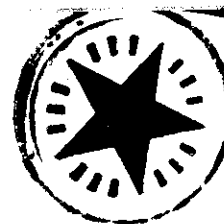




Environmental Audit
TWICKENHAM RIVERSIDE SWIMMING POOL

(rec'd 7.7.03)




Environmental Audit

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1. BRIEF

Waterman Environmental was instructed by Dearle & Henderson, on behalf of the London Borough of Richmond upon Thames to undertake an environmental audit of the Twickenham Riverside Swimming Pool site. The area has been disused for a number of years and the Council has recently submitted a planning application for a short-term scheme at the site (with a duration of up to five years). This scheme involves the demolition of buildings on part of the site and the creation of a landscaped garden incorporating children's play areas, public seating together with a hard and soft landscaped area fronting the Embankment. The Council has set out its principles for a longer-term redevelopment which will involve works to the wider site and will include commercial enabling development to fund site clearance and landscaping, public open space and mixed uses.

This environmental audit involves the analysis of the baseline conditions for the following technical issues and making suitable recommendations to enable the demolition and construction works to proceed:

- Ecological Walkover and review of reports produced by WS Atkins;
- Review of (unattributed) ecology report produced by the Twickenham Riverside Terrace Group (for the Council Cabinet meeting on December 10 2002)
- History of the site;
- Hazardous materials and their potential locations; and,
- Asbestos walkover survey.

Whilst the audit addresses these factors across the whole of the site and is therefore useful as a "baseline" assessment, its applicability is particularly focused on the short-term scheme described above.

Waterman Environmental has endeavoured to assess all information provided to them during this investigation, but makes no guarantees or warranties as to the accuracy or completeness of this information.

2. SITE DESCRIPTION AND WALKOVER SURVEY

The site is centred at National Grid Reference TQ 162 731 and is located on the northwestern bank of the River Thames at Twickenham in the London Borough of Richmond-upon-Thames. It is set back from the river by the width of The Embankment, which is a paved road and pedestrian promenade. The site is bounded by Water Lane and a private car park to the northeast and Wharf Lane to the southwest. A service road runs along the rear of the site and forms the northwestern boundary.

The site is located in a mixed retail, office, residential and leisure facilities area situated between the main shopping street and the northwest bank of the Thames. Further residential areas and leisure amenities such as yachting and rowing clubs together with commercial boat yards are present on Eel Pie Island in the Thames directly opposite the site.

The site comprises:

- The derelict Twickenham Riverside Swimming Pool that occupies the central part of the site and include related and ancillary facilities: a changing block with a separate small plant room adjacent its southwest elevation; an open-air swimming pool with surrounding open areas; also, a former restaurant and a bath house.
- An unused public toilet block to the southeast corner of the site.



Twickenham Riverside Swimming Pool



- An electrical sub-station to the northeast corner of the site.

The site slopes significantly from the service road in the northwest towards the Thames in the southeast and two levels are present as a consequence:

- **Upper Ground Floor Level** – Most of the site is an elevated platform raised about two to three metres above the level of The Embankment. This includes the swimming pool and ancillary features such as the upper floors of the changing block and bath house, small plant room, restaurant and public toilet. The swimming pool itself is located to the rear of the changing block as seen from The Embankment and comprises the derelict pool basin, which slopes down to a central deeper section and a delapidated terrace around the edge of the pool. Landscaped areas occur around the periphery of the site but these are all overgrown.
- **Lower Ground Floor Level** - The lower floors of the changing block and bath house front onto the Embankment and are therefore subject to flooding as they are below the floodplain level.

With the exception of the bathhouse (which provides accommodation to a local charity), all of the buildings are in a derelict condition and unused.

3. SITE HISTORY

Ordnance Survey maps dating from 1880 were consulted. In 1880 the site was part of the grounds (including parkland and landscaped areas) for Richmond House; the house occupied the northwest section of the site. The River Thames flowed in a northerly direction to the south of the site. The area surrounding the site was predominantly occupied by the grounds of Richmond House. A post office was situated to the north, and residential properties were located off King Street (to the north of the site) and Waterside Lane (to the east of the site). Eel Pie Island is situated in the centre of the River Thames, to the southeast of the site.

By the end of the 1800s the site had not changed, although the area to the north had become slightly more developed - a town hall and library are amongst the buildings identified. This layout remained largely the same until between 1920 and 1934 when Richmond House was demolished and the swimming pool and associated facilities had been constructed. This included two fountains located at either end of the pool. To the northwest of the site the land had been redeveloped from the grounds of Richmond House to residential use.

The layout of the site has remained largely the same until the present day, with only a few alterations. These included the construction of a paddling pool towards the northeast of the site by 1972 the fountain to the north of the swimming pool was no longer present.

Between 1992 and 1999, The Embankment vehicular access had been constructed to the southeast of the site, adjoining the River Thames.

4. ECOLOGY OF THE SITE

An extended phase 1 habitat survey of the site was carried out on 9 May 2003 by Ecology Consultancy Ltd., a specialist consultant to Waterman Environmental. Habitats were described and mapped following standard Phase 1 survey methodology (JNCC 1993), as adapted and developed for Greater London by the London Ecology Unit and its successor the GLA Biodiversity Unit (LEU 1994).

A protected species assessment was also made, searching suitable habitat features within the site for evidence of protected species such as bats, reptiles and other species.

This section reports on the findings of the survey and provides an assessment of the current ecological status of the site.



It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterization and prediction of the natural environment. The survey was carried out early in the growing season and plant species that develop later in the year will not have been recorded. However it is considered that sufficient detail was gathered to enable an objective assessment of the ecological value of the site and the likely impacts of the proposed development upon it.

4.1 BASELINE SURVEY

The various habitats and vegetation communities within the site are described in turn below. Scientific names are given after the first mention of a species, thereafter common names only are used. Nomenclature follows Stace (1997). A full list of the plant species recorded from the site is presented in Appendix 1.

4.1.1 Habitats

- Peripheral Treebelt/Woodland

Planted trees occur in the former landscape areas around the periphery of the swimming pool and on sloping ground leading down to the Embankment on either side of the main building. The tree line along the rear of the site is well developed and comprises mature specimens of fastigate hornbeam *Carpinus betulus* and Indian bean tree *Catalpa bignonioides*, together with a single specimen of whitebeam *Sorbus aria*. Shrubs such as hawthorn *Crataegus monogyna*, escallonia *Escallonia* sp. and cotoneaster *Cotoneaster* spp. occur below the trees. Elsewhere on the site the planting includes Lawson's cypress *Chamaecyparis lawsoniana*, spotted laurel *Aucuba japonica*, cherry laurel *Prunus laurocerasus* and privet *Ligustrum ovalifolium*, amongst others.

The planted areas have subsequently been colonised by self-seeded trees and shrubs such as sycamore *Acer pseudoplatanus*, goat willow *Salix caprea* and elder *Sambucus nigra* and have taken on the character of secondary woodland. Remnants of the original planting also occur in the ground vegetation, and include Spanish bluebell *Hyacinthoides hispanica* and daffodil *Narcissus pseudonarcissus*. These have been joined by common woodland plants such as bramble *Rubus fruticosus* agg., herb robert *Geranium robertianum*, wood avens *Geum urbanum* and wood false brome grass *Brachypodium sylvaticum*. Ivy *Hedera helix* is also common in the ground vegetation and grows up some of the trees.

- Scrub

Scrub vegetation consisting of butterfly bush *Buddleja davidii*, goat willow, grey willow *Salix cinerea* and elder has developed around the edge of the derelict swimming pool. Saplings of silver birch *Betula pendula*, pedunculate oak *Quercus robur*, holm oak *Q. ilex* and hornbeam are also frequent here, the latter presumably regenerated from the planted trees on the boundary. The ground vegetation below the denser areas of scrub is generally sparse but include occasional specimens of male fern *Dryopteris filix-mas* and lady fern *Athyrium filix-femina*. The more open areas are characterised by bramble and by herbs such as nettle *Urtica dioica*, cleavers *Galium aparine* and Michaelmas daisy *Aster* spp. Honesty *Lunaria annua* is common in the scrub area at the eastern end of the swimming pool.

A small area of willow scrub also occurs in a damp area in the deeper central part of the swimming pool, adjacent to a stand of swamp vegetation (see below).

- Ruderal Vegetation

Cracks between paving, piles of broken masonry and the brickwork of the derelict buildings have provided a niche for some ruderal plants. Although fairly sparse, such vegetation is scattered throughout the site and comprises species such as Oxford ragwort *Senecio squalidus*, red valerian *Centranthus ruber*, Michaelmas daisy, Guernsey fleabane *Conyza sumatrensis*, willowherbs *Epilobium* spp. and mugwort



Twickenham Riverside Swimming Pool



Artemisia vulgaris. Sandy areas between the paving on the edge of the swimming pool support a range of ephemeral and annual species such as sticky mouse-ear *Cerastium glomeratum*, thyme-leaved sandwort *Arenaria serpyllifolia*, annual pearlwort *Sagina apetala* and flattened poa *Poa compressa*, together with a small amount of mouse-ear hawkweed *Pilosella officinarum*.

- Swamp

As noted above, there is a small stand of swamp vegetation in the deeper central part of the old swimming pool. This is dominated by common bulrush *Typha latifolia*, with celery-leaved buttercup *Ranunculus sceleratus* and water pepper *Persicaria hydropiper* growing in the more open areas. The area was dry at the time of survey but water evidently ponds here, but only after heavy rain.

- Hedge

There is a short section of hawthorn hedge along the boundary in front of the public toilets.

- Amenity Grassland

Small areas of amenity grassland occur in the area in front of the public toilets. This is dominated by perennial ryegrass *Lolium perenne* and contains common herbs such as daisy *Bellis perennis* and great plantain *Plantago major*, amongst others.

- Fauna

The following birds were noted on the site during the course of the habitat survey: feral pigeon, collared dove, blue tit, long-tailed tit, blackbird, robin, wren and chaffinch. A pair of mallard was loafing on the flat-topped roof of the main building whilst house martins were seen foraging over the site. Other species recorded in the unattributed Terrace Group survey included grey heron, dunnock, great tit, jackdaw and carrion crow; the WS Atkins survey (2001) also noted grey wagtail, starling, swallow and magpie; however, none of these were identified during the course of the current survey. Blue tit and wren were confirmed as breeding on the site in 2001 (W.S. Atkins - op.cit.) and several of the other species might also presumably nest there although, again, no evidence of such was found during the course of the current study.

Mammals noted during the current survey included brown rat in the buildings and fox in the scrub and woodland around the swimming pool. An active fox earth occurs on the southwestern boundary and another apparently unused earth is located under trees on the northwestern boundary.

All accessible parts of the buildings were searched for evidence of roosting bats. Some of these (e.g. the plant room and other lower ground floor areas of the changing block) would appear to provide suitable roosting sites but no evidence of bats was found. There are several areas which could not be examined and which might, conceivably, offer potential roosting sites, including spaces under the swimming pool terrace, cavities in the roof of the main building plus the bathhouse and other buildings at the north-eastern end of the site. Accordingly, a bat survey has been commissioned across the whole site to enhance certainty of information. It should be noted in this context that for the purposes of this survey (and its related recommendations) the focus is on the short-term scheme proposed by the Council. However, since adjoining derelict buildings could conceivably be exposed to noise and other disturbance from the proposed demolition works, the bat survey will be designed to encompass these areas also. WS Atkins (2001) carried out a bat activity survey on the Embankment in front of the swimming baths and recorded two bats (which were tentatively identified as noctule or Leisler's bats) foraging around horse chestnut trees on the Embankment. Two of the larger horse chestnut trees were considered to provide potential bat roosting sites. The London Bat Group has records of common pipistrelle from the Twickenham area plus soprano pipistrelle and noctule from the wider Richmond-upon-Thames area.

WS Atkins (2001) found common frog in the swamp area in the central part of the swimming pool and considered that smooth newt and common toad might also occur here. Given the lack of standing water in the area it seems rather unlikely that any amphibians successfully breed here, at least not in 2003.



WS Atkins also carried out a search of likely microhabitats around the periphery of the pool for evidence of common reptiles such as slowworm and common lizard. Although they failed to find any evidence of these species, it was considered that there was might be the potential for slowworm, in particular, to occur. Consequently, a survey has been commissioned to determine the presence or otherwise of reptiles on the site.

Both the bat and reptile surveys are scheduled to take place in June/July 2003 and the findings will be reported to the relevant authorities.

4.2 EVALUATION

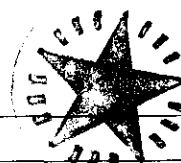
Table 1 evaluates the nature conservation value of the study area using the criteria for nature conservation sites adopted by the Greater London Authority (See Appendix 2). The evaluation is based on data collected during the habitat survey carried out in May 2003, the WS Atkins report (2001) and the unattributed information from the Twickenham Riverside Terrace Group.

Table 1 Evaluation of the Site against GLA Criteria

GLA Criteria	Remarks
Representation	None of the habitats present within the site can be regarded as the best of their type, either in Richmond-upon-Thames or Greater London.
Habitat rarity	The habitats present are generally typical of derelict sites and buildings and are common in Greater London. ('Wasteland' habitats such as this are however listed as a priority habitat in the London Biodiversity Action Plan (London Biodiversity Partnership 2001). The area of bulrush-dominated swamp in the swimming pool is unusual in a setting such as this - but is a common vegetation type generally.
Species rarity	The majority of the plant species recorded on the site are common and widespread at a national scale. The following are uncommon in Greater London: Flattened meadow grass <i>Poa compressa</i> , which was recorded from 8.5% of Greater London tetrads in the Flora of the London Area (Burton 1983). This was found to be occasional on the terrace area around the swimming pool. Lady fern <i>Athyrium filix-femina</i> , again recorded from 8.5% of Greater London tetrads (Burton op. cit.). A single plant was found growing under shade near the main building. Stinking iris <i>Iris foetidissima</i> , recorded from 1.5% of Greater London tetrads (Burton op. cit.). A single plant growing beneath trees. Annual pearlwort <i>Sagina apetala</i> , recorded from 9.5% of Greater London tetrads (Burton op. cit.). Found growing in cracks between paving slabs on the terrace and elsewhere. Red valerian <i>Centranthus ruber</i> recorded from 7.25% of Greater London tetrads (Burton op. cit.). Grows on the roof of the main building. Pampas grass <i>Cortaderia selloana</i> , not recorded at the time of the London Flora but increasingly naturalised (Preston et al 2002). A single plant grows on the wall above Wharf Lane. All of the birds recorded on the site are common and widespread in the London area (Hewlett 2002), although house martin (which feed over the area) have exhibited a decline in recent years and are a London Biodiversity Action Plan priority species (London Biodiversity Partnership 2001).
Habitat richness	Habitat richness is generally low, with the majority of the site either covered by planted trees/woodland and scrub or by sparse ruderal vegetation.
Species richness	Species richness is moderate.
Size	The site is relatively small.
Important populations	No important species populations are known to be present on the site based on previous



Twickenham Riverside Swimming Pool



GLA Criteria	Remarks
	inspections and surveys together with the present study, however there might be the potential for protected species such as bats and common reptiles to occur.
Ancient character	The site is artificial and the habitats present are of recent origin.
Recreatability	All of the habitats present are potentially recreatable.
Typical urban character	The habitats present are generally typical of derelict buildings and brownfield sites in urban areas.
Cultural or historic character	None known.
Geographic position	The site is adjacent to the River Thames, which is a Site of Metropolitan Importance for Nature Conservation. However it provides habitat for only a limited range of species associated with the river, with most of the species present being typical of terrestrial habitats.
Access	There is no official public access.
Use	Mostly derelict and unused, with one building in use as offices.
Potential	The site has some potential for ecological enhancement although it is difficult to envisage how this could be achieved without quite substantial modification, including the removal of dangerous and derelict structures.
Aesthetic appeal	Whilst the site itself is situated in an attractive area (by virtue of the riverside setting), the aesthetic appeal of the area and the site itself is marred by the derelict nature of the buildings and graffiti.

Taking all of the above criteria into account, the site can be considered to have some ecological value in a local context. However similar value might reasonably be expected to develop on any derelict/vacant site that had been abandoned for approximately a 20-year period. Despite its proximity to the riverside, the elevated nature of the site means that, apart from the ground floor of the main building (which is concrete), the site is physically separated from the floodplain of the River Thames and consequently it does not support any riparian habitats or species of note.

