

JOB NUMBER: **MD1899**

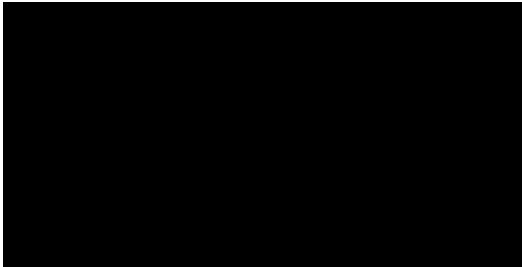
PROJECT: **ST. AIDENS DEVELOPMENT**

REPORT NUMBER: MD1899/rep/001

REPORT TITLE: **FLOOD RISK AND DRAINAGE ASSESSMENT**

Appendix A – Drainage Strategy
Appendix B – Surface Water Calculations
Appendix C – NWL Plan
Appendix D – Level Survey
Appendix E – Flow Control Detail
Appendix F – Maintenance Schedule

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1 INTRODUCTION

M Design were commissioned to undertake a flood risk and drainage assessment in support a proposed development at St. Aiden's Church, South Shields.

The planning process requires an assessment to be made of any flood risks related to proposed developments. In particular this involves two key issues; whether the development itself would be at risk of being flooded or whether the development would increase the risk of flooding elsewhere. This assessment is contained within this report which has been prepared for submission with the planning application.

The study also assesses the potential requirements for any surface water storage within the on-site infrastructure design.

1.2 Scope of Report

The following tasks were undertaken in the preparation of this report:

- A site visit was carried out in order to identify any risks of flooding to the site, identify drainage patterns, receiving watercourses, and to identify any constraints to the drainage system that may restrict the proposed development;
- Liaison with the Environment Agency was undertaken to establish occurrences of flooding in the area;
- An evaluation was made of how the proposed development would affect the existing surface water runoff.

1.3 Consultations and Data Sources

The following tasks were undertaken in the preparation of this report:

- Environment Agency Flood Maps;
- Landmark Information Group Maps;
- Environment Agency;

2 Site Description

2.1 Site Location

The site is located in South Shields at a grid reference of NZ 368 676. As existing the site is a large open grassed area. The site falls approximately 5m from the western to the eastern boundary.



Fig 2.1 Location Plan

2.3 Site Flooding Potential

The development is shown by the Environment Agency flood maps to lie within flood zone 1.



The Environment Agency's definition of this is stated below:

Flood Zone 1

Definition

This zone comprises 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. This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

To establish if the proposed development is appropriate within Flood Zone 1 the vulnerability of the site is to be assessed. Referring to the table below, the proposed building would be classed as “**More Vulnerable**”.

Table D.2: Flood Risk Vulnerability Classification

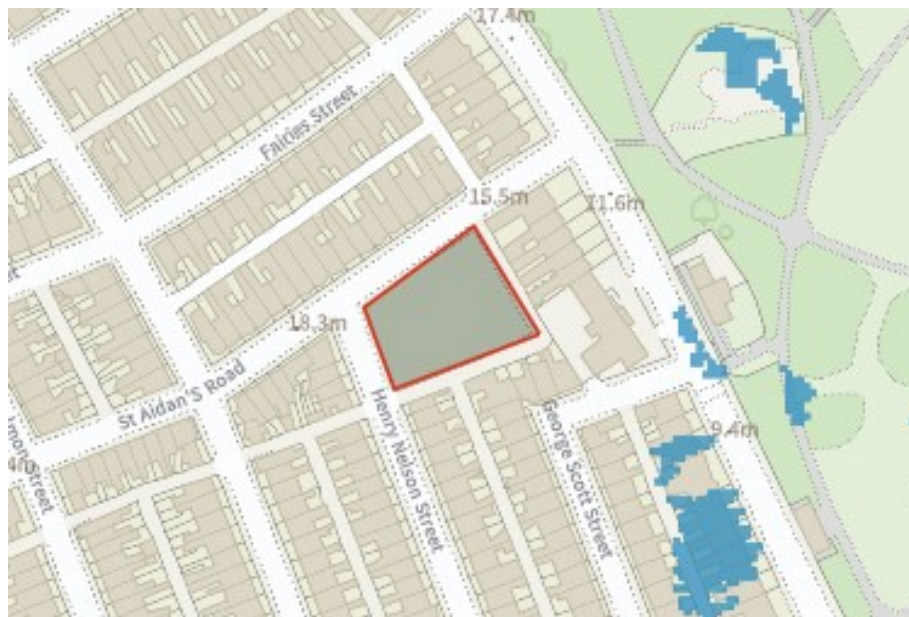
Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	• Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.¹⁹
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; and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste.²⁰ • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable'; 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 working). • Water treatment plants. • Sewage treatment plants (if adequate pollution control measures are in place).

Table D.3: Flood Risk Vulnerability and Flood Zone 'Compatibility'

<u>Flood Risk Vulnerability classification (see Table D2)</u>	<u>Essential Infrastructure</u>	<u>Water compatible</u>	<u>Highly Vulnerable</u>	<u>More Vulnerable</u>	<u>Less Vulnerable</u>
<u>Zone 1</u>	YES	YES	YES	YES	YES
<u>Zone 2</u>	YES	YES	Exception Test Required	YES	YES
<u>Zone 3a</u>	Exception Test Required	YES	NO	Exception Test Required	YES
<u>Zone 3b</u> <u>'Functional Floodplain'</u>	Exception Test Required	YES	NO	NO	NO

As shown previously the site is within **Flood Zone 1** and is classed as **More Vulnerable**. Table D.3 confirms that the development is appropriate, and no exception test is required.

