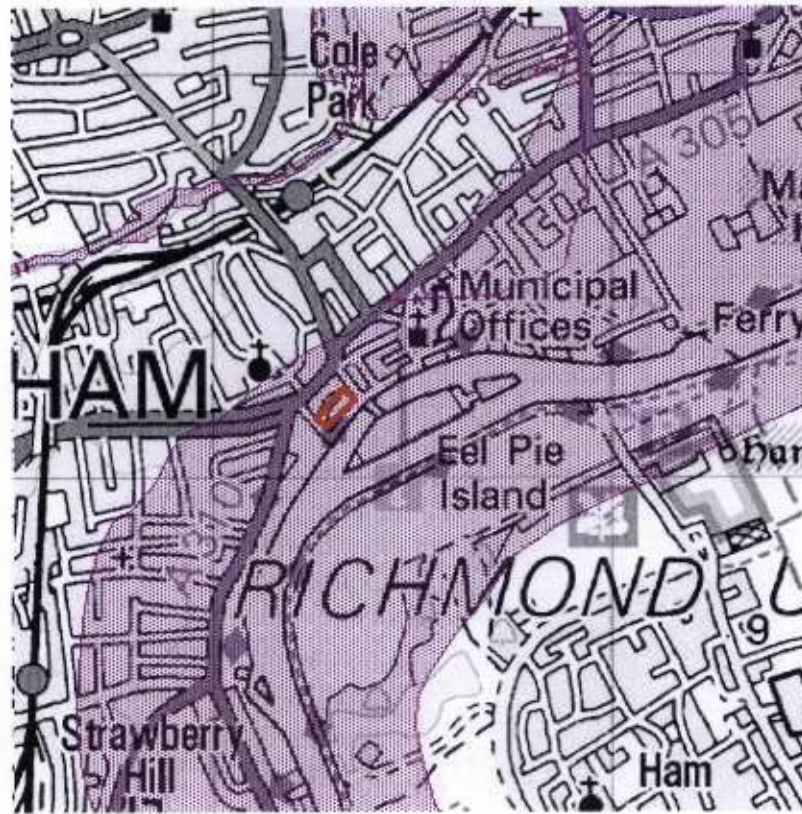


Appendix A – Environment Agency Indicative Floodplain



Environment Agency indicative floodplain maps from www.environment-agency.gov.uk.
The Twickenham Riverside site is shown in red with flooding shown in purple.



Wall south of pool building, on corner of The Embankment and Wharf Lane, which will stay as part of proposed garden.



Wharf Lane south of site.

Appendix C – Drawings

Location

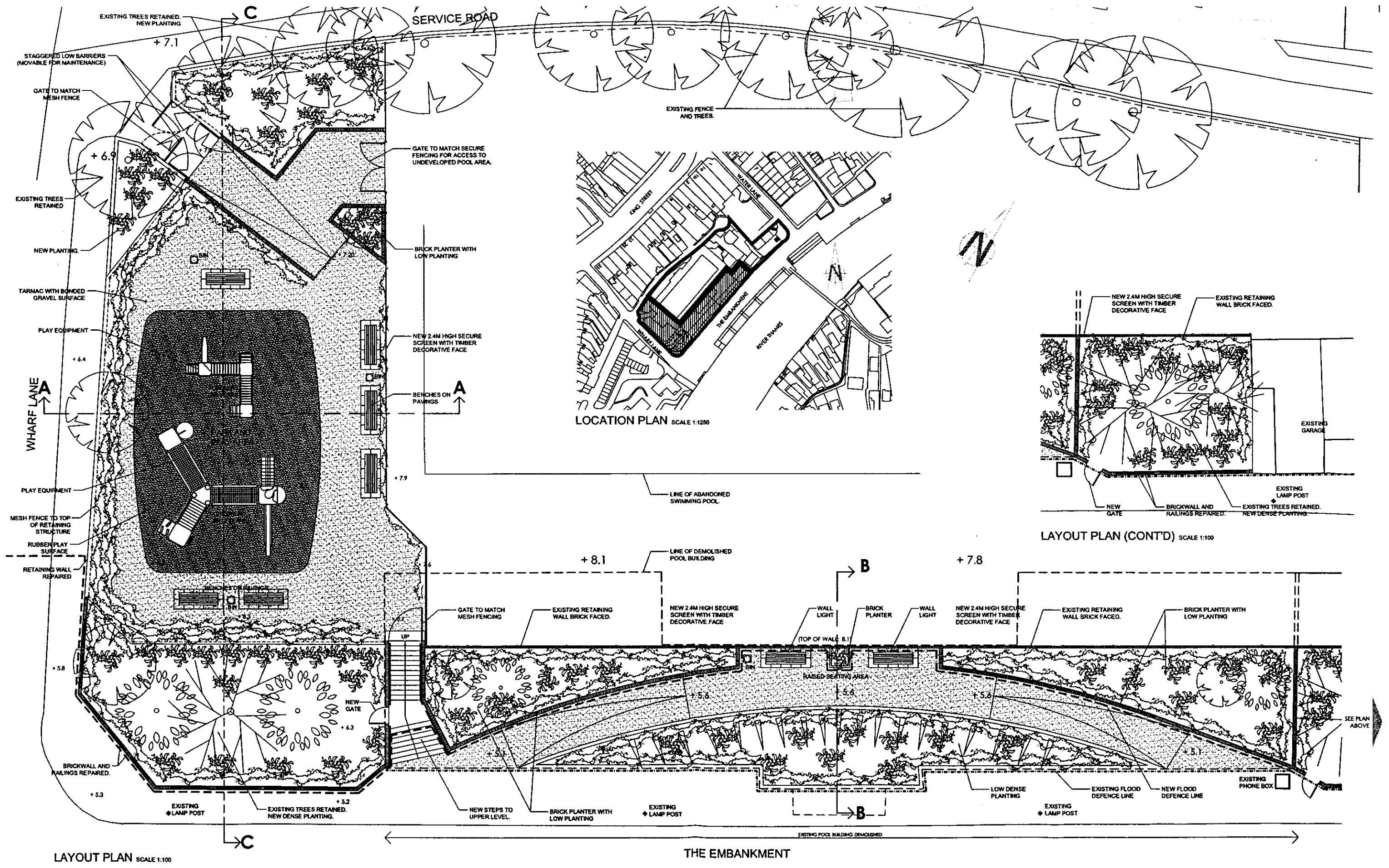
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Client: London Borough of Richmond Upon Thames
Project: Twickenham Riverside
Drawings: Layout Plan and Location Plan
Drawing No.: C2799/109

Dearle and Henderson architectural drawing
Client: London Borough of Richmond Upon Thames
Project: Twickenham Riverside
Drawings: Elevations
Drawing No.: C2799/101

Dearle and Henderson architectural drawing
Client: London Borough of Richmond Upon Thames
Project: Twickenham Riverside
Drawings: Sections
Drawing No.: C2799/102

Environment Agency Cross Sections

Thames Tidal Defences – Local Land Charge Registration
The Embankment, Twickenham, Middlesex, TW1 3DX
Client: National Rivers Authority Thames Region
By: Mason Land Surveys
Property No: 84/401/5
Date: July 1995
Drawing Number: 1-3



LAYOUT PLAN SCALE 1:100

THE EMBANKMENT

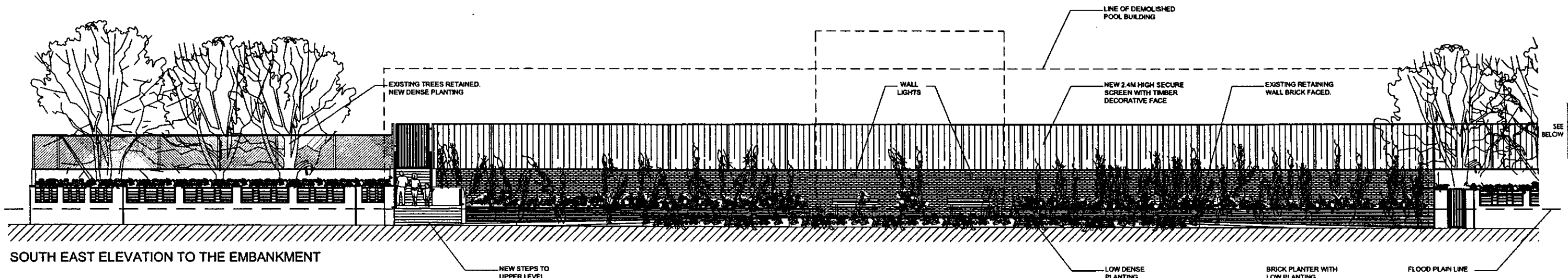
© THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE. NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.
 NO PART OF THIS DRAWING IS TO BE COPIED OR REPRODUCED WITHOUT THE PRIOR CONSENT OF THE ARCHITECT.
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rev.	date.	amendment.	chkd.	rev.	date.	amendment.	chkd.
drg status							

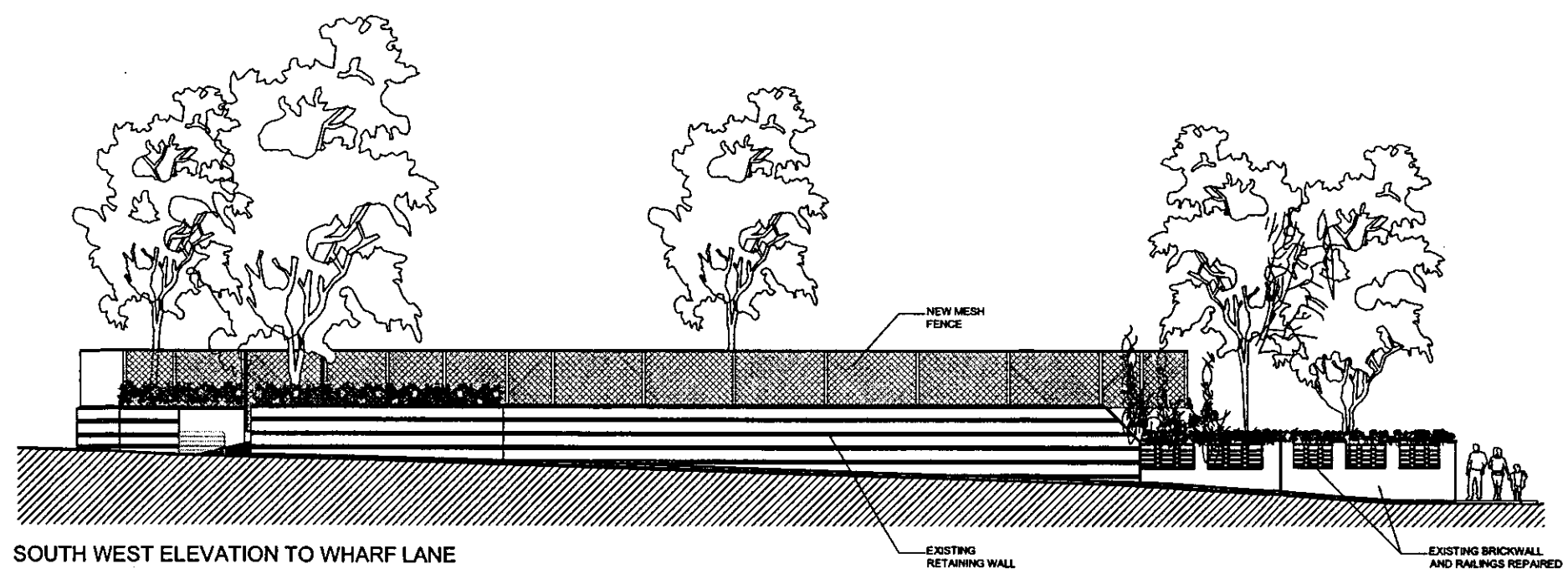
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LBRUT	LAYOUT PLAN & LOCATION PLAN	C2799/100	P2
project		drawn	date
TWICKENHAM RIVERSIDE		MA	MARCH 2008
		scale	VARIOUS @ A1