On the basis of existing information the site is considered to be of insufficient ecological interest to merit designation as a Site of Nature Conservation Importance and was not listed as such by the former London Ecology Unit in their handbook 'Nature Conservation in Richmond upon Thames' (Archer & Curson 1993).

However, as previously noted, there might be the possibility that buildings and other structures within the site could be used by roosting bats, which are given protection under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and the Schedule 2 of the Habitat Regulations 1994.

It is also possible that the more open areas of the site are inhabited by slowworm and possibly other common reptiles, which are protected from killing, injury and sale under Schedule 5 of the Wildlife & Countryside Act 1981.

Bat and reptile surveys have been commissioned across the whole site particularly with regard to locations that will be affected by the short-term scheme.

If protected species are found, suitable mitigation measures can be devised and agreed with English Nature. A licence would need to be obtained from DEFRA before undertaking any work which affects bats or their roosting sites.



4.3 IMPACTS OF THE SHORT TERM SCHEME AND RECOMMENDATIONS

The proposed redevelopment of the site will involve the demolition of the main building and the construction of an L-shaped garden along Wharf Road and the Embankment. The garden will include children's play areas and seating areas. The swimming pool, bathhouse and public toilet areas will be retained and separated from the garden by secure fencing. Existing trees along the rear of the site are to be retained and the applicant has identified that consultation with the Council's arboriculturist will take place to consider issues of maintenance and tree surgery (e.g. thinning). The scheme seeks the retention of a number of trees on either side of the main building on the Embankment (subject to thinning/tree surgery to address structural damage/weakening caused by self-seeded trees); this area will therefore be retained and supplemented with new shrub and tree planting.

The main ecological impacts of the scheme will be the loss of a small area of secondary woodland, scrub and ruderal vegetation at the Wharf Lane end of the site. It is likely that an additional area of these habitats will need to be cleared around the perimeter of the swimming pool to facilitate the demolition of the main building and construction works. This will result in the potential removal of some nesting and foraging habitat for birds locally. All nesting birds are given protection under Section 1 of the Wildlife & Countryside Act 1981. It is therefore preferable to undertake clearance and demolition works outside of the bird breeding season (March-August) where at all possible. If clearance or demolition work is carried out during the breeding season, it will need to be preceded by inspections for nesting birds.

Whilst no evidence has been found as yet to support their presence on the site, bats and reptiles such as slow worms could be affected if they are located in parts of the site that that will be disturbed by demolition/construction work.

A fox earth on the Wharf Lane boundary will be lost to facilitate the short-term scheme, although this will take place outside the breeding season.

The landscaping of the garden area presents opportunities for providing new habitats for wildlife, to compensate for the removal of some existing habitats, however careful thought will need to be given to the appropriateness of the following planting suggestions given the intended use of the site to provide children's playgrounds and to the fact that the development is proposed as having a five-year duration. Mature trees will mostly be retained and under-planted with new shrubberies. The ecological value of this planting can be maximised by utilising predominantly native species that will provide larval foodplants and nectar sources for insects and nesting sites and fruit for birds. Suitable species include: hawthorn *Crataegus monogyna*, holly *Ilex aquifolium*, dog rose *Rosa canina*, dogwood *Cornus sanguinea* and guelder rose *Viburnum opulus*. In terms of any new tree planting, species such as silver birch *Betula pendula*, pedunculate oak *Quercus robur*, wild cherry *Prunus avium*, grey willow *S. cinerea* and goat willow *S. caprea* should be planted to reflect the character of the existing vegetation. It would also be appropriate to include native wetland trees in a riverside location such as this, including alder *Alnus glutinosa*, crack willow *Salix fragilis*, white willow *S. alba* and aspen *Populus tremula*. The ground vegetation below the trees could mainly be left to colonise naturally, although it might be appropriate to plant ivy *Hedera helix* in selected locations and perhaps transplant selected plants from the existing vegetation e.g. male fern *Dryopteris filix-mas* and lady fern *Athyrium filix-femina*. The inclusion of some butterfly bush *Buddleja davidii* in the planting scheme is also recommended – although not a native species it is an established part of the urban flora and is a valuable nectar source for insects, especially butterflies. Climbers such as honeysuckle *Lonicera periclymenum* and traveller's joy *Clematis vitalba* could be planted and trained up the fencing at the rear of the garden to provide further foodplants and later, nesting places for birds. This would need to be balanced with the fact that this is intended as a short-term scheme. Bird boxes could be established as a supplementary measure.

In the longer-term and as part of more enduring development, bird nesting and bat roosting boxes could be erected on mature trees (ensuring they are out of the reach of vandals) to provide new opportunities for these species.



It is likely that much of the ruderal flora of the area will survive on the remaining part of the site i.e. around the fenced swimming pool basin. Further niches for some of the less common ruderal plants such as flattened meadow-grass, annual pearlwort etc. could be created within the more open parts of the playground areas e.g. between paving stones, on walls etc. However, the level of usage and disturbance in the playground might limit the growth of these species.

5. ARCHAEOLOGY

A full archaeological desk study was undertaken by the Museum of London Archaeological Survey (MOLAS) in 2001. This provided a thorough analysis of potential archaeological considerations for a more comprehensive redevelopment (e.g. with extensive subterranean works).

In light of the proposals to develop the public play areas and landscaped gardens in part of the site, it is not considered these works will necessitate a full archaeological evaluation. For the short term scheme there will be no significant intrusive ground works at a depth (or locations) that the MOLAS study identified as potentially containing archaeological remains.

6. ASBESTOS

6.1 BACKGROUND INFORMATION

6.1.1 General

Asbestos is the name given to a group of naturally occurring fibrous silicate minerals commonly found in rocks worldwide and commercially mined chiefly in Canada, Russia and South Africa. There are three main types: chrysotile (white), amosite (brown) and crocidolite (blue) asbestos. There are also three other comparatively rare forms: Tremolite, Actinolite and Anthophyllite.

Its useful properties have been known for centuries but it was not until the last hundred years or so that its widespread use began as a result of rapid industrial expansion. It has been estimated that approximately 6 million tonnes of asbestos has been imported into the UK since the turn of the last century. This peaked in 1973 at approximately 195,000 tonnes. Asbestos has been called the "miracle fibre" due to its widespread occurrence, relative cheapness of extraction and its multiplicity of uses. Its most prized characteristics were considered to be its strength, flexibility and heat resistance. Much of it is still in situ within buildings and cannot always be easily recognised. There has been a large number of applications including: sprayed fire protection to structural elements; lagging to pipework and plant; insulation board ceiling tiles, firebreaks, partition walls and door panels; cement roof sheet, wall cladding, flues, gutters and water tanks; woven seals, fire blankets and safety curtains; paper lining beneath manmade mineral fibre thermal insulation and vinyl flooring material; also, asbestos' high tensile strength has been used as a re-enforcement for plaster, vinyl, bitumen and plastic materials forming a wide variety of manufactured products such as "artex", floor tiles, felts and toilet goods.

The fibres can be small enough to penetrate the furthest reaches of the lungs and can remain there for decades. This can lead to the development of one of three fatal illnesses: asbestosis (scarring of the lungs), lung cancer and mesothelioma (a cancer of the lining around the lungs and stomach). They are thought to be responsible for about 3,000 deaths a year in Great Britain.

The physical properties of asbestos containing materials can vary, particularly in relation to their friability (tendency to crumble and release airborne fibres as a result). Even small scale routine maintenance to such materials as sprayed asbestos, lagging and insulation board can lead to airborne fibre levels well in excess of current permitted levels. Once more extensive works are initiated, such as refurbishment or



demolition, the risk of major contamination resulting from disturbance to a wide range of asbestos containing materials is significantly increased.

6.1.2 Legislation

The early Asbestos Regulations up to and including those made in 1969 were chiefly concerned with the use of asbestos in manufacturing processes and focused on such measures as the installation of suitable draught ventilation in factories. The modern era was ushered in by the Health & Safety at Work etc Act 1974 that imposed a general duty of care on employers to provide a safe workplace. This was followed by the Control of Asbestos at Work Regulations 1987 (CAWR, as amended in 1992 & 1998) that imposed much more detailed duties on employers that were specific to asbestos materials. The revised CAWR, made on 21 November 2002, have further extended the scope of the regulations and there is now a specific duty to manage asbestos risks in non-domestic premises. This duty is imposed by a new Regulation 4 that has an 18-month lead-in period terminating in May 2004, after which the HSE will begin enforcement. Persons acquire duties under CAWR if they have responsibilities for maintenance and repair and they may include a wide variety of individuals such as employers, owners, landlords, managing agents, surveyors, architects and engineers. Developers may also become duty holders as a result of acquiring ownership of property.

Private dwellings such as house and flats are domestic premises and are therefore excluded from the scope of the CAWR Regulations. Common parts of buildings such as housing developments, blocks of flats and the like would still fall within the provisions of Regulation 4, however, as detailed in the supporting HSE Approved Code of Practice and Guidance: "The management of asbestos in non-domestic premises - Regulation 4 of the Control of Asbestos at Work Regulations 2002" L127 (2002). Paragraph 7 of the document specifically refers to "Examples of common parts would include foyers, corridors, lifts and lift shafts, staircases, boiler houses, vertical risers, gardens, yards and outhouses".

A whole raft of other ancillary legislation, approved codes of practice and HSE guidance notes support the Regulations.

A further key piece of legislation, the Construction (Design & Management) Regulations 1994 (CDM) also requires that arrangements be put in place for dealing with a wide range of health and safety issues during construction projects and asbestos is specifically mentioned in the supporting HSE Approved Code of Practice and Guidance: "Managing Health and Safety in Construction. Construction (Design and Management Regulations) 1994." HSG 224 (2001).

6.1.3 Surveys

Adequate risk assessment will be integral to the proper management of asbestos-containing materials (ACMs) either in non-domestic premises or during construction projects. Although not prescribed by CAWR or CDM, in many instances proper risk assessment will involve technical asbestos survey work supported by sampling and testing of suspect materials. In advance of CAWR 2002, the HSE issued a benchmark publication for the proper conduct of asbestos survey work: HSE Guidance Note MDHS 100 "Surveying, sampling and assessment of asbestos-containing materials" 2001. The Guidance outlines three types of asbestos survey that can be carried out, any one of which or a mixture of all three would be a very useful tool in developing a register of known or suspected asbestos materials to satisfy the relevant legislation.

- Type 1: Presumptive Survey

This type of survey is designed to visually locate, as far as reasonably practicable, the suspected ACMs in the building and assess their condition. Sampling does not take place until there is a likelihood of them being disturbed by such works as refurbishment or demolition. The scope of the survey is still comprehensive, with ceiling voids, risers, lift shafts and other features being investigated and any areas of no access being recorded. Key to this type of survey is that a suitably experienced individual can usually identify a material that possibly contains asbestos. Until this initial assessment is tested by analysis, however, the material must be presumed to contain asbestos in the absence of strong evidence



to the contrary such as it is clearly wood, glass, plasterboard and the like or that the original specification is still available detailing that a non-asbestos product be used. Therefore, it may well be that a number of non-asbestos materials will have to be presumed to contain asbestos until proved otherwise. Furthermore, an enhanced status, that of strong presumption of asbestos content, will have to be ascribed to a material if for example fibres consistent with asbestos are visible within it.

- Type 2: Standard Sampling Survey

This is exactly the same scope of investigation as the Type 1 survey, with the addition of sampling & analysis of suspect materials, to confirm or otherwise its asbestos content.

- Type 3: Pre-Demolition/Major Refurbishment Survey

This type of survey is designed to identify and annotate, as far as practicable, all ACMs with the use, where appropriate, of destructive techniques. A full sampling regime is utilised and estimates as to the extent of the ACMs is undertaken. The condition of the ACMs is not assessed, however, as the purpose of the exercise is to facilitate its removal. The resulting document can then support the asbestos removal tender and it will form part of the Health and Safety Plan and File for the project if it falls within the CDM Regulations.

6.2 FINDINGS OF WALKOVER INSPECTION

6.2.1 General

On 9 May 2003 a walkover inspection of the site was carried out by Sean Cunningham of Waterman Environmental following a site briefing provided by Mike Joyce of Dearle & Henderson and Tom McKeivitt of the London Borough of Richmond-upon-Thames.

The site has been disused for some 20 years and the site conditions bear this out with the changing room block now derelict and the external areas heavily overgrown and decrepit. Graffiti covers most available surfaces with the resulting used spray paint cans scattered across the site. It is also understood that the bathhouse premises have been squatted in the past.

Generally, within those buildings to which the walkover inspection could gain access, materials strongly presumed to contain asbestos are not greatly in evidence; some additional presumed ACMs were noted, however. There are also some locations that it was not practicable to access that should be investigated during the technical survey work that will occur after the grant of a planning consent. This survey work will be required before soft strip and demolition can proceed. Details regarding these suspect materials and locations are given in Section 6.2.2 below.

6.2.2 Specific

The findings of the inspections are as set out below. Although these initial inspections are not technical investigations as outlined in Section 6.1.3, a similar system of "strong presumption" (Table 2) and "presumption" (Table 3) for suspected asbestos-containing materials is adopted. In addition, suspect locations that could not be inspected and which may also contain asbestos materials are included in Table 4.



Twickenham Riverside Swimming Pool



Table 2: Materials Strongly Presumed to Contain Asbestos

Location	Room/Area	Item	Photo	Suspect Material	Comment
Changing Block	Ladies WC (East Toilets)	Redundant Flue/Pipe	5	Asbestos Cement	The original location of this flue/pipe could not be ascertained.
Small Block House	Internal	Flash Guards Within Fuse Box	6	Asbestos Rope	More asbestos components may be found in electrical plant elsewhere on site (see Table 3 below).
Swimming Pool	Open Area to North West	Discarded Board Material	7	Asbestos Cement	The original location of this material could not be ascertained. It may well be fly tipped.

Table 3: Materials Presumed to Contain Asbestos

Location	Room/Area	Item	Photo	Suspect Material	Comment
Changing Block	Southwest Plant Room on Lower Level	Redundant Pipe Unit	8	Insulation	Poor lighting prevented an adequate inspection of this item. Its origin could not be ascertained.
Changing Block	Upper Level	Red Floor Screed	9	Bitumen	Asbestos has sometimes been added to these flooring materials although this is relatively uncommon.
Changing Block	Ladies & Gents WCs	Toilet Goods	10	Bakelite	Debris from removed toilet seats present in both locations.
Changing Block	Flat Roof Areas to Changing Rooms & WCs	Roofing Material	11 & 12	Bitumen Felts & Screeds	Debris from damage to these materials may also be present to areas below

Table 4: Additional Suspect Locations that May Contain Asbestos Materials

Location	Room/Area	Item	Photo	Comment
Changing Block	Northeast Plant Room on Lower Level	Electrical Equipment	13	Possible presence of internal asbestos components.
Changing Block	Northeast Plant Room on Lower Level	Pipework	14	Possible presence of internal gasket components.
Changing Block	North West Elevation	Stack	15	This stack is routed up through the Gents WC but it was not possible to locate its base in the plant room below. It may possibly originate in the void between the Changing Block and the Swimming Pool.
Changing Block	Ladies & Gents WCs	Skylights	16	Rope seals are commonly found in association with flashings to the glazing panels forming these skylights. The glazing is now largely destroyed but the flashings are still in evidence and could not be closely inspected.
Swimming Pool	Open Area Adjacent Changing Block	Sub-Floor Voids	17 & 18	Small doors at high level within the plant rooms of the Changing Block (photo 13) lead into these voids (photo 14). Future investigation of these voids should be the subject of confined spaces risk assessment.



6.2.3 Areas of Restricted Access

The following buildings to the northeast and southeast of the site are locked and boarded up. They were not inspected on the day of the current survey as they do not form part of the short-term scheme that is the focus of this report.

- Restaurant;
- Bath House; and,
- Public Toilet Block.

Unless already assessed by the London Borough of Richmond Upon Thames as part of its own preparations for the revised CAWR (e.g. in an asbestos register), it is considered a matter of importance for these buildings to be inspected as soon as is practicable, particularly in view of the fact that a cement flue, strongly suspected of asbestos, was observed to the northeast corner of the restaurant premises (photo 19).

