WEST OXFORDSHIRE
DISTRICT COUNCIL

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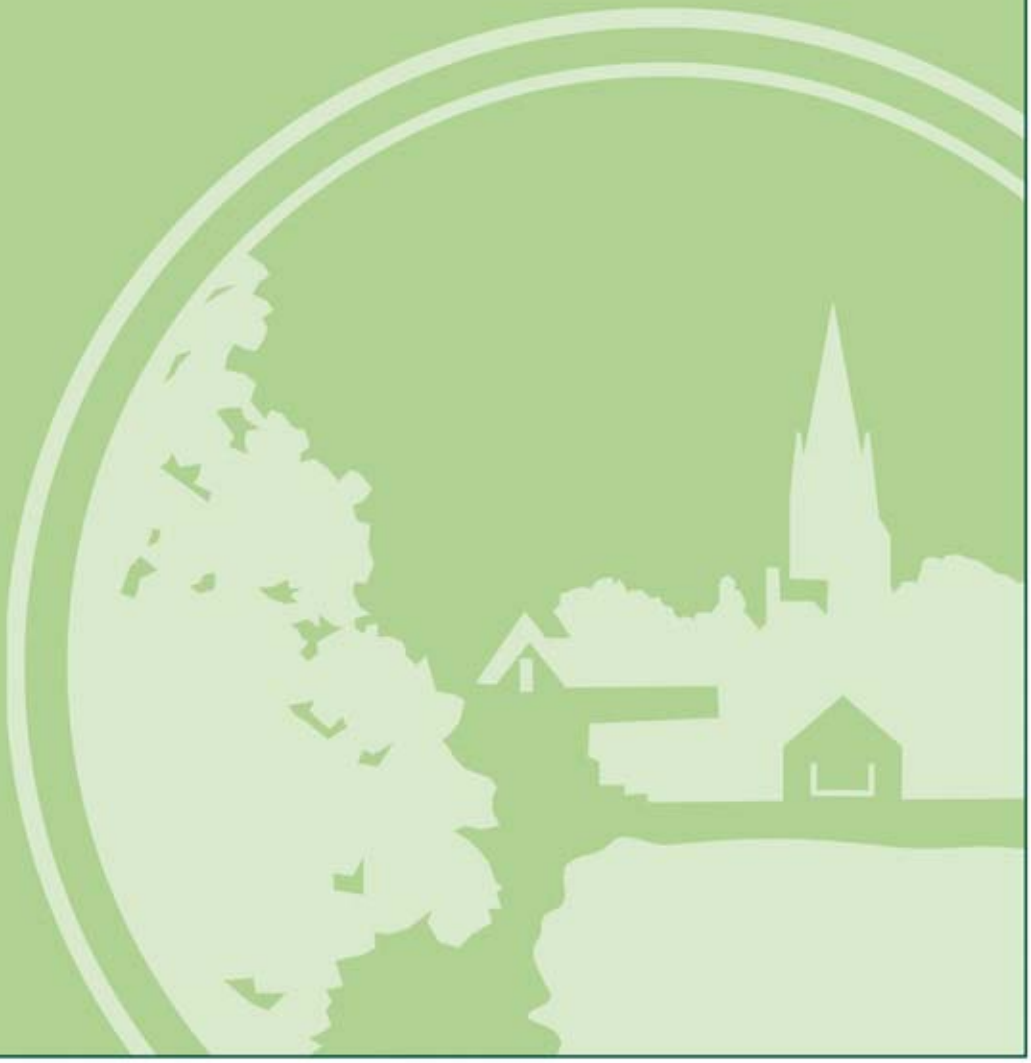
Parish Flood Report:
Standlake

May 2008



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1.0 INTRODUCTION

On the 20th July 2007 large parts of the South of England were subjected to intensive storms. The scale and speed of the rainfall was unprecedented and took most communities by surprise causing widespread flooding of highways and property. On this occasion, unlike previous storms / flooding experienced, this impacted on many properties that had never been affected before, due to much of the flooding coming in the form of rain water run off from land.

A swathe of the district was particularly badly affected by the massive storms, which commenced in the morning and subsided in the evening. During the following days further disruption occurred due to rising river levels. At RAF Brize Norton, the records show that over 125 mm (5 inches) of rain fell in 12 hours, and this is a record going back over 100 years. Not only that, but the period from May to July had been the wettest on record since 1903 and meant that the ground was saturated and unable to absorb any more water.

On the 10th October 2007, the District Council's Cabinet considered a report and approved additional resources in order that a review of the affected areas could be carried out and further reports be prepared for the Council's considerations.

1.1 Purpose of the report

In response to requests from both the Parish and Town Councils and the general public West Oxfordshire District Council has produced a number of reports that identify each individual cause of flooding within the Parish / Town, what work is being carried out by external agencies (EA, Thames Water etc); what the potential options are for future mitigation - and who might be best placed to fund such schemes. The reports themselves reflect the series of water systems that all played a part in the flooding experienced in July 2007 and will help all the organisations involved understand the need to sequence their activities.

This report has been prepared by a qualified Engineer in consultation with the key external agencies and seeks to explore the main reason behind why the floods happened in July 2007 and give an overview of the event itself. It will also provide an understanding of the different roles and levels of responsibility for the agencies involved.

This report should be used to make sure that all the agencies involved with flood prevention – like the Environment Agency, Thames Water, Oxfordshire County Council, Town / Parish Councils and private land owners – work in true partnership for the good of everyone in the local community.

A key outcome of the reports is that residents are given a broad overview of the complex linkages between the different organisations involved and also the range of options available.

1.2 Roles and responsibilities

One of West Oxfordshire District Councils key ongoing roles is to continue to lobby National agencies / Government on behalf of the residents and businesses of the district to secure funding and/or additional resources to assist with flood prevention and other relevant activities. The Council will also work closely with other agencies and organisations in order to highlight the local issues and actions identified in the report.

The legal responsibility for dealing with flooding lies with different agencies and is complex, so below is a simplified summary.

Environment Agency (EA) – permissive powers[1] for main rivers

Oxfordshire County Council (OCC) – Responsible for adopted highways and highway drainage.

Thames Water (TW) – Responsible for adopted foul and surface water sewers.

West Oxfordshire District Council (WODC) – duties as a riparian[2] land owner, and permissive powers[1] under Land Drainage Act 1991, Public Health Act 1936, Highways Act 1980 and Environmental Protection Act 1990.

Private land owners - duties as a riparian land owner.

1.3 Consultation and consent

The key organisations mentioned above are currently carrying out their own investigations, but operate independently of each other, have different methods of prioritisation and different funding criteria. The District Council has consulted with these agencies together with Parish Councils, Town Councils and individual property owners in order to prepare this report.

It is recognised that the majority of the options proposed in this report require further investigations / feasibility studies and / or consultation before they are carried out. Therefore these options may not be appropriate in every case when full costings, environmental, landscaping, biodiversity, built environment and historic factors are fully considered.

When considering protection against future flooding, it must be emphasised that the risk and impact of flooding can be mitigated against but in some cases not fully removed.

1.4 Response to this report

The options section of this report highlights the potential areas of work / activities under the responsible agency, for example the Environment Agency, West Oxfordshire District Council etc. If you have any specific questions relating to these activities please contact the relevant agency using the contact details provided at the top of the chart.

If you have any general questions please contact your Parish / Town Council who have been a key contributor to the production of the report and have agreed to act as the first point of contact.

The Council is also planning to hold a series of 'road shows' in the Parish areas where representatives from all the relevant areas will be available to answer any questions local residents have as well as provide more information on ways residents may help themselves.

[1] Permissive powers are when an organisation may choose whether or not to exercise their powers. I.e. they are NOT under a duty. In making this choice account must be taken of any factors required by the legislation, plus for example how urgent, how necessary they are, cost, likely result, etc.

[2] Riparian owners are responsible for the maintenance of any watercourse within or adjacent to the boundaries of their property.

1.5 Legal

2.0 DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS

Ditch Clearance

- 1731 Linear metres WODC owned ditches cleared overall
- 1923 Linear metres Privately owned ditches cleared overall
- Overall 2.27 miles of ditches have been cleared

Flood Grants

- 1137 WODC Flood Grants totalling £284,250 given out overall
    - 36 (£9,000) for Standlake
- 40 Red Cross Flood Grants totalling £80,929 administered by WODC overall
- 301 Hardship Grants totalling £155,050 given out overall

Reports

- Interim Flooding Report published October 2007
- 12 Parish Flood Reports completed by June 2008, 1 report for Standlake

Actions from the Council's Interim Report published in January 2008

- The table below provides a summary of some of the completed actions identified in the report

Bronze command procedure to be updated to recognise the need for ensuring shift rotas are in place in the early stages of an emergency
Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances
The emergency plan specifically addresses the need to keep in regular contact with elected members
That in future emergency situations District Councils ensure that they have a representative present at Silver Command from the start of the emergency to act as a conduit for information between Silver Command and the District Councils
The council should encourage all residents residing in the flood plain and in areas at risk of flooding to sign up to the EA Flood Alert system.
Provide clear information to residents and businesses about what type of waste we can collect and how it will be collected
Explanations to residents of our need for bulky waste to be placed on the roadside for collection
Commence a review of the mapping of the many thousands of privately owned ditches and culverts, and ensure they are kept clear and well maintained in accordance with the new policy (2 TOR 3)
Lobby central government for a single agency to take control of all land drainage issues
WODC continues to act in a coordination capacity with key external agencies
Continue to liaise with EA to ensure that procedures relating to planning consultations are robust. Seminar being arranged to take place early in 2008 to progress this
Progress the Strategic Flood Risk Assessment
Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances
Approaches to be made to the EA and Metrological Office with regard to improving their predictive capability
During emergency events, have an external media person (BBC) in Bronze Command
Purchase digital TVs to assist with reviewing weather, local and national news to assist emergency management

3.0 EXECUTIVE SUMMARY

Following the flooding events of July 2007, West Oxfordshire District Council (WODC) has responded to requests from both Town and Parish Councils to aid the coordination of all the agencies and bodies that were undertaking their own investigations into the floods through the production of Parish Flood Reports.

