

Abbey Fields, Kenilworth: Warwick Leisure Centre

Heritage Statement S73

Mace and Warwick District Council



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Version 2

Hampton Heritage Design & Consultancy Ltd



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1 Introduction

This Heritage Statement supports a Section 73 planning application to vary conditions attached to planning permission reference W/21/170 for the redevelopment of the existing swimming pool at Abbey Fields, Kenilworth. The reason for this application is a redesign to the consented application W/21/0170 to raise the building 500mm so that the foundations minimise any physical impacts on buried medieval archaeological remains which have been discovered during the demolition process for the original scheme. Historic England as statutory consultee and engaged stakeholder in the permitted development, have welcomed a redesign which aims to conserve the archaeological remains, and supports the raising of the building by 500mm which would protect the buried archaeology whilst not significantly affecting the setting of the scheduled monument of Kenilworth Abbey.

2 Changes from permitted scheme

2.1 Comparison between permitted and proposed new scheme

As a statutory consultee Historic England (HE) gave their formal advice to Warwick District Council on Planning Application ref W/21/0170 dated 24th February 2021 (HE ref: P01369031). In their response HE acknowledged the public benefits of renewing and modernising the swimming pool and they offered to work with the applicant team to reach an acceptable design which would not adversely impact or harm the scheduled monument or other designated heritage assets at Abbey Fields. Following engagement with Historic England throughout the determination of the application, a letter confirming a position of 'no objection' was submitted by Historic England on 9th August 2021.

Although much of the western part of the site had been disturbed to c.3m in depth by previous swimming pools, archaeological investigation revealed medieval and later remains in the eastern part of the site. These lay at a level that would be impacted by the foundation design, and the extent of these remains prevented simply moving ground beams, pile caps and drainage to areas without significant archaeology.

In accordance with Historic England recommendations, the structural engineers and architects have produced a redesign which raises the foundation level of the building by 500mm so that all ground beams and utilities would lie above the remains, as would the vast majority of pile caps. The resultant design has reduced some ceiling heights within the building so that the ridge would need to be only 350mm higher than the permitted scheme. The exterior appearance and layout of the building remains generally the same as the permitted scheme, with some minor amendments to elevations which are set out in the submitted Design and Access Statement and Planning Statement. In addition, access for all requires some landscaping around the new build so the landform would allow a gentle rise up to it from current ground level.

2.2 Summary of archaeological knowledge prior to permitted scheme

The history of the Abbey and related archaeological discoveries have been reported on in detail in several documents issued as supporting statements for the permitted scheme (W/21/0170). It is not necessary to repeat the previously known information about the abbey for the purposes of this S73 application.

Details on previous disturbance caused by the Lido and later swimming pool are contained in Hampton Heritage's Assessment document: *Abbey Fields, Kenilworth: Warwick Leisure Centre, Heritage Statement (Revised)* June 2021. In this report Appendix 2 "210311 Comparative plans depth disturbance" (Figures 2 & 3) supplements the information within a report by SLR Consulting *Abbey Fields Swimming Pool, Kenilworth Desk Based Study* (April 2020).

To summarise the history and extent of previous disturbance from Appendix 2: in 1896 an open-air swimming pool was excavated to a depth of 2.5m below the current ground level measuring 75 ft by 35 ft (22.86 x 10.67m). In 1935 this was replaced by a lido, which was the same length but double the width of the original pool; it was also 3 feet higher in its depth, burying the floor of the earlier pool, which was left in situ. In 1965, new changing rooms, an entranceway and a kiosk were built. The current swimming pool complex was built in 1985, during which the ground level was raised.

Geotechnical and geoarchaeological boreholes were drilled and sampled in 2020, and the results of these investigations suggested some alluvial deposition in the north-western part of the site, but little indication of surviving archaeological deposits. Previous watching briefs on installation of play equipment in the surrounding area, and from a personal comment from the Warwickshire County Archaeologist who observed the construction of the 1980s buildings, had also not found any significant evidence for preserved archaeological remains within the area of the swimming pool. It was on this baseline evidence that Historic England reached a position of no objection and permission was granted for redevelopment of the site, a decision based on a low expectation of encountering archaeological remains because of previous iterations of the swimming pools which would have disturbed the ground extensively, and because little had been found in any previous events in, or adjacent to, the site. The zone was away from the main monastic buildings and gatehouse, in a wet area around the Finham Brook, and the main archaeological potential was masonry in the stream's revetment wall which might have been from a mill, or bridge abutment, in part of the site that was not scheduled for deep foundations.

2.3 Summary of preserved archaeological remains found during current works

2.3.1 Introduction

As a condition for the permitted scheme an archaeological Written Scheme of Investigation (WSI) was designed and approved by the planning authority, informed by consultation with Warwickshire County Council's (WCC) archaeological planning advisor and Historic England (Condition 3 of W/21/0170). The WSI included post-demolition trial trenching within the swimming pool building complex to characterise the deposits and identify whether archaeological remains survived. Following the discovery of preserved medieval masonry and other deposits from these investigations, Historic England and WCC's archaeologist agreed a staged approach to further investigation and for the proof digging to remove concrete and pile foundations. The results from this programme of work are summarised below (from Archaeology Warwickshire Report 2358).

2.3.2 Overview

The archaeological works so far have revealed medieval structures across much of the site and subsequent post-medieval and modern activity that has in places truncated the medieval remains.

2.3.3 Archaeological Features and Deposits Medieval



Parts of at least three medieval buildings have been exposed, one at the north end and two towards the southern end of the site. The northern building appears to have been aligned roughly north-south, whereas the southern ones were roughly east-west. The northern building was of significantly different construction to the southern buildings (Fig 1).

