



# 1 APPENDIX E

## 1.1 Archaeological Areas Table

**Table 1: Byfield Mine**

Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
Byfield 1 (near modern entry)  Plans 33 & 34	500	3	Boundary pillar with picking bed <i>on the northern edge</i> , working faces with wrist stone, chamfered notches and chamfered jads and sporadic wedge pits. Probable long rooms on north side seen through windows as filled with spoil to roof. Approx. 5 m wide.  Route of modern roadway follows mixed fines and rubble spoil topped with thrown-up rubble to roof. Graffiti on isolated sawn face has names and tally board. Other examples of graffiti in the centre of the area have multiple dates and names and tally boards ranging from the C18th - C19th.	The boundary pillar follows the north limit of the workings and small openings at the western end appear to have surface quarrying spoil entering. Further east, the windows accessed or were accessed from long room workings which have been entirely filled, and may be linked to the Area 7 workings. The distinctive fines and rubble spoil appear to have been derived from the Area 3 jad-cut pillars. Dates of 1909 and 1916 are written in a different hand to the other graffiti and display the names of quarrymen associated with C20th quarrying in the Byfield mine. The graffiti discovered during 2007 date initially from September 1823, and represent later pillar robbing within this area, possibly from the Byfield entrance or from later workings associated with quarry 503. Graffiti on the same pillar faces bearing the name J E Dowling and dating to the late C19th, is another example of his presence within both the Firs and the Byfield mine complexes.
Byfield 2 Entry as far as the east side of the bat nursery.  Plan 34	500 &  501	3  2 OR 3	Corbelled pillars with some regular direct about 3x3 m. Jad slots, some sawn faces. The pillars are less regular on the southern edge and roughly corbelled. Occasional parallel rows of wedge pits noted. Rooms about 4 m wide, some large near entry with central pillars. 3-4 m high. Long room type on south side. Area has indistinct spoil heaps, largely cleared in near distance leaving a flat floor. Graffiti “1908” on sawn face. Graffiti ‘1823’ and ‘1902’ on several sawn faces.  East of the bat area nursery has large pillars 5-6 m by	This is an entry area, probably re-used as a store, from which spoil seems likely to have been removed or levelled. A substantial collapse has taken place recently near the entry. The floor beneath the collapse was used in the C20th to grow mushrooms, the area of levelling to the north and west consists of substantial tipping platforms of waste stone from Area 3 (quarry 503) The mortared stone piers, of which several piers survive on an NW-SE alignment, probably supported a 1920s water amenity. A 1925 plan of the amenity has been recovered and added to the archive. Access to ‘Bat Avenue’ within 2007 revealed a substantial boundary pillar located between areas 2 and 3, dividing C17th & C18th quarrying areas (501/502 & 503). The pillar also in part forms the support for the southern edge of the quarry where it

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			3 m and 4-6 m high with picking bed removal and jad slots with spoil piled against. Boundary pillars with occasional jad slots and picking bed removal are noted on the eastern edge	meets the surface. The similar types of quarrying extraction noted in quarries 501 & 502 have made clarification of separate periods of working less obvious, suggesting that they may be contemporary.
Byfield 4  Plans 52 & 55	504	3	Corbelled and direct pillars 3-5 m high, 3 or 4 x 2 m with chamfered notches and jad slots. Probably long rooms with heaped debris. Floor to roof rubble noted throughout the area. The use of successive wedge pits, executed in horizontal rows, is noted. Sawn pillar faces demonstrate the extraction of stone using saws.	Possibly modified by spoil shifting in development of Area 3 and now considered part of Phase 504. Most pillars are corbelled ( but some direct) and formed with wedge and chips using the main and minor joint system. Later pillar robbing is evident along the length of the cart-way (located on the northern edge of the area and within Area 5). Numerous pillars exhibit sawn faces and probably contemporary with Quarry 503. A stratigraphic sequence within rubble located 5 m to the east of the Irvings incline revealed at least three phases of floors level. Each floor level was buried beneath successive layers of banker mason waste fines, with bat droppings noted on each successive interface. This suggests an area where stone blocks were finished or roughly wrought ready for transport to the surface. Several lathe-turned stones have been recovered and sawn blocks have also been recovered from the centre of the area along a short length of barrow-way. One square based, lathe-turned artefact has the remains of a semi-cylindrical end attached, suggesting that the square bases were the wasters of much larger stone columns sawn from the square bases once they have been turned. The columns could be formed into decorative spindles.
Byfield 3  Plan 34	502 & 503	3 OR 4	Jad-cut pillars up to 6 m high with jad slots, some corbelled some direct. The corbels are formed from the jad slot, usually cut into the second bed beneath the roof. Occasional sawn pillar faces noted on some pillars were cut at the same time as the jad cuts. 1820s graffiti on sawn face along with WWII graffiti. Open room working with ramp, and coursed rubble (some sawn stones) arched inclined entry, whose advance is protected (and diverted) by a heavily built rubble wall to support the roof. Spoil tipped in heaps at sides. Graffiti with mid-late C20th dates, indistinct. Several pillars exhibit graffiti from the quarryman over period of three centuries and also from external visitors entering the mine through this part of the Byfield Mine.	This area is probably early C19th based on its relationships with surface features. Use of jad cuts is highly unusual at Combe Down. This is the likely source of the fines and rubble spoil tipped along the northern and western sides in Area 1. The access from the incline appears to have been driven through through earlier C18th workings within Area 4, and thus probably post-dates it. Access in 2007 revealed that the incline was constructed to support a large WSW-ENE orientated roof gull. The jad cut pillars also exhibited occasional sawn faces and are now considered to be contemporary with the initial extraction. A sawn pillar face about 4 m above the mine floor has a date of 1827 or 1822 and suggests an extraction date of this period. Graffiti surviving from WWII reflects use of the mine as an air-raid shelter during the Baedeker bombing raids of April 1942 and by military personnel housed in the War Hospital at Combe Park.

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Byfield 5  Plans 34 & 52	504	III	Boundary pillar (Combe Road Pillar) on east side and long pillars on the western side of the area. Corbelled and direct pillars up to 5 m high and 3 or 4 x 2.5 m. Picking bed, chamfered jads and long horizontal jad slots along the boundary pillar, and some sawn faces. Parallel lines of horizontal wedge pits. Rooms variable, some appear small, partially infilled with spoil, some windows or side openings pierce longer pillars Two shafts, large diameter, the nearest to entry with a massive rubble wall to one side, the other in-filled with a shaft cone. Cartway 4-5 m high, 5 m wide leading under first shaft and to side of second shaft. Cylindrical stone structure protects probable well.	Extension westwards on the north side now considered part of Phase 503, 504, but not 505, which are revealed as successive blocks in which Phase 503 may have been the final area worked. The area was probably first accessed in the late C18th via the high cart-way and shafts with the incline accessed area worked later, with the entry near the other, earlier entries from Jones Quarry (Gammons/Ralph Allen Yard). The southern extent of the area was accessed by a Ralph Allen phase cart-way from Jones Quarry as far north as the large shaft nearest the entry. Apophygate pillars are evident as far north as the shaft and also several metres to the north of the shaft. The cart-way was extended northwards in the Allen Estate period and subsequently again in the early C19th century, following and defining the southern edge of the Combe Road Pillar. The cylindrical stone structure well-shaft probably dates to the mid C19th, and was used for the Hines Brewery (now William IV Public House). Other Quarries to the west all seem to have had their own entries with the exception of Quarry 503, which was accessed from the Irvings Incline.
Byfield 6  Plan 52	505,  917  & 916	I & II          III	Apophygate pillars 4 x 2 m and Combe Road Boundary Pillar, with some corbelled at margins with chamfer jads, jad slots and sporadic picking. The cart-way is the most significant feature, with spoil-filled long rooms at the east side (quarry 916). It is some 4-5 m wide and 2.5 m high and has ruts (between 1.20 and 1.40 m apart and hub marks and coursed-rubble packs and an arch near the entry from Jones' Quarry (Gammons Yard/Ralph Allen Yard).  It ran to and under a wide spoil-filled shaft with a cone at its foot (the cart-way continuing in Area 7). Quarry 917 (located on the northern side of area 6) exhibits apophygate pillars with similar spacing to area 6. Floor to roof rubble throughout. Corbelled and direct pillars 4 x 2 and 4 x 5m, jad slots and sporadic wedge pits, some in horizontal rows. Rooms partially filled with rubble with barrow-ways and low tipping platforms. Stone packs retaining discards on southern extents.	The Area incorporates one of three original lengths of cart-way into Byfield Mine from the 'Jones' Quarry location. It enters into a substantial area of apophygate pillars (Quarry 505). The low roof height seems characteristic of the earlier cartways. The cart-way and its associated workings seem to have been driven northwards, with an average width of 6-8 m, towards Area 7, forming the Combe Road Pillar. An area of stone immediately to the east was not exploited during this enterprise and was later quarried as part of Quarry 916. The stone arch near the entry and the supporting stone packs are C19th and were constructed to consolidate the roof on the edge of the open quarry face.  Area to the north of Area 6 and to the east of Area 7 probably form part of the Ralph Allen period extraction (Quarry 505). The area is largely in-filled with floor to roof rubble with the occasional roof supporting stone packs. Visible pillars are generally apophygate with some direct, reflecting localised roof conditions. Quarry 916, An area of stone immediately to the east of Allen Cartway that was not exploited during Allen's initial drive northwards. It was probably extracted in the Allen estate period and exhibits some horizontal lines of wedge pits and regular squarer pillars with no apophygation. Stone packs retaining substantial discards on southern extent are contemporary waste management structures. Barrow-ways and low tipping platforms of waste reflect probable C19th later waste deposition from the still accessible cart-way length.

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Byfield 7 (Sector X)  Plan 52	917	II & III	Apophygate pillars, near the (blocked) shaft (see 6 above), otherwise corbelled, 3 x 2 m, 1.5-2.5 m high, with chamfer jads and jad slots. Long rooms, mainly filled with rubble spoil. Cartway continued to be driven northwards, rising slightly at the accessible end between massive rubble stone packs which had been advanced in short stages to support a difficult roof. There were substantial falls and loose blocks with only some 2 m to surface.	Designated “Sector X” because it was not previously surveyed. The condition was dangerous and partly damaged by remedial action before archaeological access. The cart-way may have continued further. The long rooms on the south west side may link to those seen in Areas 1 and 5. The area probably reflects extraction in the Allen and Allen estate transition periods. The lengths of supporting stone packs are likely to be C19th and reflect the importance of the cart-way route for continued extraction. Dendrochronology samples of timber supports associated with the stone packs have been taken for future analysis, but are unfortunately not datable as they reflect local felling.
Byfield 8  Plans 50, 52 & 56	505	II	Apophygate pillars, typically 3 or 4 x 2 m, some much smaller, usually in wide rooms about 2 m high. Spacing typically 5-7 m but as much as 10 m. Served by the cart-way [39] as in <i>Area 9</i> below. Occasional sawn faces are found near the cart-way. The second shaft on the cart-way, in the centre of the area, was very heavily walled around, supporting obvious loose blocks in the roof. Artefacts included scapped (squared) blockstones and a stone bench for holding saws whilst sharpening. The area has substantial tipping platforms and Barrow-ways throughout. Surfaces and floors around the large central shaft survive. Timber sprags used occasionally for roof support probably date to the C19th.	The former High Grade Archaeological Areas extent of the apophygate pillars suggests the first major phase of working under Ralph Allen and his “clerk” Richard Jones. The originally narrow workings widened, presumably as confidence grew, to a dangerous degree, only seen elsewhere in the mines in a similar area (208-9) in Firs. Views of lengths of over 50 m are possible. One pillar was less than 1 m square in section. Roof collapses are a prominent feature, and as some were either diverted round by a new section of cart-way <i>or removed to the side of the existing cart-way</i> Surfaces and floors around the large central shaft survive from the Ralph Allen or early estate periods before the roof collapsed and were not sealed by later tipping. Large waste stone tipping platforms and associated barrow-ways are evident throughout the area. They originated from Cartway 39 when it was extended northwards during the Allen estate extraction period (Area 13, quarry 507). Other tipping on the eastern side of the area originates from Area 1401 (Quarries 517 and 514). Stone extraction associated with Quarry 517 to the east has impacted the Ralph Allen quarry area to a larger extent than had been previously thought. Localised secondary extraction associated with Quarry 517 is also evident from wedge pits within the roof on the eastern side of the Allen workings.
Byfield 9  Plan s 50 & 55	505	II	This is mainly the cart-way [39] from Jones Quarry, minimum sizes 2.8 by 2.8 m through apophygate arches near the entry, some only 2.5 m wide. Entry has rubble packs and sawn stone voussoirs for support. Adjacent workings are entirely infilled with spoil. Rope grooves were noted near the entry. A probable shaft on the first section of cart-way had partially collapsed.	This is the major cart-way, serving the central part of 505, which was extended to the furthest extent of the apophygate pillars and later almost as far north as the North Road. It is not clear whether the small dimensions of adjacent rooms were due to traditional caution or to particularly poor roof conditions near the outcrop. A stone arch with voussoirs (similar to that constructed in the Area 6 entry) and supporting stone packs are C19th and were constructed to consolidate the roof on the edges of the cart-way. An area to the east with substantial roof collapse has been attributed to the Allen period but will remain inaccessible.

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Byfield 10  Plan 50-60	517	III	Transition to corbelled pillars (with some direct) is marked by a step-down in the roof. Pillars here are typically 2 x 2.5 m stems with 3 x 3.5 m tops with use of chamfer slots and jads, and jad slots and with wedge pits on roof and faces. Jad slots are particularly well developed near junction with Area 17 at the 'H Pillar'. Rooms are largely open up to 2 m high, with 5-8 m between pillars, floors rubble with barrow-way between low rubble heaps, occasional stone packs employed for supporting spoil and, possibly the roof.	The new method removed the need for human access to the picking bed, resulting in substantially less spoil from this source. Corbelled pillars (usually with some direct) remained the dominant technique for the next century. A similar transition is observable in Firs Mine. The distinctiveness of jad slots near 'H' Pillar may indicate a later working phase.
Byfield 11  Plan 50	517	III	Corbelled and apophygate pillars, rather rounded, 3-4 x 2 m with chamfered notches and jads on the former. Timber sprags regularly used as roof support. Rooms are 4-5 m - 25-30 m and about 2 m high. Length parallels a boundary pillar between 505 and 506 Rubble floor with barrow-ways and lateral rubble spoil dumps and platforms. Packs used to retain spoil and support roof. Extends to the cart-way in Area 13 (extension of that in Areas 8 and 9) at northern edge.	Views here are unusually long, but the method of working is not fully determined. The transition from apophygate to corbelled is less distinct here than in Area 10. The long spans in the rooms caused contemporaneous roof-falls, which were cleared away.
Byfield 12 (Same as, but later designated to Area 1402)  Plans 60 & 61	519          518	II          III	Several pillars immediately adjacent to the entry are apophygate, the remainder generally corbelled, about 3-4 x 2 m cross-section. Sawn faces may be later. The ingress of C20th surface quarry backfill and rubbish, with some concrete ingress, has filled the northern edge of the area. The shaft cone in-filling the 'Hills Shaft' has also covered a considerable area and is thought to represent surface back-filled quarry rather than a vertically extracting shaft.  A low but well-used barrow-way links Area 11 south-Eastwards to a partially blocked entry. <i>The</i> barrow-way is associated with Quarry [514] and waste stone deposition along its western limits. A 5-7 m high cart-way runs SSE, communicating with Area 17 and, possibly, 27, alongside a boundary pillar and represents the principle cart-way for Quarry [518].	There is possibly an early entry here contemporary with or earlier than the Allen period workings, which was incorporated into later C18th workings associated with [Quarry 520] driven to the south, or with [Quarry 520] driven to the south. The entry here has been called 'Hills Shaft', but it is almost certainly not a shaft and represents in-filled workings on the edge of a former open quarry. The quarry [519] is distinguishable by apophygate type pillars around a small entry. The pillars differ from those associated with the Allen workings and are more crudely worked. They have been accessed from Rock Lane Quarry (formally 'Sheeps House' Quarry) and driven southwards in a delta shape. Should they indeed reflect pre-Allen quarrying, it suggests that the open surface quarry was larger than had previously thought in the C18th prior to Allen accessing the same surface quarry for his industrialised extraction, principally on its northern edge. What appear to be long room workings are just visible in the adjacent Area 27 and represent workings associated with Quarry [518], extending to the south-east.

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Byfield 13  Plans 56 & 57	506 & 507	II & III	Workings alongside the cart-way [39/65]in Area 13, as far north as the wide shaft (third shaft from Jones quarry) are apophygate, changing to corbelled (some direct) north of the shaft. Rooms are still open (as Area 11), but with increasing amounts of spoil introduced by barrow-ways from the north over the earlier rubble surfaces. One substantial barrow-way south of the shaft, lined with rubble packs may have been for blockstone. The barrow-way transported waste stone to a substantial area of floor to roof rubble deposited within Area 14. West of the cart-way corbelled pillars and long room working appear to have been used, possibly the same 507 quarry as in Area 14. Stone packs with rubble makes it largely visually inaccessible.	The shaft seems to denote the northern limit of the early phase of working associated with the apophygate pillars, and it is possible that this is the limit of the Ralph Allen period method of working to just after his death in 1764. The degree of apophygation is reduced, many pillars being almost direct. The area has been attributed to the Allen estate working period to the north of the apophygated shaft on Cartway 39. Primary barrow-ways routes associated with the transportation of waste stone, originating from area 23(Quarry 509), have in-filled most of the area and the southern part of Area 14.
Byfield 14  Plan 57	507	III or III	Long room working, substantially backfilled with rubble behind unusually neat stone packs to a metre or less from the roof. There is one main barrow-way on the periphery between Areas 14 and 15 which links to the spoil behind the packs. Pillars are direct or with small corbels.	The distinctiveness is probably due to an individual foreman/quarryman. The pillars are largely direct with small corbels carved from the top two beds (mainly the first). This may have been done where blocks of stone naturally protruded beyond the pillar within the first bed beneath the roof and were fashioned to reduce weight, or from individual preference for traditional methods of roof support. The northern part of the area is contemporary with the Ralph Allen estate period, with a transitional Allen/Allen estate area on the southern extent. The western limits of the quarry contain floor to roof rubble and the relationship with the surface quarrying to the west are as yet unclear. The northern limits of Quarry 507 probably respect the shaft within the southern area of Quarry 509.
Byfield 15  Plan 58	509	III	Direct regular pillars with jad slots and systematic use of wedge slots on faces. Jad slots have been used within several of the beds of stone and not within the upper two of three beds only as standard .Two pillars have small packs constructed on pillar benches to give roof support. Timber sprags have systematically been used to support the roof beds. Long wall and gullet face exposed along boundary pillar showing wrist stone and vertical benching methods. Fairly large ‘Cockles’ are noted within the boundary pillar at the northern limits of the area. Rooms 4-5 m wide, and rooms and pillars left 5-6m high. Spoil dumping was along a central barrow-ways in	This appears as a well organised quarry with systematic working and spoil disposal. The main access is from the south, located to the north of the earlier cart-way 65, and oriented on a shaft on the southern limits of the area. Some sawn faces suggest a later scavenging operation and scavenging on a localised basis has taken place and is associated with waste stone tipping activity contemporary with area 21[Quarry 510]. Large tipping fronts from areas 16 and 21 [Quarries 508 and 510 respectively] are the only later tipping in the area and both provided clear stratigraphic relationships with adjacent quarrying areas.