In addition, access could not be gained to the electrical substation but this is very likely to be controlled exclusively by the local electricity service provider and any assessment for asbestos materials therein will require their co-operation. Likewise, unless already assessed by the London Borough of Richmond Upon Thames as part of its own preparations for the revised CAWR, it is recommended that the Council contact the electricity supplier to ascertain the status of the sub-station.

6.3 RECOMMENDATIONS

During the walkover inspection a relatively small number of materials were noted that are strongly suspected of containing asbestos as well as further materials that may be found to contain asbestos following sampling and analysis. Inaccessible locations were also encountered where asbestos materials may be present.

In addition, there are a significant number of buildings on site that were not inspected as they are locked and boarded up and will not be the subject of development in the present planning application. At least one of these buildings, the restaurant, is strongly suspected of containing asbestos materials.

Regulation 4 of CAWR 2002 will be enforced from May 2004 onwards and an asbestos risk management plan including an up-to-date register of known/presumed asbestos materials will have to be developed for all buildings on site. An effective means of achieving this will be to commission a technical asbestos survey in accordance with HSE Guidance Note MDHS.

Assuming planning consent is granted, an MDHS 100 Type 2/3 full access intrusive/destructive asbestos survey should be carried out by a suitably UKAS accredited specialist asbestos laboratory in those buildings that are to be demolished/refurbished for the short term scheme. This should be done to satisfy the Control of Asbestos at Work and Construction (Design And Management) Regulations before soft strip and demolition take place. The resulting report should form part of the CDM Health & Safety Plan and File for the project and can be included in the tender package for the demolition work or as part of a separate asbestos removal contract.



7. ENVIRONMENTAL MANAGEMENT OF THE DEMOLITION WORKS

To help ensure that the demolition and construction works proceed with minimal disturbance and nuisance to surrounding sensitive receptors, including residential properties, local wildlife and the River Thames, it is recommended that an Environmental Management Plan (EMP) be prepared and implemented by the demolition and/or building contractors. These documented management systems are a useful method to control potential environmental impacts, ensure that relevant legislation is followed and that appropriate environmental practices are adopted. An outline of the potential content and relevant procedures for the Twickenham Swimming Pool scheme is described below.

- **Noise and Vibration** - Residential accommodation is located quite close to the site; mainly along Water Lane, Wharf Lane and King Street. It is advisable to ensure that the works proceed with minimal disturbance to these receptors, any businesses and also to electricity sub stations in close vicinity to the site. The procedure for noise and vibration control will include monitoring the existing baseline levels and setting appropriate action levels to control levels during the works.
- **Emissions to Air** - dust creation and emission should be controlled and minimised. A procedure can be implemented that minimises dust creation and has recommendations for action levels where nuisance to surrounding users may occur.
- **Neighbourhood Liaison** - The residents and businesses in the surrounding area would benefit from having a phone number that they can call in case they have any problems with the site, and it would be advisable for them to be made aware of any unusual works that are planned before they take place. This might be done by requesting such receptors to register their contact details prior to the commencement of demolition and construction with the contractor.
- **Ecology** - A procedure should be prepared that allows for the relevant area to be surveyed for bats, nesting birds and slow worm prior to works commencing on the site and for the provision of a suitable mitigation strategy if evidence renders this necessary.
- **Asbestos** - All asbestos needs to be identified and removed prior to works commencing on the site. Those items of asbestos that are notifiable to the enforcing HSE authority will need to be removed by specialist removal contractors holding a license from the HSE.
- **Hazardous Materials** - All waste already present on the site will need to be disposed of in accordance with relevant legislation. This includes the empty spray paint cans and oil drums. A decommissioning and dismantling procedure will ensure that all works to clear the site are undertaken safely and correctly.
- **Waste Management** - Methods to minimise waste production can be implemented, along with procedures to ensure that all waste is disposed of in accordance with the relevant legislation.
- **Archaeology** - *archaeology is not anticipated to be a significant issue.*
- **Discharges to water and site drainage** - Due to the location of the site close to the River Thames it is advisable that procedures are implemented to minimise the potential of any pollutant (e.g. silt, oil, fuels) entering either the river or the groundwater. Temporary site drainage may need to be established.
- **Material storage and handling** - Storage of all fuels, oils and other chemicals correctly will minimise the risk of spillages and potential pollution of the river or groundwater.
- **Emergencies and Accidents** - In the event of any discharge into nearby waterbodies or groundwater suitable procedures need to be rapidly available to limit any damage and the Environment Agency should be contacted immediately.
- **Traffic Management** - Traffic routes to and from the site will need to be agreed with the London Borough of Richmond to provide reasonable and appropriate access for demolition and building contractors and minimise disturbance to residents. Given the need to balance these factors, it may be necessary to adopt a range of procedures to reduce queuing on the roads leading to the site.



8. CONCLUSIONS AND RECOMMENDATIONS

8.1 GENERAL SITE CONDITIONS

It is considered that the historical site uses represent a low risk of contamination, as prior to the swimming pool complex being constructed in the mid 1900s the site was part of the gardens for Richmond House. However, prior to works commencing on the site it is recommended that a limited site investigation be undertaken in the ground areas occupied with the fuel storage tanks and chlorine tanks. This will establish whether any of this material needs to be removed as Special Waste. Chemical testing of all excavated ground materials will also be required to ensure that it is correctly disposed of in accordance with the Duty of Care Regulations.

A full record of all hazardous materials present on the site should be made prior to works commencing, which will enable dismantling / decommissioning procedures to be prepared.

8.2 ECOLOGY

The main ecological impacts of the scheme will be the loss of a small area of secondary woodland, scrub and ruderal vegetation at the Wharf Lane end of the site. It is likely that an additional area of these habitats will need to be cleared around the perimeter of the swimming pool to facilitate the demolition and construction works. This may result in the loss of some nesting and foraging habitat for birds although similar habitats are available in the immediate vicinity. Slowworm and other reptiles, (if they were present), could also be affected. The demolition of the main building could result in the loss of other potential nesting sites for birds, which could be mitigated by the inclusion of nesting boxes as appropriate.

Surveys are scheduled to be undertaken to determine whether roosting bats and slowworm occur on the parts of the site that could be affected by this short-term development. If protected species are found, suitable mitigation measures will need to be devised and agreed with English Nature. A licence would need to be obtained from DEFRA before undertaking any work which affects bats or their roosting sites.

The landscaping of the garden area presents opportunities for providing new habitats for wildlife, to compensate for loss of existing habitats. Mature trees will mostly be retained and under-planted with new shrubberies. The ecological value of this planting can be maximised by utilising predominantly native species, which will provide larval food-plants and nectar sources for insects and nesting sites and fruit for birds. Prior to the long-term development of the site, a further environmental assessment, including ecological surveys, would be necessary.

8.3 ASBESTOS

During the walkover inspection a relatively small number of materials were noted that are strongly suspected of containing asbestos as well as further materials that may be found to contain asbestos following sampling and analysis. Inaccessible locations were also encountered where asbestos materials may be present.

An asbestos risk management plan including an up-to-date register of known/presumed asbestos materials will have to be developed for all buildings on site to comply with the new Regulation 4 of CAWR 2002. An effective means of achieving this would be to commission a technical asbestos survey in accordance with HSE Guidance Note MDHS.



Assuming planning consent is granted, an MDHS 100 Type 2/3 full access intrusive/destructive asbestos survey should be carried out by a suitably UKAS accredited specialist asbestos laboratory in those buildings that are to be demolished/refurbished for the short term scheme. This should be done to satisfy the Control of Asbestos at Work and Construction (Design And Management) Regulations before soft strip and demolition take place. This can take place as part of the normal contracting/tender process.

8.4 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

As described in Section 8, an EMP is a useful working document which can be used to control environmental aspects during the demolition and construction phases of the proposal redevelopment. Production of an EMP and implementation of pollution control procedures are recommended for this scheme, in view of the surrounding sensitive receptors (residential uses, the River Thames and the groundwater) that have the potential to influence the works.



Appendix A SITE PLANS

- o SITE LOCATION PLAN (FIG. 1)
- o SITE PLAN (FIG. 2)
- o ECOLOGICAL WALKOVER INFORMATION (FIG. 3)



