S1209/210902/WB/LDD

BAILEY
JOHNSON
HAYES
CONSULTING ENGINEERS

PROPOSED COMMERCIAL DEVELOPMENT AXIS J9, HOWES LANE, BICESTER PHASE 3

SITE SPECIFIC FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

Bailey Johnson Hayes
Consulting Engineers

Tel: 01727 841172
Fax: 01727 841085
Email: wb@bjh.co.uk

S1209/September 2021
Issue 2

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

SITE SPECIFIC FLOOD RISK ASSESSMENT

INDEX

APPENDIX

September 2021
S1209/Issue 2

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

SITE SPECIFIC FLOOD RISK ASSESSMENT

1 DEVELOPMENT DESCRIPTION AND LOCATION

1a. What type of development is proposed and where will it be located?

The 14-Acre Site is located on Howes Lane, Bicester.

The proposed commercial Development is submitted for 181,920 sq ft as shown at **Appendix A**. Cornish Architects Plan numbered 20019-TP-002F. The Site has Planning Permission previously for 150 houses.

1b. What is its vulnerability classification?

The Scheme is classified as "less vulnerable".

1c. Is the proposed development consistent with the Local Development Documents?

The Development is consistent with the Local Development Plan.

1d. Please provide evidence that the Sequential Test or Exception Test has been applied in the selection of this site for this development type?

The Site is located in Flood Zone 1 Area and therefore the Site is appropriate.

2 DEFINITION OF THE FLOOD HAZARD

2a. What sources of flooding could affect the site?(see Annex C PPS25).

We have considered all sources of potential flooding as follows:-

Fluvial (Rivers)

- Inundation of floodplains from rivers and watercourses
- Inundation of areas outside the floodplain due to influence of bridges, embankments and other features that artificially raise water levels
- Overtopping of defences
- Breaching of defences
- Blockages of culverts
- Blockages of flood channels, or flood corridors.

Tidal

- Sea
- Estuary
- Overtopping of defences
- Breaching of defences
- Other flows (fluvial surface water) that could pond due to tide locking
- Wave action.

Surface Water

- Sheet run – off from adjacent land (urban or rural)
- Surcharged sewers (Combined, foul or surface water sewers).

Groundwater

- Water table rising after prolonged rainfall to emerge above ground level remote from a watercourse.
- Most likely to occur in low lying areas underlain by permeable rock (aquifers).
- Groundwater recovery after pumping has ceased for mining or industry.

Infrastructure Failure

- Reservoirs
- Canals
- Industrial processes
- Burst water mains
- Blocked sewers or failed pumping stations.

The site does not have a history of Flooding and only localised flooding could occur due to blocked or inadequate drainage facilities.

2b. *For each identified source, describe how flooding would occur, with reference to any historic records wherever these are available.*

The Site does not have a history of flooding.

2c. *What are the existing surface water drainage arrangements for the site?*

Surface Water from the Site outfalls into the existing ditches along Howes Lane.

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

3 PROBABILITY

3a. Which flood zone is the site within?

The Site is within Flood Zone 1 – see attached Environment Agency Maps (**Appendix B**).

3b. If there is a Strategic Flood Risk Assessment covering this site, what does it show?

Yes and this confirms that the Site is at low risk of flooding.

3*c. What is the probability of the site flooding taking account of the contents of the SFRA and of any further site specific assessment?*

The Land is assessed as having less than 1 in 1000 annual probability of river or sea flooding.

3d. What are the existing rates and volumes of run-off generated by the site?

The Greenfield Run-Off for the Site is assessed at 22.11 l/sec for the QBAR average storm event.

4 CLIMATE CHANGE

4a. How is flood risk at the site likely to be affected by Climate Change?

It is accepted that climate Change is occurring however this Site is unlikely to be at risk of flooding. The risk should remain in Zone 1, i.e. 1 in 1000.

4b. The Drainage Scheme is designed for a 100 year event + 40% for Climate Change.

5 DETAILED DEVELOPMENT PROPOSALS

5a. Provide details of the development layout, referring to the relevant drawings.

.

Refer to Cornish Architects' Plan 20019-TP-002E (**Appendix A**) and BJH Concept Drainage Layout Plan (**Appendix C**).

The Drainage proposals allow for restricting the flows to the ditch alongside Howes Lane to "Greenfield" Run-Off using on-site swales/ponds and retention tanks.

5b. Where appropriate, demonstrate how land-uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding.

There are no areas of the Site which are sensitive to flood risk.

6 FLOOD RISK MANAGEMENT MEASURES

6a. How will the site be protected from flooding, including the potential impacts of climate change, over the development s lifetime?

The on-site Drainage Systems will be designed for a 1 in 100 year + 40% Climate Change Storm event.