BIRMINGHAM 0121 832 1700 : CAMBRIDGE 01223 467136 : DUNDEE 01382 726 810 : GLASGOW 0141 435 3500 : GRESE COURT (LONDON) 020 7467 7300
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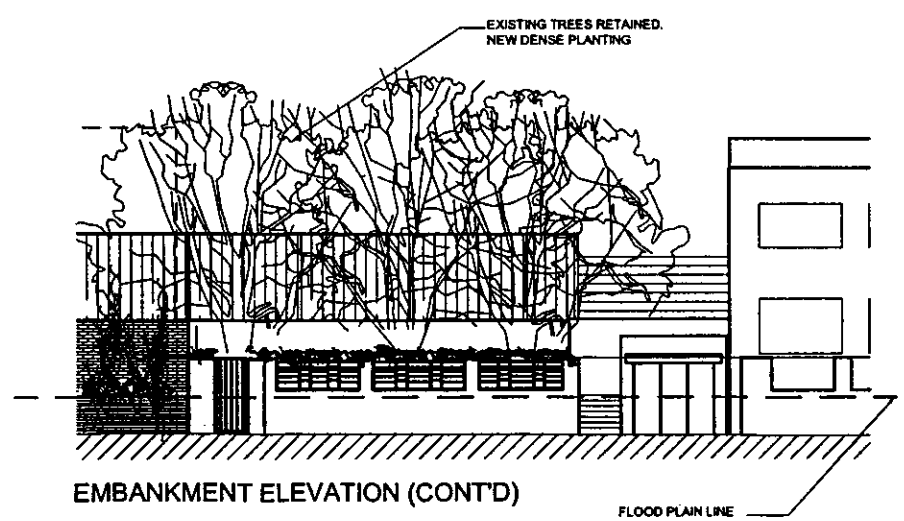
DEARLE & HENDERSON



SOUTH EAST ELEVATION TO THE EMBANKMENT



SOUTH WEST ELEVATION TO WHARF LANE



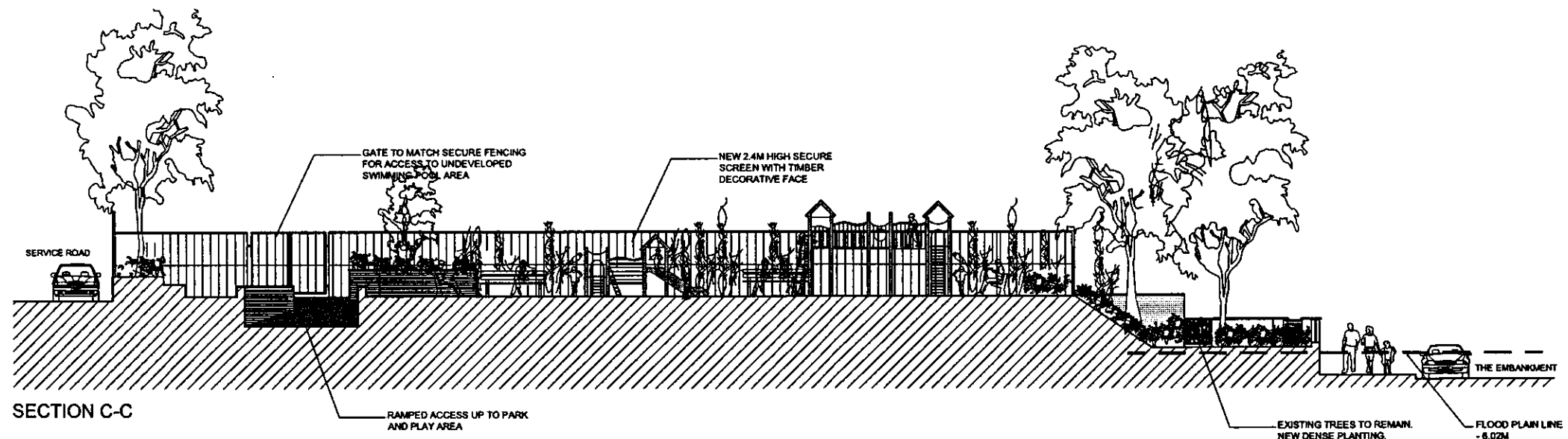
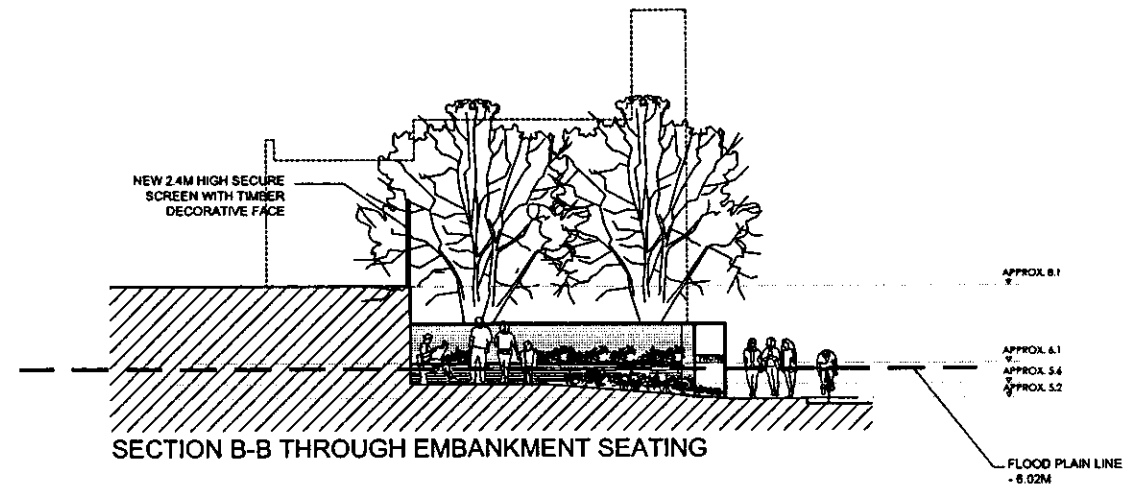
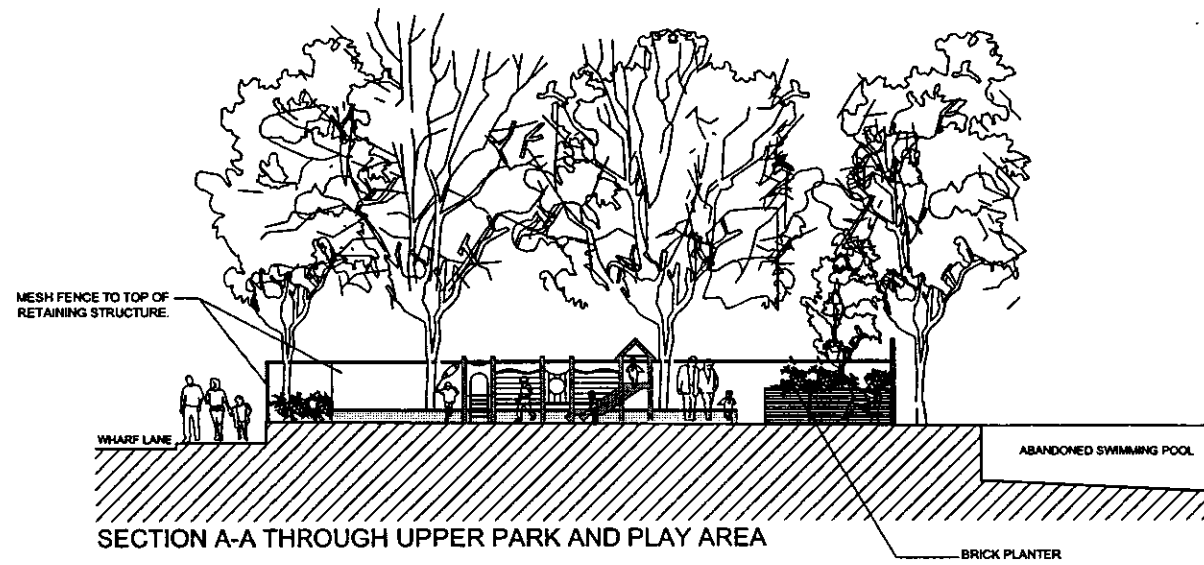
EMBANKMENT ELEVATION (CONT'D)

©	rev.	date.	amendment.	chkd.	rev.	date.	amendment.	chkd.
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<p>drg status</p>								

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LBRUT	ELEVATIONS	C2799/101	P2
Project	drawn	date	scale
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 LYON PLACE (LONDON) 020 7730 8021 : MANCHESTER 01622 860044 : NEWCASTLE 0191 253 0170 : WALTON FOREST 020 8088 6700 : WORTHING 01903 322 400

