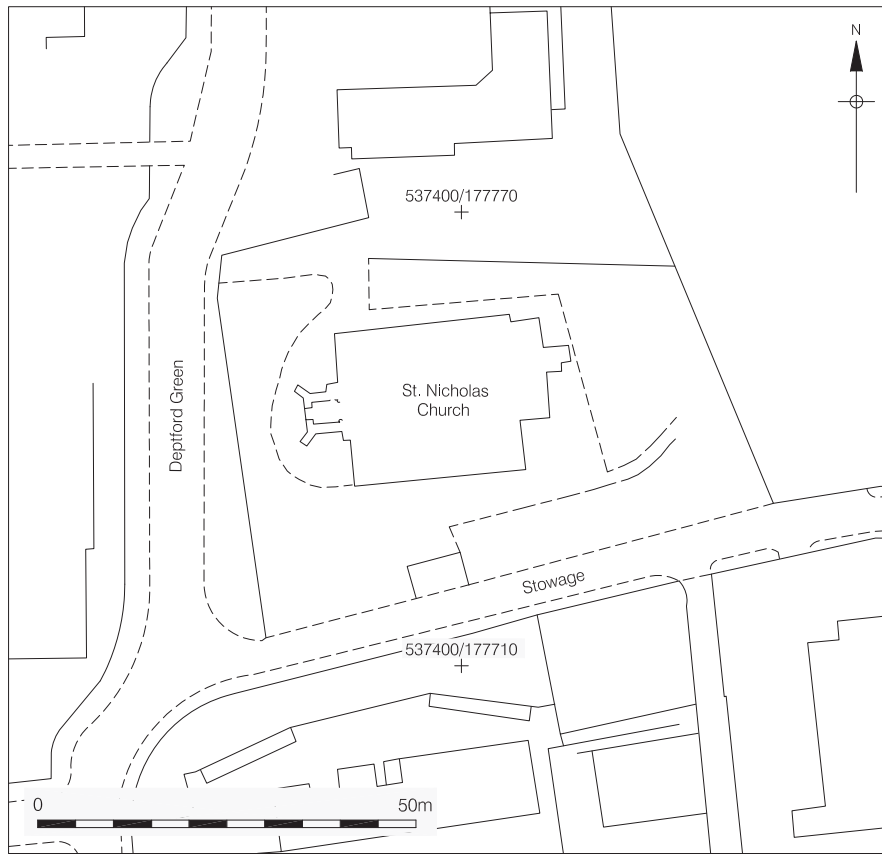
Reproduced from Ordnance Survey 1:25,000 Data © Crown Copyright 1993

© Pre-Construct Archaeology Ltd

Figure 1
 Site Location
 1:12,500 at A4

2. INTRODUCTION & PLANNING BACKGROUND

- 2.1 This report has been commissioned by Austin Winkley & Associates, on behalf of the vicar, churchwardens & PCC of St Nicholas' Church. The survey was undertaken according to the specification for archaeological work prepared by Austin Winkley & Associates.
- 2.2 The site is bounded by the Stowage to the south, St Nicholas flats to the north and Gilbert House to the west (Figure 2). The tower is the oldest building on site, and is attached to a 1697 church. There is a 1701 charnel house in the churchyard. The original 18th century brick boundary wall still survives along some of the site's perimeter, with a pair of stone skull and cross bones on the gate posts commemorating the 1665 plague pit which was dug in the north east corner of the churchyard. The church is a Grade II* listed building. The church is considered to be of much historic interest, being representative of high quality architecture from the late 15th to early 20th centuries, little of which survives intact locally.
- 2.3 The historic building survey was undertaken by PCA Ltd in accordance with a brief prepared by Austin Winkley & Associates. The site survey was completed in two phases. The first phase was undertaken during December 2003 and January 2004, producing plans, detailed stone by stone elevations, and sections and architectural details of the interior and exterior of the tower. The second phase of works was undertaken between the 12th and the 22nd October 2004, producing external elevations of the cleaned fabric, a record of the mortar and a record of the tower's appearance post-conservation. In addition a full photographic survey was undertaken. Medium format colour, black and white prints were made, along with some colour slides. The results of the survey and subsequent archival research are presented in this report.



© Pre-Construct Archaeology Ltd

Detailed Site Location
1:1,000



South West view of St Nicholas' Church, Deptford
before conservation

Figure 2
Site plan showing St Nicholas' Church and tower

3. METHOD

- 3.1 The work was undertaken to record, stone by stone, the fabric of the western tower of St Nicholas' Church as it existed and was accessible before, during and after conservation work to clean and replace masonry that had been damaged by pollution or weathering. The site work consisted of a measured survey of the historic and replacement fabric and a full photographic survey.
The extent of environmental damage from daily pollution was found to be most damaging closer to the modern ground level. The extent of weathering was limited to the quoins and laminated limestone window frames of the upper storey of the tower.
Below the first floor stringcourse the fabric remains in its original form, except for the stone steps leading to the west door that are a 20th century addition. The upper part of the tower is an early 20th century addition built after the 19th century parapet and belfry was damaged by a storm. The original medieval church building does not survive, having been demolished and rebuilt in 1697. Further repairs were made to this building in 1716 and 1780, and in 1956 a wholesale rebuilding of the bomb-damaged nave and chancel was undertaken.
- 3.2 A stone by stone photogrammetric survey was undertaken prior to the erection of the scaffolding. Once the scaffolding had been erected the errors in the photogrammetric survey were corrected and the materials, damage, and areas of Roman cement and Portland cement-based mortar were identified. The first set of elevation drawings produced represented a record of the then current state of the tower's exterior.
- 3.3 Plans were also made of the interior of the tower at ground floor level, upper ground floor level, at the first and second floor level and at the level of the roof.
- 3.4 Following work by Church Conservation Ltd to clean the exterior masonry and remove pollution staining and inappropriate pointing, a second set of elevation drawings was prepared showing the stone as revealed by cleaning. During the conservation works on the tower the site was visited from time to time to record the fabric of the tower revealed by the removal of the stones to be replaced. Profiles were drawn of mouldings including capitals, corbels, mullions and hoodmoulds. Medium format colour and monochrome photographs were taken of each of the internal rooms of the tower, the roof, the exterior of the tower and of typical details. Additional general and detailed colour slide photographs were also taken.
- 3.5 A final set of elevation drawings was produced after the completion of repair works, showing the replaced fabric.

4 ARCHAEOLOGICAL & HISTORICAL BACKGROUND

4.1 Although little is published concerning the history of St Nicholas', the history of the site can be traced through previous archaeological and antiquarian investigations, map evidence, the records of successive vestry minutes from 1627 onwards, and also paintings, sketches and writings.

The earliest historical reference to St Nicholas' is found in the *Textus Roffensis* of 1115 (Phillipotts, 1997), where it appears again in 1287 with the church valued by Edward I at 15 marks (Dews, 1884). There are no upstanding walls belonging to the original church body, except for some evidence remaining within the fabric of the 15th to mid 16th century tower in its east elevation.

The tower was built between 1450 and 1558, dated through ceramic building material in the fabric and a sketch, from 1558, showing the church with a spire. Human remains have been found in an excavation of the late post medieval brick crypt, revealing a 16th century burial (Jones, 1976), and in the south west corner of the tower space, a jumble of disturbed bone, suggesting that the tower was built on ground already used for burial.

The earliest surviving map showing the tower is from 1623 (Figure 3). The church is shown surrounded by fields and houses at the head of the 'commone greene', with a spire and extended nave. It shows the road bounding the south of the church (Church Lane), and to the northwest the close geographic location of the Royal Dockyard of Henry VIII and manorial house of Sayes Court. Excavations at Convoy's Wharf (Divers, 2001) recovered evidence of the Royal Dockyard and also a number of economic activities, including brickfields and limekilns, which probably provided some of the material to build St Nicholas' church tower.

In the belfry was hung one bell at this time, known as the 'great bell'.

The church of St Nicholas' has been owned by a series of authorities; reverting from the Abbot and the Convent of Begham (Kent) in 1183, to the Crown at the Dissolution in 1526, and back to the Church in 1568 (Steele, 1993).

4.2 St Nicholas' Church was originally in the Diocese of Kent. Built in the fishing village of Deptford, this riverside parish church traditionally became known as the 'Westminster Abbey of the Navy', through its close geographic association with the River Thames and the Royal Dockyards to the north. Historically, sailors used to pray at the church dedicated to the patron saint of sailors before embarking on sea voyages.

The brethren at Trinity House – the authority administering lighthouses and sea markings – had an establishment to the east of the church, and celebrated Trinity Monday with an annual service at St Nicholas'. Many renowned admirals, captains and shipwrights of the Royal Navy are buried within the church and churchyard including: Peter Pett Esq (acclaimed for inventing the frigate), the explorer Martin Frobisher, the High Admiral of England Lord Howard of Effingham and the naval hero Francis Hosier. The church was rebuilt in 1603 with substantial donations from the East India Company and the Treasurer of the Royal Navy, Sir William Russell (Steele, 1993).

4.3 The parish life of Deptford is preserved in the vestry minutes, baptism, marriage and death registers from 1563. In keeping with the majority of contemporary early parish records, the surviving vestry minutes are dominated by accounts of helping the poor of the parish, while the fabric and upkeep of the church and tower are occasionally mentioned. The 1563 burial register records the interment of the playwright Christopher Marlowe who was 'slaine by Francis Frezer the 1 of June'. Stow's 'Survey of England' at the beginning of the 17th century records that five bells were hung in the belfry and John Evelyn writes about the clock installed into the north and south faces of the tower during the early 17th century, the timber frames of which still survive on the walls of the first floor. Between 1638 and 1688 parishioners had applied 'for certificates to be toyched (sic) for Kings Evil'. The

church was again rebuilt in 1697, partly due to the increasing numbers of the congregation and partly because of decay in the fabric of the church, “which was ruinous and transparable” (Vestry minutes, 1710). A peal of eight bells was hung in the tower’s belfry to complete the renovations. A watching brief in the churchyard partially uncovered a post medieval brick burial vault and an 18th century deposit, consisting of charnel remains from previously disturbed graves (Slater, 2002), indicating the large numbers of parishioners and limited space in the churchyard. The most significant event was the Hundred Church Law, which radically changed the parish by effectively halving Deptford as new boundaries were created along Deptford High Street in 1710 for the new parish church of St Paul.

- 4.4 Rocque’s Map, from 1745, shows the plan of the church built in 1697 against the western tower. Contemporary engravings and a painting by Jan Griffier the Elder show the spire replaced by a cupola, which later photographs show had been removed by 1854 and a flat roof constructed in its place.

Substantial repairs were made to the church fabric in 1717, when wrought iron ties were installed to maintain the structural integrity of the tower. An archaeological watching brief (Slater, 2002) in the churchyard of St Nicholas’ revealed a post medieval pit of pegged tile, which may have been associated with this phase of repair to the fabric of the tower. Speculative building had occurred around the church in the 17th and 18th century, when houses such as those found to the south of the church in Albury Street and Watergate Street were constructed (Wragg, 2004). The red brick foundations of Corporation of Trinity House almshouses built around St Nicholas’ have been recovered in several excavations in Berthon Street (Wooldridge, 1993) and Greenwich Reach (Butler et al, 1996).

The 18th and 19th century Ordnance Survey maps show Deptford Green to have been built upon, and the church surrounded with buildings. Archaeological investigations in Norman Road (Askew, 1997) and Watergate Street (Wragg, 2004) have shown that Deptford became the focus of economic activity in the late 18th to 19th century, with market gardening and hostelry businesses expanding as the Royal Dockyard declined. Excavations at Convoy’s Wharf (Divers, 2001) and the Pepys Estate (Mattinson, 2001) have recovered phases of demolition, backfilling and levelling marking the demise of the Royal Dockyard.

- 4.5 In 1900, Deptford Parish Church became part of Greenwich and consequently a part of the Diocese of Southwark. The top of the tower was destroyed in a storm, and was restored by 1904; a fact commemorated by an inscription in the west Y tracery window in the tower. The flat roof was causing problems with flooding, and subsequent down pipes were installed; one into the interior of the east elevation, the other down the exterior of the west elevation of the stair turret.

The 1932 Ordnance Survey map shows the area more or less as it is today, with St Nicholas’ bounded by the flats of St Nicholas House to the north and Gilbert House to the west. The last recorded peal of bells to be rung in the tower was on 6th March, 1939. During the Second World War, in October 1940, the church was bombed and the tower suffered minor damage. A major restoration programme was undertaken in 1954 to rebuild the church to its 1697 décor and to restore the church tower, which had started to lose its structural integrity. The church was rededicated in 1958, although only two bells remain in the belfry for tolling¹. During the current phase of works, Health and Safety considerations have

¹ A bell is rung with its mouth facing up. From there it is rotated full circle with the bell sounding once when rung. Tolling is where a bell is rung with its mouth facing down and swung side to side with the bell sounding twice when rung.

ensured that a permanent handrail has been fitted, and that electric lights have been installed in the first floor room and up the newell post staircase.



© Pre-Construct Archaeology Ltd

Figure 3a
1745 Rocque map
Approximately 1:5,000

5 DESCRIPTION OF THE TOWER

- 5.1.1 For ease of understanding, in this section and that detailing the historic sequence, the tower is described by the period of general construction. A key and glossary of technical terms can be found in Appendix 1 (Figures 16 & 17). The ecclesiastical building of St Nicholas' functions as a parish church of Deptford, within the Diocese of Southwark. It is situated within its own churchyard, with a chancel house to the south, and is bounded by a brick wall. Both wall and chancel house were constructed in 1701 (Steele, 1993). The main body of the church was rebuilt with brick in a restrained Baroque style in 1697, while the gothic Kentish ragstone tower to the west is built in the Perpendicular style typical of the period c.1350 – 16th century. The tower is built in three stages, and the exterior has 18th century diamond flushwork and 19th century wrought iron cross tie plates. The flint and ragstone flush work is of a diamond set within a ragstone rectangle and framed with knapped flint blocks characteristic of the 18th – 19th centuries (Morris, 1988). It appears between the 19th century wrought iron cross tie plates on the north and south elevations, and has been re-pointed with Portland cement-based mortar. The interior contains a 15th – mid 16th century squint, 17th century timber frames, 18th and 19th century graffiti and a late 19th century independent two tier cast iron bell frame with an 18th and a 19th century bell hung in the lower frame.
- 5.1.2 The tower is constructed predominantly of Kentish ragstone facing, with a rubble core wall of flint, stone and mortar. The ragstone facing is brought into courses and roughly hewn, with larger, better dressed stones emphasising the quoins on the buttresses and stair turret. A roughly coursed flint band, ranging in width from 0.70m – 1.25m (2' – 4'), extends around the tower and buttresses at an average height of 1.70m above the modern day ground level. The flint was originally set in a lime-based mortar and has been retouched and re-pointed with Roman cement and Portland cement-based mortar over the centuries. The ground level is 1.50m higher than the original medieval level due to overburden in the churchyard resulting from continuous interments and flood prevention over the centuries.
- 5.1.3 The tower is not symmetrical in plan, with two angled buttresses on the west side, a right angled buttress on the south east and a clasped buttress, housing the stairs to form the base of a turret, in the north east corner of the tower (Figure 24). It has a double height ground floor, the upper part formerly housing a gallery removed in 1958. The first and second floors are still extant. Each floor has a single room accessed by a stone newell post staircase housed in a turret that forms part of the northeast buttress.
- 5.1.4 The ground floor has a 20th century concrete floor covered with tiles, and is visibly lower at a height of 4.50mOD than the nave of the church, which is accessed from the tower space by a flight of 20th century stairs. The flight of stairs leads through a two-centred arch (Figure 4). The first floor is supported by large timber beams laid east to west, at intervals of 0.16m (6"), and has a square floor plan. In the east wall there is a 15th – 16th century squint, behind 17th century timber frames that surround the room. The royal coat of arms is hung on the exterior of the east elevation, where it may be seen from the nave of the church (Figure 4). The second floor is also square in plan and houses the cast iron bell frame with two bells still hanging (Figures 29 & 30).
- 5.1.5 The stair turret is asymmetrical in plan. It is accessible from each floor and leads onto the roof via a 20th century door in the south elevation of the turret. Prior to the current phase of work, the roof was of a filler-joist type of construction, resting on a step in the tower walls. This construction was overlaid with a waterproofing system consisting of concrete paving slabs set into asphalt waterproofing. During the works this was replaced by a timber roof with softwood boarding and cast



Figure 4:
View Of The Interior Of St Nicholas' Church Tower

lead sheet covering falling into a new parapet edge gutter on the east side. The parapet wall is 1.00m wide with an offset of simple moulding at the top. A down pipe is attached to the west elevation, with the projecting gutter overhanging a square rainwater head. Adjacent to the down pipe is a 20th century oak flagstaff (Figures 5 & 28).



FIGURE 5: View of the roof post-conservation

- 5.1.6 There are two main types of fenestration preserved in the tower: tracery openings, and windows and small openings. Centrally placed above the west door is a Y tracery window. The original surrounds have been severely affected by weathering. The plain glazing and the grille that covers it are early 20th century replacements. The fact that the other tracery openings further up the tower were replaced in 1901 to match earlier work suggests that it is likely that the Y tracery window is a replica of the previous window that survived until 1901. The apron bears an inscription relating to the restoration of the top of the tower following storm damage. The voussoirs form a complete segmental arch, similar to that over the west door, which has been re-pointed in Roman cement. It is apparent from the surviving surrounds that the original window, which would have lit the former gallery and nave, was slightly larger than the laminated limestone replacement.
- 5.1.7 On the north, west and south elevations, above the first floor stringcourse, are single, unglazed openings characteristic of the late 14th to mid 16th century. These have moulded laminated limestone hoodmoulds, jambs and sills. The hoodmoulds and stringcourses are bonded with Portland cement-based mortar and date from the beginning of the 20th century, replacing the original medieval work. The surrounds have small square holes 20mm wide (8/10") originally designed for suspending louvre boards. Each opening, prior to repair, was covered with a timber 'door'.

- 5.1.8 The stair turret fenestration consist of small rectangular windows formed with a surround of large blocks of laminated limestone set in oyster shell mortar and partially re- pointed with Roman cement. The lowest window is 2" away from the 1697 church wall, with its stone lintel partially hidden behind it. The window above the first floor stringcourse is level with the opening in the north elevation. It is set further away from the church wall at 0.32m. There is no evidence that the windows were originally glazed, though they are currently glazed with modern glass. Above the second floor stringcourse the openings are characterised by gothic tracery decorated with simple moulded blocks of laminated limestone in the form of foils (Figure 43).
- 5.1.9 The north elevation (Figures 43-46) is characterised by the clasped buttress of the stair turret and the northwest angle buttress to create a narrow tower wall at 2.70m (8' 10") wide. It has a wrought iron cross tie plate, flint flush work re-pointed in Portland cement-based mortar, a small opening on the first floor and a two centred arched tracery opening on the second floor level.
- 5.1.10 The west elevation (Figures 31-34) is characterised by two angle buttresses. Features of the elevation are the western door, a four centred arched Y tracery window, a small opening with a timber 'door' at first floor level above the first floor string course and a four centred arched tracery opening. The elevation has suffered from severe weathering due to its position facing the prevailing winds, and only small traces of the original mouldings and decoration can be seen. The only external access to the tower is from the west door, semi sunken below ground level, which is accessed by a staircase surrounded by a brick retaining wall. The stairs abut the chamfered stonework stringcourse to the south of the doorway, while the raised ground level potentially covers any continuation of the chamfered stone stringcourse to the north of the west door and on other elevations. The west door is framed by a two-centred drop arch, originally decorated but now very worn.
- 5.1.11 The south elevation (Figures 35-38) is characterised by an angled buttress and a buttress at ninety degrees to the tower, a small opening covered with a timber 'door' above the first floor sting course, a four centred arched tracery opening above the second floor string course and flint flush work in between two wrought iron cross tie plates. Two structural cracks are visible at the top of the elevation. Only 3.67m (12') of the original 15th to mid 16th century walls of the east elevation is visible from the exterior, as the church roof is not tied into this face. The lower part of the east elevation of the tower is visible from the nave of the church (Figures 4 & 39). The present Mansard church roof was added in the 1956 restoration, although evidence remains for previous rooflines within the fabric of the elevation. The wide band of cement along the line of the roof suggests that the 1697 roof it replaced was slightly higher and more steeply pitched than its modern counterpart. This elevation has a single four centred arched tracery opening.
- 5.1.12 The diagonal buttresses (Figures 47 & 51) are built in four stages, with plain laminated offset stones. The coping of the lowest buttress step is built with two coping stones, while the middle step is built with three coping stones and the highest with four. The walls are rubble cored, with quoins stressed and faced with roughly hewn Kentish ragstone blocks. The build lines can be followed in the faces adjacent to the main elevations. In the upper parts of the buttresses, septaria and mudstone are used. These stone types also fill the putlock holes in the adjacent elevations. The face of the ninety degree angled buttress is characterised with an extra plain laminated coping stone set in Portland cement-based mortar (Figure 55).

5.1.13 The clasped buttress (Figure 59) contains the stone newell post staircase at the northeast of the tower. The 1697 brick wall abuts onto the stair turret. A vertical mortar joint adheres the northwest facing elevation of the stair turret to the north tower wall. This stair turret elevation is different in construction and bonding from the other buttresses.

6 DETAILED DESCRIPTION OF THE INTERIOR FEATURES OF THE 15TH – MID 16TH CENTURY PARTS OF THE TOWER

- 6.1.1 The fabric of the original 15th to mid 16th century part of the tower survives to a height of 13m above the modern day ground level and includes the ground, upper ground and first floors of the tower's structure. The early 20th century part of the tower survives above the 15th to mid 16th century work to a height of 20.25m above ground level. It includes the buttresses, second floor and tower turret on the roof.
- 6.1.2 The west door opens into the tower space and from the interior is only a partial two-centred arch, with long and short jamb-stones each side. The door leading from the tower space to the newell post staircase has a two centred arch. The surround of the two-centred arch to the staircase is plain with a moulded recess at the base of each jamb. On the north wall, 3.38m above the ground floor, is another opening with a four-centred arch and 20th century decorated wrought iron railing across a worn threshold stone. The nave arch is 5.95m tall from the ground floor to the apex. Its crown is five courses of stone below the timber joists of the second floor. The arch surround on the east face of the tower is of a similar stone to the buttress quoins. The arch is composed of two recessed hollow mouldings that frame engaged columns. The responds are of painted stone. They have hexagonal plinths, elongated in the late medieval style (Jones, 1976) and rounded faces with rolled mouldings (Figure 23c). Their capitals have plain round cushion mouldings that rise from an annulet. Their abaci are octagonal and support a plain arch with hollow chamfered moulded sides. The stairs leading to the nave underneath the arch are concrete with a decorated wrought iron handrail either side (Figure 29).
- 6.1.3 The walls of the tower space have been whitewashed, except for patches where names, initials and dates are scratched into the south and west walls. The graffiti is roughly scratched into the stone using a knife and appears in two places, adjacent to the west window and on the south walls. The graffiti on the west window (Figure 6) is later ('E.E.J. FITCH 1877'), than the graffiti on the south wall ('IK 1765') (Figure 7). A row of three small shield shaped plaques with crosses decorate the south wall. Three metres above the ground floor level on the south and north walls are a pair of mortise holes measuring 0.60m x 0.42m. These may have held a floor beam of the former gallery. Concrete inserted underneath the west window has obscured any evidence of further putlock holes or mortises.



FIGURE 6: View of 'E.E.J. FITCH 1877' graffiti below the west Y tracery window

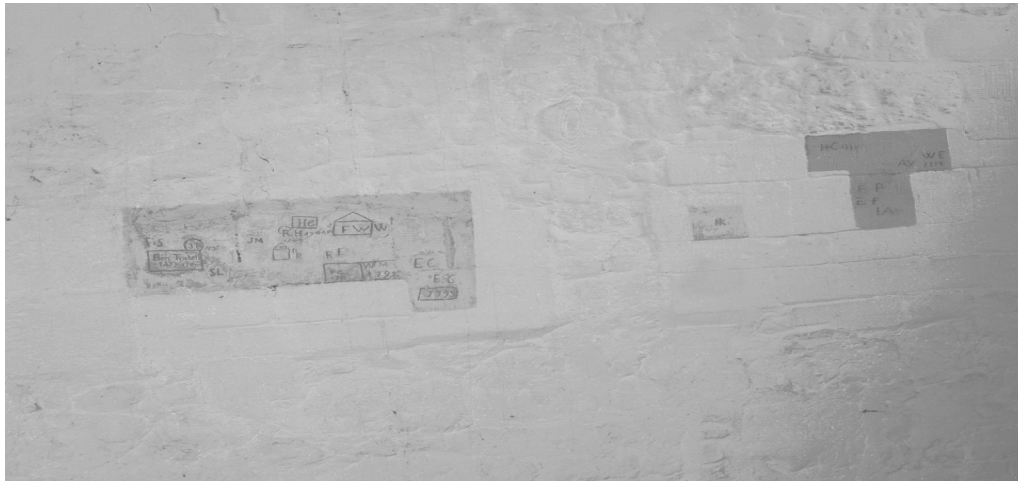


FIGURE 7: View of 18th century graffiti on the south wall of the tower space

6.1.4 The original 15th to mid 16th century Purbeck marble newell post stairs were only built for one full turn, ending below the bottom window of the stair turret. The newell post segments are 0.21m long, with a 3cm thick mortar between each stone, and are partially covered with Roman cement. Between the first and second floors, a wrought iron cross shaped tie plate is inserted into the wall of the stairs. The stone stairs above the bottom window of the turret abut this plate, indicating that this part of the stairs is the later 1950's addition, replacing the 'rotten wooden stairs' (P78/NIC/155). The first floor (Figure 8) has modern timber floorboards nailed onto three large timber beams running north to south and two oak joists 8" x 7" in scantling that run east to west. The joists are braced with three further trimmed joists, which are re-used with redundant mortise visible. The floor framing indicates a former central opening in the first floor, partly filled with 20th century joists, which has been covered in floor boards. The present bell ropes proceed through the floorboards by specifically drilled holes.

6.1.5 The timber used for the joists is extremely knotty, but in good condition. The roughly square profiles indicate an early late medieval to late post medieval date (Brunskill, 1988). The following table records the first floor timbers as seen in Figure 8:

Joist Number	Type of Joint	Comments
1	Square mortise	Re-used
2	Mullion mortise	Re-used wall/sill plate
3	None visible	Original use of timber
4	None visible	Later addition
5	None visible	Later addition
6	Circular hole & half joint	Old timber building frame
7	Half joints	Re-used beam
8	None	Modern

6.1.6 A 15th to mid 16th century squint, a 0.28m square aperture in the east wall with a sloping sill into the first floor room, is blocked up but originally overlooked the nave and gave a view of the chancel. It is presently covered with the royal coat of arms of William and Mary. Along each interior wall of the first floor is a Kentish ragstone ledge, which is visible on the east elevation as seen from the nave. On top of the ledges sit the sill beams of four timber frames that line the walls (Figures 9 & 18-21). The original framing members are of oak and joined with

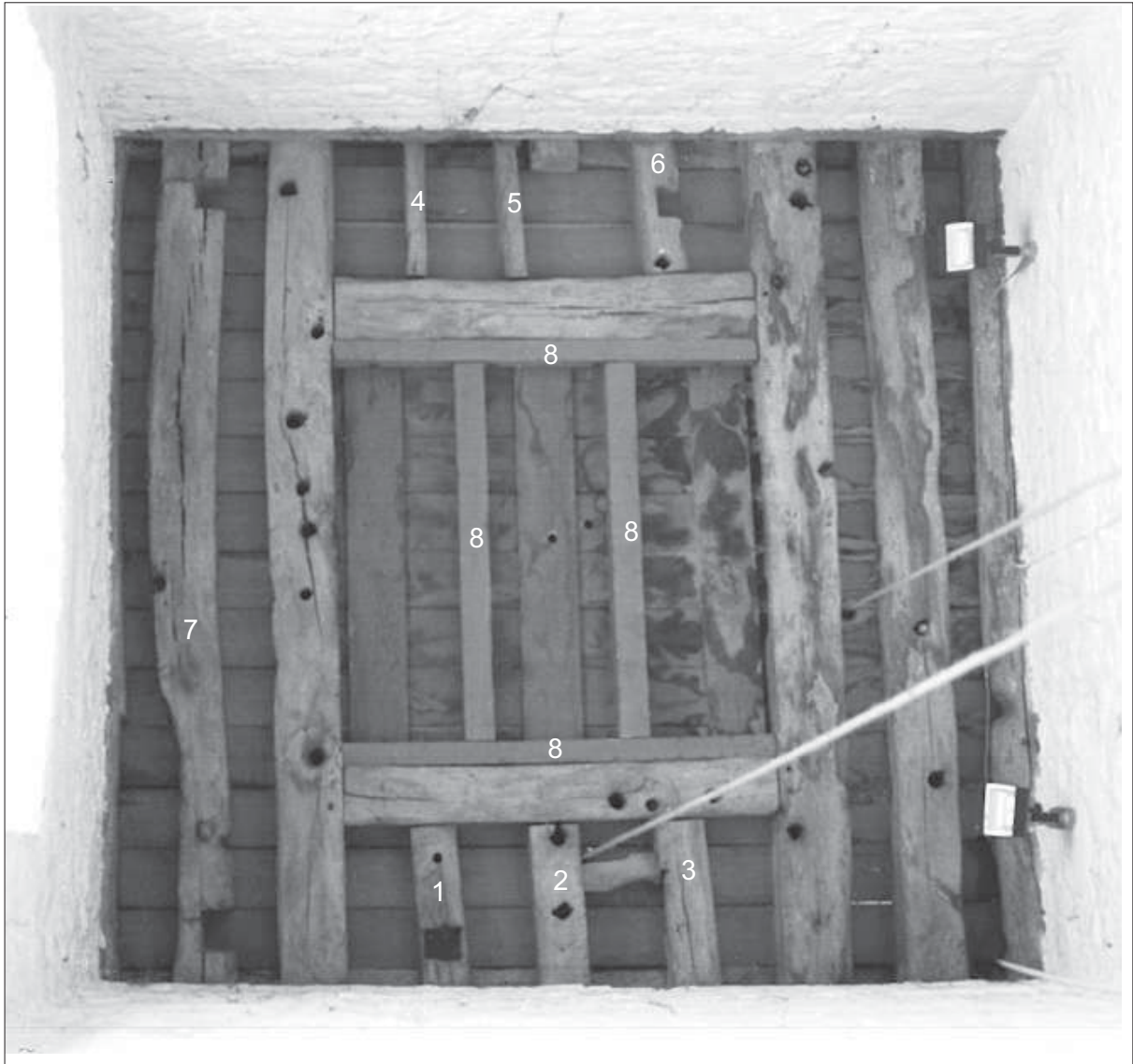


Figure 8: View of the first floor beams and joists from beneath

tenon joints. The top plates bear carpenter's marks at the end, which run clockwise around the room with the numbering starting at the south end of the east frame reflecting the primacy of the wall nearest to the altar (Figures 9 & 17 – 21). The marks are prominent and carefully cut with a chisel, reflecting their 17th century date (Brunskill, 1988).

6.1.7 The North Timber Frame

The staircase doorway is incorporated in the north frame, which is in good condition (Figures 9 & 21). The east post has become the doorjamb, and consequently has a late 20th century lock fitted into it. The sill beam is attached to the east and west frames and runs underneath the door, acting as a threshold. The top plate, which acts as a lintel over the doorway, is attached to the west top plate with a double mortise and tenon joint. It has four single cogged joints and a notched lap joint, which may be associated with the bevelled halved joint in the west frame, and a carpenter's mark with three scratches scored into the west side.

