

Report: 5182/DS1

Date: June 2021

**DRAINAGE STRATEGY and SUDS REPORT  
FOR A PROPOSED RESIDENTIAL DEVELOPMENT  
AT  
BARUGH GREEN ROAD, BARNSELY WEST (PHASE 1)**

**Prepared for  
STRATA HOMES**



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### Issue Record

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### **DRAWINGS**

5182-DS01	Location Plan
5182-DS02	Greenfield Catchment Area Plan
5182-DS03	Drainage Strategy Plan

### **APPENDICES**

A	Overall Development Strategy Plan
B	Watercourse Photographs

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**DRAINAGE STRATEGY REPORT**  
**FOR A PROPOSED RESIDENTIAL DEVELOPMENT**  
**AT**  
**BARUGH GREEN ROAD, BARNLSLEY WEST-PHASE 1**

**1 INTRODUCTION**

- 1.1 iD Civils Ltd (iD), have been appointed by Strata Homes (SH) to prepare a Drainage Strategy Report for the proposed phase 1 residential development on land south of Barugh Green Road between Higham and Gawber (known as Barnsley West).
- 1.2 The site is the first phase of a mixed-use development of Residential, Commercial and Community Infrastructure. The phase 1 area is in the north west of the overall site just south of Barugh Green Road.
- 1.3 This report has been prepared to accompany the hybrid application (outline for the full site and detailed for the phase 1 area). The phase 1 area application covers 229 residential plots of mixed size and tenure plus open space and associated infrastructure.
- 1.4 This report has been undertaken to outline the intended site drainage network, SUDS drainage features and outfall sewer arrangement. The phase 1 area sits within a wider overall strategy for the development which has been described in detail within the JPG report 'Drainage Impact Assessment', May 2021. This report should be read in conjunction with the overall strategy and only addresses details of the phase 1 area connections and runoff rates. Following progress through the planning consultation period, additional detailed design will be submitted in accordance with the principles outlined, to allow full discharge for the relevant drainage conditions. Matters to be concluded in terms of the JPG report will also require resolution during the application period.
- 1.5 This report is not meant to repeat the previous Drainage Impact Assessment but compliment it in terms of adding additional detail to the phase 1 area. The report and drawings contained herein will demonstrate how drainage proposals in line with current BMBC development control standards and Yorkshire Water 'Codes for Adoption' standards can be delivered through the 'over-arching' strategy.
- 1.6 The report is for the sole use of SH for the purposes of the planning application, and presents comments and conclusions based on information available at the time of writing. iD Civils reserve the right to amend conclusions if further information is made available or the over-arching strategy report is updated.

## 2 BACKGROUND

- 2.1 **Planning Status:** The site has been allocated in the BMBC development plan but at present has no planning status. The application is a hybrid application for outline consent for the whole allocation plus detailed for the phase 1 residential area. As such, there are no previous planning consents/conditions that must be discharged.
- 2.2 The application is being accompanied by a 'Flood Risk Assessment' and 'Drainage Impact Assessment' produced by JPG which describe the overall site's flood risk and drainage strategy. Reference to these reports is made in the Phase 1 Strategy report.
- 2.3 Where specific issues relating to phase 1 are raised in the strategy report, these issues have been further developed in the phase 1 report, e.g. pumping of surface water.
- 2.4 A brief summary of the FRA report is presented below;

**Table 5182.1 – FRA Summary**

Issue	Comment
Flood Zone Setting	The site lies totally within Flood Zone 1 and is appropriate for its intended use in accordance with National Planning Guidance.
Flood Risks	The report covers a range of flood risks as outlined below; Fluvial – Low Risk due to the site's location from major watercourses and rivers. Pluvial – Surface Water overland flood routes are shown on the line of existing watercourses and ditches with no cross-boundary sheet flows noted. Groundwater – No significant groundwater flood risk Artificial – No reservoir flood risk of other artificial risks. Sewer – No sewers within site so no flood risk from sewers.
Surface Water Management	The site is not suitable for infiltration drainage due to its previous use and natural and made cohesive ground conditions. Discharge of surface water is therefore recommended to local watercourses at greenfield rates with attenuation to suit local development policy and national standards. Flooding was raised by the LLFA downstream in a culvert below Redbrook Road and The Zenith Park Industrial Estate, and a survey has been commissioned to review the condition of the culvert and agree any necessary actions in conjunction with the granting of a connection to this watercourse.

