APPENDIX D

ECOLOGICAL SURVEY

Twickenham Riverside Project

Ecological Survey for Protected Species

June 2001

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JOB NUMBER: AJ 7412 014			DOCUMENT REF:Report of the Ecological Survey			
		KSB	HFW			
		Originated	Checked	Reviewed	Authorised	Date
Revision	Purpose Description					

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1. INTRODUCTION AND METHODS

1.1 The main ecological issues, in relation to the potential effects of the Twickenham Riverside Development, are the effects on protected species present on site.

1.2 In order to determine the potential impacts, ecological information has been sought from the following organisations:

- Richmond Borough Council;
- local bat group;
- London Natural History Society;
- Greater London Authority;
- Environment Agency;
- English Nature.

1.3 A walk-over survey of the site was undertaken in early June 2001. The buildings and the old out-door swimming pool of the Twickenham baths were inspected and the chestnut-trees of the embankment were checked for bats. No inspection of the next-door building (east of the baths) has been undertaken. The purpose of the survey was to identify breeding / nesting birds, potential bat roosting site(s) (afternoon and at dusk with bat detector) and reptiles (corrogated tin sheets were put down, scattered around the swimming pool). A survey for sensitive flora was also undertaken although it was slightly too early in the growing season for a very accurate determination. Accordingly, the assessment is not complete for flora though some conclusions have been drawn.

2. EXISTING CONDITIONS

2.1 The site consists of an old out-door swimming pool (this has not been used for more than 20 years) and its associate buildings, on the side of the River Thames (grid ref: TQ 163 732). This can be considered as an urban waste-land.

2.2 Figure 1 represents a drawing of the site area. Figure 2 represents a drawing of the site with details about the survey.

Data Collected

2.3 No information was obtained from English Nature or the Environment Agency.

2.4 The Richmond Borough Council Nature Conservation Section said that they had documents relating to the site but they weren't be able to supply us with this information in time to be included in this report.

2.5 The local Bat Group indicated that Richmond is a fairly bat 'rich' borough. Bat records for the area are shown in Figure 3 (X shows the site location - also see Appendix 3). They also indicated that they have recent records of pipistrelles, noctules and daubentons feeding by and on the stretch of river by Marble Hill Park up to Orleans Gardens but that, so far, no-one has recorded bats at the actual riverside by the proposed development site.

Flora Identified

2.6 The following plant species were identified: Cleavers (*Galium aparine*), Bramble (*Rubus fructicosus*), Rosebay Willowherb (*Chamaenerion angustifolium*), Wild Strawberry (*Fragaria vesca*), Wood Avens (*Geum urbanum*), Sweet Alison (*Lobularia maritima*), Traveller's-joy (*Clematis vitalba*), Common Mallow (*Malva sylvestris*), Common Cat's-ears (*Hypochoeris radicata*), Red Valerian (*Centranthus ruber*), Square-stalked St John's-wort (*Hypericum tetrapterum*), Green Alkanet (*Pentaglottis sempervirens*), Mugwort (*Artemisia vulgaris*), Herb-Robert (*Geranium*

Figure 1

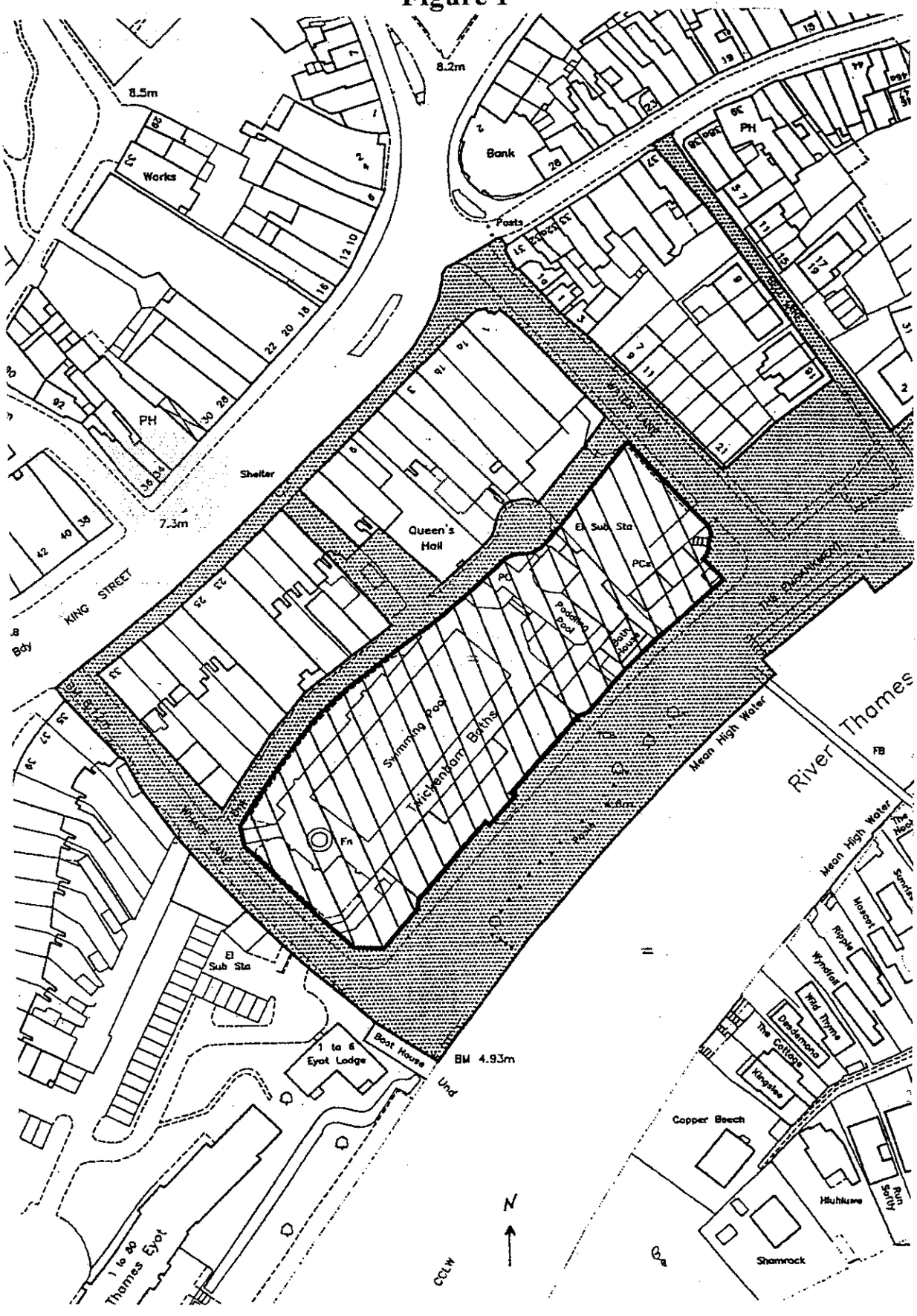

8.5m
8.2m
Works
Bank
Posts
PH
Shelter
7.3m
Queen's Hall
El Sub Sta
PCs
KING STREET
Swimming Pool
Twickenham Baths
Mean High Water
River Thames
El Sub Sta
1 to 6 Eyot Lodge
Boat House
BM 4.93m
Copper Beech
Shamrock
Thames Eyot
1 to 80
N

Figure 2

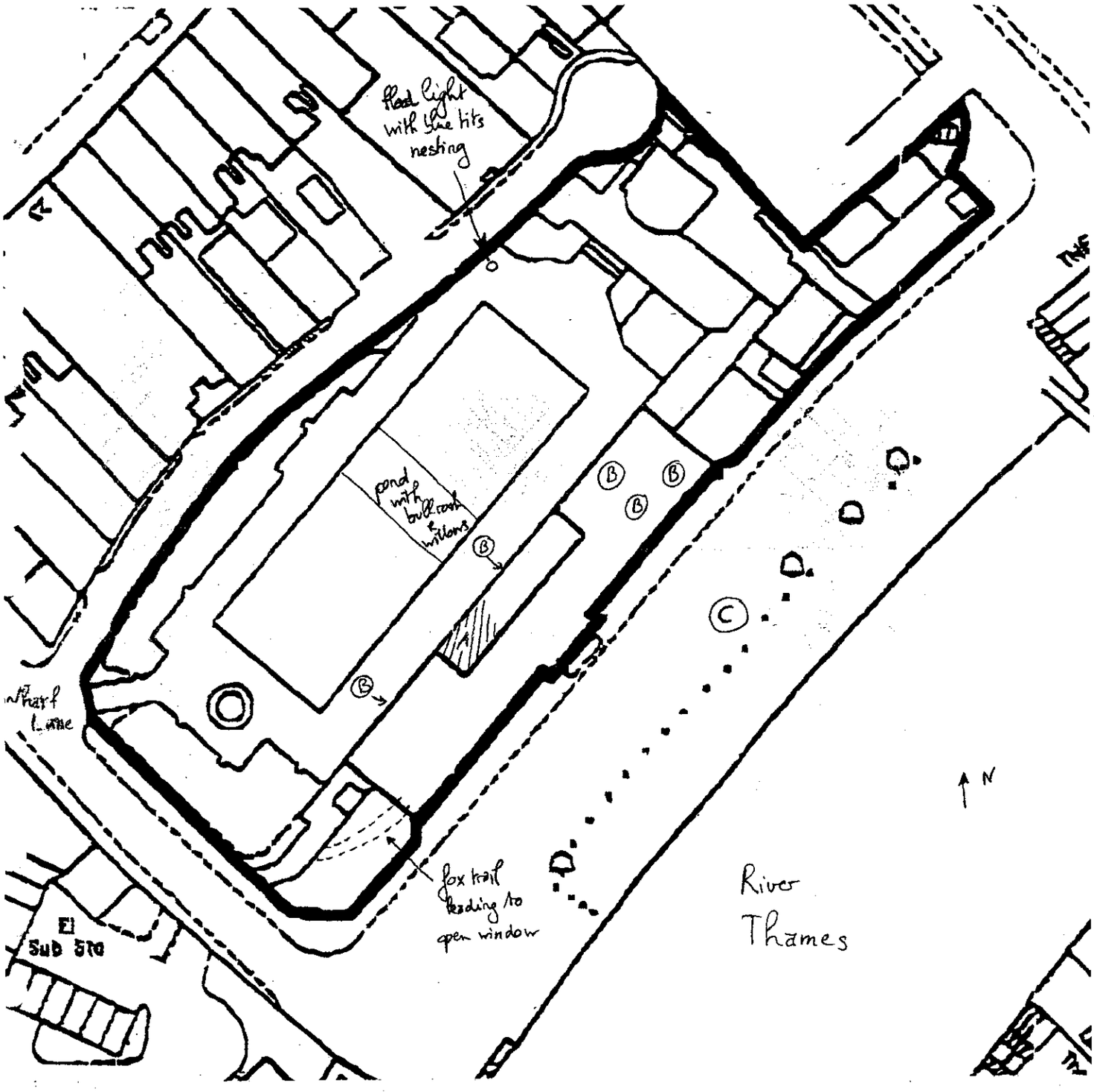

flood light with blue tits nesting
pond with bullrush & willows
B
B
B
B
B
C
Wharf Lane
fox trail leading to open window
El Sub Sta
River Thames
N

Figure 3

robertianum), Dog Rose (*Rosa canina*), Ivy (*Hedera helix*) and species from the Senecio and Thistle families.

2.7 Grasswise, Upright Brome (*Bromus erectus*) and Soft Brome (*Bromus mollis*) are present.

2.8 Trees and shrubs present throughout the site included: Hornbeam (*Carpinus betulus*), Goat Willow (*Salix caprea*), White Willow (*Salix alba*), Sycamore (*Acer pseudoplatanus*), Budleia (),Silver Birch (*Betula pendula*), Whitebeam (*Sorbus aria*), Elder (*Sambucus nigra*), Hawthorn (*Crataegus monogyna*) and Oak (Quercus sp.).

2.9 Some garden escapees and shrubs and trees that probably formed part of the original site's landscaping are also present on the site such as: Indian Bean trees and Honesty (*Lunaria annua).*

2.10 In the middle of the swimming pool, a pond has developed. Species present include Common Reedmace (*Typha latifolia*) and Willows.

2.11 No particularly sensitive flora was found on the site.

Fauna Identified

2.12 Concrete blocks and rubbish lying on the ground were turned over to look for amphibians and reptiles. Only red ants nests were found.

2.13 A Common Frog (*Rana temporaria*) was present in the pond.

2.14 Rat droppings were found in the changing rooms of the derelict building.

2.15 No reptiles were seen during the survey.

2.16 A male Beautiful Demoiselle (*Calopterix virgo*), probably coming from the River Thames, was seen in the bushes surrounding the swimming pool.

2.17 Foxes are present in the area: a strong musky smell is present inside the building and a trail (see Figure 2) coming from the swimming pool area to an open window at the West of the building are evidence of the building being used by a fox (a half eaten Magpie was also present under a bush).

2.18 A good diversity of birds are using the site: Blackbirds (*Turdus merula*), Grey Wagtails (*Motacilla cinerea*), Starlings (*Sturnus vulgaris*), Swallows (*Hirundo rustica*), Wrens (*Troglodytes troglodytes*), Magpies (*Pica pica*), Crows (*Corvus corone*), Great Tits (*Parus major*), Blue Tits (*Parus caeruleus*), Long-tailed Tits (*Aegithalos candatus*), Feral Pigeons (*Columba livia*) and Mallards (*Anas plathyrynchos*) were all seen.

2.19 Numerous nests were present in roof cavities (see Figure 2, A). An old wren nest was present inside the building. Blue Tits were nesting in the post of one of the old flood lights to the north of the outdoor swimming pool (see Figure 2) and other breeding birds were probably nesting in the bushes and trees around the swimming pool.

2.20 Wasps, Bees and twelve spotted Ladybirds were identified in addition to the red ants.

2.21 As well as small crevices in the external and internal brickworks, roof cavities present at the first floor, were thought of being potential bat roosting site (changing rooms B, see Figure 2). No bat droppings were identified (but this is not surprising as they would be right under where the bats are hanging and thus would not be on the floor of the changing rooms but in the roof cavity).

2.22 The Chestnut trees on the embankment were checked for holes. The two largest Chestnut trees showed potential bat roosting sites.

2.23 At dusk, a bat detector was used to check for bats in the area. The bat detector and the surveyors were located at point C (see Figure 2). The detector was orientated towards the building. At around 21h50 in the evening, a first bat arrived, followed by a second (detected by bat detector at around 30-35 kHz and by sight). They appeared to be hunting for insects under the Chestnut trees on the embankment. It is thought that the bats were Noctule or Leisler's Bats. It was difficult to identify the origin of these bats but it was thought that they may have come from the western Chestnut tree.

3. PRELIMINARY ASSESSMENT OF IMPACTS AND MITIGATION PROPOSALS

3.1 **Plants**: No particularly sensitive flora was found.

3.2 **Trees around the swimming pool**: If possible, the Hornbeam trees present around the swimming pool should be kept as they are nice mature trees and a good feature for wildlife. It the decision to retain them is taken, they should be adequately protected during the works.

