FLOOD RISK ASSESSMENT
SPRING LANE, CROFT

INTRODUCTION

Site-specific flood risk assessments need to be proportionate to the anticipated degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the Environment Agency's Flood Map and surface water flood risk information on Check the long term flood risk for an area in England.

National Planning Policy Framework

NPPF and its associated Technical Guidance provides guidance on how to evaluate sites with respect to flood risk. A summary of the requirements of the NPPF is provided below.

SOURCES OF FLOODING

The NPPF requires an assessment to flood risk to consider all forms of flooding and lists six forms of flooding that should be considered as part of a flood risk assessment. These forms of flooding are listed below, along with an explanation of each form of flooding.

Flooding from Rivers (Fluvial Flooding)

Watercourses flood when the amount of water in them exceeds the flow capacity of the river channel. Flooding can either develop gradually or rapidly, depending on the characteristics of the catchment. Land use, topography and the development can have a strong influence on flooding from rivers.

Flooding from the Sea (Tidal Flooding)

Flooding to low-lying land from the sea and tidal estuaries is caused by storm surges and high tides. Where tidal defences exist, they can be overtopped or breached during a severe storm, which may be more likely with climate change.

Flooding from Land (Pluvial Flooding)

Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding.

In developed areas this flood water can be polluted with domestic sewage where foul sewers surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro-level can influence or exacerbate this. Overland flow paths should be taken into account in spatial planning for urban developments. Flooding can be exacerbated if development increases the percentage of impervious area.

Flooding from Groundwater

Groundwater flooding occurs when groundwater levels rise above ground levels (i.e. groundwater issues). Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). Chalk is the most extensive source of groundwater flooding.

Flooding from Sewers

In urban areas, rainwater is frequently drained into sewers. Flooding can occur when sewers are overwhelmed by heavy rainfall, and become blocked. Sewer flooding continues until the water drains away.

Flooding from Other Artificial Sources (i.e. reservoirs, canals, lakes and ponds)

Non-natural or artificial sources of flooding can include reservoirs, canals and lakes. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and /or as a result of dam or bank failure.

FLOODING FROM RIVERS AND THE SEA

For river and sea flooding, the NPPF uses four Flood Zones to characterise flood risk. These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences.

Flood Zone Definition

1 Low probability (less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).

2 Medium probability (between 1 in 100 and 1 in 1,000 annual probability of river flooding (1%-0.1%) or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5%-0.1%) in any year).

3a High probability (1 in 100 or greater annual probability of river flooding (>1%) in any year or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any given year).

3b This zone comprises land where water has to flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 20 (5%), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

Vulnerability

Caravans, mobile homes and park homes intended for permanent residential use are classed as "highly vulnerable" to the effects of flooding.

Sequential Test

The Sequential Approach is a risk-based approach to development. In a development site located in several Flood Zones or with other flood risk, the sequential approach directs the most vulnerable types of development towards areas of least risk within the site.

PROPOSED DEVELOPMENT

The site comprises 0.45 hectare of land located along the eastern side of Spring Lane, Croft and north of the M62 motorway. The proposal is to develop the site as a residential caravan site for 5 gypsy families with a total of 10 caravans, including no more than 5 static caravans/mobile homes, laying of additional hardstanding and erection of communal dayroom building. The latter building would replace an existing storage building, in the same place but within a smaller footprint.

Flood Zone

The site is located within Flood Zones 1 and 3 on the Environment Agency's Flood Map for Planning. The vast majority of the site is located within Flood Zone 1 where there is less than a 0.01% annual probability of flooding. Only the southern tip of the land is shown is lying within Flood Zone 3 on the Environment Agencies Flood Map for Planning where this a greater than 0.01 % annual probability of flooding.

Vulnerability

All of the proposed caravans, proposed dayroom building and access driveway have been located within Flood Zone 1 as shown on the Environment Agency's Flood Map for Planning. Caravans used for permanent residential use are categorised as being "highly vulnerable" in Table 2 of the Planning Practice Guidance (PPG) concerned with flood risk and coastal change. Highly vulnerable development is appropriate within Flood Zone 1, according to Table 3 of the PPG.

Tables 2 and 3 of the PPG make no mention of access roads or vehicle parking but, as with ancillary buildings, may be regarded as "minor developments" which are acceptable, even within Flood Zones 2 and 3. Amenity open space is categorised as "water-compatible development" and, can, therefore, be accommodated within Flood Zone 3.

Sequential Test

All built development would be located within Flood Zone 1 (low risk of fluvial flooding) and outside of Flood Zones 2 & 3, in accordance with the "sequential test. The finished floor levels of all buildings and caravans will be set at 600mm above the 1 in 100 year plus climate change flood level. Therefore, safe refuge will be provided and, no internal flooding is anticipated.

OTHER SOURCES OF FLOODING

According to the Environment Agency's records, the site is at low risk from flooding by groundwater, reservoirs or, drains or sewers.

SURFACE WATER FLOODING

The site is primarily located outside of an area shown as being at risk from surface water flooding. The southern fringe of the site is shown as being at "Low Risk" from surface water flooding, with between a 0.1% and 1% chance of flooding in any one year. Even in a 1% event, the depth of flooding would be less than 30cms. Neither the residential accommodation or access driveway would be affected by surface-water flooding.

MITIGATION

The proposed scheme would retain soft landscaping along the eastern edge of the site, and, only a small area of additional landscaping would be required, located outside any area shown as being at risk from flooding, from any source.

The use of permeable paving for the caravan pitches, vehicular/pedestrian circulation areas and, vehicle parking areas, would intercept rain where it falls, with water passing through the surface to voided stone. Filter drains (linear trenches filled with stone) would be provided along the southern and northern boundaries of the proposed caravan site, in order to intercept any excess surface water run-off, provide on-site storage of rainwater, and assist the infiltration of surface water into the ground.

The only increase in impervious cover will be the 5 mobile homes and 5 touring caravans, amounting to a total roof area of about 300 sq. metres. Construction of the communal dayroom would result in a reduction in built development amounting to about 132 square metres of roof area. The net increase in impervious cover would, therefore, amount to about 168 sq. metres of roof area.

The discharge of roof drainage from the proposed mobile homes, tourers and dayroom to the filter drains along the northern and southern boundaries would intercept any excess surface water runoff.

A 30-metre-long trench, one metre wide and one metre deep, with a gravel porosity of 30% would provide an available storage volume of 9.0m^3. A 1-in-100 year storm would be expected to result in 66mm of rain over a 6 hour period. For an impermeable surface, 42.2% of this would be expected to run off onto adjacent land and, for an impermeable surface covering 168m^2, generate a volume of about 4.68^3 of run-off. The proposed filter drains would have more than adequate capacity to cope with surface water run-off even during an extreme rainfall event and, would not result in flooding off-site.

CONCLUSIONS AND RECOMMENDATIONS

Given the potential limited flood depths on site, the elevated finished floor level provided by caravan accommodation (typically 300 – 600 mm above ground level) and the availability of a safe access and egress route, it is

considered that the application site is not at significant risk from flooding and, the vulnerability of the property and potential occupants is low.

It is recommended that the proposed dayroom incorporate flood resilience measures, with the raising of the floor level by 300mm above ground level and, raising the level of electrical fitments to a minimum of 600mm above the finished floor level.