

20 April 2016

Section 55 Town and Country Planning Act 1990

Design and Access Statement
Flood Risk Assessment
Affordable Housing Statement

Construction of two houses following demolition of the existing detached bungalow

8 Ardler Road Reading Berkshire

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1. Introduction

1.1. This statement has been prepared to support the following proposal:

Construction of two houses following demolition of the existing bungalow

1.2. The site relates to 8 Ardler Road, a detached bungalow located on the west side of the street and within an area characterised by two-storey terraced houses.

1.3. Planning permission is sought for a modest scheme comprising one pair of semi-detached houses. The design for the scheme has been inspired by the appearance of dwellings within the surrounding area.

1.4. Having regard to the key material considerations in this case it is submitted that the development is appropriate and would have no overriding impact on the amenity of adjoining or surrounding occupiers.

2. Site Context

2.1. Ardler Road is characterised by a mix of two-storey terraced suburban houses dating from C1900's.

3. Policy Framework

National Policy

3.1. The National Planning Policy Framework (NPPF) became the primary national planning policy guidance on 27 March 2012. It replaced the previous PPS/PPG system of guidance documents and deleted a significant proportion of planning policy including the Regional Spatial Strategies (RSS). The NPPF includes transitional arrangements for Local Authorities to either prepare a plan that would be NPPF compliant or adapt an existing post 2004 plan to be compliant.

Implementation of the NPPF

3.2. Paras 214 to 216 of Appendix 1 give relevant advice stating:

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214. For 12 months from the day of publication, decision-takers may continue to give full weight to relevant policies adopted since 2004 even if there is a limited degree of conflict with this Framework.

215. In other cases and following this 12-month period, due weight should be given to relevant policies in existing plans according to their degree of consistency with this framework (the closer the policies in the plan to the policies in the Framework, the greater the weight that may be given).

216. From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to:

- the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given);
- the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and
- the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).

Sustainable Development

3.3. Paragraph 7 of the NPPF sets out the Government's overriding objectives of securing sustainable development. Para 7 of the NPPF identifies the roles of the planning system in achieving sustainable development:

7. There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

- an economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;
- a social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and

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- an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

3.4. Para 14 goes on to provide further emphasis on the focus towards sustainable development stating:

14. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.

For plan-making this means that:

- local planning authorities should positively seek opportunities to meet the development needs of their area;
- Local Plans should meet objectively assessed needs, with sufficient flexibility to adapt to rapid change, unless:
 - any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
 - specific policies in this Framework indicate development should be restricted.

For decision-taking this means:

- approving development proposals that accord with the development plan without delay; and
- where the development plan is absent, silent or relevant policies are out of date, granting permission unless:
 - any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
 - specific policies in this Framework indicate development should be restricted.

Housing

3.5. Section 6 Paragraph 50 of the NPPF sets out the objectives of obtaining a sustainable mix of dwellings in communities:

1. To deliver a wide choice of high quality homes, widen opportunities for home ownership and create sustainable, inclusive and mixed communities, local planning authorities should:

- plan for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community (such as, but not limited to, families

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with children, older people, people with disabilities, service families and people wishing to build their own homes);

- identify the size, type, tenure and range of housing that is required in particular locations, reflecting local demand;

Flood Risk

3.6. The site is identified within Flood Risk Zone 3. Section 10 of the NPPF is therefore relevant and the following paragraphs are pertinent.

100. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere⁴. Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

applying the Sequential Test

if necessary, applying the Exception Test

safeguarding land from development that is required for current and future flood management

using opportunities offered by new development to reduce the causes and impacts of flooding

where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations

101. The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.

102. If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

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it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared

a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall

Both elements of the test will have to be passed for development to be allocated or permitted.

103. When determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment⁵ following the Sequential Test, and if required the Exception Test, it can be demonstrated that:

within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location

development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems⁶

Affordable Housing

3.7. Following the decision of R (West Berkshire District Council and Reading Borough Council) v. Secretary of State for Communities and Local Government [2016] EWCA Civ 441 the NPPG has been amended and Paragraph: 031 Reference ID: 23b-031-20161116 is now relevant and states:

Are there any circumstances where infrastructure contributions through planning obligations should not be sought from developers?

