

Flood Risk Assessment (FRA) template

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1 Site description

1.1 Site address

Site: 13 Firle Road, Lancing, West Sussex BN15 0NY

1.2 Vulnerability classification

The existing and proposed use is a single dwellinghouse, classed as 'More vulnerable' in Annex 3 of the NPPF.

The proposal is householder development (an extension to an existing dwelling). It does not create a new dwelling or change the vulnerability classification. The garden room is ancillary to the house and is not proposed as sleeping accommodation.

1.3 Flood zone incompatibility

The site lies in Flood Zone 1 (low probability: less than 0.1% annual chance of river or sea flooding) on the Environment Agency Flood Map for Planning.

'More vulnerable' development is appropriate in Flood Zone 1 (PPG Table 2). There is no flood zone incompatibility.

1.4 Lifetime of development

The development is residential, so a design lifetime of 100 years is assumed, in line with the Planning Practice Guidance and Environment Agency climate change allowance guidance.

1.5 Local Plan policies and SFRA recommendations

Adur Local Plan 2017:

Policy 36 (Flood Risk and Sustainable Drainage) requires development to be safe from flooding over its lifetime without increasing risk elsewhere, and to use sustainable drainage (SuDS) where appropriate.

Policy 35 (Water Quality and Protection) protects groundwater and watercourses.

Policy 18 (Sustainable Design) covers water efficiency.

Adur & Worthing Strategic Flood Risk Assessment (Level 1, JBA Consulting, 2024): the SFRA identifies groundwater as a key flood source in Lancing, particularly in the low-lying Chalk/coastal plain areas. It also maps surface water risk with climate change allowances. The site is on the Downs dip slope at about 50 m AOD, well above the areas the SFRA and the Lancing Surface Water Management Plan identify as affected (Grinstead Lane, Manor Way, Old Shoreham Road, Barfield Park, Monks Avenue). The Lancing SWMP records no flooding on Firle Road.

Joint validation requirements: in Flood Zone 1, an FRA is required for sites of 1 ha or more, or where other flood sources are identified. This site is about 0.05 ha. This proportionate assessment is provided because the scheme includes excavation for a garden room set below existing garden level.

2 Assess flood risk

2.1 Existing site

The site is a detached two-bedroom bungalow with a detached garage and front driveway, in an established residential street in North Lancing. Ground level at the road is about 50.5 m AOD. The land falls south across the plot, so the rear garden sits about 1 m or more below the house ground floor

Surrounding land is residential gardens and houses. There are no watercourses, ponds or drainage ditches on or next to the site. The geology is Chalk (South Downs dip slope). Roof water from the existing house is assumed to discharge to soakaways or the public sewer [confirm on site].

We are not aware of any recorded flooding of the property. No flood incidents on Firle Road are recorded in the Lancing Surface Water Management Plan.

2.2 Fluvial flood risk

2.2.1 Design flood event

The site is in Flood Zone 1. There is no main river or ordinary watercourse near the site. The nearest main river is the River Adur, about 3 km to the east, and its floodplain lies at around 2–5 m AOD, some 45 m below the site.

No fluvial design flood level applies to the site, including the 1% annual probability event with climate change allowance.

2.2.2 Residual fluvial risk

Residual fluvial risk (for example from blockage or defence failure) is negligible, given the site's height and distance from any watercourse.

2.3 Tidal flood risk

2.3.1 Design flood event

The site is about 2 km inland and about 50 m AOD. Extreme tidal levels on this coast are around 4–5 m AOD, including allowances for climate change to 2126 and wave action. The site is far outside any tidal flood extent, so no tidal design flood event applies.

2.3.2 Residual tidal risk

Residual tidal risk, including breach or overtopping of the Shoreham Adur tidal walls or coastal defences, is nil at this elevation.

2.4 Surface water flood risk

2.4.1 Design flood event

The site is on a slope below the Downs. Rainfall runoff from Firle Road and higher land to the north follows the road and the natural fall towards the south.

The EA Risk of Flooding from Surface Water mapping shows the site at [very low] risk [confirm against EA long-term flood risk map; attach extract]. No defined overland flow path crosses the plot.

The design event for surface water drainage is the 1% annual probability rainfall event plus the climate change allowance for peak rainfall intensity (up to 45% upper end, as used in the SFRA mapping).

