

SOUTH CALDECOTTE, MILTON KEYNES

Supplementary Heritage Assessment



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South Caldecotte
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REPORT

Quality Management

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EXECUTIVE SUMMARY

This Supplementary Heritage Assessment (SHA) has been written in response to issues raised by Historic England (HE) and Milton Keynes Council in responding to the proposal (19/01818/OUT) to develop the allocated site at South Caldecotte (SD14).

Historic England requested that the assessment of the archaeological evidence in the Desk Based Assessment, Trial Trench Evaluation and WSI for Investigation was reconsidered. HE were concerned in particular with the potential survival of floor surfaces amongst the Roman period archaeology, the weight given to the survival of ridge and furrow and the impact of development on the archaeology as well as the potential for preservation in situ.

Historic England's comments closely reflected the advice of Milton Keynes' Council though the Council also requested that the investigation of the archaeology was justified in the terms specified by the National Planning Policy Framework (para 197).

The SHA opens with a formal assessment of the significance of the archaeology within the development area. It uses the evidence from the evaluation to describe the significance in terms set out in guidance issued by Historic England and DCMS. It concludes that although the Roman and Iron Age archaeology represents the periphery of the small Roman town of Magiovinium, evidence from the trial trenching and comparison with excavations in the 1970s, suggests that it is not of schedulable quality. Its significance was found to be regional rather than national. Similarly, the ridge and furrow was reviewed and it too was found to be of interest but when seen in the context of wider study represented only a fragment of a once much larger area. Its significance was deemed to be local rather than regional. The precise levels of significance for both Iron Age/Roman and medieval data sets was expressed in terms of published criteria. Medium for the Iron Age and Roman and low for the ridge and furrow.

In the section which follows the impact of development on Magiovinium was assessed in terms of development within the setting of the small Roman town (a Scheduled Ancient Monument). This was approached in stages. Firstly the significance of the monument is described, secondly its setting is determined and in the third stage the contribution that the setting makes to the significance of the Roman town is discussed. The section concludes that today it is possible to appreciate the wider setting of the Roman town, with the Greensand ridge and Ouzel valley in the hinterland, but that recent development had created an increasingly urban environment. The assessment, aided by wire-views in the Landscape AND Visual Assessment (LVIA), found that although the development would contribute a further urbanising effect this was not to the extent of substantially harming the heritage significance of the Roman town.

The third part of the report addresses the justification of the scheme. The NPPF specifically excludes archaeological excavation as a benefit of development and as a result the justification is couched in terms of the strategic and economic value of the development. This section is very clear that the justification for the development has been assessed in detail by Milton Keynes Council when allocating the site in the Local Plan - Plan:MK. Nevertheless, this section also goes on to demonstrate why the archaeology cannot be preserved in situ. Detailed information is provided about the nature of construction, the impact of large commercial buildings and the character of the geology and soils which make up the archaeological site.

The conclusion of this section is that to achieve the requirements of Policy SD14 as set out in the Plan:MK a series of commercial buildings are necessary at the site. These, accompanied by their supporting infrastructure of services, drains, carparking and access roads, would take up the majority of the site area. In theory the archaeology could be preserved beneath them, however when the extent of the archaeology, the impact of above ground development and the

compression brought about by buildings, or density of pile foundations is taken into account it was found impossible to achieve the policy of objective of the Plan:MK.

In conclusion the balanced judgement required by the NPPF, the additional information requested by Historic England and the justification asked for by Milton Keynes Council, has been provided. It shows that the archaeology within the development site is of Medium significance and that when its preservation is considered in detailed and practical terms it can only be saved by investigation if the objectives of the Plan:Mk are to be achieved. The impact on archaeology will be to reduce its significance through excavation, but to provide a body of data capable of informing wider interpretations of Roman urban development.

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1 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This subject of Supplementary Heritage Assessment (SHA) is land at South Caldecotte allocated for employment use in Plan MK (Policy SSD14). The SHA has been prepared by Michael Dawson of RPS Group on behalf of HB (South Caldecotte) Ltd .
- 1.2 The site at South Caldecotte has been allocated for employment use in Plan MK, which was adopted in March 2019.
- 1.3 This Supplementary Heritage Assessment has been written in response to the request for further information by Historic England (ex litt D Wilkinson P01092270) and in light of the recommendation for refusal of planning permission by MKDC (ex litt N Crank 30/8/19).

Scope of Study

- 1.4 The objectives of the report can be summarised as follows:
- To provide a revised assessment of significance of the Roman period archaeology (HE Ref:P01092270, para 2 ff)
 - To provide an assessment in connection with wireframes to be provided as part of the LVIA which show the effect of the views from the monument (SAM Roman Town of Magiovinium and Roman Fort, 1006943) (HE Ref:P01092270, para 15ff)
 - An assessment of the impact of development (HE Ref:P01092270, para 12 ff) and justification for the harm to heritage assets.
- 1.5 Evidence for the above has been taken from reports submitted as part of the application including a Desk Based Assessment (MOLA 15/151 2015), geophysical survey (MOLA 18/51 2018) and trial trenching (MOLA 18/19 2019) together with published and reasonably available archive data.

The Proposed Development

- 1.6 The proposed development 19/01818/OUT is an “Outline application including access for the development of the site for employment uses, comprising of warehousing and distribution ...at the South Caldecotte site allocated for employment in the adopted Plan MK”.

2 SIGNIFICANCE OF HERITAGE ASSETS

- 2.1 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.
- 2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), and it was last updated in February 2019. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014, with the guidance on Conserving and Enhancing the Historic Environment last updated 23rd July 2019 (<https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment>).
- 2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

- 2.4 Section 16 of the NPPF, entitled Conserving and Enhancing the Historic Environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets.
- 2.5 *Significance* is defined in Annex 2 as: The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting...
- 2.6 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases.¹ Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting.

Statement of Significance

- 2.7 In the following section the statement of significance adheres to the definition of significance in Annex 2 of the NPPF, focussing on the archaeological, architectural, artistic or historic values of the deposits. The statement is cognizant of Historic England's opinion expressed in the now dated Conservation Principles where heritage values are defined as evidential, historic, aesthetic and communal.²

¹ (Bedford Borough Council v Secretary of State for Communities and Local Government 26/7/2013) where the High Court judge suggested that substantial harm would arise if 'very much, if not all, of the significance was drained away.'

² A new updated Conservation Principles is under consultation and the latest consultation draft of Conservation Principles has been posted on HE's website on 30/8/19.

- 2.8 The four principal areas of significance defined by the NPPF are, where appropriate, subdivided. For instance, in relation to historical value where Conservation Principles identifies *illustrative* and *associative* values. Illustrative is defined as *'the perception of a place as a link between past and present which depends on the visibility in a way that evidential value (for example of buried remains) does not'*. In contrast Associative value lies *'with a notable family, person, event or movement [and] gives historical value particular resonance.'*³
- 2.9 *In the section which follows the archaeological remains within the allocated site have been identified by land ownership. (See Fig 4)*

Roman and Iron Age

- 2.10 This section considers the heritage value of (1) Unwin's, an area of street running north east from the Roman small town of Magiovinium, (2) Woburn an enclosure of Roman date to the south and (4) Iron Age/Roman enclosures east of the brook and within Norman's land.
- 2.11 **Evidential Value.** The principal focus of the Roman period archaeology that is the subject of this proposal lies within the area indicated on Fig 4 (Unwin's, Norman's and Woburn). In this location the evidence survives primarily as sites of buried archaeological deposits from the Roman era whilst the earthwork remains at both Unwin's and Woburn (3) comprise the upstanding remnants of agriculture probably from the Medieval Period. The full extent of archaeology within the South Caldecotte Strategic Employment Allocation includes enclosures of Iron Age on high ground to the east; a street running out from the core area of the Roman town (1) Unwin's, an area of enclosures, (4) Normans, further to the east beyond a small brook which flows westwards to the River Ouzel⁴ and an enclosure (2) Woburn close to the southern roundabout on the A5. The land surface above (1) Unwin's and (2) Woburn is characterised by the earthwork remains of medieval farming (ridge and furrow).
- 2.12 The spatial disposition of the below ground archaeology at South Caldecotte indicates that it represents the periphery of the Roman small town of Magiovinium. Evaluation indicates that in (1) Unwin's a short stretch of metalled Roman period street leads north eastwards away from the urban core of the small Roman town towards the open countryside. Initially passing through an area of gravel quarrying, active in the 1st century AD, pressure on the settlement area to the west of the A5 seems to have led to the development of dwellings on plots flanking the street in the later Roman period. The regularity of the plots within which the houses sit suggests some form of land allotment or enclosure. This area was occupied possibly throughout the 3rd and 4th centuries. The gravel metalled street may have led initially through the area of gravel quarrying to several enclosures east of the brook today identified as (4) Normans' land.
- 2.13 In area (2) Woburn's, an enclosure of Roman date extends the area of enclosures identified by Neal (1987, site 17) in 1978-80.
- 2.14 The evaluation of the Roman street area revealed a ceramics assemblage which confirmed the local character of the majority of the pottery, but with important regional elements including Nene Valley Colour coat and Gaulish Samian were imported in the 1st century. Much of the remaining material culture was unexceptional with brick (94 frags from 31 contexts weighing 9.65kg), kiln bars (72g), quern stones, fired clay, iron slag and nails. The specialist report notes that *"This*

³ Conservation principles 2008, 28-29.

⁴ To the north-east of the Roman street Trenches 14 and 25 were positioned to examine two rectilinear enclosures revealing the enclosure ditches and a further possible curvilinear ditch beyond the northern enclosure. Several internal features were also identified. The enclosures contained both Iron Age and Roman period ceramics and although plough eroded have the potential to reveal further evidence of early occupation.

amount of brick and tile is not usual for an evaluation and suggests that there is/are likely that there had been Romanised building(s) on site constructed with tiles and brick". These groups represent the normal range of activities familiar from Roman small towns, from pottery production to food production (Burnham, Wachter 1990, 46-50).