Please see Table below summarizing the Flood Risk:

Flood Source	**Potential Risk**				**Description**
	High	**Medium**	**Low**	**None**	
Fluvial/River/Sea				X	Located within Environment Agency River Flood Zone 1
Groundwater			X		No recorded history of Groundwater flooding
Canals				X	None present on or adjacent to site
Reservoirs				X	The site is outside the zone of reservoir failure risk
Sewers				X	None present on or adjacent to site
Surface Water Runoff/Flows			X		Levels locally are shallow falls, significant exceedance runoff unlikely with infiltration
Effect of development on wider catchment			X		Increase in the number of impermeable surfaces such as roofs and yards

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7 WATER QUALITY

A Water Quality Assessment (WQA) has been undertaken below to assess the potential hazards from the site and the appropriateness of the SuDS features considered. The 'Simple Index Approach' from The SuDS Manual is used as follows:

Step 1 – Define Pollution Hazard Indices

7a. An assessment has been undertaken in Table 5.1 to define the potential level of hazard from different drained surfaces within the proposed development.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Typical Industrial Roof	Low	0.3	0.3	0.05
Non-residential car parking e.g. offices	Low	0.5	0.4	0.4
Commercial Yard and Delivery Area and Parking	Medium	0.7	0.6	0.7
Sites with lorry parks and approaches to industrial estates	High	0.8	0.8	0.9

Note: The indices range from 0 (no pollution hazard) to 1 (high pollution hazard).

Step 2 – Determine SuDS Pollution Mitigation Indices

7b. To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type):

Total SuDS mitigation index ≥ *Pollution Hazard Index*
(for each contaminant type) (for each contaminant type)

Where the only destination of the runoff is to surface water – that is there is no infiltration from the SuDS to the groundwater – the surface water indices should be used. Where the principal destination of the runoff is to groundwater, but discharges to surface waters may occur once the infiltration capacity is exceeded, the groundwater indices should be used. The risk to surface waters will be low, as dilution will be high for large events, so treatment is not required.

The table below indicates the mitigation indices of SuDS features used to discharge groundwater.

Indicative SuDS mitigation indices for discharges to surface waters:

	Mitigation Indices		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Swale	0.5	0.6	0.6
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Proprietary treatment systems	**These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.**		

Step 3 – Conclusions and Recommendations

7c. For roof water drainage it is suggested that flows from this surface type are directed to any of the SuDS options available. Generally, low contamination is expected from the roof and therefore all proposed SuDS solutions satisfy the water quality requirements. It would be preferential to outlet into an open feature so that if any small wildlife became trapped in the system they would be able to escape more easily.

7d. Permeable paving is an option within the car parking areas. In terms of water quality, it is completely satisfied for water quality indices due to the nature of runoff filtering through the open graded stone. Thereafter, it gets a second layer of filtration as it moves into the appropriate soil. Permeable paving would be highly recommended in the car parks as it would also reduce the impermeable area of the site and mimic existing drainage.

7e. Surface water generated by yards and delivery areas is considered a 'Medium' water pollution hazard from Table 5.1. Runoff generated in these areas would not be adequately treated by infiltration basins or swales alone. As a result, a petrol interceptor has been specified to treat runoff to acceptable EA standard levels for each unit. This approach is considered adequate to treat runoff, subject to implementation of a certified petrol interceptors.

7f. As proposals are at outline stage and details or end user requirements remain unclear an assessment has been made based on moderate industrial use at the development. Multiple features benefiting water quality like Permeable paving, Swales and Infiltration Basins have been considered for this site. If these SuDS features were adopted in detailed design then water quality would be discharged at an acceptable quality.

Surface Water Drainage Proposals

7g. The concept surface water drainage strategy has been prepared based on the Illustrative Scheme in line with Oxfordshire County Council's (LLFA) guidance for Surface Water

Drainage, together with national guidance and industry best practice. The drainage strategy is summarised below based on this and explanation is provided for sub-catchments allocation, impermeable drained areas, potential discharge strategy, greenfield runoff rates, infiltration rates for design, storage volume estimates and SuDS features application.

The proposed concept drainage & external works schemes are presented by Bailey Johnson Hayes in **Appendix C**. The following SuDS features have been proposed:

- Swales
- Permeable Paving
- Petrol Interceptors
- Catchpits, Gullies and Line Drains
- Flows control devices

8 OFF SITE IMPACTS

8*a.* *How will you ensure that your proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?*

Surface Water out-flows from the Site will be restricted to less than "Greenfield" run-off at 10 l/sec (**see Appendix D**).

8b. *How will you prevent run-off from the completed development causing an impact elsewhere?*

On-site swales and ponds.

9 RESIDUAL RISKS

9a. *What flood-related risks will remain after you have implemented the measures to protect the site from flooding?*

The flood risk on completion of the Development will be low and only related to blockages to pipework.

9b. *How, and by whom, will these risks be managed over the lifetime of the development.*

The Drainage Systems will be managed by the Site Management Company as per the management and maintenance plan (**See Appendix F)** for the rest of the Axis J9 development.

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

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W Bailey C.Eng., F.I.Struct.E., M.I.C.E.
On behalf of Bailey Johnson Hayes