As set out in the Starter Homes written ministerial statement of 2 March 2015, starter homes exception sites should not be required to make affordable housing or tariff-style section 106 contributions.

There are specific circumstances where contributions for affordable housing and tariff style planning obligations (section 106 planning obligations) should not be sought from small scale and self-build development. This follows the order of the Court of Appeal dated 13 May 2016, which give legal effect to the policy set out in the written ministerial statement of 28 November 2014 and should be taken into account.

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These circumstances are that;

contributions should not be sought from developments of 10-units or less, and which have a maximum combined gross floorspace of no more than 1,000 square metres (gross internal area)

in designated rural areas, local planning authorities may choose to apply a lower threshold of 5-units or less. No affordable housing or tariff-style contributions should then be sought from these developments. In addition, in a rural area where the lower 5-unit or less threshold is applied, affordable housing and tariff style contributions should be sought from developments of between 6 and 10-units in the form of cash payments which are commuted until after completion of units within the development. This applies to rural areas described under section 157(1) of the Housing Act 1985, which includes National Parks and Areas of Outstanding Natural Beauty

affordable housing and tariff-style contributions should not be sought from any development consisting only of the construction of a residential annex or extension to an existing home

Local Policy

3.8. The Local Development Framework is encapsulated within the Reading Core Strategy 2006 (as amended). The relevant policies are as follows:

Policy CS1: Sustainable Construction and Design

Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

To meet these requirements:

- All new housing is required to meet the most up to date Eco-Homes 'Very Good' as a minimum standard, and all new commercial developments are required to meet the most up to date

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BREEAM 'Very Good' as a minimum standard;

- On larger developments of more than 10 dwellings or 1,000 m² of floorspace, ensure that 50% of the provision meets the most up to date Eco-Homes and BREEAM 'Excellent' standards;
- All new developments maximise the use of energy efficiency and energy conservation measures in their design, layout and orientation to reduce overall energy demand;
- All developments of more than 10 dwellings or 1000m² floorspace incorporate on-site generation of energy from renewable sources and energy efficient design measures (including the use of CHP where appropriate) to off-set at least 20% of predicted carbon dioxide emissions from the estimated energy usage of the completed and occupied development;
- All developments reduce mains water use and demonstrate that water conservation measures are incorporated so that predicted per capita consumption does not exceed the appropriate levels set out in the Code for Sustainable Homes or BREEAM Standards
- Developments incorporate sustainable urban drainage facilities and techniques as part of the layout of a development as appropriate and as advised by the Environment Agency, including minimising the size of impermeable areas so that peak run-off and annual water run-off is reduced where possible and in any case is no greater than the original conditions of the site. Particular care will be needed

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in areas of flood risk where different solutions may be required.

Policy CS5: Inclusive Access

All buildings should be located, sited and designed to provide suitable access to, into and within, its facilities, for all potential users, including disabled people, so that they can use them safely and easily.

Policy CS7: Design and the Public Realm

All development must be of high design quality that maintains and enhances the character and appearance of the area of Reading in which it is located. The various components of development form, including:

- Layout: urban structure and urban grain;
- Landscape;
- Density and mix;
- Scale: height and massing; and
- Architectural detail and materials.

will be assessed to ensure that the development proposed makes a positive contribution to the following urban design objectives:

- Character - a place with its own identity and sense of place
- Continuity and enclosure
- Quality of the public realm
- Ease of movement and permeability
- Legibility - clear image and easy to understand
- Adaptability – capable of adaptation over time
- Diversity – meets a wide range of needs.

Developments will also be assessed to ensure that they:

- Respond positively to their local context and create or reinforce local character and distinctiveness,

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including protecting and enhancing the historic environment of the Borough and providing value to the public realm;

- Create safe and accessible environments where crime and disorder or fear of crime does not undermine quality of life or community cohesion;
 - Address the needs of all in society and are accessible, usable and easy to understand by them; and
 - Are visually attractive as a result of good high quality built forms and spaces, the inclusion of public art and appropriate materials and landscaping.
- Applications for major and minor developments should be accompanied by a design and access statement that deal with all the above matters.

