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Summary

Twelve samples were taken from timbers of the first floor and attic of this building. Six of these were not analysed because of their short ring-width sequences. The analysis carried out on the remaining six samples resulted in the construction of a single undated site chronology and the individual dating of two samples.

Site chronology LVCDSQ01, has 58 rings and is constructed from two samples, LVC-D01 and LVC-D02. It could not be matched and so the timbers from which these samples were taken remain undated.

Attempts to date the remaining four samples individually resulted in sample LVC-D09 being found to span the period AD 1350-AD 1431, and sample LVC-D12, the period AD 1383-AD1438. Both sample have the heartwood/sapwood boundary ring, which can be used to calculate a felling date within the range AD 1448-73, for the timbers these samples are taken from.

The other two samples, LVC-D08 and LVC-D11 could not be dated.

The analysis has resulted in two samples being successfully dated. The two timbers dated to AD 1448-73 are from a main post and a stud at first-floor level.

Keywords

Dendrochronology
Standing Building

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Introduction

The late medieval courtyards which form the Upper Vicars' Close and Lower Vicars' Close are divided by a central range of timber-framed buildings. A wall-plate from 8 Vicars' Close, a building on the north side of the Upper Vicars' Close has been dated to within the period AD 1450-75 (Arnold *et al* forthcoming (a) and the primary frame of 1 Vicars' Close, part of the central range, has been found to contain timbers felled in *c* AD 1451 (Arnold *et al* forthcoming (b). Additionally, attic floor joists in 10 The Close, at the east end of the central range, have been tree-ring dated to AD 1453-78 (Howard *et al* 1998). The building, which is the subject of this report, 3 Vicars' Close (approximately SK118097; Figs 1 and 2) is part of the central range of buildings, but unlike its counterparts, it was built as a wing across the main axis of the range. The west end of these buildings originally contained the common hall of the Vicars' Choral.

The jettied south elevation of this wing is in storey-high close studding, with long curved braces up from the corner posts to the tiebeam. Most of the remaining external walls have been rebuilt or encased in red brick.

Unlike the majority of the Vicars' Choral dwellings, each contained within a single bay, this unit is of two bays (Fig 3), and whereas most of the internal partitions of the other houses are composed of very large panels, those in 3 Vicars' Close were at least partially close-studded. At first-floor level, on each side of the central partition, the framing of the side walls also had long curved braces. In the ground-floor south room the double-hollow-chamfered transverse ceiling beam has stops which respect the chimney stack, implying that the two might be contemporary. Conversely, on the first floor of the same bay, the attic floor is secondary; the west end of the transverse beam is supported by an internal, secondary prop, and the south end of each joist is carried by an inserted half-beam. This implies that in the first phase the first floor of the south bay had no ceiling, ie, it was a chamber open to the roof.

The large-panelled truss which divides the two bays includes evidence of studs on the ground floor, and a primary doorway on the first floor, and was, therefore, closed at both ground-floor and first-floor levels. Originally there were two queen struts up to the single collar. The clasped side purlins with wind-braces are scarfed across this truss. Curiously, all four purlins have chamfer stops at the mid-span of each bay, implying that together they were designed to span bays with intermediate trusses.

On stylistic grounds this building is thought to date to *c* AD 1450-1500 with the construction date thought to be nearer AD 1500.

Sampling and analysis by tree-ring dating was commissioned and funded by English Heritage, as part of their training programme in dendrochronology. Additionally, it was hoped that by undertaking this analysis it would be possible to secure a date for the original frame of the building and in doing so assist in the understanding of the general development of buildings in the Vicars' Closes.

The Laboratory would like to take this opportunity to thank Mr and Mrs Lodge for allowing us access to the property and Bob Meeson for his help in interpreting the building. Bob Meeson also provided the building description used here. The drawings used to illustrate this report and locate samples (Figs 3-5) are from a Staffordshire County Council survey.

Sampling

After on-site discussion with Bob Meeson about the provenance of the timbers twelve core samples were obtained. Each sample was given the code LVC-D (for Lichfield, Vicars' Close, site "D") and numbered 01-12.

These twelve samples were obtained from purlins, rafters, and a tiebeam in the attic and posts on the first floor. The position of the timbers in the house from which these samples came are marked on Figures 4 and 5. Details of the samples are given in Table 1.

Analysis

All twelve samples were prepared by sanding and polishing, at this stage six of the samples were rejected as they were deemed to have too few rings for secure dating. The growth ring widths of the remaining six samples were measured; the data of these measurements are given at the end of the report. The growth-ring widths of the six samples were compared with each other by the Litton/Zainodin grouping procedure (see appendix).

At a minimum value of $t = 4.5$ two of the samples had matched each other at the relative positions shown in Figure 6. The growth-ring widths of these two samples were combined at these relative offset positions to form LVCDSQ01, a site chronology of 58 rings. Site chronology LVCDSQ01 was compared with a series of relevant reference chronologies but could not be securely matched and so the samples contained within it remain undated.