- 2.15 The ceramics assemblage which includes pottery of Iron Age and Romano-British character includes Iron Age material from the roadside ditches (8522/21), (8518), [8540] and fragments of Iron Age ceramics have been recovered from the surface of the street. In addition, Iron Age ceramics have been found in the ditches of the flanking enclosures (8527, 8609, 8727) as well as in the ditch of an enclosure in (3) Normans Land (2807). The ceramics report describes the assemblage as poorly preserved with many wares abraded and with weathered surfaces. Of particular interest is the suggestion that (MOLA 18/169 page 49) pottery from the roadside ditches is indicative of a date of deposition not long after the Roman Conquest and there is no doubt that the Roman town was established in an already occupied Iron Age landscape. Equally significant is the observation based on the constituents of the ceramics assemblage that *"Despite being close to the town at Magiovinium, the assemblage is jar-dominated (61%) and produced only 14% bowl/dishes; figures expected from a rural site without easy access to a roadway. Beakers occupy a moderately high but not unexpected proportion of the assemblage (compare to the 13.4% from the recently-excavated assemblage from Steeple Claydon, Bucks.: Sutton 2018, fig.46). Mortaria are very well represented, though, at 1.42 EVEs and 5.5% of the assemblage."*
- 2.16 The animal bone and charred plant remains indicate a diet perhaps dominated by beef (cattle at 60%) with sheep and goat bones comprising some 24% of the assemblage. Oats, wheat and barley were evident in the roadside ditches of Trench 87 whilst horse bones, likely to represent the remains of draught animals, comprised 13% of the bone assemblage.
- 2.17 No human remains were recovered from the trenches.
- 2.18 In summary the areas of Roman activity retain significant evidence in the form of archaeological deposits relating to the 1st to 4th centuries. In relation to periodisation the later Iron Age pottery hints at the location elsewhere of an earlier settlement whilst the Roman pottery suggests that the street was first occupied in the pre-Flavian period until at least the late 2nd century, when the flanking ditches may have been allowed to silt up. The earliest activity at the Unwin's site may have been quarrying alongside the road before any settlement activity occurred. Enclosures seem to have been established here after the quarry period from the late 1st century onwards and occupied into the 3rd century before the town began to contract in the 3rd and 4th centuries. This is a situation which is comparable to that identified during David Neal's excavation along the route of the A5 (Neal 1987).
- 2.19 **Historical Value:**
- 2.20 **Illustrative:** The archaeology in (1) Unwin's and (3) Norman's land is a common survival of archaeology peripheral to a small Roman town. It comprises the type of activities which might be expected of such areas, from the initial gravel quarrying through the construction and metalling of the street during the late 1st and 2nd century. Later the street would be characterised by ribbon-like development of enclosures and possibly habitation and or workshops. The enclosures east of the brook, which flows through Unwin's, are an example of settlement transition from urban periphery to rural landscape.
- 2.21 The evidence at South Caldecotte shows how military dispositions of the early invasion period evolved into economic centres. The small town of Magiovinium has long been considered to have its origins in a small fort, adjacent to the roundabout on the A5, which acted as a focus for settlement. This was established in an area to the north of the fort, close to Dropshort Farm and the River Ouzel. The developmental model is represented by the Scheduled Monument Area.

- 2.22 The line of the street found in (1) Unwin's at South Caldecotte continues the line of the street surface discovered by Neal (Site 18) where he argued the street led towards the main gate into Magiovinium, although its northern route was at that time uncertain. Possibly, he speculated, it may have led towards Harrold in Bedfordshire. In time the wayside ditches at Site 18 and to the south at Site 17 were allowed to silt up in the later 2nd century suggesting the street changed character during its period of use.
- 2.23 The evidence also supports the conclusions by Neal (Site 17) that a series of five deep fairly narrow north-south gullies *'indicates a certain uniformity. Most of the plots were about 19m wide and correspond to similar enclosures found at Towcester'* (Neal 1987, 9) and suggest a planned settlement of land allotments.
- 2.24 In summary the Roman archaeology at South Caldecotte, (1) Unwin's and (2) Woburn, further illustrates aspects of the model proposed in the 1980 by Neal that the civil settlement at Magiovinium may have been a planned settlement beyond an earlier Roman fort. The dating from the evaluation suggest this may have taken place in the Pre-Flavian period (before 69AD).
- 2.25 The model of economic development has been taken further by Millett and endorsed recently by Allen et al., who have proposed that the later economic development of planned small towns was related to their function as locations for tax collection based perhaps on market centres and trade.⁵ The model developed above illustrates how through investigation, past people, events and aspects of life can be connected through a place to the present. In the absence of such investigation the illustrative value of the site, as Historic England note,⁶ is confined to the ridge and furrow which together with modern ploughing on (4) Normans land illustrates agricultural practice.
- 2.26 The enclosures to the east of the Brook, (4) Normans land, are of landscape interest interdigitating the area of peripheral activity into the countryside.
- 2.27 **Associative:** The Roman remains have limited associative value in three ways. Firstly, it is an area of surviving, though truncated, Roman activity on the periphery of a small town. This dates from a period when the town was expanding. Its greatest extent was characterised, in Neal's terms, by ribbon development along a street leading to the core of the small town (the SAM). Secondly, it is associated with a recognised period of decline in the 3rd and 4th centuries which appears to have affected some small towns in the south and Midlands. This occurred at the same time that some of the major urban sites were developing significant defences and experiencing a change in focus and function. Some towns during this period saw the enlargement and improvement of public buildings whilst others experienced growth led by economic factors such as the establishment of markets.
- 2.28 There is also some significance in that the evidence represents the periphery of a small town. It is located in an area which might be considered to be especially sensitive to a variety of factors such as economic growth, proximity to Watling Street and where existing facilities and proximity to other centres of population and resources were influential. The Iron Age dating of the peripheral enclosures hints at an earlier settlement pattern, possibly subsumed within the Roman period landscape.
- 2.29 **Aesthetic value**
- 2.30 The Iron Age and Roman archaeology and the earthworks of the medieval ridge and furrow at the South Caldecotte site has little aesthetic value in its current form. It is effectively hidden from view
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⁵ Allen et al., 2017, 174-177, 237-80; Millett 1992, 123-6, 190-5

⁶ HE Ref:P01092270, para 13

and has not been the focus of research until the present round of assessment and evaluation. As noted above the current investigations allow people with some background information or prior knowledge to draw some intellectual stimulation from the place.

2.31 Conclusion

2.32 As Conservation Principles' notes a '*statement of significance*' of a place is a summary of the cultural and natural heritage values currently attached to it and how they interrelate which distils the particular character of the place.⁷ The following summarises the significance of the archaeology at South Caldecotte and assesses the archaeological remains in the context of the nearby Scheduled Ancient Monument of Magiovinium. The statement is cognizant of the criteria for scheduling⁷ and, as Historic England have requested, this section considers the criteria set out in Table 3 of the Desk Based Assessment (MOLA 2015) [see below].

2.33 In addition, the summary also takes into account the criteria set out in *Settlement Sites to 1500 Scheduling Selection Guide* (Historic England 2018) which specifies that: *Roman: Where they retain reasonable archaeological potential, Roman settlement sites will be deemed to have national importance. However, in some areas, both upland and lowland, certain types of settlement are sufficiently common to require discrimination in terms of scheduling recommendations. Again, considerations such as condition, group value and potential will require evaluation.*

⁷ DCMS *Scheduled Monuments & nationally important but non-scheduled monuments* 2013: **Period** All classes of monuments that characterise a category or period should be considered for preservation. **Rarity** There are some classes of monuments that are so scarce that all surviving examples that still retain some significance should be preserved; in general, however, a selection must be made of those monuments which best portray the typical and commonplace as well as the rare; this process should take account of all aspects of the distribution of particular classes of monument, both in a national and a regional context. **Documentation/finds** The significance of monuments may be enhanced by the existence of records of previous investigations or, in the case of more recent monuments, by the supporting evidence of contemporary records or representations; conversely, the absence of documentation contemporary to a monument can make its potential more important as the only means of developing our understanding. Similarly, their significance can be enhanced by the existence of related artefacts or ecofacts, such as those held in museums or other public depositories. **Group value** The significance of a single monument may be greatly enhanced by its association with related contemporary monuments and/or those of different periods; in such cases it is sometimes preferable to protect the complete group of monuments, including associated and adjacent land, rather than to protect isolated monuments within the group. **Survival/condition** The survival of a monument's significance, both above and below ground or underwater, is a particularly important consideration and should be assessed in relation to its present condition plus its surviving features. **Fragility/vulnerability** The significance of some monuments can be destroyed by a single ploughing or unsympathetic treatment, while there are standing structures of particular form or complexity whose significance can be severely reduced by neglect or careless treatment; vulnerable monuments of this nature could particularly benefit from the legal protection that scheduling confers. **Diversity** Some monuments may be selected for designation because they possess a combination of high-quality features, others because of a single important attribute. **Potential** On occasion, the nature of the archaeological interest of a monument cannot be specified precisely, but it may still be possible to document reasons anticipating the existence and importance of such evidence, and so to demonstrate the justification for designation; the greater the likelihood that such evidence would be revealed through expert investigation, the stronger will be the justification for designation.

Level of sensitivity	Definition
Very high - high	Sites of international importance: World Heritage Sites Sites of national importance include those that are designated as Scheduled Ancient Monuments or those that are considered to be suitable for scheduling, Grade I and Grade II* Listed Buildings, Registered Battlefields, Grade I and II* Registered Historic Gardens
Medium	Sites of regional importance include Grade II Listed Buildings, Grade II Registered Historic Gardens, Conservation Areas and those sites which are considered to be significant regional examples with well-preserved evidence of occupation, industry etc.
Low	Sites which are of less-defined extent, nature and date or which are in a poor or fragmentary state, but which are considered to be significant examples in a local context
Negligible	Areas in which investigative techniques have produced negative or minimal evidence of antiquity, or where large-scale destruction of the archaeological resource has taken place (e.g by mineral extraction)

Criteria for assessing the relative importance of cultural heritage sites used in the desk-based assessment by MOLA

- 2.34 **Period:** The site is part of a Roman period settlement and comprises a section of street on the periphery of what is probably the settlement core within the Scheduled Area. The dating evidence set out in more detail above indicates the creation of the Roman street shortly after the Roman conquest in the mid- 1st century. There can be little doubt that the Roman settlement was established in a landscape of established activity characterised as Iron Age.
- 2.35 **Rarity:** Sections of archaeological evidence on the edge of the small Roman town of Magiovinium have been highlighted by the HER map provided by the Desk Based Assessment (Fig 12 & 13). Some 49 entries characterise the intensity of interest in the site over the past 200 years. In terms of spatial data, however, an important dataset is that assembled for the assessment and evaluation of Eaton Leys to the west of the SAM. This shows a linear settlement form arranged along Watling Street⁸ (CgMs July 2018 WSI).
- 2.36 In terms of the region's Roman towns, Magiovinium is part of two principal distributions. Towns along Watling Street, including Towcester to the north and Dunstable to the south, and towns in the region within 50km including Alcester and Dorchester to the west, Baldock, Sandy, Godmanchester and Irchester in the east. Each of these towns has a similar settlement periphery and rural hinterland.⁹ In terms of the entire province of Britannia which forms the wider dataset for

⁸ Eaton Leys: MOLA 2014, report 14/217;

⁹ For an indication of the character of the hinterland of these towns and their settlement periphery see Burnham and Wachter 1990: Towcester 152 Fig 44, Alcester 92-103, Dorchester (on Thames) 117-122, Godmanchester 122-129; for Sandy, Beds., see Dawson

Roman towns, no recent survey is available, though, Burnham and Wachter listed 54 'small towns' in 1990. This list clearly understates the number as neither Magiovinium nor Sandy were listed and the list does not include the larger towns of which there may have been up to 28.¹⁰ This brief survey suggests that the evidence at South Caldecotte constitutes a small sector on the periphery of the Roman small town of Magiovinium, one amongst over 28 major towns and over 54 small towns.