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Job No:- EN3076

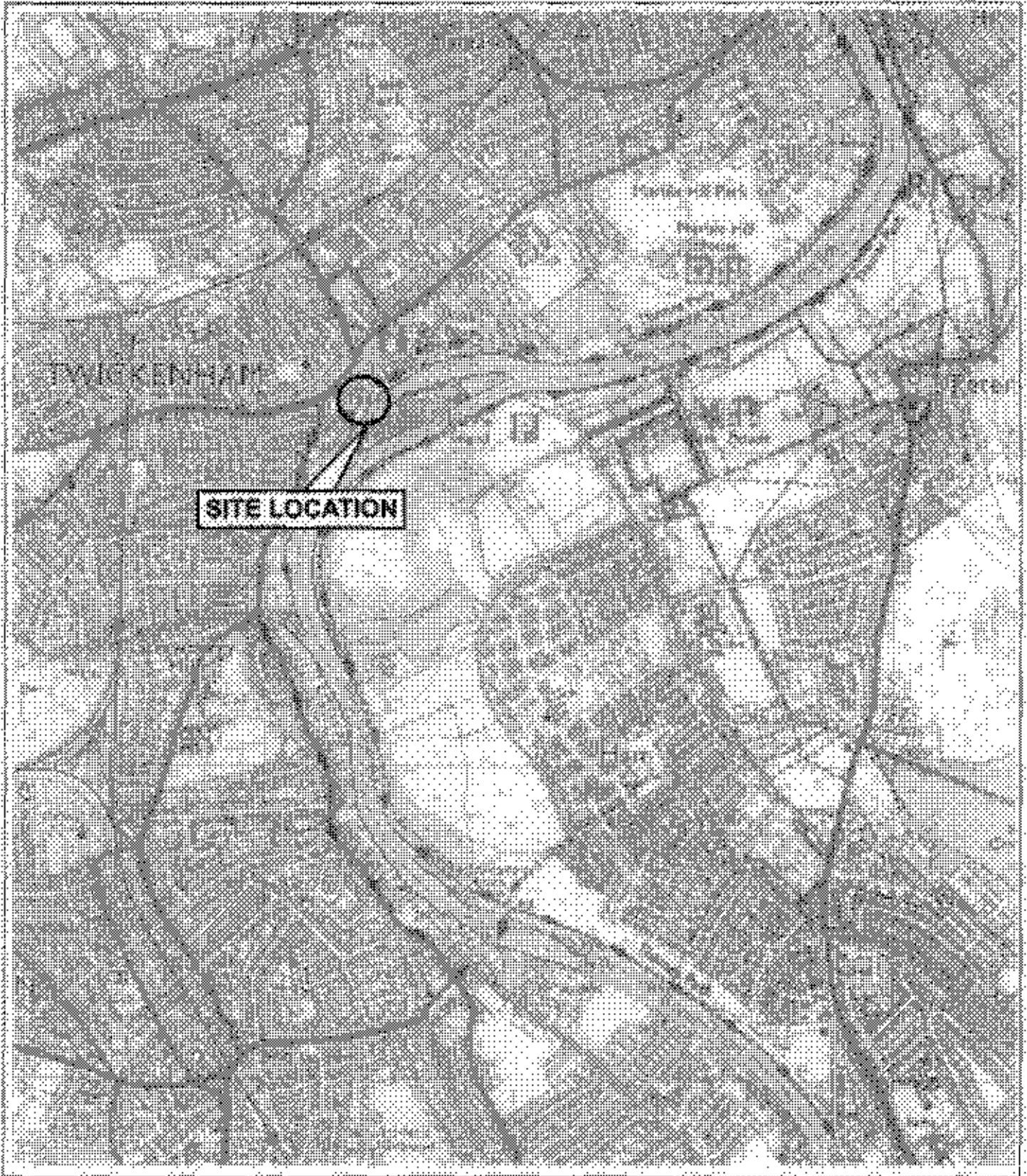
Figure No:- 1

Title: Twickenham Swimming Pool
Site Location Plan

Date - May 2003

Scale: NTS

Drawn By: DS





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TELEPHONE 020 7928 1998

LONDON SE1 8MJ
FAX 020 7928 0698

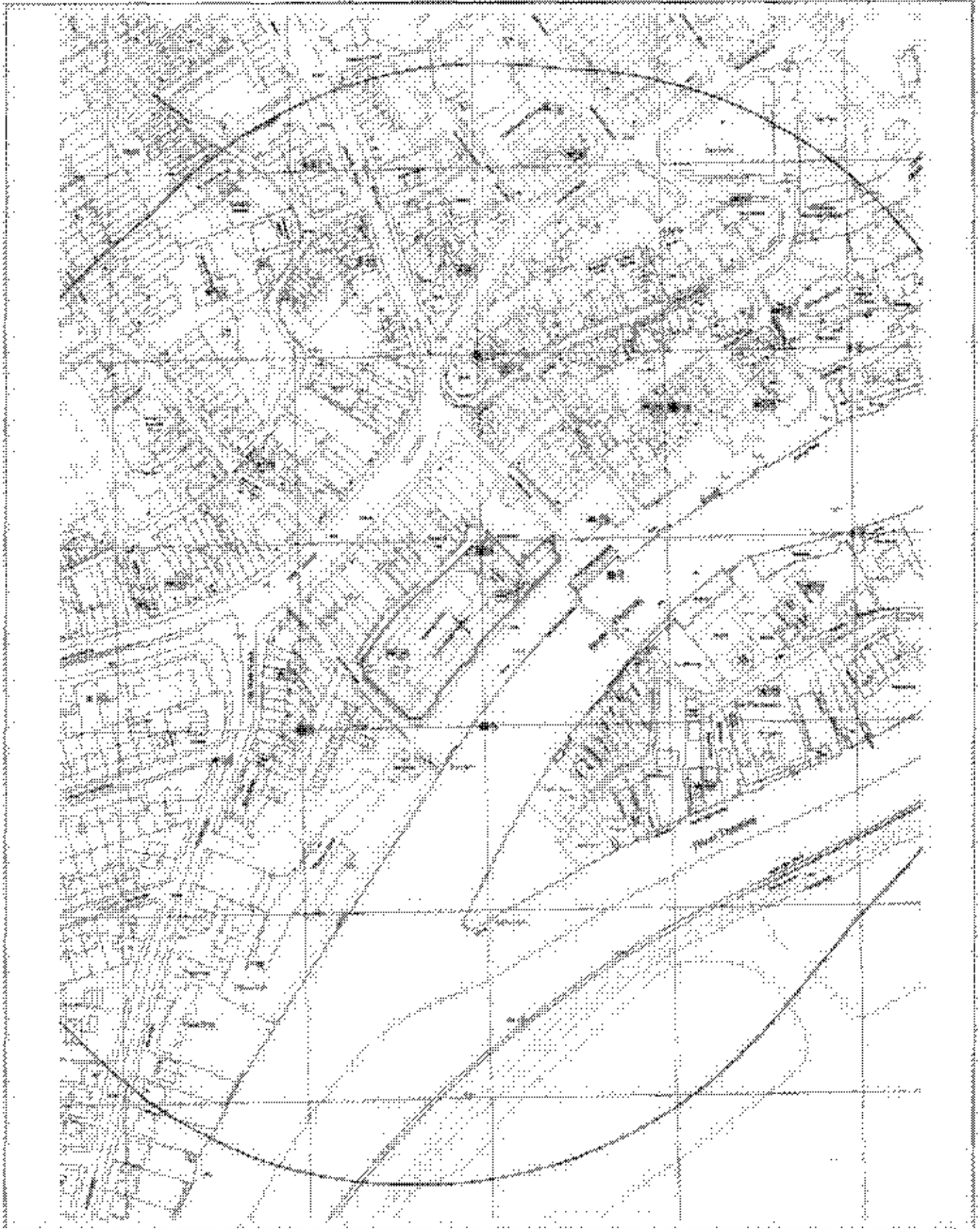
Job No:- EN3676

Figure No. 2

Title:- Twickenham Swimming Pool
Site Plan

Scale: 1:15
Drawn By: JG

Date:- May 2003





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Figure No:- 4

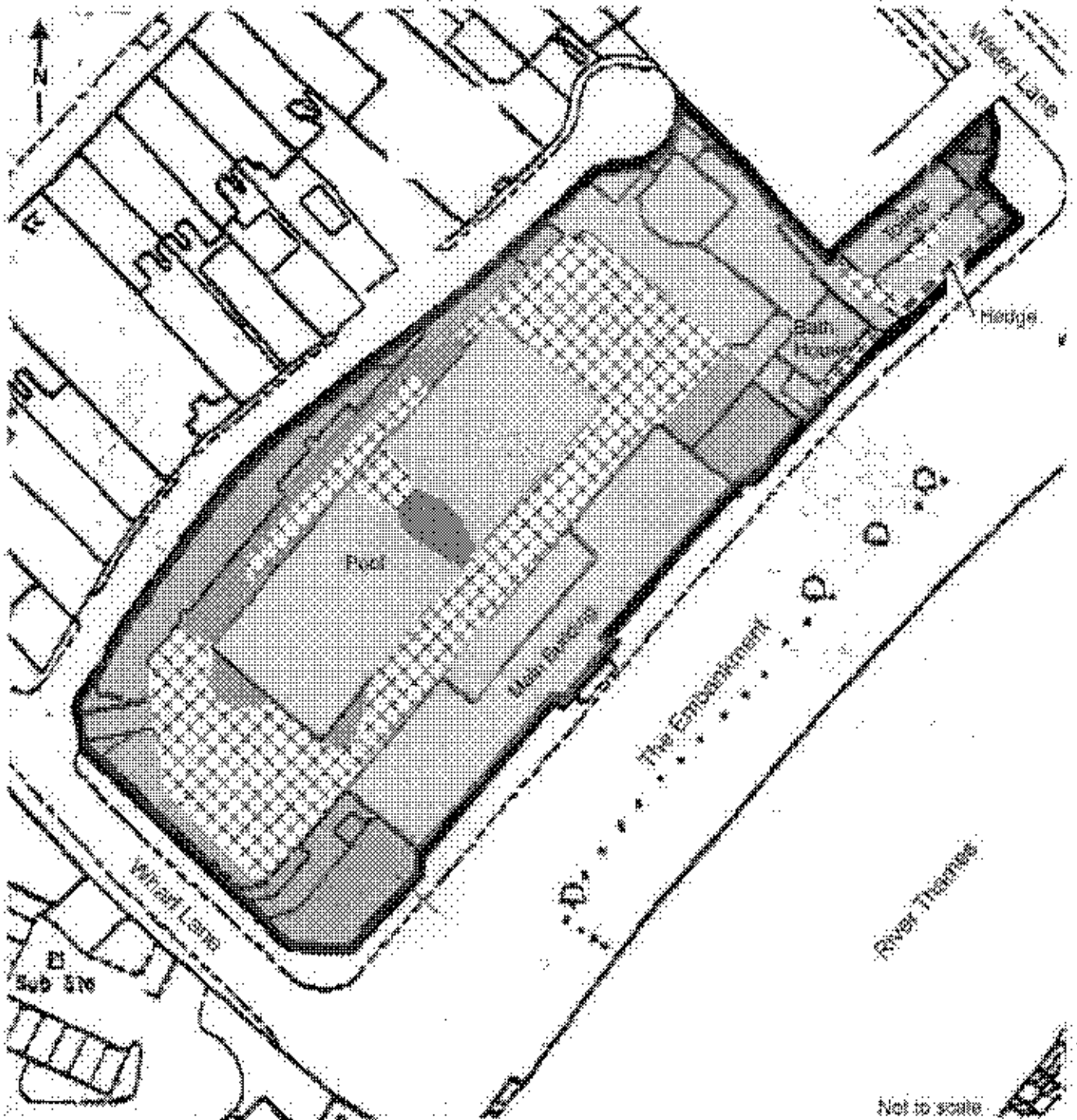
Title:- Twickenham Swimming Pool
Ecological Walkover Information

VERSAILLES COURT 1 PARIS GARDEN
Tel: 020 7828 7055

LONDON SE1 8AA
Fax: 020 7828 0656

Date:- May 2003

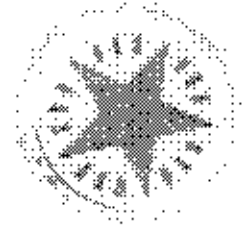
Scale:- NTS
Drawn By:- DS



- | | | | |
|--|------------------------|--|---------------------------|
| | Planted trees/woodland | | Barren/sparsely vegetated |
| | Scrub | | Swamp |
| | Ruderal vegetation | | |



Twickenham Riverside Swimming Pool



Appendix B: SITE PHOTOGRAPHS

o Pages 1-19



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Plate 1 of 2

Title: Twickenham Riverside Swimming Pool
Site Photographs

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Date: May 2003

Scale: N/S

Drawn By: DS



Plate 1 - Interior view of the main building

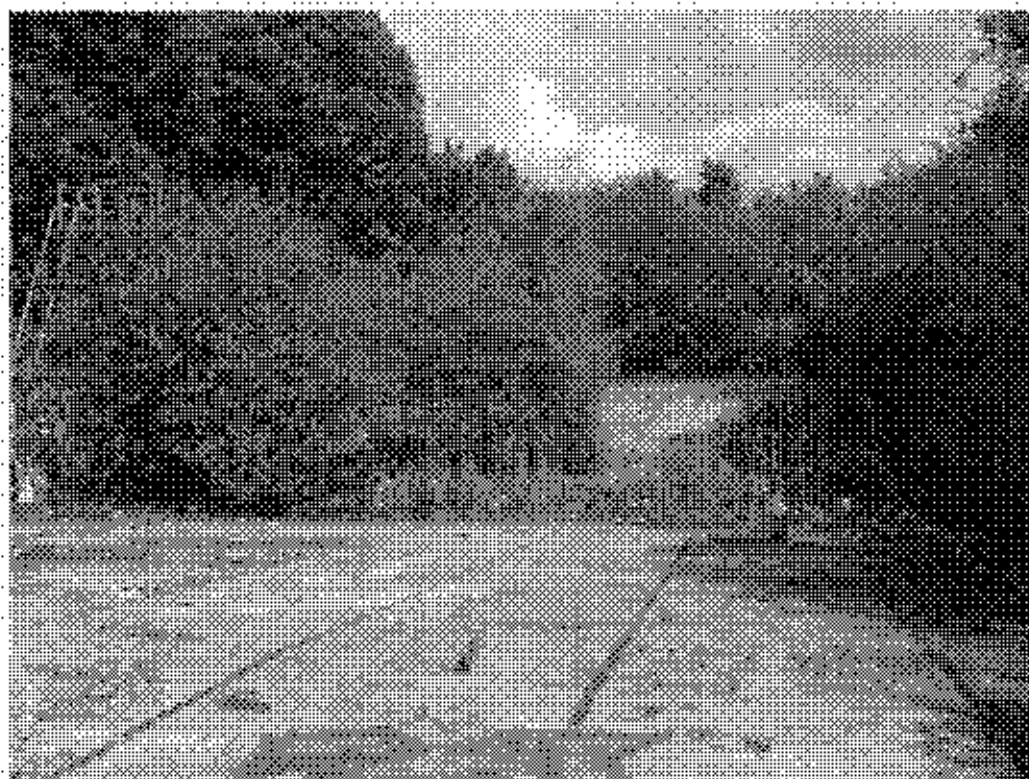


Plate 2 - The derelict swimming pool showing willow scrub and common bulrush swamp in the deeper central area.



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Plates 2 & 4

Title: Twickenham Riverside Swimming Pool
Site Photographs

Date - May 2003

Scale: NTS
Drawn By: DS



Plate 3 - View across the pool towards the north-western boundary, showing mature planted hornbeam trees.

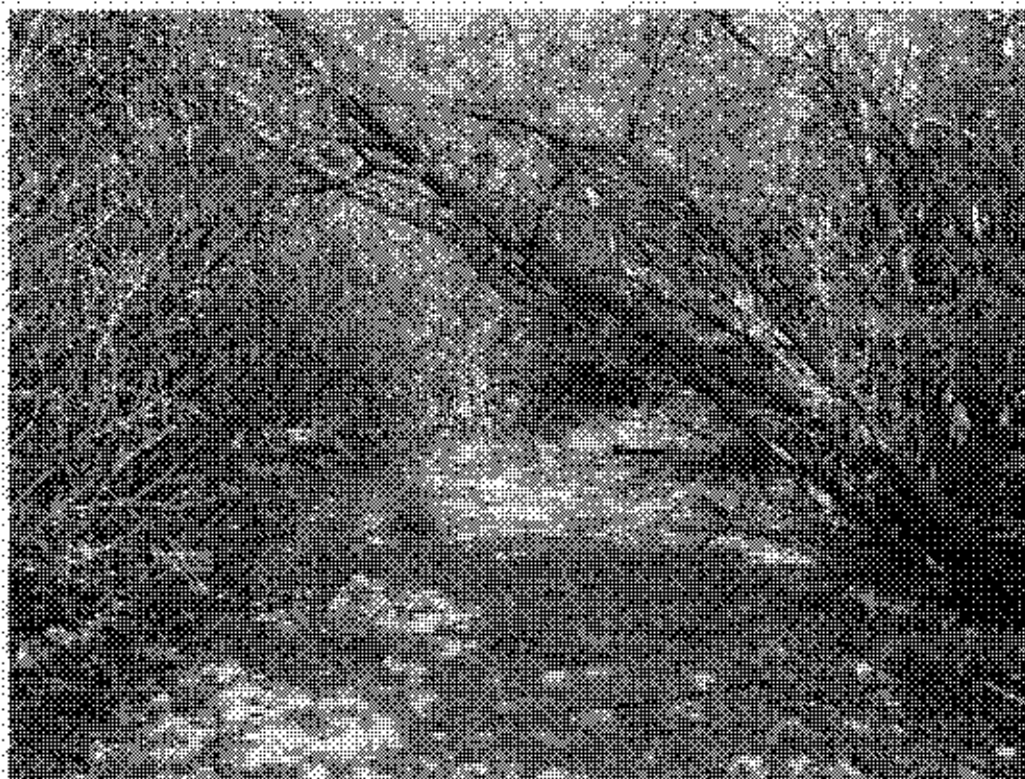


Plate 4 - Dense scrub habitat on the terrace surrounding the pool



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Plates: - 5 & 6

Title: Twickenham Riverside Swimming Pool
Site Photographs

Date: - May 2003

Scale: NTS
Drawn by: DS



Plate 5 - Changing Block - redundant cement flue/pipe in ladies WC
(East Toilets)

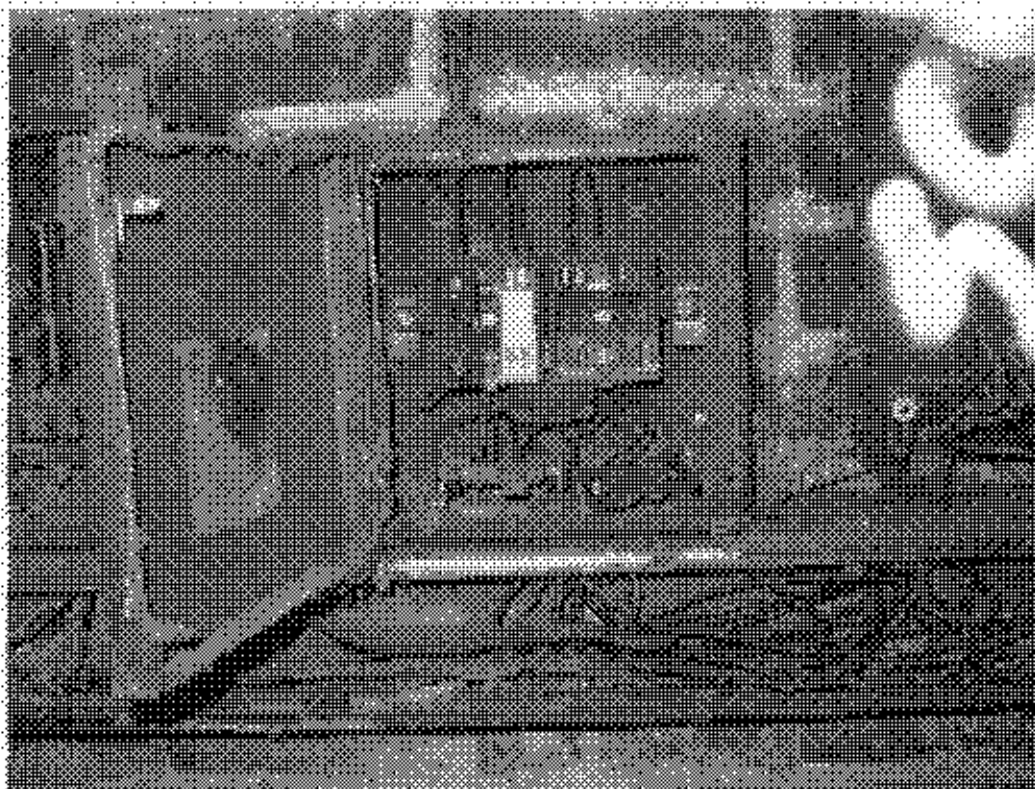


Plate 6 - Small Block House adjacent changing block - rope flash guards
with electrical fuse box



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Plates - 7 & 8

Title- Twickenham Riverside Swimming Pool
Site Photographs

Date- May 2003

Scale - N1:1
Drawn By - DS



Plate 7 - Open area to northwest of swimming pool - discarded board material.



Plate 8 - Changing Blocks - redundant pipe unit in southwest plant room on lower level.



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Plates - 9 & 10

Title - Twickenham Riverside Swimming Pool
Site Photographs

Date - May 2003

Scale: NTS
Drawn By: J.S.



Plate 9 - Changing Block - bituminous red floor screed to upper level



Plate 10 - Changing Block - toilet seat debris to floor of gents WC (West Toilets)



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Job No. - EN3876

Plates - 11 & 12

Title - Twickenham Riverside Swimming Pool
Site Photographs

Date - May 2003

Scale - N/A
Drawn by - JCB



Plate 11 - Changing Block - Bituminous screeds and felt to roof

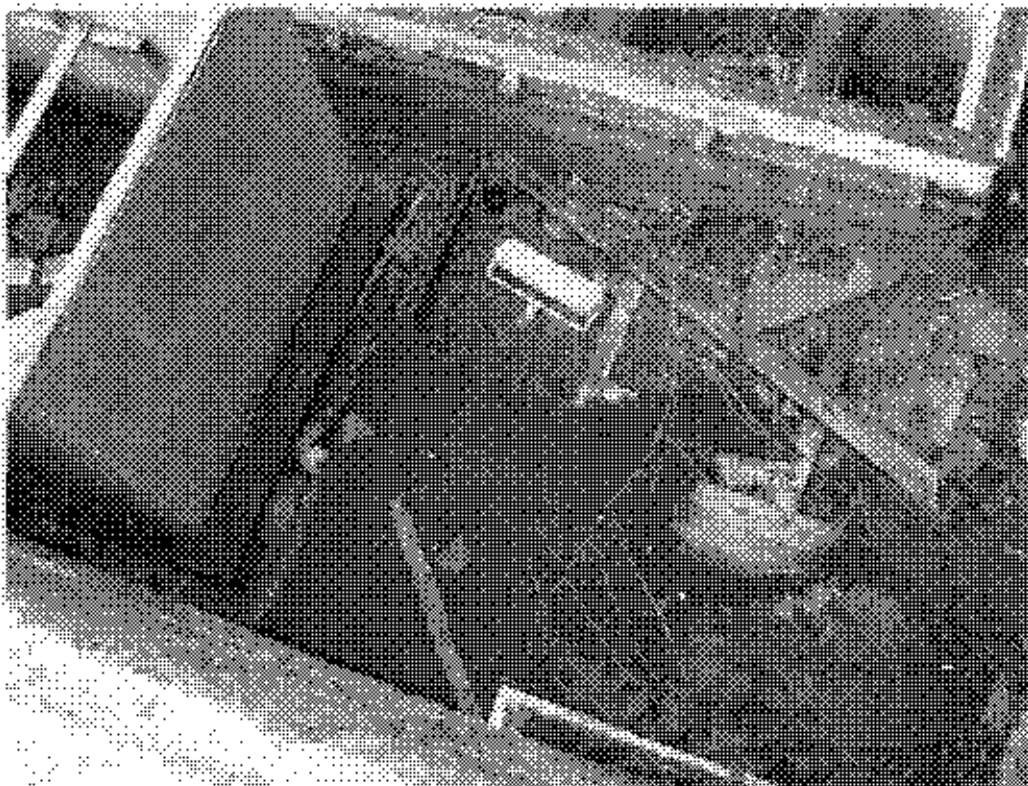


Plate 12 - Bituminous felt to roof of ladies WC (East Toilets)