Policy CS15: Location, Accessibility, Density and Housing Mix

The appropriate density and mix of residential development within the Borough will be informed by:

- An assessment of the characteristics, including the mix of uses of the area in which it is located;
- Its current and future level of accessibility by walking, cycling and public transport, as defined in Policy CS4;
- The need to achieve high quality design in accordance with Policy CS7; and
- The need to minimise environmental impacts, including detrimental impacts on the amenities of adjoining occupiers.

Developments should provide an appropriate range of housing opportunities in terms of a mix of housing types, sizes and tenures, in

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accordance with the findings of a housing market assessment. The mix of dwellings should include an appropriate proportion of units designed to the Lifetime Homes standard. Net densities of below 30 dwellings per hectare will not be acceptable.

Policy CS16: Affordable Housing

All developments of 15 dwellings and above will provide 30% of the total number of dwellings in the form of affordable housing to meet the needs of the area, as defined in a housing needs assessment.

Affordable housing is subsidised housing that enables the asking price or rent to be substantially lower than the prevailing market prices or rents in the locality, and is subject to mechanisms that will ensure that the housing remains affordable for those who cannot afford market housing.

In all cases where proposals fall short of the policy target as a result of viability considerations, an open-book approach will be taken and the onus will be on the developer/landowner to clearly demonstrate the circumstances justifying a lower affordable housing contribution.

In determining residential applications the Council will assess the site size, suitability and type of units to be delivered in relation to the current evidence of identified needs. The Council will seek an appropriate tenure mix of affordable housing to include social rented, affordable rent, intermediate rent and shared ownership affordable units. The affordable units provided should be integrated into the development.

Priority needs, in 2014, are for family sized housing, specialist accommodation for vulnerable people and extra care housing. The Council will regularly monitor and review the

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need for, and delivery of, affordable housing.

Policy CS17: Protecting the Existing
Housing Stock

Planning permission will not be granted for any
loss of residential accommodation or land
unless there are exceptional circumstances.
Planning permission will not be granted for a net
loss in the number of residential units or gross
floor area.

Policy CS24: Car/ Cycle Parking

Maximum car parking standards and cycle
parking requirements will be applied in relation
to the accessibility of locations within the
Borough to sustainable transport facilities,
particularly public transport.

4. Development Principles

4.1. The development is within Reading and comprises previously developed land within the developed area.

4.2. The principle of residential development is established by the existing form of development on the site.

4.3. This development seeks a continuation of the pattern of development within the street and as such is considered appropriate in principle subject to detailed design and amenity considerations.

5. Design Appraisal

Amount

5.1. The amount of development has been carefully considered in relation to plot size, layout and position within the street. Having regard to these matters the proposed scheme of two houses is considered an appropriate amount and would result in the net increase of one house on the site.

5.2. The proposed houses otherwise comply with the March 2015 Technical housing standards – nationally described space standard.

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5.3. The proposed amenity space provision for both new houses is considered appropriate having regard to the urban grain and plot form found within Ardler Road.

5.4. Having regard to development already alongside it is submitted that this proposed scheme otherwise addresses the requirements of the Core Strategy and the NPPF.

Scale

5.5. The scale of development does not differ from that within the street. The proposed development seeks a two-storey built form to mimic the adjoining two-storey buildings.

Layout

5.6. The site has been laid out to comply the pattern of built form within the street. The proposed houses are set behind a modest front forecourt and have a traditional front-to-back arrangement.

Landscape

5.7. The proposal seeks an appropriate landscape setting including front and rear gardens to position the properties in space. The landscape setting of development on this site is considered acceptable.

Appearance

5.8. The appearance of development mimics the appearance of the adjoining terraced houses in built form, architectural detailing, fenestration and materials. As such is considered an appropriate response to the site and its surroundings.

6. Access Appraisal

6.1. Ardler Road is a one-way street (north to south) with unrestricted on-street car parking available on both sides of the street.