3.3 **Chestnut Trees on the embankment:** These trees are an important asset to the embankment and show holes, which are potential bat roosting sites. They should therefore be protected during the works.

3.4 **Breeding Birds**: Numerous breeding birds were present throughout the site (inside and outside the building). All nesting bird species are protected under the Wildlife and Countryside Act 1981 (as amended). Vegetation clearance and the removal of the roofs of the north west end of the building should thus be undertaken outside the breeding and nesting season (April to September) to avoid contravening the law. And if an occupied nest is found during the works, works in the area should stop immediately until nesting activity has ceased.

3.5 This area is of obvious importance as a nesting site for local populations of bird species. The removal of the existing vegetation and buildingd will result in a loss of potential nest sites. It is therefore advised that different sized bird nest boxes should be provided as part of the development. This will also enhance the nature conservation value of the finished development. (see Appendix 1 for examples).

3.6 **Amphibians:** A Common Frog was found on site. It is also likely that Smooth Newts or Common Toads are present on site. The only protection given by the Wildlife and Countryside Act (1981) is of "sale", section 9(5). But it is advised that, to minimise the damage to any amphibians encountered during the works, they should be translocated to a suitable near-by habitat.

3.7 **Reptiles:** Although no reptiles have been found during the survey, this does not mean that none are present as these animals can be difficult to find. Moreover, it is thought that the site, being derelict for more than 20 years, has a good potential for Slow-worms (*Anguis fragilis*), as the site is densely vegetated and offers numerous potential shelter places.

3.8 The Slow-worm is protected by the Wildlife and Countryside Act 1981 (as amended) against intentional killing and injuring and against being sold or other forms of trading. This does not specifically cover protection of habitat. "However where a site occupied by Slow-worms is threatened, for example, by development then the developer must take reasonable measures to prevent the killing or injuring of Slow-worms." (from "Species Conservation Handbook: Translocation of Slow-worms", English Nature, 1998). In the present case, if Slow-worms are present on site, this may require the removal of Slow-worms from areas that are being developed. This removal, termed translocation, may involve removal to an alternative site elsewhere.

3.9 We therefore recommend that the first action taken will be to remove carefully (by hand) all concrete blocks and rubbish. Before carrying out this task, the person(s) in charge of this task should be briefed about reptiles and amphibians, which may be present under this debris (details about how to recognise them and how to handle them). If a reptile is found, a qualified ecologist should be contacted and the works stopped. Translocation of the reptile population should then take place and be carried out by an ecologist, in order to avoid any injuring or killing during the works. No works should be carried out in the areas where the reptiles are present as long as reptiles are present. Should the situation happen, WS Atkins would be happy to help with the procedure.

Nota Bene: If reptiles are present, it will be necessary to collect all individus by trapping them. It is recommended to trap over at least one full season (March to end-September) (from "Species Conservation Handbook: Translocation of Slow-worms", English Nature, 1998).

3.10 **Bats:** Bats are fully protected under the Wildlife and Countryside Act 1981 (as amended) which makes it illegal to intentionally or deliberately kill, injure or capture bats, deliberately disturb bats, damage, destroy or obstruct access to bat roosts.

3.11 Although no direct evidence of bats being present in the building was found during the site survey, it is thought that the roof cavities present in the changing rooms are potential bat roosting sites. We would therefore recommend that the first works carried out in the building would be to check these cavities prior to removal of the roofs. The person(s) in charge of carry out this task should be briefed about bats (what

they look like and what their droppings look like). Again if a bat is found or signs discovered, the works should stop immediately and an ecologist should be contacted urgently. The ecologist would then have to carry out a specialised bat survey to establish which species it is and a program to translocate the bats should be set up with the help of licensed bat workers (there will be a need to get a "Development" licence from DETR, see Appendix 2 for details). English Nature should also be informed and allowed time to advise on special precautions that may be necessary. No works should be carried out inside the building as long as bats are present.

3.12 To enhance the nature conservation value of the proposed development, it is recommended that the opportunity should be taken to include measures such as artificial bat roosting sites within the design for the development (bat boxes and Bat brick: see Appendix 1). This would be an obligation for the developer, should bat roosts be found to be present on the building, in order to get the DETR licence. It would also be a god opportunity for the developer to contribute to the enhancement of the biodiversity in the area.

Bird and Bat Boxes

Schwegler Bat and Bird Boxes

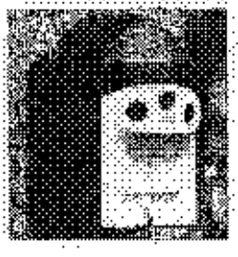
Schwegler bat and bird boxes are individually designed to meet the needs of specific species, or groups of species, and are produced in close consultation with leading bird and conservation experts. Because of their durability, size and the fact that they are modelled closely on natural holes Schwegler boxes are able to boast the highest successes of breeding birds and roosting bats of all nest box types.

The boxes are constructed from a concrete wood mixture, which is a completely natural material and made from 75% wood together with other natural additives. This material allows good natural respiration, controlling the temperature range and preventing the build up of moisture which can be a problem with nest boxes made from concrete or other artificial materials. The design of the boxes and their hangers ensures they are easy to clean out and mount on either walls or trees.

Space prevents us showing the entire range of Schwegler boxes here, but the full product range is illustrated on our website: **www.alana-esp.net**

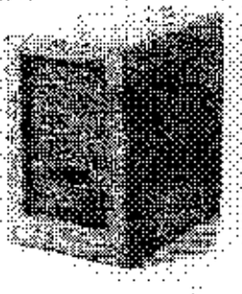
1B Nest Box Suitable for Great Tit, Blue Tit, Marsh Tit, Coal Tit, Redstart, Nuthatch, Pied Flycatcher and Tree Sparrow. Available with 26mm, 32mm, or oval entrance. Available in Brown or Forest Green.

1B 32 mm entrance, brown
Code: 2010 £17.95
1B 32 mm entrance, forest green
Code: 2007 £17.95
1B 26 mm entrance, brown
Code: 2011 £17.95
1B 26 mm entrance, forest green
Code: 2008 £17.95
1B oval entrance, brown **Code: 2009 £17.95**
1B oval entrance, forest green **Code: 2052 £17.95**



2GR Nest Box with larger nesting area than a standard box. Suitable for Great Tit, Marsh Tit, Coal Tit etc. Also available with a single oval hole.

2GR oval hole, brown
Code: 2047 £21.95
2GR 3 hole, brown
Code: 2046 £21.95



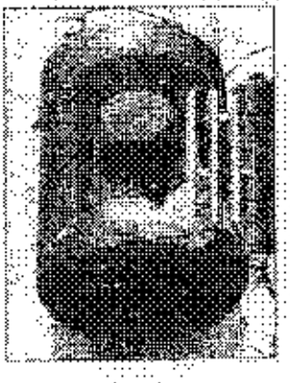
Type 27 Bat Box
Code: 2006 £29.95

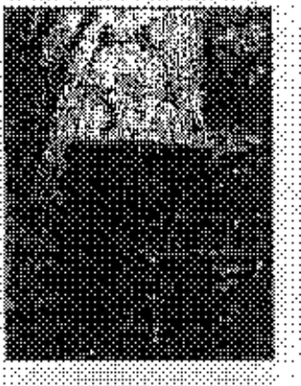
2F Bat Box The 2F is the simplest design with a front access slit. Suitable for the smaller British bat species including pipistrelle, long-eared and Daubenton's bats.
Code: 2002 £25.95

2F-DFP Bat Box The same as the 2F bat box but with the addition of the double front panel. This makes the box especially suitable for Pipistrelle and Daubenton's bat.
Code: 2003 £24.95

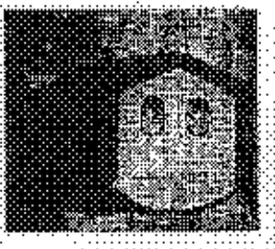
2FN Bat Box Has a wider access slit as the base, and an access panel underneath making it suitable for larger bats such as the Noctule, Bechsteins, etc.
Code: 2004 £23.95

1FW Hibernation Box Contains a very effective insulating material between the slots of inner walls. With internal wooden panels. Weight 24kg.
Code: 2001 £99.95





Bat Brick Can be used to replace an existing brick or incorporated into new structures. The slits are the perfect size for Pipistrelle's, Natterer's, Long-eared, Brandt's etc. to roost in.
Code: 2052 £7.50



1H Deep Box
Code: 2017 £21.95

1FF Bat Box
Code: 2000 £34.95

DETR
Environment
Transport
Regions

Appendix 2

APPLICATION FOR A LICENCE IN RESPECT OF BAT SPECIES AFFECTED BY DEVELOPMENT

NOTES FOR GUIDANCE *Please read the following notes carefully before completing this form*

i. This application form is for people wishing to capture, disturb and/or relocate Bats in relation to development work.

ii. Licences can be granted under Regulation 44(2)(e) of the Conservation (Natural Habitats, &c.) Regulations 1994, for the purpose of preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, to allow people to carry out activities which would otherwise be illegal. Applicants must be able to demonstrate that they have a suitable amount of expertise to achieve the objectives of the proposed work.

iii. Under the Conservation (Natural Habitats, &c.) Regulations 1994 licences can only be issued if DETR are satisfied that:

- there is no satisfactory alternative and
- the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

iv. All sections of this application form must be completed in full unless otherwise stated, failure to provide adequate information will delay the processing of your application. We aim to determine applications within 25 working days. English Nature and the Local Planning Authority are given 15 working days to fulfil our request for information (see note vi).

v. Before a licence can be issued we expect an appropriate survey to have been carried out. This is to ensure that the proposed work is based on accurate information. Results of that survey will need to be enclosed with this application.

vi. If you wish to speed the processing of your application you should supply 2 copies of the application and Method Statement, together with a copy of the planning consent, the report to the Planning Committee and the report/minutes of the meeting when permission was granted by the Committee.

vii. Details of licences issued, including names and addresses of licensees, will be stored and processed on a computer database. The information will be used by DETR solely to undertake licensing functions.

viii. You will need to include a Method Statement including a proposed work programme. It should be noted that the Method Statement will be appended to any licence granted. As part of the licence it may be supplied in response to specific requests for information under the Environmental Information Regulations 1992 and any future open government legislation.

PART A Personal Details and Experience

All questions relate to the person who will be the named licensee if a licence is granted under the Conservation (Natural Habitats &c.) Regulations 1994. That person should complete and sign this form. Please complete this form in **BLOCK CAPITALS** and black ink or type.
(* delete as applicable)

1. Your name: (Mr./ Mrs / Ms / Miss / Dr / other*)

2. Name of Company (if appropriate)

3. Address

4. Telephone number _____ Fax number _____

E-mail (if applicable) _____

5. Please specify which species of bat is affected by the proposed works.

SPECIES OF BAT	
Common name	*Scientific name*

6. Have you held a licence issued by English Nature or DETR within the last 3 years? YES/NO*

If "YES":
a) Please give your last licence number _____

7. You will need to enclose written references (originals only, not photocopies) from two people who can vouch for your suitability for this type of work unless you have held a licence in which you were responsible for a similar work programme in the last three years. At least one of these should have held a licence within the last three years. We may contact these referees to verify the statements that you enclose.
Tick the relevant circle

O I enclose two written references. - **Please go on to Question 8**

O I have held a similar licence within the last three years. - **Please go on to Question 9.**

8. Please give brief details below of your experience and qualifications in working with the species listed above and how it relates to the proposed work programme.

9. An accredited agent is a suitably qualified person who is able to carry out work under a licence without the personal supervision of the licensee. To carry out work they must be in possession of a letter signed by the licensee appointing him or her as an accredited agent of the licensee for the purpose of the licence. At all times the licensee is fully responsible for all the work carried out under licence.

   An assistant is employed by a licensee or his or her agent to work under their direct personal supervision at all times.

   a). Do you propose to employ accredited agents? YES/NO *

If 'YES', please state what work they will be carrying out and how they will be trained. Please give their full name where known.

   b). Do you employ assistants YES/NO *

PART B Summary of work programme

This part of the form requests a summary of the proposed work programme. Please answer all questions. A more detailed Method Statement must also be submitted in support of the application as detailed in the notes to this form which will be attached to a licence.

10. Please specify the site name, county and the administrative area and full grid reference of all sites involved with this application.

11. Explain the reasons why it is necessary to carry out the proposed work, including a brief description of the proposed development. If the development is not subject to planning permission then provide details of its purpose and the legal basis under which it may take place, (attach an additional page, if necessary).

12. State the type of methods proposed and the time period in which they will be used (only give full details of how these methods will be carried out in the method statements, as specified in the annex to this form).

Activity to be licensed						Method	Time Period	
Capture	Kill	Transport	Disturb	Obstruct access	Destroy breeding site or resting place (delete)		From	To

13. Indicate the number and life-stage of the bats that will be affected. We will need to see the results of the survey and the methods used to obtain the survey results in a separate method statement as described in the annex to this form.

14. Briefly state how you will you maintain an equivalent population at or near the site. More details should be given in the method statement in the annex to this form.

PART C – Enclosures and Declaration

Enclosures: Failure to provide adequate information will delay the processing of your application.

Please tick to indicate that you have enclosed the following documents in support of this application.

O A copy of the full planning permission - **MUST BE INCLUDED**

O Written authority from owner / occupier to permit entry to any employees or representatives of DETR and English Nature for the purpose of monitoring or inspecting the work - **MUST BE INCLUDED**

O Written authority from owner / occupier stating that you are acting on their behalf - **MUST BE INCLUDED**

O A **Method Statement** describing the proposed work under each of the headings given in the annex to this form - **MUST BE INCLUDED**

O Two referees must be enclosed if you have not had a similar licence in the last three years (see Question 6).

WARNING: DETR can modify or revoke at any time any licence that may be issued. Any licence that is issued is likely to be revoked immediately if it is discovered that false or incorrect information had been provided on this form or any part of the enclosures which resulted in the issue of a licence.

Declaration

Applicants should note that is an offence under Regulation 46 of the Conservation (Natural Habitats &c.) Regulations to knowingly or recklessly provide false information in order to obtain a licence.

- I understand that failure to comply with any conditions included on any licence granted in respect of this application may constitute an offence.
- I have read the notes for guidance on this form.
- I declare that the particulars given in this application and accompanying documents are correct to the best of my knowledge and belief, and I apply for a licence in accordance with these particulars.

Signed ..... Date .....

Now send your completed form, method statement and the enclosures requested, to:

The Licensing Officer,
The Department of the Environment, Transport and the Regions,
Zone 1/8, Temple Quay House,
2 The Square, Temple Quay, Bristol, BS1 6EB.

Rev. 30/05/2001

ANNEX – Method Statement – to be attached to the licence. (Please use this format)

To accompany this application we require a method statement which clearly describes how the proposed work will be carried out. We will also need information regarding the methods used and results of the survey upon which the work programme is based. **All method statements must contain the following information**

1. Rationale for the proposed work

Explain the background and why there is a need to carry out the proposed work and state what alternative solutions have been considered and why they have been discounted.

