



Easy Flood Risk Assessment
Consulting Engineers

Proposed Temporary Buildings

**Scania (Great Britain) Ltd, Warden Tree Lane,
Spalding PE11 3UG**

Flood Risk Assessment

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Executive Summary

Easy Flood Risk Consultants has been commissioned to prepare this Flood Risk Assessment (FRA) in support of a proposal consisting of erection of temporary buildings at Scania (Great Britain) Ltd, Warden Tree Lane, Spalding PE11 3UG.

The main source of information to undertake flood risk assessment is the flood maps and data of the Environment Agency and the past flood studies of the Local Authority.

The proposed development is categorised as 'less vulnerable'.

The site is located in close proximity to the River Welland with the risk of fluvial flooding. There were no records of flooding around the site.

The Environment Agency's flood map indicated that the site lies within Flood Zone 3 (high probability flooding) and the risk of flooding is 'medium'.

The Environment Agency's modelling data indicated that the site will not be flooded by the 1 in 100 year and 1 in 1000 year events. However, the site is subject to a shallow flooding (maximum flood depth 0.33m) by the 1 in 100 year plus climate change event. As the flood depth is relatively shallow and the site topography is flat where we can expect a relatively low flow velocity, it is reasonable to conclude that the hazard to the people and the property will not be significant.

There is a low risk of flooding from other sources including surface water, underground water, sewer and reservoir.

As part of the flood risk management, the residents should be made aware of potential flood risk and flood warning services. It is recommended that the residents should utilise the Environment Agency's Flood Warnings Direct and the Flood Warning Service available in the area.

The surface runoff from the site will be improved by implementing appropriate Sustainable Drainage Systems (SuDS). It is proposed to implement rainwater harvesting system using water butts from the buildings.

This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not impose any flood risk elsewhere.

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Abbreviations

Abbreviation	Definition
AOD	Above Ordnance Datum
DEFRA	Department for Environment, Food, and Rural Affairs
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
NPPF	National Planning Policy Framework
SFRA	Strategic Flood Risk Assessment
PFRA	Preliminary Flood Risk Assessment
SuDS	Sustainable Drainage Systems

1.0 Introduction

1.1. Terms of Reference

Easy Flood Risk Consultants has been commissioned to prepare this Flood Risk Assessment (FRA) in support of a proposal consisting of erection of temporary buildings at Scania (Great Britain) Ltd, Warden Tree Lane, Spalding PE11 3UG.

The National Planning Policy Framework requires a Flood Risk Assessment to be carried out to ensure flood risk to the proposed development is considered as well as the impact the development will have elsewhere on people and property.

This FRA has been prepared in accordance with the Environment Agency's Flood Risk Assessment (FRA) Guidance Note 3 and best practices in flood risk management.

1.2. FRA Requirements

It is a requirement for development applications to consider the potential risk of flooding to a proposed development over its expected lifetime and any possible impacts on flood risk elsewhere, in terms of its effects on flood flows and runoff.

Where appropriate, the following aspects of flood risk should be addressed in all planning applications in flood risk areas:

