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JOB NUMBER: **MD0785**

PROJECT: **PROPOSED DEVELOPMENT, SPRING VILLE**

CLIENT: AMETHYST HOMES

REPORT NUMBER: MD0785/rep/001 Rev B

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

Prepared with reasonable care and attention:

[redacted]

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APPENDICES

EXECUTIVE SUMMARY

M Design were commissioned by Amethyst Homes to undertake a Flood Risk Assessment (FRA) in support of the proposed development at Spring Ville, East Sleekburn.

The area of the development shown to be is within Flood Zone 1, and therefore not as risk from coastal or river flooding. The Sleek Burn flows approximately 110m to the south of the site; however the flood zone does not encroach into the site area.

The proposed development is the construction of approximately 48 residential dwellings with associated infrastructure including access road and parking areas. The site as existing is a large open grassed field with scattered trees around the boundaries.

As the site is currently fully permeable, any development will increase the impermeable area of the site. This would have the possibility of increasing the surface water runoff which is unacceptable. To ensure that the proposed development will not increase the likelihood of flooding, either on site or elsewhere in the surrounding area, it is important to ensure that the drainage is designed appropriately. This is discussed within the body of this report.

The proposed development will be designed to ensure it does not exacerbate flood risk either on the site or to the surrounding area. The proposed development is not shown to be in a zone at risk of flooding. Development of this site is therefore considered appropriate in relation to flood risk.

1 INTRODUCTION

M Design were commissioned by Amethyst Homes to undertake a Flood Risk Assessment (FRA) in support of the proposed development at Spring Ville, East Sleekburn.

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;
- Calculations were undertaken to establish the current surface water runoff from the site
- 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;
- Institute of Hydrology (1994) Report 124 – Flood Estimation for Small Catchments;
- CIRIA Document 624 ‘Development and Flood Risk’
- Environment Agency;

2 Site Description

2.1 Site Location

The site is located off Brook Lane in East Sleekburn. The site area is approximately 1.4 hectares and the centre of the site is at NZ 287 836. The site elevation is approximately 12m A.O.D.

Fig 2.1 Proposed Development at Spring Ville.

The site is situated to the west of Brock Lane. To the west is the A189 the is its surrounded by a mixture of housing developments and open fields.

A site photograph is included within this report as Appendix A.

2.2 Site Walkover Survey

A site visit was conducted by M Design on 5th November 2013 in order to determine key site topographical features.

The site is accessed via an access road to the east. The site is reasonable flat but slopes by approximately 400mm towards the eastern boundary.

2.3 Site Flooding Potential

The development is shown by the Environment Agency flood maps to lie within **Flood Zone 1** (Appendix C). The Environment Agency's definition of Flood Zone 1 (taken from PPS25) is stated below:

Zone 1 Low Probability

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. Although not referred to directly in the table below the proposed works 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'

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

2.3 Over Land Flood Risk

As part of the flood risk assessment it is important to assess the risk of flooding from over land flows. M Design liaised with the local council regarding the risk of flooding from ground water. It was confirmed by the plan received below that there is an area of the site that is prone to ponding in heavy rainfall events. This is shown however to be in 1 in 100 and 1 in 1000 year flood events.

The site investigation shows that the ground conditions below the topsoil is heavy clays and this area of ponding is consistent with a local low spot on site when looking at the topographical survey. It is there likely that this ponding is as a result of rain water collecting on site in large storm events, percolating through the topsoil and being unable to percolate through the clay.

The local authority also confirmed that the site is not shown in an area at risk of flooding within the strategic flood risk assessment:

"From the Northumberland County Council Strategic Flood Risk Assessment (SFRA) the development area does not fall within any areas susceptible to surface water flooding".

A site visit has confirmed that the site will not be prone to any over ground flows from the surrounding area. There is an earth embankment to the north, east and west of the site which is elevated above any road levels in the area. There is also road drainage visible within the road network.

The A189 to the west of the site does show areas of flooding on the local authority flood map; however the site is elevated high above this road. Brock Lane to the north of the site is cambered. Therefore only a small amount of water would be shed toward the site; also road gullies are visible to drain any surface water flows.

Brock Lane to the east of the development has a cross fall on the road which falls away from the site, therefore any surface water will be diverted away. Again road gullies are visible along this stretch of road.

Road networks to the south of the site are all at a lower level to the site.

To add further assurance that the properties will not be at risk of flooding it is recommended that the finished flood levels of the proposed dwellings are raise 150mm above the existing ground levels.

The existing issue with ponding on site will be removed by the development due to the new drainage that is to be installed. Any rainfall that falls onto the hardstanding areas of the site will be drained into the system of gullies and plot drainage, stored within the oversized pipes and discharged into the local sewer network at a restricted rate. As the impermeable area of the site is over 50% this will greatly reduce the amount of water that may produce ponding. Also taking into account the raised site levels there properties should not be at risk from groundwater flooding.