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Job No: EN3678

Plates: 13 & 14

Title: Twickenham Riverside Swimming Pool
Site Photographs

Date: May 2003

Scale: 1:50
Drawing: 03

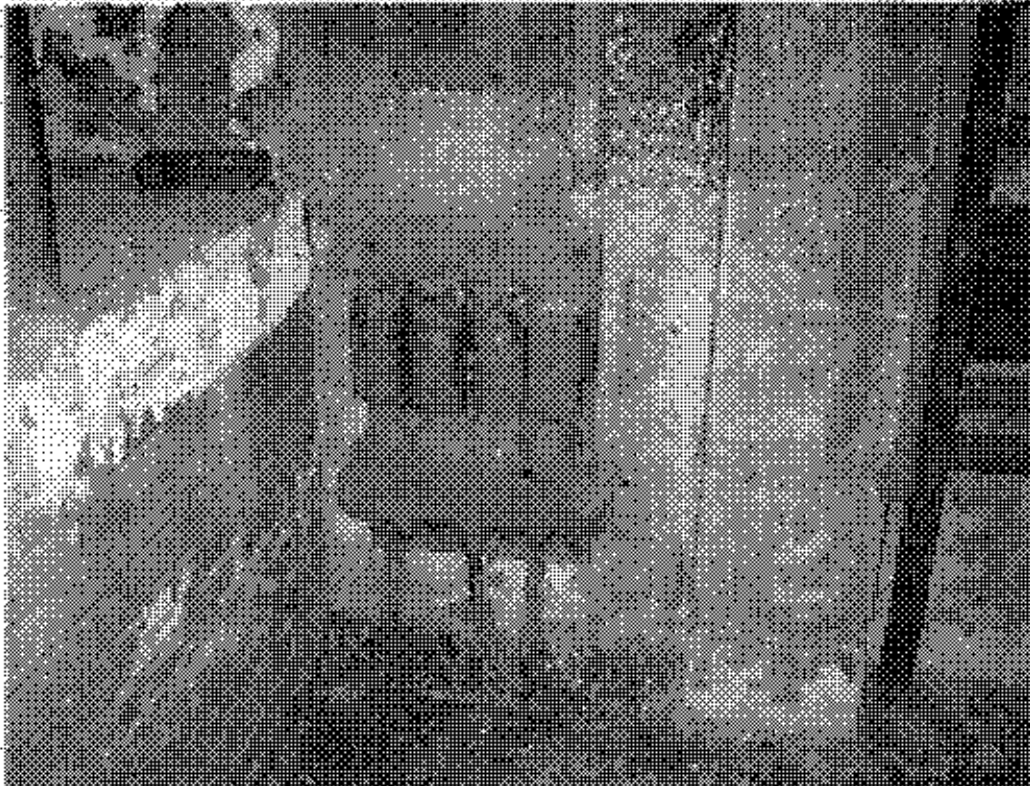


Plate 13 - Changing Block - electrical equipment within northeast plant room on lower level

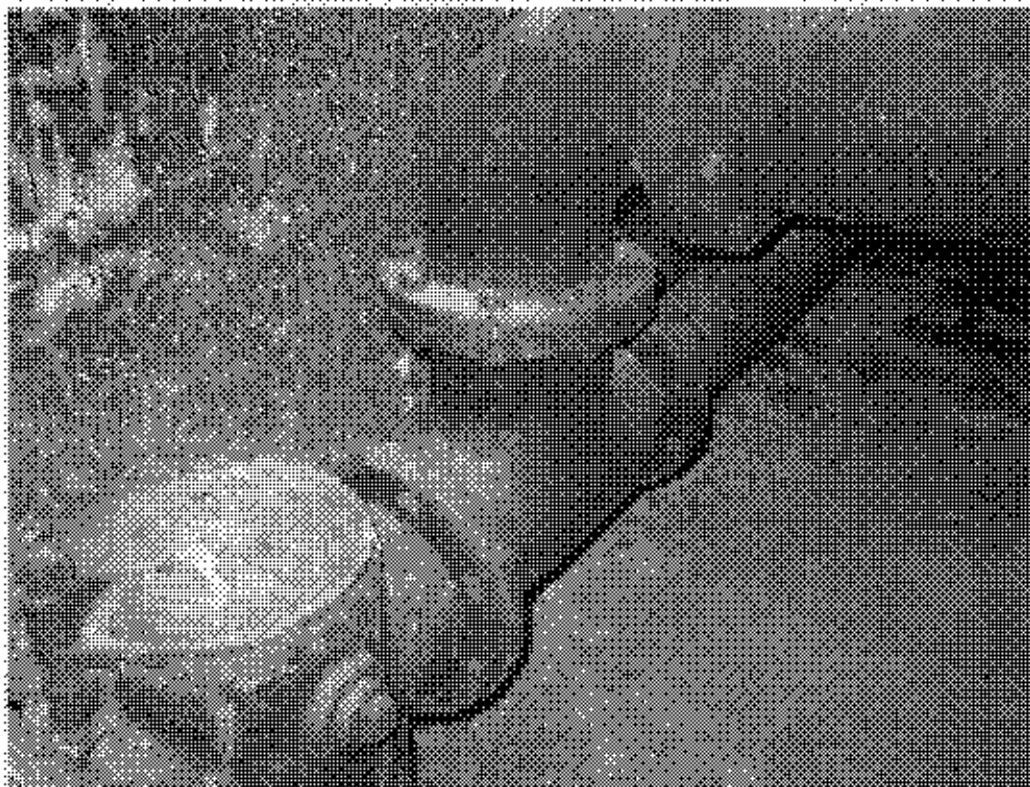


Plate 14 - Changing Block - pipework in northeast plant room on lower level



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Job No: EN3676

Plates: 15 & 16

Title: Twickenham Riverside Swimming Pool
Site Photographs

Date: May 2003

Scale: NTS

Drawn by: DS

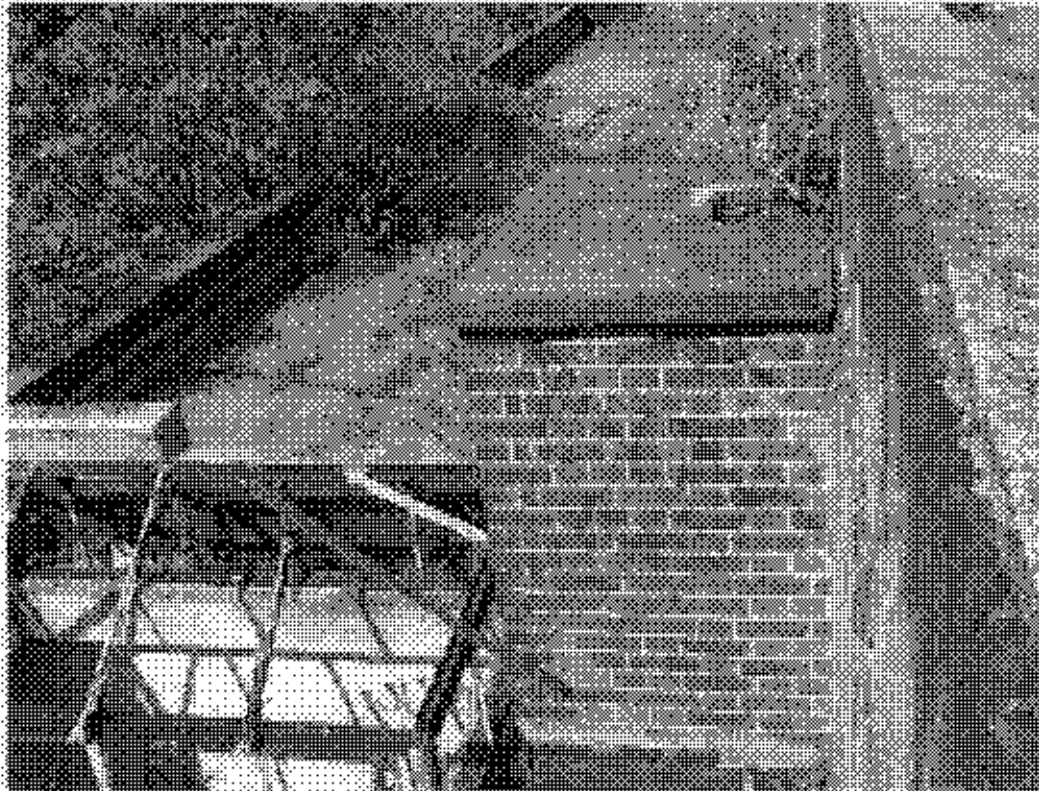


Plate 15 - Changing Block - stack to northwest elevation

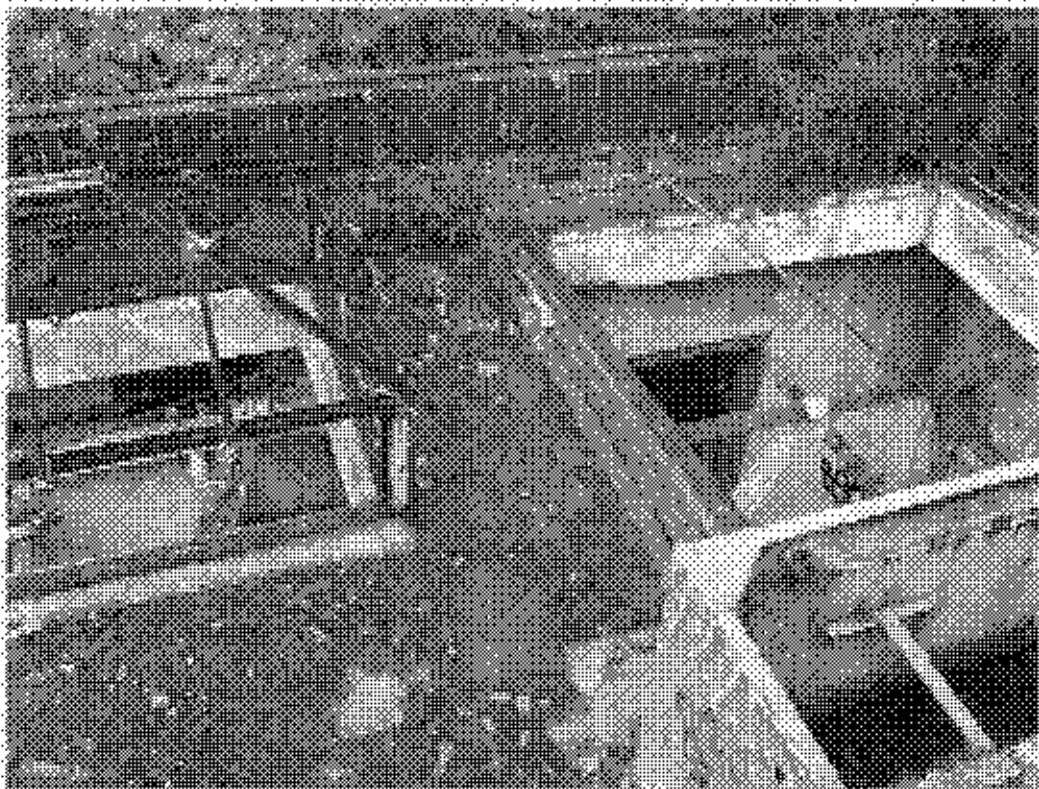


Plate 16 - Changing Block - skylight above ladies WC (East Toilets)



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Plates:- 17 & 18

Title:- Titchenham Riverside Swimming Pool
Site Photographs



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Date:- May 2003

Scale: NTS

Drawn By: JPS

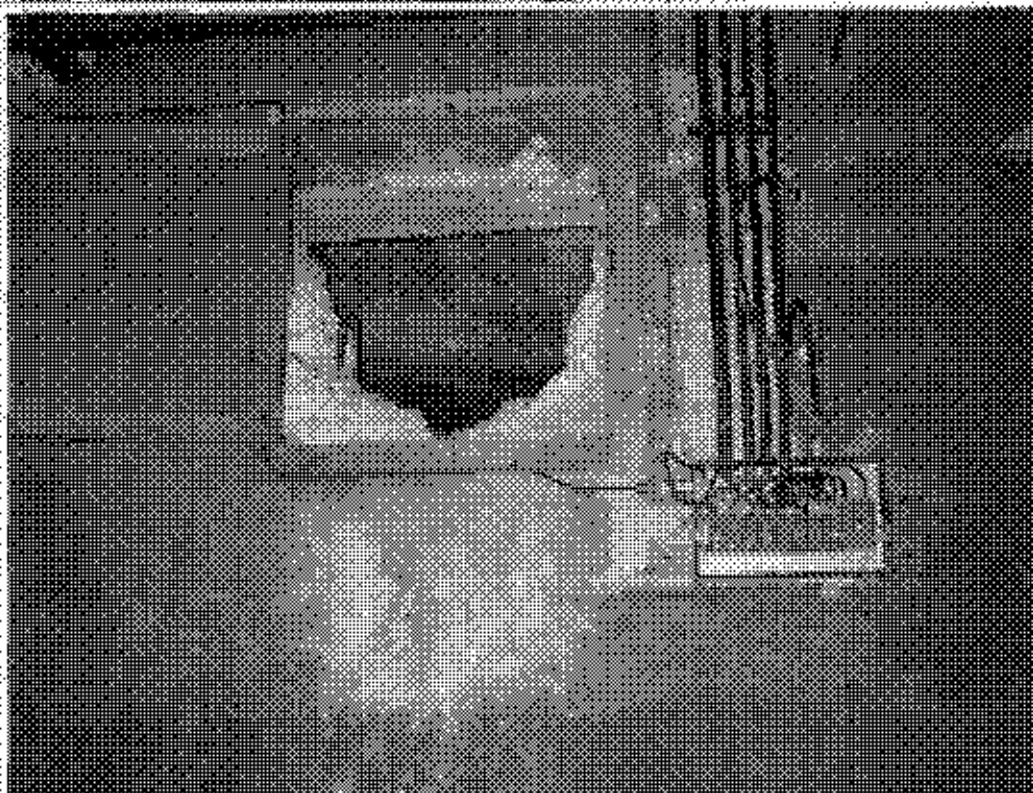


Plate 17 - Changing Block - high level access door to sub-floor void adjacent swimming pool



Plate 18 - Swimming Pool - sub-floor void between swimming pool and northeast elevation of changing block



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Job No:- EN3678

Plate:- 19

Title:- Twickenham Riverside Development
Site Photographs

Scale:- NTS

Date:- May 2003

Drawn by:- DS



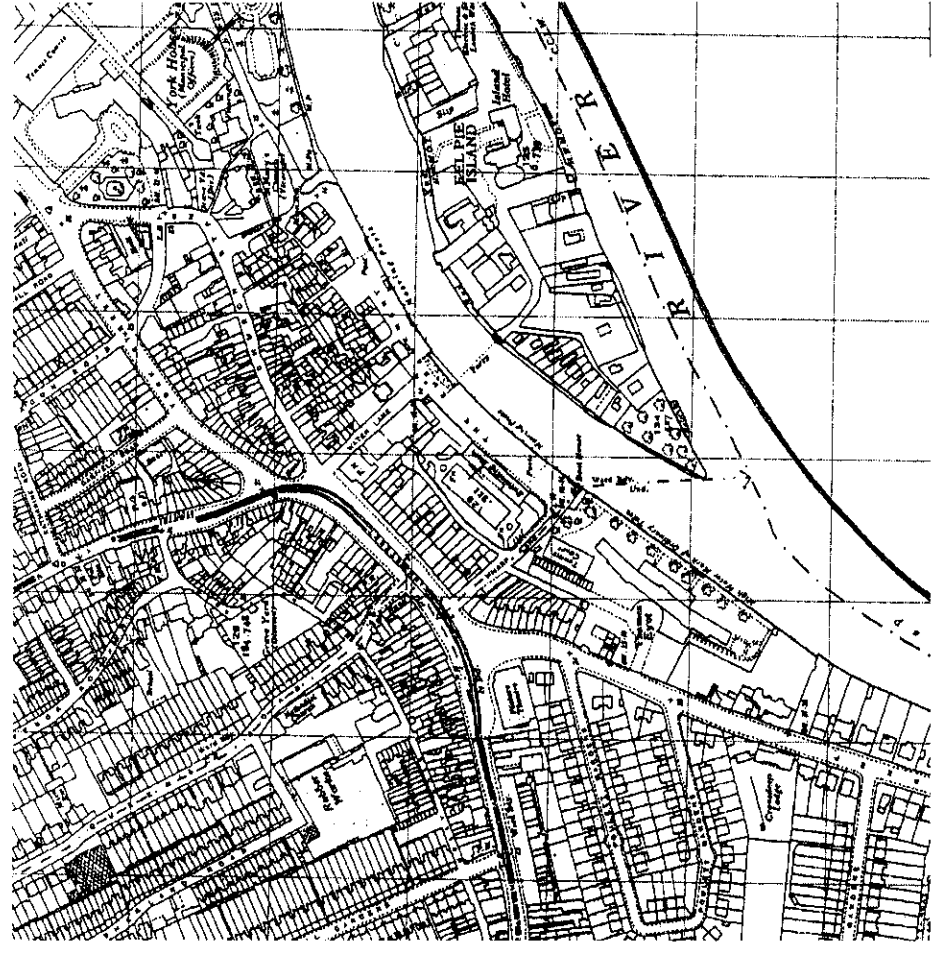
Plate 19 - Restaurant - Cement flue to northeast corner