This document is the Parish Flood Report for Standlake and has been prepared by the Council's Engineering team. It pulls together information from external agencies and individual property owners and seeks to identify the causes of flooding during July 2007 and potential mitigating solutions.

This report recognises the statutory duties of WODC to maintain and enhance the biodiversity, protect local habitats in the UK Biodiversity Action Plan, protect specially protected species, conserve and enhance the character and appearance of Conservation areas and protect/ maintain listed buildings.

Standlake is a rural parish of 1000 Hectares (2471 Acres), including the communities of Standlake village, Brighthampton, Standlake Common and Rack End sandwiched between the River Thames to the south and River Windrush to the north. Several visual walkover surveys have been undertaken of the flooded areas and properties. Meetings or conversations have been held with affected residents, the Parish Council, Thames Water and Oxfordshire County Council.

Standlake flooding has been assessed in three separate areas (see section 5.1) comprising Rack End (Area 1), Standlake High Street (Area 2) and Abingdon Road (Area 3).

Rack End (Area 1) suffered extensive damage which was attributable to either or a combination of over-topping of the River Windrush, surcharging of the existing combined sewer or the drowning of the sewage pumping station at Rack End. Similarly High Street Standlake suffered extensive damage which in this case was not so much attributable to the over-topping of the River Windrush but to one or a combination of the following: rising high water table (at times of heavy rain) seeping through traditional porous stone floors, run-off seeping through traditional porous stone walls, surcharging of the existing combined sewer or drowning of the High Street sewage pumping station. Abingdon Road (Area 3) suffers from sewage surcharging during periods of heavy rain as surface water is connected to the local combined sewer that overloads the pumping station.

A number of properties in Rack End and Standlake High Street were evacuated initially as an emergency precaution and subsequently to undertake repairs.

Flooding problems and options, including description of works and how each public and private body is affected, effectiveness of each solution, affects on adjacent land and cost, are included in Section 5 and 6.

Conclusions and recommendations, including maintenance and flood defence improvement schemes and programme, are shown in Section 7.

Some of the recommendations directly affect flood zones and environmentally sensitive areas such as important wildlife sites, listed buildings and Tree Preservation Orders.

4.0 SURVEY

4.1 Description of Area

Standlake Parish is approximately 1000 Hectares (2471 acres) in size comprising the communities of Standlake Village, Brighthampton, Standlake Common and Rack End.

The parish is rural in nature forming part of the catchment area for the River Thames and River Windrush. The parish is sandwiched between the River Windrush to the north and River Thames to the south.

There are five farms (Stones Farm, Magdalen Farm, Deans Farm, Old Manor Farm, and Malthouse Farm), two schools, four caravan parks, two retirement homes (Meadow View and Cherville Cottage), gravel batching plant and a water sports centre located within the parish. There are 41 lakes around Standlake (former gravel pits) for fishing, sailing and watersports. Standlake contains numerous listed buildings located within the Parish.

4.2 Survey

Several visual walk-over surveys and visits of the parish have been undertaken including the High Street, Rack End and Broad Bridges where the property flooding events of 2007 occurred.

See Appendix 1 – Photographs.

4.3 Meetings

A meeting was held on 13 November 2007 with Ted Tolput (Parish Council Chairman), David Bevan (Parish Clerk) and Brenda Smith (Ward Council Member for West Oxfordshire). Contact has also been made with Adrian List who is representing the parishioners of Standlake in discussions with the EA.

Owners of properties that flooded in July 2007 were also contacted and details of the conversations are included in the table below.

Locations	When	Problems/ Issues
Properties in Rack End (no flood protection bund)	11/12/08	• Properties flooded where there is no Windrush River flood protection bund to the rear. • Water bypassed Rack End to cross the road and flood properties on the south side. • Low lying properties to the south of Rack End have temporary sand bag protection and are particularly vulnerable. • Residents of three properties on the north side of Rack End have moved into large caravans located on their front gardens. • All residents (39 people) in Meadow View nursing home were moved out as a precaution even though ultimately the home did not flood. • Local knowledge indicates that Standlake has flooded 4 times in the last 70 years including the 2007 flood. • Raw sewage came out of foul manholes
Properties in Standlake High Street (including Rack End with flood protection bund, Church End, The Butts, The Green).	11/12/08	• Water table rose and came through traditional stone floors. • Very high water table flooded the gardens. • Some highway gullies were blocked and could not receive water • Pipes along High Street laid to very flat gradients.

Discussions were held with the EA who advised that in 2008 a flood protection bund was provided, along the south bank of the River Windrush between No's 19 and 37 Rack End, to increase the freeboard by 450mm. This was to provide 1 in 100 year flood protection.

Discussions were also held with Thames Water who advised that in 2005 they installed a new 225mm diameter sewer, to replace the existing 150mm diameter sewer for a length of 350m, along Abingdon Road (A415). Additionally a 150m length of 900mm diameter tank sewer was constructed downstream of the upsized pipes.

This attenuation facility was designed to provide 1 in 30 year flood protection but was subsequently overwhelmed by the extreme event of July 2007 and subsequent river flooding. Also the Pumping Stations at Rack End and the High Street were overloaded and struggled to cope. This was not assisted by the loss of power which occurred when the buildings flooded.

Also Thames Water advised that they replaced the rising main at Church End and High Street in early 2007 and upgraded the storm pumps to suit.

It is also known that the pipe networks in Standlake are susceptible to ground water infiltration into both the foul and combined systems.

4.4 Grant Aid

The District Council has distributed a range of financial support to the residents of district in the form of;

- Emergency Flood Relief Grant Aid of £250
- 'Hardship' Grants
- Red Cross Grants

There have been 36 applications for Grant Aid from Standlake. Many locations have been surveyed to verify the claim. All claimants have been given a sum of £250 towards Emergency Aid.

Whilst the Emergency Flood Relief Grant Aid was not paid to industrial and commercial properties, the Council did provide advice and support to local business affected by the flooding on funding available from Business Link and other organisations.

5.0 PROBLEMS AND CAUSES

5.1 Location Plan

Figure 1 (in Appendix 2) shows areas in Standlake Parish where flood damage occurred during 2007.

A further map included in Appendix 2 shows:

- **1% annual probability of flooding - Flood Zone 3 (previously referred to as 1 in 100 year flooding)**

  A plan showing the 2008 Environment Agency 1% annual probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 1 per cent chance happening in any year. This is the high probability risk zone.

- **0.1% annual probability of flooding – Flood Zone 2 (previously referred to as 1 in 1000 year flooding)**

  A plan showing the 2008 Environment Agency 0.1% annual probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 0.1 per cent chance happening in any year. This is the medium probability risk zone.

5.2 Area 1 – Rack End

Eighteen properties flooded east of number 14 Rack End. This was attributable to either or a combination of over-topping of the River Windrush or excess surface water reaching the existing combined sewer. This excess flow in the combined sewer drowned the village pumping station located at Rack End.

Local residents who have lived in Rack End their whole lives claim that there has been at least five flooding events in the previous 70 years and two in the previous ten years prior to July 2007.

To limit flooding the EA have previously built a flood protection bund to the southern bank of the River Windrush extending from the Rectory Garden to number 21. Recently this was extended to number 39 Rack End.

We have assumed the cause of flooding to be one or a combination of the following:

5.2.1 River Windrush

Following periods of heavy rain the water level in the River Windrush rises, over-tops and floods properties along the north side of Rack End. Some water runs across the road and floods properties on the south side of Rack End. Properties on the south side built at a lower level are particularly vulnerable to flooding.

5.2.2 Combined Sewer

Excess surface water reaches the combined sewer running under Rack End and surcharging occurs.

5.2.3 Pumping Station

Drowning of the village pumping station located at Rack End.

5.3 Area 2 – High Street

Eighteen properties were flooded in Standlake High Street which includes the following areas: west of Rack End, Church End, The Butts and The Green. This could be attributed to any or a combination of the following: the water table rising through traditional porous floors, highway drainage run-off and yard drainage seeping through traditional porous walls, surcharging of the combined sewer running through the village and the village pumping station, due to overload, becoming ineffective.

Local residents who have lived in Standlake their whole lives claim that there has been at least five flooding events in the previous 70 years and two in the previous ten years prior to July 2007.

We have assumed the cause of flooding to be one or a combination of the following:

5.3.1 Low lying properties

Older properties (CIRCA 200 to 300 years) constructed at a lower level using traditional building practices and materials becoming vulnerable to the high water table generated in the area after prolonged heavy rainfall. Additionally low lying properties are at risk from highway run-off flooding on account of the adjacent road level building up over time.

5.3.2 Combined Sewer

Excess surface water reaches the combined sewer running under Standlake High Street and surcharging occurs.