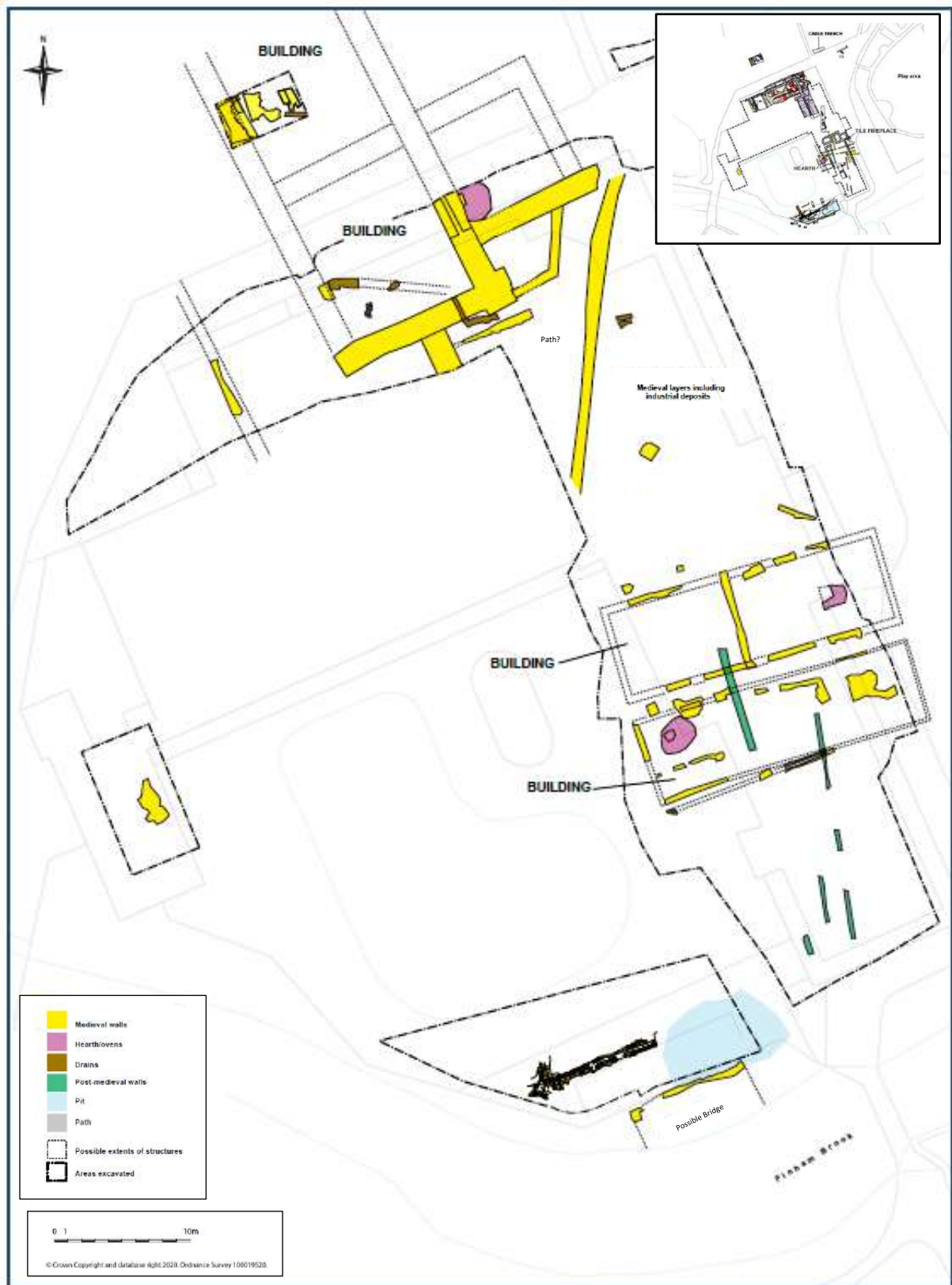


Figure 1: Excavation areas and Medieval remains



Northern building

The exposed section of this building measures c.12m east-west and 8m north south, with its northern limit lying beyond the northern extent of the site. An exposed central buttress plinth suggests a possible north-south length for the building of *circa* 16m. It is stone-built with its east elevation being 1.5m wide and constructed from large, faced sandstone blocks including three courses of chamfered stonework towards its base (Photo 1). The wall, which had a square buttress forming the southeast corner of the building, also contained a small number of re-used blocks from an earlier building, including carved Norman stonework. A number of masons marks were recorded on the chamfered stones, some of which have previously been recorded in the existing barn and gatehouse buildings and were also recorded in the test pit for the new electricity sub-station (see below).

The southern wall was of similar width but was of very different construction. At its west end a surviving relieving arch (Photo 2) within the foundation was constructed from roughly shaped blocks. The significant difference between the two walls suggests that the east wall was the principal face of the building and it may have fronted onto the access route into the abbey from the south.

The building had been demolished to below floor level and there was no evidence to suggest its former function, but pottery recovered from around the building currently suggests a date for construction of *circa* 1300. Its apparently imposing east elevation suggests that the east end was intended to make an impression and supports the idea it may have been one of the first, if not the first, building people would encounter if approaching the abbey from the south across the brook.



Photo 1: Stonework on the east elevation of the northern building



Photo 2 relieving arch in the south wall of the northern building



Photo 3 West wall (top right) of the possible extension to the Northern building with the later fireplace/oven and circular oven.

A later extension was built onto the west wall that extended beyond the eastern and northern edges of the excavation area and was constructed from sandstone blocks. Its west wall was constructed on and along the line of the reduced eastern wall of the northern building (Photos 3 and 9). The size and form of the building is not known but it was clearly a substantial construction with its south wall being at least 1m wide and extending approximately 8m to the east.

It contained a square stone lined fireplace/oven of possible 16th century date and slightly later circular oven constructed from tile (see Photo 3). The base of the earlier fireplace/oven was constructed from part of a flat slab inscribed with circles and lines, which had clearly been reused from elsewhere on the site (Photo 4).



Photo 4 Inscribed stone used as the base of the fireplace in the extension to the northern building

Southern buildings

The two southern buildings were of similar design and size, c.16m x 6m, and both buildings were aligned roughly east-west and there appears to be a walkway between them.

They consisted of narrow foundations constructed from sandstone blocks with large sandstones pads on the corners, suggesting they were timber-framed (Photo 5). The northern building was divided into two rooms, with one containing a large fireplace/oven constructed from roof tiles set on edge, which showed signs of burning (Photo 6).

There was no evidence within the exposed remains to suggest a function for the buildings, but on 19th century mapping this area has been marked as containing farm buildings.



Photo 5 General view east across the southern buildings during cleaning showing the stone foundations running across the site and cut by the later pool foundations



Photo 6 Hearth/oven constructed from tiles one edge in the middle of one of the southern buildings

Drains and other structures

Parts of five stone lined drains have been recorded across the site, with three in the main pool complex area and possibly two in the electricity sub-station test pit. All are of very similar design with stone lining capped by sandstone blocks, or in one case sandstone roof tiles (Photos 7 and 8).



Photo 7 Stone capped drain running north-south through an arch below the floor of the northern building (note reused decorative stone block at far end)

The drains contained reused stone from earlier buildings, indicating they were not part of the original layout of the abbey. Apart from a section of one drain that was aligned north-south below the northern building the drains were generally aligned east-west or northwest-southeast and all drained down towards the east and southeast.

All the drains were truncated by later activity on at least one end and some continued beyond the excavation areas, so even though one drain ran through an arch below the northern building it is not possible at the moment to determine if they were associated with buildings or were for more general land drainage. Samples from the fills may provide evidence for what was passing through the drains.

Possible pathway

A possible northeast-southwest pathway across the site is indicated by a length of surviving wall (Photo 9) and the line of rough wall/rubble filled robber trench. The surviving wall butts against the east face of the buttress on the southeast corner of the northern building and extends east for a short distance before turning northeast and possibly butting the south wall of the extension.



Photo 8 Stone drain capped with sandstone roof tiles in the sub-station test pit



Photo 9 Drone shot of the northern building showing the possible pathway (indicated by the ranging rod) formed by the later angled wall butting the east wall and the robber trench. Note the later extension at the top of the photo

The possible path crosses an area containing compacted gravel surfaces, which spread around the east and southeast of the northern building and extend to the south across parts of the central area of the site. There are at least two phases of gravel surface, with the possible pathway associated with the later phase.

Industrial deposits

Extensive spreads of metal working waste including lumps of slag and hammerscale are present across the central area of the site and in a large pit at the southern end of the site. The amount of material suggests the metal working, most likely a smithy, was on or very close to the site, although at present there is no identifiable trace of a forge building.

Riverside structures

Investigations on the riverside structure suggest it could have been part of a bridge over the Finham Brook but works here have stopped following the collapse of part of the structure.