DEARLE & HENDERSON



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rev. date amendment chkd

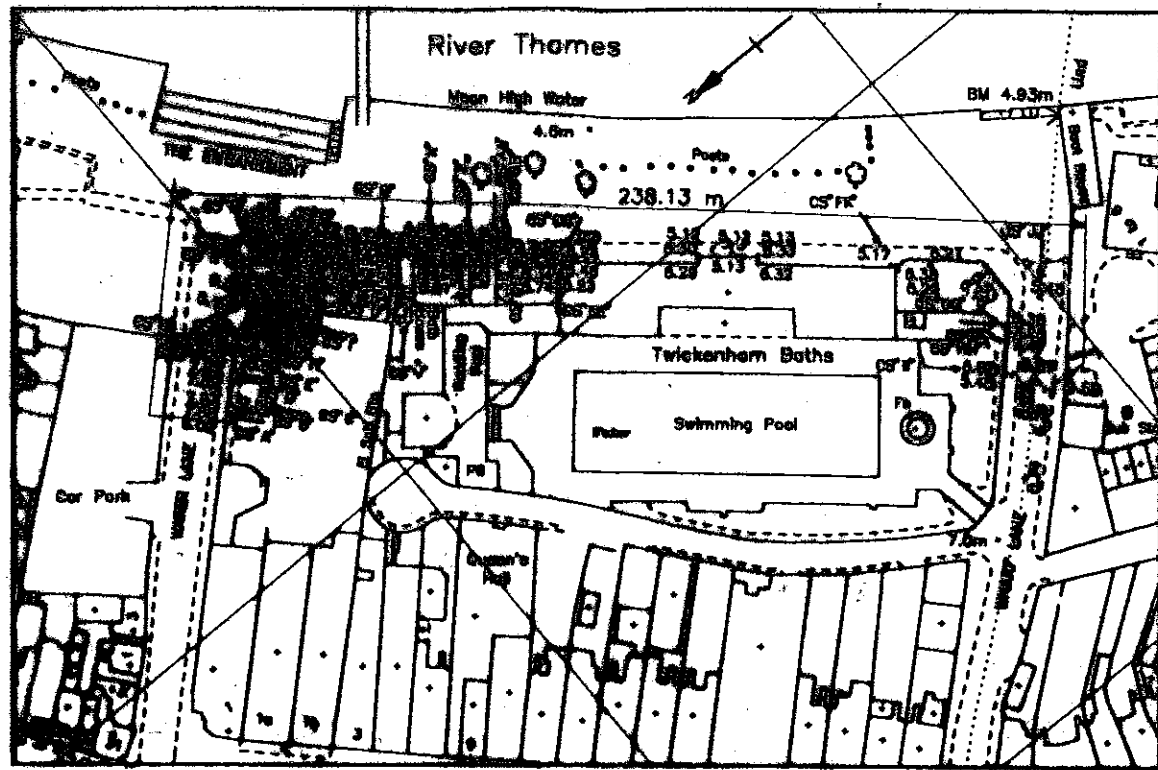
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drg status

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LYON PLACE (LONDON) 020 7730 9001 · MANCHESTER 01622 890044 · NEWCASTLE 0191 223 0779 · WALTON FOREST 0151 9388 6788 · WORTHING 01903 222 400

DEARLE & HENDERSON

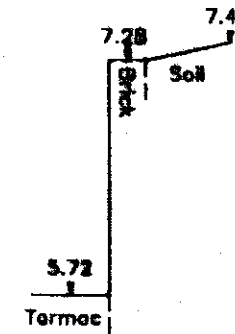


Total Length of Flood Defence 238.13 m

Scale 1 : 1250
TQ1673 SW

River Thames

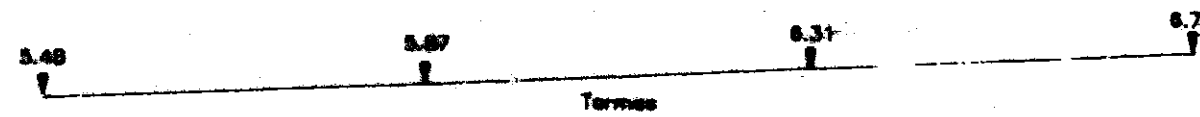
84/401/5



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River Thames

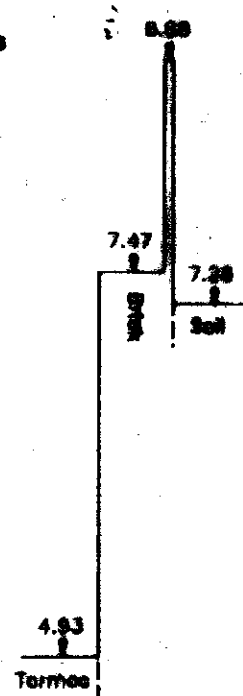
84/401/5



Cross - Section "JJ"
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River Thames

84/401/5



Cross - Section "II"
Scale 1 : 50

Note : Building Line with Thresholds at Levels of 5.12, 5.13 and 5.17 Above Ordnance Datum Newlyn can be found between CS^{EE} and CS^{FF}, and Between CS^Z and CS^{AA} Respectively.

THAMES TIDAL DEFENCES — LOCAL LAND CHARGES REGISTRATION

The Embankment
Twickenham
Middlesex
TW1 3DX

Client :
**NATIONAL RIVERS
AUTHORITY
THAMES REGION**
Surveyed by:
**MASON LAND
SURVEYS**

Property No:
84/401/5
Scale:
As Noted
Date:
JULY 1988
Drawn No:
Sheet 3 of 3

River Thames

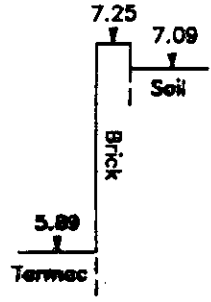
84/401/5

River Thames

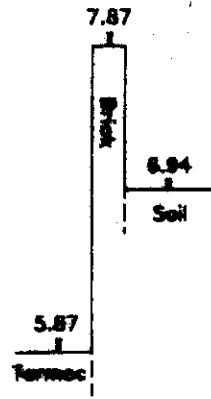
84/401/5

River Thames

84/401/5



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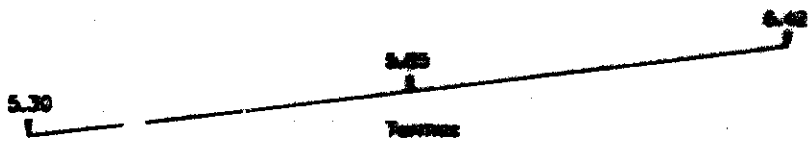
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River Thames

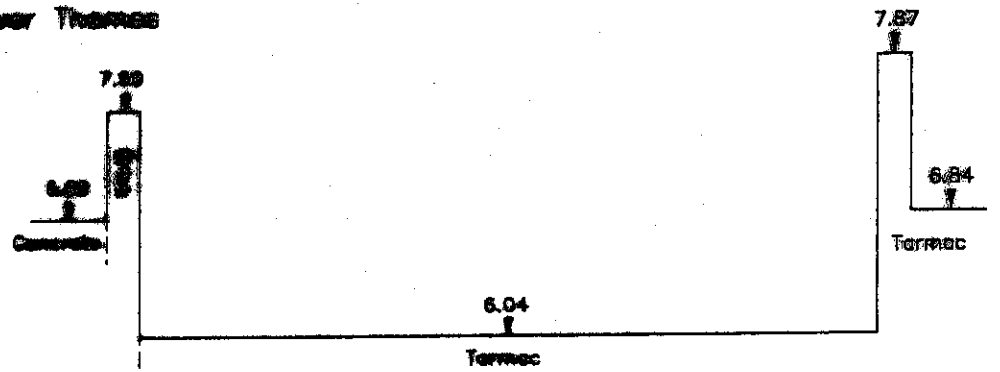
84/401/5



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River Thames

84/401/5



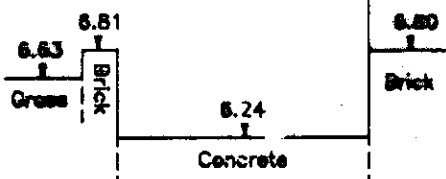
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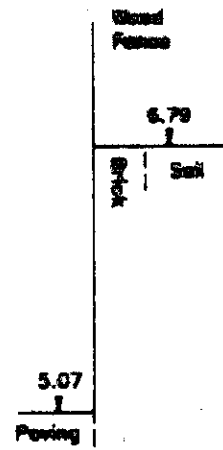
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River Thames

84/401/5

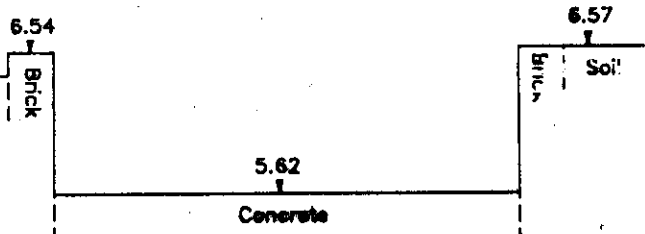


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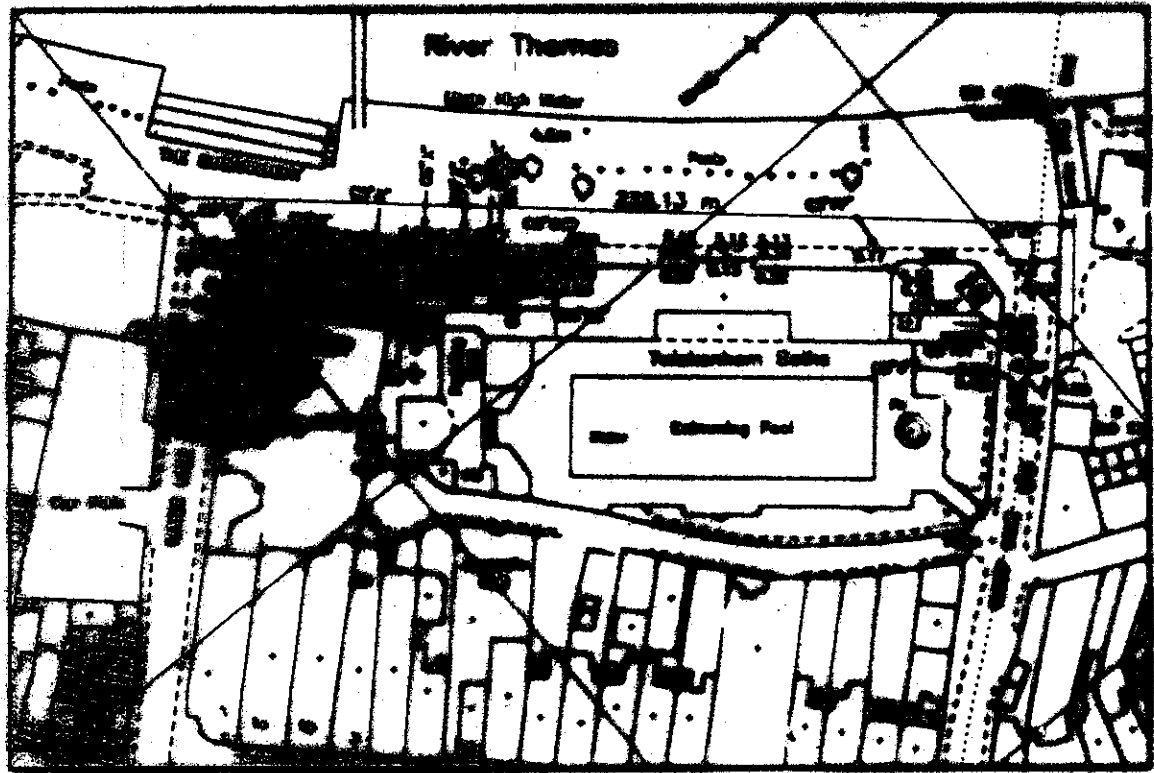
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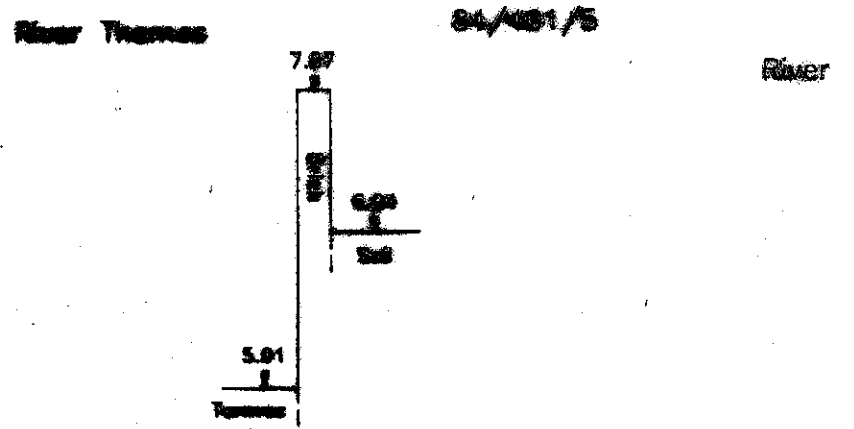
THAMES TIDAL DEFENCES - LOCAL LAND CHARGES REGISTRATION

