

Flood Risk Assessment

LITTLE HAMPTON, Land at Watersmead Business Park

16 April 2019

Prepared for: Amazon

CONTACT DETAILS

Name	Position	Email	Telephone	Mobile
J awsy J abbar	Principal Engineer			
David Meigh	Director			

APPROVALS

	Name	Position	Date
Prepared by	J awsy J abbar	Principal Engineer	15.04.19
Reviewed by	David Meigh	Director	15.04.19
Approved by	David Meigh	Director	15.04.19

VERSIONS

Number	By	Date	Context
1	J awsy J abbar	04.02.19	For Comment
2	Andrew Quinn	15.04.19	For Comment

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CONTENT

1	INTRODUCTION.....	3
2	EXISTING SITE CONDITIONS	4
2.1	Site description.....	4
2.2	Topography.....	4
2.3	Geological ground conditions.....	5
2.4	Existing surface water management.....	5
3	PROPOSED DEVELOPMENT.....	6
4	PROBABILITY OF FLOODING	7
4.1	Flooding from rivers (fluvial flooding) & sea (tidal flooding).....	7
4.2	Flooding from land & sewers	8
4.3	Flooding from groundwater.....	9
4.4	Flooding from reservoirs, canals, and other artificial sources	10
5	POLICY STATUS FOR PROPOSED DEVELOPMENT	11
5.1	Vulnerability classification.....	11
5.2	Sequential Test & Exception Test.....	12
6	FLOOD RISK MANAGEMENT STRATEGY	14
7	CONCLUSION	15
	APPENDIX A - SITE LOCATION PLAN.....	16
	APPENDIX B - GPR SURVEY	17
	APPENDIX C - PROPOSED DEVELOPMENT PLANS	18
	APPENDIX D - EXISTING & PROPOSED IMPERMEABLE AREAS.....	19
	APPENDIX E - PROPOSED DRAINAGE STRATEGY	20

1 INTRODUCTION

Pinnacle Consulting Engineers Ltd have been commissioned by Amazon to carry out a Flood Risk Assessment report (FRA) for a proposed development of a site off Norway Lane, Watersmead Business Park, Toddington, BN17 6GY. A site location plan is enclosed in Appendix A.

With reference to the indicative flood maps published by the Environment Agency, the site appears to lie in Flood Zone 1. This FRA report has been prepared in accordance with the requirements contained within National Planning Policy Framework (NPPF, July 2018) and the associated Planning Practice Guidance. The guidance refers to the Environment Agency's 'standing advice' on flood risk. Based on requirements set by the Environment Agency, a Flood Risk assessment is needed to support the planning application.

This report has been prepared in accordance with (i) National Planning Policy Framework (NPPF), (Department for Communities and Local Government, July 2018) and the accompanying (ii) Planning Practice Guidance (Ministry of Housing, Communities and Local Government, March 2014); and (iii) Level 1 and 2 Strategic Flood Risk Assessment (SFRA) undertaken on behalf of Arun District Council by JBA Consulting, Nov 2016 (iv) Other statutory laws and local bylaws and rules.

It is stated in Paragraph 30 of the Flood Risk and Coastal Change chapter within the Planning Practice Guidance that 'a site-specific flood risk assessment is carried out by (or on behalf of) a developer to assess the flood risk to and from a development site. Where necessary the assessment should accompany a planning application submitted to the local planning authority. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users'.

This report has been prepared to address the requirements of the NPPF and has derived the following data/information from various sources including:

- ¿ Information published or explicitly provided by the Environment Agency;
- ¿ Information published by the Local Planning Authority, including the SFRA;
- ¿ A site-specific topographical survey;
- ¿ Enquiries made to relevant authorities to understand possible risks of flooding in the area; and
- ¿ Specific design works carried out for this report.

Pinnacle Consulting Engineers Ltd are specialists in flood studies with a track record of several hundred successful FRA reports and assessments.

2 EXISTING SITE CONDITIONS

2.1 Site description

The proposed development is located at National Grid Reference (NGR) 503839, 103654 off Norway Lane, Watersmead Business Park, Toddington, BN17 6GY.