Electricity sub-station

Investigations within the proposed locations for the electricity sub-station have revealed a substantial stone wall within a mound of rubble at the southwest end of the pit. The wall included a number of large worked and faced stones on the north end (Photo 10). The faced stones, which had been removed in the southern half of the test pit were set of a line of more rounded sandstones, which appeared to form a foundation. The wall was overlain by rubble, presumably from the demolition of the former structure, but there was no evidence for its former use. Its location is thought to be on or close to the former line of the mill pond bank, but the impressive nature of the wall suggests it may have been part of a building rather than the pond bank.

The faced stones had a few masons marks, some of which were also recorded on the northern building inside the pool area and they will be compared to those recorded on the gatehouse to the north.

A layer of flat sandstone blocks, thought to have been part of a wall or floor at the northeast end of the test pit were investigated following the removal of a 1930s park structure and they were part of a surface with a possible stone lined drain below (Photo 11).



Photo 10 Worked and faced stones of the wall in the sub-station test pit



Photo 11 Stone surface in sub-station test pit with possible drain below

2.3.4 Artefacts

A relatively small number of finds have been recovered, with ceramic building material, mostly floor and roof tile, being the most common type, with pottery and animal bone also recovered.

The finds assemblage has not been assessed or analysed yet, so no detailed interpretation is possible at this stage.

The pottery, which was largely recovered from around the southeast corner of the northern building mostly dates from the 13th-14th century and the assemblage contains a number of fragments from jugs and cooking pots, suggesting a kitchen or brewhouse.

Animal bone included fragments of cattle, sheep/goat and bird bones, so represent food waste, supporting the idea of this area containing a kitchen.

2.4 Assessment of archaeological significance

The results from the investigations have demonstrated well-preserved masonry remains, abbey infrastructure, activity zones and related waste deposits, and although no floors have been uncovered, plenty of ceramic tiles survive within demolition deposits. Organic remains have been found preserved at lower levels within the site, although there is no direct evidence for these to be associated with human activity, and they could represent residues caught within a palaeochannel of the former Finham Brook.

The plan of the buildings and associated evidence has enhanced our understanding of Kenilworth Abbey, and substantially added to the previously known extent of its built form. Despite this part of the scheduled monument having been assessed as of relatively low likelihood to contain surviving evidence due to disturbance from previous pool construction, the recent work in fact has shown the area to have great value for preservation of important archaeological evidence.

3 Revised design and impact assessment

3.1 Summary of S73 application design

The key design aims for redevelopment of the Abbey Fields swimming pool have not changed from the permitted scheme, with natural light, park views and the indoor / outdoor relationship key to the success of this design. In short this includes: ·

- A durable and versatile design with significantly improved sustainability from the (now demolished) previous building, and one that employs natural light, with areas of transparency on the façade, maximising views in and out.
- Construction which applies sensitive, yet durable materials that complement the site context, enhancing the surrounding natural environment and heritage context, with a prominent entrance and an attractive primary elevation as viewed from the park.
- A layout which aids the facility to be commercially effective and incorporates a well-proportioned and functional external space relating to the family pool area.
- A minimalist approach to any new soft landscaping to ensure the building takes visual prominence, and does not overpower the already existing mature and attractive surrounding park landscape.

Drawings AFK-DB3-SP-ZZ-D-A-2000 PROPOSED ELEVATIONS 1 and AFK-DB3-SP-ZZ-D-A-2001 - PROPOSED ELEVATIONS 2 submitted as part of this application, show the external appearance of the new facility. The architectural design and materials remain the same as the permitted scheme as does the footprint of the new building which will be c.1775sqm. The internal arrangements are largely the same as the permitted scheme, and any minor changes to these would not affect the historic environment (Appendix 3). The proposed finished floor level, however, will be at 75.650m AOD as opposed to 75.150m AOD in the permitted scheme (a difference of 500mm), whilst the highest roof ridge level would be at 83.527m AOD as opposed to 83.165m AOD for the permitted scheme (a maximum difference of 362mm).

A final foundation design was not included in the permitted scheme, because it needed to be informed by the results of archaeological trial trenching following demolition (controlled by condition), so that an approach could be agreed with Historic England that was sensitive to the designated status of the site and one that would result in less than substantial harm to the scheduled monument. A revised foundation design has been approved by Historic England on 4th August 2023 (Appendix 1) which has lifted the pile caps, ground beams and utilities (Drawings AFK-CCE-SP-00-D-S-3000 Foundation Review and AFK-CCE-00-00-D-C-0310-P03_Private Drainage Layout) above the level of the preserved archaeological remains, and this design forms part of the S73 application. This has resulted in finished floor levels being 500mm above those in the permitted scheme. An array of c.239 piles of 300-400mm diameter up to c.9m depth will support the structure above. These will be installed by continuous flight auger (CFA) rotational drilling.

Areas of deeper groundworks will be required for the flood attenuation tanks and for the pool pump room, but on Historic England's advice, these have been located away from significant archaeological remains. An electrical sub-station will be located to the north of the building, in the same location as proposed within the permitted scheme, and the base of this will lie above the medieval walls and

floors found during the archaeological investigation in this area. The cable connection will run underground from the sub-station and then it will be brought into the new building above ground level, so as to avoid damage to the northern medieval building which lies within the footprint.

In several locations the higher floor level within the S73 application requires external landscaping to gently ramp up the ground for access purposes.

3.2 Impact assessment

3.2.1 Impact within the footprint of the proposal

A revised foundation design applying a suspended slab has been achieved in collaboration with Historic England, so that the potential substantial harm that would have occurred if the provisional formation level in the permitted scheme had been constructed, is avoided. By raising the foundation level 500mm, and placing ground beams and pile caps in areas of less archaeological sensitivity, the resultant groundworks during construction have minimised potential damage, consistent with the less than substantial harm accepted by the scheduled monument consent (reference S00242214 dated 16.2.22) and planning permission (ref W/21/0170) for the previous scheme.

The total area that has been proof dug and archaeologically investigated beneath the demolished building amounts to c.980sqm. Within this total area, two main zones with medieval buildings have been identified, with the northern building complex amounting to c.248sqm and the southeastern structures c.235sqm. Much of the western part of the site, the location for the new pools and attenuation tanks, has been shown to have little of archaeological interest surviving. Sheet piling will be installed into the bedrock to separate the pool excavation area from the rest of the site, and part of this comes close to the northern medieval building. To reduce risk of vibration damage to medieval remains from hammering the sheet piles into the ground, it is proposed to use a CFA to drill 600mm interlinking boreholes into which the piles can be lowered, and so form the sheet piling without the potential disturbance likely from percussive techniques.

Although within the revised foundation design there remain five pile cap locations which might disturb the top of archaeological deposits, these are being archaeologically investigated before any final approval from Historic England is given. The potential impact from piling is subject to each location being inspected and recorded by an archaeologist, so that Historic England have available information of the potential degree of damage that would accrue from drilling. Within the northern and eastern parts of the building footprint it is calculated that the maximum loss of archaeological deposit to the CFA piles would be 0.4%, assuming each 300mm diameter has minimal collateral damage (see also Appendix 2). However, ongoing dialogue with piling contractors over specialist design suggests that if stones are encountered a diamond cutting edge would need to be used, and a sleeve inserted, so that the maximum diameter in these specific locations would be 500mm.

