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### *The forts on Hadrian s wall: a comparative analysis of the form and construction of some buildings*

David J.A. Taylor

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**The forts on Hadrian's Wall: a comparative analysis of the  
form and construction of some buildings**

**in three volumes**

**David J. A. Taylor**

**Volume 2**



**19 JUL 2000**

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## **APPENDIX 1**

### **Data Sheets for Primary Forts**

## NOTES TO APPENDICES 1 AND 2

The following information is given in the appendices relating to the forts:-

### 1 **Fort Data Sheet**

The English and Latin names are those given in Daniels (1978). The details of the previous excavations and fieldwork, together with the references, are those within the ramparts of the fort, unless otherwise stated. These details and references are not conclusive. The overall size of a fort is that given in Daniels (1978), unless corrected by later survey or later interpretation. The details of the fort's garrison are those set out in Breeze and Dobson (1991).

### 2 **Building Inscriptions**

A selective assemblage of building inscriptions on dedication-slabs and building stones which give details of any building work within the fort. The RIB reference is stated.

### 3 **Dating Evidence**

An assessment of the reliability of the dating evidence based on the methodology of the past excavations, and other relevant data.

### 4 **Building Data Sheets**

A data sheet is prepared for each recorded building of a fort, setting out detailed dimensions as discussed in chapter 1.5 and shown in figures 31 and 32.

Dimensions given in standard type are those measured by the author.

Dimensions obtained from other sources are shown in italics. The date of the building is given, together with other relevant data. The orientation of the buildings is that used in the latest excavation report.

## Schedule of Primary Forts Per *Lineam Valli* and to the West Coast

Wallsend	Birdoswald
Newcastle upon Tyne	Castlesteads
Benwell	Stanwix
Rudchester	Burgh-by-Sands
Halton Chesters	Drumburgh
Chesters	Bowness-on-Solway
Carrawburgh	Beckfoot
Housesteads	Maryport
Great Chesters	Moresby
Carvoran	

**Note** Burrow Walls is not included as it may not have been part of the defensive system, and the lack of Hadrianic evidence.

## The Roman Fort at Wallsend

<b>Roman Name</b>	Segedunum (fig. 2)	
<b>OS NGR</b>	NZ 301660	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	90%	
<b>Previous Excavations</b>	1895	W. S. Corder. Area within south east angle (Corder 1905, 141)
	1912	W. S. Corder. East gate (PSAN <sup>3</sup> 1912, 209-14)
	1929	F. G. Simpson West, north and south gates together with parts of the rampart to establish the plan of the fort. <i>Principia</i> located. (Dodds 1930, 485-93)
	1975-84	C. M. Daniels, for the Department of the Environment and the University and Society of Antiquities of Newcastle upon Tyne. The whole available area of the fort. (Goodburn 1976, 306-308; Frere 1977, 371-372; Goodburn 1978a, 419; 1979, 279; Grew 1980, 355-358; 1981, 322; Rankov 1982, 340-342; Frere 1983, 289; 1984a, 277-279; 1985, 268-270)

1997- Tyne and Wear museums. Interior and exterior of the fort. (Esmonde Cleary 1998, 383-384)

### Size of Fort

north-south 138.080 m (453' 0")

east-west 119.790 m (393' 0")

area 1.660 hectares (4.1 acres)

### Garrisons

Under Hadrian: *cohors quingenaria equitata(?)*

Under Marcus Aurelius: *cohors II Nerviorum civium Romanorum(?)*

Third century: *cohors IV Lingonum equitata*

*Notitia: cohors IV Lingonum*

The *cohors II Nerviorum* could have been the Hadrianic garrison, although it was not *equitata*. The inscriptions of *cohors IV Lingonum* from the fort (RIB 1299-13-1) are not dated, but are certainly late and are probably third century. The tile of *ala I Hispanorum Asturum* (Britannia 7 (1976) 388) is insufficient evidence for its having been stationed here.

## **The Roman Fort at Wallsend**

### **Building Inscriptions**

1 Building stone found before 1867 at Wallsend, now lost.

'The Second Legion Augusta (built this).' RIB 1308.

This stone may possible not belong to the fort (Collingwood and Wright, 1965, 433).

## **The Roman Fort at Wallsend**

### **Dating Evidence**

The excavations of 1975-84 would appear to have created a firm chronology for the site, which has been further refined by the latest work on site. Unfortunately, this remains unpublished at the present time and is only available in archival form. The present ongoing excavations have further refined the chronology.

<b>Site</b>	Wallsend		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Period I, Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	23.850
		south elevation	24.000
		east elevation	32.390
		west elevation	32.200
	cross-hall length	north elevation	23.960
		south elevation	24.000
	width	west elevation	9.070
		east elevation	9.280
	rear range	depth	4.990
	courtyard	north elevation	14.360
		south elevation	14.170
		east elevation	13.040
		west elevation	13.160
	width of	north elevation	5.085
		east elevation	4.900
	ambulatory	west elevation	4.860
		width	4.730
<i>aedes</i> (int. dims.)	depth	5.030	

<b>Site</b>	Wallsend		
<b>Building</b>	Forehall to <i>Principia</i> and Granary		
<b>Date</b>	Period II, late second or early third century		
<b>Dimensions</b>	overall lengths	north elevation	<i>46.100</i>
		east elevation	<i>9.000</i>
		west elevation	<i>9.000</i>
	size of piers to	width average	<i>1.500</i>
	arcading	depth average	<i>1.500</i>
	distance between piers		<i>2.300</i>
	number of piers		<i>12</i>

<b>Site</b>	Wallsend		
<b>Building</b>	Double Granary		
<b>Date</b>	Period I, Hadrianic		
<b>Orientation</b>	Built originally with loading platforms to face south, orientation changed to face north in late second century and then changed to face south in early third century when the fore-hall was built.		
<b>Dimensions</b>	overall lengths	north elevation	<i>11.550</i>
		south elevation	<i>11.450</i>
		east elevation	<i>26.000</i>
		west elevation	<i>26.000</i>
	overall lengths	north elevation	<i>12.950</i>
	over buttresses	south elevation	<i>12.850</i>
		east elevation	<i>27.400</i>
		west elevation	<i>27.400</i>
	internal width	eastern granary	<i>4.500 - 4.750</i>
	internal width	western granary	<i>4.550</i>
	number of	north elevation	<i>3</i>
	buttresses	south elevation	<i>3</i>
		east elevation	<i>9</i>
		west elevation	<i>10</i>
	spacing of buttresses		<i>2.700 -3.300</i>
	projection of buttresses		<i>700</i>
	width of buttresses		<i>700-900</i>

**Note** Raised floor to eastern granary; solid floor to western granary.

<b>Site</b>	Wallsend		
<b>Building</b>	North Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Period I, Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	<i>17.900</i>
		south elevation	<i>17.700</i>
		east elevation	<i>5.850</i>
		west elevation	<i>5.700</i>
	portal widths	north elevation east	<i>2.550</i>
		north elevation west	<i>2.600</i>
		south elevation east	<i>2.600</i>
		south elevation west	<i>2.600</i>
	width gate passage	north elevation	<i>7.400</i>
		south elevation	<i>7.350</i>
	depth gate passage	east elevation	<i>4.000</i>
		west elevation	<i>4.000</i>
	east guardchamber	north elevation	<i>5.200</i>
		south elevation	<i>5.150</i>
		east elevation	<i>5.850</i>
		west elevation	<i>5.850</i>
	west guardchamber	north elevation	<i>5.300</i>
		south elevation	<i>5.200</i>
		east elevation	<i>5.800</i>
		west elevation	<i>5.700</i>
	projection forward of guardchambers to north face of gate		<i>1.800</i>

**Notes**

Some stonework extant to east guardchamber.

Little/no stonework remaining to west guardchamber and *spina*.

The foundation bases to the *spina* are *c.* 1.500-1.600 m square.

<b>Site</b>	Wallsend		
<b>Building</b>	South Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Period I, Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	<i>17.900</i>
		south elevation	<i>17.900</i>
		east elevation	<i>5.900</i>
		west elevation	<i>5.800</i>
	portal widths	north elevation east	<i>2.400</i>
		north elevation west	<i>2.600</i>
		south elevation east	<i>2.550</i>
		south elevation west	<i>2.500</i>
	width gate passage	north elevation	<i>7.300</i>
		south elevation	<i>7.100</i>
	depth gate passage	east elevation	<i>4.100</i>
		west elevation	<i>4.100</i>
	east guardchamber	north elevation	<i>5.400</i>
		south elevation	<i>5.400</i>
		east elevation	<i>5.900</i>
		west elevation	<i>5.750</i>
	west guardchamber	north elevation	<i>5.200</i>
		south elevation	<i>5.400</i>
		east elevation	<i>5.900</i>
		west elevation	<i>5.800</i>
	Projection forward of guardchambers to south face of gate		<i>1.750</i>

**Notes**

Traces of foundations only extant.

Dimensions assumed to the north west corner of western guardchamber and the south wall of eastern guardchamber.

The foundation bases of the *spina* are *c.* 1.800 by 1.800 m.

<b>Site</b>	Wallsend		
<b>Building</b>	West Gate. Double portal with guardchamber to each side		
<b>Date</b>	Period I, Hadrianic		
<b>Dimensions</b>	depth of gate passage	south elevation	<i>3.900</i>
	south guardchamber	north elevation	<i>5.600</i>
		south elevation	<i>5.750</i>
		east elevation	<i>5.400</i>
		west elevation	<i>5.300</i>
<b>Note</b>	South guardchamber only excavated.		

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 1		
<b>Date</b>	Period 1, Hadrianic-Antonine		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>12.200</i>
		south elevation	<i>12.100</i>
		east elevation	<i>7.700</i>
		west elevation	<i>7.900</i>
	<i>contubernia</i>	north elevation	<i>35.800</i>
		south elevation	<i>35.800</i>
		east elevation	<i>8.000</i>
		west elevation	<i>7.900</i>
	width <i>contubernia</i>	average	<i>3.600</i>
	number of <i>contubernia</i>		9

**Notes**

A central division was seen in the officer`s quarters.

Two *contubernia* were seen to be sub-divided.

A paved verandah was seen to the front elevation 2.000 m wide.

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 2		
<b>Date</b>	Period Ia, Hadrianic		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>c. 11.500</i>
		west elevation	<i>7.900</i>
	<i>contubernia</i>	north elevation	<i>34.300</i>
		west elevation	<i>8.000</i>
	number of <i>contubernia</i>		9
<b>Notes</b>	The north western portion only, of the building, was excavated. Overall dimensions assumed.		

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 3		
<b>Date</b>	Period 1, Hadrianic		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	south elevation	<i>11.400</i>
		east elevation	<i>8.100</i>
	<i>contubernia</i>	south elevation	<i>c. 34.400</i>
		east elevation	<i>8.100</i>
	width of <i>contubernia</i>		3.400-3.700
	number of <i>contubernia</i>		9
<b>Notes</b>	The south east part of the building only, was excavated.		
	Overall dimensions assumed.		

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 4		
<b>Date</b>	Period Ia/Ib, Hadrianic-Antonine		
<b>Orientation</b>	<i>Per scamna</i> , in west of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters.	north elevation	12.100
		south elevation	12.050
		east elevation	7.700
		west elevation	7.800
	<i>contubernia</i>	north elevation	32.800
		south elevation	33.000
		east elevation	7.600
		west elevation	7.700
	width of <i>contubernia</i>		3.200-3.500
	number of <i>contubernia</i>		9
<b>Notes</b>	Officer`s quarters sub-divided to west of centre.		
	Position of divisions in <i>contubernia</i> slightly different in periods Ia and Ib.		

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 5		
<b>Date</b>	Period Ia/Ib, Hadrianic-Antonine		
<b>Orientation</b>	<i>Per scamna</i> , in west of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>12.300</i>
		south elevation	<i>12.650</i>
		east elevation	<i>7.700</i>
		west elevation	<i>7.600</i>
	<i>contubernia</i>	north elevation	<i>33.600</i>
		south elevation	<i>32.700</i>
		east elevation	<i>7.600</i>
		west elevation	<i>7.700</i>
	width of <i>contubernia</i>		<i>3.300-3.500</i>
	number of <i>contubernia</i>		<i>9</i>
<b>Notes</b>	Officer`s quarters divided into three compartments by central east/west stud partition walls, and by wall running south from central division to external wall.		

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 9		
<b>Date</b>	Period Ia/Ib, Hadrianic-Antonine		
<b>Orientation</b>	<i>Per scamna</i> , in west of <i>praetentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>12.000</i>
		south elevation	<i>12.000</i>
		east elevation	<i>8.300</i>
		west elevation	<i>8.500</i>
	<i>contubernia</i>	north elevation	<i>34.010</i>
		south elevation	<i>34.010</i>
		east elevation	<i>8.000</i>
		west elevation	<i>8.300</i>
	width of <i>contubernia</i>		<i>3.400-3.650</i>
	number of <i>contubernia</i>		<i>9</i>

**Notes**

Northern rooms in *contubernia* occupied by cavalry troops, with the southern rooms by horses.

The officer`s quarters, which also included a stable, was divided into three compartments by central east/west stone partition wall and by wall running south from central division to external wall.

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 10		
<b>Date</b>	Period Ia/Ib, Hadrianic-Antonine		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>praetentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>10.900</i>
		south elevation	<i>10.900</i>
		east elevation	<i>8.450</i>
		west elevation	<i>8.650</i>
	<i>contubernia</i>	north elevation	<i>35.250</i>
		south elevation	<i>35.100</i>
		east elevation	<i>8.600</i>
		west elevation	<i>8.650</i>
	width of <i>contubernia</i>		<i>3.200-3.600</i>
	number of <i>contubernia</i>		<i>9</i>

**Notes**

Line of south wall of officer`s quarters assumed.

Southern rooms in *contubernia* occupied by cavalry troops, the northern rooms by horses.

<b>Site</b>	Wallsend			
<b>Building</b>	Barrack Block. Building 11			
<b>Date</b>	Period Ia/Ib, Hadrianic-Antonine			
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>praetentura</i>			
<b>Dimensions</b>	officer`s quarters	north elevation	<i>12.200</i>	
		south elevation	<i>12.100</i>	
		east elevation	<i>7.700</i>	
		west elevation	<i>7.900</i>	
	<i>contubernia</i>	north elevation	<i>33.800</i>	
		south elevation		
		east elevation	<i>7.900</i>	
		west elevation	<i>8.000</i>	
		width of <i>contubernia</i>		<i>3.300-3.600</i>
		number of <i>contubernia</i>		9

**Notes**

The same internal arrangement of the *contubernia* as barrack block 10 is assumed.

Officer`s quarters divided into two compartments by north/south partition wall.

Line of south wall assumed.

<b>Site</b>	Wallsend		
<b>Building</b>	Barrack Block. Building 12		
<b>Date</b>	Period II, Severan		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>praetentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>11.000</i>
		south elevation	<i>11.000</i>
		east elevation	<i>8.900</i>
		west elevation	<i>8.900</i>
	<i>contubernia</i>	north elevation	<i>34.020</i>
		south elevation	<i>34.010</i>
		east elevation	<i>8.600</i>
		west elevation	<i>8.100</i>
	number of <i>contubernia</i>		9

**Notes**

The same internal arrangement of the *contubernia* as barrack block 9 is assumed.

South and east external walls assumed.

No evidence was seen of internal divisions.

## The Roman Fort at Newcastle-Upon-Tyne

<b>Roman Name</b>	Pons Aelius (fig. 3)
<b>OS NGR</b>	NZ 250639
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	Probably less than 5%
<b>Previous Excavations</b>	1978 - 1990 M. Ellison and B. Harbottle until 1983 and J. Nolan thereafter for the City of Newcastle. The central portion of the fort to the north and west of the Keep. (Frere 1984b, 278; 1986, 376-8; 1987, 315; 1991, 232, 234)
<b>Size of Fort</b>	Extent of fort not known but could be c. 110 m (360' 0") by 67 m (220' 0"), c. 0.74 hectares (c. 1.85 acres)
<b>Garrisons</b>	Under Hadrian: no evidence  Under Marcus Aurelius: no evidence  Third century: <i>cohors I Ulpia Traiana Cugernorum civium Romanorum</i> (213)  <i>Notitia: cohors prima Cornoviorum</i>  It is impossible to say if <i>cohors I Thracum</i> (RIB 1323), attested on a building record, was ever stationed at Newcastle.

## The Roman Fort at Newcastle-Upon-Tyne

### Building Inscriptions

- 1 Dedication slab found in 1903 in dredging the north channel of the swing bridge, Newcastle-Upon-Tyne.

'For the Emperor Antoninus Augustus Pius, father of his country, the detachment (of men) contributed from the two Germanies for the Second Legion Augusta and the Sixth Legion Victrix and the Twentieth Legion Valeria Victrix, under Julius Verus, emperor's propraetorian legate, (set this up).'

RIB 1322.

Julius Verus, governor of Britain *c.* 155 - *c.* 159.

## **The Roman Fort at Newcastle-Upon-Tyne**

### **Dating Evidence**

The nature of the site is such that due to much later disturbance, and site limitations, archaeological evidence of the earlier phases is limited. The ditch below the west granary produced Hadrianic pottery and it is considered by the excavators that the fort is Antonine/Severan, late second century or early third century in date. It is probable that the fort replaced an earlier one close by.

<b>Site</b>	Newcastle-Upon-Tyne		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Antonine		
<b>Dimensions</b>	overall length	north elevation	<i>c. 15.000</i>
	overall width	west elevation	<i>c. 9.200</i>
	cross-hall width		<i>c. 5.400</i>
	rear range width		<i>3.520</i>
	<i>aedes</i> (int. dims.)	length	<i>2.800</i>

<b>Site</b>	Newcastle-Upon-Tyne		
<b>Building</b>	West Granary		
<b>Date</b>	Antonine		
<b>Dimensions</b>	overall lengths	east elevation	<i>6.750</i>
		west elevation	<i>6.750</i>
	lengths overall	east elevation	<i>8.170</i>
	buttresses	west elevation	<i>8.170</i>
	internal width		<i>4.390</i>
	number of buttresses		not known
	spacing of buttresses		<i>2.780 - 3.175</i>
	projection of buttresses		<i>540 - 820</i>
	width of buttresses		<i>980 - 1.375</i>

## The Roman Fort at Benwell

<b>Roman Name</b>	Condercum (fig. 4)
<b>OS NGR</b>	NZ 216647
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	Possibly in excess of 30%
<b>Previous Excavations</b>	1926-1927 J. A. Petch. Eastern portion of fort south of the road (Petch 1927, 135-192; 1928, 46-74)
	1929 G. R. B. Spain. Strong room to <i>principia</i> (Spain 1929, 126-130)
	1933 E. Birley, P. Brewis and J. Charlton. The <i>Vallum</i> Crossing (Birley, Brewis, Charlton 1934, 176-184)
	1937 F. G. Simpson and I. A. Richmond. The greater part of the <i>retentura</i> (Simpson and Richmond 1941, 1-42)
	1958 D. Charlesworth. The well in the <i>praetorium</i> (Charlesworth 1960, 233-5)
	1990 N. Holbrook. Pipe trenches in southern portion of eastern range of granary (Holbrook 1991, 41-5)

**Size of Fort**

north-south 170.690 m (560` 0")  
east-west 120.700 m (396` 0")  
area 2.060 hectares (c. 5 acres)

**Garrisons**

Under Hadrian: *ala quingenaria(?)*  
Under Marcus Aurelius: *cohors I Vangionum milliaria equitata*

Under Commodus (Ulpius Marcellus governor): *ala*

Third century: *ala I Asturum (205-8)*

*Notitia: ala I Asturum*

The inscriptions by legionary centurions (RIB 1327 and 1330) do not necessarily indicate the presence of a full legionary detachment under Antoninus Pius.

**Note**

The dimension of the forts size are those proposed by the author (Taylor 1997,61-64), and are based on a re-assessment of the published excavation reports.

## **The Roman Fort at Benwell**

### **Building Inscriptions**

- 1 Building slab found in 1937 in the portico of the granaries at Benwell fort.  
`For the Emperor Caesar Trajan Hadrian Augustus under Alus Platorius  
Nepos, emperor`s propraetorian governor, the detachment of the British fleet  
(built this).` RIB 1340.  
  
Nepos governed Britain from 122 to about 126.
- 2 Building stone found in 1789 on the north side of Benwell fort.  
`The Second Legion Augusta (built this).` RIB 1341.
- 3 Building stone found in Benwell fort before 1873.  
`From the Second Legion the fourth cohort (built this).` RIB 1343.
- 4 Building stone found before 1732 at Benwell.  
`The century of Arrius (built this).` RIB 1345.
- 5 Building stone found before 1873 at Benwell.  
`The century of Arrius (built this).` RIB 1346.
- 6 Building stone found before 1732 at Benwell.  
`The century of Peregrinus (built this).` RIB 1347.

## **The Roman Fort at Benwell**

### **Dating Evidence**

The quality of the dating evidence is low. The major excavation in 1937 was carried out in haste, and involved the cutting of a series of trenches with the object of obtaining a plan of the fort. The foundation of the fort does appear to have a firm Hadrianic date on the basis of work carried out by a detachment of the fleet in Britain, RIB 1340.

<b>Site</b>	Benwell		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	24.080
		south elevation	24.080
		east elevation (est.)	45.110
		west elevation (est.)	45.110
	cross-hall	length	21.030
		width	6.680
	aisle to cross-hall	width	3.040
	rear range	depth	6.100
	courtyard	north elevation	12.190
		south elevation	12.190
		east elevation (est.)	24.380
		west elevation (est.)	24.380
	width of	east elevation	3.960
	ambulatory	west elevation	3.960
	<i>aedes</i> (int. dims.)	width	3.660
		depth	5.180

**Notes**

The length of the east and west elevations are those proposed by the author based on an unpublished paper on a reassessment of the excavation reports.

A strongroom probably of later date was situated below the room east of the *aedes*.

The dimensions are obtained from the excavation reports and some dimensions are of low reliability.

<b>Site</b>	Benwell			
<b>Building</b>	Double Granary			
<b>Date</b>	Hadrianic			
<b>Orientation</b>	Loading platforms faced south with a portico			
<b>Dimensions</b>	overall lengths	north elevation	18.290	
		south elevation	18.290	
		east elevation (est.)	42.670	
		west elevation (est.)	42.670	
	lengths overall	north elevation	20.710	
		south elevation	20.710	
	buttresses	east elevation (est.)	43.870	
		west elevation (est.)	43.870	
		internal width	western granary	7.310
			eastern granary	6.870
	number of	east elevation (est.)	12	
	buttresses	west elevation (est.)	12	
	spacing of buttresses		3.760	
	projection of buttresses		600	
	width of buttresses		1.220	

**Note** Building slab (RIB 1340) was found in the portico of the granaries recording its building by a detachment of the British fleet. The slab would appear to have been *in situ* and not re-used.

<b>Site</b>	Benwell	
<b>Building</b>	Lesser West Gate	
<b>Date</b>	Hadrianic	
<b>Dimensions</b>	portal width	<i>2.900</i>
	passage depth	<i>5.560</i>
<b>Notes</b>	Dimensions taken from the recorded foundations (Simpson and Richmond, 1941, 8-9)	

<b>Site</b>	Benwell			
<b>Building</b>	Double Barrack Block			
<b>Date</b>	Hadrianic			
<b>Orientation</b>	<i>Per scamna</i> , in west of <i>retentura</i>			
<b>Dimensions</b>	officer`s quarters	north elevation	<i>9.450</i>	
		south elevation	<i>10.060</i>	
		east elevation	<i>26.210</i>	
		west elevation	<i>26.210</i>	
	<i>contubernia</i>	north elevation	<i>36.560</i>	
		south elevation	<i>35.660</i>	
		east elevation	<i>26.210</i>	
		west elevation	<i>26.210</i>	
		width of <i>contubernia</i>		<i>c. 3.350</i>
		number of <i>contubernia</i>		18
<b>Note</b>	<p>The east and west dimensions are overall the double barrack.</p> <p>The width of the verandah to the front of the <i>contubernia</i> is 1.520 m.</p> <p>The dimensions are of low reliability.</p>			

## The Roman Fort at Rudchester

<b>Name</b>	Vindobala (fig. 5)	
<b>OS NGR</b>	NZ 112676	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	less than 10%	
<b>Previous Excavations and fieldwork</b>	1924	P. Brewis. Part of the <i>principia</i> and the greater part of single granary to the west, together with parts of the <i>praetorium</i> , south and west gateways (Brewis 1925, 93-120)
	1972	J. P. Gillam, R. M. Harrison and T. G. Newman. South eastern portion of <i>retentura</i> on the south edge of <i>via quintana</i> . Part of the barrack blocks located (Gillam, Harrison, and Newman 1973, 81-85)
	1990	Field survey by M. C. B. Bowden and K. Blood (Bowden and Blood 1991, 25-31)
<b>Size of Fort</b>	north-south	156.970 m (515' 0")
	east-west	117.350 m (385' 0")
	area	1.820 hectares (c. 4.5 acres)

## Garrisons

Under Hadrian: *cohors quingenaria equitata(?)*

Under Marcus Aurelius: no evidence

Third century: no evidence, fort run down from 270s till

370s

*Notitia: cohors prima Frixagorum* (presumably

*Frisiavonum*)

## **The Roman Fort at Rudchester**

### **Building Inscriptions**

- 1 Building stone found about 1875 in the wall of the stackyard at Rudchester.  
`From the fourth cohort, the century of Pedius Quintus (built this).` RIB 1400.
- 2 Building stone seen in 1848 at Rudchester, now lost.  
`From the sixth cohort the century of Aprilis (built this).` RIB 1401.
- 3 Building stone found in 1875 in an old wall at Rudchester.  
`The century of Arrius (built this).` RIB 1402.

## **The Roman Fort at Rudchester**

### **Dating Evidence**

Gillam attributes the period I barracks to a Hadrianic date, and there is no reason to doubt this, nor not attribute the first phase of the other buildings to this date.

<b>Site</b>	Rudchester		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	<i>19.200</i>
		south elevation	<i>19.200</i>
		east elevation (est.)	<i>43.130</i>
		west elevation (est.)	<i>43.130</i>
	cross-hall	length	<i>19.200</i>
		width	<i>7.000</i>
	aisle to cross-hall	width	<i>2.440</i>
	rear range	depth	<i>5.200</i>
	courtyard	north elevation	<i>10.000</i>
		south elevation	<i>10.000</i>
		east elevation (est.)	<i>27.000</i>
		west elevation (est.)	<i>27.000</i>
	width of	east elevation	<i>4.880</i>
		ambulatory	west elevation

**Note**                      The reliability of most of the dimensions stated above is poor.

<b>Site</b>	Rudchester		
<b>Building</b>	Single Granary		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	Loading platform found at the south		
<b>Dimensions</b>	overall lengths	north elevation	<i>9.750</i>
		south elevation	<i>9.750</i>
		east elevation (est.)	<i>40.080</i>
			<i>(37.030)</i>
		west elevation (est.)	<i>40.080</i>
			<i>(37.030)</i>
	lengths overall	north elevation	<i>10.670</i>
		south elevation	<i>10.670</i>
	buttresses	east elevation (est.)	<i>41.000</i>
		west elevation (est.)	<i>41.000</i>
		number of	east elevation (est.) 12 (11)
	buttresses	west elevation (est.) 12 (11)	
	spacing of buttresses		<i>c. 3.810</i>
	projection of buttresses		<i>460</i>
width of buttresses		<i>914</i>	

## Notes

The northern portion of the building was not excavated.

The dimensions without brackets are those calculated assuming the building was constructed without a portico to the *via principalis*. The excavator postulated a further portico and the dimensions for this are given in brackets. The number of buttresses is stated accordingly. It cannot be assumed that the total length of the external walls was exposed.

<b>Site</b>	Rudchester		
<b>Building</b>	South Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	portal width	south elevation west	<i>3.050</i>
	depth gate passage	west elevation	<i>4.270</i>
	west guardchamber	north elevation	<i>c. 5.500.</i>
		south elevation	<i>c. 5.500</i>
		east elevation	<i>c. 4.800</i>
		west elevation	<i>c. 4.800</i>
<b>Note</b>	Door to western guardchamber faces north.		

<b>Site</b>	Rudchester
<b>Building</b>	West Gate. Double portal with a guardchamber to each side
<b>Date</b>	Probably Hadrianic
<b>Dimensions</b>	portal width    east elevation south    3.350

## The Roman Fort at Halton Chesters

<b>Roman Name</b>	Onnum (fig. 6, 7)
<b>OS NGR</b>	NY 997684
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	less than 30%
<b>Previous Excavations and Fieldwork</b>	<p>1823-1827 J. Hodgson. Area cleared north of road and bath house found in north west section of <i>praetentura</i> (Hodgson 1840, 179-80, 316-20)</p> <p>1935-1936 F. G. Simpson &amp; I. A. Richmond. North, east and west gateways, and north east section of <i>praetentura</i> (Simpson &amp; Richmond 1937, 151-171)</p> <p>1956-1958 M. G. Jarrett. South west section of the <i>retentura</i> including extension to fort (Jarrett 1959, 177-90)</p> <p>1960-1961 J. P. Gillam. The granary and buildings to the west up to the Hadrianic rampart (Taylor 1961, 164; 1962, 164-5)</p> <p>1989 K. Blood and M. C. B. Bowden. An analytical field survey (Blood &amp; Bowden 1990, 55-62)</p>

1995 J. Berry and D. J. A. Taylor. A magnetometer survey of the fort (Berry and Taylor 1997, 51-60)

### **Size of Fort**

north-south 140.210 m (460' 0")  
east-west 124.970 m (410' 0"), 173.740 m (570' 0") with extension  
area c. 1.740 hectares (c. 4.3 acres)  
c. 1.940 hectares (c. 4.8 acres) with extension

### **Garrisons**

Under Hadrian: *cohors quingenaria equitata(?)*

Under Marcus Aurelius: no evidence

Third century: *ala Sabiniana*

*Notitia: ala Sabiniana*

The fort was run down from the 270s till the 370s, but the unit apparently survived in name at least.

There is an inscription of it from the fort (RIB 1433) which is apparently third century.

## The Roman Fort at Halton Chesters

### Building Inscriptions

1 Dedication slab found in 1936, fallen from its position over the west gate.

`For the Emperor Caesar Trajan Hadrian Augustus the Sixth Legion Victrix Pia Fidelis (built this) under Aulus Platorius Nepos, the emperor's propraetorian legate.` RIB 1427.

Nepos was governor 122 to c. 126. The stone was heavily weathered before it fell.

2 Dedication slab found in 1753 at Halton Chesters.

`The Second Legion Augusta built this.` RIB 1428.

3 Building stone found in or before 1768 at Halton Chesters.

`The Sixth Legion Victrix Pia Fidelis built this.` RIB 1429.

4 Building stone found before 1760 at Halton Chesters.

`The Sixth Legion Victrix and the Twentieth Legion Valeria Victrix built this.` RIB 1430.

5 Building stone found in 1753 at Halton Chesters.

`From the Twentieth Legion Valeria Victrix the century of Hortensius Proculus (built this).` RIB 1431..