5.3.3 Pumping station

Drowning of the village pumping station located in the High Street

5.4 Area 3 – Abingdon Road

Two properties flooded in Abingdon Road and neither made an application for the Emergency Flood Relief Grant.

It would appear that the 1 in 30 year flood protection measures put in place by Thames Water in 2005 was not effective for these properties. The flooding was due to the following:

5.4.1 Combined Sewer

Excess surface water reaches the combined sewer running under Abingdon Road and surcharges the local pumping station. This has the net effect of flooding the above properties in Abingdon Road every time there is heavy rain.

6.0 OPTIONS

The following table shows the possible options available for flood alleviation schemes throughout the Parish, and their potential effectiveness, as assessed by the District Council Engineers. The areas affected by flooding within the Parish have been given unique area numbers, i.e. Area 1. Several options for flood alleviation projects are identified for each area as "Actions" or "Options".

Many of these options will require further detailed investigation along with the agreement of the responsible landowner, identification of budget and a cost benefit analysis to be carried out before they could be implemented.

Some of the options shown are also mutually exclusive, that is if one option is carried out then another will not be necessary, to find if this is the case for an option, please look at the detailed description in the Conclusions and Recommendations Section (7.0).

If you require further information regarding a particular option, please contact the agency that would be responsible for implementation of the proposal, where this has been shown, using the contact information at the top of the column. If no contact details are shown, there may be a private landowner responsible. If this is the case the District Council will ensure that private landowners are made aware of their responsibilities.

West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Standlake Parish

Version 1 - May 2008

Option ref	Problem overview / Options	Description of work required: Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private/ Riparian	Key issues: Effectiveness	Effects on adjacent land	Cost	Comments
		For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	**For queries** Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk	**For queries** Tel: 08459 200800	**For queries** Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk					
Area 1 – Rack End										
	Following periods of heavy rain the water level in the River Windrush rises, over-tops and floods properties along the north side of Rack End. Some water crosses the road, and floods properties on the south side of Rack End. Properties on the south side built at a lower level are particularly vulnerable to flooding. Also excess surface water reaches the combined sewer running under Rack End which in turn drowns the village pumping stations at Rack End and the High Street.									
A	Provide a flood protection bund along the south bank of the River Windrush between No's 19 and 37 Rack End to increase the freeboard by 450mm. The EA advise that this will provide 1 in 100 year flood protection. As of 30 April 2008 the EA advise that this work is complete.	As of 30 April 2008 EA advise that this work is complete. Solution does not assist the flooding of properties in the High Street.					This scheme will provide 1 in 100 year flood protection.	Requires land from properties backing onto the River Windrush to construct the bund.	£20K to £50K. To be funded wholly by the Thames Regional Flood Defence Committee.	
B	Provide a new surface water sewer & hydrobrake under Rack End to attenuate flow. Storage to be provided by upgrading a pond to include a swale (SUD) facility to the rear of No 40 Rack End. Highway, roof, yard and driveway drainage to be connected to the new sewer thus changing the existing 150mm diameter combined sewer to foul only. This will remove excess surface water currently taken by the Rack End pumping station. Thames Water to make adjustments to each property as required.	EA to advise on quantity and quality of discharge acceptable to balancing pond. EA to advise on size of balancing pond.	OCC to connect existing highway drainage network in the locality to the balancing pond.	Thames Water to install new surface water sewer, hydrobrake and balancing pond (to the rear of No.40 Rack End). All highway, roof, yard and driveway drainage to be connected to new sewer to change combined sewer to foul only.	WODC to co-ordinate works with this proposal.	Ownership and access to land to the rear of No. 40 Rack End to be agreed. Private surface water drainage connections to be diverted to the new drainage network by Thames Water.	This will provide a level of protection up to 1 in 100 years.	Pond to the rear of No. 40 Rack End to be upgraded to become a balancing pond. This option will remove excess load currently taken by the Rack End and High Street pumping stations.	£100K to £200K To be funded wholly by Thames Water.	
C	Lower northern bank of the River Windrush to ensure flood water dispersed into adjacent agricultural land. Along with work recently undertaken by the EA (see Option A above) this will prevent flooding to properties north of Rack End plus the Village Hall.	EA to lower northern bank of the River Windrush to ensure flood water dispersed into adjacent agricultural land.			WODC to co-ordinate works with this proposal.	Ownership and access to agricultural land to the north of the River Windrush to be established.	This scheme will provide 1 in 100 year flood protection.	Flood plain extended across agricultural land to the north.	£5K to£20K. To be funded by EA.	

West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Standlake Parish

Version 1 - May 2008

Option ref	Problem overview / Options	Description of work required: Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private/ Riparian	Key issues: Effectiveness	Effects on adjacent land	Cost	Comments
		For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	**For queries** Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk	**For queries** Tel: 08459 200800	**For queries** Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk					
Area 2 – Standlake High Street										
	Following periods of heavy rain properties flood along Standlake High Street. This could be caused by any or a combination of the following: (i) Water table rising through traditional porous floors (ii) Highway and yard run-off seeping through ancient porous walls (iii) The combined sewer running under the High Street unable to cope with the additional flow. (iv) The village pumping stations become drowned and are unable to receive excess discharge.									
A	Low lying properties at risk of water ingress through the floor and walls to have floors re-laid with a suitable hygroscopic membrane, to the satisfaction of WODC Planning / Conservation Department. Work to be undertaken by the property owner.				WODC to co-ordinate works with this proposal.	Work to be undertaken and funded wholly by the private owner.	This option will prevent water rising through the floor but will not prevent flooding of gardens/ driveway etc.		£20K to £50K. To be funded wholly by the private property owner.	
B	Low lying properties that flood to be corralled by a perforated pipe laid with a single size stone bed and surround to a depth of 1 metre. A well point pump to be provided in the lowest corner of the drainage network to pump out water ingress. This will lower the water table locally around the property. Pumped water to be stored on site in a tank which will be emptied at regular intervals as required. Work to be undertaken by the property owner.	EA to give consent on pumping rate and discharge quantity required to lower the water table.			WODC to co-ordinate works with this proposal.	Work to be undertaken and funded wholly by the private owner.	This option will prevent water flooding the house/ garden if required. Option depends on provision of holding tank by the private owner and regular pumping out.		£20K to £50K To be funded wholly by the private property owner.	
C	Provide new surface water tank sewer & hydrobrake under High Street to attenuate flow. Highway, roof, yard and driveway drainage to be connected & change the existing 150mm diameter combined sewer to foul only. This will remove excess surface water currently taken by the High Street pumping station. Thames Water to make adjustments to each property.	EA to advise on permissible discharge rate from tank sewer to avoid flooding.	OCC to connect existing highway drainage network in the locality to the tank sewer.	Thames Water to install new surface water tank sewer and hydobrake. All highway, roof, yard and driveway drainage to be connected to the new sewer to change the combined sewer to foul only.	WODC to co-ordinate works with this proposal.	Private surface water drainage connections to be diverted to the new sewer by Thames Water.	Level of protection dependant on size of tank sewer which is dependant on available land.	This option will remove excess load currently taken by the Rack End and High Street pumping stations. Thames Water to make property adjustments.	£100K to £200K To be funded wholly by Thames Water	
Area 3 – Abingdon Road										
	Following periods of heavy rain two properties in Abingdon Road flood with raw sewage. This is caused by excess surface water reaching the combined sewer running under Abingdon Road and surcharges the local pumping station.									
A	Provide additional storage capacity in existing combined sewer to ensure surcharging does not occur leading to pump failure.			Thames Water to extend the existing 225mm diameter combined sewer under Abingdon Road and tank sewer, installed in 2005, to accept flow from No's 161 and 163 Abingdon Road. Surcharging hence pump failure to be addressed			This scheme will provide 1 in 30 year flood protection.		£5K to£20K. To be funded by Thames Water.	

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Area 1–Rack End

7.11 Maintenance

The following on-going maintenance is recommended:

- OCC are to increase the frequency of gulley emptying to ensure free discharge of surface water without obstruction.
- EA to clear pond to the rear of No 40 Rack End if attenuation Option C is to be taken forward.

7.1.2 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option A – EA to extend the flood protection bund along the southern bank of the River Windrush. This was carried out in early 2008.

Mid-Term (under 1-2 years)

- Option B – Thames Water to install a new surface water sewer with hydrobrake utilising a possible swale (SUD) and balancing pond to the rear of No 40 Rack End. All highway, roof, yard and driveway drainage to be connected to the new sewer thus changing the existing 150mm diameter combined sewer to foul only. OCC to connect the existing highway drainage system in the locality to the new balancing pond.

7.2 Area 2 – Standlake High Street

7.2.1 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option A or Option B – Dependant on private property owner choice either Option A, relaying of traditional floor including a suitable hygroscopic membrane, to the satisfaction of WODC Planning / Conservation Department, or option B, providing a water table lowering well point facility to the perimeter of the property is to be carried out. Funding would be wholly the responsibility of the property owner and WODC accept no liability in recommending these solutions.

Mid-Term (under 1-2 years)

- Option C – Thames Water to install a new surface water tank sewer with hydrobrake to attenuate discharge. Size of tank dependant on available land. All highway, roof, yard and driveway drainage to be connected to the new sewer thus changing the existing 150mm diameter combined sewer to foul only. OCC to connect the existing highway drainage in the locality to the new tank sewer.

