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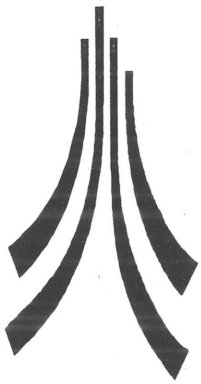

February 1997

DUNHAM MASSEY
STABLE YARD

Greater Manchester

Archaeological Survey Report

Commissioned by:

The National Trust

Dunham Massey Stableyard
Greater Manchester

Archaeological Survey Report

Checked by Project Manager. ..... Date
Passed for submission to client. ..... Date

Storey Institute
Meeting House Lane
Lancaster
LA1 1TH

February 1997

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ACKNOWLEDGMENTS

Lancaster University Archaeological Unit would like to thank Jeremy Milln and Johnathan Fisher of The National Trust for their considerable assistance and support in the course of the field work.

Dennis Thompson undertook the rectified photography of the cobbled surface and was assisted by Emma Donnelly.

The field survey was undertaken by Chris Wild and Jamie Quartermaine and was assisted by Graham Mottershead. The illustrations are by Graham Mottershead and Chris Wild. The report was written by Chris Wild and edited by Jamie Quartermaine and Richard Newman. The project was managed by Jamie Quartermaine.

EXECUTIVE SUMMARY

The Lancaster University Archaeological Unit (LUAU), at the request of The National Trust, undertook a survey of the cobbled stable yard at Dunham Massey, Greater Manchester (SJ 735873), in October 1996.

This involved the execution of a primary instrument survey to record the outline and extent of the stable yard and establish survey control throughout the study area. This was followed by a programme of rectified photography to record the detailed make up of the cobbled surface. The outline detail of patches of cobbling was digitised from the rectified photographs and incorporated with the instrument survey within a Computer Aided Draughting (CAD) system. A gazetteer of all cobble patches was compiled as the basis for analysis of the courtyard surface.

The analysis identified the areas of repair and relaying, which when excluded from the CAD drawing, highlighted the surviving elements of an early cobble layout.

The survey will serve as a management tool during the proposed consolidation and repair programme being undertaken by the National Trust of the stable yard surfaces to facilitate access by those with mobility limitations.

1. INTRODUCTION

1.1 In October 1996 a photographic survey was undertaken by the Lancaster University Archaeological Unit (LUAU), on behalf of The National Trust, of the stable yard at Dunham Massey, Greater Manchester. The aim of the survey was to inform the consolidation, repair and relaying of parts of the yard to facilitate access by the less able, which is being undertaken as part of a programme of improvement works to the adjacent visitor facilities. The work has been undertaken in accordance with a brief by the National Trust (*Appendix 1*) and a methods statement by LUAU (*Appendix 2*).

1.2 The survey comprised a primary instrument survey to provide the architectural context and survey control and a programme of rectified photography to record the cobbles.

1.3 The present report sets out the results of this work and incorporates a methodology statement, the survey results, analysis and a survey gazetteer. It provides an assessment of the surviving original areas of cobbled surface and provides an interpretation of the original form of the stable yard surface.

2. METHODOLOGY

2.1 INSTRUMENT SURVEY

2.1.1 An instrument survey of the cobbled stable yard (approximate area 1043sqm) at Dunham Massey was undertaken by two experienced survey staff. This element of the survey recorded all architectural detail and the more significant elements, such as drain-grids, within the cobble surface. It was also intended to provide an adequate amount of control for the provision of the rectified photographic survey.

2.1.2 The survey was undertaken with respect to a primary, local survey control that was established by closed traverse to an accuracy of +/- 0.025m in plan and 0.02m in height.

2.1.3 The architectural detail was surveyed using a Zeiss ELTA 3 total station and data-logger. The digital survey data was transferred, via DXF file format, into a Computer Aided Draughting (CAD) system. The archaeological detail was drawn up in the field with respect to field plots of the survey data and these edits were then transferred onto the raw survey data within the CAD system.

2.1.4 For the rectified photographic control it was originally proposed that a grid of strings be established across the courtyard, whereby the intersections between the east/west and north/south strings provided a visible grid depiction for the photography. However, in the event it was not possible to restrict public access to the courtyard area and the suspended strings consequently presented a health and safety risk to the general public. As an alternative the photography was taken without prior control and the control was subsequently surveyed in with respect to the photographic prints, which provided for up to four survey points per photograph.

2.2 PHOTOGRAPHIC SURVEY

The rectified photographs were taken from a consistent height using a medium format camera, mounted on a mobile scaffolding tower. The tower was moved along parallel lines to enable a comprehensive and systematic coverage of the cobble surfaces. The rectified photography provided prints at an approximate scale of 1:20 and each photograph covered an approximate extent of 4m x 4m. Because of precise survey control at each corner of the photograph any photographic errors resultant from the camber of the yard surface did not result in the proliferation of error across the rest of the study area.

2.3 DRAWING PRODUCTION

The results of the field survey were digitally translated into a CAD system (FastCAD), which provided control information for the rectified photography. Each photograph was digitised to capture significant detail and patterning; this incorporated information on cobble alignment and cobble size but did not record the individual cobbles. The CAD drawing incorporates control information, on a separate layer, to enable the underlaying of the individual photographs beneath a film copy of the survey drawings (Fig 2). This allows a direct comparison

between the analytical depiction and the raw photographic data and from this it will be possible to generate stone by stone drawings, if required, in the future.

2.4 ANALYSIS

On the basis of the digitised cobble patterning it was possible to identify areas of different episodes of surface work on the basis of cobble size and alignment. These patches of discrete areas of cobbling are described in the site gazetteer (*Section 5*) and are shown on Fig 3. Analysis of the cobble patterns enabled the identification of repairs and also provided for a basic phasing pattern. The results of this analysis are presented in *Section 3*.

3. SURVEY RESULTS

3.1 INTRODUCTION

3.1.1 The aim of the analysis was to examine the different areas of cobbling, on the basis of rectified photographic evidence, and to distinguish the areas of repair from surviving elements of the original surface. It was thus possible to identify an earlier pattern of the stable yard surface. The patches of cobbling are shown on Fig 3 and are described in the gazetteer.

3.1.2 The analysis of the stable yard cobbles was undertaken from the rectified photographs, which, for the most part, provided a clear and informative depiction of the surfaces character; however, in some localised areas these were partly obscured. Because of the prevailing weather conditions and because the courtyard was open to the public at the time of the survey it was impractical to completely clean the surface of leaves and standing water prior to photography. The major problem affecting the analysis of the cobbles, however, was caused by differential lighting conditions during the photographic survey. Contrasting direct sunlight or overcast conditions lead to differences of contrast and colour tones between photographs. In general, however, the condition of the photographic record, in its present form, is good, and the excluded areas have only had a minimal impact on the analysis.