Prior to piling, the archaeological remains will be protected by relaying 100mm of excavated local material (with the remains first covered by teram) to continue the preservation conditions which have conserved them for the past c.500 years. Above this a geogrid tensile matting with Type 1 aggregate will be laid and covered by 150m of lightly rolled MOT approved sub-base aggregate. This will be topped by the piling mat. The resultant loading on the archaeological remains from the piling rig and

other heavy machinery has been agreed as acceptable by Historic England. Vibration limits have also been discussed.

The above measures have effectively reduced the risks to archaeological remains sufficiently for Historic England to be able to support the S73 application, balancing the public benefit of the scheme against the less than substantial harm to the monument. Nine small research excavations have also been identified, to maximise information retrieval while the medieval remains are available for study. These will help enhance understanding of the scheduled monument.

It is therefore concluded that the S73 application design has successfully reduced adverse impact to a very low level, and the direct effect on the entirety of the scheduled monument will be negligible.

3.2.2 Impact outside the footprint of the proposal

The S73 application has potentially both direct and indirect impacts on the scheduled monument, with physical change occurring from ramping up the current ground level to access the new building which has a floor level 500mm higher than in the permitted scheme, and indirect (visual) impact from the slightly higher roof ridge line (c.362mm higher).

These areas of land rise are localised to the main entrance, and to the west next to Abbey Pool. Around the rest of the building current ground levels will be maintained (Figure 2). The landscaping will use locally sourced hard core from the demolished building to make up the ground to the correct level, before surfacing it.

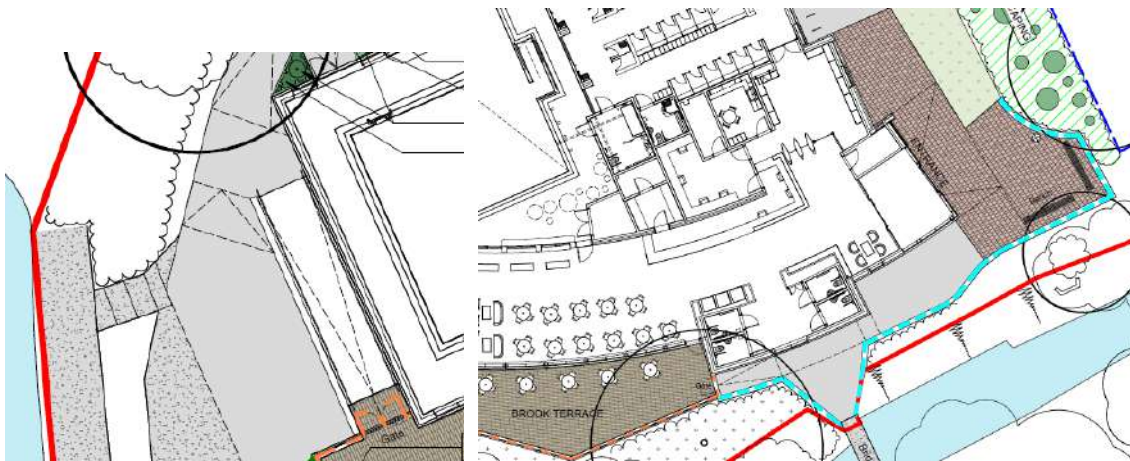


Figure 2 Area of ground to be raised for access ramp at rear (west) of facility, and in front of main entrance to east

The proposed additional ridge height does not change the conclusions to the permitted scheme, which Historic England agreed would not result in harm to the heritage assets, as the difference between the permitted scheme and the S73 application will be barely perceptible (Appendix 1). A comparison between the original photomontages and those for the revised scheme effectively demonstrate this, as submitted with this application (AFK-DB3-SP-ZZ-I-A-1120 – 1126).

It is concluded that the significance of the visual change and any potential adverse impact on the scheduled monument and its setting would therefore be negligible.

4 Conclusions

This heritage impact assessment has compared the design of the new swimming pool as permitted by planning permission ref W/21/0170, with the changes proposed in the S73 application. It has summarised the discoveries made as part of the permitted scheme, which revealed medieval masonry remains and other deposits which are of high significance and form part of the abbey complex. The importance and detailed records of these findings has enabled the engineers and architects to redesign the foundations in order to preserve the archaeological remains in situ, with the exception of a very small degree of intrusion into archaeological deposits caused by the need for piles to support the new build. The percentage of damage from these piles is calculated at 0.4% of the archaeologically significant area, well below the 5% that has been accepted as a benchmark to allow modern development in medieval York (Ove Arup and Partners and York University in association with Bernard Thorpe 1991 'York Development and Archaeology Study' Section 9.4.4, p83).

The approach that has been adopted by the design team towards construction, piling, vibration and associated risks, has been informed by Historic England's 2019 *Piling and Archaeology: Guidance and Good Practice* Swindon: Historic England (first published 2007). An archaeological mitigation strategy is agreed for the permitted scheme (Hampton Heritage Design & Consultancy May 2023 *Abbey Fields Leisure Centre: Written Scheme of Investigation: Mitigation version 2, W/21/0170 Condition 3*), which with minimal change can be adapted for the S73 scheme if granted consent.

In conclusion the S73 application can be seen to comply with the NPPF paragraphs 194 (field evaluation), 199 (conservation of the asset), 202 (less than substantial harm and public benefit) and 205 (record and advance understanding proportionate to the loss of a heritage asset's significance). It also addresses Warwick District Council's Local Plan 2011-2029:

- Policy HE1 – Designated Heritage Assets and their setting (*Where development would lead to less than substantial harm to the significance of a designated heritage asset, this harm will be weighed against the public benefits of the proposal, including securing its optimum viable use*);
- Policy HE2 – Conservation Areas (*5.164 Gardens and open spaces that add to the historic appearance and interest of conservation areas should be protected from development, and 5.173 Abbey Fields is listed as a Locally Important Park*); and
- Policy HE4 – Archaeology (*There will be a presumption in favour of the preservation of locally and regionally important sites, except where the applicant can demonstrate that the benefits of development will outweigh the harm to archaeological remains*)



Appendix 1 Historic England approval of revised foundation design

KENILWORTH ABBEY

Scheduled Monument No: SM 35115, HA 1021079

Our ref: S00242214

Application on behalf of Warwick District Council

Thank you for your emails of the 27 July 2023 providing revised proposals for the foundation design and safeguarding of the nationally important archaeological remains that has been identified within the footprint of the new swimming pool. Also for the on site discussions of the 28 July 2023.

The proposed raising of the foundation design by 500mm to minimise harm to these archaeological remains is welcomed and we consider that these changes have reduced harm to a level consistent with the granting of scheduled monument consent by the Secretary of State as advised by Historic England. We can therefore support the progression of the design on this basis, with ongoing discussion and consideration of minor adjustment, mitigation, enhanced understanding of the archaeological remains, and presentation as appropriate.

We understand that the revised scheme will require a new planning application, which is expected to be applied for in the coming weeks.

Historic England will need to consider whether a variation to the existing scheduled monument consent will be required. This will be dependent on the changes to the overall design and associated landscaping. Once this information is ready please forward to us and we will review and advise. If variation is required, we would expect this to be delivered within a 4 week period that should parallel the new planning application.

Thank you for your engagement with the archaeological sensitivities of the monument and the creative solutions that the development team have achieved to minimise harm.