6.1.8 The West Timber Frame

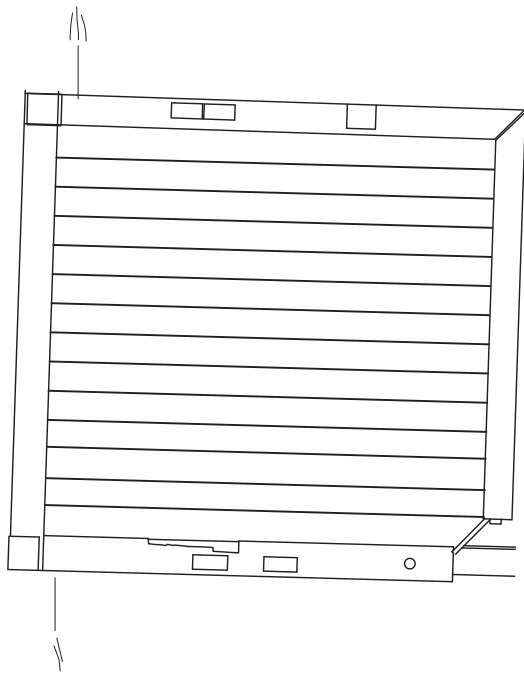
The west timber frame is joined by the sill beam to the north and south frames with simple mortise and tenon joints, visible at the south end of the frame (Figures 9 & 18). The frames are joined with a top plate, but the joint is not visible. The frame members are in good condition. The top plate has five single cogged joints and is fixed to the diagonal posts with a square flat headed nail. A timber peg joins the top plate to the post. The diagonal braces bear evidence of re-use from a timber framed building. The top of the south post is jowled with a longitudinal bevelled half joint, and there is a circular cut in the north post.

6.1.9 The South Timber Frame

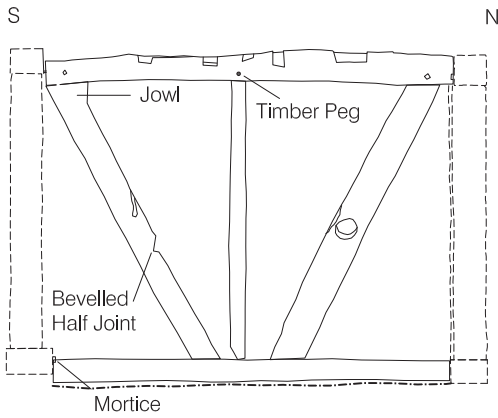
Opposite the four-centred arch of the first floor doorway, the south timber frame is in fairly poor condition (Figures 9 & 19). Recent studs support the east tension brace, which is heavily marked with circular holes and chisel marks. The sill beam is also in quite poor condition and bears evidence of secondary use with a prominent halved lap joint facing towards the centre of the room. The wall plate is heavily joined, with six single cogged joints and a notched house joint [B] in the face below one of the single cogged joints [A] (see Figure 9). Chisel marks are evident to the west as tool scars and a carpenter's mark with two scratches scored into the west side of the top plate.

6.1.10 The East Timber Frame

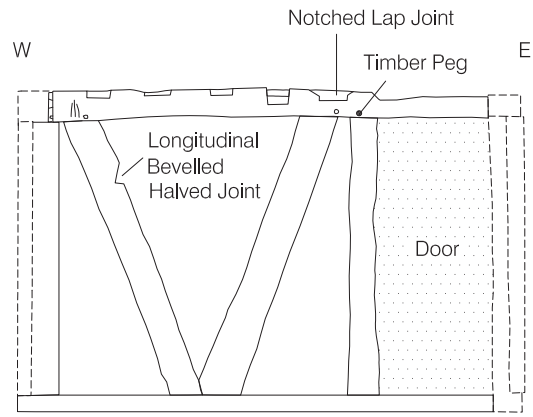
The east timber frame is in front of the squint and is in very poor condition, particularly as it is truncated to the south by the installation of the early 20th century down pipe (Figures 9 & 20). The top plate is heavily jointed from previous uses with seven single cogged joints and a very worn half joint visible above the north brace. The bracing is supported with two modern struts, where the frame has been truncated at its south end, and the southern strut is cut with a dovetail joint. A later arch brace has been added for extra support in the north and is affixed by a round-headed nail to the top plate and by timber pegs to the post.



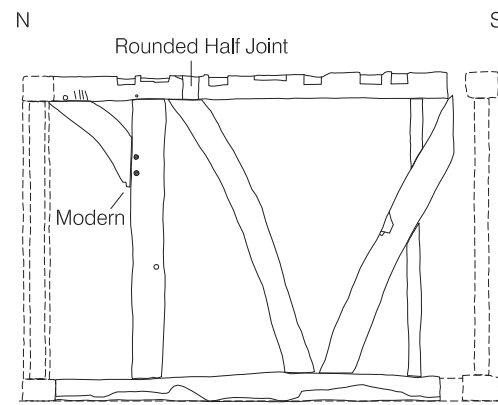
Plan of Timbers & Clock Frame On The First Floor



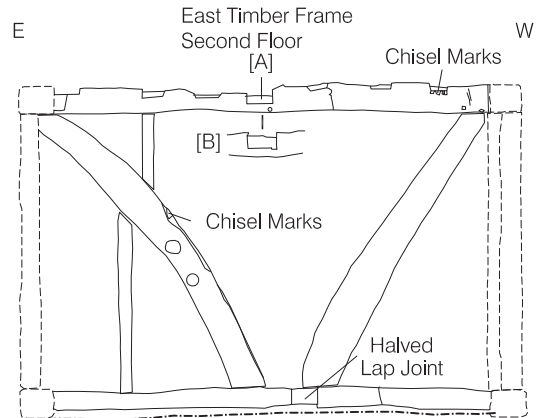
West Timber Frame
First Floor



North Timber Frame
First Floor



East Timber Frame
First Floor



South Timber Frame
First Floor



[A] Single Cogged Joint
facing ceiling
[B] Notched House Joint
facing floor

Figure 9
Timber Frames on the First Floor
1:50 at A4

6.2 DETAILED DESCRIPTION OF THE EXTERIOR OF THE 15th TO MID 16th CENTURY PARTS OF THE TOWER

- 6.2.1 The fabric of the original 15th to mid 16th century masonry walls survives to a height of 13m, and has only suffered damage where later fixtures have been tied into existing walls, for example where the cross tie plates were inserted to add support to the walls below the belfry. There is no architectural evidence for a spire or cupola, demolished in the construction of the top stage of the early 20th century part of the tower. For details of each elevation recorded see Appendix 4 (Figures 31 – 62).
- 6.2.2 There are three main build, characterised by larger Kentish ragstone blocks at the bottom measuring on average 0.44m x 20m (1'5" x 7"), small squarer blocks towards the middle measuring about 0.26m x 0.16m (10" x 6") and rectangular blocks towards the top of the 15th to mid 16th century parts of the tower measuring on average 0.37m x 0.17m (1'2" x 6"). Further build lines are represented by levelling courses of tile towards the bottom and smaller blocks of ragstone further up, which can be traced around the whole structure along with flint and ragstone galletting. The two types of build lines alternate every three and five metres up the elevations, and are currently preserved in the fabric up to the second floor stringcourse. The peg tile is predominantly of fabric type 2271², a local London fabric that is generally inefficiently fired dating from 1150 to the early post medieval period. The lower part of the elevations has several levelling courses of peg tile and is only mismatched in the north elevation of the stair turret. Also present are fabric types 2856, dating from 1230 to the early post medieval period, and 3033, local handmade brick fabric dating from 1450 to 1700. During the current phase of conservation works, a sample of the tower's walling stone was taken by Church Conservation Ltd. from an unspecified point and analysed. The stone was described as pale greenish grey, dense, medium to coarse grained, glaucolitic, sandy limestone whose lithology compared closely with the 'hassock' lithologies of the Kentish Ragstone (Lower Cretaceous) of the Maidstone area.
- 6.2.3 There is little peg tile in the fabric of the buttresses. Ceramic building material in the lower part of the buttresses includes tile of fabric types 2271 & 2586. The northeast elevation of the northwest buttress contains brick of fabric types 3033 & 3034, the latter fabric representing later 17th to early 20th century repair work. The south east elevation on the south west buttress contains a large fragment of plain glazed Flemish tile, dating 1350 – 1500, set upside down. Two stone samples were taken by Church Conservation Ltd. from unspecified points on the southwest buttress; one, of a quoin, was described as fine grained, bioclastic limestone from the Kentish Ragstone (Lower Cretaceous) succession, probably from the Maidstone area and of 'ragstone' lithology; the other was described as weathered, friable, laminated, pale yellow, glauconitic, fine grained sandy limestone, comparable with lithologies from the Chilmark Stone (Upper Jurassic).
- 6.2.4 There are two distinct mixtures of building materials in the tower. At the bottom, associated with the flint band, lie arenaceous stones (such as the red, green and brown sandstones) and argillaceous stones (such as mudstone). Basalt, granite and the conglomerate ferricrete are also associated with the flint band. In the upper levels, at the height of the cross shaped wrought iron tie plates, the fabric also includes septaria and shelly limestone. It is only at the top of the 15th to mid 16th century part of the tower, immediately underneath the second floor string course, that other building materials appear in the fabric. This pattern is associated with the rebuilding of the tower top. These stone types are not

² Building material classification system used in Greater London. Examples of the fabric can be found in the archives of PCA Ltd and the Museum of London. An index of all fabric types found in the tower can be seen in Appendix 1.

purposefully selected, other than for appropriate size and shape. However, the vitreous limestone, which is associated with the flint, is the only example of stone type being chosen for its close semblance to the siliceous stone. The range of stone types suggests a pattern of opportunistic procurement with the possibility that some stone was reused from other structures or from ship's ballast. The stone types generally indicate that the stone was brought up the River Thames from the east.

- 6.2.5 The flint band is at its widest on the south elevation, at a height of 2.00m from modern ground level. It is associated with a variety of other building material including ferricrete, basalt and granite. The flint band continues around to the west elevation, but is not visible in the buttress elevations, and abuts the window surround on both sides. At 2.27m above modern ground level, the flint band is level with the original 15th to mid 16th century Y tracery window sill on the west elevation.
- 6.2.6 The west elevation has fewer stone types than the north and south elevations. This is presumably in order to produce a finish that is aesthetically pleasing and emphasises the importance of the west door, which historically would have been used for processions at specific times of the church calendar. The door opening is made of three parts; an arch of Kentish ragstone voussoirs, a moulded surround and hoodmould. The top arch survives as the partial apex of a segmental arch constructed with Kentish ragstone blocks repointed with Roman cement. The surround has a two centred arch with the mouldings continuing down the jambs. It has worn, smooth corbels incorporated into the springer and is re-pointed with a pinkish brown lime mortar containing oyster shell. The hoodmould is a two-centred arch with a badly weathered archivault, and is set in a light brown chalky mortar. The ragstone jambs are also severely weathered and originally appear to have been formed of two successively recessed pairs of responds. Patches of overlying mortar at the top of the doorway suggest several phases of re-pointing, repair and alteration that occurred after the original setting in lime mortar. At the bottom of the elevation two large red sandstone blocks have been laid at opposite sides of the door, while post medieval bricks have been bonded in Portland cement-based mortar as repairs. The doorstep has been replaced by concrete, and the oak studded plank door has had four panels replaced and re-studded.
- 6.2.7 An earlier roof scar is visible above the roofline in the east elevation and also in the south east buttress as a 0.30m wide band of septaria, oolitic limestone and sandstone set in mortar. The evidence is not so compelling for the north east turret side, although the build lines do not match at this point; there is also a large patch of Roman Cement associated with this area, despite the wall having been slightly altered with the construction of the brick church wall in 1697. Above the roof scar is a Kentish ragstone build line, seen in all elevations. The stone becomes more varied in type and is predominantly set in Portland cement-based mortar. It is indicative that the subsequent courses above are later than the roof scar and the fabric at the bottom of the tower.
- 6.2.8 One putlock hole is visible in the north wall of the tower, above the wrought iron cross tie plate. It is similarly sized and at the same height as a western putlock hole in the south elevation, and filled with septaria, shelly limestone and mudstone. A corresponding putlock hole 0.105m x 0.16m is seen on the north face of the stair turret. Four Putlock holes are visible in the west elevation. Two are above the upper ground floor Y tracery window and two above the wrought iron cross tie plates. Similarly sized and at the same level to one another, the lower pair is in-filled with ragstone bonded in Roman cement. The upper putlock holes, although similarly shaped and infilled with flint and ragstone, are not level to one another. The north putlock hole is 0.25m lower than the south, suggesting that the scaffolding was not horizontal across the whole elevation. Putlock holes

are also visible either side of the roof scar in the east elevation, and correspond to those in the west elevation. The putlock hole to the north is 0.11m x 0.21m and is infilled with flint and peg tile (fabric type 3033). A larger rectangular scar to the south, measuring 0.41m x 0.65m, is filled with ragstone and Portland cement-based mortar, and is associated with the addition of a down pipe from the early 20th century roof. The gutter of the down pipe projects from this point of the wall.

- 6.2.9 The north elevation of the northeast stair turret (Figure 44) has unaligned windows and two plain laminated limestone stringcourses towards the middle and top of the elevation. The lowest window is 2" away from the 1697 church wall, with the stone lintel partly obscured by the wall. The opening above the first floor stringcourse is set further away from the church wall at 0.32m. The lowest seven metres, below the first floor stringcourse in the northwest elevation of the stair turret, are different in construction and bonding, comprising large Kentish ragstone blocks across the whole of the face (Figure 60). From the ground level, a straight mortar joint extends 1.90m before flint pebbles are used to fill the mortar joint between the turret and the north tower wall. The stones of the north wall of the tower and the turret are not tied into each other until a height of 3.41m, just above the pebbles of the straight mortar joint. The quoin stones at the north west corner of the turret step in and out. The most obvious are four stones 1.65m above the modern ground level. These stones are set out from the turret wall by 0.10m, indicating that they are later than the surrounding works. They have been re-pointed with an oyster shell rich mortar.
- 6.2.10 The flint band is present on the stair turret face, but is slightly narrower than the north elevation of the tower and is directly below the lowest opening. The wall abutting the stair turret was partially rebuilt in 1953, with the lowest 7.00m being original 1697 work with modern re-pointing. The identification of the 17th century work is crucial to the dating of the flint band. At this point the flint is unworked and is partially hidden by the 1697 brick wall, and is therefore an earlier and original feature of the tower. In the south east buttress elevation the flint is worked except where it is found adjacent to the 1697 church wall and within the core of the wall, visible in voids in the fabric of the tower.
- 6.2.11 The tile used in the galletting below the first lower opening of the stair turret is peg tile of fabric type 2271, and is independent of any tile in adjacent elevations. At the bottom of the turret, building material other than Kentish ragstone is restricted to the outer quoins of the turret and the area adjacent to the church wall. Towards the top of the turret, the courses of building material are continued from the north elevation.

6.3 DESCRIPTION OF THE INTERNAL FEATURES OF THE EARLY 20th CENTURY PARTS OF THE TOWER

6.3.1 The second floor is composed of 20th century wooden floorboards on top of I section steel joists, which are carried by larger steel I section beams. The early 20th century steel joists and beams are joined together with hexagonal nuts and bolts to span the entire length of the tower, and are in good condition with little oxidation. The joist ends are supported on laminated sandstone pad stones set into the Fletton brick walling of the internal face of the tower. There is a covered hatchway in the floor. The room contains an independent two tier cast iron bell frame.

6.3.2 John Warner and Sons re-installed the cast iron bell frame, consisting of two independent tiers, in 1904. The frame consists of single cast iron Y plate trusses, 1.14m long, 0.89m high and 28.5mm (1 ¼ " thick), bolted together with hexagonal bolts which indicate an early 19th century date. The lower tier is a complex frame consisting of five bell pits with the bells hung to swing in two directions. The main north to south sections are 1.79m long while the east to west sections are 2.32m long. The frame fills the second floor, measuring 3.33m x 3.53m, and is bolted with square bolts to oak beams below. The upper tier is a simple frame consisting of three parallel bell pits 1.65m above the lower frame. The bells in the upper frame would have swung in one direction. The main north to south sections are 3.69m long while the east to west sections are 2.43m long, and consequently the upper tier is only partially suspended over the lowest. The frame is supported on an inserted steel I beam with 8° tapered flanges, dating to the early 20th century. A treble and tenor bell are hung in the lower tier without their wheels, to be rung as tolling bells (Figure 10). There are no bells in the upper tier. The following table describes the bells:

Bell	Weight	Diameter	Cast	Founder	Inscription
1 (Treble)	5 ¼ cwt	30"	1701 Cripplegate	Samuel Newton Isaac Hadley	1701
2 (Tenor)	29 ¼ cwt	49"	1842 Cripplegate	Thomas Mears II	Thomas Mears Founder London 1842 Rev AE Skethchley MA Vicar, Charles Barlee, William Knott



Figure 10a:
The Independent Two Tier
Cast Iron Bell Frame
Second Floor

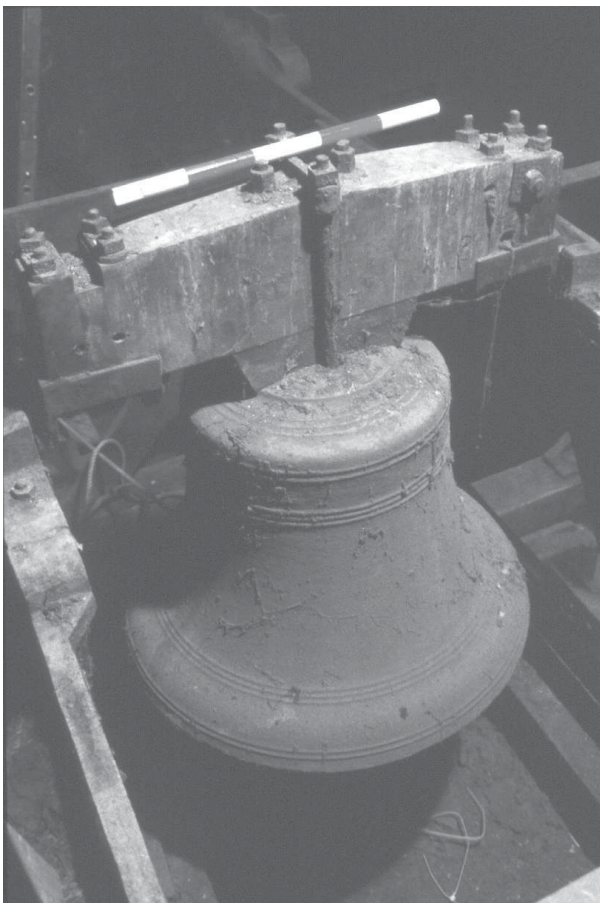


Figure 10b:
The Treble Bell (Bell 1)

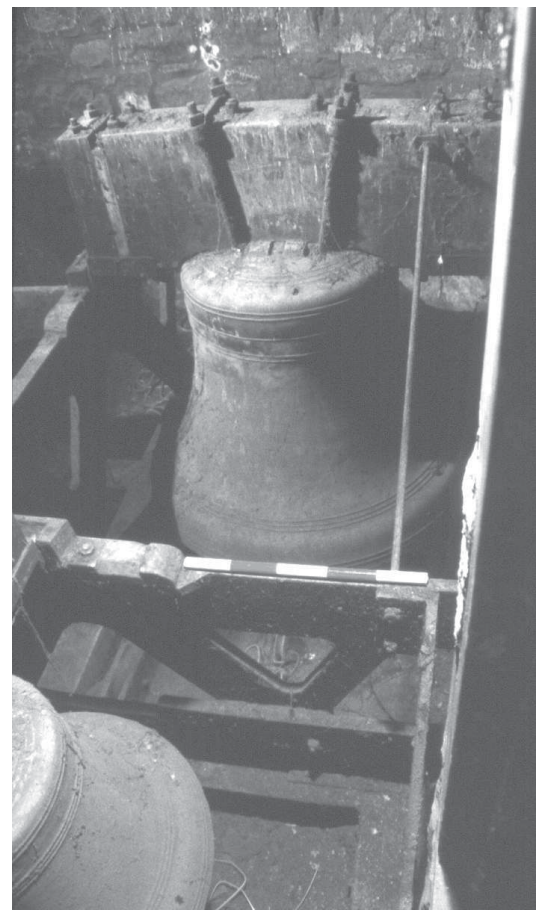


Figure 10c:
The Tenor Bell (Bell 2)

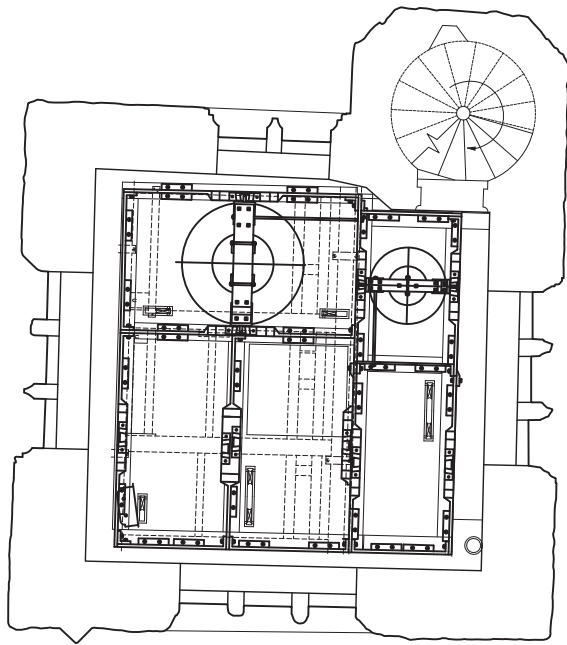
6.4 DETAILS OF THE EXTERIOR FEATURES OF THE EARLY 20th CENTURY PARTS OF THE TOWER

- 6.4.1 The early 20th century part of the tower is constructed of a Kentish ragstone faced Fletton brick wall, built 1901 – 1903 after storm damage weakened the top of the tower. The upper 8.61m of the tower is constructed in two stages (Figure 11). The Fletton brick wall was laid primarily in Flemish bond, 0.37m thick, on the inner faces of the thicker 15th to mid 16th century Kentish ragstone walls. The bricks range in size from 210 to 220mm x 100 to 65mm and are bonded with Portland cement-based mortar. The Kentish ragstone facing, 0.30m thick, was laid in a broken range work bond pattern. The ragstone is bonded with a sharp sand mix of Portland cement-based mortar and tied into the brick wall. The ragstone ranges in size from 0.20m x 0.12m to 0.30m x 0.24m. There are no build lines or galletting, although a decorated laminated limestone stringcourse extends around the early 20th century part of the tower. It is accentuated by laminated limestone bosses, set at centres of 1.45m, decorated with rosettes formed as flowers. The rosettes have been badly affected by weathering, particularly on the north and west elevations.
- 6.4.2 Structural cracks are visible on the south elevation from the top of the tracery opening arch to the parapet. The western crack extends from the top of the Kentish ragstone course to the bottom of the embossed string course for 1.43m. The eastern crack extends from the top of the parapet through the string course to the quatrefoil tracery of the tracery window, a distance of 3.14m. Conservation work has partially repaired the structural deficit through replacement of the south tracery opening.

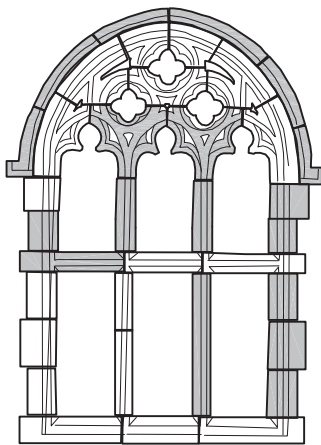


FIGURE 11: View of conservation works to the east opening on the second floor, showing the construction of the 1901 – 1903 walls.

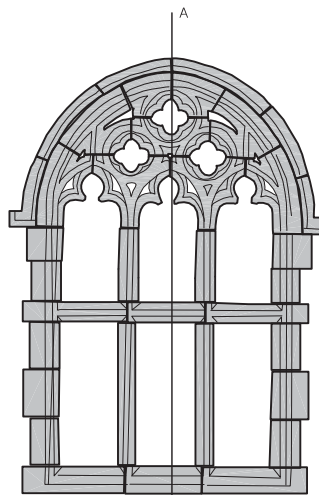
- 6.4.3 The openings at second floor level were built to transmit the sound of the bells. The north elevation tracery opening has a two centred arch, a central mullion composed of two substantial blocks of limestone and transom covered with timber louvre boards (Figure 12). The tracery consists of simple moulded blocks of limestone forming a central quatrefoil and two foils at the top of the upper lights. It has been built into the west elevation of the stair turret, creating a partial springer and losing the long jamb stones and stop on the east side of the opening. Because of its fairly poor condition, with the centrally moulded stones worn and smooth from weathering, it was replaced during the conservation works.
- 6.4.4 The openings of the west, south and east elevations are larger openings, but of similar construction with two mullions instead of one (Figure 12). The tracery on each of these openings consists of nine moulded blocks of limestone forming three quatrefoils and three foils below. The simple hoodmould is formed of two stops and springers with four voussoirs. The east elevation opening is in good condition and has suffered less weathering than the west and south openings, although one mullion has been replaced during the conservation works and is now composed of two limestone blocks. The south window was in very poor condition and the whole tracery opening was replaced during the survey.



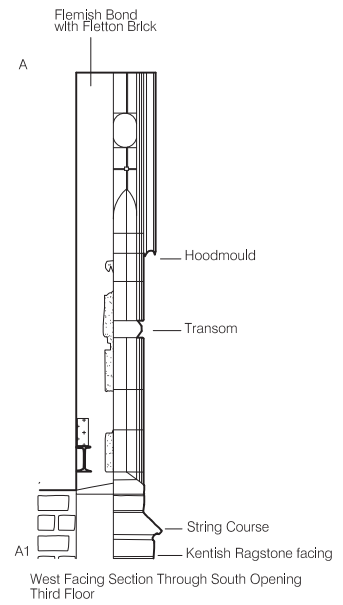
Second Floor Plan of Western Tower



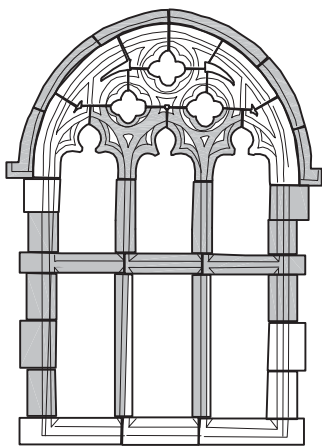
East Opening Tracery
Second Floor



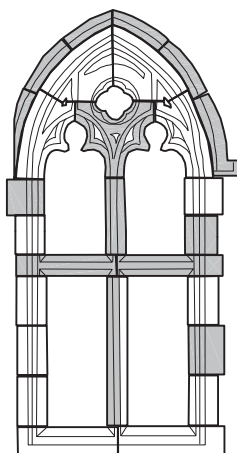
South Opening Tracery - completely replaced
Second Floor



- Key
- Cement
 - Laminated Limestone blocks replaced during current works
 - Victorian Laminated Limestone blocks
 - Timber
 - Beam



West Opening Tracery
Second Floor



North Opening Tracery
Second Floor

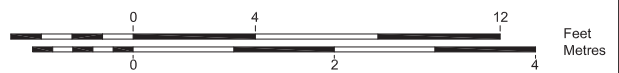


Figure 12
Detail of the second floor opening tracery
1:75 at A4

7 THE HISTORIC SEQUENCE

There is evidence for eight phases of development to the west tower. Historic events such as the Reformation, the plague of 1655, and World War Two have had major impacts on the structure as a whole, although there is a high level of survival of original fabric and features. The original plan also remains largely unaltered.

7.1 Phase I: 15th – mid 16th century

7.1.1 The west tower was built amid fervent ecclesiastic building in Tudor London. The funding for such a prestigious building project was raised entirely by the congregation of St Nicholas'. Recorded donations include eight pence for hanging the great bell by Yeoman Richard Hanson, and three shillings and four pence by John Sulham in 1476 and Thomas Violett in 1483 (Lettwich, 1945).

7.1.2 Although written records help confirm a time frame of construction, they do not conclusively give a date as money could be donated and used later (particularly in the hanging of the great bell). Using a variety of dating sources, such as the building material within the fabric of the tower, architectural styles and contemporary sketches, we can say with confidence that the tower was constructed around 1450 – 1558, the end of the late medieval and beginning of the post medieval period. A late 15th century construction date is more likely, as the tower is constructed of stone rather than the fashionable brick of the 16th century. Several characteristic pieces of ceramic building material (CBM) were identified from this period, predominantly situated at the bottom of the tower. The following table details their type and location:

CBM Fabric	CBM Type	Date	Elevation	Origin
2271	Peg tile (roof)	1100 – 1500+	All elevations	London area
2856	Peg tile	1230 – 1500+	North	London area
3033	Unfrogged brick	1450 – c1700	North NW buttress	London area
Plain Flemish	Floor tile	1350 – 1500	SW buttress	?London area

The mouldings are characteristic of the Perpendicular style (1350 – 1500), although the major styles of decoration overlap considerably and consequently the tower maintains some Early English elements around the west door and interior ground floor door. A sketch by Anthonis van den Wyngaerde of Greenwich Palace in 1558 clearly shows that the tower of St Nicholas', with a timber framed spire, had been constructed by this date.

7.1.3 From the architectural evidence (Figure 61), it is likely that the construction of the tower began with the lower part of the tower walls. The straight mortar joint in the north west facing elevation of the stair turret indicates that further work after initial building had taken place (Parker, 1995). At least 3.45m of the tower walls and buttresses were constructed before the stair turret was built. Above this mortar joint, the join between the turret and the north elevation is filled with small stones before eventually being tied in to the north elevations. Another major characteristic of building after initial construction is that galletting and build lines do not match, as seen in the stair turret and north elevation. Build lines are an important feature in the construction of walls, allowing a chance to level the beds and continue at a level height all the way around the wall. The lowest seven metres of the north elevation suggest that the stair turret and tower were not built simultaneously. However, the vestige of the elevations and buttresses constructed above this seven metres were constructed simultaneously with the buttresses and the elevations tied into one another.

- 7.1.4 The turret's appearance in its bottom seven metres also suggests further work after initial building. The bottom light is not aligned vertically to any of the other lights in the north facing elevation and its lintel extends behind the 1697 church wall, characteristic of an early and original build. The shape of the turret is considerably rounder than the angular walls just above the bottom light. The building material types and sizes show considerable variance to other material found in the rest of the tower. This variety implies that further work was undertaken after the construction of the stair turret. The stonework in the northwest elevation of the stair turret has a different bond pattern to any other buttress, while the mortar mix is also different. Some variation within the mortar should be expected throughout the whole building, as each batch of mortar would have been composed of differing quantities of material. The mortar below the flint band in the stair turret is a pinkish brown lime mortar, while that of the north elevation below the flint band is a mid brown lime mortar with medium chalk and flint fragments, as seen throughout the rest of the tower.
- 7.1.5 Little evidence of the medieval church of St Nicholas' survives. Archaeological investigations in 1976 revealed an early chalk wall foundation abutting the tower (Jones, 1977). The tower was built as an extension to the west end of the church, with the nave arch supporting the west wall once it was broken through. The early archaeology of the tower was revealed during the 1956 restorations, which revealed that it was constructed over part of an already established burial ground, as demonstrated by the discovery of the remains of three human skeletons. It was apparent that the tower space was subject to flooding as a soak-away was cut into its early floor, which was presumably covered with timber floorboards (P78/NIC/155). Above, the two pairs of mortise holes in the north and south walls would have carried fairly substantial square timber beams that supported the gallery. The gallery would have been in use by the choir and bell ringers, participating in the processions and liturgical practice of late medieval London.
- 7.1.6 The 16th century witnessed the effects of the Reformation begun by Henry VIII, continuing with Edward VI (1547 – 1553), and the Counter-Reformation under Mary (1553 – 1558). The architecture of the tower reflects this tumultuous period, particularly in the plain décor and moulding of the arch giving access to the nave, as changes in liturgy required changes in the decoration of the church and particularly the altar. The architecture of the tower reflects the importance of the chancel and altar; the arch would have enabled people entering the church through the west door, under the gallery, to see the chancel focusing in onto the holiest part of the church. The squint in the tower's first floor east wall provided visibility of the altar for those not in the nave. This small, unobtrusive window may have allowed those ringing the bells to observe the process of the service and perhaps receive signals from the priest. The floor was probably tiled with plain glazed Flemish floor tiles in a chequer pattern, a fragment of which was used in the south east face of the south west buttress as a repair, while Dews (1884) mentions oak benches which would have been placed around the nave walls for the elderly or infirm.
- 7.1.7 The prestigious spire of St Nicholas' would have made a huge impact on the Deptford landscape, making the parish church of Deptford a landmark from as far away as Greenwich Park, the River Thames and beyond. St Nicholas' Church was part of a landscape reclaimed from the River Thames, with a series of ditches and river walls constructed to drain the marshy land enough to form meadows and pastures. Although reclaimed, these areas were subject to flooding from rising sea levels, and even the church and tower had been subject to flooding, as is evident by the cutting of soak-aways in and around the church. The church was situated at the head of Deptford Green, around which was a small settlement of houses. In 1514 the Trinity House Corporation built an almshouse with flint walls and clay floor to the east of St Nicholas' to house the poor of the parish. The area was still sparsely populated and was situated on the

periphery of the main local industrial activity at the Royal Dockyards, to the northwest. As well as the dockyards rebuilding and refitting royal ships, the church was near brickfields and kilns – the products of which were presumably used in the fabric of the tower - and was also near several limekilns which presumably provided the lime for the mortar (Phillipotts, 1997).