### 3 RECOMMENDATIONS OF PREVIOUS DRAINAGE IMPACT ASSESSMENT REPORT

3.1 The 'Drainage Impact Assessment' for the overall site produced by JPG offers a number of recommendations and comments which apply to both the overall and phase 1 areas. The principles of the SUDS hierarchy have been reviewed and liaison with the LLFA has been undertaken to understand suitable discharge points. In addition, Yorkshire Water has been consulted with regards to foul water disposal and adoption of SUDS basins via a formal pre-development enquiry submission and subsequent meeting.

3.3 The principle findings and recommendations are set out below;

**Table 5182.2 – Findings and Recommendations of previous DIA**

Issue	Recommendation
SUDS Hierarchy	<p>The site is partly a former quarry which has been backfilled. Significant areas of the site are underlain by cohesive and granular made ground. Natural ground in the area is predominantly cohesive, so infiltration drainage is not possible for the site.</p> <p>The site is crossed by two watercourses and further ditches and discharge to the watercourse is recommended in accordance with the SUDS hierarchy. Watercourses combine to the east of the site and flow into culvert below Redbrook Road and The Zenith Park Industrial Estate.</p> <p>There are small ditches adjacent to Barugh Green Road to the north of the site (north of phase 1 area) which discharge to culvert below Barugh Green Road and on to watercourse behind the Aldi store to the north east. Further survey work to map these culverts is suggested if they are to be considered for use as part of the phase 1 area.</p> <p>Greenfield rates have been assessed as 3.9 l/s/ha and agreed with the LLFA.</p>
Discussions with LLFA	<p>The LLFA has raised issues with the section of culvert through Redbrook Road and the Zenith Park Industrial Estate. The LLFA has required that, if this culvert is to be used to take flows from the site, a survey be undertaken to determine its condition and any remedial works are agreed prior to discharge rates being agreed. That survey has been instructed and is awaited. It is the intention of the applicant to agree to the use of this watercourse as the primary outfall.</p> <p>Further investigation is required to establish the outfall to the ditch adjacent Barugh Green Road and its downstream culvert condition.</p> <p>There is a highway drain along the northern footpath of Barugh Green Road which can accept highway runoff from the proposed new roundabout which forms the northern access at an agreed rate.</p>
Discussions with Yorkshire	<p>Foul drainage can be taken to the existing 600mm combined sewer in Barugh Green Road. The capacity of the sewers is limited at present but</p>

Water	<p>work to secure increased capacity will be undertaken by Yorkshire Water following granting of a planning approval. These works will be recharged under the domestic water rating system and not be funded by the developer.</p> <p>Yorkshire Water will require a programme of phased development in order to assist in their upgrade works.</p> <p>Surface Water and foul water sewers within the site residential areas and spine sewers will be adopted by YW under 'Codes for Adoption'. Sewers around commercial areas will remain private.</p> <p>Adoption of SUDS features could be by Yorkshire Water or Private Management company and is to be determined as the application progresses. Codes for Adoption allows YW to adopt SUDS features.</p> <p>Basins will provide the main treatment feature for the site wide drainage system. Primary treatment may need to be considered on a plot by plot basis.</p>
Surface Water Strategy	<p>Primary discharge is to watercourse to the eastern part of the site.</p> <p>There may be some discharge allowed to the shallow watercourse to the south of Barugh Green Road subject to determining its connectivity and capacity. Discharge to this watercourse would avoid the need to pump surface water from the northern tip of phase 1.</p> <p>The LLFA has confirmed that a connection can be made to local watercourses at greenfield rate. The LLFA has highlighted existing issues with a culvert below Redbrook Road and confirmed that a cctv survey is required to ascertain condition and determine any improvement works.</p> <p>Total site discharge rate will be in the order of 233 l/s subject to detailed design and catchment areas.</p> <p>On site system to be designed to:</p> <p>No surcharge in the 1 in 2-year event</p> <p>No flooding in the 1 in 30-year event</p> <p>No flooding of buildings or property within the 1 in 100-year event plus 40% climate change factor.</p>
Land drainage	<p>Temporary land drainage will be required across the site to drain surface runoff from development plateaus formed during the initial phase of earthworks. The LLFA agree that land drains can be discharged to the local watercourses provided that some filtration system is used to prevent silts passing to the watercourses. This is to be subject to a separate design by the earthwork's contractor.</p>
Foul Water Strategy	<p>Foul water will discharge to the 600mm diameter combined sewer in Barugh Green Road to the north of the site.</p>

