BAILEY JOHNSON HAYES
CONSULTING ENGINEERS
Bailey Johnson Hayes
Grange House, John Dalton Street
Manchester. M2 6FW
Tel: 0161 279 7777 Fax: 0161 236 3552
Web: www.bjh.co.uk

Project	Project No.	Sheet No.
Plot 1, Skimmingdish Lane Bicester.	S1344	D-1
	Drawing No.	Rev.
		0
Section	By	Date
Surface Water Drainage	P.A.B.	March 2018
	Checked	Date

Calculations

PROPOSED DEVELOPMENT,

PLOT 1 (PHASE 3). SKIMMINGDISH LANE, BICESTER.

SURFACE WATER DRAINAGE CALCULATIONS

1.0 INTRODUCTION

The following calculations have been prepared to justify the design of a below-ground drainage system to serve the above development plot. These calculations are to be read in conjunction with previous calculations ref S1230 to justify the design of retention basins for the wider site including Plots 1-3.

The drainage scheme for the site is developed upon principles agreed with Oxfordshire CC to attenuate surface water outflows from the proposed development site to Langford Brook to a peak figure of 17 litres/second.

These calculations are specifically prepared for the design of below-ground surface water drainage serving Plot 1, but the modelled drainage system includes drain runs for the systems on Plots 2 and 3, and the site access road, already constructed. The drain pipes serving Plot 1 relate to manholes ref 1B.1 to 1B.19 and 1A.1 to 1A.22. Detailed analyses of the drains serving Plots 2 and 3 have been undertaken separately.

2.0 DRAINAGE DESIGN

Development of the entire site has created three large plots to accommodate a series of industrial/commercial buildings, including associated external service yards, access roads, and car parking.

Four retention basins are to be constructed within the landscaped areas surrounding the development plots. Drawings of each basin are appended.

The drainage is designed using the Microdrainage WinDes software package and adopting FEH design rainfall.

BAILEY JOHNSON HAYES
CONSULTING ENGINEERS
Bailey Johnson Hayes
Grange House, John Dalton Street
Manchester. M2 6FW
Tel: 0161 279 7777 Fax: 0161 236 3552
Web: www.bjh.co.uk

Project	Project No.	Sheet No.
Plot 1, Skimmingdish Lane Bicester.	S1344	D-2
	Drawing No.	Rev.
		0
Section	By	Date
Surface Water Drainage	P.A.B.	March 2018
	Checked	Date

Calculations

Appended to these calculations are drawings as follows:

- S1340-DD01 Plot 3 Drained areas and pipe references.
- S1345-DD01A Plot 2 Drained areas and pipe references.
- S1344-DD01 Plot 1 Drained areas and pipe references.
- S1230-DD03 Basins 1 and 2.
- S1230-DD04 Basin 3.
- S1230-DD05 Basin 4.
- S1344-D02A Plot 1 SW Drainage Plan.

The below-ground drainage system is modelled in the System 1 module of WinDes, and then exported into the Simulation module where the car park retention basins, and Hydrobrake flow controls are included. For the purpose of design zero infiltration flow has been considered, in which case the results are conservative.

3.0 DRAINAGE DESIGN RESULTS

The modelled site as a whole has a total drained area of circa 9ha.

3.1 Source Control 100yr+30%CC storms

In order to establish the critical storm event a simple model is created within the Source Control module of Windes using a 95m x 95m x1m deep pond fitted with an Hydrobrake flow control device to restrict outflows to 17 l/sec.
Microdrainage pages 0-3 indicate that the critical storm is a 2880 minute winter event.

3.2 Simulation 30yr storms

Microdrainage pages 1-20 model details of a 30 year 15 minute winter event and include details of the entire sitewide drainage network, the four principal retention basins, and hydrobrake flow controls.
With the exception of one minor incidence of flooding (<1m ^{3}) at manhole 1A.17 in the service yard to Unit 1A, zero flooding is predicted to occur.

Microdrainage pages 21-68 indicate the results only for models of all 30 year design storms up to and including the critical 2880 minute event.

By inspection no flooding on Plot 1 is predicted to occur during 30 year storm events.