3.1.3 In the gazetteer and the analysis of the stable yard, reference is made to component small cobbles, which are defined as up to 50mm in diameter, medium cobbles, which are between 50mm and 80mm across, and large cobbles, which are larger than 80mm, but generally no larger than 150mm x 60mm. Most of the medium and large cobbles are not rounded, but are elongated and because of this they can be seen to have been laid in patterns, orientated in specific directions.

3.1.4 ***Cobble Binding Media:*** It is highly probable that differences occur between the binding media used in the cobble patches that were recorded during the survey. However, the remit of this project was to study the surface from the rectified photographs. At the time of photography the yard was dirty, and most of the cobble gaps were mud and silt filled. Thus, without physical examination and sampling of a significant proportion of the mortar form, it was not possible to differentiate between different binding media. It was not possible to confidently identify areas where a concrete type mortar has been used, because of the condition of the surface in some areas.

3.2 ANALYSIS

3.2.1 The broad layout of the cobbled surface, as it survives, shows two distinct pattern areas. Firstly there is the area of the stable courtyard, at the northern end of the study area, where the pattern appears to be centred on the surface drains which run to a central point on the eastern edge of the courtyard. The patterns in this area are generally aligned north/south or east/west, although there are a few areas of unpatterned cobbling. The cobbles are generally small or medium sized, although there are two areas of large cobbles (patches 24/28 and 47)

3.2.2 The second area is the drive part of the cobbled yard, to the south of the study area. Here the orientation of the cobbles is, in the main part, either parallel or perpendicular to the drive, although there are many random patches. Cobble stones in this area are of all sizes, although the areas showing stronger linear patterns tend to contain small or medium sized cobbles. There is a greater proportion of repair work in this area reflecting the higher levels of traffic in this area.

3.2.3 ***Repairs:*** In order to gain an understanding of the original layout of the cobbled surface, areas of repairs were identified. The exclusion of areas of repair can be identified with high confidence levels, and therefore present a clearer plan of the remaining features for subsequent phasing. It was not possible to draw clear chronological comparisons between many of the repairs, except where they inter-connect, but repairs can be postulated as either earlier or later.

3.2.4 In the stable yard there are three particularly distinctive repairs (patches 57, 58, and 61). Patch 57 is the most striking, containing large cobbles in what appears to be a random layout. Patch 58 also contains mainly large cobbles, which distinguish it from the surrounding areas (patches 54 and 59), but in this area there are linear rows of cobbles on a spacing of *c* 0.5m as seen within other areas. However, the cobbles in between are randomly laid. Patch 61 is a small area of randomly laid small and medium cobbles on the eastern edge of the courtyard, and is clearly distinguishable from the linear east/west patterning surrounding it to the north, south and west. Two other patches of random cobbling are present in the stable yard: patches 56 and 68.

3.2.5 Many of the repairs on the drive area of the yard are easily identified by their random patterning. Patches 4, 7, 9, 16, 23, 26, 35, 38, 40, 48, and 50 all have these characteristics, and they all consist of mainly large cobbles, with the exception of patch 7 which contains some small and medium cobbles, and patches 4, 23, and 40, which contain predominantly medium sized cobbles. It is therefore possible to suggest that these repairs may all date from a similar period, but, with the general paucity of inter-relationships between the patches, it is not possible to prove this argument. There is, however, a clear relationship between patches 47, 49, 50, 51, 66 and 67. Patch 50 is a narrow band of large random cobbles which cuts through small linear cobbles and also through repair patch 47. This demonstrates that patch 50 is the latest feature of this area, and represents the cutting and refilling of a trench from the building immediately to the east, and is probably associated, with the localised repair (patch 67) in patch 66 around the service cover.

3.2.6 The purpose of several of the repairs is evident; many can be linked to the introduction of drainage pipes and other services (e.g. patches 50, 67, and 69), whilst others are due to wear on the surfaces, which probably accounts for most of the repairs on the main drive. Patch 38 is a repair to the north-west corner of the stable yard, and corresponds directly with the route taken by traffic through the gate in that corner of the yard. As a result of continued traffic the repair itself is beginning to show rutts, and is in need of further replacement. Patches 57, 58 and 47 are also repairs by entrances into the courtyard and are also most likely to have been required because of the heavy flow of traffic (both vehicular and pedestrian)

through the courtyard entrances. Two other similar repairs (patches 55 and 56) are in front of doorways on the eastern side of the stable yard.

3.2.7 Once these random areas have been discounted from the patterning, the remaining areas are orientated approximately east/west, north/south, or at offset angles. With the exception of the surface drains (patches 3, 18, 62, 63, and 64), the remaining off-set angled patches appear also to represent repairs. Three of these areas (patches 13, 14, and 44) are relatively small (less than 2m x 1m) and have been laid parallel to their longest edge, which is a logical way to lay cobbles. A further block (patch 3) is aligned parallel to the adjacent drain, whilst the remaining two patches (patches 28 and 31) are orientated parallel to the garden wall at the eastern end of the cobbled yard. It is unclear, however, why repairs should be aligned parallel to this wall, when the other adjacent areas do not have a similar alignment. In the case of patch 31 its alignment is parallel to the shape of the patch, and is of similar size to patches 13, 14, and 44. As patch 28 butts patch 31 it may have been laid in the same direction if it was a later repair.

3.2.8 With the exception of patch 66, and the drains (patches 3, 18, 62, 63, and 64), the remaining patches are aligned either east/west or north/south. Patch 66 is unusual in that it is constructed of stone sets, approximately 200mm x 90mm in size. These continue through the doorway at the northern end of the Stable Yard into the courtyard beyond. It is not possible to tell whether the sets are an original feature of the stable yard, or whether they have been inserted at a later date to protect the gateway from wear. Furthermore, because of the nature of sets, it is very difficult to tell whether they have been replaced at any time. This is particularly apparent to the east of patch 67, where two sets must have been removed, but because of the regularity in their shape it is difficult to detect how they have been relaid.

3.2.9 The linear patterns, aligned east/west every 470mm in patch 54, continue through the adjacent patch 55, but the patterning in the rest of patch 55 becomes random and smaller. This appears to indicate that the cobbles within this patch (55) have been relaid, although the pattern itself has remained either untouched or has been reinstated.

3.2.10 ***Residual Pattern:*** With the removal of the more evident repairs there are patches of both north/south aligned cobbles and east/west aligned cobbles and there is an element of doubt as to whether one orientation was original, or whether elements of both are original. Patches of both directions display good quality linear patterning. The stable yard is predominantly orientated east/west, apart from patch 53, which does not extend all the way to the central drain, or the southern wall. It is partly surrounded, to the east and north, by patch 18, which does have an east/west orientation. Such a north/south orientation in this western quadrant could facilitate better run-off to the central drain, within the quadrant pattern. The linear patterning within the patch does not exactly match those in patch 54, however, there is sufficient similarity as to suggest that they were of a contemporary phase of construction; the separation between the linear coursing is *c* 0.4m in both. There is also a broad similarity of constructional form between patches 59 and 60, and to a lesser extent patch 18, which is nevertheless somewhat distinct from that of patches 53 / 54.