- 3.4 A review has been undertaken of the shallow watercourse to the south of Barugh Green Lane (western watercourse), and on the site visit at the end of May flows were seen to be coming from higher ground to the south (the phase 1 area) into the ditch. The ditch was flowing east along its length to the point where it abuts the wall of the adjacent property. Flows were constant with no ponding, with water leaving the ditch to pass through to what is understood to be a 300mm culvert below the road. From discussions with a local resident it is understood that prior to the construction of the estate to the north flows from the culvert passed to a watercourse to the north and headed east to the area of the current Aldi store.
- 3.5 The outlet from the ditch could not be seen due to rubble and undergrowth and this area is to be excavated to confirm the presence of the culvert and cctv its route across the road to determine its condition.

#### 4 DRAINAGE STRATEGY – PHASE 1

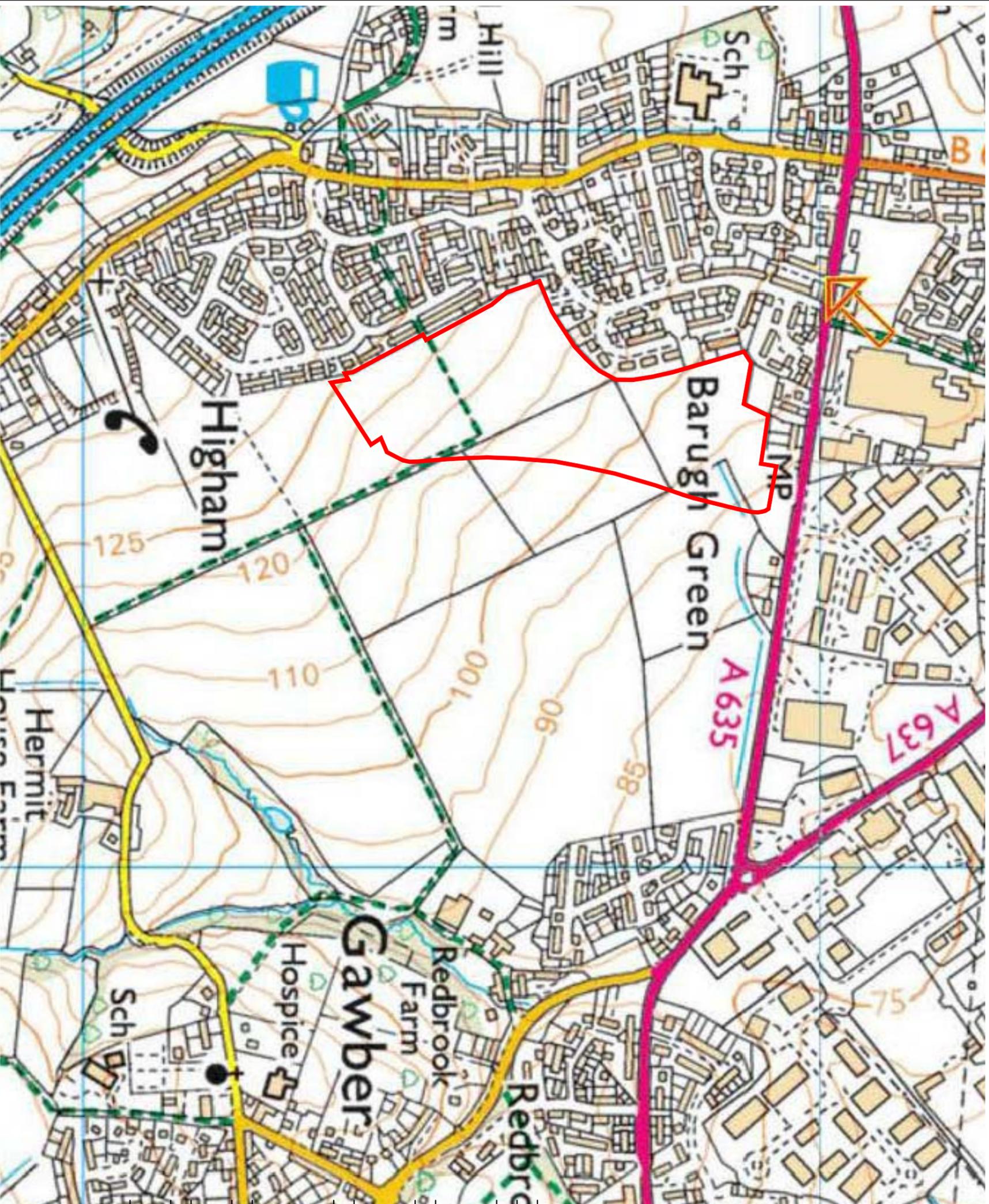
- 4.1 The previous DIA report examines options for surface water outfalls from the overall site covering the phase 1 area in the north west. These options, plus others have been reviewed during the preparation of this report. In addition, a review of the site investigation has been undertaken to confirm that infiltration drainage cannot be utilised.
- 4.2 **Surface Water Discharge Point:** In accordance with the drainage hierarchy in Part H of the Building regulations, if soakaways are not suitable the next best means of drainage is to watercourse. The DIA identifies the main flows from the site should be to the watercourse to the east via a series of large attenuation basins. The report also states that a connection to the shallow watercourse adjacent Barugh Green Road should be considered in order to avoid pumping of the northern part of phase 1 to the main spine drainage.
- 4.3 The watercourse to the north has been visually inspected and we can confirm that it is flowing and taking its flows from higher ground to the south within the phase 1 area.
- 4.4 A review of the existing site topographical survey has been made to establish the area within phase 1 which will drain to this watercourse and a plan is presented in this report(5182-DS02) to illustrate the area of 1.34ha which flows to the ditch. Photographs from the site visit in May are included in appendix B showing the steady flow of water coming from the phase 1 area.
- 4.5 The main spine road and sewer infrastructure for the site will be laid to the east of the phase 1 area as shown in the JPG drainage Strategy plan. Two connections for the site are provided in the centre and southern area of the eastern boundary. These connections are to be utilised for the majority of the site with attenuation storage located in the large basins to the east offsite. Discharge from the majority of the site will therefore be unrestricted but attenuated offsite.

