

*"We want to make
boating on the
Thames even safer,
still more
enjoyable, and
entirely friendly to
the whole
environment."*



ENVIRONMENT AGENCY



042637



NRA

National Rivers Authority

Thames Region

Guardians of the Water Environment

*"Navigation on the
Thames has been
subject to legislation
since 1350."*



*A crowded
lock -
no fun
without
safety*

Rivers of pleasure

Today, the River Thames and its tributaries are among the most popular pleasure-boat waterways in the country.

It wasn't always so. In the distant past, the Thames had more serious business to handle. For the Romans it was a valuable trade route. The Saxons sailed up it to establish their settlements. The Vikings used it for their raiding expeditions.

Then, for most of the next thousand or so years, the Thames became the pre-eminent commercial thoroughfare of south central England. It brought the produce of the up-river farms down to London. And it brought the products of the city back to the country.

Because this navigation was so important, it was strictly controlled. In the eleventh century, Edward the Confessor's 'Ancient Laws' emphasised the importance of navigation rights on the Thames and demanded the removal of obstructions. The first Act of Parliament specifically concerned with navigation on the Thames was passed in 1350, and navigation on the Thames has been subject to legislation of one kind or another ever since.

All change

The coming of the railway in the middle of the last century drastically reduced the role of the Thames as a commercial highway between the country and London (although the tidal Thames grew in importance as an international port). So far as the inland transport of cargo was concerned, the railway was obviously better, quicker and cheaper.

But the railway also carried people, making the whole length of the river accessible to thousands of would-be navigators (of one kind or another) from London and its suburbs, indeed from towns and cities all over the country.

MOT for boats?

Licences are currently only granted to boats that comply with our stringent regulations on construction and the provision of safety equipment (such as fire extinguishers). With British Waterways and the Broads Authority, we are now working on a National Boat Safety Scheme. It will work rather in the same way as the MOT car testing scheme. Boats will have to be tested at regular intervals - perhaps every four years. The NRA will oversee the boat-yards and others that carry out the test. It is anticipated that the new scheme will come into operation during 1995.

We patrol the river

Our patrol launches can make spot checks on all vessels on the rivers in our Region that come within our authority - and generally enforce the rules of the river, including speed limits. We have 14 such vessels, all of them purpose-built and easily recognisable, even by those new to the River (we like people to know that we're around!).

But regulation is only part of their duty. The main aim of our patrol crews is to help and advise anyone about the river, and particularly navigators, whenever help or advice is needed.

Navigation means more than that

Our work extends beyond what the word 'Navigation' is normally taken to mean. We are, in fact, responsible for *managing* the rivers.

-We operate locks - and our lock keepers have the task of guiding craft safely on their way.

-Our Inspectors and lock keepers have a further vital job. By the control and operation of weir gates, water is held back by the weirs to levels needed for navigation and abstractors, nearly always the water companies. Without weirs holding the water back, the Thames in summer would only be about two foot deep, compared with the average present depth of eight feet.

-Our patrol boats and our lock and weir keepers have to be constantly on the alert for obstructions in the river - which could be anything

from a wrecked boat to a overhanging tree that looks likely to fall into the water at any moment.

-We have to watch over regattas held on the rivers in our Region. Henley Regatta is just one of them, the best known, but there are up to 400 others, all of them requiring our supervision and guidance.

Levels of service

So far we've talked a lot about the responsibilities of river users and the rules and regulations they must follow.

The traffic, however, is two-way. We in the NRA have duties and responsibilities to you. A leaflet entitled 'Navigation Levels of Service' aims to list the ways in which we aim to help you, and defines the levels of service that we try to achieve. You may want to have your own copy. If you write to us, we'll send you one.

Here are examples of the levels of service we aim to achieve:

- We will provide staff to help river users through each lock.

- From April to October, we will provide bulk water supplies on average every ten miles and sewage disposal points on average every 15 miles.

- We will inspect all hire launches once a year.

- We will inspect the River by patrol launch and report and/or deal with all relevant issues in accordance with the following minimum criteria:

- i) Inglesham-Oxford - once per fortnight
- ii) Oxford-Teddington - once per week

- We will attend all major organised river events or activities ... to ensure optimum benefit to all river users.

- A recorded 'Navigation Information' service is available at all times on 0734 535520.

Settling differences

Rivers have always been a source of contention. From the very earliest times, mill-owners have complained (or worse) about navigators who have complained

about fishermen who have etc etc. Disputes of all kinds are still common between one or other group of water users.

A particular common form of argument is between riparian owners and boat-owners - because, as there is no right of navigation on the tributaries of the Thames, the permission of the riparian owner is needed before the river can be used for boating or canoeing.

We are more than happy to offer our expertise, experience - and independence - to help reach agreements in any kind of disputes over competing rights or interests. In fact we see this intermediary role as one of our most important functions, one we are uniquely suited to fill. We are, after all, in the business of establishing a workable balance between all river users.

Searching for better ways

Research and development within the NRA is a national responsibility - with every Region benefitting from the work. R&D covers two main areas: management and technology.

'Management' research covers, for instance, the development of monitoring and survey techniques that will help us to improve the facilities we offer and the levels of service.

'Technology' research includes the development of environmentally acceptable boat propulsion, bank protection systems, better engineering methods for navigation installations and design standards generally.

The next thousand years

As we said earlier, the Thames has been a much used, much loved asset for a thousand years.

The next thousand years starts now.



NRA

*National Rivers Authority
Thames Region
Kings Meadow House
Kings Meadow Road
Reading Berkshire RG1 8DQ*

In the last 100 years, as working hours shortened and holiday times lengthened, and as rail transport improved (road transport too), people became increasingly able to savour the delights available on and around the river. Yachtsmen, oarsmen, punters (in the literal sense), people who just like messing about in boats and people who just like sitting in boats while someone - or something - else propels them, were all able to do their thing on the river.

Thousands of boats

The river's popularity with amateur inland sailors has continued to grow, until today no fewer than 19,000 boats are registered with NRA Thames Region. Two thirds of them are motorised craft. And there are another 6,000 craft visiting the Thames from other waterways (they only need a short-stay certificate).

Registration is important - and compulsory! Every pleasure boat, including inflatables and tenders ('tenders' are small boats towed or carried by another larger boat), must be registered with the NRA before being used in any way on the River Thames upstream of Teddington Weir. Moreover, every boat with an engine must also have a licence to navigate. These licences are issued free to registered boats.

Without control, there would be conflict and danger. Just think - 25,000 pleasure boats on 217 kilometres of navigable river - about 8 metres per boat!

Boating as part of the balance

The number of boats is only the beginning of the problem. The Thames attracts hundreds of thousands of other river-lovers and river-users - anglers, naturalists, walkers, strollers, people on picnics, people who just want to sit and watch, and tourists from all over the world. 250,000 people between them make seven million visits to our locks each year.



*Inspecting
a launch*



*Operating
weir gates*

*"The Thames is an
international landmark-
one of the most famous
rivers in the world...
as well as a valuable
community asset for those
living on its banks."*

The River has many vital practical uses. It is essential for land drainage, for irrigation, as a source of drinking water, and as a disposal system for the treated outfalls from sewage works.

It is home to a wonderful variety of wildlife.