Attempts were then made to date the remaining four samples individually, resulting in the successful dating of two samples. Sample LVC-D09 was matched at a first-ring date of AD 1350 and a last-ring date of AD 1431 and sample LVC-D12 was matched at a first-ring date of AD 1383 and a last-ring date of AD 1438. The evidence for these dates is given by the *t*-values in Tables 2 and 3.

Samples LVC-D08 and LVC-D11, could not be matched and remain undated.

Interpretation

The analysis of samples from 3 Vicars' Close produced a single site chronology and two individually dated samples. The site chronology, LVCDSQ01, containing samples LVC-D01 and LVC-D02, both from purlins, could not be matched and so the timbers it represents are undated.

The two individually dated samples were LVC-D09, and LVC-D12, a main post, and a stud post. Samples LVC-D09 and LVC-D12, are both main posts, from two separate trusses. LVC-D09 has a first-ring date of AD 1350 and a last-ring date of AD 1431 and LVC-D12 has a first-ring date of AD 1383 and a last-ring date of AD 1438. Both samples have the heartwood/sapwood boundary ring which allows estimated felling date ranges to be calculated for the timbers they were taken from to AD 1446-71 and AD 1450-75, respectively. The average heartwood/sapwood boundary ring date for the two samples together gives a felling date for the timbers within the range AD 1448-73. All felling date ranges are based on the estimate that 95% of mature oaks in this area have between 15-40 sapwood rings.

Conclusion

This building had been dated on stylistic grounds to *c* AD 1450-1500 with the construction date thought to be nearer AD 1500. Following tree-ring analysis it is now possible to say that two of the timbers of the building are from trees felled some time between AD 1448-73, consistent with that suggested on stylistic grounds, although perhaps not as late as AD 1500. The dating is also consistent with those dates already gained for timbers in Numbers 1, 3, and 10 Vicars' Close.

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Figure 1: Map showing the general location of the Vicars' Close, Lichfield Cathedral