- 4.6 The JPG plan shows a surface water pumping station pumping flows from the lower northern area up to the spine sewer. The pumping of surface water should be regarded as a 'last resort' due to the long-term maintenance of a pumping station being required and the associated risk of pump failure.
- 4.7 The watercourse to the south of Barugh Green Road has been reviewed and Qbar flows to this watercourse have been calculated based on IOH124 as 5.22 l/s. Flows from the 100-year event will be significantly greater.
- 4.8 A positive outfall is present from this ditch as flows are leaving the ditch and crossing below the road. In accordance with SUDS guidance the pumping of surface water should be avoided and where possible gravity connections should be made. The LLFA has indicated that there are downstream issues with this culvert, however it is proposed that any discharge is to be below current greenfield rates and set at the minimum adoptable flow of 3.5 l/s. This proposal is subject to the CCTV survey of the road crossing, but is considered to be far more sustainable than a pumped solution, and therefore in accordance with local and national guidance.
- 4.9 **Foul Water Discharge Point:** A pre-development enquiry has been submitted as part of JPG work and YW has agreed to a connection to the 600mm diameter combined sewer in Barugh Green Road. Spine sewers will be laid to the east of the phase 1 area with a connection to that sewer in the north of the phase 1 area.
- 4.10 **Surface Water Discharge Rate and Storage Volumes:** The majority of the site will discharge at an unrestricted rate to the two spine sewer connections in the road to the east. Attenuation will be provided offsite in basins to the east under a separate design to be agreed with the LLFA/YW as part of the JPG drainage design work.
- 4.11 Discharge of the limited area to the north which cannot gravitate to the spine sewer will be at a rate of 3.5 l/s to the watercourse south of Barugh Green Road.
- 4.12 The total catchment area of phase 1 which will drain to this point is cc 0.33 Ha and to storage water from the 100 year plus 40% storm will require approximately 200m<sup>3</sup> of storage. Detailed design will follow to verify this volume.
- 4.13 **Storage Form:** Given the steep gradient across the phase 1 area and the limited room adjacent to the roundabout, below ground pipe storage is recommended for this area. The forms of storage should be to YW adoption criteria to allow adoption.
- 4.14 **Maintenance of SUDS:** It is intended that the offsite basins to the east will be adopted by YW and this is to be agreed by JPG as part of further design work and discussions. The tank storage to the north will be adopted by YW under a section 104 agreement and will be subject to their normal asset maintenance plans. In the period prior to formal adoption the developer will maintain the sewers and storage to an agreed management plan which is likely to be subject of a planning condition.