The existing site consists of three large warehouse buildings, associated service yards, circulation routes and HGV parking areas. The site is located to the east of Wick, in the north of Toddington and just north of A259. The site is bound to the north by railway tracks between Angmering and Ford, to the south by parking and circulation roads associated with the Bodyshop HQ building and the 'kids unlimited' pre-school, to the west by The Co-operative Childcare nursery and residential dwellings along Gratwicke Drive and to the east by a large feature lake running northwards towards Black Ditch. An approximately 0.5ha feature lake can be identified to the east of the site and appears to run into a complex of interconnecting tributaries and reservoirs roughly 140m north of the site.



Figure 2.1 - Aerial View of the existing development site (approximate site boundary edged red)

2.2 Topography

The development site is relatively flat with ground levels across the site varying between approximately 5m and 4m Above Ordnance Datum (AOD). The site falls generally in a south direction.

Topographical survey has been commissioned to confirm the levels across the site.

Details of existing development site levels are enclosed in Appendix B.

2.3 Geological ground conditions

Geological conditions at the site are detailed below and are based on a British Geological Survey (BGS) report and the Short Form Geotechnical Report carried out by Deltasimons in March 2019. The focus of this study on geology is on the potential movement of water through Made Ground, Drift Geology and Solid Geology.

These strata are outlined in Table 2.2.

Formation	Description
Artificial Ground (Made Ground)	Artificial deposits delineated in available Dynamic Sampler on site identify Made Ground proven to approximately 0.45m bgl.
Superficial Deposits (Drift Deposits)	River Terrace Deposits (undifferentiated) - Sand, Silt and Clay. These deposits are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary. These deposits have been proven to approximately 2.43m bgl.
Bedrock	New Pit Chalk Formation - Chalk. These sedimentary rocks are shallow-marine in origin. They are biogenic and detrital, generally comprising carbonate material (coccoliths), forming distinctive beds of chalk. Chalk deposits have been proven to 45.72m bgl.
Water Table	Available boreholes identify a water table at 5.18m deep that is not expected to significantly impact drainage design or associated earthworks activities.

Table 2.2 - Geological Ground Conditions

2.4 Existing surface water management

A GPR survey was conducted by Malcom Hughes Chartered Land Surveyors in March of 2019 to define the location of existing infrastructure within the site. Current survey records identify that the site has two fully operational, primary, positive surface water networks, with separate discharge locations serving the existing site. Due to the lack of evidence to suggest otherwise, it is reasonable to assume the identified networks discharge into the large feature lake situated approximately 20m to the east of the site. Assumed outfall locations are positioned along the eastern perimeter of the site. One of sewers are assumed to outfall from the north east corner of the site via a $\varnothing$ 375mm and the other discharges immediately to the east of the central service yard via a $\varnothing$ 1050mm pipe. Following a critique of the existing networks, it is assumed that surface water runoff discharges into the pond at an unrestricted rate.

A series of gullies are depicted running along the inner kerb lines bordering the large warehouse to the north and are assumed to connect into the adjacent sewers, which roughly follow the centre line of the existing circulation routes. A series of surface water sewers are identified running parallel to the existing buildings along the centre of the site; they are shown to serve the central service yard, the large distribution centre to the north and both warehouse buildings to the south.

The existing drainage arrangement shown on the drainage survey is provided from the GPR Survey and enclosed in Appendix B.

3 PROPOSED DEVELOPMENT

The proposed development comprises installation of 5 no. vehicle-to-ground lifts and a canopy cover over the associated service yard area for a temporary period of five years, minor alterations to the internal access road, including widening works, creation of a new spur, provision of a pedestrian footbridge, and associated lighting and drainage infrastructure provision.

The proposed development plans are enclosed in Appendix C.

4 PROBABILITY OF FLOODING

The NPPF identifies six potential sources of flooding:-

- ¿ Flooding from rivers (fluvial flooding);
- ¿ Flooding from the sea (tidal flooding);
- ¿ Flooding from land;
- ¿ Flooding from sewers;
- ¿ Flooding from groundwater; and
- ¿ Flooding from reservoirs, canals, and other artificial sources.

These are considered below.

4.1 Flooding from rivers (fluvial flooding) & sea (tidal flooding)

The assessment of flood risk in this report is based on the definitions in Table 1 of the Flood Risk and Coastal Change, Planning Practice Guidance, which recognises the following Flood Zones:

- ¿ Flood Zone 1 - little or no risk, with annual probability of flooding from rivers and the sea of less than 0.1% (1 in 1000-year)
- ¿ Flood Zone 2 - low to medium risk, with annual probability of flooding between 0.1% and 1.0% from rivers and between 0.1% and 0.5% from the sea
- ¿ Flood Zone 3a - high risk of flooding with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.
- ¿ Flood Zone 3b - the 'Functional Floodplain' with an annual probability of flooding of 5% or greater.