3.2.11 If a regular pattern in the cobbled surface were intended, it is odd that there are only three drains emanating from the central drain outlet and it is therefore probable that there was originally a fourth drain aligned to the north-east. The patches where this drain would have been (patches 22, 27, and possibly 36) are all aligned with north/south orientated patterning. This suggests that these too, are replaced patches, and further suggests that the majority of the original cobbling had an east/west alignment. With the notable exception of patch 53 the pattern of the cobbles is for the most part east/west aligned, including the whole area south of the courtyard, and the courtyard itself. Patch 20 has very definite borders north and south, and although it may be contemporary with patch 19, it would be highly unlikely to be contemporary with patches 24, 25, and 26, if a pattern were intended, as it would have left a very visible east/west aligned edge in an area of north/south patterning.

3.2.12 Drain 3 is distinct in constructional form from the ones in the stable yard (18, 62 and 63). Drain 3 is three to four cobbles wider, but appears to be contemporary with patch 5 which has larger stones lining the edge of the drain. The drain has subsequently been adapted for sub-terranean drainage via a grate within repair patch 69, and clearly provided drainage along the eastern edge of the main driveway of the stable yard. There is, however, a possibility that it was originally linked to Drain 18. Drain 64 is constructed of slightly smaller stones than the other drains (18, 62 and 63), but is very clearly parallel to the line of drains 18 and 63. It has been truncated at either end by repairs (patches 38 and 47), but probably originated at the gutter in the north-west corner of the yard. Its south-eastern truncated end is on the extended line from drain 62 and it is possible that there was a former relationship. There is a possibility that drain 64 was an original element of the stable yard surface.

3.2.13 Of the stratigraphically residual patches it is significant that the great majority of them are comprised of small and medium cobbles, which contrasts with the identified repairs that are either of medium, large and occasionally uniformly small cobbling. The residual patches have a predominantly east/west orientation, however, there is one large north/south orientated patch (53) which is stylistically comparable to the adjacent large, east/west orientated patch 54. Despite the differential orientations these appear to be broadly contemporary and together they stylistically contrast with the other, more typical east/west residual patches. Both stylistic forms are stratigraphically early, but there is no definitive evidence to establish which of the two is the earlier. If the 53/54 form is earlier if would suggest that only a very small proportion of the courtyard is original, and that this survival is solely concentrated in the south-west corner of the stable courtyard; it would also imply that there was a differential orientation for each of the quadrants. However, if the more common east/west orientated stylistic form was the earlier it would imply a scattered survival throughout the courtyard, albeit mostly concentrated to the west. It would also suggest a consistent orientation throughout the courtyard irrespective of the quadrants.

3.2.14 It is therefore suggested that there were two patterns of early cobbling, both of which comprised small and medium cobbles and these are presented as Fig 4. The regular string coursed cobbling comprise patches 53, 54 and possibly 29. Whereas

the east/west orientated cobbling, without regular string coursing comprised patches 1, 6, 8, 12, 17, 18, 30, 32, 33, 34, 37, 39, 41, 42, 43, 45, 51, 59, 60, 62, 63, 64, 65.

4. CONCLUSION

4.1 The survey has demonstrated that the stable yard has been subject to considerable relaying and repair of the cobbled surface. This was undertaken in a broad range of cobble orientations and sizes. The areas most affected by this work are in the centre of the driveway and to the south of the central drain, where a large area was relaid in a variety of styles and reflects the increased wear resultant from vehicular traffic. There are, however, the remains of early and possibly original cobbled surfaces, which survive best on the western side of the stable yard. This has two basic forms: one has regular lines of cobbles at a 400mm separation which reflect the constructional technique of laying cobbles in strips out from a string coursed line. The same technique is observed elsewhere, notably patch 17, but not to the same degree of regularity and consistency. The other pattern of residual cobbling has alignments, consistently on an east/west orientation, but only occasionally is it laid against string coursed lines. Both patterns are evidently early, but neither can be reliably ascribed as original. The extent of the suggested early cobbling is presented in Fig 4.

4.2 The framework for the original cobble pattern was a diagonal arrangement of drains, centred on a grid within the middle of the stable yard. A possible element (patch 64) of this drain system survives at the northern end of the cobbled yard, which runs parallel to the line of the diagonal drain runs, but is truncated at both ends. On the basis of identified drain runs and surface drain grids an interpretation of the original drain layout has been proposed (Fig 4).

5. GAZETTEER OF COBBLE PATCHES

Patch no: **1**
Cobble Size: Medium and Small
Orientation: east/west
Adjacent patches: 2,11
Dimensions: 17.2m x 2m
Description:
A linear patch of small and medium sized cobbles aligned east/west in slightly irregular rows and getting gradually more random towards the southern end.

Patch no: **2**
Cobble Size: Medium and large
Orientation: Random
Adjacent patches: 1,3,9,11
Dimensions: 18m x 1m
Description:
A patch of medium and large cobbles which runs north/south but has no alignment within the stones themselves. The cobbles have a broadly random configuration.

Patch no: **3**
Cobble Size: Medium and large
Orientation: north/south
Adjacent patches: 2,4,5,9,69
Dimensions: 12.8m x 0.4m
Description:
A linear patch of large and medium cobbles aligned north/south in lines. Cutting through this patch is a drain described in patch **69**.

Patch no: **4**
Cobble Size: Medium
Orientation: Random
Adjacent patches: 3,5
Dimensions: 5m x 2.2m
Description:
A randomly distributed patch of medium cobbles.

Patch no: **5**
Cobble Size: Medium and large
Orientation: east/west
Adjacent patches: 3,4,6,7,9
Dimensions: 13.4m x 4.7m
Description:

This large patch of cobbles contains medium and large stones which are aligned roughly east/west with occasional obvious lines but which are mostly fairly irregular.

Patch no: **6**
Cobble Size: Small and Medium
Orientation: east/west
Adjacent patches: 5,7,9
Dimensions: 8.8m x 3m
Description:
A patch of small and medium stones which are aligned very roughly east/west but with very poor patterning.

Patch no: **7**
Cobble Size: Small and medium
Orientation: Random
Adjacent patches: 5,6,8,9,10,13,14,20
Dimensions: 19.2m x 1.4m
Description:
A stretch of small and medium cobbling which is randomly placed with no patterning and also has a few areas where the cobbling has been severely damaged by traffic creating deep ruts in the surface.

Patch no: **8**
Cobble Size: Small/Medium
Orientation: east/west
Adjacent patches: 7,20
Dimensions: 18.8m x 1.4m
Description:
A stretch of small cobbles along the edge of the grass which are of a poor quality and very haphazardly placed. The cobbles are not very close together and it survives in a relatively poor condition.