Bailey Johnson Hayes
Consulting Engineers
2nd September 2021

September 2021
S1209/Issue 2

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

APPENDIX A

Cornish Architects Plan 20019-TP-002F

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Schedule of approximate areas																
UNIT	Ground Floor GEA sm	Ground Floor GEA sf	First Floor GEA sm	First Floor GEA sf	Second Floor GEA sm	Second Floor GEA sf	Total Unit GEA sm	Total Unit GEA sf	Ground Floor GIA sm	Ground Floor GIA sf	First Floor GIA sm	First Floor GIA sf	Second Floor GIA sm	Second Floor GIA sf	Total Unit GIA sm	Total Unit GIA sf	Car Parking
1	1830	19698	224	2411	0	0	**2054**	**22109**	1759	18934	195	2104	0	0	**1954**	**21038**	23
2	1665	17922	202	2174	0	0	**1867**	**20096**	1613	17362	179	1929	0	0	**1792**	**19291**	21
3	1717	18482	211	2271	0	0	**1928**	**20753**	1650	17761	183	1973	0	0	**1833**	**19734**	21
4	4412	47491	272	2928	272	2928	**4956**	**53346**	4278	46048	238	2558	238	2558	**4753**	**51165**	53
5	3552	38234	478	5145	0	0	**4030**	**43379**	3433	36953	423	4553	0	0	**3814**	**41059**	42
6	527	5673	0	0	0	0	**527**	**5673**	491	5285	0	0	0	0	**491**	**5285**	8
7	518	5576	0	0	0	0	**518**	**5576**	492	5296	0	0	0	0	**492**	**5296**	8
8	437	4704	0	0	0	0	**437**	**4704**	412	4435	0	0	0	0	**412**	**4435**	8
9	351	3778	0	0	0	0	**351**	**3778**	328	3531	0	0	0	0	**328**	**3531**	7
10	466	5016	0	0	0	0	**466**	**5016**	430	4629	0	0	0	0	**430**	**4629**	8
11	651	7007	0	0	0	0	**651**	**7007**	600	6458	0	0	0	0	**600**	**6458**	7
TOTAL	**16126**	**173580**	**1387**	**14930**	**272**	**2928**	**17785**	**191438**	**15486**	**166691**	**1219**	**13118**	**238**	**2558**	**16901**	**181920**	**206**

NOTES

Subject to Statutory Approvals.

Subject to Highways Development.

- Perameters Boundary
- Planning Site Boundary
- Ownership Boundary
- Notional Boundary
- Hedgerow Protection
- SLR License
- 2.5m high acoustic fence
- 4m high acoustic fence with acoustic gates

Rev	Description	Chk	Date
F	Site Boundary Updated	CS	02/09/2021
E	Site Boundary updated	CS	31/08/2021
D	Acousitc fences added	SK	20/08/2021
C	Sheet number amended. Road layout updated. Areas updated.	SK	16/08/2021
B	Paving around units 1-3 yards adjusted. Acoustic fence added and landscaping adjusted between units 10 and 11.	SK	29/07/2021
A	Units 6-11 moved further into the site to acheive 10m buffer to eastern site ownership boundary	SK	16/07/2021

Peer House
8 -14 Verulam Street
London WC1X 8LZ

tel +44(0)20 7400 2120

enquiries@cornisharchitects.com
www.cornisharchitects.com

RIBA Chartered Practice

cornisharchitects

Project Title.
PHASE 3 AXIS J9 BICESTER

Drawing Title.
PROPOSED SITE PLAN

Drawing Status.
TOWN PLANNING

Scale.
0 10 metres 80

Drawn By.	Scale.	Date.	Chk'd By.
S K	1:1000 @ A1	08/07/2021	C S

ALBION LAND

Drawing No. 20019 - TP - 002 Rev. F

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

APPENDIX B

Environment Agency Flood Map for Planning

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Flood map for planning

Your reference	Location (easting/northing)	Created
Axis J9, P3	**456540/223265**	**25 Aug 2021 15:07**

Your selected location is in flood zone 1, an area with a low probability of flooding.

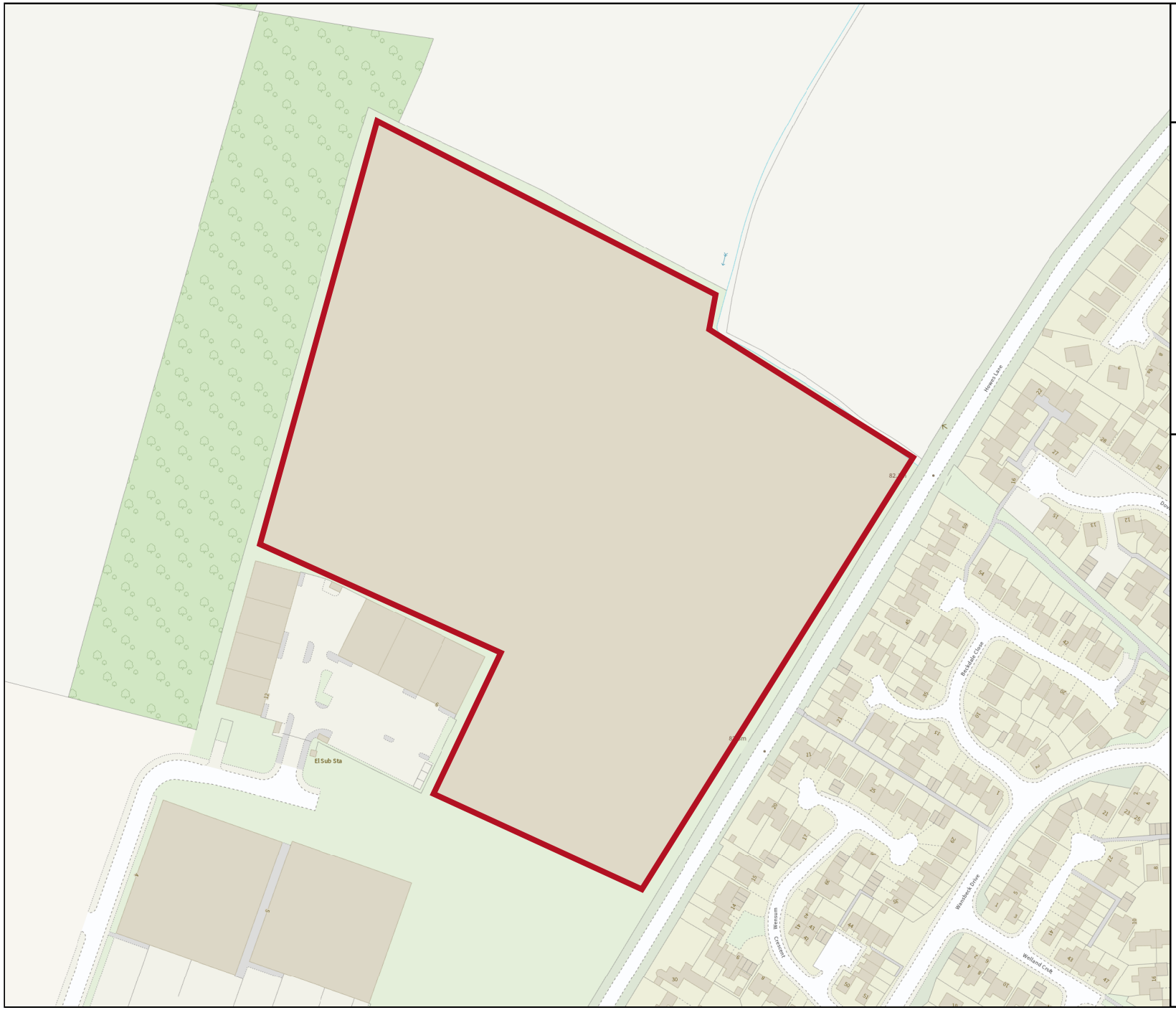
This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
Axis J9, P3