An extract from the Environment Agency's online flood map published on their website is shown in Figure 4.1 below, with Flood Zone 3a & 3b denoted by dark blue hatch and Flood Zone 2 a light blue. The site is located within a Flood Zone 1 'Low Probability' area and therefore lies outside an area at risk of fluvial/tidal flooding.

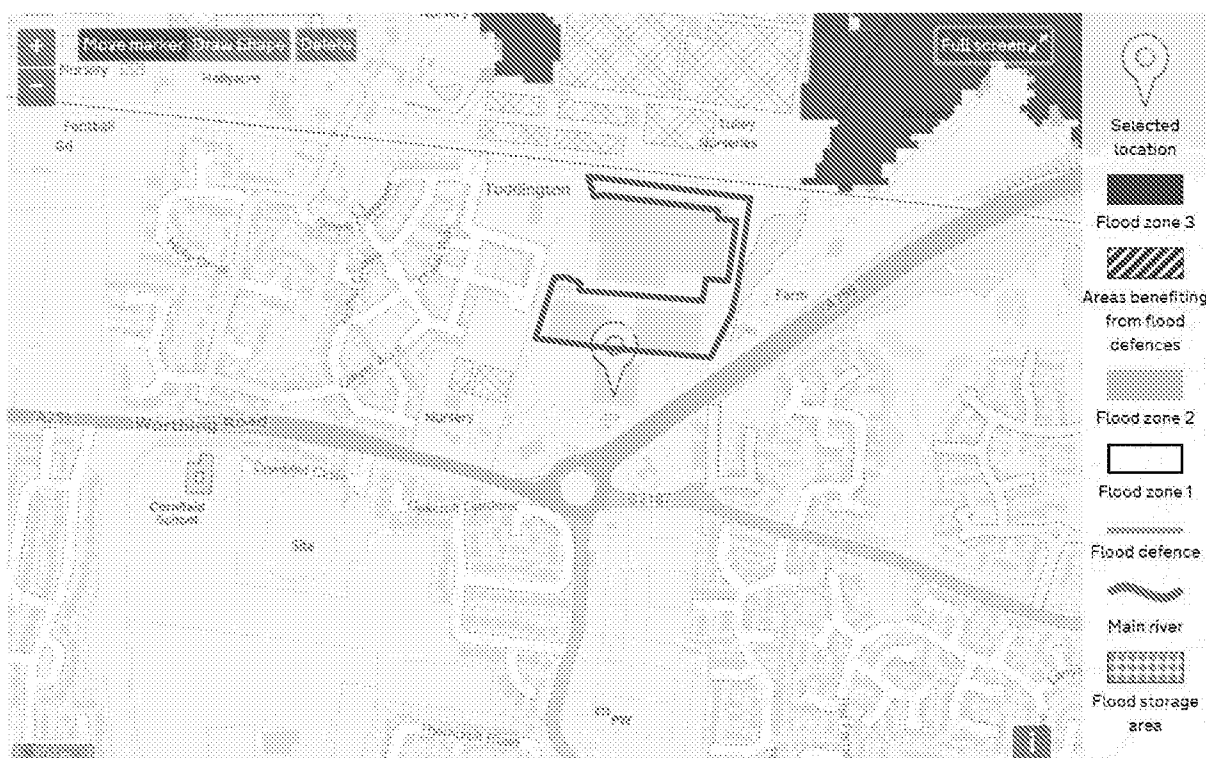


Figure 4.1 - Environment Agency Online Flood Map Extract for Planning (Approximate Site Extents Edged Red)

Based on the Figure 4.1, proposed site lies in Flood Zone 1.