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			the worked-out area leaving heaps and platforms of blocky rubble.	
Byfield 16  Plan 58	508 (upper level only)	IV or V	These are the upper workings with 1-1.5 m thick vuggy or “cockly” beds between it and the lower Area 19. Despite substantial infilling with spoil, it has largely collapsed. Barrow-way 1.5 m high lined with rubble packs. Stone lined well passes about a metre away. Boundary pillar with window, jad slots. Picked and sawn faces. Horizontal rows of wedge pits regularly used. Timber sprags employed as roof support. Large blockstone produced.	Tipping appears to have taken place from Area 16 into 15, suggesting a later date of operations. The area has largely been filled with floor to roof rubble supported and retained behind stone packs that have also the dual purpose of supporting the roof in places. The height of the stone extracted in this quarry is on average about 2.5 m and therefore there has been only a limited area to dispose of waste stone. Waste stone appears to have been transported southwards to the west of the northern extent of the ‘Combe Road Pillar’ noted in Areas 5 and 6. This reflected the surface boundary of the former parishes of Monkton Combe and Widcombe and Lyncombe parishes, which formerly followed the Combe Road.
Byfield 17 “H Pillar”  Plans 51 & 60	518,  517,  915 &	VI  III,  III,	<p>James Riddle’s late C19th quarry [518] with square-sawn faced pillars in an open room method of working, served by railway (sleeper-holes) and post cranes (basestone and chog-holes). Much use of deeper jad slots for frig-bob saw insertion and systematic use of many timber sprags for roof support .Narrow, post 1860s, pick blades used in the jad slots as opposed to the traditional wider 1 inch width blades.</p> <p>This cuts into an older quarry [505] with corbelled pillars exposing a face of packs and spoil banks on its eastern and north-eastern edges. The quarry has mainly corbelled pillars but some direct and exhibits traditional jad slots with wedge pits and hacked faces. Timber sprags have been used to a lesser extent and stone packs support discards and provide roof support. A series of wedge pits in the roof on the eastern edge of quarry [505] marks the quarries western boundary, pillar robbing the earlier Ralph Allen workings.</p> <p>Riddles quarry cuts quarry 915 which has direct and corbelled pillars with traditional jad slot extraction techniques. The pillars are 2m x 2 m and are square in plan, with 3-4 m pacing. Where the truncation has</p>	<p>James Riddle worked into the 20th century at his Allotments Quarry, hauling stone out via the shaft in an enterprise of quarrying that had probably started in the 1880s. The extraction was largely carried out using frig-bob saws as oppose to picking and wedging the stone from the working face. The jad slots are higher than those needed in earlier traditional jad slots, where wedges were mainly used, to allow adequate access to the upper stone bed for the stone saws. Sawn faces are abundant and allow easy flat surfaces for writing tally and other types of graffiti. Graffiti includes the top-hatted and cigar smoking gentleman with exposed genitals, perhaps an example of late C19th social comment.</p> <p>The quarry [517] was truncated by the Riddle workings on the south-eastern edge with several of the longer pillars re-exploited. It represents late Allen or contemporary Allen quarry extraction originating in Areas 8 or 9, and extracted from the west to the east. The quarry area extends on the northern limits into Area 11.</p> <p>Quarry [915] represents contemporary Allen estate workings that had been driven from the southern escarpment of the hill from the approximate area of Summer Lane. The workings are not associated with any visible Allen type cart-way extraction techniques and suggest that they are not Allen estate working and have been probably driven northwards from other pre-Allen workings. The limits of the area are poorly defined and have been badly truncated and reworked by the Riddles quarry, with often the lengths of its long pillars being divided and robbed.</p>



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	912	III &	<p>occurred the roof of the new quarry has frequent wedge pits which suggest the direction of extraction and numerous associated soot marks. One of the early pillars has the top of its corbel and has been directly cut by one of the Riddle phase sawn faces. Stone packs provide support for discards and also gives some roof support.</p> <p>Riddles quarry also cuts an earlier area of direct and corbelled pillar on its northern edge [912]. The area is linear and measures 70 m in length E-W and 20m N-S. The pillars are rectangular in plan, are corbelled and are on average 3 m x 2m, with 3-4 spacing. A long boundary pillar on northern edge separates from quarry [520] on the north. The quarry has Jad slots throughout and the occasional wedge pits and rows of horizontal wedge pits are noted.</p> <p>Timber sprags provide roof support and numerous waste stone Barrow-way routes and tipping fronts are evident. Timber sprags have been sampled for dendrochronological analysis.</p> <p>Riddles quarry also cuts into the south-eastern edge of the Allen apophygate pillar workings [505]</p>	<p>The quarry [912] could be Allen estate workings, but they are probably contemporary non-Allen quarrying given their isolation from cartways. It been probably been driven northwards from early pre-Allen workings from Area 18 [516], rather than from the north, driven southwards from Area 10 [Quarry 517]. The quarry has mainly corbelled with some direct pillars.</p> <p>The roof in this south-western area is poorly supported with wide pillar spacing and numerous roof falls are evident especially in quarry area [505].The Bastard Bed stone seen exposed in the roof by a fall near the H pillar has some three beds of well jointed blocks.</p>
Byfield 18  Plan 60	516	I	<p>At the south west margin of James Riddles Quarry is a small area of rooms with apophygate pillars (intruded by modern externally poured concrete). It was broken into by the corbelled area in Byfield 17 [912] and substantially infilled with rubble throughout. Localised jad slots and chip impressions are noted, but the chip impressions are of a later phase associated with [Quarry912].</p>	<p>The isolation from known cartways suggests the apophygate area may be pre-Allen (i.e. early C18th) and probably worked from the surface on the Summer Lane. The apophygate pillar types are less well-fashioned than the Allen period pillars and appear rougher in their appearance. Many form almost naturalised arches between pairs and groups of pillars. Surface ingress of surface backfilled quarries and floor to roof discards largely fill the area. There are clear changes in roof height and relationships between quarry extraction techniques on the western limits of this quarry, clearly indicative that Quarry 915 is the latter. Quarry [516] may be of a contemporary date to the extractive Quarry [911], located to the south of Quarry [915].</p>
Byfield 19	512	IV	This is largely below Byfield 16 and Quarry [509].	The main passage with neatly maintained barrow-way was apparently used to convey

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Plan 68	(lower level only)		<p>These are the lower workings with 1-1.5 m thick vuggy or “cockly” beds in the roof between it and the upper Area 16.</p> <p>The north section, accessed through a roof-fall, consists of a partially collapsed passage, probably a barrow-way, shored-up by rubble and many sawn stone-packs built under the roof. Timber sprags are used in places to support the roof.</p> <p>The south area has two small quarries, one partially with spoil dumps, and the other, exceptionally neatly worked, with regular square split stone (using wedge and chips) pillar, clear floor and neat pack. There were several scapped blocks left.</p> <p>Opposite was a curved sawn face over a straight vertical sawn face.</p> <p>Clay from the underlying Fullers Earth derived deposit Ctx 414, from the adjacent well was spread over the barrow-way, and thought to have occurred in post-quarrying periods.</p>	<p>stone, possibly to an entry from the surface quarrying west of Combe Road which was active in the early C19th.</p> <p>Either side of the principle open barrow-way, low lateral packs have been constructed to retain varying sizes of waste rubble. The rubble has been well sorted and neatly stacked.</p> <p>Other stone packs which lined the passage were initially constructed to retain the large amounts of waste discards and maintain the access. Secondary placed sawn blocks, with a notably lighter patina than the rubble used in the lower extents of the packs, were inserted to help consolidate the roof. Timber sprags were also employed for additional roof support. The roof has settled on the top of the packs, crushing the upper blocks, and has also split several timber sprags in half.</p> <p>The small-scale and very unusual character may suggest working for the property above by the mason involved. The well post-dated the working, and would probably have been in service a few years before 1830 when the house is shown on a plan.</p> <p>The upper level workings in Area 16 [Quarry 508] are likely to be later than the lower level working. The lower level having been accessed from surface quarrying to the west, leaving the poor ‘cockly’ beds in the roof and not extracting the full height of available stone.</p>
Byfield 20  Plan 58	509	III	<p>Similarities with adjacent Byfield 15 with direct regular pillars. Extraction benches are next to partly clear floors with scapped blocks and barrow-way with ruts. Spoil (from dressing floors) contained by low packs. Tipping has taken place into Area 15 associated with deposition from Area 21 [Quarry 510].</p>	<p>Blockage of stacked rubble may suggest access from surface quarry to the north. This quarry [509] represents the same working as those seen in Area 15 and have been partially overlain by later quarrying activity waste from Area [510] to the north.</p>
Byfield 21  Plans 76 and 59	509 &  510	III  IV or V	<p>Quarry [509] south of area. Pillars direct, occasional corbelled. Long wall and gullet working with long side of pillars aligned with rooms.</p> <p>Cartway with ruts 1.28 m apart runs north from Quarry [510] middle of area.</p> <p>Frequent sawn blocks and bankers waste.</p> <p>Networks of barrow-ways with low, lateral tips and platforms.</p> <p>Shaft at south of area in quarry [509] probably served that quarry (see Area 15)</p>	<p>A possible later re-use is possible, producing the blocks.(see Byfield Area 22)</p>

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Byfield 22  Plan 77	510 &  514	IV or V  IV or V &  III or IV	<p>Quarry [510] appears to have been served by barrow-ways with entries from the surface quarries north of North Road. Quarry [514] has been driven northwards from ‘Hills Shaft’ in area 1401 and 1402.</p> <p>Mainly direct pillars with occasional corbelled. Extractive Barrow-ways noted extending northwards; depositional barrow-ways with lateral stone packs to retain discards numerous. Timber sprags support the roof and graffiti noted on sawn faces.</p> <p>Major part is Quarry [514] which is west of a possible boundary pillar, with corbelled and direct pillars. Some infilling has taken place from Area 24 (north-east). Graffiti includes dates of 1818 and 1838 and 1845 amongst even later dates on sawn faces.</p> <p>The Principle transport system of this quarry is a north-west, south-east orientated cart-way originating at ‘Hills Shaft’ and a spur cart-way which is sealed by later tipping fronts. A loading platform at the northern end of the principle cart-way is a unique feature in the Combe Down Mines .Crane positions located through Lewis bolt slots are evident along the length of cart-way</p>	<p>The barrow-way from the central area may have served a possible entry from surface quarries north of North Road. The principle Barrow-way in this area has transported substantial waste discards from area 24, [quarry 2222], southwards to a large area of tipping platforms. The platforms have overlain deposits and barrow-ways in the northern end of quarries [510], and have also overlain the primary transport Cartways in the north of quarry area [514].</p> <p>The confusing number of dates on sawn faces is not inconsistent with an early 19th-century date based on quarrying methods and access from the north of North Road surface quarries. The dates of 1838 and 1845 represent later quarrying activity associated with Areas 21 and 22, [quarry 510], and the earlier date of 1818 is consistent with the northern end of quarry [514] extraction.</p> <p>Quarry [510] has been driven southwards from the open quarrying area to the north of North Road and principle well maintained extractive Barrow-ways are orientated in the northerly direction. The deposition of waste discards have been placed to the south partially overlying features in quarries [514] and [509].</p> <p>Quarry [514] has been driven northwards following a principle Cartway for 100m or more in length, with an average width of 5-15m. A near complete boundary pillar which has small side piercing on the eastern edge of the Cartway forms a natural boundary from an area of floor to roof rubble in area 1403. There are crane positions along its length with evidence of horizontal haulage and a single rare example of a loading platform at the northern limits. Deposition of waste from the enterprise has taken place along its western limits throughout its extraction. Later deposition from quarries [510] and [2222] has sealed its northern limits.</p>
Byfield 23  Plan 81	514	III or IV	<p>A continuation of 514 noted in Area 22. However spoil dumping forming platforms with arcuate fronts here has largely taken place from the southwest, from Quarry [515]. This part is within two lines of NW/SE probable boundary pillars. There are two cartways with wheel ruts, one running alongside the boundary</p>	<p>Identification of boundaries for Quarry [514] is strengthened by this lower area. The downward tapering pillars are otherwise only seen in workings in Firs 103, of the late C19th. There is only a single downward tapering pillar, which cannot be seen as a standard in this area. The pillar has been sawn on three faces. Two of the faces were sawn to give better access for cart-way traffic where a single cart-way and a secondary spur cart-way Both spurs are thought to be associated with the same</p>

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			pillar. An unusual pillar sawn on three sides with a downwards taper.	working. There is still no conclusive evidence that Quarries [515] (first noted in 2002) and [514] are not of contemporary working, and evidence still being correlated. No further access was gained within the boundaries of the two areas and they have since been combined together to form Quarry[514].
Byfield 24  Plan 76	2222	IV or V	Direct pillars. Filled floor to roof with rubble. Surface infill noted on the north edge, probably at entry from surface quarries accessed from the northern side of North Road.	Generally inaccessible in the northern part of this quarry but thought to be the same workings as the northern end of Area 1403. (see Area 1403)
Byfield 25  Plan 77	510	IV, V	Direct and corbelled pillars. There is one major barrow-way probably leading towards the surface quarries (surface quarry infill). A stone pack located between Areas 25 and 26 <i>retains discards and has also afforded additional roof support.</i>	Small area of open workings seen on the northern limits of the Byfield Mine which is part of the much larger open workings located to the west. The area is characterised by open surface with minor barrow-way activity and one major barrow-way probably leading towards the surface quarries to the north of North Road. Surface quarry back-fill is noted along the northern limits of the area.. A stone pack located between Areas 25 and 26 retains discards and has also afforded additional roof support.
Byfield 26  Plans 55 & 60	2221	III, IV	Corbelled and direct pillars. Same as Area 1404 with sawing contemporary along the length of the principal cart-way that originates in Area 1405, Surveyor's crosses incised on pillars are also noted along the cart-way length. Packs used for roof support and retaining discards. Graffiti noted along the length of the cart-way, with the northernmost pieces dating to about 1830s. A large shaft at the northern end is probably contemporary with the length of cart-way	Northern extent of Firs and Byfield boundary. Extensive collapse opening around 3m of extra beds with historic collapse being removed from the cart-way surface. High packs support the roof on the western side and secondary phase packs retain large volumes of material either side of the cart-way An abortive shaft is evident to the east of the cart-way There has been no apparent secondary robbing of this area and all stone has been extracted during a single phase of stone extraction from the southern to the northern limits. The quarry Area 2221 extends from the north-western edge of the open surface quarry, Rock Lane (Sheeps House Quarry), through Areas 1405, 1404 and 26 and follows a wide and well maintained cart-way The pillars along its length are fairly large to support the roof. This is one of at least three cartways attributable to different enterprises, which were driven from the Rock Lane Quarry towards the northern end of the Firs Mine in the early-mid C19th. Surveyor's crosses have been carved into the pillars. These are not limited to this area and Area 1403 and are seen throughout the cart-way length. They fit the general pattern seen across the Firs quarry of incised survey crosses being introduced in the early-mid C19th. Later sawing is not evident and is contemporary with the main stone extraction. A shaft at the northern end of the cart-way is probably contemporary and suggests that towards the northern reaches of the quarry the stone may have been extracted through the shaft and not along the entire length of cart-way back to Rock Lane Quarry.

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Byfield 27  Plan 61	913	II or III,	<p>Direct and corbelled pillars, with variable 2.5-5.5 m spacing. Jad slots have been executed by 1 inch hack with depths of 100-200 mm, 600-700 mm from roof height. The 1 inch hack is also used for sporadic hacking and cutting sprag recesses; there are a few in-situ sprags. There is one patch of thin blade pick work. The area has a long boundary pillar forming its eastern limit. This divides it from Area 31. There are a number of barrow-ways with tipping platforms showing three phases (platforms) of tipping attributable to the same phase. Some barrow-ways have parallel rubble packs retaining material. The dumped material originates from the north-west. The boundary pillar has defined worked faces in it, with benches and a sail pillar being formed.</p> <p>An area of wedge pit impressions in the roof beside the boundary pillar indicates that the first bed below the roof was cemented to the roof. Direction of execution is towards the pillar.</p>	<p>This boundary pillar forming the eastern limit appears to demarcate the division between Byfield and Firs. Extraction appears to date to the early C19th with extensive later use of the area for dumping. The 1 inch hack has been used almost exclusively. The instance of thin blade picking may be a later addition, although this is now thought to be a misdiagnosis of the tool marks, and represents instead the edge of the wider pick, rather than the pointed end of a narrow pick introduced in the 1870s.</p> <p>The barrow-ways and the three associated tipping platforms, attributable to this phase of quarrying are seen to tip waste from the north to the south, suggesting that the direction of workings originated from the south to north, starting on the southern hill escarpment in the vicinity of Combe Road, but more analysis is required. However, the large boundary pillar on the southern limits of the area has few possible entries to access the quarry from the south although access has not been total.</p>
	520	III or IV	<p>Mainly direct with some corbelled pillars 4 m x 4m and 5m x 3m, spaced 3 m-6 m. Boundary pillars on the northern and southern boundaries. Frequent jad slots, sporadic single and lines of horizontal wedge pits.</p> <p>Principal cart-way with crane position throughout the cart-way length with numerous Lewis bolt anchorage slots.</p>	<p>Southern extent of Quarry [520] (see also Areas 12 and 1401) has been driven south-eastwards from the vicinity of the ‘Hills shaft’. The access for the quarry was from Rock Lane quarry (formerly ‘Sheeps House’ Quarry). The quarry was driven 15-20 m in width following a principal cart-way southwards with crane positions placed approximately every 15 m along its length. Waste stone deposits from barrow-ways and tipping fronts have been deposited northwards into Quarry [913]. The relationship with Quarry [912] to the south is currently unclear and further analysis of the two quarries is needed.</p>
	913	III or IV &	<p>Corbelled and some direct pillars 4 x 4 m and 6 m x 5 m and longer small boundary pillars, spacing up to 5-6 m, largely exploiting the NW-SE main joint system. Jad slots in the 1st and 2nd beds and sporadic use of wedge pits and hacked faces. Area infilled with depositional barrow-ways and tipping fronts from Quarry [519]</p>	<p>Quarry area with mainly corbelled with some direct pillars largely exploiting the main natural joint systems. Jad slots and wedge pits have been used to extract the stone but in an unsystematic way. The area has been driven southwards from the earlier contemporary Allen Quarry [914] developed from the ‘Sheeps House Quarry’ (see below).</p> <p>The area contains depositional barrow-ways and tipping fronts, with lateral tips and stacked floor to roof rubble discards. These are attributable to Quarry [520] and have been deposited from the northern extent of that quarry into the southern limits of</p>

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	914	II	Apophygate pillars 4 m x 6 m with wide, spacing average 6-10 m; occasional jad slots and very occasional sporadic wedge pits. Secondary infilling from the south by waste discards and retaining stone packs associated with quarry [913]. Area largely impacted by C20th cones of concrete from the surface near Quarrymans Court. Collapsed roof in the northern limits makes the area largely inaccessible.	Quarry [913].  The area of apophygate pillars has largely been impacted by later quarrying activity from the south and by C20th cones of concrete from the surface near Quarrymans Court. The tool markings are few and far between and the area is largely inaccessible, which also limits the accessible tool markings. The area was originally accessed from the area of Quarrymans Court, and the south-western side of Rock Hall Lane Quarry (formally 'Sheeps House Quarry') and appears to be pre-Allen workings. They may be part of the same series of workings to the east in the Firs mine Areas 29 and 604 [Quarry2349].
Area 28  Plans 51 & 55	915	III	Area of direct and some corbelled pillars with a variable spacing of 2.8-3 m. A jad slot was recorded on the perimeter of the area, executed by 1 inch hack, 150mm deep and set 530 mm from roof height. A very severe gull crosses the area on an east-west alignment causing instability in the roof. At the worst point a large dome of stacked rubble has been erected to support it. There is a long boundary pillar on the same alignment, which divides this area from Area 32 to the south. The pillar marks the division between quarries [915] and [911] and represents a block of unquarried stone. The position of the pillar may have given additional support to the roof but was probably not left un-quarried solely for that purpose. The primary function of stone packs in the area are for waste discard retention rather than roof support. The small well-like structure in Area 32 intrudes from this area. One barrow-way was traced running along the southern boundary pillar, the area being almost entirely covered by tipping and collapse. The area is demarcated north and south by banks of rubble.	This area is thought to be contemporary to the Allen estate workings). Except for the barrow-way along the boundary, any routes in the area were concealed by lateral tipping and collapse from an overhead gull (vertical fault). The high stack of rubble supporting the roof provides a good example of supporting a particularly unstable area.
Area 29 Firs Mine  Plans 105 & 106	2349	I	Apophygate pillars, with a 3-4.5 m spacing. Two jad slots were observed, one over a bench, executed with a 1 inch hack with depths of 150 mm and 170 mm, and were 600 mm and 1280 mm from the roof respectively. Sporadic hacking from forming the apophygate arches confirms the 1 inch hack in the	This appears to be an area of pre-Allen (Phase I) extraction. The apophygate pillars and extraction methods are not dissimilar to those seen in the Allen areas, but the isolation and an absence of cart-way make it distinctive. All of the known Allen working are cart-way driven whereas this area is cut off from the early cartways. There is significant infilling of surface backfilled quarry waste throughout the northern edge.

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			<p>extraction. The area has been filled from A604 to the north-east [Quarry 2338], with material being retained from Area 30 and to the south-east by high rubble packs. A short stretch of barrow-way was seen leading to or from the shaft on the western limit. Most of the surfacing is covered in spoil or collapse. The boundary pillar seen in Area 27 continues through this area, but represents a block of unquarried stone separating the two quarries, which has been pierced at a later date. Tipping fronts and barrow-ways associated with quarry [2388] to the north-east.</p>	<p>The quarry has been driven southwards, accessed from the former surface quarry at 'Sheeps House Quarry' (Quarrymans Court), and it is likely this was also the route that the quarried stone was extracted to.</p> <p>The quarry is likely to be pre-Allen and possibly contemporary with and part of the same quarry working as [Quarry 914] in the northern part of Area 27.</p> <p>As with the pre-Allen quarry in Area 27, it suggests the open limits of the surface quarry at the beginning of the C18th during, but probably before Allen intervention and quarrying enterprise.</p>
<p>Area 30 Firs Mine</p> <p>Plan 105</p>	2338	II or III	<p>Area of corbelled and some direct pillars with a variable spacing of 4-5.5 m. The natural joint has been exploited the natural sedimentary bedding. The jad slots have been executed with a 1 inch hack, are typically 200 mm deep and set 450 mm from the roof. A 2 inch hack has been used on the hacked faces. A large four tier stepped working face is an good example of the type of extraction technique employed but does not defines the area as a whole. There are numerous areas to the south of the stepped face example where this type of working method has been used, but this remains the most complete area. This is 7 m long by 7 m high and runs perpendicular to the long boundary pillar dividing this area from Areas 27 and not 29 to the north. There are two wrist stones set adjacent to their beds on the face. Tipping from Area 29 which has been brought through from Area 604 is retained by small rubble pack. Finally, a major barrow-way runs in from the south-west, flanked by parallel tips.</p>	<p>This area is of Allen Estate or early working continuing the close exploitation of the principle northeast-southwest aligned natural jointing seen in adjacent Areas 27, 39 and 31 (and generally throughout the Byfield and Firs Mines). The stepped worked face in this area is the most extensive example stepped face working in either Byfield or Firs quarries to date.</p> <p>The quarry has similar characteristics to long room workings seen within other areas of Allen estate period workings and would suggest a comparative date for its extraction.</p> <p>The major barrow-way, orientated towards the south-west within the long room workings represents a principle extractive feature and may have been used to transport the stone to the 'Sheeps House Quarry'. The northern end of the workings are overlain by tipping associated with the later Allen estate , a later phase of contemporary quarrying in Area 604 [Quarry 2338]. The southern limits of the quarry by substantial roof collapse.</p>
<p>Area 31</p> <p>Plans 100 &amp; 105</p>	913	II or III	<p>Area of corbelled pillars with a variable spacing of 3.8-5 m. Forms a long room working from Area 27. Major instability caused by a large gull, which is partially supported by the boundary pillar this area shares with areas 27, 29 and 30. A barrow-way runs into the area from the side of the 'long room' tipping</p>	<p>This long room results from the breaching of the shared boundary pillar from Area 27, allowing them to tip into the earlier apophygate workings to the south-west. The extraction of this area is only the short stretch of long room bridging Area 27 to the apophygate workings. Further analysis is needed in this area but it seems these workings are part of a larger complex of quarrying and part of Area 27, Quarry [913].</p> <p>Re-assessment in this area in early 2007 shows it is unlikely that the boundary pillar</p>

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			out onto an earlier from an arcuate platform. This platform has in turn been sealed by lateral tipping from within the long room. The only tool-marks observed were on an intrusive bench in the south western apophygate area. These were in the form of a chamfered notch with a probable 1 inch hack.	was breached, and it is more likely that the area forms a small side room to the area 27 quarry. The area has been infilled with tipping platforms from the north and it is unclear whether there was access to the surface in the southern end of this area. The access and the direction of the quarrying extraction in Areas 27 and 31 is unclear at present.
Area 32  Plan 55	911	I	Area of apophygate pillars with a variable spacing of 2.5-3.5 m. No definable tooling or routes bar a crawl space. There is a remnant of surface to the south-west, otherwise sealed by lateral tipping and collapse. If this is a dressing floor it would explain the very high ratio of fines to small rubble in the numerous heaps across the area. One such bank of material conjoins the boundary pillar to divide the area from Area 28. Numerous stone packs retain waste stone discards and both extraction and deposition barrow-ways are noted. On the western limits there are roof supporting stone packs. A shaft located on the southern limits probably represents a well or drain.	North limit of apophygate workings. The high ratio of fines to small rubble may be from pillar formation. The apophygate pillared Long Drung cart-way Allen drive in Firs has a comparable ratio. Located beyond the corbelled workings south of H pillar. Probably pre-Allen or Allen period small-scale working. These working are certainly contemporary with the Allen workings and the absence of a cart-way are also independent workings. The western limits of this quarry have poor roof conditions and have been supported by stone packs. The area will remain inaccessible. It is likely that the western part of this quarry may be part of the Allen workings in Area 9, Quarry [505]. On the southern edge surface quarry backfilled waste overlies quarry features.
Area 33  Plan 61	913	II or III	Same as quarry in Area 31	
Area 34  Plan 174	910	I	Area of apophygate pillars at least 3.5 m high, typically 3 m x 4 m with a variable spacing on average 3 m -4 m. The pillars on the southern extent have the characteristics of long boundary pillars to give roof support. The natural joint system has been exploited, with sporadic wedge and chips noted throughout, picked chamfered jads and notches are the predominant tool markings. The area is filled with floor to roof rubble throughout with both sawn blocks and lathe-turned stones recovered. The roof has been supported in places with tall rough stone packs along what would have been barrow-way routes. No obvious barrow-ways	The quarry workings are C18th and continue well south of the Irvings incline dated to around 1800. They have been driven northwards from the surface on the southern escarpment. Lathe-turned stone artefacts and other highly decorative carved stone blocks were recovered during the works. Their recovery from the waste stone underground provides strong evidence for the production and finishing of building stone by skilled masons/quarrymen underground. The quarry waste tipping originates from the north, being deposited into previously quarried areas to the south. It is not known whether the tipping is contemporary with the C18th or is associated with later C19th quarrying to the north in archaeological Areas 2, 3 and 4.