BAILEY JOHNSON HAYES
CONSULTING ENGINEERS
Bailey Johnson Hayes
Grange House, John Dalton Street
Manchester. M2 6FW
Tel: 0161 279 7777 Fax: 0161 236 3552
Web: www.bjh.co.uk

Project	Project No.	Sheet No.
Plot 1, Skimmingdish Lane Bicester.	S1344	D-3
	Drawing No.	Rev.
		0
Section	By	Date
Surface Water Drainage	P.A.B.	March 2018
	Checked	Date

Calculations

3.3 Simulation 100yr+30%CC storms

Microdrainage pages 100-119 model details of a 100 year +30%CC 30 minute winter event and include details of the entire sitewide drainage network, the four principal retention basins, and hydrobrake flow controls.
22m^3 of flooding is predicted to occur at manhole 1A.17 in the service yard to Unit 1A. 5m^3 of flooding is predicted to occur at manhole 1A.10 in the car park to Unit 1A.
23m^3 of flooding is predicted to occur at manhole 1B.17 and 1B.18 in the service yard to Unit 1B.
These volumes of surface flooding are remote from the buildings and will be temporarily held on the external hard surfaces until the storm abates.

Microdrainage pages 121-123 indicate the results only for a very short duration high intensity 100 year +30%CC 15 minute design storm. However the software highlights that the analysis maybe unstable.
A total of 51m^3 of flooding is predicted to occur at manholes 1A.5, 1A.16, and 1A.17 in the service yard to Unit 1A; a total of 66m^3 of flooding is predicted to occur at manholes 1B.1, 1B.2, 1B.17, and 1B.18 in the service yard to Unit 1B: this floodwater will result in temporary shallow standing water within the service yards.
A total of 40m^3 of flooding is predicted to occur at manholes 1A.6, 1A.7, and 1A.10 in the car park to Unit 1A. This equates to a temporary depth of less than 100mm of standing water over the centre of the car park which is remote from the building and considered acceptable for such extreme circumstances. 8m^3 of flooding is predicted to occur at manholes 1B.4 and 1B.5; this water will spill onto the site access roads where it can be temporarily stored at shallow depth.

Microdrainage pages 124-167 indicate the results only for remaining models of all 100 year +30%CC design storms up to and including the critical 2880 minute event. Zero flooding is predicted on Plot 1 for the 60min design storm and above. The maximum predicted water level in Basin 3 is 69.39m AOD i.e. a depth of circa 765mm.

4.0 Exceedance events

To safeguard the buildings on Plot 1 in the event of exceedance, the access road between Units 1A and 1B is maintained below the building floor levels such that any build-up of surface water will naturally run down the service yard of Unit 1B and in a south easterly direction towards Langford Brook.