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	Surveyed by:	MASON LAND SURVEYS	Scale:	As Noted
			Date:	JULY 1985
			Draw No:	Sheet 1 of 5

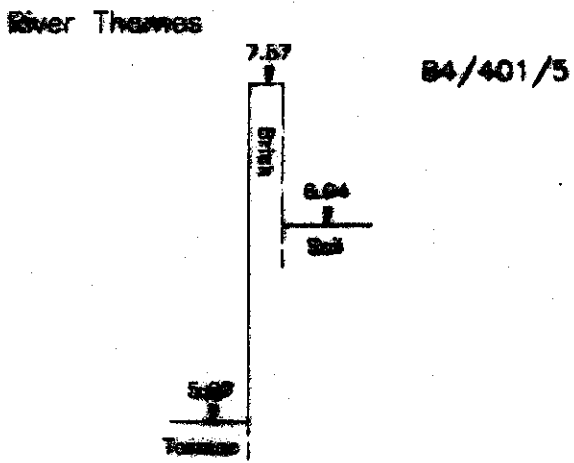


Total Length of Flood Defense 238.13 m

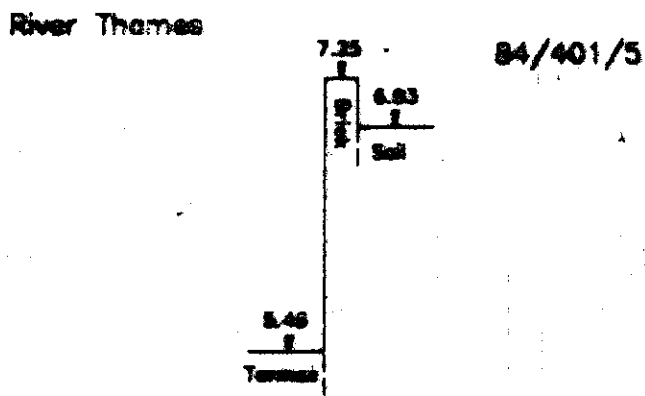
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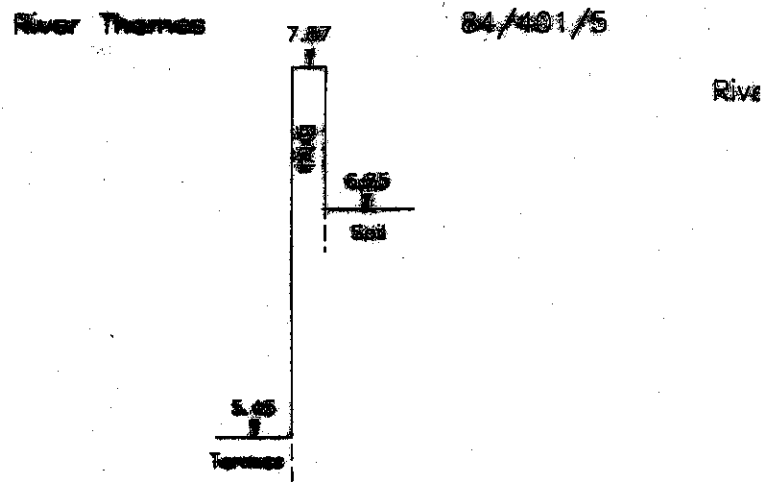
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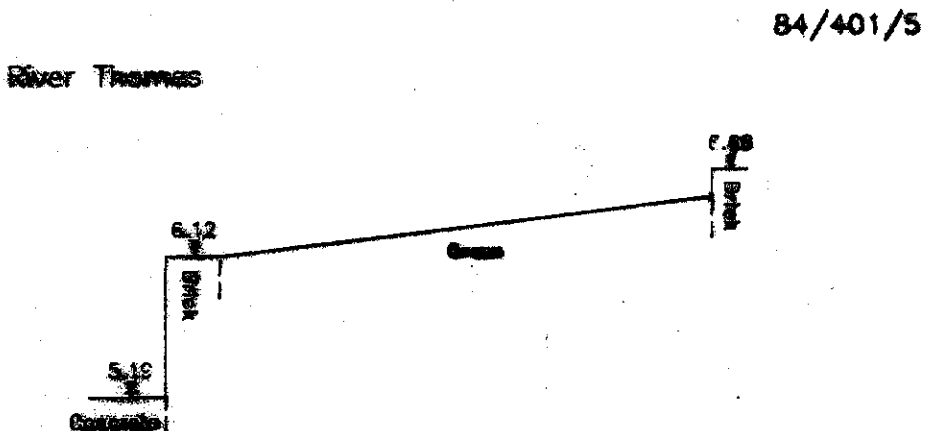
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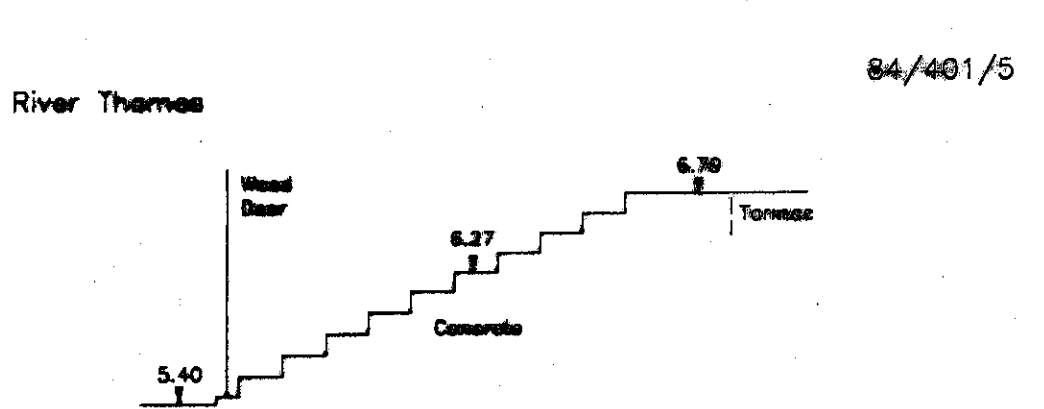
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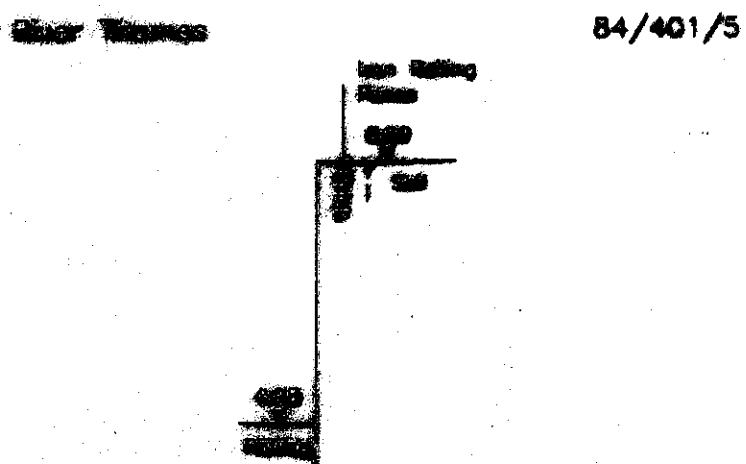
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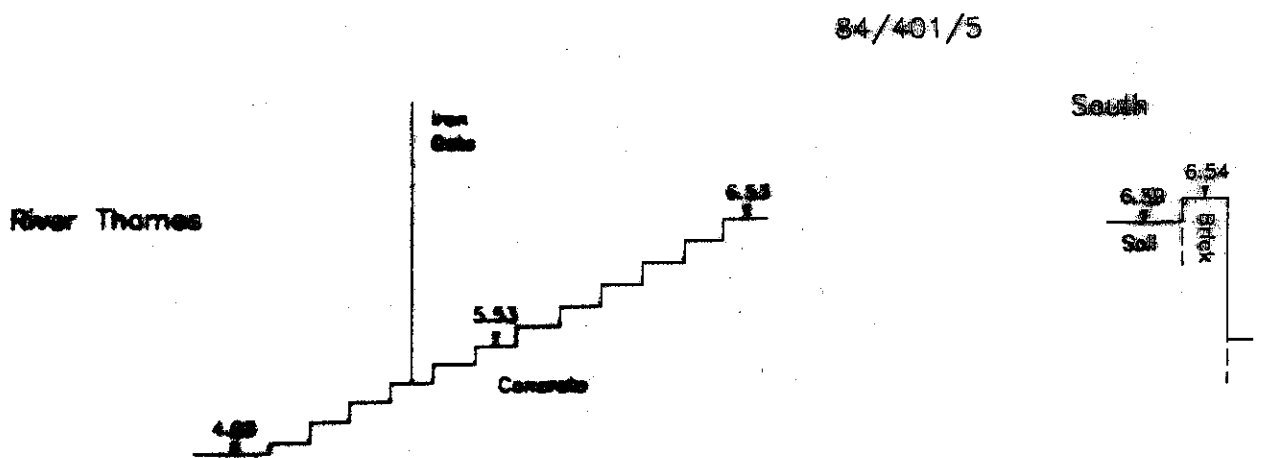