3 Proposed Development

3.1 Proposed Development Description

The proposal for the site is the construction of approximately 48 residential dwellings with associated infrastructure including access roads and parking area. This site will be accessed via a junction to the west.

The site is shown by the Environment Agency flood maps to lie within flood zone 1; therefore not at risk from flooding and no special requirements are necessary in relation to the setting of the finished floor levels for the proposed dwellings.

A topographical survey is included within Appendix F.

3.2 Proposed Development Surface Water Runoff & Proposals

The drainage design has been carried out by others submitted as part of this application.

3.3 Proposed Development Foul Water Runoff & Proposals

The drainage design has been carried out by others submitted as part of this application.

The NWL record plan is shown within Appendix E.

4 Conclusions

4.1 Conclusions

This report has shown that the proposed development will be designed to ensure that it will not increase the risk of flooding either on site or downstream.

The foul and surface water design has been carried out by others and submitted as part of this application.

The site is shown by the Environment Agency flood maps to lie within flood zone 1; therefore not at risk from flooding and no special requirements are necessary in relation to the setting of the finished floor levels for the proposed dwellings.

The risk of flooding on the development site has been shown to be negligible. The development is therefore deemed as acceptable in relation to flood risk.

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Appendix A

Aerial Photograph of Site

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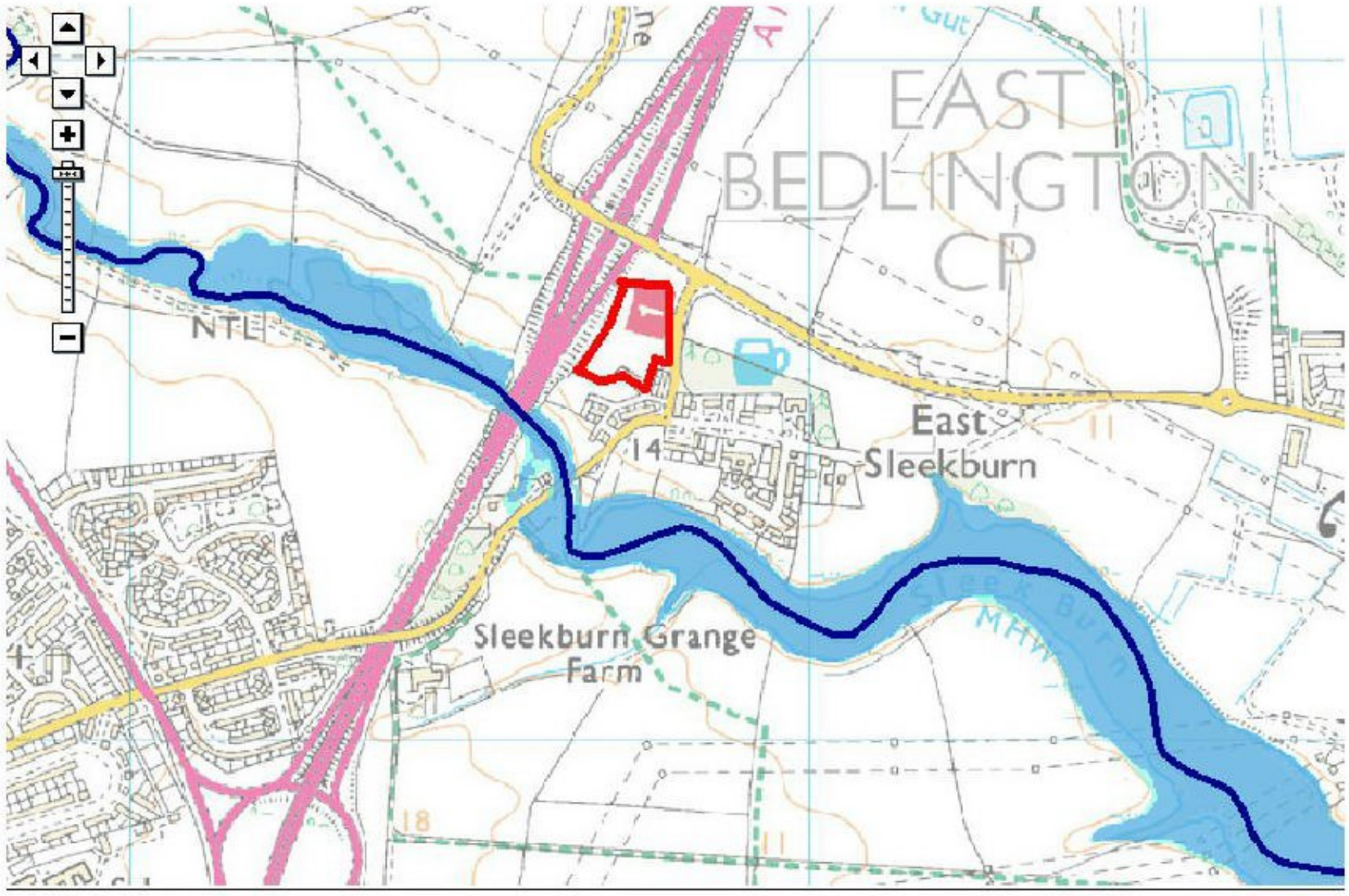
Appendix B