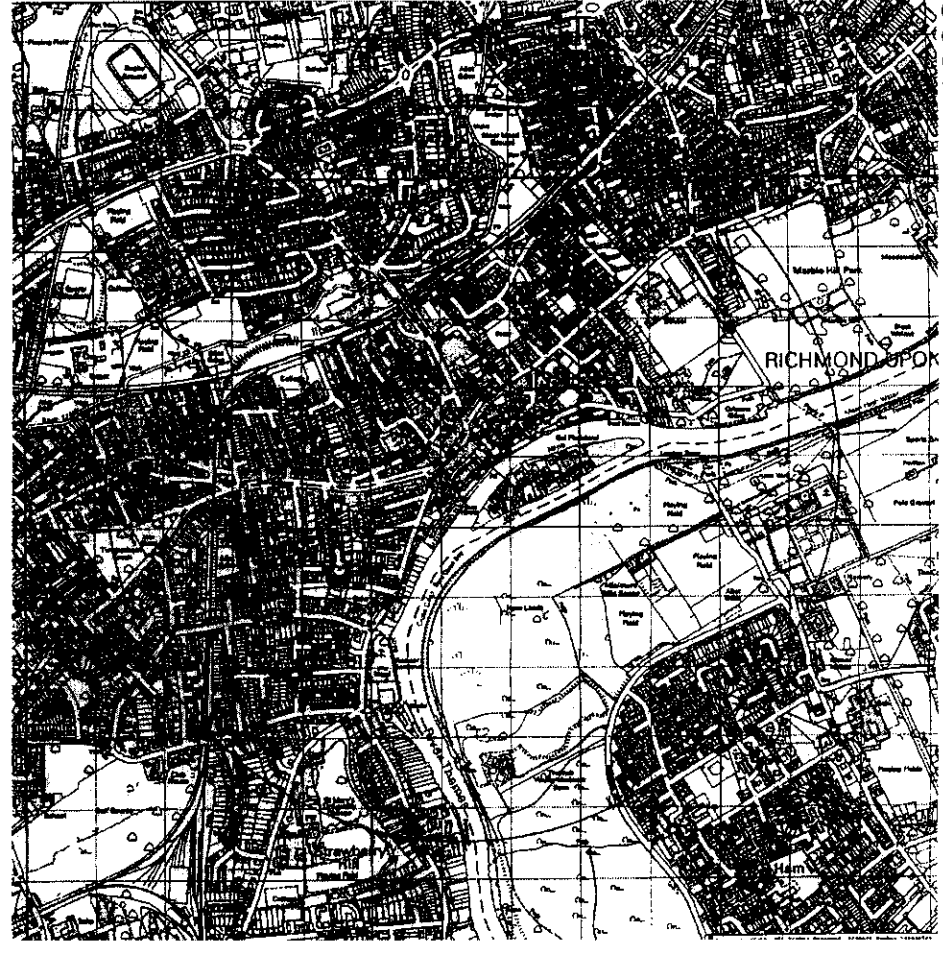
Appendix C HISTORICAL MAPS



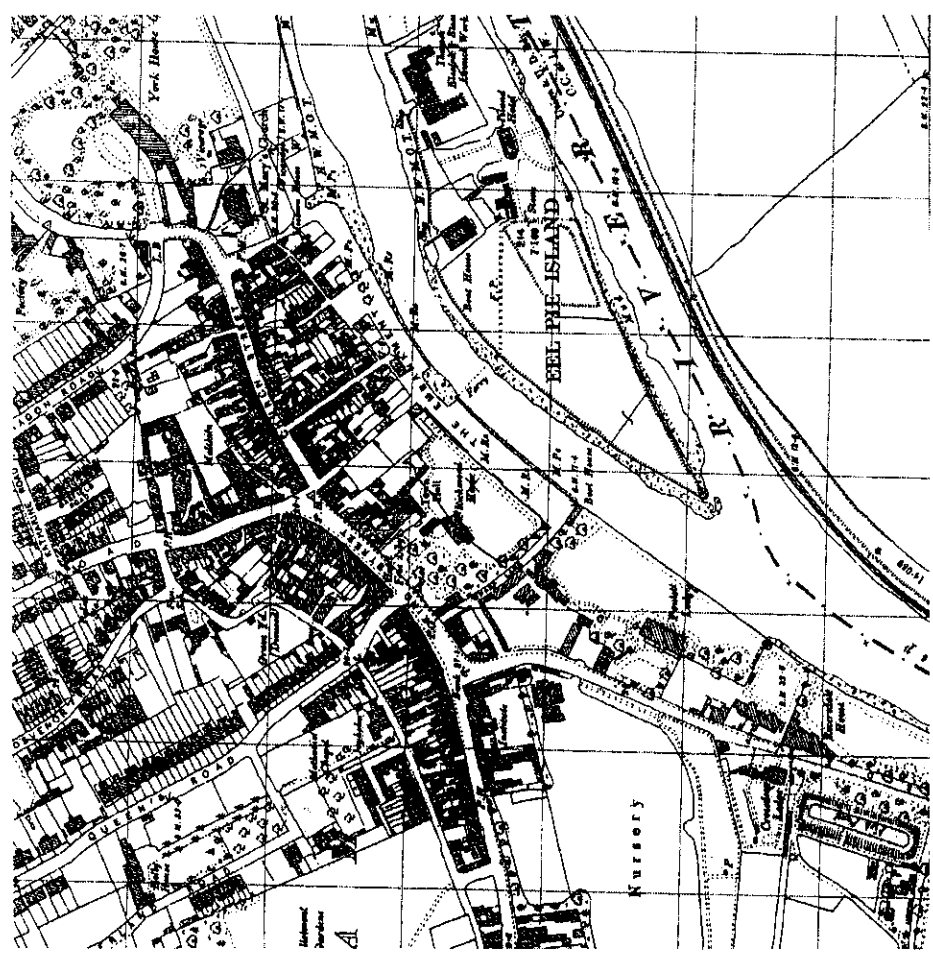
o FOR THE YEARS 1896, 1934, 1972-87, 1999 (FIG 4)



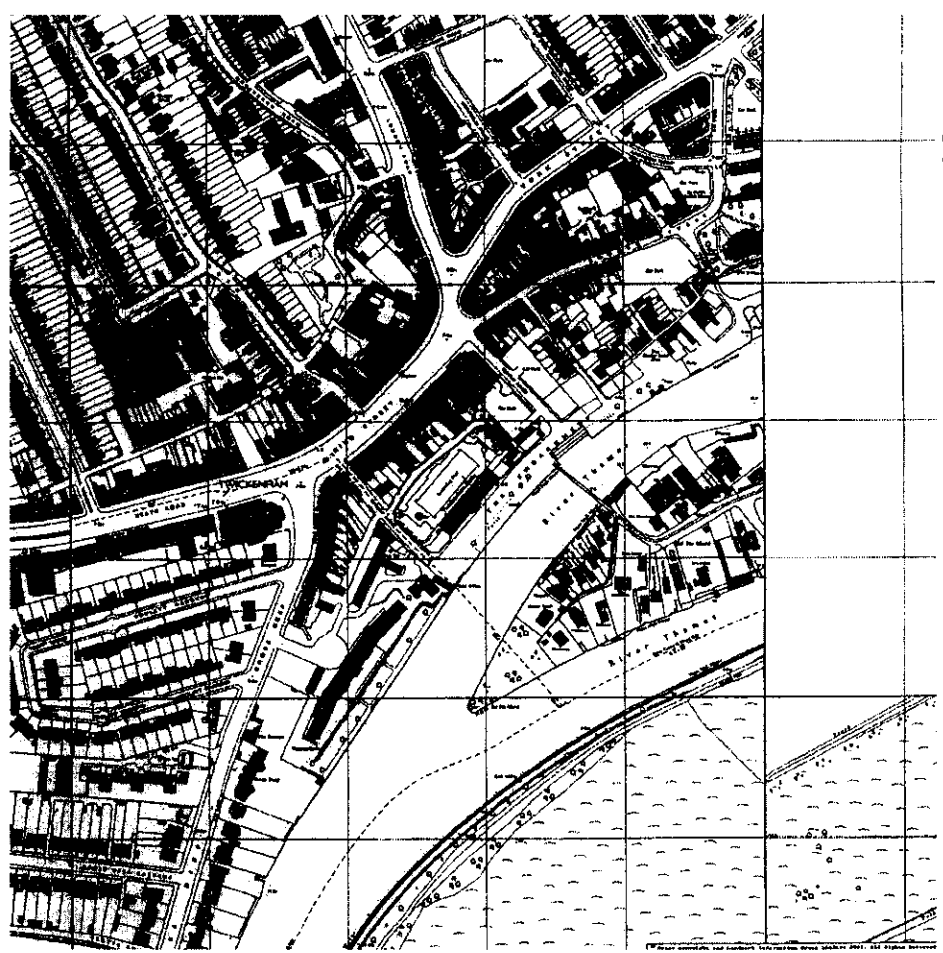
1934



1999



1896



1972-87



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3 PARIS GARDEN LONDON SE1 8ND
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Job No:- EN3676

Figure No:- 4

Title:- Twickenham Swimming Pool
Historical Maps

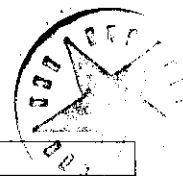
Date:- May 2003

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Drawn By:- DS



Appendix D FULL LIST OF PLANT SPECIES / ABUNDANCE ON SITE

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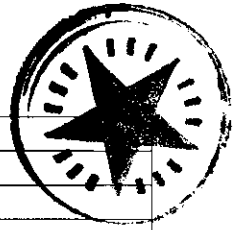
FULL LIST OF PLANT SPECIES / ABUNDANCE ON SITE*

Scientific name	Common name	Abundance	Remarks
<i>Acer pseudoplatanus</i>	Sycamore	A	Planted and self-sown trees and saplings
<i>Aesculus hippocastanum</i>	Horse chestnut	R	Seedling
<i>Agrostis stolonifera</i>	Creeping bent	O	
<i>Althaea rosea</i>	Hollyhock	R	
<i>Anisantha sterilis</i>	Barren brome	R	
<i>Arabidopsis thaliana</i>	Thale cress	O	
<i>Arenaria serpyllifolia</i>	Thyme-leaved sandwort	O	
<i>Arrhenatherum elatius</i>	False-oat grass	R	
<i>Artemisia vertolorium</i>	Chinese mugwort	R	
<i>Artemisia vulgaris</i>	Mugwort	O	
<i>Aster spp.</i>	Michaelmas daisy	F	
<i>Athyrium filix-femina</i>	Lady fern	R	
<i>Aucuba japonica</i>	Spotted laurel	R	Planted shrub
<i>Ballota nigra</i>	Black horehound	R	
<i>Bellis perennis</i>	Daisy	O	Lawn near toilet block
<i>Berberis sp.</i>	Barberry	R	Planted shrub
<i>Betula pendula</i>	Silver birch	O	Sapling trees
<i>Brachypodium sylvaticum</i>	Wood false-brome	O	
<i>Buddleja davidii</i>	Butterfly bush	A	Self-established shrub
<i>Campanula poscharskyana</i>	Trailing bellflower	R	Planted near bath house
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	O	
<i>Cardamine hirsute</i>	Hairy bitter-cress	O	
<i>Carpinus betulus</i>	Hornbeam	F	Planted trees and self-sown saplings
<i>Catalpa bignonioides</i>	Indian bean-tree	O	Planted trees
<i>Centranthus ruber</i>	Red valerian	R	
<i>Cerastium fontanum</i>	Common mouse-ear	R	
<i>Cerastium glomeratum</i>	Sticky mouse-ear	O	
<i>Chamaecyparis lawsoniana</i>	Lawson's cypress	O	Planted tree
<i>Chelidonium majus</i>	Greater celandine	O	
<i>Cirsium arvense</i>	Creeping thistle	R	
<i>Clematis vitalba</i>	Traveller's joy	F	
<i>Convallaria majalis</i>	Lily-of-the-valley	R	Planted near Bath House
<i>Conyza sumatrensis</i>	Guernsey fleabane	O	
<i>Cortaderia selloana</i>	Pampas grass	R	SW margin of site
<i>Cotoneaster horizontalis</i>	Cotoneaster	O	Bird-sown shrub
<i>Cotoneaster sp.</i>	Cotoneaster	O	Planted shrub
<i>Crataegus monogyna</i>	Hawthorn	O-LF	Shrub and planted hedge
<i>Crepis capillaris</i>	Smooth hawk's-beard	R	
<i>Cupressus/Cupressocyparis sp.</i>	Cypress sp.	O	Planted tree
<i>Dactylis glomerata</i>	Cocksfoot	O	
<i>Deutzia sp.</i>	Deutzia	R	Planted shrub
<i>Dipsacus fullonum</i>	Teasel	R	
<i>Dryopteris filix-mas</i>	Male fern	R	In shade under scrub

*The DAFOR scale used is a standard method for assessing plant abundance within an area or site. It relates only to the relative abundance of a species within the area of search and is not an indication of its rarity at any other scale, either national or otherwise.