7.2 Phase 2: mid 16th century - 1696

- 7.2.1 The beginning of the 17th century was a time of growth for the parish church that saw great developments within the tower. By 1603, St Nicholas' had a ring of five bells hung in the belfry, including Richard Hanson's 'great bell', tolling to call the faithful to church and dictating community life. The first bell, or treble, appears to have been rung often, and the May 1672 vestry minutes record that there was no payment to be made for its ringing.
- 7.2.2 The vestry minutes of May 1672 also record not only a set of bells in the tower, but also that by this time a clock bell and clock faces on the north and south side had been installed in the first floor. The clock mechanism and bell would have hung from the wooden frame around the walls on the first floor. The ringing and maintenance of the bell was the responsibility of the sexton, a Thomas Martin, who was paid forty shillings by the parish "soo (sic) long as hee (sic) shall behave himself becoming his employment". The installation of the clock bell is clear evidence of the change in liturgical practices at St Nicholas' by this time, rendering the squint and first floor obsolete. The use, and probably installation, of the ringing platform/gallery on the upper ground floor was essential to accommodate the bell ringers who would have no longer fitted into the first floor with the clock mechanism.
- 7.2.3 In 1630 the East India Company gave a generous donation to the church that permitted the nave to be extended to the north. The relationship between the East India Company and St Nicholas' was not exclusive, reflecting the nature of business rather than a specific relationship, as the company also donated a substantial sum of money to build a chapel of ease in Poplar (East London) 24 years later. The extended nave doubled the size of the church, enabling it to comfortably contain its ever-increasing congregation at a time when parishioners were obliged to attend the services hosted by their church. With a newly extended nave, the chancel was adorned and decorated largely using the donations of Sir William Russell, the treasurer of the Royal Navy (Dews, 1884).
- 7.2.4 After a period of growth and investment in St Nicholas', the church was to be plunged into upheaval during the middle part of the 17th century with the advent of the plagues which swept through London and England at this time. About 1200 victims were buried in a plague pit in the north east corner of the burial ground (Steele, 1993). At this time the fabric of the church suffered understandable neglect, which is evident in the fabric of the church and later reports detailing the state of disrepair the walls had fallen into. From the fabric report, it is apparent that a number of small repairs were made, only those made towards the bottom of the tower surviving. At some time the quoins in the stair turret were replaced, along with the lintels and surround of its bottom light. These stones were set in a mortar which was similar to the earlier pinkish lime mortar, but contained oyster shell. Further repairs were made above the west door and directly above the gabled roof of the church on the east elevation, using the same oyster shell rich mortar. It is interesting to note that the repairs were completed in accessible places either by climbing a ladder or climbing onto a roof. Unfortunately further works, if any, have not survived later periods of building and repair. By 1696 the church had become ruinous.
- 7.2.5 During this time, the church of St Nicholas' slowly became a focus for settlement around Deptford Green along with the development of the Royal Dockyard. A

series of docks and wharves for private companies, such as the East India Company, were added, and the population of the dockside community slowly increased. Peg tile roofs of tenements, constructed in 1608, grew up to the east of the church. A red brick almshouse associated with a new Trinity House Hall and chapel, and later known as Trinity Hospital, was also built on the east side of St Nicholas' Church in the late 17th century. The house provided for 24 seamen's widows (Phillpotts, 1997).

7.3 Phase 3: 1697 – 18th century

7.3.1 Around 200 years after its construction

"Politicians were obliged to pull down the Parish Church which was ruinous and upon the same foundacon (sic) did build a decent new church"

(Vestry minutes, 1710)

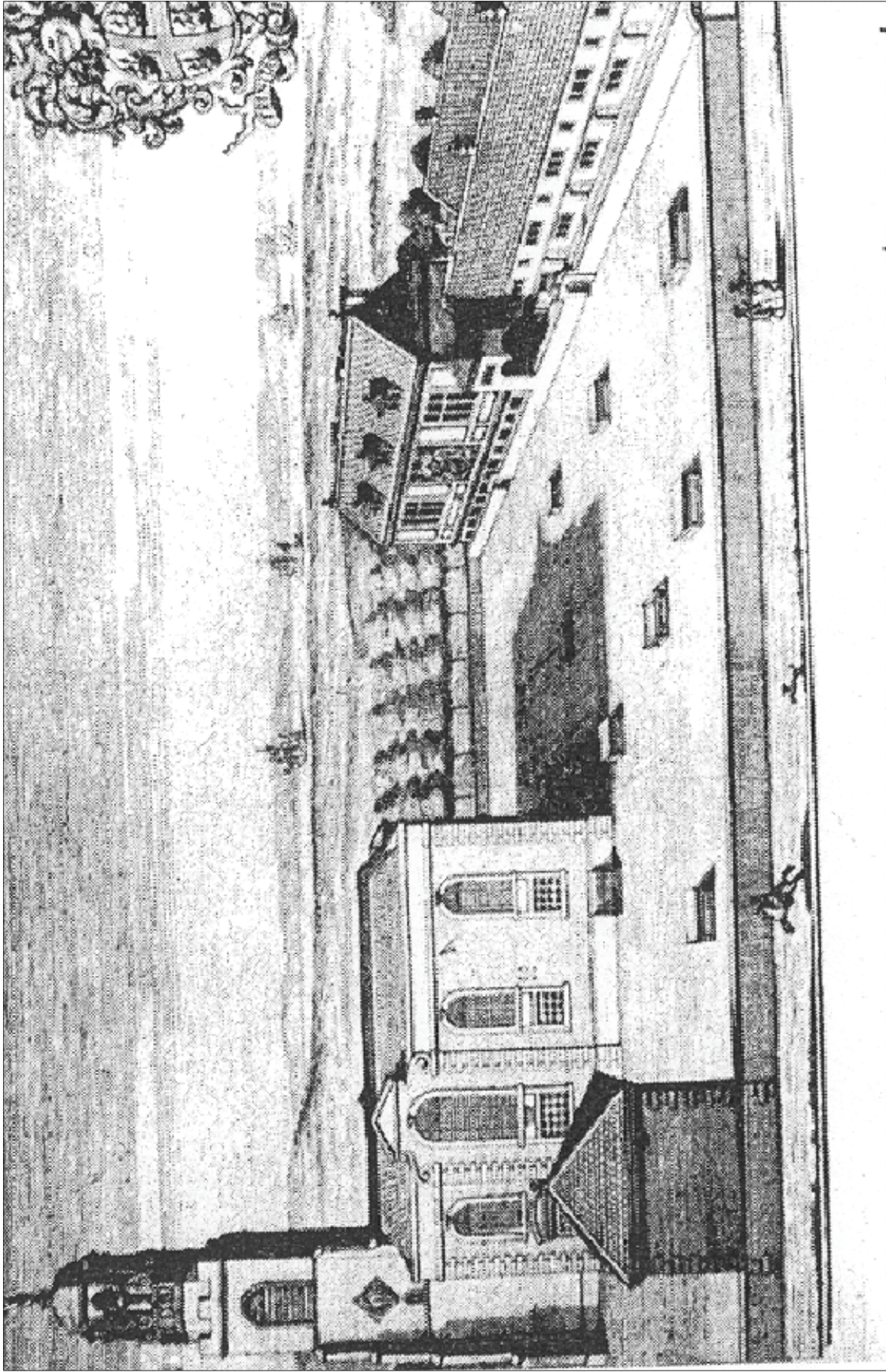
The fact that it housed the bells, clock and associated mechanisms appears to have saved the tower from destruction during the demolition of the medieval church. Repairs were made to the tower throughout this period, particularly on the east elevation where the void created by the new church roof was filled with procured material such as stone from local buildings or ballast, material to hand in a maritime community that loaded and unloaded ships and boats at the dockyards. From the archaeological evidence and contemporary paintings (Vosterman, 1680), the new church roof was a double-pitched gabled roof with a rise of 3.10m and run of 2.20m where it crossed the east face of the tower. The roof was tied into the south buttress, evident by the later insertion of roughly hewn gneiss blocks rather than the quoins seen elsewhere in the tower.

- 7.3.2 The form of the tower, however, did not remain unchanged (Figure 13). A flight of straight steps was constructed from the west door to span the difference between the churchyard and tower space, and remained until the mid 20th century. A contemporary painting by Jan Griffier the elder shows the wooden spire of St Nicholas' gone and in its place a cupola erected, no evidence of which survives in the tower's fabric. Building work continued in various stages for at least 33 years, with funding becoming increasingly difficult. A petition was placed in the House of Commons on February 1710 to:

"Put forward 6,000 pounds or such other sums as to yor (sic) wisdom of this Hon House shall soon fit for Rebuilding their steople (sic) and Building Another Convenient Church Especially since wee (sic) Have not assummed (sic) to ask assistance from any Public Fund"

(Vestry minutes, 1710)

- 7.3.2 The fabric and structural soundness of the tower became increasingly uncertain. A brick crypt was built under the church and partially running into the tower space, extending beneath the base of the columns to the nave arch (P78/NIC/155). This weakened the tower, and in 1713 one of the five bells was removed to a lower floor, to ensure that the structure was not compromised any further (Gurnett, 1992). It may have been hung in an adapted timber clock frame. This suggests that the clock had been dismantled by then, leaving the wooden frame in-situ. The resulting voids from the removed clock faces were filled with flint flushwork diamonds. It is possible that other blocking material was used initially and that the flint fragments were a later replacement, although this is not certain. By 1716 the tower required strengthening, and four tie rods spanning the width of the tower were installed.



© Pre-Construct Archaeology Ltd

Figure 13
St Nicholas' Church, 17th century drawing
Greenwich Heritage Centre

7.3.3 A new ring of eight bells was cast in 1702 at the Cripplegate Bell Foundry, the only recorded ring to have been cast there and sent to the same belfry (P78/NIC 160/2). The bells were hung by 1718 in a new two independent tier cast iron frame. Five bells (the treble, bell 2, bell 4, bell 5 and the tenor) were hung on the lower tier while the remaining three bells (bell 3, bell 6 and bell 7) were hung in the upper tier. The following table records their details:

Bell	Weight	Diameter	Cast	Founder	Inscription	Shillings to ring
1	5 ¼ cwt	30"	1701	Samuel Newton & Isaac Hadley	1701	0
2	5 ¾ cwt	30 ¼"	1701	"	1701	2
3	6 ¼ cwt	32 ¼"	1701	"	1701	4
4	8 ¼ cwt	36 ½"	1701	"	1701	6
5	10 cwt	39"	1702	"	1702	9
6	12 ¼ cwt	41 ½"	1701	"	1701	10
7	15 cwt	44 ¼"	1701	"	SNIH 1701	12
8	20 ¼ cwt	49"	1701	"		15

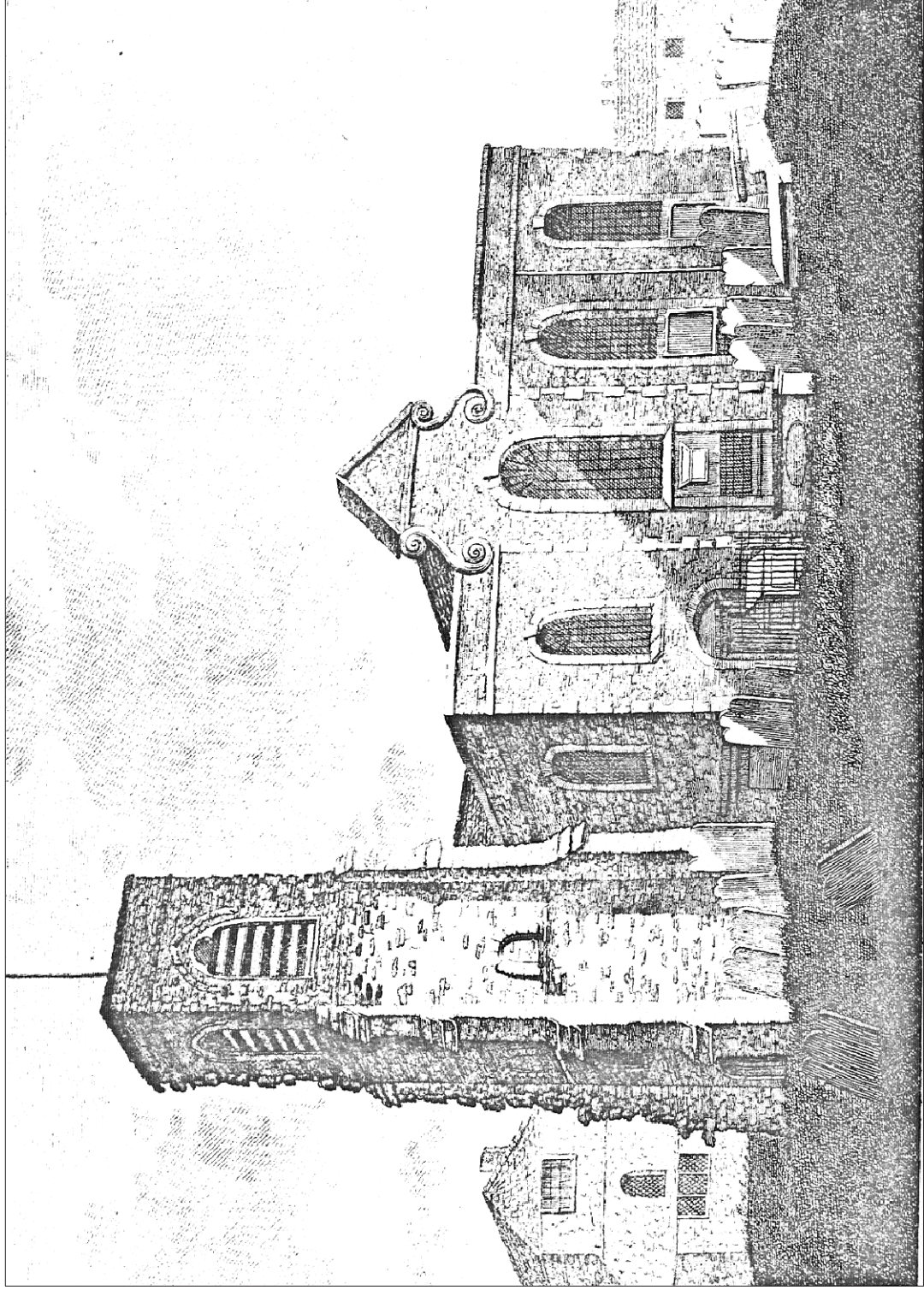
The Felstead Peal Records state that the first recorded peal³ rung from the tower was a Plain Bob Major in 1741.

7.3.4 Samuel Priestman, appointed by an Act of Vestry dated 1st September 1712, was the first sexton and was paid two pounds every quarter to maintain the condition of the new church and tower. The 1717 vestry minutes record the requisition of a well and pump, which were situated at the bottom of the straight flight of steps and were found during the 1956-58 works. The vicar records that the well was twenty feet deep and built of brick, with an iron pipe leading to the tower (P78/NIC/155).

7.3.5 The rebuilding of St Nicholas and the alterations to the fabric of the western tower were necessary to preserve the church in a competitive and imitative period of building (Platt, 1978). The new cupola bore a striking resemblance to the cupola of neighbouring St Alfrege to the east, illustrated in contemporary paintings which feature it adjacent to the spire of St Nicholas. The cupola integrated the tower with the classicism of the rest of the church and represented a monument of prestige, particularly after the addition of the ring of eight bells. This was particularly important after 1730 when the medieval parish of Deptford was divided, due to an increasing population, to create a parish for a new Queen Anne church of St Paul.

7.3.6 With a newfound classicism, St Nicholas' church formed a renewed focus to the development and community of Deptford Green. Rocque's 1745 map shows the church bounded with houses built to the west and east, which were similar to those found to the south of the church in present day Aldbury Street. Foundations of the almshouses of the Corporation of Trinity House and tenements of red brick were found during excavations of Greenwich Reach, by PCA Ltd (Butler et al, 1996). Ministry to the poor of the parish was a major concern to the vicars of St Nicholas' with the vestry minutes dominated by references to alms given to the needy and, after 1740, moving the deprived to the workhouse. The local workhouse was just to the northeast at the old manorial house of Sayes Court, and destitute parishioners continued to live there until a new workhouse was constructed in 1759 (Phillpotts, 1997).

³ A peal consists of over 3,000 changes in the order of the way the ring of bells are rung. It takes three hours to ring a complete peal. (Coleman, 1999).



© Pre-Construct Archaeology Ltd

Figure 14
St Nicholas' Church, 19th century etching
Published February 4th by S.Woodburn No.112 St Martin's Lane, London

7.4 Phase 4: 18th century – 1901

7.4.1 Contemporary drawings show that the cupola had been demolished by this time, probably as a consequence of the structural weakness of the tower exacerbated by the extra loading of the cupola. The removal of the cupola would also have made the tower appear to be more gothic, an important factor during the period of the Gothic revival (Figure 14). ‘Restoration’ above the first floor stringcourse to preserve the “Gothic archway to the church” was recommended by a local surveyor who also noted an alarming list of the tower five feet to the south (Dews, 1884, 64). Evidence of this phase of ‘restoration’ is preserved throughout the whole of the tower as patches of Roman cement and stones bonded in that material. The hexagonal bolts indicate a post 1820s date for the cross-shaped tie plates and rods. The Fletton brick in the fabric behind the cross-shaped tie plates indicates that they post date the late 19th century; therefore they date to 1901. The ring of eight bells was still complete and contemporary accounts tell of the tower shaking when they were all rung. By 1780 the tenor bell, which was now 153 years old, was in need of repair and was subsequently recast. It was recast again 62 years later in 1842 by Thomas Mears II (Figure 10).

7.4.2 Maintenance and use of the tower and churchyard is very much evident towards the end of the 19th century. Mr. Dinwiddy the local surveyor noted that

“It bears evidence of changes, and of former large openings being filled in, both above the second belfry floor level... A flint panel fitted on the south side suggests a former sundial”

(Dews, 1884,63)

7.4.3 The well in front of the west door steps was demolished, filled with rubble and capped with old tombstones, one bearing a date of 1789 (P78/NIC/155). Further repairs with Roman cement were made to the exterior fabric, while inside graffiti was scratched into the south walls. The graffiti is level with the ringing gallery, and the eight initials scratched together in one place on the wall suggest some form of initiation of bell ringers (Figure 7).

7.4.4 The changes in the west tower of St Nicholas’ are reflective of a change in the community. By 1830 the once industrious dockyard was in slow decline reverting to ship breaking, and by 1869 the dockyard had closed and was turned into the foreign cattle market. Sayes Court was also demolished and converted to a public park (Divers, 2001). In 1877 the Trinity almshouses were also demolished to make way for terraced housing, the foundations of which were found in the 1993 evaluation at Berthon Street (Wooldridge, 1993). Streets of terraced houses began to appear as the focus of economic activity shifted from the dockyards to Deptford, where a wide range of industries, such as brew houses and timber yards, had appeared alongside market gardening serving the City of London (Phillpotts, 1997). The Norman Road watching brief revealed the 19th century cultivated soil of these market gardens (Askew, 1997). The increasingly humble appearance of the tower reflected the lack of ostentatious display of wealth in the community. The new non-conformist chapels that were appearing in the parish at this time provided competition for resources and meant that the congregation was not as wealthy as it once was.

7.5 Phase 5: 1900 – 1939

7.5.1 The large Y tracery window, which threw light onto the ringing platform/gallery and nave, has an apron inscription concerning the storm in 1901 that damaged the top of the tower. The Fletton brick, faced with the Kentish ragstone laid in Portland cement-based mortar, is evidence that the whole belfry and roof was rebuilt. New louvred geometric tracery openings were installed in each elevation

that helped transmit the sound of the bells. During this major building work, the eight bells were taken down and the church closed. The lower cast iron bell frame was bolted to the beams below with square bolts. The upper part of the lower frame and the upper frame had hexagonal bolts. The square bolts may denote an earlier phase, and may indicate that the lower frame was left in-situ during the 1901-1903 works. New stringcourses and window surrounds were built, and each of the buttresses was re-faced and pointed with Portland cement-based mortar. An extra stage was added to the southeast buttress, by laying ragstone completely in Portland cement-based mortar (Figure 15). The roof was replaced with asphalted concrete and the stair turret raised to provide easy and protected access to the roof and flagpole (Figure 5). A boiler and associated chimney were installed in the tower space against the nave arch (P78/NIC/155).



FIGURE 15: View of the southeast buttress showing the Kentish ragstone set in Portland cement-based mortar

7.5.2 The bells were re-hung in the belfry by John Warner and Sons, and the Bishop of Rochester rededicated the tower on 11th November 1904. By the 1930's the church and tower had become surrounded by houses, the latest developments being the St Nicholas House flats built by the London Power Company to house its workers, a factory in the old almshouses to the east of St Nicholas' making canvas sacks, and poor housing of multiple tenancies (Phillpotts, 1997).

7.6 Phase 6: 1939 – 1949

7.6.1 At the outbreak of World War II, St Nicholas' bells fell silent for the second time in their history. The last peal to be recorded in the Felstead Peal Records was a Plain Bob Major on 6th March 1939, the first recorded peal rung by the same peal of bells and not rung since. An incendiary bomb severely damaged the church in October 1940, forcing it to close for 15 years.

7.7 Phase 7: 1950 – 1958

7.7.1 Correspondence with various authorities, including the Ministry of Defence, procured financial grants to commence re-building. The architect for the project was Mr Thomas F Ford, assisted by Mr Alan Ford, Mr AT Bradford, Mr Myeth and Mr Halliday, who designed the present day tower space. An essential part of this

progress was the successful application to English Heritage for the listing of the church building on 19th October 1951 and the scheduling of the west tower as an Ancient Monument on 30th January 1952 (P78/NIC/155).

- 7.7.2 However, the bells were not so fortunate. The crowns were fractured, gudgens and bearings worn and rusted. The wheels on the treble, third and fifth bells were also broken, and the fifth and fourth bell were cracked (P78/NIC/160/2). Being in such poor condition, the only option was to sell the second, third, fourth, fifth, sixth and seventh bells for scrap metal – the proceeds going towards the Restoration Fund. The treble and tenor bells were re-hung for tolling. Consequently, the now redundant ringing platform in the former gallery was also demolished leaving the two pairs of mortise holes and the blind doorway halfway up the tower space walls (P78/NIC/155).
- 7.7.3 Access was created to the tower from the outside by the present day steps, retaining brick wall and drain (to prevent flooding of the tower space). Inside, access to the tower space was created by the addition of a straight flight of concrete steps with decorated wrought iron handrails either side. The chimney and boiler were taken down, and the 17th century brick crypt was partially cut to reveal the bottom of the arch. The present newell post stairs replaced the rotten wooden stairs, creating easier access to the upper floors. Access to the new church roof space was created with the insertion a small hatch into the east wall of the first floor (Figure 29). The rubble was then used to infill voids in the tower fabric before it was plastered and whitewashed (P78/NIC/155).
- 7.7.4 The restored church and tower of St Nicholas' was re-dedicated on 14th February 1958 by the Rt Revd. The Lord Bishop of Southwark in the presence of HRH The Duke of Gloucester.

7.8 Phase 8: 1959 – 2004

- 7.8.1 At the beginning of the 21st century, about 500 years after the initial construction of the tower, further works were required on the exterior fabric of the tower to restore and conserve features. A detailed survey was undertaken by PCA Ltd in 2004 to record stone by stone the fabric as it existed before, during and after conservation work.

8 DISCUSSION & CONCLUSION

- 8.1 The original 15th to mid 16th century tower survives in good condition up to a height of 13m from the modern day ground level. Preserved within its fabric is evidence of various architectural styles, functions and fittings. Although structurally the original tower was very different from the present day tower, with a bell for tolling and a timber framed spire, the modern day tower still houses tolling bells.
- 8.2 The different values and functions of St Nicholas' church tower are clearly delineated architecturally. The tower changes dramatically from a medieval monument of prestige and display prominently visible in the landscape with a wooden spire and then cupola, to a more functional space, used primarily for the storing and ringing of bells, in the 18th century. The 1901-1903 work to an extent reinstated the building as an imposing gothic monument, although it continued to function as a utilitarian space with the installation of the boiler and chimney, and the storage of wall monuments during the 1956-8 restoration.
- 8.3 The tower has reflected the wealth of the community surrounding St Nicholas'. The cupola, along with the bells, was affecting the structural integrity of the tower yet was still retained, in order to proclaim the wealth of the community and its associations with the Royal Dockyard, Sayes Court and the Royal Palace of Greenwich. It also conferred a fashionable classicism to the tower that maintained a better relationship between the tower and the main body of the Baroque church.
- 8.4 The tower's architectural development and its adherence to shifting fashions provide a record of the changing economic fortunes of the community. The original Perpendicular tower was not very fashionable, with a plain nave arch, thick solid rubble walls, relatively muted mouldings and a spire of timber rather than stone. This may indicate that the parish was not wealthy at that time. The church is not likely to have been built long after the beginning of the 16th century as stone was chosen rather than brick, which was becoming increasingly fashionable by the mid 16th century. The addition of the cupola and clock represent an attempt to keep pace with the classical fashions of the period. The fact that the tower was not completely rebuilt in the restrained Baroque style when the body of the church was, also indicates a relative lack of wealth. It must also be mentioned that these developments took place at a time when church building was a more centralised activity and that the congregation paid for the alterations to St Nicholas'. The decay of the tower in the 19th century is indicative of economic decline and reflects the relative lack of commitment to religion at the time. The survey and repairs of the later 19th century and the major rebuilding of the early 20th century took place during a period of religious revival and accorded with the architectural principles of the Gothic Revival. The external decorative enrichment of the early 20th century part of the tower accords with the penchant for fine craftsmanship that resulted from the Arts and Crafts movement. The lavish work of 1901 – 1903 also took place at a time of economic prosperity. The 1950's alterations were functional, not executed in the Gothic style, and the bells were sold as the emphasis of the works was on the main body of the church. This may have been a result of economic prioritisation but may also have reflected the fact that the previous functions of the tower were not seen as being central to liturgical practices as they once were.
- 8.5 The different functional spaces within the tower are clearly delineated by their differing architectural treatment. The most viewed area was the ground floor tower space, as an access route to the nave of the church, and consequently this is the most highly decorated area with the nave arch, plaques, whitewashed walls and decorative redundant doorway to the former gallery. Tiled flooring is used on the hardwearing access route and for ringing the bells. This contrasts with the parquet flooring of the church and the floorboards of the first and second floors.

The interior wall faces above the upper ground floor are not internally plastered, and the patches of brick left uncovered on the internal walls reflect the fact that the tower was in essence a utilitarian space. The third floor even lacks electric lighting.

- 8.6 The west tower of St Nicholas' Church is of historic interest both locally and regionally. It is a rare survival of Perpendicular architecture in the area. Of particular interest is the 17th century timber bell frame on the first floor, as few examples remain in-situ. Although substantial alterations have occurred since the tower was originally built, the original spaces and historic sequence within the tower are well preserved.

9 ACKNOWLEDGEMENTS

The author and PCA Ltd would like to thank the vicar, PCC, churchwardens and congregation of St Nicholas' Church, Deptford for commissioning and funding the work. We would also like to thank Austin Winkley & Associates for writing the brief and the staff of Greenwich Heritage Centre for their archival assistance.

The authors would like to thank Ken Sabel for managing the project, Karl Hulka for initial supervision and the preliminary plan and section CAD drawings, John Brown for his assistance with the site recording, Fiona Keith-Lucas for advice on the timbers, Cheryl Blundy for the site photography and colleagues for the photogrammetric survey; also Josephine Brown, Hayley Baxter and Cheryl Blundy for their invaluable assistance with the primary CAD elevation drawings.