APPENDIX A

BAILEY JOHNSON HAYES DRAWINGS

S1340-DD01 – Plot 3 Drained Areas/Pipe Refs

S1345-DD01A – Plot 2 Drained Areas/Pipe Refs

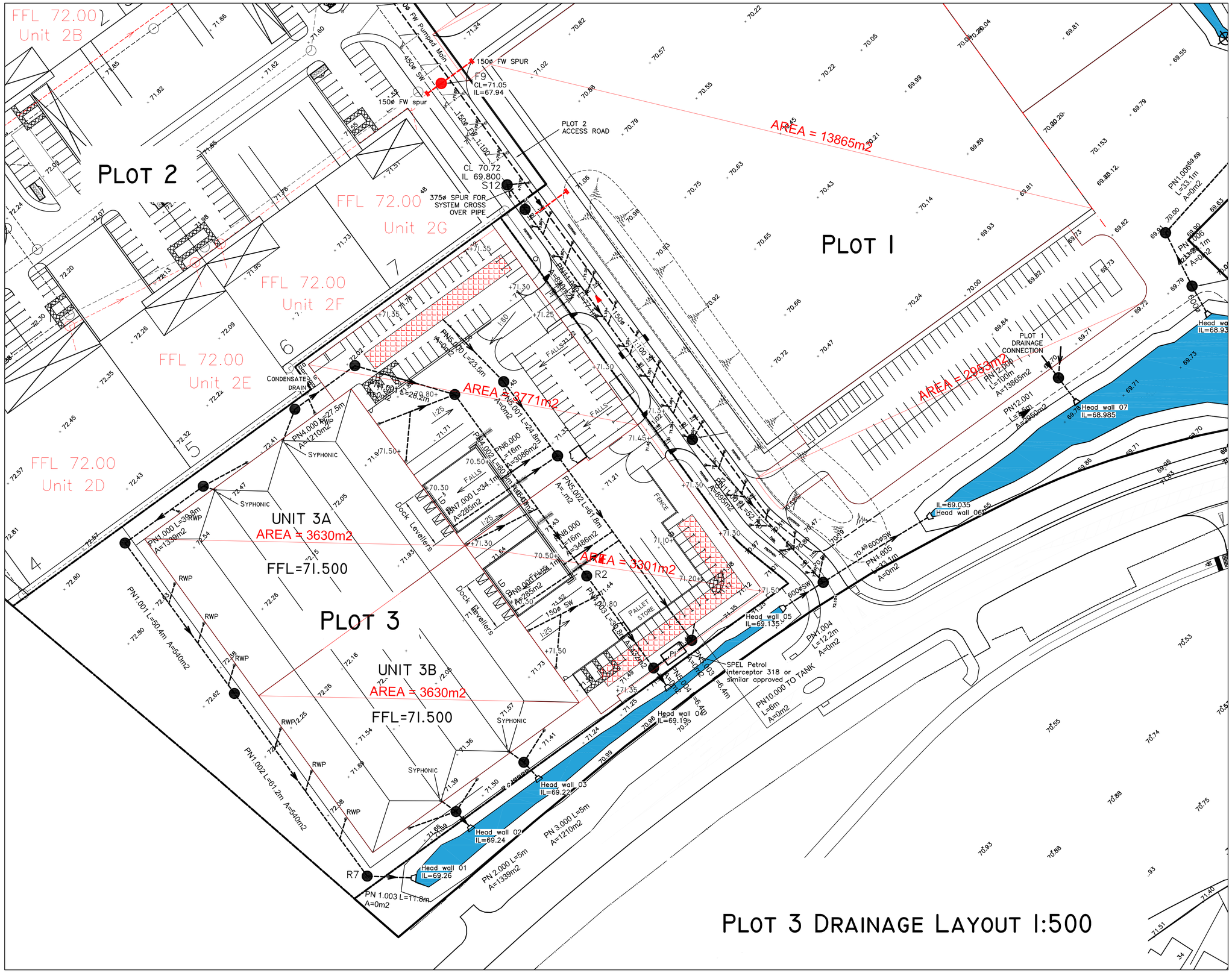
S1344-DD01 – Plot 1 Drained Areas/Pipe Refs

S1230-DD03 – Basins 1 & 2

S1230-DD04 – Basin 3

S1230-DD05 – Basin 4

S1344-D02A – Plot 1 SW Drainage Plan



PLOT 3 DRAINAGE LAYOUT 1:500

Rev	Date	Revision Description
.	.	.

