# Development at Land off Normanby Road, Scunthorpe, DN15 8QZ

*Flood Risk Assessment, Foul and Surface Water Drainage Strategy*

February 2025

Project No. 0030

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Contents



**Revision History**

| Rev | Date | Purpose/Status | Comments |
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| - | Jan 2025 | Information | First Issue |
| A | Feb 2025 | Information | Updated to suit latest site plan |
| | | | |
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## 1. INTRODUCTION

1.1. AFA Consulting Engineers Ltd have been commissioned by Life Property Construction to prepare a FRA, Foul and Surface Water Drainage strategy report to accompany the planning application for a Health care facility at the Land off Normanby Road, Scunthorpe, DN15 8QZ.

1.2. This report will provide detailed layout and construction details for disposal of foul and surface water from the development for discharge of related planning conditions.

1.3. This report has been prepared for the use of Life Property Construction. No other third party may rely upon or reproduce the contents of this report without the written approval of AFA Consulting Engineers Ltd. If any unauthorised third party comes into the possession of this report, they rely on it entirely at their own risk and AFA do not owe them any Duty of Care or Skill.

## 2. EXISTING SITE

2.1. The 0.72-acre site sits off Normanby Road, Scunthorpe, DN15 8QZ. A copy of the existing and proposed site plan is contained within Appendix A.

2.2. The site is located approximately 1.3km north from the City Centre Boundary and is not within any conservation area. The site is on greenfield land and is surrounded by industrial/commercial development to the south and east, greenfield land to the north and B1430 Normanby Road to the west of the site.

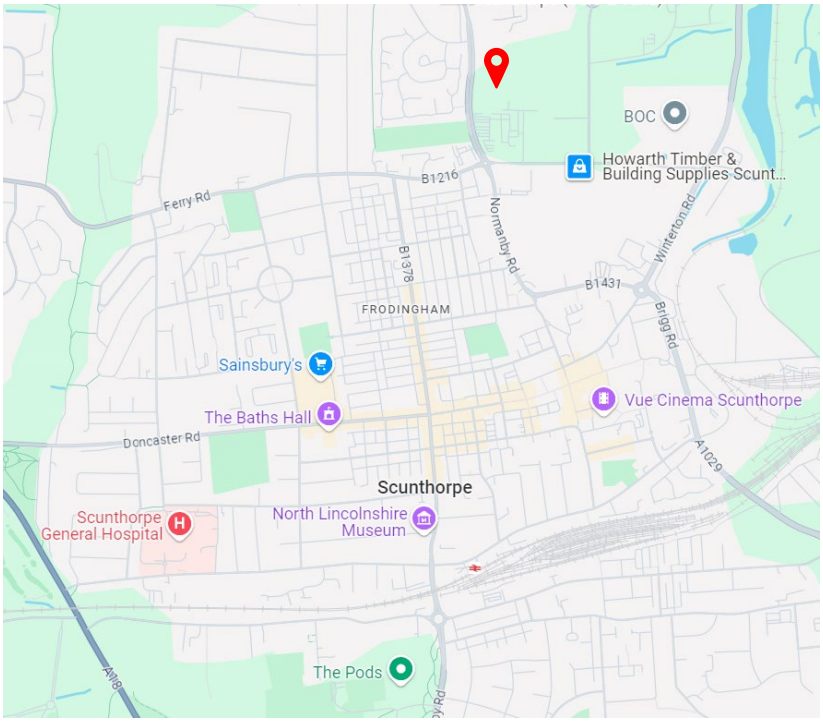


Figure 1 – Site Location Plan


Figure 2 – Proposed Site from birds eye view

2.3. The topography of the site is relatively flat. However, towards the western boundary of the site there is a small incline presumably associated with Normanby Road and a steep decline along the northern boundary.

2.4. No faults or superficial deposits are indicated to be present on the site.

2.5. From the BGS Geology of Britain Viewer, it is understood that the site is underlain by superficial brown sand deposits to the west with the superficial deposits absent in the east. The bedrock is indicated to comprise of Frodingham Ironstone Member. The BGS Viewer also indicates that the northern boundary of the site to comprise of artificial deposits of made ground.