6 Stone seen at Matfen Hall about the middle of the nineteenth century.

`The Century of Saturninus (built this).` RIB 1432.

## The Roman Fort at Halton Chesters

### Dating Evidence

Simpson and Richmond's report of the 1936 excavations gives very little evidence to support the dating conclusions made. The basis for the dating of the construction of the fort to the reign of Hadrian would seem to be the inscription found by the west gate, and presumably built into the structure at the time of its construction. The forehall is dated by them to after 197, but no evidence is put forward to support this conclusion.

Jarrett (1959, 178-183) concludes from pottery evidence that the Hadrianic fort was extended to the west of the *retentura* by Septimus Severus at the beginning of the third century. It would seem consistent to date the forehall to this period, particularly as the date of the forehall at Wallsend can be placed within this period.

Implied dating can be obtained from the turf block filling below the guardchamber floor to the west gate. This filling is consistent with the site strip of the area within the fort, prior to building.

<b>Site</b>	Halton Chesters		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation (est.)	<i>30.000</i>
		south elevation (est.)	<i>30.000</i>
		east elevation (est.)	<i>39.000</i>
		west elevation (est.)	<i>39.000</i>

**Notes**                    The estimated dimensions are obtained from a geophysical survey carried out in 1995 (Berry and Taylor 1997, 51-60).  
It is assumed that any later phase of the building overlaid the original foundations

<b>Site</b>	Halton Chesters		
<b>Building</b>	Forehall to <i>Principia</i>		
<b>Date</b>	Probably Severan		
<b>Dimensions</b>	overall lengths	north elevation (est.)	<i>48.770</i>
		east elevations (est.)	<i>9.140</i>
		west elevation (est.)	<i>9.140</i>

**Note** The dimensions were obtained from notebook no. 58 of the Richmond Archive on Roman Britain, Ashmolean Library, Oxford.

<b>Site</b>	Halton Chesters		
<b>Building</b>	Single Granary		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	Loading platform to the south		
<b>Dimensions</b>	overall lengths	north elevation(est.)	10.560
		south elevation(est.)	10.560
		east elevation (est.)	39.000
		west elevation (est.)	39.000
	overall buttresses	north elevation(est.)	11.600
		south elevation(est.)	11.600
		east elevation (est.)	40.200
		west elevation (est.)	40.200
	internal width	(est.)	9.020
	number of buttresses	east elevation (est.)	13
		west elevation (est.)	13
	spacing of buttresses		c. 3.600
	projection of buttresses		450-610
width of buttresses		550-670	

**Notes** If the granary is to fit in the *latera praetorii* the main body of its length must approximate to that of the *principia* and *praetorium* at c. 39.000 (Berry and Taylor 1997).

Some dimensions have been obtained from the unpublished site archive.

<b>Site</b>	Halton Chesters		
<b>Building</b>	North Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	portal width	south elevation west	<i>c. 3.290</i>
	depth gate passage	west elevation	<i>c. 4.870</i>
	west guardchamber	south elevation	<i>c. 5.030</i>
		east elevation	<i>c. 6.780</i>
	projection forward of guardchamber to		
	north face of gateway		<i>c. 1.800</i>
<b>Notes</b>	<p>Doorway to guardchamber to west portal faces into passage.</p> <p>Some dimensions were obtained from notebook no. 58 of the Richmond Archive on Roman Britain, Ashmolean Library, Oxford.</p>		

<b>Site</b>	Halton Chesters		
<b>Building</b>	East Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	portal width	east elevation north	<i>c. 3.250</i>
	depth gate passage	north elevation	<i>c. 5.000</i>
	north guardchamber	north elevation	<i>6.930</i>
	projection forward of guardchamber to east face of gateway		<i>c. 1.780</i>
<b>Notes</b>	Door to guardchamber north portal faces into passage. North pier of <i>spina</i> measures 1.550 m by 1.680 m.		

<b>Site</b>	Halton Chesters		
<b>Building</b>	West Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	portal widths	east elevation north	3.050
		west elevation north	<i>c.</i> 3.010
	width gate passage		-
	depth gate passage	north elevation	4.920
	north guardchamber	north elevation	6.710
		south elevation	6.710
		east elevation	4.880
		west elevation	4.990
	projection forward of guardchamber to		
	west face of gateway		1.830

**Notes** Dimensions obtained from notebook no. 58 of the Richmond Archive on Roman Britain, Ashmolean Library, Oxford.

<b>Site</b>	Halton Chesters		
<b>Building</b>	Double Barrack Block 1		
<b>Date</b>	Probably Hadrianic with later alterations		
<b>Orientation</b>	<i>Per strigas</i> , in west of <i>praetentura</i>		
<b>Dimensions</b>	officer's quarters	north-south elevations (est.)	20.000
		east-west elevations (est.)	7.500
	<i>contubernia</i>	north-south elevations (est.)	20.000
		east-west elevations (est.)	34.000
	width of <i>contubernia</i> (est.)		3.500-4.000
	number of <i>contubernia</i>		16

**Notes**                    The estimated dimensions are obtained from a geophysical survey carried out in 1995.

                                 This set of data is of low reliability.

<b>Site</b>	Halton Chesters
<b>Building</b>	Double Barrack Block 2
<b>Date</b>	Probably Hadrianic with later alterations
<b>Orientation</b>	<i>Per strigas</i> , in east of <i>praetentura</i>
<b>Dimensions</b>	<i>contubernia</i> north-south elevations (est.) 20.000
	number of <i>contubernia</i> 16

**Notes**

The officer's quarters were not identified.

The estimated dimensions are obtained from a geophysical survey carried out in 1995.

This set of data is of low reliability.

<b>Site</b>	Halton Chesters		
<b>Building</b>	Double Barrack Block 3		
<b>Date</b>	Probably Hadrianic with later alteration		
<b>Orientation</b>	<i>Per scamna</i> in west of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north-south elevations (est.)	16.000
		east-west elevation ( est.)	24.000
	<i>contubernia</i>	north-south elevation (est.)	37.000
		east-west elevation (est.)	24.000
		number of <i>contubernia</i>	16

**Notes**                    The estimated dimensions are obtained from a geophysical survey carried out in 1995.

This set of data is of low reliability.

<b>Site</b>	Halton Chesters		
<b>Building</b>	Double Barrack Block 4		
<b>Date</b>	Probably Hadrianic with later alteration		
<b>Orientation</b>	<i>Per scamna</i> in east of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north-south elevation (est.)	10.000
		east-west elevation (est.)	24.000
	<i>contubernia</i>	north-south elevation (est.)	35.000
		east-west elevation (est.)	24.000
	number of <i>contubernia</i>		16

**Notes**                    The estimated dimensions are obtained from a geophysical survey carried out in 1995.

                                  This set of data is of low reliability.

## The Roman Fort at Chesters

<b>Roman Name</b>	Cilurnum (fig. 8)
<b>OS NGR</b>	NY 912701
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	not known, but probably in excess of 50%
<b>Previous Excavations</b>	1843 J. Clayton. <i>Praetorium</i> (Clayton 1844, 142-47)
	1867 J. Clayton. East Gate (Clayton 1876, 171-76)
	1879 J. C. Bruce. South Gate (Bruce 1880, 211-21)
	c. 1888 J. C. Bruce. Barracks in <i>praetentura</i> (Bruce 1889, 374-5)
	1900 F. Haverfield. Wall ditch inside fort (Haverfield 1902, 9-21)
	1910 T. H. Hodgson. The <i>principia</i> (Hodgson 1910, 134-43)
	1960 R. P. Harper. The <i>praetorium</i> (Harper 1961, 321-6)
<b>Note</b>	Unpublished excavations by J. Clayton are omitted.

**Size of Fort**

north-south 177.000 m (581' 0")  
east-west 131.000 m (430' 0")  
area 2.320 hectares (5.75 acres)

**Note**

The dimensions are scaled from a drawing prepared by the RCHM surveyed Jan. 92/Jan. 93 coll. 858849

**Garrisons**

Under Hadrian: *ala Augusta ob virtutem appellata*

Under Pius: auxiliary regiment (146)

Under Marcus Aurelius: no evidence

Under Commodus (Ulpius Marcellus governor): *ala*

*II Asturum*

Third Century: *ala II Asturum* (205-08)

*Notitia: ala II Asturum*

The inscriptions under Pius of II Augusta are building inscriptions (RIB 1460-61) and do not prove that a detachment of the legion was in garrison. On the other hand the diploma of 146 found at the fort suggests strongly that there was an auxiliary regiment in garrison then. The tombstone to the daughter of a commanding officer of *cohors I Vangionum* (RIB 1482) is not easily explained as a death on a visit to the fort, and the wife's *nomen* Aurelia suggests a date not earlier than 161. The *cohors I Delmatarium* is also recorded at the fort and must have been in garrison at some time in the second century.

## The Roman Fort at Chesters

### Building Inscriptions

- 1 Dedication slab found in 1868 lying loose against a buttress in the south east corner of the *principia*.

‘For the Emperor Titus Aelius Hadrianus Antoninus Augustus Pius, father of his country, in his second consulship, the Sixth Legion Victrix (built this).’

RIB 1460.

Antoninus accepted the title *pater patriae* in 139. Clayton said that the stone came from the east gate. Haverfield attributed it to the *principia* on the basis of information supplied by the workmen who excavated the stone.

- 2 Dedication slab found in 1889 reused in the barracks in the north east portion of the *praetentura*.

‘For the Emperor Titus Aelius Hadrianus Antoninus Augustus Pius, father of his country, in his second consulship, the detachment of the Sixth Legion

*Victrix Pia Fidelis* (built this).’ RIB 1461.

- 3 Fragments of an octagonal dedication slab found 1870-1886, part in *principia*.

‘For the Emperor-Caesars Lucius Septimus Severus Pius Pertinax Augustus and Marcus Aurelius Antoninus Pius Augustus and for Publius Septimus Geta, most noble Caesar, the Second Cavalry Regiment of Asturians (built this) under the charge of Alfenus Senecio, of consular rank, and Oclatinus Adventus, procurator, under the direction of ....’ RIB 1462.

Senecio was governor of Britain from 205 to c. 208.

4 Dedication slab found in 1897 in a room west of the lesser east gate. It had probably come from the west cistern placed at the gate.

‘Water brought for the Second Cavalry Regiment of Asturians under Ulpius Marcellus, emperor’s propraetorian legate.’ RIB 1463.

Ulpius Marcellus was governor *c.* 217.

5 Dedication slab found in 1798 in the south west portion of the *retentura*.

‘The Emperor Caesar Marcus Aurelius Antoninus Pius Felix Augustus, most honourable priest of the Invincible Sub-god Elagabalus, pontifex maximus, in his fourth year of tribunician power, thrice consul, father of his country, son of the deified Antoninus, grandson of the deified Severus, and Marcus

Aurelius Alexander, most noble Caesar, partner of empire, for the Second

Cavalry Regiment of Asturians styled Antoniniana restored (this building)

fallen in through age, through the agency of Marius Valerianus, imperial

propraetorian legate, under the direction of Septimius Nilus, prefect of cavalry;

dedicated on October 30th in the consulship of Gratus and Seleucus.’

RIB 1465.

The letters describing the building were erased.

6 Building stone found in 1879, built into the seventh course of the east wall inside the east guardchamber of the south gate.

‘The Sixth Legion Victrix (built this).’ RIB 1471.

7 Building stone found before 1873 apparently at Chesters.

‘The century of the senior centurion (built this).’ RIB 1472.

8 Building stone found before 1840 probably from Chesters.

‘From the first cohort the century of Nas ... Bassus (built this).’ RIB 1473.

9 Building stone found before 1873 at Chesters.

`From the ... cohort the century of Flavius Civilis (built this).` RIB 1474.

10 Building stone seen in 1760 probably from Chesters.

`From the fifth cohort the century of Caecilius Proculus (built this).` RIB 1475.

11 Building stone found before 1873 at Chesters.

`From the fifth cohort the century of Caecilius Proculus (built this).` RIB 1476.

12 Building stone found before 1873 at Chesters.

`The century of Hortaesius Maximus (built this).` RIB 1477.

13 Building stone seen in 1807 at Chesters.

`The century of Locu(... (built this).` RIB 1478.

14 Building stone found in 1843 near the *praetorium*.

`The century of Similis (built this).` RIB 1479.

15 Fragment of altar found in 1978 in the bank of the River Tyne 150 m south east of the fort.

`To the discipline of the emperor Hadrian the cavalry regiment styled Augusta for valour (set this up).`

This confirms that the fort was built for a quingenary *ala* (Hasall and Tomlin 1979, 346).

## **The Roman Fort at Chesters**

### **Dating Evidence**

As the major excavations within the fort were carried out before the advent of modern excavation techniques, the dating of any of the later phases of the buildings cannot be relied upon with any certainty. The primary phase of the buildings is Hadrianic and this is supported by artifactual and other evidence (Budge 1903, 363-408). Birley (1985, 18) states that John Clayton's excavations lowered the floor to the cross-hall and the other rooms to their original Hadrianic levels.

<b>Site</b>	Chesters		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	27.380
		south elevation	27.540
		east elevation	39.190
		west elevation	38.990
	cross-hall length	north elevation	27.530
		south elevation	27.580
		width	9.600
	aisle to cross-hall	width	3.200
	rear range	depth	6.840
	courtyard	north elevation	15.620
		south elevation	15.650
		east elevation	15.610
		west elevation	15.560
	width of	north elevation	3.560
	ambulatory	east elevation	5.870
		west elevation	5.920
	<i>aedes</i> (int. dims.)	width	5.790
		depth	6.070

**Note** A strong room of probable Severan date was built below the room to the east of the *aedes*

<b>Site</b>	Chesters		
<b>Building</b>	North Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	18.900
		south elevation	18.760
		east elevation	5.650
		west elevation	5.810
	portal widths	north elevation east	3.080
		north elevation west	3.260
		south elevation east	3.180
		south elevation west	3.220
	width gate passage	north elevation	8.320
		south elevation	8.230
	depth gate passage	east elevation	4.090
		west elevation	4.110
	east guardchamber	north elevation	5.360
		south elevation	5.360
		east elevation	5.650
		west elevation	5.660
	west guardchamber	north elevation	5.490
		south elevation	5.420
		east elevation	5.730
		west elevation	5.810
	projection forward of guardchambers to north face of gate		1.680-1.720

**Note**

Doors to guardchambers face into the gate passage.

<b>Site</b>	Chesters		
<b>Building</b>	South Gate. Double portal with guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	18.190
		south elevation	18.170
		east elevation	5.620
		west elevation	5.580
	portal widths	north elevation east	3.240
		north elevation west	3.240
		south elevation east	3.280
		south elevation west	3.260
	width gate passage	north elevation	8.250
		south elevation	8.300
	depth gate passage	east elevation	3.990
		west elevation	4.000
	east guardchamber	north elevation	5.050
		south elevation	4.960
		east elevation	5.620
		west elevation	5.570
	west guardchamber	north elevation	4.910
		south elevation	4.890
		east elevation	5.690
		west elevation	5.690
	projection forward of guardchambers to south face of gate		1.580-1.680

**Note**

Doors to guardchambers face into the gate passage.

<b>Site</b>	Chesters		
<b>Building</b>	East Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	5.780
		south elevation	5.670
		east elevation	19.730
		west elevation	19.600
	portal widths	east elevation north	3.260
		east elevation south	3.260
		west elevation north	3.230
		west elevation south	3.230
	width gate passage	east elevation	8.290
		west elevation	8.260
	depth gate passage	north elevation	3.980
		south elevation	4.100
	north guardchamber	north elevation	5.780
		south elevation	5.760
		east elevation	5.800
		west elevation	5.750
	south guardchamber	north elevation	5.640
		south elevation	5.670
		east elevation	5.590
		west elevation	5.640
	projection forward of guardchambers to west face of gate		1.520-1.780

**Note**

Doors to guardchambers face into the gate passage.

<b>Site</b>	Chesters		
<b>Building</b>	West Gate. Double portal with guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	5.780
		south elevation	5.810
		east elevation	19.470
		west elevation	19.540
	portal widths	east elevation north	3.310
		east elevation south	3.280
		west elevation north	3.240
		west elevation south	3.260
	width gate passage	east elevation	8.350
		west elevation	8.210
	depth gate passage	north elevation	4.080
		south elevation	4.140
	north guardchamber	north elevation	5.780
		south elevation	5.770
		east elevation	5.610
		west elevation	5.570
	south guardchamber	north elevation	5.830
		south elevation	5.810
		east elevation	5.570
		west elevation	5.690
	projection forward of guardchambers to east face of gate		1.650-1.690

**Note**

Doors to guardchambers face into the gate passage.

<b>Site</b>	Chesters		
<b>Building</b>	Lesser East Gate		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	east elevation	6.140
		south elevation	<i>c. 5.710</i>
	portal width	east elevation	3.390
	width gate passage	west elevation	3.930
	depth gate passage	south elevation	<i>c. 5.710</i>
<b>Note</b>	This gateway gave access to the military way and the bridge over the North Tyne.		

<b>Site</b>	Chesters		
<b>Building</b>	Barrack Block (north)		
<b>Date</b>	Hadrianic with later alterations		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>retentura</i>		
<b>Dimensions</b>	officer's quarters	west elevation	c. 12.000
	<i>contubernia</i>	east elevation	c. 10.550
	width <i>contubernia</i>		3.600-3.770
	number of <i>contubernia</i>		10
	depth of verandah		1.500

**Notes** The east, west and part of the northern section of the building remains unexcavated.

The depth of the *contubernia* reduces by c. 120 mm in each of the five compartments measured to the west of the officer's quarters.

It is unlikely that much of the upstanding masonry to the two exposed barracks is Hadrianic, but it is probable that it is built on Hadrianic foundations.

<b>Site</b>	Chesters		
<b>Building</b>	Barrack Block (south)		
<b>Date</b>	Hadrianic with later alteration		
<b>Orientation</b>	<i>Per scamna</i> . In east of <i>retentura</i>		
<b>Dimensions</b>	officer's quarters	north elevation	11.060
		south elevation	11.640
		east elevation	11.730
		west elevation	12.520
	<i>contubernia</i>	east elevation	10.540
	width of <i>contubernia</i>		3.440-3.640
	number of <i>contubernia</i>		10
	depth of verandah		1.520

## The Roman Fort at Carrawburgh

<b>Roman Name</b>	Brocolitia (fig. 9)	
<b>OS NGR</b>	NY 859712	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	less than 5%	
<b>Previous Excavations</b>	1934	E. Birley. North west angle tower and establishing the line of the <i>Vallum</i> through fort (Birley 1935, 95-99)
	1967-1969	D. J. Breeze. <i>Principia</i> and part of south gate (Breeze 1972, 81-144)
<b>Size of Fort</b>	north-south	140.000 m (460' 0")
	east-west	111.700 m (366' 0")
	area	1.60 hectares (3.9 acres)
	The dimensions are as stated by Breeze (1972, 82)	
<b>Garrisons</b>	Under Hadrian: <i>cohors quingenaria equitata</i> (?)	
	Under Marcus Aurelius: no evidence	
	Third Century: <i>cohors I Batavorum equitata</i> (213-17)	
	<i>Notitia</i> : <i>cohors I Batavorum equitata</i>	
	There are a large number of units attested here, <i>cohorts I Aquitanorum, I Tungrorum, I Cugernorum, I Frisiavonum</i> and <i>II Nerviorum</i> . The first two are attested building, but the others were possibly merely honouring the local goddess Coventina. There is no	

evidence that RIB 1545 is earlier than RIB 1544, here used to give the earliest certain date that *Batavorum* was at Carrawburgh.

## The Roman Fort at Carrawburgh

### Building Inscriptions

- 1 Altar, found in 1875 during excavations at Carrawburgh.  
`To Minerva Quintus, an engineer (*architectus*), willingly and deservedly fulfilled his vow.` RIB 1542.
- 2 Part of a dedication slab found in 1838 in the north-east corner of Carrawburgh fort.  
`. . . under . . . ]verus as emperor`s propraetorian legate the First Cohort of Aquitanians built this under . . . Nepos, the prefect.` RIB 1550.  
Dated to about 130-3 (Collingwood and Wright 1965, 495)
- 3 Building stone found before 1732.  
`The century of Alexander (built this).` RIB 1554.
- 4 Building stone found in 1874 at Carrawburgh fort.  
`The century of Antonius Rusticus (built this).` RIB 1555.
- 5 Building stone found in 1871 in a wall of the internal tower between the west gate and the south-west angle of Carrawburgh fort.  
`The Thruponian century (built) 24 feet.` RIB 1556.

## The Roman Fort at Carrawburgh

### Dating Evidence

A Hadrianic foundation for fort has been established by D. J. Breeze by pottery association (Breeze 1972, 83). Two or three later phases were identified in the *praetentura*.

The fragmentary inscription of the first *cohort* of the *Aquitanians* (RIB 1550) is usually attributed to the governor Sextus Julius Severus (c. 130-133) and could be used to date the building of the fort.

<b>Site</b>	Carrawburgh		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	26.200
		south elevation	26.200
		east elevation	28.000
		west elevation	28.000
	cross-hall	length	26.200
		width	7.050
	aisle to cross-hall	width	2.300
	rear range	depth	6.500
	courtyard	west elevation (est.)	6.800
	width of		
	ambulatory	west elevation (est.)	3.500
	<i>aedes</i> (int. dims.)	width	4.700
		depth	6.500
	strong room	north elevation	2.450
		south elevation	2.450
		east elevation	2.600
		west elevation	2.450

**Site** Carrawburgh  
**Building** West Granary  
**Date** Probably Hadrianic  
**Orientation** north-south

<b>Dimensions</b>	overall lengths	width (est.)	<i>13.800</i>
	overall buttresses	width (est.)	<i>16.200</i>
	internal width		<i>11.400</i>
	spacing of buttresses		<i>3.300</i>
	projection of buttresses		<i>1.200</i>
	width of buttresses		<i>1.000</i>

**Notes** The eastern granary is positioned 2.300 m to the east of the western granary.

The eastern buttresses to western granary are shared by the eastern granary.

<b>Site</b>	Carrawburgh	
<b>Building</b>	Barrack block	
<b>Date</b>	Hadrianic	
<b>Orientation</b>	<i>Per scamna</i> , in the <i>praetentura</i>	
<b>Dimensions</b>	width overall	<i>11.000</i>
<b>Notes</b>	<p>The dimension includes the verandah to the front across which a partition between each <i>contubernia</i> ran.</p> <p>A further barrack block of similar size was seen facing this to the south.</p>	

## The Roman Fort at Housesteads

<b>Roman Name</b>	Vercovicium (fig. 10)	
<b>OS NGR</b>	NY 790688	
<b>Orientation</b>	To the east	
<b>Extent of Fort</b>		
<b>Excavated</b>	100%	
<b>Previous Excavations</b>	1822	J. Hodgson. Western half of south gate and area to north side of <i>principia</i> (Hodgson 1840, 186)
	1830	J. Hodgson. Eastern side of south gate (Hodgson 1840, 186)
	1831	J. Hodgson. South gate and area near east gate (Hodgson 1840, 186-7; Bosanquet 1904, 200)
	1833	J. Hodgson. East gate and part of the west gate (Hodgson 1840, 186-7)
	c. 1849 - 1858	J. Clayton. Some probable excavation of ramparts and gates (Bosanquet 1904, 201-203)
	1898	R. C. Bosanquet. Interior of fort (Bosanquet 1904, 193-300)
	1909	F. G. Simpson. North west and north east angles of fort (Simpson 1976, 125-133)

- 1911 - 1912 F. G. Simpson. South east angle of fort and latrines (Simpson 1976, 133-152)
- 1930 F. G. Simpson. North gate (Collingwood and Taylor 1931, 218)
- 1932 E. Birley. The ditches of the fort (Birley, Charlton and Hedley 1933, 82-96)
- 1954 D. J. Smith. Eastern portion of *principia* (Smith 1954)
- 1959 - 1960 J. Wilkes. Barrack block XIV (Wilkes 1960, 61-71; 1961, 279-300)
- 1967 - 1969 J. Wilkes and D. Charlesworth. The commandants house (Charlesworth 1975, 17-42)
- 1969 - 1973 D. Charlesworth. The hospital (Charlesworth 1976, 17-30)
- 1974 - 1977 C. M. Daniels and J. P. Gillam. Barrack block XIII (report in preparation)
- 1979 - 1980 C. M. Daniels and J. P. Gillam. Area inside north rampart east of north gate (report in preparation)
- 1984 J. G. Crow. North curtain wall (Crow 1988, 61-124)

## Size of Fort

north-south	111.860 m (367' 0")
east-west	185.930 m (610' 0")
area	2.020 hectares (c. 5 acres)

## Garrisons

Under Hadrian: *cohors milliaria peditata*

Under Marcus Aurelius: no evidence

Third century: *cohors I Tungrorum milliaria, numerus*

*Hnaudifridi, cuneus Frisiorum Ver. (Severus Alexander)*

*Notitia: cohors I Tungrorum*

The inscriptions of *cohors I Tungrorum* and the *numerus Hnaudifridi* are undated, but a third-century date seems probable. A sculpture of an archer from Housesteads has been dated to the second century, with uncertain implications. The inscription referring to *mil(ites) leg. II Aug. agentes in praesidio* (RIB 1583) is generally taken with RIB 1582 to refer to a garrisoning of Housesteads by soldiers of that legion, though there is no evidence when this was.

## The Roman Fort at Housesteads

### Building Inscriptions

- 1 Four fragments of a dedication slab found at Housesteads. Fragments (a) & (b) found in 1898 in the *principia*. (c) found in 1931 in the south granary, (d) found in or before 1873 somewhere in the fort.

‘For the Emperor-Caesars Lucius Septimus Severus Pius Pertinax Augustus and Marcus Aurelius Antoninus Pius Augustus ....’ RIB 1612.

This falls within the dates 198-209 (Collingwood and Wright 1965, 513)

- 2 Building stone found in 1898 lying on the south wall of one of the buildings in the north east quarter of Housesteads fort.

‘Aurelius chiselled (this).’ RIB 1625.

- 3 Part of building stone found before 1922 at Housesteads.

‘The length in feet built by ....’ RIB 1629.

- 4 A building stone found in 1986 built into the outer face of the north wall of the southern boundary.

‘The First Cohort of Tungrians (built this).’ (Hassall and Tomlin 1987, 369)

## **The Roman Fort at Housesteads**

### **Dating Evidence**

Although Bosanquet's excavations of 1898 did not identify the building of the Wall as the work of Hadrian, he did in many instances identify the various phases of the buildings which he excavated (Bosanquet 1903, pl. opp. 210)

Later work has shown that the earliest period is Hadrianic (Crow 1995, 17) and has thrown more light on the dating of the subsequent phases of the buildings (Crow 1995, 85). Barrack building XIII, period I, was assigned to the Hadrianic period by J. Wilkes during the 1960 excavation. The forthcoming report of the 1974-80 excavations in the north-east sector of the fort confirms the existing chronologies.

<b>Site</b>	Housesteads		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	27.580
		south elevation	27.280
		east elevation	23.250
		west elevation	23.500
	cross-hall length	west elevation	23.360
		east elevation	23.280
		width	6.970-7.000
	aisle to cross-hall	width	2.410
	rear range	depth	5.760
	courtyard	north elevation	8.910
		south elevation	8.730
		east elevation	16.180
		west elevation	16.220
	width of	north elevation	3.530
	ambulatory	south elevation	3.580
		east elevation	3.420
		<i>aedes</i> (int. dims.)	width
		depth	5.090
	portico to east	depth	2.130

**Note** The overall dimensions exclude the portico to the east.

<b>Site</b>	Housesteads		
<b>Building</b>	Granary		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	Loading bays to west		
<b>Dimensions</b>	overall lengths	north elevation	25.880
		south elevation	25.520
		east elevation	14.730
		west elevation	14.790
	overall buttresses	north elevation	28.210
		south elevation	27.850
		east elevation	16.860
		west elevation	16.960
	internal width		13.180
	number of buttresses	north elevation	7
		south elevation	3
		east elevation	2
		west elevation	2
	spacing of buttresses to long sides		2.760-3.660
	projection of buttresses	north elevation	720-1.140
		south elevation	920-990
		east elevation	1.280-1.410
west elevation		760-920	

width of buttresses	north elevation	560-1.290
	south elevation	740-880
	east elevation	1.070
	west elevation	790-960

**Note**

Due to the variance in the size of the buttresses, the maximum dimensions are stated overall the buttresses.

<b>Site</b>	Housesteads		
<b>Building</b>	North Gate. Double portal with guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	16.220
		south elevation	15.910
		east elevation	6.040
		west elevation	5.950
	portal widths	north elevation west	2.540
		south elevation east	2.960
		south elevation west	2.970
	width gate passage	north elevation	7.100
		south elevation	7.190
	depth gate passage	east elevation	5.280
		west elevation	5.370
	east guardchamber	north elevation	4.170
		south elevation	4.270
		east elevation	6.040
		west elevation	5.940
	west guardchamber	north elevation	4.590
		south elevation	4.450
		east elevation	5.970
		west elevation	5.950
	projection forward of guardchambers to		
	north face of gate		590-660

**Note**

Doorways to guardchambers face into the gate passage.

<b>Site</b>	Housesteads		
<b>Building</b>	South Gate. Double portal with guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	16.150
		south elevation	16.360
		east elevation	6.080
		west elevation	6.040
	portal widths	north elevation east	2.940
		north elevation west	2.860
		south elevation	-
	width gate passage	north elevation	7.050
		south elevation	7.150
	depth gate passage	east elevation	5.530
		west elevation	5.520
	east guardchamber	north elevation	4.560
		south elevation	4.610
		east elevation	6.080
		west elevation	6.040
	west guardchamber	north elevation	4.540
		south elevation	4.600
		east elevation	6.190
		west elevation	6.040
	projection forward of guardchambers to		
	south face of gate		530 - 550

**Notes**

Doorways to guardchambers face into the gate passage.

Some recent disturbance may have taken place to the *spina*  
to the north elevation.

<b>Site</b>	Housesteads		
<b>Building</b>	East Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	5.980
		south elevation	6.210
		east elevation	16.220
		west elevation	16.170
	portal widths		-
	width gate passage	east elevation	7.150
		west elevation	7.030
	depth gate passage	north elevation	6.080
		south elevation	6.170
	north guardchamber	north elevation	5.980
		south elevation	6.080
		east elevation	4.540
		west elevation	4.600
	south guardchamber	north elevation	6.170
		south elevation	6.210
		east elevation	4.510
		west elevation	4.540
	projection forward of guardchambers to east face of gate		-

**Notes**

Doorways to guardchambers face into the gate passage.

The south wall to the gate passage has been rebuilt, as also the south wall of the guardchamber, consequently the dimensions relating to these cannot be relied upon.

The northern side of the north portal has been reconstructed.