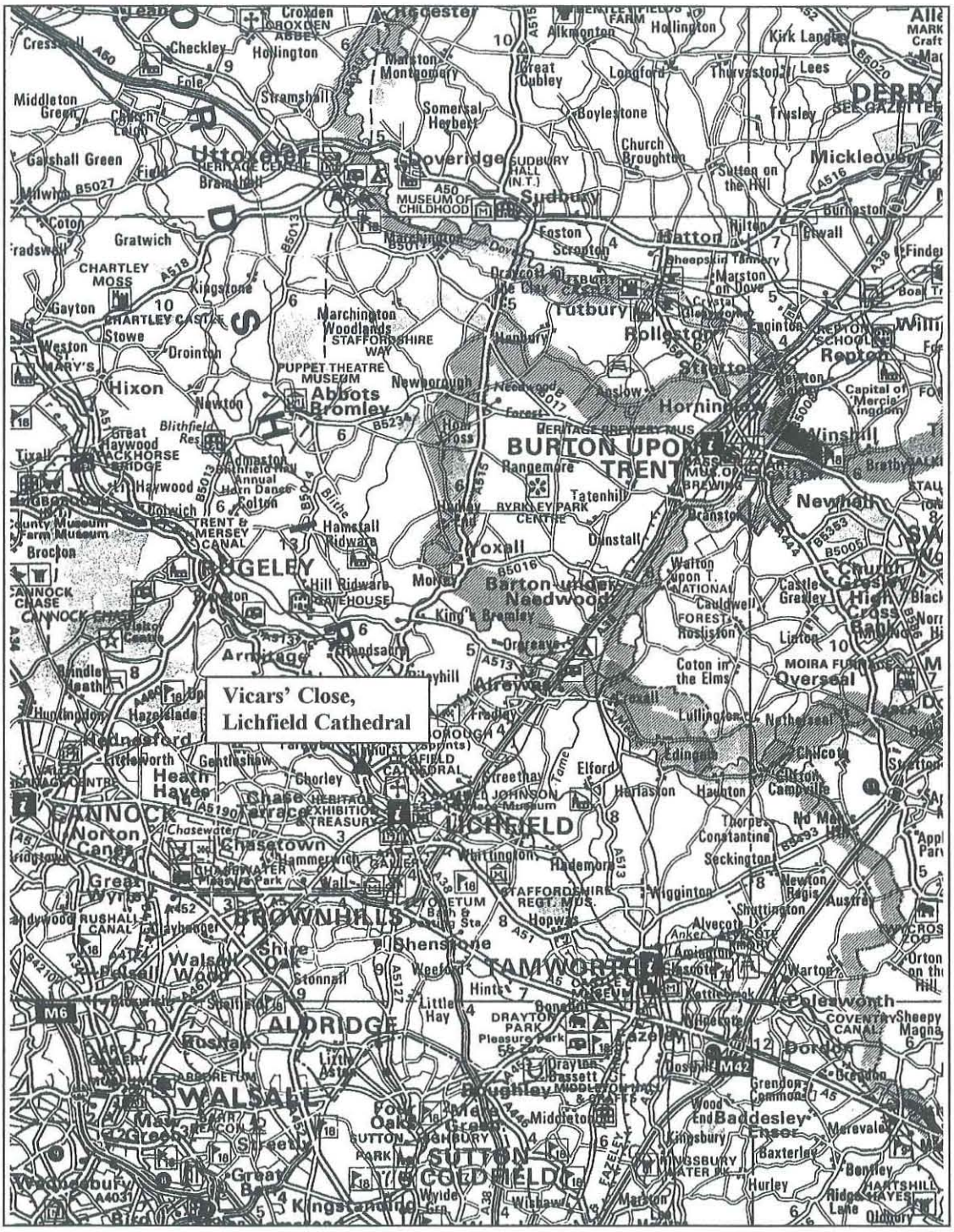


Figure 2: Sketch plan of the Vicars' Close, with 3 Vicars' Close hashed