6.2. The existing bungalow has a sub-standard garage. This is not considered to provide a dedicated car parking space. The forecourt of the bungalow is insufficient in terms of depth to provide a car parking space. As such the parking needs of this house are accommodated within the street.

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6.3. The proposed dwellings are set within behind forecourts which are insufficient in terms of depth to provide car parking. This approach has been taken in order to maintain the integrity of the building line on the west side of Ardler Road.

6.4. Given the availability of parking spaces fronting Ardler Road during the day and at evenings/weekends it is submitted that the additional 2 parking spaces required to service this development can be accommodated within the street without substantive impact to the safety and convenience of the Highway Network.

7. Affordable Housing Statement

7.1. Having regard to the requirements of the Core Strategy and the outcome of R (West Berkshire District Council and Reading Borough Council) v. Secretary of State for Communities and Local Government [2016] EWCA Civ it is submitted that the development does not generate the need for affordable housing contributions.

8. Conclusion

8.1. Given the above it is expected that the LPA will seek to approve this application. The applicant awaits confirmation of the Council's CIL standing in due course.

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Flood Risk Assessment

Construction of two new dwellings

8 Ardler Road Reading Berkshire

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1. Introduction

1.1 This flood risk assessment has been prepared to support the following proposal:

Construction of two new dwellings

1.2. This FRA has been prepared in accordance with the Technical Guidance to the National Planning Policy Framework (March 2012). Para 9 of the Technical Guidance states;

“9. As set out in the National Planning Policy Framework, local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific flood risk assessment. This should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account. Those proposing developments should take advice from the emergency services when producing an evacuation plan for the development as part of the flood risk assessment.”

2. Site Context

2.1 The existing site No 8 Ardler Road, a single storey bungalow.

2.2. Ardler Road more wisley comprises a mix of two-storey terraced houses.

2.3. The Environment Agency advises that the site is located within Flood Zone 3. The level of the land at this point is 37.5mAOD. The source of flooding is surface flooding from the non-tidal River Thames. This watercourse is some 400m at its closest point from the application site.

2.4. In the event of heavy rain waters flow to the south and down through the catchment and away from the application site.

3. Catchment Management

3.1. The site is within a known river catchment (The Thames River). The EA have an existing flood management plan which identifies the site within Policy Area 5 (Lower Thames) and states:

"These places include some of the most populated floodplain in Thames region. For instance, the Lower Thames sub-area, with 18, 000 properties with a 1% risk of flooding, is

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recognised as the largest concentration of properties not protected by flood defences in the country. These sub-areas contain 10% (170km²) of the total area of floodplain within the Thames CFMP but have 40% (56,000 properties with a 1% risk of flooding from rivers) of the properties at risk. This figure is estimated to increase by between 5% and 25% in the future due to the impacts of climate change as most of these areas are in wide flat floodplains of major rivers. More recent investigations show that in the Lower Thames the number of properties at risk from flooding could increase by 50% as a consequence of climate change. The flood risk is concentrated in known locations and problems with flooding from rivers are well documented. Large scale interventions will be expensive and difficult to build and maintain. Adaptation of the places at risk and of people's behaviour has the potential to manage risk. However, this will take time and will not always meet the expectations of partners and the communities at risk. ."

4. Strategic Flood Risk Assessment

4.1. Reading Borough Council has carried out a Strategic Flood Risk Assessment (SFRA).

4.2. The SFRA identifies that the site is within Flood Risk Zone 3a (High Probability)

Zone 3a High Probability

23 Areas subject to flooding in the 1% probability of occurring in any one year (1 in 100) design event have been delineated as Zone 3a High Probability. Development within these areas may only be considered following application of the Sequential Test and Exception Test and 'More Vulnerable' development should be avoided wherever possible.

24 The SFRA has outlined specific development control recommendations that should be placed upon development within Zone 3a High Probability to minimise the damage to property, the risk to life in case of flooding, and the need for sustainable drainage systems (SUDS). It is essential that the developer carries out a detailed Flood Risk Assessment to consider the site-based constraints that flooding may place upon the proposed development.

25 Re-development provides an opportunity to reduce the causes and impacts of flooding for example by incorporating SUDS and resilient building design, creating flood storage, re-creating functional floodplain and setting back defences.