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			were noted in plan.	
Area 35  Plans 174 & 34	910	I	Same as area 34	
Area 36  Plans 55 & 174	505	II	Apophygate pillars, typically 3 m or 4 x 2 m, some much smaller, usually in wide rooms about 2 m high. Spacing typically 5-7 m but as much as 10 m. Served by the cart-way [179] as with Area 5 above. A contemporary large diameter shaft is located at the northern end and has a later C19th, 5 m high rubble wall bisecting the centre, with a supporting stone-arched top. Highly stacked discards occupy the southern and central areas and stone packs have been used to support the roof.	Area of Ralph Allen period quarry located between the westernmost and central of three C18th cartways originating from the surface 'Jones Quarry'. The centre of the area is largely inaccessible with floor to roof discards and side tipping from the westernmost cart-way. The eastern and central cartways have been extensively consolidated along their lengths by C19th roof supporting stone packs. Each also exhibits a stone-arched support to the quarry mouth. It is supposed that the westernmost cart-way also has a supported stone arch, although there is an absence of linear supporting packs. The large circumference of the shaft with the C19th consolidation suggests that it was used as an extractive shaft, rather than a smaller air shaft, but its close proximity to the surface quarry and subsequent easy access for extracting stone is questionable. It is possible that the shaft accessed the western end of the Ralph Allen surface wooden railway and was an alternative to extraction through the surface quarry.
Area 37  Plans 56,57 & 59	506	II or III	<i>Same as Quarry 506, Area 13</i>	Primary barrow-ways routes associated with the transportation of waste stone, originating from Area 23 [Quarry 509], have in-filled most of the area and the southern part of area 14. This area remains inaccessible and could not be re-assessed before concrection.
Area 1401  Plan 150	514	III, IV	Area of corbelled and direct pillars with a variable spacing of 3 m -4 m. Extraction carried out by 100 mm deep jad slots executed by 1 inch hack. The main feature of the area is a north-south cart-way. The wheel ruts are deep with an inside gauge of 1300 mm. The cart-way is flanked with small and coarse rubble retainer packs along both flanks. Those on the west retain a level c 1.5 m higher than the cart-way surface riddled with tipping barrow ways and those to the east retain infilling to the east. The northern half of the cart-way runs immediately adjacent to a long boundary pillar which has numerous piercings filled by these retainer packs. A number of the pillar faces along the cart-way have been rubbed smooth. Sprags are prolific throughout the area. Later activity is evident in the form of sawn faces with numerous	This area constitutes the eastern limit of Byfield Estate period working, situated along the Byfield/Firs boundary pillar for the most part. There is a northward reduction of corbelled pillars as the direct cut take over. This has been seen other areas as the transition from Estate to C19th, making a diffuse boundary (see Firs Areas 211 into 502 for a comparable example). The sprags are not a post-Estate introduction and consequently are not a later addition to the southern (Estate) end of this area. Although this area comprises two periods and styles of working it constitutes a single area. The workings constitute the same contemporary working and were driven in a single enterprise from the 'Hills Shaft' northwards to Area 22. The smooth pillar faces along the cart-way suggest lateral haulage by wire rope which was not vertically fixed, smoothing the surface rather than cutting a groove. The carts were probably being loaded at the loading bay, located at the northern end of the cart-way route and then dragged back to shaft, located in the mid section of the cart-way or even back to what has been termed the 'Hills Shaft' which were surface quarry workings.

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			signatures and dates running from the latter half of the C19th through to the later 20th. See Areas 22 and 23 for description of the northern end of the Quarry [514].	Although the Firs/Byfield boundary pillar was pierced from the east this cart-way was still open and represented the easiest way of removing material. There is an open area within the boundary infilling, which was probably where the stone being loaded came from.
Area 1402  (Same as area 12)  Plan 60	520	III, IV	Area of corbelled and direct pillars with 3 m -5 m variable spacing. Extraction by 100-140 mm deep jad slots executed by 1 inch hack, located 150-230 mm from roof height. Some chamfered notches observed as well as hacked/scappelled faces which appear to have been preparing for 'breaking out'. Gullet or long wall working evident with waste stacked behind the barrow-way at the foot of the 'wall'. Parallel long rooms run south of the northernmost long wall face. A crane is evident in a number of Lewis slots on the pillars around the long wall face. Later activity or scavenging is seen in a number of undercut sawn faces with 200-250 mm jad slots executed by 1 inch hack. Scaffolding slots are cut into some of these later sawn faces, presumably to provide access to the upper beds. These are butt-ended, which distinguishes them from the crane's Lewis slots. A barrow-way runs along the long wall face to the south-east. Double wedge pits were also observed with an inverted triangular profile.	This area is of probable early C19th date suggested by its direct and corbelled pillars, jad slots and double wedge pits. There is a high ratio of corbels to direct pillars, which places the date of the area in the Estate to C19th transition (the direct pillars come into prominence later). Area 1401 represents the northward estate development from the Allen or pre-Allen apophygate working around Hill's shaft [Quarry 519]. Area 1402 (also Area 12) to the south of the apophygate workings within the same area, constitutes a later or contemporary eastern counterpart and represent a separate quarry from that driven northwards, and which are attributable to [Quarry 514].  A crane appears to have stood at the north-western end of the boundary pillar, defined by a series of lewis slots cut into the pillars, hauling material towards what has been defined as the 'Hills Shaft' and what was formally the surface quarry known as 'Sheeps House Quarry'. It may also have served to bring material back from the infilled long rooms south of the long wall. A Northwest-south-east aligned boundary pillar line seen in other Byfield areas probably divides this area from Riddle's working to the south (Area 17). The later undercut sawn faces have seriously destabilised some of the pillars removing up to 50% of the girth in some instances. In one instance where the overhead corbel became detached the robbing was abandoned mid-cut and the jad was then filled with sprag off-cuts to support the loosened corbel. The sawn faces may have been introduced from Riddle's workings (Area 17) though a greater regard for safety in Riddle's methods may suggest not. There have been no secondary pillar robbing in this quarry and the sawn faces represent contemporary extraction features. Sawn faces associated with the principal cart-way development, in the southern part of this quarry area have Lewis bolt anchorage slots cut into them and are contemporary features. This quarry was developed when the use of saws for extraction was in its infancy.
Area 1403  Plans 95 & 164	2221 &	II or IV	Area of direct pillars with some tapered examples with a variable spacing of 3 m. Extraction by chamfered jad slots executed by 1 inch hack and set 600 mm from roof. Hacked faces also utilising a 1 inch hack have associated V-shape wedge pits	This is the infilled Byfield/ Firs Quarry boundary. Extraction appears to have been carried out in the Estate period probably from A1404 to the east or by similar period working to the west (Quarry 514). The westward drive broke into A1401 and the area was infilled. The lack of sawn faces suggest that infilling occurred prior to 1830. The infilling did not quite reach the roof as in the case of the Long Drung infilling.

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
	2220	III or IV	measuring 200x160 mm. Some cutting of pillars has been carried out by 100 mm jad slots located at around 400 mm from roof height, but no secondary pillar robbing is thought to have taken place and the typology of jad slot execution, previously described by TD, has no bearing on extractive techniques. Sprags and recesses were observed. Small rubble 'box' packs were used to retain material. Some small pits dug in by pillars generally contained dumped single sprags along the north limit. Otherwise sprags were not used. No sawn faces observed.	Timber sprags were presumably used for overhead support while cutting was carried out. These were concentrated along the northern limit suggesting that this scavenging was localised. (See area 1404 and 26 for the description of the northern part of these workings).

Table 2: Firs Mine

Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
Area 101 Firs Shaft  Plan 63	2211	II or III	The shaft was about 5 m deep to the top of the workings, 7.65 m deep to general level of post-quarry use for dumping rubbish, perhaps 1.5 m deeper to the original working bottom. The width was variable, but about 4-4.5 m. It was sunk on to irregular corbelled pillars with picked, sawn and split beds. The shaft edge was vertically above three pillars but projecting from the fourth. There were beam slots and on the south side and five Lewis slots, the latter indicating a position for a post off-centre. Groove marks were found on one of the pillars.	This was probably the first major shaft sunk at Firs, probably, in view of the corbelled pillars, at the second major phase of activity. Its size indicates it was intended for winding stone, possibly by means of some form of mast crane. It is possible the original diameter was less, as unstable sides were a problem on re-opening it. It is the current main access shaft and has been shotcreted. The shaft seems to have been used as a major extraction shaft during the Ralph Allen Estate period of quarrying [Quarry 2201]. The shaft may have been employed during the mid C19th to extract stone during a later phase of pillar robbing, a contemporary crane position at the northern end of the former Allen workings could have utilised the shaft. More analysis is needed to show when the first rubbish and surface intrusive materials were deposited into the quarry. The shaft was not thought to have been employed during the early C19th quarrying activity associated with the Grand Canyon [Quarry Area 2211]. However, the length of cart-way that links all of the known Grand canyon contemporary workings extended southwards as far as the shaft, so it may have been used for ventilation shaft or perhaps as an extractive shaft during the final stages of extraction.
Area 102  Plans 63 & 75	2200 &  2201	II &  II or III	The southern extent of the area follows a cart-way, as far north as a large diameter shaft, has apophygate pillars throughout averaging 5 m x 7 m, spacing 5-7 m and greater. Areas of collapsed roof are common throughout. Sporadic wedge and chip impressions are visible and occasional hack marks, few other tool-marks noted. Quarrying has taken place in between the two parallel, N-S orientated cartways, and the majority of the area has been infilled with floor to roof rubble. Some barrow-way features survive.  Westernmost cart-way, parallel to the other contemporary easternmost cart-way in 301, with pillar and room workings known to cross between them. A large diameter shaft for extracting stone is located a few meters to the west of the cart-way. It is larger than a smaller diameter shaft sunk about 70 m in for ventilation on the easternmost cart-way. The pillars are predominantly corbelled with some direct, 6m	Former High Grade Archaeological Area. The southern extent of this area has apophygate pillars throughout and has been exploited from two parallel cartways with access from barrow-ways, for waste stone deposition and stone extraction, running along long room type extraction areas. This area of quarrying is likely to be that of the Ralph Allen period. Its total area measures approximately 61m E-W by 40 m N-S, extending up to 52 m in places. The area has some surviving barrow-way features but is largely infilled with later waste stone deposition from quarrying activity associated with Ralph Allen Estate Quarry [2201] and from later sporadic pillar robbing activity from quarry [2368].  The Allen Estate cart-way reused the southern extent of the Allen period quarry, extending the cart-way northwards from a large diameter extraction shaft sunk 70 m in from the quarry mouth which seems to be located on the interface of the two period workings. An NW-SE orientated boundary pillar, located near the extraction shaft, and seen to extend across the quarry into area 301, forms the limits of the between the Allen period quarrying to the south and the Allen Estate Quarrying activity to the north. The pillar also reflects the approximate division of the apophygate

Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
	2270	IV or V	<p>x 4 m, spacing 3.5-4.5 m .Wedge and chip impressions are more numerous than the Allen period quarrying and extraction using the Jad slot are common. Sawn faces on pillars reflect later localised pillar robbing.</p> <p>long rooms are noted on the either edge of the cart-way, and are seen to develop into gullet type features to the west and on the northern limits. Barrow-way features are seen, associated with floor to roof rubble infilling between the cart-way lengths, with rubble often stacked to within a metre of the roof.</p> <p>The end of the cart-way terminates in long rooms and a major NW-SE orientated boundary pillar marks the northern extent of the quarrying.</p> <p>Small area of late pillar robbing measuring 12 m N-S and 8 m E-W cutting into the former westernmost Allen cart-way by shaft (1210). High sawn cut pillars and natural joints exploited with rows of horizontal wedge pits and hacked faces with an approximate depth of 5-6 m in total. Lewis slots and wire rope haulage grooves cut into sawn pillars</p>	<p>and corbelled type pillars.</p> <p>The estate quarrying extraction areas of pillar and long room working are similar, with the exception that the Estate pillars are slightly smaller in size with the pillars providing greater roof support, and that the Estate pillars have a greater number of side piercings. The long room method of extraction exploits the major natural joint system which is orientated NW-SE.</p> <p>The boundary pillar, located at the northern end of the area marks the termination of northwards development for nearly a century. The boundary pillar reflects the northern end of the Ralph Allen Estate working, which was driven northwards from the former surface quarry 'Sheeps House Quarry' (Quarrymans Court). The extraction methods here are consistently more of the gullet type than the long room type.</p> <p>Small area of late pillar robbing measuring 12 m N-S and 8 m E-W cutting into the former westernmost Allen cart-way by shaft (1210). The area has exploited the eastern supporting pillar on the eastern edge of the Allen cart-way and has cut into the surface of the cart-way and the surface of late extractive barrow-way and platform associated with pillar robbing quarry [2368].</p> <p>The robbing enterprise has taken place here because of its close proximity of open shaft (1210) located 6 m to the west through which the extracted stone would have been transported.</p> <p>It is thought to be worked later than 1863 as it truncates the barrow-way and loading platform of that enterprise, and has happened before the capping of the shaft (1210). There is possibility that this was indeed the last worked carried out by James Morris associated with quarries [2367] and [2368.]</p>
Area 103 Plans 62, 63 & 80	2213	III or IV	<p>Mainly corbelled pillars with also occasional sailed pillars. Barrow-ways and associated tipping fronts bringing waste stone from the east to the west. Area remains mainly inaccessible through roof collapse and some of the area has been tipped into from Quarry 2215.</p>	<p>Quarry 2213, located on the east of the area, is the oldest quarry and was probably worked in the mid-late C18th. Most of the area is inaccessible. The southern extent of the quarry is defined by the Road 1 boundary pillar, with the western limits being defined by a large block of un-quarried stone that has subsequently been quarried by quarry [2215].</p> <p>The pillars are triangular in plan, termed as 'sailed' pillars, and have been formed that way because of a close-spaced fracture zone that appears to the north of the Road 1 boundary pillar.</p> <p>Two barrow-ways with associated lateral stacked rubble and associated tipping fronts bringing are transporting waste stone from the east to the west. This suggests that the extraction operation started on the western side of the area. The initial access into the quarry is thought to have been from the northern edge of the Allen Estate quarry [2201] to the south. The northern end of the Allen Estates westernmost cart-way extended into the area through the Road 1</p>

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
	2215	IV or V,	<p>This is a complex area in which a late period working [2215] exploited a block surrounded by earlier phases of quarrying, entered from the north from a section of surface quarry kept open for that sole purpose. Pillars are direct but with usually at least two sawn, downwards-tapered sides, worked as an open room. Numerous lewis slots throughout and an in situ Lewis shows mast cranes were used regularly for haulage. Dumping of spoil has taken place in adjacent areas and in level platforms and heaps. The older quarry [2214] is discussed in Area 406.</p> <p>Tally graffiti is noted on sawn pillars throughout the area but remained inaccessible for recording.</p>	<p>boundary pillar and must have been the primary extractive route for the exploited stone.</p> <p>The sawn phase area of quarrying is probably early to mid C19th. The quarry exploited a block of stone between three earlier quarries [2213], [2214] and [2216]. It was driven from a surface quarry to the north of North Road which was accessible and open to 1884, but soon after houses (eg Della Rosa) were built on the site.</p> <p>The quarry followed open room extraction methods and had an average height of about 4 -5 m throughout with a floor of mixed finds and small rubble. The high pillars have two or more sawn faces where the extraction was not exploiting the natural joint system. Lewis anchorage slots are seen throughout indicate the use of mast cranes for haulage.</p> <p>Low heaps of discards are noted in the centre of the area and tipping fronts at floor level, from platforms of waste, tip against the easternmost pillar boundary. High stone packs on the southern extent of the quarry, close to the Road 1 boundary pillar, partially retain the former backfilled rooms of quarry [2213].</p> <p>A tipping front of waste stone and its associated barrow-way [197] has deposited waste stone into the north-west part of Quarry from quarry [2214]. A coin of 1807 (George III) was recovered from the barrow-way make-up. The coin provides a terminus post quem for the creation of the barrow-way. However, it is now thought that the tipping front feature probably represented material displaced from the earlier quarry [2214] when quarry [2215] truncated its southernmost pillar boundary and does not represent later intrusive material.</p>
	2216	IV,	<p>Quarry [2116] has mainly direct pillars, rectangular in plan and measuring 4 m x 2 m, with spacing of 3 m. The area measures 30 m E-W and up to 60 m N-S. The area has been infilled rubble accessed from barrow-way routes and low platforms of tipping and mainly associated with quarries [2216] and [2213]. Timber sprags have been used to support the roof.</p>	<p>Quarry [2116] represents an area of quarry thought to be earlier than quarries [2217] and [2215], on the western and eastern edges. There is a possibility that the area may be attributable to part of quarry [2217] to the west and the original access into the area for extraction is not known. A side piercing in the length of the western end of the Road 1 boundary pillar (1161) could be the original access, but could easily have been established from quarry [2217] which has used the piercing to tip waste stone to the south.</p>
	2217	IV or V &	<p>Pillar are mainly direct with some corbelled, are rectangular in plan and measure 4-6 m in length, 2-3 m width, and have spacing of 4-5 m. A well- defined cart-way has parallel roof</p>	<p>Quarry [2217], located to the west, was worked in the early C19th and was accessed via a centrally placed cart-way which extends northwards towards a probable surface quarry, and eastwards into an area of collapse. The cart-way has parallel roof supporting stone packs in its central section and contemporary tally graffiti on several of the faces close to the cart-way</p>

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
	2213	III	supporting stone packs and contemporary tally graffiti. The area has been infilled with a level floor of fines. Barrow-way routes and low areas of tipping extend southwards into Areas 104 and 105 [2224]. Timber sprag roof supports are noted throughout. A frig-bob saw with wooden handles was recovered from the south of the area.	Pillar are mainly direct with some corbelled, are rectangular in plan and have spacing of 4-5 m. Where the spacing of the pillars increases to 7-9 m roof collapses have occurred.
Area 104  Plan 63	2201  2368	III  V	<p>Long-room and gullet working with corbelled pillars showing the trench of the gullet (about 5 m from floor to roof), with links to a former cart-way or large barrow-way, in front of the last section of working face, here the boundary pillar. The face has half formed pillars set out and also benches and a window. Behind the gullet, spoil from the face has been dumped behind a low rubble pack. A similar, but totally backfilled area lies on its east side, separated by a high end wall.</p> <p>Small area of secondary quarrying, contemporary with quarry [2367], and is located on the western limits of the Allen Estate quarry in Area 301. The quarry has robbed several of the long room type working pillars and has been extracted with wedge and picks, but mainly by sawn extraction. The initials 'Jm' and the date '1863' appear on one of the sawn faces. The extraction has also used the a crane for lifting or horizontal haulage and several lewis slot anchorage slots are noted on several of the pillars.</p>	<p>This is the type area for this form of working. The northern extent of this quarry is certainly associated with the Ralph Allen Estate. The southern part of the area, located close to a small circular ventilation shaft, probably defines the interface between them. The historic quarry area map will probably reflect this relationship closer with improved access to the area in the future. See Area 102.</p> <p>This area has been driven northwards form associated parallel cart-way drive.</p> <p>Small area of secondary quarrying, contemporary with quarry [2367], and is located on the western limits of the Allen Estate quarry in Area 301. On one of the sawn extracted faces in the area has written graffiti, The initials 'Jm' and the date '1863'. The author's signature has also been seen in other quarrying areas of sawn activity to the east in [Quarry 2202], including the name 'James Morris' and the date '1863'.</p> <p>The extracted stone is likely to have hauled to the west, up a tipping front on the western limits of the extraction that has had steps carved into the front to facilitate easier access. At the top of the tipping front, a level barrow-way extends through the former 'Long Room Preservation Area' and continues southwards along the westernmost Allen cart-way The barrow-way has deposited material laterally along its length and has represents the final in a sequence of barrow-way route that have deposited up to about 1 m of infilled material over the original cart-way surface.</p> <p>The stone would have been extracted along a platform of waste, a specifically designed loading platform, to the surface through shaft [1210]. This activity is the last in the area and must have taken place prior to the shaft having been capped in the mid C19th.</p>

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
Area 105  Plan 62	2224	III or IV	Possibly a westwards extension of 104, but filled to within about 1.4 m from the roof with spoil apparently derived from the north via a barrow-way passing through a piercing in the boundary pillar. The tipping front and associated barrow-way originated at later Quarry [2217] (see area 103). Long-room and gullet working with mainly corbelled pillars with some direct pillars, similar to the workings to the east. Well-defined barrow-ways with associated tipping fronts are evident along the southern limits and originated from the west. A boundary pillar defines the southern limits	The quarry seems to have been driven from the east as the infilling with later barrow-way activity. The quarry could have originated from an early surface quarry. The area was impacted by the early enabling works and has also been tipped in from later quarrying activity to the west.
Area 106  Plan 78, 79 & 62	2218	IV or V	Unstable area with crown-holing almost to surface. Corbelled pillars. Small slate-like stone with ruled scratches for tally board. two large, well- defined barrow-ways with associated tipping fronts extend southwards into Areas 108 and 114.	Area remains largely inaccessible because of substantial roof collapse. The quarry western limits are defined by a large boundary pillar dividing this quarry from Area 110 [Quarry 2219]. A small area of the quarry can be noted through a window from Area 110, but the access was limited. Two parallel barrow-ways extend southwards from the quarry into Areas 108 and 114, tipping into the northern and north-eastern limits of quarry [2224]. They are associated with large amounts of waste stone tipping fronts overlying many deposits in the northern extent of Quarry [2343] and have been developed southwards. Other similar and contemporary long barrow-way routes are also seen to tip into the northern limits of [Quarry 2342]. The quarry is largely inaccessible and is thought to have been developed from quarrying associated with surface quarries to the north of North Road, possibly contemporary with [Quarry 2219] located to the west.  Quarry 2343, to the south, that has been tipped into from quarry [2218], and was working in the early to mid C19th and has contemporary quarrying graffiti dates of 1814 and secondary dates of 1838. This would suggest that quarry 218 was indeed slightly later.
Area 107  Plans 62 & 80	2224	III or IV	Pillars form long lines either side of the rooms, corbelled but with some “sailed” due to joints, and offset across joints. Long room area with gullets at south-east end in course of filling from barrow-way leading from north-east. Barrow-way has long lateral rubble spoil tips either side. Separated from 108 by window through 8 m wide boundary pillar.	The workings may have been extended from around the western side of the Allen Estate quarry [2201], and driven along the southern face of the Road 1 boundary pillar towards the west. The north-western limits of the quarry are slightly different in character to those seen to the south within [Quarry 2343], with the pillars being smaller in size. A large boundary pillar, or un-exploited area of limestone, partially divides the quarry areas; it is possible that the western limits of quarry 2224 were driven from the west, perhaps from the northern edge of North Road. Further research is required to confirm this.
Area 108  Plan 79	2343	III, IV	Mainly direct but also corbelled pillars. Appears to be at an intersection of boundary pillars. Tipped into from Area 107 in at least on one location, associated with [Quarry 2218].	The northern limits of [Quarry 2343] are noted within this area and have been developed from the south from Area 114. See Area 114.