Yours sincerely

Neil Rimmington

Dr Neil Rimmington
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Historic England



Appendix 2 Kier professional services statement on piling

Comments below are drafted with reference to Historic England’s publication “Piling and Archaeology – Guidance and Good Practice”, 2019 edition. I give page references in brackets. **Blue text = my thoughts extrapolating from HE’s guidance. Red text = my conclusions from HE’s guidance.**

Rotational disturbance

CFA piling typically results in little to no sediment displacement adjacent to the pile shaft (page 19). Provided the auger is driven at the correct speed, and provided that obstructions are not encountered, CFA piling should not physically damage deposits outside of the area of the auger (page 26).

However if the auger is rotated too rapidly then adjacent material may be drawn into the bore (page 26).

Where structural material forms part of the deposit, there is a risk that these could be drawn into the bore – this could occur if the surrounding ground is too weak to restrict movement, or if the auger is not fitted with a suitable cutting head (page 27).

In the context of displacement piles, the comment is made that pre-augering limits disturbance to the area of the pre-auger (page 42). **I would say it is reasonable to believe that by inspection this must also be true for an augered pile.**

A case study in HE’s publication (page 51) demonstrated that disturbance to historical deposits was limited to the area of a pre-auger. **It would be reasonable to believe that the same must be true for an augered pile.**

Some model-scale research has been undertaken (page 69, figure 59) that an augered pile has very limited impact outside of it’s diameter. This is supported by similar findings from field-scale research (page 69, figure 60).

My reading of the above is that Historic England’s guidance is that damage of loss of the historic remains can be said to be limited to the area/ diameter/ perimeter of the auger, provided the auger is correctly operated and fitted with an appropriate cutting head.

Diameter of the piles

From our telephone discussion I understand that the piles are to be 300mm diameter. The outside diameter of the auger is unknown. **HE’s guidance referenced above suggests that the area of damage or loss would be limited to the diameter of the auger.**

Collateral damage

Collateral damage might reasonably be expected to arise from either rotation of the auger (however see my comments above about rotation), or else draw-down of the deposit-bearing strata. The comments HE make in their guidance regarding disturbance around the piles are written around draw-down as well as rotational disturbance. Insofar as collateral damage around the piles are concerned, HE’s publication indicates that this is something that occurs with displacement piles rather than augered – it’s a result of the soils being physically pushed out of the way of the pile. This doesn’t occur with augered piles, where the soil is actually removed.

One risk that HE do identify with augered piles is that if the auger encounters a void, then that void will fill with concrete as the pile is cast. I cannot advise on the likelihood of voids being encountered.



Stone displacement

If there is building material in the path of the auger, this could be cut through *provided the auger is provided with an appropriate cutting head.*

Logically, if stone debris is encountered and it is larger than 300mm across, then it cannot pass up the auger – anything drawn into the borehole that is larger than the auger itself, cannot pass up the auger.

If I assume that the auger encounters stone debris, and draws it into the borehole, there is therefore a limiting dimension of 300mm.

Overall summary

Review of Historic England’s publication “Piling and Archaeology – Guidance and Good Practice” suggests that the area affected by each pile would be no larger than the auger. If the auger were to draw material into the borehole, anything larger than the auger itself would not pass – so the plausible worst case zone of collateral damage would be 300mm around the perimeter of the auger (but that would require 900mm diameter of material to pass up a 300mm diameter pipe, which is unlikely to occur – more likely would be occasional voids developing in the pile bore wall, if small pieces of debris are disturbed). HE’s guidance however suggests that if the auger is correctly operated and fitted with an appropriate cutting head, then this collateral damage will not occur.