7.3 Area 3 – Abingdon Road

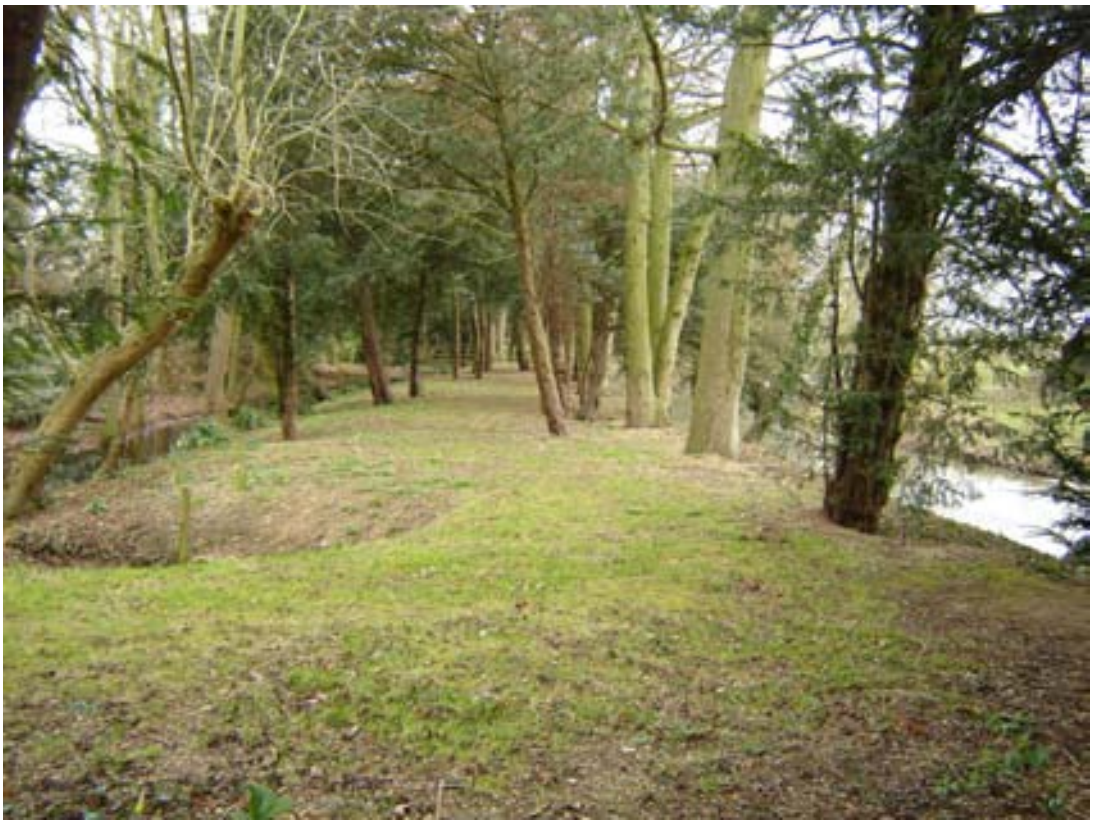
7.3.1 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

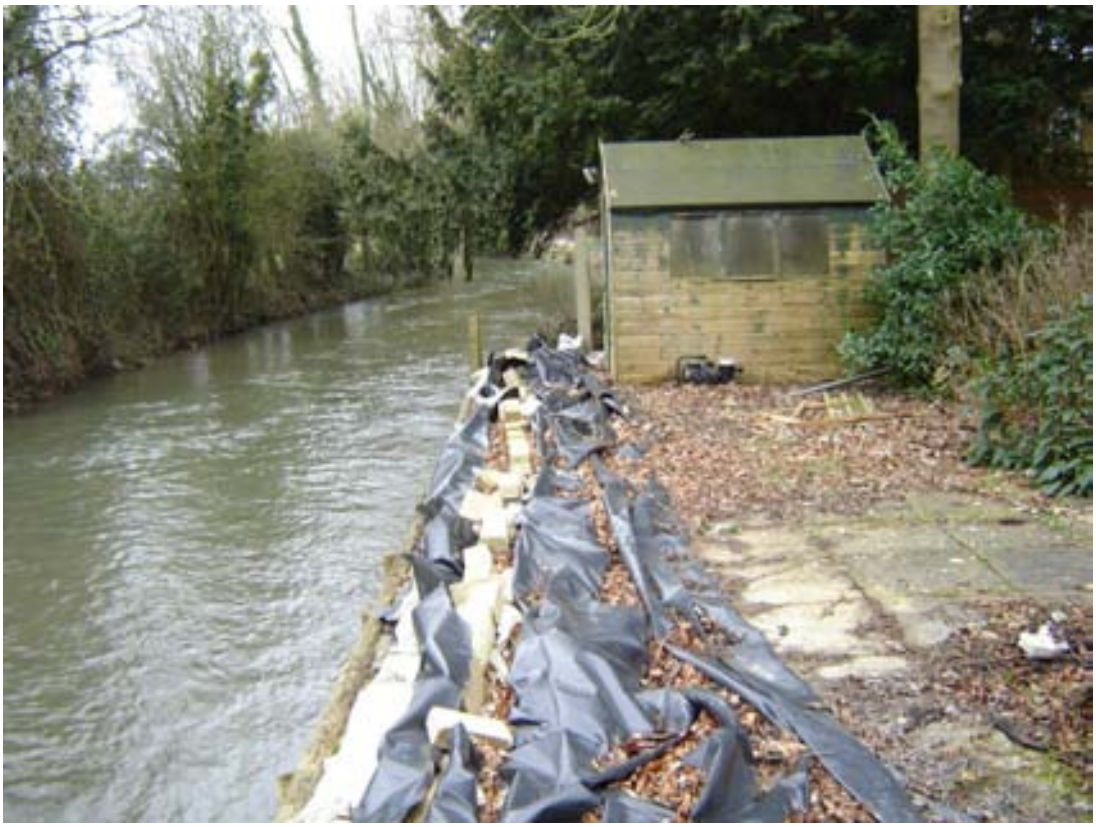
Immediate (under 1 year)

- Option A – Thames Water to extend the existing 225mm diameter combined sewer, under Abingdon Road, and tank sewer, installed in 2005, to accept additional flow.