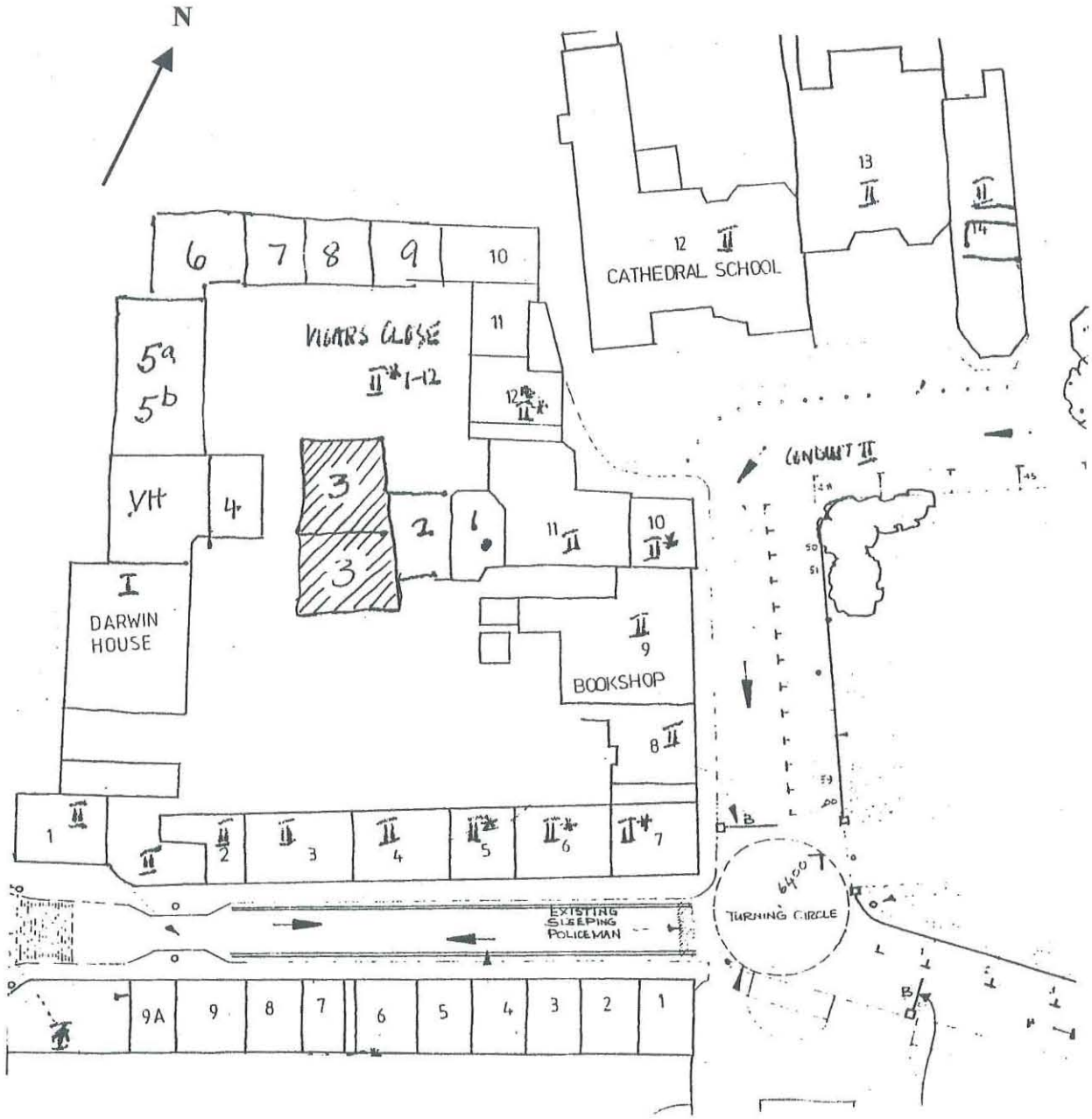
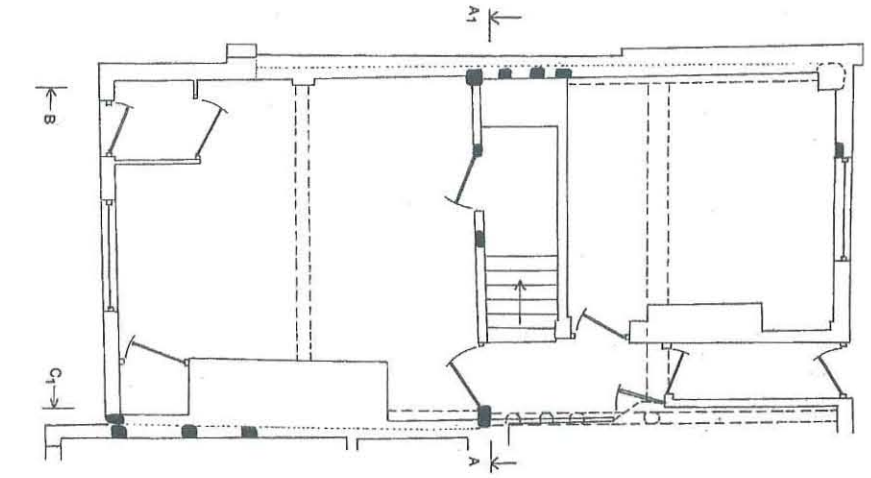
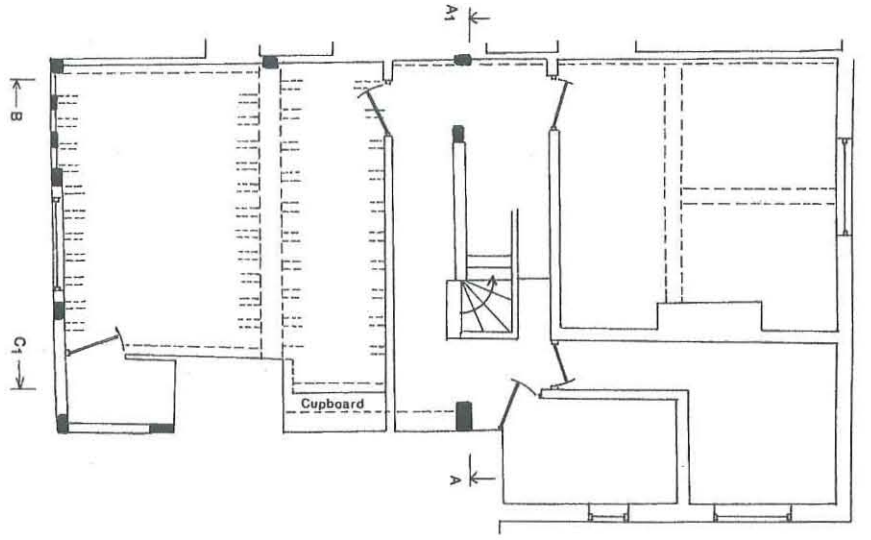