<b>Site</b>	Housesteads		
<b>Building</b>	West Gate. Double portal with guardchamber to each side		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	5.900
		south elevation	6.250
		east elevation	16.250
		west elevation	16.100
	portal widths	east elevation north	3.020
		east elevation south	2.850
		west elevation north	2.810
		west elevation south	2.830
	width gate passage	east elevation	7.120
		west elevation	7.170
	depth gate passage	north elevation	5.390
		south elevation	5.460
	north guardchamber	north elevation	5.900
		south elevation	5.930
		east elevation	4.710
		west elevation	4.460
	south guardchamber	north elevation	5.980
		south elevation	6.250
		east elevation	4.420
		west elevation	4.470
	projection forward of guardchambers to west face of gate		510 - 540



**Notes**

Doorways to guardchambers face into the gate passage.

The north and south walls to the gate passage have been reconstructed, together with the north and south walls of the guardchambers; dimensions relating to these cannot be relied upon.

<b>Site</b>	Housesteads		
<b>Building</b>	Barrack Block XIII		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	<i>Per strigas</i> , west of <i>praetentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	9.400
		south elevation	9.600
		east elevation	10.350
		west elevation	10.350
	<i>contubernia</i>	north elevation	40.650
		south elevation	40.450
		east elevation	8.660
		west elevation	8.660
	width of <i>contubernia</i>		3.350-3.600
	number of <i>contubernia</i>		10

<b>Site</b>	Housesteads		
<b>Building</b>	Barrack Block XIV		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	<i>Per strigas</i> , west of <i>praetentura</i>		
<b>Dimensions</b>	officer's quarters	north elevation	8.250
		south elevation	8.250
		east elevation	10.590
		west elevation	10.590
	<i>contubernia</i>	north elevation	40.900
		south elevation	40.900
		east elevation	8.850
		west elevation	8.650
	width <i>contubernia</i>		3.300-3.550
	number of <i>contubernia</i>		10
<b>Note</b>	Cobbled verandah to front, c. 2.140 m wide		

## The Roman Fort at Great Chesters

<b>Roman Name</b>	Aesica (fig. 11)	
<b>OS NGR</b>	NY 703668	
<b>Orientation</b>	To the east	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 10%	
<b>Previous Excavations</b>	1800	J. Lingard. Strongroom to <i>principia</i> (Hodgson 1840, 203)
	1894	W. Charlton. South west angle of fort, trench through <i>retentura</i> , west portion of south gate (Northumberland Excavation Committee 1895, xxii-xxxi)
	1895 & 1897	J. P. Gibson. Southern portion of inside of west rampart, west gate, north west angle, southern part of <i>retentura</i> , south gate, western portion of <i>principia</i> and <i>praetorium</i> (Gibson 1903, 19-64)
	1925	F. G. Simpson. North west angle of fort and Wall (Hull 1926, 197-202)
	1939	F. G. Simpson. Location of MC 43 under ramparts (Wright 1940, 149-50)
<b>Size of Fort</b>	north-south	108.200 m (355' 0")
	east-west	127.700 m (419' 0")
	area	1.2 hectares (3 acres)

## Garrisons

Under Hadrian: *cohors VI Nerviorum* (?)

Under Marcus Aurelius: *cohors - Raetorum* (166-9)

Third Century: *cohors II Asturum* (225).

*Raeti gaesati* (?)

*Notitia: cohors I Asturum* (presumably error for *II Asturum*)

## The Roman Fort at Great Chesters

### Building Inscriptions

- 1 Dedication slab found shortly before 1851 near the east gate.  
`For the Emperor Caesar Trajan Hadrian Augustus, father of his country.`  
RIB 1736.
- 2 Dedication slab found before 1857 at Great Chesters.  
`For the Emperor Caesars-Antonius and Verus, both Augusti, conquerors of Parthia, Media and Armenia, the Sixth (?) Cohort of Raetians.....` RIB 1737.  
Dated to 166-9.
- 3 Dedication slab found in 1767 in digging up the foundations of a building in the north part of the fort.  
`The Emperor Caesar Marcus Aurelius Severus Alexander Pius Felix Augustus for the soldiers of the Second Cohort of Asturians, styled Severus Alexander`s, restored from ground-level this granary fallen in through age, while the province was governed by . . . Maximus, emperor`s propraetorian legate, under the charge of Valerius Martialis, centurion of the . . . Legion, in the consulship of Fuscus for the second time and Dexter.` RIB 1738, dated to 225.

## The Roman Fort at Great Chesters

### Dating Evidence

The excavations during the late nineteenth century failed to identify any datable finds from within a building context. However, coins and stamped Samian can be dated to the last quarter of the first century. No later excavations have provided firm dating evidence for the buildings.

The dedication slab RIB 1736 is able to supply a probable date for its erection. Hadrian received the title *pater patriae* in 128, and therefore it is likely that it was erected in 129 (Collingwood and Wright 1965, 544). It is however feasible, though unlikely that the date could have been as late as 138, at the close of Hadrian's reign. A word of caution should be noted as it is known that this title was used prior to 128 (Bennett 1984, 234-5), this however was exceptional.

The rampart and the narrow curtain wall are of one build (Wright 1940, 149) and are set back behind the foundation for the broad wall.

<b>Site</b>	Great Chesters		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation (est.)	24.800
		south elevation (est.)	24.800
		east elevation (est.)	23.930
		west elevation (est.)	23.930
	cross-hall	length	23.930
		width	7.010
	rear range	depth	5.490
	<i>aedes</i> (int. dims.)	width	5.120
		depth	4.720
	strong room	width	1.900
		depth	1.980

**Note** Dimensions taken from site plan of scale 30' 0" to 1 inch in the published report by Gibson, prepared by C. Dickinson of Hexham.

**Site** Great Chesters

**Building** South Gate. Double portal with guardchamber to each side

**Date** Hadrianic

<b>Dimensions</b>	overall lengths	north elevation	<i>19.500</i>
		south elevation	<i>19.500</i>
		east elevation	<i>5.490</i>
		west elevation	<i>5.560</i>
	portal widths	-	-
	width gate passage		<i>8.230 ?</i>
	depth gate passage		<i>3.960</i>
	east guardchamber	north elevation	<i>5.490</i>
		south elevation	<i>5.490</i>
		east elevation	<i>5.640</i>
		west elevation	<i>5.640</i>
	west guardchamber	north elevation	<i>5.490</i>
		south elevation	<i>5.490</i>
		east elevation	<i>5.560</i>
		west elevation	<i>5.560</i>
projection forward of guardchambers to south face of gate		<i>1.460-1.680</i>	

**Notes** Doorways to guardchambers open into passage.

Dimensions obtained from the original survey drawing by Sheriton-Holmes dated October, 1894.

**Site** Great Chesters

**Building** West Gate. Double portal with guardchambers to each side

**Date** Hadrianic

<b>Dimensions</b>	overall lengths	north elevation	<i>5.800</i>
		south elevation	<i>5.860</i>
		east elevation	<i>18.720</i>
		west elevation	<i>18.700</i>
	portal widths	east elevation north	<i>3.080</i>
		east elevation south	<i>3.240</i>
	width gate passage	east elevation	<i>8.210</i>
	depth gate passage	south elevation	<i>4.000</i>
	north guardchamber	north elevation	<i>5.800</i>
		south elevation	<i>5.640</i>
		east elevation	<i>5.060</i>
		west elevation	<i>5.040</i>
	south guardchamber	north elevation	<i>5.680</i>
		south elevation	<i>5.860</i>
		east elevation	<i>5.420</i>
		west elevation	<i>5.420</i>
	distance face of gateway back from face of guardchambers		<i>1.680</i>

**Notes** Doorways to guardchambers open into passage. Dimensions obtained from drawing nos. NS 146 AS 8/21 & 22, scale 1:20, dated March 1986, prepared by the Central Excavation Unit.

## The Roman fort at Carvoran

<b>Roman Name</b>	Magna (fig. 12)
<b>OS NGR</b>	NY 665657
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	Nominal
<b>Previous Excavations</b>	1972 R. E. Birley. Partial excavation of North Gate (Wilson 1973, 275)
<b>Size of Fort</b>	north-south 134.110 m (440' 0") east-west 109.730 m (360' 0") area c. 1.420 hectares (c. 3.5 acres)
<b>Garrisons</b>	Under Hadrian: <i>cohors I Hamiorum</i> (136-8) Under Marcus Aurelius: <i>cohors I Hamiorum</i> (governor Calpurnius Agricola) Third Century: <i>cohors II Delmatarum equitata</i> <i>Notitia: cohors II Delmatarum</i> The inscription of <i>cohors II Delmatarum</i> (RIB 1795) is undated, but a third century date is probable

## The Roman Fort at Carvoran

### Building Inscriptions

- 1 Part of a dedication slab found about 1930 built into a field wall to the north of the fort.  
`For the Emperor Caesar Trajan Hadrian Augustus ....` RIB 1808.
- 2 Building stone found about 1755 at or near Carvoran, now lost.  
`From the third cohort the century of Claudius Augustanus (built this).`  
RIB 1811.
- 3 Building stone seen in 1766 by Hutchinson built into a farm building at Carvoran.  
`The century of Claudius (built) 30 1/2 feet.` RIB 1813.
- 4 Building stone found in 1887 built into a wall of the farm house at Carvoran.  
`The century of Felix built 20 feet.` RIB 1814.
- 5 Building stone seen in 1832 by Hodgson at Carvoran.  
`The century of Julius Ca[...] built 100 (and more) feet of rampart.` RIB 1816.
- 6 Building stone found in or before 1752 at Carvoran.  
`From the century of Martialis, Antonius Viator from Upper Germany built this.` RIB 1817.
- 7 Building stone originally from Carvoran.  
`The century of Prim[...] built 112(?) feet of rampart under the command of Flavius Secundus, the prefect.` RIB 1818.

8 Building stone found in 1940 about 100 yards east of the east rampart of the fort.

`The century of Silvanus built 112 feet of rampart under the command of Flavius Secundus, the prefect`. RIB 1820.

9 Building stone seen in 1807 at Carvoran by Lingard.

`The century of Sorio (built this)`. RIB 1821.

10 Building stone seen by Hutchinson in 1766 at Carvoran, and by Lingard in 1807.

`The century of Valerius Cassianus (built) along the fort-rampart 19 feet.`  
RIB 1822.

11 Building stone seen apparently by Hutchinson in 1766, and in 1807 by Lingard at Carvoran.

`The first cohort of Batavians built this`. RIB 1823.

12 Inscription seen in 1766 by Hutchinson, now lost.

`of the unit ... of Magn[...] ....` RIB 1825.

## **The Roman Fort at Carvoran**

### **Dating Evidence**

Although the site has for all practical purposes been unexcavated, much dating evidence is provided by inscriptions. RIB 1778, 1818 and 1820 refer to the construction of a fort under the prefect Flavius Secundus, who can be dated to 136-8, (Collingwood and Wright 1965, 565).

## The Roman Fort at Birdoswald

<b>Roman Name</b>	Banna? (fig. 13, 14)	
<b>OS NGR</b>	NY 615663	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 30%	
<b>Previous Excavations and Fieldwork</b>	1850-1852	H. Norman, W. S. Potter and H. G. Potter. Lesser east and west gates, main east and south gates (Potter 1855, 63-75, 141-9)
	1859	H. Norman. South granary (Norman 1860, 249)
	1895-8	F. Haverfield. Established the line of the <i>Vallum</i> and that the fort was built over the line of the Turf Wall (Haverfield 1897b, 413-433; 1898, 172-90)
	1927-1933	F. G. Simpson with I. A. Richmond from 1928 onwards. Barracks in <i>praetentura</i> , part of <i>retentura</i> , and area to south of the fort. (Richmond 1929, 303-315; 1931, 122-134; Richmond and Birley 1930, 169-205; Simpson and Richmond 1932, 141-5; 1933, 246-62; 1934, 120-30)

- 1950 J. P. Gillam. Three internal towers and north guardchamber of east gate. (Gillam 1950, 63-9)
- 1987-1992 T. Wilmott for English Heritage. Granaries, west gate and *basilica* (Wilmott 1997)
- 1997-8 T. Wilmott for English Heritage, the north-west sector of the *praetentura* (Wilmott 1998, 4-5)
- 1997 J. A. Biggins and D. J. A. Taylor. A geophysical survey of the fort and *vicus* (Biggins and Taylor forthcoming)

**Size of Fort**

north-south 176.800 m (580' 0")  
 east-west 121.920 m (400' 0")  
 area 2.144 hectares  
 (5.30 acres)

**Garrisons**

Under Hadrian: *cohors I Tungrorum milliaria* (??)  
 Under Marcus Aurelius: no evidence  
 Third Century: *cohors I Aelia Dacorum milliaria* (205-8), *venatores Bannienses*  
*Notitia: cohors I Aelia Dacorum*

## The Roman Fort at Birdoswald

### Building Inscriptions

- 1 Dedication slab found in 1929 in the Theodosian floor of a barrack block in Birdoswald fort.

‘For the Emperor-Caesars Lucius Septimus Severus Pius Pertinax and Marcus Aurelius Antoninus, both Augusti, and for Publius Septimus Geta, most noble Caesar, the First Aelian Cohort of Dacians and the First Cohort of Thracians, Roman citizens, built the granary under Alfenus Senecio, the consular governor, through the agency of Aurelius Julianus, the tribune.’ RIB 1909.

- 2 Part of a dedication slab found in or before 1886 at Birdoswald fort.

‘To the Emperor Caesar ...’ or ‘To the Emperor-Caesars ....’ RIB 1913.

- 3 Dedication slab found in 1852 outside the wall of the south guardchamber of the main east gate of Birdoswald fort.

‘Under Modius Julius, emperor’s propraetorian legate, the First Aelian Cohort of Dacians (built this) under the command of Marcus Claudius Menander, the tribune.’ RIB 1914.

Modius Julius was governor of Lower Britain in 219 (Collingwood and Wright 1965, 591).

- 4 Building stone seen in 1599 in Birdoswald, probably from the fort or from the milecastles close by.

‘The Sixth Legion Victrix Pia Fidelis built this.’ RIB 1916.

- 5 Building stone found before 1873 at or near Birdoswald fort.

‘The century of Congaonius Candidus (built) 30 feet.’ RIB 1917.

6 Part of dedication slab found before 1856 at Birdoswald fort.

` . . . built this from ground-level . . . in the consulship of Maximinus and Africanus.` RIB 1922.

The consulship of the emperor Maximinus and of Africanus in AD 236 would fit the inscription (Ibid., 594).

7 Building stone found in 1995 in a field wall north of the fort.

`The century of Ulpianus Reginus (Built this).` (Hassall and Tomlin 1996, 442).

## **The Roman Fort at Birdoswald**

### **Dating Evidence**

The recent excavations directed by T. Wilmott On behalf of English Heritage have produced a firm chronology for the north west section of the fort (Wilmott 1997, 401-410). Wilmott warns that this chronology may not appertain for the rest of the fort

<b>Site</b>	Birdoswald		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	<i>c. 28.000</i>
		south elevation	<i>c. 28.000</i>
		east elevation	<i>c. 32.000</i>
		west elevation	<i>c. 32.000</i>
	cross-hall	length	<i>c. 28.000</i>
		width	<i>c. 9.000</i>
	rear range	depth	<i>c. 6.000</i>
	courtyard	north elevation	<i>c. 12.000</i>
		south elevation	<i>c. 12.000</i>
		east elevation	<i>c. 19.000</i>
		west elevation	<i>c. 19.000</i>
	width ambulatory		<i>c. 4.000</i>
	<i>aedes</i> (int. dims.)	width	<i>c. 7.000</i>
		depth	<i>c. 5.000</i>

**Notes** Dimensions are obtained from a geophysical survey carried out by J. A. Biggins and D. J. A. Taylor in May/June, 1997. Richmond (1930, 4-5) records that the south elevation of the building was 28.040 m in length.

<b>Site</b>	Birdoswald	
<b>Building</b>	<i>Basilica</i>	
<b>Date</b>	Hadrianic, Period 2	
<b>Dimensions</b>	width	<i>16.050</i>
	length (est.)	<i>42.000</i>
	width of aisles	<i>3.530</i>
	internal width of aisles	<i>2.850</i>
	width of nave (est.)	<i>8.880</i>
	internal width of nave	<i>7.480</i>
	distance between arcade piers	<i>c. 2.360</i>
	size of piers	<i>c. 1.320 x 710</i>
	number of intercolumniations (est.)	10

**Notes** Dimensions taken from the text of the report (Wilmott 1997).  
The length of the building and estimated number of intercolumniations is based on a geophysical survey carried out in 1997.

<b>Site</b>	Birdoswald		
<b>Building</b>	Northern Granary		
<b>Date</b>	Early third century		
<b>Orientation</b>	To the east		
<b>Dimensions</b>	overall lengths	north elevation	<i>29.370</i>
		south elevation	<i>29.230</i>
		east elevation	<i>8.200</i>
		west elevation	<i>8.080</i>
	overall buttresses	north elevation	<i>32.170</i>
		south elevation	<i>32.030</i>
		east elevation	<i>9.500</i>
		west elevation	<i>9.380</i>
	internal width		<i>6.000-6.400</i>
	number of buttresses	north elevation	none
		south elevation	9
		east elevation	2
		west elevation	2
	spacing of buttresses		<i>3.220-3.420</i>
	projection of buttresses	south elevation	<i>1.100-1.300</i>
east elevation		<i>1.250-1.400</i>	
west elevation		<i>1.250-1.400</i>	
width of buttresses		<i>1.100-1.230</i>	

**Note** Dimensions taken from a site drawing prepared during the 1987-1992 excavations.

<b>Site</b>	Birdoswald		
<b>Building</b>	South Granary		
<b>Date</b>	Early third century		
<b>Orientation</b>	To the east		
<b>Dimensions</b>	overall lengths	north elevation	<i>29.100</i>
		south elevation	<i>28.480</i>
		east elevation	<i>8.250</i>
		west elevation	<i>7.980</i>
	overall buttresses	north elevation	<i>31.700</i>
		south elevation	<i>31.080</i>
		east elevation	<i>9.520</i>
		west elevation	<i>9.250</i>
	internal width		<i>6.000-6.300</i>
	number of buttresses	north elevation	none
		south elevation	9
		east elevation	2
		west elevation	2
	spacing of buttresses	south elevation	<i>2.800-4.000</i>
	projection of buttresses	south elevation	<i>1.160-1.270</i>
		east elevation	<i>1.300</i>
		west elevation	<i>1.300</i>
width of buttresses		<i>1.000-1.080</i>	

**Note** Dimensions taken from a site drawing prepared during the 1987-1992 excavations.

<b>Site</b>	Birdoswald		
<b>Building</b>	South Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic, Period 2		
<b>Dimensions</b>	overall lengths	north elevation	17.950
		south elevation	17.830
		west elevation	5.630
	portal widths	south elevation east	3.350
		south elevation west	3.400
	width gate passage	south elevation	8.370
	depth gate passage	west elevation	4.440
	east guardchamber	north elevation	-
		south elevation	4.690
		east elevation	-
		west elevation	-
	west guardchamber	north elevation	4.840
		south elevation	4.880
		east elevation	5.540
		west elevation	5.630
	distance of face of portal back from		
	face of guardchambers		1.070-1.100

**Note** Doors to guardchambers face north.

<b>Site</b>	Birdoswald		
<b>Building</b>	East Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic, Period 2		
<b>Dimensions</b>	overall lengths	north elevation	5.730
		south elevation	5.790
		east elevation	18.550
		west elevation	18.520
	portal widths	east elevation north	3.390
		east elevation south	3.370
		west elevation north	3.440
		west elevation south	3.350
	width gate passage	east elevation	8.260
		west elevation	8.270
	depth gate passage	north elevation	4.610
		south elevation	4.600
	north guardchamber	north elevation	5.730
		south elevation	5.725
		east elevation	4.690
		west elevation	4.700
	south guardchamber	north elevation	5.680
		south elevation	5.790
		east elevation	5.480
		west elevation	5.560
	distance of face of portals from face of guardchambers		1.080-1115

**Note**

Doors to guardchambers face west.

<b>Site</b>	Birdoswald		
<b>Building</b>	West Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Hadrianic, Period 2		
<b>Dimensions</b>	overall lengths	north elevation	5.480
		south elevation	5.580
		east elevation	18.580
		west elevation	18.590
	portal widths	west elevation north	3.380
		west elevation south	3.390
	width gate passage	east elevation	8.370
		west elevation	8.370
	depth gate passage	north elevation	4.410
		south elevation	4.440
	north guardchamber	north elevation	5.480
		south elevation	5.520
		east elevation	4.760
		west elevation	4.640
	south guardchamber	north elevation	5.480
		south elevation	5.580
		east elevation	5.450
		west elevation	5.480
	distance of face of portals back from face of guardchamber		1.040-1.110

**Note** Doors to guardchambers face west.

<b>Site</b>	Birdoswald		
<b>Building</b>	Lesser West Gate		
<b>Date</b>	Hadrianic, Period 2		
<b>Dimensions</b>	overall lengths	north elevation	5.220
		south elevation	5.220
		east elevation	5.860
		west elevation	5.860
	portal widths	west elevation	3.400

<b>Site</b>	Birdoswald		
<b>Building</b>	Lesser East Gate		
<b>Date</b>	Hadrianic, Period 2		
<b>Dimensions</b>	portal widths	east elevation	3.320

<b>Site</b>	Birdoswald		
<b>Building</b>	Barrack Block		
<b>Date</b>	Probably Hadrianic with later alterations		
<b>Orientation</b>	<i>Per scamna</i> , in east of <i>retentura</i>		
<b>Dimensions</b>	officer`s quarters	north elevation	<i>c. 10.000</i>
		east elevation	<i>c. 10.000</i>
	<i>contubernia</i>	north elevation	<i>c. 39.000</i>
		west elevation	<i>c. 10.000</i>
	width of <i>contubernia</i>		<i>c. 3.000 - 3.500</i>
	number of <i>contubernia</i>		8

**Notes** Three barracks of similar form were seen in the east of the *retentura*, the widths of these did appear to be narrower at *c. 7.500 m.*

This data was obtained from the geophysical survey in 1997.

<b>Site</b>	Birdoswald		
<b>Building</b>	Barrack Block		
<b>Date</b>	Hadrianic		
<b>Orientation</b>	<i>Per scamna</i> , in west of <i>praetentura</i> . Second block to south of <i>intervallum</i> road.		
<b>Dimensions</b>	officer`s quarters	north elevation	9.900
		west elevation	11.710
	<i>contubernia</i>	north elevation	37.000
		east elevation	9.200
	width of <i>contubernia</i>		3.780-4.000
	number of <i>contubernia</i>		8
<b>Notes</b>	Verandah to front 2.600 m wide. Data supplied by T. Wilmott of English Heritage Central Archaeology Service.		

## The Roman Fort at Castlesteads

<b>Roman Name</b>	Camboglanna (fig. 15)	
<b>OS NGR</b>	NY 513635	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	Nominal	
<b>Previous Excavations</b>	1934	I. A. Richmond and K. S. Hodgson.  Portion of the east, west and south ramparts (Richmond and Hodgson 1934, 159-165)
<b>Size of Fort</b>	north-south	c. 121.920 m (c. 400' 0")
	east-west	120.100 m (394' 0")
	area	c. 1.520 hectares  (c. 3.75 acres)
<b>Garrisons</b>	Under Hadrian: <i>cohors IV Gallorum equitata</i> (?)  Under Marcus Aurelius: no evidence  Third century: <i>cohors II Tungrorum equitata</i>  (241)  <i>Notitia</i> : no entry	

## The Roman Fort at Castlesteads

### Building Inscriptions

- 1 Fragment, probably of an imperial dedication, found before 1741 at Castlesteads.  
  
`For the Emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, father of his country, consul for the third time, under . . . .` RIB 1997.  
  
The fragment is dated to 141-2.
- 2 Dedication slab found in 1600 in a hypocaust at Castlesteads.  
  
`under the charge of . . . , emperor`s propraetorian legate, the Second Cohort of Tungrians set this up.` RIB 1999.
- 3 Building stone found before 1732 near the east gate of Castlesteads fort, now lost.  
  
`The Sixth Legion Victrix built this.` RIB 2000.
- 4 Fragments of building stone found before 1873 at Castlesteads.  
  
`From the fourth cohort the Marcian(?) century of the *hastatus posterior* (built this).` RIB 2001.

## **The Roman Fort at Castlesteads**

### **Dating Evidence**

There is no firm dating evidence. Two Hadrianic mortaria (?fragments) found during excavation associated with the fort wall. This must be considered of doubtful value for dating the fort.

## The Roman Fort at Stanwix

<b>Roman Name</b>	Petriana (fig. 16)
<b>OS NGR</b>	NY 402571
<b>Orientation</b>	To the east
<b>Extent of Fort</b>	
<b>Excavated</b>	less than 10%
<b>Previous Excavations and Fieldwork</b>	1931-1934 F. G. Simpson. North and south ramparts and probably some barrack blocks. (Simpson 1932, 147-9; 1933, 275-6; 1934, 155-8; 1935, 256-8) 1939-1940 F. G. Simpson and I. A. Richmond. Position and size of fort determined. A granary and other internal buildings identified. (Simpson and Richmond 1941b, 129-30) 1984 J. A. Dacre. North rampart. (Dacre 1985, 53-69) 1996 J. A. Biggins and D. J. A. Taylor. A geophysical survey in the south-east of the <i>praetentura</i> (unpublished).

## Size of Fort

north-south c. 185.600 m (c. 609' 0")

east-west 213.360 m (700' 0")

area 3.96 hectares (9.79 acres)

The size of the fort is based on the excavations of 1984

## Garrisons

Under Hadrian: *ala Petriana* (?)

Under Marcus Aurelius: no evidence

Third century: *ala Augusta Petriana bis torquata civium Romanorum*

*Notitia: ala Petriana*

The rejection of Petriana as the name of the fort leaves open the question of the second-century garrisons, though the apparent size of the fort would suggest it was built for a military *ala*, and the *ala Petriana* is the only such unit known in Britain.

## **The Roman Fort at Stanwix**

### **Building Inscriptions**

- 1 Building stone `12 in. long` (305 mm) found before 1794 at Stanwix.  
`From the Twentieth Legion Victrix the first cohort built this.` RIB 2028.

## **The Roman Fort at Stanwix**

### **Dating Evidence**

In 1930 an excavation through King's Meadow between the fort and the river uncovered several datable objects (Collingwood 1931, 69-80). Amongst the material found, a quantity of potsherds was described as "standard second-century types", and a stamped second-century Samian form 27 was identified. The coin series ended with Hadrian, and the brooches included nothing which needed to be dated later than 150. The impression gained by the collator of the material was that the site was contemporary with the Wall, and that it was destroyed by a flood in the mid-second century.

Three periods of construction were identified during the excavation of 1984 and the phasing was complex. From pottery it was found that the ramparts suggest a Hadrianic or later date, of post *c.* 125 for its construction (Dacre 1985, 65).

<b>Site</b>	Stanwix		
<b>Building</b>	Granary		
<b>Date</b>	Hadrianic?		
<b>Dimensions</b>	overall lengths	north elevation (est.)	<i>36.600</i>
		south elevation (est.)	<i>36.600</i>
		east elevation (est.)	<i>9.140</i>
		west elevation (est.)	<i>9.140</i>
	overall buttresses	east elevation (est.)	<i>10.660</i>
		west elevation (est.)	<i>10.660</i>
	spacing of buttresses		<i>3.660-3.960</i>
	projection of buttresses		<i>760 mm</i>
	width of buttresses		<i>1.060-1.220</i>

**Notes**                    The spacing and size of the buttresses is based on three buttresses only to the north elevation. This information has been obtained from an undated drawing prepared by Percy Dalton, City Engineer and Surveyor, Carlisle. The reliability of this data is low.

## The Roman Fort at Burgh-by-Sands

<b>Roman Name</b>	Aballava (fig. 17)
<b>OS NGR</b>	NY 329592
<b>Orientation</b>	To the north
<b>Extent of Fort</b>	
<b>Excavated</b>	less than 5%
<b>Previous Excavations and Fieldwork</b>	1921 R. G. Collingwood. North-east section of <i>praetentura</i> and part of east gate (Collingwood 1923, 3-12)
	1980 & 1982 G. D. B. Jones. To east of fort (Evans, Jones & Mattingley forthcoming)
	1991 Carlisle Archaeological Unit. A small area of the <i>praetentura</i> (McCarthy & Flynn 1991)
	1992 N. Linford & M. Cole. Geophysical survey of north east portion of fort and areas to north and east (Linford 1993)

## Size of Fort

north-south	168.000 m - 177.000 m (550' 0" - 580' 0")
east-west	c. 125.000 m (c. 410' 0")
area	c. 2.120 hectares (c. 5.2 acres)

The size of the fort is based on the 1980 and 1992 excavations (Daniels 1989, 24)

## Garrisons

Under Hadrian: *cohors quingenaria equitata/milliararia peditata(?)*

Under Marcus Aurelius: no evidence

Third century: *cohors I Nervana*

*Germanorum milliararia equitata(?)*,

*numerus Maurorum Aurelianorum*

(253-8), *cuneus Frisionum*

*Aballavensium* (241) (?)

*Notitia: numerus Maurorum*

*Aurelianorum*

## **The Roman Fort at Burgh-by-Sands**

### **Building Inscriptions**

None

## The Roman Fort at Burgh-by-Sands

### Dating Evidence

Neither of the excavations in 1980 and 1982, or those of 1995, produced any pottery or other dating evidence earlier than a third century date.

A fort (fort 1) was constructed some short distance to the south and can be seen to be constructed in three phases (Daniels 1989, 23). All phases of the fort would appear to be occupied during the beginning of the Wall period.

Fort 3 to the south west was probably occupied prior to the Wall (fort 2) and consisted of two phases. A stone built *principia* and bath house have been identified within the fort rampart (pers. com. M. McCarthy)

## The Roman Fort at Drumburgh

<b>Roman Name</b>	Congavata (fig. 18)		
<b>OS NGR</b>	NY 264598		
<b>Orientation</b>	To the east		
<b>Extent of Fort</b>			
<b>Excavated</b>	less than 5%		
<b>Previous Excavations</b>	1899	F. Haverfield. Location of Wall curtain and part of west rampart to stone fort, together with part of building in south-west corner of <i>retentura</i> (Haverfield 1900, 81-92)	
	1947	F. G. Simpson & I. A. Richmond. Location of turf rampart to original fort (Simpson & Richmond 1953, 9-14)	
<b>Size of Fort</b>	turf fort	north-south	82.300 m (270' 0")
		east-west	96.300 m (316' 0")
		area	0.800 hectares (1.960 acres)
	stone fort	size unknown but located within the ramparts of turf fort	
<b>Garrisons</b>	No unit attested		

## **The Roman Fort at Drumburgh**

### **Building Inscriptions**

- 1 Building stone built into the gable of a stable opposite Drumburgh Castle. It may have come from the fort or an adjacent part of the Roman Wall.

`The seventh cohort (built this).` RIB 2051.

- 2 Building stone found in 1783 in a house in Drumburgh. It may have come from the fort or an adjacent part of the Roman Wall.

`The eighth cohort (built this).` RIB 2052.

- 3 Building stone found in 1859 at Drumburgh. It may have come from the fort or an adjacent part of the Roman Wall.