It is also an international landmark - one of the most famous rivers in the world, and part of our national heritage, as well as a valuable community asset for those living on or near its banks.

So, looking after the Thames is an immense privilege and an extremely demanding one. Not surprisingly for such an important asset, a management responsibility emerged over the centuries, mainly but not wholly concerned with navigation. The NRA inherited this responsibility. Our task is to bring it in line with today's needs, adding where necessary, but above all protecting it for future generations.

The authority

As the navigation authority for the River Thames between Cricklade near the source and Teddington Lock where the river becomes tidal, the NRA is responsible for providing a wide range of services for river-users and for managing the river on behalf of the whole community.

The task of balancing all the varied needs of all the different river-users lies at the heart of that responsibility. Like you, like every user, we want our rivers to remain in as unspoilt a condition as possible, and we want them to be shared, enjoyed and valued by present and future generations.

Our task in the Navigation Service is to make sure that boat-users play their part in creating and preserving an acceptable balance. Boat owners and users have to abide by rules governing safety, hygiene, respect for other users, and care for the environment.

"We have produced leaflets which give useful advice and information of direct interest to every river-user."



Keeping a weir free of obstruction



The event-full Thames

Responsible enjoyment rules - OK?

In brief, we want people on boats to: care for the environment; respect the rights of riparian land owners (the people who own the riverbanks and often live there); and recognise and be considerate to the needs of other legitimate river users.

No-one would openly deny those ideals. But in order to implement them in everyday situations, a number of rules have been agreed, some of them in the form of laws (which the NRA is empowered by Parliament to promote and enforce). Most of the rules and laws are obvious common-sense.

Many of the controls are directly concerned with safety. It is not simply a question of whether a boat is river-worthy or not. No boat should ever be a cause of danger to others. The truth is that if a boat were to sink in mid-channel because it was not river-worthy, and no other vessels were in the vicinity, that would be a tragedy to those sailing in it, but no-one else need be seriously affected. If a boat caught fire in a crowded lock, that could be a tragedy not only for those in it, but for all the other people in nearby boats. Fire, often following an explosion, is a frequent cause of disaster. Petrol-engined launches which are not properly maintained and serviced are at the greatest risk of a fire or explosion. We must do everything we can by education and by law to reduce those risks.

Other rules relate to the environment and consideration for others, and enforce procedures that prevent pollution (from on-board lavatories, for instance). No-one should any longer think that the Thames is a personal dustbin.

Read all about it

We have produced leaflets which give useful advice and information of direct interest to every river-user - and summarise the rules which apply on the river.

The leaflets give succinct but comprehensive descriptions of the needs and likely problems of all the major types of river user. You are likely to be familiar with your own rights, aspirations and problems. In the heat of the moment, you may not always appreciate the rights etc of other people (who may just happen to be feeling the heat at the same time).

Here's a familiar situation where two sets of 'rights' clash and which could easily lead to hard feelings and broken tackle (perhaps worse):

"All craft have a right to navigate the full width of the river ... all anglers have a right to fish (provided they have a rod licence).

It so happens that some anglers choose to sit where they are hidden from the river by bankside vegetation. Assume that an angler has just felt a bite and is about to play the fish. Assume that a sailing dinghy is making a particularly difficult tack. Inevitably, the dinghy hits the line - with dire results. Who is to blame? Neither of them and both of them! Care, alertness and tolerances on both sides would have prevented the accident."

Convenient addresses

The leaflets also contain many useful addresses - where to launch your boat, where to moor it and where to pump out your sewage. They also give a table of distances and measurements of the headways of bridges for the whole length of the navigable river from Lechlade to Teddington.

continued on back page

The National Rivers Authority (NRA)

The NRA is the largest environment protection agency in Europe. It was created by Parliament through the Water Act of 1989. Its duties were further defined in the Water Resources Act 1991.

The NRA's mission is to:

- protect and improve the water environment.
- reduce pollution.
- manage water resources.
- provide effective flood defence.
- improve and develop fisheries.

It has an advisory role too. For instance, it is consulted by planning authorities about major building or civil engineering developments that may affect the water environment. It also helps evaluate the environmental assessments that potential developers have to make.

The NRA is 'sponsored' by the Department of the Environment (DoE) - in other words, the DoE is its main link with the Government. It also works closely with the Ministry of Agriculture, Fisheries and Food (MAFF), and the Welsh Office. It cooperates with other bodies such as local authorities, Her Majesty's Inspectorate of Pollution, the Drinking Water Inspectorate, the Office of Water Services and the Commission for the European Communities.

Thames Region

In Thames Region, we have responsibilities for the rivers, streams, lakes, ponds and underground waters in the whole catchment area - that is, all the land which drains into the Thames. So the Region stretches from Wiltshire in the west to the Estuary in the east, from Luton in the north to the Surrey Downs in the south - nearly 13,000 square kilometres.

Navigation, the subject of this leaflet, is one of our key responsibilities. The others - Conservation, Environmental Quality, Fisheries, Flood Defence, Recreation and Water Resources - are covered in separate leaflets.

In reality, we can't treat these responsibilities separately. Whatever we do must be done in the context

of the whole catchment. This means that the work of one specialist department can only be effectively carried out in collaboration with the others. (So it's a good idea to read all the leaflets, and not just this one. In that way you'll get a better understanding of what we are trying to do.)

The collaboration extends well outside the NRA. In Navigation, for instance, we work closely with people and organisations who want to maintain and improve navigation on the rivers of our Region.

But the most important collaboration is with individual members of the public. The media - newspapers, magazines, TV and radio - help by keeping people informed about navigation problems. But only public opinion can ensure that the water environment continues to be given the care and attention it needs. That is why your interest and support is so critical.

Some of our external 'partners'

(in addition to ones mentioned above)

- Royal Yachting Association.
- British Canoe Union.
- British Waterski Federation.
- Amateur Rowing Association and other representative organisations.
- British Waterways.
- Inland Waterways Association.
- River User Groups.
- British Marine Industries Association and other trade associations.
- Marine Safety Committees.
- English Nature and Countryside Commission - both statutory advisers to the Government.
- National Trust.

And, most importantly, thousands of individual river-users of all kinds

"We receive valuable guidance from the Thames Regional Rivers Advisory Committee. Members represent relevant local and national bodies and bring a wide range of expertise and experience. Meetings of this Committee are open to the public."



The NRA's eight regions cover the whole of England and Wales.

*simplified cutaway diagram of
an electro-hydraulic lock on the River Thames*

H O W I T W O R K S

(Upstream bound; reverse for downstream)



Tail gate open -
Boat enters lock.