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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
			The area includes one possible shaft structure obscured by roof substantial collapse.	
Area 109  Plans 62 & 78	2220  2221	III or IV  III or IV  III or IV	<p>Apparently three quarries separated by boundary pillars, with a fourth boundary arm separating these from Area 110.</p> <p>[2220] Is south of the boundary pillar and has direct pillars, worked by long room and gullet and a levelled floor. Barrow-ways link to a hidden cart-way The northern end of this cart-way has never been seen as it is sealed by later barrow-way activity, but the open space of the primary transport route is inferred. The southern extent of the quarry has not been widely explored and most of the area was under concrete prior to detailed study. The route of the cart-way can be clearly seen in the Hawkins pillar plan as a wide linier route between pillars and has been driven from the north-west edge of the former surface quarry 'Sheeps House' Quarry (Quarrymans Court).(see areas 26 and 1405)</p> <p>[2221] is to the south-west of the boundary pillar and has also been driven from the former 'Sheeps House' Quarry. The quarry relationship is uncertain as the northern limits are overlain by later tipping. (see Area 1601 for description)</p> <p>The third quarry [2218] relationships with other quarries are still uncertain. It has been described in Area 106 and extends along the south-east edge of the boundary pillar. The primary feature is a large tipping front and barrow-way, transporting waste stone southwards. The area has many large roof collapses and has been systematically supported with timber sprags. Revealed by quarry [2219] on western edge.</p>	The well probably belonged to now demolished buildings east of Stonehouse Lane. Since the buildings seem to have been there in the mid C18th the well probably pre-dates the workings. The presence of older houses has probably led to the underground working of this area north of North Road.
Area 110  Plan 78	2219	IV or V	Quarry [2219] has direct pillars with a well shaft with low encircling wall penetrating the north-east end. A series of dumping platforms extend into the area from the north-west. West end has sawn blocks in small numbers at several discrete (working?) places. Unstable roof has dropped large blocks at some time but these have been removed or buried. To the east a boundary pillar has been pierced by several windows cut at high level to reveal older workings extending to the north-east [2218] (not illustrated on the Historic quarry	These workings may correspond to and undermine the former quarry road leading in from what is now Stonehouse Lane, curving slightly west of the present road. If so it may suggest a relatively late date of working. The stone packs retained infilled rooms stacked high with waste discards and supported the roof and still may have led out to surface quarry. The quarried stone was extracted northwards and the waste discards were generally bought southwards. Several partially carved pillars were recovered from the northern limits of the area which was largely infilled with waste quarry discards of inaccessible from

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
			<p>map). The workings are inaccessible.</p> <p>The quarry extends Northwest from the west end of [2219], in a “panhandle” roughly under Stonehouse Lane. It is a neat levelled area with several small stacks of dressed stone. Walled entries may have led out to the surface quarry on the northern side of the North Road. Both the above descriptions are for the same Quarry [2219].</p>	substantial roof collapses.
Area 111  Plan 78	2219	IV or V	Northern extent of Quarry 2219, as above, the area has substantial collapse throughout, deteriorating northwards under North Road and is largely inaccessible. Stone pack roof supports throughout and floor to roof rubble with occasional low open space. Finds include roughly scapped stone pillar segments.	
Area 112  Plan 169	2201  2344	II or III &  IV	<p>Allen Estate workings, same as Area 102 with a later localised deep quarry extraction area within.</p> <p>The area measures approximately 24 m e-w and 14 m n-s, and is about 5 m in height. Direct and corbelled pillars are noted with 2 m x 2 m, spacing 2 m-3 m. Hacked faces and wedge pits and chip impressions throughout. Several drawn Survey Crosses on pillars on the eastern edge indicate early C19th survey practices. The southern, northern and eastern limits defined by large boundary pillars. A central barrow-way has tipped over a former cart-way or major barrow-way which previously accessed the gullet workings in Area 104. The barrow-way was the primary stone extraction and waste stone tipping feature and was oriented on a former Ralph Allen shaft to the south in Area 102.</p>	<p>Localised area of quarrying extracting a block of stone not exploited within the Allen Estate area of quarrying on the western edge of the western parallel cart-way The Allen estate workings seem to have extended to the west and north of this block of un-exploited stone.</p> <p>The area remains open and has not been back-filled by other quarry waste from any other quarrying areas and remains the last workings in the area. It would seem to have been surveyed or demarcated prior to the extraction as there are several drawn Survey Crosses and marks on all the principle pillars on the eastern edge of the exploited block. These probably indicate early C19th survey practices and mark out the area that was to be exploited.</p> <p>The area has been worked in two principle long rooms (not the type of extraction technique), with the southern room having being developed first and then subsequently back-filled with the waste discards from the northern room. The most prominent feature in the area is a well defined central barrow-way, seen to have tipped over a former cart-way or major barrow-way previously used in the Allen Estate period . The barrow-way was the primary stone extraction and waste stone tipping feature and was oriented southwards on a former Ralph Allen shaft to the south in Area 102. The barrow-way extends towards the shaft for a distance of approximately 46 m, creating tipping fronts of waste on-route, and beyond to a large tipping front tipped into the northern limits of [Quarry 2343]. There is no obvious link to the former open Allen shaft but the shaft remains the only open access to the surface and is located 7 m to the east on the barrow-ways southern extent.</p>

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
Area 113  Plan 63	2201	II or III	See Areas 102 & 301 Quarry [2201]	Former High Grade Archaeological Area.
Area 114  Plans 75 & 96	2201  2342  2343	II  III or IV  III or IV	<p>Ralph Allen quarrying area exploited by the westernmost of two parallel cartways. See Areas 102 &amp; 701.</p> <p>Linear extraction centred on a C19th cart-way originating in the ‘Sheeps House Quarry’ and extending northwards towards northern Firs. Same as Area 109.</p> <p>Mainly direct but also corbelled pillars. Appears to be at an intersection of boundary pillars at the northern extent and Tipped into from Area 107 in at least on one location, associated with [Quarry 2218]. The area includes one possible shaft structure obscured by roof substantial collapse. The workings are linear in plan orientated along the natural joint structure and measures 80 m in length and has an approximate width of 20 m. The workings are generally open room and the area is defined on the northern and southern edges by large boundary pillars that have subsequently been pierced.</p> <p>The pillars are mainly direct with some corbelled elements, one pillar is direct with the upper two or three beds corbelled by the use of sawn extraction and is located in one of the remaining open full height working of 5-6 m. The majority of the extraction is still with wedge and picks with Jad slots and hacked faces noted throughout. Timber sprag recesses are noted throughout as are roof supporting packs.</p> <p>Linear barrow-way routes follow the linear rooms towards a possible blocked/collapsed shaft at the northern extents. The shaft is inaccessible because of substantial collapsed roof.</p> <p>quarry [2218], was working in the early to mid C19th and has contemporary quarrying graffiti dates of 1814 and secondary dates of 1838</p>	<p>The western limits of the area are probably later than the easternmost as the direction of working has been from east to west. This is not reflected in the phasing map as the periods for the later working have not been established.</p> <p>The linear extraction located on the western limits of the area (see Area 1601) originating in the ‘Sheeps House Quarry’ and extending northwards, follows a linear cart-way until it has been tipped over by a substantial tipping front originating from [Quarry 2218] to the north.</p> <p>Quarry [2243], was working in the early to mid C19th and has contemporary quarrying graffiti dates of 1814 and secondary dates of 1838.</p> <p>The linear workings are generally open room and the area is defined on the northern and southern edges by large boundary pillars that have subsequently been pierced, probably by this quarry. The southern extents are more open possibly suggesting the later area of extraction; the earlier sides may have been developed from the large probable shaft in the northern part of the area.</p> <p>The pillars are mainly direct with some corbelled elements, one pillar is direct with the upper two or three beds corbelled by the use of sawn extraction and is located in one of the remaining open full height working of 5-6 m. The majority of the extraction is still with wedge and picks with Jad slots and hacked faces noted.</p> <p>It has been tipped into by substantial tipping fronts on the north-eastern edge and the south-eastern edge, associated with quarries [2344] and [2370] respectively. It has also been tipped into by quarry [2218] on its northern extent.</p>
Area 201	2201	III or IV	long rooms running roughly east-west and south of a boundary pillar running from the Firs Shaft (101) to Area	The Area of quarrying has been driven from the west and the south towards and along the length of the large east-west orientated boundary pillar. The main

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Plans 84, 173 & 175			<p>205.</p> <p>The main pillars noted are of the corbelled type and are typically rectangular in plan and up to 15 m in length, exploiting the natural NW-SE orientated joint system and forming long rooms. Isolated pillars are on average 4.0 m in length and measuring 2.0 m in width, with an average spacing of 4 m throughout.</p> <p>Corbelled pillars and largely infilled with spoil. At the eastern end the linear directions of pillars change to east-west with long pillars between each room, some with working faces and features such as wrist stones on them. The use of Jad slots is standard at the base of the second bes below the roof and chips and wedges impressions are standard extraction techniques.</p>	<p>area has largely been infilled with floor to roof rubble on the northern limits and represents the eastern drive of the Allen Estate workings [Quarry 2201].</p> <p>The northern limits have been substantially tipped over by barrow-way routes and tipping fronts of waste derived from open piercings in the boundary pillar.</p> <p>The waste material is associated with the Grand Canyon Quarry that is attributable to the ‘Three acre Quarry’ driven by William Burgess between 1810 and 1837.</p> <p>At the eastern limits the quarry has also been impacted by the waste tipping derived from the [Quarry2203]</p>
Area 202 (Grand Canyon type area)  Plan 85, 90, 93 & 173	2211	IV, V	<p>Pillars regular and direct, some corbelled, 4 x 3 m, rising up to 8.4 m above the lowest floor. Chamfer notches and chamfer jads at the roof, but jad slots below, with sporadic use of rows of individual wedge pits. Some sawn faces on pillars, one completely inaccessible.</p> <p>Rooms 2-5 m, average 3 m.</p> <p>Entry via piercing in Boundary Pillar on west side which forms final working face, on to 3 m high large rubble and block pack.</p> <p>Timber sprags have been used as roof support throughout the workings.</p> <p>Gullet used as barrow-way and cart-way (leading westwards, out of view, towards a cart-way in Area 401), joins further way to working face in open room.</p> <p>Spoil held back by high vertical packs between pillars beyond the gullet served by barrow-way under roof.</p> <p>Inclined barrow-way leads to Area 204 to the southwest, flanked by lateral rubble dumps.</p> <p>Limestone candle box reported at open room working face tips.</p>	<p>The former High Grade Archaeological Area is the most dramatic area so far seen, a “cleft” between the high wall on the left and, over the gullet, between-pillars, rubble pack-faced spoil tips almost to the 8 m high roof level. The barrow-way has a distinct groove, rising at about 1:6 to the south and is known to enter Area 205. It appears to have been worked by both long wall and gullet, and open room methods, and may thus be transitional. The inaccessible sawn face suggests limited contemporary use of saws, although numerous other sawn faces have been examined since, but are not the standard main extraction method being adopted .</p> <p>The southern side of the area has been well defined by the boundary pillar that extends along the length of road one, and the eastern end of the working has impacted and truncated the western limits of [Quarry 2234.]The eastern end has broken into former quarries [2203], [2205] and [2334].</p> <p>There are clear phases of tipping fronts and barrow-way activity within the area. The upper limits of the quarry, extracted within two metres of the roof and forming the first areas to be extracted, have produced significant waste material. Side piercings in the southern boundary pillar forming windows, have been used for barrow-way routes driving southwards into Quarries [2201] and [2203] delivering material to substantially sized tipping fronts.</p> <p>There are also significant amounts of waste material being transported to the eastern edge of the quarry, into former Quarry [2334], on long lengths of barrow-ways with associated tipping fronts.</p> <p>At the intermediate quarry heights, at 3-6m below the roof, the waste stone has been deposited laterally into adjacent rooms, with several long room or gullets driving and extracting stone independently but at contemporary times.</p> <p>Waste at the base of the Grand Canyon has been tipped eastwards on level</p>

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				<p>barrow-way routes, also into adjacent quarries, and the most significant feature is an inclined barrow-way delivering material into Quarry [2334]. The inclined barrow-way has an overall length of 50 m with several spur routes with associated tipping fronts at the easternmost end.</p> <p>The Grand Canyon was thought to be the southernmost working of the 'Three acre Quarry' driven by William Burgess between 1810 and 1837, and represented the end of that extraction period as clay pipes recovered from the canyon have given dates to around the mid to late 1830's. However several main barrow-way routes have deposited significant quantities of waste stone on the northern edge of the canyon, from other workings to the north, suggesting that some other mine districts were still active to the north as the canyon was being driven. This can be best illustrated on the Grand Canyon main plan, Plan 173.</p> <p>Data from graffiti on sawn pillar faces in Area 203/5 may also suggest working finished after 1836.</p>
Area 203  Plan 64	2203	III or IV	<p>Direct and corbelled pillars. Dumping area, with entry blocked by last phase of dumping (into 205 –not yet accessed) via the inclined barrow-way which rises south east from 202. The barrow-way emerges from under dumped spoil and after rising at about 1:4, forms several distributorship to produce arcuate dumping platforms and fronts across the south of 203. These appear to post-date sawn faces in the area. The area includes the Boat graffiti close to an inclined (1:6) cart-way on the east boundary, which probably once served Area 202. The cart-way is the easternmost of three cartways which served the quarry; the central one of the three a spur from the westernmost. It was originally separate to the Area 202. A large boundary pillar defines the eastern limits and another separates this quarry from the Grand Canyon to the north.</p>	<p>Similar sawn faces a few metres away in Area 204, in a separate quarry, bear the name Sumsion (local quarry owners) and dates 1835 and 1836.</p> <p>The quarry is late C18 or early C19 although they may have been limited pillar robbing in the area as the cartways remained open and accessible. Barrow-way activity and tipping fronts from the Grand Canyon to the north, dated between 1810 and 1837, have overlain the workings and two windows in the Canyon have clearly broken into the northern edge of the quarry area.</p> <p>The quarry has been driven northwards, following an existing cart-way with apophygate working, from the former surface quarry located to the north of the Ralph Allen Cottages.</p>
Area 204  Plans 64 & 65	2203	III, IV	<p>Open area with direct pillars and with level rubble floor sometimes overlain by secondary spoil dumping from short barrow-ways. Possibly long room development leaving lines of long pillars with doors and windows served by adjacent cart-way which runs north-south, but may have turned west into the most northerly rooms. Includes two graffiti on sawn faces mentioning Sumsion and the dates 1835 and 1836, but also "Sumsion, Combe Down 1861" (or 1866).</p>	<p>The dates suggest an early C19th date for development, as the sawn faces only affecting beds above the rubble floor. The graffiti dates are associated with secondary pillar robbing in the western limits of the earlier probable Allen Estate quarry 2201. The graffiti dates are probably associated with the extraction in the northern limits of Quarry 2203, described above, and are seen as opportunistic robbing; other secondary sawn faces in the area are also noted.</p>
Area 205	2334	III or IV	<p>Area of long room development in which the last phase of spoil dumping from quarry [2211] took place via the long</p>	<p>The quarry has mainly corbelled pillars with neatly executed chamfered jad slots and notches throughout. The contemporary floor surface has been</p>

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Plan 64			inclined barrow-way which commences in 202. The pillars are mainly corbelled with some direct, pillars 2.2x 1.5, spacing up to 2-3 m. Chamfered jads and jads, sporadic wedge pits and hacked faces. Substantial tipping fronts and well defined and clear barrow-ways.	obscured by later barrow-way activity associated with large tipping fronts derived from the Grand Canyon inclined barrow-way, that has divided into several side tipping areas. The barrow-ways are well maintained and clean and represent the last activity in the area. The area is probably associated with the linear northwards extraction associated with cart-way (5150) on the eastern edge or from a large vertical shaft (5132).
Area 206 Plan 83	2203	III or IV	Small area close to large roof fall in which a mast crane stood (Lewis slots, wedge slots and chain grooves and impressions). It may have operated for some 8-10 m away by dragging up a small ramp. The crane position relates to the eastern end of an NW-SE orientated former cart-way	Because of the use of a crane, this may be part of the area 306 south of the fall. The area is separate from Area 306, and a large NW-SE orientated boundary pillar divides the area of quarrying. It is more likely that the crane position was located at the western end of the easternmost of two parallel cartways, associated with quarry 2203 (see area 204).The cart-way was seen to extend towards the crane position before it was sealed by roof collapse.
Area 207 Plan 64	2203	III or IV	Corbelled pillars replaced by vertical to the north, some of which are fairly small (2 x 2.5 m). Vertical jad cuts are a feature on the visible lower half of pillars. Barrow-way on the east side runs between stacked rubble packs, some clearly to support roof. May be route of former cart-way running next to the boundary pillar to the area of the Boat graffiti in 203. (southern part of quarry 2203)	Western limits of quarry 2203 following an area of inaccessible collapsed roof. A single crane location is noted at the end of the E-W orientated cart-way, south of the other contemporary NW-SE orientated cartways.
Area 208 Plans 64 and 65	2202	I &	Apophygate pillars with two full arches surviving, some large but smaller ones are often degraded. Area of apophygate pillars measures 28 m N-S and 24 m E-W. The pillars are between 2m and 4 m and rectangular pillars up to 7 m x 4 m, spacing 6 m and up to 8 m. Substantial collapse seen in between Early formation of jad slots noted, some up to 280 mm in height. A single length of cart-way route suggested, extended later by quarry [2203] to the north. Rooms are sometimes large - 7 m and even over 10 m in some size - resulting in pillar failure and some collapse. The west and southern end of 208 extends into Area 207 and has slightly curving corbelled pillars, perhaps a transition out of apophygate. A very small pillar has been excessively degraded by cutting into it using jad slots. A nearby date on a sawn face is '1824' but relates to later development of the are northwards.	The smell of roses noted in spring by the miners suggests that the area is close to surface, probably the surface quarry behind de Montalt Place. The pillar form suggests an early working phase. It is feasible that an entry was made to here from the then active quarry, to the north of the Ralph Allen Cottages..  The eastern end of the area attributable to Quarry 2202 is occupied by apophygate style workings, was probably associated with a cart-way (now hidden under roof collapse) which was later developed into a northern drive for Quarry 2203. The area has sustained frequent collapses throughout because of wide pillar spacing. The area of collapse may have been illustrated on an 1840's conveyance plan which marked the location of poor roof. The area is thought to be Pre-Allen in development.  The western end of the area, attributable to Quarry 2341, also has apophygate pillars, which are more crudely cut and seem to have no associated cart-way

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	2341	II		access. The workings are possibly pre-Allen and were also worked from a surface former quarry, perhaps later developed into the Masons House Quarry. The western extent of this quarry mainly contains surface derived clay and C20th rubbish, the western mainly sealed by substantial roof collapse.
Area 209  Plan 65	2205  2345	III or IV &  II	Pillars dominantly corbelled with some direct. A north-south rutted cart-way runs through the area, past a wide shaft (which has a low-arch cap visible from the underside). Pillars close to the cart-way are noticeably more substantial than away from it. A contemporary wall surrounds one failed pillar.  This quarry has not been accessed but pillars on the southern edge are apophygated although this could be surface frost damage or a variation/interface with the corbelled pillar.	It is possible this is the Greenaway Cartway, made over a ten year period about 1810 towards the Hadley Arms. The cart-way extends through or on the edge of earlier apophygate pillar areas which are inaccessible, towards Area 210 (also attributable to the same quarry).
Area 210  Plan 65	2206	III or IV	Mainly direct, some corbelled square pillars, some with picked or hacked faces. The occasional sawn face is also noted. Narrow barrow-ways with lateral rubble are mainly covered with later tipping from within the area. Barrow-ways and tipping fronts are originating from the north to the south, with only a single barrow-way used for access that was subsequently overlain by tipping activity. Secondary, localised, pillar robbing is illustrated by a sawn face with graffiti dating to 1886.	Continuation of quarry activity from the southern former surface quarry located to the north of the Ralph Allen Cottages. The system of working is probably contemporary with Quarry 2205 to the west. Barrow-ways and tipping fronts originating from the north to the south with no clear extraction access southwards to the surface quarry. The quarry extends quite considerably to the north although the area was only accessed on the western extents of the area.
Area 211  Plans 102 & 107	2332	III, IV	Predominately corbelled pillars and occasional direct with an average spacing of 5-6.5 m. Picking bed extraction with jad slots varying from 16-24 mm cut with 1 and 1/4inch picks. Wedge pits were evident in the roof and some chamfered notches were observed. Entablature (change in roof height) was seen on the boundary with an extra bed being extracted in this area than in the adjacent 2331. Two cartways ran through the area. The western cart-way ran directly north and was intersected at a stone capped shaft by a north west driven cart-way from 2331. Rope grooves were seen on the western cart-way indicating lateral haulage and sawn faces evidenced later scavenging and widening of the route. Graffiti was visible on these faces as signatures, dates and cartoons, providing saw extractions dates from 1841 to c1880. Scappelled faces were observed with 4 inch blade widths. Along with the timber sprags on the cart-way these constitute later additions to the area. Tipping occurred either	This area appears to be the Allen Estate (ie post 1764) extension of the Allen cart-way, terminating at the stone capped shaft. The intersecting cart-way is of the same phase but appears to have been re-driven by Greenaway 1810-1820, continuing past the shaft heading for the Hadley Arms. It is a reopening of Allen's Drung boundary cart-way in Area 212. The graffiti dates and later additions in the way of timber sprags scappelling and sawn faces pertain to Greenaways work, showing that both cartways were in use for a considerable length of time. The north-aligned cart-way has related barrow-ways and tipping sealing Greenaway north-west drive, indicating the former was in use after the latter.