Location (easting/northing)
456540/223265

Scale
1:2500

Created
25 Aug 2021 15:07

- Selected area
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

PROPOSED COMMERICAL DEVELOPMENT, AXIS J9, HOWES LANE, BICESTER - PHASE 3

APPENDIX C

BJH Concept Drainage Plans:

S1209-PH3-02C – SW Drainage Layout
S1209-PH3-03C – FW Drainage Layout
S1209-PH3-04B – External Works & Levels
S1209-PH3-05 – Typical Drainage Details

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A1

SURFACE WATER MANHOLE / INSPECTION CHAMBER SCHEDULE

MH REF	CL	IL	DEPTH	DIA	OPENING	COVER	COMMENTS
S1	83.450	81.250	2200	1800	2/600x600	D400	Hydrobrake 7 l/s + Wier Overflow 82.850m
S2	84.100	81.700	2700	1800	600x600	D400	300mm Catchpit
S3	84.100	81.850	2250	1800	600x600	D400	.
S4	83.600	81.950	1650	1800	600x600	D400	.
S5	83.700	82.200	1500	1500	600x600	D400	.
S6	83.700	82.425	1275	1350	600x600	D400	.
S7	83.700	82.525	1175	1200	600x600	D400	300mm Catchpit
S8	84.100	82.450	1650	1350	600x600	D400	.
S9	84.100	83.150	950	600	600x600	D400	600m Dia. PPIC 150mm Concrete Encased
S10	84.100	82.100	2000	1200	600x600	D400	.
S11	84.100	82.550	1550	1200	600x600	D400	.
S12	83.800	82.425	1375	1200	600x600	D400	.
S13	83.800	82.275	1525	1200	600x600	D400	.
S14	83.800	82.650	1150	1200	600x600	D400	.
S15	83.850	81.725	2125	1350	600x600	D400	.
S16	84.100	82.100	2000	1350	600x600	D400	.
S17	84.100	82.250	1850	1350	600x600	D400	.
S18	84.100	82.425	1675	1200	600x600	D400	.
S19	84.000	82.775	1225	1200	600x600	D400	.
S20	84.000	82.050	1950	1200	600x600	D400	300mm Catchpit
S21	84.150	82.350	1800	1350	600x600	D400	.
S22	84.150	82.500	1650	1350	600x600	D400	.
S23	84.200	82.675	1525	1200	600x600	D400	.
S24	84.300	83.100	1200	1200	600x600	D400	.
S25	84.200	82.500	1700	1200	600x600	D400	.
S26	84.200	82.875	1325	1200	600x600	D400	.
S27	83.000	80.900	2100	1800	2/600x600	D400	Hydrobrake 3 l/s + Wier Overflow 82.200m
S28	83.100	81.300	1800	1200	600x600	D400	.
S29	83.200	81.200	2300	1350	600x600	D400	300mm Catchpit
S30	83.000	81.575	1425	1350	600x600	D400	.
S31	83.000	81.750	1250	1200	600x600	D400	.
S32	83.100	81.950	1150	1200	600x600	D400	.
S33	82.750	81.700	1050	1200	600x600	D400	.
S34	83.100	81.300	2100	1350	600x600	D400	.
S35	83.100	81.390	1710	1350	600x600	D400	.
S36	83.100	81.500	1600	1350	600x600	D400	.
S37	83.100	81.875	1225	1200	600x600	D400	.
S38	83.100	82.150	950	600	600x600	D400	600m Dia. PPIC 150mm Concrete Encased
S39	83.100	81.625	1475	1200	600x600	D400	.
S40	83.100	81.850	1250	1200	600x600	D400	.