- 4.15 **Exceedance:** In the event of the storm exceeding the design event, consideration needs to be given to exceedance routing of surface water flows to ensure that flows do not flood property. The exceedance route from the proposed system is illustrated on the strategy plan and predominantly is designed to flow down the estate roads and avoid flows through domestic curtilage. Exceedance from the storage tank in the north would be directly onto Barugh Green Road.

## 5 SUMMARY

- 5.1 The principles identified under the overall Drainage Impact Assessment have been reviewed as part of the phase 1 drainage design. Whilst the majority of the site can be drained to the spine sewers and large storage basins to the east, a small area of the site in the north would require pumping to reach these sewers. Whilst still subject to further on-site investigation, an outfall to the watercourse to the north at minimum adoptable rates is proposed with a small storage tank adjacent to the new roundabout. This system will be gravity based and avoid pumping therefore preferable in terms of sustainability.
- 5.2 The foul discharge from the site can be in accordance with the JPG strategy and connect to the foul spine sewer which discharges to the north into Barugh Green Road.
- 5.3 Detailed design is to be provided for all elements once the layout is fixed in order to achieve regulatory approvals with regards to section 104 agreement and also planning condition discharge.
- 5.4 The discharge rate from site will be set at greenfield rate or below (northern area). Via attenuation designed to achieve storage for the 100 year plus 40% storm event.



Rev	Description	By	Date

Client:

Strata Homes

Project Title:  
Barugh Green Lane, Barnsley West  
- Phase 1

Drawing Title:

Location Plan

Scale	Date	
NTS@A3	June 2021	
Drawing No	Revision	Status
5182-DS01	0	Final



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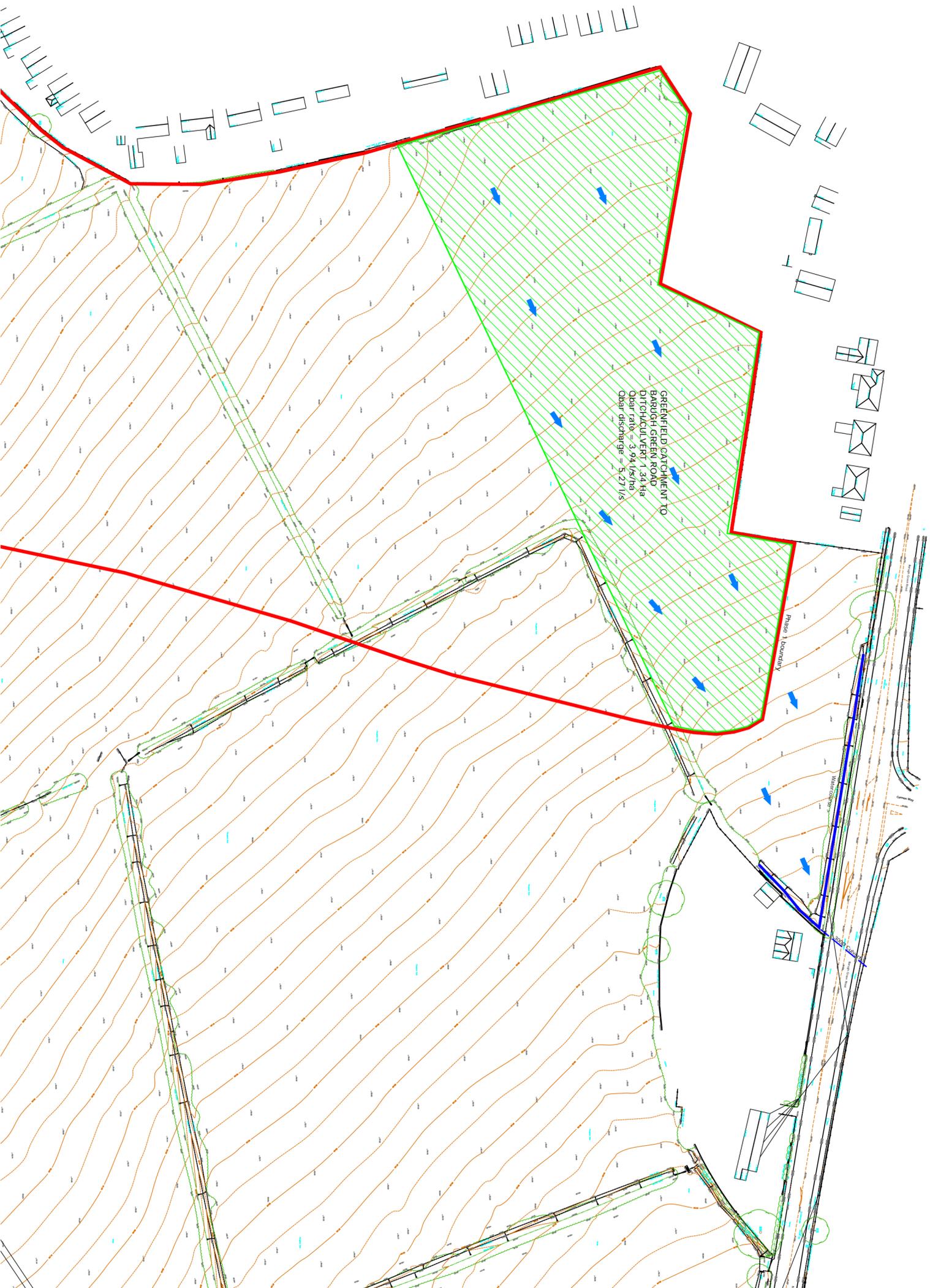
**NOTES**