Twickenham Riverside Swimming Pool



Scientific name	Common name	Abundance	Remarks
<i>Epilobium ciliatum</i>	American willowherb	R	
<i>Epilobium hirsutum</i>	Great willowherb	R	
<i>Epilobium parviflorum</i>	Hoary willowherb	R	
<i>Epilobium tetragonum</i>	Square-stemmed willowherb	R	
<i>Escallonia macranta</i>	Escallonia	R	Planted shrub
<i>Euphorbia pepus</i>	Petty spurge	R	
<i>Festuca rubra</i>	Red fescue	O	
<i>Forsythia sp.</i>	Forsythia	R	Planted shrub
<i>Fragaria x ananassa</i>	Garden strawberry	O	Planted near bath house
<i>Fraxinus excelsior</i>	Ash	R	Sapling tree
<i>Galium aparine</i>	Cleavers	O	
<i>Geranium robertianum</i>	Herb robert	R	
<i>Geranium sp.</i>	Geranium sp.	R	Planted near bath house
<i>Geum urbanum</i>	Wood avens	F	
<i>Hedera helix</i>	Ivy	A	Carpets ground below trees and scrub
<i>Helleborus sp.</i>	Hellebore/Christmas rose	R	Planted near bath house
<i>Hieracium sp.</i>	Hawkweed	R	
<i>Holcus lanatus</i>	Yorkshire fog	O	
<i>Hordeum murinum</i>	Wall barley	O	
<i>Hyacinthoides hispanica</i>	Spanish bluebell	F	Planted
<i>Hypochaeris radicata</i>	Cat's-ear	R	
<i>Ilex aquifolium</i>	Holly	R	Tree near bath house
<i>Iris foetidissima</i>	Stinking iris	R	
<i>Lamium purpureum</i>	Red dead-nettle	R	
<i>Ligustrum ovalifolium</i>	Privet	O	Planted shrub
<i>Lobularia maritima</i>	Sweet Alison	R	
<i>Lolium perenne</i>	Perennial ryegrass	F	Lawn near toilet block
<i>Lonicera nitida</i>	Wilson's honeysuckle	R	Planted shrub
<i>Lonicera sp.</i>	Honeysuckle sp.	O	
<i>Lunaria annua</i>	Honesty	LF	
<i>Mahonia sp.</i>	Mahonia	R	Planted shrub
<i>Malus domestica</i>	Apple	R	Tree on SW boundary
<i>Malva sylvestris</i>	Common mallow	R	
<i>Medicago lupulina</i>	Black medick	R	
<i>Mercurialis annua</i>	Annual mercury	R	
<i>Mycelis muralis</i>	Wall lettuce	R	
<i>Narcissus pseudonarcissus</i>	Daffodil	O	Planted bulb
<i>Parietaria judaica</i>	Pellitory-of-the-wall	R	
<i>Pentaglottis sempervirens</i>	Green alkanet	LF	
<i>Persicaria hydropiper</i>	Water pepper	O	Swamp area in swimming pool
<i>Philadelphus sp.</i>	Mock orange	R	Planted shrub
<i>Phyllitis scolopendrium</i>	Hart's-tongue fern	R	
<i>Picris hieracioides</i>	Hawkweed ox-tongue	R	
<i>Pilosella officinarum</i>	Mouse-ear hawkweed	R	
<i>Plantago major</i>	Great plantain	O	Lawn near toilet block
<i>Poa annua</i>	Annual meadow-grass	O	
<i>Poa compressa</i>	Flattened meadow-grass	O	
<i>Poa pratensis</i>	Smooth-stalked	R	



Twickenham Riverside Swimming Pool



Scientific name	Common name	Abundance	Remarks
	meadow-grass		
<i>Poa trivialis</i>	Rough-stalked meadow-grass	R	
<i>Polygonum aviculare</i>	Knotgrass	R	
<i>Prunus avium</i>	Wild cherry	R	Sapling tree
<i>Prunus laurocerasus</i>	Cherry laurel	R	Planted shrub
<i>Pseudofumaria lutea</i>	Yellow corydalis	R	
<i>Quercus cerris</i>	Turkey oak	F	Seedlings and saplings
<i>Quercus ilex</i>	Holm oak	O	Seedlings and saplings
<i>Quercus robur</i>	Pedunculate oak	O	Saplings
<i>Ranunculus acris</i>	Meadow buttercup	R	
<i>Ranunculus repens</i>	Creeping buttercup	R	
<i>Ranunculus sceleratus</i>	Celery-leaved buttercup	O	Swamp area in swimming pool
<i>Rosa canina</i> agg.	Dog rose	O	
<i>Rosa</i> sp.	Cultivated rose	O	Planted shrub
<i>Rubus fruticosus</i> agg.	Bramble	O	
<i>Rumex obtusifolius</i>	Broad-leaved dock	R	
<i>Sagina apetala</i>	Annual pearlwort	O	
<i>Sagina procumbens</i>	Procumbent pearlwort	R	
<i>Salix caprea</i>	Goat willow	F	
<i>Salix cinerea</i>	Grey willow	F	
<i>Sambucus nigra</i>	Elder	O	Self-established shrub
<i>Scrophularia nodosa</i>	Common figwort	R	
<i>Senecio jacobea</i>	Ragwort	R	
<i>Senecio squalidus</i>	Oxford ragwort	R	
<i>Senecio vulgaris</i>	Groundsel	R	
<i>Solanum dulcamara</i>	Bittersweet	O	
<i>Solidago canadensis</i>	Canadian goldenrod	R	
<i>Sonchus asper</i>	Prickly sow-thistle	R	
<i>Sonchus oleraceus</i>	Smooth sow-thistle	R	
<i>Sorbus aria</i>	Whitebeam	R	Planted tree
<i>Sorbus aucuparia</i>	Rowan	R	Sapling tree
<i>Stellaria media</i>	Chickweed	O	
<i>Taraxacum officinale</i> agg.	Dandelion	R	
<i>Typha latifolia</i>	Common bulrush	LD	Swamp area in swimming pool
<i>Urtica dioica</i>	Nettle	O	
<i>Veronica arvensis</i>	Wall speedwell	O	
<i>Veronica hederifolia</i>	Ivy-leaved speedwell	O	

¹**DAFOR Scale:** This provides an estimate of the relative abundance of each species recorded *within the context of the site*, whereby D = Dominant; A = Abundant; F = Frequent; O = Occasional and R = Rare. Prefix L = Locally e.g. LF = Locally frequent.



**Appendix E FACTORS CONSIDERED IN THE EVALUATION OF
SITES FOR NATURE CONSERVATION IMPORTANCE**





FACTORS CONSIDERED IN THE EVALUATION OF SITES FOR NATURE CONSERVATION IMPORTANCE



Representation

The best examples of each major habitat type are selected. These include typical urban habitats such as abandoned land colonised by nature ("wasteland"). Where a habitat is not extensive in the search area it will be appropriate to conserve all or most of it, whereas where it is more extensive a smaller percentage will be conserved.

Habitat Rarity

The presence of a rare habitat makes a site important, because the loss of, or damage to, only a few sites threatens the survival of the habitat in the search area.

Species Rarity

The presence of a rare species makes a site important in a way that parallels rare habitat.

Habitat richness

Protecting a site with a rich selection of habitat types not only conserves those habitats, but also the wide range of organisms that live within them and the species that require more than one habitat type for their survival. Rich sites also afford more opportunities for enjoyment and educational use.

Species Richness

Generally, sites that are rich in species are to be preferred, as this permits the conservation of a correspondingly large number of species. However, some habitats, such as reed beds, heaths and acid woodlands, are intrinsically relatively poor in species.

Size

Large sites are usually more important than small sites. They may allow for species with special area requirements. Large sites may be less vulnerable to small-scale disturbances, as recovery is sometimes possible from the undisturbed remainder. They are also more able to withstand visitors, by diluting their pressure within a wider space. Size is also related to the richness of habitats and species, and so is used as a surrogate for these other two criteria where information is incomplete.

Important Population of Species

Some sites are important because they hold a large proportion of a species for the search area (e.g. waterfowl populations or colonial birds such as heron and jackdaw).

Ancient Character

Some sites have valuable ecological characteristics derived from long periods of traditional management, or even a continuity in time to the woodlands and wetlands that occupied the London area before agriculture. Ancient woodlands, old parkland trees and traditionally managed grasslands tend to have typical species that are rare elsewhere. These habitats deserve protection also because of the ease with which they are damaged by changes in management, ploughing, fertiliser and herbicide treatment.

Recreatability

Habitats vary in the ease with which they can be recreated and the length of time required; for example ponds can be created from scratch with reasonable success within a few years, but woods not only take much longer – at least decades – to mature, but even when then they do not contain the same flora and fauna as ancient woods on undisturbed soils. In addition to the ecological reasons why certain habitats cannot be recreated, many sites are not capable of being recreated because of practical reasons such as land availability and cost. The more difficult it is to recreate a site's habitats the more important it is to retain it.



Twickenham Riverside Swimming Pool



Typical Urban Character

Features such as canals, abandoned wharves, walls, bridges, tombstones and railway sidings colonised by nature often have a juxtaposition of artificial and wild features. Some of these habitats are particularly rich in species and have rare species and communities of species. Their substrates may have a particular physical and chemical nature that allows species to thrive that are rare elsewhere. They may also have particular visual qualities. Such areas are often useful for the study of colonisation and ecological succession.

Cultural/Historic Character

Sites such as historic gardens with semi-wild areas, garden suburbs, churchyards and Victorian cemeteries which have reverted to the wild may have a unique blend of cultural and natural history.

Geographical Position

This criterion is operated through the use of search areas. Each of the criterion (in this list) is used to facilitate a comparison of candidate sites within a given search area (metropolis, borough or locality within a borough) and thus they do not take absolute values independent of the search area. Obviously, criteria that show a site to be valuable for a larger search area than London (a region or nation, for example) mean that it is very likely to be important for London. The converse is not necessarily so.

Access

Access is an important consideration, especially in areas where there may be few places for large urban populations to experience the natural world. Nature conservation is not restricted to the preservation of wildlife, but goes hand in hand with the enjoyment of it by all people, from the specialist naturalist to the casual visitor. Some access is desirable to all but the most sensitive of sites, but direct physical access to all parts of a site may not be desirable.

Use

The importance of a site can include its established usage, (e.g. for education, research or quiet enjoyment of nature).

Potential

Where a site can be enhanced by modest changes in management practices this gives it value. Opportunity exists where a site is likely to become available for nature conservation use, or where there is considerable local enthusiasm about it or where a voluntary group is willing to use and manage it. Potential in this context can be for habitat enhancement through management, for educational or nature conservation amenity use. Where such potential could remedy a deficiency, or is readily capitalised, it is considered important.²

Aesthetic Appeal

This factor is the most difficult to measure, but it includes such factors, which contribute to a countryside feel, as seclusion, views, variety of landscape and habitat structure, colour, and natural sounds and scents.

Reference:

Greater London Authority 2001 *Connecting with London's nature*. The Mayor's Draft Biodiversity Strategy, Greater London Authority, London.



Twickenham Riverside Swimming Pool

Appendix F GRADING OF SITES IN THE LONDON AREA





GRADING OF SITES IN THE LONDON AREA

Sites of Metropolitan Importance

These are defined as those sites that contain the best examples of London's habitats, sites that contain particularly rare species, rare assemblages of species or important populations of species, or sites that are of particular significance within otherwise heavily built up areas of London.

Sites of Borough Importance

These are defined as those sites that are important in a borough perspective in the same way as the Metropolitan sites are important to the whole of London. Although sites of similar quality may be found elsewhere in London, damage to these sites would mean a significant loss to the borough. As with Metropolitan Sites, while protection is important, management of the borough sites should usually allow and encourage their enjoyment by people and their use for education.

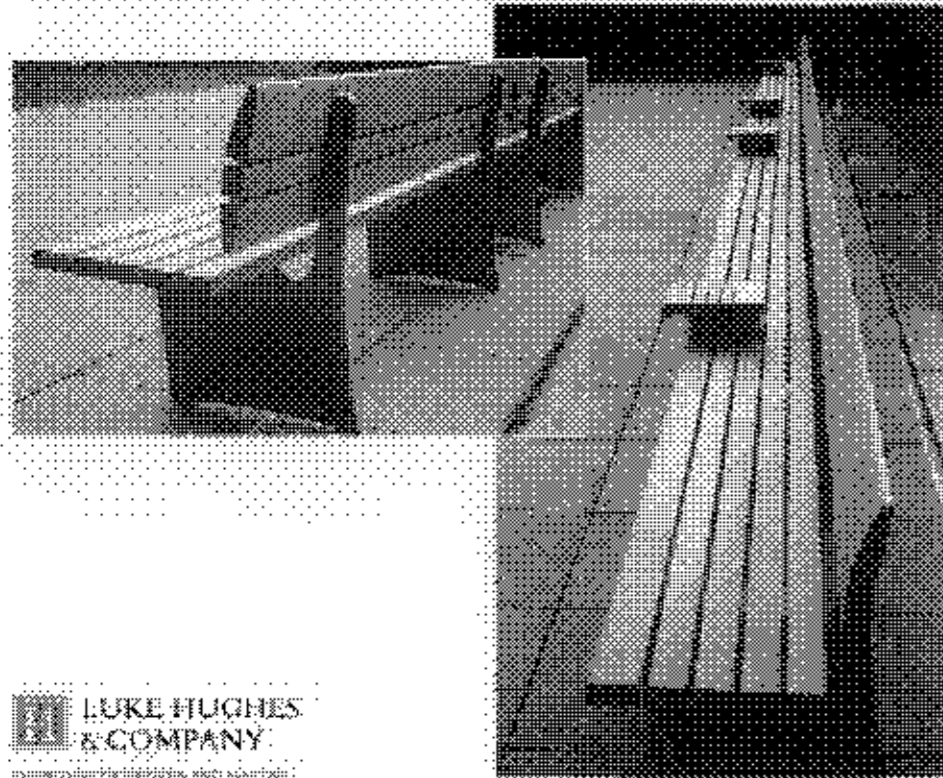
Since 1988 Borough sites are divided, on the basis of their quality, into two grades, but the GLA stress that they are all important on a borough-wide view.

Sites of Local Importance

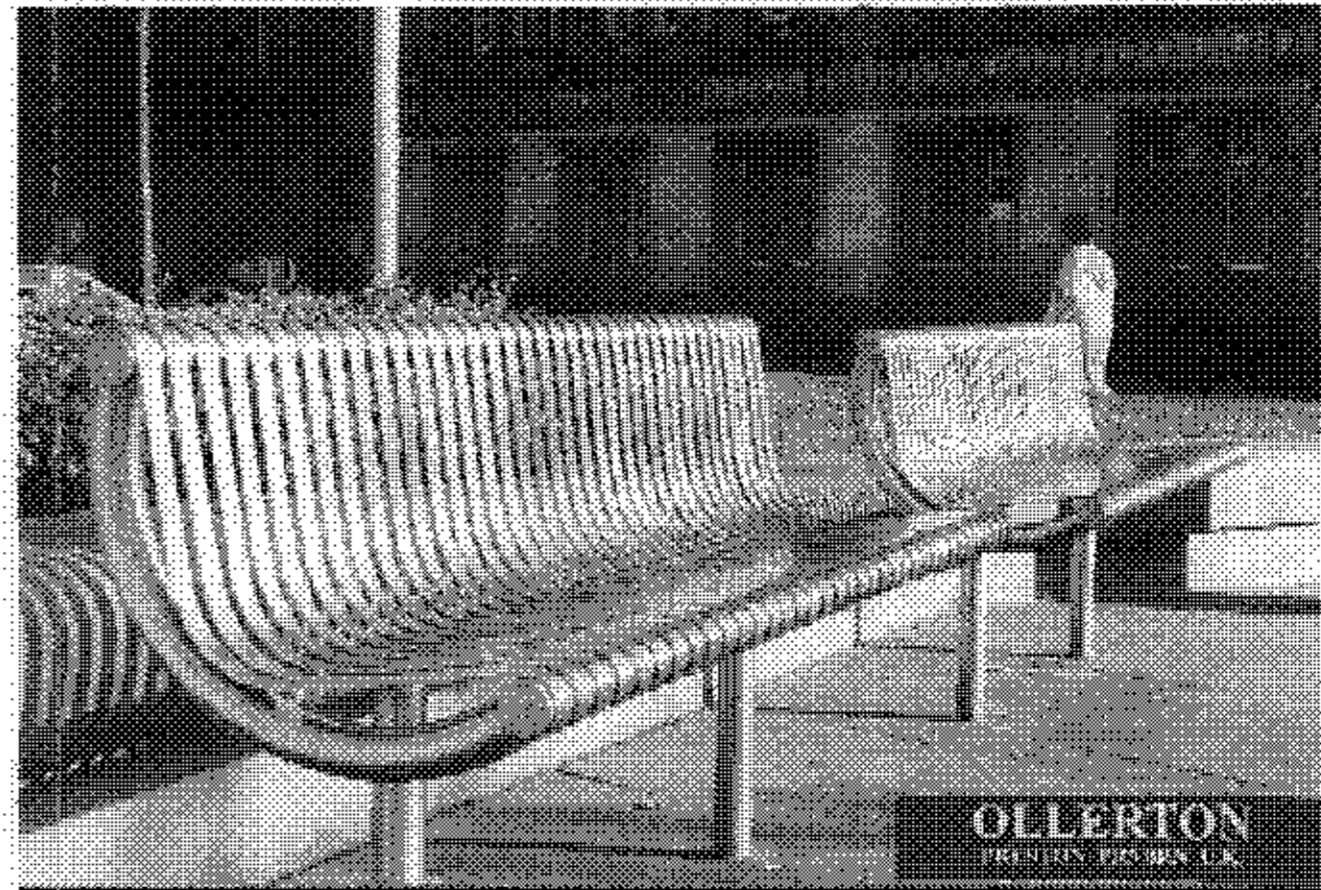
A Site of Local Importance is one that is, or may be, of particular value to people nearby (such as residents or schools). LEU state that Local Sites are of particular importance in areas otherwise deficient in nearby wildlife sites.