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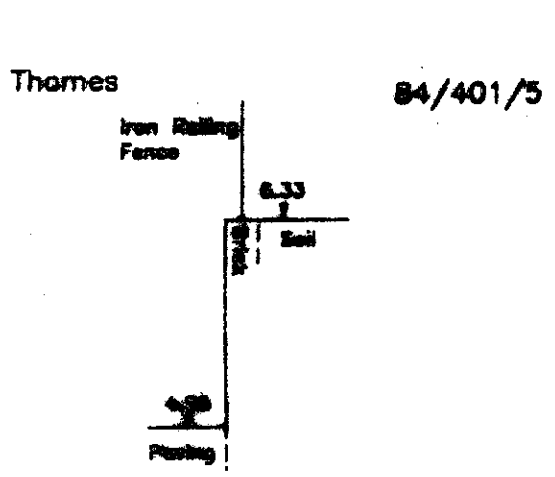
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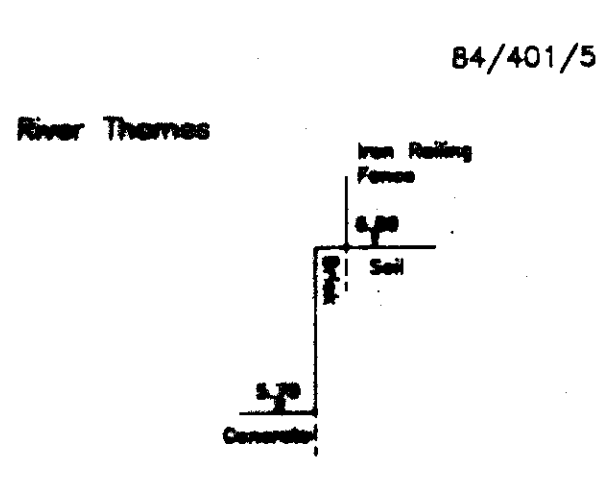
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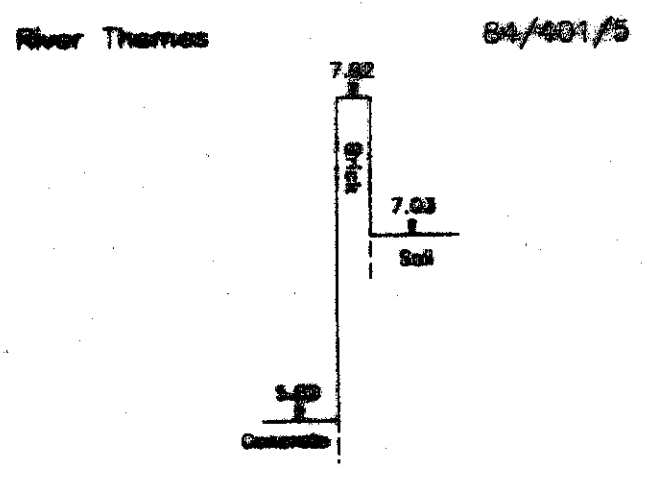
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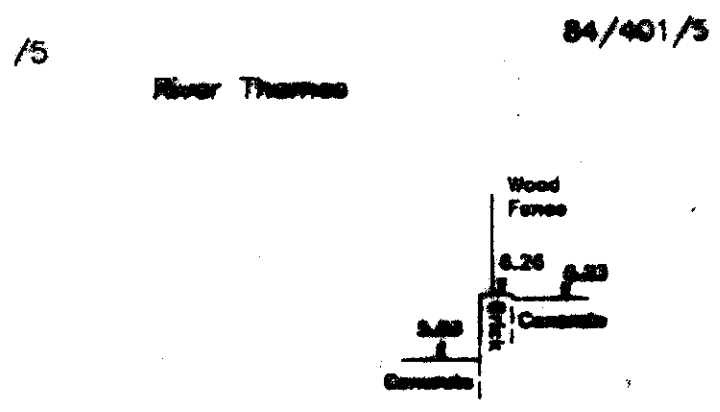
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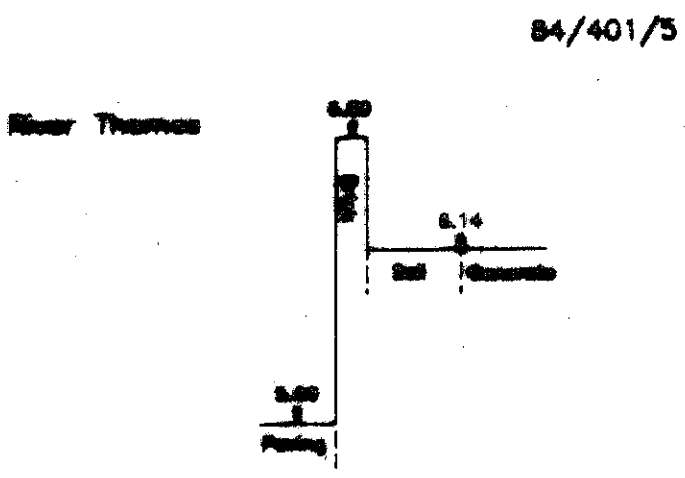
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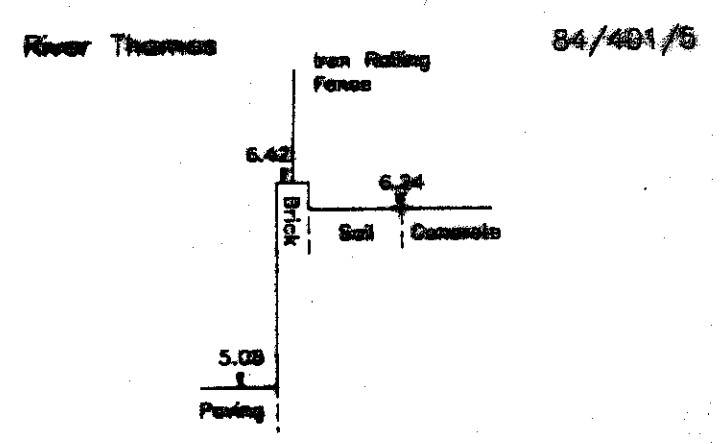
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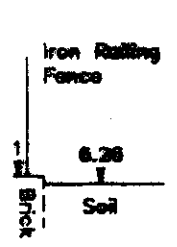
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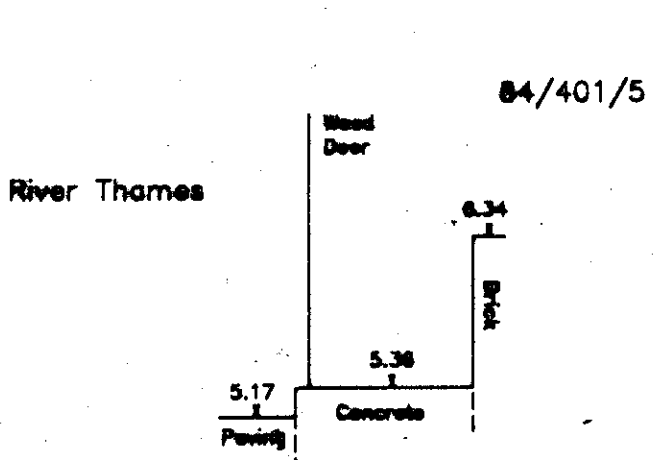