NOTE: ALL DRAINAGE IS INVERT TO INVERT MANHOLE DESIGN

NOTE: ALL RWP PIPE POSITIONS TO BE AGREED WITH ARCHITECT

Phase 3 SW Drainage Layout 1:1000

DRAINAGE NOTES

1 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND BAILEY JOHNSON HAYES DRAWINGS AND SPECIFICATIONS.

2 DRAINS TO BE 'HEPWORTH SUPERSLEEVE' LAID IN CLASS S BEDDING TO BS 882 1983: TABLE 4, OR TO BS 8301 1985: APPENDIX D. 450 DIA DRAINS AND ABOVE TO BE HEPWORTH CONCRETE PIPES CLASS H . OR EQUAL APPROVED DRAINS WITHIN THE SITE MAY BE THERMOPLASTIC STRUCTURED WALL PIPE IN ACCORDANCE WITH CLAUSE E2.22 OF SFA 8th EDITION

3 ALL TRENCHES WITHIN TRAFFICKED AREAS TO BE BACKFILLED WITH 75 MM DOWN GRADED STONE FILL, PLACED AND COMPACTED IN 150 MM LAYERS. ALL PIPES IN ROADWAYS, SERVICE YARDS AND CARPARKS LESS THAN 1200 MM DEEP TO BE ENCASED IN CONCRETE. PROVIDE FLEXIBLE JOINTS AT 3 METRE CENTRES.

4 MANHOLES TO BE CONSTRUCTED IN PRECAST CONCRETE RINGS TO BS 5911: PART 1. RINGS TO BE BEDDED IN SEALANT STRIPS.

5 MANHOLES IN FOOTPATHS OR LANDSCAPED AREAS TO BE BACKFILLED WITH 40 MM DOWN GRADED STONE FILL, COMPACTED IN LAYERS NOT EXCEEDING 150 MM THICK. MANHOLES BENEATH ROADS AND PARKING AREAS TO BE CASED IN 150 MM CONCRETE SURROUND.

6 ALL CONNECTIONS TO RAIN WATER PIPES TO BE PROVIDED WITH RODDING ACCESS.

7 ALL ROAD GULLIES TO BE HEPWORTH ROAD GULLIES., REF RGR4, WITH 150 MM DIAMETER OUTLETS. GULLIES TO BE ENCASED IN 150 MM MINIMUM CONCRETE.

8 DRAINS UNDER BUILDING AND WITHIN 300 MM OF THE UNDERSIDE OF FLOORSLAB TO BE ENCASED IN 150 MM CONCRETE. CASING TO INCORPORATE FLEXIBLE FIBRE BOARD JOINTS AT SPACINGS AS RECOMMENDED BY THE PIPE MANUFACTURER. DRAINS UNDER BUILDINGS GENERALLY TO HAVE MIN 100 FULL GRANULAR SURROUND TO CLASS S BS8301

9 WHERE PIPES RUN THROUGH GROUND BEAMS, FLEXIBLE JOINT CASINGS AT EACH FACE OF THE GROUND BEAM ARE TO BE PROVIDED. PIPES WHICH RUN UNDER GROUND BEAMS TO BE PROTECTED WITH 50 MM MINIMUM POLYSTYRENE PLACED OVER THE CROWN OF THE PIPE.

10 ALL WORK TO EXISTING PUBLIC SEWERS TO BE IN ACCORDANCE WITH SEWERS FOR ADOPTION 8TH EDITION AND BS 8301 : CODE OF PRACTICE FOR BUILDING DRAINAGE

11 WHERE DRAINS RUN CLOSE TO BUILDINGS AND INVERT LEVELS ARE BELOW FOUNDATIONS THE DRAINS SHOULD BE ENCASED AS FOLLOWS:-

(a) WHERE THE DRAIN TRENCH IS WITHIN 1M OF THE BUILDING THE TRENCH SHOULD BE FILLED WITH CONCRETE UP TO FOUNDATION FORMATION LEVEL or

(b) WHERE THE DRAIN TRENCH IS FURTHER THAN 1M OF THE BUILDING THE TRENCH SHOULD BE FILLED WITH CONCRETE TO A LEVEL BELOW FOUNDATION FORMATION EQUAL TO THE DISTANCE FROM THE BUILDING LESS 150mm.

KEY:

- ○ INDICATES GULLIES
- INDICATES SURFACE WATER MANHOLES
- INDICATES NEW PIPE RUNS
- INDICATES LINE DRAIN RUNS
- ▭ INDICATES EXISTING MANHOLES

ALL PIPES CONNECTED DIRECTY INTO GULLIES TO BE 150MM DIAMETER

20m 10m 0 20m 40m 60m

Scale 1:1000 @A1

PRELIMINARY

Rev	Date	Revision Description
C	02.09.21	Red line planning boundary adjusted
B	23.08.21	Updated to latest Architects layout, pipe sizes added & manholes scheduled
A	20.07.21	Updated Ditches, Mounds & SLR

Revision Schedule

Project Title: Axis J9 - Bicester

Client: ALBION LAND

Drawing Title: PHASE 3 SW Drainage Layout

BAILEY JOHNSON HAYES
Consulting Engineers
ST.ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST.ALBANS, Herts AL1 5FL
MANCHESTER: Grange House, John Dalton Street, MANCHESTER, M2 6FW