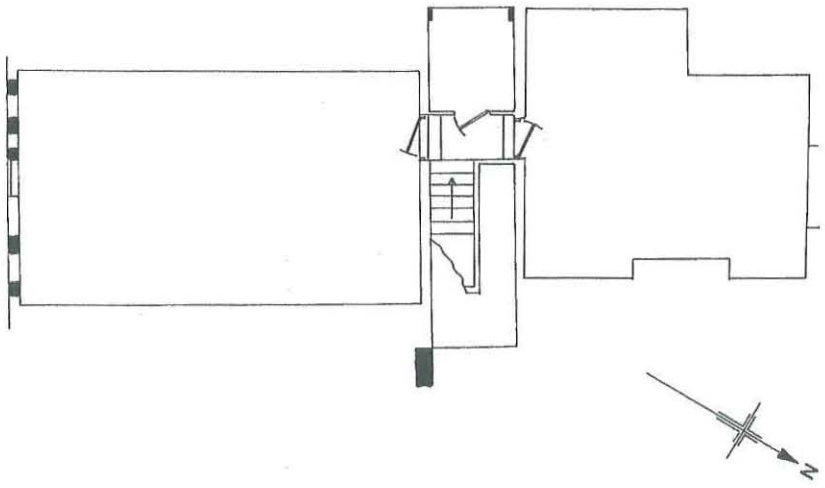
Figure 3: Plans - 3 Vicars' Close, Lichfield (provided by Staffordshire SMR)