5. Survey Information

5.1. A visit to the site was carried on 20 April 2017.

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5.2. The existing site comprises an existing bungalow set within a partially hard surfaced curtilage.

5.3. The site is flat and level.

5.4. The site, at present, drains to the combined sewer system that serves the wider Reading area.

5.5. Whilst there were incidents of flooding in Reading in 2014 this site was unaffected and both the Flood Management Plan and the SFRA indicate that the current flood defences are sufficiently well managed and maintained.

6. Source - Pathway Receptors

6.1 The existing site comprises an existing bungalow set within a partially hard surfaced curtilage.

6.2. The site is flat and level.

6.3. The site is located within Flood Risk Zone 3. The site is in excess of 400m the River Thames. The SFRA indicates that the site is defended and that the principal source of flooding is surface water flows from the source associated with an extreme storm event leading to scenarios of overtopping or breach. A secondary source of flooding is identified as groundwater flows closely associated with river levels. As these are linked the primary pathway is considered here.

6.4. The existing receptor is the existing dwellinghouse.

6.5. The proposed receptor to flooding is two dwellings (one additional dwellinghouse).

6.6. The proposed development would be located in Flood Risk Zone 3. Whilst this may place additional persons at risk it is considered that the possibility of flooding at the source of the river is remote.

6.7. Whilst there would be a net change to the number of persons at risk during a flood event it is considered that this can be mitigated by design and as such would not place additional persons at risk.

6.8. The pathway will be:

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overland surface flows from heavy rains exceeding the capacity of the existing defences or resulting in a breach of those defences and flowing across densely developed residential areas.

6.9. Table 2 confirms that the proposed development (Buildings and land associated with dwelling houses) Are classified as more vulnerable.

6.10. This proposal is not anticipated to result in a significant increase in surface water run-off.

7. Flood probability

7.1. Table 1 of the Technical Guidance to the NPPF confirms that the land is assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

7.2. The normal level of the Thames at Reading in average weather conditions is between 6.58m and 6.76m. It has been between these levels for at least 151 days in the past year.

7.3. The usual range of the Thames at Reading in more extreme weather conditions is between 6.58m and 7.00m. It has been between these levels for 90% of the time since monitoring began.

7.4. The most recent high is 7.30m, reached on Friday 10th January 2014 at 4:30am.

7.5. The highest level ever recorded at the Thames at Reading is 7.41m, reached on Saturday 4th January 2003 at 5:15pm.

7.6. The height of the flood monitoring station is 37.2m AOD and the normal level of the river is some 1m below the height of the station. (36.2m AOD).

7.7. Given the above data and the height of the site it is submitted that the Predicted Flood Level is some 37mAOD based on the Extreme Level, as recorded on 10/1/14.

8. Climate change

8.1. The SFRA confirms the extent of the floodplain based on a design life of the development of 100 years. It is anticipated that the classification of the land will remain unchanged.

8.2. The Guidance to support the National Planning Policy Framework September 2013 provides at Table 1 recommended national precautionary sensitivity ranges for peak

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rainfall intensity, peak river flow, offshore wind speed and wave height. Taking Peak sensitivity increased for river flow to 2115 the predicted flood level will remain the same (in absence of significant flood protection works) and the extreme level will increase to 49.95mAOD (+35).

9. The Sequential Test

9.1. The site is located within Zone 3 (High Hazard).

9.2. In light of presence of residential development on the site it is submitted that the sequential test has been passed.

10.0 The Exception Test

10.1 In light of presence of residential development on the site it is submitted that the exception test has been passed.

11. Site Specific Flood Risk Assessment

11.1. This proposal would create one additional dwelling.

11.2. This proposal does not alter the flood risk classification of the site nor does it:

- 1) have an adverse effect on a watercourse, floodplain or its flood defences;
- 2) would impede access to flood defence and management facilities; or
- 3) where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

11.3. Given the height of the site the proposed houses would be above the normal and extreme level of the river. The houses, being two storey, provide suitable refuge at first floor level before, during and after a flood event.