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			side of the cart-way, around the shaft and forming a south-easterly arm of barrow ways toward area 2331. There were low stone packs of small rubble, retaining banks of rubble.	
Area 212  Plan 97	2331	II	Apophygate pillars with a variable spacing of 5-7 m. Picking bed extraction was used evidenced by a number of chamfered notches executed with a 1 inch pick. One jad slot was seen with a width of 100 mm, and chip impressions were present in the roof. There were two cartways in the area, splitting from a fork on the southern boundary. The eastern arm heading north-west, terminated a short way into the area and was partially sealed by tipping from Area 211. The eastern arm ran up the west side of the Drung boundary pillar (beneath the surface boundary). It was inclined, rising to the north, which coupled with the absence of cart ruts, suggested this was not the original surface. The limit of the area was delineated by entablature, from which an extra bed was removed into Area 2332. Area 213 (2330) east of the Drung and later, tips back into this area.	Further study is required. Apophygate pillars with a variable spacing centred on one definite cart-way, running under and to the east of the 'Long Drung' surface are, and another on the south-eastern boundary limits which has later interpretation would suggest was a barrow-way route possibly following the original line of a cart-way. The eastern cart-way terminated a short way into the area and was partially sealed by tipping from Quarry Area [2332], but the northern route is clearly delineated by the Hawkins pillar survey. The length of cart-way within the apophygate pillar extent was 40 m, extending for a further 30 m in length within corbelled and direct pillars probably associated with later Allen Estate periods. These later period areas need to be further assessed and have yet to be added to the overall quarry area survey.
Area 213  Plans 98 & 179	2330	III or IV	Area of corbelled pillars including two direct examples, with a variable spacing 2-5 m. The natural joint has been exploited by 100-150 mm deep jad slots executed with a 1 inch hack and set on average 480 mm from the roof. Sporadic hacking has been carried out with both 1 and 2 inch hacks, and blocks recovered from the waste display scappelling executed by 1 inch hack. A thin blade pick has also been employed, although along with a chamfered jad slot it appears to be intrusive work from Area 214. The barrow-ways are on average 1 m wide with high parallel fines and small rubble banks. Two barrow-ways run back to the Long Drung Cartway (Area 212) and a third runs in from Area 214 to the east, tipping onto an earlier sealed route from a platform. The earlier route has been gradually thinned by parallel 'box' packing forming three retaining packs. This arrangement indicates the area has been tipped into from both adjacent areas. A quantity of collapse concentrates around an east west aligned gull. The area is divided from Area 214 to the east by three high parallel roof supporting small rubble packs. There are re-cut apophygates on the western border from re-working Area 212.	This area could be an Allen Estate, but it is unlikely that the Allen or Allen Estate workings extended east of the Long Drung and that this is part of the William Burgess eastern extension from the Long Drung Cartway Area 212. It is also possible that it may originate from Area 214 to the east, however, technological differences suggest not. The opportunity has not arisen to examine the area in detail yet, but both have apophygate pillars. The area could be attributable to the Ralph Allen period quarrying, although his cart-way developments were generally served with a pair of cartways, and for this reason it can be suggested that this was not driven by Allen. The area belonging to Allen, located between the Long Drung and the Combe Road, was indicated by fir tree plantations on a detail of 'Survey of the Manours of Hampton, Claverton and Widcombe' by Thomas Thorpe. (fig. 5, Irving 2005). Although the area was owned by Allen it may have been exploited prior to the ownership, from the southern escarpment of Combe Down or indeed a surface quarry.
Area 214	2330	III, IV	Area of direct pillars with 2-3 m spacing. The natural joint	This appears to be later C18th or early C19th work based from the shaft with



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Plans 98, 130 & 179			comprising small beds, have been exploited by chamfered jad slots executed by 1 and 2 inch hacks. There are indistinct marks that may be from a thin blade pick. No sawn material recovered. The barrow-ways are 1 m wide with substantial parallel fines and small rubble banks. Small rubble packs have been used to retain material. Two benches have been cut into pillars and appear to be part of the original extraction. A frig-bob saw was recovered from a shaft on the south limit which is supported by a circular small rubble pack. A stone carrying wheel barrow was found by the shaft. The southern limits have been defined by a boundary pillar and are largely infilled with floor to roof rubble. The boundary pillar represents the northern limits of a pillar noted in Area 1207. The south-eastern limits of the quarry are inaccessible due to large roof collapses and influx of natural clay and rubble.	the circular pack or external access to the east, where collapse and clay prevented further excavation. The distinct use of chamfered jads and the frig bob and wheel barrow suggest a later C19th date for the area. Barrow-way activity has deposited waste stone southwards into Area 1207, [Quarry 2351]
Area 215 Plans 65, 67 & 101	2205 2206 2354	III or IV III or IV III or IV	Area of corbelled pillars with an average spacing of 3-5 m. The area incorporates Quarries 2205 and 2206 and the western side of Quarry 2354. The quarries were driven with similar quarrying methods and are all attributable to the late C18th/C19th transitional period.	Possible cart-way drive east of the Long Drung attributed to Greenaway. This is associated with Area (205) and not 213 to the north-west which is also corbelled. It has been suggested that the intention was to drive through the Long Drung adjoining Allen's earlier cart-way to link up to the drive north west of the domed shaft in Area 211, also attributed to Greenaway. However, these areas could equally be Burgesses.
Area 301 Plans 75, 84 & 168	2201       2367	II and III &       V	<p>Cartway with modified apophygate pillars with corbelled further in. Slight wheel ruts visible and dried slurry from ruts piled on sides. Entrance has substantial rubble stone packs to support roof and limiting gauge of 2.4 m x 2.4 m section. Long rooms penetrate about 20 m to parallel second cart-way. Small diameter shaft was sunk at the intersection of this and two other cartways. The main cart-way continues along to the wide Firs Shaft, to the north-west of which a crude flight of steps are cut into a fines bank.</p> <p>Small Area of quarrying and associated pillar robbing on the western side of the Allen Estate period quarry 2201 that has truncated the western limits of the cart-way. This area measures 7 m in length N-S and 6 m Width E-W and has a depth of 5.60 m below the roof. The quarry has been extracted by saw and there is also evidence for wedge and chip extraction methods with rows of horizontal wedge pits. The beds have been removed in</p>	<p>This is one of Allen's original entries into this area of his quarries, served by a crane from the (then) cliff-top. There has been possible widening and the apophygation has been modified or is hidden behind the stone packs. The original rooms at the entry seem to have been comparatively wide.</p> <p>This area measures 7 m in length N-S and 6 m Width E-W and has a depth of 5.60 m below the roof. It represents a mid nineteenth century pillar robbing area on the western edge of the easternmost Ralph Allen cart-way close to main Firs shaft entrance. The quarry has been extracted by saw and there is also evidence for wedge and chip extraction methods with rows of horizontal wedge pits. A Frig-Bob saw was recovered 5m away to the south of the quarrying area, leaning against a graffiti inscribed sawn face. The graffiti included the</p>

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			benches and the pillars are mainly direct.	name 'James Morris' and the date '1863'. The author's signature has also been seen in other quarrying areas of sawn activity to the east in [Quarry 2202]. The initials 'Jm' and the date '1863' appear also on a sawn face within another pillar robbing quarry [2368], within Area 113 located 14 m to the north, and is likely that the two areas are contemporary quarrying extracted by the same individual or team of quarryman.
Area 302  Plans 74 & 75	2201	III and IV	Corbelled pillars and long room workings on the east side of the Allen cart-way in area 301 and on the northern side of a later branch, a rutted cart-way that is 5 m or 6 m high heading ESE to a further small ventilation shaft. Here Lewis slots and rope or chain grooves suggest mast cranes were used either side of the east-west cart-way, (in this and in Area 303) loading from a platform some 2 m or more above the cart-way floor. A substantial floor to roof pack on the north side isolated one of the crane positions from the cart-way	Former High Grade Archaeological Area. The area has an open cart-way length of at least 26 m, located about 5-6 m below the roof level. It is believed that the initial length of cart-way was associated with the eastern development of the Allen Estate quarrying and has evidence for at least two crane locations at either end. The easternmost had several Lewis slots anchorage positions and associated chain grooves, suggesting mast cranes were used. A later stone pack was built to support a collapsed roof at the eastern crane location, isolating the former crane position. The cart-way was later re-used to serve quarry [2202] in Area 304 in the mid C19th, and it is the surviving cartruts of this period that survive.
Area 303  Plan 75	2201	II, III	Similar long room, corbelled pillar workings on the south side of the east-west cart-way See comments for Firs 302 above.	Former High Grade Archaeological Area. See above.
Area 304  Plan 75	2202	V	Vertical pillars with use of a great many timber sprags, developed as 6 m high open room. The possible last working took place at a working face in the south-west corner, where the height is over 7 m and a short ramp was used to drag stone onto the spoil-levelled floor and cart-way level. Spigots projecting from a pillar suggest a winch or pulley blocks were used for this. Most pillars have joint or split faces, with a few sawn, but two pillars on the north side have been sawn square roof to floor. The quarry has broken into older backfilled workings and packs were used to support spoil from both these and the working itself. The Hadley Arms graffito is located on a sawn face here and also dates of 1856 and 1886.	This is a dramatic area with much open space on a levelled floor. A major collapse has occurred near the entrance. The quarry has exploited a block of stone which was not extracted during the Allen Estate phase of workings. The quarry has well defined boundaries, and has broken into an earlier quarry to the south, Quarry 2340; and into Quarry 2203 on the northern and eastern limits. The initial drive would seem to have extended eastwards from the cart-way in Area 301. The quarry has deposited substantial waste stone along a steep 25 m long inclined barrow-way with tipping fronts to the east. The stone was lifted and dragged by numerous crane positions, numbering over a dozen locations. Crane anchorage positions are frequent and the mast type crane was in operation throughout. Some later pillar robbing was also carried out in the 1860's
Area 305 Plan 83	2202	V	Small area north of 306 and probably the same quarry near boundary pillar. Part of Quarry 2202	
Area 306  Plan 83	2202	V	This area extends south of a boundary pillar on the north side and linking to the east-west cart-way It is adjacent to corbelled pillar workings which seem from Lewis slots to have used cranes. There has been later scavenging using	Major collapses affect the area outside the cart-way

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			wedging and sawing of blocks from small working faces in the boundary and other pillars, one block having left a curved groove as it was rotated forward. On the north side of the pillar there are a series of largely backfilled rooms, with windows through the pillar. These are attributable to the eastern extent of Quarry 2203.	
Area 307  Plan 64	2202	V	Probably the same quarry as Area 207 with corbelled pillars with some direct. The cart-way enters a large fall. The area is attributable to the easternmost extent of Quarry 2202 and has boundary pillars to the east and north, piercing Quarry 2203 and Quarry 2340 to the south.	
Area 308  Plan 74	2201	II or III	Mainly corbelled and some direct pillars 2 m x 1 m, spacing 2 m-3 m. Chamfered jads and jad slots. Barrow-ways and tipping fonts originating from the Allen cart-way in Area 301 with the area infilled to about 2 m below the roof level. A large boundary pillar to the north supports the roof and defines the NW-SE oriented boundary pillar seen to divide the Allen and Allen Estate workings.	An area of probable Allen Estate workings located on the eastern edge of the cart-way in Area 301. The area probably marks the interface between the Allen and the Allen Estate periods. It has largely been infilled with waste stone barrowed directly from the cart-way. The eastern edge has been pierced by later C19th century quarry activity, associated with Quarry 2202, and stone packs have been built to support the earlier discards from collapsing.
Area 309  Plans 75, 99 & 100	2340	III	The pillars are mainly corbelled with some direct 2 m x 2.5 m increasing to 2 m x 4 m to support roof joints, spacing between 2 m-5 m. Jad cuts throughout, wedges and chips have been used throughout, with occasional rows of wedge pits. A central shaft with high stone packs to consolidate and fill the shaft for post quarrying use. Barrow-ways and tipping fronts throughout with a major centrally placed barrow-way used to tip waste stone into apophygate Quarry [2341] to the south. Roof supporting packs have consolidated the roof near tipping fronts. Surface debris fills western limits of the quarry from the former 'Sheeps House' quarry.	Area of corbelled quarrying originating from the surface quarry, the former 'Sheeps house' quarry (Quarrymans Court), and extending eastwards. The western limits have been infilled from the surface quarry with C20th debris and the southern limits are well defined with a solid boundary pillar. Two crane locations are suggested from Lewis slot anchorage positions on the southern boundary pillar. The northern limits are defined by a boundary pillar, pierced by later activity associated with Quarry [2202], Area 306.
Area 401  Plans 90 & 66	2211	IV	Mainly direct pillars, some corbelled, (many irregular) rectangular, 2 m x 4 m, probable boundary pillar at Grand Canyon (Firs 202). Chamfered notches and jads near roof, some jad slots lower down, timber sprags, one stone sprag. Long wall and gullet type working (Grand Canyon sub-type). Rooms 3-4 m wide, kept clear at sides of cart-way with high rubble packs holding back spoil beyond. Secondary dumping from cart-way, which is 5-6 m high, probably also, used as	Continuation of cart-way 401 between long-wall and gullet area. Either side of cart-way was kept clear for a few metres probably for working areas for scappling and storing blocks, beyond which were high rubble packs, to, or almost to, the roof. Secondary working was probably responsible for low heaps of rubble abutting the high rubble packs, possibly related to later working or scavenging of stone using saws. The workings are more open at the western end of the area.

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			spoil barrow-way. Some picked and sawn faces. Sporadic use of wedge slots. Shaft infilled with rubble including a revolver and sheet-iron etc.	
Area 402  Plans 66 & 71	2211	IV	Mainly direct pillars, some corbelled, large rectangular (many irregular) 5-6 x 2 m near cart-way, smaller on the north side. Chamfered notches and chamfered jads and jad slots, sporadic and sometimes grouped wedge slots. A few timber sprags Long wall and gullet working (Grand Canyon sub-type). Rooms generally narrow 2-3 m, sometimes 4 m wide by up to 40 m long. Sawn and picked, probably secondary working faces. Rubble packs on north side supporting rubble to within 1-2 m from roof. Secondary barrow-way and dumping platforms supported by own packs. Roof supported by large semicircular stone arch, supported between pillars on SW side of wide shaft with spoil cone spilling out. End of 6 m high rubble pack, to north of shaft also between pillars.	Continuation of cart-way on south-east side of modern roadway. Both sides still kept clear for working room for some metres back, but some dumping has taken place over the cart-way The very substantial arch and associated rubble pack and noticeably narrower rooms may reflect worsening roof conditions.
Areas 403/405  Plan 71	2211	IV	Direct, with some corbelled (possibly reflecting post-working delamination of beds and roof falls), rectangular pillars 5 x 2 m, with systematic use of jad slots and with rows of wedge pits. Systematic use of sprags. Some sawn and picked faces on pillars. Rooms 2-3 m wide, 15-20 m long. Roof above shows delamination and many falls of rock, some contemporary with working since cleared away. Large diameter shaft apparent from the spoil cone below, with adjacent room between arches on north side supported by massive 6 m high coursed rubble pack. North side has spoil to within 2-3 m of roof, without support packs, with barrow-ways linked to low platforms of spoil with arcuate dumping fronts on top. Two neatly incised crosses, one on a boulder, the other on a pillar face. A massive roof fall separates this area from the massive rubble North Road support wall.	The modern roadway (4) follows north along the Cartway 4001 projected route after the shaft, which is not visible. The narrow width of rooms and increase in number of smaller size pillars is a reflection of difficult roof conditions. Here several thin beds of limestone have laterally replaced the Bastard Stone seen further west. There is also a distinctiveness of use of jad slots and wedge pits which suggests a later phase of working than the area (402) west of the shaft. Secondary spoil appears to have been dumped on top of earlier spoil from the north side, or from barrow-ways along the north side. A spur north from roadway (4) skirts a massive roof fall which extends under the North Road. The North Road Wall runs under the southern edge of the North Road, between pillars, but is absent under the critical fall area. Modern stubs reveal use of repeated rubble-stone packs and spoil infilling in rooms developed under the road itself. Incised crosses may be surveyor's marks, which are fairly rare though several have been found in this NE Firs area. The survey crosses seem to have been introduced in the early C19th and are also noted in other early C19th quarries, see also Area 112 [Quarry 2344].  Some form of entry from the surface quarries to the north is likely.

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	Components Present Pillar type – morphology - typical plan-size Features on pillar - Method of working Room size variation and other features	Brief Summary of Archaeology
Area 404  Plan 71	2212	III or IV	<p>The quarry has mainly corbelled pillars with some direct on average 1.5 x 2 m, spacing 2-3 m but as much as 4-5 m. Jads and chamfered jads, fairly common use of wedge pits, occasional rows of. Low tipping platforms throughout the area and barrow-way activity.</p> <p>Several survey crosses are noted in the area.</p> <p>The southern and northern extents are defined by pierced boundary pillars which were originally thought to be technical developments in roof consolidation until the quarry was better accessed.</p> <p>The northern edge has floor to roof pack walls to support the north road and a single shaft possibly may have been an access for works associated with the turnpike Road on North Road.</p>	<p>Area of isolated corbelled quarrying probably driven under the North Road from a surface quarry on the northern side and seen to have been pierced by the 1810-1838 William Burgess 'Three Acre Quarry'.</p> <p>Several survey crosses noted in the area may be contemporary with the quarry or associated with the William Burgess drive southwards, as they are also seen towards the Hadley Arms.</p>
Area 406	2214	IV	<p>Area of extraction on the northern edge of the Firs quarry measuring approximately 40 m in length and 25m in width. The pillars are mainly direct with only a few corbels noted, square in plan average 2 m x 2 m, rectangular pillars are 5 m x 1.5 m; spacing 3- 3.5 m.</p> <p>Hacked faces, Jad slots are noted.</p> <p>Timber sprag recesses throughout.</p> <p>Mainly floor to roof rubble infilling with roughly stacked rubble packs either side of single open barrow-way route; A coin of 1807 (George III) was recovered from the barrow-way make-up.</p> <p>Collapsed roof throughout northern area.</p>	<p>Quarry area 2214 is located on the northern limits of area 103. The quarry has mainly direct pillars and is largely inaccessible and has been infilled with floor to roof rubble infilling.</p> <p>The quarry has a fairly well defined boundary pillar on the easternmost edge and another on the southwestern edge dividing it from quarry [2215].</p> <p>Roughly stacked rubble packs are seen either side of single, NE-SW orientated open barrow-way route. The barrow-way has been transporting stone from east to west, with what was believed to be a tipping front of waste stone at the south-eastern part of quarry, tipping into quarry [2215]. A coin of 1807 (George III) was recovered from the barrow-way make-up. The coin provides a terminus post quem for the creation of the barrow-way. However, it is now thought that the tipping front feature probably represented material displaced from the earlier quarry [2214] when quarry [2215] truncated its southernmost pillar boundary and does not represent later intrusive material.</p> <p>Quarry 2214 has probable been infilled by quarries [2212] and [2211] from the east and has been impacted by quarry [2215] on the western limits.</p>
Area 407 (Close to the Hadley Arms Steps)  Plans 71 & 72	2211 (part of quarry 2211)	IV, V	<p>Pillars are regular, direct and about 3 m square. They have systematic use of jad slots and use of sprags and rows of jad slots. Western end is a boundary pillar with windows.</p> <p>Open room working system, 6 m high and 3-4 m wide with low lateral tips and platforms linked to barrow-way.</p> <p>Substantial spoil heaps (as seen in above areas) are lacking.</p> <p>Isolated sawn and picked faces, some chamfered to let in the saw.</p> <p>There is a Lewis slot.</p> <p>A shaft, seen in the roof of about a metre diameter, is located</p>	<p>These workings occupy the area south of the North Road Wall and west of the Hadley Arms, which graffiti elsewhere suggests was utilised by miners, presumably using the steps to the yard. The steps seem to pre-date the North Road Wall, which extends west from here to the large fall noted above.</p> <p>Blocking –off of the steps at the top suggests a road widening and the wall would thus also relate to that time, perhaps when the tramway was installed down the road, c1904.</p> <p>The Lewis slot suggests the open-room working with low tips have probably been worked using a crane.</p> <p>The 'Bathite' blocks (a faced concrete block made by Tarmac at Mount Pleasant</p>

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	<b>Components Present</b> <b>Pillar type – morphology - typical plan-size</b> <b>Features on pillar - Method of working</b> <b>Room size variation and other features</b>	<b>Brief Summary of Archaeology</b>
			next to the North Road. Roof falls are less frequent, but occur. A sawn face has a cartoon figure of a top-hatted capitalist. Two sawn faces have graffiti dates of 1888 and 1889, the second celebrating the Queen Victoria Silver Jubilee, and relate to secondary pillar robbing. The massive rubble pack of the North Road wall is pierced by two corbelled arches, rising about 4 m from the floor. One leads under the road and (reportedly, has normal arching within), the second has steps leading to the roadside, partially blocked by the surface footpath at the top. A third corbelled arch is blanked-off. Two rooms between pillars are blocked with “Bathite Blocks” and there are two mounted car headlamps.	Quarry in the 1970s) give additional support for a house built next to the Hadley Arms, whilst the car lamps illuminated Saturday night gatherings (Hadley Arms landlord pers comm.) in the 1980s.
Area 408  Plan 103	2337	IV	Direct, mainly corbelled pillars, not executed by picking bed extraction through chamfered faces and 100 mm jad slots executed with 1 and 1 and 1/4 inch pick widths. Scappled (hacked) faces, wedge pits and soot marks were also observed. There were also a comparatively high number of windows.	It is unclear whether this phase is distinct from 2311. It may be the case that these two phases constitute the original Hadley plot, quarried in the early to mid C19th. Although the boundary with phase 2336 has been rendered diffuse by piercing from north to south, the technology appears to differ sufficiently to differentiate. This is supported by the line of large boundary pillars.
Area 409/410  Plan 103	2336	III or IV	Direct pillars with some corbelled examples, with average spacing of 3-4 m. Picking bed extraction has been used to exploit natural joint pattern, apparent in the form of chamfered notches and jad slots executed with 1/2 inch and 1 inch picks. Wedge and chip impressions were seen in the roof. Numerous timber sprags had been set around the southern shaft (there are two in the area) to support the roof where sawn face scavenging was also abundant. Scappelling was also seen carried out with a 4inch blade. The distinction in area numbers relates to spoiling in the area. 409 is the north half of the area which has been piled high to the roof leaving an open height of around 2 m. In 410 around the southern shaft the workings are open to around 5-6m with a gullet working leading out to area 502 (2334). Revetting stone packs had been used to maintain this open space. The waste rubble from 409 has been tipped out into area 410 around the shaft. Some windows were observed in 409 (the north area) however, as the north limit shares it shaft with 2337 these may be intrusive. The sawn faces around the southern shaft can be confirmed as intrusive, as they have	This phase of workings appear to be distinctive from most of the other areas of west Firs in that it was driven southwards possibly from the quarry in the north west corner of Prior park. There are technological similarities with south headed area/s at Byfield and with Area 902 (also driven south). The Byfield south drive has been attributed to Lord De Montalt who carried out extensive building work to the south which would have needed a good supply of stone. It seems logical that if building was being carried out to the south that the necessary quarrying might be carried out to the north. There is a duality in the technologies from the later scavenging. The excessive deposition of waste material in 409 appears to be largely attributable to piercings through the boundary from areas 407/408 (2311/2337) to the north showing that quarrying to the north dumped waste material into the area. This is more likely to have been from beyond 407/408 (the Hadley quarry). The piercing of the boundary from the west works agrees with the workings being de Montalt’s as they would therefore be earlier than the 407/408 which have been attributed to the Hadley family.