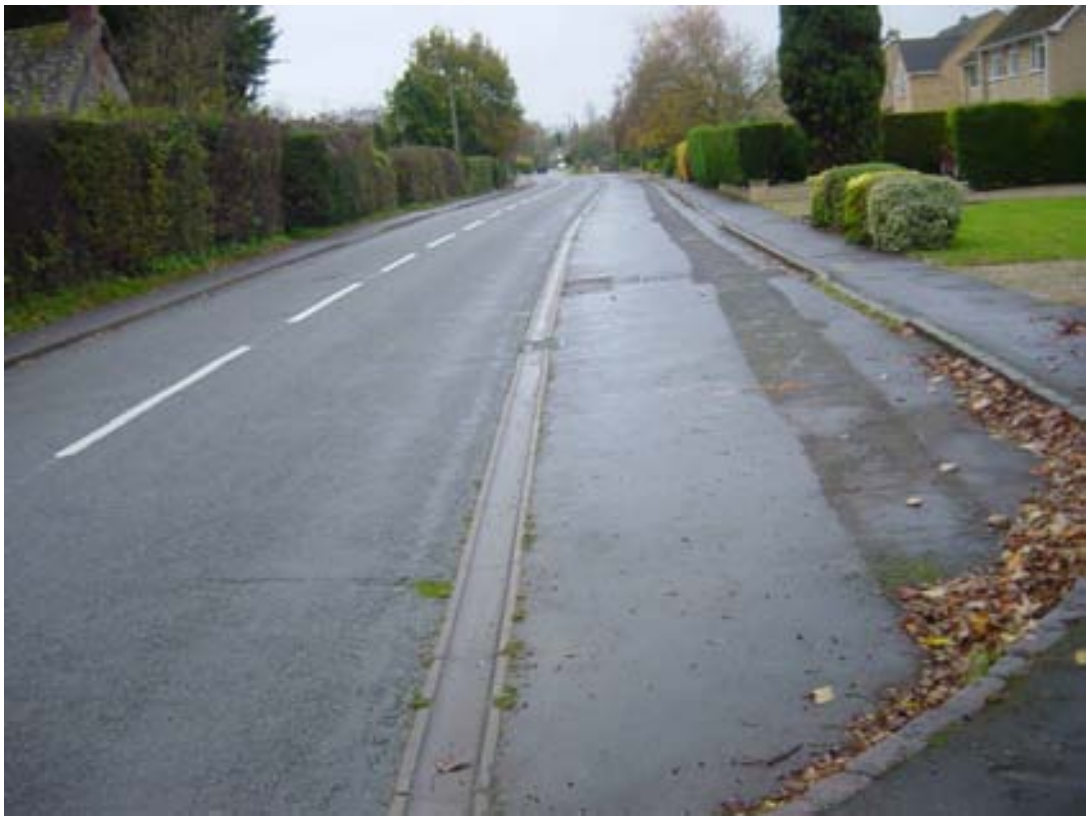
Appendix 1: Photos



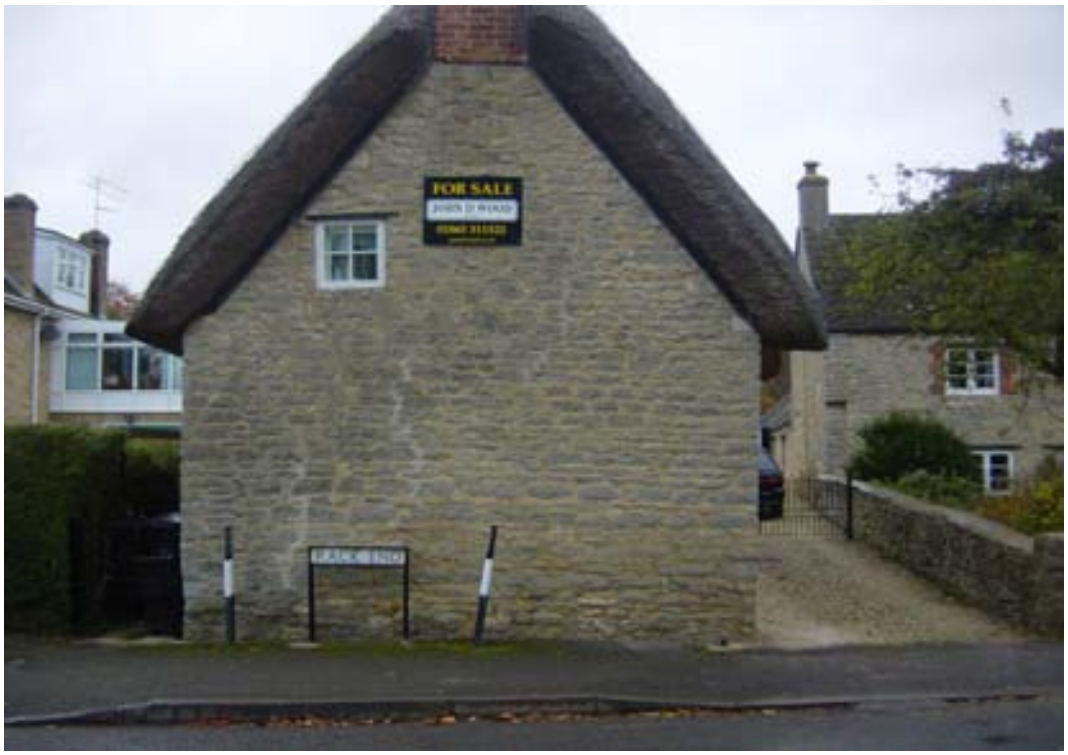
Area 1 – Rack End
Existing flood protection bund December 2007



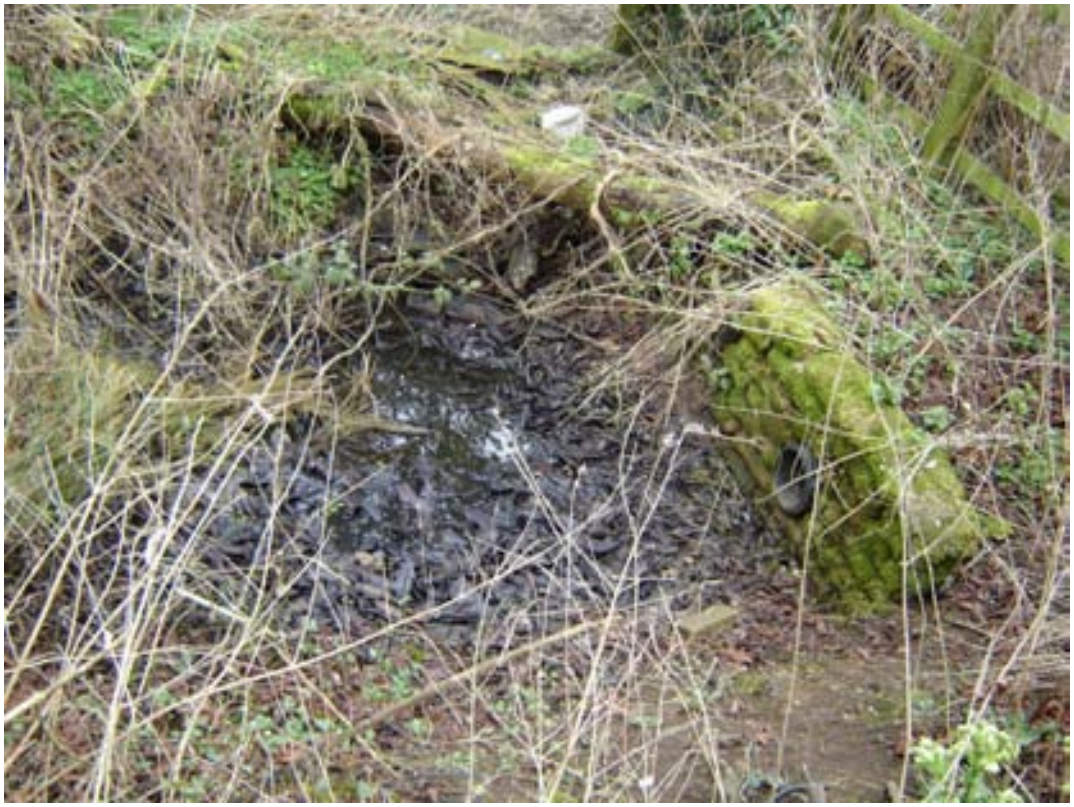
Area 1 – Rack End
Option A location December 2007