10 BIBLIOGRAPHY

- Askew P, 1997 *53 Norman Road, Greenwich, London SE10, London Borough of Greenwich An Archaeological watching Brief, MoLAS*
- Brooke CJ (ed), 1994 *The Archaeology of Bellframes* Institute of Field Archaeologists Buildings Special Interest Group
- Brunskill RW, 1988, *Timber Building In Britain*, Victor Gollancz
- Butler J, Pine C A & Williamson V D, 1996 *Report on the Archaeological and Geoarchaeological Evaluation of land at Greenwich Reach in the London Borough of Greenwich for Fairview Homes* PCA Ltd
- Coleman S, 1999, *..The Bell ringer's Early Companion* Sue Coleman Publishing
- Drake H H (ed), 1886 *Hasted's History of Kent vol 1 The Hundred of Blackheath*
- Dews N, 1884, *The History of Deptford*, JD Smith
- Divers D, 2001, *An Archaeological Evaluation of Convoys Wharf, Deptford* PCA Ltd
- Gurnett PAT, 1992 *Guide to the Ancient Parish Church of Deptford* An Historic Deptford Publication
- Jones DT, 1977 *Archaeological Investigation Carried Out at St Nicholas Church, Deptford 27th & 28th November, 1976*, London South East Archaeology Group
- Lettwich BR, 1945 *The Church and Parish of St Nicholas, Deptford* The Ecclesiological Society
- Mattinson R, 2001 *An Archaeological Watching Brief at Pepys Estate, Deptford, London Borough of Lewisham* PCA Ltd
- Morriss R K, 1988 *The Archaeology Of Buildings* Tempus
- Phillpotts C, 1977 *Deptford Creek. Archaeological Desk Based Assessment*, PCA Ltd
- Platt C, 1978 *Medieval England* Book Club Associates
- Slater D, 2002 *An Archaeological Watching Brief at St Nicholas' Church, The Stowage, Deptford* PCA Ltd
- Steele J, 1993 *Turning The Tide, The History Of Everyday Deptford* Deptford Forum Publishing Ltd
- Wragg E, 2004 *An Archaeological Watching Brief at 15 – 19 Watergate Street, Deptford, London Borough of Lewisham* PCA Ltd
- Woodlridge K, 1993 *Ida Works, Blackhorse Wharf, Grimstead Road, SE8*, MoLAS
- Worldwideweb.kent.lovesguide.com Ring of 8 Church Bells at St Nicholas, Deptford

Greenwich Heritage Centre	<i>A View of the Two Distinct Bodys of Almshouses at Deptford in Kent belonging to the Corporation of Trinity House, who built the lower part in ye years 1671 & 1680</i> 17 th century St Nicholas' Church Drawing
Greenwich Heritage Centre	19 th century Etching of St Nicholas' Church
Greenwich Maritime Museum	Anthonis van den Wyngaerde; <i>Greenwich Palace</i> Sketch 1558
Greenwich Maritime Museum	Jan Griffier the Elder; <i>View from One Tree Hill: The Queen's House and the Royal Observatory, Greenwich</i> Painting c 1651 - 1718
Greenwich Maritime Museum	BHC 1818: Hendrick Danckerts; <i>Greenwich From The Park Showing The Queen's House</i> Painting c 1670
Greenwich Maritime Museum	Johannes Vosterman; <i>View From One Tree Hill</i> Painting c1680
London Metropolitan Archive	X92/183 Vestry Minutes 1628 – 1797
London Metropolitan Archive	P78/NIC/155 1956–1961 Vicar's diary of the restoration, including correspondence
London Metropolitan Archive	P78/NIC/160/2 Bell restoration correspondence

KEY FOR USE WITH ELEVATIONS






Key to Stone Types

	Kentish Ragstone (Grey Sandy Limestone)
	Flint
	Laminated brown Sandstone
	Grey Glauconitic Shelly Sandy Limestone
	Obscured
	Void
BA	Basalt
BR	Brick
BS	Brown glauconitic limey sandstone
C	Conglomerate of flint pebbles and brown sandstone (Ferricrete)
CH	Chalk
D	Dolomite
GM	Grey Mudstone
GR	Granite
GS	Green sandstone
P	Pebble
PM	Purbeck Marble
R	Reigate Limestone
RL	Red fossiliferous limestone
RS	Red coarse grained sandstone
S	Septaria
SSS	Brown coarse grained shelly sandstone
T	Tile (Fabric Type 2271 unless stated)
V	Vesicular Limestone

Key to Weathering

WU	Worn and Unstable
WS	Worn and Stable




Key to Mortar Types

	Pale Lime Based Mortar		Portland Cement Based Mortar
	Brown Lime Based Mortar		Roman Cement Based Render
	Oyster Shell Rich Mortar		

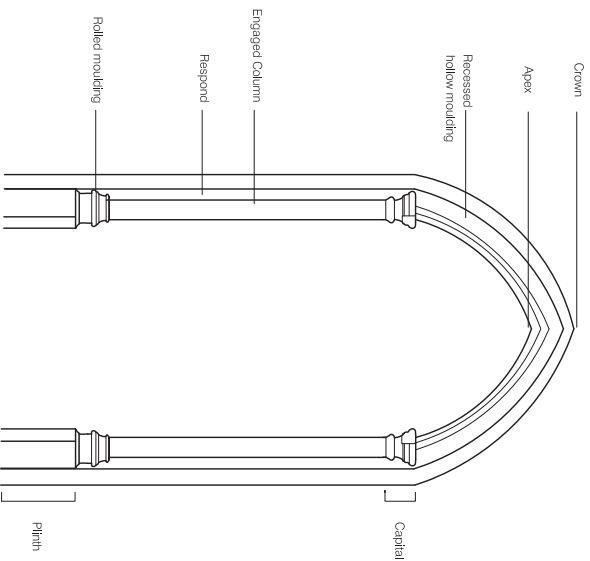
Key to Ceramic building material

2271	Ineffeciently fired orange peg tile, London area, dating 1100 -1500+
2856	Orange tile with frequent sand dating 1230 - 1500+
3033	Orange unfrogged brick from local brickearth 1450 - c1700
3034	Silty orange unfrogged brick from local brickearth

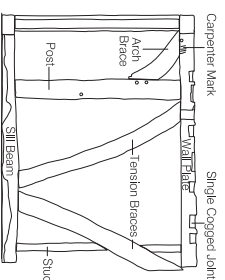
Other

	Metal
	Wood
	Window opening

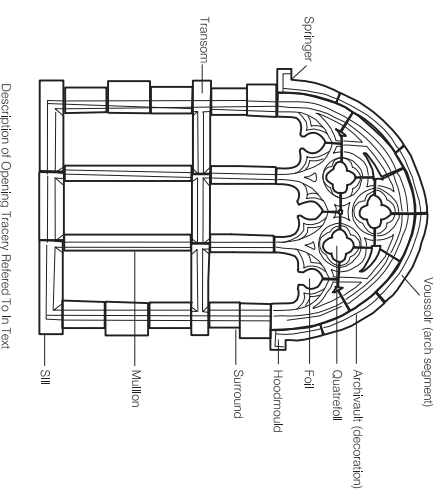
APPENDIX 1 : GLOSSARY OF TECHNICAL TERMS



Description of Nave Arch
Features Related To In Text



Description of Clock Frame
Members Related To In Text



Description of Opening Tracery Related To In Text

BALLAST
BELFRY
BOND
BOSS
CHAMFER
CHANCEL
CHARNEL HOUSE
CUPOLA
DIOCESE
DOWNPIPE
EMBRASURE
PEAL (OF BELLS)
PORTLAND CEMENT
POST MEDIEVAL
PULLOCK HOLE
QUOINS
ROMAN CEMENT
TOLLING

Weight used to balance a ship or boat

Room at top of a church tower used to hang and ring bells

Pattern of brick and stone laid in a specific way

Projecting stone from wall elevation which is often decorated

Moulded stone protruding from a wall face which often acts as a hood mould

East end apse of a church where the altar is situated

Small structure used to lay and store the dead

Decorative dome in a classical style

Region of Church administration covering several counties

Metal pipe set vertically down the face of a wall to caollect and drain rain water from the roof of a building

The opening of a doorway, often moulded

A peal consists of over 5000 changes in the order the ring of bells are rung. It takes three hours to ring.

20th century sharp sand mix to bond beds of stone or brick together

Period of history from 1485 onwards

Square hole in the fabric of a wall used to support large timber posts of scaffolding

Large, well dressed stones at the corner of elevations

19th century render used to repair and make building fabrics watertight. Usually has pabbles and other stone within it

A bell is rung with its mouth facing up. From there it is rotated full circle with the bell sounding once when rung.

Tolling is where a bell is rung with its mouth facing down and swung side to side with the bell sounding twice when rung.



Figure 18: View Of The West Timber Frame



Figure 19 : View Of The South Timber Frame



Squint



Figure 20: View Of The East Timber Frame



Figure 21: View Of The North Timber Frame

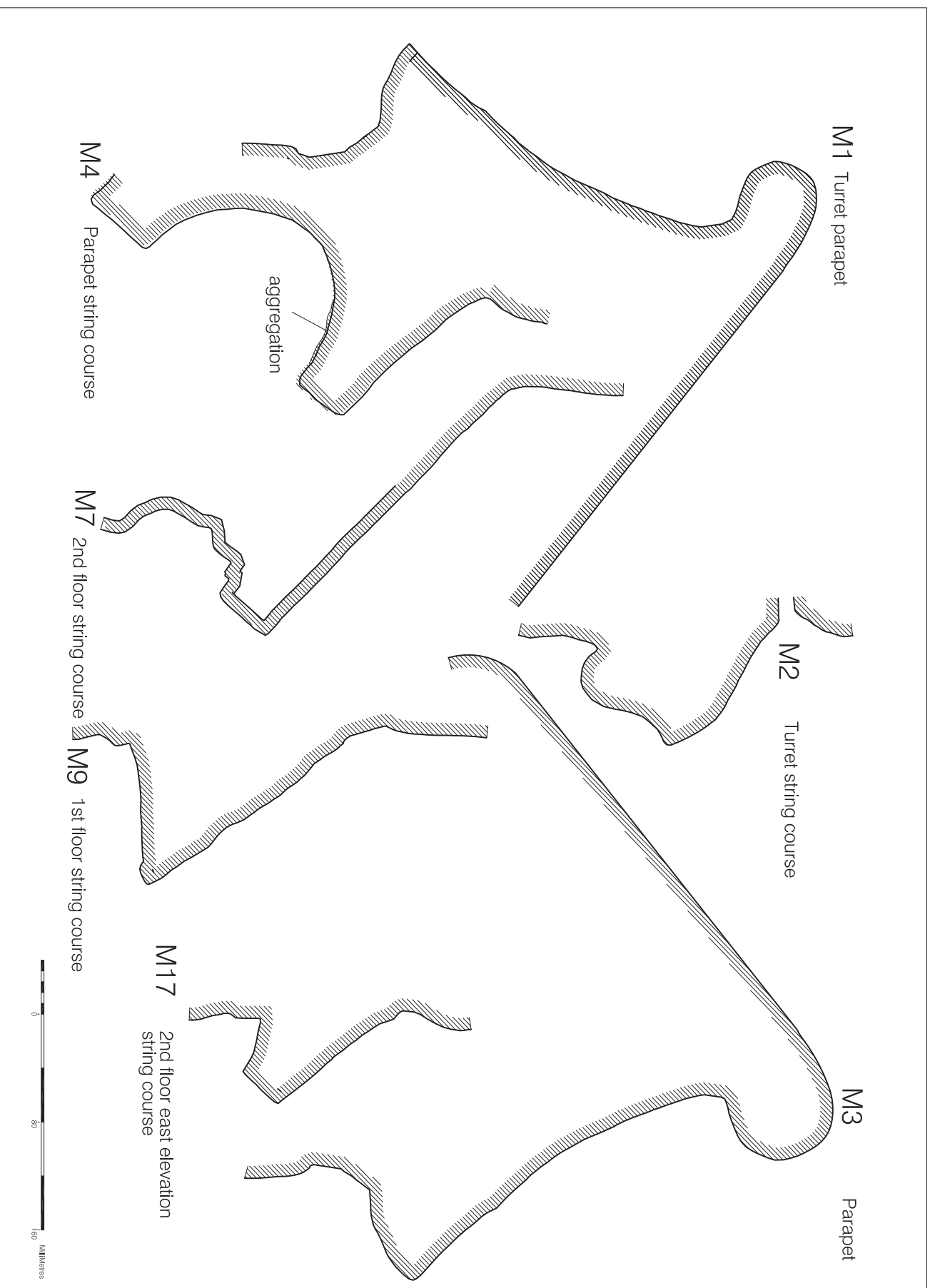
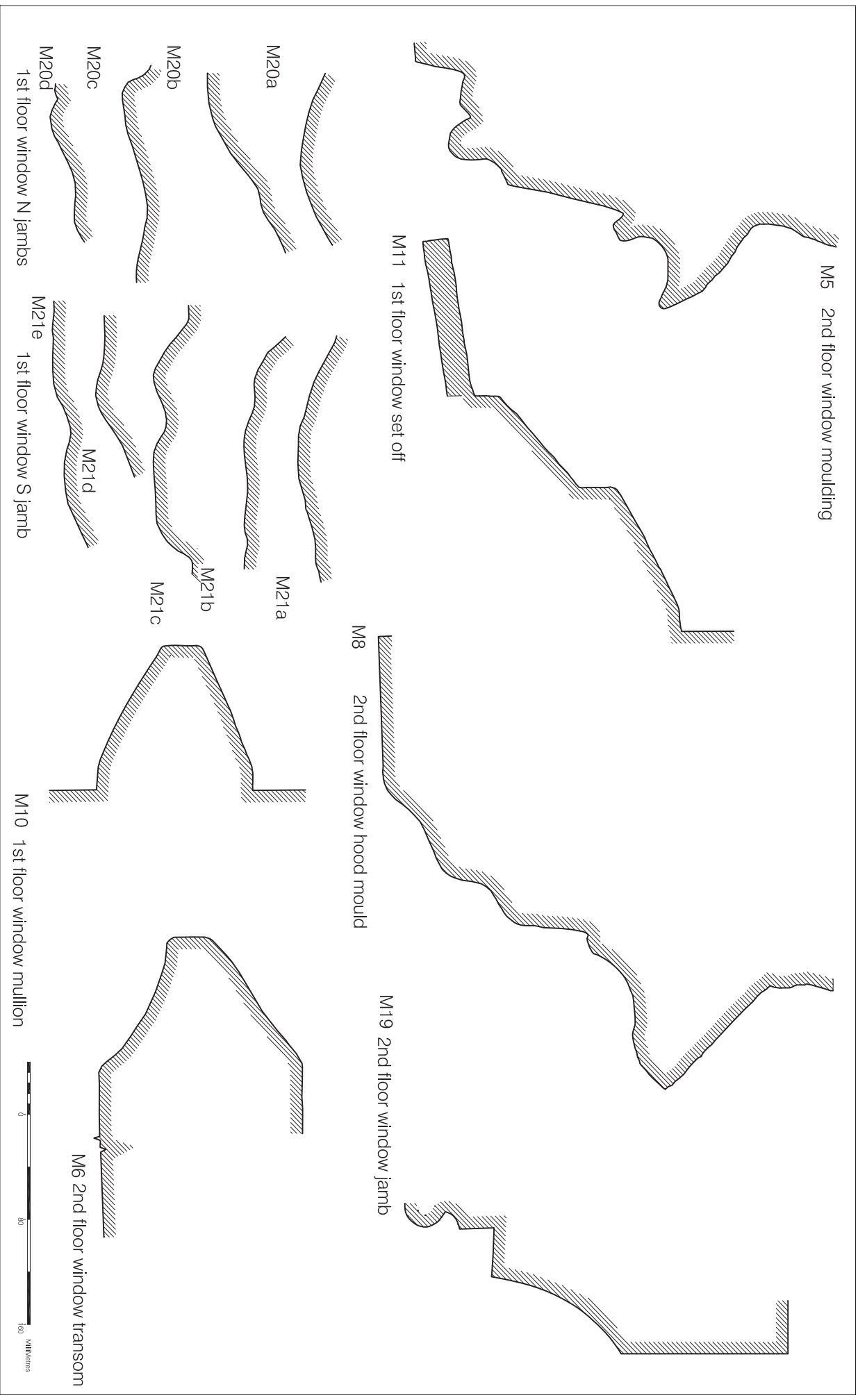
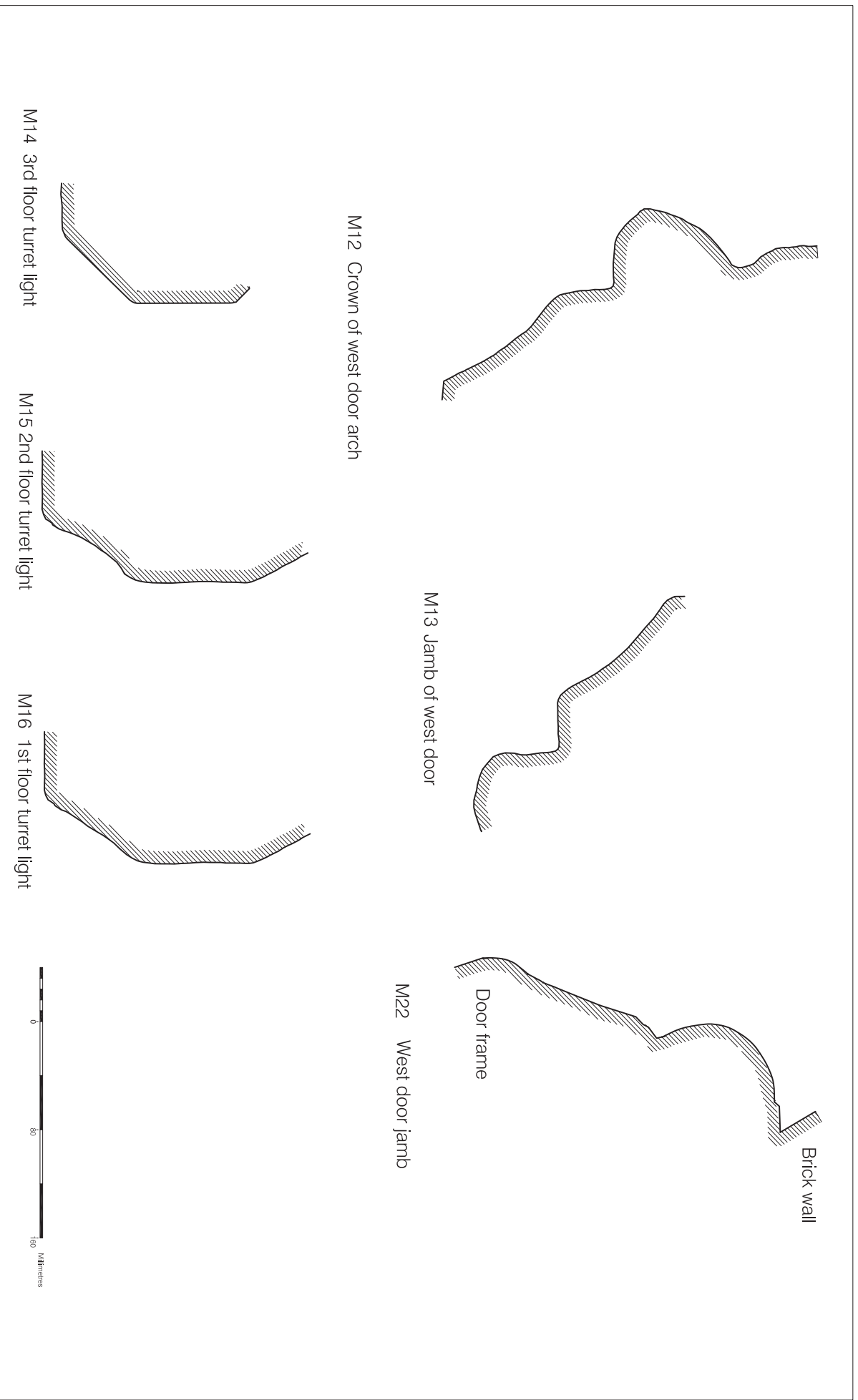


Figure 22
Moulding profiles of the parapet, turret and string courses
1:4 at A4



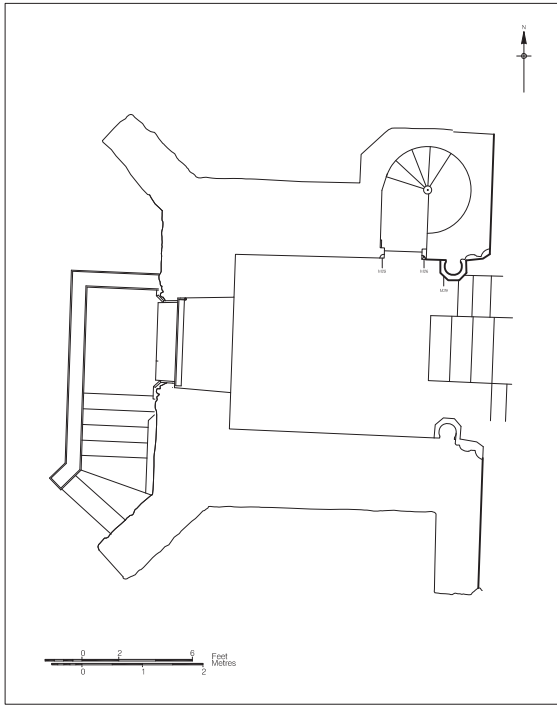
© Pre-Construct Archaeology Ltd

Figure 23
Moulding profiles of the windows
1:4 at A4

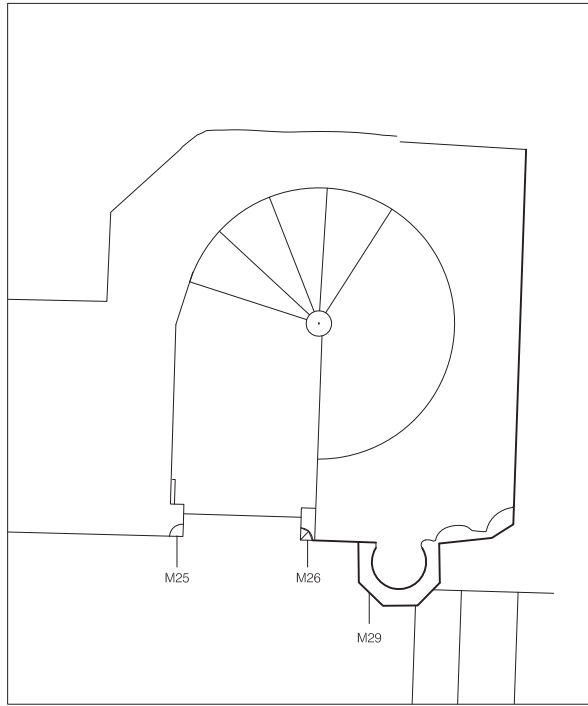


© Pre-Construct Archaeology Ltd

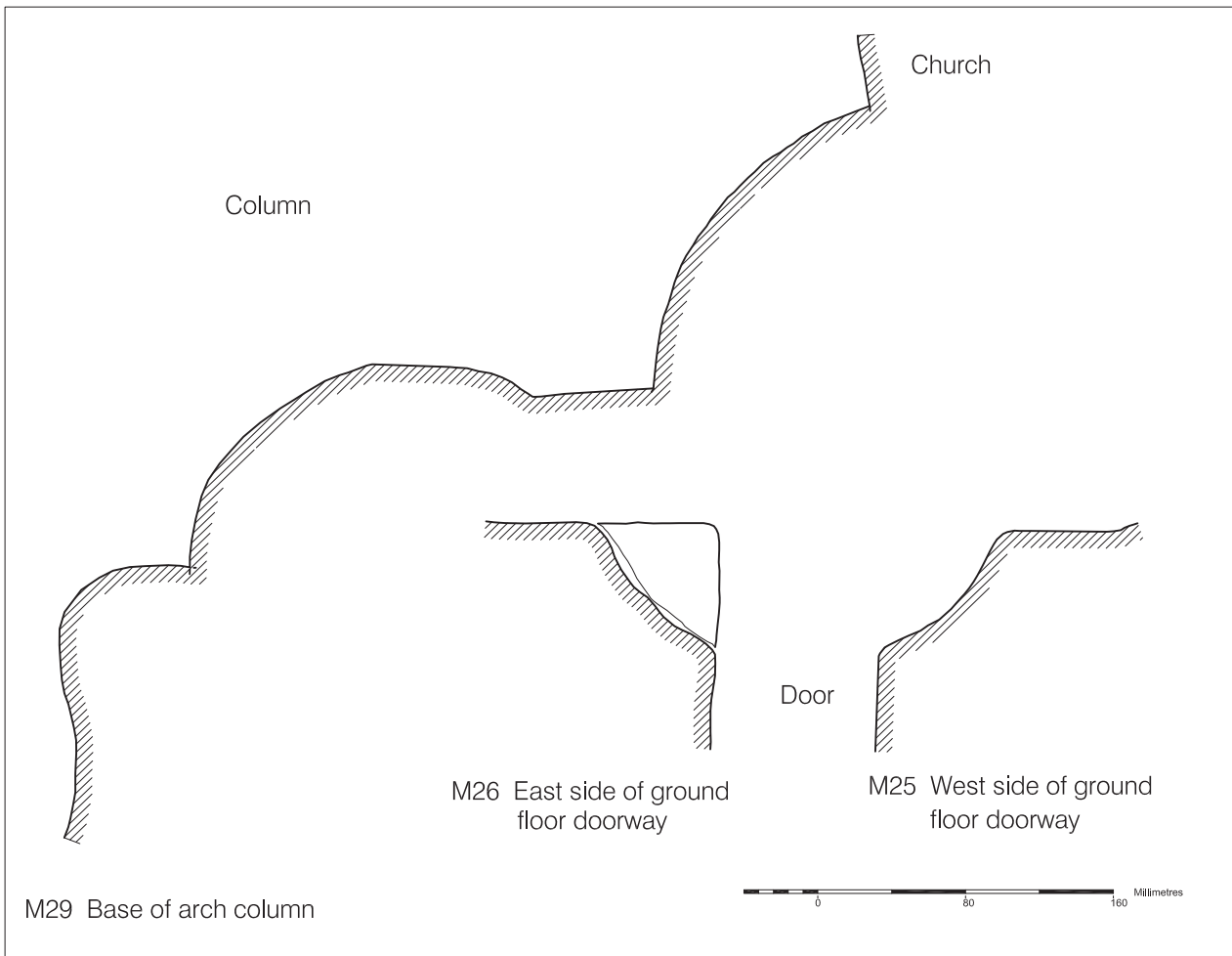
Figure 23a
 Moulding profiles of the west door and openings
 1:4 at A4