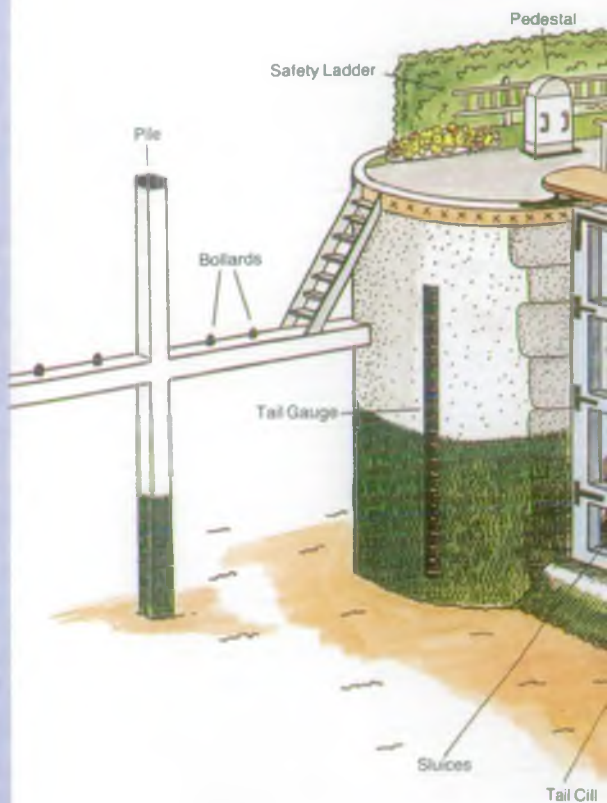


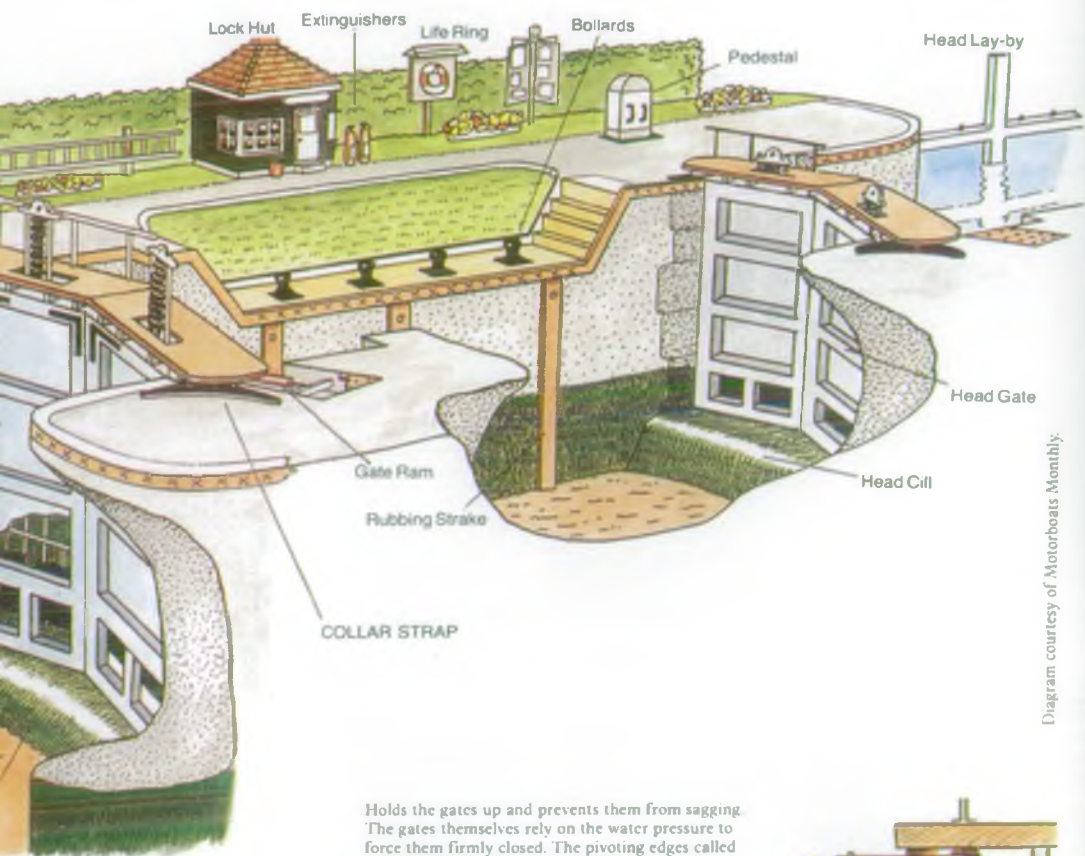
Both gates closed -
Lock filled via sluices.



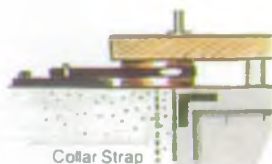
Levels equal -
Gate can be opened.

P R E S S U R E O N G A T E S





Holds the gates up and prevents them from sagging. The gates themselves rely on the water pressure to force them firmly closed. The pivoting edges called quoins recess into a groove in the lockwall and make a watertight seal.



From pre-historic times the Thames has been used by man as a route for transporting himself and his goods. He undoubtedly encountered difficulties and hazards when he ventured onto the river in his frail dug-out canoe or on his unwieldy raft. But as he faced even greater problems if he journeyed on land, where no roads existed as we know them today, he used the river whenever he could. In those days, and in its natural state, the stream wandered at will, along many channels and through extensive marsh-lands.

In summer, due to lack of water, there would have been shallows to negotiate. In winter or after heavy rains there were raging floods.

We do not know when the first rudimentary weirs were built — or by whom. We do know that Viking raiders built the occasional dam to raise water levels over shallows that had grounded their longships. We also know that fish traps were built out into the river and that millers built weirs to hold back water to power their mill wheels.

And so, whilst the building of weirs assisted one of the navigator's difficulties — by raising water levels — the presence of the weirs themselves posed another problem — how to get boats past the dam-like obstructions?

Where the weir had been built by a miller to hold up water to power his mill wheel, he would not have been pleased to open up sections of his weir to allow boats free passage. Water was lost and his mill wheel would have stopped turning.

On the other hand the navigator had his right of passage, confirmed by Magna Carta in 1215.

No doubt much fierce bargaining took place locally!!

Weirs were then built with sections that could be removed to allow river traffic through and were known as 'flash locks.' They were difficult and dangerous to use

although the last of these was not removed from the Thames, at Easton Hastings, until 1937.



From these early beginnings the weir and lock system on the Thames that we know today slowly developed.

It is known that the first 'pound locks' on the Thames were constructed in the Oxford-Abingdon area in the 1630s. A 'pound lock' is simply an artificial chamber with gates at either end and the basic principle of operation relies on the fact that water always finds its own level. The diagram overleaf helps explain how it operates.

Weirs are used today to control water levels for land drainage, water supply and navigation reasons and each weir on the Thames can be by-passed by river traffic using the adjacent pound locks.