`The length in feet built by Vindomorus.` RIB 2053.

This is tentatively dated to 369.

## **The Roman Fort at Drumburgh**

### **Dating Evidence**

There is insufficient data from the excavation record to establish any firm dating.

Huntcliffe ware was found in a late context, and probably BB1.

<b>Site</b>	Drumburgh	
<b>Building</b>	Granary	
<b>Date</b>	Possibly Antonine	
<b>Dimensions</b>	spacing of buttresses	<i>3.050</i>
	projection of buttresses	<i>780-810</i>
	width of buttresses	<i>780-810</i>

## The Roman Fort at Bowness-on-Solway

<b>Roman Name</b>	Maia (fig. 19)	
<b>OS NGR</b>	NY 222628	
<b>Orientation</b>	To the east	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 5%	
<b>Previous Excavations</b>	1930	E. Birley. Part of western rampart and west gate (Birley 1931b, 140-5)
	1955	C. M. Daniels. To west of western ramparts (Daniels 1960, 13-9)
	1967	J. D. Mohamed. Part of western rampart (Mohamed 1968, 17)
	1973	T. W. Potter. Part of western rampart and west gates (Potter 1975, 29-57)
	1976	T. W. Potter. Part of buildings in north-west <i>praetentura</i> (Potter 1979, 321-349)
	1988	P. S. Austen. Part of east rampart (Frere 1989, 275)
<b>Size of Fort</b>	north-south	c. 128 m (c. 420' 0")
	east-west	188 m (616' 0")
	area	2.310 hectares (5.78 acres)

The size of the fort is based on the excavations of 1988

**Garrisons**

Under Hadrian: *cohors milliaria equitata(?)*

Under Marcus Aurelius: no evidence

Third century: *cohors milliaria* (251-3)

*Notitia*: no entry

## **The Roman Fort at Bowness-on-Solway**

### **Building Inscriptions**

1 Part of a building stone found in 1739 at Bowness.

'The sixth legion Victrix Pia Fidelis built this.' RIB 2061.

## **The Roman Fort at Bowness-on-Solway**

### **Dating Evidence**

Pottery was found in a sealed context by Potter during the 1976 excavations. The Samian ware included two Flavian-Trajanic vessels with a much larger number dating to the Hadrianic-Early Antonine period, which could be related to a phase 1 building. This pottery in this range was dated to *c.* 120-180 (Potter 1979, 333-4).

Potter considered that the finds as a whole could be made to fit a date of *c.* 125 which matches the date when the decision was made to construct forts on the line of the Wall, although some years later would have been more comfortable.

Phases 2 and 3 cannot be accurately determined but fall with a period *c.* 125 - *c.* 190. No chronological distinction can be made between phases 1 and 2, and 2 and 3.

<b>Site</b>	Bowness-on-Solway		
<b>Building</b>	West Gate. Timber gate and towers		
<b>Date</b>	Phase 1 Hadrianic, c. 125-135		
<b>Dimensions</b>	north tower	north elevation	<i>c. 2.000</i>
		south elevation	<i>c. 2.000</i>
		east elevation	<i>c. 1.700</i>
		west elevation	<i>c. 1.600</i>

**Notes**                    The dimensions stated are those overall the timber posts to each elevation. The post sockets were 200 by 200 mm.

<b>Site</b>	Bowness-on-Solway		
<b>Building</b>	West Gate. Double portal with guardchamber to each side		
<b>Date</b>	Phase 2, latter half of second century		
<b>Dimensions</b>	north guardchamber	north elevation	<i>6.200</i>
		south elevation	<i>6.100</i>
		east elevation	<i>4.800</i>
		west elevation	<i>5.000</i>
<b>Note</b>	Doorway to guardchamber opens into the passage.		

<b>Building</b>	Possible Barrack Block		
<b>Date</b>	Phase 1, Hadrianic <i>c.</i> 125-135		
<b>Orientation</b>	<i>Per scamna</i> , north of <i>praetentura</i>		
<b>Dimensions</b>	<i>contubernia</i>	north elevation	8.500
		south elevation	8.500
	verandah	width	1.350
<b>Notes</b>	<p>Of timber construction.</p> <p>On account of the building's length (min. 57.000 m), its use as a barrack block is questionable.</p> <p>No officer's quarters were identified.</p>		

<b>Site</b>	Bowness-on-Solway		
<b>Building</b>	Possible Barrack Block		
<b>Date</b>	Phase 3, latter half of second century		
<b>Orientation</b>	<i>Per scamna</i> , north of <i>retentura</i>		
<b>Dimensions</b>	<i>contubernia</i>	north elevation	8.300
		south elevation	8.300
<b>Note</b>	Of timber construction.		

## The Roman Fort at Beckfoot

<b>Roman Name</b>	Bibra (fig. 20)		
<b>OS NGR</b>	NY 090489		
<b>Orientation</b>	To the west		
<b>Extent of Fort</b>			
<b>Excavated</b>	nominal		
<b>Previous Excavations</b>	1879-1880	J. Robinson. Ramparts and gates (Robinson 1881b, 136-148)	
	A very clear picture of the probable final plan of the interior of the fort can be seen in an aerial photograph (St. Joseph 1951, pl. IV no. 2, 56)		
<b>Size of Fort</b>	north-south	86.260 m (283' 0")	
	east-west	123.440 m max. (405' 0" max.)	
	area	c. 1.315 hectares (c. 3.25 acres)	
<b>Garrisons</b>	Under Hadrian: <i>cohors quingenaria peditata</i>  The only unit attested at any time is the <i>cohors II Pannoniorum</i>		

## The Roman Fort at Beckfoot

### Building Inscriptions

- 1 Two chamfered stones from the plinth of a building, 1.520 m long overall, 330 mm high and 700 mm deep. The letters were cut in a 200 mm chamfer. Found before 1794 in the fort at Beckfoot, Mawbray.  
` . . . , prefect of the Second Cohort of Pannonians, built this.` RIB 880.

## **The Roman Fort at Beckfoot**

### **Dating Evidence**

The dating evidence is sparse and must be viewed with some reservations.

Collingwood states (1936, 82) that a few preserved fragments of pottery dated from the Hadrianic-Antonine period. He considers from Robinson's description that the pottery spans the period from the 2nd-4th centuries. Some worn coins of Trajan were found.

## The Roman Fort at Maryport

<b>Roman Name</b>	Alauna (fig. 21)
<b>OS NGR</b>	NY 038373
<b>Orientation</b>	To the west
<b>Extent of Fort</b>	
<b>Excavated</b>	c. 5%
<b>Previous Excavations</b>	1966 M. G. Jarrett & A. R. Birley. Eastern defences and part of <i>retentura</i> (Jarrett 1976, 27-82)
<b>Size of Fort</b>	north-south 164.900 m (525' 0") east-west 164.900 m (541' 0") area c. 2.640 hectares (c. 6.5 acres)
<b>Garrisons</b>	Under Hadrian: <i>cohors I Hispanorum milliaria equitata</i> ( <i>quingenaria</i> during part of Hadrian's reign) Under Pius: <i>cohors I Delmatarum equitata</i> Under Marcus Aurelius: <i>cohors I Baetasiorum civium Romanorum</i> Third Century: <i>cohors milliaria(?)</i>

## **The Roman Fort at Maryport**

### **Building Inscriptions**

- 1      Dedication stone found in 1779 in the fort of Maryport.  
  
        'Detachments of the Second Legion Augusta and of the Twentieth Legion  
        Valeria Victrix built (this).' RIB 852.
- 2      Building stone found in 1880 north-west of Maryport fort.  
  
        'The Twentieth Legion (built this).' RIB 853.
- 3      Part of a dedication slab found in or before 1794 at the Roman fort at  
  
        Maryport.  
  
        'The twentieth Legion Gordiana (built this).' RIB 854.
- 4      Two fragments of a dedication slab found in 1794 at the Roman fort at  
  
        Maryport.  
  
        'The First Cohort of Spaniards built (this).' RIB 855.

## **The Roman Fort at Maryport**

### **Dating Evidence**

Although it is possible that a Flavian fort occupied the present site, there is no evidence for it. Jarrett (1976, 87) considers from his excavated evidence that the occupation of the cliff-top fort began in the early years of Hadrian's reign. This is consistent with the evidence found at the Cumbrian coastal forts, where Maryport was the only large, safe, deep water harbour. This would have been needed as a supply base for the construction of the Wall and the supporting forts.

Ashmore considers that the fort might have been built hurriedly in 118 or as an afterthought to the Wall some five years later (Ashmore 1991, 4). He considers that the shape reflects a pre-Hadrianic design, and that it may have been established prior to 118 and later rebuilt in stone.

<b>Site</b>	Maryport		
<b>Building</b>	Barracks, east block		
<b>Date</b>	Hadrianic, Period I		
<b>Oientation</b>	<i>Per strigas</i> , in north of <i>praetentura</i>		
<b>Dimensions</b>	officer`s quarters	width	<i>10.000</i>
		length	<i>11.000</i>
	<i>contubernia</i>	width	<i>7.800</i>
<b>Note</b>	A verandah was seen to the front of the <i>contubernia</i> .		

<b>Site</b>	Maryport
<b>Building</b>	Barracks, west block
<b>Date</b>	Hadrianic, period I
<b>Orientation</b>	<i>Per strigas</i> , in north of <i>praetentura</i>
<b>Dimensions</b>	<i>contubernia</i> width 7.700

## The Roman Fort at Moresby

<b>Roman Name</b>	Gabrosentum? (fig. 22)
<b>OS NGR</b>	NX 982210
<b>Orientation</b>	To the west
<b>Extent of Fort</b>	
<b>Excavated</b>	Nominal
<b>Previous Excavations</b>	1859 G. Wilkinson. Extent of fort determined (Bruce 1867, 372; Birley 1949, 218-9)
<b>Size of Fort</b>	north-south 109.120 m (358' 0") east-west 134.110 m (440' 0") area 1.420 hectares (c. 3.5 acres)
<b>Garrisons</b>	Under Hadrian: <i>cohors II Lingonum equitata</i> (??) <i>Notitia</i> : <i>cohors II Thracum equitata</i>

## The Roman Fort at Moresby

### Building Inscriptions

- 1 Part of a dedication found before 1607 at Moresby; now lost.  
`... to mark the success in building the gable.` RIB 799.
- 2 Three fragments of a buff sandstone tablet, found in 1822 about 6.000 m east of the east gate of Moresby fort.  
`(This work) of the Emperor Caesar Trajan Hadrian Augustus, father of his country, the Twentieth Legion Valeria Victrix (built).` RIB 801.  
As Hadrian became *Pater Patriae* in 128, this inscription could be dated to 128-38.
- 3 Fragment of an inscription found in or before 1586 at Moresby.  
`The seventh cohort (built this).` RIB 802.
- 4 Building stone found in or before 1859 at Moresby.  
`The second cohort of Thracians built this.` RIB 803.

## The Roman Fort at Moresby

### Dating Evidence

An assemblage of pottery from no known context was examined by Birley (1948, 42-72). The Samian ware could be dated to the Antonine period, and the coarse wares from the time of Hadrian to the third century. There was nothing to suggest a pre-Hadrianic date.

The best dating evidence is the inscription RIB 801 found just outside the east gate. This was probably mounted over the east gate and attributed the fort to Hadrian. It is significant that in RIB 801, and also RIB 1638 which probably come from Hotbank milecastle, the genitive case for Hadrian, *Hadriani* was used. This use is rare and although it could be used to indicate imperial property, this is unlikely. It is probable that the reference refers to Hadrian's personal involvement in the Wall, arising out of his visit to the province and his likely involvement in determining the line of the Wall and some of the forts (Collingwood & Wright 1965, 520).

## **APPENDIX 2**

### **Data Sheets for Secondary Forts**

## **Schedule of Secondary Forts**

### **Outpost Forts**

Birrens

Netherby

Bewcastle

### **Stanegate and other Forts**

South Shields

Chesterholm

Old Church, Brampton

## The Roman Fort at Birrens

<b>Roman Name</b>	Blatobulgium (fig. 23)	
<b>OS NGR</b>	NY 219752	
<b>Orientation</b>	To the south	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 25%	
<b>Previous Excavations</b>	1895	D. Christison <i>et al.</i> Trenching to enable general plan of fort to be ascertained (Christison 1896, 81-199)
	1936-1937	E. Birley <i>et al.</i> Sections cut through north, east and west ramparts together with some trenches within the fort (Birley 1938, 275-347)
	1962-1967	A. S. Robertson, Training School for Scottish School of Archaeology.  Extensive trenching of the ramparts and within the fort (Robertson 1975)
<b>Size of Fort</b>	north-south	140.420 m (464' 0")
	east-west	118.900 m (390' 0")
	area	1.68 hectares (4.2 acres)

## Garrisons

Under Hadrian: no evidence

Under Pius: *cohors II Tungrorum milliaria equitata*

c. 1.(158)

Under Marcus Aurelius: no evidence

Third century: fort abandoned

*Cohors I Nervana Germanorum milliaria equitata,*

attested at this fort, may have been in garrison either

under Hadrian or early in the reign of Pius.

## The Roman Fort at Birrens

### Building Inscriptions

1 Statuette found in 1731 in the ruins of a building outside the fort.

`Sacred to Brigantia: Amandus, the engineer, by command fulfilled the order`.

RIB 2091.

This reference is included as Amandus in the latin text is described as an *architectus*. He is assumed to have belonged to the Sixth Legion and based in York (Collingwood and Wright 1965, 641).

2 Altar found at Birrens before 1772.

`Sacred to the goddess Harimella: Gamidiabus, the engineer, gladly, willingly, and deservedly fulfilled his vow`. RIB 2096.

This reference is included as Gamidiabus is also described as an *architectus*.

It is unusual to find two inscriptions relating to an *architectus* at a fort.

3 Roughly dressed stone found in 1895 in excavations at Birrens.

`The Sixth Legion Victrix (built this)`. RIB 2112.

4 Building stone found in 1915, presumably from Birrens.

`The Sixth Legion Victrix (built this)`. RIB 2113.

5 Sculptured stone recorded as having been found at Birrens before 1772.

`The Twentieth Legion Victrix (built this)`. RIB 2114.

## **The Roman Fort at Birrens**

### **Dating Evidence**

The structural sequence of the fort site has been established by Robertson (1975 73-94). A Flavian occupation was identified, together with a Hadrianic fort and two Antonine forts.

Although stone buildings in the *latera praetorii* are known to be of the Hadrianic period, these were not excavated by Robertson as they were overlaid by buildings of a later phase.

## The Roman Fort at Netherby

<b>Roman Name</b>	Axelodunum? later Castra Exploratum (fig. 24)
<b>OS NGR</b>	NY 398715
<b>Orientation</b>	Not known
<b>Extent of Fort</b>	
<b>Excavated</b>	None recorded
<b>Previous Excavations</b>	None recorded within the area of the fort Review of the site (Birley 1954, 6-39)
<b>Size of Fort</b>	Not known
<b>Garrisons</b>	Under Hadrian: no evidence Under Marcus Aurelius: no evidence Third century: <i>cohors I Aelia Hispanorum equitata</i> (214-16) The inscription of the third or early fourth century referring to a dedication to Cocidius by a commander of <i>cohors I Nervana</i> (RIB 966) may not belong to this fort

## The Roman Fort at Netherby

### Building Inscriptions

1 Inscription seen in 1601 built into the house, later lost.

‘For the Emperor Caesar Trajan Hadrian Augustus the Second Legion Augusta (built this).’ RIB 974.

2 Lower right corner of dedication slab found before 1794 at Netherby.

‘... the First Aelian Cohort of Spaniards, one thousand strong, part-mounted, styled Antoniniana, built this from its foundations under the charge of Gaius Julius Marcus, emperor’s propraetorian legate, under the direction of ... Maximus, tribune.’ RIB 977.

3 Dedication slab found in 1762 at Netherby.

‘For the Emperor Caesar Marcus Aurelius Severus Alexander Pius Felix Augustus, pontifex maximus, with tribunician power, consul, father of his country, the First Aelian Cohort of Spaniards, one thousand strong, part-mounted, devoted to his Deity and majesty, built a cavalry drill-hall, long since begun from the ground, and completed it, under the charge of Marius Valerianus, emperor’s propraetorian legate, under the direction of Marcus Aurelius Salvius, tribune of this cohort in the consulship of our Lord the Emperor Severus Alexander Pius Felix Augustus.’ RIB 978.

The inscription is dated to 222.

4 Building stone found before 1873 in the Netherby Collection, probably from the fort.

‘A detachment of the Sixth Legion Victrix Pia Fidelis (built this): of the Sixth Legion Pia Fidelis.’ RIB 981.

5 Lower right-hand corner of a dedication slab found before 1873 at Netherby.

` . . . rampart work.` RIB 982.

## The Roman Fort at Bewcastle

<b>Roman Name</b>	Fanum Cócidi? (fig. 25)	
<b>OS NGR</b>	NY 565747	
<b>Orientation</b>	To the north west	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 15%	
<b>Previous Excavations and Fieldwork</b>	1937	I. A. Richmond, K. S. Hodgson and K. St. Joseph. The west gate, <i>principia</i> , <i>praetorium</i> and other unidentified buildings (Richmond <i>et al.</i> 1938, 195-237)
	1949 & 1954	J. P. Gillam. The bath house in the south-east corner of the fort (Gillam 1950a, 216-8; 1954, 265-7)
	1977-8	P. S. Austen for C. E. U. of Dept of Environment. North-west portion of the fort (Goodburn 1978, 421; Austen 1991)
	c. 1989	I. Sainsbury and H. Welfare. An analytical field survey (Sainsbury and Welfare 1990, 139-146)
<b>Size of Fort</b>		an irregular hexagon
	area	c. 2.420 hectares (c. 6 acres)

## Garrisons

Under Hadrian: *cohors I Dacorum milliaria peditata*

Under Marcus Aurelius: no evidence

Third century: *cohors milliaria?*

The inscription of two tribunes dedicating to Cocidius

(RIB 988-9) suggest a military cohort was stationed here  
in the third century.

## The Roman Fort at Bewcastle

### Building Inscriptions

- 1 . Dedication slab found in the churchyard at Bewcastle before 1732.  
`For the Emperor Caesar Trajan Hadrian Augustus the Second Legion Augusta and the Twentieth Legion Valeria Victrix, . . . , emperor`s propraetorian legate (built this).` RIB 995.
- 2 Dedication slab seen in the church at Bewcastle in 1601.  
`The second Legion Augusta built this.` RIB 996.

## The Roman Fort at Bewcastle

### Dating Evidence

A chronology for the site has been established by Austen (1991, 30), which revises that put forward by Richmond (1938 195-237). The chronology places period I, which includes the Hadrianic buildings, as occurring between 122-139/42. Austen considers that the hexagonal shaped fort was a Hadrianic foundation, with a turf rampart. He considers it probable that the stone gates and *principia* were also Hadrianic (ibid., 43-4). A lost inscription found in the churchyard records Hadrian and the Second and Twentieth Legions. As the inscription mentioned Hadrian without the title *pater patriae*, it could date it prior to 128.

<b>Site</b>	Bewcastle		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Hadrianic		
<b>Dimensions</b>	overall lengths	north elevation	<i>c. 30.500</i>
		south elevation	<i>c. 30.500</i>
		east elevation	<i>c. 22.000</i>
		west elevation	<i>c. 22.000</i>
	cross-hall	length	<i>c. 22.000</i>
		width	<i>c. 22.000</i>
	rear range	depth	<i>c. 5.200</i>

**Notes**                      The dimensions obtained from Richmond's and Austen's published plans of the fort, and should be taken as a guide only.



## The Roman Fort at South Shields

<b>Roman Name</b>	Arbeia (fig. 26)
<b>OS NGR</b>	NZ 65679
<b>Orientation</b>	To the north-west
<b>Extent of Fort</b>	
<b>Excavated</b>	Over 50%
<b>Previous Excavations</b>	1875-1876 R. E. Hoopell. Central portion of the fort excavated prior to the erection of housing (Hoopell 1880, 126-167)
	1949-1950 I. A. Richmond. Re-excavation and consolidation of previously excavated areas (Richmond 1955, 297-315)
	1966-1967 J. N. Dore and J. P. Gillam. Northern portion of the fort (Dore and Gillam 1979)
	1977-1981 R. Miket. Greater part of the defences (Miket 1983)
	1984- P. Bidwell and N. Hodgson. Extensive excavation and consolidation, still continuing, for Tyne and Wear Museums (Bidwell and Speak 1994; Hodgson 1994, 49-50; 1995, 61-62)

**Size of Fort**

north-south 148.000 m (485.56 ft)

east-west 113.000 m (370.73 ft)

area 1.670 hectares

(4.10 acres)

**Garrisons**

Under Hadrian: no evidence

Under Marcus Aurelius: *cohors (?)*Third century: *cohors V Gallorum (213)*Notitia: *numerus barcariorum Tigriensium*

## The Roman Fort at South Shields

### Building Inscriptions

- 1 Dedication slab found in 1893 in the south-east quadrant of South Shields fort.  
`The Emperor Caesar Marcus Aurelius Severus Alexander Pius Felix Augustus, grandson of the defied Severus, son of Antonius the Great, pontifex maximus, with tribunician power, father of his country, consul, brought in this supply of water for the use of the soldiers of the Fifth Cohort of Gauls, under the charge of Marcus Valerianus, his propraetorian legate.` RIB 1060.
- 2 Building stone found in 1883 *in situ* in the front wall of the cross hall of the *principia*.  
`The Sixth Legion (built this).` RIB 1061.
- 3 Building stone found in 1994 in the post-Roman tumble outside the south-east wall of the extended fort.  
`Of the Sixth Legion Victrix, Dutiful and Loyal, of the Third Cohort, the century of . . . . . (built this).` (Hassall and Tomlin 1995, 379-80).

## The Roman Fort at South Shields

### Dating Evidence

The dating evidence is based on the recent excavations, and a reassessment of the earlier excavations, carried out by South Tyneside Metropolitan Borough Council, and Tyne and Wear Museums. The development and chronology of the fort is described in Bidwell and Speak's recent report (Bidwell and Speak 1994). The excavations have shown the development of the fort over nine periods as follows:-

Period 1	Flavian-Trajanic
Period 2	Trajanic? to Hadrianic
Period 3	Late Hadrianic to early Antonine?
Period 4	Mid-Antonine to <i>c.</i> 205-7
Period 5	Severan <i>c.</i> 205-7? to 222-35
Period 6	Severan 222-35 to late 3rd or early 4th century
Period 7	Late 3rd or early 4th century to mid 4th century
Period 8	Mid to late 4th century onwards
Period 9	Early post Roman

<b>Site</b>	South Shields		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Period 4B, mid Antonine to <i>c.</i> 205-7		
<b>Orientation</b>	To the north-west		
<b>Dimensions</b>	overall lengths	north-west elevation	24.000
		south-east elevation	23.800
		north-east elevation	29.300
		south-west elevation	29.600
	cross-hall length	north-west elevation	23.900
		south-east elevation	23.900
	cross hall width	north-east elevation	8.200
		south-west elevation	8.200
	rear range	depth	4.800
	courtyard	north-west elevation	14.400
		north-east elevation	11.500
		south west elevation	11.800
	width ambulatory	north-west elevation	4.600
		north-east elevation	4.700
		south-west elevation	4.600
	<i>aedes</i> (int. dims.)	width	3.800
		depth	4.000

**Notes** The inscribed building stone, RIB 1061, size 600 by 600 by 170 mm, found in south east corner of the fort, is almost certainly part of a pier to the ambulatory to the courtyard.

<b>Site</b>	South Shields		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Period 5, c. 205-7 to 222-35		
<b>Orientation</b>	To the south-east		
<b>Dimensions</b>	overall lengths	north-west elevation	24.000
	including probable	south-east elevation	24.000
	courtyard	north-east elevation	24.000
		south-west elevation	24.000
	cross-hall length	north-west elevation	24.000
		south-east elevation	24.000
	cross-hall width	north-east elevation	8.400
		south-west elevation	8.200
	rear range	depth	4.400
		projection of <i>aedes</i>	c. 1.000
	probable courtyard	north-west elevation	22.200
		south-east elevation	22.200
		north-east elevation	10.200
		south-west elevation	10.200
	<i>aedes</i> (int. dims.)	north-west elevation	c. 4.400
		south-east elevation	c. 4.400
		north-east elevation	c. 5.200

<b>Site</b>	South Shields		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Period 6, 222-35 to late 3rd or early 4th century		
<b>Orientation</b>	To the south-east		
<b>Dimensions</b>	overall lengths	north-west elevation	<i>21.080</i>
		south-east elevation	<i>21.080</i>
		north-east elevation	<i>10.650</i>
		south-west elevation	<i>10.650</i>
	cross-hall length	north-west elevation	<i>21.080</i>
		south-east elevation	<i>21.080</i>
	cross-hall width	north-east elevation	<i>7.650</i>
		south-west elevation	<i>7.650</i>
	rear range	depth	<i>3.000</i>

<b>Site</b>	South Shields		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Period 7, late 3rd or early 4th century onwards		
<b>Orientation</b>	To the south-east		
<b>Dimensions</b>	overall lengths	north-west elevation	24.800
		south-east elevation	24.000
		north-east elevation	25.200
		south-west elevation	25.000
	cross-hall length	north-west elevation	24.000
		south-east elevation	24.000
	cross-hall width	north-east elevation	8.300
		south-west elevation	8.300
	rear range	depth	5.200
	projection of <i>aedes</i>		c. 1.000
	courtyard	north-west elevation	15.200
		south-east elevation	15.100
		north-east elevation	9.200
		south-west elevation	9.200
	width ambulatory	north-east elevation	4.100
		south-west elevation	4.500
		south-east elevation	3.000

*aedes* (int. dims.)    north-west elevation *c. 4.400*  
south-east elevation *c. 4.400*  
north-east elevation *c. 5.200*  
south-west elevation *c. 5.200*

<b>Site</b>	South Shields		
<b>Building</b>	Double Granary, Building A5		
<b>Date</b>	Period 4B, mid-Antonine, <i>c.</i> 163		
<b>Orientation</b>	Loading bay(s) to north-west, portico to south-east elevation		
<b>Dimensions</b>	overall lengths	north-west elevation	14.700
		south-east elevation	15.700
		south-west elevation	23.060
		north-east elevation <i>c.</i>	22.780
	overall buttresses	north-west elevation	15.640
		south-east elevation	16.620
		south-west elevation	24.080
		north-east elevation <i>c.</i>	23.800
	internal width	south-west granary	6.390
		north-east granary	6.510
	number of	north-west elevation	4
	buttresses	south-east elevation	4
		south-west elevation	10
		north-east elevation	10
	spacing of buttresses to long side		2.260-2.370
	projection of buttresses		450-510
	width of buttresses		710-850
	width of portico		2.170-2.260

**Notes**

The buttresses to the side walls were not extant and the information concerning them can only be assessed from the foundations and drawings.

<b>Site</b>	South Shields		
<b>Buildings</b>	Granaries C1 - 11, type 1		
<b>Date</b>	Period 5, Severn, <i>c.</i> 205-7		
<b>Orientation</b>	C1 - C9	to the south-east	
	C10 - C11	to the north-west	
<b>Granary C1</b>	overall dimensions	length	<i>30.400</i>
		width	<i>6.600</i>
<b>C2</b>	overall dimensions	length	unknown
		width	<i>6.500</i>
<b>C3</b>	overall dimensions	length	unknown
		width	<i>6.500</i>
<b>C4</b>	overall dimensions	length	<i>29.000</i>
		width	<i>6.600</i>
<b>C5</b>	overall dimensions	length	unknown
		width	<i>6.500</i>
<b>C6</b>	overall dimensions	length	unknown
		width	unknown
<b>C7</b>	overall dimensions	length	unknown
		south-east elevation	<i>6.970</i>
	overall buttresses	south-east elevation	<i>7.890</i>
	internal width		<i>4.850</i>
	spacing of buttresses		<i>2.700-2.760</i>
	projection of buttresses		<i>440-460</i>
	width of buttresses		<i>660-750</i>

C8	overall dimensions	south-west elevation	26.200
		width	unknown
	spacing of buttresses		3.600-3.800
	projection of buttresses		830-850
	width of buttresses		820-860
C9	overall dimensions		unknown
C10	overall dimensions	length	unknown
		north-west elevation	6.550
	overall buttresses	north-west elevation	8.240
	internal width		4.390
	spacing of buttresses		3.060-3.300
	projection of buttresses		940-990
	width of buttresses		770-950
C11	overall dimensions	length	unknown
		north-west elevation	6.490
	overall buttresses	north-west elevation	8.100
	internal width		4.470
	spacing of buttresses		3.190-3.230
	projection of buttresses		750-830
	width of buttresses		660-910

## Notes

Type 1 (Period 5) have ten buttresses along each side wall, the end buttresses to each side forming an extension to the gable wall. The two buttresses to each gable wall are set closer together than the granaries in Type 2. The dimensions of granaries C1 - C6 and C9 are obtained from the excavators report (Dore and Gillam 1979, 42-47). The width overall the buttresses is not known in every case as, in many instances the stonework to the buttresses is not extant. The buttresses to granaries C1 - C6 averaged 800 mm wide by 700 mm projection. Some buttresses are recorded as being up to 1.200 m wide.

<b>Site</b>	South Shields		
<b>Buildings</b>	Granaries C12 - C16, type 2		
<b>Date</b>	Possibly Severan, <i>c.</i> 222 - 35		
<b>Orientation</b>	To the north west		
Granary C12	overall lengths	north-west elevation	6.920
	overall buttresses	north-west elevation	8.160
	internal width		4.890
	spacing of buttresses		2.660-2.800
	projection of buttresses		600-690
	width of buttresses		740-800
C13	overall lengths	north-west elevation	6.810
	overall buttresses	north-west elevation	8.040
	internal width		4.700
	spacing of buttresses		2.660-2.880
	projection of buttresses		570-690
	width of buttresses		750-820
C14	overall lengths	north-west elevation	6.340
		south-east elevation	6.830
		north-east elevation	30.500
		south-west elevation	29.910
	overall buttresses	north-west elevation	7.270
		south-east elevation	7.750
		north-east elevation	31.500
		south-west elevation	30.890
internal width		4.190-4.700	

	spacing of buttresses	2.700-2.930
	projection of buttresses	430-480
	width of buttresses	760-780
C15	spacing of buttresses	2.600-3.220
	projection of buttresses	430-480
	width of buttresses	730-790

**Notes**

Type 2 (Period 6) have eleven buttresses along each side wall, each buttress being set back from the corner on each elevation by 500 - 600 mm.

<b>Site</b>	South Shields		
<b>Building</b>	The Forecourt Granary		
<b>Date</b>	Period 7, Severan, c. 205 - 7		
<b>Orientation</b>	To the north-east		
<b>Dimensions</b>	overall lengths	north-west elevation	-
		south-east elevation	-
		north-east elevation	-
		south-west elevation	-
	internal width	north-west elevation	22.200
		south-east elevation	22.200
		north-east elevation	4.600
		south-west elevation	4.600
<b>Note</b>	The granary was formed out of the courtyard walls to the period 4B <i>principia</i> .		