Patch no: **9**
Cobble Size: Large
Orientation: Random
Adjacent patches: 2,3,5,6,7,10
Dimensions: 0.9m x 3.2m
Description:
A patch of randomly placed large cobbles with no patterning.

Patch no: **10**
Cobble Size: Small
Orientation: east/west
Adjacent patches: 7,9,11,12,13

Dimensions: 4m x 5.1m
Description:
A patch of well laid east/west orientated small cobbles which are very compact but contain areas where they have been damaged by vehicles to cause holes and ruts in the surface.

Patch no: **11**
Cobble Size: Large
Orientation: east/west
Adjacent patches: 1,2,10,12,16,17
Dimensions: 5.2m x 5.1m
Description:
An irregular patch of large cobbles aligned east/west which are quite well placed but have become very uneven due to traffic passing over them.

Patch no: **12**
Cobble Size: Medium
Orientation: east/west
Adjacent patches: 10,11,13,14,15
Dimensions: 2m x 4.4m
Description:
An irregular patch of medium sized cobbles which are quite regularly spaced.

Patch no: **13**
Cobble Size: Medium
Orientation: north-east/south-west
Adjacent patches: 7,10,12,14
Dimensions: 1.5m x 1m
Description:
A small patch of medium sized cobbles very similar to those of **12** and **14** but with a north-east/south-west alignment which distinguishes this from adjacent patches.

Patch no: **14**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 7,12,13,15
Dimensions: 1m x 0.8m
Description:
A small patch of medium sized cobbles similar to **12** and **13** but which is distinctive because of a north/south alignment and a slightly more haphazard arrangement.

Patch no: **15**
Cobble Size: Medium and large
Orientation: north/south
Adjacent patches: 11,12,14,16,17

Dimensions: 2.6m x 1.4m,
Description:
A patch of north/south aligned medium and large well-set cobbles cut off from **20** by a large irregular rut in the surface caused by vehicle use.

Patch no: **16**
Cobble Size: Large
Orientation: Random
Adjacent patches: 11,15,17,19,20,21
Dimensions: 6m x 1m
Description:
A linear patch of randomly placed large cobbles with an uneven surface.

Patch no: **17**
Cobble Size: Small and medium
Orientation: east/west
Adjacent patches: 11,16,18,53,62
Dimensions: 10.4m x 5m
Description:
A rectangular patch of well laid small and medium cobbles aligned north/south in obvious lines. It is cut by drain **18** and butts onto patch **53**.

Patch no: **18**
Cobble Size: Medium
Orientation: north-west/south-east
Adjacent patches: 17,19,22
Dimensions: 8.2m x 0.2m
Description:
A linear drain running north-west/south-east to a drain-grid in the centre of the yard. The drain is slightly concave and is lower at the north-western end where it meets the grid.

Patch no: **19**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 16,18,20,22
Dimensions: 2.8m x 3m
Description:
a patch of well laid medium cobbles which has drain **18** running along its northern edge. It butts **20** and **22**.

Patch no: **20**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 7,8,12,13,14,15,16,19,21,24,25

Dimensions: 8.5m x 6.4m
Description:
A large area of well laid medium cobbles in north/south linear patterns which seems to be cut by **21.** It has a metal grid in the northern part around which there is no disturbance suggesting it was contemporary with the laying of the cobbles.

Patch no: **21**
Cobble Size: Medium and large
Orientation: Random
Adjacent patches: 16,20
Dimensions: 0.6m x 3.3m
Description:
A patch of randomly placed cobbles which seems to cut **20**, possibly as a repair.

Patch no: **22**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 18,19,23,24,27,60,61
Dimensions: 9.3m x 8.2m
Description:
A large area of well laid medium cobbles in north/south linear patterns with drain **18** running along the south-western edge. This patch is cut by **23**.

Patch no: **23**
Cobble Size: Medium
Orientation: Random
Adjacent patches: 19,22,24
Dimensions: 5m x 2m
Description:
A patch of randomly placed medium cobbles which cuts **22** and **24**. There are three small metal covers for drains or services in this patch and it is likely that the patch is a result of their insertion.

Patch no: **24**
Cobble Size: Large
Orientation: north/south
Adjacent patches: 20,23,24,25,28
Dimensions: 11m x 2m
Description:
A patch of large cobbles placed in an irregular north/south alignment and which have a somewhat uneven surface.

Patch no: **25**
Cobble Size: Small
Orientation: north/south

Adjacent patches: 20,24,26,28
Dimensions: 9.2m x 4.1m
Description:
An area of compact small cobbles with some linear north/south patterns but in many areas it has been disturbed by traffic which obscures the patterns.

Patch no: **26**
Cobble Size: Large
Orientation: Random
Adjacent patches: 25,28,29
Dimensions: 2.2m x 1.8m
Description:
A patch of randomly laid, large cobbles with an uneven surface and varying spacing. It is probably a later repair.

Patch no: **27**
Cobble Size: Small
Orientation: north/south
Adjacent patches: 22,24,31,36,37,38,39,60,61,64
Dimensions: 13m x 9m
Description:
A large area of small compact cobbles well laid; it has linear patterns showing in the areas not disturbed by traffic. It butts patch **60** and drain **64**.

Patch no: **28**
Cobble Size: Large
Orientation: north/south
Adjacent patches: 24,26,29,31,32
Dimensions: 5.6m x 2.2m
Description:
An irregular patch of large cobbles placed in a slightly irregular east/west alignment but with no real patterns. The surface is relatively even and could be a repair.

Patch no: **29**
Cobble Size: Small/Medium
Orientation: east/west
Adjacent patches: 26,28,30,33
Dimensions: 5.6m x 2m
Description:
An area of well defined small cobbles which are well laid in north/south linear patterns and are placed very compactly.

Patch no: **30**
Cobble Size: Small

Orientation: Random
Adjacent patches: 29,33,34,39
Dimensions: 9m x 0.6m
Description:
A band of randomly placed but well laid and compact small cobbles along the edge of the garden wall.

Patch no: **31**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 27,28,32,36,47
Dimensions: 4.6m x 0.8m
Description:
A small patch of east/west aligned medium cobbles showing little disturbance.

Patch no: **32**
Cobble Size: Large
Orientation: Random
Adjacent patches: 28,29,31,33,47
Dimensions: 2.5m x 2.6m
Description:
A patch of large cobbles laid randomly with a metal service cover at the northern edge. It is likely that these cobbles were replacements for cobbles removed during the insertion of the service.

Patch no: **33**
Cobble Size: Small
Orientation: east/west
Adjacent patches: 29,30,32,34
Dimensions: 1.8m x 2.4m
Description:
A patch of small well laid cobbles aligned north/south but not showing the distinct linear patterns which are in the adjacent patch **29** to the south.