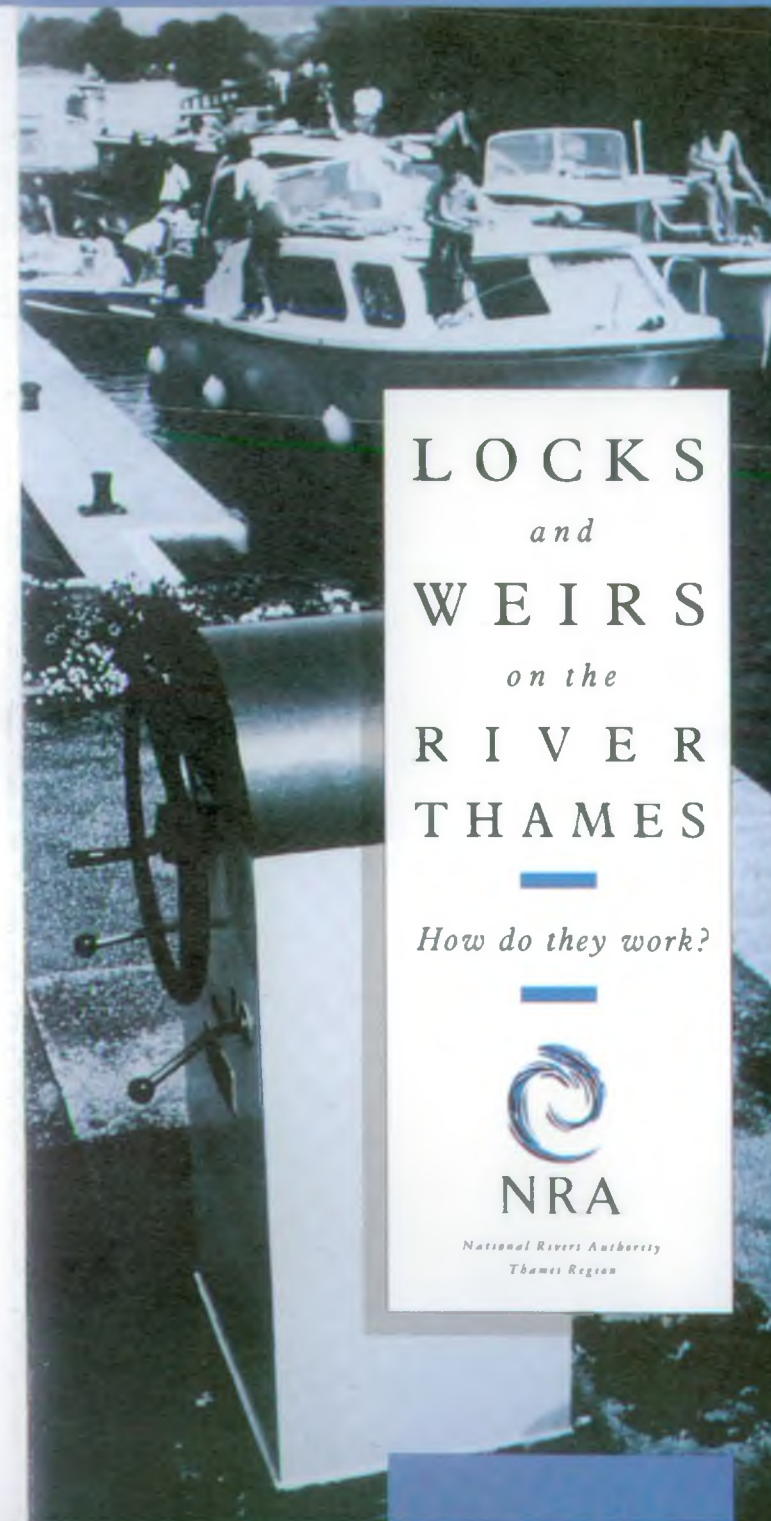
The Navigation Service of the National Rivers Authority, Thames Region, mans and maintains 45 locks and weirs on the Thames. The highest is St. Johns Lock near Lechlade at 234 feet above sea level — the lowest is at Teddington, Middlesex at 14 feet above sea level.



NRA

National Rivers Authority
Thames Region

National Rivers Authority, Thames Region
Kings Meadow House, Kings Meadow Road, Reading RG1 8DQ



LOCKS and WEIRS on the RIVER THAMES

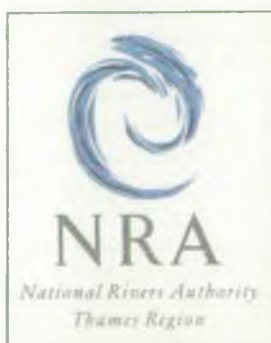
How do they work?



NRA

National Rivers Authority
Thames Region

HAMBLEMEN LOCK



Frantic activity has been taking place over the last few weeks at Hambledon Lock, on the River Thames downstream of Henley. Main contractor J Murphy & Sons is racing to re-open the lock for Easter holiday weekend following a rebuilding project which promises to remove a notorious bottleneck for some of the 25,000 pleasure boats that cruise on the Thames each year.

National Rivers Authority new works manager Nick Lyness says the project arose out of consultations with boating organisations and other interested groups. "We identified five locks where there was serious crowding every summer. Hambledon was given top priority because it was the narrowest below Oxford, and because it was in urgent need of major maintenance."

The original structure was built in the 1870s. A pound lock – the modern type with upper and lower gates – is known to have existed on the same site since 1773, and there is evidence of a single-gated flash lock at Hambledon in the 14th century. NRA has taken the opportunity this time to update the basic design of the lock, speeding the operating cycle and simplifying maintenance.

The basic principles of pound locks are centuries old. Boats from the low level move into the lock when water levels inside and outside are the same and the lower gates have been opened. The gates are shut and the top sluices opened, allowing water from the higher level to flow into the lock chamber.

Once the level in the chamber has risen to match the higher water level, the top gates can be opened. Boats heading upstream move out, those going downstream move in, and the gates are shut. Top sluices are closed, bottom sluices opened and the level in the chamber falls until it matches that of the lower level.

Traditional locks – like most of those on the UK canal system – are little more than simple channels lined with concrete, stone,

or even turf. Gates are usually made of oak, and carry the sluice gates and their operating mechanism. More recent locks on the Thames have used underfloor filling systems with some sluices moved from the gates to the chamber walls.

At Hambledon the NRA has gone for a full underfloor system, with independent sluice gates to simplify maintenance. Lyness explains: "It's the first full bullnose system – all the inlets and outlets have been moved away from the gates to bullnoses top and bottom. These are linked by four 825mm diameter concrete pipes, which are connected to the lock chamber by a total of 36 300mm diameter nozzles, angled out towards the chamber walls.

"It may sound like a giant jacuzzi, but it means we can move 679,000 litres of water into or out of the lock in 3.5 minutes without excessive turbulence, which is far more than would be possible with gate sluices. And the gates are much simpler and cheaper."

Overall dimensions were increased by almost 50% – chamber length went from 41.5m to 61m, width from 5.4m to 7.7m – which meant the NRA had to purchase a 3m wide strip of land to the south. And NRA designers added an underslab drainage system of 150mm diameter porous concrete pipes to minimise hydraulic uplift.

Work on the project is only possible during winter. Construction was therefore split into two phases over consecutive winters.

The first winter's £184,000 piling contract, programmed for a 13 week closure, went to P Trant. Between January and March 1993 more than 400 14m long Larssen piles were driven through 13m of gravel and chalk on each side of the existing lock and within 4m of its walls. "We designed the cofferdam to be propped at one point 1m above existing ground level only," Lyness says.

Piling was completed in 10 weeks, then the original lock was left to function for the 1993 boating season. In the meantime, the NRA accepted the £842,000 tender from Mur-



LOCK FAST

A race has been in progress to complete the rebuilding of a lock on the River Thames in time for the start of the holiday season. Dave Parker reports.

phy for completion of the cofferdam, demolition of the existing structure and construction of the new, larger lock.

Work started on 1 October 1993 with only 27 weeks before the Easter 1994 opening. When demolition began the poor state of the existing structure became all too obvious. "It just fell over", says NRA project manager Colin Platt.