- 2.37 **Documentation/Finds:** The documentation in relation to Magiovinium is extensive. See the Desk-Based Assessment which,¹¹ at Fig 13, draws attention to 40 events listed in the local Historic Environment Record and discusses the material on pages 19-21 concluding that *"A large amount of archaeological work has been carried out to the north, west, south-west and south of the site including excavations, fieldwalking, watching briefs, trial trenching and geophysical survey. One watching brief has been carried out within the site boundary at Crossroads Farm, where modern disturbance was found with a field drain and recent sheep burials."*
- 2.38 *The majority of the archaeological investigative work to the south and south-west of the site has found evidence of the Roman town of Magiovinium lies adjacent to the site to the south-west and its limits are not known. It is likely that this would extend into the southern end of the site, but evidence of Roman settlement has not been found as far east as Crossroads Farm.*
- 2.39 This conclusion was reached prior to the data gathering at Eaton Leys had been completed and before the trial trenching and geophysical survey of the current site had been undertaken.
- 2.40 **Group Value:** The site of (1) Unwin's is part of the periphery of the Roman small town of Magiovinium. The scale of activity in relation to the town has been set out above in terms of events and HER entries. The level of information derived from commercial activity has increased significantly in recent years, in particular in relation to the west side of the town and the Eaton Leys development, whilst Neal's excavations in the late 1970s were in response to road building. The contribution the Unwin's site makes to understanding of the entire SAM is limited, however.
- 2.41 The quotations from the specialist work, above, in relation to the trial trenching make clear, that qualitatively the evidence points to an area without easy access to a roadway. This may suggest a quarter in which craft activities took place, evident from the brick, kiln bars, quern stones, fired clay, iron slag and nails. If the second stage of activity took place in an area of early quarry, the evidence suggests that this may have been a craft quarter occupied not by dwellings but by workshops and yards within the enclosures. This suggestion, based on the trial trench evidence, is to some extent supported by the absence of clearly identifiable buildings in the geophysical survey. It also consistent with the idea of post supported workshops rather than housing.
- 2.42 **Survival/Condition:** The (1) Unwin's site has a high level of survival in comparison to the adjacent fields where modern ploughing has significantly eroded the archaeology on (4) Normans' land. The survival can be quantified by reference to the trial trench evaluation. Though no evidence for waterlogging has been found and the upper horizons have been eroded by medieval ploughing. The early plough erosion appears to have resulted in the removal of any historic surfaces such as

1995, 167-176; for towns along the A5 see Roucoux O 1984 *The Roman Watling Street from London to High Cross*, 14-21; for Dunstable Matthews L 1981, and Simco 1984, 29-32. In all cases updated by the regional Research Frameworks, Oake et al, 2007, Hey & Hind 2014.

¹⁰ Higham N 1991 "Old light on the Dark Age landscape: the description of Britain in the *de Excidio Britanniae* of Gildas". *Journal of Historical Geography* 17 (4): 363-72

¹¹ MOLA 18/51 Fig 13,

floors or working areas and no evidence of surviving surfaces was found within the trial trenches. In trench 87 the sections show no surviving surfaces beneath the plough soil and the sharp edges of post hole [8705] and features [8711] [8722] suggests that these are not the upper eroded edges of the features but the truncated edges once deeper features.¹² A similar profile can be seen in features [8805] and [8807] in trench 88, and in trench 89 (MOLA 2018, fig 23), [8912] [8907] [8910]. In trench 86, (MOLA 2018 Fig 25), the profile of the ditch has a sharp upper edge beneath a deep plough soil. Together the evidence suggests that, despite the apparent protection provided by the ridge of the ridge and furrow, the early ploughing has eroded the upper surfaces of the Roman site. The result is the absence of any evidence for surviving working surfaces or floors. The exception to this is the cambered gravel surface of the Roman period street shown in MOLA 2019 Fig 21. This shows the road surface surviving both in section and in plan. However, this photograph also shows the pattern of ridge and furrow. Here the ridge coincidentally runs above the road surface oriented in precisely the same direction as the road. Hence, by chance the ridge has acted to preserve the road surface which has remained in place. Although this might imply that in other areas surfaces will survive beneath the ridges of the ridge and furrow, the evidence from the trial trenching does not support this interpretation and no surfaces have been recorded.

- 2.43 **Fragility/Vulnerability:** The archaeology at (1) Unwin's and (2) Woburn lies beneath ridge and furrow. If the present land use regimes are maintained the site will remain preserved beneath the grazed grassland subject only to the vicissitudes of the rising and falling water table within the gravels. However, as the condition of the archaeology on the neighbouring fields indicates the site is fragile to the extent that modern ploughing would erode the upper horizons including the surface of the street.¹³ Areas (4) Norman's land illustrates from the trial trench evaluation the potential erosion due to ploughing.
- 2.44 **Diversity:** In terms of diversity the archaeology at South Caldecotte represents Roman period gravel quarrying, a length of street on the periphery of a small Roman town, and an area of craft/service activity which may include low level pottery production. This area opens onto farmland in which several enclosures probably mark the transition to agriculture. The features recovered so far are comparable to those recovered by Neal at Site 18 in the late 1970s, although no evidence of human burial has been recovered.¹⁴
- 2.45 **Potential:** The Roman period archaeology, evidence of 1st to 4th century development on the periphery of a Roman small town, is capable of the informing the regional Research Frameworks¹⁵ objectives in relation to crafts trade and industries (12.11) and settlement (12.6). In addition, research objectives for the east counties are relevant with respect to informing the development of small towns in relation to changes in their internal layouts and housing densities, role as centres of supply and demand; character of late Roman towns in the region, the morphology of small towns. To the research objectives of the eastern counties could be added the research objectives of the

¹² See the results of the Overton Down Experimental earthwork where the upper edges of the ditch were found to be eroded by weathering to a round lip or threshold rather than surviving as a sharp edge. The latter is evidence of plough erosion of the upper surfaces of the site.

¹³ Despite the observations of the local authority the site remains vulnerable to illegal metal detector use and there is no currently available evidence that the local authority has either the resources or evidence to demonstrate that it could protect the site from further activity of this sort. The current owner has not neglected the site but it has also proven beyond his resources to protect it.

¹⁴ Neal D S 1987, Excavations at Magiovinium, Buckinghamshire, 1978-80, Excavation on Site 18, Records of Buckinghamshire 29, 24-31.

¹⁵ Hey & Hind 2014, 179-184

East Midlands¹⁶ 5B Dissemination, 5e Diet and Health 5G Secondary Urban Centres and making a minor contribution to 5H Landscape Context. Its potential when assessed on a scale of high, moderate or low, is moderate as demonstrated by the depth of stratigraphy and range of artefactual and environmental data.

- 2.46 **Discussion and Statement of Significance:** The archaeological evidence recovered from the areas identified as (1) Unwin's, (2) Woburn, (4) Norman comprises a street running north east from the small Roman town of Magiovinium. The Roman town was established in the mid-1st century shortly after the Conquest in AD 43. The street, first identified by Neal in 1978-80 during excavations along the diverted route of the A5, was probably constructed shortly after the foundation of the town and surfaced by gravel quarried from adjacent pits. In time the area of quarrying was allowed to silt-up and enclosures were established in the same area. The enclosures remained in use from the 1st to the 3rd centuries. The dates from the trial trenching correlate well with the evidence from previous excavations suggesting a contraction of the Roman town in the 3rd and 4th centuries AD (Neal 1987, Hunn et al., 1995). The trial trenching suggested the possible remains of one timber built/post hole building. The pottery assemblage included several high-status shards including decorated Samian, once again comparable with Neal's excavation. The animal bone assemblage was dominated by cattle followed by sheep/goat and together with fragments of quern stone, which, together with plant macrofossil remains, provided evidence for arable cultivation and livestock farming. A small quantity of iron slag was also recovered together with fragments of kiln bars which suggest that pottery kilns may have existed close to the street.
- 2.47 There is no indication that the evidence recovered from the current evaluations indicates that the development area will produce substantially better-preserved deposits than those recovered by Neal between 1978 and 1980. Neal's area of investigation was beneath ridge and furrow and no surfaces were recovered from Site 18. Neal's excavation reports do not discuss the significance of ridge and furrow in relation to the survival of the Roman evidence, however, aerial photography from 1945 and Plate 1 of Neal's excavation at Site 17¹⁷ to the south, close to the roundabout, shows the survival of ridge and furrow. It is likely, therefore, that Neal's excavations provide a reasonable comparison with the current area of evaluation.
- 2.48 The area went out of use in the 3rd century from which point the land use history is obscure until ploughing led to the creation of ridge and furrow. The later, beyond its morphology, is undated and it has been assumed throughout that the ridge and furrow represents medieval cultivation in the open fields of Caldecotte township.
- 2.49 The evidence recovered from the evaluation suggests that is capable of the informing the Solent Thames area Research Frameworks those of the Eastern counties and the East Midlands.
- 2.50 In summary the heritage value of archaeology within the development site lies in its capacity to inform the research frameworks of the region, to contribute to the archaeology of the small Roman small town and the wider study of Roman urbanism. Knowledge of the archaeology also has the facility to inform the sense of place and illustrate the land-use history of this part of Dropshort Farm. Lastly the evidence has the potential to contribute to a sense of place, though not without prior reading, for specific areas on the periphery of Magiovinium.
- 2.51 The evidence at South Caldecotte is comparable to several sites in the region discussed above where excavation and investigation has revealed much about the development of smaller Roman

¹⁶ Knight et al., 2012

¹⁷ Neal 1987, Plate 1; Area 17 produced the plans of several buildings, none of which included surfaces.

towns and their hinterland. The importance of the site at South Caldecotte lies principally in its potential to yield further evidence about the development of Magiovinium. Yet the scope of the evidence is clear and whilst it may inform a more detailed model of the development of Magiovinium itself the evidence recovered so far suggests that it will confirm, rather than question, existing interpretations. Development models of Roman urbanism continue to reflect the higher levels of investigation in the larger towns.¹⁸ Small towns are seen as administrative, regional, local market and service centres and the balance of current opinion is that small towns served as local socio-economic centres, though few small towns in the region developed into market centres. The majority may be better understood as rural, rather than central, places.

- 2.52 In conclusion the heritage values, potential and attributes derived from the Scheduling criteria, suggest that the archaeology at (1) Unwin's, (2) Woburn and (4) Norman's represents an unexceptional area on the periphery of the small Roman town of Magiovinium. The evidence contains no indication of exceptional or rare quality; it does not appear to have the potential to change or amend existing models of small- town development contributing only an enhanced view of a local model probably of relevance to the region's small towns. In terms of its survival although superficially well protected by ridge and furrow and, therefore, offering the potential to recover a higher level of data from the deposits, the evidence suggests that plough erosion has removed the levels which might have retained occupation surfaces. The profiles of features appear to show truncation of the upper horizons whilst comparison with Neal's excavations, in particular Site 18, from 1978-80, suggest that the results, though more extensive, will be comparable in their evidential contribution. The evidence, heritage value and survival of the archaeology at (1) Unwin's, (2) Woburn and (4) Norma's is of local and possibly regional importance but does not encapsulate the qualities which would elevate it to a site of national significance and, therefore, potentially of Schedulable quality.
- 2.53 In relation to Table 3 cited in the desk based assessment (and by Historic England and MKC) which maps the relative importance of a site against its sensitivity the site falls between levels 2 and 3, between *'sites which are considered to be significant regional examples with well-preserved evidence of occupation, industry etc.'* and *'a site which is 'considered to be [a] significant example in a local context.'*
- 2.54 The MKC Development Consultation also draws attention to a 5 point scale (International Significance to Negligible). However, a more appropriate scale is the 6 point DMRB Table 5.¹⁹

¹⁸ Fulford in Fulford and Holbrook 2015, *The towns of Roman Britain - the contribution of commercial archaeology since 1990*, Britannia Monograph Series no 27. Edited by Michael Fulford and Neil Holbrook

¹⁹ Design Manual for Roads and Bridges 2007, Volume 11 Environmental Assessment, Section 3 Environmental Topics, Part 2 Ha 208/07 Cultural Heritage

Factors for assessing the value of archaeological assets	
Very High	<ul style="list-style-type: none"> World Heritage Sites (including nominated sites). Assets of acknowledged international importance. Assets that can contribute significantly to acknowledged international research objectives.
High	<ul style="list-style-type: none"> Scheduled Monuments (including proposed sites). Undesignated assets of schedulable quality and importance. Assets that can contribute significantly to acknowledged national research objectives.
Medium	<ul style="list-style-type: none"> Designated or undesignated assets that contribute to regional research objectives.
Low	<ul style="list-style-type: none"> Designated and undesignated assets of local importance. Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives.
Negligible	<ul style="list-style-type: none"> Assets with very little or no surviving archaeological interest.
Unknown	<ul style="list-style-type: none"> The importance of the resource has not been ascertained.