Part of Phase 1 is drained to a ditch running alongside Barugh Green Road which discharges to the north across the road via a culvert.

Area of phase 1 which is within the catchment of this ditch is 1.34 Ha

10H124 Obar greenfield rate is 3.97 l/s/ha

Existing natural runoff (Obar) is therefore 5.27 l/s



Rev	Description	By	Date

Client:

Strata Homes

Project Title:

Barnsley West

Drawing Title:

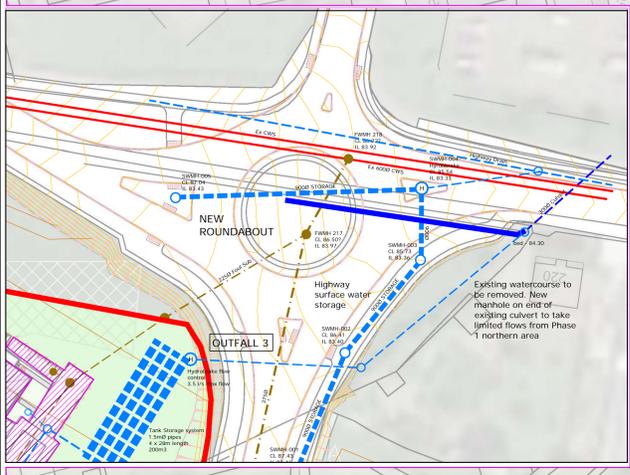
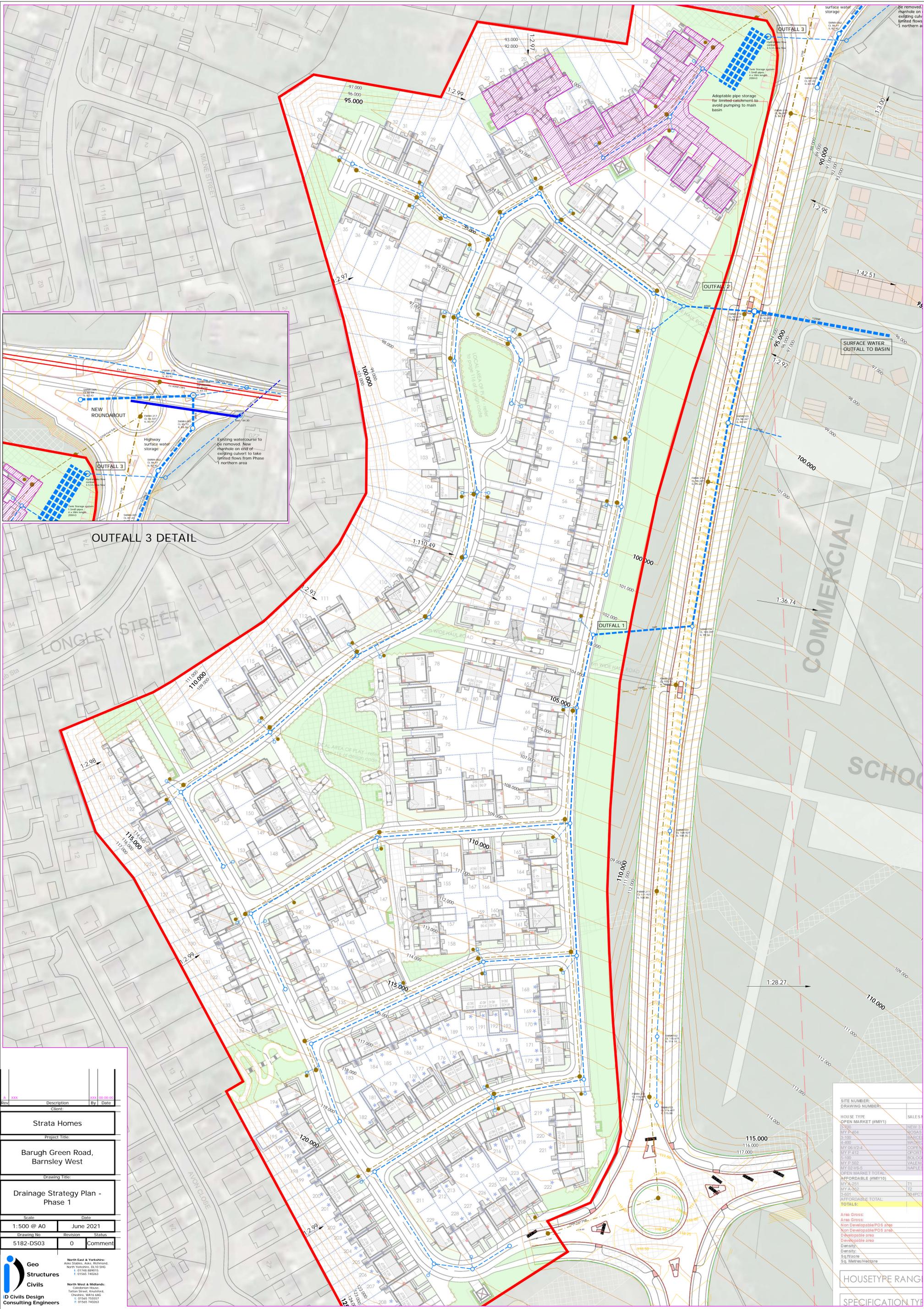
Greenfield Catchment to Barugh Green Road Culvert

Scale	Date	
1 : 1000 @ A2	June 2021	
Drawing No	Revision	Status
5182-DS-02	0	Final

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OUTFALL 3 DETAIL

Rev	Description	By	Date
1	Client		06/20/21

Strata Homes		
Project Title:		
Barugh Green Road, Barnsley West		
Drawing Title:		
Drainage Strategy Plan - Phase 1		
Scale	Date	
1:500 @ A0	June 2021	
Drawing No	Revision	Status
5182-DS03	0	Comment

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SITE NUMBER:	
DRAWING NUMBER:	
HOUSE TYPE	SALES
OPEN MARKET (#MY1)	NEW 3
MY P 404	REGAS
S-100	BARGE
4-400	MADRID
MY P 502	OPEN
MY P 412	OPORI
S-100	BOLOG
MY P 502	VALENT
MY P 404	MAPLES
OPEN MARKET TOTAL	
AFFORDABLE (#MY10)	
MY P 201	11
MY P 302	12
S-601	184PCT
AFFORDABLE TOTAL	
TOTALS	
Area Gross	
Area Gross	
Non Developable/POS area	
Non Developable/POS area	
Developable area	
Density	
Density	
Sq Metres	
Sq Metres/Hectare	
HOUSTYPE RANG	
SPECIFICATION TY	

## Appendix A



## Appendix B

## Barnsley West

### Barugh Green Road ditch



End of ditch approximately 3m from culvert



Approximately mid way along ditch