2. Work schedule

Provide a work schedule for all the proposed work including the length of time that methods will be used. Also include detail of when any relevant development will commence and the expected timetable of works.

3. Survey information

Give details of the survey undertaken to identify the location and indicate the level of the species population. State when the survey was carried out, methods used, and results and the name of the surveyor who undertook the work. Please ensure that the results of the survey can be interpreted in relation to the map of the site. As a result of the survey, please describe the population of the site involved in relation to the local or regional status of the species, if known.

4. Maintenance of the favourable conservation status

Explain how you will maintain an equivalent population at or near the site. This may include habitat creation or restoration.

5. Methodology

Explain fully all the methods you propose to use. Give details of how and where on the site they will be used and what you propose to achieve from these actions.

6. Post development habitat management and maintenance

If equipment is to be left on site explain how this will be monitored and maintained as appropriate. Explain how the site will be managed and maintained after the work has occurred to ensure that the objectives are achieved in the long term.

7. Population monitoring

Give details regarding how you will monitor the populations after development. It is important that all work is monitored to ensure that the desired conservation benefits are achieved. This enables future decisions to be better informed.

8. Consultation

If you have consulted with anyone in English Nature please give the name, date and all relevant details stating whether the consultation was verbally or by letter. Attaching copies of any written consultations will assist us in processing your application.

9. Map(s) – Preferably A4 or A3

Include an appropriately scaled map of all sites involved which shows site locations relative to the nearest street or town. This map, or an additional larger scale map if necessary, should also show:

- Details of both the donor and receptor site if translocation is proposed.
- Details of surrounding habitats.
- All proposed disturbance or destruction of habitats on the site if occurring.
- Location of proposed methods.

LONDON BAT GROUP RECORDS

LB Richmond (partial)

numbering on Figure 2

species	*recdate*	*place*	*gridref*		*feedingarea*	*roost_site*	*abundance*
Bat sp.	24/08/94	Bushy Park	TQ1569	1	N	Y	2-5
	28/10/91	Wick Road, Teddington	TQ170701	2	N	Y	PRESENT
	24/09/92	St.Albans Church	TQ165713	3	N	Y	PRESENT
	24/09/92	Sheen Common Drive, Richmond	TQ196749	4	N	Y	PRESENT
	June 1983	Model Cottages, SW14	TQ2075	5	N	N	1
	15/07/93	Queens School,Kew	TQ192772	6	N	N	PRESENT
Nyctalus noctula	18/05/91	Crane Park	TQ145727	7	Y	N	3
Pipistrellus pipistrellus	03/06/83	Eel Pie Island	TQ165731	8	N	Y	PRESENT
(45kHz)	05/07/95	Priests Bridge, SW15	TQ215755	9	N	Y	100-500
	07/07/90	Orleans Rd, Twickenham	TQ171736	10	N	Y	21-100
	09/08/85	Richmond	TQ185746	11	N	Y	PRESENT
	15/07/90	Brook Gardens, Barnes	TQ219759	12	N	Y	21-100
	19/06/89	Broom Park,Tedd'ton	TQ177702	13	N	Y	21-100
	02/07/90	Ham Common	TQ185714	14	N	Y	PRESENT
	1990	Queens Rd,Richmond	TQ189747	15	N	Y	PRESENT
	26/06/85	Lebanon Park,Twick	TQ167735	16	N	Y	PRESENT
	28/06/88	Church Rd, Richmond	TQ185746	17	N	Y	PRESENT
	29/05/91	Bedford Rd, Twickenham	TQ148725	18	N	Y	PRESENT
	30/06/88	London Rd	TQ152740	19	N	Y	6-20
	30/07/89	Woffington Close, Hampton	TQ173700	20	N	Y	21-100
	1985	Ham Com	TQ178717	21	N	Y	PRESENT
	18/05/91	Crane Park	TQ145727		Y	N	2
	23/07/95	Bedford Rd.Twickenham	TQ147725		N	Y	14
	12/07/97	Taylor Close	TQ144713	22	N	Y	273
	26/08/99	Edward Rd. Hampton Hill Burtons Rd. Hampton	TQ144714		N	Y	40

Appendix 3

- Ecological Survey for Protected Species -

LONDON BAT GROUP RECORDS

LB Richmond (partial)

species	*recdate*	*place*	*gridref*		*feedingarea*	*roost_site*	*abundance*
Pipistrellus pygmaeus*	19/08/95	Crane Park	TQ128728	23	Y	N	3
(55kHz)	19/08/95	Crane Park	TQ132729	24	Y	N	4
	30/06/97	Rutland Court, Wellersley Rd, Strawberry Hill	TQ154724	25	N	Y	191
	31/05/00	Belmont Rd,Twickenham	TQ145729	26	N	Y	17

Although P.pygmaeus was not 'named' until recently, bat recorders have been distinguishing between 45khz and 55kHz pipstrelle bats for some time.

APPENDIX E

ARCHEOLOGY REPORT

ENGLISH HERITAGE

LONDON REGION

Head of Planning
Development Control
London Borough of Richmond upon Thames
Planning and Building Control
Civic Centre
44 York Street
Twickenham
TW1 3BZ

Your Ref:

Our Ref: LAG/27/218-5

Contact: Mark Stevenson

Direct Dial: 020-7973-3737

11th June 2001

f.a.o. Mr R Summers

Dear Sirs,

TOWN & COUNTRY PLANNING ACT 1990
PLANNING POLICY GUIDANCE NOTE 16

Former Twickenham Baths site, The Embankment, Twickenham: 01/0540/FUL
Proposed redevelopment of Twickenham Swimming Pool, Public Convenience and car park.

Recommendation of Approval of Archaeological Report
Having received the required two copies of the archaeological desk-based assessment at the above site, I am happy to recommend its approval.

Recommendation for Archaeological Conditions

In the circumstances I do not consider that any archaeological fieldwork need be undertaken ***prior*** to determination of this planning application but that the archaeological position should be reserved by attaching conditions to any consent granted under this application:

Standard Archaeological Condition

Condition *"No development shall take place until the applicant has secured the implementation of a programme of archaeological work in accordance with a written scheme for investigation which has been submitted by the applicant and approved by the Local Planning Authority. The development shall only take place in accordance with the detailed scheme pursuant to this condition. The archaeological works shall be carried out by a suitably qualified investigating body acceptable to the Local Planning Authority."*

Informative The development of this site is likely to damage archaeological remains. The applicant should therefore submit detailed proposals in the form of an archaeological project design. The design should be in accordance with appropriate English Heritage guidelines.

and

Foundation Design Condition

Reason — Where the Local Planning Authority wishes to secure, as a reserved matter, the agreement of detailed foundation and groundwork design, including a method statement that will minimise damage to the archaeological resource.

Condition — *"No work on site shall take place until a detailed design and method statement for the foundation design and all new ground works has been submitted to and approved in writing by the Local Planning Authority."*

Informative — The Local Planning Authority wish to ensure that archaeological remains on this site are preserved in situ. The detailed proposals should include appropriate drawings, notes and method statements showing how the objectives of in situ preservation is to be achieved. Particular attention should be paid to the design of foundations and new ground works including any piling, underpinning, new slab levels, slab construction, lift shafts or new service trenches. You are advised to contact the relevant Planning Department case officer and English Heritage's Archaeological Advisor on 0171 973 3732 to discuss the submission of details required to discharge this condition. You are also advised to contact the Divisional director (Building Control) to ensure that all Building Control regulations are met.

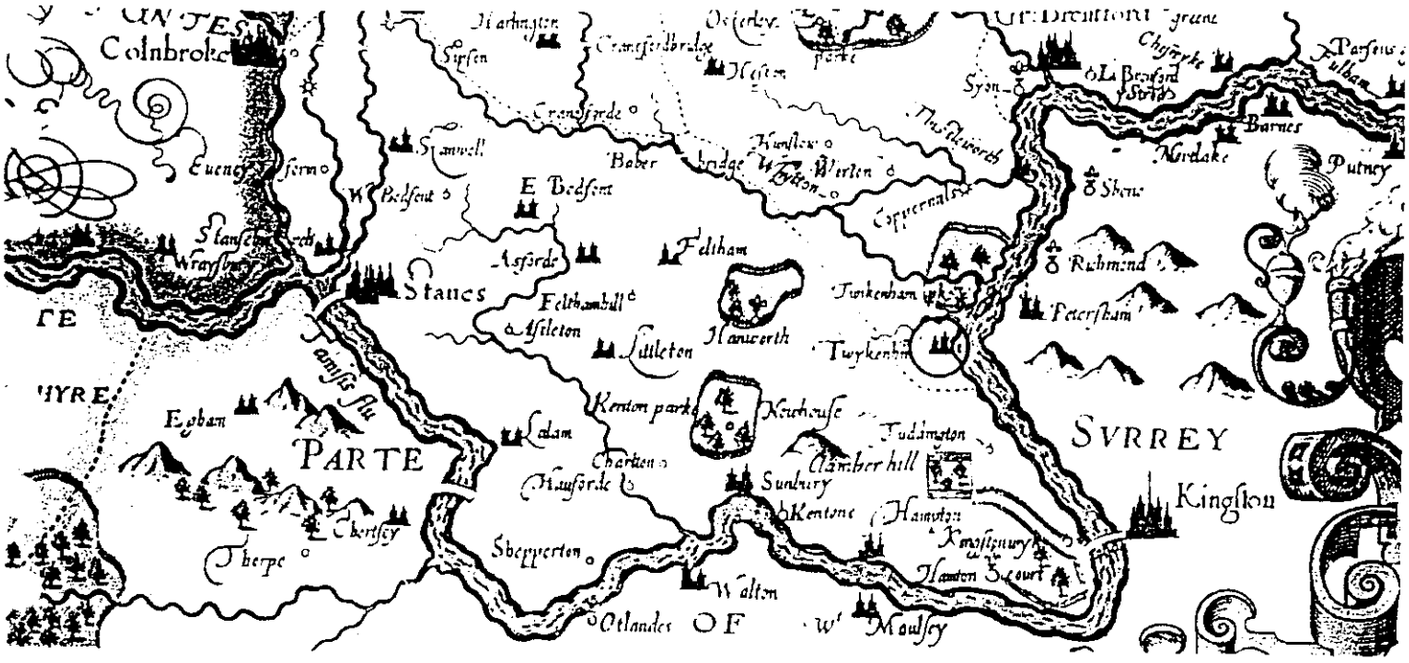
It is anticipated that the archaeological interest can be progressed through the application of a programme of trial trench evaluation. It may be that the work will need to be phased given possible access difficulties. It is also recommended that any geo-technical investigation be combined with the archaeological work. It is understood from discussions with Mr N Turvey of Turner & Townsend that no geo-works are to be conducted pre-determination.

A specification will need to be submitted by the appointed archaeological field specialist organisation and once approved then the on-site evaluation work may commence.

If you need any further information at this stage please contact me and please note that this response relates solely to archaeological considerations.

Yours sincerely

Mark Stevenson
Archaeology Adviser
Greater London Archaeology Advisory Service
cc Mr N Turvey, Turner & Townsend
Ms E Howe, MoLAS
Mr C Sumner, Historic Buildings Inspector, English Heritage



Twickenham Riverside Development
The Embankment, Wharf Lane, and Water Lane, Twickenham London TW1

London Borough of Richmond upon Thames

An Archaeological Impact Assessment

REGISTERED IFA ORGANISATION

MUSEUM OF LONDON

Archaeology Service

May 2001

Twickenham Riverside Development
The Embankment, Wharf Lane, and Water Lane, Twickenham London TW1

London Borough of Richmond upon Thames

An Archaeological Impact Assessment

National Grid Reference: TQ 1629 7317

Project Manager George Dennis & Elizabeth Howe

Author Nicholas J Elsden

Graphics Peter Hart-Allison

Museum of London Archaeology Service

Walker House, 87 Queen Victoria Street, London, EC4V 4AB
tel 020 7410 2200 fax 020 7410 2201
email molas@molas.org.uk

List of Contents

List of Figures

Front cover: detail from Norden's map of Middlesex, 1610

Note: site outlines may appear differently on some figures owing to distortions in historic maps.

Summary (Non-Technical)

This report presents the results of desk-based assessment work carried out by the Museum of London Archaeology Service for the Twickenham Riverside Development, The Embankment, Wharf Lane, and Water Lane, Twickenham, in the London Borough of Richmond upon Thames. The report was commissioned by Turner & Townsend Project Management.

The report considers the archaeological potential of the site, and the likely impact on this of the proposed redevelopment, the main component of which will remove almost all surviving made ground/archaeological deposits with the possible exception of c 3-5% of the site where they would nevertheless be significantly affected.

There is a good potential for remains from buildings, gardens, and grounds of the late 17th and early 19th century buildings both known as Richmond House. There is also, a moderate potential for Neolithic and medieval remains, and a low, but finite, potential for Mesolithic, Bronze Age, Iron Age, and Roman remains, based on finds from the surrounding area. There is a very low potential for Saxon remains, based on documentary references to the Saxon settlement, the precise location of which is unknown at this time, and also for Palaeolithic remains within natural channels in the terrace gravels, which have been found in the surrounding area.

However, the archaeological potential of the site and the additional impact upon this from the proposed development will have been significantly reduced locally by the degree of existing truncation. A former municipal swimming baths occupying part of the site will already have had a severe effect, removing the majority of made ground/archaeological deposits in that location.

The report concludes that despite the degree of previous damage, there may well be coherent areas of archaeological survival remaining on the site. These would be removed during construction works for the proposed development. English Heritage, who advise the London Borough of Richmond in archaeological matters, may therefore recommend an archaeological field evaluation, in order to define the actual nature and extent of any surviving remains. It may be possible to combine such an exercise with any planned engineer's geotechnical site investigation.

1 Introduction

1.1 Site location

The Twickenham Riverside Development lies to the north of the River Thames and Eel Pie Island in the London Borough of Richmond upon Thames. It is bounded to the south-east by The Embankment, to the south-west by Wharf Lane, to the north-east by Water Lane, and to the north-west by a service road (see Figure 1). In addition to this main site, the development includes a new pedestrian link from the north side to King Street. The Ordnance Survey National Grid reference is TQ 1629 7317. Within this report the property is known as 'the site'.

1.2 Site status

This archaeological Impact Assessment is being prepared in support of an application for planning consent.

The site does not contain either a listed building or a Scheduled Ancient Monument.

1.3 Origin and scope of the report

This report has been commissioned from the Museum of London Archaeology Service (MoLAS) by Turner & Townsend Project Management. It has been requested in advance of possible redevelopment of the site (see Section 1.6 & 5) and may be required in relation to the planning process in order that the local authority can formulate appropriate responses in the light of any identified archaeological resource.

The desk-based assessment (*Archaeological Impact Assessment*) has been carried out in accordance with the model brief published by the Greater London Archaeological Advisory Service, and in accordance with the standards originally specified by the Institute of Field Archaeologists (IFA, 1999).