Ground floor



First-floor



Attic

Figure 4: Section A-A[1] - 3 Vicars' Close, Lichfield, showing the location of samples LVC-D01-D04, and LVC-D09 (supplied by Staffordshire SMR)

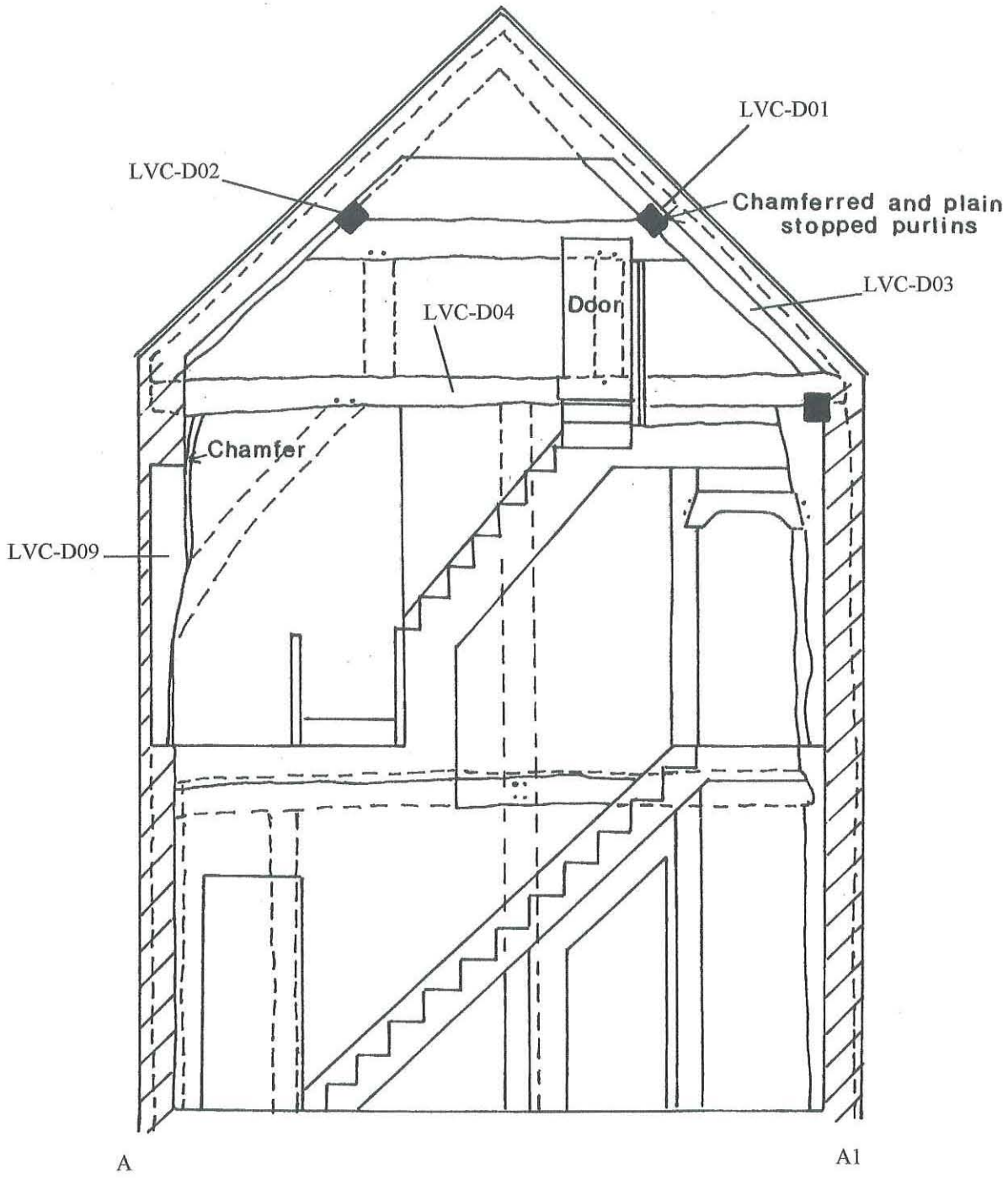


Figure 5: South Elevation - 3 Vicars' Close, Lichfield, showing the location of samples LVC-D05-D08, and LVC-D10-D12 (supplied by Staffordshire SMR)