<b>Site</b>	South Shields		
<b>Building</b>	North West Gate. Double portal with a guardchamber to each side		
<b>Date</b>	Period 4A, mid-Antonine, <i>c.</i> 163		
<b>Dimensions</b>	overall lengths	north-west elevation	<i>17.900</i>
		south-east elevation	<i>17.900</i>
		north-east elevation	<i>5.800</i>
		south-west elevation	<i>5.800</i>
	portal width	south-east elevation	sw 2.990 (3.380)
	width gate passage	north-west elevation	<i>8.050</i>
	depth gate passage	south-west elevation	<i>4.140</i>
	north-east		
	guardchamber	north-west elevation	<i>4.400</i>
		south-east elevation	<i>4.400</i>
		north-east elevation	<i>5.300</i>
		south-east elevation	<i>5.300</i>
	south-west		
	guardchamber	north-west elevation	<i>4.400</i>
		south-east elevation	<i>4.400</i>
		north-east elevation	<i>5.350</i>
		south-west elevation	<i>5.350</i>
	projection forward of guardchambers to		
	north-west face of gate		<i>1.700</i>

**Notes**

Doorways to guardchambers face south-east.

Due to the absence of much of the external walls, some of the dimensions are estimated.

The maximum and minimum portal widths are given for above and between the lower offset course.

<b>Site</b>	South Shields		
<b>Building</b>	South West Gate. Double portal with guardchamber to each side		
<b>Date</b>	Period 4A, mid-Antonine, <i>c.</i> 163		
<b>Dimensions</b>	overall lengths	north-east elevation	<i>17.500</i>
		south-west elevation	<i>17.500</i>
		north-west elevation	<i>6.500</i>
		south-east elevation	<i>6.500</i>
	portal widths	north-west	<i>2.700</i>
		south-east	<i>2.700</i>
	width gate passage	south-west elevation	<i>7.600</i>
	depth gate passage	north-west elevation	<i>3.750</i>
	north-west		
	guardchamber	north-west elevation	<i>6.800</i>
		south-east elevation	<i>6.800</i>
		north-east elevation	<i>5.400</i>
		south-west elevation	<i>5.400</i>
	south-east		
	guardchamber	north-west elevation	<i>6.800</i>
		south-east elevation	<i>6.800</i>
		north-east elevation	<i>5.400</i>
		south-west elevation	<i>5.400</i>
	projection forward of guardchambers to		
	south-west face of gateway		<i>1.700</i>

**Notes**

The foundations of the gateway only are extant.

The width of the portals, the projection forward and the size of the guardchambers are the excavator's published dimensions; the remainder are estimated.

<b>Site</b>	South Shields		
<b>Building</b>	South East Gate. Single portal with a guardchamber to each side		
<b>Date</b>	Period 5, <i>c.</i> 205 - 7		
<b>Dimensions</b>	overall lengths	north-west elevation	12.060
		south-east elevation	12.190
		north-east elevation	5.730
		south-west elevation	5.930
	portal width	north-west elevation	2.320
		south-east elevation	2.390
	width gate passage	north-west elevation	2.320
		south-east elevation	2.390
	depth gate passage	north-east elevation	5.840
		south-west elevation	5.860
	north-east		
	guardchamber	north-west elevation	4.940
		south-east elevation	4.940
		north-east elevation	5.730
		south-west elevation	5.840
	south-west		
	guardchamber	north-west elevation	4.760
		south-east elevation	4.860
		north-east elevation	5.860
		south-west elevation	5.980

projection forward of guardchamber to

south-west face of gateway

450 mm

**Note**

The dimensions should be treated with some caution as they represent the reconstructed plan of the gateway.

<b>Site</b>	South Shields		
<b>Building</b>	Barrack Block. B1		
<b>Date</b>	Period 4B, Mid-Antonine <i>c.</i> 163		
<b>Orientation</b>	<i>Per scamna</i>		
<b>Dimensions</b>	overall lengths	s.w elevation	<i>c.</i> 8.000
		n.e elevation	<i>c.</i> 8.000
<b>Note</b>	The external walls may have supported a timber superstructure.		

<b>Site</b>	South Shields		
<b>Building</b>	Barrack Block. B3		
<b>Date</b>	Period 4B, mid-Antonine <i>c.</i> 163		
<b>Orientation</b>	<i>Per scamna</i>		
<b>Dimensions</b>	overall lengths	n.w elevation	<i>c.</i> 42.000
		s. e elevation	<i>c.</i> 42.000
		s. w elevation	<i>c.</i> 9.500
		n. e elevation	<i>c.</i> 9.500

**Note**                      The external walls may have supported a timber superstructure.

<b>Site</b>	South Shields		
<b>Building</b>	Barrack Block. B6		
<b>Date</b>	Period 4B, mid-Antonine <i>c.</i> 163		
<b>Orientation</b>	<i>Per scamna</i>		
<b>Dimensions</b>	overall lengths	n. w elevation	<i>c.</i> 43.000
		s. e elevation	<i>c.</i> 43.000
		s. w elevation	<i>c.</i> 9.500
		n. e elevation	<i>c.</i> 9.500

**Notes**                    The external walls may have supported a timber superstructure.  
The partition walls were of timber.

## The Roman Fort of Chesterholm

<b>Roman Name</b>	Vindolanda (fig. 27)	
<b>OS NGR</b>	NY 771663	
<b>Orientation</b>	To the south	Stone Fort 1
	To the north	Stone Fort 2
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 33% of stone forts 1 & 2	
<b>Previous Excavations</b>	1818	A. Hedley. East gate SF1 & 2 (Bruce 1867, 211; Hedley 1822, 208-12; Hodgson 1840, 195-202)
	1829	A. Hedley. North gate SF2 (Hodgson 1840, 195-202)
	1831-1833	A. Hedley. West gate, part of west rampart and north part of east rampart, nw corner of <i>praetorium</i> of SF2 (Bruce 1867, 211-2; Hodgson 1840, 195-202)
	1930	E. Birley. East rampart, north, east and west gates SF2. Overall dimensions of fort established (Birley 1931a, 182-212)
	1931	E. Birley. Tower and corner of a building in the north-west corner of the fort. (Birley 1932, 216-221)

- 1932-1934 E. Birley, I. A. Richmond & J. A. Stansfield. The *principia* to SF1 & SF2. (Birley E., Richmond & Stanfield 1936, 218-57)
- 1934-1935 E. Birley, I. A. Richmond & J. A. Stansfield. West gate SF1, east gate SF1 & SF2, north-east section of fort. (Birley E., Richmond & Stanfield 1936, 218-57)
- 1935 E. Birley. A trench across a granary in SF2. (Bidwell 1985, 50)
- 1969 R. Birley. South gate SF2. (Birley R. 1970, 97-156)
- 1972 R. Birley. North-west part of the latrine and adjoining rampart of SF2. (Birley R. 1977, 95)
- 1980 P. Bidwell. An area in the north-east of the *praetentura*. (Bidwell 1985)

**Size of Fort (SF 2)**

north-south 156.800 (514.430)

east-west 93.200 (305.770)

area 1.46 hectares (3.6 acres)

The size of SF2 is as put forward by Bidwell (1985, 34)

## The Roman Fort at Chesterholm

### Building Inscriptions

- 1 Part of a dedication slab found before 1840 at Chesterholm.

‘For the Emperor Caesar Trajan Hadrian Augustus the Second Legion Augusta (built this) under Aulus Platorius Nepos, propraetorian legate.’ RIB 1702.

It is possible that this might have come from an early Hadrianic fort at Chesterholm (Collingwood and Wright 1965, 535).

- 2 Dedication slab found before 1702 at Chesterholm fort.

‘... the Fourth Cohort of Gauls styled Severus Alexander’s, devoted to his deity, restored from the foundations this gate with its towers under Claudius Xenophon, our emperor’s propraetorian legate of Lower Britain, under the charge of . . . .’ RIB 1706.

Birley and Richmond (1936, 233) show that this text belonged to the south gate of the third century fort. The inscription is dated to 223 (Collingwood and Wright 1965, 537).

- 3 Building stone found before 1835 in a field-wall near Chesterholm fort.

‘The Twentieth Legion Valeria Victrix (built this).’ RIB 1708.

- 4 Building stone found in 1830 at Chesterholm.

‘The century of Valerianus (built this).’ RIB 1711.

- 5 Voussoir stones seen in or before 1720 by Hunter in the vault of the bath house west of Chesterholm fort.

(a)	X	‘10’	(c)	XIII	‘13’
(b)	XI	‘11’	(d)	XVIII	‘14’

RIB 1720.

## The Roman Fort at Chesterholm

### Dating Evidence

Bidwell (1985, 3) has reassessed the chronologies put forward by E. Birley following the 1930-1936 excavations, and those of the 1967-1976 excavations by R. Birley. This reassessment follows Bidwell's excavation in the *praetentura* of the fort in 1980.

He places the building of Stone Fort 1 at perhaps 122-4 along with *vicus 1*, and a rebuilding of the fort *c.* 163. Construction of Stone Fort 2 and *vicus 2* is dated to *c.* 223-5.

<b>Site</b>	Chesterholm		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Stone Fort 1, Hadrianic, 122-4		
<b>Dimensions</b>	overall lengths	north elevation	24.380
		south elevation	23.450
		east elevation	26.520
		west elevation	26.520
	cross-hall	length	24.400
		width	7.620
	rear range	depth	9.430
	<i>aedes</i> (int. dims.)	width	6.510
		depth	8.650

<b>Site</b>	Chesterholm		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Stone Fort 2, c. 233-5		
<b>Dimensions</b>	overall lengths	north elevation	24.340
		south elevation	25.000
		east elevation	28.030
		west elevation	27.290
	cross-hall	length north elevation	24.670
		south elevation	24.930
		width east elevation	8.540
		west elevation	8.670
	rear range	depth	5.210-5.310
	courtyard	north elevation	14.310
		south elevation	14.750
		east elevation	6.170
		west elevation	5.530
	width of rooms to	north elevation	4.690
	sides of courtyard	east elevation	5.020
		west elevation	5.060
	<i>aedes</i> (int. dims.)	width	5.370
		depth	8.460
		projection to rear	3.070

**Site** Chesterholm

**Building** North Gate. Single portal with a guardchamber to each side

**Date** Stone Fort 2, c. 233-5

<b>Dimensions</b>	overall lengths	north elevation	13.170
		south elevation	13.190
		east elevation	6.560
		west elevation	6.630
	portal widths	north elevation	2.760
		south elevation	2.760
	width gate passage	north elevation	3.850
		south elevation	3.770
	depth gate passage	east elevation	5.010
		west elevation	4.930
	east guardchamber	north elevation	4.630
		south elevation	4.670
		east elevation	6.630
		west elevation	6.600
	west guardchamber	north elevation	4.710
		south elevation	4.730
		east elevation	6.530
		west elevation	6.520
	projection forward of guardchamber to north face of gate		1.550-1.700

**Notes** Doors to guardchambers face south

<b>Site</b>	Chesterholm		
<b>Building</b>	South Gate. Single portal with no guardchambers		
<b>Date</b>	Stone Fort 2, <i>c.</i> 233-5		
<b>Dimensions</b>	overall lengths	north elevation	<i>5.710</i>
		south elevation	<i>5.710</i>
		east elevation	<i>4.370</i>
		west elevation	<i>4.370</i>
	portal width	south elevation	<i>2.130</i>
	width gate passage		<i>3.890</i>
	depth gate passage		<i>3.120</i>

**Notes** Dimensions scaled from unpublished drawing in the Department of Archaeology of Durham University prepared by R. E. Birley dated March/April 1969. An accompanying note says that the west wall was drawn from the “ghost wall” of the robber trench.

<b>Site</b>	Chesterholm		
<b>Building</b>	South Gate. Single timber gates with no guardchambers		
<b>Date</b>	Period II	90-97	
	Period III	<i>c.</i> 97-103	
<b>Period II</b>	Form	single portal, 8 posts, gateway flush with outer face of rampart	
		width	<i>3.800</i>
		depth	<i>3.400</i>
		portal width	<i>3.200-3.230</i>
	spacing of	width	<i>3.440</i>
	posts	depth	<i>1.000</i>
<b>Period III</b>	Form	single portal, 8 posts, gateway flush with outer face of rampart	
		width	<i>3.800?</i>
		depth	<i>3.000</i>
		portal width	<i>3.000</i>
	spacing of	width	<i>3.120</i>
	posts	depth	<i>920</i>
	Measurements given as follows:		
	width:	overall width between outer edges of posts	
	depth:	overall depth between outer edges of posts	
	portal width:	measurements between the posts flanking the portal	
	spacing of		
	posts:	measurements between post centres	

**Notes**

Data obtained from (Birley 1994, 55). Format of catalogue as Manning and Scott's gazetteer of Roman Military Gateways (Manning and Scott 1979, 30).

<b>Site</b>	Chesterholm		
<b>Building</b>	West Gate. Single portal with a guardchamber to each side		
<b>Date</b>	Stone Fort 2, <i>c.</i> 233-5		
<b>Dimensions</b>	overall lengths	north elevation	7.870
		south elevation	7.950
		east elevation	14.050
		west elevation	14.040
	portal widths	east elevation	3.300
		west elevation	3.300
	width gate passage	east elevation	4.100
		west elevation	4.100
	depth gate passage	north elevation	5.850
		south elevation	6.000
	north guardchamber	north elevation	7.870
		south elevation	7.700
		east elevation	5.030
		west elevation	5.030
	south guardchamber	north elevation	7.700
		south elevation	7.950
		east elevation	4.920
		west elevation	4.910
	projection forward of guardchambers to west		
	face of gate		1.600-1.640

**Notes**                      Doors to guardchambers face east

## The Roman Fort at Old Church, Brampton

<b>Roman Name</b>	Not known (fig. 28)	
<b>OS NGR</b>	NY 509614	
<b>Orientation</b>	To the north	
<b>Extent of Fort</b>		
<b>Excavated</b>	c. 5%	
<b>Previous Excavations</b>	1935	F. G. Simpson and I. A. Richmond.  Section through fort ramparts, trenches through <i>latera praetorii</i> and south-west <i>retentura</i> (Simpson and Richmond 1936, 172-182)
<b>Size of Fort</b>	north-south	c. 124.970 (410' 0")
	east-west	c. 120.700 (396' 0")
	area	c. 1.500 hectares  (c. 3.70 acres)
<b>Garrisons</b>	The fort was probably built for a <i>cohors quingenaria peditata</i>	

**The Roman Fort at Old Church, Brampton**

**Building Inscriptions**

None

## **The Roman Fort at Old Church, Brampton**

### **Dating Evidence**

There was little material found during the excavation of the fort which had been levelled at the time of its abandonment. The tilery some three quarters of a mile from the fort, has been dated by ceramic evidence to *c.* 100 - 125 and it is likely that the closure of the fort can be dated to *c.* 125 (Manning 1972, 234; Simpson 1974, 327)

The buildings within the fort were seen to be of stone construction, which would be consistent with a Trajanic date for the founding of the fort

<b>Site</b>	Old Church, Brampton		
<b>Building</b>	<i>Principia</i>		
<b>Date</b>	Probably Trajanic		
<b>Orientation</b>	To the north		
<b>Dimensions</b>	overall lengths	north elevation	<i>24.380</i>
		south elevation	<i>24.380</i>
		east elevation	<i>c. 27.130</i>
		west elevation	<i>c. 27.130</i>
	rear range	depth (est.)	<i>6.600</i>
	courtyard	north elevation	<i>12.800</i>
		south elevation	<i>12.800</i>
	width ambulatory	east elevation	<i>c. 4.600</i>
		west elevation	<i>c. 4.600</i>
	<i>aedes</i> (int. dims.)	width	<i>4.570</i>
		depth	<i>5.760</i>

**Notes** Dimensions obtained from excavators report (Simpson and Richmond 1936) and note book no. 19 of the Richmond Archive on Roman Britain, Ashmolean Library, Oxford.

The stonework was bonded with clay.

<b>Site</b>	Old Church, Brampton		
<b>Building</b>	Eastern Granary		
<b>Date</b>	Probably Trajanic		
<b>Dimensions</b>	overall lengths	north elevation	7.926
		south elevation	7.926
		east elevation	23.160
		west elevation	23.160
	internal width		<i>c.</i> 6.100
	number of buttresses	north elevation	none
		south elevation	none
		east elevation	7
west elevation		7	

**Note**                    The stonework was bonded with clay.

<b>Site</b>	Old Church, Brampton		
<b>Building</b>	Western Granary		
<b>Date</b>	Probably Trajanic		
<b>Dimensions</b>	overall lengths	north elevation	<i>7.920</i>
		south elevation	<i>7.920</i>
<b>Note</b>	The stonework was bonded with clay.		

<b>Site</b>	Old Church, Brampton		
<b>Building</b>	Possibly Barracks		
<b>Date</b>	Probably Trajanic		
<b>Orientation</b>	<i>Per scamna</i> , in the west of the <i>retentura</i>		
<b>Dimensions</b>	overall lengths	north elevation	40.540
		south elevation	40.570
		east elevation	7.920
		west elevation	7.920

**Notes**                    The dimensions are overall the officer's quarters and *contubernia*.

No internal walls were recorded.

## **APPENDIX 3**

### **Tables Setting Out Tabulated Dimensions of the Buildings and their Selected Parts**

**TABLE 1**

**Dimensions and area of the forts<sup>1</sup>**

Fort	length <sup>2</sup>	width	area (hectares)
Wallsend	138.080	119.790	1.660
Newcastle-upon-Tyne	110.000	67.000	0.740 ?
Benwell	170.690	120.700	2.060
Rudchester	156.970	117.350	1.820
Halton Chesters	140.210	124.970	1.740
Chesters	177.000	131.000	2.320
Housesteads	185.930	111.860	2.020
Carrawburgh	140.000	111.700	1.600
Great Chesters	127.700	108.200	1.200
Carvoran	134.110	109.730	1.420
Birdoswald	176.800	121.920	2.144
Castlesteads	121.920	120.100	1.520
Stanwix	213.360	185.600	3.960
Burgh-by-Sands	177.000	125.000	2.120
Drumburgh	96.300	82.300	0.800
Bowness-on-Solway	188.000	128.000	2.310
Beckfoot	123.440	86.260	1.315
Maryport	164.900	160.000	2.640
Moresby	134.110	109.120	1.420
Birrens	141.420	118.900	1.680
Netherby	-	-	-
Bewcastle	irregular hexagon		2.420
South Shields <sup>3</sup>	148.000	113.000	1.670

Chesterholm <sup>4</sup>	156.800	93.200	1.460
Old Church, Brampton	124.970	120.700	1.500

#### Notes

- 1 The dimensions are taken overall the curtain wall.
- 2 The first dimension stated is that on the main axis of the fort.
- 3 Period 4A and B mid-Antonine.
- 4 Stone fort 2.

**TABLE 2**  
**The Principia**  
**Comparative overall sizes**

Fort	length	width
Wallsend	32.200-32.390	23.850-24.000
Benwell	45.110	24.080
Rudchester	43.130	19.200
Halton Chesters	39.000	30.000
Chesters	38.990-39.190	27.380-27.540
Carrowburgh	28.000	26.200
Housesteads	27.280-27.580	23.250-23.500
Great Chesters	24.800	23.930
Birdoswald	32.000	28.000
Bewcastle	30.500	22.000
South Shields (4B)	29.300-29.600	23.800-24.000
Chesterholm (SF1)	26.520	23.450-24.380
Old Church, Brampton	27.130	24.380

**TABLE 3*****The Principia*****Comparative dimensions**

Fort	Span of cross-hall	Width of aisle to cross-hall	Depth of rear range
Wallsend	9.070-9.280	none	4.990
Benwell	6.680	3.040	6.100
Rudchester	7.000	2.440	5.200
Halton Chesters		likely	
Chesters	9.600	3.200	6.840
Carrawburgh	7.050	2.300	6.500
Housesteads	6.970-7.000	2.410	5.760
Great Chesters	7.010	no evidence	5.490
Birdoswald	9.000	unlikely	6.000
Bewcastle	7.600	no evidence	5.200
South Shields	8.200	none	4.800
Chesterholm (SF 1)	7.620	none <sup>1</sup>	9.430
Old Church, Brampton		no evidence but unlikely	6.600

**Notes**

1 The evidence from Chesterholm is open to interpretation.

**TABLE 4****The Principia****Comparative dimensions**

Fort	Size of Courtyard width x length	Width of Ambulatory	Size of Aedes width x length
Wallsend	14.170-14.360 x 13.040-13.160	4.860-5.085	4.730-5.030
Benwell	12.190 x 24.380	3.960	3.660-5.180
Rudchester	10.000 x 27.000	4.880	-
Halton Chesters	-	-	-
Chesters	15.620-15.650 x 15.560-15.610	3.560 & 5.870-5.920	5.790 x 6.070
Carrawburgh	6.800	3.500	4.700 x 6.500
Housesteads	16.180-16.220 8.730-8.910	2.550-2.800	4.970 x 5.090
Great Chesters	-	-	5.120 x 4.720
Birdoswald	12.000 x 19.000	4.000	7.000 x 5.000
Bewcastle	-	-	- x 5.200
South Shields	14.400 x 11.500-11.800	4.600-4.700	3.800 4.000
Chesterholm (SF1)	-	-	6.510 x 8.650
Old Church, Brampton	12.800 x -	4.600	4.570 x 5.760

**TABLE 5**  
**The Granaries**  
**Comparative overall sizes**

Fort	length	width	overall buttresses	
			length	width
Wallsend (D)	26.000	11.450-11.550	27.400	12.850-12.950
Benwell (D)	42.670	18.290	43.870	20.710
Rudchester	40.080	9.750	41.000	10.670
Halton Chesters	39.000	10.560	40.200	11.600
Carrowburgh (D?)	28.000	13.800	-	16.200
Housesteads (D)	25.520-25.880	14.730-14.790	27.850-28.210	16.860-16.960
Birdoswald N	29.230-29.370	8.080-8.200	32.030-32.170	9.380-9.500
S	28.480-29.100	7.980-8.250	31.080-31.700	9.250-9.520
Stanwix	36.600	9.140	-	10.660
Drumburgh	-	-	-	-
South Shields (D) <sup>2</sup>	22.780-23.060	14.700-15.700	23.800-24.080	15.640-16.620
South Shields <sup>3</sup>	29.910-30.500	6.340-6.830	30.890-31.500	7.270-7.750
Old Church, Brampton	23.160	7.926	-	-

**Notes**

- 1 (D) indicates a double granary.
- 2 The granary is A5 of Period 4B (mid Antonine).
- 3 The granary is C14 of period 6 (Severan). All granaries of this type are of similar size, see appendix 2.

**TABLE 6****The Granaries****Comparative dimensions of buttresses**

Fort	Spacing	Projection	Width
Wallsend (D)	2.700-3.300	700	700-900
Benwell (D)	3.760	600	1.220
Rudchester	c. 3.810	460	914
Halton Chesters	c. 3.600	450-610	550-670
Carrowburgh	3.300	1.200	1.000
Housesteads	2.760-3.660	720-1.140	560-1.290
Birdoswald N	3.220-3.420	1.100-1.300	1.100-1.230
S	2.800-4.000	1.160-1.270	1.000-1.080
Stanwix	3.660-3.960	760	1.060-1.220
Drumburgh	3.050	780-810	780-810
South Shields (D) A5	2.260-2.370	450-510	710-850
South Shields (C14)	2.700-2.930	430-480	760-780
Old Church, Brampton	-	-	-

**Notes**

- 1 This table relates to buttresses along the length of the building and not to the gable walls.
- 2 The notes to table 5 apply.

**TABLE 7****The Granaries****Method of support to floors**

Fort	
Wallsend (D)	Western granary solid clay floor, eastern granary 3 sleeper walls running the length of the building.
Newcastle-upon-Tyne	Western granary, 3 sleeper walls running the length of the building.
Benwell (D)	Western granary and southern part of eastern granary solid floor. Northern part of eastern granary transverse sleeper walls.
Rudchester	Not recorded.
Halton Chesters	Transverse sleeper wall to southern end of granary for distance of c. 13.000 from inside sleeper wall. 7 sleeper walls north of this running the length of the building.
Carrowburgh	Not recorded.
Housesteads (D)	Stone <i>pilae</i> .
Birdoswald	Single central sleeper wall. Row of timber posts set midway between sleeper wall and external walls.
Stanwix	Not recorded.
Drumburgh	Suspended - details not recorded.
South Shields (A5)	Stone <i>pilae</i> .
South Shields (Severan)	4 longitudinal sleeper walls.
Old Church, Brampton	Single central sleeper wall. Responds to inside of external wall.

**TABLE 8**  
**The Gates**  
**Comparative sizes**

Fort		length	width
Wallsend	N	17.700-17.900	5.700-5.850
	S	17.900	5.800-5.900
Rudchester <sup>1</sup>	S	-	5.500
Halton Chesters <sup>1</sup>	N	-	6.780
	E	-	6.930
	W	-	6.710
Chesters	N	18.760-18.900	5.650-5.810
	S	18.170-18.190	5.580-5.620
	E	19.600-19.730	5.670-5.780
	W	19.470-19.540	5.780-5.810
	LEG	6.140	5.710
Housesteads	N	15.910-16.220	5.950-6.040
	S	16.150-16.360	6.040-6.080
	E	16.170-16.220	5.980-6.210
	W	16.100-16.250	5.900-6.250
Great Chesters	S	19.500	5.560-5.640
	W	18.700-18.720	5.800-5.860
Birdoswald	S	17.830-17.950	5.630
	E	18.520-18.550	5.730-5.790
	W	18.580-18.590	5.480-5.580
	LEG	-	-
	LWG	5.860	5.220
Bowness-on-			
Solway <sup>1</sup>	W	-	6.100-6.200

South Shields	NW	17.900	5.800
	SW	17.500	6.500
	SE	12.060-12.190	5.730-5.930
Chesterholm	N	13.170-13.190	6.560-6.630
	S	5.710	4.370
	W	14.040-14.050	7.870-7.950

### Notes

- 1 Width based on the dimension of one guardchamber only

**TABLE 9****The Gates****Comparative Dimensions**

Fort		Portal widths	Width Gate Passage	Depth Gate Passage
Wallseend	N	2.550-2.600	7.350-7.400	4.000
	S	2.400-2.600	7.100-7.300	4.100
	W	-	-	3.900
Benwell	LWG	2.900	-	5.560
Rudchester	S	3.050	-	4.270
	W	3.350	-	-
Halton Chesters	N	3.290	-	4.870
	E	3.250	-	5.000
	W	3.050-3.010	-	4.920
Chesters	N	3.080-3.220	8.230-8.320	4.090-4.110
	S	3.240-3.280	8.250-8.300	3.990-4.000
	E	3.230-3.260	8.260-8.290	3.980-4.100
	W	3.240-3.310	8.210-8.350	4.080-4.140
	LEG	3.390	3.930	5.710
Housesteads	N	2.540-2.970	7.100-7.190	5.280-5.370
	S	2.860-2.940	7.050-7.150	5.520-5.530
	E	-	7.030-7.150	6.080-6.170 <sup>1</sup>
	W	2.810-3.020	7.120-7.170	5.390-5.460
Great Chesters	S	-	8.230	3.960
	W	3.080-3.240	8.210	4.000

Birdoswald	S	3.350-3.400	8.370	4.440
	E	3.350-3.440	8.260-8.270	4.600-4.610
	W	3.380-3.390	8.370	4.410-4.440
	LEG	3.320	-	-
	LWG	3.400		5.220
Bewcastle	W	2.740	-	4.240
South Shields	NW	2.630	8.050	4.140
	SW	2.700	7.600	3.750
	SE	2.320-2.390	2.320-2.390	5.840-5.860
Chesterholm	N	2.760	3.770-3.850	4.930-5.010
	S	2.130	3.890	3.120
	W	3.300	4.100	5.850-6.000

### Notes

- 1 These dimensions to the east gate almost certainly reflect later alterations.