Patch no: **34**
Cobble Size: Small and Medium
Orientation: Random
Adjacent patches: 30,33,47,49
Dimensions: 4m x 3.2m
Description:
A patch of compact small and medium cobbles with an uneven surface and some traffic disturbance in the north-eastern corner which has caused a rut.

Patch no: **35**

Cobble Size: Large
Orientation: Random
Adjacent patches: 34
Dimensions: 0.6m x 0.9m
Description:
A patch of irregular random large cobbles contained within patch **34**.

Patch no: **36**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 27,31,37,64
Dimensions: 8.7m x 6.6m
Description:
A patch of medium cobbles laid north/south but not showing any particular patterns and somewhat disturbed.

Patch no: **37**
Cobble Size: Small/Medium
Orientation: east/west
Adjacent patches: 27,36,64
Dimensions: 2.2m x 2.2m
Description:
A patch of medium cobbles laid east/west but not showing any particular patterns and somewhat disturbed.

Patch no: **38**
Cobble Size: Medium and Large
Orientation: Random
Adjacent patches: 27,39,40,64
Dimensions: 7.2m x 4.4m
Description:
A patch of randomly placed and very uneven large and medium cobbles which is very disturbed as it is right in front of the gate to the staff car park and its shape follows the turning direction of cars going in or out. There are also two metal drain covers inserted in this patch which may account for it being laid.

Patch no: **39**
Cobble Size: Small and medium
Orientation: east/west
Adjacent patches: 27,38
Dimensions: 7.2m x 2.7m
Description:
A slightly disturbed patch of east/west aligned small and medium cobbles in which linear patterns can be seen. There is also a drain in this area against the wall for a pipe leading out of the building.

Patch no: **40**
Cobble Size: Medium
Orientation: Random
Adjacent patches: 38
Dimensions: 1.3m x 3.4m
Description:
A patch of undisturbed randomly placed medium cobbles with no patterning which were probably placed at the insertion of a drain which is next to the wall to the north out of which comes a pipe.

Patch no: **41**
Cobble Size: Small and medium
Orientation: east/west
Adjacent patches: 38,42,43,44,46,64
Dimensions: 3.3m x 5m
Description:
An irregular area of east/west aligned medium cobbles with linear patterns which is cut by drain **64** and has a large rut in the eastern portion.

Patch no: **42**
Cobble Size: Small
Orientation: east/west
Adjacent patches: 41,43
Dimensions: 0.6m x 2m
Description:
A small patch of east/west oriented small cobbles laid compactly but not showing any patterning.

Patch no: **43**
Cobble Size: Medium
Orientation: east/west
Adjacent patches: 41,42,44,45
Dimensions: 1.4m x 3m
Description:
a patch of east/west oriented medium cobbles showing no patterning.

Patch no: **44**
Cobble Size: Medium
Orientation: north-west/south-east
Adjacent patches: 41,42,43,45,46
Dimensions: 0.6m x 3.2m
Description:
A patch of medium sized cobbles aligned north-west/south-east which shows no patterning and cuts **41** and **45**.

Patch no: **45**
Cobble Size: Medium
Orientation: east/west
Adjacent patches: 43,44,46
Dimensions: 2.2m x 3.2m
Description:
An area of east/west oriented medium cobbles showing linear patterns which is cut by **44** and has a drain against the northern building wall for a drainpipe coming out of the building.

Patch no: **46**
Cobble Size: Medium
Orientation: north/south
Adjacent patches: 41,44,45,47,64
Dimensions: 6m x 3.4m
Description:
A patch of medium cobbles aligned north/south which shows occasional linear patterns and is cut by drain **64**.

Patch no: **47**
Cobble Size: Large
Orientation: north/south
Adjacent patches: 31,32,34,36,44,46,49,50,64,66
Dimensions: 7.8m x 2.8m
Description:
A patch of large cobbles aligned north/south showing linear patterns which has a small metal service access cover at the south edge and a drain in the middle, neither of which shows any difference in cobbling around them and therefore could be contemporary.

Patch no: **48**
Cobble Size: Large
Orientation: Random
Adjacent patches: 47
Dimensions: 0.5m x 0.6m
Description:
A small patch of random large cobbles contained within area **47** which may be an area of repair.

Patch no: **49**
Cobble Size: Medium and large
Orientation: east/west
Adjacent patches: 30,34,47,50,65
Dimensions: 4.6m x 2.3m
Description:

An area of medium and large cobbling aligned east/west and showing no patterning. The cobbles have been badly disturbed in the southern portion and two large ruts have formed.

Patch no: **50**
Cobble Size: Large
Orientation: Random
Adjacent patches: 47,49,51,65
Dimensions: 0.4m x 2.4m
Description:
A linear patch of large cobbles laid randomly which cuts **49** and **51** but stop at the edge of **65.**

Patch no: **51**
Cobble Size: Small
Orientation: east/west
Adjacent patches: 50,65,66,67
Dimensions: 1.2m x 1.8m
Description:
A patch of small compactly laid cobbles aligned east/west which does not show any patterning and is cut by **50**.

Patch no: **52**
Cobble Size: Medium
Orientation: north-west/south-east
Adjacent patches: 51
Dimensions: 1.2m x 1.8m
Description:
A patch of medium cobbles laid north-west/south-east and showing a vague linear patterning. There is also a drain at the junction of the two walls to the north and east, the insertion of which could be associated with these cobbles.

Patch no: **53**
Cobble Size: Small and medium
Orientation: north/south
Adjacent patches: 17,62,68
Dimensions: 7.4m x 11.4
Description:
A large patch of well laid and well preserved small and medium aligned north/south and showing distinct linear patterns. It is cut by drain **62** and butts area **17**.

Patch no: **54**
Cobble Size: Small and medium
Orientation: east/west
Adjacent patches: 55,56,57,58,62

Dimensions: 10.7m x 10.6m
Description:
An area of well laid small and medium cobbles showing distinct east/west linear patterns for most of the area but these patterns have disappeared through disturbance at the northern end where the main weight of visitors comes through the gates.

Patch no: **55**
Cobble Size: Small
Orientation: Random
Adjacent patches: 54
Dimensions: 3.6m x 2m
Description:
A small patch of small cobbles placed randomly and showing no patterns. This could be due to them being directly in the entrance to the garage which has a large amount of visitors.

Patch no: **56**
Cobble Size: Small
Orientation: Random
Adjacent patches: 54
Dimensions: 2.6m x 3m
Description:
A patch of small randomly spaced cobbles which show no patterns. They lie in front of the entrance to the visitors reception and have been quite disturbed due to this.

Patch no: **57**
Cobble Size: Large
Orientation: east/west
Adjacent patches: 54,58
Dimensions: 2.2m x 3.4m
Description:
A patch of east/west aligned large cobbles around a grid which could, along with repair from the volume of traffic through the nearby entrance, account for this patch.