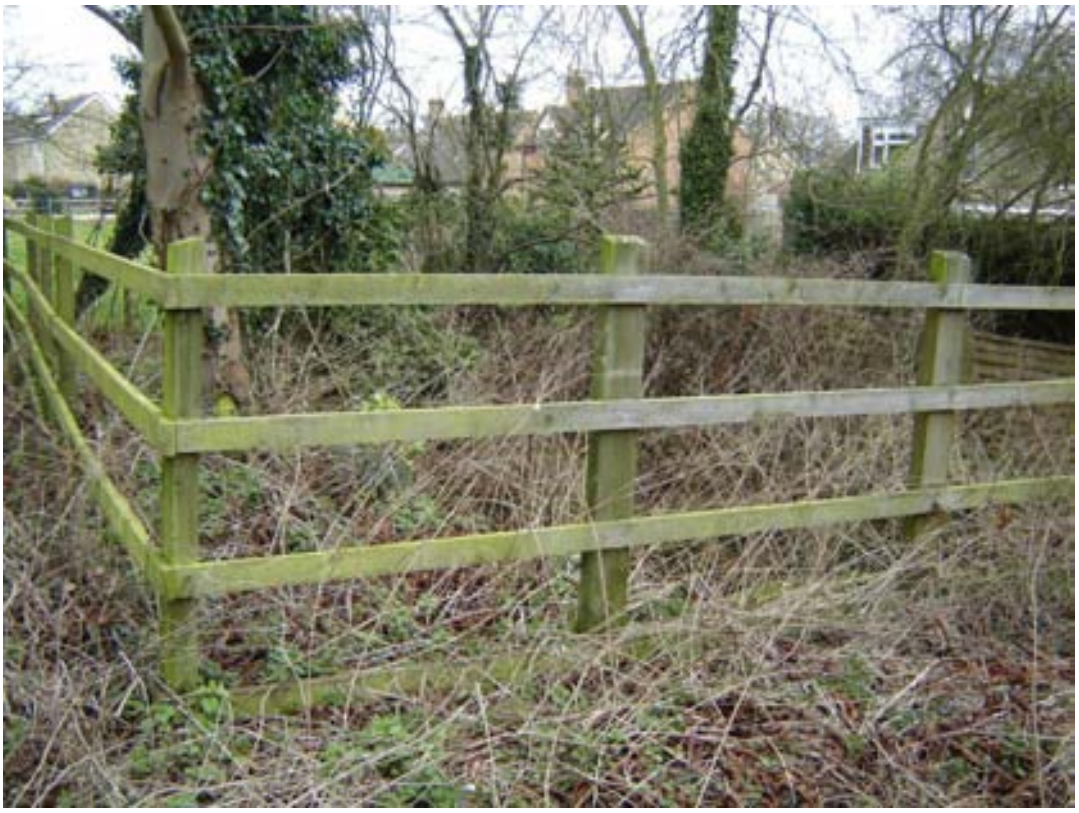
Area 1 – Rack End
Option B location



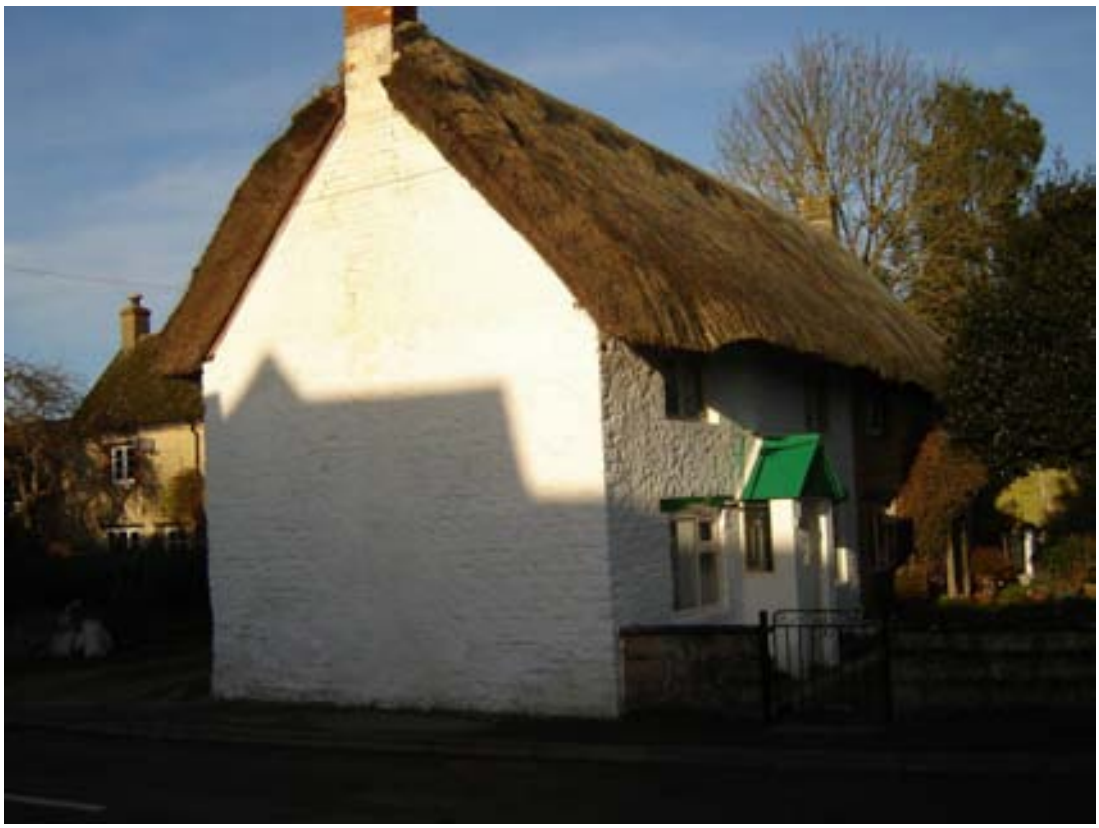
Area 1 – Rack End
No's 1 to 3



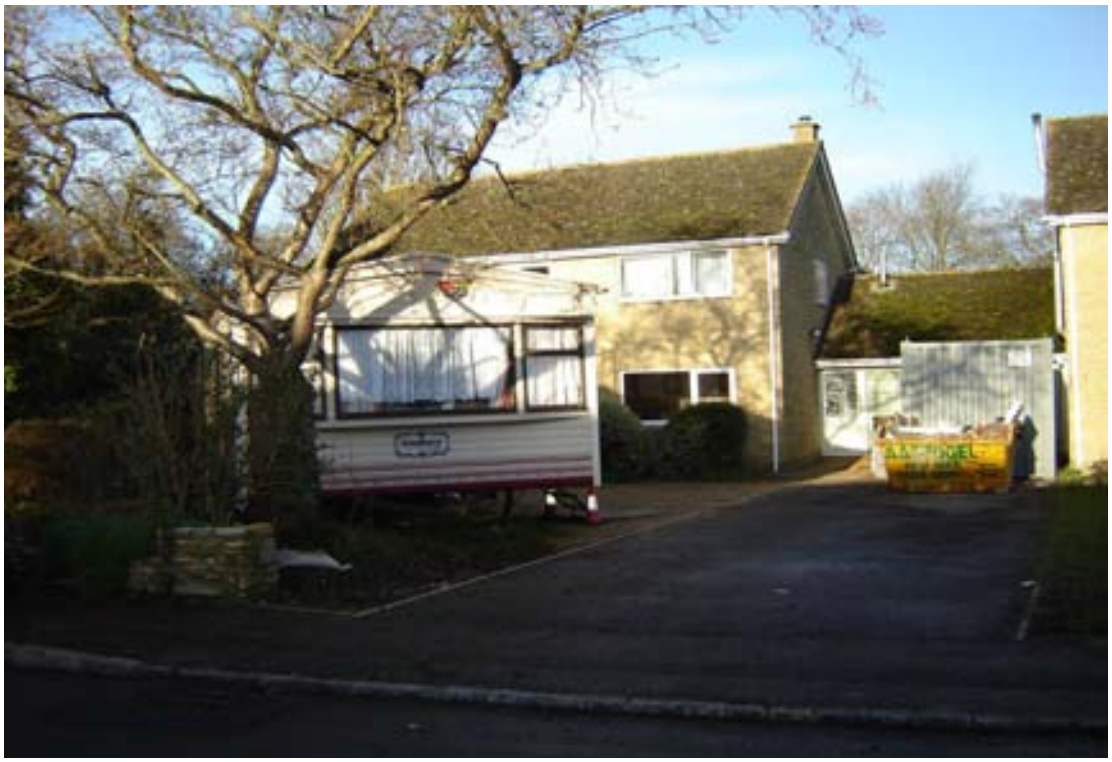
Area 1 – Rack End
Option C location



Area 1 – Rack End
Option C location

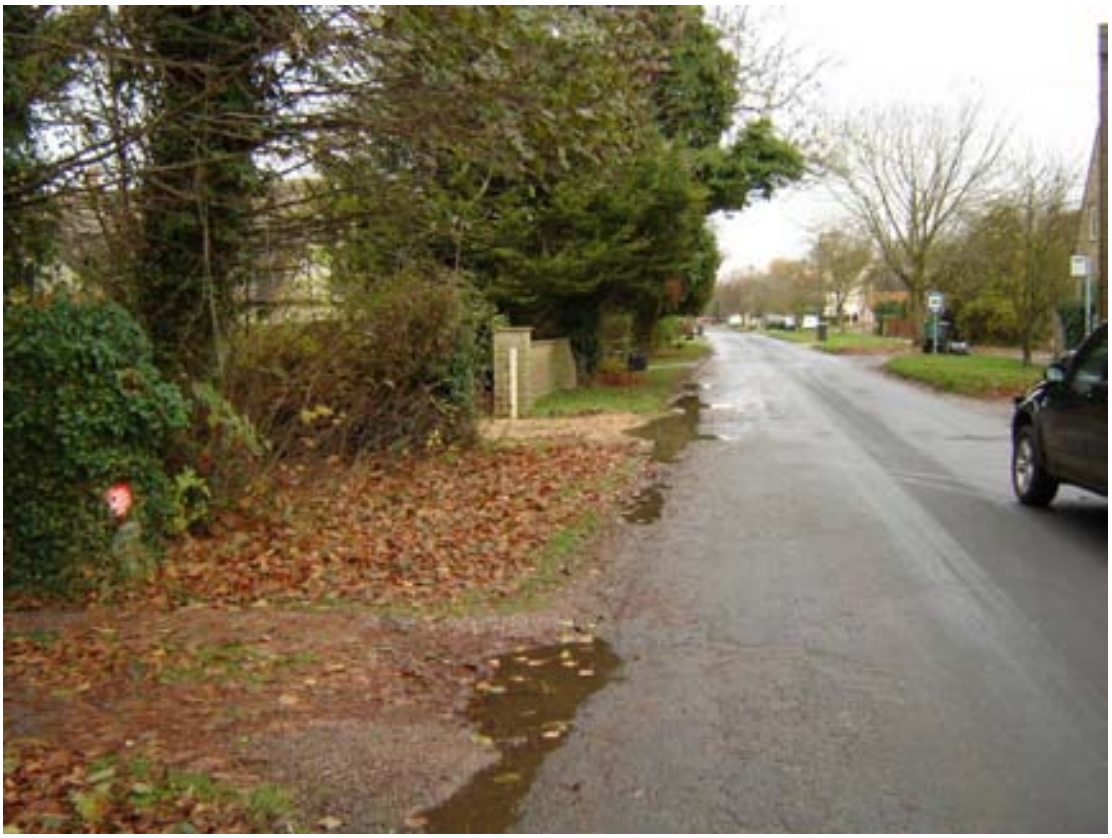


Area 1 – Rack End
No's 5 - 7

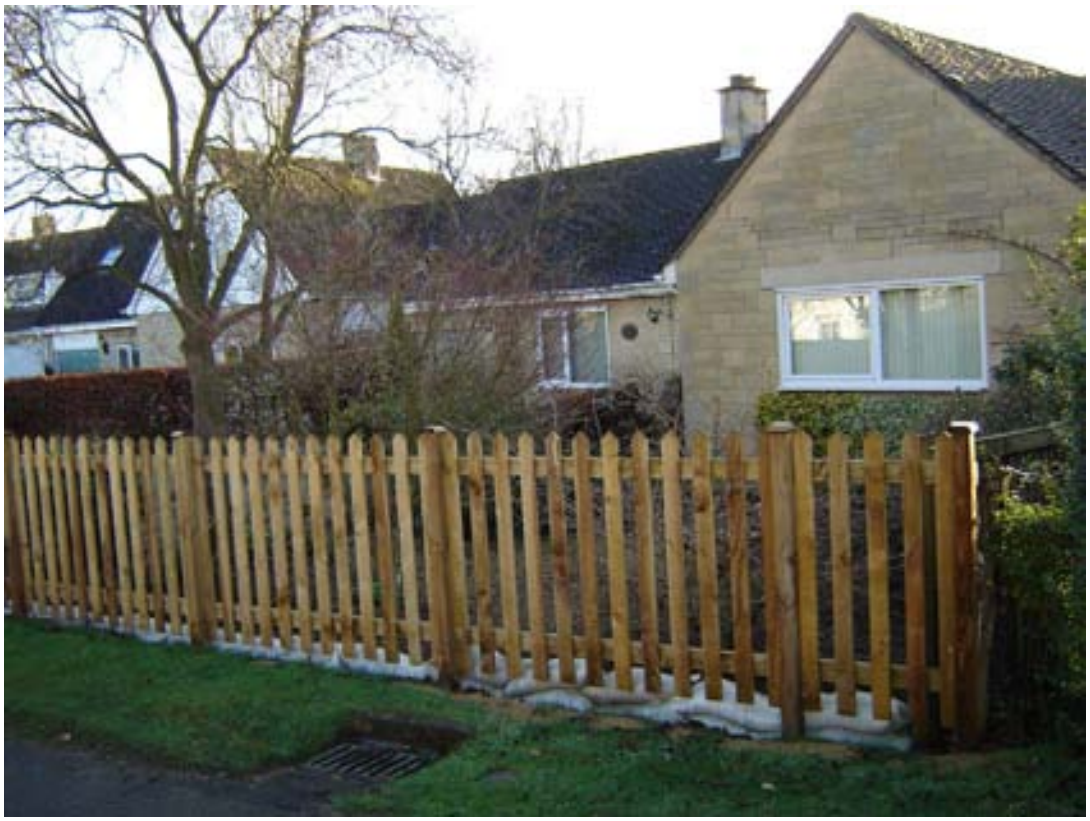