The NRA team put a lot of thought into the detail design of the concrete chamber structure. Basic design was to the water-retaining structure code BS 8007, but to further

reduce risk of cracking a low-heat 30:70 blend of Ordinary Portland Cement and ground granulated blastfurnace slag was specified for the C35 concrete.

"And to improve surface hardness and durability on the lock walls we decided to use controlled permeability formwork", says Platt.

Pours of the base slab went smoothly, but the first wall pours were more of a challenge. Controlled permeability formwork was produced by stretching porous Zemdrain material over plywood shutters, and this took up to

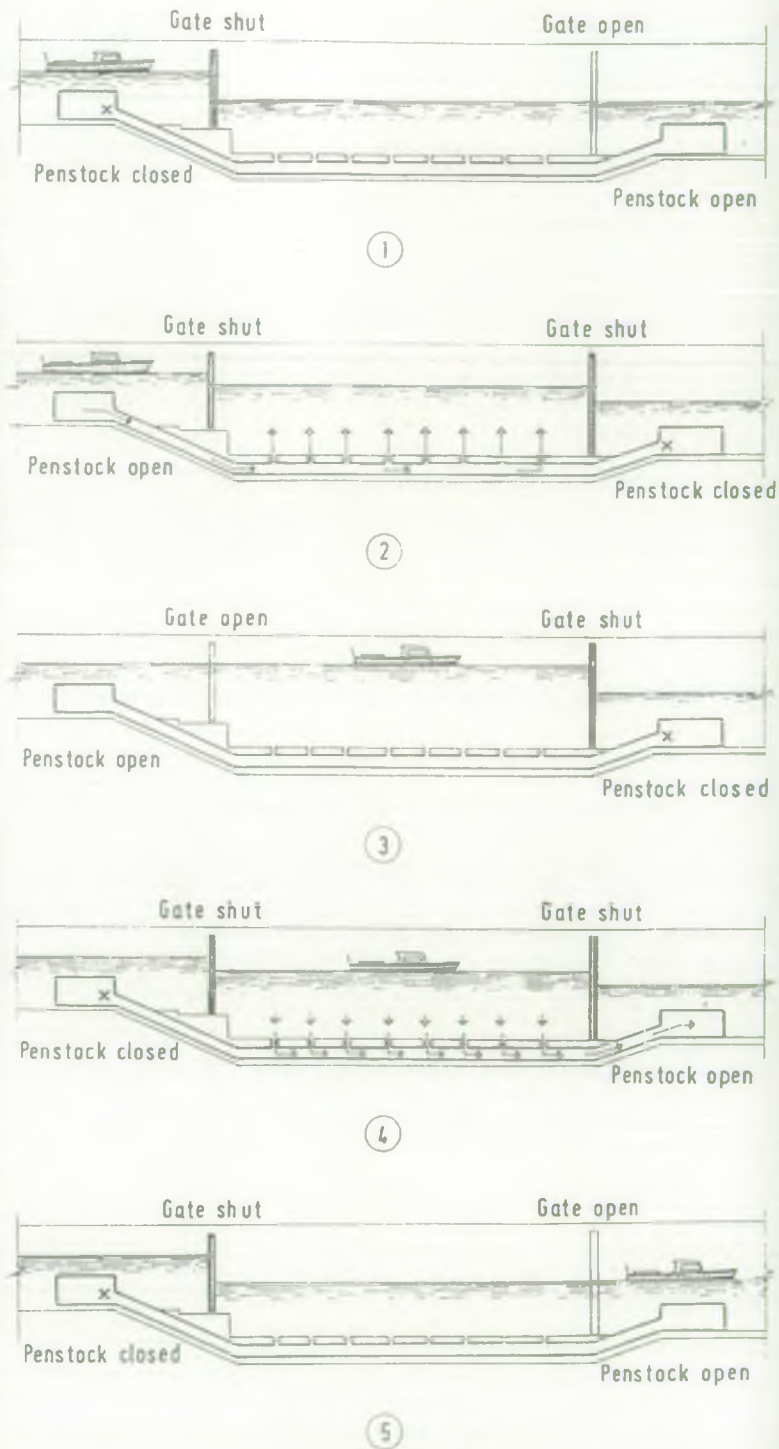
WATERWAYS



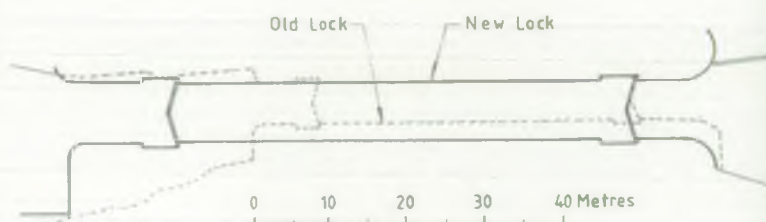
six hours per shutter to get right at first Platt says. But the benefits were obvious when the shutters were struck. "There was a complete absence of blowholes and no need for any rubbing up," Platt says.

The first set of steel chamber gates were fitted in the second week in March, and the first of the eight inlet and outlet penstocks a week later. When the lock first re-opens only manual operation by the lock-keeper will be possible, but by May the hydraulic rams on the sluices and gates will be under electronic control.

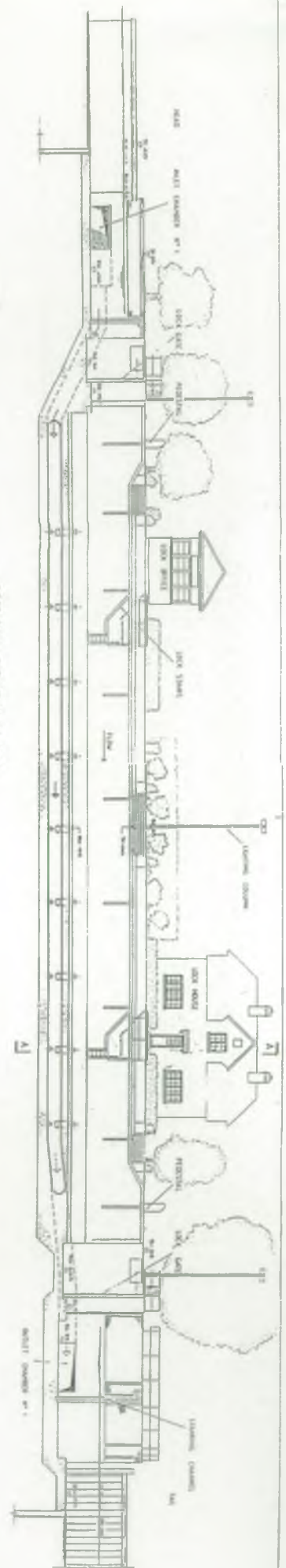
The site viewed from downstream.