2.4.2 Residual risk

The main residual risk is created by the scheme itself. The garden room is set below the original garden level, with the excavated garden levelled to the south. Water running off the terrace, the steps and the garden slope above could collect at its threshold.

This is a local, controllable risk, managed by the drainage measures in Section 5.5.

2.5 Sewer flood risk

The property is served by Southern Water sewers in Firle Road. We are not aware of any sewer flooding records for the property or the street. The site is high up in the catchment, so the risk of foul or surface water sewers surcharging onto it is low.

The garden room is at lower-garden level. If it gets a sink or WC [confirm], its drainage connection would be below the house's existing drainage level. A pumped connection or an anti-flood (non-return) valve would then be fitted, so the sewer cannot back up into the room.

2.6 Groundwater flood risk

The site sits on Chalk. The SFRA identifies Lancing as among the areas most susceptible to groundwater flooding. That susceptibility relates to emergence in the low-lying coastal plain and valley bottoms, mostly below about 10 m AOD. At about 50 m AOD on the dip slope, groundwater in the Chalk is expected to lie many metres below the surface.

The excavation is shallow: about 1–1.5 m below existing garden level, to give the garden room 2.0 m internal height (drawing A.301). It is not expected to intercept the water table.

As a precaution, the garden room and retaining walls will be waterproofed to BS 8102. A land drain will be laid behind the retaining walls, discharging to the soakaway, so perched water or seepage after heavy rain is intercepted.

2.7 Reservoir flood risk

The site is outside the maximum extent of flooding from reservoirs on the EA long-term flood risk mapping. There are no large raised reservoirs upslope of the site.

2.8 Canals and other artificial sources of flood risk

There are no canals or other artificial water bodies near the site. Burst water mains are a remote, short-duration risk that applies to any property, and are dealt with by the surface water drainage measures.

2.9 Coastal erosion risk implications on tidal flood risk

Not applicable. The site is about 2 km inland and about 50 m AOD, and is unaffected by coastal erosion.

2.10 Interactions of various sources

There are no fluvial, tidal or reservoir sources to combine with surface water or groundwater. The only plausible combination is heavy rainfall during a period of high groundwater, which could reduce how well the soakaway drains. Soakaway design will be based on infiltration tests (BRE 365) carried out at the proposed depth. An overflow route to the existing drainage will be kept if the tests show poor infiltration.

2.11 Design flood level according to all the sources identified

No river, tidal or reservoir design flood level applies to the site. The governing consideration is local surface water. The design standard is the 1% annual probability rainfall event plus 45% climate change allowance, and the garden room threshold is set above adjacent external ground with drainage (Section 4.1).

2.12 Exception Test

Not required. The site is in Flood Zone 1, and the proposal is minor householder development. The NPPF and PPG confirm that such development is not subject to the Exception Test.

2.13 Summary of flood risks

Fluvial: very low (Flood Zone 1)

Tidal: none

Surface water: low (local runoff to the lowered garden room, managed by drainage)

Sewer: low

Groundwater: low (shallow excavation high on the Chalk slope; waterproofed to BS 8102)

Reservoir, canal and coastal erosion: none

Overall, the site is at low risk of flooding, and the development will not increase flood risk elsewhere.

3 Avoid flood risk

3.1 Evidence of the Sequential Test

Not required. The site is in Flood Zone 1, and the proposal is a householder extension to an existing dwelling (minor development). The NPPF and PPG confirm that the Sequential Test does not apply to minor development.

3.2 Sequential Approach

All built development is in Flood Zone 1. The new habitable rooms (kitchen/diner and loft bedrooms) are at or above the existing ground floor level.

The only accommodation below existing ground is the ancillary garden room. It is non-sleeping, directly accessible from the garden at the same level, and has a direct escape route via the external steps to the house and street.

4 Control flood risk

4.1 Proposed site levels

The existing house ground floor level is unchanged. The rear extension and terrace are set at the existing ground floor level.

Part of the rear garden is dug down and levelled towards the south boundary, forming the garden-room floor and a level lawn (drawing A.301). Final levels and the extent of retaining are to be confirmed at detailed design stage, and can be secured by condition.

The garden room floor will be set at least 150 mm above the adjacent finished external ground, with a slot or channel drain across the opening. External ground will slope away from the building.

4.2 Flood flow route

Overland flow from the north follows Firle Road and the natural fall of the land. The development does not obstruct any flow route.