Note: within the limitations imposed by dealing with historical material and maps, the information in this document is, to the best knowledge of the author and MoLAS, correct at the time of writing. Further archaeological investigation, more information about the nature of the present buildings, and/or more detailed proposals for redevelopment may require changes to all or parts of the document.

1.4 Aims and objectives

A desk-based assessment (*Archaeological Assessment*) as defined by the Institute of Field Archaeologists (IFA, 1999) will:

determine, as far as is reasonably possible from existing records, the nature of the archaeological resource within a specified area. It will be undertaken using appropriate methods and practices which satisfy the stated aims of the project, and which comply with the Code of Conduct, Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, and other relevant By-Laws of the Institute of Field Archaeologists.

A desk-based assessment represents:

> *a programme of assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written, graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate.*

The purpose of desk-based assessment is to:

> *gain information about the known or potential archaeological resource within a given area or site, (including its presence or absence, character and extent, date, integrity, state of preservation and relative quality of the potential archaeological resource) in order to make an assessment of its merit in context, leading to one or more of the following:*

- *the formulation of a strategy to ensure the recording, preservation or management of the resource*
- *the formulation of a strategy for further investigation, whether or not intrusive, where the character and value of the resource is not sufficiently defined to permit a mitigation strategy or other response to be devised*
- *the formulation of a proposal for further archaeological investigation within a programme of research.*

The submission of a Desk Based Assessment to accompany a Planning Application also conforms to the intent of paragraph 7 (under 'The Role of Public Authorities and Planners') of the *Code of Good Practice* established by the Cultural Heritage Committee of the Council of Europe (CHCE 2000), which states that *before taking decisions affecting the archaeological heritage, planners should obtain adequate information and advice, applying non-destructive methods of investigation wherever possible;* also with the intent of paragraph 1 (under 'The Role of Architects and Developers') which states that *the purpose [of assessment] will be not only to establish if it is necessary to dig but also to build a picture of [the site's] urban morphology and its potential.*

1.5 Methodology

The assessment has been carried out in accordance with guidance from various bodies including the London Borough of Richmond upon Thames, The Greater London

Archaeological Advisory Service, and the Institute of Field Archaeologists and the Association of County Archaeological Officers (see above). In summary the work has involved:

- identifying the client's objectives
- identifying the sources available for consultation
- assembling, consulting and examining these sources
- consulting specialists within MoLAS as appropriate

The degree to which archaeological deposits actually survive on the site will depend on previous land-use, so an assessment is made of the destructive effect of the previous and present activity and/or buildings, from the study of available plan information, ground investigation reports, etc.

In order that the appropriate archaeological response(s) can be identified, consideration is given to the need for either further assessment and/or field evaluation work to identify and locate surviving deposits on the site.

1.6 Proposed development summary

The proposed redevelopment comprises the demolition of the present buildings, including the Twickenham Baths and Bath House (see Figure 1), and the construction of a new complex of mixed retail and residential premises. For further details see Section 5.

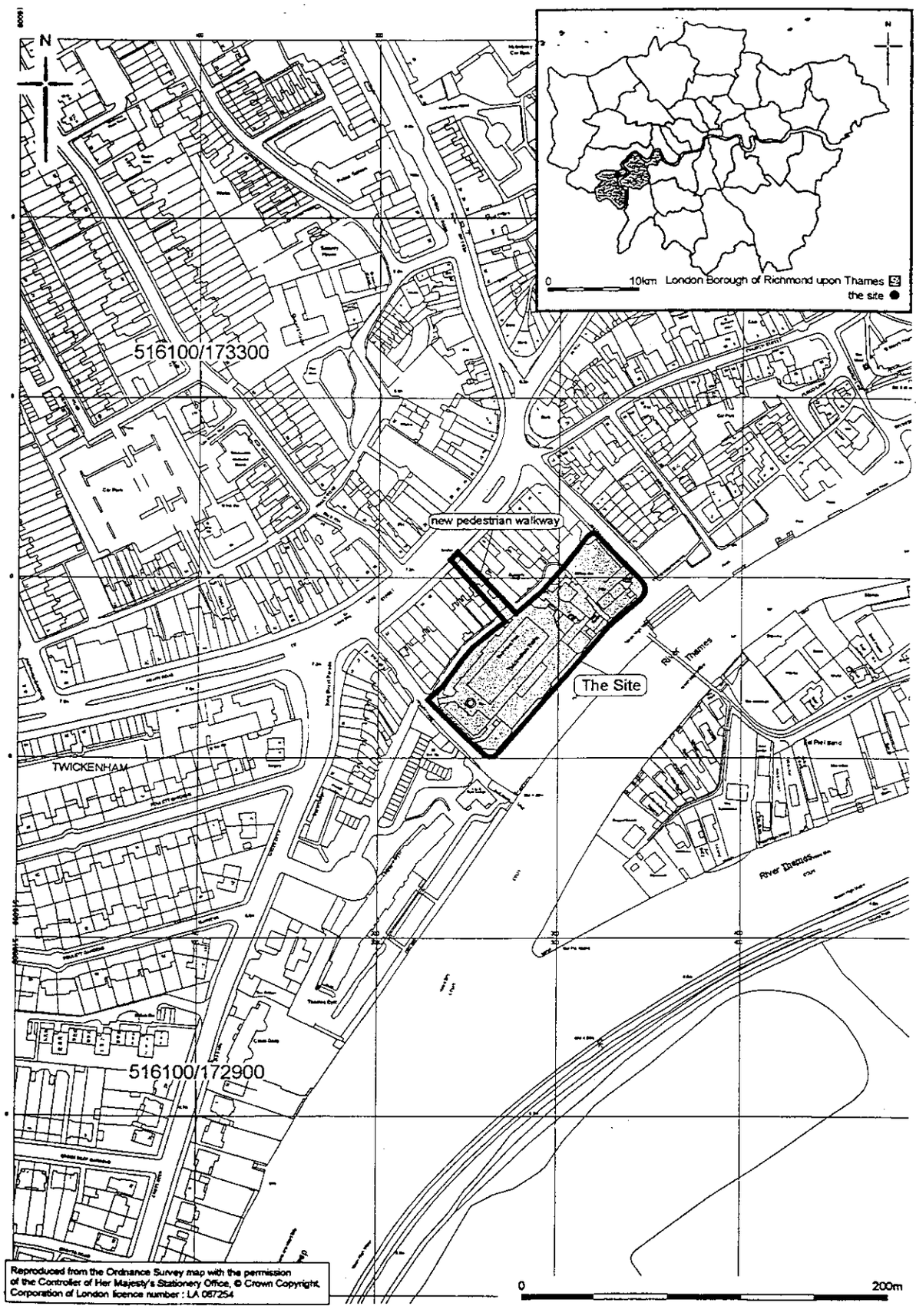


Figure 1. Site location map

2 Planning and Legislative Framework

2.1 Planning Policy Guidance (PPG16)

The Department of the Environment published its *Planning Policy Guidance Note 16: Archaeology and Planning* (PPG 16) in November 1990. This set out the Secretary of State's policy on archaeological remains on land, and provided recommendations many of which have been integrated into local development plans. The key points in PPG 16 can be summarised as follows:

— Archaeological remains should be seen as a finite and non-renewable resource, and in many cases highly fragile and vulnerable to damage and destruction. Appropriate management is therefore essential to ensure that they survive in good condition. In particular, care must be taken to ensure that archaeological remains are not needlessly or thoughtlessly destroyed. They can contain irreplaceable information about our past and the potential for an increase in future knowledge. They are part of our sense of national identity and are valuable both for their own sake and for their role in education, leisure and tourism.

— Where nationally important archaeological remains, whether scheduled or not, and their settings, are affected by a proposed development there should be a presumption in favour of their physical preservation.

— The key to informed and reasonable planning decisions is for consideration to be given early, before formal planning applications are made, to the question of whether archaeological remains are known to exist on a site where development is planned and the implications for the development proposal.

— When important remains are known to exist, or when archaeologists have good reason to believe that important remains exist, developers will be able to help by preparing sympathetic designs using, for example, foundations which avoid disturbing the remains altogether or minimise damage by raising ground levels under a proposed new structure, or by careful siting of landscaped or open areas. There are techniques available for sealing archaeological remains underneath buildings or landscaping, thus securing their preservation for the future even though they remain inaccessible for the time being.

— If physical preservation *in situ* is not feasible, an archaeological excavation for the purposes of 'preservation by record' may be an acceptable alternative. From an archaeological point of view, this should be regarded as a second best option.

— Agreements should also provide for the subsequent publication of the results of any excavation programme.

— Development plans should reconcile the need for development with the interests of conservation — including archaeology. Detailed development plans should include policies for the protection, enhancement and preservation of sites of archaeological interest, and their settings.

— Decisions by planning authorities on whether to preserve archaeological remains *in situ*, in the face of proposed development, have to be taken on merit, taking account of development plan policies and all other material considerations — including the importance of the remains — and weighing these against the need for development.

— Planning authorities, when they propose to allow development which is damaging to archaeological remains, must ensure that the developer has satisfactorily provided for excavation and recording, either through voluntary agreement with the archaeologists or, in the absence of agreement, by imposing an appropriate condition on the planning permission.

PPG16 itself forms part of an emerging European context which recognises the importance of the archaeological and historic heritage in consideration of development proposals. This has recently been formulated in the *Code of Good Practice On Archaeological Heritage in Urban Development Policies* established by the Cultural Heritage Committee of the Council of Europe, and adopted at the 15th plenary session in Strasbourg on 8-10 March 2000 (CC-PAT [99] 18 rev 3). As stated at the beginning of that document however, '*a balance must be struck between the desire to conserve the past and the need to renew for the future*'

2.2 Archaeology and planning in Richmond

The London Borough of Richmond upon Thames's *Unitary Development Plan* (UDP) was adopted in 1996. The policies set out in this document determine the position of archaeology as a material consideration in the planning process and incorporate recommendations from the Department of the Environment's *Planning Policy Guidance Note 16* (PPG 16).[1]

The borough council seeks to promote the conservation, protection and enhancement of the archaeological heritage of the borough. With reference to archaeology, the purpose of the UDP is to

> involve agreements with developers who will be expected to include design, land use and management safeguards for archaeological sites affected by their proposals[2].

The UDP includes two other Policies which deal specifically with archaeological Preservation and Investigations:

> **POLICY ENV 44**: Where development proposals may affect archaeological remains or areas of archaeological potential; as identified.....the Council will encourage early discussions of the implications with developers and specialist bodies where appropriate. The Council may require a preliminary archaeological site evaluation, including trial work, funded by the developer, before proposals can be considered.
>
> **POLICY ENV 45**: On sites of archaeological importance the Council will require the remains to be preserved in situ or, in exceptional cases where preservation in situ is not feasible, investigated and recorded prior to development, funded by the developer.

The present site lies within one of the **Areas of Archaeological Priority** designated by the borough.

[1] Richmond upon Thames UDP March 1992 Policies ENV 43 (4.143-4.144), 44 (4.145-4.146) & 45 (4.147-4.148)
[2] Richmond UDP ENV 43 4.144

3 Archaeological and Historical Background

The time-scales used in this report are:

Palaeolithic:	450,000-12,000 BC
Mesolithic:	12,000-4,000 BC
Neolithic:	4,000-2,000 BC
Bronze Age:	2,000-600 BC
Iron Age:	600 BC-AD 43
Roman:	AD 43-410
Saxon (early-medieval):	AD 410-1066
Medieval:	AD 1066-1485
Post-medieval:	AD 1485-present

Sites referred to within this Section (eg Site 1, Site 2, etc) are shown on Figure 2 and appear in the Gazetteer of Sites, Section 3.5.

3.1 Geology and topography

3.2 Topography

The site lies on ground that slopes down steeply towards the River Thames to the south-east. Current Ordnance Survey maps indicate a level of 7.0m OD at the junction of Wharf Lane and the service road to the north-west of the site, and 4.6m OD on The Embankment to the south-east of the site, a drop of 2.6m. The King Street end of the new pedestrian walkway lies a little higher than the service road, at 7.3m OD.

Ground levels *within* the existing site are, however, artificially raised above those of the surrounding land. On the north-western side of the site, adjacent to the access road, levels are raised between approximately 0.45m and 1.30m above the pavement outside the site. On the southern side of the site, levels are raised by up to *c* 2m above the level of The Embankment. As there is, at present, no site survey of the existing conditions, it is not possible to quantify this more accurately.

These levels produce an overall drop in level of only *c* 0.85m across the raised part of the site. This land raising may have been conducted in advance of construction of the swimming pool, or, at least partially, for one of the incarnations of Richmond House (see 3.4.8).

3.3 Geology

London occupies part of the Thames Basin, a broad syncline of chalk filled in the centre with Tertiary sands and clays. In most of London, this Tertiary series of bed-rock consists of London Clay. Above the bed-rock lie the Pleistocene (Quaternary) fluvial deposits of the River Thames arranged in flights or gravel terraces. These terraces represent the remains of former floodplains of the river, the highest being the oldest with each terrace becoming progressively younger down the valley side.

According to the mapping of the British Geological Survey, the site lies on brickearth overlying gravel of the first Thames Terrace.

Immediately north-west of the site at the junction of Wharf Lane and King Street (Site 1), the ground level lay at 7.40 m OD, and natural brickearth was found at 6.60–7.00m OD. This overlay terrace gravels at 6.20 to 6.30m OD. These levels should be similar to those on the northern edge of the site, but are expected to slope steeply down to the south-east towards the Thames.

3.4 Archaeological and historical summary

3.4.1 Palaeolithic

In 1892 a curious assemblage of animal bones, and plant and molluscan remains were discovered in gravels during the excavation of a sewer trench from the Thames near Popes Grotto to Twickenham Sewage Works[3]. The remains were found in a 'dark loamy bed' in the gravel, at depths of between 11 to 18ft (3.35 to 5.50m) below ground level. The deposit occurred in the western half of Popes Grove, 420yd (384m) west of the Thames, and along the rest of the trench which 'continued through other roads' (probably including Popes Avenue) north to the sewage works. The plant and molluscan remains indicated marshy ground associated with a slow flowing watercourse. About 300 bones were collected from the surface of the 'loam' by navvies digging the trench. They were identified as those of *Bos taurus* and possibly *Bos longifrons* (species of cattle), *Cervus capreolus*[4] (roe deer), *Rangifer tarandus* (reindeer), *Sus scrofa* (wild boar), *Cervus elaphus* (red deer), *Canis lupus* (wolf)[5] and *Bison priscus* (bison)[6]. Interestingly, the 'marrow-bones' of the bison and the cattle had been split and cracked, possibly indicating the presence of man (although artefacts were not found with the bones). The fauna is a curious mixture of wild and domesticated species reflecting widely differing climatic conditions. For example the reindeer indicate cold conditions consistent with those prevailing at the end of the last glaciation, and could therefore date to the Upper Palaeolithic or Early Mesolithic. The other species reflect the warmer conditions of the Holocene, and the domesticated cattle in particular could not be earlier than the Neolithic.

