Flood Risk and Rainfall Run-off Assessment Report

for the Re-Development of a Residential Site,

at Bellbrooke Avenue, Darfield, Barnsley

Prepared for

Synergy Housing Solutions and the Chevin Housing Group

December 2008

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Issue	:	01
Written by	:	G.Shuttleworth
Date	:	12th December 2008

1.0 DEVELOPMENT DESCRIPTION AND LOCATION

1.1. The application site is located within an existing residential area at Bellbrooke Avenue, Darfield Barnsley. OS Grid Reference SE 410 052. A drawing showing the location of the site is provided in Appendix 1.

1.2. The site, on the north side of Bellbrooke Avenue is currently occupied by a 22 two storey semi-detached properties and associated outbuildings and garages. The site also includes a garage block. The majority of the buildings are derelict and some have been demolished. All the buildings are eventually to be demolished and new replacement dwellings built within the new site.

1.3. It is proposed to submit an application for Planning Permission to construct 18 two storey semi-detached dwellings, 10 semi-detached single storey dwellings and 2 detached single storey dwellings. The existing two storey semi-detached dwellings on the south side of Bellbrooke Avenue are outside the site and are to remain for the time being. A drawing showing details of the proposed development is provided in Appendix 1.

1.4. The footprint of whole site is some 0.85ha with 30% covered in impermeable surfaces. Following development approximately 38% of the site will be covered with impermeable surfaces.

1.5. Ground levels on the site slope from 64.80m AOD in the west to 55.00m AOD on the eastern boundary. A drawing showing the existing site and levels is provided in Appendix 1.

1.6. The proposed development is considered to be a windfall development being located on a brownfield site within an existing residential area.

1.7. In accordance with PPS 25 Table D2: Flood Risk Vulnerability Classification, the development would be classed as 'More Vulnerable'

1.8. The site is located some 600m to the west of the floodplain of the River Dearne and 2km north of the floodplain of the River Dove. However, the flood level is approximately 30m AOD and the site is elevated at least 25m above the floodplain. Therefore the site is in Flood Zone 1 and suitable for development. A copy of the Environment Agency Indicative Flood Palin Map published on their web-site is provided in Appendix 1.

1.9. As the site is in Flood Zone 1 the Sequential Test and Exception Test are not required.

2.0 DEFINITION OF THE FLOOD HAZARDS

2.1. As stated above the site is elevated well above the flood plains of the Rivers Dearne and Dove and as such fluvial flooding is not considered further in this report.

2.2. The site is in an area served by Yorkshire Water for water supply and sewerage services and the site can be considered potentially at risk from flooding from burst water mains or failure of the drainage or sewerage infrastructure. However, given the steep gradient across and to the east of the site provided that the gradient is maintained in the new development there should be no risk of internal flooding of the new buildings. There is however, potential for external flooding to shallow depths from any surface water flowing across the site.

2.3. There is also potential for flooding from groundwater sources should groundwater levels increase. However, as stated above provided the steep gradient across the site is maintained there should be no risk of internal flooding to the buildings.

2.4. The buildings will also be at risk from internal flooding due to the failure of internal plumbing and heating systems. This risk is present in all properties and although the effects can be as damaging as flooding from external sources it is understood that this type of flooding should not be included in a PPS25 Flood Risk Assessment and is not considered further in this report.

3.0 PROBABILITY

3.1. In accordance with PPS25 the site is in Flood Zone 1.

3.2. It is proposed to limit the surface water run–off from the site to existing levels so the probability of flooding elsewhere in the catchment is not increased.

4.0 CLIMATE CHANGE

4.1. The effects of climate change are well documented. Annex B of PPS 25 provides guidance on potential effects of climate change on flooding.

4.2. The development will not be adversely affected by the predicted increase in sea levels or increases in flow in the Rivers Dearne and Dove.