Scale	1:1000 @A1
Date	23.06.21
Drawn	JNG

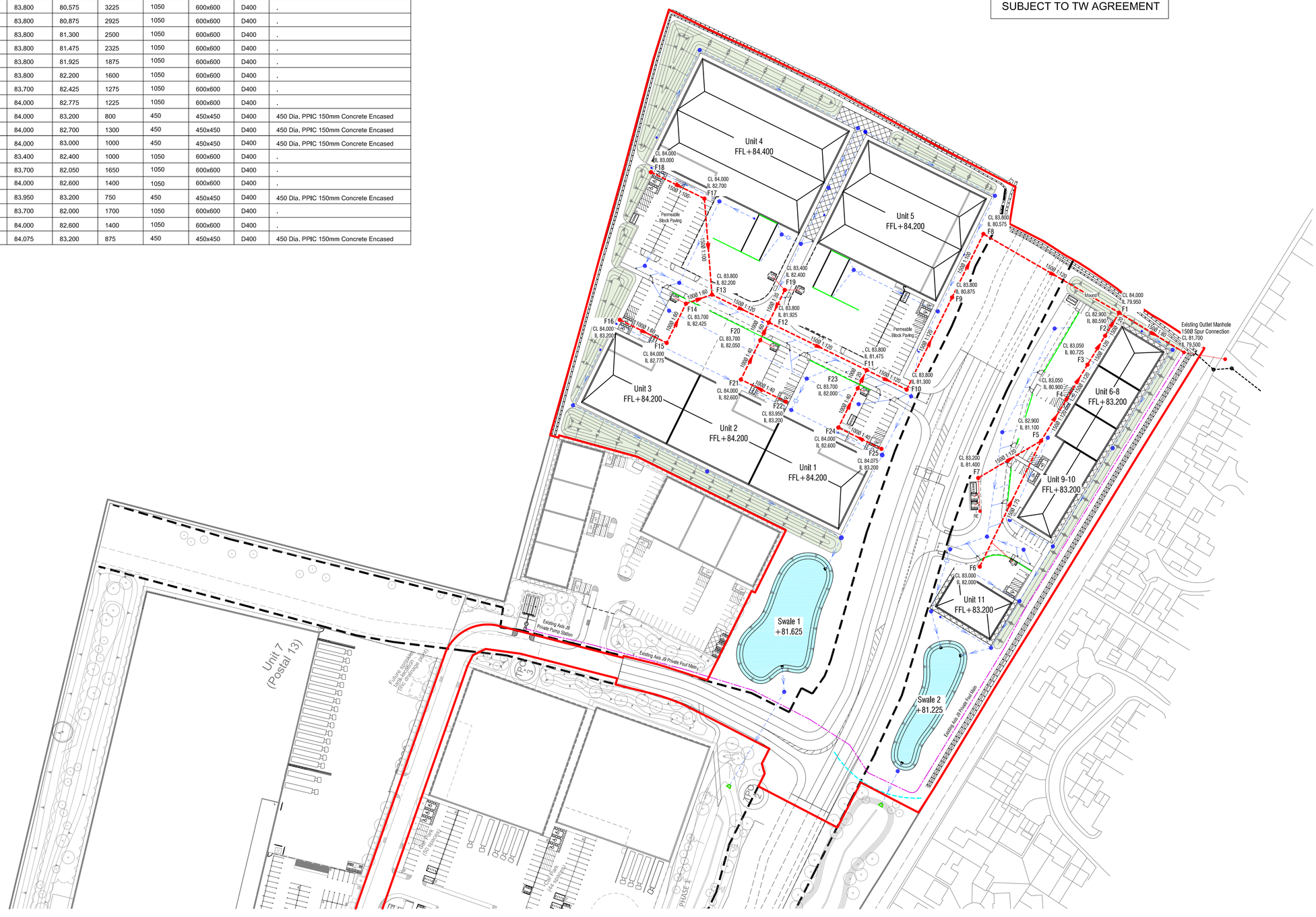
Drawing Number: S1209-PH3-02 C

A1

FOUL WATER MANHOLE / INSPECTION CHAMBER SCHEDULE

MH REF	CL	IL	DEPTH	DIA	OPENING	COVER	COMMENTS
F1	84.000	79.950	4050	1050	600x600	D400	.
F2	82.900	80.590	2310	1050	600x600	D400	.
F3	83.050	80.725	2325	1050	600x600	D400	.
F4	83.050	80.900	2150	1050	600x600	D400	.
F5	82.900	81.100	1800	1050	600x600	D400	.
F6	83.000	82.000	1000	1050	600x600	D400	.
F7	83.200	81.400	1800	1050	600x600	D400	.
F8	83.800	80.575	3225	1050	600x600	D400	.
F9	83.800	80.875	2925	1050	600x600	D400	.
F10	83.800	81.300	2500	1050	600x600	D400	.
F11	83.800	81.475	2325	1050	600x600	D400	.
F12	83.800	81.925	1875	1050	600x600	D400	.
F13	83.800	82.200	1600	1050	600x600	D400	.
F14	83.700	82.425	1275	1050	600x600	D400	.
F15	84.000	82.775	1225	1050	600x600	D400	.
F16	84.000	83.200	800	450	450x450	D400	450 Dia. PPIC 150mm Concrete Encased
F17	84.000	82.700	1300	450	450x450	D400	450 Dia. PPIC 150mm Concrete Encased
F18	84.000	83.000	1000	450	450x450	D400	450 Dia. PPIC 150mm Concrete Encased
F19	83.400	82.400	1000	1050	600x600	D400	.
F20	83.700	82.050	1650	1050	600x600	D400	.
F21	84.000	82.600	1400	1050	600x600	D400	.
F22	83.950	83.200	750	450	450x450	D400	450 Dia. PPIC 150mm Concrete Encased
F23	83.700	82.000	1700	1050	600x600	D400	.
F24	84.000	82.600	1400	1050	600x600	D400	.
F25	84.075	83.200	875	450	450x450	D400	450 Dia. PPIC 150mm Concrete Encased

NOTE: FOUL DISCHARGE IS SUBJECT TO TW AGREEMENT



DRAINAGE NOTES

1 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND BAILEY JOHNSON HAYES DRAWINGS AND SPECIFICATIONS.