Patch no: **58**
Cobble Size: Large
Orientation: east/west
Adjacent patches: 54,57,59,63
Dimensions: 2.1m x 10m
Description:
A band of large cobbles with linear patterns but random within these lines.

Patch no: **59**
Cobble Size: Small and medium

Orientation: east/west
Adjacent patches: 58,63
Dimensions: 10.8m x 9m
Description:
An area of small and medium compactly laid cobbles which show some linear patterning, although a lot of the patterning is very indistinct which is possibly due to the stable entrances.

Patch no: **60**
Cobble Size: Small and medium
Orientation: east/west
Adjacent patches: 22,27,61,63
Dimensions: 11.2m x 10.8m
Description:
An area of small and medium compactly laid cobbles which show some linear patterning, although a lot of the patterning is very indistinct which is possibly due to the stable entrances.

Patch no: **61**
Cobble Size: Small and medium
Orientation: Random
Adjacent patches: 22,27,60
Dimensions: 2.8m x 1m
Description:
A patch of small and medium cobbles spaced randomly with no patterning which is very disturbed.

Patch no: **62**
Cobble Size: Medium
Orientation: north-east/south-west
Adjacent patches: 53,54
Dimensions: 15m x 0.2m
Description:
A linear drain made up of medium cobbles running north-east/south-west to a metal grid at the north-east end.

Patch no: **63**
Cobble Size: Medium
Orientation: north-west/south-east
Adjacent patches: 58,59,60
Dimensions: 15.4m x 0.2m
Description:
A linear drain made up of medium cobbles running north-west/south-east to a metal grid at the south-east end. There is also a metal grid at the north-west end against the northern wall.

Patch no: **64**
Cobble Size: Medium
Orientation: north-west/south-east
Adjacent patches: 27,36,37,38,41,46,47
Dimensions: 9.8m x 0.3m
Description:
A linear drain made up of medium cobbles running north-west/south-east. It heads towards metal grids at both ends but stops before it actually reaches them.

Patch no: **65**
Cobble Size: Small
Orientation: Random
Adjacent patches: 49,50,51
Dimensions: 2.4m x 0.4m
Description:
A thin band of randomly placed but well laid cobbles which are very compact and undamaged due to their proximity to the wall.

Patch no: **66**
Cobble Size: Large
Orientation: east/west
Adjacent patches: 44,47,51,52
Dimensions: 2.3m x 3.8m
Description:
A patch of large sets, instead of cobbles, which measure 200mm x 80mm each and are placed in east west rows end to end. This lies at the entrance to the hall courtyard and as such sees a lot of use by visitors.

Patch no: **67**
Cobble Size: Small
Orientation: Random
Adjacent patches: 66
Dimensions: 0.4m x 0.6m
Description:
A patch of small random cobbles placed around a metal service cover which was inserted into the area of large sets (patch **66**).

Patch no: **68**
Cobble Size: Small
Orientation: Random
Adjacent patches: 53
Dimensions: 0.6m x 11.5m
Description:

A length of randomly placed but well laid small cobbles along the southern wall which contains four metal grids.

Patch no: **69**
Cobble Size: Medium and large
Orientation: Random
Adjacent patches: 2,3,4
Dimensions: 1.2m x 0.6m
Description:
A patch of randomly placed medium and large cobbles set around a metal grid which was inserted through the linear patch of cobbles at **3**.

APPENDIX 1
PROJECT BRIEF

APPENDIX 2
PROJECT DESIGN

METHODOLOGY FOR THE SURVEY OF COBBLED STABLE YARDS AT DUNHAM MASSEY

SURVEY

Execute field work as the basis of the reinstatement and consolidation of the cobbled stable yard at Dunham Massey. It is understood that the area of cobbles to be surveyed and photographed occupies approximately 1043sqm.

It is recommended that an instrument survey, accurate to a scale of 1:20, of the cobbled stable yard be undertaken, which will then form the basis for the rectified photographs that will be taken from a consistent height using a medium format camera, mounted on a mobile scaffolding tower. LUAU propose to conduct the survey control for the plans by means of its in-house total station facility, linked to a portable data logger. In conjunction with Computer Aided Draughting (CAD) software, the use of total station instrumentation allows for a very accurate and accurate survey to be produced. The survey plans and control for the rectified photography can thus be computer-generated as the survey proceeds.

The aim of the survey is to provide accurate, three-dimensional co-ordinates, with respect to a local grid and OS altitude datum. It is proposed that survey control be established by closed traverse to an accuracy of +/- 0.025m in plan and 0.02m in height. Sufficient control will be established to provide four control points per photograph, which will be defined by gridded strings across the cobbled surface. To prevent any health and safety risk to the general public during the three days of the photographic survey, it will be necessary to cordon off half of the stable yard from public access at any one time. If this is not possible the costs defined below will need to be subject to variation.

The rectified photography will provide photographic prints at an approximate scale of 1:20 and it is anticipated that the extent of each photograph will cover an extent of 4m x 4m. This will result in the production of up to 94 photographs. Two cost options are defined below, dependant upon whether the prints are monochrome or colour; colour printing provides a cheaper alternative and can also provide additional information for the subsequent interpretation of the original design.

Because of irregularity of the stable yard surface it will not be possible to guarantee true rectification. The scale of the prints may therefore vary between 1:18 and 1:22. However, each photograph will be precisely located by the survey control and therefore any errors of rectification will not proliferate beyond the extent of the individual photograph.

Preparation of drawings

LUAU possesses the facility to generate drawings in CAD format. The results of the field survey will be down-loaded to an industry standard CAD system (FastCAD), and which will incorporate the primary instrument survey information and the photographic control points. Each individual photograph will be digitised to capture significant detail and patterning within the cobbled surfaces but will not record individual cobbles, unless of abnormal size or character. The CAD drawing will incorporate annotated control information, so that the client will be able to underlay individual photographs beneath the film copy of the survey drawings. It will therefore be possible to generate stone by stone drawings if required in the future.

Design interpretation
On the basis of the cobble record provided by the digitised photographic survey, a graphic interpretation of the original design will be produced and generated as a separate layer within the CAD system. This will reconstruct where identifiable any evidence of phasing in the cobbled design. Accompanying the graphic reconstruction of the design will be a short report that will outline the methodology, and the evidence for the reconstruction of the original design and any identifiable phasing.

Drawing output
The survey plans outlining the cobbled outline detail and survey information will be produced on dimensionally stable drafting film at a presentational scale of 1:20 and prints will be provided at a similar

scale (1:20). Each sheet will be fully titled. Line thicknesses will be chosen to allow for ease of duplication and/or reduction. Particular attention will be paid to achieving drawings of the highest quality and accuracy.

Copies of the rectified photographic prints will be labelled with reference to the survey plans to facilitate the identification of the cobbled areas for digitising purposes.