Table 5 from the Dept Manual for Roads and Bridges (DMRB) 2007

- 2.55 In relation to the DMRB criteria it is clear that the Iron Age and Roman archaeology at South Caldecotte falls into the **Medium** category, a site able to contribute to regional research objectives.

Ridge and Furrow

- 2.56 This section refers to (3) ridge and furrow earthworks in both Unwin's and Woburn land at South Caldecotte. The remains of ploughing in strip fields, remnants of agricultural activity, possibly from the medieval period have been described by MKC in Development Management Consultation as of lesser importance than the Iron Age and Roman period deposits. However, the MKC Development Management Consultation (DMC) also misrepresents the section related to the ridge by implying that the significance relied on the description of the ridge and furrow as feint in the DBA, where in fact it is stated clearly that this was a factual description of an aerial photograph and the first mention of this heritage asset.²⁰ The DMC gives no credence to the subsequent description that "*Evaluation in 2018 confirmed that some ridge and furrow survived as low earthworks in both Unwin's and Woburn*". Secondly the DMC asserts that the significance of the ridge and furrow has been wrongly attributed by reference to the long-term survey '*Turning the Plough*'. Whilst this may not have been intended for use in determining significance, nevertheless the criteria used to identify significant areas of ridge and furrow for the study are clearly of assistance in determining the significance of the small area of surviving ridge furrow at South Caldecotte. For these two reasons the following has been extracted from the Written Scheme of Investigation (paras 1.5.1-1.5.7) as a stand-alone assessment of the significance of the ridge and furrow.
- 2.57 "*The ridge and furrow at (3) Unwin's and Woburn was once part of wider area of similar earthworks. They are the remains of medieval and possibly later ploughing in the parish of Bow Brickhill. The ridge and furrow was first recorded by the Desk Based Assessment (MOLA 2015*

²⁰ For the avoidance of doubt, the full caption in the DBA 2015, page 29 reads "This oblique aerial photograph shows the north-west corner of the site. The railway can be seen in the lower right corner and the A5 Fenny Stratford bypass is visible at the top right. The cropmarks in the centre are referenced in the HER as the Crossroads Farm Enclosure (MMK6189) and have been interpreted as dating from the early Iron Age to the Roman period. Although the earthworks do not appear to continue beyond the hedge line to the south-west, it is likely that the remains will survive into the fields beyond. **It is also possible that ridge and furrow survives to the south-east of the enclosure, however, the feint north-south-aligned earthworks are not recorded in the HER.**"

15/151) and it was illustrated in Fig 21 described as 'feint north-south-aligned earthworks' (see FN20).

- 2.58 *The ridge and furrow at Unwin's and Woburn represent small surviving areas of medieval earthworks from Bow Brickhill parish. The land use and resources available to a medieval township²¹ comprise four main types, arable, meadow, woodland and waste (often referred to as heath or moor, fen). In the Midlands many townships were characterised by having some 90% arable land. This was divided into open fields and subject to crop rotation, often referred to as the three-field system. Ridge and furrow represents a cultivated ridge of land, a strip field or furlong, flanked by furrows for ease of identification and drainage. Evaluation in 2018 confirmed that some ridge and furrow survived as low earthworks in both Unwin's and Woburn.*
- 2.59 *Analysis of the ridge and furrow was carried out in 2001 when English Heritage²² undertook a survey of ridge and furrow in parts of 9 counties which included Milton Keynes (Hall 2001, Fig 4). The English Heritage survey mapped and assessed the ridge and furrow in the whole of the South Midlands, East of Birmingham based on the extent of survival, and the quality of historic documentation within each township. Each township (of 1577) was scored on a four-point system based on:*
- *Poor: little or no ridge and furrow*
 - *Fair: some ridge and furrow*
 - *Good: fair quantity of ridge and furrow with vill and other associations*
 - *Outstanding: a large area of ridge and furrow, usually with associations*
- 2.60 *From this assessment 140 townships were identified which had, by area, more than 18% survival of ridge and furrow. This sample was examined county by county with each county archaeologist taking into account fragmentation, village earthworks, and other historic associations. From this sub-sample 43 townships in 40 civil parishes were identified as priority townships. No priority townships were identified in the Milton Keynes area, though Passenham on the Northamptonshire border was included. The priority townships were identified based on scheduling criteria: group value, survival (extent), potential, documentation and condition.*
- 2.61 *In addition to this extensive survey, which did not identify the ridge and furrow of Bow Brickhill as significant, the development site has been evaluated by geophysical survey. The surveyors concluded that "parallel linear anomalies relating to medieval and early post-medieval ridge and furrow cultivation are very widespread across the survey area. The furrows are typically spaced at 5m to 8m intervals, and often follow gentle reversed-S curves rather than running straight. They occur in coherent blocks (furlongs) the ends of which (headlands) are sometimes followed by modern field boundaries. The clearest anomalies occur in the southern pasture fields where the ridge and furrow is best preserved, still surviving as earthworks. Elsewhere the anomalies vary from weak to very weak. This variation will principally reflect broad scale variations in the*

²¹ The term township or vill was the basic economic unit in the countryside before the industrial revolution. It contained all the essential resources needed by an agricultural community. It contained all the essential resources needed by an agricultural community water supply, arable, pasture (had its own field system), meadow land, access to woodland for timber and fuel and a mill. It was the area occupied by a distinct community and is not to be confused with a manor (area of secular jurisdiction) or parish (area of religious practice served by a parish church supported by tithes), although these sometime occupy the same area.

²² English Heritage 2001 *Turning the Plough Midland Open fields: landscape character and proposals for management*, Hall D

magnetism of the ploughsoil and subsoil, although the degree of truncation by later ploughing may also be a factor”.

- 2.62 *There is no available quantification of the extent to which the ridge and furrow survives as earthworks in the parish. Bow Brickhill was excluded from the priority townships of the Turning the Plough project (Hall 2001) as it had less than 18% survival.*
- 2.63 *The earthwork remains of ridge and furrow are similarly non-designated. They comprise a small surviving proportion of a much larger area of such earthworks and consequently they have only low value in terms of group value; their survival over a small area is high, but their extent is low, their potential to illuminate more than a restricted range of site formation processes is limited with the potential to contribute in a minor way to Research Objective 7I Development of the Open Field System.”*
- 2.64 In conclusion the significance of the ridge and furrow (based on the DMRB criteria) is **low**. They are assets with poor survival of contextual associations, able to contribute only to local research objectives and in the context of the whole township area remnants of a much wider system.
- 2.65 The study concurs with the DMC in that the ridge and furrow is of lesser significance in comparison to the Iron Age and Roman deposits.

3 HERITAGE ASSETS – SETTING

Introduction

- 3.1 Section 16 of the NPPF, entitled Conserving and Enhancing the Historic Environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets.
- 3.2 *Significance* is defined in Annex 2 as: The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting...
- 3.3 *Setting* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.
- 3.4 In the second part of the report the potential effect of the development is assessed in terms of development within the setting of the SAM of Magiovinium. This section is based on the 4 staged approach outlined by Historic England in 2017.

Assessing the Implications of Development – Significance and Setting

- 3.5 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' and for the contribution setting makes to significance for this or future generations.
- 3.6 The significance of the archaeology at the proposed development site at South Caldecotte (1) Unwin's, (2) Woburn and (4) Norman's) has been set out in detail above. The heritage values of the site and the relationship of the site to the SAM will be discussed below.
- 3.7 **Significance:** The small Roman town of Magiovinium is a Scheduled Ancient Monument. Its significance is **high** (see DMRB table 5 above). The SAM lies to the west of the proposed development separated from it by the dual carriageway of the A5. The national heritage list contains no description of the small town, though the HER (MK669) describes it as a
- 3.8 *"Small Roman town situated to the east of the ford (?) where Watling Street crossed the River Ouzel or Lovat. Settlement later enclosed within a ditch. Road led from west entrance of the town northwards and some evidence to suggest a southern road."*²³
- 3.9 The HER information has been summarised in the Desk Based Assessment (MOLA 2015, 19-20, Figs 12 & 13). Pastscape²⁴, sponsored by Historic England, describes it's **evidential** significance as: *"A Romano-British small town, defences visible as either slight earthworks or a soilmark. The*

²³ The HER has 71 specific references to the small Roman town, with 81 more general citations and up to 47 associated event records.

²⁴

https://www.pastscape.org.uk/hob.aspx?hob_id=344743&sort=2&type=&rational=a&class1=1&period=43%7C410%7CROMAN%7C38%7C0&county=None&district=None&parish=None&place=&yearfrom=43&year=410&recordsperpage=60&source=text&rtype=&number=&p=23&move=n&nor=2642&recf accessed 11/9/19;

4th century settlement of Magiovinium occupies a spur jutting into the floodplain of the River Ouzel and is bisected by Watling St. No extensive modern excavations have ever been undertaken, and most finds have been made either on the surface or in service trenches. Foundations of buildings have been exposed on either side of Watling Street and a timber building was discovered in a trench 750 yds south-east of Fenny Stratford. Painted wall plaster, rough tesserae, tiles, pottery and coins have been found mainly in fields adjoining a house called Dropshort. The ploughed-down remains of the defences comprise a bank and ditch. A cemetery was situated outside the defences, and possibly the rampart followed the hedgeline where the adjoining fields are at different levels. The settlement was oval, measuring 350 metres north-west to south-east by 250 metres transversely”.