Revision Schedule

INFORMATION

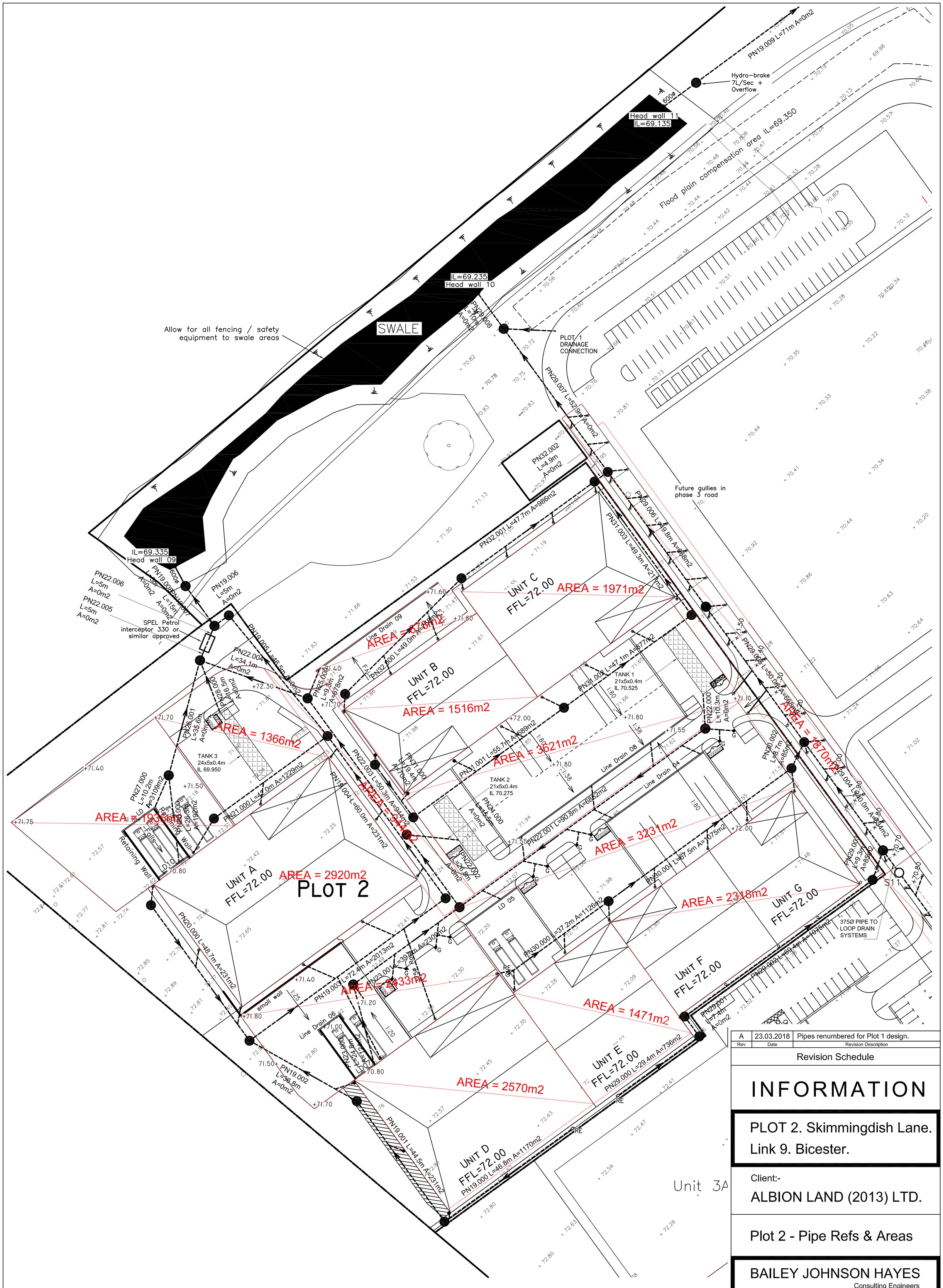
PLOT 3. Skimmingdish Lane.
Link 9. Bicester.

Client:-
ALBION LAND (2013) LTD.

Plot 3 - Drained Areas

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton Street Tel 0161 279 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale	1:500 at A1	Project Ref.	Drawing No.	Rev.
Date	11.2017	S1340	DD01	.
Drn	BJH	Chkd BJH		



Rev	Date	Revision Description
A	23.03.2018	Pipes renumbered for Plot 1 design.

Revision Schedule

INFORMATION

PLOT 2. Skimmingdish Lane.
Link 9. Bicester.

Client:-
ALBION LAND (2013) LTD.

Plot 2 - Pipe Refs & Areas

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton Street Tel 0161 279 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale	1:500 at A1	Project Ref.	Drawing No.	Rev.
Date	11.2017	S1345	DD01	A
Drn BJH	Chkd BJH			

Rev	Date	Revision Description
.	.	.