**TABLE 10**

**The Gates**

**Comparative Dimensions**

Fort		Guardchamber Sizes		Projection forward of face of guardchamber from face of gate
		length	width	
Wallsend	N east	5.150-5.200	5.850	
	west	5.200-5.300	5.700-5.800	1.800
	S east	5.400	5.750-5.900	
	west	5.200-5.400	5.800-5.900	1.750
	W south	5.300-5.400	5.600-5.750	
Rudchester	S west	4.800	5.500	
Halton Chesters	N west	5.030	6.780	1.800
	E north		6.930	1.780
	W north	4.880-4.990	6.710	1.830
Chesters	N east	5.360	5.650-5.660	
	west	5.420-5.490	5.730-5.810	1.680-1.720
	S east	4.960-5.050	5.570-5.620	
	west	4.890-4.910	5.690	1.580-1.680
	E north	5.750-5.800	5.760-5.780	
	south	5.590-5.640	5.640-5.670	1.520-1.780
	W north	5.570-5.610	5.770-5.780	
south	5.570-5.690	5.810-5.830	1.650-1.690	
Housesteads	N east	4.170-4.270	5.940-6.040	
	west	4.450-4.590	5.950-5.970	590-660
	S east	4.560-4.610	6.040-6.080	
	west	4.540-4.600	6.040-6.190	530-550

	E north	4.540-4.600	5.980-6.080	
	south	4.510-4.540	6.170-6.210	
	W north	4.460-4.710	5.900-5.930	
	south	4.420-4.470	5.980-6.250	510-540
Great Chesters	S east	5.490	5.640	
	west	5.490	5.560	1.460-1.680
	W north	5.040-5.060	5.640-5.800	
	south	5.420	5.680-5.860	1.680
Birdoswald	S east	4.690	-	
	west	4.840-4.880	5.540-5.630	1.070-1.100
	E north	4.690	5.725-5.730	
	south	5.480-5.560	5.680-5.790	1.080-1.115
	W north	4.640-4.760	5.520-5.480	
	south	5.450-5.480	5.480-5.580	1.040-1.110
Bowness on Solway	W north	4.800-5.000	6.100-6.200	
Bewcastle	W	-	-	1.500
South Shields	NW ne	4.400	5.300	
	sw	4.400	5.350	1.700
	SW nw	5.400	6.800	
	se	5.400	6.800	1.700
	SE ne	4.940	5.730-5.840	
	sw	4.760-4.860	5.860-5.980	450
Chesterholm	N east	4.630-4.670	6.630-6.600	
	west	4.710-4.730	6.520-6.530	1.550-1.700
	W north	5.030	7.700-7.870	
	south	4.910-4.920	7.700-7.950	1.600-1.640

**TABLE 11**  
**The Barracks**

**Comparative overall sizes**

Fort		length	width <sup>1</sup>	Verandah	
Wallsend	1	48.000	10.000	Yes	
	2	45.800	7.900-8.000	?	
	3	45.800	8.100	?	
	4	44.900-45.050	7.600-7.800	?	
	5	45.350-45.900	7.600-7.700	?	
	9	46.200	8.200	?	
	10	46.000-46.150	8.600-8.650	?	
	11	46.000	7.700-8.000	?	
	12	45.010-45.020	8.100-8.900	?	
	Benwell (D) <sup>2</sup>		45.720-46.010	26.210	Yes
	Halton Chesters (D) <sup>2</sup>	1	41.500	20.000	?
		2	-	20.000	?
3		53.000	24.000	?	
4		45.000	24.000	?	
Chesters	N	-	12.000	Yes	
	S	-	11.730	Yes	
Carrawburgh <sup>2</sup>		-	11.000	Yes	
Housesteads	XIII	50.050	10.350	Yes	
	XIV	49.150	10.590	Yes	
Birdoswald <sup>2</sup>	E	49.000	10.000	Yes	
Birdoswald	W	46.900	11.800	Yes	
Bowness on Solway		-	8.3000	?	
Maryport	E	-	11.000	Yes	
	W	-	-	? Yes	

South Shields	B1	-	8.000	No
	B3	42.000	9.500	No
	B6	43.000	9.500	No
Old Church, Brampton		40.540	7.920	No

#### Notes

- 1 The overall width includes the verandah, where it is known.
- 2 The dimensions for these buildings have a low reliability

TABLE 12

## The Barracks

## Comparative dimensions

Fort		Size of Officer's Quarters		Size of <i>Contubernia</i>		
		length	width	length	width <sup>1</sup>	
Wallsend	1	12.000-12.200	7.700-7.900	35.300	7.900-8.000	
	2	11.500	7.900	34.300	8.000	
	3	11.400	8.100	34.400	8.100	
	4	12.050-12.100	7.700-7.800	32.800-33.000	7.600-7.700	
	5	12.300-12.650	7.600-7.700	32.700-33.600	7.600-7.700	
	9	12.000	8.300-8.500	34.010	8.000-8.300	
	10	10.900	8.450-8.650	35.100-35.250	8.600-8.650	
	11	12.100-12.200	7.700-7.900	33.800	7.900-8.000	
	12	11.000	8.900	34.010-34.020	8.100-8.600	
	Benwell (D)		9.450-10.060	26.210	35.560-36.660	23.160
	Halton Chesters (D) <sup>2</sup>	1	7.500	20.000	34.000	20.000
		2	-	20.000	-	20.000
3		16.000	24.000	37.000	24.000	
4		10.000	24.000	35.000	24.000	
Chesters	N	-	12.000	-	10.550	
	S	11.060-11.640	11.730-12.520	-	10.540	
Housesteads	XIII	9.400-9.600	10.350	40.450-40.650	8.660	
	XIV	8.250	9.350	40.900	8.650	
Birdoswald <sup>2</sup>	E	10.000	10.000	39.000	10.000	
Birdoswald	W	9.900	11.710	37.000	9.200	
Bowness on Solway		-	-	-	8.300	
Maryport	E	11.000	10.000	-	7.700	
	W	-	-	-	7.800	

South Shields	B1	-	8.000	-	8.000
	B3	-	9.500	-	9.500
	B6	-	9.500	-	9.500
Old Church, Brampton		-	7.920	-	7.920

#### Notes

- 1 The width of the *contubernia* excludes the verandah
- 2 The dimensions for these buildings have a low reliability

TABLE 13

## The Barracks

## Comparative Dimensions

Fort		Width of <i>Contubernia</i>	No. of <i>Contubernia</i>	
Wallsend	1	3.600	9	
	2	-	9	
	3	3.400-3.700	9	
	4	3.200-3.500	9	
	5	3.300-3.500	9	
	9	3.400-3.650	9	
	10	3.200-3.600	9	
	11	3.300-3.600	9	
	12	-	9	
	Benwell		3.350	18
	Halton Chesters <sup>2</sup>	1	3.500-4.000	16
		2	-	16
3		-	16	
4		-	16	
Chesters	N	3.600-3.770	10	
	S	3.440-3.640	10	
Housesteads	XIII	3.350-3.600	10	
	XIV <sup>1</sup>	3.300-3.550	10	
Birdoswald <sup>2</sup>	E	3.000-3.500	8	
	W	3.780-4.000	8	
Bowness on Solway		-	-	
Maryport	E	-	-	
	W	-	-	

South Shields	B1	-	-
	B3	-	-
	B6	-	-
Old Church, Brampton		-	-

1        *Contubernia* 10 is considerably narrower, being 2.750 m wide.

2        The dimensions for these buildings have a low reliability.

## **APPENDIX 4**

### **Catalogue of Decorated and Moulded Stonework**

## Catalogue of Decorated and Moulded Stonework

This appendix sets out and discusses the decorated and moulded stonework from known or probable Hadrianic contexts; some later comparables are included from the mid-Antonine fort of South Shields. All types of stonework are included, with the exception of splayed or chamfered plinth courses which have been discussed in previous chapters (3.4). The catalogue is limited, due to the paucity of examples in secure contexts, and must not be considered definitive.

### A Column Capitals

#### Wallsend

- 1 A single re-used sandstone capital of phase 3 (site archive) rests upside down in the northern ambulatory of the *principia*. In form it is in the Tuscan style, having a flat ovolo mould ending at its upper edge in a groove below a small outwardly inclined fascia mould. The *abacus* is 690 mm square, having a stepped fascia and a pronounced projection above the capital (fig. 57). The *abacus* approximates in size to the Hadrianic bases. There are no columns on site so it is not known if a *torus* mould was present below the capital. There is some doubt as to the reason for the siting of this capital, as it is incorporated in a colonnade which was defunct in period 3. There is also a possibility that it could have been used on a column base (site archive). In view of the evidence from site, it might be intrusive.

From the underside of the capital it can be seen that the top of the column had a diameter of 225 mm. Although it is questionable to reproduce the column height using the comparative proportions of the orders after Sir W. Chambers, or other authorities, it is useful as a guide in ascertaining its original height. Using Chambers' proportions (Bannister Fletcher 1954, 844) for a Roman Tuscan column, the diameter of the top of the column is three quarters of that at its base, and the distance from the top of the *abacus* to the bottom of the base is eight column diameters. Using these criteria, the base of the column would be 300 mm in diameter, and the height of the top of the abacus 2.400 m above ground level. This would approximate to eaves height, giving a column length of *c.* 1.900 m.

### Housesteads

1 Six capitals on columns standing on moulded bases formed an arcade running down the centre of the granary. The capitals bear a close similarity curving out on all four sides above a *torus* mould to end in a cavetto below a fascia mould, above which was the *abacus* (fig. 58). The underside of the capitals range from 410 by 420 mm to 480 by 480 mm, with the top of the *abacus* varying from 600 by 600 mm to 650 by 690 mm. Although the work is not of high quality, the design is strong, simple and pleasing and has been carried out to a fair standard. The form to the underside of the capital could suggest that it was supported by a square column. Two similar capitals, without provenance, stand outside the museum at Chesters. The lower portion of each capital is missing/damaged, and one would appear to have been used as a whetstone; there is no evidence of a *torus* or other mould. At the top of the splayed sides ending in a cavetto, there is a recessed fillet below an

*abacus* (pl. 60). One face of the capital has been cut off, possibly reflecting later reuse. The similarity in style is reflected in the size, with the complete side of the *abacus* being 630 mm, and the underside of the capital 420 mm. The similarity of these two capitals would appear to suggest the same "school".

The form of the capital could suggest an intermediate stage in the working of the stonework prior to the cutting of the detail. The figure in (Wilson-Jones, 1993, 34 fig.11) shows the various stages of working a capital, with the intermediate stage showing a marked resemblance to this capital.

- 2 A possible capital to column base no. 2 (EHCHS HO 322)<sup>1</sup>. The underside of the capital is recessed to take a square shaft. The simple mouldings are set below a deep square *abacus*.

## **B Column Bases**

### **Wallsend**

- 1 The extant column bases to the ambulatories differ slightly in size and style. It is difficult to understand why the bases are different if they are of the same phase and alignment (site archive). Three bases have equal sides and measure from 690 - 750 mm to each side. The inset square to the upper surface, inside a groove and rounded cyma recta mould to the side of the base, measures between 390 - 400 mm in all cases (fig. 57). Two bases to the western ambulatory are very similar in style, but differ in that the sides are almost vertical and the mould has become sub-ovolo in form. All the bases are between 270 - 280 mm high.

## Housesteads

1 Four moulded column bases are extant in the *principia* to the cross-hall arcade *h, l, j* and *k* (fig. 30). Two column bases are extant to the ambulatories to the courtyard *a* and *f*. Column *d* is intrusive, having been brought from block XII; however it does bear a close resemblance to the others. The bases are all lathe turned, with the sinking for the lathe visible in the top of the base, and are formed out of one piece of stone, comprising plinth, mouldings and lower part of shaft (pl. 61).

The bases, although varying considerably in detail, bear a similar resemblance. Base *h* is by far the best in design and workmanship (pl. 62). A. C. Dickie describes it thus (Bosanquet 1903, 268), 'It is worked sharp and clean to a delicately-designed profile, consisting of two *tori* above a square projecting plinth. Noticeable peculiarities are the great projection of the upper *torus*, and the V-shaped sinkings on it and the drum of the column. The whole is in excellent preservation, and shows unmistakable signs of having been turned in a lathe'. Unfortunately, after almost 100 years of exposure, it is now in not quite so good a state of preservation. Base *a* shows a greater amount of the lower section of column shaft than any other; the exaggerated entasis of the column above the bold *tori* being very pronounced (pl. 63).

2 A single column base is situated to the east of the building (pl. 64), and could be from the portico to the east front (EHCHS HO 322). In style it is dissimilar to the bases within the building, and almost certainly supported a square stone column or timber post. The method of forming the base is similar, in that plinth, mould and lower part of column are formed as one piece.

- 3 The six bases to the central row of columns in the granary are of dissimilar detail. Some are of plain square design with slightly tapering sides and a simple incised moulding in the top, or simple stepped moulding to the sides (pl. 65). Others have a crude stepped detail to the sides; in most cases the stepping does not occur to all sides. This omission could be the result of later work. The size of the upper surface of the bases varies from 440 by 450 mm to 500 by 580 mm, and the height from 300 - 460 mm. In every case the lower section of the base is unfinished. All bases rest on a substantial foundation course.

### **Chesters**

- 1 Two column bases, one *in situ*, are extant to the northern barrack block in the *praetentura* (pl. 66). The column base is made up of a single *torus* mould above a square base, which does not extend beyond the mound. The column is 37 mm in diameter and of typical proportions.

### **C Columns**

Apart from the lower portion of columns attached to their bases described above, a complete column and column fragments have been found at South Shields, in the forecourt of the period 7 (late third, early fourth century) *principia*. The complete column, in four pieces, is 2.100 m long with a diameter of 335 mm and was lathe turned (Bidwell and Speak 1994, 146 and fig. 5.2). There is a single *torus* mould at the top of the column and two at the base. The sides of the column are irregular and there is no evidence of entasis.

## D Cornice Mouldings

### Housesteads

- 1 A cornice mould with supporting console brackets found in the cross hall of the *principia*. The cornice is somewhat rudely worked and comprises a simple fascia with a slight sinking having a concave face and two inscribed lines, supported by brackets 80 mm apart. This fragment could have formed the lower part of a simple pediment over the entrance into the cross hall from the courtyard (Bosanquet 1904, 273, fig. 20; EHCHS HO 128).
- 2 A shallow cornice mould, probably that from the impost to one of the openings in the west wall of the cross hall of the *principia* (fig. 59A). The profile comprises a cyma recta mould below a fillet which has a sinking in its face of a slight concave moulding within two grooves. A groove is cut into the edge of the bedding planes. The width between the grooves on each side is 590 mm. This compares with the width of the west wall of the cross hall of 570 mm, its possible original position. This mould, cornice mould EHCHS HO 128 and the string courses all have a sinking in the fillet; a detail not recognised elsewhere *per lineam valli*.
- 3 A cornice mould (fig. 59B; EHCHS HO 432), probably from the *principia*. The profile is made up of a fillet above a cavetto and cyma recta mould; a groove is set back some 5 mm on the bedding plane. A portion of undressed stonework is left projecting on the rear face of the stone of some 500 mm. A pier base, perhaps *in situ* on the line of the north colonnade and the courtyard of the *principia*, set in the east wall of the cross-hall, has an identical moulding on three sides of the almost square plinth.

- 4 A section of cornice found lying at the east gate (Bosanquet 1904, 273, fig. 17; EHCHS HO 408). The fragment shows the zig-zag linear decoration, below the triangular sunk ornament, set into the recessed upper face of the cornice mould. The shallow sinking on the fillet is typical of almost every mould found during the 1898 excavation. There are clear parallels in CSIR 1.6. 45 and 302, both probably from Chesterholm.

### **Birdoswald**

- 1 A section of cornice almost certainly from the west gate, which could have been a decorative cap to the *spina* or gate pier; it is fully described in Wilmott (1997 60-62 and fig. 37). The mould comprises a quadrant above a fillet below which is a cavetto terminating in an astragal. The quality of the work is higher than that usually produced by the army.
- 2 A dentilled cornice block which could have come from the same gate (ibid., 62 and fig. 37). The flat soffit has four dentils of varying dimensions below a fillet and recessed indent underside moulding. The profile of the section at each end shows little variance so as to ensure a good match with other blocks, and suggests that a template was used.

### **E String Courses**

#### **Housesteads**

- 1 Two definite types of string course moulding have been identified by Welsby<sup>2</sup>, (Welsby 1989, 20-24). Both types are identical in that type II does not have a groove cast into the lower bedface by the moulding, as does type III. The stones vary in thickness from 100 - 140 mm, with 125 mm being the most

common dimension. The general form of the mouldings is standardised, but there is significant variation in their width ranging from 75 - 170 mm. 26 examples of type II have been identified (*ibid.*, 22) including one corner block; a total length of 10.380 m has been recovered. Four corner blocks have mouldings of type II along one edge and type III on an adjacent edge. Type III is the most common form of string course moulding, 126 examples having been identified. The range of thickness is between 100 - 160 mm with the majority falling between 120 - 130 mm (pl. 67). The design is made up of a fillet in the centre of which is a concave mould with grooves either side with the lower part of the face projecting boldly down above a cyma recta mould, with a groove on the lower bedding plane. Clear signs of weathering can be seen by the moulded edge. 126 blocks of this type have been identified with 17 being corner blocks, representing a total length of 53.270 m.

The mouldings have been designed by someone with a knowledge of classical architecture although the workmanship is not consistent. During an examination of the EHCHS, and as a limited means of forming a comparison, sections were drawn through 17 examples of string course moulds of approximately the same equal thickness of 140 mm. Although it is unlikely that many blocks came from the same building, little evidence of matching sections could be identified. In a general comparison of other sections, little matching of the sections could be seen, although EHCHS HO 1 and HO 30 were very similar. On balance it must be questioned whether a template was used. Hill (1981, 13) does not think that the Romans made use of the template. He considers instead that they were cut roughly in the workshop and finally dressed when set in position. This could account for the general poor quality

of the mouldings. This conforms with Blagg's findings during an examination of the column bases at Great Witcombe and Bignor where it was apparent that no template was used (Blagg 1976, 170).

The gatehouses are the obvious buildings to which the cornice moulds can be attributed, as many have been found close to the north, south and east gates, some in fairly secure provenances<sup>3</sup>. Sections of cornice can also be seen on an early photograph of the north gate at Housesteads (Hadrian's Wall Archive, photo no. 6701). The internal and angle towers are also considered to be possible buildings, their use however, should not be precluded from other buildings within the fort, possibly even building XV. From excavation on site it is probable that the string course and the buildings to which they related were wholly or partly demolished in the later third or early fourth century (Welsby 1989, 24).

2 Examples of stones with a simple chamfer, probably a string course, have been found by the east and west gates (EHCHS HO 258 and 501-504). The stones are 100 - 138 mm thick. HO 504 has a chamfer to two sides.

### **Birdoswald**

1 Stones *c* 60 - 120 mm thick with a simple chamfer to one side or to two adjacent sides, were found close to the west gate. It has been identified as a probable a string course, as the chamfer is much weathered. This is fully discussed in Wilmott (1997, 65 & fig. 37). Chamfered stones have frequently been found on Hadrian's Wall (ibid., 65) and could have been built into the top of the Wall with the chamfer projecting.

## **South Shields**

- 1 Seven slabs of magnesian limestone were recovered from the fill of a ditch in front of the south-west gate (Bidwell and Speak 1994, 149, 151 & fig. 5.5.). Five were chamfered on one edge and two along adjacent edges. In most cases the surface above the chamfer showed signs of weathering, and it would seem that the string courses were built-in with the chamfer facing downwards, the usual way in good architectural detailing. Of the seven slabs, in five cases the angle of chamfer was 45 degrees, with one of 40 degrees and one of 60 degrees. The length of the slabs was between 330 mm and 550 mm, the width 300 mm and 550 mm, and the thickness 80 mm - 140 mm.

## **F Gate Imposts**

### **Chesters**

- 1 An impost is extant to the south portal of the east gate. The impost is formed from a large piece of stone 1.200 m long by 380 mm high. The mould is expressed on the west face by a hammer-dressed finish area 780 mm long by 220 mm high, contrasting with the fine pitched face finish to the rest of the stonework (pl. 68). It takes the form of a broad fascia above a chamfer, the lower edge of which is set forward on the face of the inner respond. The impost mould does not project into the fort, but projects into the portal opening 130 mm.
- 2 A probable impost from the east respond to the south portal of the east gate is extant on site (pl. 69). The overall size of the stone block is 540 mm long by 630 mm wide by 360 mm high, and matches the size of the extant respond. The impost has a fascia 130 mm deep set forward above a splay by 110 - 130 mm.

The stone dressing below the splay is unfinished. There is a groove cut on the bedding plane 100 mm from the outer face. The stone was later re-used.

- 3 A probable impost from the east respond to the north portal of the west gate is extant on site (pl. 70). The overall size of the block is 1.460 m by 730 - 800 mm wide by 260 mm deep. The moulding to the portal opening is badly damaged and formed a chamfer below a fascia of 130 mm. A small fillet has been cut to the undamaged outside edge. The depth of the fascia matches the other extant imposts on site.

## **Birdoswald**

- 1 An impost is extant to the east gate (pl. 51). The mould is 205 mm high and takes the form of a broad fillet above a chamfer. The chamfer is unequal, projecting 125 mm into the portal and 100 mm to the east elevation. The stone is dressed to a fine pitched finish.

## **G Base Moulds and Thresholds**

### **Base Moulds, Chesterholm and South Shields**

- 1 Three sections of a moulded sill were found, two from the period 7 forecourt and the other from the kerb of the *via praetoria* (late third or early fourth century) of the *principia* at South Shields. The moulding to the stone sill is very similar to that of the stones to the upper surface of the offset to the Chesterholm tribunal (fig. 60) where a similar slot 100 mm wide by 100 mm deep has been cut<sup>4</sup>. It is possible that the stones are re-used in this position, and could have come from an earlier context. There is some element of doubt in attributing the stone sill mould at South Shields to period 4B (mid-

Antonine). It could equally well be attributed to period 5 or 6 (Severan to late third century) and might have even come from a tribunal in the *principia* 1 of period 6 (pers. com. Nick Hodgson). This latter context would make it contemporary with that at Chesterholm.

### **Thresholds, Housesteads and Chesterholm**

- 2 Details of these thresholds have been discussed in chapter 3.4.1.1 (pl. 20, 21. fig. 61), and a comparison made between the two. Dimensionally and stylistically the thresholds are so similar that if they were not carried out by the same person they are likely to have been carried out by the same “school”.

### **Threshold, Chesters**

- 3 A fragment of a moulded threshold is extant in the cross-hall of the *principia* (pl. 72). The stone is set in the ground and placed centrally opposite the room to the west of the *aedes*. It runs north-south and is probably not in its original context. The threshold is 630 mm broad and has a central slot 390 mm wide. Between the slot and both outside edges is cut a small groove. The groove and slot finish 260 mm from the edge of the stone. The threshold is narrower in width than that at Housesteads, 520 - 530 mm, and Chesterholm, 470 mm, but the slot is wider being 200 mm at the former and 270 mm wide at the latter. The undecorated end may be truncated. It is possible that the threshold came from the *aedes* or one of the flanking rooms.

## **H Merlon Caps**

The following shaped stones are considered to be merlon caps, although it is possible that they were used elsewhere in the building.

### **Housesteads**

- 1 Merlon Caps Type IV (Welsby 1989, 22), 12 examples of this moulding have been recognised, mainly from the north and south gates. The dressed stones have a chamfer ranging from 28 - 50 degrees. The size of the caps range from 380 - 600 mm long by 340 - 510 mm wide, and 12 - 14 mm thick. These sizes compare with similar features found at South Shields which were 405 - 540 mm long by 285 - 390 mm wide and 90 - 180 mm thick (Bidwell and Speak 1994, 148-9). Welsby is not convinced that they were used as merlon caps, pointing out that evidence of weathering can be seen on one example on its chamfered face and thinks this may be the string course (*ibid.*, 22). The fact that one cap does have three chamfered faces and another two, does seem to preclude an alternative use.

### **South Shields**

- 1 A slab of magnesian limestone with a chamfer to three sides, size 550 mm by 370 mm and 180 mm thick (Bidwell and Speak 1994, 9, fig. 5.5). The top of the cap shows signs of weathering whilst the underside shows little evidence. Around the edges, except on one side which is fractured, there is a smooth weathered surface which indicates that the block projected 30 - 40 mm beyond the face of the wall.

- 2 Slab of limestone with a chamfer to three sides, size 405 mm by 285 mm and 90 mm thick (ibid. 10, fig. 5.5). Weathered, possibly fractured to one side.

## **J Arcuate Lintels**

From discussion in an earlier chapter (3.4.3.1) it is known that arcuate lintels formed the window heads to openings in the gates in a great many instances. It is certain that they were used elsewhere on buildings within the fort, in view of the mouldings and level of applied decoration on some of the lintels.

## **Housesteads**

One of the most characteristic groups of architectural features found at Housesteads are the arcuate window heads, many of which are decorated. This decoration takes the form commonly of two sets of incised lines with roundels, rosettes and other decoration within the spandrels (Bosanquet 1903, 267, CSIR 1 6, nos. 244, 413-433). A double incised line occurs around the perimeter of most examples and it is probable that these all came from the same workshop. Unfortunately, out of 41 fragments from a minimum of 28 windows, very few have a secure provenance (Welsby 1989, 24-27). Due to the fragmentary nature of most of the window heads, it is difficult to ascertain accurately the width of the internal clear opening. The widths seem to fall within the range of 570-600 mm with one example with a width of only 420 mm. That a great number came from the gates is inescapable, many are shown in early photographs: north gate lintel with double incised line decoration (Hadrian's Wall Archive photo. no. 6701), south gate lintel with double incised line decoration (Crow 1995, 91). This lintel is also shown on an early photograph of c. 1878 where it is shown in a different position with the decoration concealed (Durham University, Department of

Archaeology photo. archive)<sup>5</sup>. Many of the arches of no provenance have roundels in the spandrels, often with three or four spokes.

- 1 Decorated arcuate lintel 770 mm high by 870 mm wide by 140 mm thick was found in the *praetorium* (? *principia*). Above the arch are two birds on interlaced ivy pecking at the leaves (CSIR 1.6, 414).
- 2 Decorated lintel (probably Hadrianic), 435 mm high by 660 mm wide by 155 mm deep was found at the entrance to one of the guard chambers of the south gate of the fort (CSIR 1.6, 435).
- 3 A little under half of a decorated arcuate lintel (Housesteads EHCHS HO 414), probably from the *principia*<sup>6</sup>, height 675 mm. Moulding around edge of lintel with two roundels remaining above the arch.

### **Birdoswald**

- 1 Arcuate lintel 680 mm high by 830 mm wide by 400 mm with an opening of 660 mm, found at the east gate, having a simple head mould above the arch (Wilmott 1997, 63, fig. 38). Three other similar lintels were found at the gate.
- 2 Left hand side of a bilithic window head. When paired it would have formed an opening 660 - 680 mm wide (Wilmott 1997, 63, fig. 39).

### **South Shields**

- 1 An arcuate lintel 600 mm high by 930 mm wide by 130 mm deep with an opening of 600 mm, found in front of the south-west gate (Bidwell and Speak 1994, 148, fig. 5.4). The lintel is without carved ornament but has lines of

limewash radiating from the window opening to a continuous arch representing a ring of nine *voussoirs*.

- 2 An arcuate lintel 620 mm high by 930 mm wide by 130 mm deep with an opening of 600 mm was found near the north-west gate (*ibid.*, 148, fig. 5.4). Seven incised lines imitate *voussoirs* above the opening. The use of arcuate lintels with painted or incised representation of *voussoirs* would imply that arched openings with *voussoirs* were usual. The use of lintels was probably confined to openings up to *c* 600 mm maximum as this is a commonly occurring dimension (see examples in museum and arched openings in *apodyterium*, at Chesters).

## Notes

- 1 The English Heritage Catalogue of Housesteads Stone (EHCHS) was prepared by D. Welsby and is housed at Corbridge Museum; it is unpublished. The number included for an item is that stated in the catalogue
- 2 Types 1 and 4 were present but in minimal numbers. It is possible that type 4 related to the buildings under discussion. These types are fully discussed by Welsby (1998, 21-24)
- 3 See EHCHS archive
- 4 An early photograph shows cladding still *in situ* to the front of the tribunal on the moulded stonework. University of Durham, Palace Green Library, Photographic Collection from Department of Archaeology, Box S7.
- 5 Photographic collection as above
- 6 This piece is shown on a lantern slide by J. P. Gibson as being in the *principia* during the excavation of 1898 (EHCHS HO 414)

## APPENDIX 5

### Structural Calculations

- A The *basilica*, Birdoswald
- B The south granary, Birdoswald

## **NOTES TO APPENDIX 5**

The structural calculations have been prepared by D. J. Lingard and Associates, structural engineers, in accordance with the current Codes of Practice.

The pages to each of the calculations are numbered separately and do not follow the pagination sequence.

**A The *basilica*, Birdoswald**

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Page No.:

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Project

THE BASILICA AT BIRDOSWALD

Project No.

2953

## WIND LOADINGS:

$$V = 46 \text{ m/s}$$

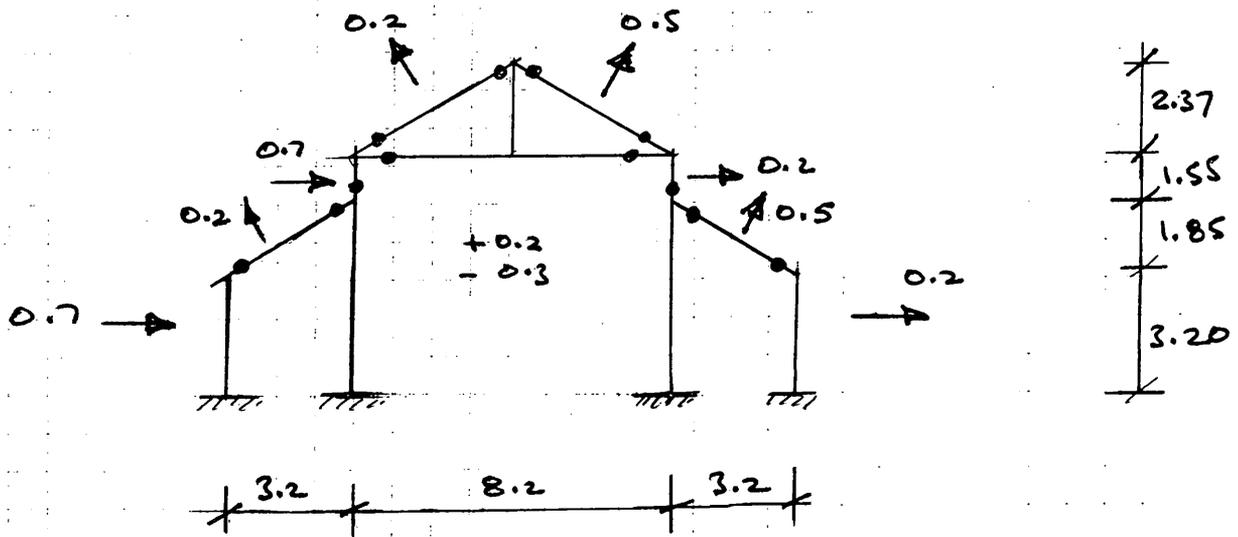
$$S_e = 0.75 \quad (\text{Category 2B})$$

$$V_c = 0.75 \times 46 = 34.50 \text{ m/s}$$

$$q = 0.613 V_c^2$$

$$= 0.613 \times 34.5^2 \times 10^{-3}$$

$$\therefore q = 0.73 \text{ kN/m}^2$$



## TRANSVERSE WIND COEFFICIENTS

MASONRY LOADINGS  $22 \text{ kN/m}^3$

ROOF LOADINGS  $2 \text{ kN/m}^2$  (IN PLAN)

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The following analysis assumes the structure to take the form of four cantilevered walls with simply supported roofs. Fixity at the base of walls provides the only means of transverse stability.

The analysis is an elastic analysis for 1 m length of building.

The nave arcading has been modeled into the program by assuming the nave side walls to be 25% of the solid wall upto 2m from the ground.

The Romans knowledge of structures was fundamental but effective and without the benefit of computer analysis could only adopt a simplified approach.

Timber and masonry were the usual building materials with the latter being designed to sustain compression only. Consequently jointing materials

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for masonry were not necessarily required other than to provide a bonding or bedding material between building blocks.

I can only speculate how the Roman Engineer, who undoubtedly would have had some mathematical understanding of forces and moments, would go about the design of such complicated structures without the benefit of modern thought or equipment.

His starting point would be to understand the mechanism of failure which would then lead him to a sound solution.