1:125

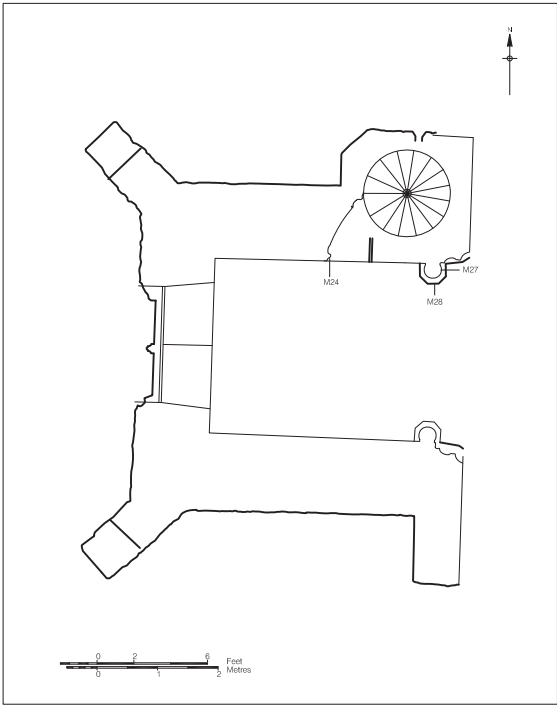


Moulding Locations
1:40

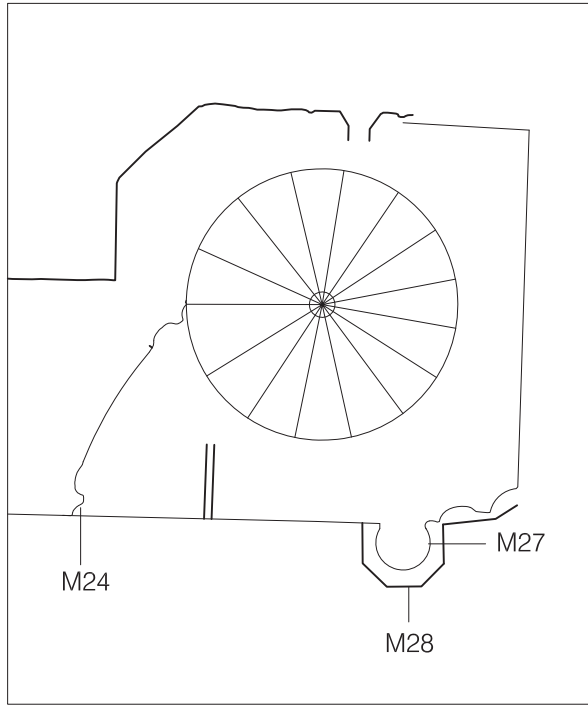


© Pre-Construct Archaeology Ltd

Figure 23b
Moulding profiles of the interior ground floor
1:4 at A4



1:125



Moulding Locations
1:40

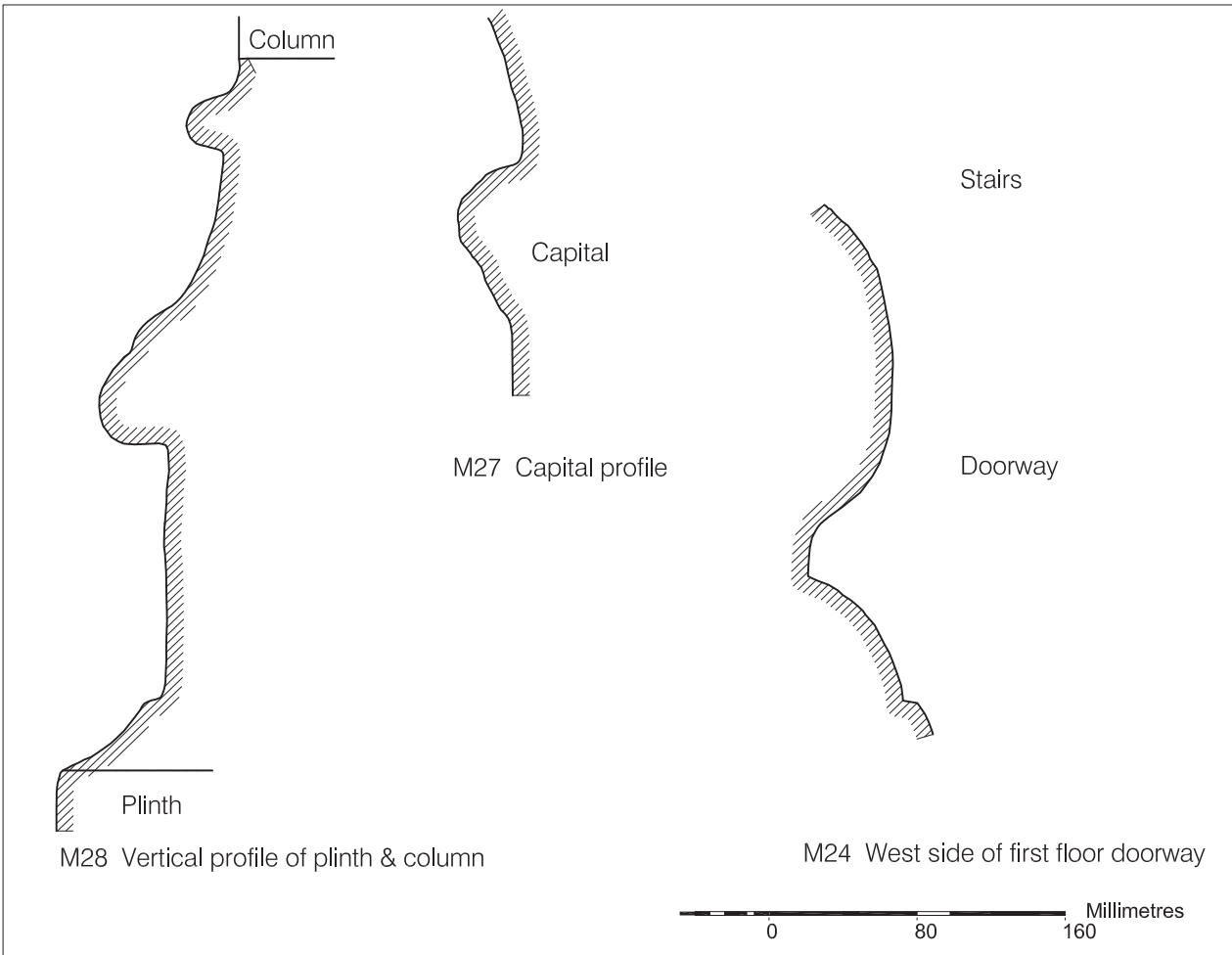


Figure 23c
Moulding profiles of the arch and first floor
1:4 at A4

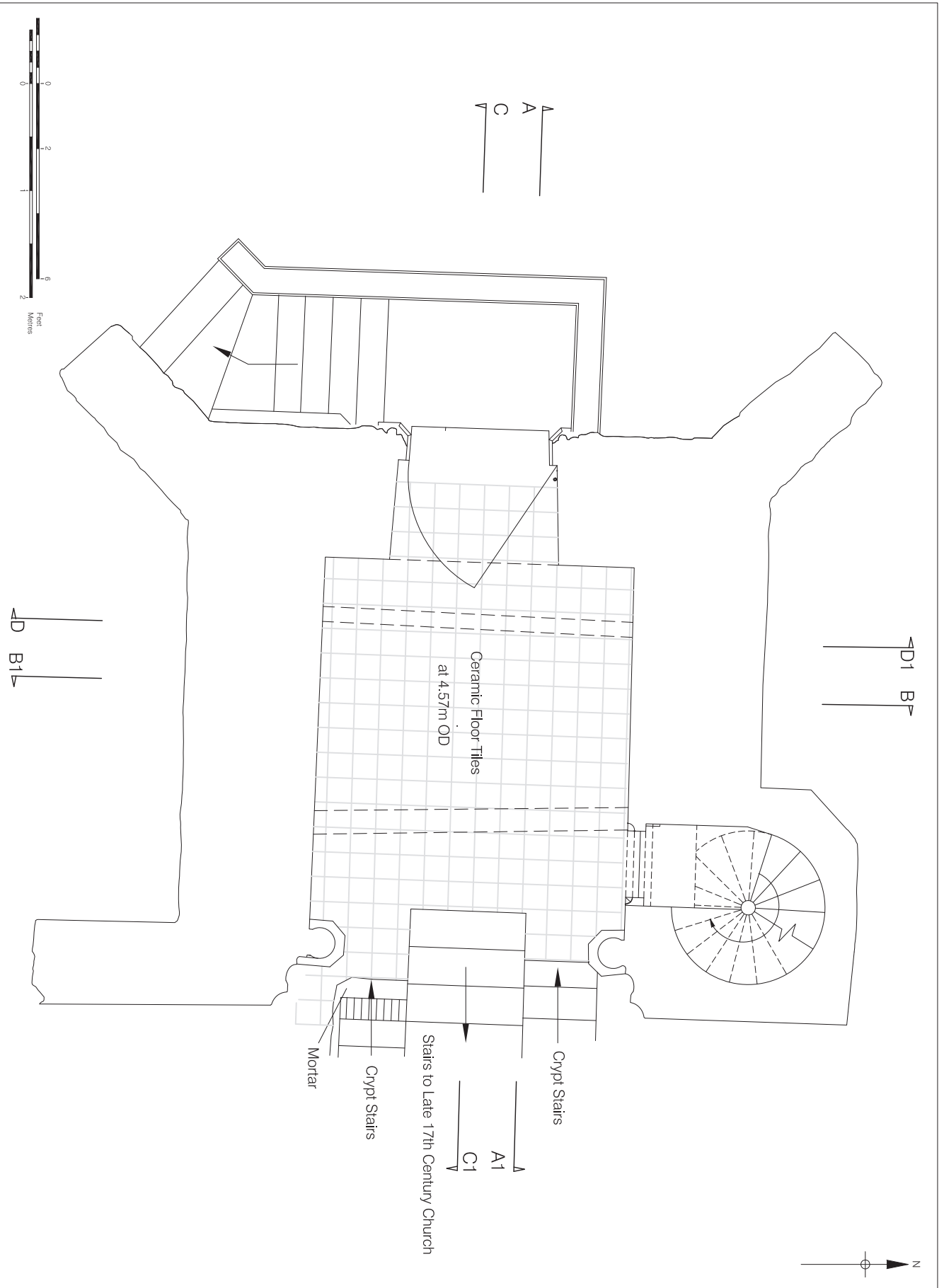


Figure 24
 Ground floor plan of St Nicholas' Church
 1:50 at A4

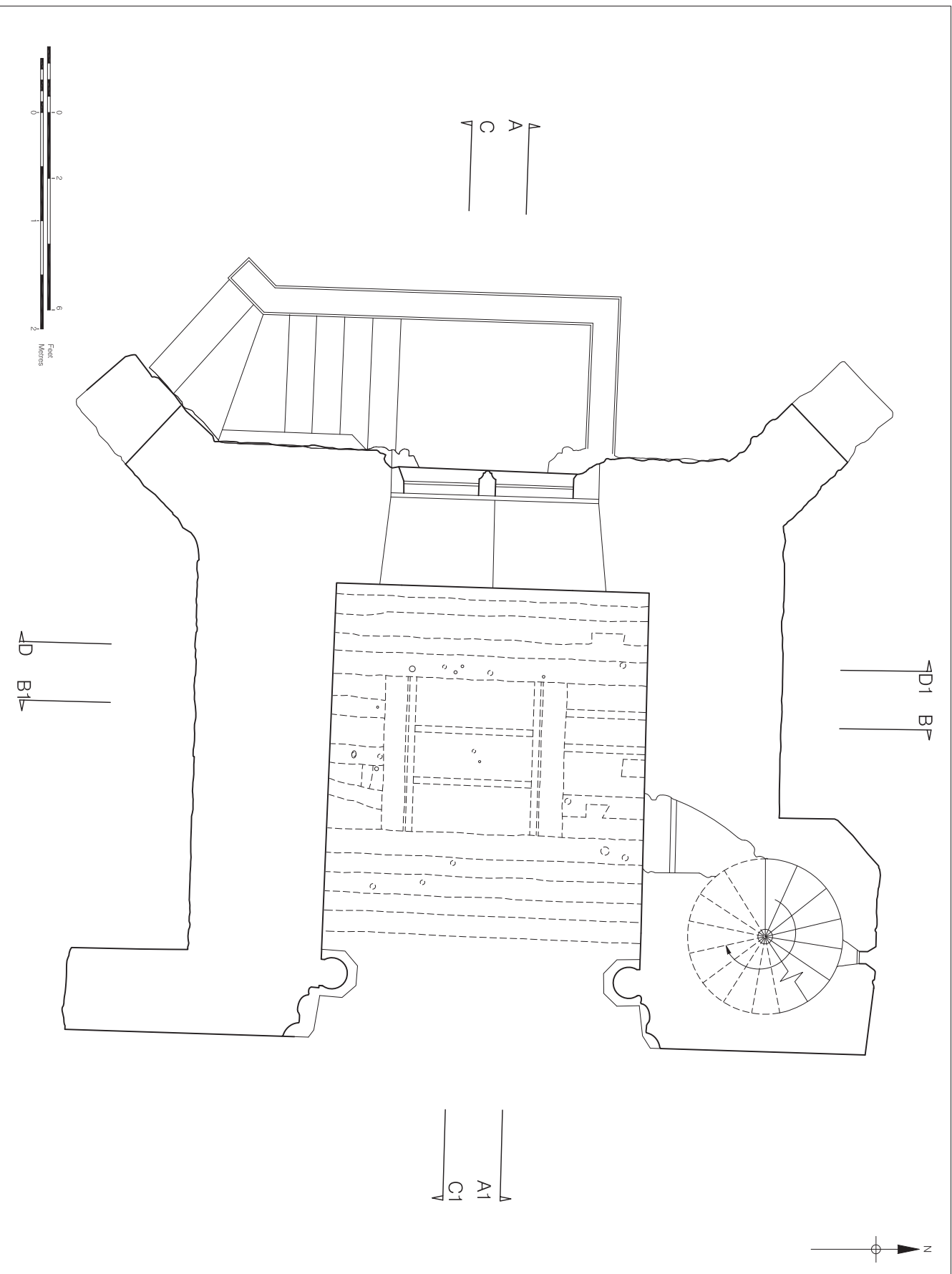
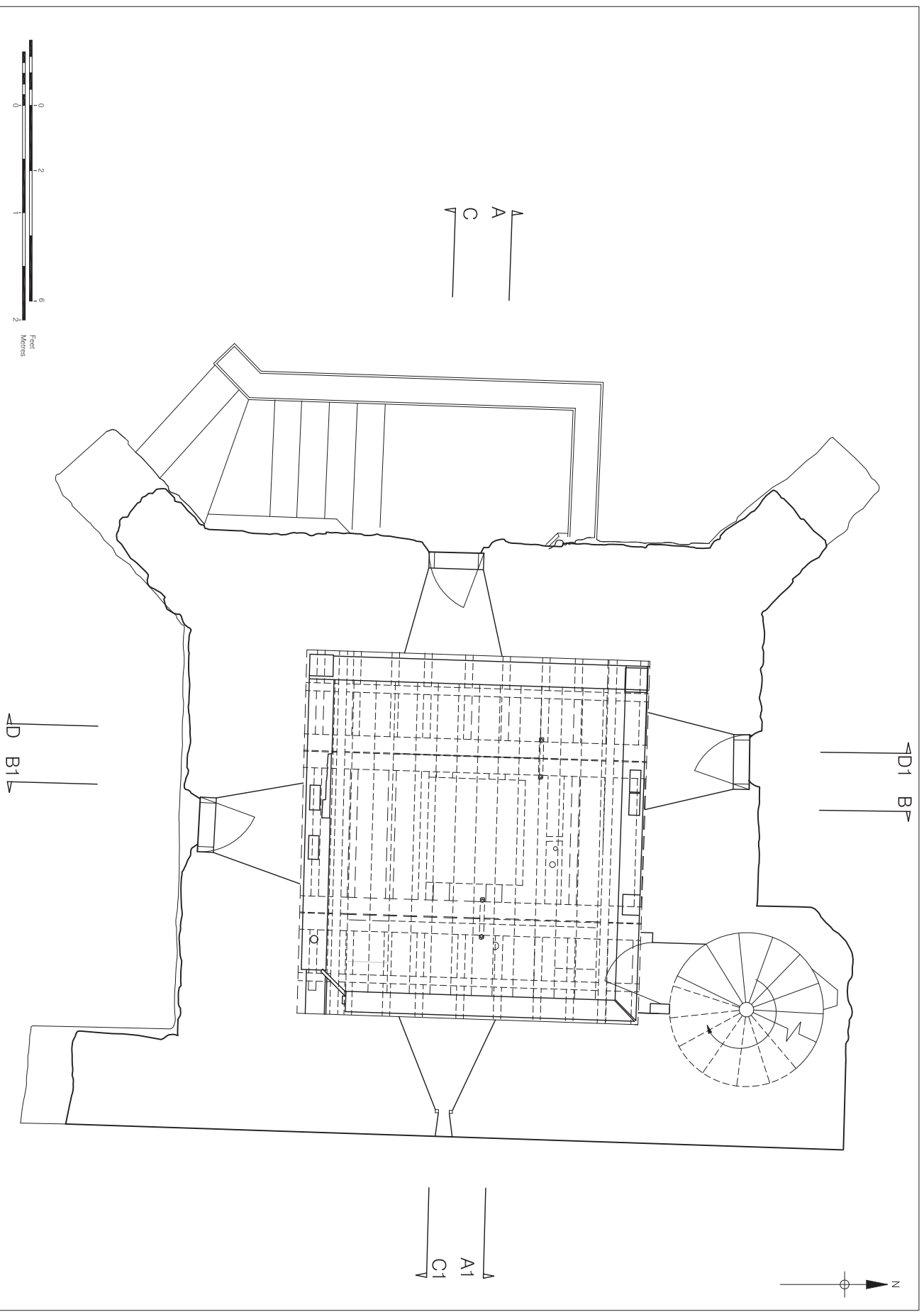


Figure 25
Upper ground floor plan of St Nicholas' Church
1:50 at A4



© Pre-Construct Archaeology Ltd

Figure 26
 First floor plan of St Nicholas' Church
 1:50 at A4

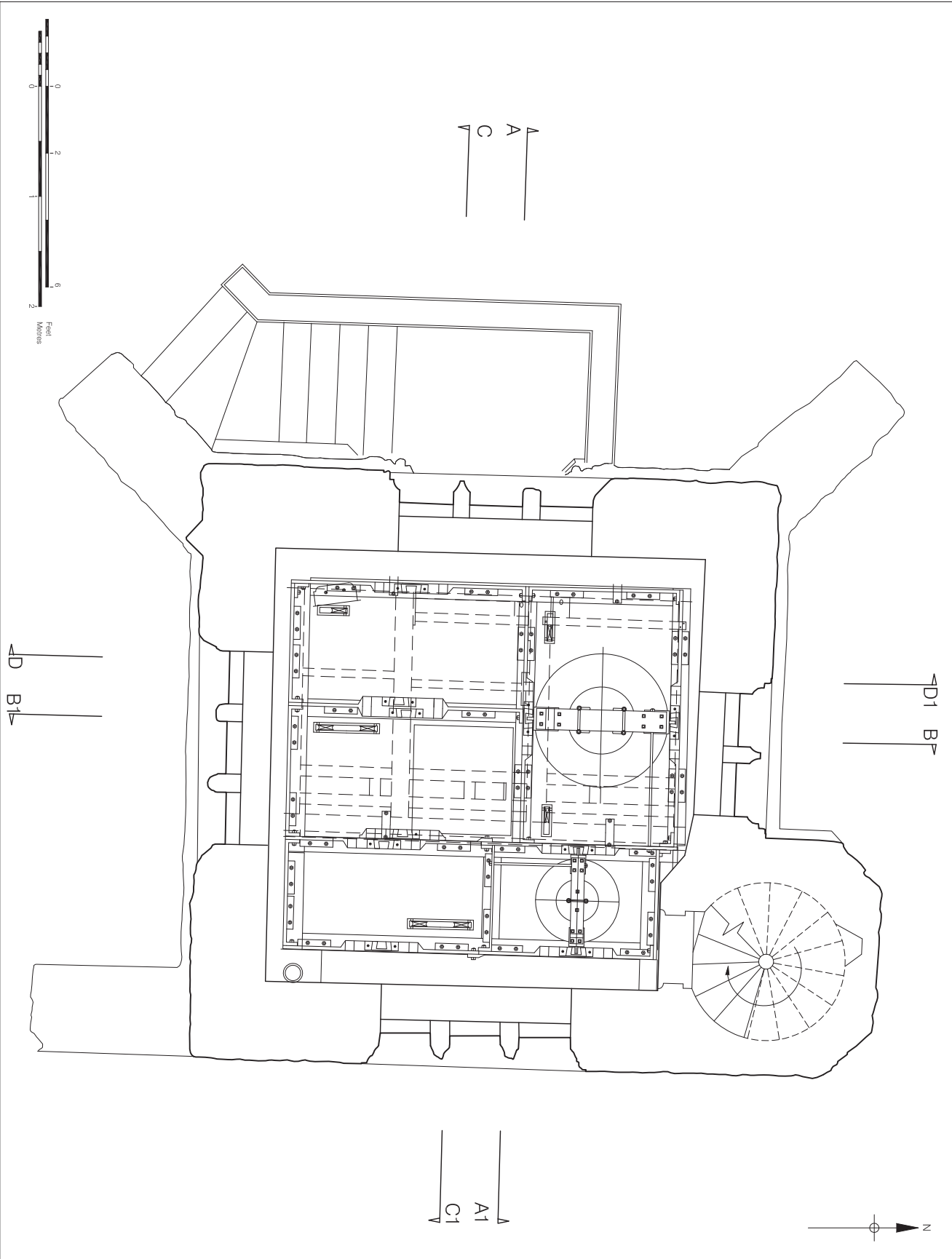


Figure 27
 Second floor plan of St Nicholas' Church
 1:50 at A4

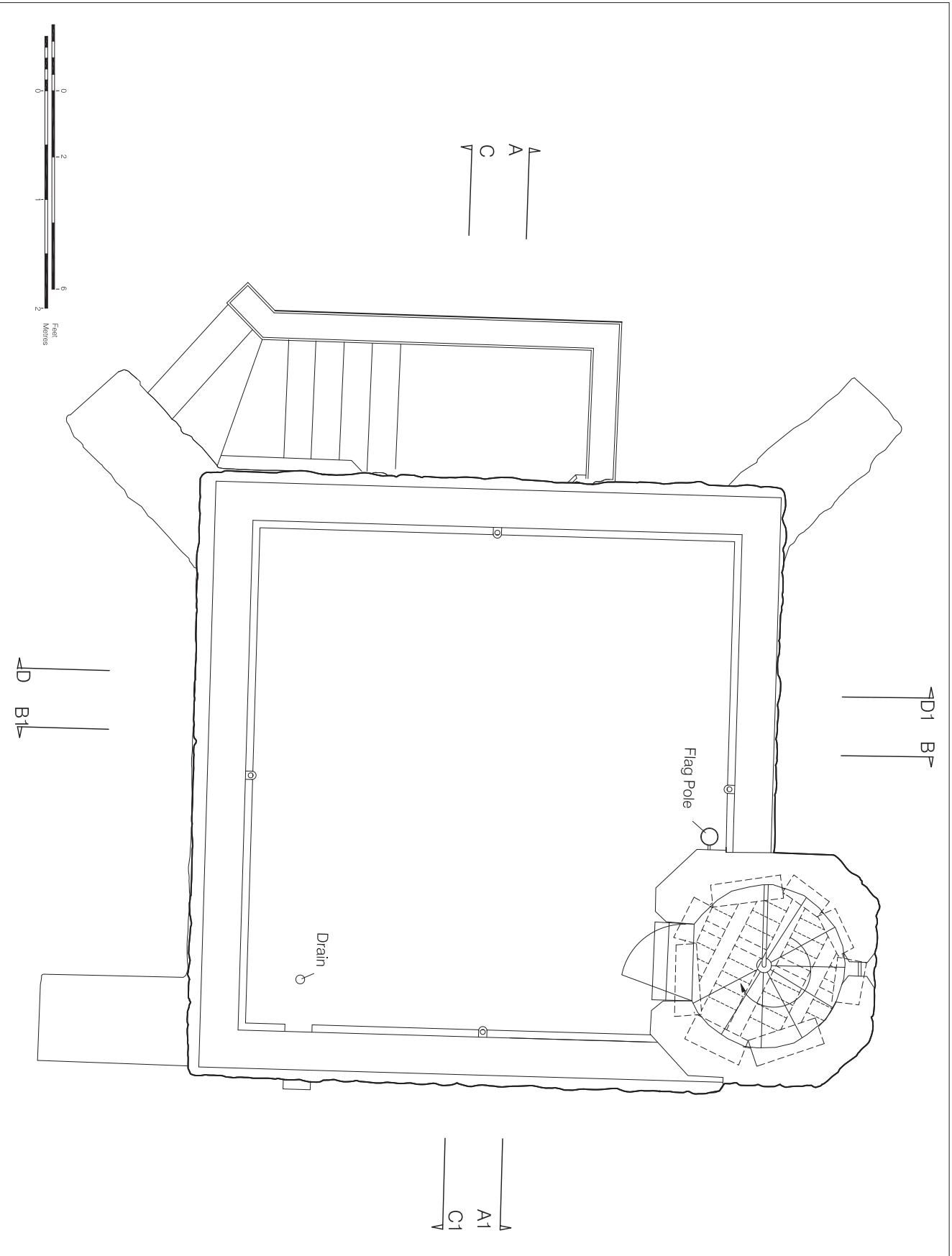


Figure 28
 Roof plan of St Nicholas' Church
 1:50 at A4

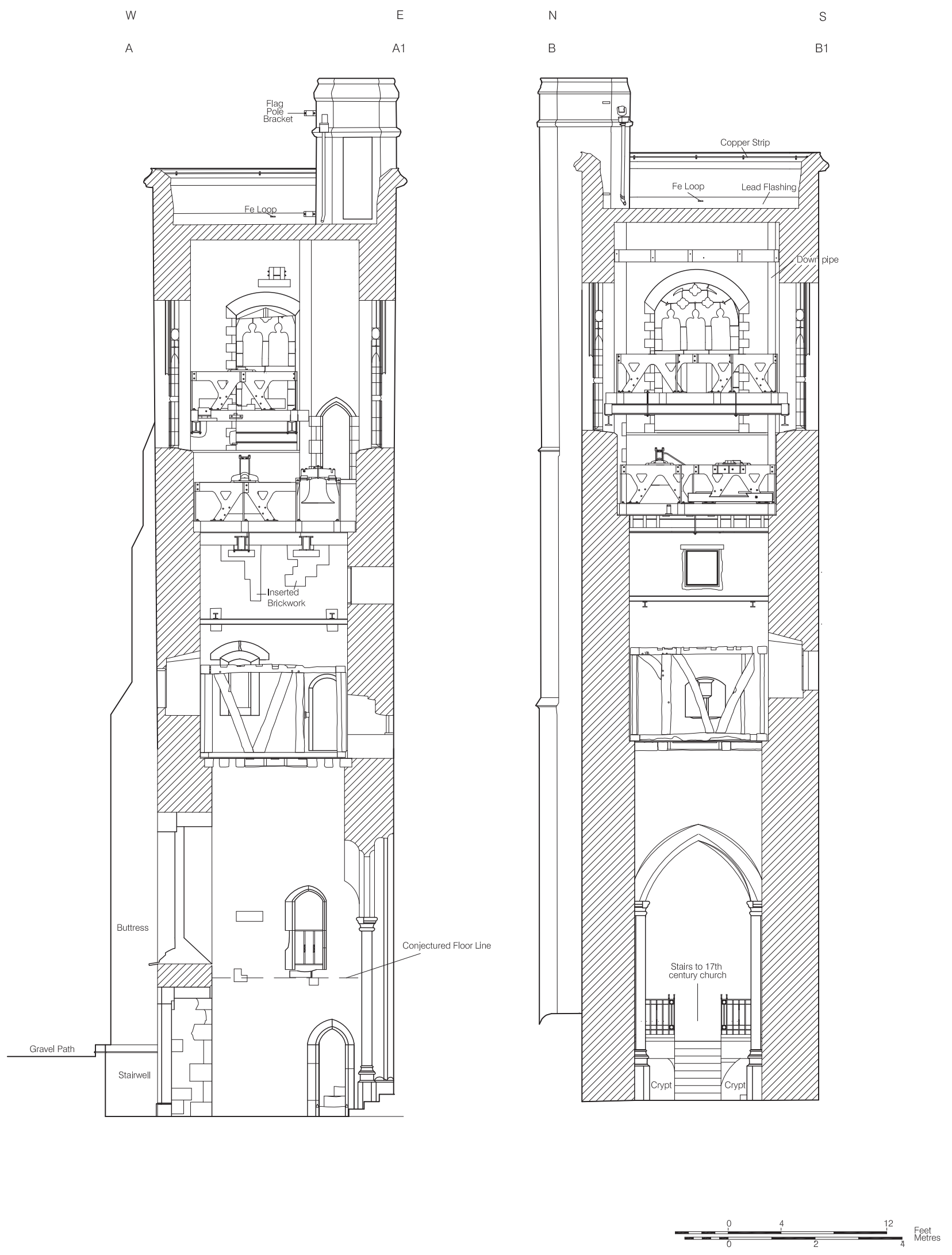


Figure 29
Sections A - A1 / B - B1 through St Nicholas' Church
1:100 at A3



© Pre-Construct Archaeology Ltd

Figure 30
 Sections C - C1 / D - D1 through St Nicholas' Church
 1:100 at A3

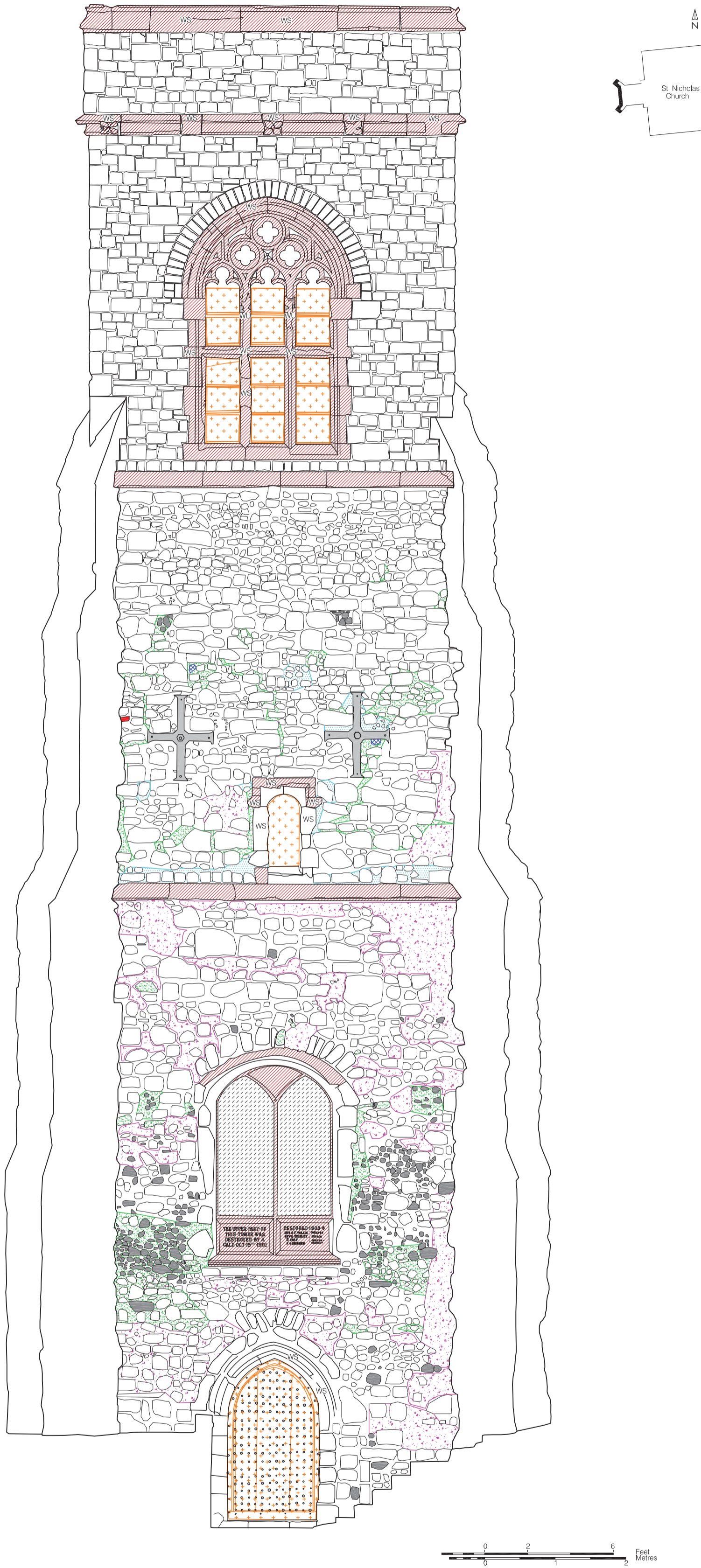


Figure 31
 West elevation - pre-conservation survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2

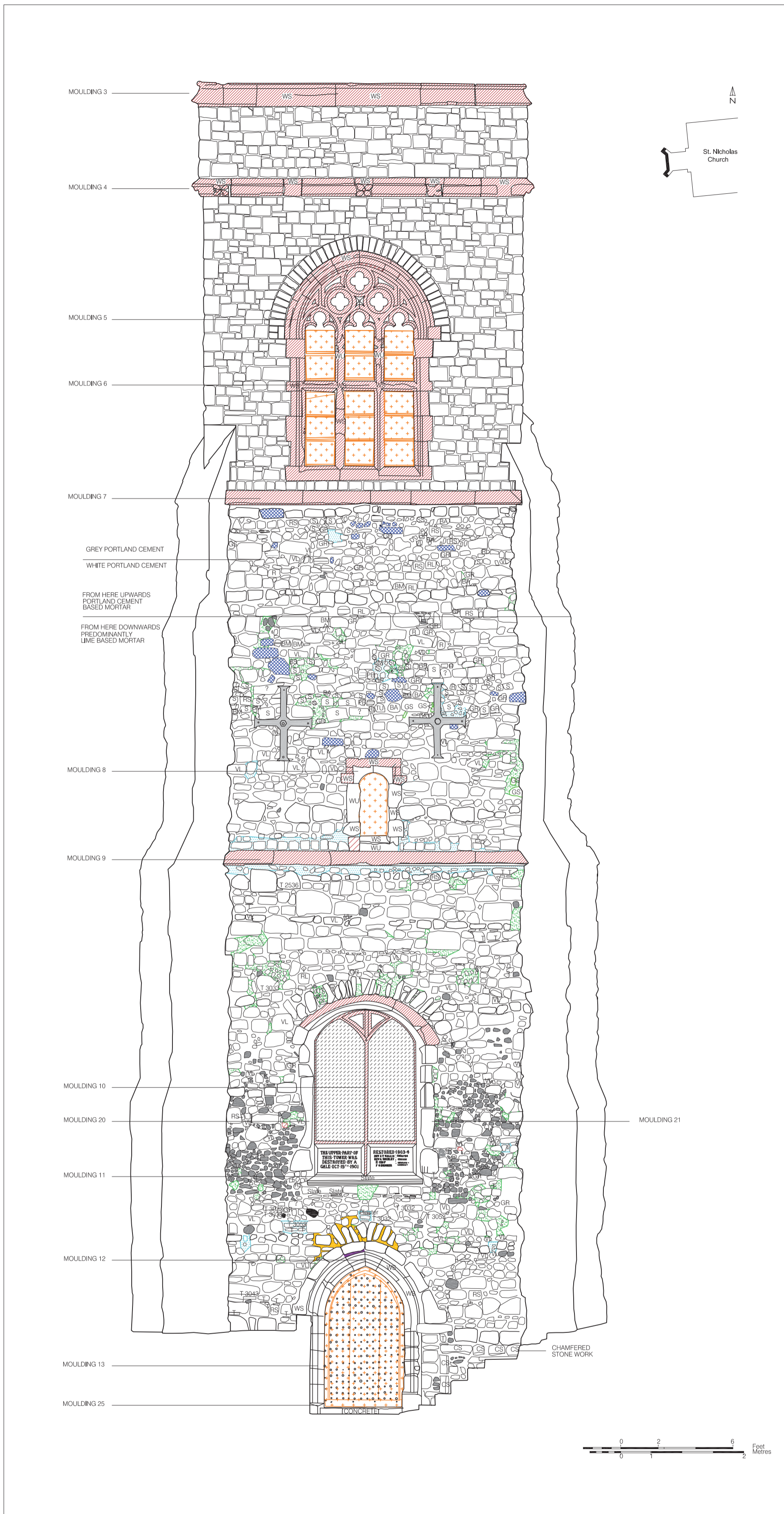
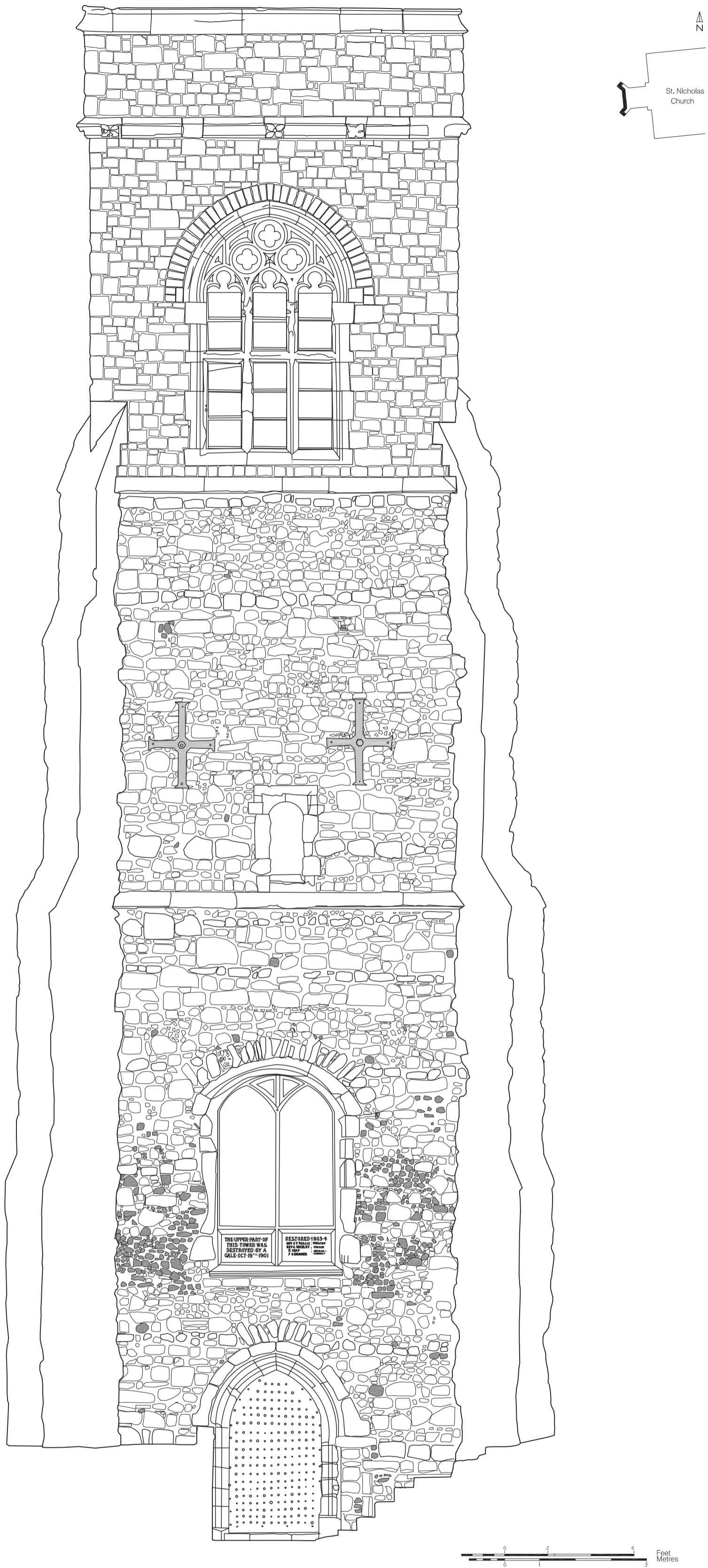
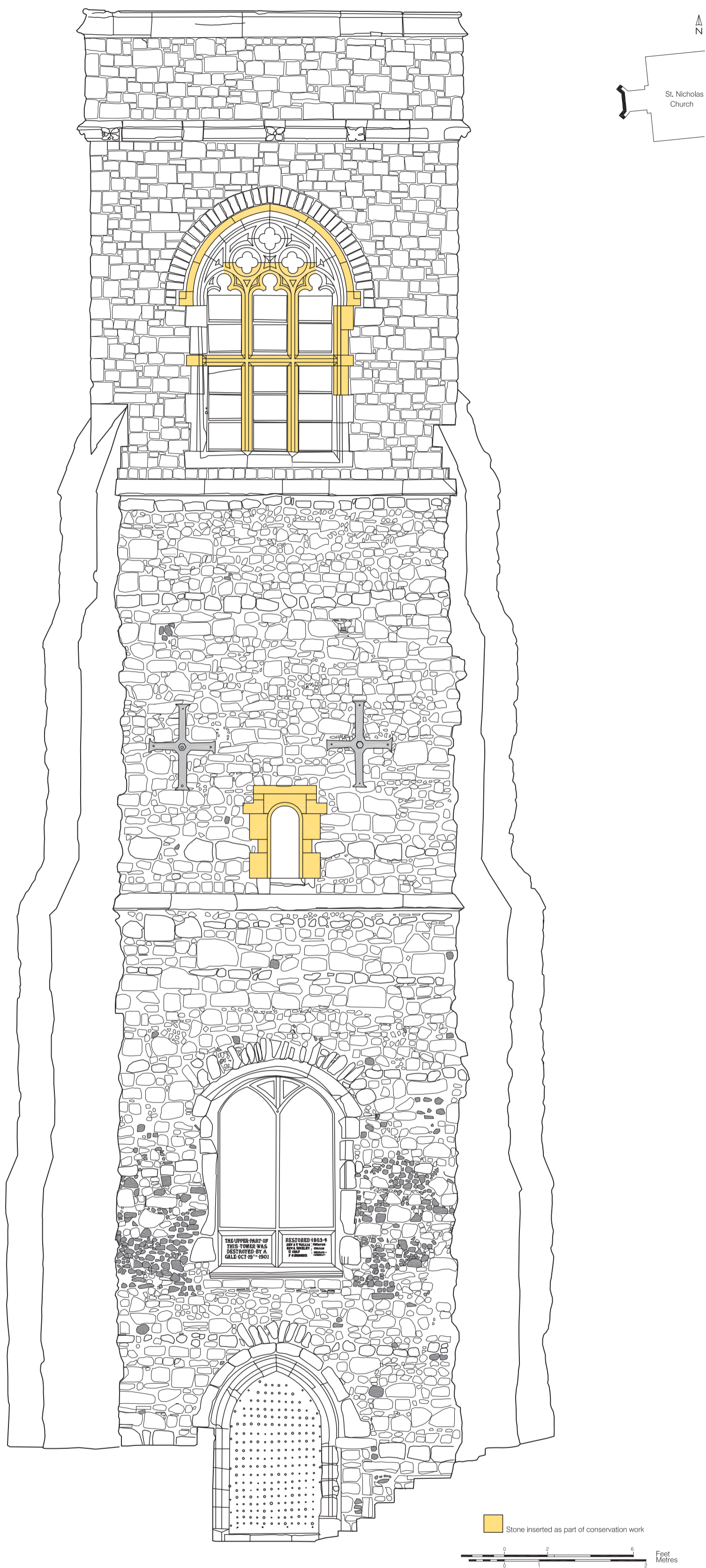