Area 1 – Rack End
No 19 with temporary caravan whilst refurbishment ongoing

Area 1 – Rack End
Meadow View Nursing Home

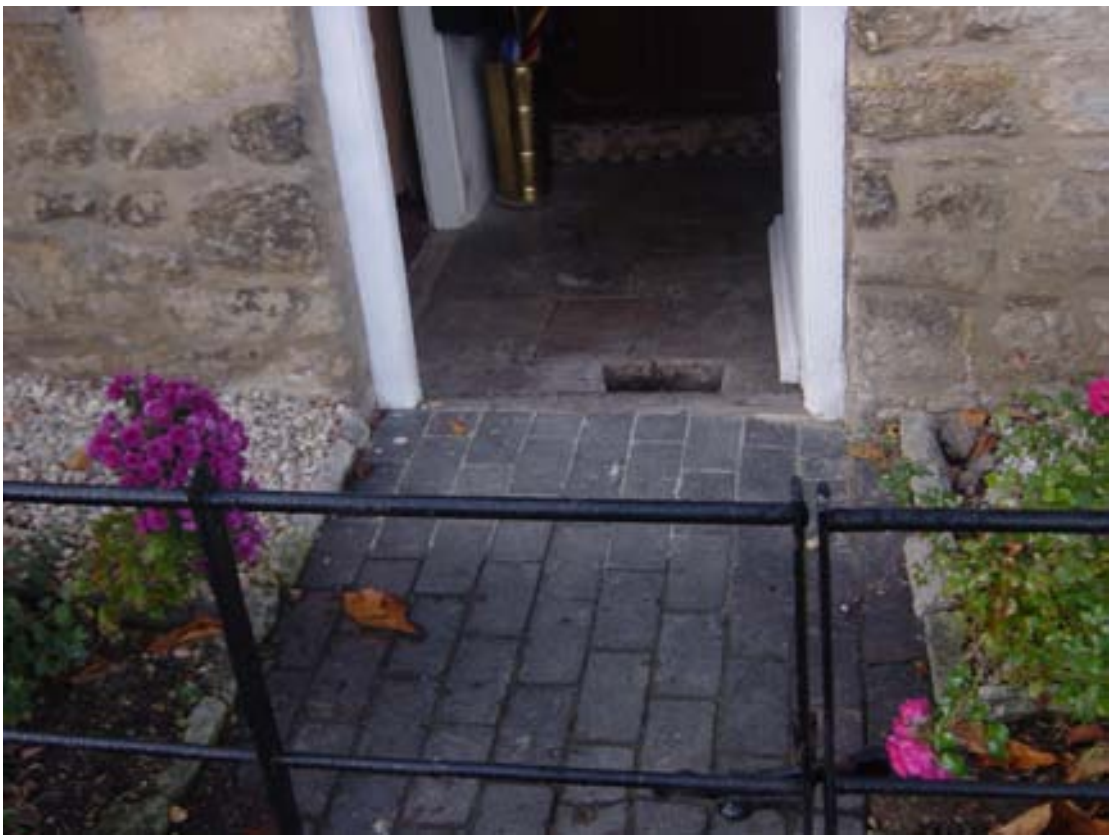


Area 2 – Standlake High Street
Flooding

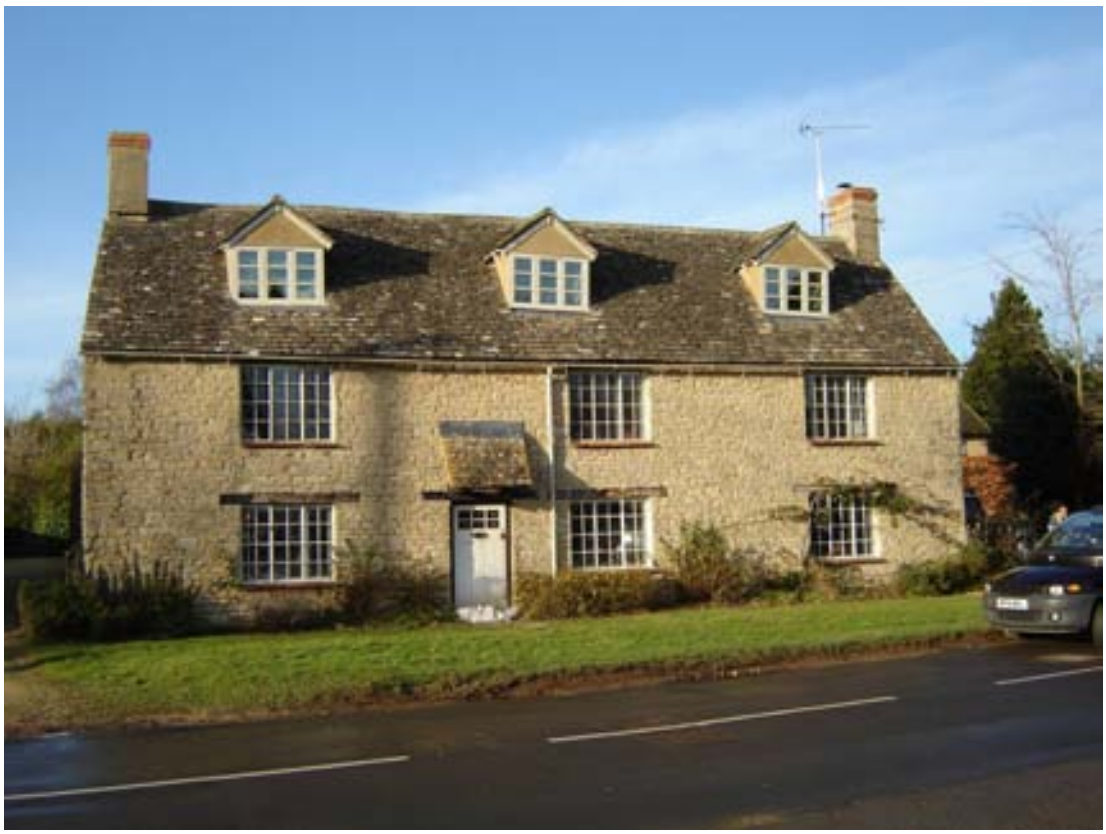


Area 1 – Rack End
No 40

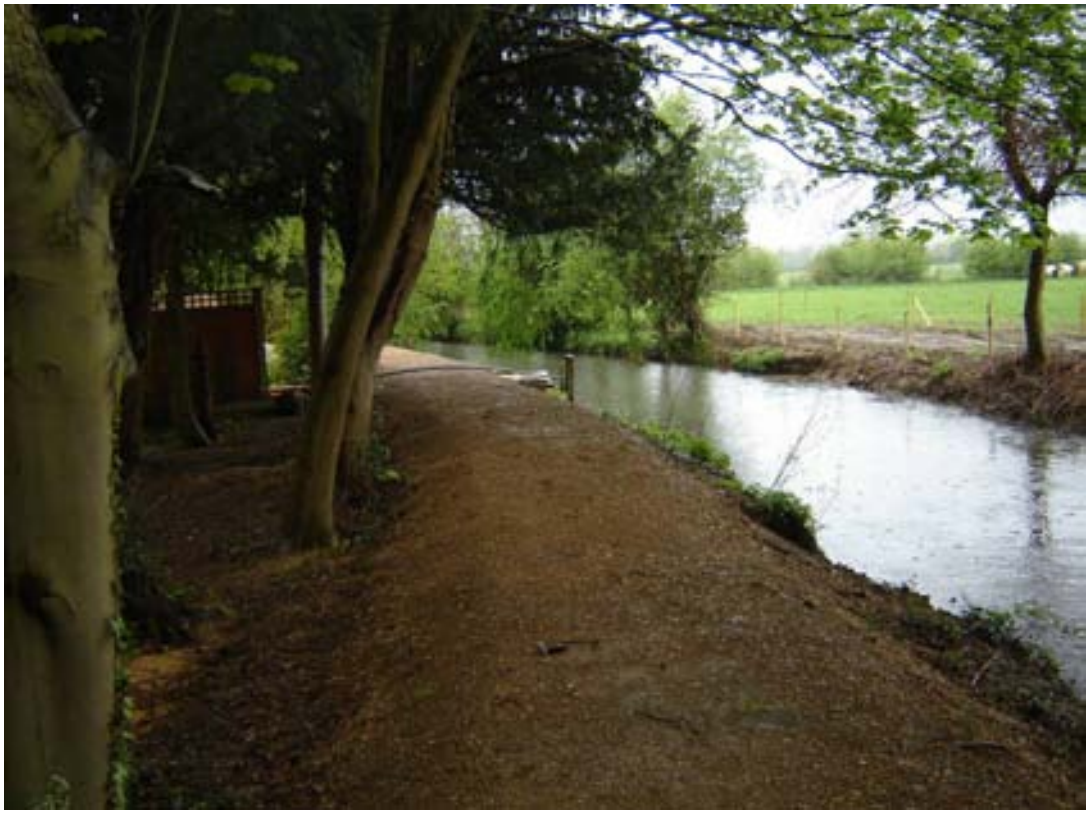
Area 1 – Rack End
No 42