3.4.2 Mesolithic

Mesolithic activity is indicated in Twickenham by a small assemblage of struck flints from an excavation in Church Street (Site 9), which include a bladelet with a steep retouch (Smith 1968, 18; Sanford 1970, 200). Mesolithic perforated tools of red deer antler have been found at Eel Pie Island (Site 10) and Twickenham (Site 13: VCH 1969, 26-7; Lacaille 1961, 135-6, Fig 7 no.6). Across the river in Ham Fields a large number of Mesolithic struck flints were collected, mostly during gravel extraction or fieldwalking during the first half of the 20th century (Field 1983; Lacaille 1966).

3.4.3 Neolithic

Until recently most evidence for Neolithic activity in Twickenham had come from the River Thames, which has produced at least nine stone and flint axes (listed in Adkins & Jackson 1978). Most of these finds were only given the vague provenance of 'Twickenham', but two specimens made of ground flint came from near Eel Pie Island (London Museum acc. no. 0.460) and opposite Orleans House (acc. no. 4.9.107/103) and respectively. A third axe made of pecked and ground greenstone/epidiorite (acc. no. 0.626) was found upstream from the ait. A chipped adze (acc. no.4.9.107/41) was also found in the river opposite Orleans House.

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[3] The site of Twickenham Sewage Works is now a depot at the west end of Craneford Way.

[4] *Capreolus capreolus* according to modern nomenclature.

[5] It was suggested that the single 'wolf' bone may have come from a dog (Leeson & Laffan 1894, 461)

[6] Possibly confused with aurochs.

The main evidence for Neolithic occupation in the Twickenham area comes from an excavation undertaken behind Nos. 48 and 49 Church Street in 1966 by the Twickenham Local History Society (Site 9: Sanford 1968; 1970; MacDonald 1976, 20). The excavation revealed a north-south feature, either a watercourse[7] or possibly a ditch, containing Neolithic artefacts. Among the finds recovered from the feature were 140 flint-tempered sherds from at least a dozen thick-walled pots and bowls. The pottery was in a early style antedating those of the Ebbsfleet variety (Smith 1968). A substantial assemblage of struck flints from the feature were probably of Neolithic date, and included eighteen cores, a flake scraper, and about ninety flakes (thirteen of which showed signs of use). There were also nearly a hundred very small flakes and spalls.

3.4.4 Bronze Age

Fragmentary evidence for Bronze Age field systems and/or enclosures has been found in Twickenham at Pope's Grotto Public House (Site 5).

The River Thames in west London has been one of the richest sources of Bronze Age metalwork in Britain, with particularly large concentrations of finds immediately downstream from Twickenham at Richmond and Syon Reach (see Needham & Burgess 1986, 452-5). By comparison the number of finds from the river at Twickenham is modest. They include a small dagger blade and spearhead from the channel on the north side of Eel Pie Island (Lawrence 1926, 76-7), and a basal looped spearhead from near the upstream end of the eyot (Field 1980). A short distance upstream, two dagger blades, a spearhead, two axes, a leaf-shaped sword[8] (Lawrence 1926, 76) and a 'flint dagger' were recovered from the river near the site of Pope's Villa (*Thames Basin Archaeological Observers Group Newsletter* 6, July 1961).

3.4.5 Iron Age

Excavations at St John's Hospital (Site 6) revealed a number of features provisionally dated to the Iron Age. They included two postholes, two parallel gulleys (field drains) and a ditch.

A small hoard of nine tin coins was found on Eel Pie Island (Site 10: Smith 1920, 18). A total of twenty-five potin coins from the Isleworth foreshore opposite the northern tip of Isleworth Ait may represent a similar hoard (Cotton & Wood 1996, 25). Because the distribution of such coin hoards[9] seems to be focused on the river it has been suggested that their deposition may have been more to do with the movement of people than with trade (Canham 1976, 48).

3.4.6 Roman

There is no evidence for Roman activity in the immediate vicinity of the site. However, the excavations at St John's Hospital (Site 6) revealed several late Roman drainage

[7] This was the interpretation favoured by one of the excavators, Rosalind Sanford.

[8] This is probably the 'particularly graceful' sword described in Vulliamy 1930, 105.

[9] Other Iron Age coin hoards have been found at Brentford, Gunnersbury, Hammersmith, St James's Park and Shepperton.

ditches and an enclosure ditch, probably indicating the site of a late 3rd- or 4th-century farm.

3.4.7 Saxon and medieval

The first documentary reference to Twickenham (*tuican hom*) is in a charter of AD 704 (Gelling 1979, 95, No. 191; Sawyer 1968 87, No. 65). In the charter Suebraed, King of the East Saxons and Paeogthath 'Comes' grant land to the bishop of London. Although this indicates that an estate had been established at Twickenham by the 8th century no archaeological evidence has been found for Saxon settlement in the locality.

The evidence for medieval settlement in Twickenham is limited, but suggests that the village (as it was then) lay immediately to the north of the site. The nucleus of medieval Twickenham may have been the precursor to the present Church of St Mary (Site 11), which may have been built by the late 11th century (VCH 1962, 139). However, judging from the layout of 17th-century Twickenham, mapped by Glover in 1635, it seems more likely that the main settlement followed a linear pattern, with a single row of houses on either side of Church Street–King Street (Figure 3). The archaeological evidence for medieval occupation comprises a medieval ditch in Church Street Car Park (Site 9) and a rubbish pit containing 15th-century pottery at 29 and 31 King Street (Site 1), immediately north-west of the site.

An evaluation immediately to the north of the site (Site 1) revealed that the natural brickearth was cut by a late medieval rubbish pit, which contained sherds of 15th-century pottery, fragments of peg tile, animal bones, oyster and mussel shells, and charred cereal grains.

3.4.8 Post-medieval

Cartographic evidence indicates that by the early 17th century the site lay within the settlement area (Figure 3).

From the late 17th century until the early 20th century the site lay in the grounds of Richmond House (see Cobbett 1872, 254-6; Ironside 1797, 78). The house was occupied by the eminent Whig politician Francis Newport, Earl of Bradford, from 1682 until his death in 1708, when it passed to his second son Lord Torrington, and subsequently to Lady Anne Torrington, who lived there until her death in 1735. In 1740 Lady Anne's executors sold the property to Viscount Montague, and in 1744 it was purchased by Anthony Keck. The house and its extensive grounds are clearly shown on John Rocque's map of 1745 (Figure 4). From 1766 to 1791 it was occupied successively by Mary, Dowager Countess of Shelburne and her son the Hon. Thomas Fitzmaurice.

In 1797 Edward Ironside (1797, 78) described the property thus:

'In the middle of the town is a large house called Richmond, one front of which faces the Thames, with a pleasing garden, and extensive terrace, guarded by handsome iron rails. The other front is to the street, but hid by a high wall, at each end of which is a porters lodge. Within is a good court-yard.'

In *c* 1816 the house was demolished by a Mrs Lionel Dawson Damer, and was replaced by a new residence. It is shown on the Twickenham Inclosure Award Map of 1819 (Plot 427) as a substantial building, which was further enlarged in about 1829. In 1850 the property was left by Mrs Damer to Mrs Budgen, who leased it to Field Marshal Sir Edward Blakeney. In 1867 the lease was taken by George Gordon Mackintosh of the Bengal Civil Service, who lived there until his death in 1903. His widow lived there until well into her nineties. By this time the house had become 'rather dilapidated, and the garden a great wilderness' (Goode 1974, 6). She died in 1922, and a few years later Richmond House was demolished and the entire estate was redeveloped.

Photographs and maps show Richmond House in the late 19th century as a rectangular building with a conservatory on its west side (Figure 6). Two verandas on the south side of the residence overlooked an extensive lawn which swept down to the Embankment, while the grounds to the north and west were mainly occupied by large mature trees.

The evaluation immediately to the north of the site (Site 1) produced a large rubble-filled pit containing bricks dated to between the late 15th century and the mid-17th century, which may have been associated with the demolition of the first Richmond House in *c* 1816. Several small pits were interpreted as garden features.

3.5 Gazetteer of adjacent or relevant archaeological sites

The list below represents a Gazetteer of archaeological excavations and observations in the vicinity of the site, and should be read in conjunction with Figure 2.

Sites with five letter/number site codes (*e.g.* ABC87), were controlled excavations carried out by the Museum of London.

3.5.1 Museum of London sites

- **Site 1 (KST96)**
  29 & 31 King Street, Twickenham
  Robert Cowie, MoLAS

  TQ 1624 7316

  Natural brickearth was cut by a late medieval rubbish pit containing 15th-c pottery; other pits appear to have been contemporaneous with *Richmond House* (built in the late 17th c and occupied until the 1920s) in whose grounds the site lay, and these pits may have been associated with the gardens. The rubble fill of a large pit included bricks dated to between the late 15th c and the mid-17th c: these may have derived from the demolition of the first Richmond House in *c.*1816.

- **Site 2 (FRT93)**
  11 Ferry Rd, Twickenham
  Michael Shea, Museum of London

  TQ 1668 7344

  17th/18th c waterlain silts underlay 18th/19th c land reclamation dumps.

- **Site 3 (LPT94)**
  55 Lebanon Park, Twickenham
  TQ 1673 7341
  Robert Cowie & Jeanette Arreger, MoLAS

  Natural sand was overlain by garden soil, sealed by a turf layer.

- **Site 4 (YST95)**
  33-35 York Street, Twickenham
  TQ 1650 7340
  Stewart Hoad, MoLAS

  Natural brickearth was overlaid by post-medieval garden deposits.

- **Site 5 (POP92)**
  Pope's Grotto public house (car park), Cross Deep, Holmes Rd, Twickenham
  R Cowie, MoLAS

  TQ 1595 7265

  An evaluation in 1992 demonstrated that above natural brickearth was a layer of post-medieval ploughsoil. In one testpit this was sealed by building debris, probably resulting from the destruction of the mid 19th c *Pope's Grotto Hotel* during World War II. In a second testpit a ditch cutting the ploughsoil was succeeded by construction trenches for the walls of a 20th c structure.

  A watching brief in 1999 on contractor's excavations in the car park on the south side of Pope's Grotto public house revealed river terrace sands and gravels overlaid by brickearth. These deposits were cut by at least two features dated to the prehistoric period. The most substantial of these was an east-west ditch, which may have been part of a land boundary or an enclosure. It was traced for a discontinuous length of 18.50m and, although truncated from above, survived to a depth of 0.64m and was up to 2.30m wide. Over thirty struck flints and a few bones of ox, pig and sheep were recovered from the ditch. The flints are mostly waste flakes and probably date to Late Neolithic or Bronze Age, although one patinated blade could be of Mesolithic or Neolithic date. The ditch was cut to the east by a feature which produced two potsherds - one dated to the Neolithic or Middle Bronze Age, the other to the Late Bronze Age or Early Iron Age. This feature, which was only partly exposed, may have been another ditch and may have continued further to the east where an undated feature was recorded. Across most of the site the brickearth was overlaid by agricultural and garden soils of post-medieval date.

- **Site 6 (APR94)**
  St John's Hospital, Amyand Park Rd, Stafford Rd, Twickenham
  Stewart Hoad, MoLAS

  TQ 1645 7365

  Natural brickearth was truncated by prehistoric - possibly Iron Age - pits, postholes and ditches containing pottery, flint implements and burnt flint fragments. Truncating these was a series of intercutting pits, postholes and ditches, including what is thought to have been an enclosure ditch, dated to the late Roman period AD350-400. Interpretation of these features suggests the presence of a small farmstead and, although no structures could be identified, the numerous amounts of pottery and metal artefacts recovered indicate that occupation occurred within the vicinity, possibly centred under what is now Strafford Road, adjacent to St John's Hospital. The Roman features were overlain by ploughsoil, in which bedding trenches and pits, ash pits, and postholes of post-medieval date were recorded and interpreted as features associated with the gardens of *Amyand House* (b 1760), which occupied the site prior to the hospital. Above lay a layer of garden soil, modern dump deposits and topsoil.

- **Site 7 (CRX00)**
  St Catherine's School, Cross Deep, Twickenham
  Sadie Watson & Lindy Casson, MoLAS

  TQ 1580 7342

  Evaluation was carried out during February 2000, and a further watching brief took place during May 2000. Two evaluation trenches were excavated prior to the installation of a new hockey pitch in the school grounds. The site overlies the location of Alexander Pope's gardens, called Pope's Grotto, hence the requirement for some archaeological work.

  Trench 1 revealed modern foundations just below the tarmac ground surface. Trench 2 revealed a garden path constructed of brick fragments and ash. The position of this path was extrapolated onto maps from the 18th century and it appeared to be a path from Pope's garden. Adjacent to the path was a line of tree throw holes, possibly representing a hedge line. No other features were observed. The top of the path was at 9.84m OD, untruncated.

  The natural ground was a clayey brickearth, seen at 9.04m OD.

  The watching brief revealed more of the garden path, seen at 9.87m OD.

- **Site 8 (HLY00)**
  29-35 Holly Road, Twickenham
  Robert Cowie, MoLAS

  TQ 1622 7328

  The earliest archaeological features were two undated ditches cut into the river terrace gravel. Both were probably no later than medieval in date since neither contained any datable artefacts or post-medieval inclusions, and they were on a north-south alignment that was inconsistent with the early post-medieval settlement pattern of the immediate area.

  Excavations also revealed features dated to the 17th or early 18th century, when the site was still open ground and probably used for agricultural/horticultural purposes. They comprised possible bedding trenches, a pit and a ditch. The latter possibly served as a boundary between two plots of land.

  The earliest structure recorded was a brick wall, which may date back to the late 17th century. Several other brick structures, including brick-lined soakaways or cesspits and the walls of buildings, were dated to the 18th and 19th centuries. This fits well with the cartographic evidence that suggests that by the mid-18th century the site had been absorbed by the rapidly expanding village of Twickenham.

- **Site 9 (CHU88)**
  Church Street Car Park, Twickenham
  Jonathan Nowell, Museum of London

  TQ 1650 7330

  Excavation in 1988, in an area where traces of Mesolithic and Neolithic activity had been recorded in 1966, revealed a length of ditch aligned N-S across the site. On the evidence of several phases of recutting, it apparently served to drain water into the Thames between the early 14th and mid 16th c, predating the late 16th/early 17th c street frontage. A late 18th c cesspit contained a large assemblage of pottery of that date. Little prehistoric evidence was found.

3.5.2 Greater London Sites and Monuments Record

This is a database of archaeological sites and findspots within the London area and the following entries are additionally recorded within a 500m radius of the study site.