Figure 32
West elevation - historic building survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A2





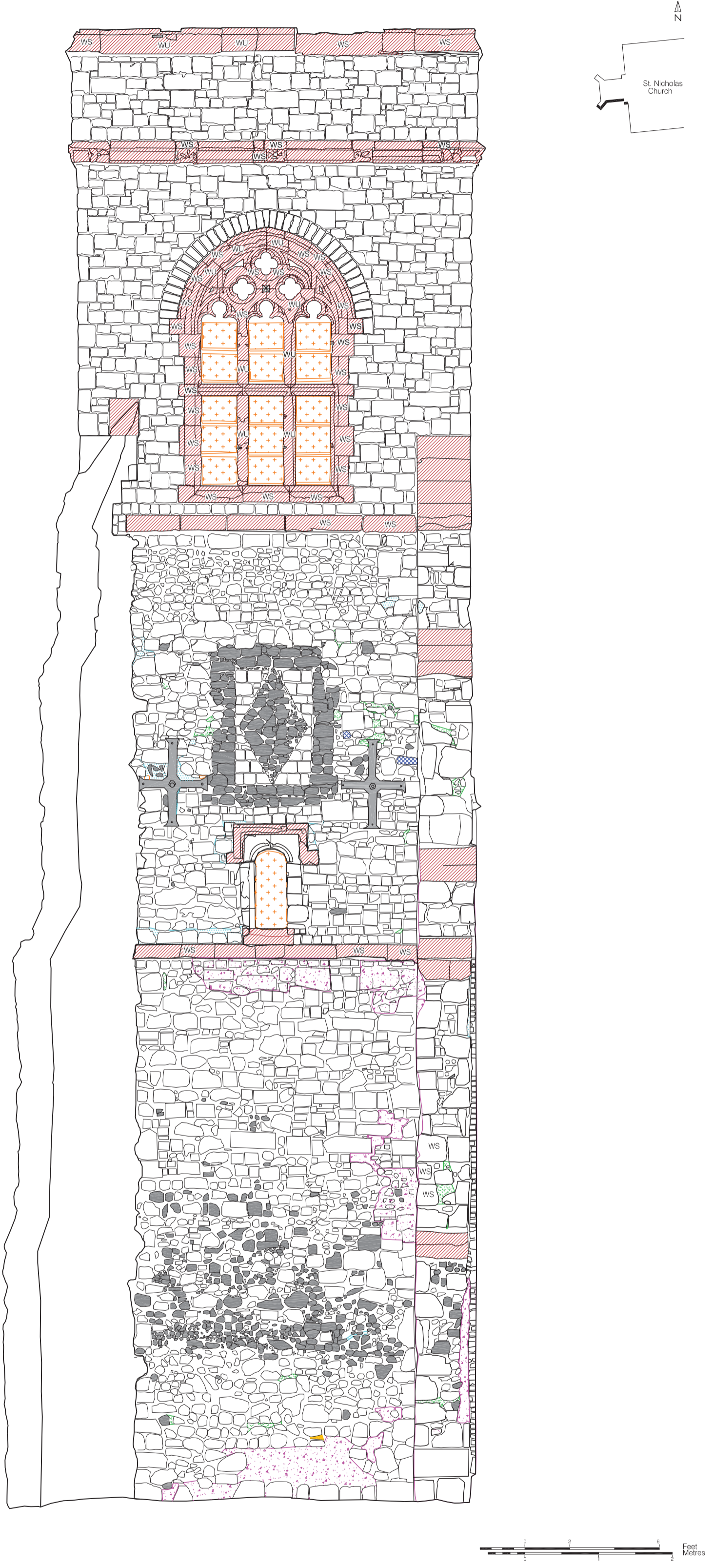


Figure 35
 South elevation - pre conservation survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2

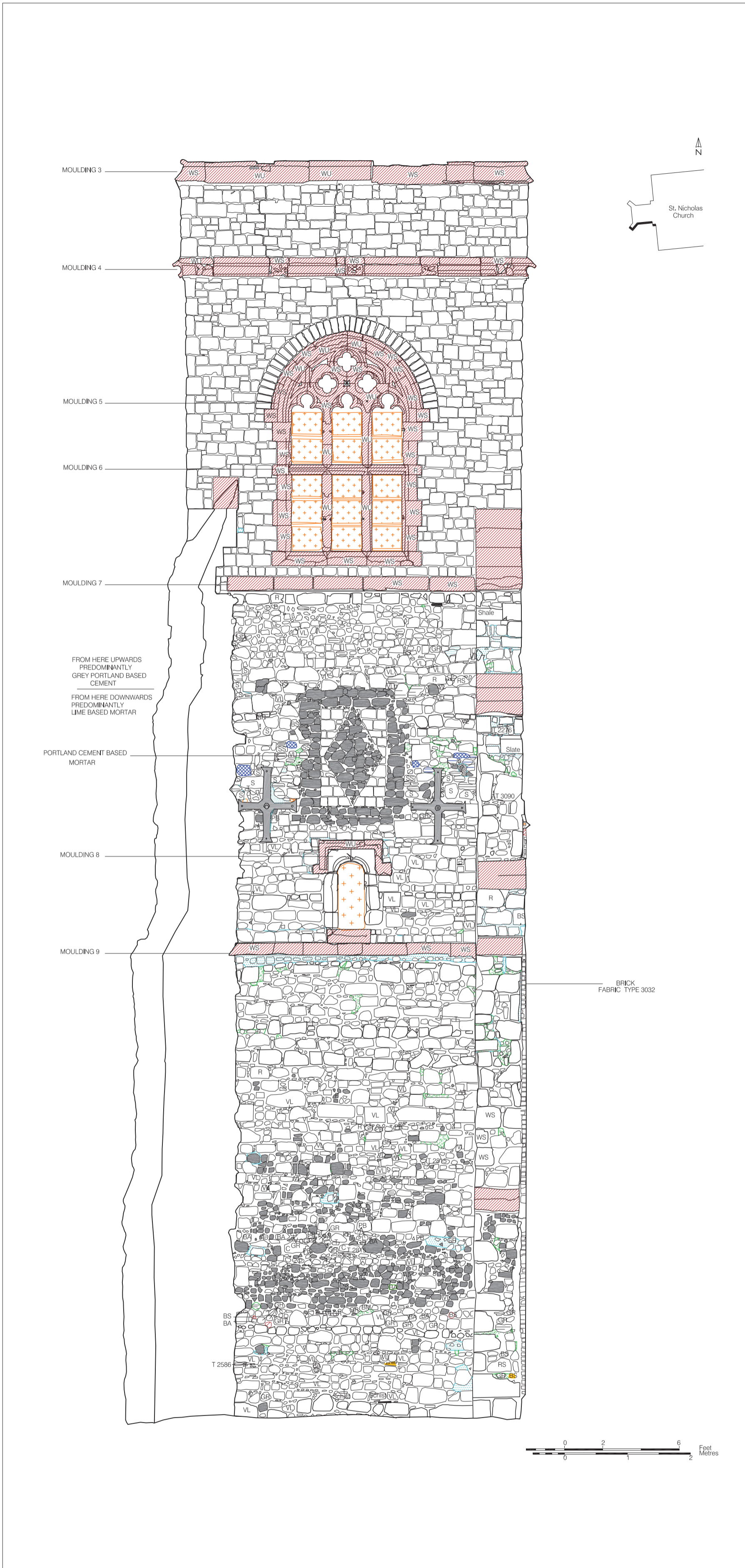


Figure 36
 South elevation - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2

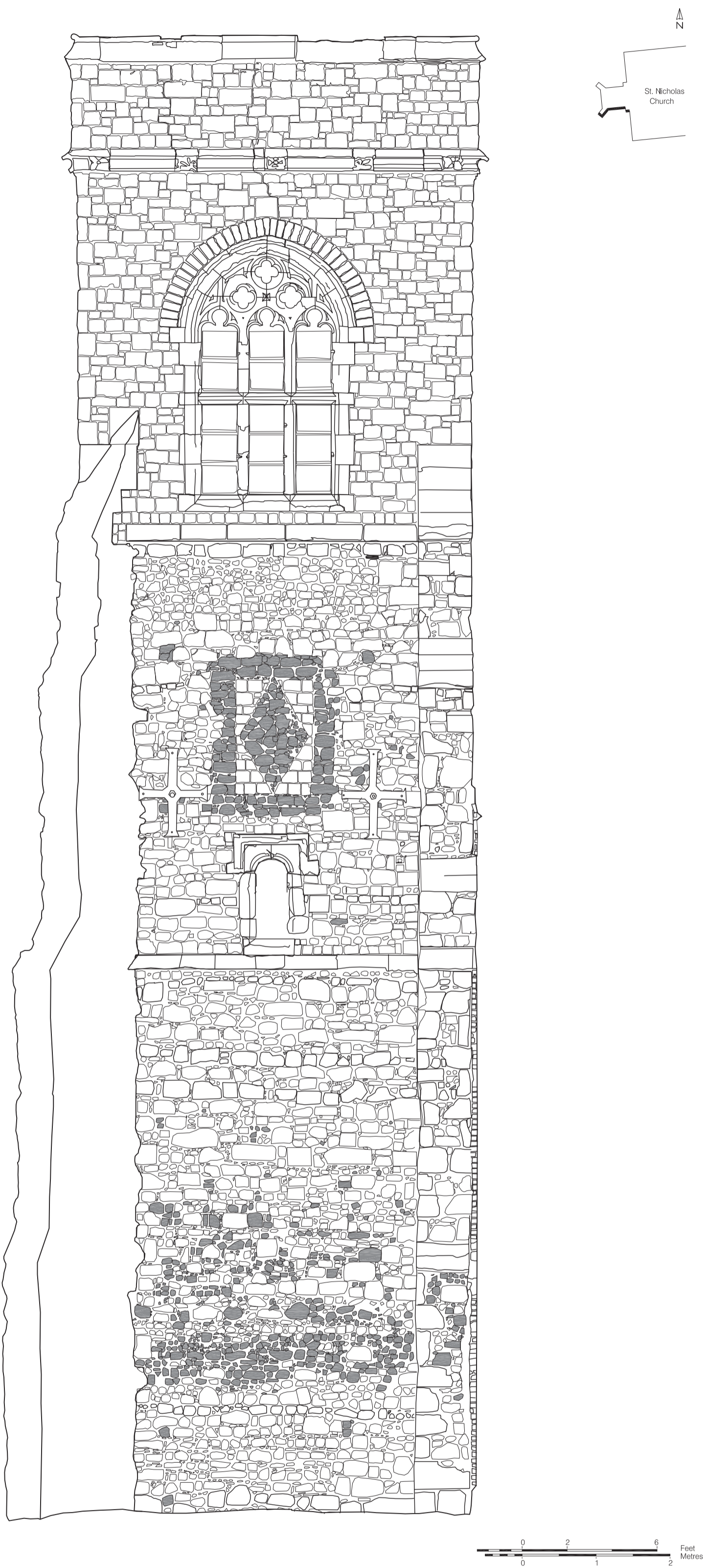
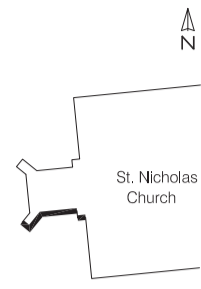
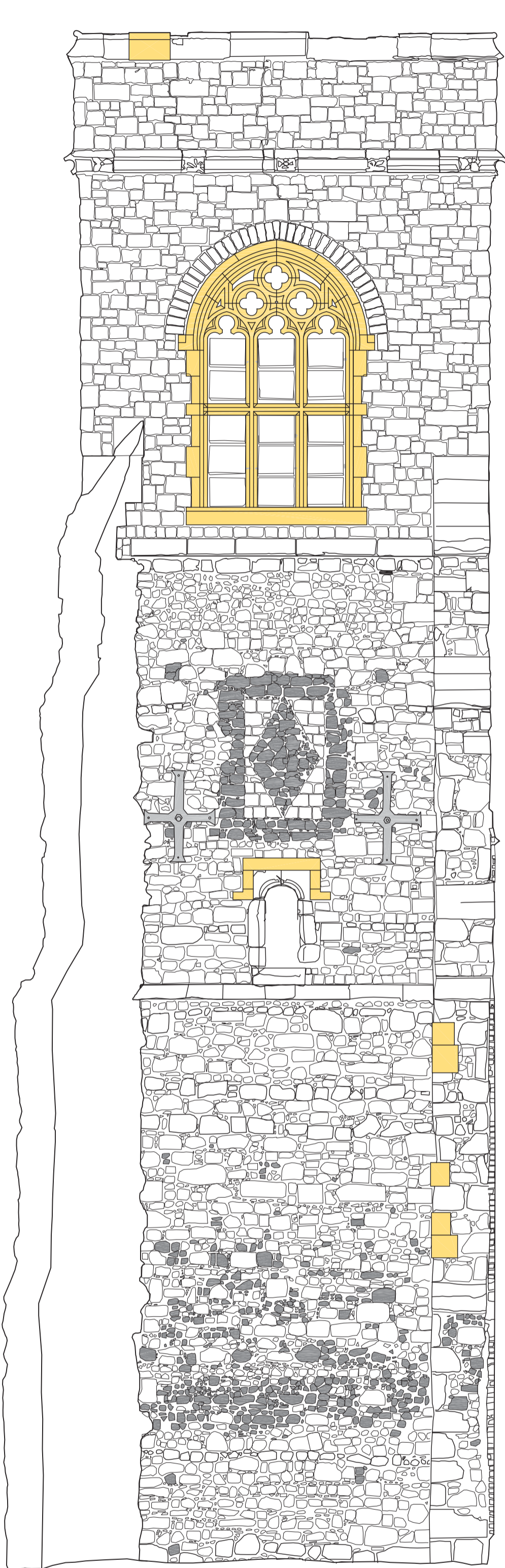
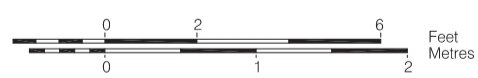


Figure 37
South elevation - architectural drawing
1:50 at A2



Stone inserted as part of conservation work



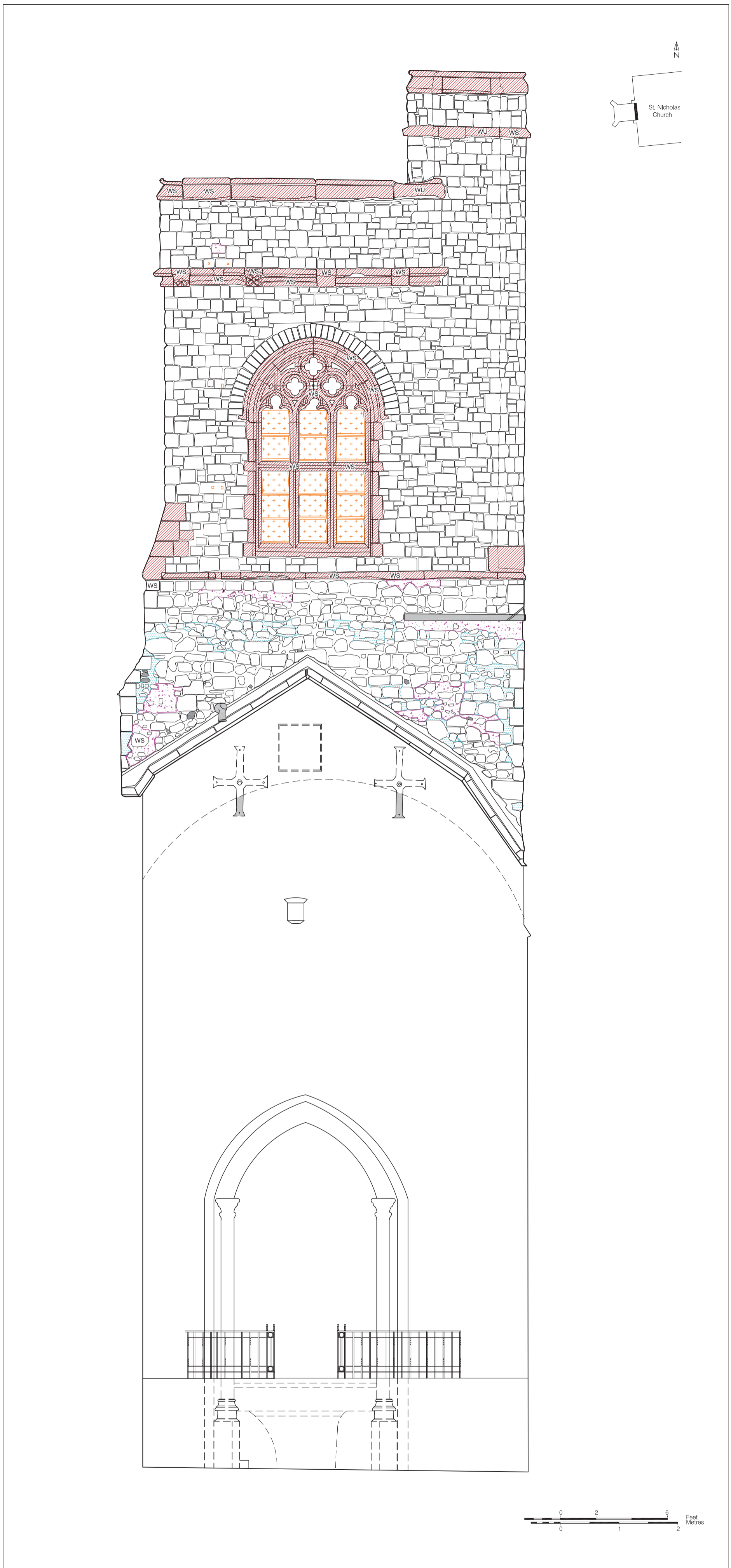


Figure 39
 East elevation - pre-conservation survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2

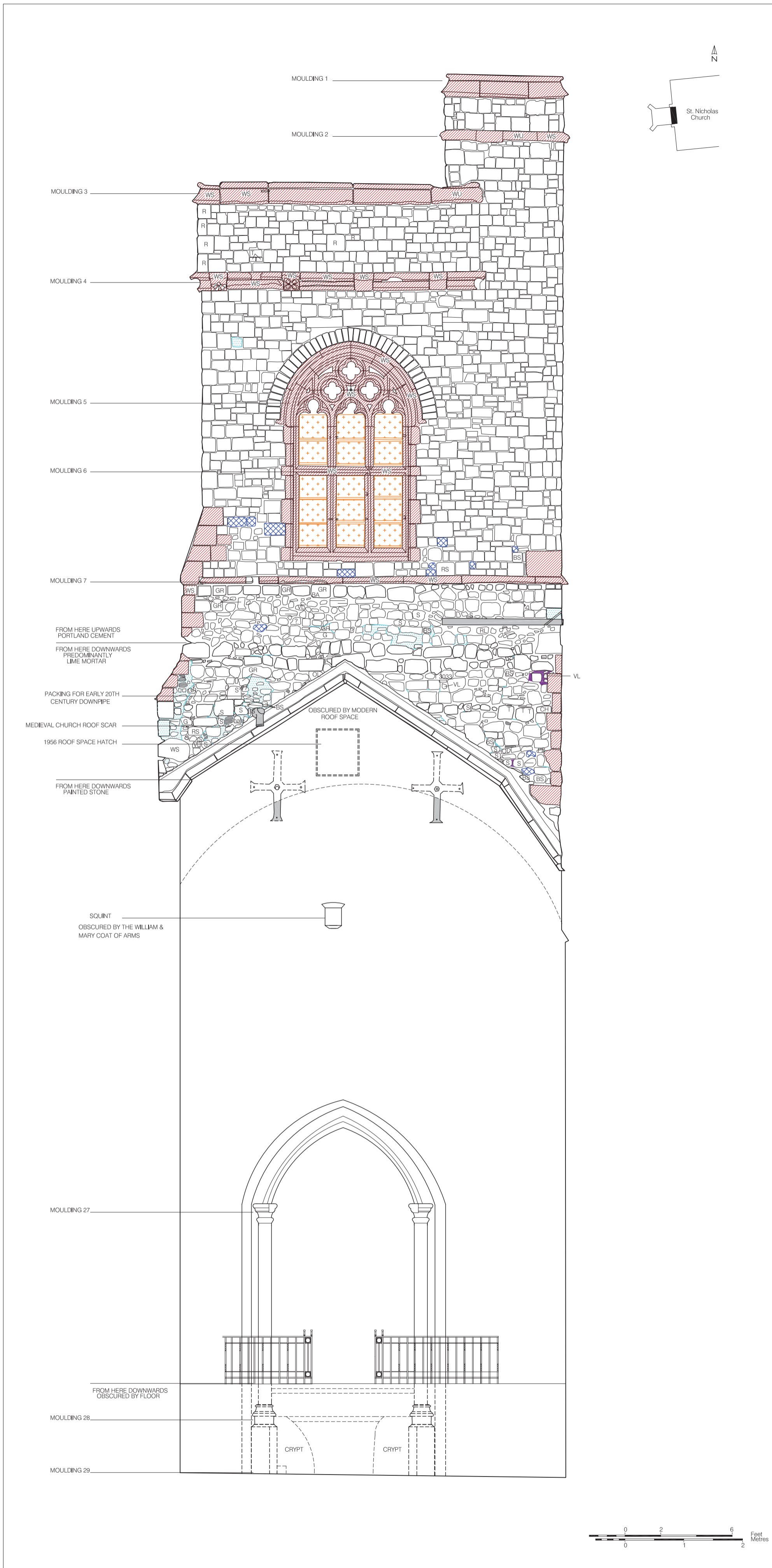


Figure 40
 East elevation - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2

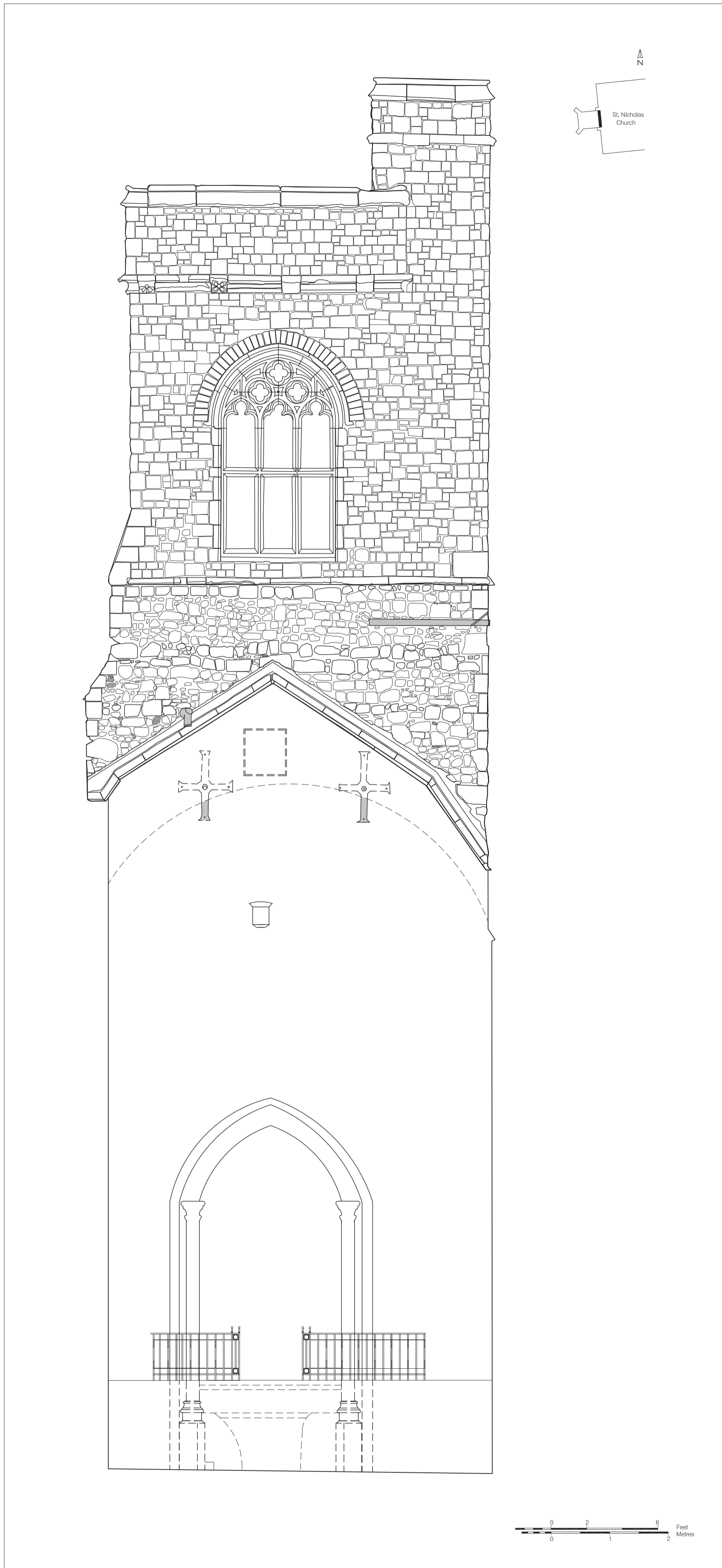


Figure 41
East elevation - architectural drawing
1:50 at A2

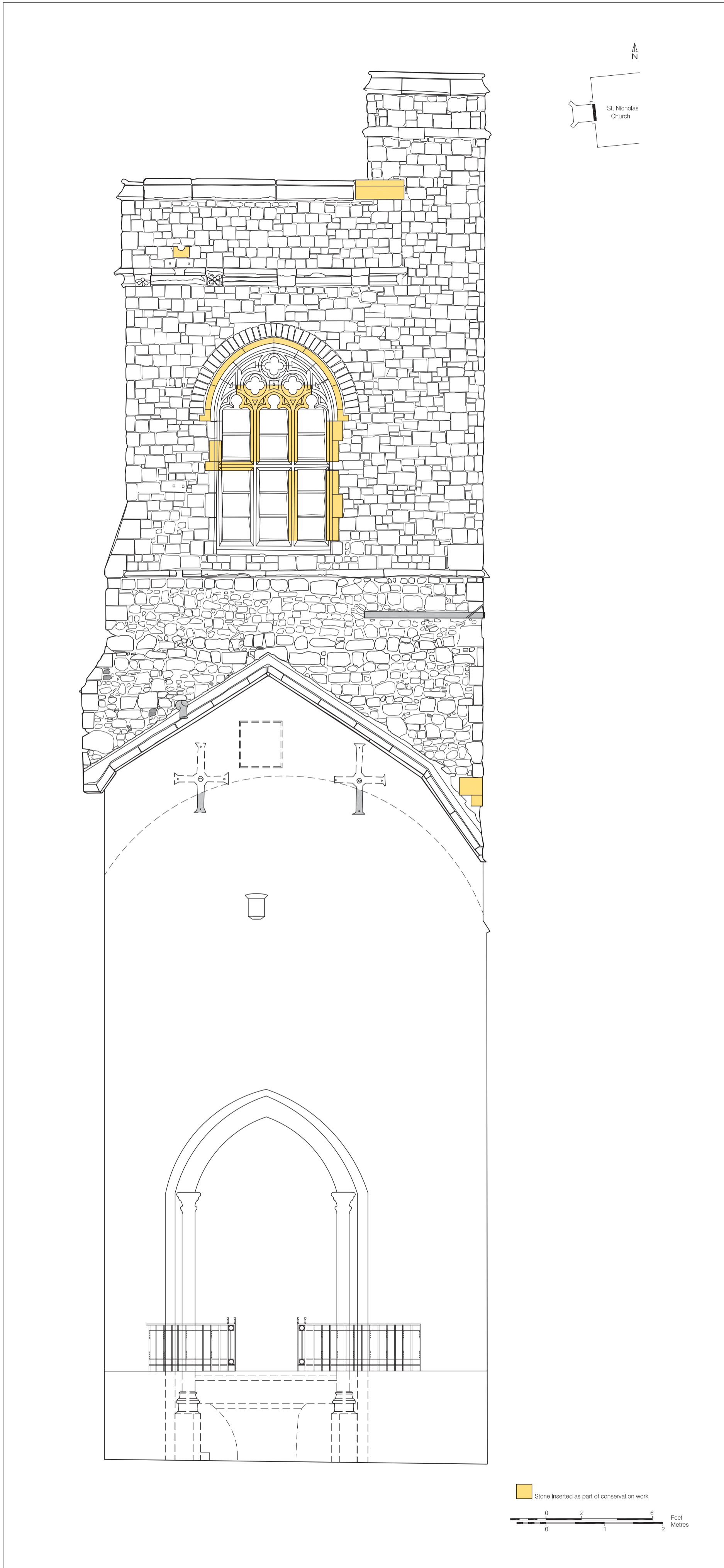


Figure 42
East elevation - post-conservation drawing
1:50 at A2

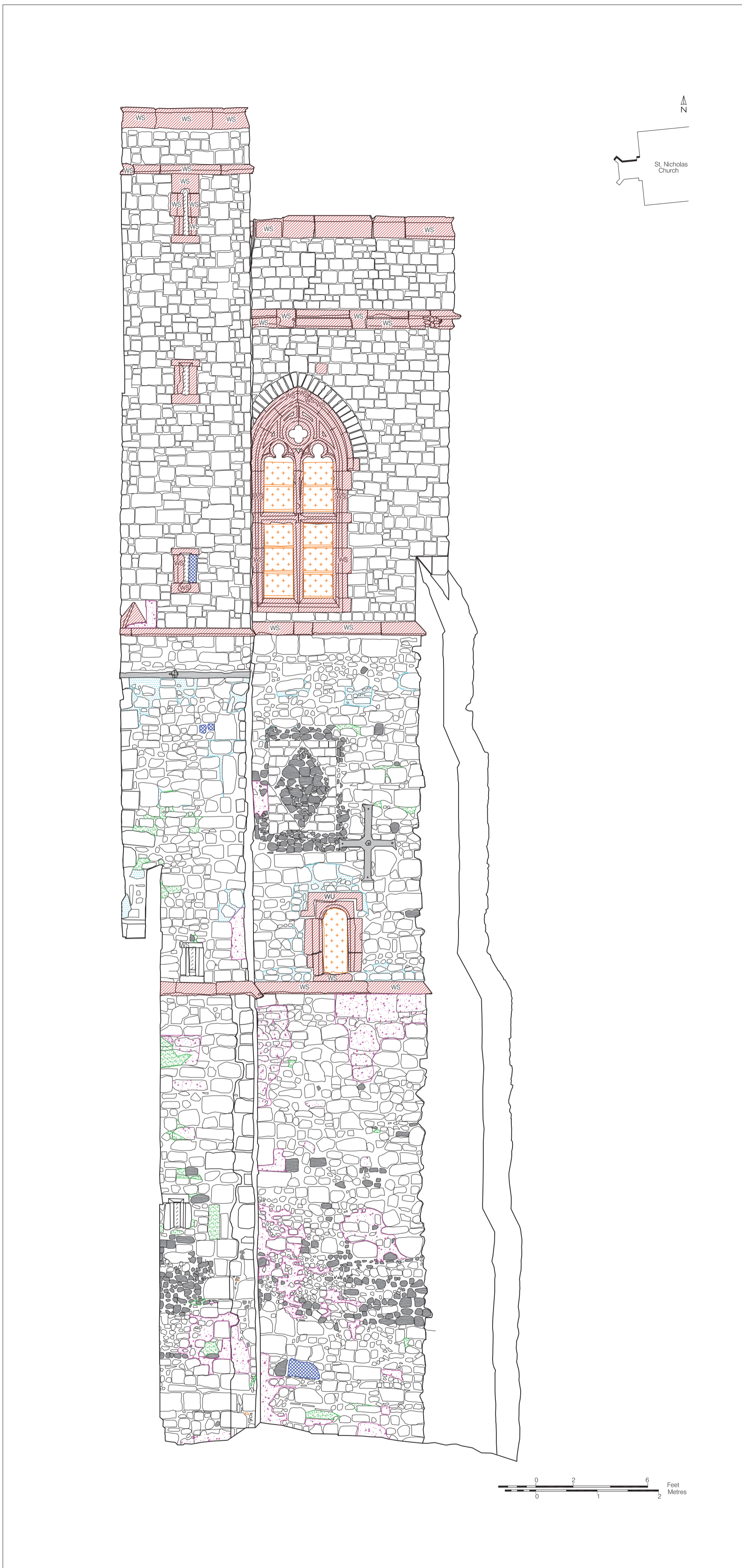


Figure 43
North elevation - pre-conservation survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A2