4.2 Flooding from land & sewers

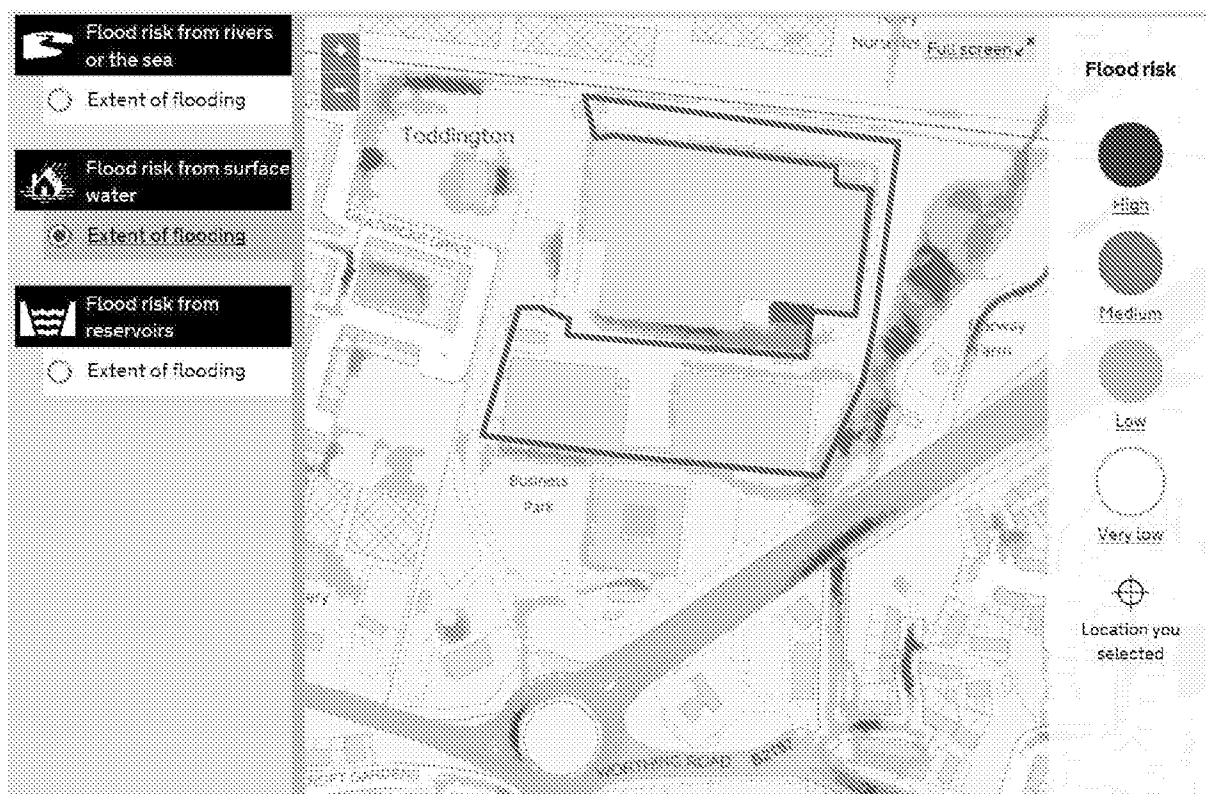


Figure 4.2 ~ Environment Agency Online Flood Map Extract for surface water flooding (Approximate Site Extents Edged Red)

Based on the Figure 4.2, proposed site lies in low to medium zone for the surface water flooding.