2 DRAINS TO BE 'HEPWORTH SUPERSLEEVE' LAID IN CLASS S BEDDING TO BS 882 1983; TABLE 4, OR TO BS 8301 1985; APPENDIX D. 450 DIA DRAINS AND ABOVE TO BE HEPWORTH CONCRETE PIPES CLASS H . OR EQUAL APPROVED DRAINS WITHIN THE SITE MAY BE THERMOPLASTIC STRUCTURED WALL PIPE IN ACCORDANCE WITH CLAUSE E2.22 OF SFA 8th EDITION

3 ALL TRENCHES WITHIN TRAFFICKED AREAS TO BE BACKFILLED WITH 75 MM DOWN GRADED STONE FILL, PLACED AND COMPACTED IN 150 MM LAYERS. ALL PIPES IN ROADWAYS, SERVICE YARDS AND CARPARKS LESS THAN 1200 MM DEEP TO BE ENCASED IN CONCRETE. PROVIDE FLEXIBLE JOINTS AT 3 METRE CENTRES.

4 MANHOLES TO BE CONSTRUCTED IN PRECAST CONCRETE RINGS TO BS 5911: PART 1. RINGS TO BE BEDDED IN SEALANT STRIPS.

5 MANHOLES IN FOOTPATHS OR LANDSCAPED AREAS TO BE BACKFILLED WITH 40 MM DOWN GRADED STONE FILL, COMPACTED IN LAYERS NOT EXCEEDING 150 MM THICK. MANHOLES BENEATH ROADS AND PARKING AREAS TO BE CASED IN 150 MM CONCRETE SURROUND.

6 ALL CONNECTIONS TO RAIN WATER PIPES TO BE PROVIDED WITH RODDING ACCESS.

7 ALL ROAD GULLIES TO BE HEPWORTH ROAD GULLIES., REF RGR4, WITH 150 MM DIAMETER OUTLETS. GULLIES TO BE ENCASED IN 150 MM MINIMUM CONCRETE.

8 DRAINS UNDER BUILDING AND WITHIN 300 MM OF THE UNDERSIDE OF FLOORSLAB TO BE ENCASED IN 150 MM CONCRETE. CASING TO INCORPORATE FLEXIBLE FIBRE BOARD JOINTS AT SPACINGS AS RECOMMENDED BY THE PIPE MANUFACTURER. DRAINS UNDER BUILDINGS GENERALLY TO HAVE MIN 100 FULL GRANULAR SURROUND TO CLASS S BS8301

9 WHERE PIPES RUN THROUGH GROUND BEAMS, FLEXIBLE JOINT CASINGS AT EACH FACE OF THE GROUND BEAM ARE TO BE PROVIDED. PIPES WHICH RUN UNDER GROUND BEAMS TO BE PROTECTED WITH 50 MM MINIMUM POLYSTYRENE PLACED OVER THE CROWN OF THE PIPE.

10 ALL WORK TO EXISTING PUBLIC SEWERS TO BE IN ACCORDANCE WITH SEWERS FOR ADOPTION 8TH EDITION AND BS 8301 : CODE OF PRACTICE FOR BUILDING DRAINAGE

11 WHERE DRAINS RUN CLOSE TO BUILDINGS AND INVERT LEVELS ARE BELOW FOUNDATIONS THE DRAINS SHOULD BE ENCASED AS FOLLOWS:-

(a) WHERE THE DRAIN TRENCH IS WITHIN 1M OF THE BUILDING THE TRENCH SHOULD BE FILLED WITH CONCRETE UP TO FOUNDATION FORMATION LEVEL or

(b) WHERE THE DRAIN TRENCH IS FURTHER THAN 1M OF THE BUILDING THE TRENCH SHOULD BE FILLED WITH CONCRETE TO A LEVEL BELOW FOUNDATION FORMATION EQUAL TO THE DISTANCE FROM THE BUILDING LESS 150mm.

KEY:

- ○ INDICATES GULLIES
- INDICATES FOUL WATER MANHOLES
- INDICATES NEW PIPE RUNS
- ▭ INDICATES EXISTING MANHOLES

ALL PIPES CONNECTED DIRECTY INTO GULLIES TO BE 150MM DIAMETER

20m 10m 0 20m 40m 60m

Scale 1:1000 @A1

Phase 3 FW Drainage Layout 1:1000

PRELIMINARY

Rev	Date	Revision Description
C	02.09.21	Red line planning boundary adjusted
B	23.08.21	Updated to latest Architects layout, pipe sizes added & manholes scheduled
A	20.07.21	Updated Ditches, Mounds & SLR

Revision Schedule

Project Title: Axis J9 - Bicester

Client: ALBION LAND

Drawing Title: PHASE 3 FW Drainage Layout

BAILEY JOHNSON HAYES
Consulting Engineers
ST.ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST.ALBANS, Herts AL1 5FL
MANCHESTER: Grange House, John Dalton Street, MANCHESTER, M2 6FW