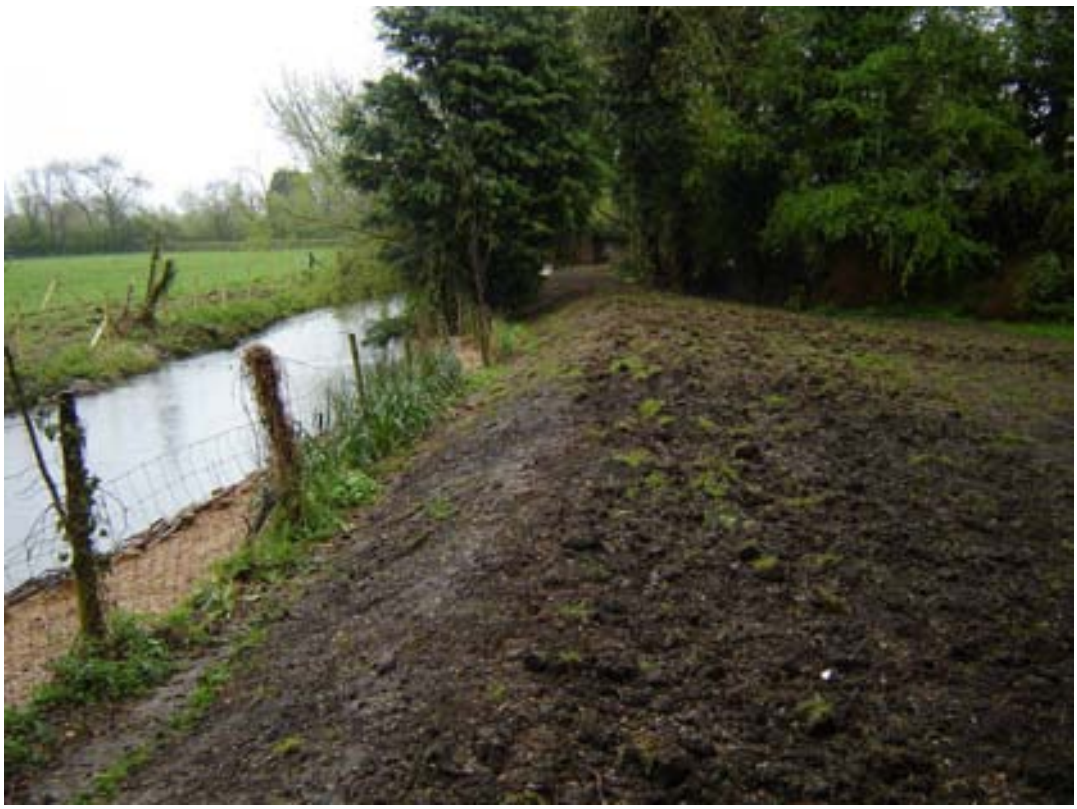
Area 2 – Standlake High Street
Option A / B



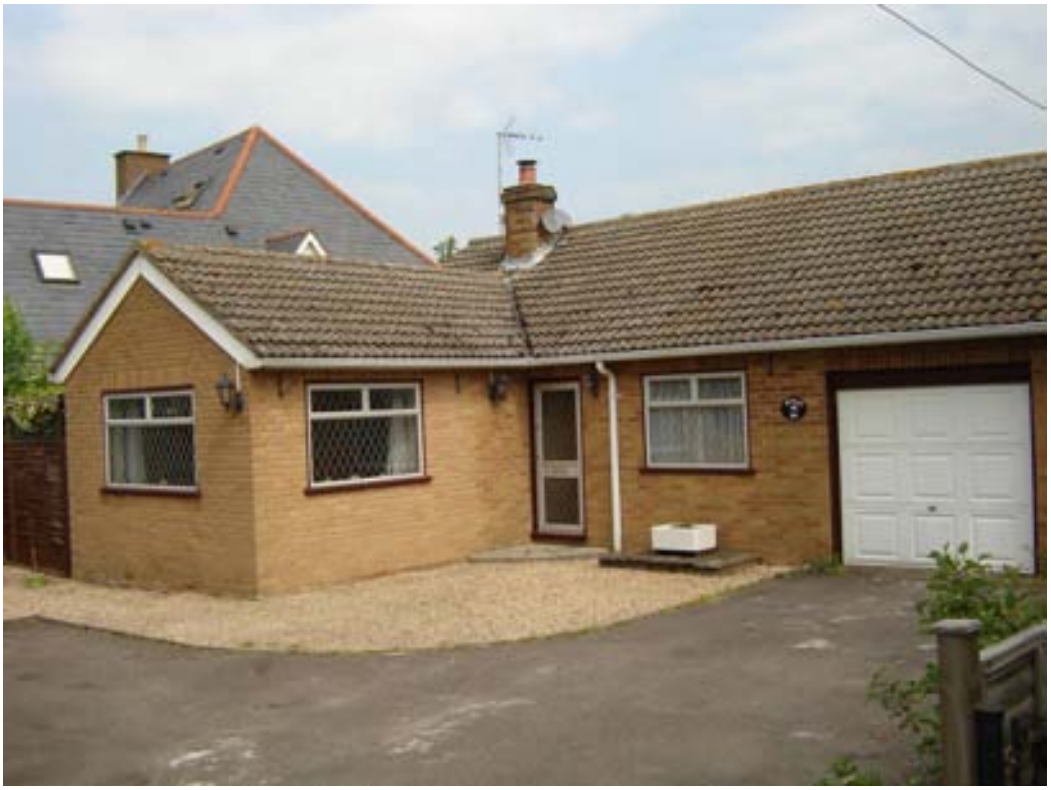
Area 2 – Standlake High Street
No 16



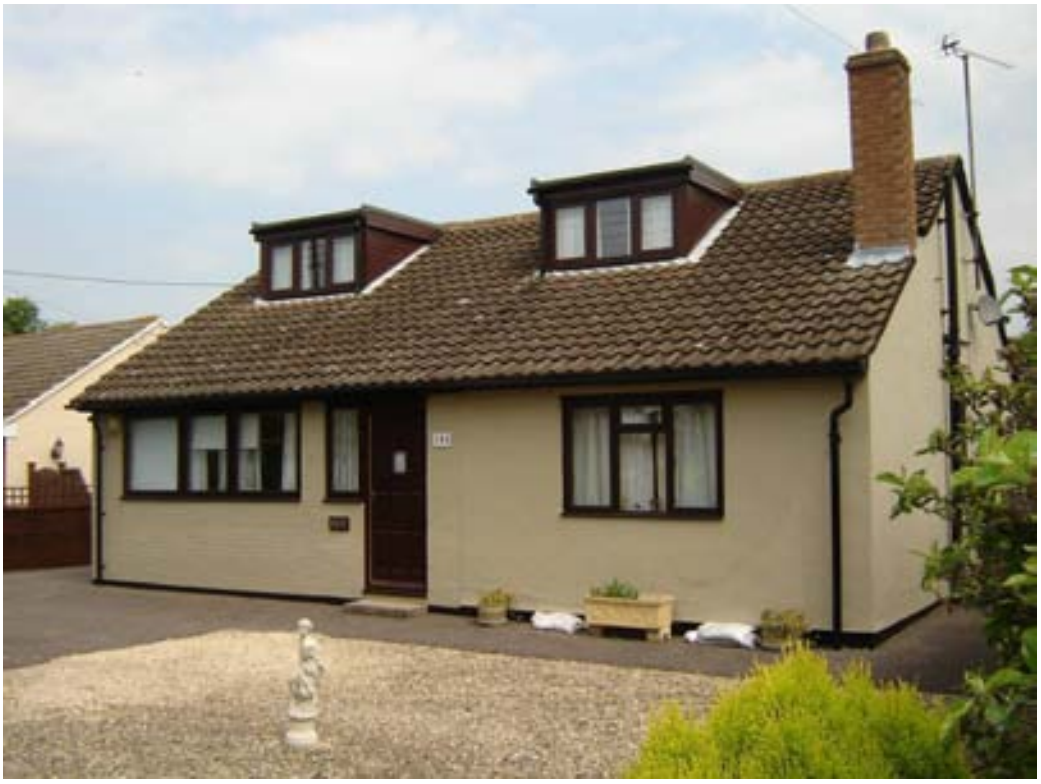
Area 1 – Rack End
Option A (completed in April 2008)



Area 1 – Rack End
Option A (completed in April 2008)



Area 3 – Abingdon Road



Area 3 – Abingdon Road