2.6. Ground investigation was conducted by Evolve Geo-Environmental Limited on 10th October 2024. A summary of the observed ground conditions concluded typical made ground comprising of soft clays with mixed lithologies of gravel at depths from 1.5-3.0m. Brown sand silty fine to coarse sand at depths of 3.0m and firm becoming very stiff Frodingham Ironstone Member at 3.36-4.30m. However, extremely weak dark grey silty Mudstone was observed towards the south west of the site.

2.7. The site does not lie within a Groundwater Source Protection Zone and there are no surface or groundwater extractions within 500m.

## 3. FLOOD RISK ASSESSMENT

### 3.1. Development proposals and flood risk vulnerability

- With reference to Table 2 of Planning Practice Guidance to the National Planning Policy Framework, the proposed care home development would be classified as More Vulnerable.

| Flood Risk Vulnerability Classification | |
|---|---|
| **Vulnerability** | **Development types** |
| 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, night clubs, and hotels. |
| | **Non-residential uses for health services, nurseries and educational establishments.** |
| | Landfill and sites used for waste management facilities for hazardous waste. |
| | Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan. |

Table 1 - Source: Planning Practice Guidance – 2014

### 3.2. Flood risk - Fluvial / Tidal flooding

- An extract of the Environment Agency flood map for planning (Rivers and Sea) is provided below in Figure 3. The flood map was extracted from the Environment Agency's web site on the 23th October 2024. The map indicates that the development site is located within Flood Zone 1 (Low Probability). Full map and details are contained in Appendix J.