LOCK FILLING SYSTEM



NEW AND OLD LOCKS



SECTIONAL ELEVATION OF LOCK

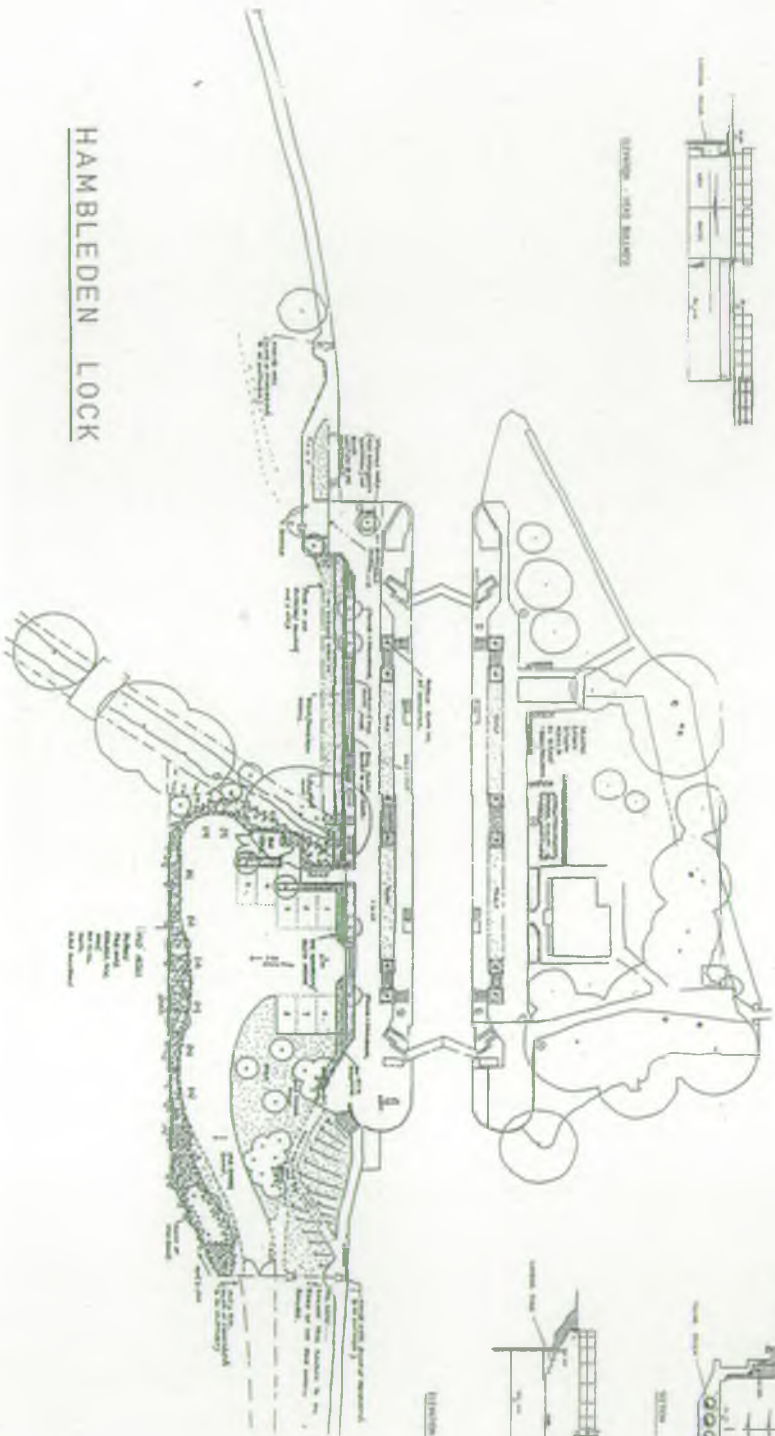
ELEVATION - LOCK BUILDING



ELEVATION - LOCK BUILDING



HAMBLEDEN LOCK



HAMBLEDEN LOCK CEREMONY 20 MAY 1994

BOAT TRANSPORT

The guests will be taken from the Leander Club to Hambleden Lock and back again by boat. M.S. Maratama has been booked from Hobbs of Henley to take the bulk of the guests.

The following will travel on M.S. Windrush if the party is too large for all to travel on M.S. Maratama:

Rt. Hon. John Selwyn Gummer
Marcus Nelson, DoE
Nigel Dorling, DoE
Lord Crickhowell
Ed Gallagher
John Norris
Les Jones
Joan Wykes
Michael Davies
Anne Powell
Stu Darby
Adrian Birtles

(N.B. John Redmond or John Waters will also be on the Windrush, but will be counted as a crew member).

NM
11/4/94

NATIONAL RIVERS AUTHORITY THAMES REGION

OFFICIAL OPENING OF HAMBLEDEN LOCK

20 MAY 1994

10.45 am	Guests park at the Leander Club, Henley-on-Thames
	<i>Leave</i>
11.00 am	Board boat to travel to Hambleden Lock <i>prompt</i>
11.30 am	Disembark and walk to Lock
11.45 am	Official opening ceremony conducted by the Rt. Hon. John Selwyn Gummer and Lord Crickhowell
12.15 pm	Board boat for return journey to the Leander Club
12.45 pm	Pre lunch drink at Leander Club
13.15 pm	Buffet lunch
2.30 pm	Depart

HAMBLEDEN LOCK CEREMONY 20 MAY 1994

THE DAY!!

Put up display boards in the Leander Club (the dining room).
Could this be done the day before? Who will put up the boards?

John Powell is hiring a mini-bus for the day. This will be used to drive anyone held up at the lock by media interviews to the Leander Club for lunch. (Maybe it can also be used to take the display boards to the Club).

Nina and Paul will travel (in separate cars) to the Leander Club to meet the guests when they arrive, hand out name badges, etc.

Dean will drive straight to Hambleden Lock and will meet the media, and generally keep them under control!

Nina and Paul will remain with the guests for the whole function.

Dean will return to the office once all the media have left the lock site.

Mary will man the office.

NM

20/4/94

NATIONAL RIVERS AUTHORITY THAMES REGION
PROGRAMME FOR OFFICIAL OPENING OF HAMBLEDEN LOCK
FRIDAY 20 MAY 1994

10.30am onwards	Guests park at Leander Club, Henley-on-Thames. Greeted and given name badges. Board boat.
11.00am	Boat leaves Leander Club to cruise to Hambleden Lock. During cruise Stuart Darby welcomes guests and outlines the programme for the day. Morning coffee served.
11.30am	<p>The Rt. Hon. John Gummer arrives at Hambleden Lock by car and is greeted by Les Jones.</p> <p>Boat arrives in Hambleden Lock. Guests disembark and gather around commemorative plaque at lock for ceremony.</p>
11.45am	<p>The Rt. Hon. John Gummer unveils plaque and gives speech. Response by Lord Crickhowell. Les Jones presents gifts to the Rt. Hon. John Gummer and Lord Crickhowell.</p> <p>Lock is blessed by the Reverend Pyburn.</p>
12.00 noon	Guests inspect the lock while media interviews (if required) are given.
12.15pm	Everyone boards boat for return journey to the Leander Club. A mini-bus will be available to take anyone delayed by media interviews back to the Leander Club.
12.45pm	Pre lunch drink in dining room.
1.15pm	Buffet lunch served in dining room.
2.00pm	Rt. Hon. John Gummer departs.
2.30pm	Last guests depart.