For the structure under consideration stability failure would result from side winds (in the absence of buckling due to slender members) due to racking and would necessitate overturning of the walls at ground level. Resistance against instability

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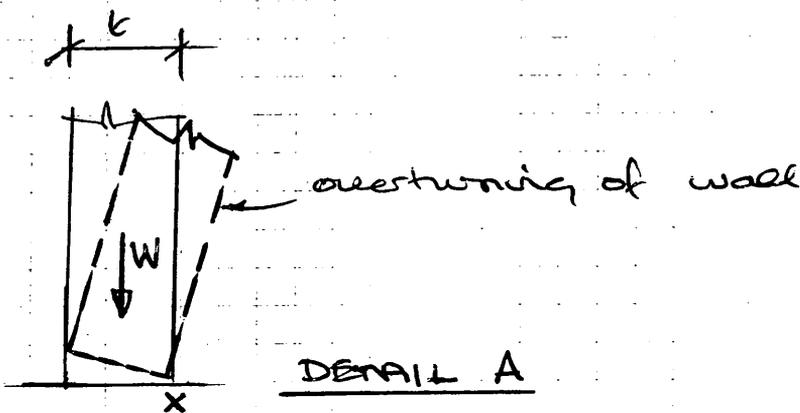
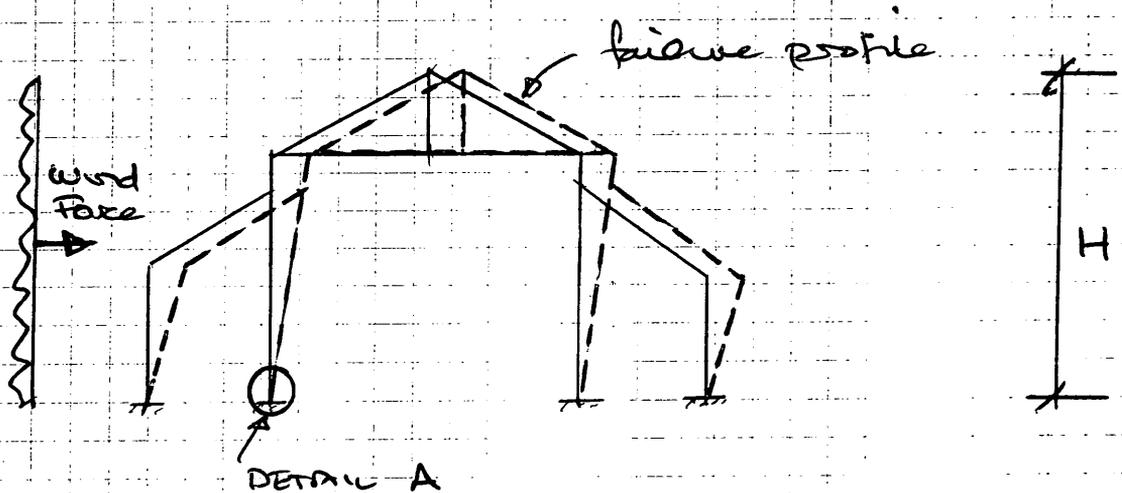
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## IDEALIZED DESIGN CONCEPT



$x$  is point about which the wall overturns

$W$  is weight of wall through its centre of gravity.

$t$  = thickness of wall

$H$  = Height of building

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If a simple approach is adopted the overturning moments acting on the structure at ground level results from the multiplication of the wind force and half the height of the building.

The resistance against overturning is provided by the weight of the masonry about the pivot point

$$= W \times \frac{k}{2}$$

If the sum of the resistance moments exceed the overturning moments by an adequate margin then there is a factor of safety against failure.

A factor of safety of 2 or 3 may have been adopted.

The concept of the design is to provide heavy sections with enough thickness to ensure that the compressive stresses overcome any tendency to develop tensile stress.

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Consulting Civil and Structural Engineers

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Accrington, Lancashire BB5 1NT

Tel : (01254) 399711

Job Ref : THE BASILICA, BIRDSOWALD

Sheet : 2953 / 006

Made by : DJL

Date : Saturday, October 12, 1996 / Version 5.33

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Approved :

Fax : (01254) 233804

**MasterFrame Data File****STABILITY CHECK****Load Group Labels**

Load Group UT : Unity Load Factor (All Cases)  
 Load Group D1 : Dead Load  
 Load Group L1 : Uniform Snow Load  
 Load Group W1 : Transverse Wind Load (Internal Pressure)  
 Load Group W2 : Transverse Wind Load (Internal Suction)

**Loading Cases and Load Combination****Loading Case 01 : Dead + Live (Serviceability)****Load Combination**

1.00 UT + 1.00 D1 + 1.00 L1 + 0.00 W1 + 0.00 W2

**Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability)****Load Combination**

1.00 UT + 1.00 D1 + 0.00 L1 + 1.00 W1 + 0.00 W2

**Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability)****Load Combination**

1.00 UT + 1.00 D1 + 1.00 L1 + 0.00 W1 + 1.00 W2

**The Nodal Co-ordinates**

Node	X (m)	Y (m)	Z (m)	Node	X (m)	Y (m)	Z (m)
1	0.000	0.000	0.000	2	3.200	0.000	0.000
3	11.400	0.000	0.000	4	14.599	0.000	0.000
5	3.200	1.999	0.000	6	11.400	1.999	0.000
7	0.000	3.200	0.000	8	14.599	3.200	0.000
9	3.200	5.050	0.000	10	11.400	5.050	0.000
11	3.200	6.600	0.000	12	7.299	6.600	0.000
13	11.400	6.600	0.000	14	7.300	8.969	0.000

**Member Properties****Members 1 8**

1 . . . . . 680 th Stone Masonry E 26E6 G 10E6  
 A 6800E-4 Ix 2620000E-8 Iy 5670000E-8 J .1048

**Members 2 5**

1 . . . . . 700 th X 250 Stone Masonry E 20E6 G 7.69E6  
 A 1750E-4 Ix 715000E-8 Iy 91150E-8 J 2860000E-8

**Members 3-4 6-7**

1 . . . . . 700 th Stone Masonry E 26E6 G 10E6  
 A 7000E-4 Ix 2860000E-8 Iy 5830000E-8 J .1143

**D.J. LINGARD & ASSOCIATES**

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**Members 9-15**

M . . . . . 225x225 E 008.8E6 G 03.4E6

**Member Loading****Members 1 4**

W1 UDLX +000.365 ( kN/m )

W2 UDLX +000.730 ( kN/m )

D1 D 022.000 ( kN/m3)

**Members 2-3 5-6**

D1 D 022.000 ( kN/m3)

**Members 7-8**

W1 UDLX +000.292 ( kN/m )

W2 UDLX -000.073 ( kN/m )

D1 D 022.000 ( kN/m3)

**Members 9 13**

W1 UDLN +000.292 ( kN/m )

W2 UDLN -000.073 ( kN/m )

D1 UDLY -001.000 ( kN/m )

L1 UDLY -000.600 ( kN/m )

**Members 10 14**

W1 UDLN -000.511 ( kN/m )

W2 UDLN -000.146 ( kN/m )

D1 UDLY -001.000 ( kN/m )

L1 UDLY -000.600 ( kN/m )

**Member End Releases**

4 --- +++	7 --- +++	9 --- ---	10 --- ---	11 --- +++
12 +++ ---	13 --- ---	14 --- +++	15 --- ---	

**Nodal Loading and Support Conditions****Nodes 1-4**

UT Rs 1 1 1 1 1 1

**End of Data File**

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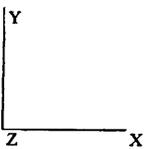
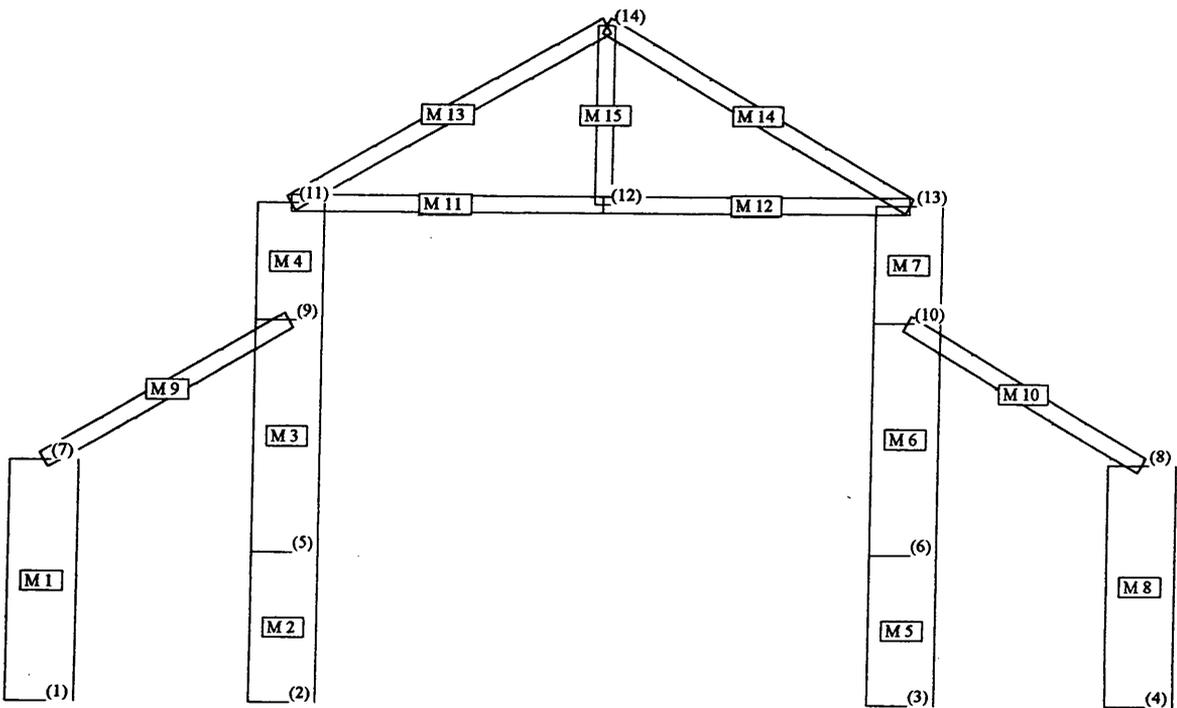
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**STABILITY CHECK**  
**Frame Geometry - (Full Frame) - Front View**

to scale

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**Nodal Deflections (Loading Case 01 : Dead + Live (Serviceability))**

Node	Nodal Def. (mm and Degrees)				Node	Nodal Def. (mm and Degrees)			
	$\delta X \rightarrow$	$\delta Y \uparrow$	$\phi Z \nearrow$	$\delta XY$		$\delta X \rightarrow$	$\delta Y \uparrow$	$\phi Z \nearrow$	$\delta XY$
1	0.00	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	4	0.00	0.00	0.00	0.00
5	0.01	-0.06	0.00	0.06	6	-0.01	-0.06	0.00	0.06
7	0.00	-0.01	0.00	0.01	8	0.00	-0.01	0.00	0.01
9	0.03	-0.07	0.00	0.07	10	-0.03	-0.07	0.00	0.07
11	-0.17	-0.07	0.01	0.18	12	-0.01	-0.81	0.00	0.81
13	0.15	-0.07	-0.01	0.17	14	-0.01	-0.77	-0.28	0.77

**Member Forces (Loading Case 01 : Dead + Live (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
1	1	52.566C	-0.131	0.418		0.000
	7	4.694C	-0.131	0.000	@	1.344
2	2	100.814C	0.131	-0.660		0.002
	5	93.118C	0.131	-0.399	@	0.960
3	5	93.118C	0.131	-0.399		0.000
	9	46.132C	0.131	0.000	@	1.281
4	9	41.590C	0.000	0.000		0.000
	11	17.720C	0.000	0.000	@	0.992
5	3	100.812C	-0.131	0.660		0.002
	6	93.116C	-0.131	0.399	@	0.960
6	6	93.116C	-0.131	0.399		0.000
	10	46.131C	-0.131	0.000	@	1.281
7	10	41.589C	0.000	0.000		0.000
	13	17.719C	0.000	0.000	@	1.116
8	4	52.565C	0.131	-0.418		0.000
	8	4.693C	0.131	0.000	@	1.344
9	7	2.462C	3.998	0.000	3.695	2.797
	9	2.161T	-3.998	0.000 @	1.848 @	1.848
10	8	2.462C	-3.997	0.000	-3.693	2.794
	10	2.160T	3.997	0.000 @	1.848 @	1.848
11	11	17.360T	1.772	0.000	1.410	1.034
	12	17.360T	-2.793	-2.092 @	1.599 @	1.804
12	12	17.357T	2.794	-2.092	1.412	1.037
	13	17.357T	-1.774	0.000 @	2.502 @	2.297

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**Member Forces (Loading Case 01 : Dead + Live (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
13	11	23.009C	5.123	0.000	6.065	7.536
	14	17.089C	-5.123	0.000 @	2.368 @	2.368
14	13	23.006C	-5.123	0.000	-6.065	7.536
	14	17.086C	5.123	0.000 @	2.368 @	2.368
15	12	5.587T	0.001	0.000	0.000	0.000
	14	8.226T	-0.001	0.000 @	1.185 @	1.185

**Support Reactions (Loading Case 01 : Dead + Live (Serviceability))**

Support Reactions (kN and kN.m)				Support Reactions (kN and kN.m)			
Node	Rx→(kN)	Ry↑(kN)	Mz↗(kN.m)	Node	Rx→(kN)	Ry↑(kN)	Mz↗(kN.m)
1	0.131	52.566	-0.418	2	-0.131	100.814	0.660
3	0.131	100.812	-0.660	4	-0.131	52.565	0.418
9	0.000	0.000	0.000	10	0.000	0.000	0.000
11	0.000	0.000	0.000	13	0.000	0.000	0.000
Total	0.000	306.757	0.000				

**Nodal Deflections (Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability))**

Nodal Def. (mm and Degrees)					Nodal Def. (mm and Degrees)				
Node	δX→	δY↑	φZ↗	δXY	Node	δX→	δY↑	φZ↗	δXY
1	0.00	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	4	0.00	0.00	0.00	0.00
5	0.01	-0.05	0.00	0.05	6	0.00	-0.05	0.00	0.05
7	0.01	0.00	0.00	0.01	8	0.03	0.00	0.00	0.03
9	0.05	-0.06	0.00	0.08	10	0.01	-0.06	0.00	0.06
11	17180.67	-0.07	-635.08	17180.67	12	17180.80	-0.67	0.00	17180.80
13	17180.94	-0.06	-635.09	17180.94	14	17180.81	-0.63	-0.16	17180.81

**Member Forces (Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
1	1	50.879C	1.216	-2.022		0.001
	7	3.007C	0.048	0.000	@	1.216
2	2	95.692C	0.183	-0.922		0.003
	5	87.996C	0.183	-0.557	@	0.960
3	5	87.996C	0.183	-0.557		0.000
	9	41.010C	0.183	0.000	@	1.281

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**Member Forces (Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
4	9	37.635C	2.517	-0.904		0.000
	11	13.765C	1.952	0.758	@	0.976
5	3	94.181C	0.047	-0.240		0.001
	6	86.485C	0.047	-0.145	@	0.960
6	6	86.485C	0.047	-0.145		0.000
	10	39.500C	0.047	0.000	@	1.281
7	10	37.334C	1.146	0.129		0.000
	13	13.464C	0.694	-0.246	@	0.868
8	4	51.386C	2.573	-6.737		0.006
	8	3.514C	1.638	0.000	@	1.312
9	7	1.464C	2.628	0.000	2.428	1.838
	9	2.198T	-2.628	0.000 @	1.848 @	1.848
10	8	3.177C	-2.222	0.000	-2.053	1.553
	10	0.485T	2.222	0.000 @	1.848 @	1.848
11	11	14.304T	1.761	0.000	1.392	1.012
	12	14.304T	-2.804	-2.138 @	1.599 @	1.804
12	12	14.297T	2.805	-2.138	1.394	1.013
	13	14.297T	-1.762	0.000 @	2.502 @	2.338
13	11	18.136C	3.367	0.000	3.986	4.954
	14	13.447C	-3.367	0.000 @	2.368 @	2.368
14	13	18.405C	-2.848	0.000	-3.372	4.189
	14	13.716C	2.848	0.000 @	2.368 @	2.320
15	12	5.609T	0.001	0.000	0.000	0.001
	14	8.248T	-0.001	0.000 @	1.185 @	1.232

**Support Reactions (Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability))**

Node	Support Reactions (kN and kN.m)			Node	Support Reactions (kN and kN.m)		
	Rx→(kN)	Ry↑(kN)	Mz↻(kN.m)		Rx→(kN)	Ry↑(kN)	Mz↻(kN.m)
1	-1.216	50.879	2.022	2	-0.183	95.692	0.922
3	-0.047	94.181	0.240	4	-2.573	51.386	6.737
9	-1.747	0.000	0.904	10	-0.406	0.000	0.000
11	1.667	0.000	0.758	13	0.479	0.000	0.000
Total	-4.025	292.138	11.584				

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**Nodal Deflections (Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability))**

Node	Nodal Def. (mm and Degrees)				Node	Nodal Def. (mm and Degrees)			
	$\delta X \rightarrow$	$\delta Y \uparrow$	$\phi Z \nearrow$	$\delta XY$		$\delta X \rightarrow$	$\delta Y \uparrow$	$\phi Z \nearrow$	$\delta XY$
1	0.00	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	4	0.00	0.00	0.00	0.00
5	0.02	-0.06	0.00	0.06	6	0.00	-0.05	0.00	0.06
7	0.03	-0.01	0.00	0.03	8	0.01	-0.01	0.00	0.01
9	0.07	-0.07	0.00	0.10	10	-0.02	-0.07	0.00	0.07
11	17180.64	-0.07	-635.08	17180.64	12	17180.80	-0.80	0.00	17180.80
13	17180.96	-0.07	-635.10	17180.96	14	17180.80	-0.76	-0.26	17180.80

**Member Forces (Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
1	1 7	52.131C 4.259C	3.227 0.891	-6.590 0.000		0.005 1.280 @
2	2 5	101.485C 93.788C	0.298 0.298	-1.506 -0.910		0.004 0.960 @
3	5 9	93.788C 46.803C	0.298 0.298	-0.910 0.000		0.001 1.281 @
4	9 11	41.592C 17.722C	1.316 0.184	0.631 -0.008		0.001 0.821 @
5	3 6	99.973C 92.277C	-0.068 -0.068	0.343 0.207		0.001 0.960 @
6	6 10	92.277C 45.292C	-0.068 -0.068	0.207 0.000		0.000 1.281 @
7	10 13	41.290C 17.420C	1.443 1.556	-0.247 0.276		0.000 0.930 @
8	4 8	52.637C 4.765C	0.562 0.795	-2.172 0.000		0.002 1.376 @
9	7 9	1.360C 3.263T	4.133 -4.133	0.000 0.000	3.819 1.848 @	2.892 1.848 @
10	8 10	3.074C 1.549T	-3.727 3.727	0.000 0.000	-3.443 1.848 @	2.606 1.848 @
11	11 12	16.999T 16.999T	1.771 -2.794	0.000 -2.096 @	1.409 1.599 @	1.035 1.763 @
12	12 13	16.990T 16.990T	2.795 -1.773	-2.096 0.000 @	1.411 2.502 @	1.036 2.297 @

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**Member Forces (Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability))**

Mem ber No.	Node End1 End2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kN.m)	Maximum Moment (kN.m @ m)	Maximum Deflection (mm @ m)
13	11	22.610C	5.296	0.000	6.269	7.791
	14	16.689C	-5.296	0.000 @	2.368 @	2.368
14	13	23.058C	-4.778	0.000	-5.656	7.030
	14	17.138C	4.778	0.000 @	2.368 @	2.368
15	12	5.589T	0.001	0.000	0.000	0.001
	14	8.227T	-0.001	0.000 @	1.185 @	1.208

**Support Reactions (Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability))**

Node	Support Reactions (kN and kN.m)			Node	Support Reactions (kN and kN.m)		
	Rx→(kN)	Ry↑(kN)	Mz↻(kN.m)		Rx→(kN)	Ry↑(kN)	Mz↻(kN.m)
1	-3.227	52.131	6.590	2	-0.298	101.485	1.506
3	0.068	99.973	-0.343	4	-0.562	52.637	2.172
9	-0.261	0.000	-0.631	10	-0.985	0.000	0.000
11	0.000	0.000	0.000	13	0.971	0.000	0.276
Total	-4.295	306.226	9.570				

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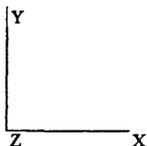
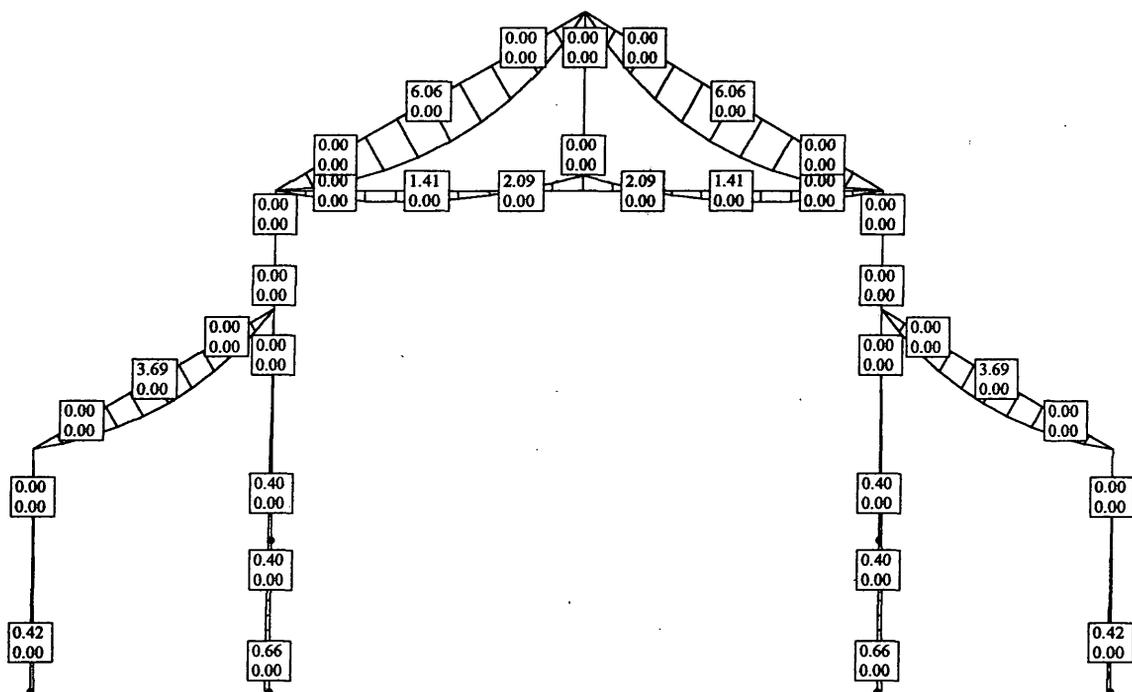
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**Loading Case 01 : Dead + Live (Serviceability)**

**Bending Moment Diagram (Major and Minor Axes) - (Full Frame) - Front View**

**Bending Moment Values (kN.m)**

**10 kN.m = 1m**

not to scale

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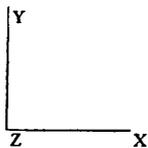
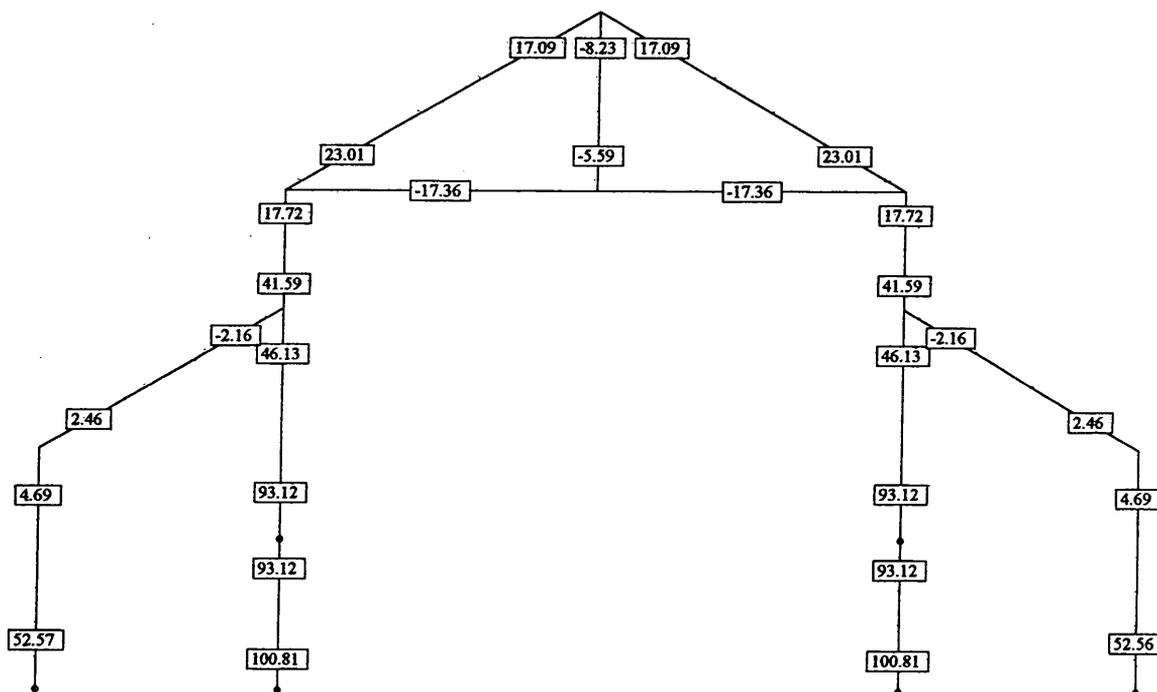
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**Loading Case 01 : Dead + Live (Serviceability)**  
**Frame Geometry - (Full Frame) - Front View**  
**Axial Force (kN) - Compression Positive**

to scale

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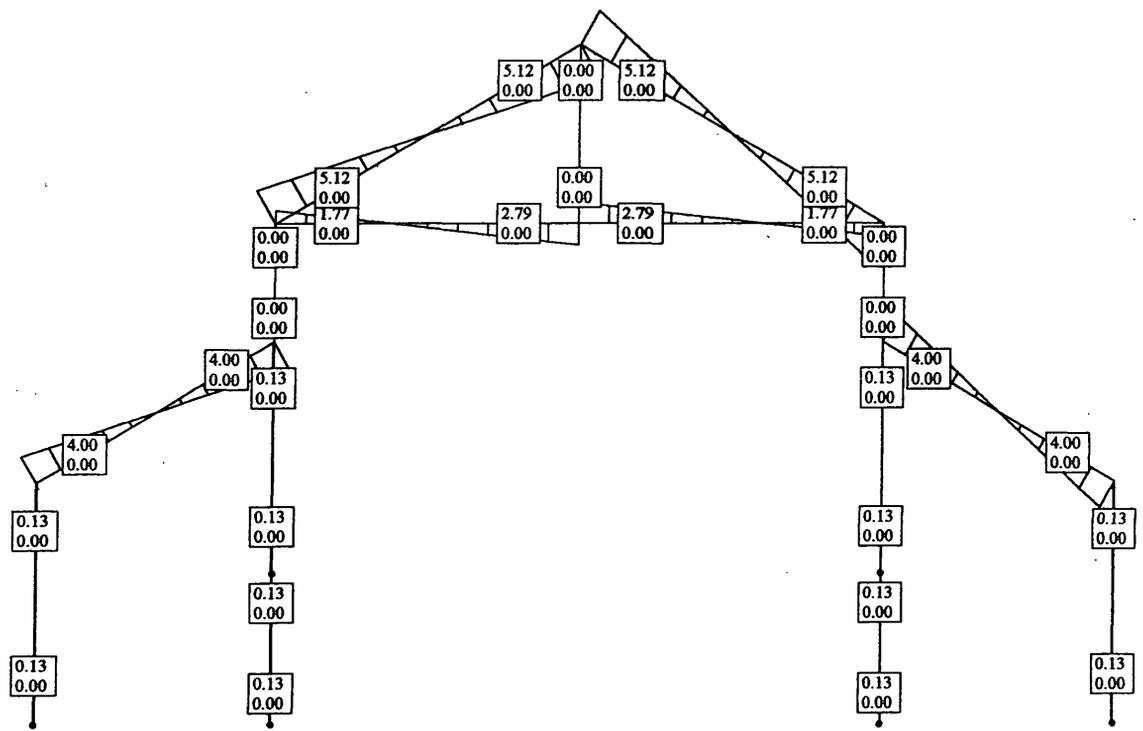
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**Loading Case 01 : Dead + Live (Serviceability)**  
**Shear Force Diagram (Major and Minor Axes) - (Full Frame) - Front View**  
 ShearForce Values (kN)

to scale

10 kN = 1m

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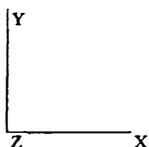
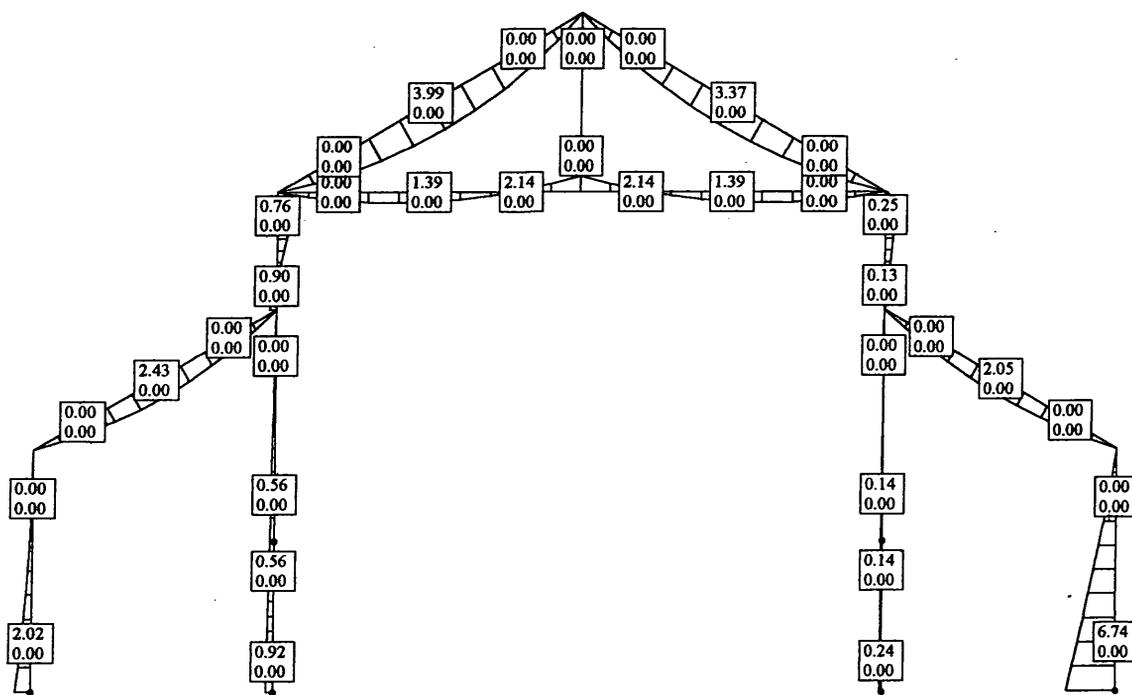
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**Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability)**  
**Bending Moment Diagram (Major and Minor Axes) - (Full Frame) - Front View**

t to scale

Bending Moment Values (kN.m)