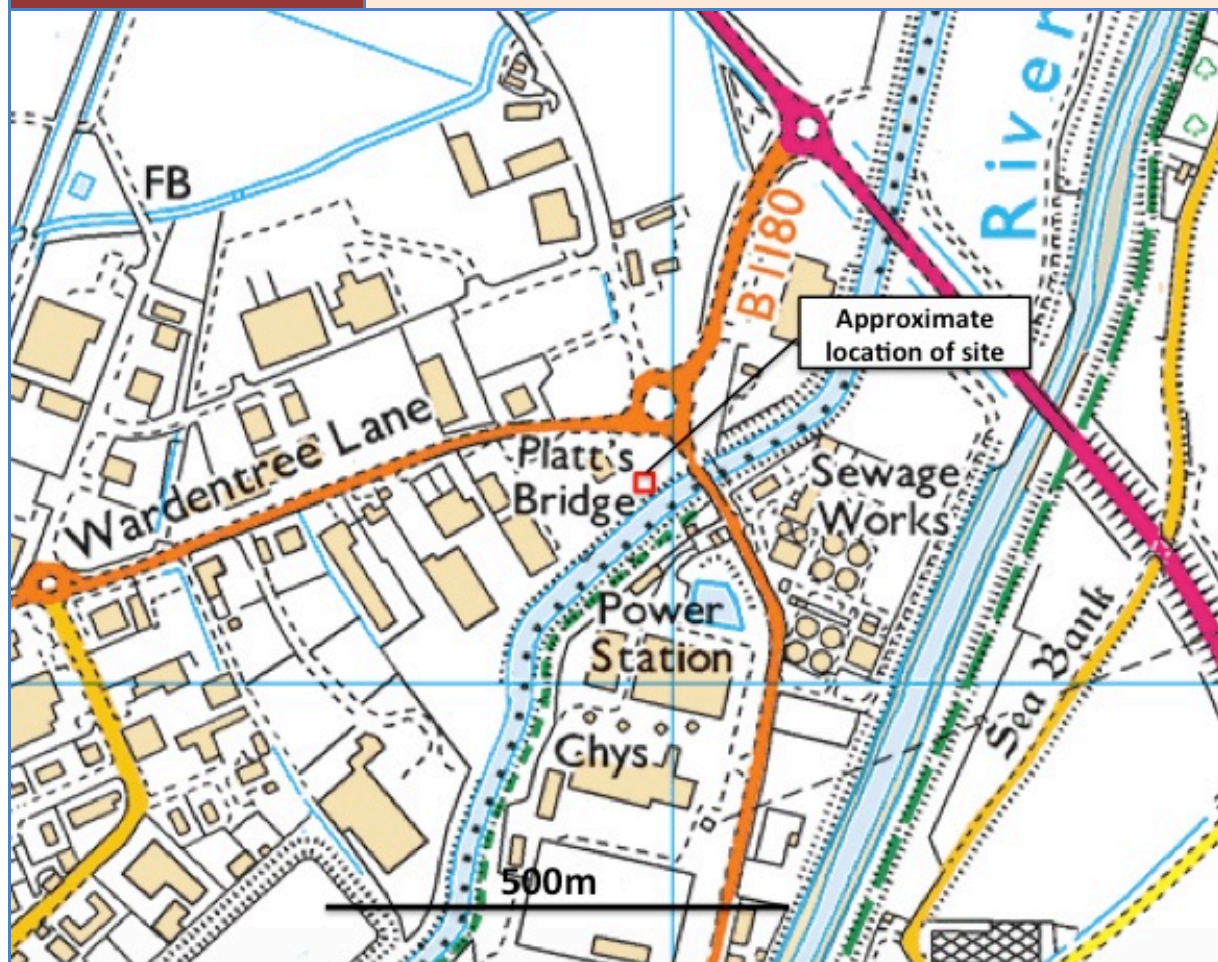
- The area liable to flooding.
- The probability of flooding occurring now and over time.
- The extent and standard of existing flood defences and their effectiveness over time.
- The likely depth of flooding.
- The rates of flow likely to be involved.
- The likelihood of impacts to other areas, properties and habitats.
- The effects of climate change.
- The nature and currently expected lifetime of the development proposed and the extent to which it is designed to deal with flood risk.

This FRA follows government guidance on development and flood risk (National Planning Policy Framework).

1.3. Site Details

Figure 1 - Summary of site details

Site/Property	Scania (Great Britain) Ltd, Warden Tree Lane, Spalding PE11 3UG
Purpose of development	Erection of temporary buildings
Vulnerability of use	Less vulnerable
Nearest water body	River Welland
OS NGR	525989,325206
Country	England (NPPF applies)
Local planning authority	South Holland District Council
Other authorities	Environment Agency Lincolnshire and Northamptonshire



1.4. Site Description

The development site is located at Scania (Great Britain) Ltd, Warden Tree Lane, Spalding PE11 3UG (Figure 2). The access to the site is via Warden Tree Lane. The topography of the site is relatively flat. The surrounding area consists of predominantly commercial.

Figure 2 – Site Location (Google Map)



1.5. Development Proposals

The proposal involves erection of temporary buildings.

2.0 Development and Flood Risk Policy

2.1. Planning Context

2.1.1. Applicable Planning Policy

The National Planning Policy Framework (NPPF) was issued by the Department for Communities and Local Government in March 2012. The NPPF deals specifically with development planning and flood risk using a sequential characterisation of risk based on planning zones and the Environment Agency Flood Map. The main study requirement is to identify the Flood Zones and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

2.1.2. Flood Zones

The Environment Agency has developed a Flood Map that shows the risk of flooding in England and Wales for different return period events. It should be noted that the Environment Agency's Flood Map is based on broad scale hydraulic modelling and is an indication of the potential flood risk to a site and the actual risk may differ. The Flood Zone Maps (without climate change) provide the information required by NPPF for planning purposes, as described in Section 3.2. The Flood Zones do not take account of the effect of flood defences.