(revised 5/5/94)

NATIONAL RIVERS AUTHORITY THAMES REGION

OFFICIAL OPENING OF HAMBLEMEN LOCK

FRIDAY 20 MAY 1994

LIST OF ATTENDEES

The Rt. Hon John Gummer, Secretary of State

Jonathan Tillson, Private Secretary

Marcus Nelson, Dept of Environment

Gillian Ashmore, Dept of Environment

Reverend Alan Pyburn, St Nicholas Church, Remenham

Geoffrey Copas, Copas Bros

Peter Sly, President Remenham Residents Association

Sarah West, Remenham Parish Council

Paul Wagstaffe, British Marine Industries Federation

Tony Read, Liaison Officer, Flower Pot Hotel

Tony Davis, Inland Waterways Association and Regional Rivers
Advisory Committee

Keith French, French Brothers (Member, Regional Rivers Advisory
Committee)

David Moss, (Member, Regional Fisheries Advisory Committee)

James O'Callaghan, J Murphy & Sons Ltd

John Crossin, J Murphy & Sons Ltd

Keith Pollard, J Murphy & Sons Ltd

Reginald Andrews, J Murphy & Sons Ltd

Mick Healey, J Murphy & Sons Ltd
Tony Fellows, Sulby Hydraulics Ltd
Philip Parker, L G Kimber (Engineering) Ltd
Tim Trant, P Trant Ltd

Lord Crickhowell, Chairman, NRA
Ed Gallagher, Chief Executive, NRA
Helen Gallagher
John Norris, Board Member, NRA
Dr Kevin Bond, Director of Operations, NRA
Miles Wilson, Director of Public Affairs, NRA
Les Jones, Regional General Manager, Thames Region, NRA
Giles Phillips, Regional Technical Manager, Thames Region, NRA
Stuart Darby, Area Manager West, Thames Region, NRA
Adrian Birtles, Area Manager, South East, Thames Region, NRA
Michael Davies, Chairman, Regional Flood Defence Committee,
Thames Region, NRA
Joan Wykes, Chairman, Regional Rivers Advisory Committee, Thames
Region, NRA
Dr Anne Powell, Chairman, Regional Fisheries Advisory Committee,
Thames Region, NRA
Craig McGarvey, Recreation & Navigation Officer, NRA
Peter Svendsen, Lock Keeper, Thames Region NRA
Mrs Susan Svendsen
Jane Svendsen
John Powell, Area Navigation Manager West, Thames Region, NRA
Roger Powling, Flood Defence & Engineering Manager West, Thames
Region, NRA

Colin Platt, Project Manager Engineering Services West, Thames Region, NRA

Nicholas Lyness, New Works Manager, West, Thames Region, NRA

Neale Ferguson, Project Manager Engineering Services, Thames Region, NRA

Roger Wren, Senior Engineer Market Services, Thames Region, NRA

Allan Perkinson, Senior Contracts Engineer, Thames Region, NRA

Roger Sturgess, Operations Manager West, Thames Region, NRA

Andrew Mepsted, Technician, Market Services, Thames Region, NRA

Manoch Kerman, Project Manager Engineering Services West, Thames Region, NRA

Martin Johnston, Senior Navigation Inspector, Thames Region, NRA

Tony Plytas, Assistant Solicitor, Thames Region, NRA

19 May 1994

mh

HAMBLEDEN LOCK OPENING CEREMONY 20 MAY 1994

INVITATION LIST

DoE

Marcus Nelson
Nigel Dorling

Head Office

Lord Crickhowell
Ed (and Helen?) Gallagher
Kevin Bond
Clive Swinnerton
Nigel Reader
Craig McGarvey
MILES WILSON

Board/Committee Members

John Norris
Michael Davies
Joan Wykes
Anne Powell
Michael Sheffras
D.W. Moss
Keith French
Peter Coyne
Tony Davis

Contractors

J Murphy's:

John Crossin
Keith Pollard
James O'Callaghan
Mick Healey
Reginald Andrews

L G Kimber:

Terry Lipeart

Sulby Hydraulics:

Tony Fellows

P Trant:

Tim Trant

Residents

Tony Reid
Peter Sly
Rev. Alan Pyburn
Mrs S West
Tony Southwell
Geoffrey Copas

Badges

Alan Crossin

0484
H23522

NRA Thames Region

West Area:

John Powell
Martin Johnston
Roger Powling
Roger Sturgess
Nicholas Lyness
Colin Platt
Neale Ferguson
Alan Perkinson
Manoch Kerman
Stuart Darby
Peter and Susan Svendsen, and Jane

PES:

Alan Ingles
Andrew Mepsted

Regional:

Leslie Jones (do not send invitation)
Adrian Birtles
John Redmond
John Waters
Kevin Patrick
Tony Plytas

Reserves:

Roger Wren
Kevin Broadhead

N.B. The Rt. Hon. John Gummer, MP. has already accepted his invitation. He will be accompanied by a staff of two.

NM
6/4/94

HAMBLEDEN LOCK

1. History

This lock replaces a 120 year old concrete structure. Prior to that a pound lock existed on the same site since 1773 and Thackers suggests a flash lock possibly as early as 1338.

2. Background

The River Thames is one of Britain's most popular inland waterways for pleasure boat cruising. 19,000 boats are currently registered with the NRA to use the Thames, of which two thirds are motorised craft (together with about 6,000 visiting craft from other waterways).

The NRA's navigation staff have identified five 'bottleneck' locks where the worst crowding occurs: Hambleden, Caversham, Bray, Boveney and Shepperton. After consultation with boating organisations and other interested bodies , the NRA has concluded that to enlarge these locks will significantly improve the flow of traffic up and down the river.

Hambleden lock is the first to be enlarged. It has been chosen because it is the narrowest lock below Oxford, on one of the busiest stretches on the Thames. It was also in need of major maintenance work as it was last 'modernised' 120 years ago and the structure had reached the end of its safe operating life. This was amply demonstrated when the bullnose collapsed during demolition.

3. Navigation

Traditionally on the Thames as the winter months have the least river traffic the opportunity is taken to carry out essential work on locks, laybys and lock cuts. This confines work to between the months of October and March with statutory notification of lock closures prepared 4 months in advance.

4. Filling Method

Traditionally locks on the Thames and other waterways have used sluices contained within the lock gates. More recently, those constructed on the Thames have departed from this method and have adopted various degrees of under floor filling systems which utilise

pipework running under the lock chamber to fill the lock.

The system being installed at Hambleden uses the under floor pipework to both fill and empty the lock chamber via sluices contained within the structure at the head and tail of the lock and 36 nozzles discharging from the chamber floor. The main advantage of using an under floor system is that turbulence within the lock chamber is greatly reduced thus allowing a higher rate of filling and therefore a reduced cycle time. Inclusion of sluices at the tail also allows the pipework to be flushed through to prevent silt build up within the pipes.

Approx. 679th. litres of water are designed to be discharged into/out-of the lock in approx. 3.5 mins.

5. Contract Details

In order to minimise inconvenience to river users and to the local community and to comply with the maximum 6 months lock closure, the lock enlargement has been split into two contracts spanning two navigation years.

Contract 1 - Piling Contract (Jan 93 to Mar 93)

Contract Value	£184,000
Contractor	P Trant Ltd
Programmed Construction period	13 weeks
Actual Construction period	10 weeks

The first contract commenced during January 1993 with a winter lock closure and involved the installation of the cofferdam piles on either side of the lock with the river closure piles to be placed in the later contract. The poor condition of the tail structure of the lock and the close proximity of the lock house necessitated the use of the latest piling techniques to reduce vibration and noise. The lock walls were only 4 metres from the driven piles.