4.3 Flooding from groundwater

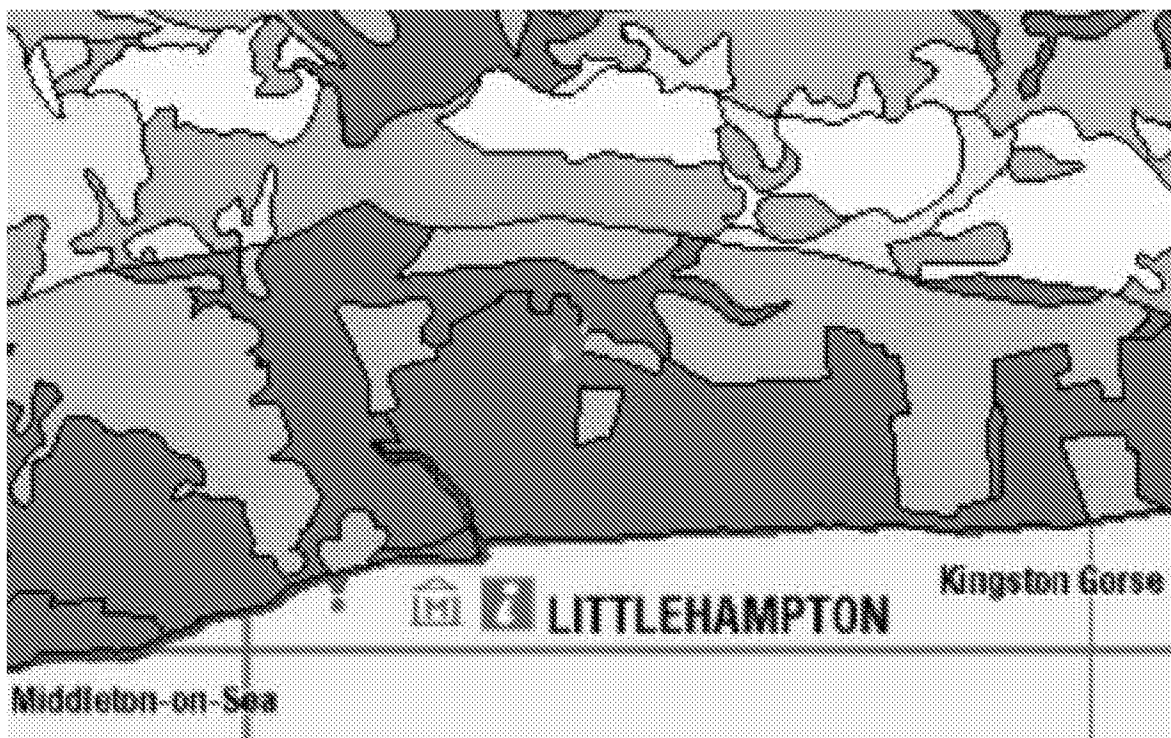


Figure 4.3 ~ Defra Groundwater Vulnerability Map (Approximate Site location Edged Red)

Based on the Figure 4.3 the proposed site lies in Major Aquifer High vulnerability zone.

4.4 Flooding from reservoirs, canals, and other artificial sources

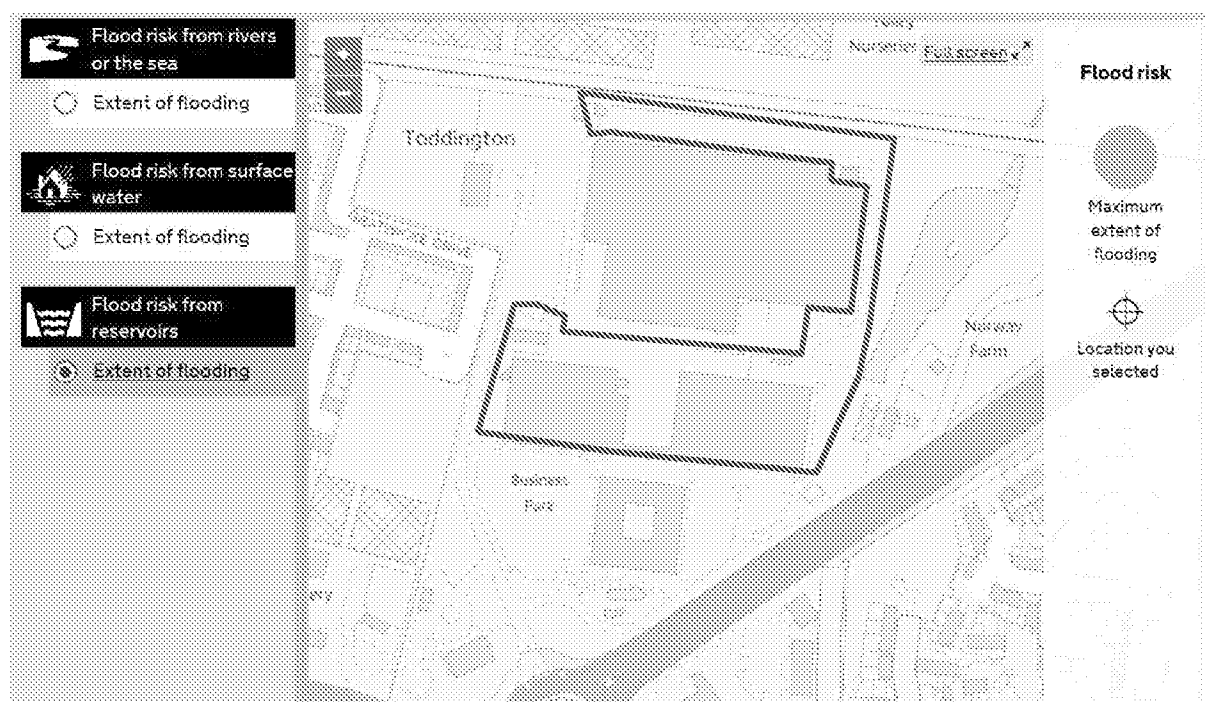


Figure 4.4 - Environment Agency Online Flood Map Extract for Reservoir flooding (Approximate Site Extents Edged Red)