2.1.3. Sequential and Exception Tests

The Sequential and Exception Tests should be applied when choosing the location of new development and the layout of the development site. The Sequential Test aims to promote development in areas with low flood risk. The Exception Test is used where no suitable development areas can be found in low risk areas, the risk of flooding is clearly outweighed by other sustainability factors, and the development will be safe for its lifetime, taking climate change into account.

As the proposal consists of erection of temporary buildings, the sequential test will not be required.

2.1.4. Vulnerability and Flood Risk Assessment

The proposed development is categorised as 'less vulnerable' (Table 2). The site is located in Flood Zone 3. The proposed development is therefore appropriate at this location (Table 3). The proposal should ensure that all types of flood risk have been considered as part of the Flood Risk Assessment: *'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'*.

This FRA aims to demonstrate that the proposal will remain safe for its lifetime and not increase flood risk elsewhere.

2.2. NPPF Flood Zones

Table 1 shows how the Flood Zones relate to a sequential planning process.

Table 1 - NPPF Flood Zones and Requirements

Zone 1: Low Probability	
Land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).	Appropriate uses All uses of land are appropriate in this zone. FRA requirements For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. Policy aims Developers and local authorities should seek opportunities to reduce the overall level of flood risk through the layout and form of the development, and the appropriate application of sustainable drainage techniques.
Zone 2: Medium Probability	
Land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.	Appropriate uses The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table 2 are appropriate in this zone. Highly vulnerable uses in Table 2 are only appropriate in this zone if the Exception Test is passed. FRA requirements All proposals in this zone should be accompanied by a FRA. Policy aims Developers and local authorities should seek opportunities to reduce the overall level of flood risk through the layout and form of the development, and the appropriate application of sustainable drainage techniques.
Zone 3a: High Probability	
Land 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	Appropriate uses The water-compatible and less vulnerable uses of land in Table 2 are appropriate in this zone. The highly vulnerable uses (Table 2) should not be permitted in this zone.

year.	The more vulnerable and essential infrastructure uses in Table 2 should only be permitted in this zone if the Exception Test is passed. FRA requirements All proposals in this zone should be accompanied by a FRA. Policy aims Developers and local authorities should seek opportunities to: • reduce the overall level of flood risk through the layout and form of the development and the appropriate application of sustainable drainage techniques; • relocate existing development to land with a lower probability of flooding; • create space for flooding to occur by allocating and safeguarding open space for flood storage.
Zone 3b: Functional Floodplain	
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 greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the local planning authority and the Environment Agency, including water conveyance routes).	Appropriate uses Only the water-compatible uses and the essential infrastructure listed in Table 2 that has to be there should be permitted. It should be designed and constructed to: • remain operational and safe for users in times of flood; • result in no net loss of floodplain storage; • not impede water flows; • not increase flood risk elsewhere. FRA requirements All proposals in this zone should be accompanied by a FRA. Policy aims In this zone, developers and local authorities should seek opportunities to: • reduce the overall level of flood risk through the layout and form of the development and the appropriate application of sustainable drainage techniques; • relocate existing development to land with a lower probability of flooding.

Source: NPPF Technical Guidance Table 1

Table 2 - Flood Risk Vulnerability Classification

Essential Infrastructure	Essential transport infrastructure and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations and emergency dispersal points. Basement dwellings, caravans, mobile homes and park homes intended for permanent residential use. Installations requiring hazardous substances consent.
More Vulnerable	Hospitals, residential institutions such as residential care homes, children's homes, Social services homes, prisons and hostels. Buildings used for: dwelling houses, student halls of residence, drinking establishments, nightclubs, hotels and sites used for holiday or short-let caravans and camping. Non-residential uses for health services, nurseries and education. Landfill and waste management facilities for hazardous waste.
Less Vulnerable	Buildings used for shops, financial, professional and other services, restaurants and cafes, offices, industry, storage and distribution, and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste facilities), minerals working and processing (except for sand and gravel). Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place).
Water-compatible Development	Flood control infrastructure, water transmission infrastructure and pumping stations. Sewage transmission infrastructure and pumping stations. Sand and gravel workings. Docks, marinas and wharves, navigation facilities. MOD defence installations. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location Water-based recreation (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, nature conservation and biodiversity, outdoor sports and recreation. Essential sleeping or residential accommodation for staff required by uses in this category, subject to a warning and evacuation plan.