The system selected involved the use of the Giken Silent Piler which was able to satisfy the vibration and noise restrictions placed on the contractor. This method proved so successful, on occasions over 20 piles were pitched and driven in one day, that the lock was reopened three weeks ahead of schedule for the start of the boating season.

The contract involved driving 410 No 14 metre long Larssen 6 piles through 13m of gravel and chalk. The opportunity was also taken to drive 170 No 8 metre long Larssen 9W piles to create a new head layby during this period.

Contract 2 - Lock construction (Oct 93 to Apr 94)

Contract Value	£842,000
Contractor	J Murphy & Sons Ltd
Programmed Construction period	27 weeks

Originally a 7 month lock closure had been planned for but demands on navigation meant that only 6 months was made available when the contract was let. The early Easter also meant that the lock had to be opened by the end of March to river traffic, hence the lock closure was only available from 1-10-93 to 31-3-94. This set the pace for the contract.

This second contract, involved demolition of the existing lock chamber and construction of a new reinforced concrete lock within the cofferdam partially constructed under the previous contract. The opportunity was also taken to complete the new head layby and to construct a new lock office, along with new steel lock gates and a modern hydraulic operating system.

Excavation at the head of the lock was carried out under an archaeological watching brief in anticipation of finding the remains of the previous lock. Although some timber rivetments were revealed which indicated its outline, nothing further of note was discovered.

The new lock chamber consumed approximately 3500 Tonnes of concrete and 120 Tonnes of reinforcement steel. These and the other associated materials were transported to site by road along a pre-arranged route agreed with the local community in order to reduce the direct impact of the construction works.

Key Dimensions

Length of old lock chamber : 41.5m
Length of new lock chamber : 61.0m

Width of old lock chamber : 5.4m
Width of new lock chamber : 7.7m

6. Piling Technique

Giken Silent Piler Model No.KGK130
Max. Imposed Load - 130T
Grips 4No. preceeding piles and drives 5th.

A crane on the bankside pitches each pile into the jaws of the piler which then aligns and plumbs the pile before driving it. In difficult ground a water jetting lance was fitted to the pile to assist penetration.

Noise levels generated by the piling were less than the background noise generated by the weir.

7. Cofferdam

The design of the cofferdam by the NRA's own engineers assumed that it would be propped by the successful contractor at a level 1m above ground level. This avoided the need to instal additional props at lower level which would have interfered with the works and possibly have led to unsightly construction joints or local repairs. 14m long Larsson 6's were selected and pre-ordered by the NRA to obviate any lead-in time on the 552 piles required to complete the cofferdam. Sufficient were then free-issued to the piling contractor for installation of the sides of the cofferdam with the balance being issued to the civils contractor to allow him to close the ends.

8. Concrete

The structural concrete being employed in these works is a C35 mix using 30:70 OPC/GBFS and a 0.42 w/c ratio which, with its low heat properties, has eliminated the thermal and shrinkage cracking often experienced in thick walls and bases when using 100% OPC mixes. This blend of OPC and GBFS also gives improved durability and reduced porosity to the concrete in addition to those improvements derived from using Zemdrain. A water reducing agent was used and workability was achieved with 75mm slump.

Due to low early strengths striking of shutters are delayed until two days have elapsed after the pour, although the cube results show that strengths have recovered to as much as 30 N/mm² after 7 days and to as much as 55 N/mm² after 28 days.

In order to ensure crack-free construction for the benefit of an aesthetic finish, particularly on the exposed walls, all the base and wall elements in the lock have been designed using BS8007 the Standard for the design of water retaining structures. The use of this code in conjunction with the use of a low heat concrete appears to have achieved the desired result.

9. Zemdrain

This is a controlled permeability formwork (CPF) which was used on the exposed elevations of the lock walls.

Selected for the combined benefits of increased durability (via decreased w/c ratio at the surface, increased strength, reduced porosity, etc.) and an excellent surface finish for an improved aesthetic appearance in a sensitive location (via the omission of blowholes, rubbing-up and repairs and subsequently, a reported decrease in the growth of algae on the surface).

Also, it has led to greater shutter reuse, easier striking and faster shutter striking/erection times; 9 reuses have been achieved to-date on the formwork which is still in good condition. The new Zemdrain fabric takes about 1½ hours to apply to the 5m x 7.4m shutter.

Schmidt hammer results on the Zemdrain treated concrete face suggest a 50% increase in face strength at 6 days. This differential reduces with time with an anticipated residual improvement in strength at the face of between 10% and 30%.

10. Gates

The new gates at Hambleden are the first steel gates to be installed on a Thames lock as timber has been the traditional material used for this purpose in the past. The gates have been designed to open against a 150mm head in the event that additional filling capacity is required.

MECHANICAL CONTRACT 1 - MANUFACTURE OF LOCK GATES

Contract Value	£55,466
Contract	L G Kimber
Programme	14 Weeks
Awarded	23/9/93

11. Hydraulics

Modern, interactive control panels are being used to operate the sluice and lock gate rams. A processor in each panel at the head and tail of the lock guides the lockkeeper and public through the safe operation of the lock using indicator lights. Proximity switches on the gates and sluices together with water level transducers prevent activities being executed out of sequence. The processor also simplifies a number of operations by automatically executing a series of activities without the need for further instruction e.g. the sluices automatically close when the gates have been fully opened. All the hydraulic pipework is in stainless steel and the hydraulic oil is bio-degradable.

MECHANICAL CONTRACT 2 - SUPPLY AND INSTALLATION OF HYDRAULICS

Contract Value	£67,000
Contractor	Sulby Hydraulics
Contract Period	19 Weeks

12. Environmental Issues

This site is located in a picturesque and environmentally sensitive area. Considerable liaison has taken place between conservationists, landscape architects, landowners and the local residents to ensure that we created a structure which was in harmony with the setting. It was also important that the works were constructed in a manner that minimised the impact of these contracts on the locality. With the active support of the contractors and by maintaining effective lines of communication with the residents' liaison representatives we believe we have achieved this ambition.

13. Underfloor Drainage

A drainage system (not to be confused with the underfloor filling/emptying system) has been installed beneath the structure which vents into the tail sluice chamber. Its main purpose is to relieve the hydraulic pressure which develops under such a structure. However, the contractor found it of considerable benefit in dewatering the cofferdam, allowing him to use it to draw all the rising water away to a sump at either end of the lock which was then pumped back into the river using a 4" submersible pump. This allowed him to maintain a virtually water free excavation.

14. Staff Names

New Works Manager:	Nick Lyness
Project Manager:	Colin Platt
Engineer:	Roger Powling
Resident Engineer:	Neale Ferguson
Asst. Resident Engineer:	Alan Perkinson

15. Opening

The lock was opened on schedule for boat traffic on 31 March 1994 - this was the earliest opportunity that it could be used operationally in a manner consistent with the safety of the boating public. It is only available for use under the supervision of the lockkeeper during normal working hours. Finishing works continued for a further month until the official opening took place on 20 May 1994.