4.3. Rainfall intensities are predicted to increase by as much as 30% over the next 75 years. New surface water drainage systems will need to be designed to accommodate the potential increase in rainfall intensities to prevent flooding at the development site and not to contribute to an increased risk of flooding elsewhere in the catchment.

4.4. It is anticipated that the normal Building Regulations requirement of setting the finished floor level at a minimum of 150mm above the adjacent ground level should provide sufficient freeboard for the potential effects of climate change.

5.0 DETAILED DEVELOPMENT PROPOSALS

5.1. The proposed development involves the construction of 18 two storey semi-detached dwellings, 10 semi-detached single storey dwellings and 2 detached single storey dwellings.

5.2. Details of the proposed development are shown on a drawing contained in Appendix 2.

5.3. It is proposed than the finished floor level is set at a minimum of 150mm above the adjacent ground level and the existing gradient across the site is maintained.

6.0 FLOOD RISK MANAGEMENT MEASURES

6.1. Setting the finished floor level a minimum of 150mm above the adjacent ground level as required by building regulations and ensuring the gradient across the site is maintained i.e. no hollows are created are the only flood risk management measures required for this site.

7.0 OFF SITE IMPACTS

7.1. Developments that involve an increase in the amount of impermeable surfaces can potentially increase the surface water run-off from a site and increase the potential for flooding elsewhere in the catchment. PPS25 requires that surface water from a development does not increase the risk of flooding elsewhere in the catchment.

7.2. It is the developer's intention to restrict surface water run-off from the site to existing levels by constructing a surface water attenuation system.

7.3. A 225mm public combined sewer is present in Bellbrooke Avenue and the existing properties are connected to it. It is intended to re-use the existing connections to enable the 18 replacement two storey properties to continue to discharge to it.

7.4. On the eastern part of the site the 12 new single storey properties will discharge to the public combined sewer in Rose Avenue. In order that the flow off the site is not increased surface water discharge from the 12 single storey properties will be attenuated so that the flow off the whole site is not increased.

7.5. Surface water attenuation will be achieved using a discharge control device and underground storage in oversize pipes located in the new adopted access road. It is intended that the surface water attenuation system will be adopted by Yorkshire Water.

7.6. The existing impermeable area is approximately 2400m^2. Following development the impermeable area will be approximately 3250m^2.

7.7. To facilitate the construction of the 12 bungalows, 4 existing dwellings and a garage and access road will be demolished which have an impermeable area of approximately 1100m^2.

7.8. The net increase in impermeable area associated with the 18 slightly larger houses is approximately 100m^2. Therefore to maintain the discharge at existing levels flow from the new bungalow part of the site would need to be attenuated to that from a 1000m^2 (1100-100m^2) permeable area.

7.9. A 1000m^2 impermeable area would generate a 1 in 1 year 15 minute (50mm/hr) discharge of approximately 14.0 l/s.

7.10. To attenuate the flow from the bungalow part of the site to 14.0 l/s for storms up to a 1 in 100 year event, including a 30% allowance for climate change would require a storage volume of approximately 55.0m^3. This can be provided in oversize pipes beneath the new road.

7.11. It is understood that the soils in the area of the site may be suitable for a soakaway system. Further investigation will be required to determine the percolation rates. Soakaways would only be used to dispose of roof water from the re-built dwellings.

7.12. Should it be practical to use soakaways for the roof drainage then the net impermeable area post development will be reduced and no attenuation will be required.

8.0 RESIDUAL RISKS

8.1. There is a residual risk that extreme events in excess of the 1 in 100 year event may occur and the surface water attenuation system may be overwhelmed. However, in these circumstances the drainage system of the existing site would also be overwhelmed and the risk of off-site would be no greater than at present.

9.0 CONCLUSIONS

9.1. The site is in Flood Zone 1 and elevated some 25m above the floodplain of the nearest watercourse, the River Dearne.

9.2. There is a steep gradient across the site and provided a gradient is maintained i.e. no hollows are created, then the risk of flooding from other sources will be minimal.