Scale	1:1000 @A1
Date	23.06.21
Drawn	JNG

Drawing Number: S1209-PH3-03 C

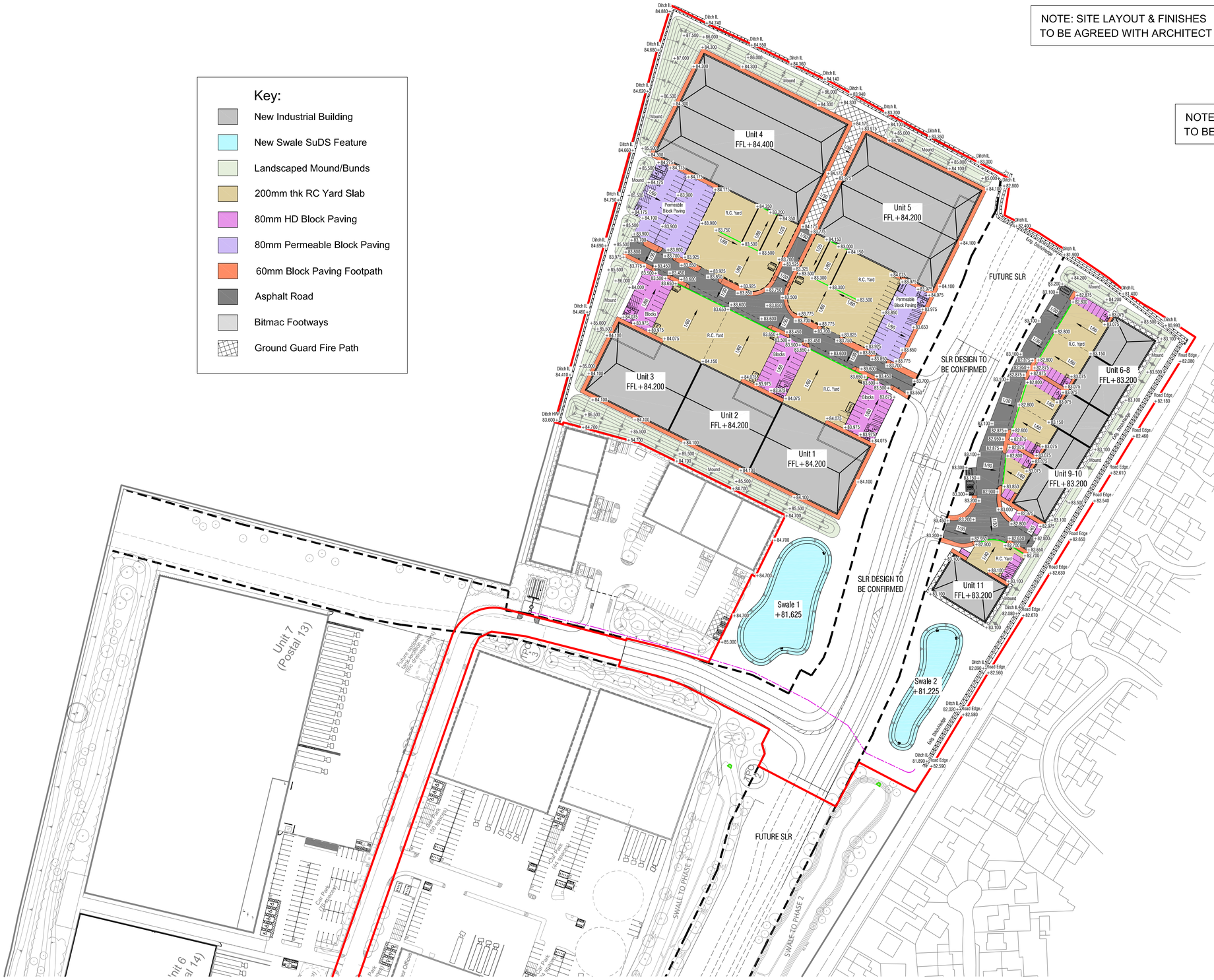
A1

NOTE: SITE LAYOUT & FINISHES TO BE AGREED WITH ARCHITECT

NOTE: LANDSCAPING SCHEME TO BE AGREED WITH ARCHITECT

Key:

- New Industrial Building
- New Swale SuDS Feature
- Landscaped Mound/Bunds
- 200mm thk RC Yard Slab
- 80mm HD Block Paving
- 80mm Permeable Block Paving
- 60mm Block Paving Footpath
- Asphalt Road
- Bitmac Footways
- Ground Guard Fire Path



Phase 3 External Works & Levels 1:1000

20m 10m 0 20m 40m 60m

Scale 1:1000 @A1

PRELIMINARY

Rev	Date	Revision Description
B	02.09.21	Red line planning boundary adjusted
A	23.08.21	Updated to latest Architects layout, all levels raised 200mm & minor revs

Revision Schedule

Project Title

Axis J9 - Bicester

Client

ALBION LAND

Drawing Title

PHASE 3
External Works & Levels

BAILEY JOHNSON HAYES
Consulting Engineers
ST.ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST.ALBANS, Herts AL1 5FL
MANCHESTER: Grange House, John Dalton Street, MANCHESTER, M2 6FW

Scale	1:1000 @A1
Date	20.07.21
Drawn	JNG

Drawing Number

S1209-PH3-04 B