Revision Schedule

INFORMATION

UNITS 1A & 1B
Skimmingdish La. Bicester

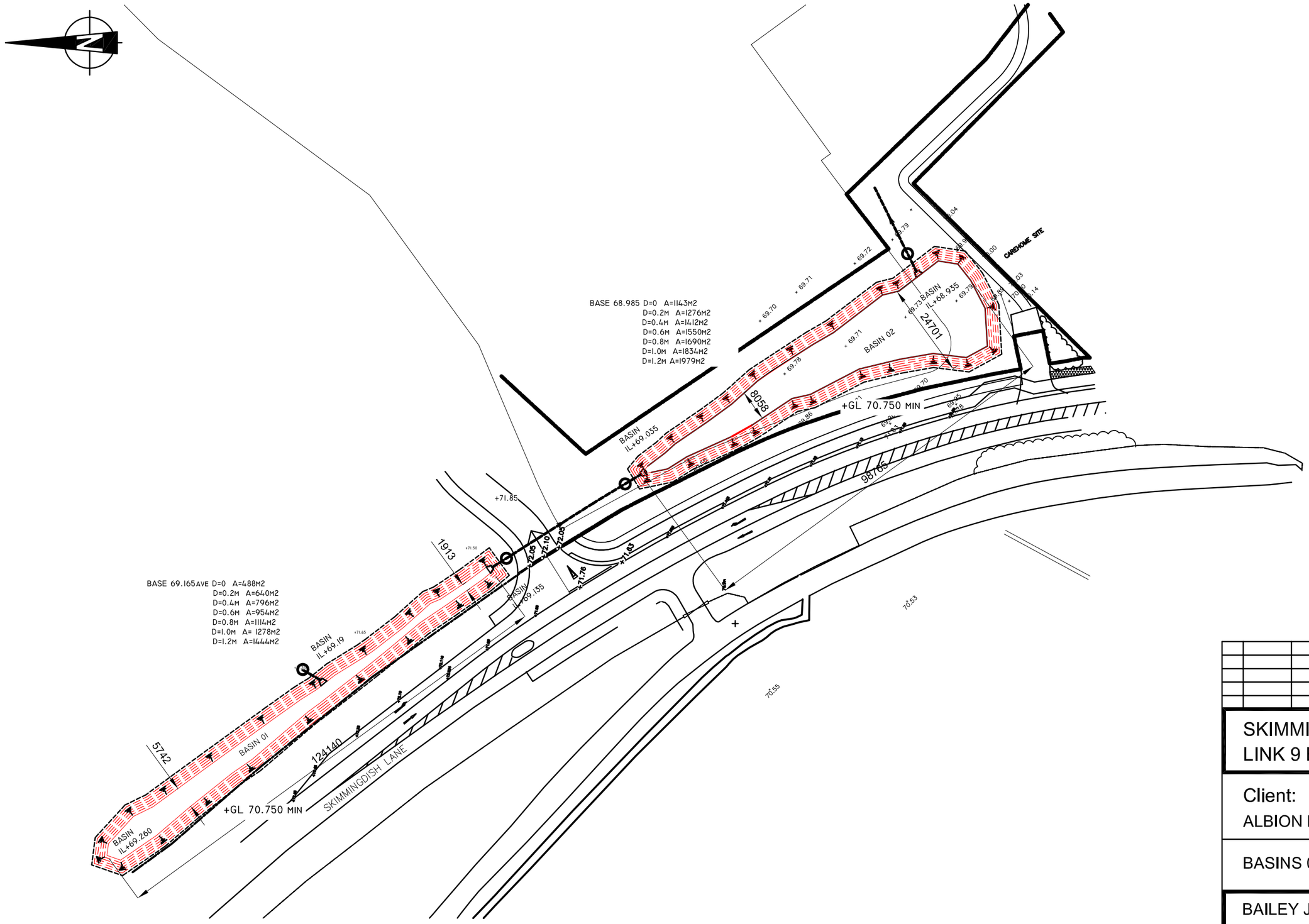
Client:-

ALBION LAND (2013) LTD

Plot 1 - SW Pipe Refs & Areas

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton Street Tel 0161 279 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale 1:500 at A0	Project Ref.	Drawing No.	Rev.
Date 00.00.00	S1344	DD01	.
Drn BJH Chkd BJH			