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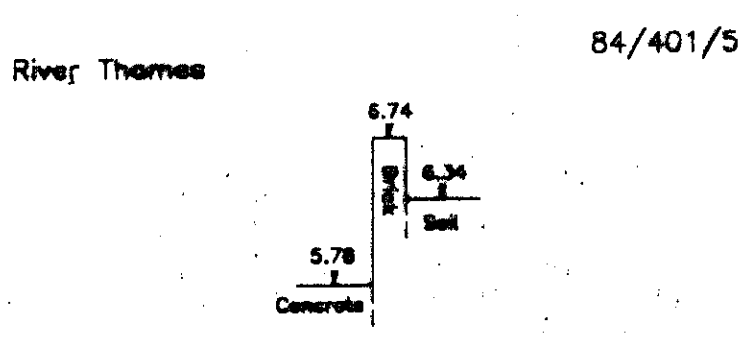
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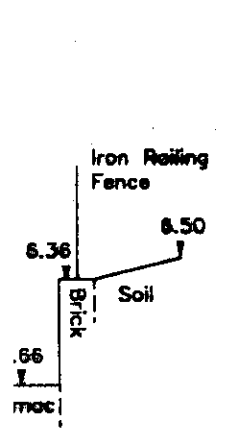
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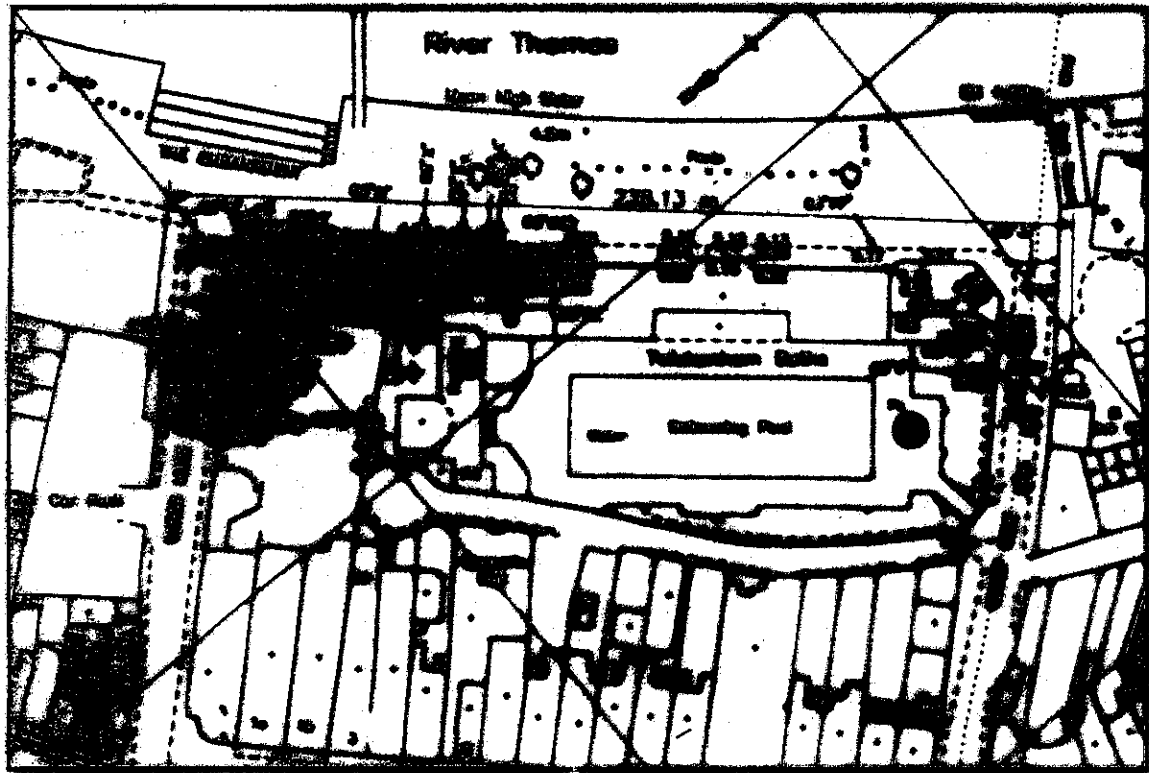
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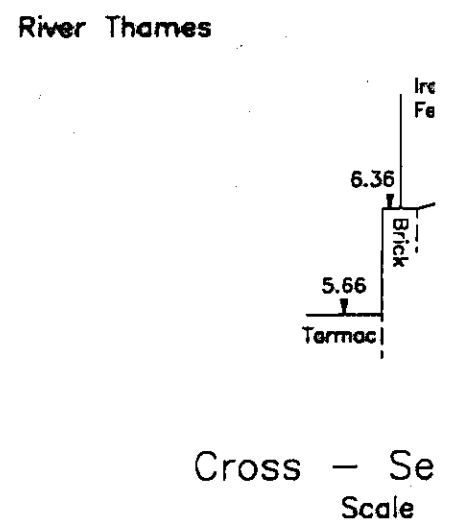
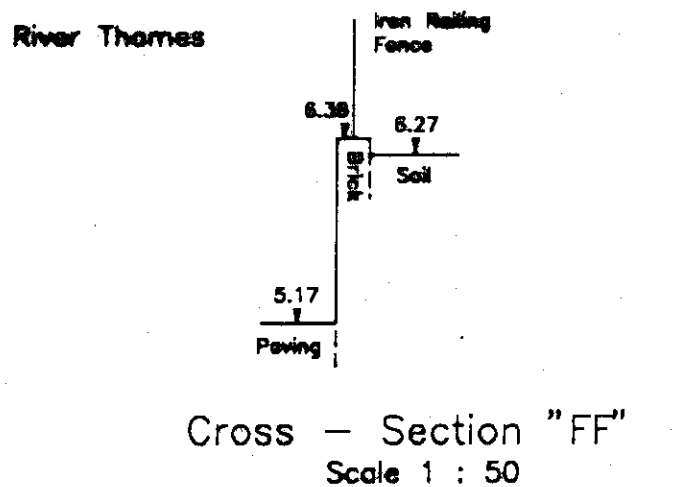
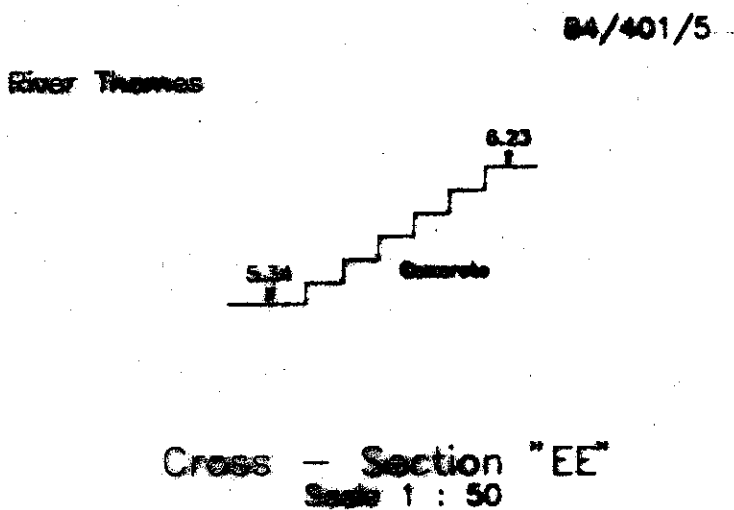
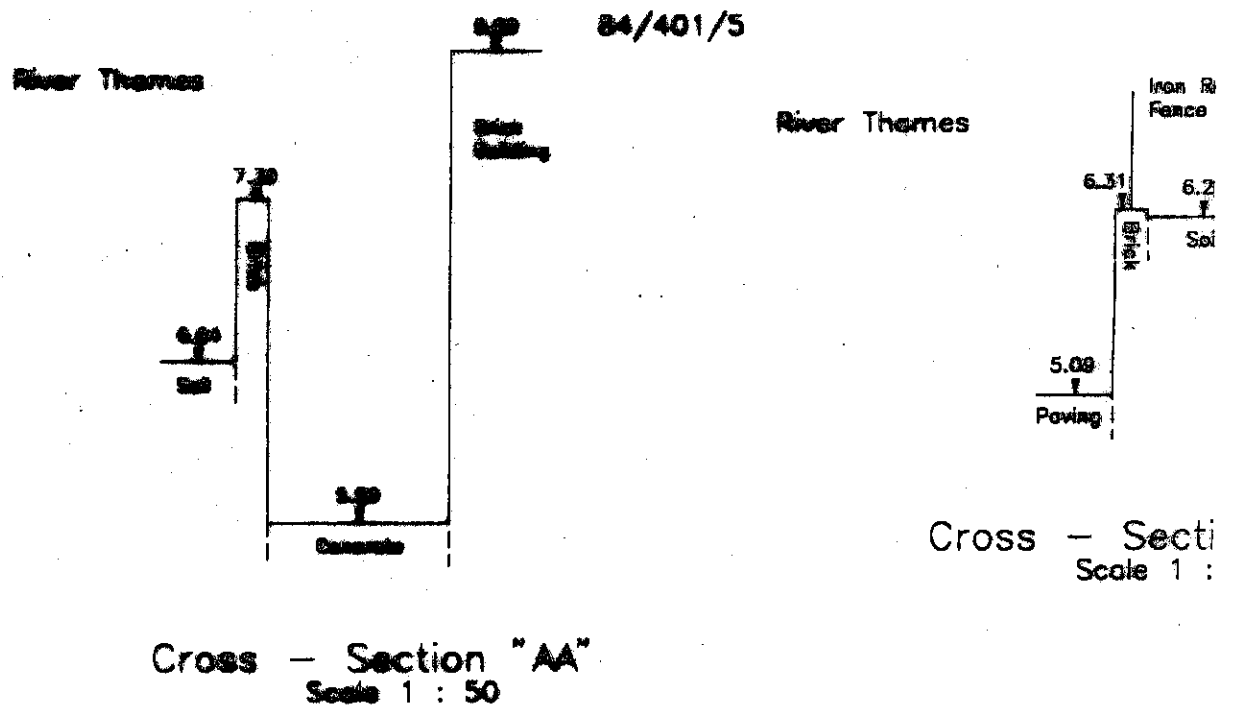
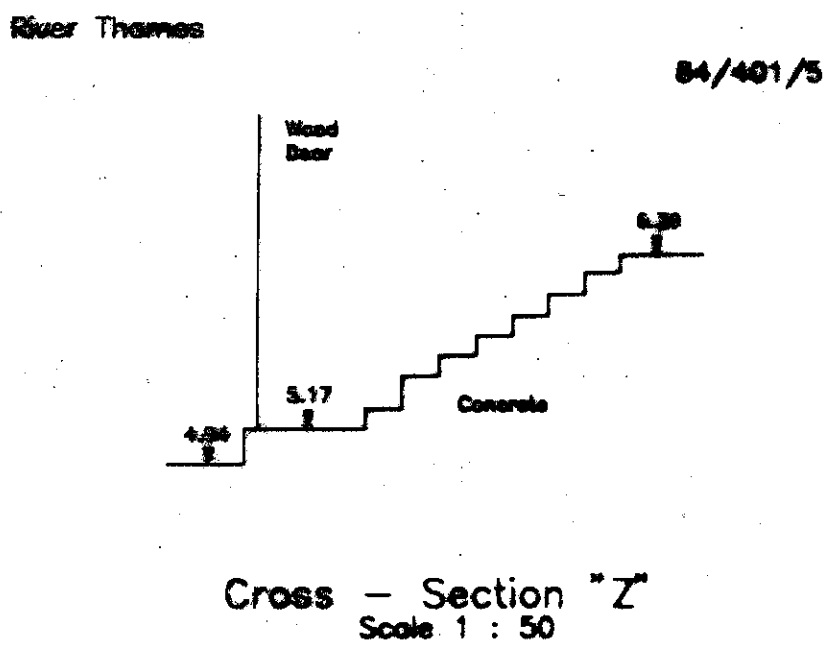
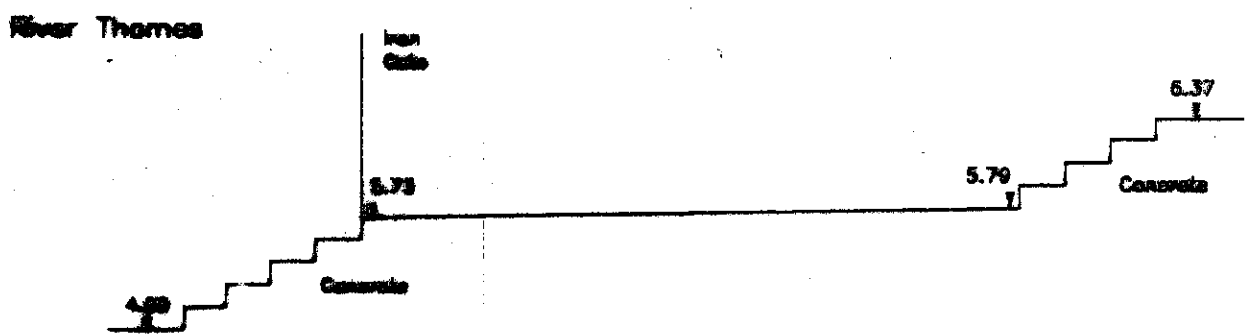
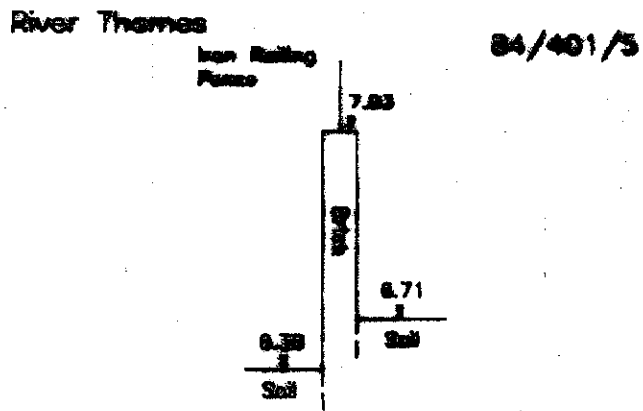
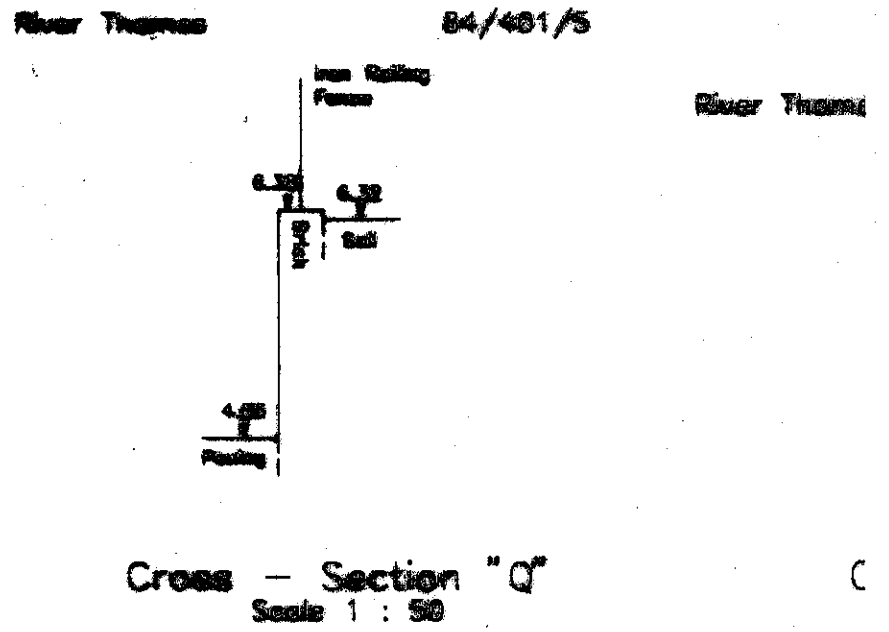
THAMES TIDAL DEFENCES - LOCAL LAND CHARGES REGISTRATION