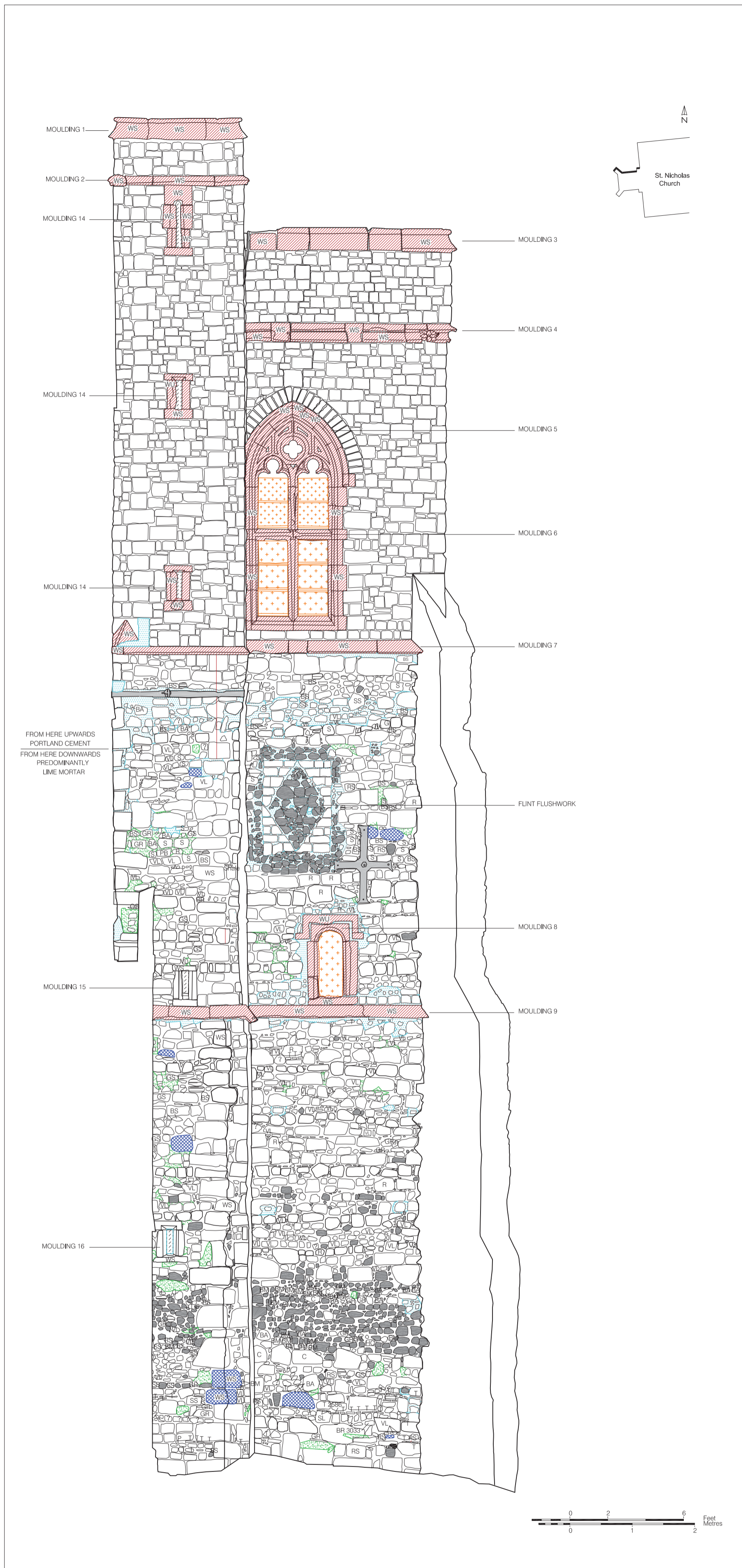
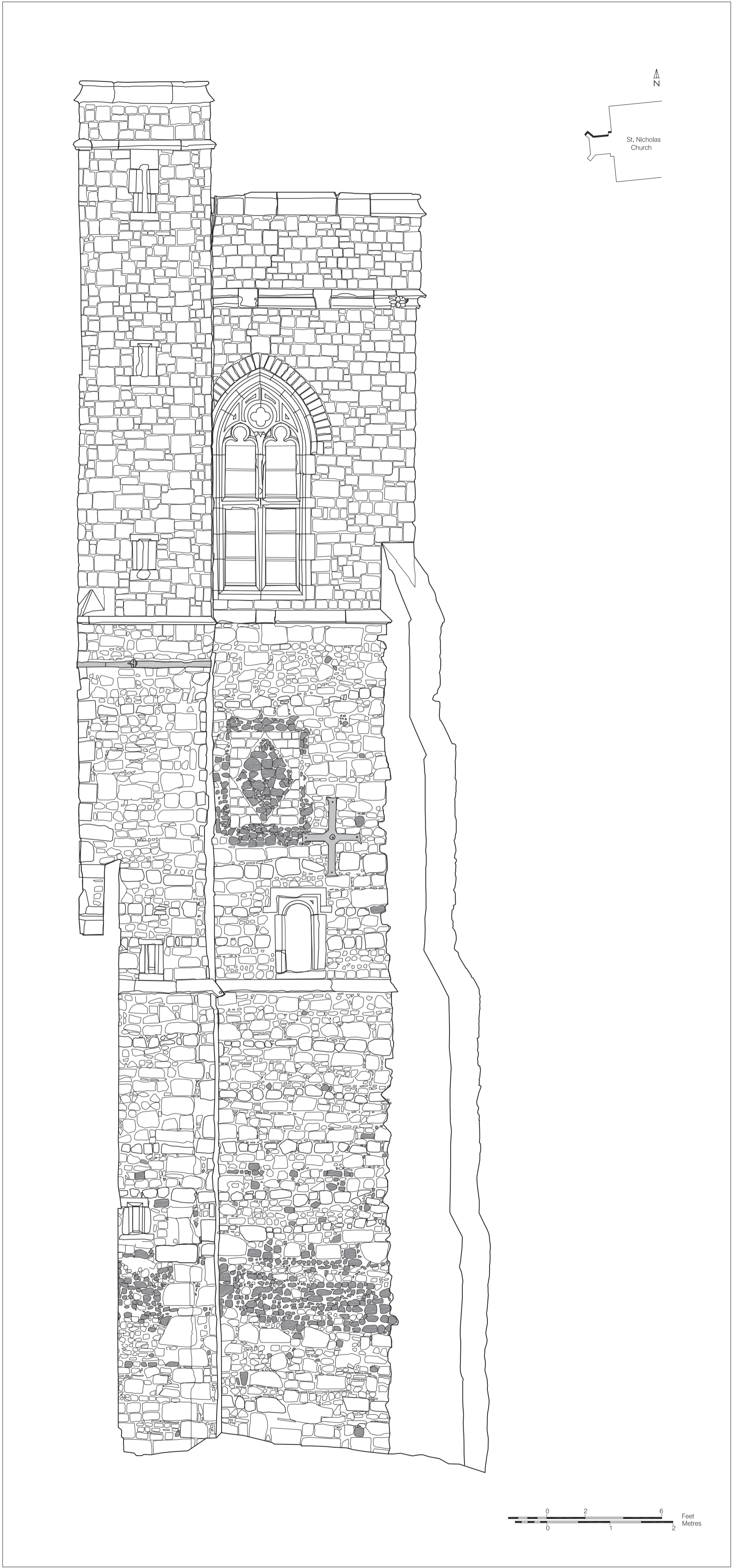
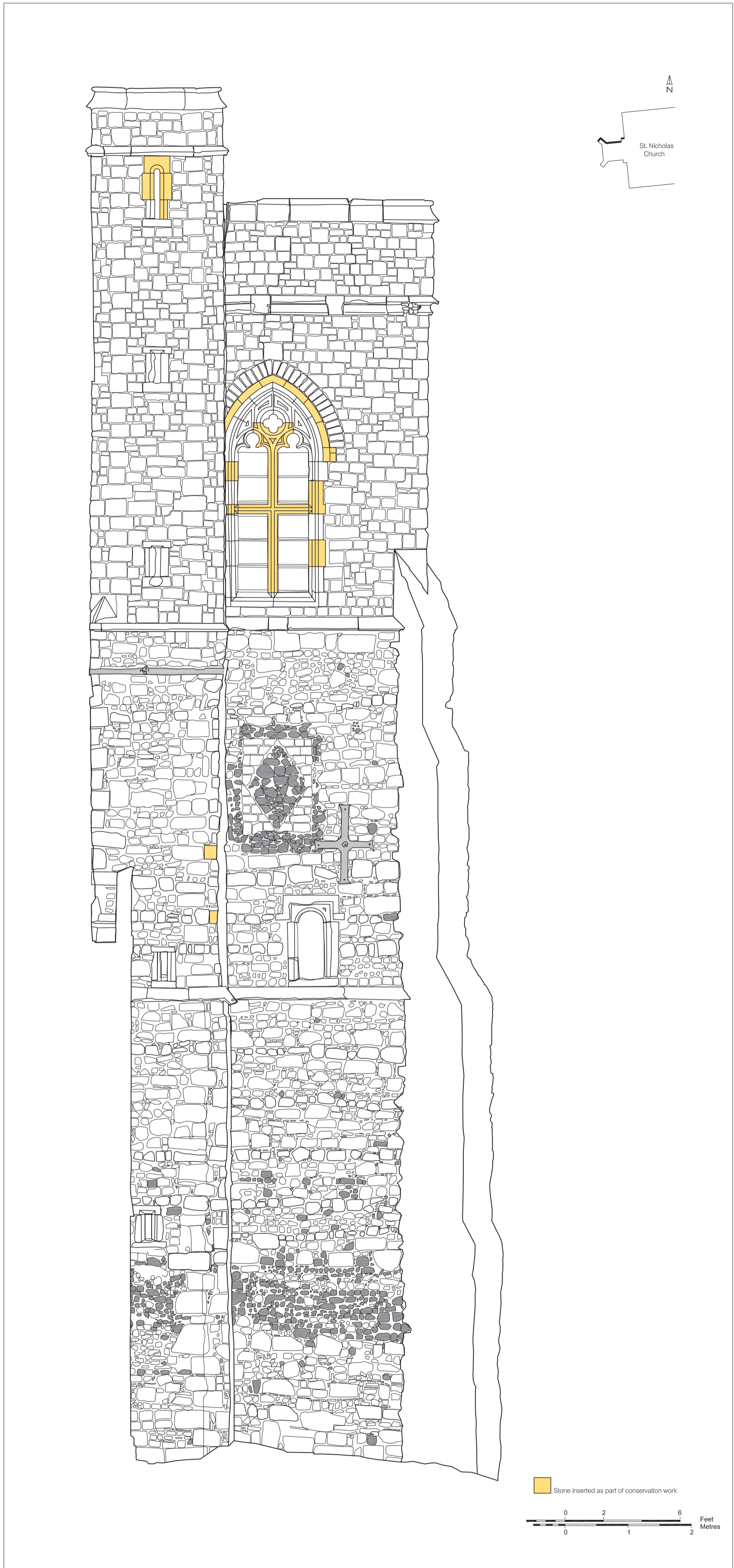


Figure 44
North elevation - historic building survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A2



© Pre-Construct Archaeology Ltd

Figure 45
North elevation - architectural drawing
1:50 at A2



© Pre-Construct Archaeology Ltd

Figure 46
North elevation - post-conservation drawing
1:50 at A2

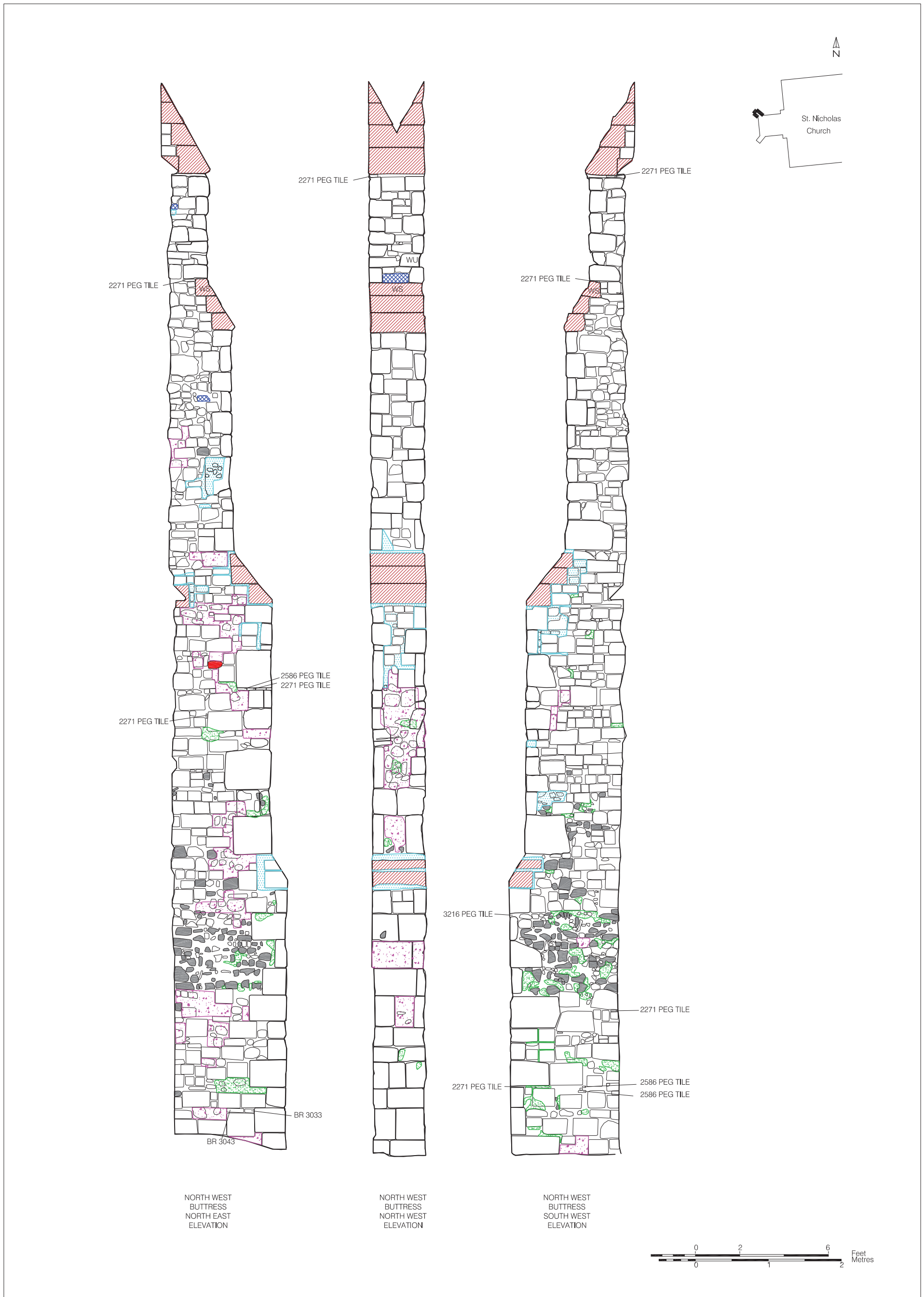


Figure 47
 Northwest buttress - pre-conservation survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A3

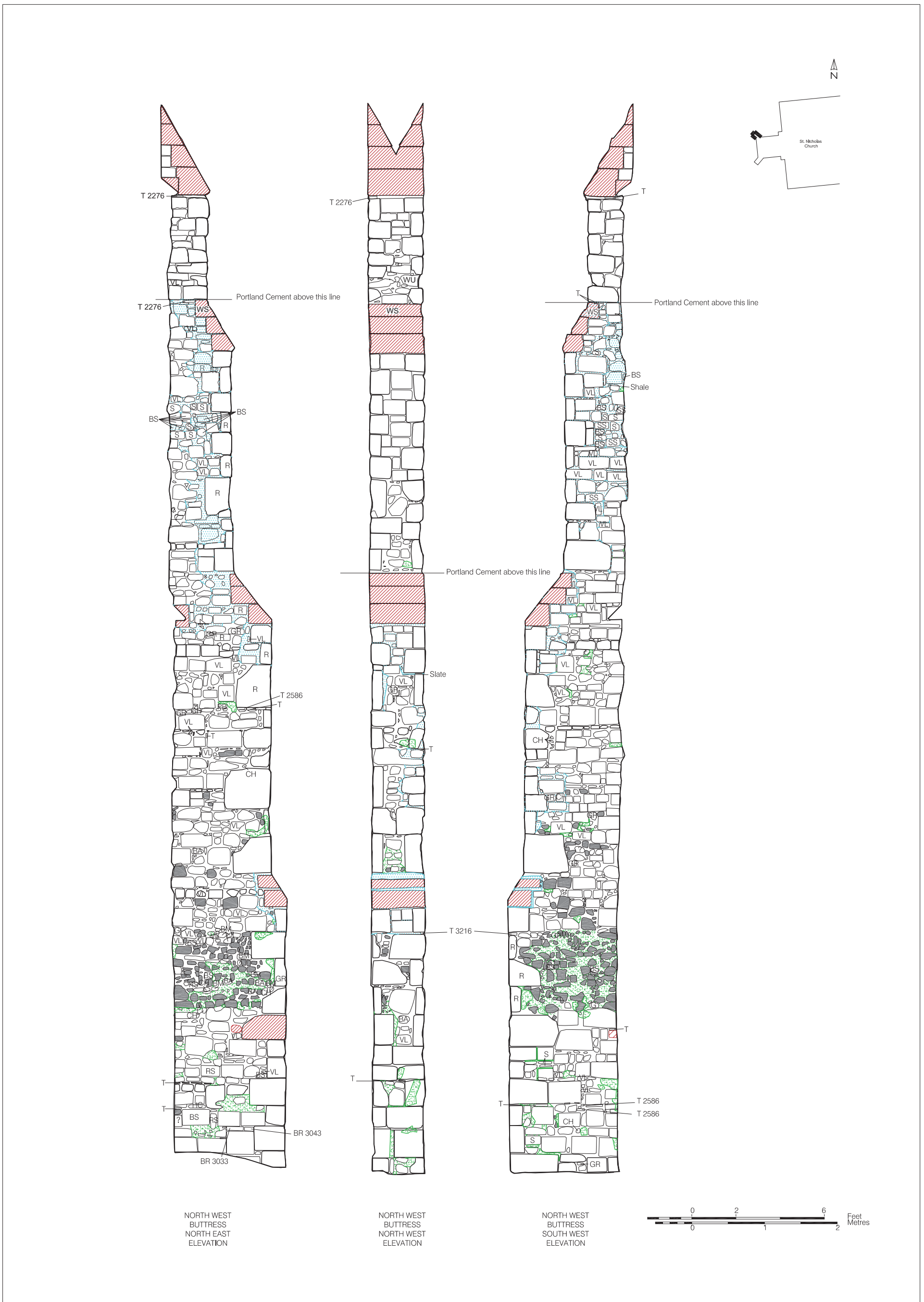


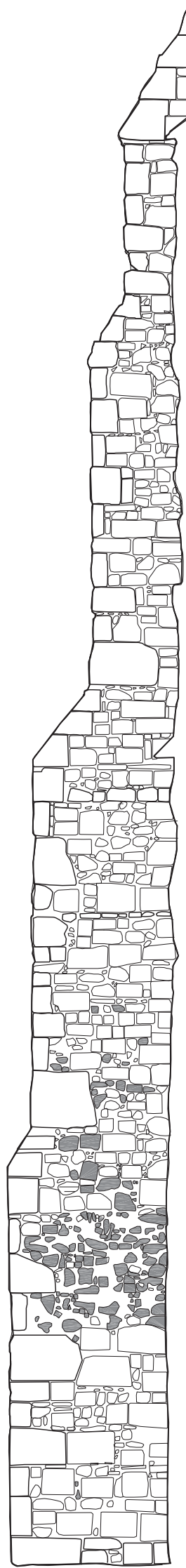
Figure 48
 Northwest buttress - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A3



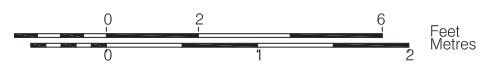
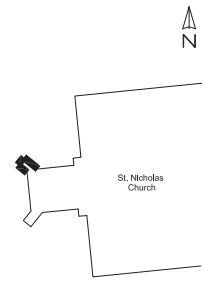
NORTH WEST
BUTTRESS
NORTH EAST
ELEVATION

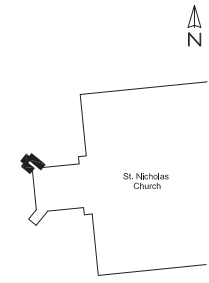


NORTH WEST
BUTTRESS
NORTH WEST
ELEVATION



NORTH WEST
BUTTRESS
SOUTH WEST
ELEVATION





NORTH WEST
BUTTRESS
NORTH EAST
ELEVATION

NORTH WEST
BUTTRESS
NORTH WEST
ELEVATION

NORTH WEST
BUTTRESS
SOUTH WEST
ELEVATION


 Stone inserted as part of conservation work





Figure 51
Southwest buttress - pre-conservation survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A3

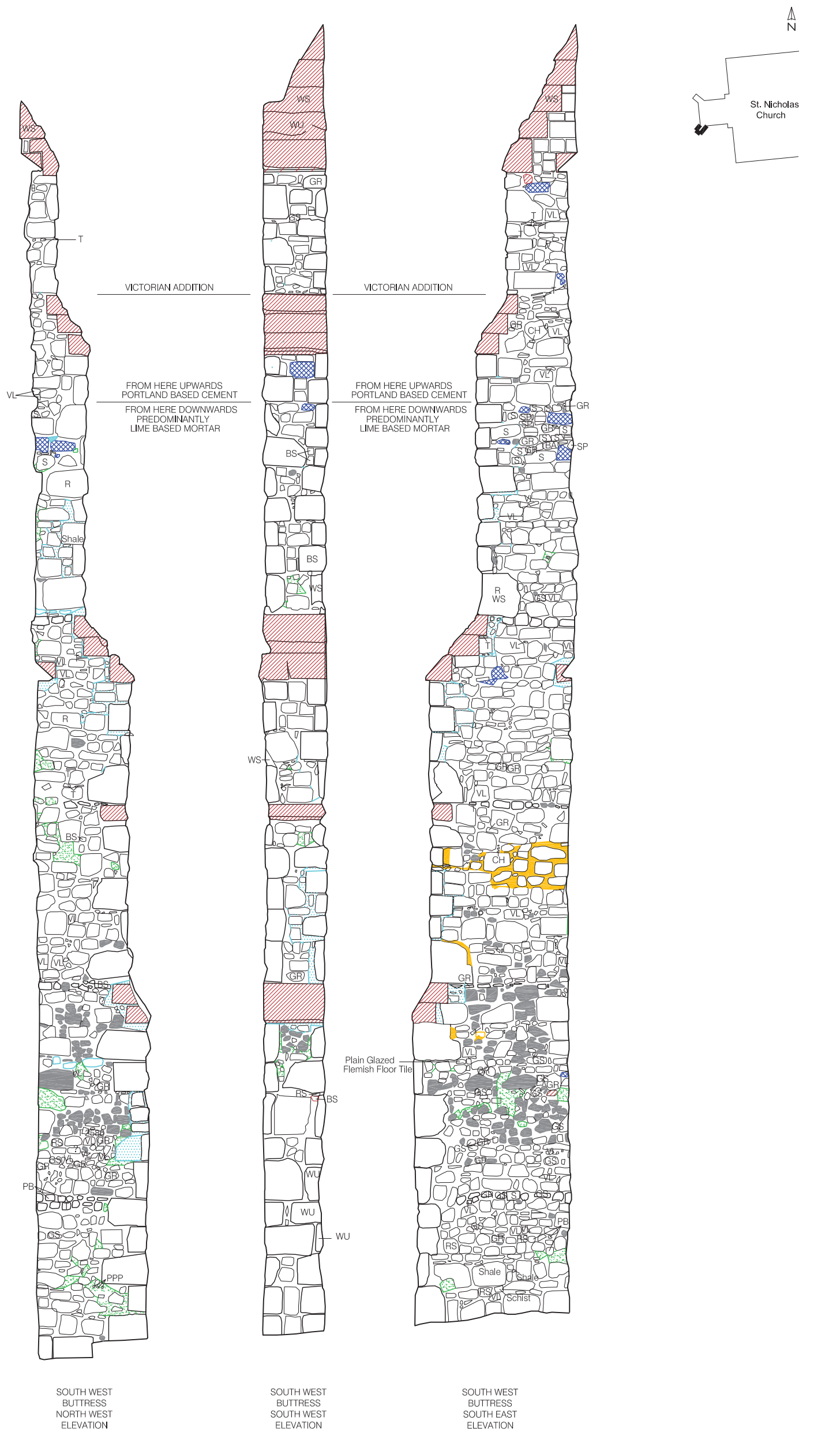


Figure 52
 Southwest butress - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A3



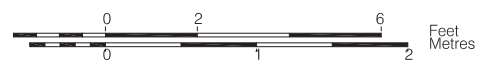
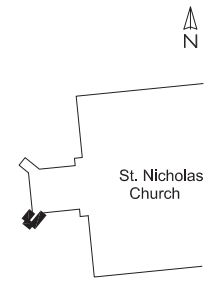
SOUTH WEST
BUTTRESS
NORTH WEST
ELEVATION

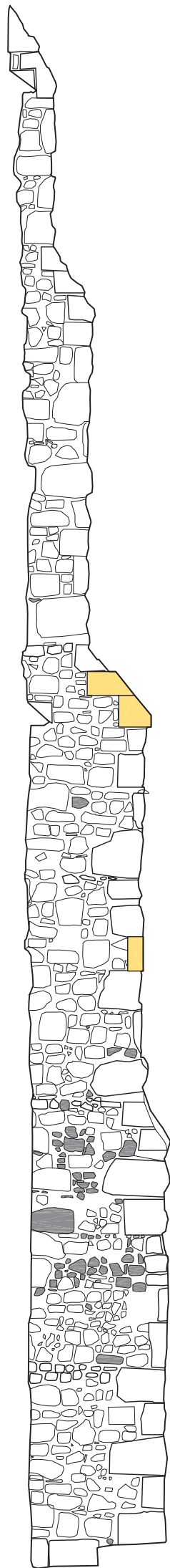


SOUTH WEST
BUTTRESS
SOUTH WEST
ELEVATION

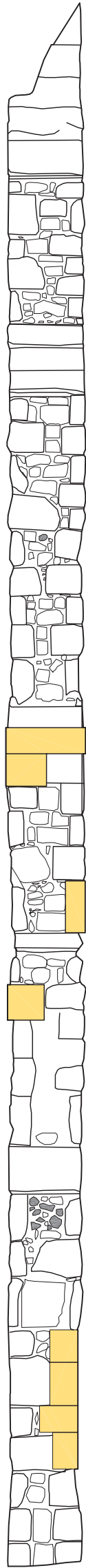


SOUTH WEST
BUTTRESS
SOUTH EAST
ELEVATION

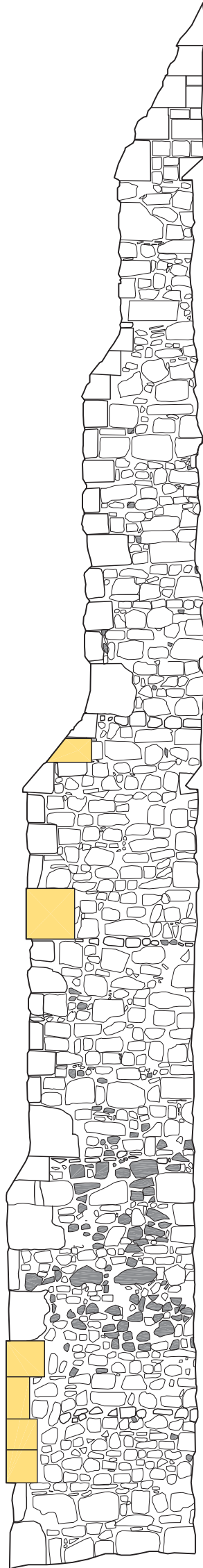




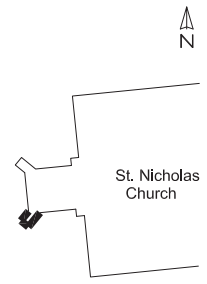
SOUTH WEST BUTTRESS NORTH WEST ELEVATION




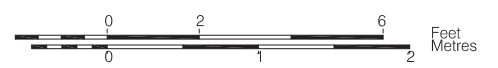
SOUTH WEST BUTTRESS SOUTH WEST ELEVATION