James Harrison
Design Engineer

Kier Transportation | Professional Services

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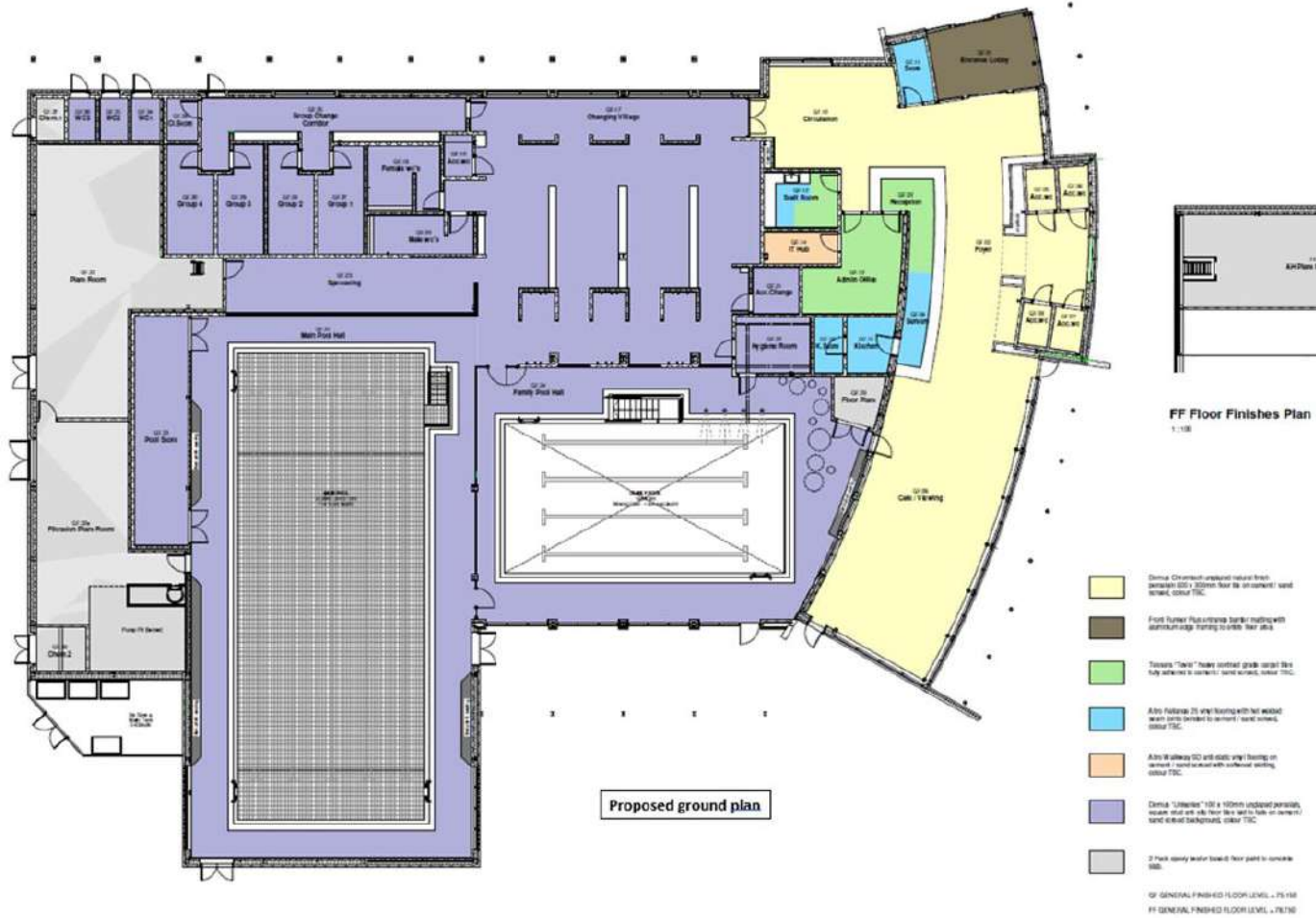
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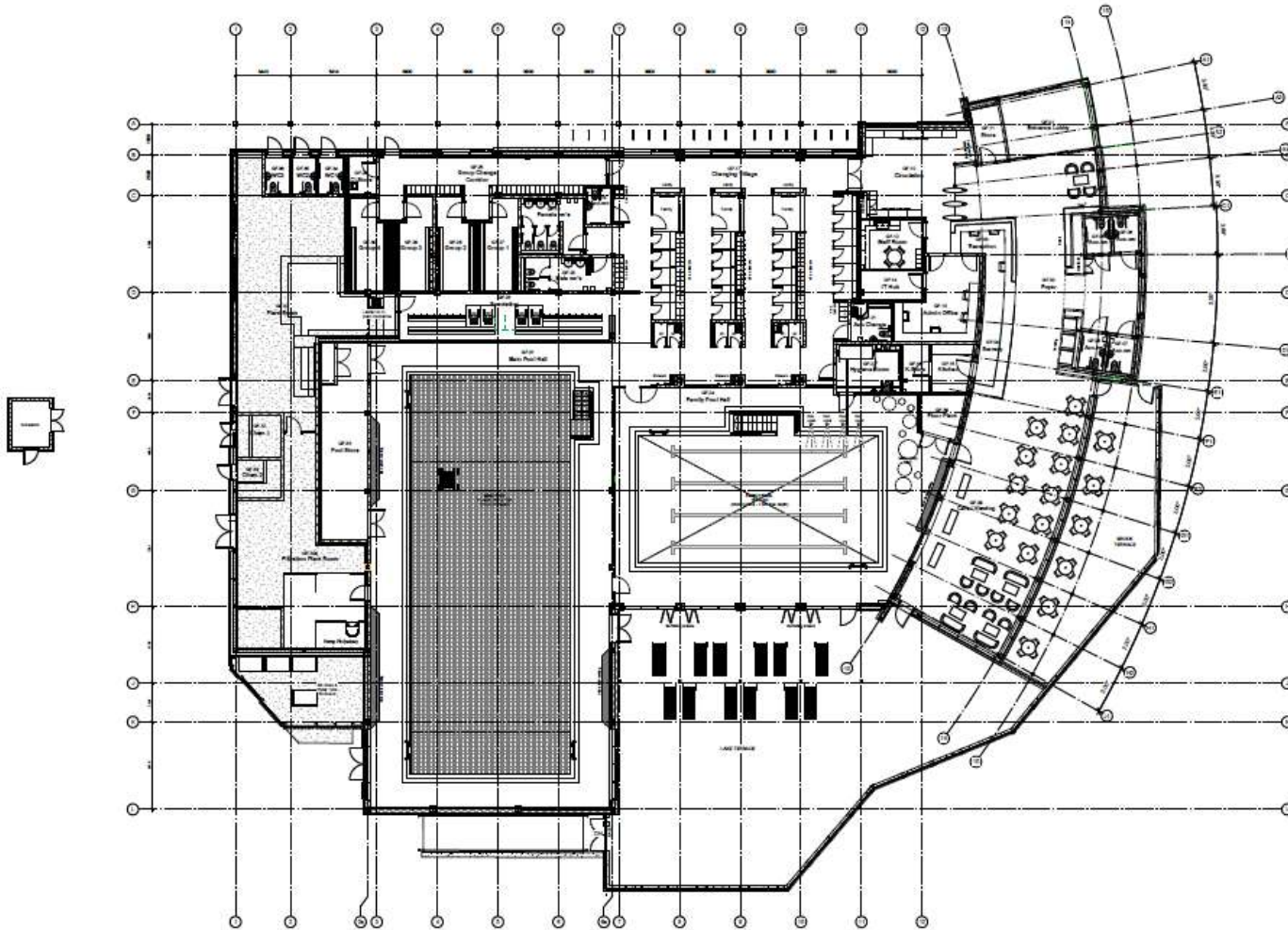
46 The Priory Queensway, Birmingham, West Midlands, B4 7LR