WORK TIMETABLE

It is envisaged that the various stages of the project outlined above will fall into three distinct phases, which would follow on consecutively.

The phases of work would comprise:

i Survey preparation
1 day

ii Field survey
4 days

iii Digitising of drawings
9.5 days

iv Preparation of drawings
2 days

v Report production
3 days

LUAU can execute projects at short notice once an agreement has been signed. It is understood that the survey must be completed prior to 14th October 1996, but the presentation of the results need not be submitted until 1st April 1997.

LUAU would be able to submit the drawings to the National Trust within 10 weeks from the completion of the field survey subject to the terms of the agreement.

OUTLINE RESOURCES

The following resource base will be necessary to achieve the proposals detailed above. The total cost quoted on the accompanying sheet, is a fixed price. Any variation from the programme of work at the National Trusts direction will require recosting. The costs defined below provide for hire of a mobile scaffolding tower.

1. Survey preparation
1 man-day Project Officer

2. Field survey
2 man-days Project Officer
2 man-days Project Assistant
2 man-days Sub-contractor (rectified photography)

3. Digitising and preparation of drawings
2 man-days Project Officer
7 man-days Project Assistant

4. Graphic reconstruction
2 man days Project Officer

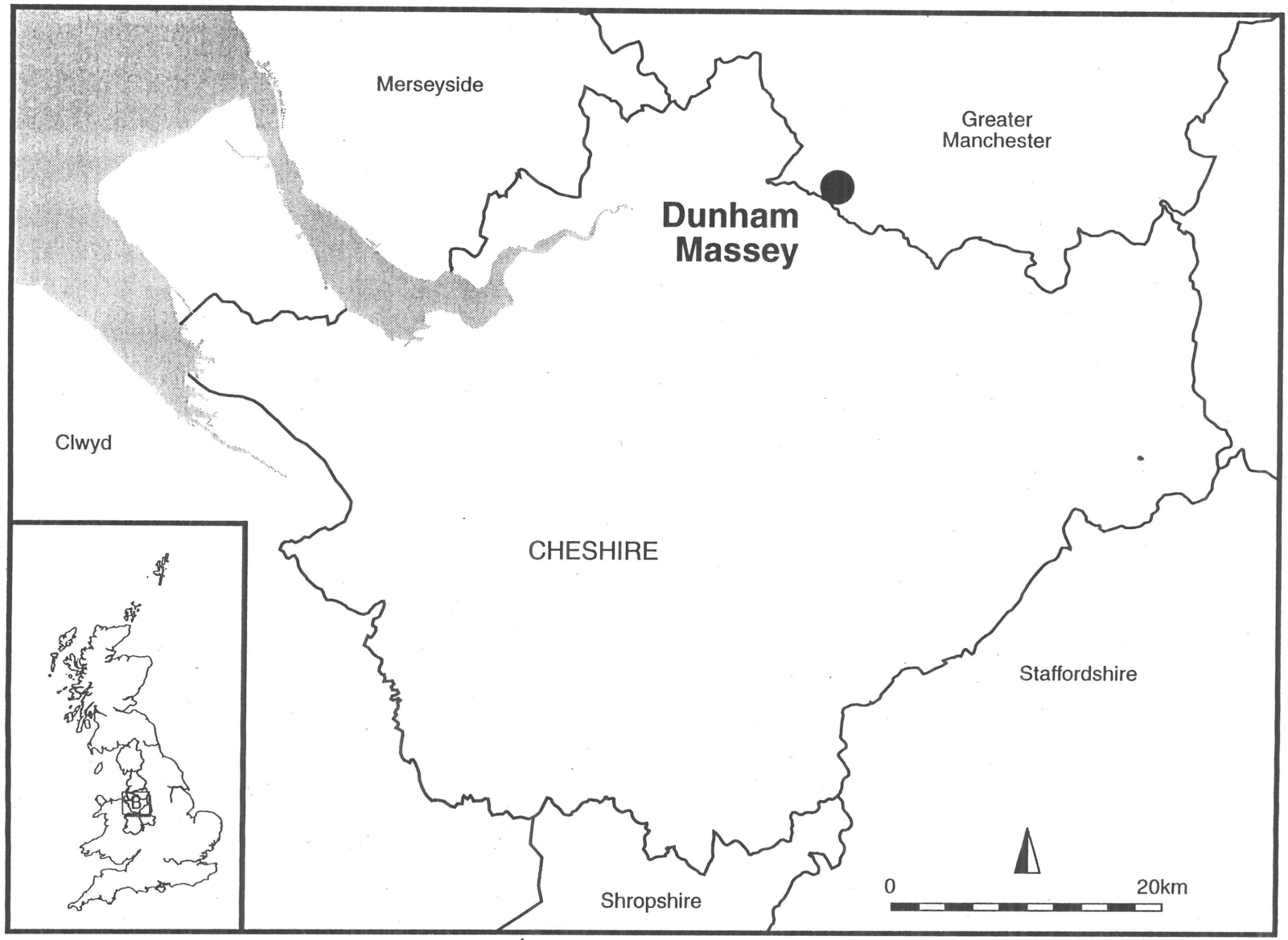
5. Report production
2 man days Project Officer

LUAU staff is made up of professional archaeologists with a wide range of experience and qualifications. It is proposed to sub-contract the rectified photography element of the fieldwork to Dennis Thompson with whom LUAU has successfully collaborated on numerous projects.

All LUAU staff comply with the relevant Codes of Practice of the Institute of Field Archaeologists, and Health and Safety at Work Act, 1974.

The project will be under the management of **James Quartermaine BA Dip(Survey) MIFA** (Project Manager) to whom all correspondence should be addressed.