Note: some 'Site' numbers have two or more entries in the same location

Site No.	GLSMR	TYPE	PERIOD	CENTURY	Description
10	021007	COIN HOARD	IA		EEL PIE ISLAND
10	020868	FLINT ARTEFACT	ME		EEL PIE ISLAND
11	200973	CHURCH	MD	15	ST MARYS CHURCH CHURCH ST
11	021112	CHURCH	MD	11	ST MARYS CHURCH (SITE OF) CHURCH ST
12	030053	FARMHOUSE	MD		YORKES FARM YORK HO
13	020883	FLINT ARTEFACT	ME		TWICKENHAM
14	200990	HOUSE	PM	17	7 THE EMBANKMENT
15	200989	HOUSE	PM	17	5 THE EMBANKMENT
16	030054	MANOR HOUSE	MP	16	ARRAGON HOUSE (SITE OF) ARRAGON RD
17	201165	HOUSE	PM	17	32-36 KING ST

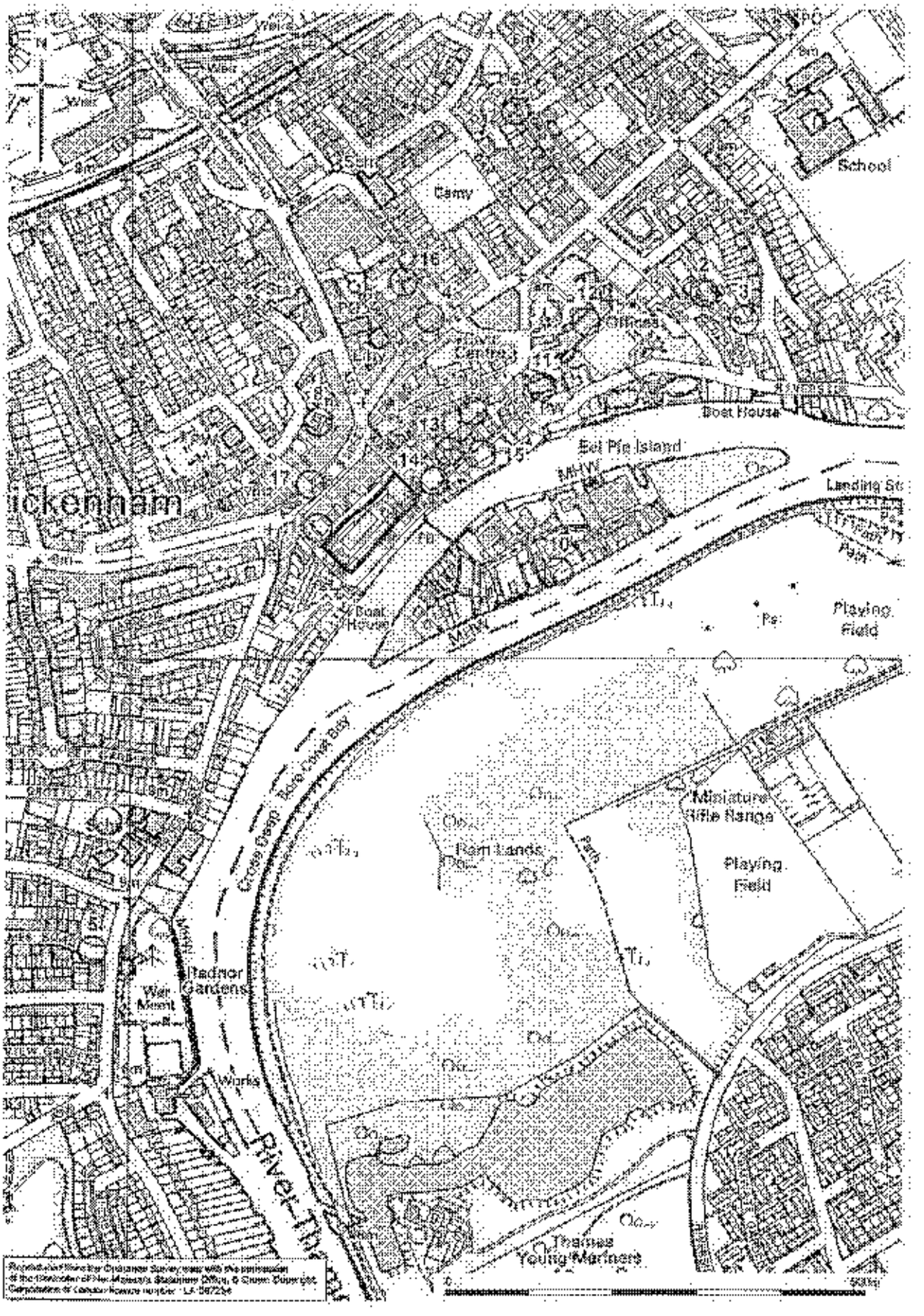

Figure 2. Previous archaeological sites and finds in the vicinity of the site

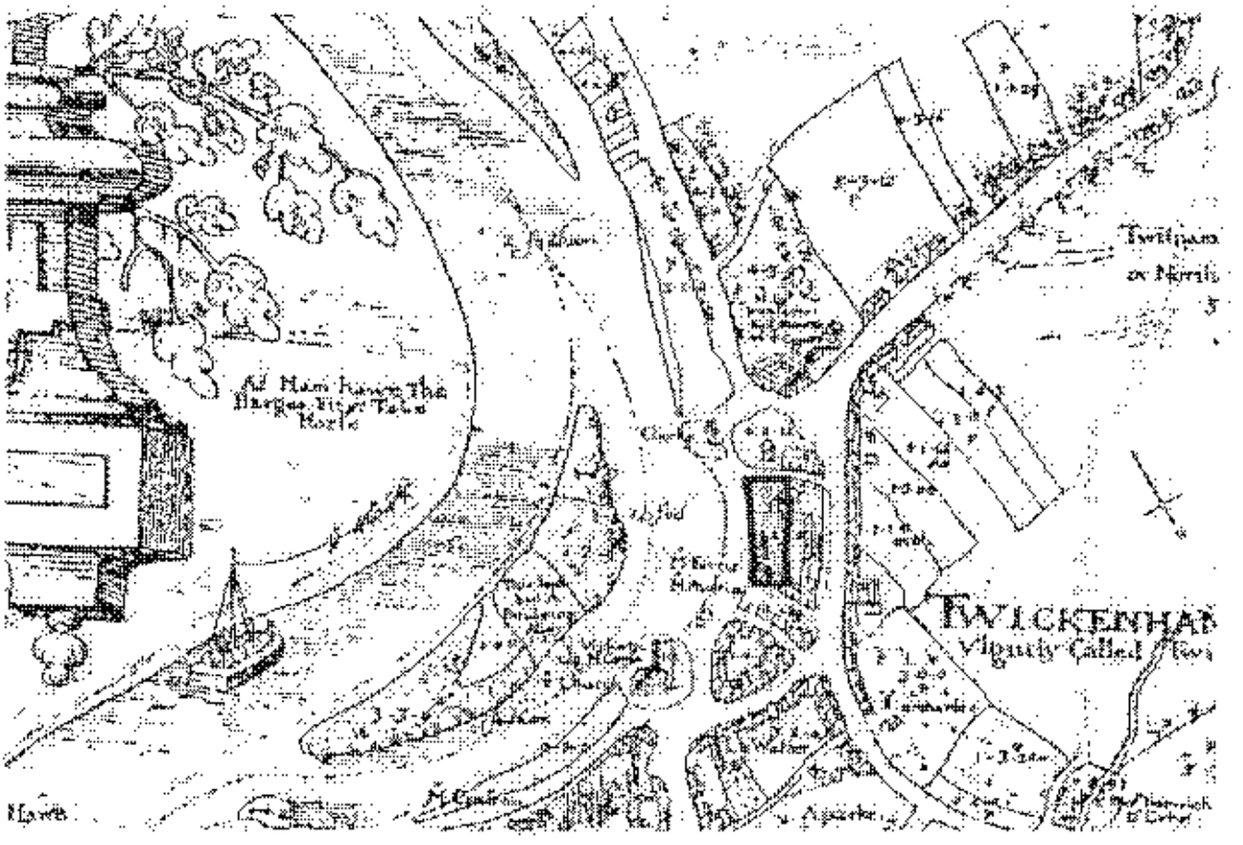

Figure 3. Detail from Glover's map of 1635 (note that south is at the top)