Appendix 3 Comparative plans between S73 and permitted schemes



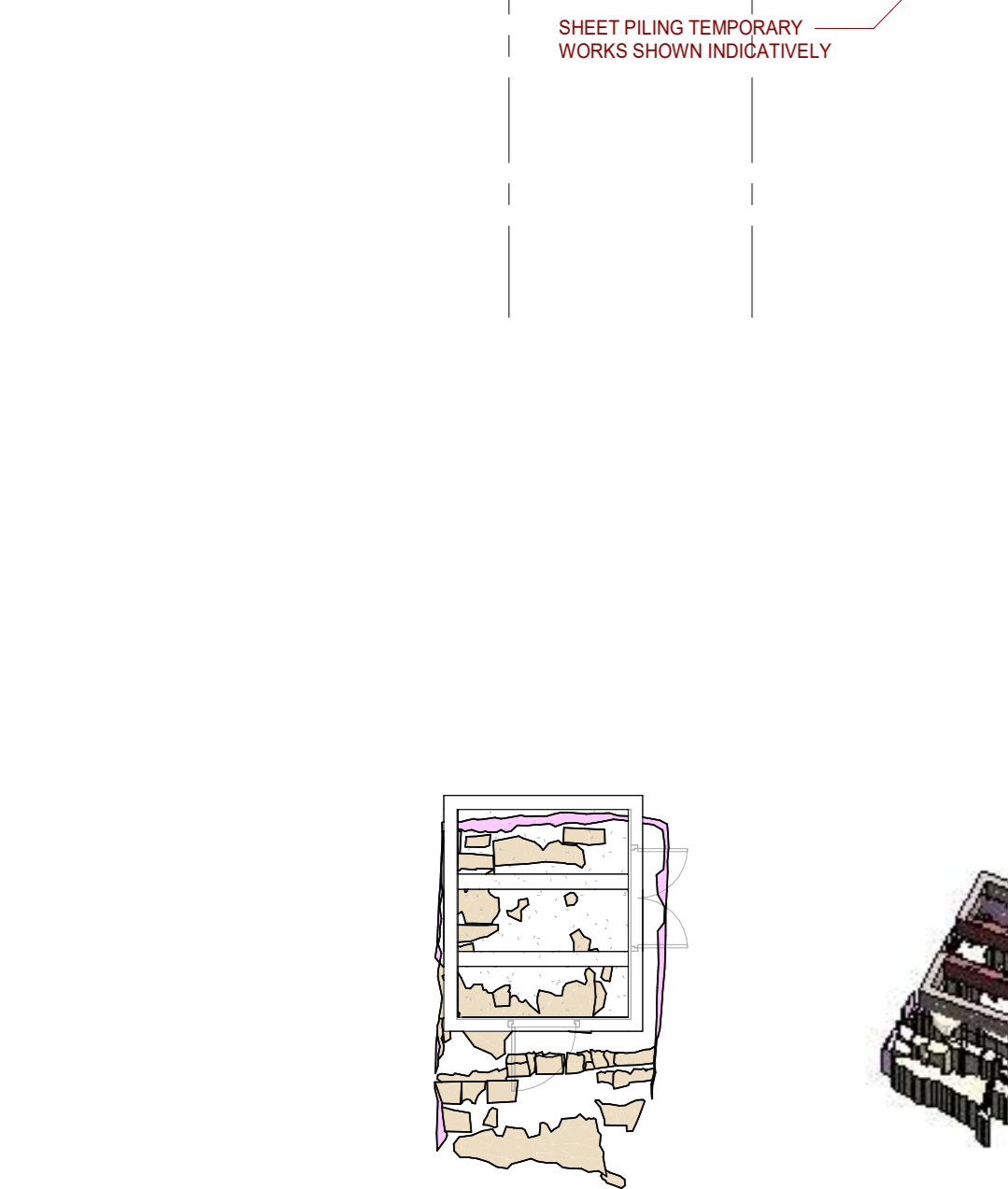
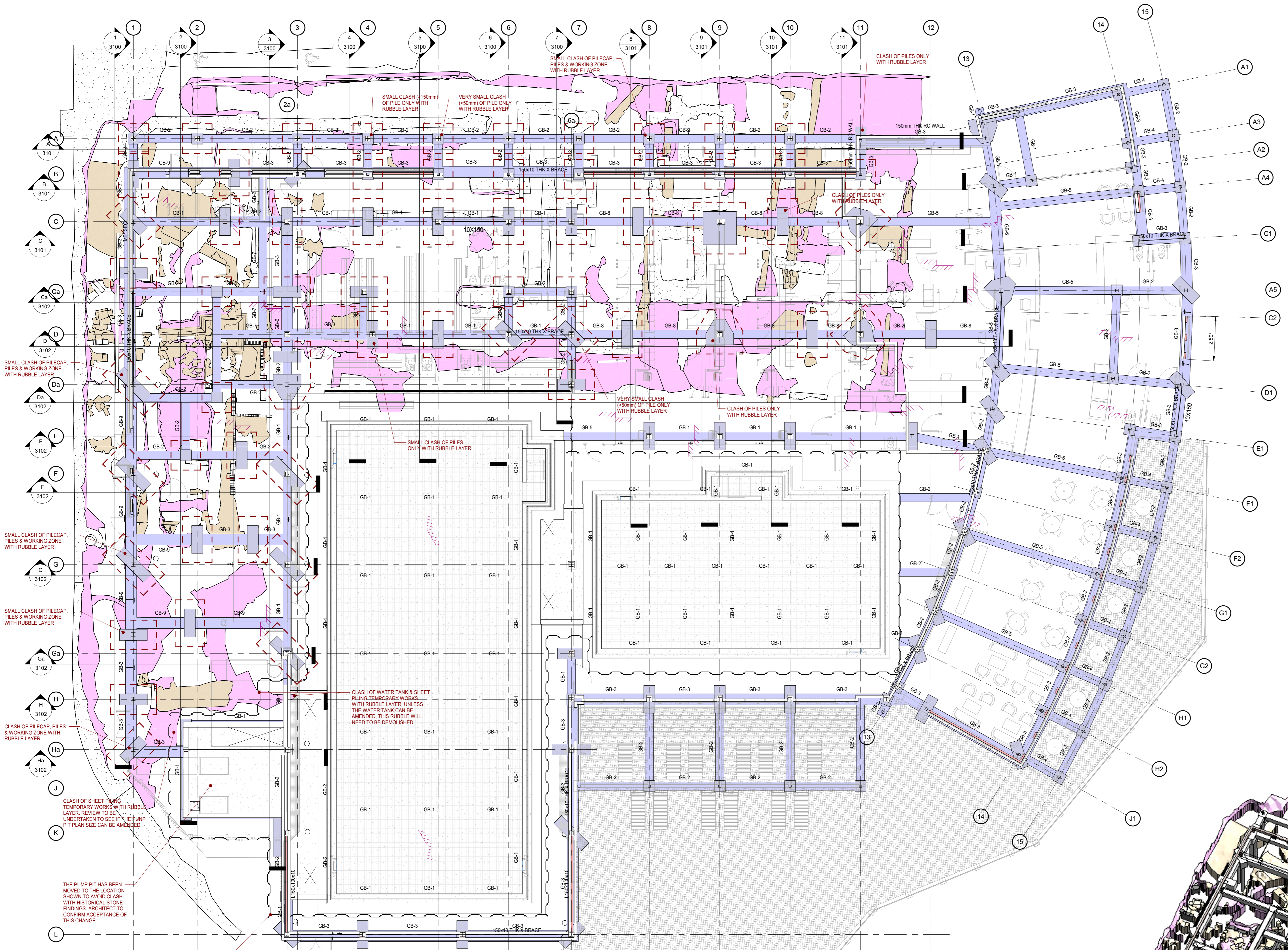
Permitted scheme



S73 ground plan

GB-1 = 450 W x 600 DP
 GB-2 = 450 W x 450 DP
 GB-3 = 600 W x 600 DP
 GB-4 = 450 W x 300 DP
 GB-5 = 450 W x 700 DP
 GB-6 = 600 W x 700 DP
 GB-7 = 450 W x 350 DP
 GB-8 = 450 W x 575 DP
 GB-9 = 600 W x 450 DP

ALLOW 550mm RUN OF LOOSE BAR REINFORCEMENT APART FROM GB-5 - ALLOW 650mm RUN OF LOOSE BAR REINFORCEMENT IN THE GROUND BEAMS.



KEY

- DENOTES MATERIAL IDENTIFIED AS STONE (FLOORS & WALLS) FROM SURVEY SOLUTIONS REVIT MODEL
- DENOTES MATERIAL IDENTIFIED AS RUBBLE (FLOORS) FROM SURVEY SOLUTIONS REVIT MODEL
- DENOTES (500mm CLEAR) WORKING ROOM AROUND PILE CAPS. CLASHES WITH HISTORIC FINDINGS DENTONED ON PLAN.

5 Historic Finds CoOrdination- SUB STATION

PS4	PLANTROOM AREA FOUNDATIONS, PILE CAPS & GROUND BEAMS RAISED 150mm TO ALLOW WEAVE PROTECTION ZONE BENEATH FOUND. WORKING ZONE AREA SHOWN AROUND PILECAPS	28.07.2023
PS3	BUILDING RAISED 500mm AND FOUNDATION LAYOUT AMENDED TO REDUCE CLASHES WITH HISTORICAL FINDS.	18.07.2023
PS2	FURTHER FINDS ADDED, EXTENT OF VIEWS EXPANDED	05.07.2023
PS1	PRELIMINARY ISSUE	04.04.2023
REV	AMENDMENT	DATE

CE PROJECT EXECUTION CLASS 2
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INFORMATION