The Embankment Twickenham Middlesex TW1 3DX	Client :	NATIONAL RIVERS AUTHORITY THAMES REGION	Property No:	84/401/5
	Surveyed by:	MASON LAND SURVEYS	Scale:	As Noted
			Date:	JULY 1985
			Dwg No:	Sheet 2 of 3



Total Length of Flood Defense 238.13 m

Scale 1 : 1250
T01673 SW



Appendix B – Photographs

Appendix D – Environment Agency Correspondence

Letter from Environment Agency - Proposal: Pre-development Enquiry for the Temporary Scheme of up to 5 years, Former Swimming Baths, Carpark. Location: 15 Kind Street and Wharf Lane, The Embankment, Twickenham.	27 February 2003
Meeting Notes - Twickenham Riverside Site, Flood Risk Assessment	18 March 2003
Email – Twickenham Riverside FRA – meeting notes	8 April 2003

Our Ref : SL/2001/004236-3/1

Your Ref : R2E

Date : 27 February 2003

London Borough Of Richmond Upon Thames
Mr . Summers
Civic Centre
44 York Street
Twickenham
Middlesex
TW1 3BZ

For the attention of Roy Summers

Dear Sir/Madam

**PROPOSAL: PRE-DEVELOPMENT ENQUIRY FOR TEMPORARY SCHEME OF
UPTO 5 YEARS FORMER SWIMMING BATHS, CAR PARK,
LOCATION: 15 KING STREET AND WHARF LANE, THE EMBANKMENT,
TWICKENHAM**

Ø

Thank you for your letter dated 30th January, which was received on 31st January. You are asked to quote the following reference in any correspondence: SL/2001/004236-3. The Environment Agency has the following comments:

CONSERVATION:

The Agency is supportive of any landscape scheme that creates a public open space adjacent to the river and that meets the above criteria. We look forward to receiving engineering details (as soon as these become available) of the proposed works within the margins set out above to enable us to progress with the consents required under the Water Resources Act 1991.

The Agency supports the creation of a landscaped area next to the Thames, however we would like to emphasise that a more appropriate location for the riverside park might have been adjacent to the Thames where it would present greater amenity and ecological value by providing important soft landscaping adjacent to this watercourse. The Agency would support the removal of hardstanding including car parking adjacent to the watercourse. The Agency would also like to emphasise that we would not expect any future building to be located within 16 metres of the tidal Thames.

Developments close to the River Thames should reflect its special character, in terms of height, scale and quality, enhancing rather than detracting from the river landscape. Normally the Agency would require that any development, including the provision of the Thames Path should be undertaken landward of the existing flood defence and incorporated within a landscaped buffer zone of at least 16 metres between the built development and the river edge. The Environment Agency has no objection, in principle to developing this area, however there must be no further encroachment into the Buffer Zone alongside the river. To

Environment Agency

10 Albert Embankment, London, SE1 7SP, Tel no:0208 305 4003, Fax no:0208 305 4090

maintain the character of the watercourse and provide undisturbed refuges for wildlife using the river corridor. Encroachment into this buffer zone would lead to an objection by the Agency.

The river wall and adjacent riverside is all part of the River Thames corridor with the river designated as a Site of Metropolitan Importance (SMI) by the London Ecology Unit (LEU). The river corridor should therefore be treated sensitively when considering planning issues.

Landscape Management Plans:

A landscape management plan would need to be developed including a planting scheme. This scheme should take account of long term design objectives, management responsibilities and maintenance schedules for all landscape areas, other than small, privately owned, domestic gardens. To protect, restore or replace the natural features and character of the area including the watercourse. Any landscaping on the site should consist of locally appropriate species and selected in line with the environment and climate of the Upper Tideway. Consideration should be given to 'habitat enabling' and natural recolonisation on parts of the site in addition to the creation of new landscaped areas.

Planting along the river edge should not include the provision of tall trees as this provides roosts for crows. Planting should comprise of native species only. Use of locally native species in landscaping plans is essential in order to benefit local wildlife and to help maintain the region's natural balance of flora. It will also help to prevent the spread of invasive, alien species within the region.

Site Lighting:

Careful consideration of the type of lighting along the river edge must be given. Any lighting should not over-spill on to the adjacent foreshore areas, to limit disturbance to feeding wildfowl.

Buffer Zones

The buffer zones should be suitably protected with fencing or a native hedge in order that it remains undisturbed and maintained for wildlife. The buffer zone should not include any built development including hardstanding, fences or formal/ornamental garden.

Buffer zones to watercourses are required for the following purposes:

- (i) to allow the watercourse to undergo natural processes of erosion and deposition, and associated changes in alignment and bank profile, without the need for artificial bank protection works and the associated destruction of natural bank habitat
- (ii) to provide for the terrestrial life stages of aquatic insects, for nesting of water-related bird species, and for bank dwelling small mammals
- (iii) to provide a "wildlife corridor" bringing more general benefits by linking a number of habitats and affording species a wider and therefore more robust and sustainable range of linked habitats

(iv) to allow for the maintenance of a zone of natural character with vegetation that gives rise to a range of conditions of light and shade in the watercourse itself. This mix of conditions encourages proliferation of a wide range of aquatic species, including fish

(v) to allow, where appropriate, for the regrading of banks to a lower and safer profile, in areas where there is public access

(vi) to prevent overshadowing of watercourses by buildings

(vii) to reduce the risk of accidental pollution from run-off.

Wildlife Protection:

There must be no fires, dumping, storage of materials or tracking of machinery within the buffer zone which should be suitably marked and protected during development.

There must be no contamination (e.g. by silt, oil, rubble or any other debris or pollutants) of the adjacent watercourses / adjacent ditches/ waterbodies or drains if development proceeds.

Any disturbance to the foreshore during works must be restored using the same materials or materials that match the original ones as closely as possible.

Bird nesting and roosting sites should be built into the development through the incorporation of ledges, crevices and boxes, where possible.

Vegetation Removal:

Tree and shrub removal from the site should be minimised if works proceed. Professional tree surgery should be carried out in preference to felling wherever possible so that trees can be made safe and retained on site. Any retained trees must be protected during construction. Appropriate replacement planting should be provided for any vegetation lost, disturbed or degraded during works.

Essential tree felling, branch lopping or scrub clearance should avoid the bird nesting season (generally March to August inclusive). This avoids disturbing wild birds during a critical period and will help to prevent possible contravention of the Wildlife and Countryside Act 1981 which protects nesting wild birds and their nests.

Trees to be felled should be inspected for bats prior to felling. All species of bat in Britain and their roosts are afforded special protection under the Wildlife and Countryside Act 1981. If bats are found, English Nature must be contacted for advice.

SURFACE WATER DRAINAGE:

Consideration should be given to the use of a sustainable urban drainage system, utilising surface water for landscape irrigation and water features.

In order to manage the disposal of surface water in a more sustainable manner, taking into account flood risk and other environmental factors, the Environment Agency will recommend that restrictions are imposed on the discharge of surface water from the site. Particular care

must be exercised where there is an increase in the impermeable area. The developer will be required to accommodate excess water and control its release into local watercourses, whether directly or by means of the local surface water sewerage system.

Sustainable Drainage Systems:

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the Environment Agency. These techniques not only cater for flood peak attenuation, but may also improve water quality and enhance the environment. Such systems include:

- permeable pavements
- grassed swales
- infiltration trenches
- ponds
- wetlands.

The developer is advised to discuss with the Agency how these techniques might be applied at this site.

PERMEABLE SURFACING:

Permeable surfacing allows rain water to pass through the road surface and sub-grade, in doing so the water is filtered before entering the underlying subsoil or storage reservoir. The degree of treatment that the filtering process provides will depend on the pollutant load in the surface water and the soil characteristics, but in most cases pollutant removal rates are high.

Various types of porous surfacing can be considered, including porous block pavements, porous asphalt or tarmac or open textured concrete blocks such as Grasscrete. Although porous surfacing can be more expensive than traditional sealed surfacing, because no gullies or gradients on the road surfaces are needed, then any extra expense is mitigated.

Porous paving will help to maintain the existing groundwater dynamics at this location.

Please contact the Environment Agency should you wish to discuss further the use of porous paving.

Opportunities should be provided for wildlife habitat enhancement through enlargement and/or appropriate management of existing habitats and through creation of new habitats.

PLANNING CONDITIONS:

While the Agency has no objection to the interim scheme the following conditions should be complied with:

CONDITION: There should be no nett loss of flood storage volume using the existing storage volume on site as the base to make the measurements from.

REASON To prevent the increased risk of flooding

CONDITION: A continuous and effective flood defence shall be established on the site and

Environment Agency

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structurally linked up with the adjacent properties. The minimum flood defence level is 6.02 metres above Ordnance Datum Newlyn. This applies to both the temporary and permanent schemes. A temporary flood defence may need to be established.
REASON: To prevent the increased risk of flooding.

CONDITION: Any construction works either affecting the flood defence or in front of the existing flood defence or within 16 metres landward of the existing flood defence will require the Agency's prior written consent.
REASON: To prevent the increased risk of flooding.

CONDITION: There shall be no storage of materials within 8 metres of the watercourse. This must be suitably marked and protected during development and there shall be no access during development within this area. There shall be no fires, dumping or tracking of machinery within this area.
REASON: To reduce the impact of the proposed development on wildlife habitats upstream and downstream, including bankside habitats.

CONDITION: A landscape management plan, including long term design objectives, management responsibilities and maintenance schedules for all landscape areas, other than small, privately owned, domestic gardens shall be submitted to and approved in writing by the Local Planning Authority before the development commences. The landscape management plan shall be carried out as approved.
REASON: To protect/conservate the natural features and character of the area.

(Note: The Environment Agency asks to be consulted on any details submitted in compliance with this condition).

CONDITION: No development approved by this permission shall be commenced until a planting scheme, has been approved in writing by the Local Planning Authority. The approved scheme shall be carried out in accordance with a programme for planting and maintenance related to stages of completion of the development.
REASON: To protect, restore or replace the natural features of importance within or adjoining the watercourse.

(Note: The Environment Agency asks to be consulted on any details submitted in compliance with this condition).

INFORMATIVES:

Under the terms of the Water Resources Act 1991 and the Land Drainage Byelaws 1981, the prior written consent of the Environment Agency is required for any proposed works or structures either affecting or within 16 metres of the tidal flood defence structure.
Contact Lucky Wehale on 020 8305 4003 for more information.

Under the terms of the Salmon and Freshwater Fisheries Act 1975, it is an offence to cause or knowingly to permit to flow, or put, into any waters containing fish, any liquid or solid matter to such an extent as to cause the water to be poisonous or injurious to fish or the spawning grounds, spawn or food of fish.