Based on the Figure 4.4 the proposed site lies in a no risk zone of flooding from reservoirs.

5 POLICY STATUS FOR PROPOSED DEVELOPMENT

5.1 Vulnerability classification

The proposed development complies with the following principles:

- ¿ The proposed development lies within Flood Zone 1;
- ¿ The proposed development is classified as 'less vulnerable' in accordance with Table 2 of the Flood Risk and Coastal Change, Planning Practice Guidance (reproduced as Table 5.1 below).

Essential Infrastructure	Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood Wind Turbines
Highly Vulnerable	Police stations, Ambulance stations, Fire stations, 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
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. Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	Police, ambulance and fire stations which are not required to be operational during flooding. 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 and sewage treatment plants (if adequate pollution control measures are in place). Sewage treatment works (if adequate measures to control pollution and manage sewage during flood events are in place).
Water-compatible Development	Flood control infrastructure. Water transmission infrastructure, pumping stations. Sewage transmission infrastructure and pumping stations. Sand and gravel workings. Docks, marinas, wharves Navigation facilities.

	MOD defence installations. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.
Notes 1 - This classification is based partly on Defra/Environment Agency research on Flood Risks to People (FD2321/TR2)21 and also on the need of some uses to keep functioning during flooding. 2 - Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity. 3 - The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.	

Table 5.1 ~ Flood Risk Vulnerability Classification

Vulnerability Classification		Essential Infrastructure	Water-compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	V	V	V	V	V
	Zone 2	V	V	Exception Test	V	V
	Zone 3a	Exception Test	V	U	Exception Test	V
	Zone 3b	Exception Test	V	U	U	U
Key V Development is appropriate U Development should not be permitted						

Table 5.2 ~ Flood Risk Vulnerability and Flood Zone :Compatibility~

The proposed development is appropriate in accordance with Table 3 of the Flood Risk and Coastal Change, Planning Practice Guidance, reproduced in Table 5.2 above.

5.2 Sequential Test & Exception Test

The NPPF requires that all development is sequential tested to steer new development to areas at the lowest probability of flooding (Flood Zone 1). The Sequential Test would normally be completed by the Local Planning Authority (LPA) to inform the preparation of the Local Development Framework (LDF), where one exists. However, where this process has not yet been completed the onus for the provision of evidence demonstrating successful application of the Sequential Test falls to the developer, or

promoter of the site. The NPPF also requires the layout of a site to be sequentially tested to locate the most vulnerable land uses in the areas at lowest risk of flooding.

The NPPF Planning Practice Guidance acknowledges that in some circumstances it may not be possible to locate development in areas of low or appropriate (considering development vulnerability) flood risk or that there may be other valid reasons for a development to take place within the floodplain. In these circumstances, it is necessary to apply the Exception Test to clearly demonstrate that the benefits for development of a site outweigh the flood risks to the development and its occupants. Table 3 of the Flood Risk and Coastal Change, Planning Practice Guidance (reproduced in Table 5.2 above) indicates when the Exception Test is required.

The proposed development site falls entirely into Flood Zone 1, meaning the Sequential Test is deemed to be passed and the Exception Test is not required.

6 FLOOD RISK MANAGEMENT STRATEGY

The proposed alterations to the internal access road have necessitated the replacement of a small area of landscaping with additional hardstanding. It is anticipated that the associated minor increase in runoff could be accommodated within the existing surface water drainage infrastructure.

A topographical and drainage survey has been commissioned for the site to confirm the existing surface water drainage infrastructure.

Given that the proposal is to marginally increase the amount of impermeable area by 789m² (refer to Appendix D), it is anticipated any overland flow routes will be left unaffected. All surface water storage requirements up to the 1 in 100 year event plus an allowance for climate change are to be stored within the site.