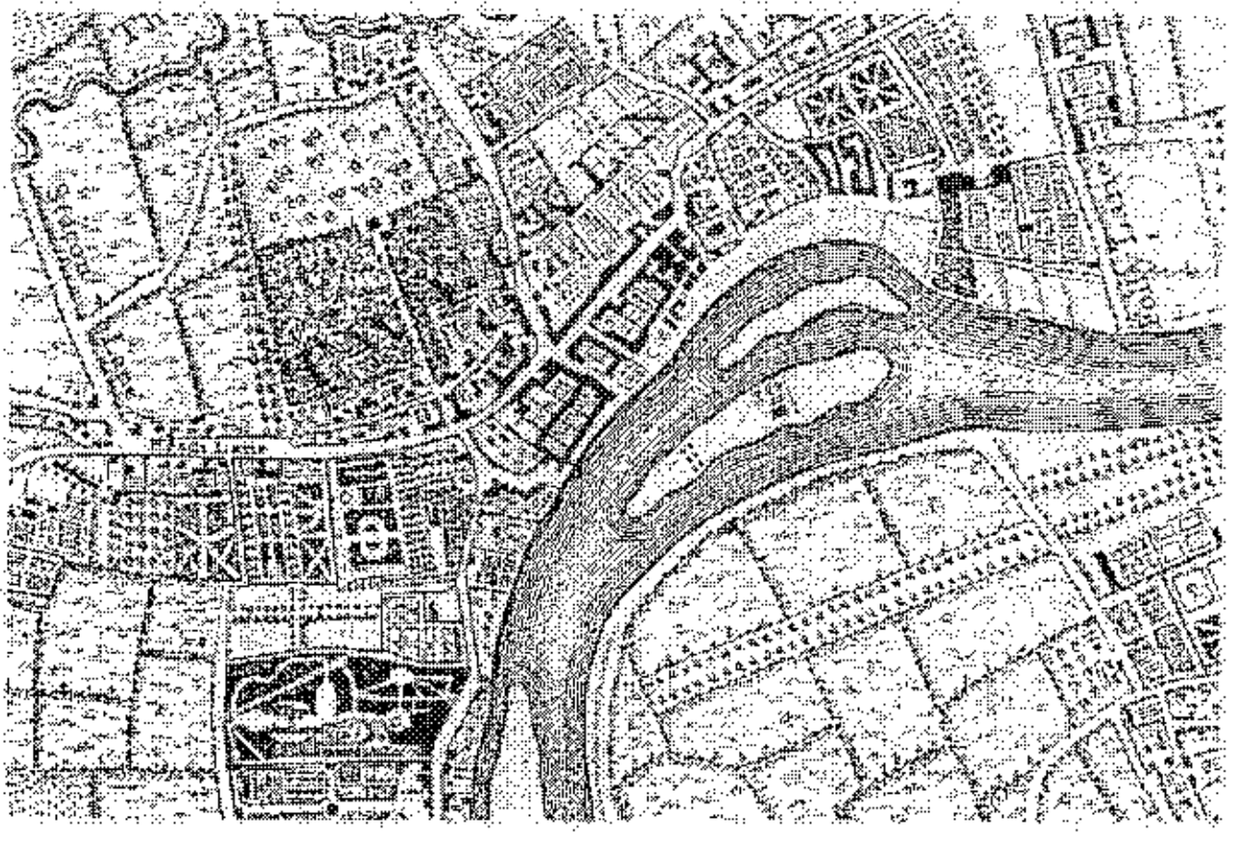

Figure 4. Detail from Rocque's map of 1746

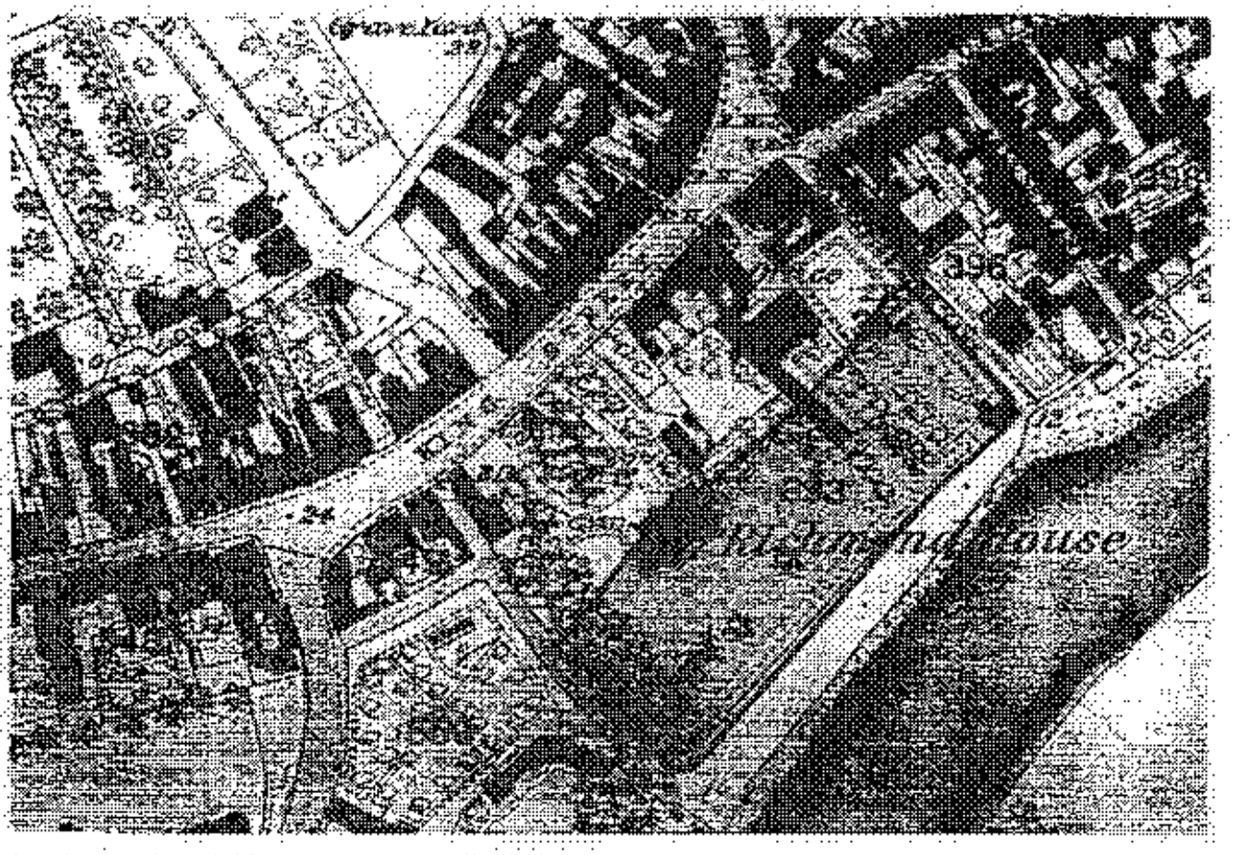

Figure 5. Detail from Ordnance Survey map of 1894-6

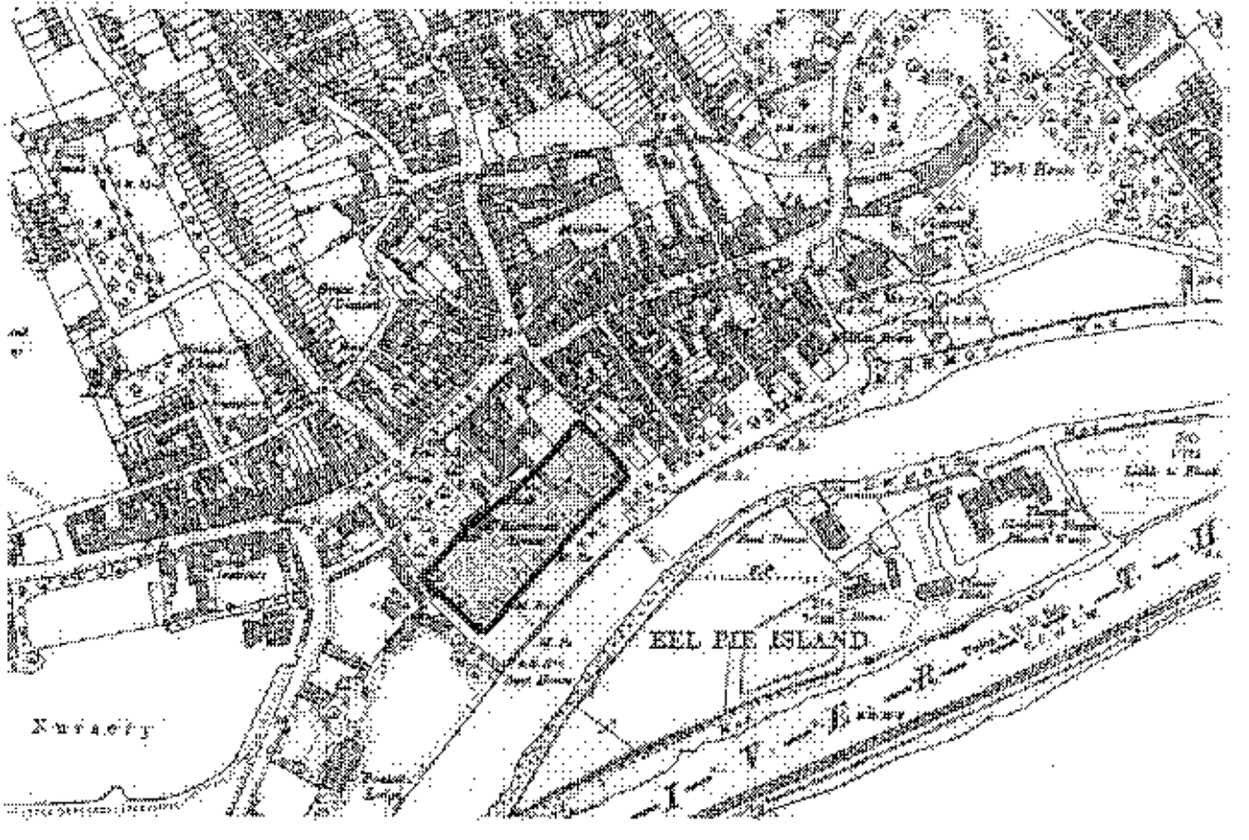

Figure 6. Detail from Ordnance Survey map of 1894-6

4 Archaeological Potential

4.1 Factors determining archaeological potential

4.1.1 Natural

Immediately to the north-west of the site (Site 1) natural brickearth lay 0.4–0.8m below the existing ground surface, and similar depths might be expected at the northern edge of the current site.

There is no geotechnical information currently available on how this might vary across the steeply sloped profile down to the south-east.

See Section 3.1 for description of underlying geology.

4.1.2 The present buildings

See Figure 7

The existing ground levels have been artificially and variably raised across the site, although detailed site survey in not currently available. On the north-western side of the site, they are raised by *c* 0.45m, increased to *c* 1.30m in the northern corner. On the south-eastern side of the site they are raised by *c* 2m.

The existing buildings include the main building and the swimming pool of the derelict Twickenham Baths, and surrounding buildings at the eastern end of the swimming baths. The latter include a garage cut into the land raising and hill-slope, Bath House built on the raised surface, and buildings to the north of Bath House, which are built on ground raised up *c* 2m from The Embankment and *c* 1.30m from the service road. At the northern end of this range there is an electricity sub-station, partially or completely in an open area outside the buildings. The eastern corner of the site contains public conveniences on raised land, and the northern corner is an open car park, raised above the level of Water Lane, but with its north-western side at the level of the access road.

The actual swimming pool will have had a **heavy impact**, removing any potential archaeological remains that might have been present (with the possible exception of Palaeolithic remains buried deep within the terrace gravels). This heavy impact may well also extend beyond of the limits of the pool shown on Figure 7 for a considerable distance, depending on the location and extent of construction cuts for the pool walls and pipes *etc.* leading into and out of it, and if pumps and other machinery are located beneath ground level. In the current absence of a detailed site survey, these cannot be quantified or shown on Figure 7.

The two-storey main building of the swimming baths, fronting onto The Embankment, has been cut into the hill-slope at approximately 1m above the adjacent street level. Its foundations and services will also have had a heavy impact on potential archaeological

remains, heavily or totally truncating any formerly present. The garage fronting onto The Embankment will similarly have had a heavy impact.

The foundations of other buildings on the site will have had a **variable impact** on potential archaeological remains, but as no details of their foundation plans or depths are currently available and the geological profile across the slope is similarly unknown, these cannot be determined in detail. It will differ depending on the degree of land raising present at each individual location, and on the method of construction. It seems likely that foundation trenches for main walls of more substantial buildings, such as Bath House and the buildings to its north, may have been excavated down to the gravels or below, having a heavy impact upon archaeological remains, although outside of the footprint of the foundations the impact may have been low, partial truncation, or none where floor levels *etc.* lie above land raising. The electricity sub-station is likely to have a substantial foundation, and cables leading to it are also likely to have caused truncation of archaeological deposits.

Similarly, the impact of the fountain and paddling pool will depend on the depth of their construction levels, and that of associated services, compared with the thickness of land raising at their locations.

The public conveniences and their associated services at the eastern corner of the site may have more shallow foundations, and as they sit on raised ground, would have had a **low impact, perhaps none,** on potential archaeological remains. Other shallow foundations, the concrete area surrounding the pool, floor construction levels, services, *etc.* are likely to have had a similarly minimal impact where they sit on *c* 1m of land raising, but a moderate impact, partially truncating potential archaeological deposits where there is less than *c* 0.5m of land raising along the north-western edge of the site.

The new pedestrian walkway to King Street lies through the existing buildings fronting onto that road. These appear not to have basements, and by comparison with the evaluation at Site 1, the building is likely to have had a moderate impact upon archaeological remains within the footprints of the foundations, and perhaps services, but the floor levels and yard surfaces to the rear are likely to have had a low impact, preserving post medieval and earlier remains.

4.1.3 Earlier buildings

Any basements to the two incarnations of Richmond House or their out-buildings, whilst themselves forming archaeological features, will have truncated all but the deepest of any earlier potential archaeological deposits.

4.1.4 Depth of archaeological deposit

Whilst this cannot be determined in detail, the depth of 0.3 to 0.4m of post-medieval horizontal stratigraphy present immediately to the north-west of the site (Site 1) might be used a guide to what might be present along the northern (inland) side of the site, beneath the modern ground raising. However, there is a natural topographic slope down towards the river and this may be steeper in origin than that indicated by the current street levels around the site. These show a fall in level of c. 2.60m. It is therefore considered likely

that the underlying made ground/archaeological deposits could also increase significantly in depth towards the river, moving off what is probably the gravel terrace into former channels/erosion planes and foreshores of the Thames. A depth of 2.50-3.50m (excluding modern levelling) might be expected along the Embankment frontage. However, such deposits will only be present locally, outside areas already damaged by previous building development.

4.2 Archaeological potential

The nature of possible archaeological survival in the area of the proposed development is summarised here, taking into account the levels of natural (see Section 3.1), the level and nature of later disturbance and truncation (see Section 4.1) and the nature of archaeological deposits and features known from adjacent sites (see Section 3.5).

The estimate of potential is made before the impact of the proposed development is taken into account, and is therefore valid for the whole site.

4.2.1 Prehistoric

The topographic location of the site, with the steep slope down to the river, suggests that there is potential for prehistoric remains located behind and above, former river banks or alluvial deposits. It should be noted, however, that as the site is located on the outside of a bend in the Thames, the course of the river may have been further away from the site in antiquity.

There is a very low potential for Palaeolithic remains, similar to those seen within the terrace gravels near Pope's Grotto, those were located *c* 3.35 to 5.50m below ground level (see 3.4.1). The probability of such remains being present at any individual site is, however, very low. There is a low potential for Mesolithic remains similar to those from Eel Pie Island and Twickenham. There is a moderate potential for Neolithic remains similar to those seen at Church Street in 1966. There is a low potential for Bronze Age features based on the evidence from Site 5, and for Iron Age remains based on those at St John's Hospital (Site 6) and the coin hoard from Eel Pie Island.

4.2.2 Roman

The late Roman features at St John's Hospital (Site 6) suggest a low potential for Roman features on the site.

4.2.3 Saxon

Given the lack of archaeological evidence for the Saxon settlement of Twickenham, there is only a very low potential for Saxon remains on the site.

4.2.4 Medieval

The site lies to the south of what was probably the core of the medieval and early post-medieval village. A late medieval rubbish pit was found immediately to the north at Site 1, and slightly further away at Church Street Car Park (Site 9) a medieval ditch was

found. These suggest a moderate potential for medieval remains. Although it is possible that the site lies in an open area between the back plots of the medieval houses along King Street and the river, it is not unlikely that some activities took place in such an open area.

The new pedestrian route to King Street has the potential for encountering the remains of medieval occupation along King Street, and pits and other features to their rear, as seen at Site 1.

4.2.5 Post-medieval

Documentary and cartographic evidence, and the features immediately north of the site at Site 1, indicate that there is a high potential for features of post-medieval date, in particular those associated with the late 17th century and early 19th century incarnations of Richmond House. These might include garden features, although the available cartographic evidence does *not* suggest landscaped formal gardens, but a few paths and patches of trees.

The maps depicting the late-17th century house are not detailed or particularly reliable (Figure 3 & Figure 4); they suggest that the main house probably lay to the north-west of the development site, but a range of other buildings ran along the north-eastern end of the site. The Ordnance Survey map of 1863 shows that the main building of the later Richmond House probably lay across the north-western boundary of the site (along the access road), with two other buildings, perhaps not associated with Richmond House, to the north-east (Figure 5).

The new pedestrian route to King Street has the potential for the remains of post-medieval occupation along King Street, and pits and other features to their rear, as also seen at Site 1.

4.2.6 Significance

Whereas the remains of Richmond House, its gardens and grounds, and earlier archaeological remains are likely to be of some local significance for the origins and history of Richmond there is nothing presently to indicate that deposits of regional or national significance might exist on the site.

4.3 Research objectives

Although any excavation research objectives for sites are normally listed in more detail in *Project Designs* compiled at a later stage, often after archaeological field evaluation has taken place, some outline suggestions can usefully be made during the initial *Impact Assessment*. In the case of this site, the most significant themes can be outlined as follows:

Evaluation specific

- Does the land raising on the site belong to the phase of construction for the 20th century swimming pool *etc.*, or to one of the versions of Richmond House ?
- What are the contours of the natural brickearth and terrace gravels, in particular across the profile down to the river ?

Archaeological features

- Are prehistoric remains present, in particular those of Neolithic or Bronze Age date ?
- Are any Roman remains present ?
- Is the any evidence for the Saxon settlement at Twickenham ?
- Are medieval remains present, and if so, what activities do they represent ? In particular, was the site located in a open area, or one of occupation ?
- Are there any post-medieval features present pre-dating the late 17th century construction of Richmond House ?
- What evidence is there for the late 17th- and early 19th-century Richmond Houses, their out-buildings, gardens, and grounds, including revetments representing stabilisation/reclamation of land from the river?

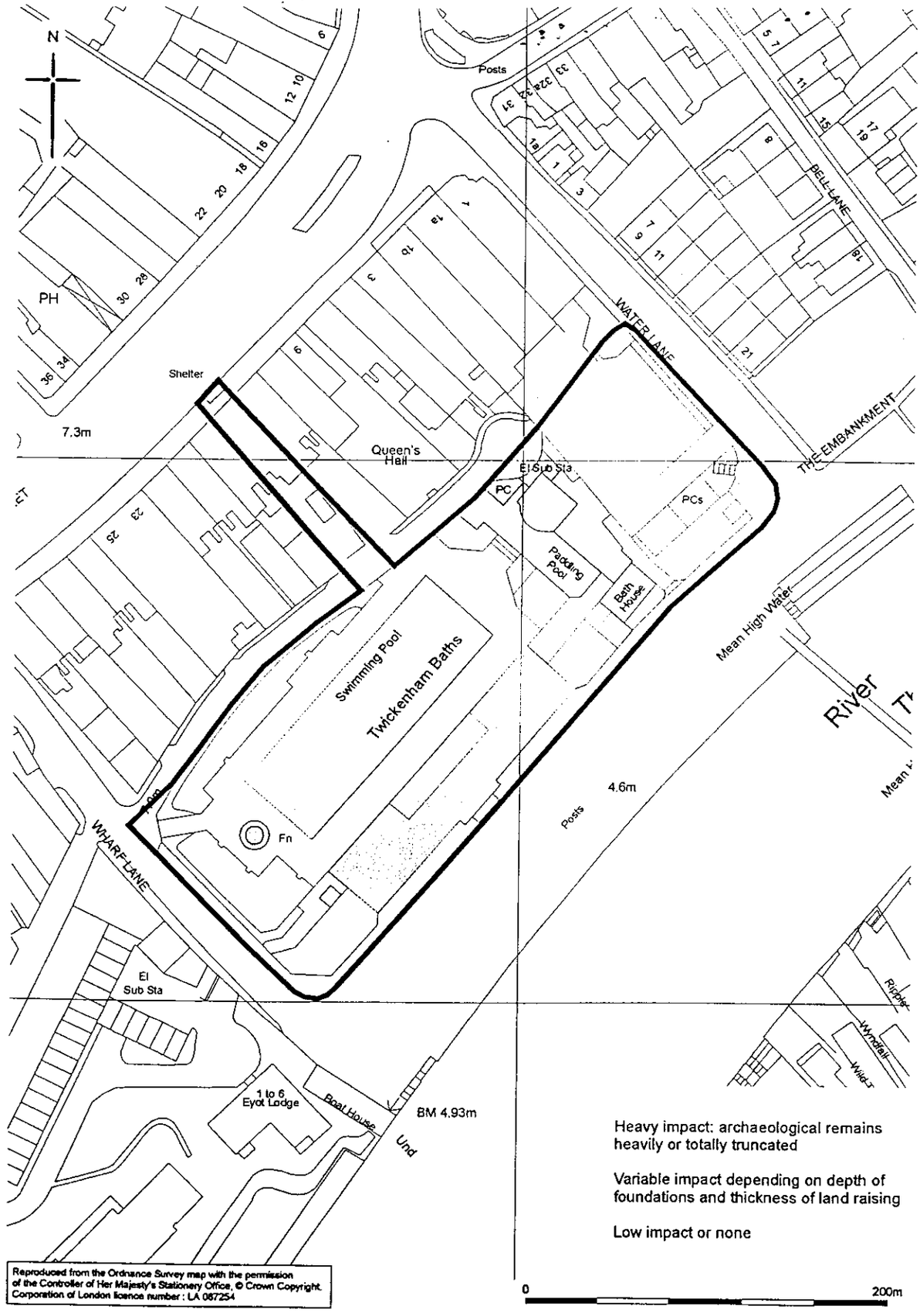

Figure 7. Impact of the existing buildings (see section 4.1.2)

5 Impact of Proposals

The proposed works involve the demolition of all of the buildings on the site (see Figure 1), and the construction of new two to three storey premises combining residential, retail properties, with a ground floor level across the site of +7.30m OD. A car park at single basement level will have a floor level of +3.80m OD. A cinema and health club with a swimming pool will occupy a second or sub-basement over *c* 80% of the area of the site, with a floor level of –0.70m OD. The pool will be constructed to levels below –0.70m OD, and the filtration plant room beneath the pool will have a floor level of –5.20m OD.