SKIMMINGDISH LANE
LINK 9 BICESTER

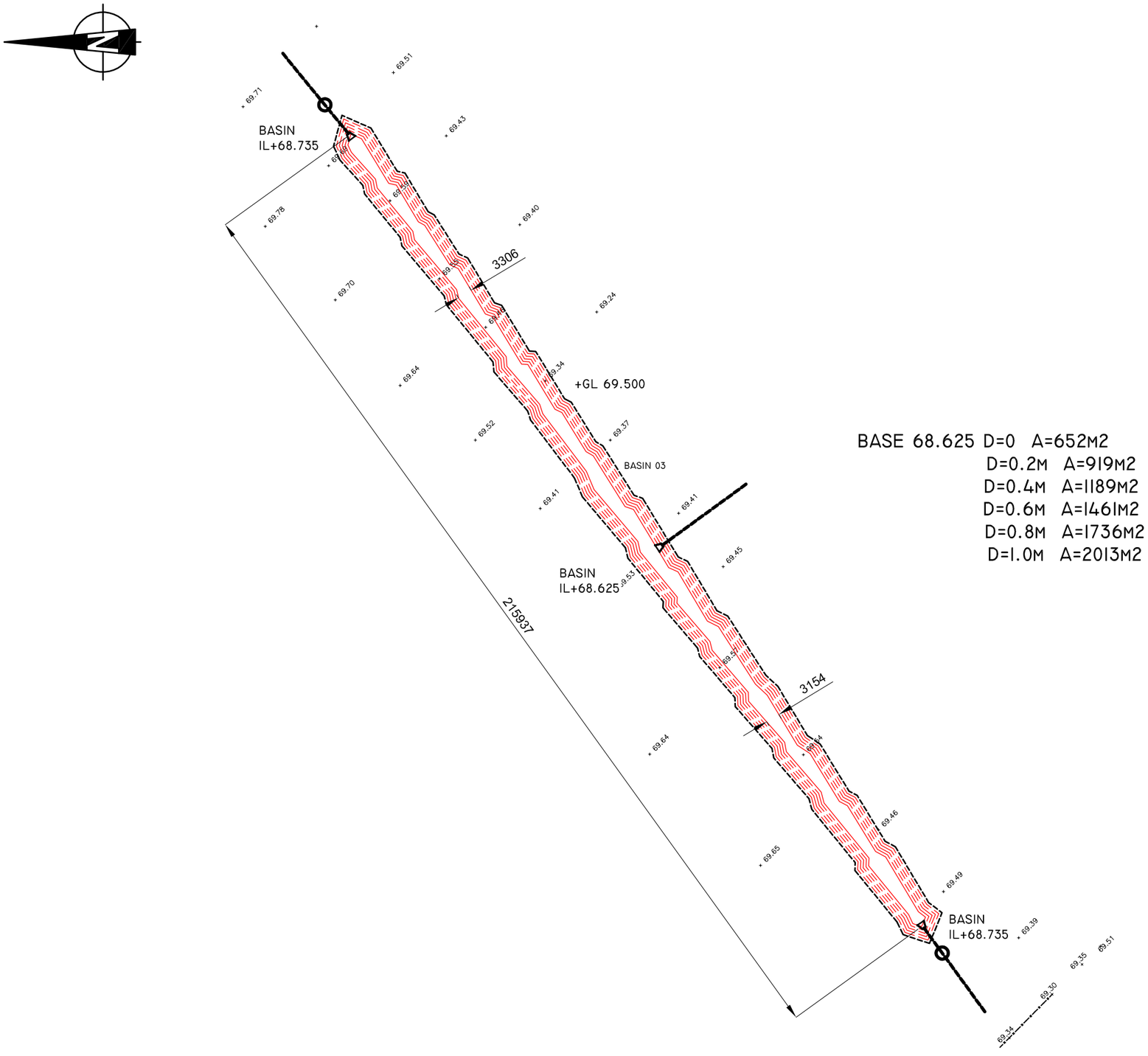
Client:
ALBION LAND (2013) LTD

BASINS 01 & 02 DETAILS

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton St. Tel 0161 279 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale	1:1000 at A3
Date	July 2017
Drawn	