Source: NPPF Technical Guidance Table 2

Table 3 - Flood Risk Vulnerability and Flood Zone 'compatibility'

Vulnerability Classification (Table 3)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (Table 2)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test	✓	✓
	Zone 3a	Exception Test	✓	✗	Exception Test	✓
	Zone 3b	Exception Test	✓	✗	✗	✗

Source: NPPF Technical Guidance Table 3

Key:

- ✓ Development is appropriate
- ✗ Development should not be permitted

3.0 Assessment of Flood Risk

3.1. Flood History

The South Holland District Council's Strategic Flood Risk Assessment (SFRA, January 2010) has provided brief overview of the historical flooding events in the area. There were no records of flooding around the site. In addition, information on the historical flooding events was obtained from the Environment Agency (Appendix A). The Environment Agency also did not have any records of flooding at the site.

3.2. Fluvial Flood Risk

The site is located in close proximity to the River Welland with the risk of fluvial flooding. Figure 3 and Figure 4 show that the proposed development site is located within Flood Zone 3 (high probability flooding) and the risk of flooding is 'medium' as described in Table 1 of the Planning Practice Guidance to the National Planning Policy Framework. The Flood Zone 3 is defined as the land having a 1 in 100 or greater annual probability of river flooding (<1%) in any year. The flood maps also show that the site is located in an area not benefiting from the flood defences. The flood risk map in Figure 4 shows that the risk of flooding to the site is 'medium'.