Current survey records identify that the site has two fully operational primary positive draining surface water networks, with separate discharge locations serving the existing site. It is assumed the identified networks discharge into the pond situated approximately 20m to the east of the site. Following a critique of the existing networks, it is assumed that surface water runoff discharges into the pond at an unrestricted rate.

Therefore, additional impermeable area created by the proposed development runoff can be managed within the existing drainage infrastructure. As part of the proposal, an additional impermeable area of 789m² will be produced by extending the kerb line along the northern perimeter. The additional surface water runoff will be attenuated, before being conveyed into the existing network at a restricted rate of 5l/s via a hydrobrake.

Please refer Appendix E of this report for the proposed drainage strategy plan and also to the Drainage Strategy Report for further details.

7 CONCLUSION

With reference to the indicative flood map published by the Environment Agency, the development site is located within Flood Zone 1 :Low probability~. This has been confirmed by the site-specific flood risk assessment as detailed at Section 4.1.

From Table 5.1 the site is classified as :Less Vulnerable~ (Flood Risk Vulnerability Classification) and therefore, from Table 5.2 the development is classified as :appropriate~.

Due to vulnerability groundwater zone, the use of infiltration methods is considered a very low viability option for the discharge of surface water runoff. It is assumed that the existing surface water drainage infrastructure has capacity to accommodate the minor increase in runoff associated with the proposed development.

It is assumed that the existing surface discharge into the adjacent pond is unrestricted. Therefore, additional impermeable area created by the proposed development runoff can be managed within the existing drainage infrastructure.

Additional water quality measures will be provided by the inclusion of appropriate deep silt trapped gullies, catchpits and silt boxes to all channel drains.

Appendix A - Site Location Plan



1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.