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PROJECT: **ABBAY FIELDS SWIMMING POOL KENILWORTH**

ISSUED FOR: **GROUND FLOOR/FOUNDATION REVIEW WITH HISTORICAL FINDS**

REV	DATE	BY	CHKD	APPD
A0	11/24/22	NT	JS	S2

8404 AFK-CCE-SP-00-D-S-3000 P04

ALL DIMENSIONS TO BE CHECKED BY CONTRACTOR



KEY

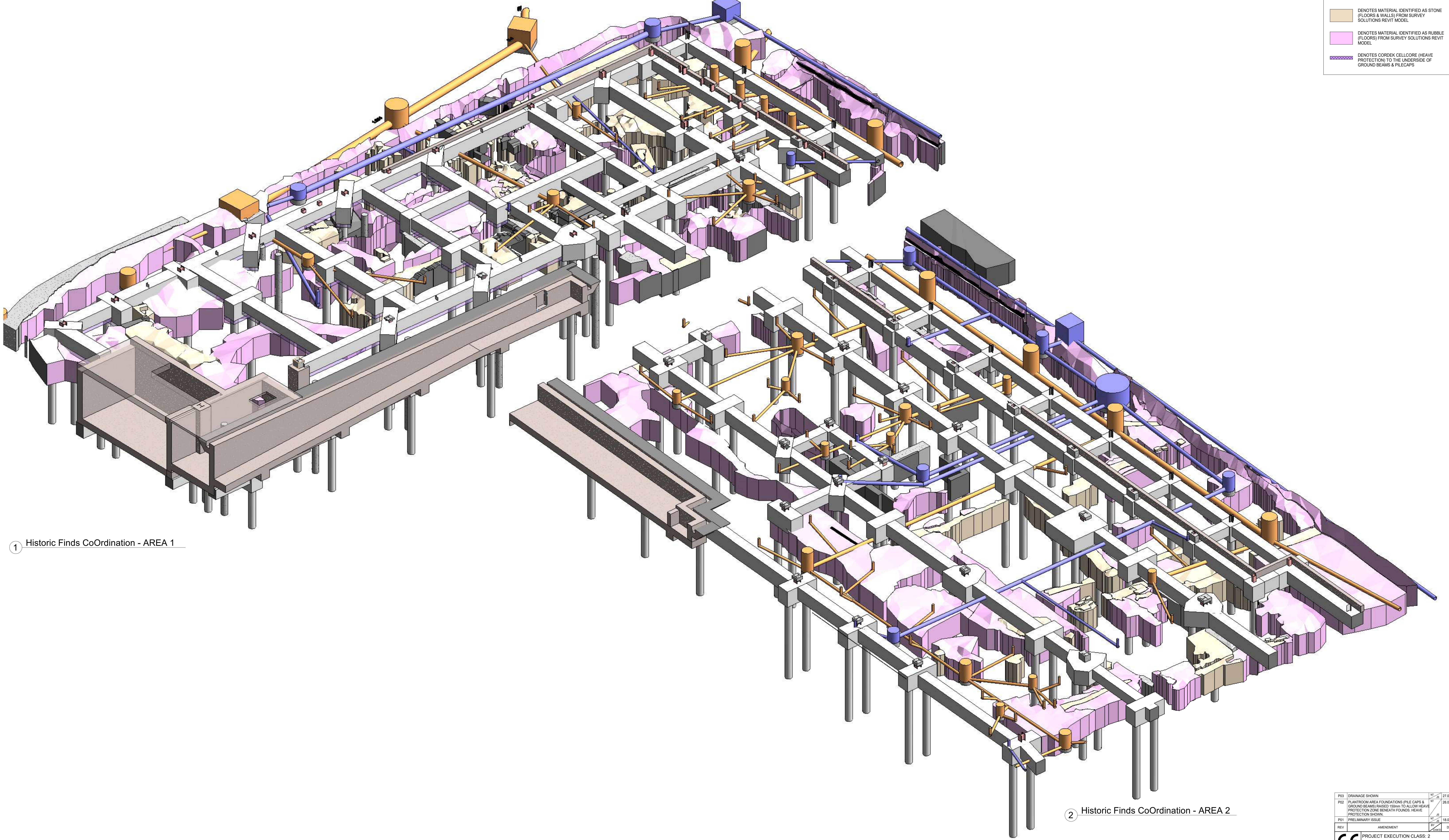
	DENOTES MATERIAL IDENTIFIED AS STONE (FLOORS & WALLS) FROM SURVEY SOLUTIONS REVIT MODEL
	DENOTES MATERIAL IDENTIFIED AS RUBBLE (FLOORS) FROM SURVEY SOLUTIONS REVIT MODEL
	DENOTES CORDEK CELLCORE (HEAVE PROTECTION) TO THE UNDERSIDE OF GROUND BEAMS & PILECAPS

P01	PRELIMINARY ISSUE	NT	26.07.2023		
REV	AMENDMENT	BY	DATE		
		PROJECT EXECUTION CLASS: 2			
<small>All materials supplied in relation to those specified on this drawing are to be CE marked in accordance with the European Union Declaration of conformity</small>					
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CLIENT					
PROJECT					
ABBEY FIELDS SWIMMING POOL KENILWORTH					
DRAWING TITLE					
PILE REVIEW WITH HISTORICAL FINDS					
SHEET SIZE	SCALE	DATE	DRAWN	CHECKED	STATUS
A1	As indicated	07.23	NT	JS	S2
CCE PROJECT No.	DRAWING No.			REV	
8404	AFK-CCE-SP-00-D-S-3001			P01	

ALL DIMENSIONS TO BE CHECKED BY CONTRACTOR

KEY

- DENOTES MATERIAL IDENTIFIED AS STONE (FLOORS & WALLS) FROM SURVEY SOLUTIONS REVIT MODEL
- DENOTES MATERIAL IDENTIFIED AS RUBBLE (FLOORS) FROM SURVEY SOLUTIONS REVIT MODEL
- DENOTES CORDEX CELLORE (HEAVE PROTECTION) TO THE UNDERSIDE OF GROUND BEAMS & PILECAPS



1 Historic Finds CoOrdination - AREA 1

2 Historic Finds CoOrdination - AREA 2

REV	AMENDMENT	DATE
P03	DRAINAGE SHOWN	27.07.2023
P02	PLANTROOM AREA FOUNDATIONS (PILE CAPS & DRIVING BEAMS) RAISED 150mm TO ALLOW HEAVE PROTECTION ZONE BENEATH FOUND. HEAVE PROTECTION SHOWN	28.07.2023
P01	PRELIMINARY ISSUE	18.07.2023
REV	AMENDMENT	DATE
CE	PROJECT EXECUTION CLASS: 2	
<p>INFORMATION</p> <p>COUCH Consulting Engineers Civil & Structural</p> <p>CLIENT KIER</p> <p>PROJECT ABBEY FIELDS SWIMMING POOL KENILWORTH</p> <p>DRAWING TITLE HISTORICAL FINDS - ISOMETRIC VIEWS</p> <p>SCALE 1:10</p> <p>DATE 07/12/23</p> <p>DRAWN NT</p> <p>CHECKED JS</p> <p>EXTN S2</p> <p>PROJECT NO. 8404</p> <p>DRAWING NO. AFK-CCE-SP-00-D-S-3050</p> <p>REV P03</p>		

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Heritage Consultancy:

- Planning Supporting Statements & Desk Based Studies
- Environmental Impact Assessment
- Expert Witness
- International Heritage Advice
- Historic Landscape Assessment
- Pre-Planning Heritage Advice
- Estate Management Heritage Input



Built Heritage/ Historic Environment:

- Historic Building Survey & Recording
- Statement of Significance
- Written Scheme of Investigation
- Conservation Area Appraisal
- Heritage Statement and Impact Assessment
- Heritage Design Advice
- Conservation Management Plan



Archaeological Consultancy:

- Archaeological Desk Based Assessment
- Written Scheme of Investigation
- Archaeological Evaluation
- Watching Brief (Archaeological Observation)
- Post Excavation Analysis and Recording
- Archaeological Survey



Outreach:

- Interpretation Panels
- Display Designs
- Booklets & Leaflets
- Lectures, School and Society Talks
- Tailored Historic Site Visits
- Cultural Tourism



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- Interior Design
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