9.3. It is possible to provide surface water attenuation for the new part of the site which will maintain the surface water discharge from the whole site at or below existing levels.

9.4. Should future site investigations demonstrate that soakaways are practical for the disposal of roof water then the overall discharge to the public combined sewer will be reduced and no attenuation will be required.

9.5. Taking into account the above points it is concluded that the proposed development can be considered appropriate in this location

10.0 APPENDIX 1 – SUPPORTING INFORMATION

a) Environment Agency Flood Map with site location added

b) Plan including existing site details and levels

c) Drawing showing the Proposed Development

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Flooding

SITE LOCATION
GRID REF SE 410 052

Enter postcode or place name:

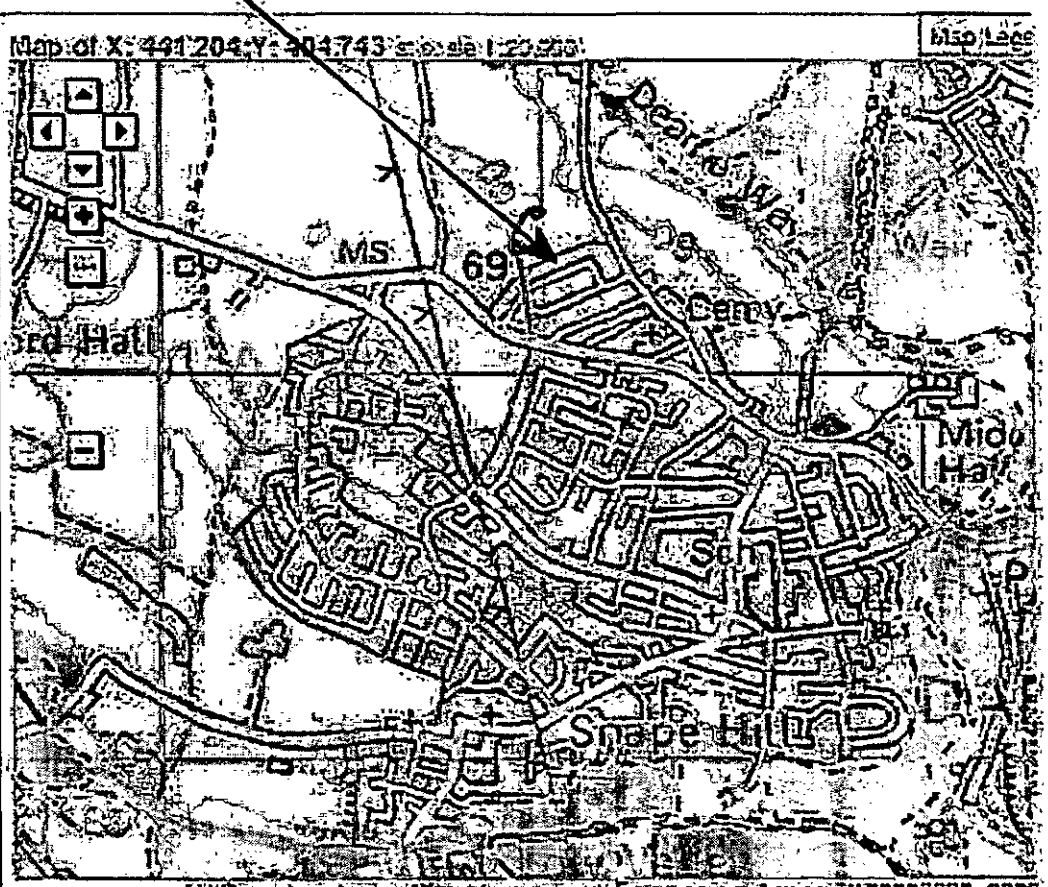
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Overview map:



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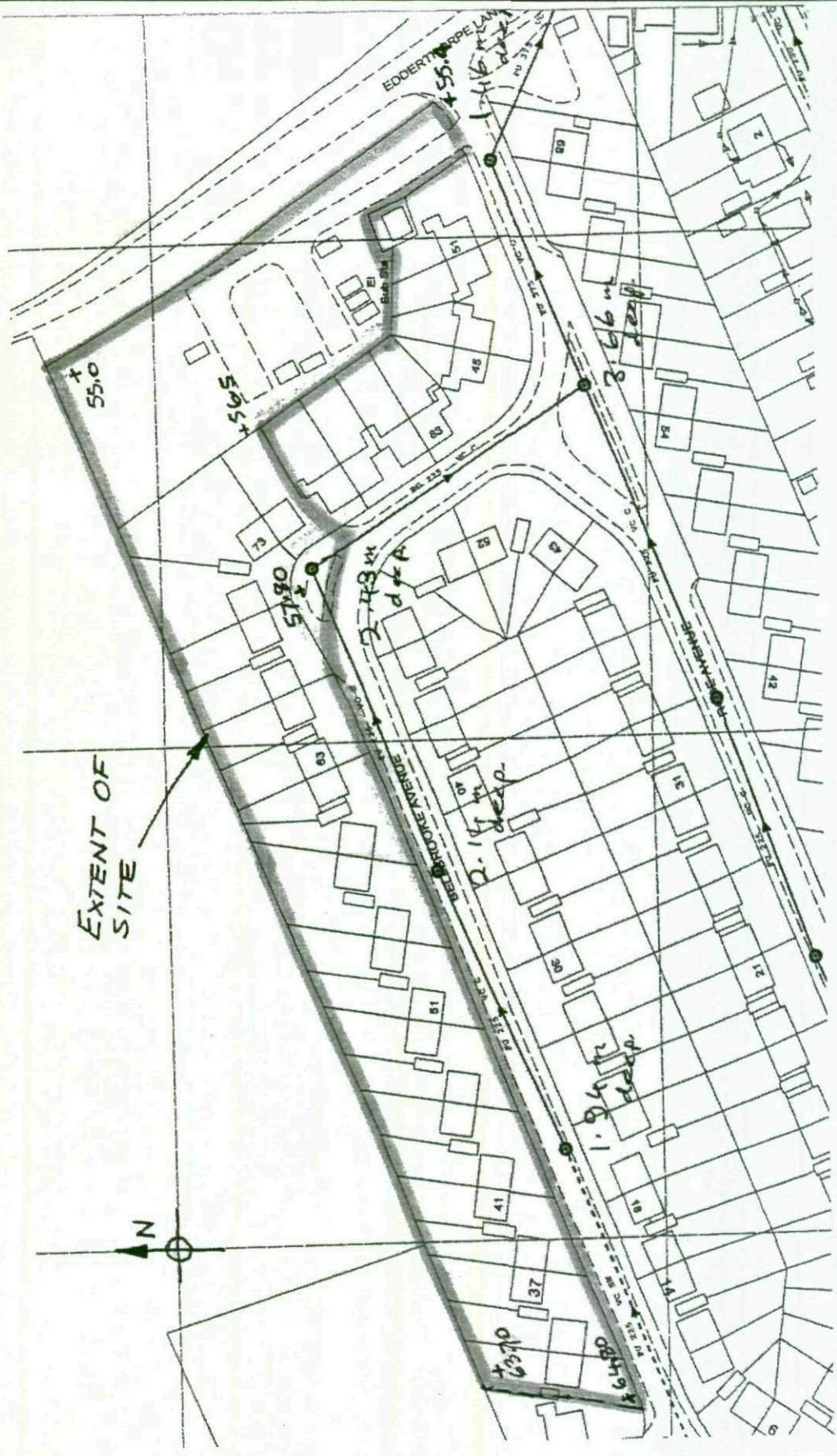
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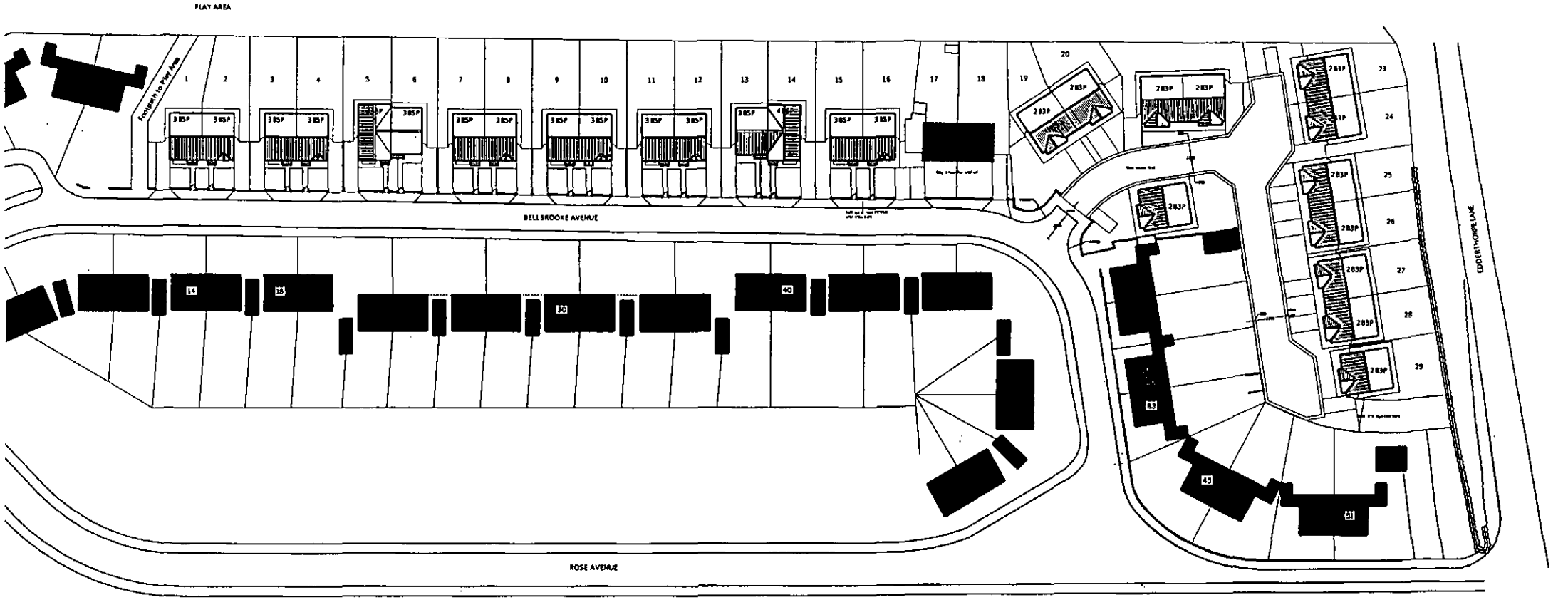


SITE GRID REFERENCE: SE 410 052

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CLIENT: SYNERGY HOUSING AND CHEVIN HOMES	DRAWN BY: GS	CHECKED BY: XXX	APPROVED BY: GS
PROJECT: HOUSING REDEVELOPMENT, BELLBROOKE AVE, DARFIELD	SCALE AT A4: 1:1250	DATE: DEC 08	
DRAWING TITLE: EXISTING SITE AND LEVELS	DRG NO.: 00-281-001	REV: -	



CLAYFIELD
CONSTRUCTION

Proposed Residential Development,
Bellbrooke Avenue
Dunfield
For
Synergy Housing

John Hill ASSOCIATES
Architectural & Surveying Consultants

Scale	1:250
Date	December 2008
Drawn by	HSA
Checked by	
Drawing No.	08/005/03A
Size	A0