Whilst the levels of the varying elements of the basements are complex, the salient feature is that they are all significantly deeper than the present ground levels of 4.6m OD on The Embankment, and *c* 7.0m OD on the service road to the north-west.

In plan, the single basement extends over the whole area of the site, see Figure 8, and with a floor level of +3.80m OD, will truncate potential archaeological deposits to *c* +3.30m OD or below. This is *c* 1.3m below ground levels on The Embankment, and *c* 3.7m below those on the service road, and will remove all surviving archaeological deposits, over the majority of the site. It may not remove all of the suggested deeper deposits along the riverward side of the site adjacent to The Embankment, but that will be subject to the additional impact of the sub-basement.

The sub-basement covers *c* 80% of the area of the site, see Figure 9, and will cause truncation down to *c* –1.20m OD or below, and to *c* –5.70 m OD or below in the area of the underlying swimming pool plant room. This will remove any archaeological remains within its footprint which are not already truncated by the single basement, *i.e.* adjacent to The Embankment.

In addition to the excavations for the basements, the connection of drains and other services might cause additional impact outside of the limits of the site.

It is understood that the new pedestrian route to King Street is to be constructed by cutting an opening within the existing structure along the King Street frontage, without excavation below current ground levels.[10] This would have no impact upon archaeological remains unless new services were also located along this route.

In summary, the combination of the two basement levels will, despite the sloping profile of the site, remove all potential archaeological remains within the footprint of the development, with the possible exception of the bases of deeply cut features in a strip of unknown width adjacent to the north-eastern end of The Embankment, but only extending over the north-eastern *c* 20% of that frontage. This latter area would, at its maximum likely extent, correspond with the plot of open land between the public conveniences and The Embankment, no more than *c* 3–5% of the area of the site. The upper parts of any such features would, however, be removed by the single basement.

[10] Neil Turvey, Turner & Townsend, pers comm.

6 Summary and Conclusions

6.1 Summary

The site lies within one of the *Areas of Archaeological Priority* designated by the borough of Richmond upon Thames.

This *Archaeological Impact Assessment* has shown that the site lies in an area of archaeological potential: there is a high potential for remains from buildings, gardens, and grounds of the late 17th and early 19th century buildings both known as Richmond House; the main 17th century house probably lay out side the site, but the 19th century building probably straddles the north-western site boundary.

There is a moderate potential for Neolithic and medieval remains, based on finds in the vicinity, and a low, but finite, potential for Mesolithic, Bronze Age, Iron Age, and Roman remains, based on finds from the surrounding area. There is a very low potential for Saxon remains, based on documentary references to the Saxon settlement, the precise location of which is unknown at this time, and also for Palaeolithic remains within the terrace gravels, which have been found in the surrounding area.

The pool and main building of the present swimming baths will have had a heavy impact upon potential archaeological remains, removing them completely over *c* 2/3rds of the site. The complex of buildings between Bath House and the electricity sub-station will have had an impact that cannot be determined in detail, but which will vary with the depth of foundations *etc.* and thickness of land raising at individual locations. By way of contrast, the open car park area at the north-eastern end of the site, and a variety of smaller pieces of land, particularly at the south-western end of the site adjacent to Wharf Lane, appear not to have been heavily disturbed, and will have been protected from minor impacts by land raising.

The principal impact of the proposed development is to remove these local areas of made ground/archaeological deposits that have survived the substantial damage already effected by previous 20th c. buildings..

6.2 Conclusions

Archaeological remains will already have been removed in whole or in part, in several areas of the site, by previous building development (particularly the municipal swimming baths). However, there may still be survival of locally – significant deposits and features between these damaged areas.

There is potential for prehistoric activity alongside the Thames, especially if any buried channels or foreshores are present; for activity close to the core of Saxon and medieval Twickenham and for parts of Richmond House and its grounds. Any surviving remains would be affected by the basements of the proposed scheme. English Heritage, who advise the London Borough of Richmond in archaeological matters, may therefore consider whether archaeological field evaluation is necessary. The purpose of this, on land where survival is likely to be highly variable, is to obtain field data from the site itself, in order to assess the quantity and quality of remains actually present

Field evaluation could address the profile and date of land raising and the natural topography across the site, in addition to providing further information on the nature and levels of any archaeological stratigraphy and features.

This selective trialwork on site is normally intended to scope the archaeological issues and allow forward planning, should any further safeguards prove necessary. It is sometime possible to combine the initial field evaluation stage with any planned engineers' geotechnical site investigation, as both exercises have similar objectives in defining ground conditions, so that detailed design work may proceed.

7 Acknowledgements

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The author is grateful to Bob Cowie for information from his forthcoming article on the prehistory of Twickenham.

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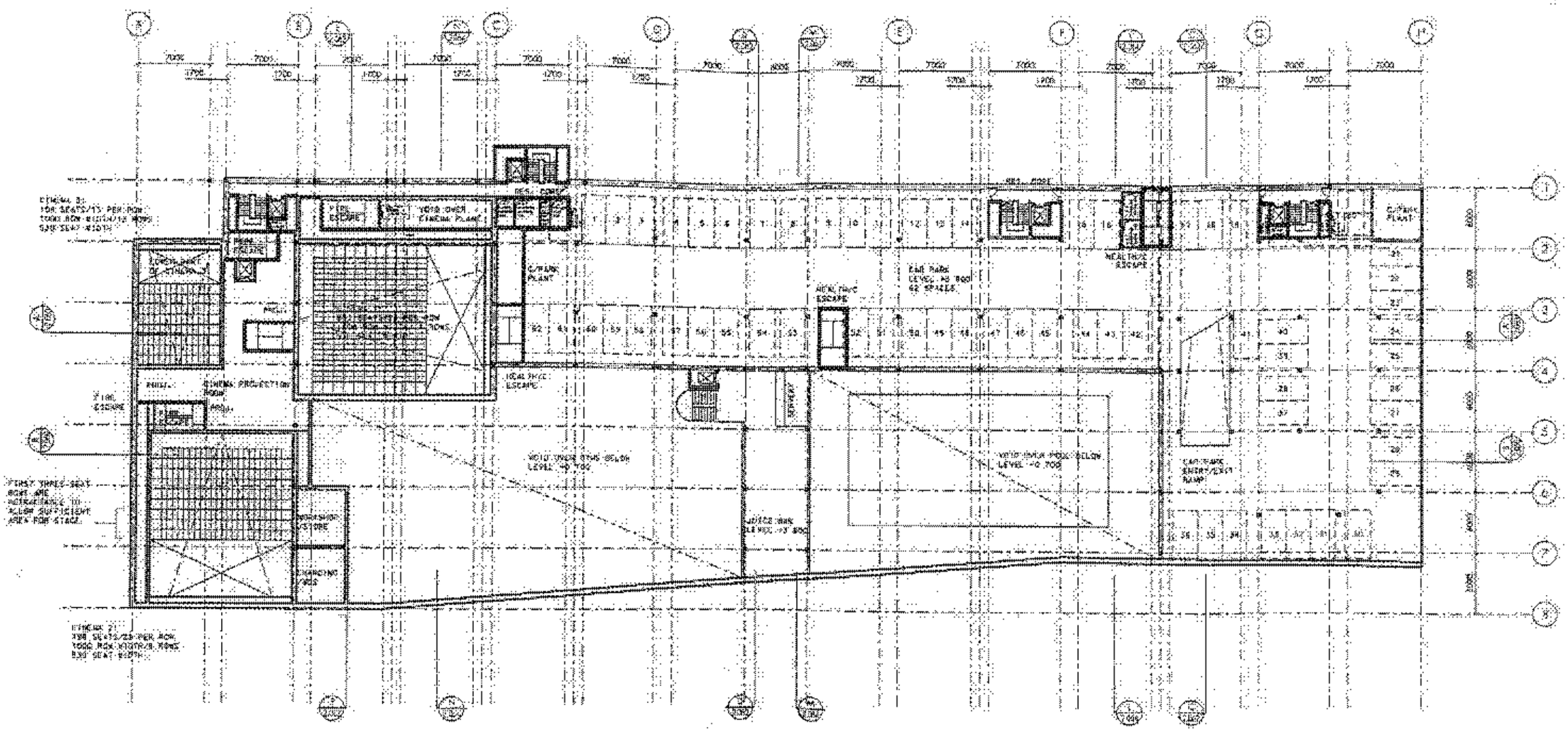

Figure 8. Impact of the proposed single basement, floor level +3.80m OD (see section 5). Illustration supplied by MacCormac Jamieson & Prichard

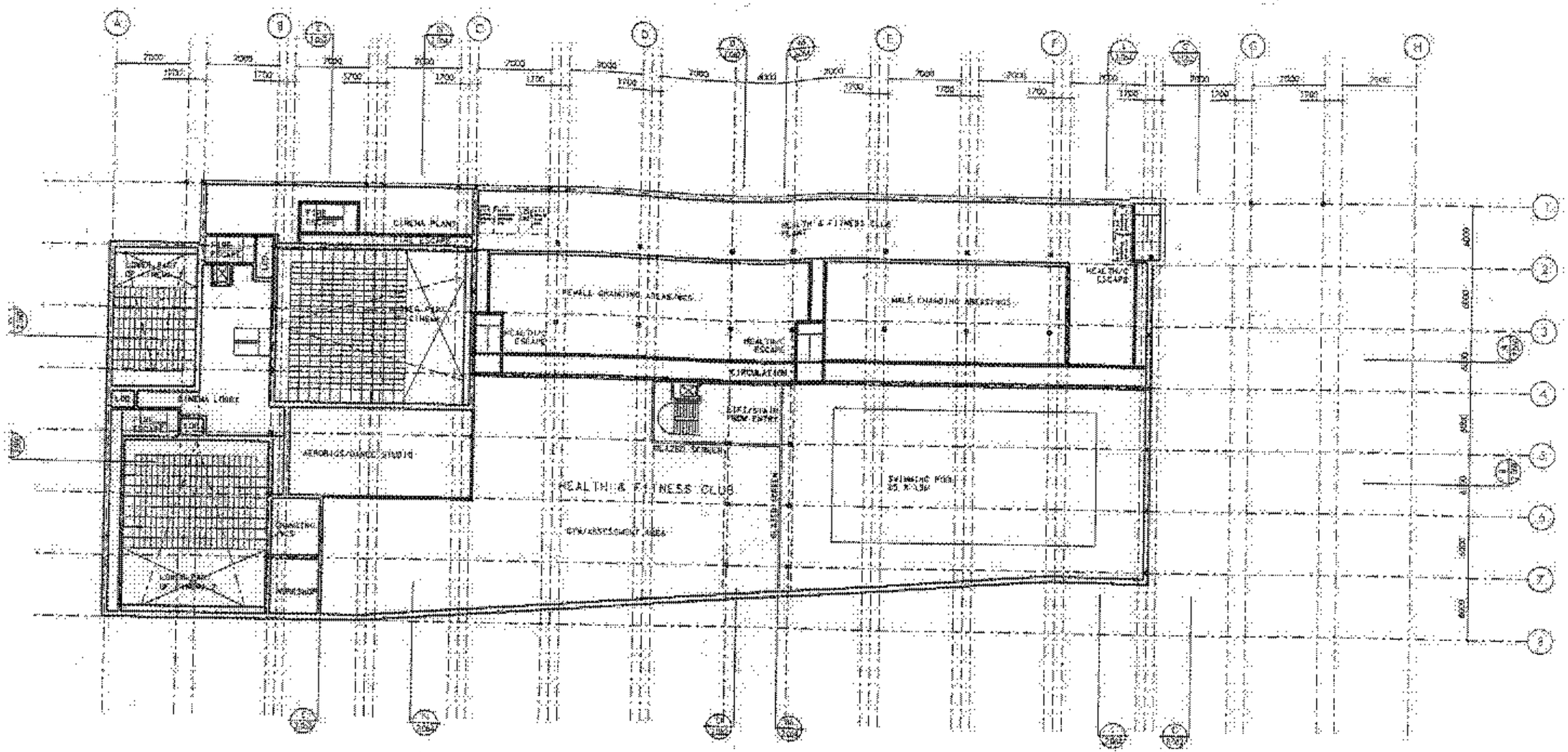

Figure 9: Impact of the proposed sub-basement, floor level -0.70m OD (see section 5). Illustration supplied by MacCormac Jamieson & Prichard

Appendix F

LIST OF ARCHITECTS DRAWINGS

APPENDIX F

Drawings : MacCormac Jamieson Prichard

0010/2 - 001 Site Plan
2 - 002 Location Plan
2 - 003 Demolitions Plan
2 - 005 Landscape Plan, Site Plan
2 - 006 Public WC.s Location Plan
2 - 007 Public WC.s Elevations

FLOOR PLANS:

0010/2 - 100 Cinema Plant Room Plan
2 - 101 Sub-basement Plan Sheet 1
2 - 102 Sub-basement Plan Sheet 2
2 - 103 Basement Plan Sheet 1
2 - 104 Basement Plan Sheet 2
2 - 105 Ground Floor Plan Sheet 1
2 - 106 Ground Floor Plan Sheet 2
2 - 107 First Floor Plan Sheet 1
2 - 108 First Floor Plan Sheet 2
2 - 109 Second Floor Plan Sheet 1
2 - 110 Second Floor Plan Sheet 2
2 - 111 Roof Plan Sheet 1
2 112 Roof Plan Sheet 2

ELEVATIONS:

0010/2 - 120 Elevation to the Embankment
2 - 121 Elevations to Water Lane and Wharf Lane
2 - 122 Elevation to the Back Lane

SECTIONS:

0010/2 - 125 Cross Sections A-A and B-B
2 - 126 Cross Section CC and DD
2 - 127 Cross Section EE and FF

DETAILED ELEVATION:

0010/2 - 130 Part Elevation of King Street Frontage
2 - 131 Part Elevation Embankment and Water Lane

PRESPECTIVES:

0010/2 - 140 Sheet 1
2 - 141 Sheet 2