Figure 3 - Environment Agency's Flood Map

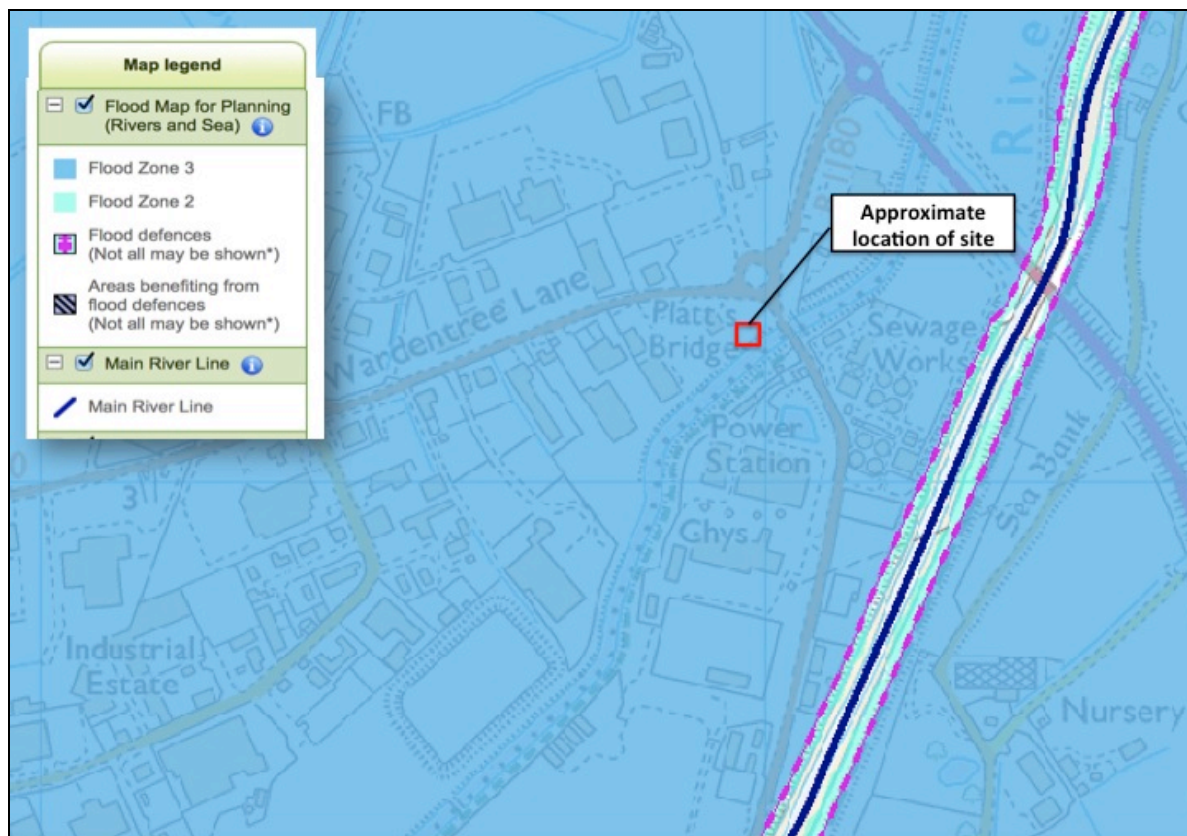
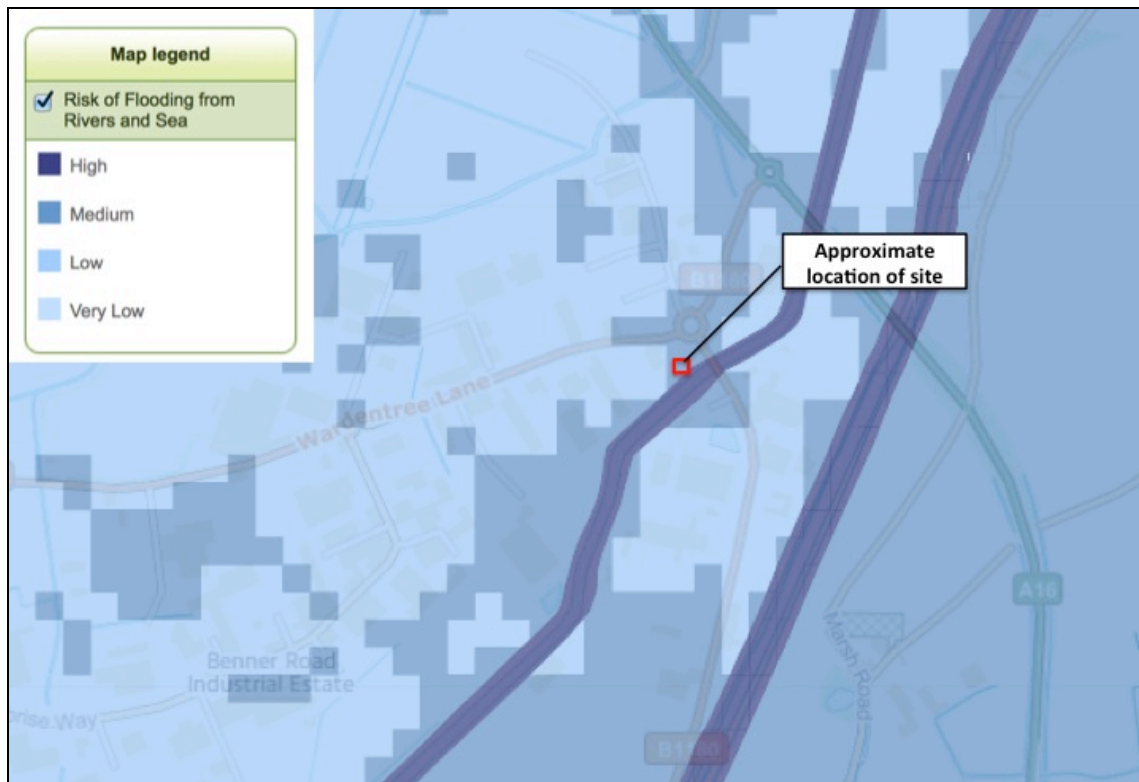


Figure 4. Environment Agency's Flood Risk Map



3.3. Modelled Water Levels

Information on modelled water levels was obtained from the Environment Agency (Appendix A). The site-specific modelled flood levels at the proposed development site have been taken from the fluvial model of the River Welland. The location map showing the model nodes near the site are shown in Figure 5 below. The map shows that the nearest model node from the site is 'WELLAND 9691'. The modelled water levels near the site are summarised in Table 4 below. The data shows that the 1 in 100 year and the 1 in 100 year plus climate change water levels at this node are 4.23mAOD and 5.25mAOD respectively.