11.4. In the highly unlikely event of a catastrophic flood within the catchment it is proposed to incorporate a water exclusion strategy in accordance with the recommendations within Improving the Flood Performance of New Buildings (2007)

11.5. As the development seeks the construction of a new dwelling the following measures are considered to be proportionate.

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Doors: Raising the threshold as high as possible, while complying with level access requirements, should be considered as the primary measure. In addition, sealed PVC external framed doors should be used and, where the use of wooden doors is a preferred option, all effort should be made to ensure a good fit and seal to their frames. Hollow core timber internal doors should not be used where the predicted frequency of flooding is high. Where sufficient flood warning is given, butt hinges, that allow internal doors to be easily removed and stored in dry areas prior to a flood, should be used. Where the frequency of predicted flooding is low or where there is no warning (e.g. overland or sewer flooding) it may be necessary to replace the doors after the flood.

Windows/patio doors: Windows and patio doors are vulnerable to flood water and similar measures to those used for doors should be taken. Special care should be taken to ensure adequate sealing of any PVC window/door sills to the fabric of the house. Of particular concern would be excessive water pressure on the glazing of patio doors. Double glazing conforming to the relevant standards would in principle adequately resist the pressures generated by flood waters; debris carrying flows may cause damage.

Air vents: special designs of air vent are available in the market to prevent water ingress in circumstances where the predicted flood depth is low (i.e. < 0.3m); e.g. periscopic air vent.

Fittings: The main principle is to use durable fittings that are not significantly affected by water and can be easily cleaned (e.g. use of plastic materials or stainless steel for kitchen units). The cost of these units may need to be balanced against the predicted frequency of flooding. Place fittings (e.g. electrical appliances, gas oven) on plinths as high as practicable above floor so that they are out of reach of flood water.

Ensure adequate sealing of joints between kitchen units and surfaces to prevent any penetration of water behind fittings. Ensure high quality workmanship in the application of fittings

Pipework: Closed cell insulation should be used for pipes which are below the predicted flood level.

Drainage services: Non-return valves are recommended in the drainage system to prevent back-flow of diluted sewage in situations where there is an identified risk of the foul sewer surcharging. Maintenance of these valves is important to ensure their continued effectiveness.

Water, electricity and gas meters: should be located above predicted flood level.

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Electrical services: electrical sockets should be installed above flood level for ground floors to minimise damage to electrical services and allow speedy re-occupation (see Figure 6.13. Note a dado rail which provides a limit for replacement of any wall covering). Electric ring mains should be installed at first floor level with drops to ground floor sockets and switches.

Heating systems: boiler units and ancillary devices should be installed above predicted flood level and preferably on the first floor of two-storey properties.

Underfloor heating should be avoided on ground floors and controls such as thermostats should be placed above flood level. Conventional heating systems, e.g. hot water pipes are unlikely to be significantly affected by flood water unless it contains a large amount of salts. The less common, hot air duct heating would remain effective provided it is installed above the design flood level.

Communications wiring: wiring for telephone, TV, Internet and other services should be protected by suitable insulation in the distribution ducts to prevent damage. Any proposed design solution for flood insulation on all potentially vulnerable wiring should be discussed with the relevant service providers.

11.6. The Environment Agency advises that the site is located within Flood Zone 3. There are flood defences in place. Having regard to the existing situation it is anticipated that evacuation would be possible before, during and after a flood event.

11.7. Given the above, it is submitted that this proposal would not put a significant additional number of persons or properties at risk and would not result in adverse effects elsewhere. It is submitted that the Site Specific Flood Risk Assessment meets the requirements of the Technical Guidance and is acceptable in all other respects.

12. Management measures

12.1. A flood risk warning and evacuation plan will be prepared if required.

13. Off site impacts

13.1 No off-site impacts are anticipated as a result of this proposal.

14. Residual risks

14.1. There are no residual risks associated with this development.

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15. Conclusions

15.1 It is submitted that this proposal would accord with the aims and objectives of the NPPF and its associated Technical Guidance.

15.2. Whilst the flood risk classification may change over time this proposal will not put a significant number of additional buildings or persons at risk from a flood event.