Reference:

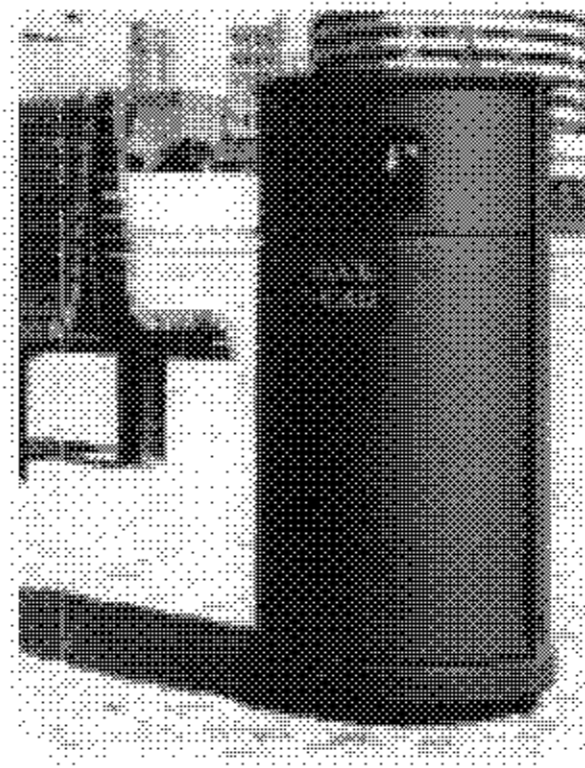
Greater London Authority 2001. *Connecting with London's nature*. The Mayor's Draft Biodiversity Strategy, Greater London Authority, London.



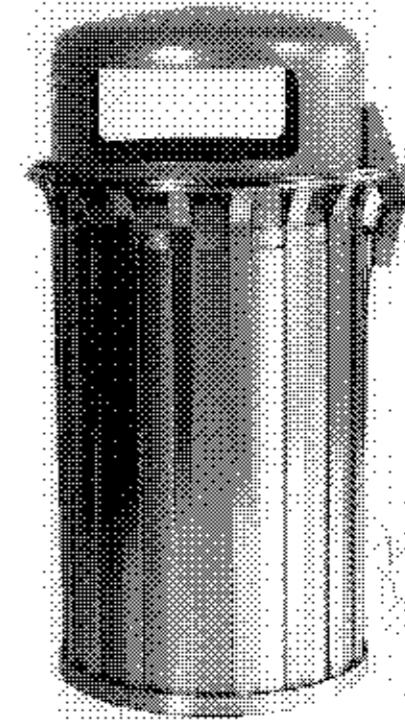
LUKE HUGHES & COMPANY



Type 2 Bench

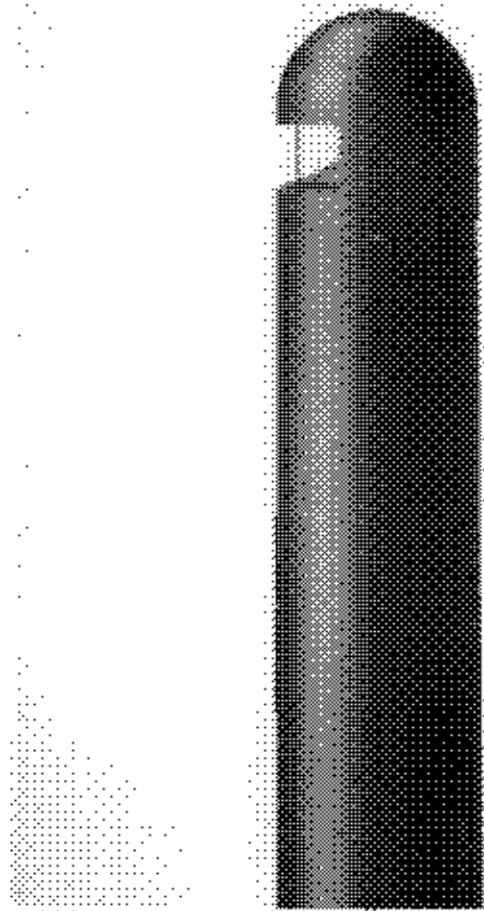


Type 1 Bin (Broxap Pierhead)

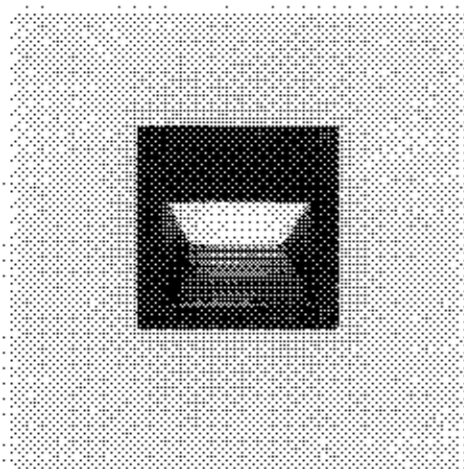
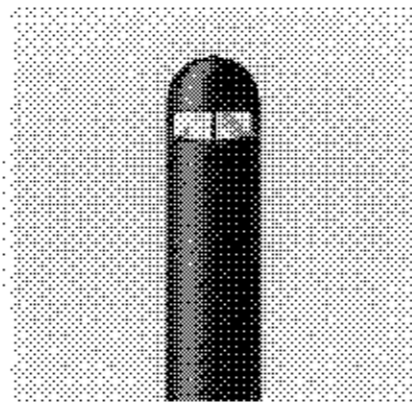


Type 2 Bin (Ollerton M3)

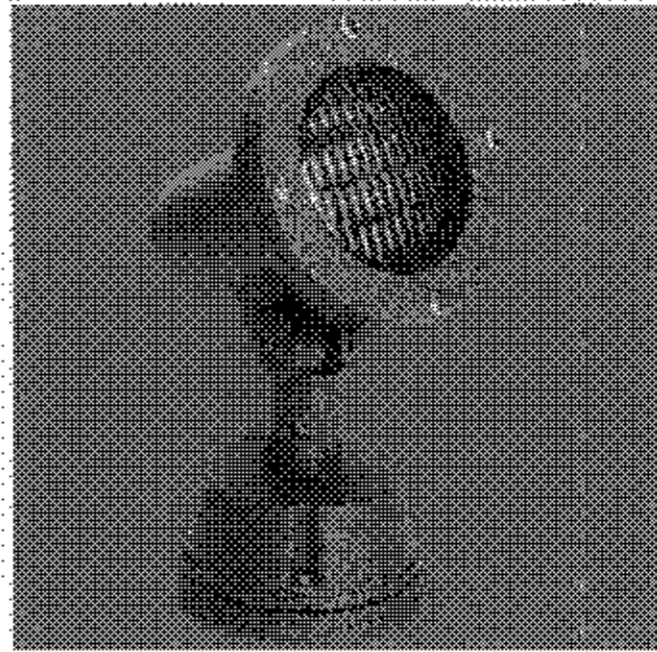
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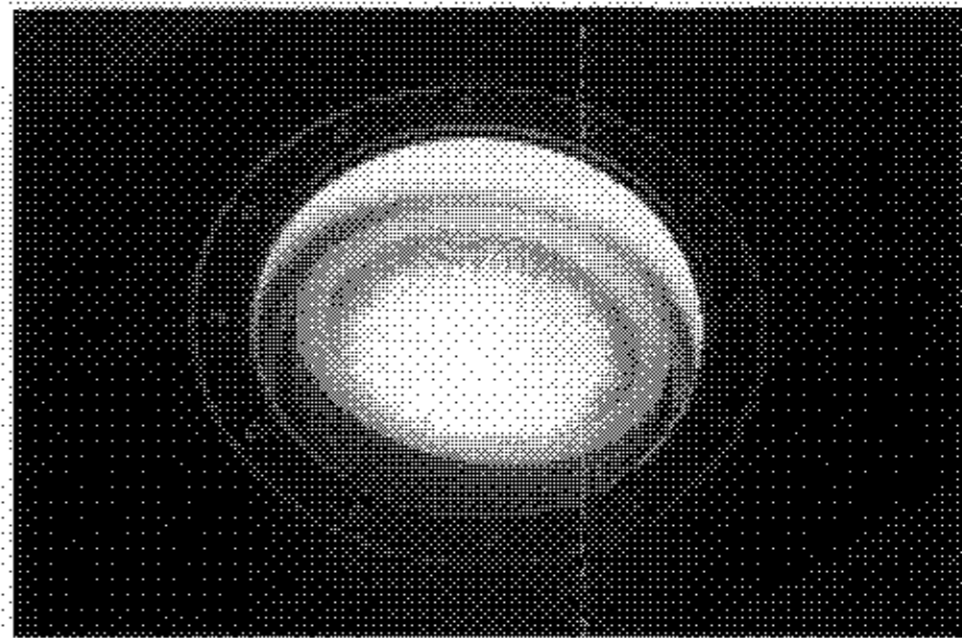
Type A - Bollard



Type C - Wall Light



Type B - Ground Fixed Floodlight



Type D - Ground Fixed Wallwash

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ZAUN'S GEMINI™

... transforms your fence into a feature.

Introduction:

Arguably Zaun's most attractive fencing system, Gemini combines several beautiful curved top designs with a strong 'anti-vandal' stainless steel. The mesh has the same horizontal wave construction as Zaun's Duo, with four square feet of wire with fitting rectangular holes, plus a continuous diamond wire to protect the ends of the panels. Steel frames complete the design and come as standard on Gemini posts. These designs are available (see opposite) in both concave, convex or a combination; concave allows for easier installation, however Gemini is the best way to ensure that your well protect from the real.

Key Features & Advantages:

- Beautiful curved top design
- Strong anti-vandal protection
- Available in a range of concave and/or convex designs
- Matching Gates available
- Long service life with little or no maintenance
- Good through-visibility
- Larger section lining system
- Easy to install

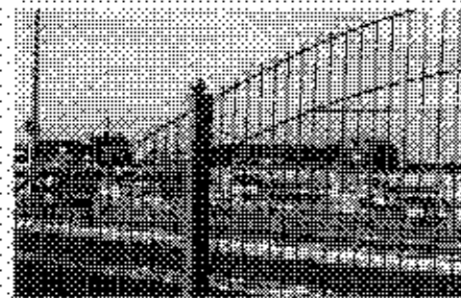
Specifications:

Height: 0.65, 1.05, 1.25, 1.45, 1.65, 1.85, 2.15, 2.45
 Post centres: 2.50m nominal

Applications:

- School Enclosures
- Theatres & Stages
- Water Features
- Commercial Buildings
- Housing Projects

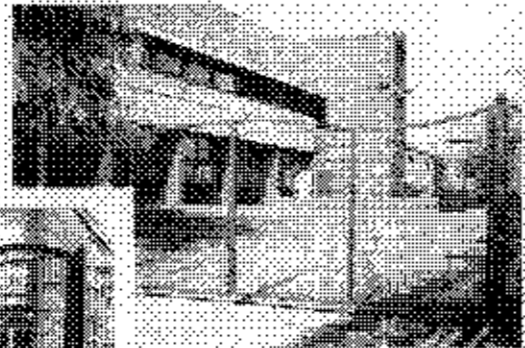
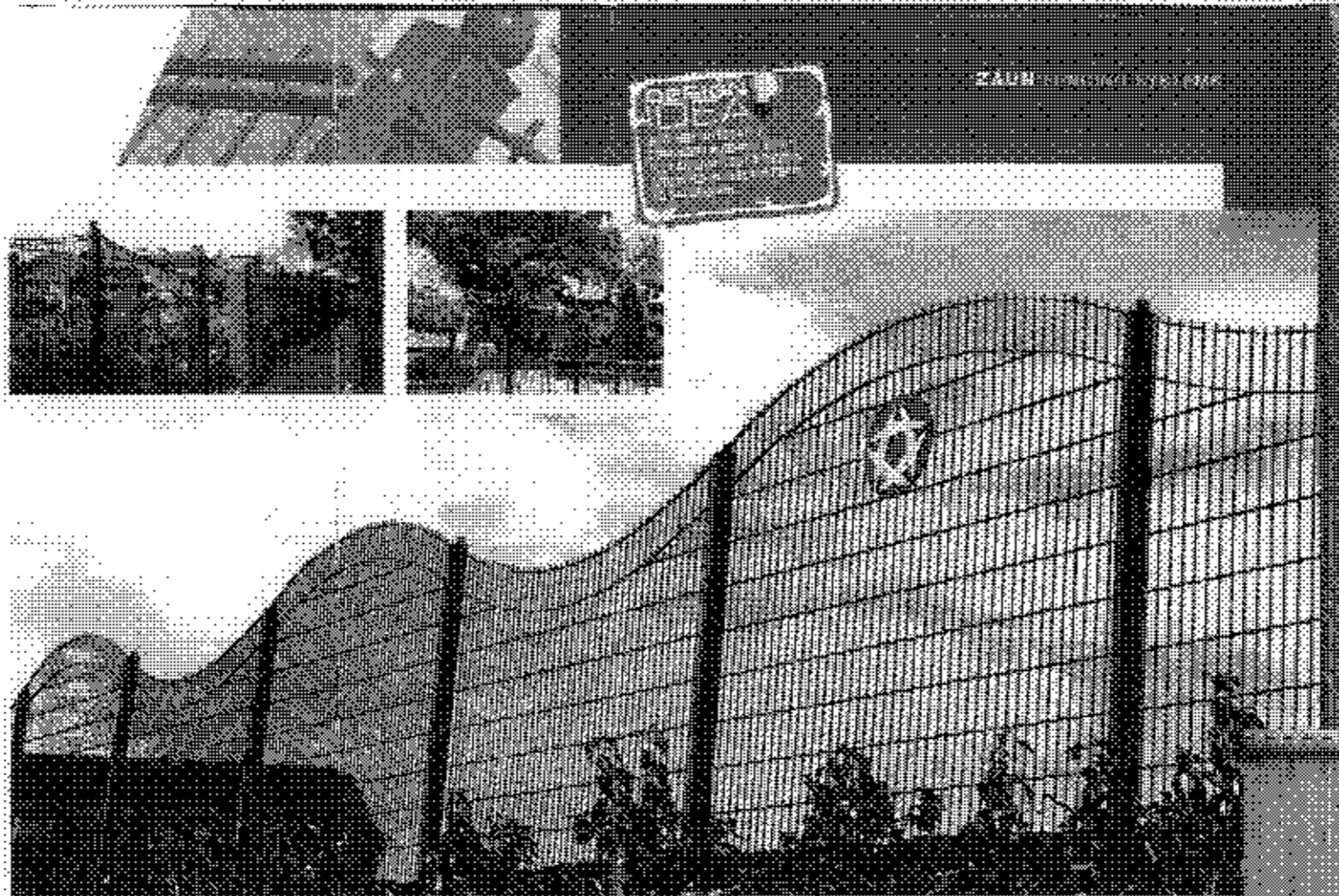
Mesh Sizes	Concave only	Convex only	Convex/Concave
Vertical Wires	6mm	6mm	6mm
Horizontal Wires	2 x 6mm	2 x 6mm	2 x 6mm
Post Pattern	200 x 60mm	200 x 60mm	200 x 60mm



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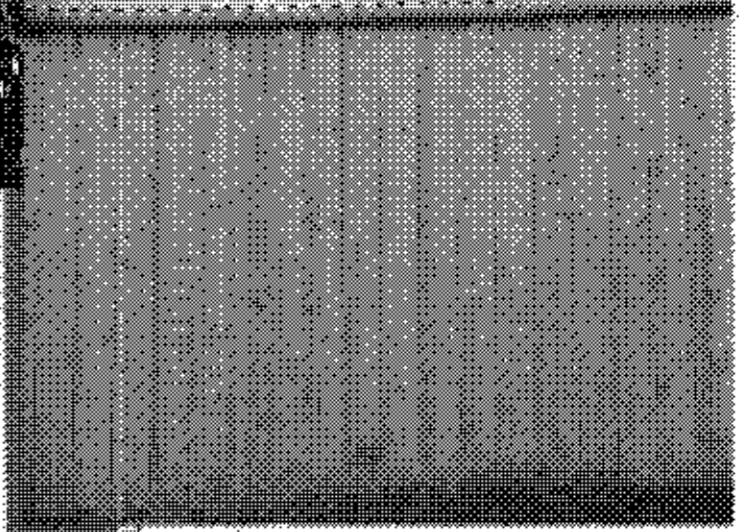


Metals mesh fences are of 120



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 PLANNING



Appearance of timber fence (untreated timber)

Metal Mesh Fence (concave)