Under the terms of the Salmon and Freshwater Fisheries Act 1975 it is an offence to disturb

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spawning fish or their habitats.

ADVISE:

A full set of Pollution Prevention Guidelines (PPGs) are available to view on the Agency website: www.environment-agency.gov.uk

Please refer to

PPG05 - Works in near or liable to affect a watercourse
PPG06 - Working at construction and demolitions sites

To report a pollution incident relating to air, land and water please call the Environment Agency 24 hour Emergency Hotline 0800 80 70 60.

If you have any further queries please do not hesitate to contact Emma Langford on 020 8305 4020.

Yours faithfully

EMMA LANGFORD
Planning Liaison Officer

E mail: emma.langford@environment-agency.gov.uk
Website: www.environment-agency.gov.uk

Meeting Notes



*Job Title / Ref.:	Twickenham Riverside Site Flood Risk Assessment	Job No. D 102072
		Project No. Z00B
Subject of Meeting	Flood Risk Assessment	Meeting No.: 1 Date & Time: 18-Mar-03 10:00
Attendees:	Tim Fisher (TF) - Scott Wilson (SW) Tong Cheah (TC) - Environment Agency (EA) Rob Docker (RD) - Dearle and Henderson (DH)	Venue: EA, 10 Albert Embankment, London, SE1 7SP Notes By: TF Distribution: TC, TF, RD, Mike Joyce, Tom McKeivitt

Item	NOTES	ACTION
1	Meeting to discuss flood risk assessment (FRA) of Twickenham Riverside Site, 15 King Street and Wharf Lane, The Embankment, Twickenham (follow up meeting to EA letter dated 27th February 2003, EA ref SL/2001/004236-3/1). Introduction	
2	TF/RD introduced and gave background to the temporary development of the Twickenham Riverside site. Proposal is for temporary development of a garden and playground on part of the site currently occupied by the former swimming paths. The derelict bathhouse building will be demolished. The temporary development is expected to be in place for 5 years and may or may not be part of the permanent development. London Borough of Richmond Upon Thames (the landowner) is investigating permanent development options.	
3	DH architecture plans C2799/100, C2799/101 and C2799/102 and SW photographs of the existing site were given to EA.	
4	TF brought up issue of flood storage volume identified in EA letter (dated 27th February 2003, EA ref SL/2001/004236-3/1).	
5	TF/RD explained that the existing flood wall (front wall of the bath house) is to be replaced by a garden and path that slope back from the Embankment footpath. The new flood defence line will be the planter boxes at the back of the garden (see architecture plan C2799/100). The temporary development will increase the flood plain storage by approximately 150 m ³ .	
6	TC was asked whether this volume would be permanently lost from the site if it was given up to flood plan storage as part of the temporary development. TC said that the 150 m ³ would not be permanently lost to the floodplain and that future development could be based on the existing flood defence line provided by the bath house front wall. In the FRA it should be made clear that the landowner reserves the right to the flood plain storage volume temporarily lost from the site as a result of temporary development.	
7	TC suggested that if the conservation value of the site was increase that the landowner may have difficulties getting back that land for development. Future schemes may require a similar degree of conservation value. RD said that playground and managed park would have low conservation value, so this should not be a concern	
8	TF brought up issue of continuous and effective flood defence identified in EA letter (dated 27th February 2003, EA ref SL/2001/004236-3/1).	
9	TC said that the flood defence level is 6.02 m AOD, which provides the standard of protection required by the EA. The flood defence level is for a design horizon of 2030 and provides for climate change until that date.	
10	The derelict bathhouse will be replaced with a garden (see architecture plan C2799/100). The new flood defence line will be the planter boxes along the back of the garden. These planter boxes will have a top level of 6.1 m AOD.	
11	Brick walls adjacent to the bathhouse will stay and are designated by the EA as the flood defence structures. Their top level is 6.3 m AOD and they retain land behind them to the same level or higher.	
12	The brick walls tie into ground levels in both Wharf Lane (south) and Water Lane (north) that are higher than 6.02 m AOD. Thus providing continuous and effective flood defence.	
13	TC expressed that he was satisfied with the flood defence measures in place. He suggested improvements to the architecture plans to make them suitable for the FRA including adding levels, adding flood defence level and designating the flood defence structures.	RD
14	EA to supply TF with EA cross-section of flood defences.	TC
15	TF asked about the requirements for a Land Drain Consent . TC said that a Land Drainage Consent would be required for the works as the flood defence structure were being affected. The Land Drainage Consent could be applied for a later date and should be supported by engineering drawings of changes to the flood defence structures.	
16	TW asked about the requirements for addressing stormwater drainage issues in the FRA.	

Meeting Notes



Item	NOTES	ACTION
17	RD explained existing and proposed stormwater drainage. The area of the temporary development shown as playground is currently paved and has soak-aways. Drainage for this area will use the same soak-aways or new soak-aways.	
18	The poolside area and bathhouse roof drain to a manhole and sewer adjacent to the pool. The sewer then drains under the bathhouse to a manhole on the Embankment. From the Embankment there is believed to be a discharge to the Thames. The new garden (to replace the bath house) will be impermeable or drain to impermeable areas. Excess stormwater will drain to the street stormwater system. The footpath surface material is under negotiation with the Richmond Council maintenance staff.	
19	The temporary development will reduce the impervious area.	
20	The client can reserve the right to have the same amount as impervious area as the existing bathing pool complex for any future development. i.e. Future development can be based on the impervious area of the existing bathing pool complex rather than the reduced impervious area of the bathing pool complex with temporary garden. Best practice sustainable stormwater design will still be expected for future developments. At least the current situation should be mimicked i.e. some soak-aways.	
21	TF asked about the site's flood history. TC said that the streets in the area flooded, but that detailed flood history information would not be required for this FRA.	

Copy to: Job file,

Tim Fisher

From: Toong Cheah [toong.cheah@environment-agency.gov.uk]
Sent: 08 April 2003 12:27
To: Tim Fisher
Subject: Re: Twickenham Riverside FRA - meeting notes

Hi Tim

Sorry for the delay in getting back to you but I have been trashing through some internal issues in respect of flood levels.

I am pleased to confirm that the meeting notes are fine. The only thing I would add is that when the permanent development is proposed, a FRA will be required, which will be for the life of the development, i.e. beyond 2030. This may be subject to a changed flood defence level, depending on results of future studies into the flood defences beyond 2030 or guidance in effect then.

Regards
Toong

>>> "Tim Fisher" <Tim.Fisher@scottwilson.com> 18/03/03 14:59:36 >>>

Toong and Rob,

Thanks for the meeting today. Please find attached the draft meeting notes. Could you please reply with any corrections or additional points.

Regards

Tim

<<Meeting re Twickenham btw EA, SW and DH 18 March 2002.doc>>

Dr Tim Fisher
for Scott Wilson,
ph - 01256 461161 extn 390
fax - 01256 460582

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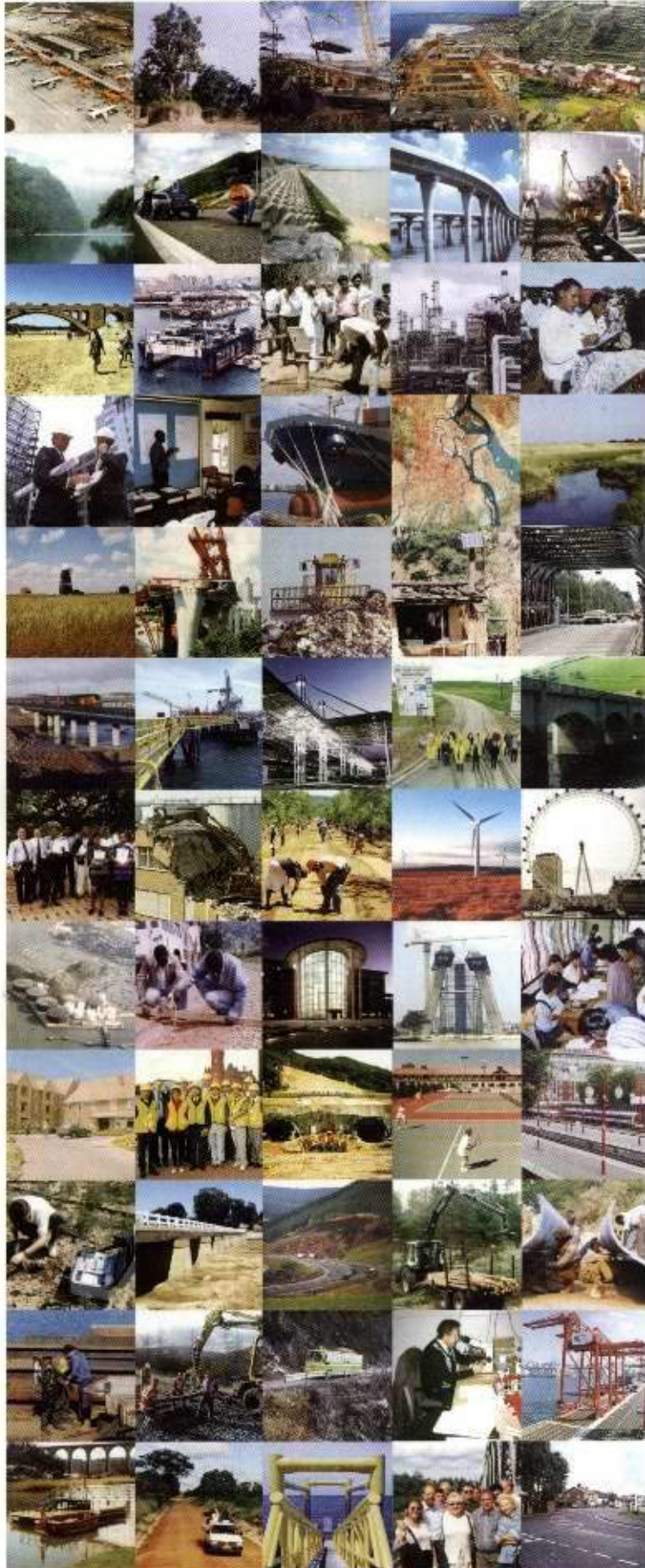
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View upstream of River Thames.



View downstream of River Thames with river wall and bridge to Eel Pie Island.



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Twickenham Baths pool building viewed from riverside pathway, with The Embankment in the middle ground.



Twickenham Riverside old pool building viewed from riverside pathway, with The Embankment in the middle ground.



View of Twickenham Baths site from Eel Pie bridge.



View of the Twickenham Baths site from Eel Pie bridge.



View upstream of the Twickenham Baths site and of Water Lane from Eel Pie bridge.



View of upstream of site from Eel Pie bridge.



Thames River wall.



Root through Thames River wall.



Flood warning sign on The Embankment.



Water Lane north of site.



Wall north east of pool building, which will stay as part of proposed garden.



Pool building wall and window, which will be demolished to make way for proposed garden.