ILLUSTRATIONS



Based on Bartholemews digital data with permission

Figure 1: The location of Dunham Massey

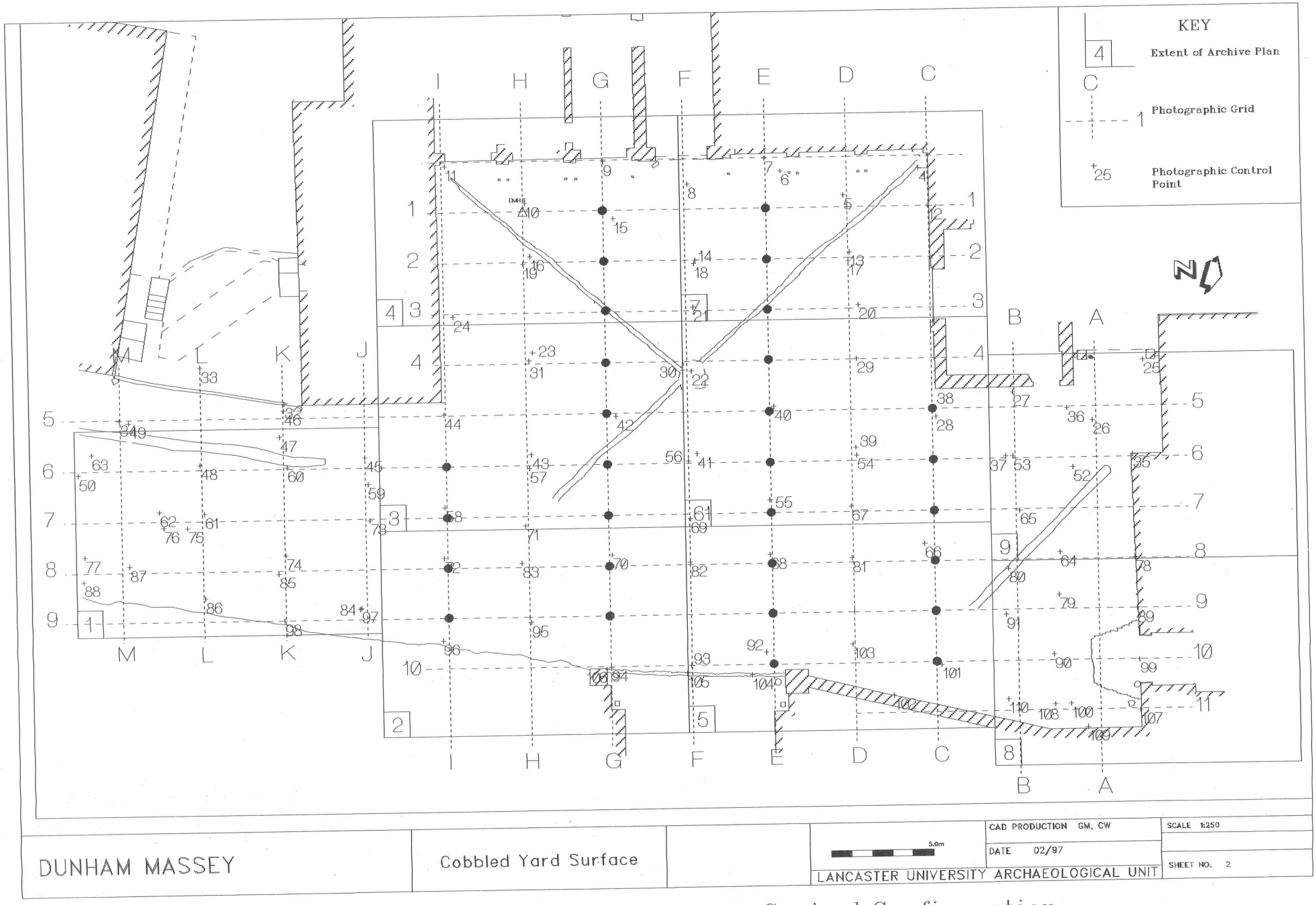


Fig 2 Photograph and Survey Control Configuration

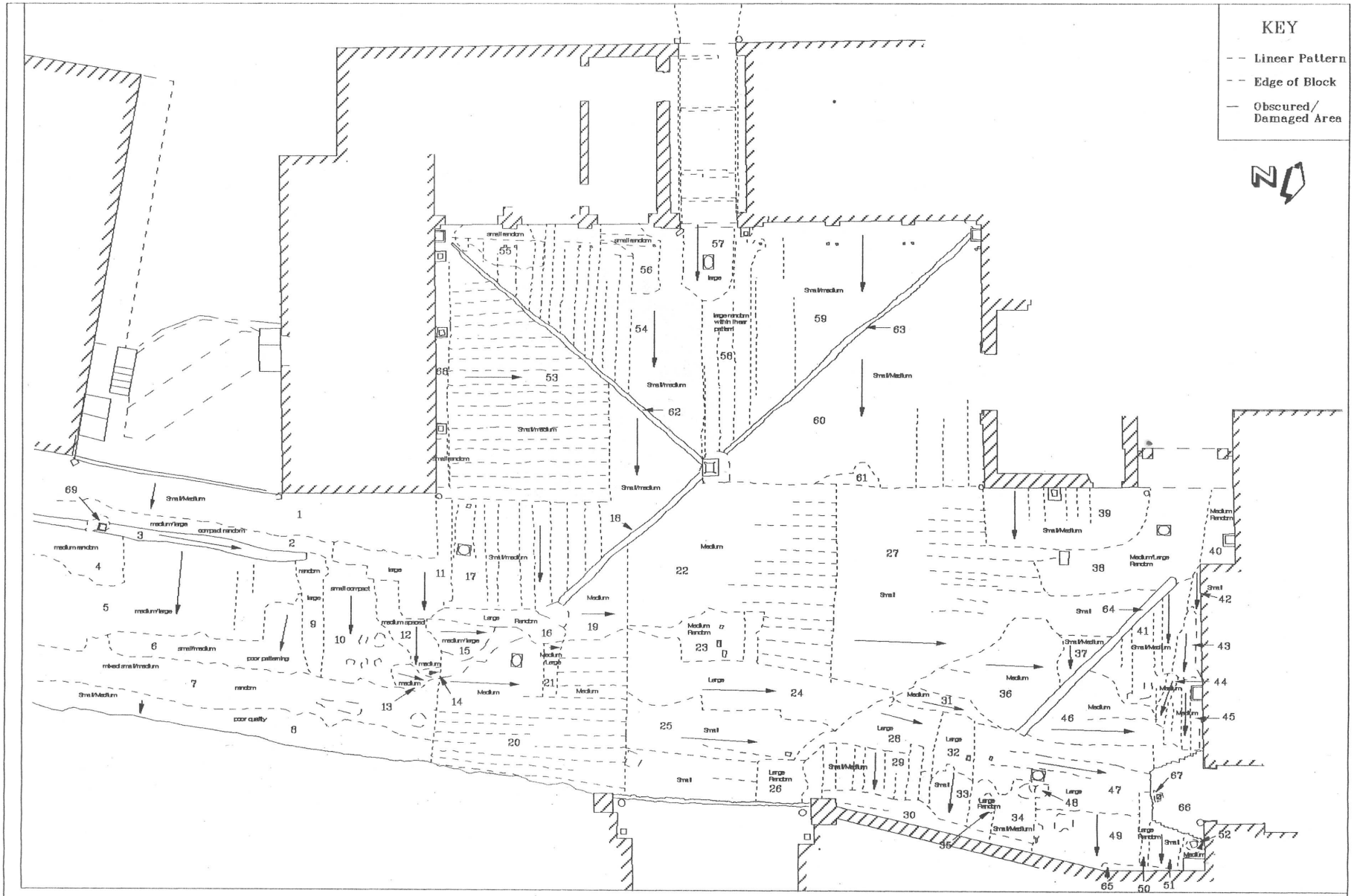


Fig 3 Analysis of Cobbled Surfaces

Fig 4 Extant patches of early cobbled surfaces