10 kN.m = 1m

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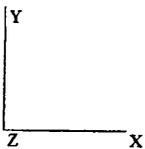
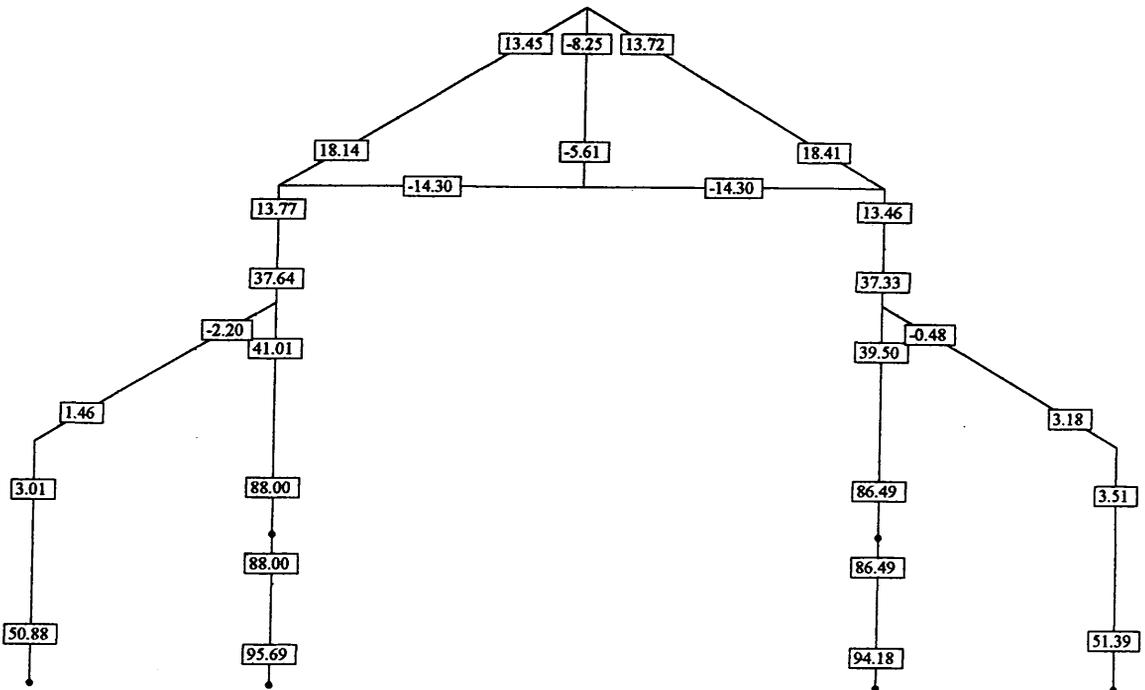
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**Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability)**

**Frame Geometry - (Full Frame) - Front View**

**Axial Force (kN) - Compression Positive**

to scale

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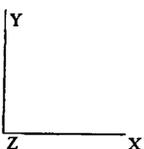
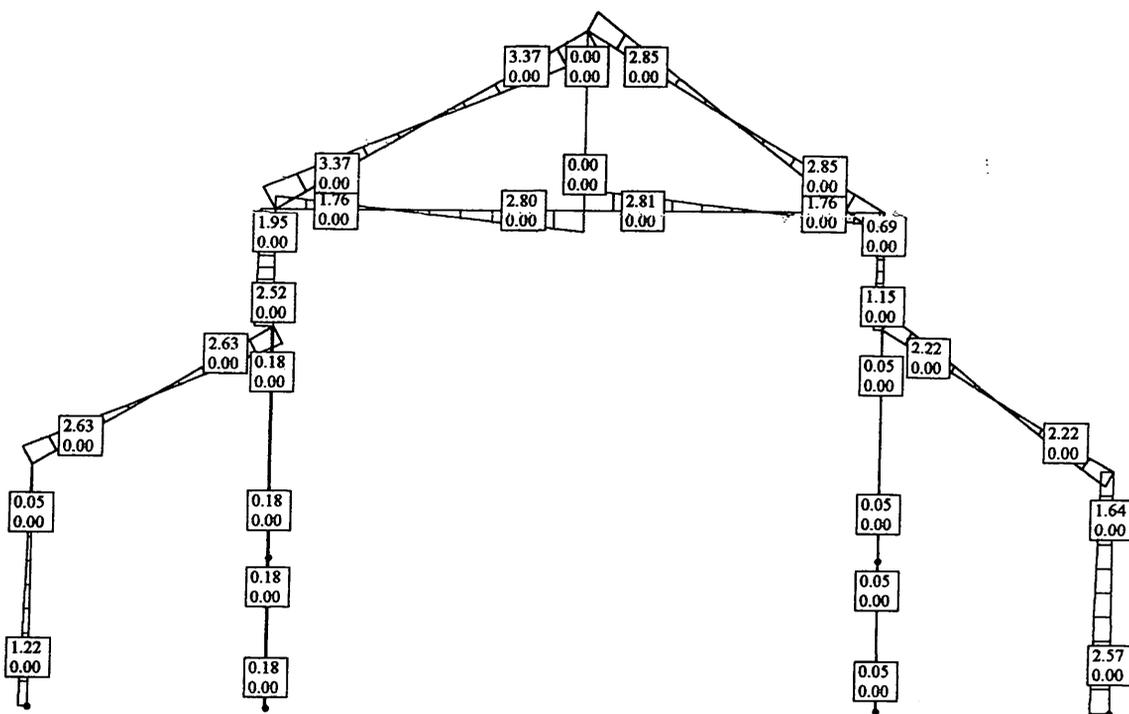
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**Loading Case 02 : Dead + Transverse Wind (Internal Pressure) (Serviceability)**

**Shear Force Diagram (Major and Minor Axes) - (Full Frame) - Front View**

**ShearForce Values (kN)**

to scale

10 kN = 1m

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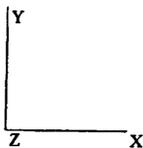
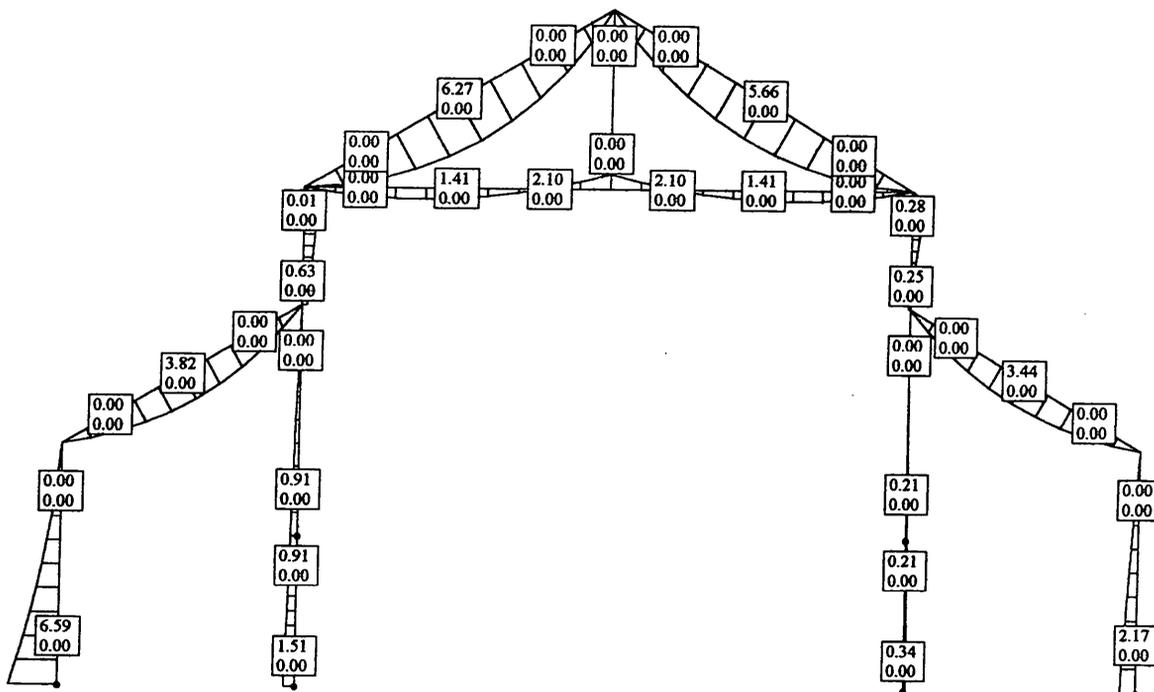
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**Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability)**  
**Bending Moment Diagram (Major and Minor Axes) - (Full Frame) - Front View**  
 Bending Moment Values (kN.m)

to scale

10 kN.m = 1m

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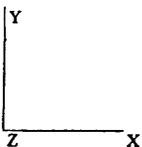
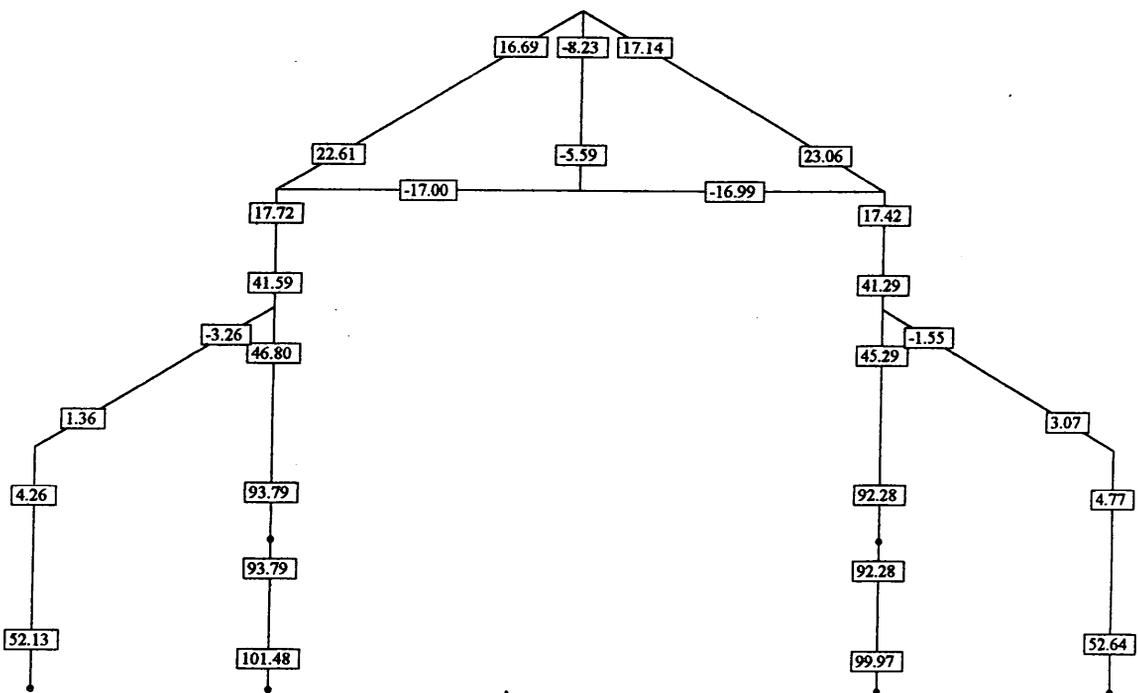
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**Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability)**

**Frame Geometry - (Full Frame) - Front View**

**Axial Force (kN) - Compression Positive**

to scale

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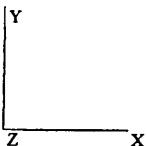
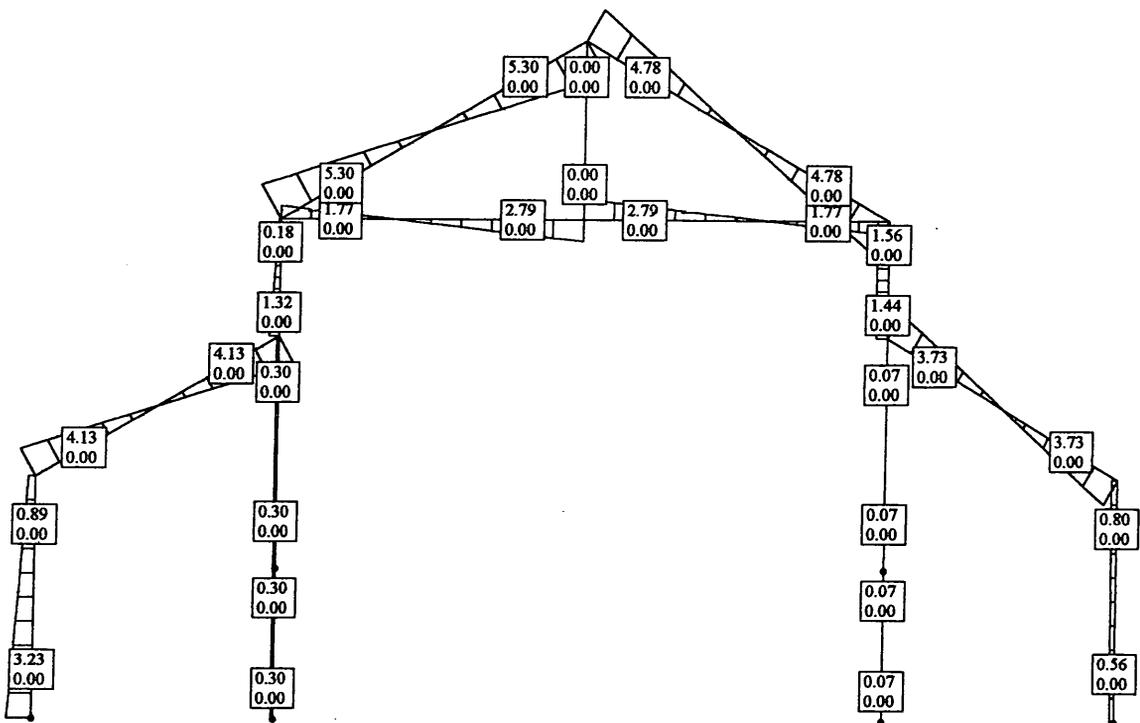
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**Loading Case 03 : Dead + Live + TW (Internal Suction) (Serviceability)**  
**Shear Force Diagram (Major and Minor Axes) - (Full Frame) - Front View**  
 Shear Force Values (kN)

to scale

10 kN = 1m

CAPACITIES OF MASONRY WALLS

Moment of Resistance of Rectangular Section =  $\frac{W}{2} \left[ t - \frac{W \gamma_m}{f_c} \right]$

where  $W$  = weight of wall / unit length

$\gamma_m$  = Safety factor for material strength

$f_c$  = Characteristic compressive strength of masonry ( $3.9 \text{ N/mm}^2$ )

For 680 mm thick wall - 1000 long

$$\begin{aligned} \text{Resistance Moment at Base of wall} &= \frac{51.39}{2} \left[ 680 - \frac{51.39 \times 3.1}{3.9} \right] 10^{-3} \\ &= \underline{16.42 \text{ kNm}} \end{aligned}$$

$$\text{Applied Moment} = 6.74 \text{ kNm} \quad \text{OK}$$

For 700 thick wall - 250 long

$$\begin{aligned} \text{Resistance Moment at Base of wall} &= \frac{101.48}{2} \left[ 700 - \frac{101.48 \times 10^3}{250 \times 3.9} \right] 10^{-3} \\ &= \underline{30.24 \text{ kNm}} \end{aligned}$$

$$\text{Applied Moment} = 1.51 \text{ kNm} \quad \text{OK}$$

**B The south granary, Birdoswald**

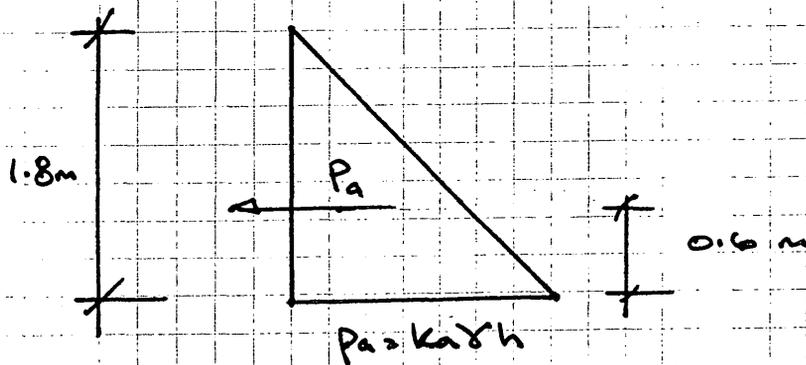
LOADINGS:

$$\text{Grain Density} = 8 \text{ kN/m}^3$$

$$\text{Angle of Repose} = \phi = 30^\circ$$

Assuming grain is free flowing and against the wall for a height of 1.8m.

NB. Bagged grain or grain roped from the wall will give less overall results.



where  $p_a$  = lateral pressure on wall

$P_a$  = lateral force on wall

$K_a$  = Active pressure coefficient

$\gamma$  = bulk density of grain

$h$  = height of grain

$$P_a = \frac{K_a \gamma h^2}{2}$$

$$\text{where } K_a = \frac{1 - \sin \phi}{1 + \sin \phi} = \frac{1 - \sin 30^\circ}{1 + \sin 30^\circ}$$

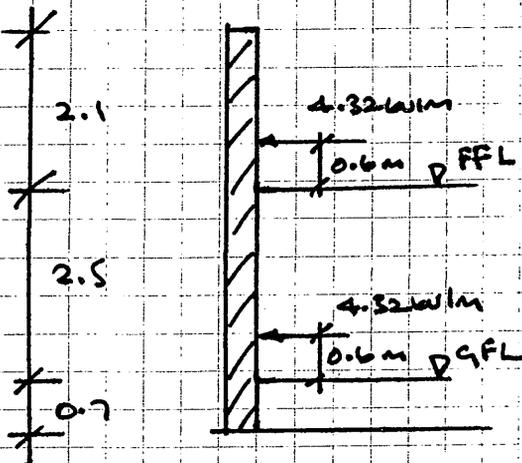
$$= \frac{1}{3}$$

$$\therefore P_a = \frac{1}{3} \times \frac{8 \times 1.8^2}{2} = 4.32 \text{ kN/m}$$

Consider Free Standing Wall:

Overturning Moment at first floor level

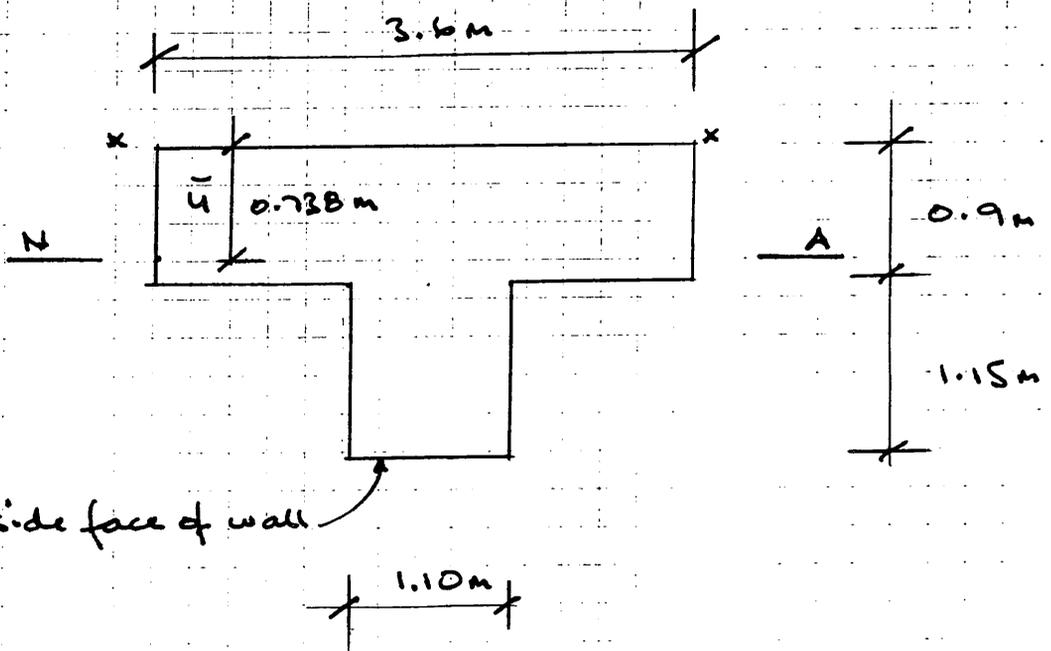
$$= 4.32 \times 0.6 = \underline{2.59 \text{ kNm/m}}$$



Overturning Moment At Base of wall

$$\text{Storage} = 4.32 \times 1.2 + 4.32 \times 3.8$$

$$= \underline{22.032 \text{ kNm/m}}$$

Consider Section Properties of WallsSection 1

Taking area moments about x-x

$$3.6 \times 0.9 \times 0.45 + 1.10 \times 1.15 \times 1.475 = 4.505 \bar{u}$$

$$\therefore \bar{u} = \underline{0.738\text{m}}$$

$$\begin{aligned} \text{Area of Section} &= 3.6 \times 0.9 + 1.10 \times 1.15 \\ &= \underline{4.505\text{m}^2} \end{aligned}$$

$$\begin{aligned} I &= \frac{3.6 \times 0.9^2}{12} + 3.6 \times 0.9 \times 0.288^2 + \frac{1.1 \times 1.15^3}{12} \\ &+ 1.1 \times 1.15 \times 0.737^2 = \underline{1.314\text{m}^4} \end{aligned}$$

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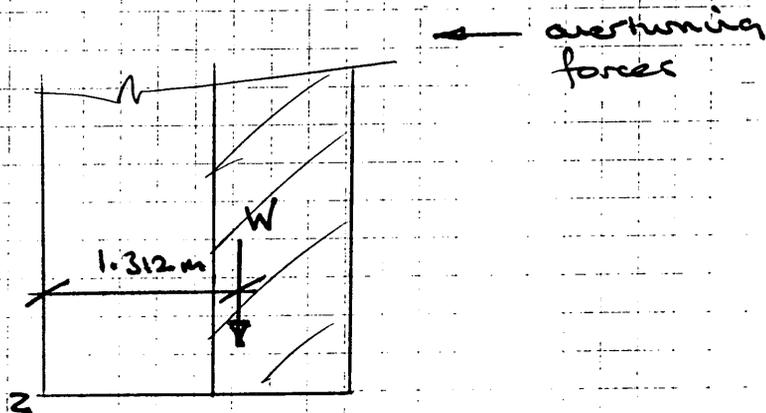
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Project

Project No.

For Free Standing Wall pivoting about point 2 and relying on mass only for stability.



$$f_k = 3.9 \text{ N/mm}^2$$



pressure diagram at point of overturning.

$$x = \frac{W \delta_m}{f_k}$$

where  $W$  = weight of wall / unit length

$\delta_m$  = safety factor for material strength

$f_k$  = characteristic compressive strength of masonry ( $3.9 \text{ N/mm}^2$ )

$$\text{Resistance Moment} = W \left( 1.312 - \frac{x}{2} \right) 10^{-3}$$

Project

Project No.

Consider Free standing wall above  
first floor level:

$$W = 2.1 \times 4.505 \times 22 = 208.13 \text{ kN} / 3.6 \text{ m}$$

$$\text{Load / m} = \frac{208.13}{3.6} = 57.814 \text{ kN/m}$$

$$x = \frac{57.814 \times 3.1}{3.9} = 46 \text{ mm}$$

$$\therefore \text{Resistance Moment} = 57.814 \left( 1312 - \frac{46}{2} \right) 10^{-3}$$
$$= \underline{74.52 \text{ kNm / m}}$$

Consider Base of wall:

$$W = 5.3 \times 4.505 \times 22 = 525.28 \text{ kN} / 3.6 \text{ m}$$

$$\text{Load / m} = \frac{525.28}{3.6} = 145.91 \text{ kN/m}$$

$$x = \frac{145.91 \times 3.1}{3.9} = 115.98 \text{ mm}$$

$$\therefore \text{Resistance Moment} = 145.91 \left( 1312 - \frac{116}{2} \right) 10^{-3}$$
$$= \underline{182.97 \text{ kNm / m}}$$

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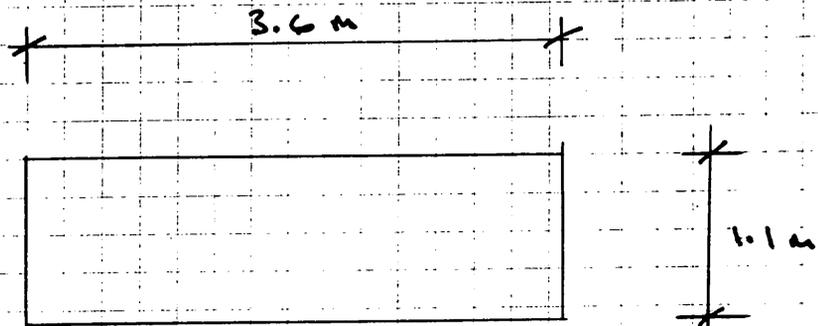
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Project

Project No.

## Section 2



$$\text{Area of Section} = 3.6 \times 1.1 = \underline{3.96 \text{ m}^2}$$

$$I = \frac{bd^3}{12} = \frac{3.6 \times 1.1^3}{12} = \underline{0.4 \text{ m}^4}$$

For free standing wall of rectangular section.

$$\text{Resistance Moment} = \frac{W}{2} \left[ t - \frac{W \gamma_m}{f_c} \right]$$

At First Floor Level:

$$W = 2.1 \times 1.1 \times 1 \times 22 = 50.82 \text{ kNm}$$

$$\begin{aligned} \text{Resistance Moment} &= \frac{50.82}{2} \left[ 1100 - \frac{50.82 \times 2.1}{3.9} \right] 10^{-3} \\ &= \underline{26.925 \text{ kNm}} \end{aligned}$$

At Base of Wall

$$W = 5.3 \times 1.1 \times 1 \times 22 = 128.26 \text{ kNm}$$

$$\begin{aligned} \therefore \text{Resistance Moment} &= \frac{128.26}{2} \left[ 1100 - \frac{128.26 \times 3.1}{3.9} \right] 10^{-3} \\ &= \underline{64 \text{ kNm}} \end{aligned}$$

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Project

Project No.

## Summary.

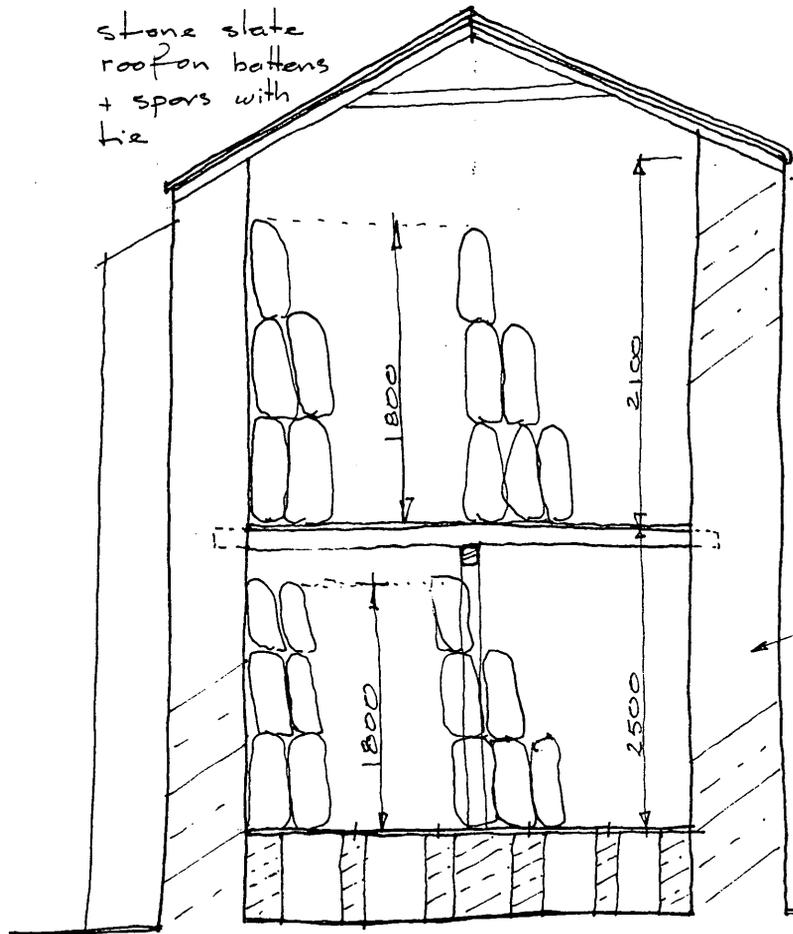
The overturning moments on the side walls at first floor level and base of wall are 2.59 kNm/m and 22.032 kNm/m respectively.

The moments of resistance of section 1 at first floor level and base of wall are 74.52 kNm/m and 182.97 kNm/m respectively.

The moments of resistance of section 2 at first floor level and base of wall are 26.925 kNm/m and 64 kNm/m respectively.

Whilst the buttressed wall has a strength at least 2.5 times the unbuttressed wall both walls are stable as free standing walls and would easily support any lateral grain loadings. Stability of the walls will be enhanced by floors, roof and any cross walls.

stone slate  
roof on battens  
+ spars with  
tie



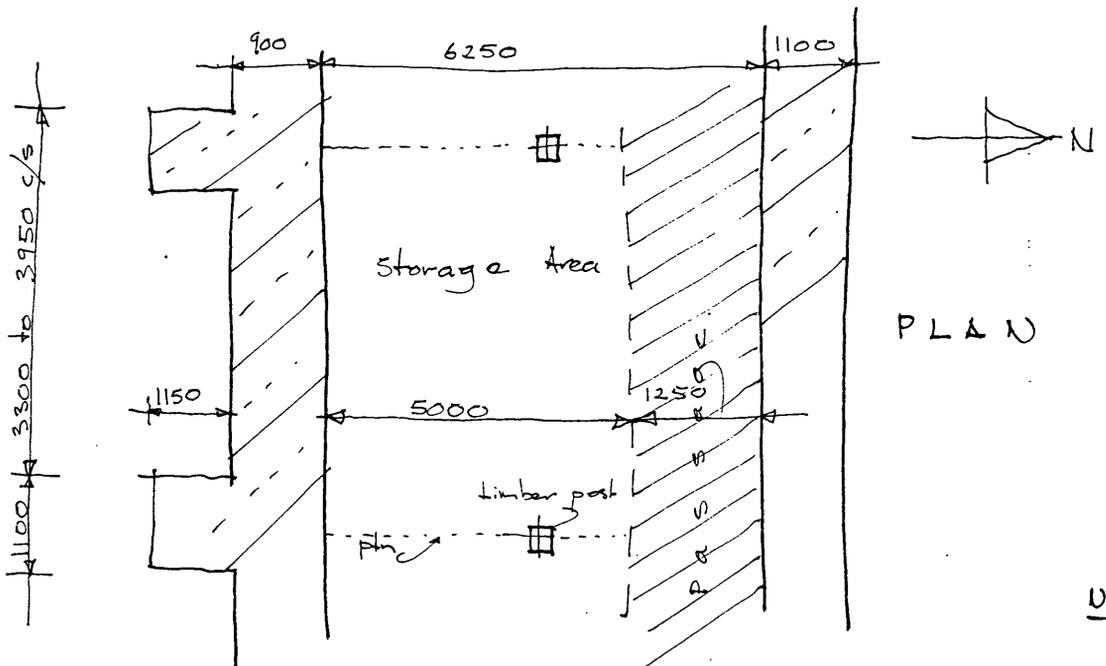
First floor. timber  
joists + stone  
flag finish

mortared stonework

Ground floor. sleeper  
walls + stone flags.

FL  
c.700

SECTION



PLAN

UTS

THE SOUTH CRAWLY - BIRDOSWALD