- 3.10 *“The site is situated about a quarter of a mile south east of Fenny Stratford. Foundations of buildings have been exposed on either side of Watling Street from SP 89113355 to SP 88833374 and a timber building was discovered in a post office trench 750 yds SE of Fenny Stratford (SP 88963364). Painted wall plaster, rough tesserae, tiles, pottery and coins have been found mainly in fields adjoining a house called Dropshort. Farm The 4th century settlement of Magiovinium is centred on SP 889336 and occupies a spur jutting into the floodplain of the River Ouzel and is bisected by Watling St. The ploughed-down remains of the defences comprise a bank and ditch, best preserved in the SE arc, where the bank is 0.2m high and the ditch 0.3m deep, but elsewhere they are reduced to a scarp or a soil mark. Its line can be traced from the Ouzel at SP 88813352 around the S and E sides to SP 89113367, at which point, all trace is destroyed by rig-and-furrow. However, its course along the North side of the settlement can be fairly accurately conjectured along the summit of a natural scarp extending to Dropshort Farm outbuildings at SP 88903377. Its Western limit is uncertain, but presumably the cemetery at SP 88753377 (SP 83 SE 29) was situated outside the defences, and possibly the rampart followed the hedgeline at SP 88813371 where the adjoining fields are at different levels.*
- 3.11 *Thus the settlement was oval, measuring 350.0m NW-SE by 250.0m transversely. Mr H Pengelly saw “a wall about 10 ft wide” at SP 89113355 on the line of the rampart during trenching along Watling St. In the same trench traces of structures and 1st-4th century pottery were found from the bridge of the Ouzel at SP 88603390 to c SP 894333, indicating that the settlement had been more extensive before the 4th c. No extensive modern excavations have ever been undertaken, and most finds have been made either on the surface or in sewage trenches etc. The area of finds known to Pengelly, other local archaeologists and the owner of Dropshort Farm, Mrs F Unwin, is indicated on OS 6” by a green band. Surveyed at 1:2500.”*
- 3.12 This description can be enhanced by the recent survey and evaluation in relation to the housing development at Eaton Leys. Within the Scheduled Area geophysical survey has identified five concentric defensive ditches protecting the southern edge of Magiovinium which cut through existing settlement evidence.²⁵
- 3.13 The **historic** significance of the SAM lies in its value to illustrate the early history of urban development in the Roman province, possibly associated with documented historic events. Historically the town was established in the mid-1st century, shortly after the conquests and subsequently defended by ditches, believed to be late 2nd or 3rd century AD. These protected the core of the previously undefended Roman town. The ditches have cut through and destroyed earlier phases of buildings and activities associated with the much larger original town footprint.

²⁵ MOLA 2015 Archaeological fieldwalking survey on land at Eaton Leys Milton Keynes, October and November 2015, Report No. 15/212, (Yvonne Wolfram-Murray); MOLA 2014 Archaeological geophysical survey at Eaton Leys Farm, Bletchley, Milton Keynes, February to September 2014, Report No. 14/217 (John Walford)

- 3.14 The ditches have been interpreted as defending the much-reduced town area and may indicate contraction of the urban area (Hunn et al 1997) in the later Roman period. However, the nature and extent of the defensive works ‘carving’ through the town footprint may be indicative of hasty defence. These defences may have been built during a period of civil unrest that occurred in eastern England around 170 AD discussed by Woodfield (in Brown ed, 1995, 140-1).
- 3.15 **Setting:** The SAM is divided into two sections east and west of Watling Street, the former A5. The immediate setting comprises the route of the A5 dual carriageway bypassing Fenny Stratford to the east, Dobbies Garden Centre and Restaurant and Dropshot Farm to the north. To the south is the Kellys Kitchen roundabout. To the south east the SAM is bordered by the A4146 which separates the site from arable farmland. To the east lies Eaton Leys, presently under development for housing (15/01533/OUTEIS).
- 3.16 The allocated site at South Caldecotte falls within the intermediate setting of the SAM, separated from it by farmland west of the A5 dual carriageway and the carriageway itself. The site, described in detail in the assessment and evaluation documents, is presently a combination of arable and grazing. The Inspectors Report on Plan MK described how: *“The site would form a new gateway development when approaching the City from the south. This in itself, however, would not be necessarily harmful, particularly given the urban character of the adjacent ‘Kelly’s Kitchen’ roundabout on the A5”.*²⁶
- 3.17 Further afield the setting to the north comprises the urban area of Fenny Stratford whilst to the south lies the open farmland north of Little Brickhill.
- 3.18 The archaeological setting comprises the below ground evidence of archaeological activity set out in the desk-based assessment (MOLA 2015, 15/151 19-21).
- 3.19 **Setting and significance:** The contribution that the setting makes to the SAM is limited. From the boundaries the SAM can be experienced as farmland and with prior knowledge a sense of place generated by the vestigial earthworks which remain. The Scheduled Ancient Monument though cannot be seen or experienced from the ground level of the development site due to the high hedgerows and embanked dual carriageway of the A5. Moreover, experience of the SAM from the development site is clearly affected by intervening road corridor. This was an issue in the site allocation and in the Sustainability Appraisal (AECOM 2017) where it was noted in the Landscape Capacity Study (2016), that: *“Residential development could not be accommodated without affecting key characteristics and/or values in the landscape. The area suffers from visual and auditory intrusion from the transport network.”*
- 3.20 The wider landscape setting includes the Greensand Ridge to the south and the rising ground towards Little Brickhill.
- 3.21 The evidential contribution made to the SAM by the below ground archaeology has been discussed above in terms of its group value and has been characterised as forming part of the periphery of the small Roman town.
- 3.22 **Impact Assessment:** The visual impact of development on the SAM has been illustrated by the wire views provided in the LVIA by Aspect²⁷ where the description notes that *“only a very small extent of the proposals set back from western boundary will be visible from Viewpoint 7 during the early stages of development. This will form a minor component in the wider view, partially seen*

²⁶ Report on the Examination of Plan MK Report to Milton Keynes Council by David Spencer BA(Hons) DipTP MRTPI an Inspector appointed by the Secretary of State, 12 Feb 2019 PINS/Y0435/429/10, para 121

²⁷ Land at South Caldecotte, Milton Keynes, Landscape & Visual Impact Assessment, September 2019, 6340.LVIA.003.VF page 33

between the existing vegetation structure, predominantly during winter months. As the landscape proposals mature, it is considered that the proposed development will be provided with further screening, particularly during summer months where the built form will be barely perceptible”.

- 3.23 The visual impact on the SAM must be assessed in terms of the experience of the heritage values of the small Roman town. These values, set out above, are both evidential and historic, illustrative and associative. There is little aesthetic significance to the setting, and this is evident from the urbanised character of the landscape noted by the local plan inspector. Appreciation and experience of the small Roman town today is characterised by its agricultural character amidst the urban fringe of Milton Keynes, the addition of the commercial buildings of the South Caldecotte will not reduce experience of the wider setting of the SAM. The densely wooded character of the Ridge will not be adversely affected and the distance between the SAM and the Ridge will remain appreciable from the SAM itself. This suggests that the visual presence of the proposed development will have only a slight impact on the heritage values of the SAM and is consistent with the views of the local plan inspector.
- 3.24 Historic England have suggested that the visual impact of “*substantial built structures which will be visible above the hedge line from the SAM will constitute some harm, but certainly less than substantial harm*”, going on to observe that “*The more the surroundings of the monument appear as urban, the less easy it is to appreciate the original rural hinterland of the Roman town*”. As Historic England note the principal contribution of the setting to the significance of the Roman town is the ability to appreciate its topographical hinterland. The LVIA has described how such an appreciation will be affected visually, whilst the local plan Inspector’s Report noted that the development would not affect the setting of the Greensand Ridge (para 121). Conversely in views from the Ridge the topographical setting of the SAM will still be appreciable despite the presence of the commercial buildings. The location of the town with respect to the Roman Watling Street, the wider landscape of the Greensand Ridge and the valley of the River Ouzel will remain as legible in the landscape as it is today. In conclusion the visual impact of the proposed development will not materially harm the present-day ability to appreciate the rural hinterland of the small Roman town when viewed and experienced from within the SAM or when viewed and experienced from its setting.
- 3.25 The final consideration in relation to the impact of development on the setting of Magiovinium is the effect on the below ground deposits within the development site. These form part of the archaeological (evidential) setting of the monument and the loss of these deposits. In this respect the removal of the Iron Age and Roman deposits within the development site will represent considerably less than substantial harm to the setting of the SAM. The balanced judgement, however, set out below, indicates that experience of the significance of the SAM will not be materially affected by the investigation of this evidence.²⁸

²⁸ While the NPPF specifically excludes the ability to record evidence of our past as a factor in decision making the recording of data through excavation, reporting, publication and archiving will not adversely affect current appreciation or experience of the SAM.

4 JUSTIFICATION FOR LOSS/HARM TO HERITAGE ASSETS

Introduction

- 4.1 This section addresses the key considerations identified by Milton Keynes' archaeologist in the Development Management Consultation (30th August 2019) in *"No justification for loss of or harm to heritage assets of archaeological interest or consideration of alternative forms of mitigation eg by retention within an amended layout"*.²⁹
- 4.2 In reviewing the application Milton Keynes Council also noted that;
- 4.3 *"The application contains no clear justification for the loss of heritage assets and fails to explain why the more significant areas of buried archaeological remains (in particular the Roman street and adjacent areas of Roman urban settlement) may not be protected and retained within the development layout. Contrary to Plan:MK Policy SD14 (9) the archaeological constraints have not informed the layout of the development."*

The Development Site

- 4.4 The proposed development site is an allocated site "Land at South Caldecotte" a Strategic Site Allocation defined in policy SD14 as "Strategic Employment Allocation, Land South of Milton Keynes". Land south of Milton Keynes in South Caldecotte, as shown on the Key Diagram and Policies Map, is allocated for the development of a mix of Class B2 and B8 employment floorspace within the plan period.
- 4.5 The Policy goes on to note that:
- 4.6 *"A comprehensive Development Framework for the site will be prepared and the development will be brought forward in line with all relevant policies in Plan:MK, particularly Policy SD1, SD9, SD10 and INF1 prior to planning applications being approved."*³⁰
- 4.7 The policy states that the development must accord with the following principles of which 9 is relevant to the historic environment:
- 4.8 *"9. A desktop Archaeological Assessment should be undertaken to understand the likely presence of archaeological remains within the site. The recommendations of the Assessment will be implemented prior to each phase of development commencing. It may be necessary to undertake a field investigation to understand the archaeological potential and significance of this site and to inform the layout of development."*
- 4.9 The strategic case for development was made in a series of assessments for the adopted MK:Plan 2019 including the Milton Keynes Council Plan:MK Draft Plan February 2017; AECOM 2017 Sustainability Assessment; AECOM 2018 Supplementary Sustainability Assessment and AECOM 2018 Sustainability Note on Reasonable Alternatives, Post Submission Note. The latter under

²⁹ This section is cognizant of the NPPF which in para 194 requires that "Any harm to, or loss of, significance of a **designated** heritage asset...should require clear and convincing justification" and to para 197 which with respect to a **non-designated heritage** "a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset".