S1230-DD03



BASE 68.625 D=0 A=652M2
D=0.2M A=919M2
D=0.4M A=1189M2
D=0.6M A=1461M2
D=0.8M A=1736M2
D=1.0M A=2013M2

SKIMMINGDISH LANE
LINK 9 BICESTER

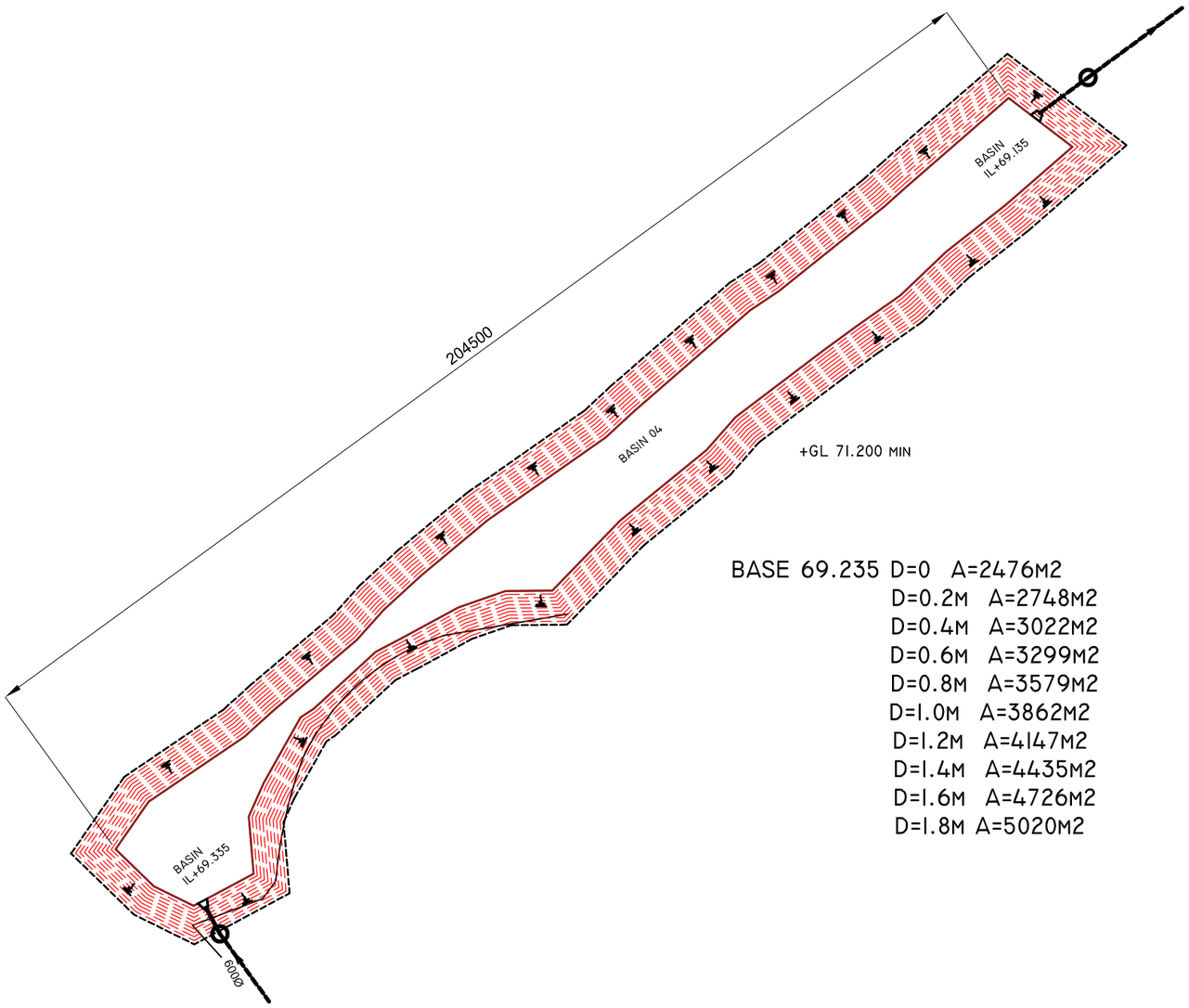
Client:
ALBION LAND (2013) LTD

BASIN 03 DETAILS

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton St. Tel 0161 278 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale 1:1000 at A3
Date July 2017
Drawn

S1230-DD04



BASE 69.235 D=0 A=2476M2
D=0.2M A=2748M2
D=0.4M A=3022M2
D=0.6M A=3299M2
D=0.8M A=3579M2
D=1.0M A=3862M2
D=1.2M A=4147M2
D=1.4M A=4435M2
D=1.6M A=4726M2
D=1.8M A=5020M2

SKIMMINGDISH LANE
LINK 9 BICESTER

Client:
ALBION LAND (2013) LTD

BASIN 04 DETAILS

BAILEY JOHNSON HAYES
Consulting Engineers
MANCHESTER : Grange House, John Dalton St. Tel 0161 278 7777 Fax 0161 236 3552
ST ALBANS : Phoenix House, 63 Campfield Road. Tel 01727 841172 Fax 01727 841085

Scale 1:500 at A3
Date July 2017
Drawn

S1230-DD05