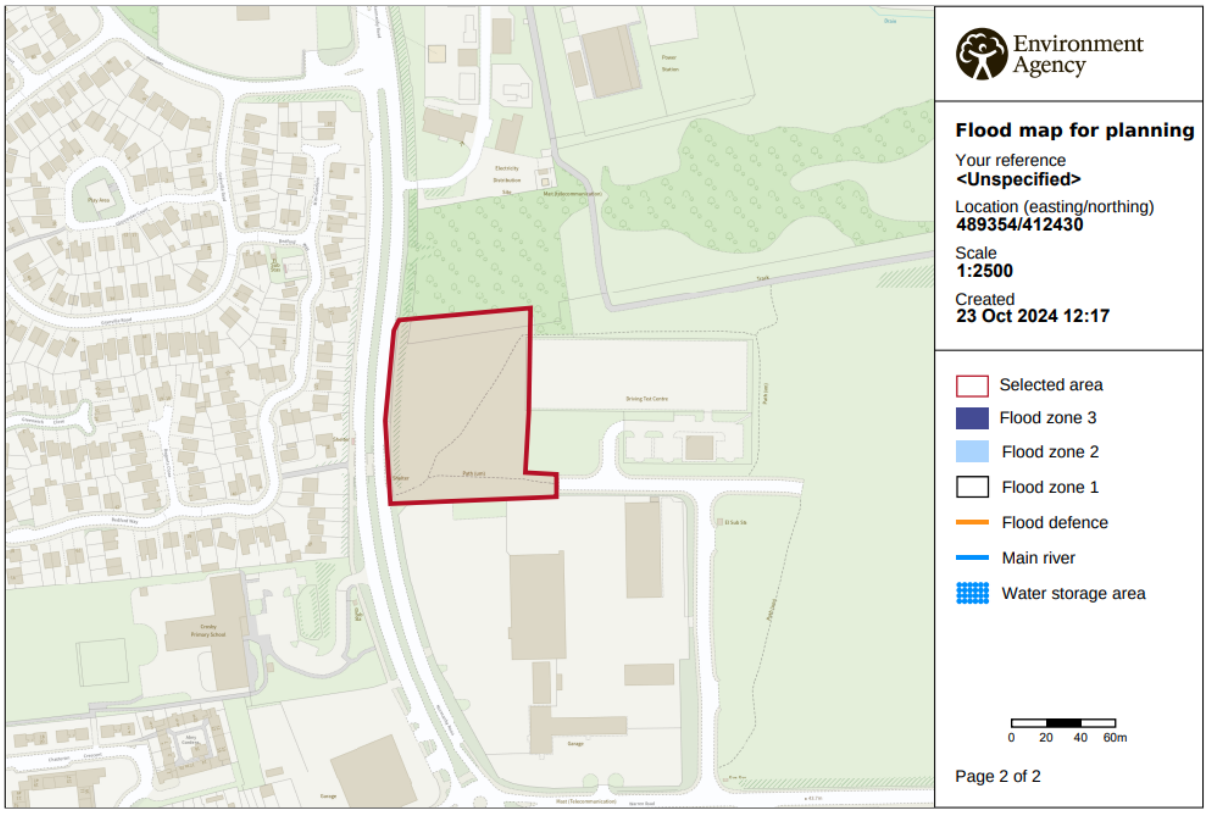



Figure 3 – Flood Map for Planning (Rivers and Sea)

**Source**: Gov.uk website – 27th June 2024

- Table 2 is a copy of Table 1 from Planning Practice Guidance for '*Flood Risk and Coastal Change'* to the National Planning Policy Framework which defines Flood Zones.
- The proposed development is located within Flood Zone 1, is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year.

| **Flood Zone** | |
|---|---|
| **Flood Zones** | **Definition** |
| **Zone 1:**<br>**Low Probability** | **Land having a less than 1 in 1,000 annual probability of river or sea flooding.** |
| Zone 2:<br>Medium Probability | Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or<br>Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. |
| Zone 3a<br>High Probability | Land having a 1 in 100 or greater annual probability of river flooding; or<br>Land having a 1 in 200 or greater annual probability of sea flooding. |

| | |
|---|---|
| Zone 3b<br>The Functional<br>Flood plain | This zone comprises land where water has to flow or be stored in times of flood.<br>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. |

Table 2 - Source: Planning Practice Guidance – 2014

### 3.3. History of Flooding

- Flooding data is maintained by the Environment Agency. The Risk of Flooding from Rivers and Sea (RoFRaS) database has no records within 50 metres of the site.
- In the period since records began in 1946, there are no records of historical floods within 250 metres of the site boundary.
- There are no flood defences, no areas benefitting from flood defences and no flood storage areas present within 250 metres of the site boundary.

### 3.4. Surface Water Flooding

- From information provided on the GOV.uk website, see Figure 4, the site is at low risk of being affected by Surface Water flooding. We are not aware of any flooding on the site caused by surface water. We would therefore consider the probability of flooding on the site from surface water as low.