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			23cm jad slots executed with 1870's type thin bladed pick. 2336 has a pierced but apparent boundary comprising very large pillars with lengths of stone packs marking it from 2337 to the north and 2334 to the south	
Area 411  Plan 72	2391	IV or V	Area of predominant direct and some corbelled pillars, with a variable spacing of 2-3 m. No jad slots were seen most faces having been taken back to the natural joint but some sporadic hacking was observed with a 1 inch width. Sprags and sprag recesses were observed. Small rubble packs support the roof. A triangular slot was cut perpendicular to the face in one of the pillars (doesn't have any obvious purpose). The area has been extensively infilled from the north, where it has been broken into by open quarrying. Some surfacing was observed pertaining to the backfilling.	Small chambered, including Arch (Ctx 4140), area north of the corbelled arch in Area 407 where the workings meet open cast quarrying north of North road. The close proximity of the pillars is probably due to being located beneath a The North Road, that was used as part of the tramway from about 1904, with associated increased instability, (see Area 412) and small bed size. The packs supporting the roof also serve as a divider from Area 407 [Quarry Area 2211] to the south, although this may be coincidental. An open quarry located on the northern edge of North Rd may have used the area for backfilling; and it is possible that this areas was also exploited by the surface quarry. The quarry is thought to have operated prior to 1850 and again during the 1870's by Mr G Mann and was again operated in the 1900's. The area thought to be part of the same phase of working as that noted within the engineering Stub road F6, which is also north of North road further to the east. The '1889' graffiti noting Je Dowling and others, (Ctx 4150), may be contemporary with this phase of quarrying and is located to the south of the small chambered areas.
Area 412  Plan 102	2355	III or IV	Area of predominant direct and some corbelled pillars, with a variable spacing of 2.5-3.5 m. Sporadic hacking was observed on natural faces, carried out by 1 inch hack. The entire area has been infilled almost to roof level with mixed small and coarse rubble. A dumping surface was seen at 1.35 m below roof level.	On technological comparison this area is part of quarry phase [2355] along with Areas 801 and 502. The pillar spacing is tighter, which is probably a due to being beneath the Long Drung, which may have been open as a highway at the time. The location also explains the extensive infilling. To the south the Long Drung is represented below ground by a long boundary pillar which has been removed here and replicated by infilling. This indicates it was a designated large scale infilling area.
Area 413  Plan 103	2337	IV	Area of predominant direct and some corbelled pillars, with a variable spacing of 2.8-3 m. A 1 inch hack has been employed in sporadic hacking and in the one jad slot observed, which was 90mm deep and located 380 mm from the roof. Sprags and recesses for sprags were seen. Coarse and small rubble packs revetted mixed rubble, which is consistently roof high. Box packing was also seen retaining waste in a square of packs.	The tight pillar spacing is comparable to areas 411 and 412 supporting the overhead highway, in this instance North road. The low density of tool markings shows the degree of success in stripping back to the natural joint. The extensive backfilling was intended to support the roof; this is also comparable to area 411 and 412.
Area 501  Plans 93 & 101	2354	III or IV,	Area of corbelled and direct pillars with a variable spacing. Extraction by jad slots executed by 1 inch hack. These are c 98 mm deep and located 1000-1400 mm from roof height. Chamfered jad slots also used occasionally. Triangular profile (160 x 160 mm) Wedge pits occur in pairs cut both across pillar faces and into them, one of the latter had an in-	This is the south-western part of William Burgess' 3 Acre quarry which may also include Area 507. The north south cartways of these two areas form a parallel drive running up to northern boundary where they meet Area 410 the connecting minor cart-way or large barrow way on the limit serves to connect the circuit. This final stretch drives ahead of the last shafts on both cartways with stone being brought back from the northern extent. It is possible that

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	2334	III or IV	<p>situ iron chip. Sprags used with some frequency their recesses being cut by 1 inch hack. Roughly constructed rubble packs used to retain waste material. Hacked faces seen with an apparent 3 inch blade width. Scavenging evident in later sawn faces with 180mm jad slots executed by 1 inch hack. The main feature is a north south aligned cart-way with a 1200mm inner gauge between the wheel ruts. The packs retain material either side of the cart-way with a number of tipping barrow ways. The cart-way runs up the west side of Area 502 with a minor connecting cart-way connecting to the Area 502 cart-way on the northern boundary. The cart-way surface has been re-used for banker mason's rough dressing and or storage. There is a crown hole (small collapse aperture) over this area of the cart way. Fairly extensive pitting (re-excavation) has been carried out to re-access pillars during later scavenging which is evident in the undercut pillars.</p> <p>Area of corbelled pillars on the eastern edge of the Grand Canyon area</p>	<p>A507's short cart-way may have linked to the Area 501 cart-way for ventilation.</p>
Area 502  Plan 94	2355	III or IV	<p>This area sees a gradual northward increase in the ratio of direct pillars to corbelled, which inverts on the Area 211 (2332) to the south, with an average pillar spacing of 4-5 m. There is prolific usage of timber sprags and scappelled faces which are associated with large wedge pits. Extraction was carried out by chamfered jads and 170 mm (type2) jad slots executed by 1 inch hack situated 560 mm from roof height. There is a gullet working crossing the area from east to west. The north heading cart way continues from area 211 (2332) terminating at the next shaft. Lewis slots and rope grooves around the shaft indicate that it had crane fitted to lift material. A barrow way continues north of the shaft along a gullet working tipping into it at the end of the area, where it is connected to the Area 501 cart-way by a minor route. A number of mixed rubble retainer packs occur through out the area. The area of barrow way they preserve beyond the terminus shaft has been used by Sawyers to prepare blocks on. To the east of the area the Long Drung boundary is delineated by a huge area of in-filling into which numerous</p>	<p>The shift in emphasis from corbelled to direct pillars seems to indicate a final drive of the north heading cart-way. Historical deeds suggest this to have been work carried out under William Burgess. There are technological similarities with the adjacent areas/phases to the south, such as the timber sprags, usage of low packs to retain spoil and what were initially thought to be rope marks from haulage. These may alternatively be horse whipple or trestle marks. There are comparable examples on other cartways across Firs and Byfield. It seems that the southern extent of the cart-way was re-driven by Greenaway between 1810-1820 continuing as the north-west cart-way intersects the shaft in Area 211 [Quarry 2332]. The actual location of the cart-way and the area, which was later leased to William Burgess' leases and may reflect the long period of time these workings were open for (graffiti dates on sawn face scavenging run from 1815 to 1839). An extensive collapse which has been cleared from the cart-way floor further demonstrates what a vital route this was. Similarities are certainly apparent with A501 showing that they are both part of William Burgess' 3 acre quarry.</p> <p>The area in-filling of the Long Drung boundary is an important event in the area, with a comparable counterpart on the Firs/Byfield boundary. Waste is brought considerable distances along barrow ways suggesting that the area</p>



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			barrow ways run. Some of the pillars have been bound by wire ropes and intermittent soot marks show candle positions. Later scavenging is apparent in the sawn faces displaying signatures, dates and tally boards. One sawn face has a 270 mm deep jad executed by 1 inch hack. The accompanying graffiti gives providence to Thomas Trisk May 19th 1896.	either side of the Long Drung had the same owner who designated the Long Drung as a specific tipping area after its extraction. This would be a reflection on space being a scarce commodity.
Area 503  Plan 109	2362	IV or V	Direct and corbelled pillars with an average 4m pillar spacing; extracted by picking bed method apparent in the form of chamfered notches and 16-20 cm high jad slots with 1 1/4inch picks and wedge pits. There are very few tool marks as most of the stone has been taken back to the natural joints. This area sees extraction progressing east through the Drung boundary. Although 1904 is given twice on scavenging sawn faces and also seen on saw bench (387) with 'Williams' graffiti, in the eastern part of the area, the main extraction occurred between 1810-1830. The close proximity of the shafts suggests a change in conveyance from cart-way driven extraction to shaft-based extraction. The barrow ways either lead to these shafts or in-fill the east side of the Drung boundary eventually closing it off with a succession of stone packs. Spoil is generally stacked roof high in banks. (See Area 901 for more)	There are number of technological changes between the west and east sides of the boundary including pillar spacing, pick width, the absence of corbelled pillars and a slight increase in natural joint exploitation. However, the main change is from cart-way to shaft-based extraction, indicative of smaller leases with localised extraction being carried out through smaller shafts. These areas would also seem not to have extracted the Freestone to the full height workings employed elsewhere.
Area 504  Plans 110 & 130	2362	III or IV	Area of direct and corbelled pillars with a variable spacing of 2.5-4.5 m. The natural joint has been exploited by 200-350 mm deep jad slots executed by a 1 inch hack. A 1 and 3/4 inch hack has been employed on the hacked faces. Sprags and sprag recesses were observed. The main route in the area is a right angled barrow way flanked by retaining small rubble packs and fines and small rubble banks, which links two working areas. The western working area has a square cut deep excavation area in the centre and high windows on three sides which were filled or packed with small rubble. The eastern working area appears to have been abandoned mid-working due to appalling instability. It bows in the middle and has been poorly supported by two sprags. The	This is a small localised quarry of probable mid-nineteenth century date. Working derives from the rope-marked shaft out to the working areas. The production appears to have predominately comprised coping stones and roof ridging stones, suggesting a likelihood of production to order. These appear to have been stored underground, probably as no yard space was owned. This can be compared to Area 505 where stone posts have been recovered, or Area 1002 where a mantel piece support was found.

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			area has been worked from a shaft on the western limit which has deep cutting rope grooves around the edge. There are two joists mid-way up indicating that there was a platform installed, indicating that a crane was used. The shaft was capped with a stone dome. A large quantity of coping stones and ridge roofing stones were recovered along with a saw bench and triangular file. Pick marks and soot marks were extant in the roof. Later scavenging is evident in sawn-faces throughout the area except beneath the dangerous roof area. These are crudely cut at an inverse angle which probably results from the sawyer shouldering the blade.	
Area 505 Plan 160	2363	IV or V	Area of Direct and corbelled pillars with a variable spacing of 3-5 m. The natural joint has been exploited by 200 mm deep jad slots executed by 1 inch hack, some chamfered notches seen. A 4½ inch hack blade has been used to widen some of the jads. The area has a thin east to west boundary pillar on its northern limit which is pierced by a pack supported shaft to the north west, which may have been shared with Area 506 north of the boundary. The boundary has been pierced which in conjunction which finds waste heaps belonging to A506 have been cut into, showing A505 to be the later quarry. The area is divided from Area 504 by backfilling which demonstrates a northern retreat up to the boundary fill to the south reaching roof height. This backfilling also divides Area 505 from Area 1201 to the south-east. The main features of this area were two roughly parallel barrow ways running close to the roof from south to north. Some spragging was observed with associated hacked faces. Mixed rubble retainer packs were constructed nearly up to the roof. Two cut stone posts were recovered. Finally two parallel barrow ways tipped into areas 1201 and 504 running back to the shaft on the north limit.	This is a small area of probable early to mid C19th date. The pierced northern boundary shows it to be later than the workings to the north where as the distinction from Area 504 to the south is mainly in the back filling and 504's contained quality. Both are small scale workings, which may have originally been one area. Access into Area 1201 to the south east would have been available prior to backfilling. However, intrusive activity is not well evidenced (see A1201). The sprags in A505 although scarce suggest a post 1800 date.
Area 506 Plan 161	2364	III or IV	Area of direct pillars with a variable spacing of 1.8-3.5 m. Extraction by chamfered jad slot executed by 1 inch hack, located 300 and 350 mm from roof height (eg's). Jadding bed is poorly preserved so few examples. Southern half of area is stacked high with rubble, one extant barrow way. More open to west where a wider barrow way follows the large east west aligned boundary it shares with A1102. A number of chamfered and 120 mm deep jads are cut into the boundary	This area is the same as A1101 to the west. They are divided by in-filling brought into the area from further east. The density of backfilling to the south where A506 meets A505 suggests that was the first part to be completed. The jad slots on the boundary pillar are not seen in the infilled area which may suggest they are a later addition from the workings to the east. Documentary evidence shows it to be the work of Frederick Cross embarked upon in 1831

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Areas 507, 508 & 509  Plans 126 & 161	2363	IV,V	Evenly distributed direct and corbelled pillars with a variable spacing of 3-5m executed by chamfered jad slots using a 1 inch hack and situated close to the roof at c 100 mm. Some chamfered notches seen with 1inch pick width. Two 200 mm jad slots executed by 1 inch hack (depth suggests they are later). Wide blade hacking executed by 2 ¼ inch hack. The main feature is a north west driven cart-way stemming from the capped shaft in Area 211 following long wall or gullet working to the south with 2-3 m small rubble packs retaining material either side. Some use of timber sprags which concentrate around the capped shaft where it intersects the northbound cart-way in Area 211. Cartway is largely sealed by dumping barrow ways from shaft and Area 501.	The north west heading stretch of cart-way which forms the primary route through this area appears to be a continuation of the Allen's Drung boundary cart-way running through area 211 (2331). It may have been driven by Greenaway 1810-20, forming a new stretch to be connected to a contemporary drive east of the Long Drung (Area 215) by re-driving Allen's original stretch. A likely starting point for the drive would be the stone-capped shaft where it meets the north heading cart way. The collusion of different working periods making it hard to determine an exact starting point, or even to be certain that this isn't part of William Burgess' adjacent working to the north. The long wall pillar south of the cart-way is also the boundary to the Estate period. Alternately it may be an attempt by Burgesses to connect his parallel cartways for ventilation.
Area 601  Plans 83 & 99	2340	III	Area of direct and a few corbelled pillars with a variable spacing of 4-6 m. The natural joint has been exploited by 100-160 mm deep jad slots executed with a 1 inch hack. Pick marks were observed, as well as a sprag recess. On the west limit was a 3 m long stepped working face with triangular slots cut either side. The centre of the area has a deeper extraction with rope grooves and lewis slots on the surrounding pillars indicating that a crane was used. A shaft on the west limit supported by small and coarse rubble packs also had rope marks on surrounding pillars. This suggests either two cranes, one to lift from the deep extraction and second by the shaft, or one crane serving for both. There is a large boundary pillar on the north limit. The barrow ways which mainly run around the top of the deep extraction area was around 1.5 m wide tipping out into it. Further routes ran in from the adjacent area to the west by the shaft. There were a number of sawn faces with tally boards, signatures and dates. The deep extraction area wasn't sawn placing it in the original extraction or interim. Routes ran out into Area 602 to the south and tipped into 601 from it where material was brought from the east. The packs around the shaft appear to have sealed off access in the north west corner.	The extraction of the area is mid-late eighteenth century, extending from the un-examined area to the west which runs back towards Ivy house. The area re-uses part of Area 602 apophygate workings to the south for dumping and suggested by tipping platforms and by the introduction of sawn material in later consolidating packs. The sawn material was used to consolidate the roof for safe tipping into the Apophygate quarrying area [2341]; access to the shaft was not used and the extracted stone was transported westwards to the former 'Sheeps House' surface quarry. The sawn faces and thin-blade picks relate to later extraction.
Area 602	2341	I	Area of apophygate and a few corbelled pillars with a variable spacing of 4-5 m. The natural joint has been exploited to form the arches. The only tool marks observed were 2 hacked faces carried out by 1 inch hack. The area has	This is a western extension of the Allen workings of the 'Sheeps House Quarry' cartways, heading back toward Ivy house. It may be a second attempt to link the two pairs of cartways or merely some side workings. It also serves as later access between Areas 601, 603 and 604.

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Plans 83 & 99			two distinct phases. The extraction phase includes some small rubble packs. The second phases are evidenced by tipping barrow ways, surfaces and small rubble packs with sawn material in their build, associated with Quarry 2340.	
Area 603  Plans 99 & 153	2341  2338	I &  II or III	Area of corbelled pillars with a variable spacing of 4.5-5.5 m. The natural joint has been exploited by 200 mm deep jad slots executed by a 1 inch hack. Some of these were packed with single pieces of rubble in the second phase re-access. The collapse seen in Area 601 is even more extensive with the second phase barrow ways running out to Area 604 and to 'Sheeps House Quarry to the east. At the most extensive point of collapse a circular pack was supporting the failing roof. Further modern collapse has occurred since the second phase historical collapse.	Allen Estate or early C19th extension from 'Sheeps House Quarry'. Has the same sequence as the adjacent areas. The northern limits of this archaeological area are attributable to the pre-Allen workings in area 602 [Quarry 2341].  The eastern extent is associated with the Allen Estate workings [Quarry 2338]. The northern extent of this quarry is sealed by backfilled surface quarry waste and rubbish and the floor is fairly level with low lateral finds tipping.
Area 604  Plans 100, 106, 153 & 170	2338  2347	II or III  I	Area of corbelled pillars with a variable spacing of 3.5-5 m. The natural joint has been exploited by 150mm deep jad slots executed by a 1 inch hack. Small rubble packs retain small rubble and fines. The area breaks into A29 Byfield where there is an abortive pillar. The same collapse and re-use sequence applies as with Area 602 and 603. An extensive surfaced area was recorded at a high level over the mid-phase collapse which results from second phase dumping. A recent sewer and buttress have been installed from one of the over head properties on the west limit.  Area of quarry to the south of quarry [2338], former High Grade Archaeological Area. The area measures approximately 40 m E-W and 36 m N-S, with a long room of some 16m on the western limits. The quarry has well defined on the western and eastern limits by boundary pillars and has been broken into on the southern limits by quarry [2348] and possibly on the north-western edge by quarry 2338. The area has corbelled pillars throughout, 4m x 2 m, with	The extraction of this area is the same as Area 603. The secondary re-use is for dumping. There is no apparent sawn material in the packs so they may have just been tipping into the area. This tipping extends into Area 30 through Area 29 where it is retained by stone packs. Barrow-ways with substantial tipping platforms have deposited waste stone within the apophygate quarry to the north and the early C18th quarrying [Quarry 2347] to the south.  The southern extent is associated with pre-Allen workings [Quarry 2347] and was accessed from E4 stub. The area has corbelled pillars throughout with large overhangs, in some instances these extent for up to 3 m beyond the vertical aspects of the pillar. Long lengths of Jad slots help define the quarry limits. The corbelled type pillars are thought to be typically mid-late C18th but the presence of an inscribed '1725' on a pillar face would suggest otherwise, see

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			<p>spacing g between 4-6 m. The corbells are very large and overhang up to 3m from the pillar in many instances. The occasional Jad Cut pillars are noted and the sporadic use of wedge pits are seen but are not grouped. Numerous long Jad slots, typically with a height of 175 mm and lengths of up to 12m, are noted on the boundary pillars and on a large centrally located block of un-quarried stone. These help to define the quarry boundaries. No sawn faces are noted within the area, directly in contrast to quarry 2348 to the south. A circular well in the north of the area contained two C19th lengths of pump rods extending into it from the surface. It provided water to two neighbouring cottages adjacent to the former Carriage Inn.</p> <p>A small drain north of the well contained surface derived wash-out from which early C18th artefacts were recovered. Barrow-way routes are noted in the western edge to dispose of waste stone and another central route is strewn with small sawn blocks. There is a 12 m length of cart-way on the northern extent with lateral stone packs to support waste stone.</p>	<p>below. The area was largely impacted prior to the drawn survey although a few barrow-way routes are noted, several of which had discarded sawn blocks on their lateral tips.</p> <p>There is a cart-way length of 12 m on the northern extent with lateral stone packs to support waste stone. A clay pipe recovered in the 1990's from the top of the pack dated to the 1720's. It is not known for sure whether this is contemporary with or is part of quarry [2347] but the clay pipe date is fairly consistent with the inscribed graffiti It has been tipped over on the northern and southern limits by barrow-way tipping fronts, on the south from activity possibly associated with quarry 2348, and on the north by quarry 2338 representing development from 'Sheeps house Quarry' southwards from [2338]. A circular well in the north of the area contained two lengths of C19th pump rods. It provided water to two neighbouring cottages adjacent to the former Carriage Inn (now a newsagents). The well is thought to be C18th in date and a greyish brown clay, thought to have derived from Fullers Earth, immediately surrounding the structure and is assumed to be the clean-out material from when the pump rods were inserted.</p> <p>A small square drain located a few metres to the north of the well was filled with washed out material from the surface. The drain is thought to have been constructed to drain water from the road besides the former Carriage Inn. The material had the appearance of being maintained and diverted around the well, presumably to avoid pollution. Pottery, including blue and grey Westerwald jugs, silver spoons and clay pipes, recovered from the material in the 1980's, dates between 1720 and Circa 1750.</p> <p>On the southwestern margins of the quarry the Stub E4 impacted a floor-to-roof stone pack, in dismantling it, the miners found two stones, each with the initials RJ (the "J" a crossed "I"), carefully placed at eye level either side of the pack. A further stone, discovered later in a remaining part of the pack, at the side had a sawn face of a small block lightly inscribed "XX 1X" (was this a date?). On the a pillar face to the north an inscription was noted, carved into the rock "JM 1725". Taken together with the relatively early pottery recovered from the area around the well [6100], suggest the workings as probably pre Ralph Allen, with at least a possibility that the RJ stood for Richard Jones. In 1725 he was apprenticed to John Pitcher, who had leased a quarry at Combe Down in 1723. Richard Jones, in 1729 became Allen's clerk, effectively, manager of Allen's stone quarrying and mason interests. It thus seems possible that the E4 Stub [2347] had cut through John Pitcher the Elder's quarry, and that the unusual and neat working methods belonged to him and his banker masons, perhaps in contrast to the later larger-scale stone (rough block removal) business in which Allen perceived his best interest.</p>