Within the plot, surface water from the levelled lower garden will be graded away from the garden room towards the south, and picked up by the drainage in Section 5.5. Flows will not be pushed onto neighbouring land at a greater rate than now.

4.3 Existing or proposed flood risk management infrastructure

No formal flood defences exist or are needed. The flood risk management measures are on-site: a soakaway or attenuation system, land drains behind retaining walls, channel drainage at the garden room threshold, and waterproofing to BS 8102.

5 Mitigate flood risk

5.1 Risk to people

Risk to occupants is very low. All sleeping accommodation is at ground floor or above. The garden room is an ancillary, non-sleeping space that opens directly onto the garden, with level access out and external steps up to the house. Floodwater depths and velocities affecting people are not expected at the site.

5.2 Risk to property/building

Garden room and retaining walls: waterproofing to BS 8102 (Grade 2 or 3 environment). Measures are external tanking or waterproof concrete (Type A/B), and a land drain to the rear of the retaining walls. Raised threshold with a channel drain. Water-resistant finishes and services in the garden room (for example tiled or screed floor, sockets set high).

House and extension: floor levels unchanged, with no increase in exposure.

5.3 Risk to essential services

Electrical supplies to the garden room will be on a separate RCD-protected circuit, with sockets and the consumer connection set above floor level. Any pumped drainage will include a high-level alarm. No essential infrastructure is affected.

5.4 Floodplain storage and conveyance compensation

Not applicable. The site is in Flood Zone 1, outside any floodplain, so no floodplain storage or conveyance is lost and no compensation is needed.

5.5 Surface water management

Scaled from drawings A.100 and A.101C, the rear extension (largely infilling the existing rear recess) and the raised terrace over the garden room add roughly 30–35 m² of new impermeable area [confirm at detailed design].

Surface water will be managed using the SuDS hierarchy under Policy 36:

1. Infiltration: roof water from the extension, dormer and terrace will go to a new soakaway in the lower garden. It will be sized to BRE 365 for the 1 in 100 year event plus 45% climate change, located at least 5 m from buildings, and based on on-site infiltration testing. The Chalk is generally free-draining.
2. Rainwater harvesting: water butt(s) on downpipes for garden use.
3. Permeable surfaces: new hard landscaping to the levelled garden will be permeable paving or gravel.

4. Threshold and retaining drainage: a channel drain at the garden room opening and land drains behind the retaining walls, both discharging to the soakaway.

If infiltration tests are unfavourable, attenuation with a restricted discharge to the existing surface water connection will be used, so there is no increase in off-site runoff. A drainage condition is acceptable.

6. Manage flood risk

6.1 Safe access and escape

Firle Road and the surrounding streets are in Flood Zone 1 and not at risk of flooding. Safe, dry access and escape are available at all times. The garden room has direct access to the garden, and from there by external steps to the house and street.

6.2 Evacuation plan

A formal evacuation plan is not required because the site is at low risk. Occupants can sign up for Met Office severe weather warnings. EA Flood Warnings do not cover this location.

6.3 Residual flood risk

Residual risk is limited to localised surface water or seepage at the garden room during extreme rainfall, or if drains block. This is managed by the raised threshold, waterproofing to BS 8102 and routine maintenance of gullies, channel drains and the soakaway by the homeowner.

6.4 Betterment provision

Roof water from the new extension, and where practical from the existing rear roof, will discharge to a soakaway with water butts rather than to the public sewer. This reduces flows to the sewer network. Permeable surfacing in the garden adds a modest betterment over the existing situation.

7. Summary of measures

1. The site is in Flood Zone 1 at about 50 m AOD. River, tidal, reservoir and coastal erosion risks are negligible.
2. Householder (minor) development: Sequential and Exception Tests not required.
3. Existing floor levels retained. No sleeping accommodation below ground.
4. Garden room: waterproofed to BS 8102, threshold at least 150 mm above external ground with a channel drain, land drains behind the retaining walls, services set high.
5. Surface water: soakaway sized to BRE 365 for the 1% annual probability event + 45% climate change, water butts and permeable surfacing. Attenuated discharge if infiltration is poor.
6. Non-return valve or pumped connection if the garden room has foul drainage.
7. Safe dry access and escape via Firle Road at all times.
8. Final levels, retaining walls and drainage details can be secured by planning condition.