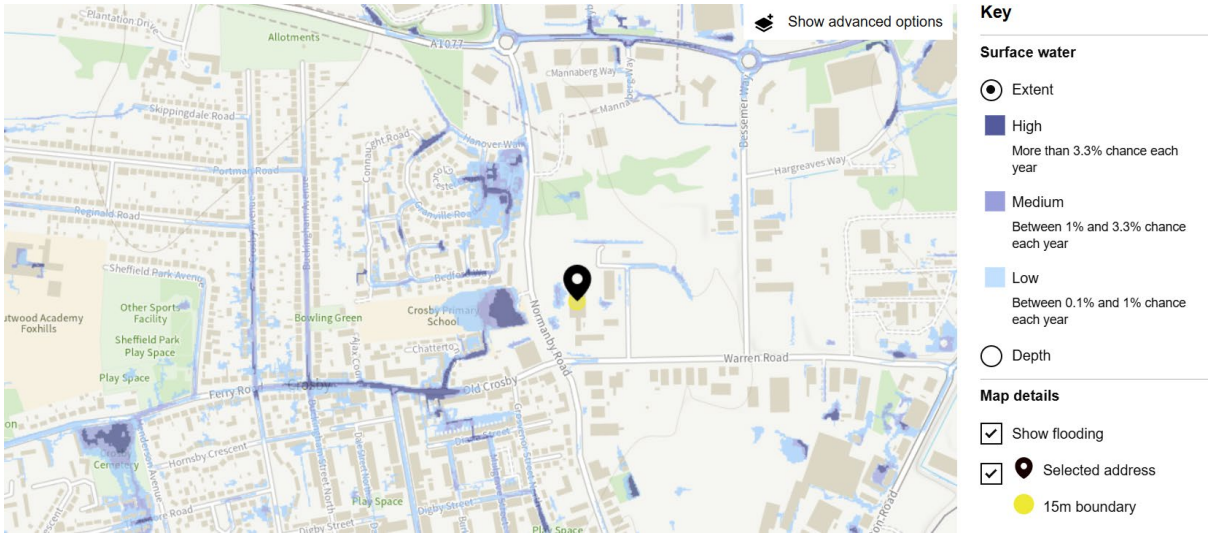


Figure 4 – Flood Risk Map for Flooding from Surface water
**Source**: GOV.uk website –1st November 2024

- The proposed development is likely to result in an increase in the impervious area which will potentially increase the volume of surface water run-off compared with existing conditions if appropriate measures are not implemented to restrict discharge rates.

3.5. **Groundwater flooding**

- Groundwater flooding is caused when the water table rises in areas where this is usually at shallow depth. Ambiental Risk Analytics indicate that there is a negligible risk of groundwater flooding on the site and a negligible risk of groundwater flooding within 50 metres of the site boundary

3.6. **Sewer flooding**

- There is no record of sewer flooding in proximity to the site.

3.7. **Reservoir or Man-made Sources of flooding**

- The site is not in an area at risk from a major failure of a reservoir and there are no other known artificial sources of flood risk in the area.

3.8. **Standard Mitigation**

- Based upon the assessment above there are no site specific flood risk mitigation measures required for the development. However the standard good practice measures below are recommended:
- Finished floor levels to be set minimum 150mm above external levels to mitigate any risk from blockage and exceedance events
- The proposed development will be designed to accommodate a 1 in 100 year rainfall event over a range of storm duration with a 40% allowance for climate change.

## 4. SURFACE WATER DRAINAGE STRATEGY

4.1. The proposed development is for the construction of a healthcare facility with associated amenity facilities, car parking and external landscaping. Refer to Appendix A for proposed site plan.

4.2. SUDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, and hence reduce the risk of flooding. In addition to reducing flood risk, these features can improve water quality and provide biodiversity and amenity benefits.

4.3. The SUDS management train incorporates a hierarchy of techniques and considers all three SUDS criteria of flood reduction, pollution reduction, and landscape and wildlife benefit. In decreasing order of preference, the preferred means of disposal of surface water runoff is:

- Discharge to ground / infiltration
- Discharge to a surface water body.
- Discharge to a surface water sewer.
- Discharge to a combined sewer.

4.4. The philosophy of SUDS is to replicate as closely as possible the natural drainage from a site predevelopment and to treat runoff to remove pollutants, resulting in a reduced impact on the receiving watercourses. The benefits of this approach are as follows:

- Reducing runoff rates, thus reducing the flood risk downstream.
- Reducing pollutant concentrations, thus protecting the quality of the receiving water body.
- Groundwater recharge.
- Contributing to the enhanced amenity and aesthetic value of development areas.
- Providing habitats for wildlife in developed areas, and opportunity for biodiversity enhancement.

4.5. The existing site is a greenfield area:

| | |
|---|---|
| Greenfield | 7145 $m^2$ |
| **Total Impermeable Area** | **0 $m^2$** |

4.6. The proposed development comprises impermeable areas including:

| | |
|---|---|
| Care Home Building | 1287 $m^2$ |
| Care Home Access Road, Car Parking | 1718 $m^2$ |
| Hardstanding | 93 $m^2$ |
| **Total Impermeable Area** | **3098 $m^2$** |

4.5. Infiltration testing has been undertaken as detailed within the site investigation report in Appendix G. The testing verified that infiltration would not be feasible on the site.

4.6. There are no watercourses in proximity to the site. Following the hierarchy or surface water discharge it is therefore proposed to discharge surface water into the Severn Trent sewer network in Warren Road. A copy of the Severn Trent records is shown in Appendix C.

4.7. The greenfield runoff rate for the site has been calculated and is shown in Appendix D.

QBar – 1.15l/s
1 in 1 year – 1.0 l/s
1 in 30 years – 2.82 l/s
in 100 years – 4.09 l/s

4.8. It is proposed to limit the discharge form site to the greenfield runoff rate of 1.2l/s via Hydrobrake located at the final manhole.