³⁰ SD 1 Place Making, SD 9 General Principles for Strategic Development, SD 10 Delivery of Strategic Urban Extensions, INF 1 Delivering Infrastructure

Option 1 noting the recommendation for the Development of SC Site to full capacity in the plan period.³¹

- 4.10 The initial Sustainability Report (AECOM 2017) noted:
- 4.11 *'The area contains two archaeological notifications sites. As such there is some historic interest which could be affected by development and potential impacts on heritage would need to be addressed before any development could commence. The extent of this will depend on how the development proposal takes this into account. The site also lies within an Open Countryside area.'*
- 4.12 With respect to the South Caldecotte site allocation no specific heritage constraints were identified during the development stage of the plan and in 2019 the Plan Inspector's report noted in paras 83 & 84 that:
- 4.13 *"...at this strategic level it is clear that South Caldecotte would be the most appropriate option for meeting the identified need for additional employment land in the short term".*
- 4.14 *The future jobs numbers and assessment of employment land supply are robust. The focus on CMK, existing employment sites and strategic additional provision at first South Caldecotte and then MKE is justified and would be effective in enabling the local economy to grow and develop in line with local, SEMLEP and wider caMKox ambitions appropriate to the Plan period."*
- 4.15 In para 122 in specific consideration of the impact on heritage assets at South Caldecotte the Inspector noted:
- 4.16 *"Elsewhere the proposal would not adversely affect the setting of the Greensand Ridge. Due to the intervening distance and the densely wooded character of the Ridge, the setting of the scheduled monument at Danesborough Iron Age fort and the Listed Grade II* parish church at Bow Brickhill would also not be adversely affected. The South Caldecotte site would be visible from the well-used footpath extending south-west out of Bow Brickhill via London End Lane. However, the development would be seen at some distance over intervening fields, thus reducing the impact of the scale of warehouse and distribution units. The consideration of landscaping, design and building heights as required by Policy SD16, would address visual impact further such that the proposed development would not significantly harm the experience or outlook for users of this rural path".*
- 4.17 The impact of development on the setting and, therefore, significance of the SAM was a not an issue raised by either the Inspector, Historic England, or the Sustainability Assessments in allocating this site for the development of a mix of Class B2 and B8 employment floorspace, which it was acknowledged would include *"warehouse and distribution units"*.

Parameters for Preservation

Introduction

- 4.18 The proposed development 19/01818/OUT is an *"Outline application including access for the development of the site for employment uses, comprising of warehousing and distribution (Use Class B8) floorspace (including mezzanine floors) with ancillary B1a office space, general industrial (Use Class B2) floorspace (including mezzanine floors) with ancillary B1a office space, a small standalone office (Use Class B1) and small café (Use Class A3) to serve the development; car and HGV parking areas, with earthworks, drainage and attenuation features and other*

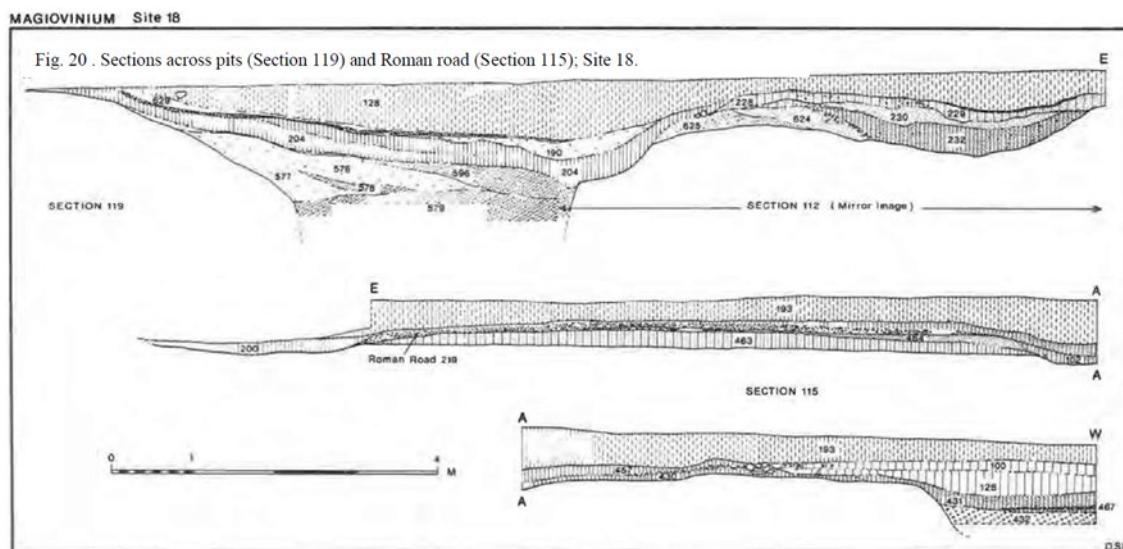
³¹ AECOM 2018 Sustainability Note on Reasonable Alternatives, Post Submission Note, Plan page 17

associated infrastructure, a new primary access off Brickhill Street, alterations to Brickhill Street and provision of Grid Road reserve to Brickhill Street with appearance, landscaping, layout and scale to be determined as reserved matters.”

- 4.19 The design of the application masterplan has been determined by the parameters of Plan:MK, the topography, the ground conditions and the presence of archaeology. The following section reviews the parameters which constrain the preservation of the archaeology and the opportunities for mitigation.

Topography, geology and previous archaeology

- 4.20 This section draws on data from relevant specialists as well as the sampling of materials and deposits undertaken as part of the trial trench evaluation (Burke/MOLA 2018). Archaeological deposits and artefacts are sensitive to change, and this section provides a summary of the baseline condition of the deposits at South Caldecotte in order to fully understand the impacts that development may have on current burial conditions and the site's significance.
- 4.21 Key materials, in particular environmental remains, such as charred plant or seed remains, have been sampled and these provide an indication of below ground conditions. In addition to the data derived from the recent trial trenching consideration is also given to the results of the Ground Investigation by BWB (BWB 2019) and to the results of Neal's earlier excavations along the line of the A5 (Neal 1987). The archaeology at Unwin's and Woburn, Milton Keynes, is situated in pasture fields with a total extent of some 11.748ha. The principal deposits occupy two areas. In the north a roughly triangular space between the A5 and a small tributary stream of the river Ouzel (BM249231, 239493- Unwin's) and in the south a small sub-rectangular area (BM288801- Woburn). The archaeology lies at some 68m above Ordnance Datum (68.59- AOD) and occupies almost level ground on the east side of the side of the wider River Ouzel valley.
- 4.22 This is a gently rolling agricultural landscape where the solid geology comprises Jurassic mudstone formations, predominantly of Oxford Clay (OCF) which is overlain by the West Walton formation in the southeast. In the areas of interest to this report this solid geology is covered in part by discrete drift deposits of river terrace gravels (RTF) in the west, towards the River Ouzel, and heads of sands or gravels across the west and centre (BGS 2018). The archaeology in Unwin's and Woburn lies in areas of river terrace gravels. The ground investigation (BWB 2019, Boreholes 04, 05, 06, 08) record the depth of the gravel deposits varies: 2.6m below ground level (bgl) (BH04); 3.7m (BH05); 2.5m BH06) and 2.1 (BH08) all lying above the Oxford Clay.
- 4.23 The role of the tributary is important in relation to the archaeology as a possible indicator of any potential waterlogging. The tributary flows from east to west, and feeds into the River Ouzel approximately 90m west of the development site. A very small section close to the archaeology has been assigned a low flood rating (greater than 1 in 1000 but less than 1 in 100 chance of flooding in any given year) in relation to flooding from rivers and the sea, with a Zone 2 floodplain and medium flood rating located approximately 20m north and west of the site (BWB 2019, Phase 1, 8).
- 4.24 The data indicates the site is located within an area of superficial deposit flooding at the surface (groundwater flooding associated with shallow unconsolidated sedimentary aquifers overlying unproductive aquifers). Groundwater strikes were noted by BWB in the Head deposits at depths of approximately 0.5m to 2.7m bgl. (BH04 2.6 Slow RTD; BH05 2.7 Slow HD; BH08 3.10). Seepages of water were also encountered within the Made Ground [archaeology], whilst post investigation groundwater monitoring confirms borehole BH06 was recorded as dry during all monitoring visits. (BWB 2019, 29). BWB noted in the Phase 2 report (2019, 7.31) that “The stream flowing through the eastern area of the site may be fed by groundwater flowing through granular horizons of the Head and River Terrace Deposits in this area. During inclement weather it is possible that localised inundation may be encountered.”



Section across the Roman Street (Area 18) published by Neal in 1987

- 4.25 Previous archaeological investigations on the adjacent site by Neal in 1978-80 published in 1987 revealed a section of cobbled street co-terminus with the gravel metalled street revealed by the 2018 evaluation. The archaeology, including sections dug across the route of the A5, revealed a traditional archaeology of street surface, 4 cremations, pits and the remains of a quarry. Among the: *“2.8 kg of soil samples recovered from Site 18 were two basic types—smithing and fuel ash slags, often dribbles. There was a hearth bottom (No. 496) 10.5 cm in diameter. Among the small finds related to this activity was an iron object (Fig. 28, No. 104) identified as an unfinished hammer-adze. It was found in the upper levels of a filled-in quarry, located at 0.575m east by 12 m north”*.
- 4.26 No environmental evidence was recovered from this area.
- 4.27 Area 17, adjacent to Woburn (land parcel BM288801), although excavated in very wet conditions revealed no evidence of waterlogging. These excavations revealed 6 phases of activity from (1) Preconquest fields, (2) fort building to the west, (3) re-alignment of Watling Street to avoid the fort, (4) new field systems possibly aligned on the road and fort, (5) roadside ditches filled in and surmounted by metal working, (6) clearance and levelling to allow for buildings and industrial activity followed by further clearance and the creation of a cemetery.
- 4.28 The evidence of the evaluation has been presented in the report by Burke/MOLA 2018 and reviewed above for the Statement of Significance. The following reviews the evidence of preservation. The archaeology in both land parcels Unwin's and Woburn, is preserved beneath topsoil in areas where ridge and furrow earthworks survive. Excavation revealed that archaeological evidence survived beneath topsoil horizons which varied between 500mm in depth in locations where medieval ridges survived to 300mm in areas of furrowing. The majority of archaeological deposits were found to survive within an upper band down to 1.5m bgl. Some pits of over 1.5m were recorded though not fully excavated (Burke 2019, Fig 12) and there was evidence of gravel quarrying. The deeper pits are comparable with Neal's quarry pit (Neal 1987, Section 119, fill (579)) [see above].
- 4.29 The majority of small finds came from trenches 85-88 and 91 which yielded copper alloy, iron and lead. There was no excessive corrosion to indicate waterlogging. Eight 40lt soil samples were taken from archaeological features which appeared to have the potential to yield organic remains. However, with the exception of the charred plant remains, no evidence was recovered of

waterlogged preservation. Amongst the environmental samples charred plant remains were ‘well preserved...and the assemblage comprises important cereal crop, including wheat, barley and oats, all associated with charcoal concentrations’.

- 4.30 In addition to the finds and environmental data a large assemblage of animal bone was recovered (1551 fragments) of which the majority was recovered from trenches 85-88 and 91. Examination of this assemblage revealed no indication of waterlogging.
- 4.31 In summary the material from both (1) Unwin’s and (2) Woburn conform to the profile of finds expected from a buried, well drained rather than waterlogged environment (Williams 2016, Fig 2 based on Retallack 1984).
- 4.32 The evidence above suggests that the below ground archaeological deposits have the potential to survive in situ. Their relative stability is indicated by the range of materials found, the nature of the surface geology and the indication of a stable though not waterlogged environment. The survival of artefacts from the Pre-Flavian period to the present day (before 69AD to 2019) indicates the level of stability. At present there is no indication that with the maintenance of the **status quo** the burial conditions will deteriorate or that existing rates of decay and corrosion of artefacts will accelerate.