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				<p>It is not certain why the “RJ” pack was built across the contemporary passage; it may have been to assist ventilation, though more likely it formed an ownership division of the workings.</p> <p>The discovery is particularly important, not only for its possible connections with Richard Jones, but also because it shows that not all early workings are necessarily characterised by the apophygate pillars seen in known Allen workings, and that the jad slot features that are normally associate with the late Allen or the Allen Estate periods have had an earlier history.</p>
<p>Area 605</p> <p>Plans 170 &amp; 153</p>	<p>2348</p>	<p>II or III</p>	<p>The quarry measures approximately 26 m NW-SE and is 12 m wide. It has been defined by boundary pillars on the southern and northern extents and has been driven from quarry [2347] to the north.</p> <p>The pillars are mainly direct, with a single corbelled pillar to support a localised section of roof and are arranged in two parallel working areas little more than three metres wide with a single partially pierced long pillars of rock left in between. Sawn faces are noted throughout with the occasional Jad Cut also noted. Wedge pits and horizontal rows of wedge pits are noted.</p>	<p>Quarry 2348 is located on the south of the area 2347, accessed from Stub E5. It has two parallel working areas little more than three metres wide with long pillars of rock left in between. On the northern and southern extents a solid boundary pillar exists, with the remnants of another at the northern extent, partially dividing it from quarry [2347]. The southern end of the workings are full height at about 5m, and shows near vertical fractures which would have yielded only small blocks of stone; the fractured zone may have made an easy access forward to extract better beds either side. The south east end has rows of horizontal wedge slots indicating extraction methods, and the quarry has also been exploited by sawn extraction. The activity does not extend northwards into quarry 2347 where no sawn faces are noted throughout that area. Their presence suggests that the later common use of saws on faces and blocks (c.1800 onwards seems general) are also employed at a much earlier date underground locally, just as it had at surface. The quarry is thought to have been extracted later than [2347] but still exploited in the C18th.</p> <p>Against the southern boundary quarry face were three carved stone capitals were recovered, making it clear that banker-mason work was indeed carried out there underground before finished pieces were recovered to the surface. A barrow-way on the northern limits of this area has numerous sawn blocks which seems to extend to the west towards a remnant of cart-way. It is not clear where the blocks of stone from this area were extracted to, but access was possibly towards the church Road to the south from a former surface quarry that was later developed by Ralph Allen, 'Masonry House Quarry'.</p>
<p>Area 606</p> <p>Plan 170</p>	<p>2346</p>	<p>III</p>	<p>Isolated quarry located to the north of the Ralph Allen workers cottages on Church Road. The quarry remains inaccessible except through one of the cottages and has been largely sealed off from access since it was isolated from the former surface quarry, located to the north of the Ralph Allen cottages which name has not survived.</p> <p>The tool markings consisted of benches of worked stone and vertical faces of natural pillar face, largely exploiting the</p>	<p>Isolated quarry from the main Combe Down complex and now only accessible through the House of No.89 Church Road.</p> <p>The quarry is thought to have been driven southwards from a former open surface quarry that was located to the north of the Ralph Allen Cottages. The name of the surface quarry does not seem to have survived but the eastern limits of the quarry were exploited by William Burgess in the early C19th.</p> <p>The quarry was not accessed before August 2008, but some of the finds from within the quarry were collected by one of the owners of No.89 Church Rd</p>

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			<p>natural pillar joint system. Wedges and chips were used as standard and several of the impressions were drawn. Jad slots of between 120 mm and 330 mm were noted both in the first and second beds below the roof. Several chamfered jad slots were also noted. The first bed below the roof would have been easily separable from the roof as few wedge impressions are noted on the roof.</p> <p>A small triangular shaped hole in the roof, measuring 1.5 m by 1.5 m, had been infilled with two sawn blocks and probably represented a drain dug from the surface and not part of the original quarrying features.</p>	<p>who live within one of the former Ralph Allen cottages. The owners have kindly donated the pottery and clay pipe artefacts to add to the archaeological interpretation.</p> <p>The recovered pottery types mostly include Staffordshire white salt-glazed stoneware from c1760s+, Small amounts of Creamware c1770+ and a largely complete C18th Staffordshire trailed slipware jar.</p> <p>The recovered material was not recovered from known archaeological contexts from within the quarry, and the majority of the finds are thought to have been recovered from surface quarry backfilled material (6095) noted on the northern limits of the quarry [Quarry 2346]. The pottery suggests a quarrying extraction period from the early- mid 18<sup>th</sup> Century.</p> <p>In August 2008 the quarry became accessible for the first time to more detailed survey. This was only achieved when the lower proportions of the quarry had already been infilled with concrete as part of the stabilisation process to form a level floor for access and to stabilise some of the gulls and fractured joints within the pillars. Except for a couple of photographs which were taken during the early stages of archaeological assessment back in 2001, none of the quarry floor extent remains for exploration. There are however a fairly good representation of surviving tool markings and bench workings surviving within the upper two meters of the quarry.</p>
Area 701  Plan 75	2200	II	<p>Area of apophygate pillars with a variable spacing of 3-4 m. Natural joint exploited to form pillars then later re-exploited in a few instances by 150-200 mm jad slots. An east west track-way running out of this long room working forms the mainstay of the area linking the two Allen Ivy house cartways. A concave 1m wide barrow way runs through the adjacent to or from the eastern cart-way A 2 inch hack has been employed in sporadic and patch hacking. Two small and coarse rubble packs were observed toward the western cart-way</p>	<p>Track-way linkage between the two Ivy house cartways with tipping either side from barrow ways. Interestingly, the chamfered jads seen to the east of the east Ivy house cart-way do not occur here.</p> <p>The area is on the southern side of the supposed Allen/Allen Estate boundary and should be looked at within the context of Quarries 2200 and 2201, see Areas 102 and 303.</p>
Area 801  Plan 102	2335	III or IV	<p>Area of direct and some corbelled pillars with a variable spacing of 2.5-4.5m. The natural joint has been exploited by chamfered jad slots executed by 1 inch hack and located around 200mm from the roof. Sporadic hacking also occurs, also carried out by 1 inch hack. Pick marks were observed. A long east west aligned boundary pillar marked the southern limit of the Long Drung in-filling area. Graffiti was seen on the natural face of this pillar reading IB 8th 11 1830. There are two phases of barrow ways and associated tipping of fines and small rubble, pertaining to the Long Drung in-</p>	<p>This area is part of phase 2335 along with Area 502. The limits of 801 span east of the north area of the William Burgess' cart-way extension to the long Drung in-filling. Northwards it meets Area 411 and 413 and to the south Areas 502 and 503. Activity in the area relates to either the in-filling of the Long Drung or the east side of 'William Burgess' cart-way where material is retained up to 2m high by small rubble packs.</p>

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			filling. Sprags and sprag recesses were observed along with a pillar that appeared to have been bound in rope or wire, perhaps for stability. Small rubble packs have been used to retain spoil along the cart-way and across the area generally.	
Area 901  Plan 102	2361	III or IV	Area of direct and some corbelled pillars with a variable spacing of 3-4m. The natural joint has been exploited by 100-180 mm deep jad slots executed by 1 inch hack. Sporadic hacking appears to have been carried out by 1 inch and a 1 and 3/4 inch blade. The area's major feature is a north south barrow way running up from the shaft on the east side of area 503. In-filling has been carried out along either side of the route and is generally retained by small rubble packs. On the west side it is higher stacked and better retained forming consecutive runs of pack between pillars; this side comprises the eastern half of the Long Drung in-filling. The north end of the barrow way is sealed by lateral tipping which in conjunction with the high level of surrounding material indicates that capacity was reached and the retreat ran southwards. Area 901 is divided from 902 by the infilling and packs on the eastern side. At the north end of the north south barrow way a largely sealed barrow way runs west into the Long Drung in-filling suggesting that this may be its northern limit. A 'box' pack was recorded on the eastern limit. Rope marks were seen on a pillar on the western side of the main barrow way, which appear to indicate that lateral haulage was running south along the barrow way to the area 503 shaft.	Extraction in this area is probably part of phase 2334 along with Areas 801 and 502, (which may be contested by the 1 3/4 inch hack). This probably results from the eastern expansion of William Burgess' area up to the east limit of the Drung possibly further which was subsequently consolidated by the in-filling. The lateral haulage rope marks may pertain to underground storage and have comparable examples on in Area 209 and in Byfield. These seem to occur at that transitional point between Allen and Allen Estate (II-III). The shaft in the south east corner of Area 502 which the 901 rope marks run back to may be the north limit of the workings associated with Allen's Long Drung cart-way
Area 902  Plan 104	2361	III or IV	Area of direct and some corbelled pillars with variable spacing of 3-4 m, tightening to 2.3 m in very unstable areas particularly around a gull. The natural joint has been exploited by jad slots with no clear tooling. The majority of these are 100 mm yet there are a few 200 mm examples, which diagnostic tooling might have revealed as a later phase. A few sprags were seen along with recesses executed by 1 inch hack; this is joined by a 3 inch blade on the hacked faces. Intermittent pick marks were observed. The area's shaft has a stone capping which appears to be later than those seen in areas 209 and 207 as it has cement in the build. One sawn face was observed with a tally board and a small water bowl had been cut into a pillar ledge. Some windows and	The extraction of this area appears to be distinct from Area 901. There are similarities between this area and Area 410 which has been attributed to De Montalt who was working at the end of the 18th century. Further comparable examples can be seen in the southern driven area/s at Byfield which have also been attributed to De Montalt. It is not clear yet but this seems likely. If this is the case it would imply that Thomas' work spanned across the Long Drung. In support of such an interpretation the back-filling has been carried out from a northward retreat. There are a few shafts in the area showing that extraction was shaft rather cart-way based, as is area 410. It was clearly divided from Area 901 by the western line of packs and in-filling and characteristically more disorderly than 901.



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	2366	IV or V	<p>faces were retained between pillars on the east west jointing alignment. The barrow ways were moderately large and had associated tipping platforms. There was a sizeable quantity of spoil in the area in the form of heaps or retained by small rubble packs. A very severe gull crossed the north limit explaining the high volume of collapse throughout the area.</p> <p>Area of direct pillars with the occasional corbelled, measuring approximately 70 m E-W and 30 m N-S. The pillars are square 3 m x 4 m, with 4-5 m spacing and have been worked in an open room extraction. See Area 905 for more description.</p>	
Area 903 Plan 156	2366	IV or V	Same as 905.	
Area 904 Plans 115, 116, 156 & 157	2356	IV or V	<p>Area of quarry largely inaccessible to the survey because of substantial floor to roof infilling throughout.</p> <p>Direct pillars measuring 4 m x 2 m and 6 m x 2 m, with spacing of between 2-4 m. The close spacing is reflective of the poor condition and thinness of the beds noted in the northern Firs quarry.</p> <p>The extraction has exploited the natural joint system and only the occasional sawn face is noted. A single sawn face with tally graffiti (9042) was removed with the silicon rubber retrieval method.</p> <p>The area has largely been infilled with floor to roof rubble throughout retained by poorly constructed stone packs. A single length of barrow-way route, remaining largely open throughout its length was noted. Barrow-way (9050) was orientated NW-SE, measured 1 m in width and had an overall length in excess of 80 m. The route was flanked with vertical floor to roof stone packs that retained rooms full of floor to roof discards. The length may have been attributable to one phase of working or could have been extended of re-used by many enterprises.</p>	<p>The area is well defined on its northern limits by the North Road boundary pillar, other smaller lengths of boundary pillar are noted throughout but could equally have been un-exploited areas of stone or larger roof supporting roof pillars. The area is likely to have been further subdivided into smaller quarrying areas, under separate quarry ownership, but overall access is very restricted. Further analysis of the pillar data will probably better subdivide the area, especially when it is combined with historical maps, quarry leases and house indentures details.</p>
Area 905 Plans 104, 112, 119 & 120	2366	IV or V	Area of direct pillars with the occasional corbelled, measuring approximately 70 m E-W and 30 m N-S. The pillars are square 3 m x 4 m, with 4-5 m spacing and have been worked in an open room extraction.	<p>The quarry area has possibly been developed northwards from quarry [2361] to the south, but could equally been extended from a single extraction shaft. The area contains two definable well shafts and two possible extraction shafts. One of the shafts located on the southern extent of the quarry (9045) may be</p>

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			<p>The northern extent of the area is fairly well defined by a boundary pillar, and the westernmost has the remnants of a boundary pillar that has subsequently been pierced several times.</p> <p>The area contains two definable well shafts and two possible extraction shafts. One of the shafts located on the southern extent of the quarry (9045) may be attributable to this working or associated with the northernmost extent of a cart-way from quarry [2361. The other shaft (9036) is 2 m in diameter and has been barrel vaulted and probably represents the primary extraction shaft for the area.</p> <p>Some areas of open floors and associated barrow-way routes with lateral tips of fines and rubble spoilbanks.</p>	<p>attributable to this working or associated with the northernmost extent of a cart-way from quarry [2361. The other shaft (9036) is 2 m in diameter and has been barrel vaulted and probably represents the primary extraction shaft for the area. Some areas of open floors survive open to a depth of 2.50 m below the roof level, associated barrow-way routes with lateral tips of fines and rubble spoilbanks are also noted. Given the height of the floor levels and areas of rubble deposits within 2.50 m below the roof, it would suggest that a greater height of stone was extracted before the deposition occurred, in contrast to the smaller workings attributable to single property where only 2.5 -3.5 m were worked. The workings are probably at the northernmost part of the main south-north direction of development seen in the Far eastern Firs quarry.</p>
Area 1000  Plan 128		IV, V	<p>Area of direct pillars with 1.5-3.5 m spacing. One possible jad slot observed which appears to have been executed by a 1 inch hack. It was 200 mm deep and located 480 mm from the roof. Hacked faces were carried out by 1 inch hack. There was one small barrow way running through the area to a pair of shafts, flanked by small rubble and fines banks. A 2 inch hack has been employed around the eastern shaft; this may be associated with later sawn face with thin blade picking.</p>	<p>Localised shaft based quarry of mid to later C19th date. It re-uses Area 214 to the south for access to the pack supported shaft. The chamfered jad slots of Area 214 distinguish the two areas.</p>
Area 1002  Plan 128	2353 & 2358	VI	<p>Sawn pillar gallery with a variable spacing of 2-3 m. The pillars have been executed by 200-230 mm jad slots driven with a pointed pick. Horizontal spragging has been employed and fits into the use of this method employed in quarries of the latter C19th and early C20th. There are two shafts in the area which are very close to a third which pertains to Area 1001 to the south. The eastern shaft has delaminated through extensive collapse whereas the western shaft is in good condition and has barrel vaulted capping. Graffiti on the sawn faces provides the names Charlie Prescott and Mr Arthur Nowles along with some initials and dates in 1891.</p> <p>There is also a cartoon of a bandy legged man with a walking stick. Rope marks on the sawn faces and small bench by the shaft show that a crane with snatch block was in use.</p>	<p>Sawn gallery dating to 1891. It was initially considered that this may be a reworking of Area 1001 or 503 however, the consistent sawn faces show it to be a distinct working. The horizontal spragging on the boundary supported a last wedge of stone retaining the backfill of Area 503 constituting a narrowly averted disaster. The jad slots have comparable example in the scavenging of adjacent Areas 503 and 504 which are also executed by a narrow width pick and also have variable depths of 200-230 mm. Reference to the local postal records has revealed that Charlie Prescott lived at 6 Alma Place at the beginning of the C20th and, although Arthur Nowles is not listed, other Nowles provide a likely address. Finally, we may assume that as he has the title 'Mister' on both pieces of graffiti bearing his signature, that he may have been the Quarrymaster. The graffiti was recovered using both the silicon rubber retrieval method and by directly sawing the graffiti face from the pillar. The examples were used to test both the methods in their infancy's.</p>

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Area 1003  Plans 98 and 109	2361	IV or V	Quarry 2361 is largely inaccessible through floor to roof rubble. The pillars are direct 3 m x 5 m with 4-5 m spacing. The northern edge is defined by a large boundary pillar and the western edge by collapsed roof.	
Area 1101  Plan 115	2363	IV or V	Area of corbelled and direct pillars with definite form and regular spacing varying from to 2-3.5 m. One inch hacking was observed on the pillar faces Sprags are employed but appear to be a later addition contemporary with the pitting carried out to re-access pillars for robbing by sawn extraction. There are two shafts in the area. The closest to the modern road way had a diameter of less than 2 m and grooves running around its lip, which are thin enough to suggest wires were used. This shaft is probably a later addition for scavenging. Small rubble packs retain rubble and fines. The area has a long boundary pillar running east to west on the north limit. This continues through Area 506.	Same as area 506 differing in having later robbing radiating around the shaft. The north boundary shared by both areas has been pierced here into Area 1102. Later spoiling into the south west part of the area has divided 506 and 1101 into two areas. A1101 was effectively sealed off from the later activity in 506. This may be reflected in the type 2 jad slots along the boundary pillar in A506, which as in the South of A506 are not seen in A1101.
Area 1102  Plans 121 & 120	2357	IV or V	Area of corbelled pillars and occasional direct with a variable spacing of 2.5-3.5 m. Apparently extracted by 150 mm deep jad slots executed by 1 inch hack set 150 mm, 460 mm and 330 mm (egs) from roof (1 bed to apex) although considering the overall scarcity, these may be intrusions from Area 1101. A double jad was observed measuring 160 mm upper and 100 mm lower set 220 mm from the roof. There are sprag recesses but very few in-situ sprags which are a later addition from A1101. One soot mark was seen. There were a few horizontal rope marks suggesting lateral haulage. The area is heavily infilled with waste with a variable void depth of 1.4-2 m; the surface is covered by tipping barrow ways. Some later pitting had been carried out to re-access pillars for scavenging. The south limit is a very large east west aligned boundary pillar shared with A1101 and the western boundary a pillar with A903 which has been pierced in numerous places. Robbed pillars have in a few instances been re-packed. The area has one known shaft and a tunnel of two adjacent packs leading out to the north. Graffiti includes a topless bonneted lady and a pipe- smoking gentlemen.	This area appears to have been driven southwards from the stone pack tunnels of Area 1103 leading in from Prior Park. Alternatively the tunnels may have only been used for access, in either case the one shaft in the area was used to remove stone. The few sawn faces are of later date showing that access from Prior park or the shaft was maintained. The graffiti on these sawn faces provides dates of 1873 and 1879, considerably later than the main extraction. It is likely that the graffiti dates are contemporary with the tunnel extraction phase next to the North Road.  To the west the character of the workings change, the pillars are predominantly direct with only the occasional corbelled pillars. This is likely to reflect a change in workings; a separate quarry number has not yet been assigned until historic records have been consulted. The workings are well-defined on the northern limits by a large boundary pillar, which separates it from Area 1103 [] to the north, and a pierced boundary pillar to the east, separating it from quarry 2365. A possible extraction shaft is also located on the northern boundary pillar, but remains inaccessible. The eastern workings have only extracted about 2.8 m of stone beneath the roof level and consequently space to deposit waste stone discards is limited. Floor to roof discards are seen throughout the area and successive stone packs have been used to retain the discards. The primary transport features are linear barrow-ways with lateral stone packs to retain the discards and support the roof in places.

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				Wedge and chip impressions are seen throughout with the use of Jad slots for extraction. A single sawn face with graffiti has been recovered with the silicon rubber process and depicts a personified chicken character with the words 'George' and 'Bolox'.
Area 1103  Plan 158	2365	IV or V  IV or V	Quarry occupying northern part of area, described in Area 904  Quarry occupying the south-eastern part of area and defined by a boundary pillar that also represents the eastern limits of the Firs quarry. On the eastern edge, another boundary pillar divides this quarry from area 1102 [2357]. The quarry has direct pillars throughout with average size 2 m x 1 m and 2-3 m spacing. Jad slot and occasional wedge pits are noted and soot marks are seen on the roof along with soot marked cross on the quarry roof. Floor to roof discards are noted throughout with stone pack supports with a single tipping barrow-way exposed.	An Isolated quarry with no obvious extraction shaft, which may reflect that the stone extraction facilitated through a neighbouring quarry or that the area was an area of side room extraction associated with [Quarry 2357].
Area 1104  Plan 121	2357	IV or V	Area defined on the map before the area was accessed and largely occupied by a boundary pillar on the southern limits of Area 1102, Quarry 2357. See Area 1102 above.	
Area 1201  Plans 131 & 134	2339	II	Area of apophygate pillars, 3 m x 3 m and 6 m x 3 m, with a spacing of 4.5-6.5 m. The quarry is associated with a cart-way length located between flanking parallel high banks of fines and small rubble, which may result from surface maintenance. Area extends for about 120 m along a cart-way, as far as the West Cottages on Tynning Road, with an approximate width of 20m throughout. At least two contemporary large extractive shafts are noted about 40 m apart but largely inaccessible due to roof collapse. There were a number of well built 2 skin packs with rubble cores at the north end of the area, around an east to west aligned gull. Rubble had been tipped into the area from Area 505 sealing the north limit of 1201 up to the roof.	The apophygate pillar forms are of an early date and are stylistically different from those seen in the Ralph Allen quarries. They are thought not to be attributable to the Allen ownership, as they are located to the east of the 'Long Drung' feature on the surface which is believed to have marked the easterly limits of Allen's ownership. The area follows a centrally placed cart-way extending northwards from beyond a southern boundary pillar in Area 1206, and extends southwards, and is part of quarry [2350]. The eastern limits are marked by a large boundary pillar on the eastern edge of the cart-way, visible above and beyond the previously mentioned cart-way lateral stone packs. The boundary pillar has been subsequently pierced by Quarry 2359. The workings have largely been infilled with floor to roof rubble and mixed fines and only the length of the cart-way remained open, probably used for secondary waste stone tipping and access from Quarry 2359 to the east and Quarry 2351 to the west.