4.9. A predevelopment enquiry has been lodged with Severn Trent Sewer to seek approval of the proposed discharge rate.

4.10. Type C (Tanked) Permeable tarmac has been designed to the car parking area to drain the access road. The system has been designed to accommodate rainfall events over a range of storm durations up to 1 in 100 years with 40% allowance for climate change.

4.11. Attenuation storage has been designed within the subbase of the permeable paving and within attenuation crates located below the access road. A copy of the surface water drainage calculations are contained within Appendix E.

4.7. To deal with the residual risk of blockage to all onsite drainage features, the care facility operator/owner will ensure maintenance of all drainage systems in line with the requirements in Ciria C753 the SuDS Manual.

4.8. A copy of the detailed Maintenance Management Plan is shown in Appendix H. This will ensure that over the lifetime of the proposed development the drainage system will be properly maintained to ensure proper functionality. A summary schedule of proposed maintenance is shown below.

| Scunthorpe - Maintenance Schedule | | | | | |
|---|---|---|---|---|---|
| Item | Visual Inspection | Cleanse / De-sludge | CCTV Survey | Responsibility | Comments |
| Surface Water Drainage System (pipework, chambers etc.) | 1 years | 10 years | 10 years | Building Owner | Cleansing to be carried as necessary |
| Gullies / Channels / Rainwater Stacks | Monthly | 1 years | N/A | Building Owner | Cleansing to be carried as necessary |
| Catch Pit | Monthly | 1 years | N/A | Building Owner | Maintenance in accordance with manufacturer's instructions |
| Attenuation Crates / inlet and outlet | Monthly | As required | N/A | Building Owner | Clear as required |
| Foul Drainage System (pipework, chambers etc.) | 1 year | 10 years | 10 years | Building Owner | Cleansing to be carried as necessary |
| Hydrobrake | Monthly | 1 years | N/A | Building Owner | Maintenance in accordance with manufacturer's instructions |

4.9. It is recommended that the permeable tarmac, attenuation and hydrobrake are constructed early in the construction project to provide a drainage point for any surface water arising during construction.

## 5. EFFECTS OF DEVELOPMENT ON OTHER SITES

5.1. The system has been designed to ensure that there is no risk of flooding over a range of storm durations for up to 1 in 100 years plus a 40% allowance for climate change. This will ensure that the risk of flooding to adjacent sites will not be increased.

## 6. FOUL DRAINAGE STRATEGY

6.1. A Severn Trent sewer is located within Warren Road as shown in the Severn Trent Sewer records in Appendix C.

6.2. The foul drainage from the development will connect to the Severn Trent Sewer via a gravity connection.

6.3. The proposed foul drainage layout is shown in Appendix F.

## 7. CONCLUSION AND RECOMMENDATIONS

7.1. There is no site specific flood risk required for the site with all potential sources considered low.

7.2. This drainage strategy follows the hierarchy for surface water discharge.

7.3. Infiltration testing has been undertaken as detailed within the site investigation report contained within Appendix G. The testing verified infiltration would not be feasible on the site.

7.4. There are no watercourses in proximity to the site. Following the hierarchy or surface water discharge it is therefore proposed to discharge surface water into the Severn Trent sewer network in Warren Road. A copy of the Severn Trent records is shown in Appendix C.

7.5. It is proposed to limit the discharge via hydrobrake to the greenfield runoff rate of 1.2l/s via a Hydrobrake.

7.6. The attenuation storage has been designed within Type C permeable paving and attenuation crates to accommodate rainfall events up to 1 in 100 years over a range of storm durations with a 40% allowance for climate change. A copy of the supporting calculations is contained in Appendix E.

7.7. A copy of the proposed surface water drainage layout is shown in Appendix F.

7.8. The proposed foul drainage connects into the Seven Trent sewer in Warren Road. The proposed foul drainage layout is shown in Appendix F.

7.9. The proposed foul and surface drainage solution should be approved by the local authority prior to commencing any drainage works on site.