Construction Options

- 4.33 The allocation site comprises 52ha agricultural land. In Plan MK under future Employment Land needs, the Council states that (para 4.63).
- 4.34 *“The Council expects to meet the need for future office and industrial development from its stock of vacant employment land including land for office development in CMK. However, to meet the need for warehousing development and provide more flexibility in accommodating ‘large footprint’ employment developments that cannot be located elsewhere, it has allocated a site for development at Caldecotte South.”*
- 4.35 The parameters of development were set out precisely in Policy SD14 in which:
The development must accord with the following principles:
1. A minimum of 195,000m2 of Class B2/B8 and ancillary B1 employment floorspace.
- 4.36 The proposed development design footprint provides some 241,548m2 of B2/B8 employment space. Archaeological deposits in (1) (3) Unwin’s, (4) Normans and (2) Woburn extend over some 10.748ha which constitutes approximately 20% of the development area. This indicates that preservation in situ in an area untouched by development on this scale renders the development unable to achieve the minimum employment floorspace. This suggested at the outset that it is not possible to produce a scheme with an amended layout which avoids any development within the area of archaeological interest.

Preservation Options

- 4.37 The options for preservation of the archaeology (1) Unwins, (2) Woburn (3) Unwins and (4) Norman within the parameters of the allocation site are:

 - (1) preservation in situ (described as ‘*retention within an amended layout*’ by the MK Development Management Consultation) or
 - (2) investigation (described by the NPPF para 199 as requiring ‘*developers to record and advance understanding of the significance of any heritage asset to be lost...in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible.*’) It is acknowledged that the ability to record the archaeology is not part of the justification for the development.

Construction Constraints

- 4.38 The significance of the archaeology, its character and the burial conditions have been assessed above and the stable nature of the deposits noted. Three principal construction impacts can be identified from the Design and Access Statement:
- re-direction of the watercourse (DAS 2019, 4.4);
 - Zone 1, to the south of the site and bounded by the A5, and the V10 roads. A logical location for a new roundabout access/egress point spurs off the proposed spine road forming the third boundary, with the relocated water course forming the fourth. This leaves a plot development of 8.58Ha / 21.2 Ac which could hold a large floor plate building for B8 and ancillary B1 uses with a maximum GIA of 48,896m², and a maximum roof height of 21-24m
 - Zone 2, to the North West of the site and bounded by the A5, the railway line and the internal spine road. This leaves a plot development of 21.72 Ha / 53.7 Ac which could hold a large floor plate buildings for B8 and ancillary B1 uses with a maximum GIA of 127,626m² split into three plots, and a maximum roof height of 15-24m
 - It is proposed to attenuate the surface water runoff from the development through a combination of below ground cellular storage and over-sized pipes prior to its gradual release to the downstream watercourse. In line with the Milton Keynes sustainable drainage requirements, the surface water storage will be sized to accommodate the 1 in 100-year storm included a 20% allowance for future climate change. The drainage and development will also be made resilient to a larger 40% climate change allowance.
- 4.39 In addition to these broad impacts the ground investigation report (BWB 2019 Phase 2, Sec Geotechnical Report) has indicated the geotechnical constraints to the development proposals in the area of Units 1 & 2. BWB note that:
- (7.2) “..ground conditions recorded on site typically comprised of Topsoil/Made Ground overlying superficial River Terrace Deposits (RTD) at the west part of the site (Unwin’s), Head Deposits in the south-eastern portion of the site (Woburn)...” and “It is deemed that Topsoil will be removed prior to commencement of any specific earthworks, and as such is not included within the ground model for any of the plots...”
 - (7.3) in “...the western area where RTD deposits (north west area beneath Units 2 and 3) and Head (south western area beneath proposed unit 1) are present. Head deposits are unlikely to be a suitable founding stratum for the type and size of development proposed due to their variable and limited thickness limiting the potential for founding in a single strata type. The RTD are typically overlain by a thin cohesive layer, which is also considered to be an unsuitable founding stratum”.
- 4.40 In detail BWB noted that:
- 4.41 (7.4) Based on the proposed cut and fill plan, Drawing Ref. SCD-BWB-DGT-XX-DR-D-600, dated 18/05/2018 (Drawing 2), the proposed enabling works are summarised below:
- Unit 1: Cut of up to 1.8m in the southern area and fill of up to 1.8m in the northern area.
 - Unit 2: Positioned in an area of fill ranging between 1.4m in the south of the plot to 3.0m in the north-western area.
- 4.42 BWB (7.9) note that “For Units 1, 2 and 3, the current building footprints will be within significant areas of cut (up to 1.8m) and fill (up to 3.0m). Due to the variable fill thickness across the footprints of these units a shallow spread foundation solution on natural ground is unlikely to be a viable

option due to the potential for significant differential settlement within different strata types or variable thicknesses of fill”.

- 4.43 In table 7-2 BWB summarised the ground conditions in relation to foundation design as follows for Units 1 and 2 in Unwin's and Woburn:
- Unit 1 - Up to 1.8m of Fill in the north; Firm OCF formation at ~2.0m bgl following cut in the south. Due to the potential total and differential settlement, a vibro solution densifying the fill, Head Deposits and upper OCF is likely to be the most suitable option allowing shallow footings to be adopted. Alternatively, a piled solution should be considered.
 - Unit 2 Fill at ~1.0m. This is over River Terrace Deposits of circa 2.0m thick, in turn over the OCF. Due to the potential for excessive total settlement, a vibro solution densifying the fill, River Terrace Deposits and upper OCF is likely to be the most suitable option allowing shallow footings to be adopted. Alternatively, a piled solution should be considered.³²

Archaeological Constraints

The Masterplan Proposals

- 4.44 The construction constraints associated with the Masterplan proposals identified by BWB indicate the following, potential, archaeological impacts.
- Vibro compaction of the RTD (in which the Roman street is located)
 - Removal of topsoil (medieval earthworks of ridge and furrow)
 - Pile foundations (through the Roman period archaeology).
 - Diversion route of the tributary stream

³² The geotechnical parameters of the construction activities at Unwin's and Woburn have been specified by BWB (see above and BWB 2019, Phase 2. Sec 7 [7.9-7.25]). The recommendations for Units 1 and 2 can be summarised as: Vibro-replacement results in the densification of granular soils and the overall strengthening of cohesive soils by introduction of compacted stone columns, which results in enhanced bearing pressures and a reduction in settlement. The presence of Made Ground at the site, underlain by the increasingly competent bedrock geology of the OCF, indicates that a piled foundation solution may be viable for the larger units proposed, however give the likely cost associated with such a solution it is anticipated that a ground improvement option would be most cost effective. The recommendations of the BWB report were that “...that, once the earthworks strategy has been finalised and a better understanding of development plans are known, an earthworks specification be undertaken to assess the most economical foundation solution for each plot” (BWB 2019, Phase 2, iv & 7.5). That Technical note has now been drafted and is summarised below.

Unit 1 to achieve a finished floor level (FFL) of 70.65mAOD approximately 1.6m of fill is anticipated in the north of the plot, with approximately 2.0m of cut required in the south. Following the 2.0m of cut in the south the Oxford Clay Formation is likely to be exposed at surface. Based on the ground conditions at final formation, ground improvement is likely to be required for Plot 1 to comprise either vibro-stone columns, which would enable shallow foundations and a ground bearing floor slab. Other options within this plot could also comprise over excavation of the shallow materials and re-engineering of the material to a suitable end-product specification, potentially with the undertaking of high energy impact compaction to enable shallow foundations and a ground bearing floor slab.

Unit 2 to achieve a finished floor level of 69.6mAOD, based on the ground conditions likely to be present at the final formation, it is recommended that ground improvement be considered for Unit 2, comprising either vibro-stone columns, which would enable shallow foundations and a ground bearing floor slab. Other options within this plot could also comprise over excavation of the shallow materials and re-engineering of the material to a suitable end product specification, potentially with the undertaking of high energy impact compaction to enable shallow foundations and a ground bearing floor slab, however further design and assessment would be required to fully confirm the specifics of this approach.

- 4.45 In each case the preservation of archaeology is compromised. The removal of topsoil by excavation for construction or landscaping removes any protection that the soil provides to deposits buried below. Nor is impact limited to the soil removal but extends to the effect of plant movements on below ground deposits. Topsoil removal will remove the ridge and furrow earthworks.
- 4.46 Piling causes impacts not only in relation to the pile itself but up to four times the area of the pile. The effect of pile clusters can, in addition, make access to the areas within the clusters inaccessible to later investigation (Hughes et al., 2004, 98-112; Hyde 2004, 32-39).
- 4.47 Hydrological impacts have the potential to cause considerable harm to otherwise stable environments (Williams 2016 19-21) and although neither of the areas, Unwin's or Woburn, have evidence of waterlogging the change to below ground water flows will inevitably affect the preservation state of the archaeology.
- 4.48 The final impact is the excavation of a channel or culvert for the tributary stream, diverting it away from the development site to run alongside the A5. The results of the 2018 evaluation and the 1980s excavation by Neal indicate that in order to maintain the flow of the stream course along the diversion route (easement) excavation will be necessary.
- 4.49 In summary, the most significant impacts of the proposed development Masterplan are due to the interrelationship of topography and the development parameters in relation to the construction of large commercial buildings. This requires levelling to create sufficiently large building platforms to ensure the economic viability of the site; re-direction of the watercourse to ensure adequate drainage; provision of new drainage to serve the proposed new building platforms and the creation of new water bodies.

Amended Design

- 4.50 The aim of this section is to review the potential that appropriate environmental conditions could be sustained at the site to ensure the long-term survival of the archaeological evidence should it remain in place during and after development.
- 4.51 Evidently there are two main methods of reducing harm to the significance of archaeology. The first is to avoid it by designing areas, such as set-aside or public open space, in locations where archaeology is at risk. Alternatively, an engineered solution might be designed which allows development to go-ahead without impact on below ground deposits. The nature of engineering operations has been described above and BWB have identified the geotechnical parameters for the design of engineering solutions for the development of the Masterplan proposals (BWB Phase 2, Sec Geotechnical Report). This section sets out the parameters which an amended design would confront.
- 4.52 Williams (2016) notes that with respect to preservation In Situ detailed mitigation approaches are provided by Davis et al., (2004, Chap4) in a volume which provides examples of engineering strategies (4.3). These are defined as '*active measures which reduce the impact of engineering operations on the ground containing the archaeological remains*' (Davies et al., 2004, 36).
- 4.53 A Covering System (Davis et al 2004, 4.3.4) is defined as a method:
- 4.54 *"to isolate the archaeological remains from the construction activities and to contain them within or below an engineered covering regime. The aim of this approach is to actively maintain the burial environment conditions thought to be responsible for the in-situ preservation of the remains, while still permitting development at ground level."*
- 4.55 Covering Systems have been used in several projects of which the most well known in the UK are the Rose Theatre, London, Globe Theatre, London and Flag Fen, Peterborough (Davis et al., 2004, App D). In addition, there are less well-known examples Brighton and Hove - Peacehaven

Waste Water Treatment Works (16/9/09), Great Western Park, Didcot (over a Roman villa) and Thanet Earth (all RPS/CgMs projects).