SOUTH WEST BUTTRESS SOUTH EAST ELEVATION



 Stone inserted as part of conservation work



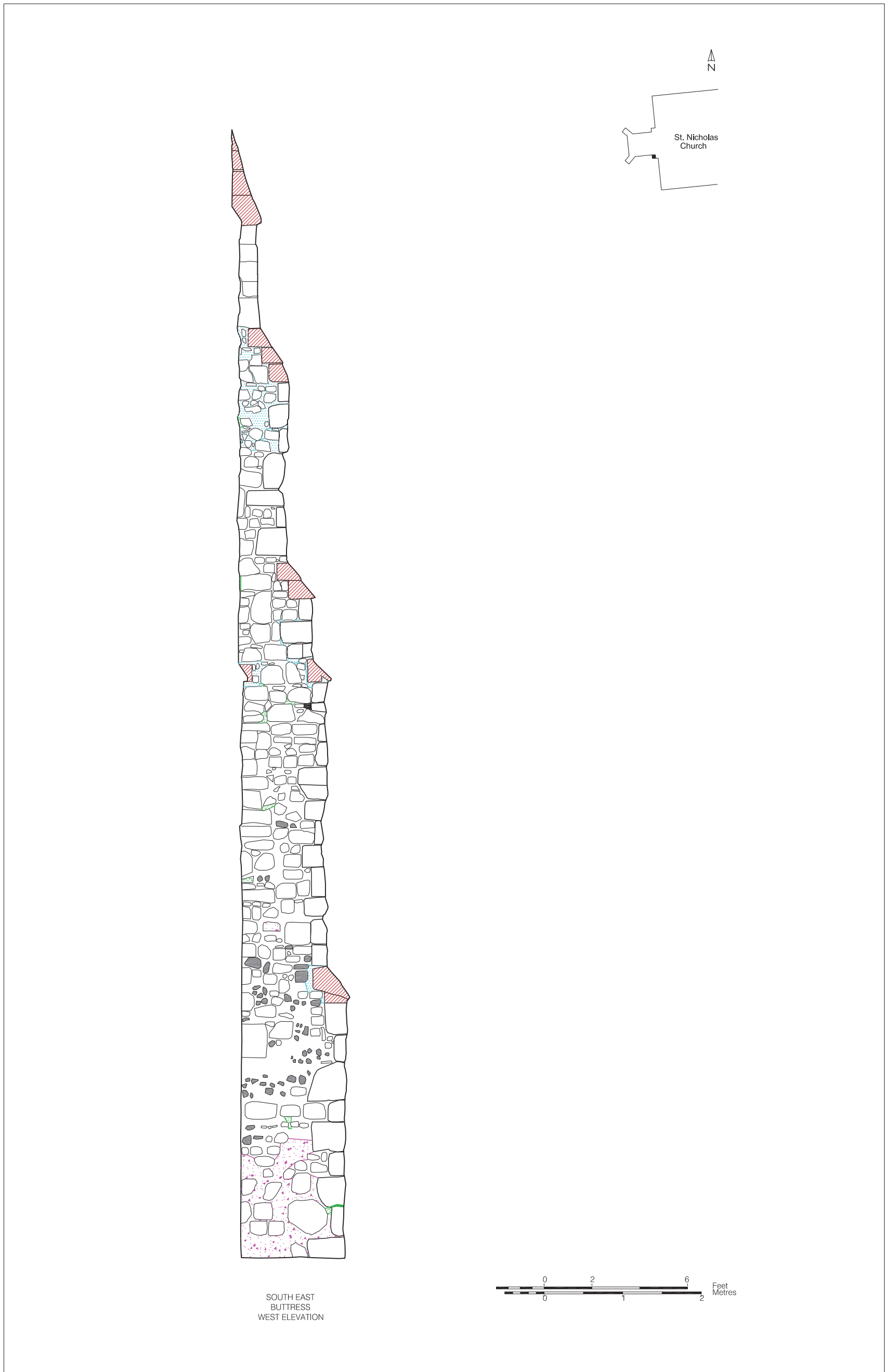
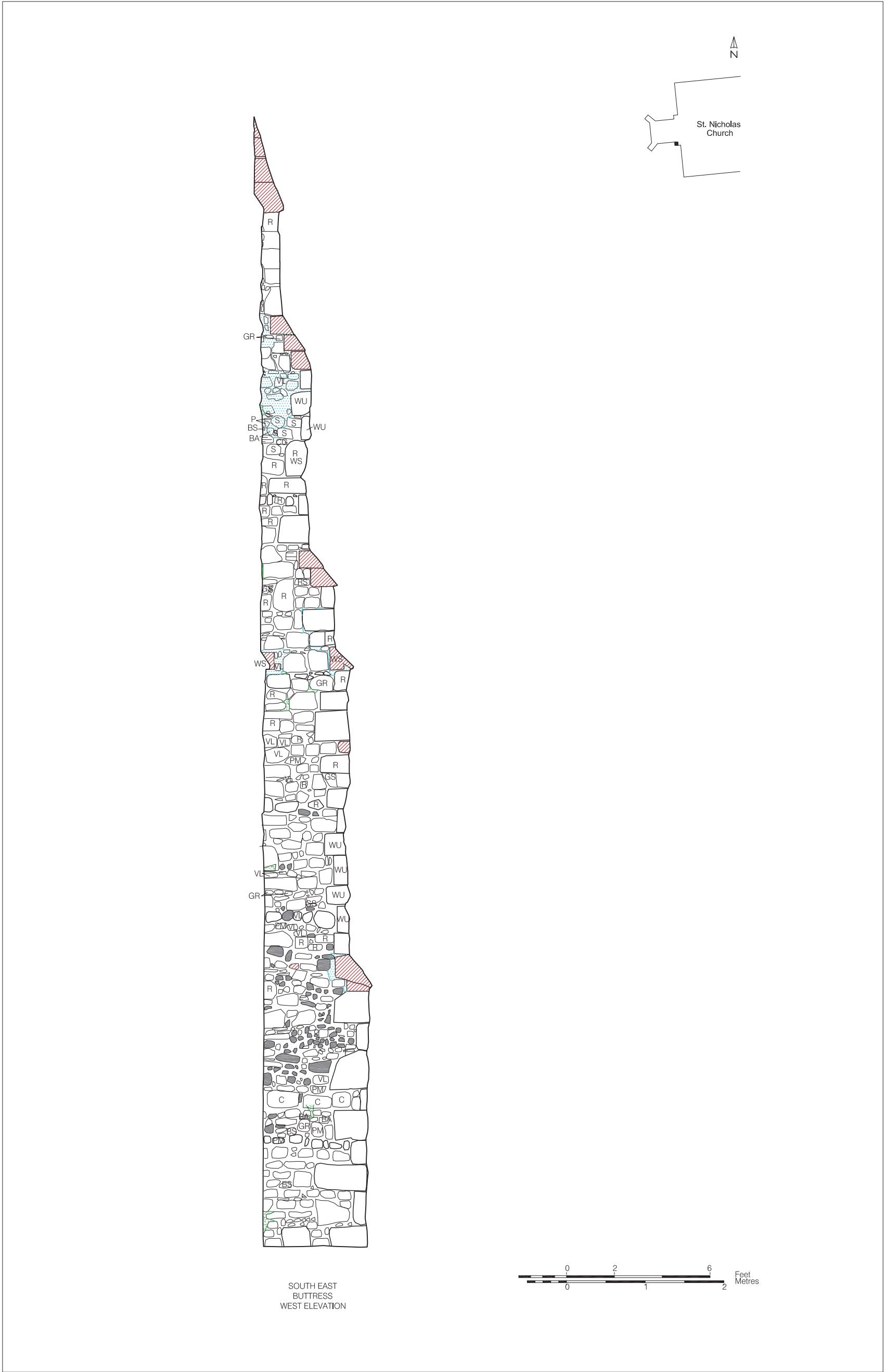
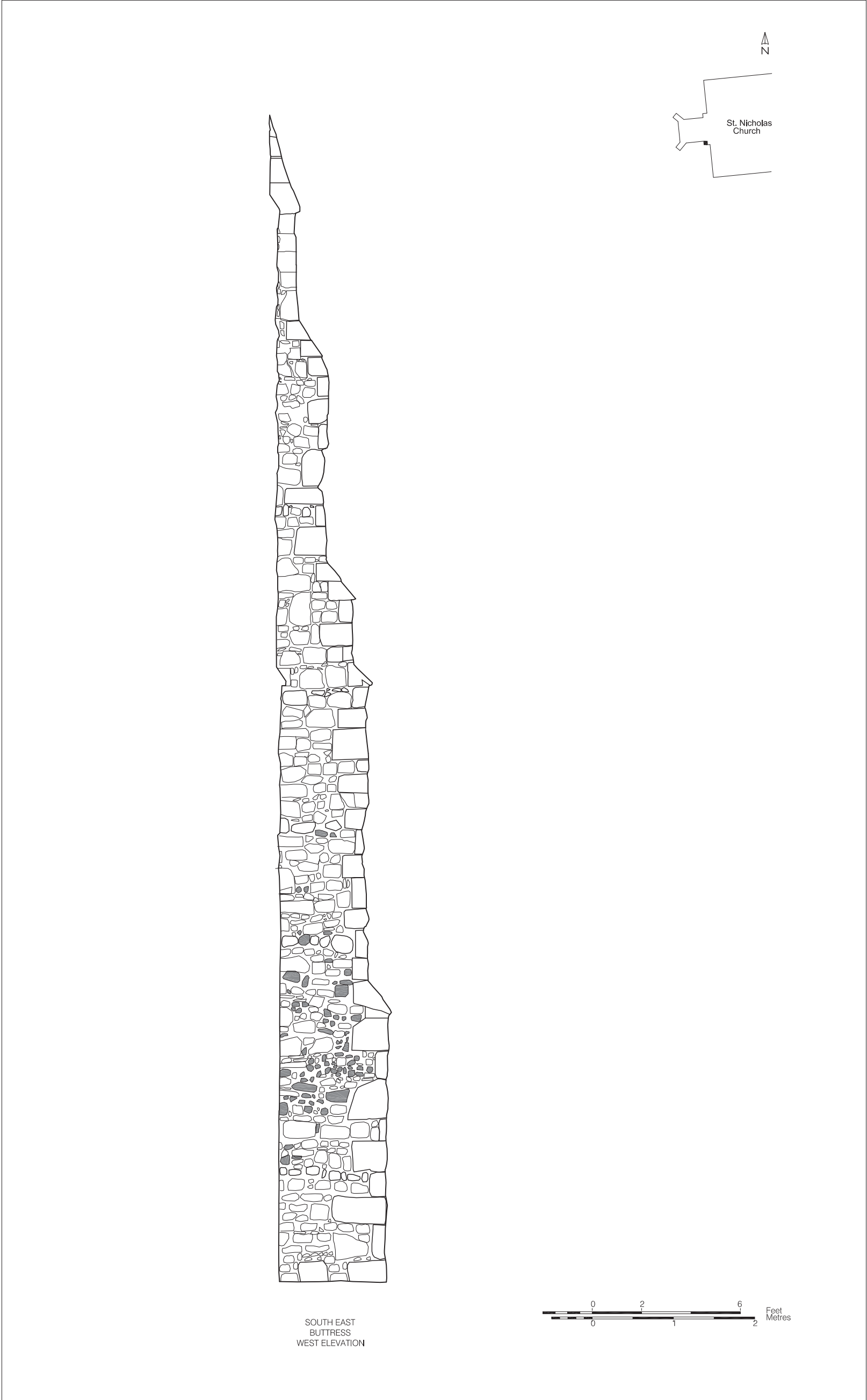


Figure 55
Southeast buttress - pre-conservation survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A3



© Pre-Construct Archaeology Ltd

Figure 56
 Southeast buttress - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A3



© Pre-Construct Archaeology Ltd

Figure 57
Southeast buttress - architectural drawing
1:50 at A3

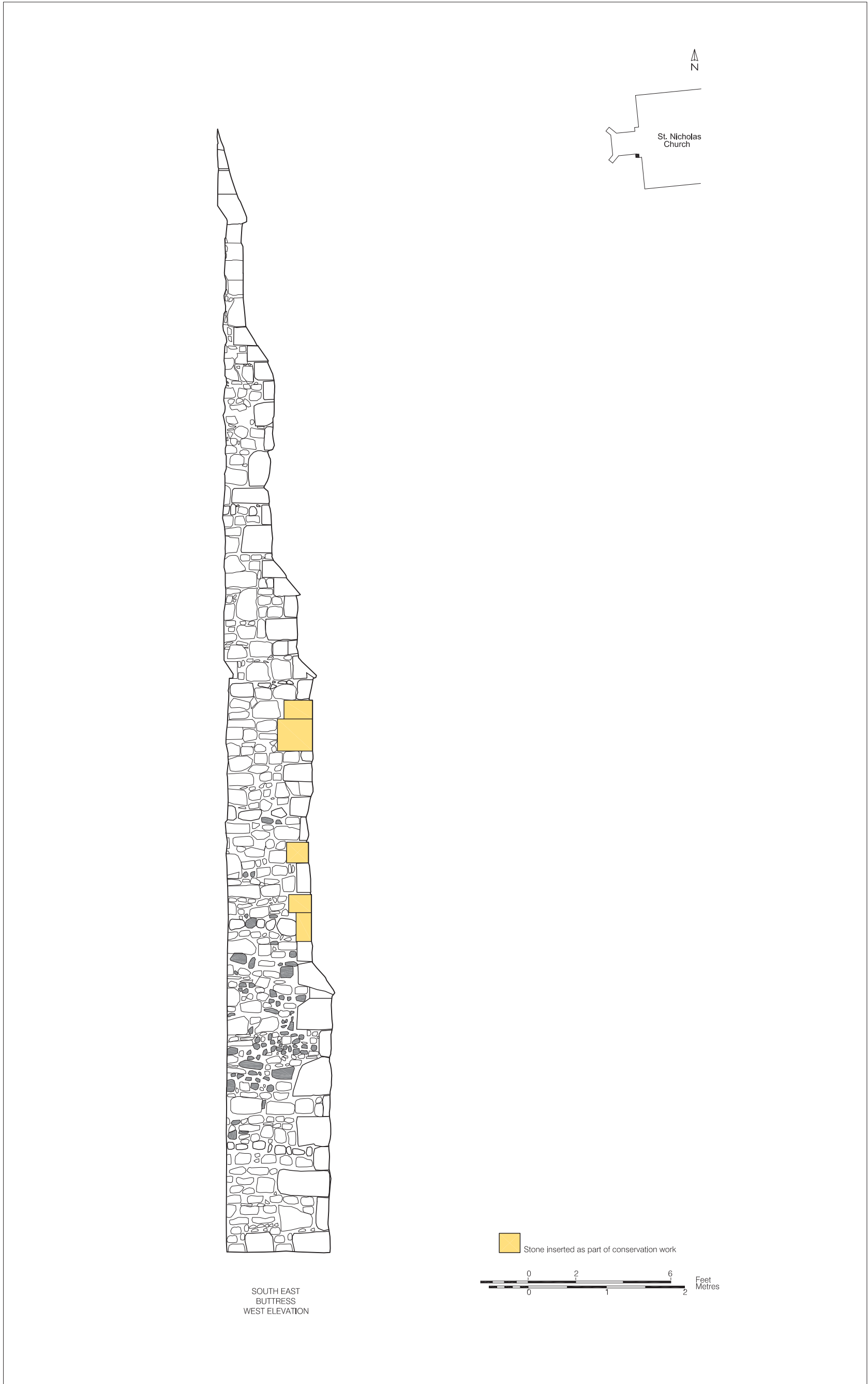


Figure 58
Southeast buttress - post-conservation drawing
1:50 at A3

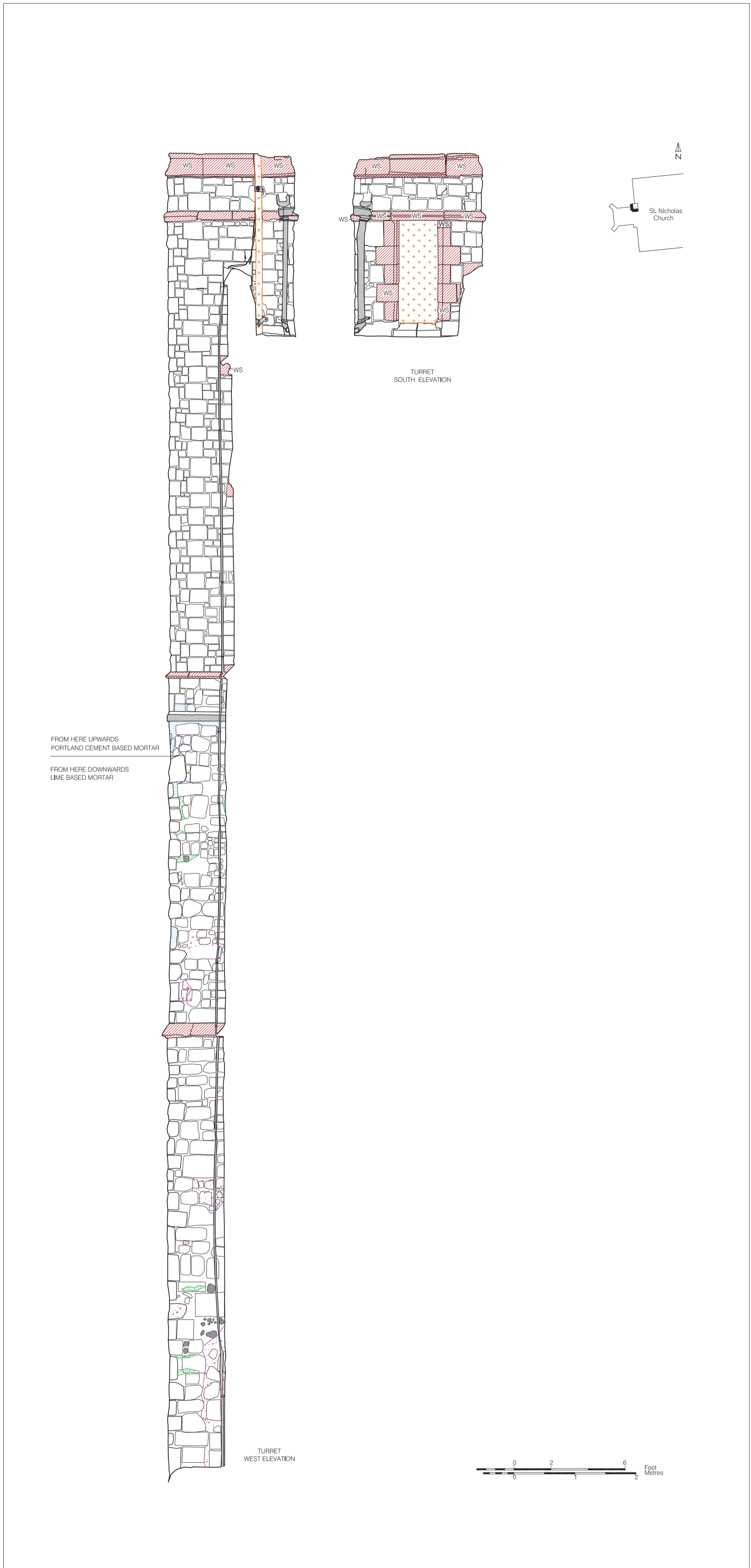


Figure 59
Northeast stair turret - pre-conservation survey
(For key to building material see Appendix 1, Figure 16)
1:50 at A2

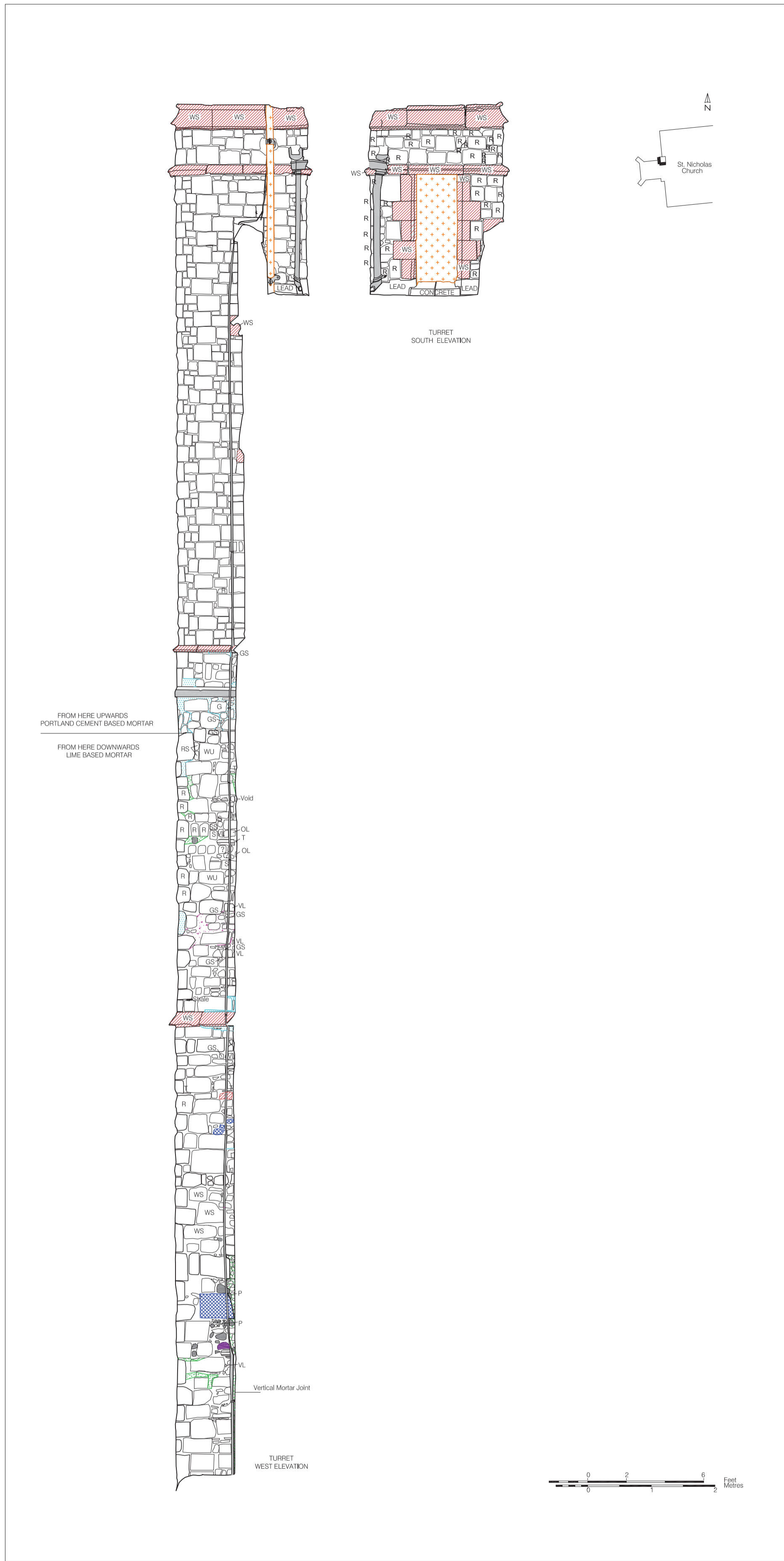
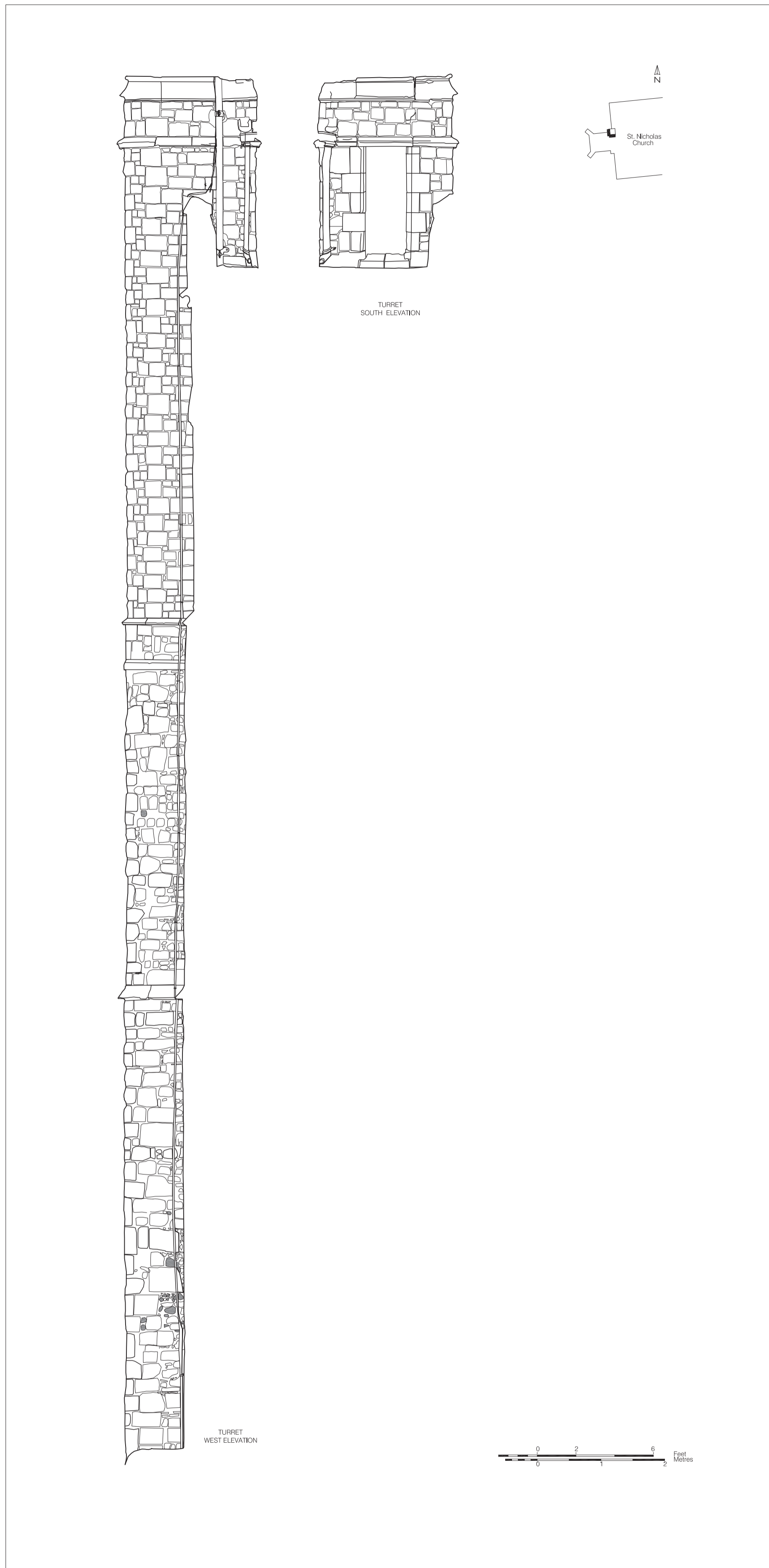
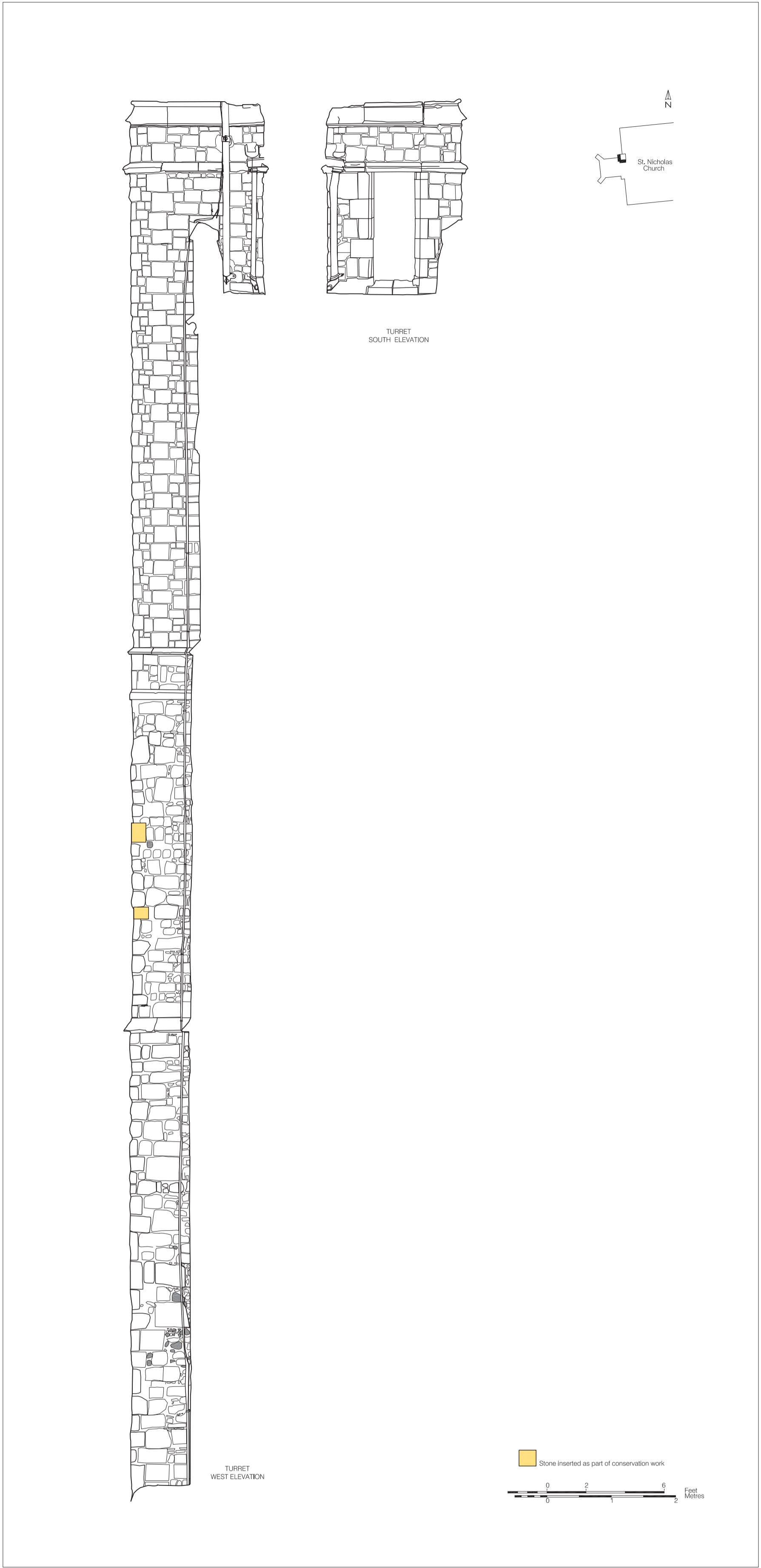


Figure 60
 Northeast stair turret - historic building survey
 (For key to building material see Appendix 1, Figure 16)
 1:50 at A2





© Pre-Construct Archaeology Ltd

Figure 62
Northeast stair turret - post-conservation drawing
1:50 at A2

APPENDIX 5 PHOTOGRAPHIC RECORD

FILM 102 120mm Colour film

1. Facing NE, exterior of St Nicholas Church and Tower

FILM 107 35mm B/W film

15. Facing W, ground floor tower space

FILM 116 35mm Colour slide

1. Facing S, south timber frame (E end)
7. Facing S, south timber frame (W end)
13. Facing E, east timber frame (S end)
19. Facing E, east timber frame (N end)
21. Facing N, north timber frame (E end)
26. Facing N, north timber frame (W end)
33. Facing W, west timber frame

FILM 122 35mm Colour Slide

17. Facing W, Tenor bell
22. Facing S, Treble bell

FILM 125 35mm B/W

20. Facing SW, Independent two tier cast iron bell frame on third floor

FILM 142 120mm Colour film

16. Facing NE, south elevation of stair turret and roof

FILM 144 35mm Colour slide

32. Facing W, construction method of 'Victorian' tower

FILM 146 120mm Colour film

16. Facing W, Victorian addition of stage to southeast buttress

FILM A Digital

1. Facing S, 18th century graffiti