EA Flood Map of Area

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Appendix D

Proposed Site Layout

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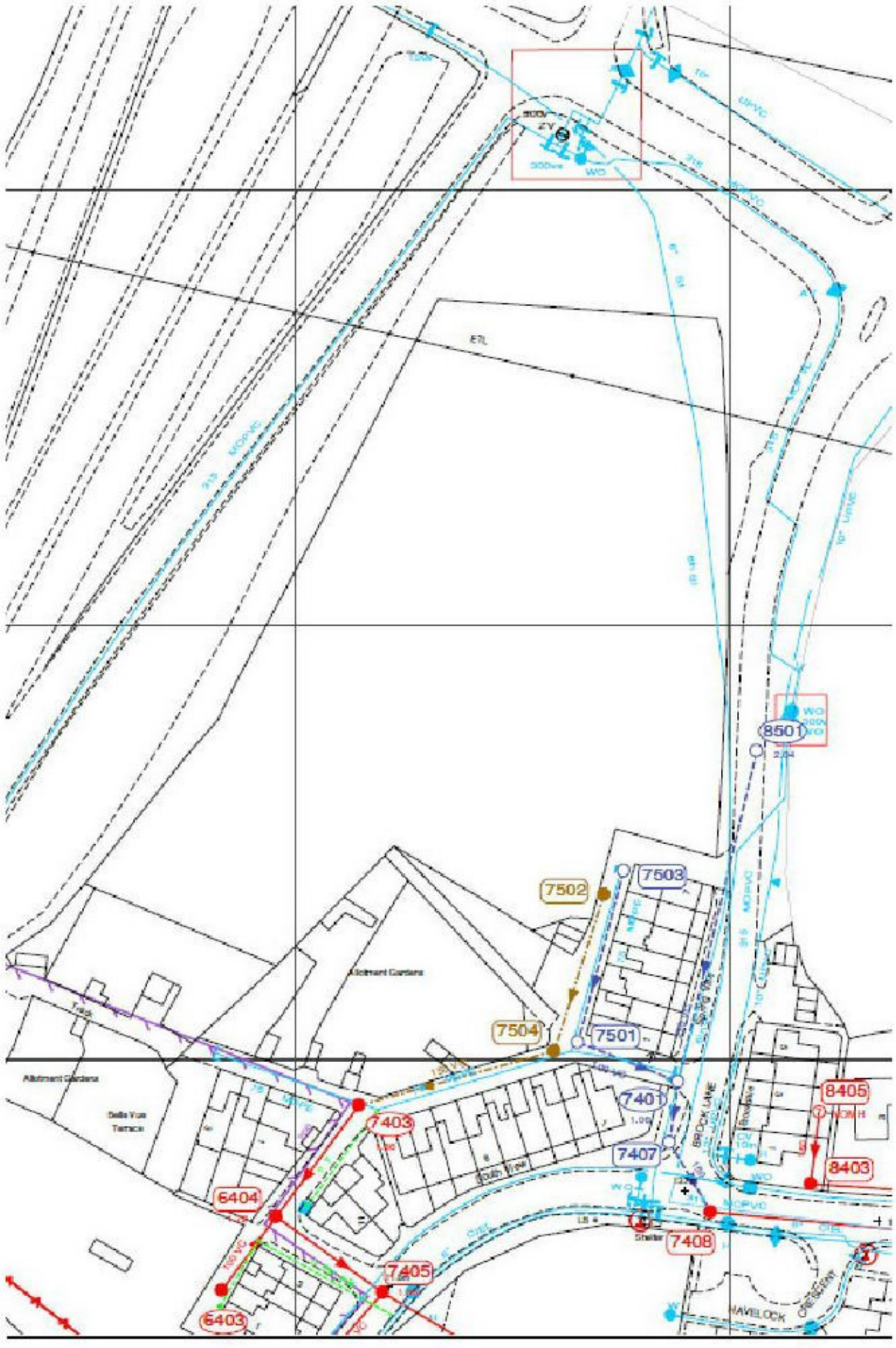
Appendix E



NWL Sewer Plan

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Appendix G

See additional PDF

Level survey

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