- 4.56 In setting out an approach to Covering Systems Davis et al., have identified the following sequence:
- Existing soil is left in situ and engineering techniques are confined to a level above ground surface
 - Construction activities will cover the archaeology (an avoidance strategy) for example by hardstanding, landscaping or foundation elements placed on top of or suspended above.
 - Where possible construction activities will be located away from the archaeology informed by the results of archaeological evaluation.
 - Construction activities should be confined within areas that are devoid of archaeology
 - If construction activities are to be located above in situ remains a material could be introduced to act as a buffer in place of or addition to archaeologically devoid surface material. The new material effectively isolates in situ archaeological remains.
- 4.57 The introduction of a buffer introduces an increased loading to the ground surface and, therefore, the possibility of compression damage, whilst a change in land use from grazing to commercial unit raises the potential of ground disturbance.
- 4.58 In 2009 DEFRA and English Heritage (now Historic England) undertook trials to test the impact of arable agricultural practice on below ground archaeology. The relevance of this study was that its objective was an *‘Assessment of the effectiveness and viability of minimal cultivation, and differing soil management techniques, in preserving the archaeological resource and to compare these techniques with conventional arable/soil management systems’*. Whilst the focus of the research was the effect of cultivation on archaeological deposits (sites) one area of research *‘Sub-soil pressures resulting from tillage implements and vehicle loads’* is relevant to mitigate the proposed construction activities.
- 4.59 The trials were carried out in respect to tillage and farm machinery rather than earth moving plant. Although the implements tested were not directly comparable to earth moving equipment, the conclusions of the initial test are a useful indicator of potential impact: *“None of the implements tested in the soil bin exerted pressure at 0.25 m depth higher than 0.3 bar, with the press and heavy roller exerting the highest pressure and the drill and light discs exerting the lowest at less than 0.05 bar. The roll, chisel tine, plough, root share, a human, drill tines and light discs resulted in intermediate sub-soil pressures”*. The tyre and track peak pressures were recorded at 0.25m and the researchers observed that *“The peak pressures generally increase with the severity of the expected loading, in that pressures under the human are between 0.00 and 0.01 bar, increasing to 0.04-0.08 bar under the terra tyre, up to 0.09 bar under the single tractor tyre, to 0.16-0.38 bar under the Fendt tractor + raised subsoiler and up to 0.44 bar below the MF390 tractor pulling the trailer.... The above data enable the identification of those operations where archaeological damage could occur, once the threshold values have been identified...”*
- 4.60 “Experiments, which followed with modern terracotta pots buried at 0.25 m at different orientations showed that the lowest breaking peak subsurface pressures were:
- 1.1 bar for horizontally-orientated pots
 - 1.9 bar for 45-degree-orientated pots
 - 2.2 bar for vertically-orientated pots
- 4.61 The replica pots broke as follows:

- the shell-tempered pot was the weakest, failing at 1.3 bar
- the grog-tempered pot is second-weakest, failing at 1.6 bar
- the flint-tempered pot is the third-weakest, failing at 3.1 bar
- the sand-tempered pot is the strongest, failing at 3.6 bar

- 4.62 The rims of all pots failed at slightly lower pressures than their bodies. The lowest peak subsurface pressure at which the bone broke was 2.8 bar. It is expected that smaller, less robust bones and vulnerable pieces such as skulls would break at lower pressures.”
- 4.63 The researchers concluded that “The determinative result extracted from the pot breakage data in the study on the replica pots was the lowest breakage point of 1.3 bar (1.1 bar for modern, more brittle pots) and 2.8 bar for bone. This provides a reference point to pot breakage indicating the ‘worst case scenario’ for the most fragile pots.”
- 4.64 The relevance of this experimental work for the proposed development at (3) Unwin’s and (2) Woburn is that the reference point for pottery breakage provides a bench mark against which to assess the impact of plant movements on below ground archaeology at depths beyond 0.25m (conventionally the depth of a shallow topsoil). In this case the data appears to show that at 0.25m none of the implements tested produced an impact greater than 0.3 bar and that this pressure was below that likely to damage below ground artefacts (pottery and bone) at 0.25m or deeper. The trial trench evaluation established the depth of the topsoil/subsoil in Unwin’s and Woburn at between 200 and 500mm.
- 4.65 The depths recorded by the MOLA evaluation (Burke 2019, Fig 12), combined with the experimental data of the DEFRA study suggest that any potential archaeological deposits within the proposed development lie below the threshold at which agricultural equipment running on the surface might damage archaeological deposits.
- 4.66 A second experiment carried out by English Heritage, the Soil Stack project looked at the effects of weight, plant movement and compression resulting from the temporary storage of topsoil during the A1 Improvement Scheme. The evidence collected included the effects of soil deposition and removal as well as the effect of plant movements to deliver and contour the stored topsoil. The data was collected over 2 years from 2003 to 2005. The archaeology revealed by evaluation was re-buried beneath 200mm of topsoil by mechanical excavator, further soil was spread by bulldozer until a depth of 300mm had been reached. In the final stage soil was imported in 150mm spits and levelled by self-propelled vibratory roller until a height of 8.9m was reached. Re-examination of the archaeological deposits took place one month after the removal of the soil stack. ‘Three potential effects of compression had been anticipated; movement of the deposits, alteration of the relationship between contexts (soft deposits coming adrift from walls and revetments) and fragmentation of finds and environmental remains.’ Illustration of the work shows the removal undertaken by 20 ton Hymac earth excavator situated on top of the soil stack.
- 4.67 The result of the work of the Soil Stack project was that ‘none of the three effects could be significantly measured’. However, there was evidence of slight movement (0.024m to 0.079m) of stones. This was attributed to the re-burial process, with no damage recorded to charcoal and charred plant remains.
- 4.68 Both research projects provide an indication of useful bench marks for the construction activities at Unwin’s and Woburn. The Soilstack Project in particular indicates that the use of plant to construct the buffer itself can safely be employed above the topsoil horizon without damage to the below ground archaeology.
- 4.69 The creation of a buffer could ensure that archaeology is not compacted beyond its present state. At South Caldecotte this approach combined with the results of the Soil Stack and DEFRA

Research suggests that any archaeology, will remain materially unaffected beneath the buffer at depths (0.35m - 1.6m) comparable to those identified during the trial trench evaluation.

Discussion

Balance and the Scale of Harm

- 4.70 This final section of the SHA has focussed on the issues and factors in relation to the *balanced judgement* required by the NPPF to resolve the dichotomy between the construction parameters of the allocated Site at South Caldecotte in the Plan MK and the significance of the archaeology. The latter referred to as (1) Unwin's, (2) Woburn, (3) Unwin's (4) Norman's. The national policy context of the NPPF (para 197) states that:
- 4.71 *"The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset."*
- 4.72 and it is acknowledged that while the effects of development can take several forms the NPPF (2019), para 192, notes that when determining planning application, local planning authorities should take account of the *'the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation'*. In addition, the warning by the NPPF, para 199, that *'the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted'* has been accepted and the reasoning below does not attempt to represent investigation as an enhancement of the heritage assets.
- 4.73 The archaeology at South Caldecotte comprises medieval earthworks (3) Unwin's and below ground Roman remains on the periphery of the Roman small town of Magiovinium: (1) Unwin's, (2) Woburn and (4) Norman's. The archaeology has been identified as a non-designated heritage asset due to its entry in the Milton Keynes Historic Environment Record. Its significance has been determined through Desk Based Assessment, geophysical survey and trial trench evaluation and found to be **Medium** as defined in the DMRB and illustrated in Table 5.1 (above).
- 4.74 The extent, character and survival of the archaeology has been mapped by MOLA through trial trenching and geophysical survey and confirms the pattern established in the 1980s as a result of excavation along the A5 by D S Neal. The potential conservation options have been identified as preservation *situ* or investigation. The former, preservation *situ*, can be achieved by setting the archaeology aside or by burial beneath a protective cover. This according to experimental data from Historic England (when English Heritage) has the potential to allow some plant movement in the area during its construction.
- 4.75 The present Masterplan has been designed to achieve the minimum specification of the Plan;MK allocation combining a series of large commercial buildings with office space, access and carparking as described above (para 4.18). The constraints of the site, including archaeology, scale of buildings and topographical limitations have been taken into account in relation to large warehouse construction. In principal the primary objective has been to secure preservation *situ* beneath shallow spread foundations. However, the archaeology lies in an area of river terrace, RTD, and head deposits in a location BWB have identified where the topography indicates that *"For Units 1, 2 and 3, the current building footprints will be within significant areas of cut (up to 1.8m) and fill (up to 3.0m). Due to the variable fill thickness across the footprints of these units a shallow spread foundation solution on natural ground is not a viable option due to the potential for significant differential settlement within different strata types or variable thicknesses of fill."*
- 4.76 The potential impact on below ground archaeology, therefore, at (1) Unwin's, (2) Woburn's, (3) Unwin's and Woburn and (4) Norman's and Woburn has been found to be threefold: (1) changes

to the ground water due to diversion of the present brook; (2) ground reduction of up to 2m followed by vibro-stone columns or high energy impact compaction; (3) plant movements associated with construction activities. In addition, infrastructure, such as services including drainage, at a level of detail outwith the Masterplan, will impact on below ground deposits throughout the development area.

- 4.77 The balance to be struck here is between the loss of some 250m of street in a craft quarter on the periphery of a small Roman town, classed as Medium significance, able to address some of the regional research objectives, and the achievement of the employment aims and objectives of Plan:MK. The justification for the loss of the archaeology therefore lies in the strategic case made for the allocation site and in the need to achieve the minimum developable area providing employment at South Caldecotte.

5 SUMMARY AND CONCLUSIONS

Summary

- 5.1 This Supplementary Heritage Assessment (SHA) has been written in response to a request for further information by Historic England (ex litt DW 3/9/19) and by a Development Management Consultation on behalf of MKC which recommended refusal of planning permission on the grounds of *'unacceptable impacts on designated and non-designated heritage assets of archaeological and historic interest'* (NC 30th August 2019). The SHA followed the principles advocated by the NPPF and Historic England. This report has provided an enhanced statement of significance, an assessment of the impact of development on the setting of Magiovinium (SAM) and provided a justification for the loss of archaeology which does not really on any benefits accruing from their investigation.
- 5.2 The SHA has confirmed the **Medium** significance of the Iron Age and Roman archaeology, which though well preserved, due to its scale and extent is capable only of informing local and regional research objectives. The SHA has also reviewed the evidence of recent survey to suggest that the development site does not contain any archaeological evidence of greater than local significance. In relation to the ridge and furrow at the site the review concurs with MKC that these earthworks are of lesser significance than the Iron Age and Roman deposits due to their extent capable of addressing only local research objectives. The significance of the ridge and furrow based on the DMRB criteria is **Low**.
- 5.3 In a further section the review has also provided a fuller assessment of the impact of development on the setting and therefore significance of the SAM of Magiovinium. This assessment concurred with historic England's assessment that the development would be less than substantially harmful. When graded against the evidence and significance of the SAM the impact was found to be at the lower end of the scale.
- 5.4 In the last section the effect of losing evidence of local to regional importance was addressed in terms of the significance of the Iron Age and Roman evidence and the Ridge and Furrow.

Conclusion

- 5.5 In conclusion the SHA, as requested by MKC, addressed the balance to be struck between the loss of some 250m of street in a craft quarter on the periphery of a small Roman town, classed as **Medium** significance, able to address some of the regional research objectives, and the achievement of the employment aims and objectives of Plan MK. The justification for the loss of the archaeology, therefore lies in the strategic case made for the allocation site in Plan MK and in terms of the need to achieve the minimum development area, providing employment at South Caldecotte.
- 5.6 Although forming no part of the justification for the loss of archaeology the outcome of this SHA is a recommendation for recording in accordance with the NPPF para 199 in that *"Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible"*

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