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				<p>A single shaft in the northern part of the area is associated with a linear SW-NE aligned separate quarry, located on the eastern edge of the cart-way, and possibly developed in the early C19th from the West Cottages on Tynning Road. It has not currently been identified as a separate quarry and has been grouped with quarry [2360]. Roof supporting stone packs in the northern end of the cart-way are faced in such a way as to suggest that they were built by mason's and are probably C19th and are located beneath the West Cottages on Tynning Road. Surface excavation in 2003 in the garden of No. 2 West Cottages revealed an area of mortared floor and an in-situ crucible that had adhered iron residue. This could be related surface workings associated with this underground quarry.</p>
<p>Area 1202</p> <p>Plans 134 &amp; 179</p>	<p>2351</p> <p>2339</p> <p>2330</p>	<p>III or IV,</p> <p>II &amp;</p> <p>III or IV</p>	<p>Area of mainly corbelled with some direct pillars, measuring 3 m x 3 m, with a spacing of 4-5 m. There are a couple of jad slots measuring 200 mm in depth and executed by 1 inch hack and are set at roof height.</p> <p>The southern and western limits are defined by large boundary pillars, the southernmost divides this quarry from the C18th quarry [2350] to the south; the westernmost from apophygate pillar quarry [2371] located to the southwest.</p> <p>The main feature of the area is a north south curvilinear cart-way, located to the west of the Allen period cart-way, and is lined by small and blocky rubble retaining packs holding banks of fines and small rubble. The waste stone and packs have eroded into most of the cart-way length.</p> <p>The wheel ruts of the Allen (westernmost) cart-way have an internal gauge of 1200 mm. Barrow ways spur off the cart-way at right angles, through breaks in the packing; these are frequently well maintained by parallel packs. The barrow ways are generally 1m wide. A set of unfinished roof ridging stones were recovered from the cart-way surface along with a horse shoe and a chain. The number '21' was written on the rough face of pillar. See Quarry [2339], Area 1201.</p> <p>See Quarry [2330], Area 1207.</p>	<p>Area of quarry (also described in Area 1207) orientated on a single cart-way length located to the east of the long Drung and to the west of the Allen cart-way length located in Area 1201. The combination corbelled and direct pillars suggest an early nineteenth century date. The cart-way carries on through area 1202, into Area 1207 to the north, where it has been partially sealed by a large roof collapse.</p> <p>Part of Allen period quarry on the easternmost limits, described in Area 1201. A set of roof ridgers presumably indicates that they were being produced in the area and are probably C19th in date. The horse shoe and chain links are particularly important as they be evidence that carthorses were being used in the area, but are also probably attributable to the C19th.</p>

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Area 1203  Plans 134 and 142	2358	III or IV	Area of corbelled pillars extracted by picking bed removal. There were a couple of jad slots as well, measuring 80 mm deep, executed by 1 inch hack and located at 250 mm from roof height. 'Breaking out extraction was carried out by chamfered jad slots executed by 1 inch hack and located 390 mm, 250 mm and 850 mm (egs). Some sporadic hacking was evident. The key features of the area are a network of c.1m wide barrow ways with intermittent rough small and coarse rubble parallel retainer packs and banks of stacked rubble. A barrow way leading from A1202 cart-way terminates in a tipping platform on the barrow ways of A1203. The A1203 barrow ways are at a higher level than the A1202 cart-way Infilling has occurred to the north of the area.	Area of corbelled pillars with typical East Firs low roof clearance. It seems to share picking bed removal with A1202, and have been extracted by open room extraction, but has additional usage of chamfered jad slots. The 80 mm jads may well be a later addition. The network of A1203 barrow ways appears to be sealed by a waste running barrow-way from the A1202 cart-way This area appears to be of Estate period working supported by the pillars usage of chamfered jads and absence of spragging. The workings are predominantly corbelled but have an apophygated element to them are likely to be contemporary with working methods in the mid-late C18th, but could be part of a transition between apophygate and corbelled workings. The cart-way mentioned above is located in Area 1201, attributable to the apophygate workings; and this area, 1203, is attributable to Quarry 2358 and represents an area of working which has pierced the boundary pillar, or block of previously un-worked stone, which originally demarcated the eastern edge of the apophygate quarry. The south-western and eastern limits are well defined with large boundary pillars separating it from Quarry 2338 to the east and Quarry 2339 to the west. On the southern limits the definition is more difficult where an area of apophygate pillars are noted (see Quarry [2352] below). The area has three well spaced vertical shafts; all three have been filled with surface materials, are inaccessible and may represent wells for houses on the surface or stone extractive shafts. Barrow-way activity originates in the west and has deposited waste discards to the south-east, suggesting that the initial direction of quarrying was from the east or south, moving westwards. An area of Apophygate pillars to the south represents earlier workings on the southern escarpment and is a likely place for the initial enterprise to have taken place.
	2352	I or II	Quarry 2352 has apophygate pillars 2 m x 3 m, spacing 3-4 m. The area has been infilled with floor to roof rubble, mainly originating from the later Quarry 2358 to the north and west, and on the eastern edge by collapsed roof blocks and natural clay deposits; from either substantial collapsed roof or surface quarry infilling. Along the western limits the area has an established boundary with a 20 m length of boundary pillar. A small window in the pillar gives glimpses of floor to roof rubble infilling a room on the western face of the pillar, which is probably attributable to Quarry [2369], see area 1206.	Quarry 2352 has apophygate pillars throughout and is located on the southern extent of the area. Later waste tipping has buried any contemporary workings and tool markings are not noted in the limited access. The quarry probably originates on the southern escarpment of the Combe Down and has been developed from a surface quarrying enterprise.
Area 1204	2360	IV or V	Quarry 2360 occupies northern part of the area. The pillars	Quarry 2360 has pierced the northern part of the boundary pillar, or block of

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Plans 131,135 & 171	2359	III or IV	<p>are mainly direct with a few being corbelled measuring on average 2-3 m x 4-6 m; spacing average 4-5 m, increasing to 7 m between larger pillars.</p> <p>The tool marks consist of jad slots and chamfered jads, hacked faces with wedges and chips used frequently in the block extraction. They are abundant on the roof of the quarry, where the first bed of stone was separated from the roof bed. Soot marks are frequently noted in the roof showing direction of working and soot mark graffiti, mainly consisting of quarrymen's initials are also noted.</p> <p>The area has largely been infilled with floor to roof rubble, retained by a succession of vertical stone packs. Barrow-way routes are frequent seen and were used successively over a period of time and all were lined with lateral stone packs. The majority of these have also been backfilled with rubble, retreating towards a centrally located shaft. The shaft was the primary extractive feature and has been capped with stone rubble blocks; many of the open barrow-ways are orientated towards the shaft.</p> <p>Quarry 2359 occupies southern part of the area and is described within Area 1209.</p>	<p>previously un-worked stone, which originally de-marked the eastern edge of the Apophygate quarry 2339. See area 1209.</p> <p>The western limits of the area have cut through the boundary pillar and have later been filled with waste, via a main barrow-way, associated with quarry 2362 (Area 1207).</p> <p>The eastern limits of the quarry are substantially infilled with floor to roof rubble and mixed fines throughout. The only areas which remained accessible were a system of narrow access barrow-ways and the occasional small rooms. The northern and eastern limits of the quarry have been defined by large boundary pillars, the easternmost also forming the easternmost limits of the Firs quarry.</p> <p>The barrow-way routes were used successively over a period of time and all were lined with lateral stone packs, primarily constructed to support discards rather than support the roof. Each of the pack walls had an earlier pack wall behind the latter, narrowing the barrow-way accesses over a period of time. A shaft in the western part of the area has several barrow-ways orientated towards it and would seem to have represented the primary extractive shaft for the area.</p> <p>The quarry has visible small quarried faces with in-situ wedges and chips have survived. The roof of the quarry has frequent wedge and chip impressions throughout which show the direction of quarrying. These suggest that the quarrying originated around the shaft and spread both eastwards and westwards.</p>
Area 1205 Plan 179	2360	IV or V	See Area 1204 above for quarry [2360]	
Area 1206 Plan 179, 184, 191 & 192	2350,	I or II,	<p>Apophygate style pillars are noted throughout the area but have some corbelled elements to them reflecting the bed depths and roof conditions. The average size is 5 m x 4 m, with spacing of 4 -5 m. Several large blocks of un-extracted stone have been left to support the roof conditions and don't seem to denote separate quarry workings?</p> <p>The tool markings include jad slots in the north of the area and occasional wedge pits noted on pillars and on the roof.</p> <p>The stone has mainly been barred out exploiting the natural joint structure.</p> <p>An open length of cart-way [12108], that can be attributable to cart-way [12002] located within quarry [2339], Area 1201, stretching for 18 m is located in the centre of the workings.</p> <p>The cart-way section has been flanked by vertical stone</p>	<p>The quarry is stylistically either pre-Allen or contemporary with the Ralph Allen quarrying to the west of the 'Long Drung', as apophygate style pillars are noted throughout the area.</p> <p>Quarry 2350 is located to the south of Quarries 2330, 2351 and 2339 and is separated from them by a substantial boundary pillar that is located on its northern limits.</p> <p>The northern limits of the quarry have been accessed through a side piercing in the boundary pillar and to the west through floor to roof discards, located to the south and east of Area 1201. The area has apophygate style pillars throughout but are not as ordered or well formed as those contained within established Ralph Allen quarries. It has largely has been infilled with floor to roof rubble and fines on the northern limits.</p> <p>The large amount of fines materials suggests that Banker masons activity has</p>

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	2369 &	I or II &	<p>packs that have been constructed to retain significant amounts of waste stone and to give addition support to the degrading roof. Other packs have been constructed to both retain discards and to support the roof.</p> <p>Several narrow lengths of barrow-way are also noted, one extends for approximately 50 m in length.</p>	<p>taken place and several sawn blocks have been recovered along the northern limits of the area. The infilling of banker masons fines represent material bought from quarry activity to the north of the boundary pillar that have been transported to the south along small and narrow barrow-ways and must be attributable to quarry [2351] to the north.</p> <p>To the south of the infilled area the quarry opens up and is largely accessible with only a few areas that have been infilled to roof level with discards. The most significant feature was the discovery of an open length of cart-way [12108], that lies to the south of cart-way [12002] located within quarry [2339], Area 1201, and represents the same feature.</p> <p>The open cart-way section has been flanked by vertical stone packs that have been constructed to retain significant amounts of waste stone and to give addition support to the degrading roof. The northern end of the cart-way has also been infilled with a stone pack to retain material to the north.</p> <p>The apophygate pillars attributable to the quarry extend at least 55 m to the west towards a large, unexcavated stone/boundary pillar is noted. It extends beyond this to the west where a substantial deposit of surface quarry infilling is noted. The apophygate pillars extend only 15 m to the east before a solid boundary type pillar is noted with only a few possible windows in the pillar length.</p> <p>The 40 m section of quarry to the west of the cart-way includes areas of floor to roof rubble with the occasional barrow-way length winding in between The two barrow-ways of note are one barrow-way length [12177] which is orientated north-south, and barrow-way [12202] which is orientated east-west and follows the stabilisation stub K30a.</p> <p>Barrow-way [12177] is well defined and has been transporting waste stone to a tipping front at its southern end and must also have been used to transport extracted stone. At the southern end a small a single sawn face is noted along with written graffiti 'George'.</p> <p>Barrow-way [12202] has been flanked by roof supporting stone packs in the north and two circular roof supporting packs, these were all video recorded prior to impactation. The barrow-way length was approximately 46 m and at the northern end orientated towards a possible shaft/drain.</p> <p>The area to the east of cart-way [12108], on the eastern edge of the boundary pillar. Here a mixture of apophygate pillars were noted but also several corbelled pillars. The area of quarrying was approximately 4-6 m in width and extended in a crescent shape northwards for 30 m. The south-eastern and eastern limits of the quarry are defined by a large boundary pillar, the western face of the same boundary pillar seen in Area 1209 [Quarry 2352]. The</p>



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	2371	I	Small are of apophygate pillars on the western limits of quarry [2350].	<p>southern limits have substantial amounts of surface quarry backfilled material or possible infill shafts, access is limited.</p> <p>The main quarry [2369] had been filled with floor to roof rubble on the southern and eastern limits, retained behind vertical stone packs, from which several C18th century 'Onions' bottles were recovered during the investigation. The area had been infilled from the north, perhaps from north of the east-west orientated boundary pillar dividing the northern end of the whole area, from Quarry [2358]. The infilling has taken place from a central N-S orientated Barrow-way and associated surface. On the surface in the southern extent a well preserved masons working area containing numerous sawn and scapped stone blocks remained in-situ. Many of the blocks survived in good condition and were recovered for further analysis after they had been planned, photographed and video recorded in-situ. A small piece of graffiti on a sawn block was also noted within the fabric of a stone pack, on the edge of the surface, and bore a date of 1730 and the name 'Francis Oliver'.</p> <p>The working area provides us with a remarkable record and archive of the type of stone that was being produced during the eighteenth century at a time when Ralph Allen was also extracting stone in Combe Down.</p> <p>Small area of apophygate pillars, only accessible from stubs K22 and K26, located on the western limits of quarry [2350].</p> <p>Only two visible, NW-SE aligned, pillars are noted in the area which could represent boundary pillars. Substantial roof collapses occupy the remaining space. A single barrow-way route is noted between two flanking stone packs, leads southwards to what is thought to be the main access to surface quarries. The quarry represents Pre-Allen quarrying probably accessed from an open surface or entry from surface quarrying to the north of Hope Cote Lodge.</p>
Area 1207 Plans 130 & 179	2330	III or IV	<p>The southern and western limits of the area are defined by a large boundary pillars, the western a continuation of the pillar located within southern limits of area 214. The southern boundary pillar represents the southern limits of this quarry and the northern limits of an earlier C18th century workings to the south, Quarry [2350].</p> <p>Located within the central and western parts of the area a large north-south orientated cart-way has been discovered and represents the areas primary extraction feature. The cart-way has been tipped on by later barrow-way activity and has parallel stone packs, constructed to support the roof and retain waste discards.</p> <p>The cart-way has been driven northwards, extending from an</p>	<p>The area has been worked in the early-mid C19th and has been extracted from a cart-way in Stub K19, separate from the one discussed above in Area 1202, and has also likely to have been driven northwards, extending from an earlier C18th cart-way length in area 1206 [Quarry 2350].</p> <p>The quarry is approximately 40m in width with the eastern and western limits defined by boundary pillars, the eastern limit exploiting the original boundary pillar associated with the apophygate pillar workings [2339].</p> <p>Quarrying has continued in the south-western limits, extracting part of the boundary pillar, and extending towards a large extraction shaft or well. It is not known whether this area of extraction is related to Quarry 2351 or 2330 or indeed an isolated smaller individual quarry using the shaft for the extraction of won stone.</p>

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			earlier C18th cart-way in Area 1206 [2350], and has been blocked on its northern limits by roof collapse.	
Area 1208			Area not accessed and originally allocated for future anticipated exploration. This area is thought to be part of the southern extent of the quarry that was called 'Poor Tynning', and has not, and will probably not be accessible from the current underground stabilisation project. It will be stabilised from the surface. Borehole video or laser scan data may become available in the future if this method is undertaken.	
Area 1209 Plans 142 & 159	2339	III or IV	Quarry 2339 has direct and corbelled pillars. The pillars are on average 2 x 3 m, increasing to 2 m x 7 m; spacing on average 5m, increasing to 11 m between boundary pillars on the eastern margins. The limits are defined on the eastern and northern limits by a continuous boundary pillar. The south-western limits are also defined by a boundary pillar which it shares with Quarry [2358], Areas 1203 and 1209; attributable to the northern limits of Quarry [2350] to the south. Well defined and open Barrow-way routes with lateral stone packs to retain discards, with rooms in between full with floor to roof discards. Tipping has taken place within the south-eastern limits into the northern limits of quarry [2358].	This quarry was probably developed in the early C19th and was partially developed from the easternmost edge of the cart-way associated with the apophygate pillars discussed in Area 1201; but more extensively northwards from quarry [2358]. The majority of the workings are open room, with the eastern limits being less developed with more linear extraction. Here, side room development is also noted within the easternmost boundary pillar with smaller working faces throughout. The workings follow the standard north to south quarrying direction seen in the Far-eastern Firs. The area has two possible ventilation shafts, the easternmost (12015) and the westernmost (12028) could also have been an extractive shaft. A small well structure with circular pack lining is also noted in the east of the workings, Well (12017). The northernmost limits have been back-filled with floor to roof waste stone, probably derived from quarry [2360].
Area 1403 Plans 95 & 164	2221 &  2220	III or IV  III or IV	Area of direct pillars with some tapered examples with a variable spacing of 3 m. Extraction by chamfered jad slots executed by 1 inch hack and set 600 mm from roof. Hacked faces also utilising a 1 inch hack have associated V-shape wedge pits measuring 200 x 160 mm. 100 mm high jad slots located at around 400 mm from roof. Sprags and recesses were observed. Small rubble 'box' packs were used to retain material. Some small pits had been dug in by pillars these generally contained dumped single sprags along the north limit. Otherwise sprags were not used. No sawn faces observed.  See Area 24	This is the infilled Byfield/ Firs boundary. Extraction appears to have been carried out in the Estate period probably from A1404 to the east. The westward drive broke into A1401 and the area was infilled. The lack of sawn faces suggest that infilling occurred prior to 1830. The infilling didn't quite reach the roof as in the case of the Long Drung infilling. The pitting containing single sprags indicates that opportunist scavenging occurred here (no secondary pillar robbing would seem to have taken place) where it did not in the long Drung infill. The sprag was presumably used for overhead support while cutting was carried out. These were concentrated along the northern limit suggesting that this scavenging was localised. (See Area 1404 and 26 for the description of the northern part of these workings).

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Area 1404  Plan 95	2221	III, IV	Area of direct pillars with variable 3-4.5 m spacing. Extraction by chamfered jad slot executed by 1 inch hack and located in the first good bed generally 700 mm. Sprags employed with recesses cut by 1 inch hack. The main feature is a east south east to west north west cart-way with deep wheel ruts with an inside gauge of 1500 mm. Original working height was 5m opened to 8.6 m by 2-3 collapse episodes. Roof high blocky small and coarse rubble retain the area 1403 infill on the west side. A second phase of high packing has been built to support the roof after the first historic collapse, at the top of which there is a slot for the builder allowing him to build to roof height. Shoddier built retainer packs line the cart-way Tipping barrow ways form a network to the east side of the cart-way There are a number of later slightly undercut sawn faces extracted by 100-150 mm jad slot using a 1 inch hack. Each slot has an adjacent area of preparatory hacking generally around 600 mm deep. Four square crosses have been hacked into different sawn faces measuring 2220x 220 mm (eg). A parallel arc has been drawn on one sawn face. There is a pack supported shaft on the east flank of the cart-way Further east a second shaft has been partially driven.	Cartway running up the Firs side of the Byfield/ Firs boundary, in effect forming a pair with the A1401 cart-way on the Byfield side. The cartways were probably driven as a pair with extraction of the boundary coming from A1404. More of the south end of the cart-way needs to be seen to clarify phasing.
Area 1405  Plans 95 & 96	2221	IV	As above with Area 1404, part of Quarry 2221	
Area 1601  Plans 79 & 96	2342	III or IV	Linear extraction centred on a cart-way originating in the north-western corner of the former surface quarry ‘Sheeps House Quarry’ and extending northwards towards northern Firs. The pillars are mainly direct with just the occasional corbelled pillars and are relatively larger in size along both edges of the cart-way, forming boundary like pillars with 2m gaps in between. The pillars are on average 5-6 m in length and 3-4 m in width away from the cart-way with 2-3m spacing in the south, extending to 4-6 m spacing in the north. The tool marks within the area are mainly represented by hacked faces with 500 mm high Jad slots in places, chip impressions are noted throughout but are sporadic and no horizontal rows are noted. There are examples of sawn faces at the northern and southern ends of the cart-way One at the	The linear extraction located on the western limits of the area (see Area 1601) originating in the ‘Sheeps House Quarry’ and extends northwards, follows a 48 m length of linear cart-way until it has been tipped over by a substantial tipping fronts originating from [Quarry 2218] to the north. The cart-way has an internal gauge of 1.30 m and was driven about 2.60 m below the roof; it has an open area of surface, including the width of the gauge, of approximately 4 m throughout its length. The western part of the area had been previously in-filled with stabilisation concrete prior to the 2007 survey so the western limits of the quarry were not observed. The eastern limits of the quarry are not distinct but could extend for 20 m, with the western limits also defined by several large, possibly boundary type pillars. The pillars are mainly direct with just the occasional corbelled pillars and are relatively larger in size along both edges of the cart-way, forming boundary like pillars with 2m gaps in between. The pillar spacing in the south are 3-4 m,

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Location Archaeological Area and Plan No.	Quarry Area	Time Phase	<b>Components Present</b> <b>Pillar type – morphology - typical plan-size</b> <b>Features on pillar - Method of working</b> <b>Room size variation and other features</b>	<b>Brief Summary of Archaeology</b>
			southern end a sawn face on the eastern limits has had graffiti written on it. The graffiti reads 'road to left Alfred Davids' next to a survey cross. Another piece of graffiti at the northern end of the cart-way has been written by A. Davids also and is located opposite two survey crosses.	extending to 4-6 m spacing in the north; this probably reflects the condition of the roof and spacing of the natural joint system.  Close to the quarry mouth, at the southern end of the cart-way, large and well constructed stone packs have been built to stabilise the roof on either side of the cart-way Otherwise the other numerous stone packs flanking the cart-way have been employed to retain substantial areas of waste discards. Timber sprags have been used throughout the area to support the roof.  The cart-way may have been developed at the same time as the cart-way in [Quarry 2220], however they are probably separate enterprises. Both quarries are early to mid C19th century.