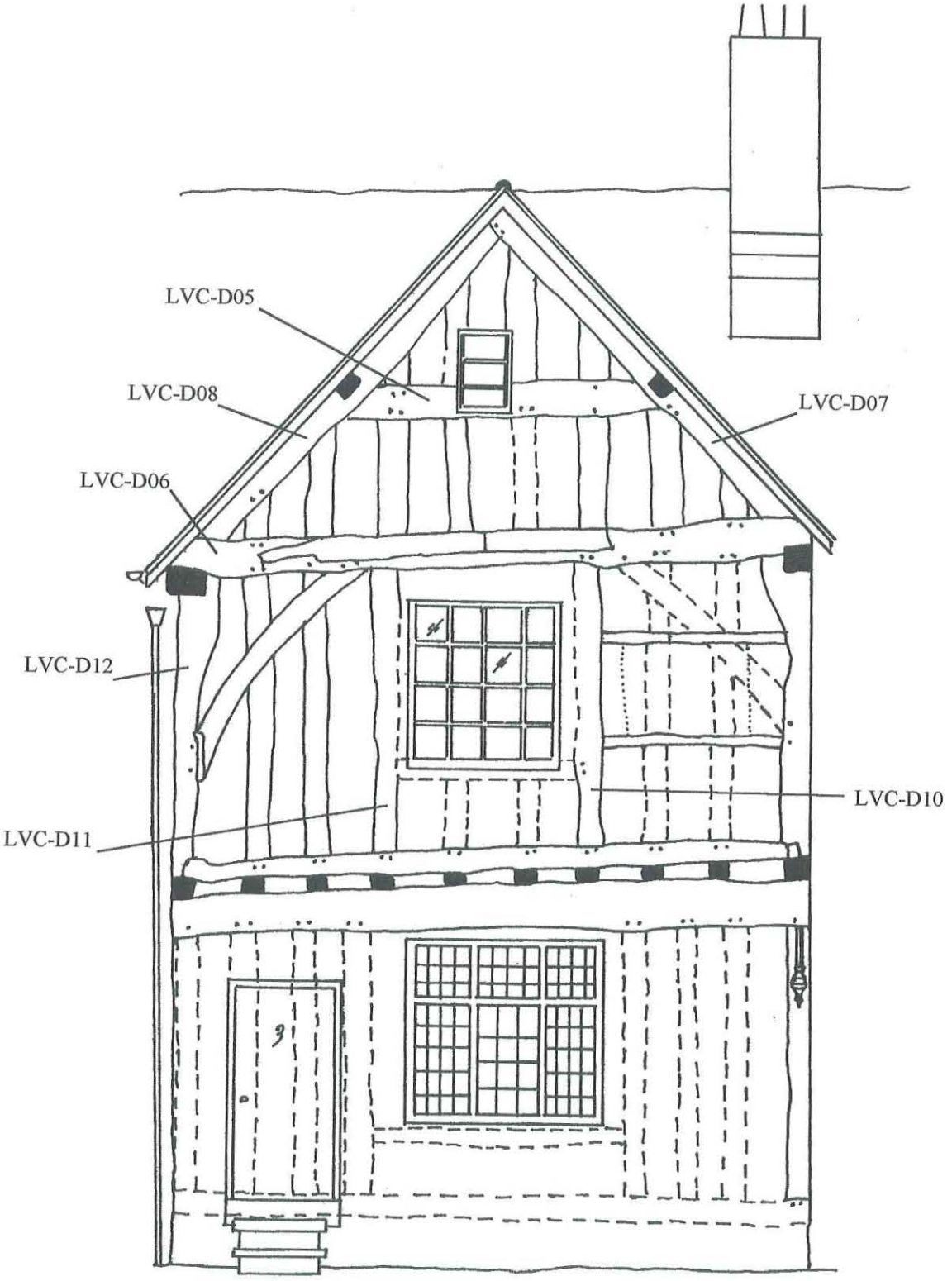


Figure 6: Bar diagram of samples in site chronology LVCDSQ01

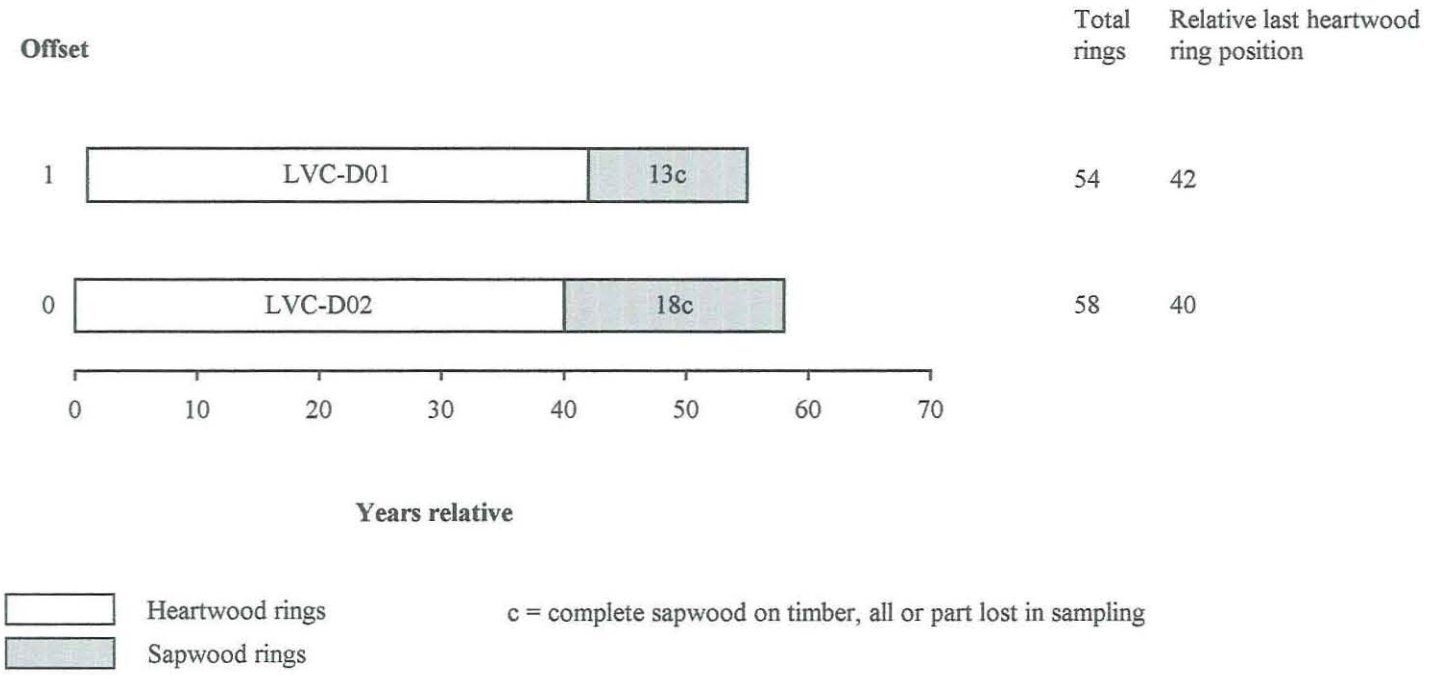


Table 1: Details of samples from 3 Vicars' Close, Lichfield

Sample number	Sample location	*Total rings	*Sapwood rings	First measured ring date	Last heartwood ring date	Last measured ring date
LVC-D01	West purlin, A-C1	54	13c(+*c*3lost)	------	------	------
LVC-D02	East purlin, A1-B1	58	18c(+*c*1lost)	------	------	------
LVC-D03	West principal rafter, truss A-A[1] (in cupboard)	NM	--	------	------	------
LVC-D04	Tiebeam, truss A-A[1]	NM	--	------	------	------
LVC-D05	Mid-rail, truss C-B[1]	NM	--	------	------	------
LVC-D06	East principal rafter, truss C-B[1]	NM	--	------	------	------
LVC-D07	Tiebeam, truss C-B[1]	NM	--	------	------	------
LVC-D08	West principal rafter, truss C-B[1]	64	--	------	------	------
LVC-D09	West main post, truss A-A[1], first-floor	82	h/s	AD 1350	AD 1431	AD 1431
LVC-D10	Post, truss B-C[1], first-floor	NM	--	------	------	------
LVC-D11	Post, truss B-C[1], first-floor	61	18C	------	------	------
LVC-D12	East main post, truss B-C[1], first-floor	56	03	AD 1383	AD 1435	AD 1438

*h/s = the heartwood/sapwood boundary is the last ring on the sample
NM = not measured
C = complete sapwood on sample
c(+*c*x lost) = complete sapwood on timber, all or part lost in sampling (+number of sapwood rings estimated to have been lost)

Table 2: Results of the cross-matching of sample LVC-D09 with relevant reference chronologies when the first-ring date is AD 1350 and last-ring date is AD 1431

Reference chronology	Span of chronology	*t*-value	Reference
England	AD 404-1981	5.7	Baillie and Pilcher 1982
Western England and Wales	AD 1341-1636	4.4	Siebenlist-Kerner 1978
Kent88	AD 1158-1540	3.7	Laxton and Litton 1989
Mercers Hall, Gloucester, Glos	AD 1289-1541	5.1	Howard *et al* 1997
Pye Corner, Moulsford, Oxon	AD 1340-1558	4.7	Alcock *et al* 1991
Upwich2	AD 946-1415	4.7	Groves and Hillam 1997
The Smithy, 78 Birmingham Road, Sutton Coldfield, W Mids	AD 1345-1415	4.5	Howard *et al* 1990

Table 3: Results of the cross-matching of sample LVC-D12 when the first ring date is AD 1383 and last ring date is AD 1438