M Design have also considered the risk of flooding for other sources. The below plan shows that there is no surface water flooding on site, even in an extreme 1 in 1000 year storm event.



The table below shows that flooding from reservoirs and groundwater is unlikely

Groundwater	More about your groundwater flood risk
We use groundwater flood alert areas to check the risk of flooding from groundwater.	
This location is outside of a groundwater flood alert area.	
▶ What this means	
What groundwater is	
Groundwater is the water that is usually held in rocks and soil underground.	
Groundwater flooding happens when this water rises and flows above the surface.	
Flooding from rivers is more likely when groundwater levels are high.	

Reservoirs	More about your reservoir flood risk
Flooding from reservoirs is unlikely in this area.	

In summary the site is within flood zone 1 and the plans and information from the Environment Agency show that it is not at risk of surface water flooding, ground water or reservoir flooding. The site is therefore deemed acceptable in terms of flood risk as long as drainage is designed accordingly.

3 Proposed Development

3.1 Proposed Development Description

The proposal for the site to construct residential dwellings with garages and parking areas to the south. There will be a decking area with steps down to the rear gardens.

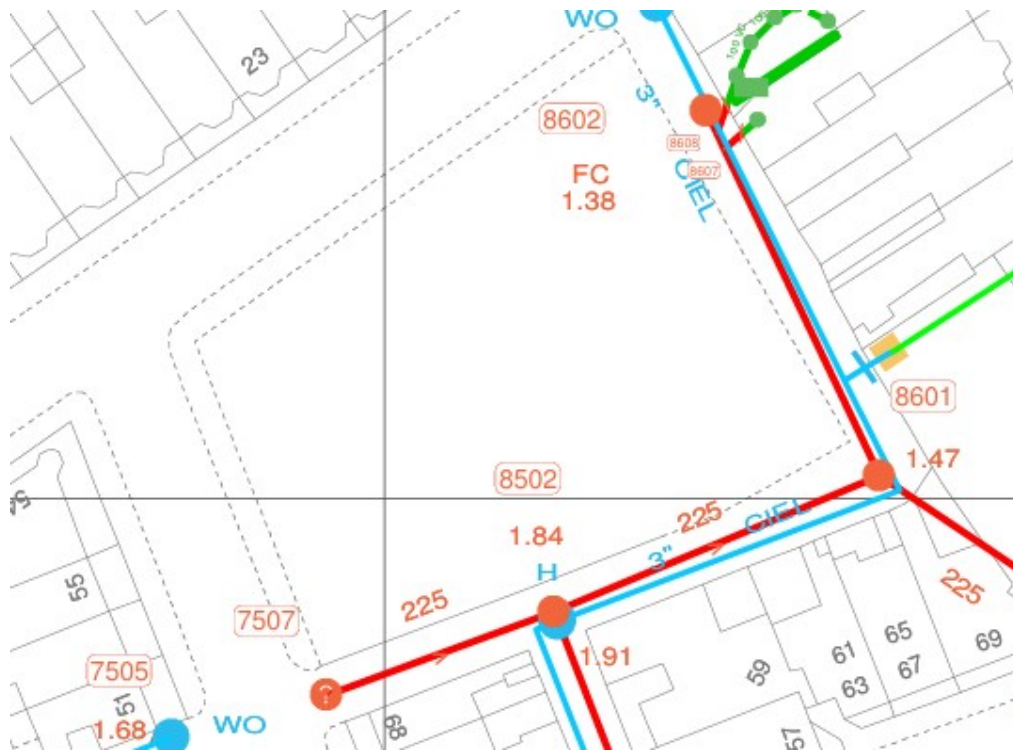


Proposed Plans

To ensure the site does not increase the risk of flooding it is important to ensure the surface water flows are restricted prior to leaving the site. There was a previous design which restricted the flows to 4.7 l/s. To improve on this the new design has been based on 3.0 l/s. This is below the normal 3.5 l/s discharge rate NWL allow into a combined sewer. The QBAR rate for the site is 0.1 l/s which would be impossible to match.

Due to the restriction rate a flow control will be required and surface water attenuation provided on site. Due to the constraints on site there is no room for a pond. Therefore, to provide SUDs and surface water treatment on site the parking areas will be installed as permeable. The surface water storage will be provided by attenuation crates. The system will be designed to accommodate a 1 in 100 year storm event with an allowance for 45% climate change and 10% urban creep.

The most logical location to discharge the foul water drainage would be into to the adopted foul water system to the south east of the site.



4 Conclusions

4.1 Conclusions

This report has shown that the site is not shown to be in any flood zone according to the Environment Agency plans.

There will be a new drainage installed which incorporates a flow control and attenuation to store the water in a 1 in 100 year storm event with an allowance for 45% climate change. SUDs have also been incorporated into the design.

Taking the above into account the site should be deemed acceptable in terms of flood risk and drainage.