Reference chronology	Span of chronology	*t*-value	Reference
Western England and Wales	AD 1341-1636	4.9	Siebenlist-Kerner 1978
England	AD 404-1981	4.4	Baillie and Pilcher 1982
Tusmore Granary, Tusmore Park, Bicester, Oxon	AD 1359-1545	4.9	Howard *et al* 1992
Manor Farm, Upper Midhope, Bradfield, S Yorks	AD 1380-1550	4.6	Howard *et al* 1996
1 Vicars' Close, Lichfield, Staffs	AD 1359-1446	4.5	Arnold *et al* forthcoming (b)
Sinai Park, Staffs	AD 1227-1750	4.4	Tyers 1997
Old Bakehouse, 61 Bicester Road, Long Crendon, Bucks	AD 1384-1440	4.4	Alcock *et al* 1990
Mercers Hall, Gloucester, Glos	AD 1289-1541	4.0	Howard *et al* 1997
Wick	AD 1255-1496	4.0	Bridge 1983

Data of measured samples – measurements in 0.01mm units

LVC-D01A 54
297 308 397 367 531 423 433 437 431 395 399 308 373 403 373 268 329 305 291 410
304 290 314 52 57 37 37 40 62 51 60 77 54 78 96 121 128 142 112 218
218 209 187 123 143 292 318 248 262 261 239 198 192 236
LVC-D01B 54
300 330 405 365 530 454 386 452 434 396 426 306 375 387 407 257 326 304 292 412
300 287 317 47 63 37 39 32 62 56 57 72 66 81 87 122 121 148 116 219
208 229 173 113 138 274 308 245 264 279 260 188 198 234
LVC-D02A 58
273 426 571 655 588 678 546 415 315 304 303 367 312 503 541 377 252 489 333 244
313 256 298 298 52 57 43 43 37 59 65 51 81 73 73 108 105 137 142 108
129 166 145 123 94 118 194 211 198 187 234 156 136 152 185 233 224 170
LVC-D02B 58
319 424 567 661 590 677 537 416 318 309 295 378 308 512 544 375 251 493 327 238
318 254 300 299 46 55 51 45 41 64 61 62 76 72 82 102 108 134 143 110
131 157 150 118 93 120 202 197 201 194 230 148 141 151 198 229 230 161
LVC-D08A 64
86 109 123 166 194 178 324 404 335 286 423 400 457 444 481 416 466 395 400 556
363 329 277 243 214 158 219 220 282 307 351 273 525 527 251 253 197 201 207 178
204 215 259 212 421 294 329 275 257 214 233 167 227 320 268 164 176 154 136 160
112 118 160 96
LVC-D08B 64
92 107 123 169 189 176 325 398 325 279 421 402 453 438 484 425 466 402 397 555
380 332 275 242 208 164 218 211 287 306 352 259 532 529 244 257 199 191 213 180
206 216 257 218 410 304 323 272 271 222 229 173 217 325 266 164 168 150 142 167
112 123 155 101
LVC-D09A 82
307 580 404 507 482 426 399 442 463 510 330 299 409 392 518 380 293 236 271 231
203 150 184 208 231 312 294 256 268 338 220 200 251 315 217 262 318 258 256 215
161 189 161 118 118 99 177 181 175 211 272 187 207 212 178 156 143 139 203 191
152 114 137 143 135 162 154 179 143 127 193 161 145 241 243 301 200 138 137 116
144 97
LVC-D09B 82
308 579 400 512 480 420 396 437 463 519 336 310 406 386 499 380 270 238 247 224
209 150 181 205 222 308 296 266 267 329 249 195 231 312 222 265 311 258 257 212
162 193 158 115 119 95 177 183 171 213 260 191 205 201 184 151 150 141 192 195
159 105 145 138 149 165 158 180 142 114 191 171 136 245 240 304 202 132 135 127
140 104

LVC-D11A 61
253 345 315 279 261 356 318 342 341 324 314 174 233 203 224 197 167 176 241 210
165 163 165 173 205 119 211 176 131 175 165 201 304 292 217 129 102 116 175 221
197 216 170 120 158 62 106 88 90 88 112 94 99 107 124 124 71 124 169 161
172
LVC-D11B 61
258 350 312 276 262 351 317 371 325 321 313 177 230 212 215 198 171 180 231 218
172 164 168 165 209 124 213 174 139 160 162 197 304 289 218 126 104 118 172 222
198 212 169 122 155 80 106 85 91 80 91 92 94 124 118 113 84 119 201 122
170
LVC-D12A 56
140 630 494 694 634 503 459 335 516 360 441 467 384 436 452 473 396 419 428 406
370 315 274 212 224 246 273 236 194 176 201 212 256 219 307 287 196 340 370 293
408 378 367 294 270 284 265 329 299 316 257 370 424 355 201 188
LVC-D12B 56
148 639 494 711 602 505 469 376 506 366 465 448 390 421 480 473 405 410 422 407
371 315 270 219 217 254 258 234 197 172 199 225 243 225 282 288 206 330 365 303
412 376 362 297 244 276 274 326 311 317 262 371 416 389 207 183