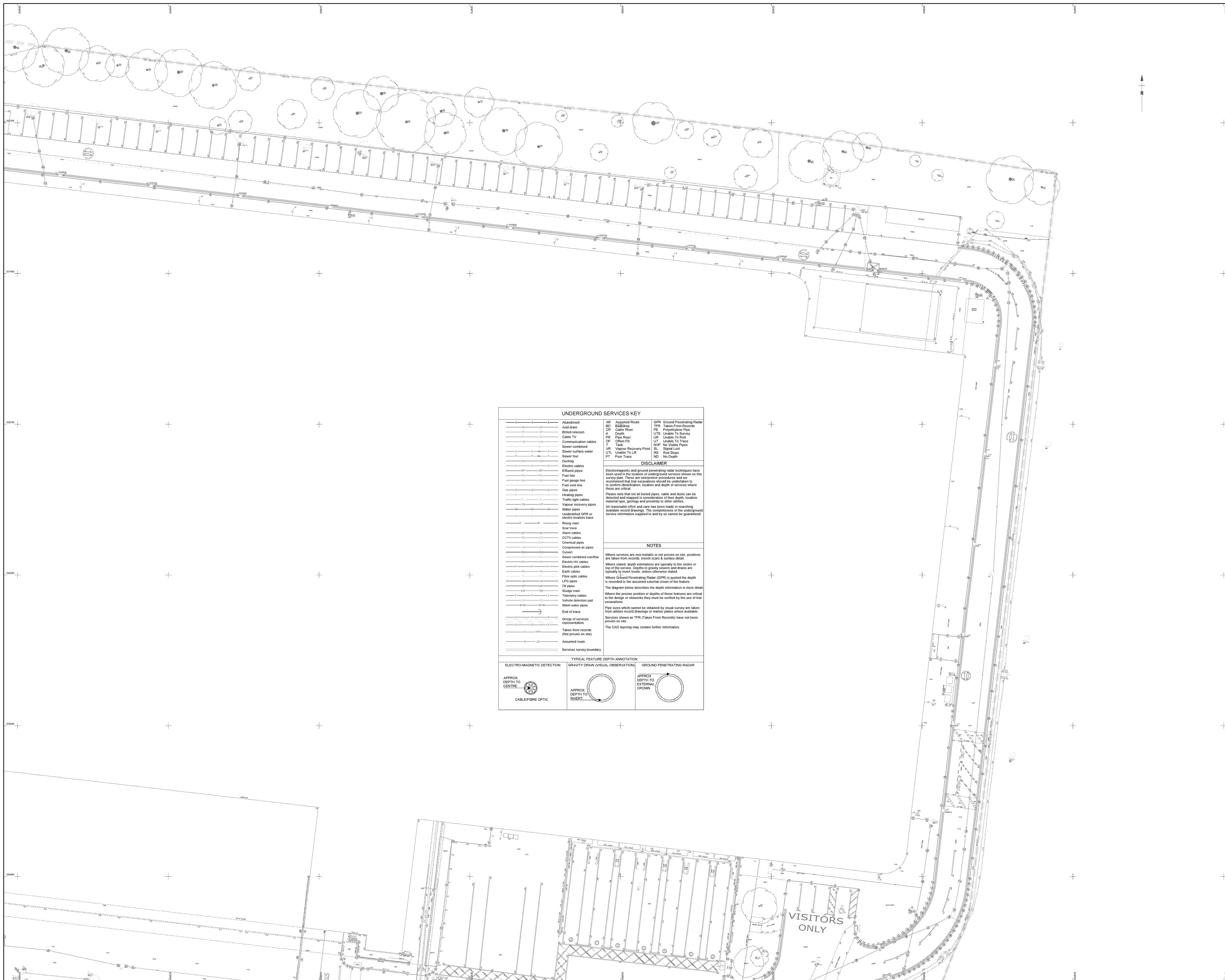
 SITE BOUNDARY

PROJECT
LITTLEHAMPTON
DBN3 REFURBISHMENT

PINNACLE
CONSULTING ENGINEERS

NORWICH		LONDON		DUBLIN		THE HAGUE	
DRAWING STATUS							
TENDER							
SCALE ● AI		DATE		DRAWN BY		CHECKED	
1:2000		FEB '19		RW		JJ	
DRG NO.						REVISION	
I90213-PIN-00-XX-DR-C-0200						T1	

Appendix B - GPR Survey



Survey Notes	
Grid:	Local Plane Metric related to National Grid at survey control SC2
Levels:	Related to OS datum from GNSS positioning, converted using the National Geoid Model OSGM15.

Notes

Topographical Survey Legend

[illegible]

ROADS

Karte		Stream	
Edge of Surfacing		Ditch	
Pedestrian Crossing		Weir	
Track		Culvert	
Footpath		Grip (Land Drain)	
		Spring	

ET FURNITURE	
--------------	--

Beltano Beacon	= BB		
Blue Step	= BS		
Bulldozer	= B		
Crk Eye	= CE		
Cost Chalk	= CC		
Crackle Break TV	= CTV		
Crack	= CR		
Decorative Pole	= DP		
Fixed Joint	= FL		
Flag Start	= FS		
Lamp Post	= LP		
Letter Box	= LB		
Home Place (Jewell)	= HP		
Mowing Ring	= MR		
Wile Post or Mowing Post	= MP		
Sunrise Marker	= MS		
Mix Stone	= MS		

Hedge	
Edge of wood/brushes	
Slump	= SLUMP
Individual Tree	
Grass with height	
Greater than 1m	
Cliff Face	
Marsh	
Reeds	

LEVEL AND HEIGHT INFORMATION

Reflector Spot	RP	
Road Sign	RE	
Road Sign	RS	
Speed Camera	SC/CAM	
Information Sign	IS/IN	
Stop	SR	
Traffic Light	TL	
Telegraph Pole	TP	
Telephone Pole	TP	
Traffic Light Camera	TL/C/P	
Control Box	☐ C/BOX	
British Telecom Box	☐ BT BOX	
Overhead Box	☐ O BOX	
Gas Box	☐ GAS BOX	
Standard Spot Height		+133.45
Maximum Spot Height		+132.456
Wind Load		36.33.89
Water Level		+W2.92
Soil Level		+S2.82
Threshold Level		+T2.95.00
Ground Level		+G2.65.45
Insert Level		+I2.35.15
Post Level		+P2.15.00
Flare Level		+F1.85.00
Finished Floor Level		+F1.67.00
Top of Ground Level		+T0.00.00
Earth Level		+E0.00.00

HAMBERS AND PIPE

Inspection Cover	IC	Flat Roof Level	FR/L
Inspection Cover (Dac)	IC/DL	Top of Canopy Level	TC/L
Manhole	MH	Underline of Canopy Level	UC/L
British Telecom Cover	BT	Window Sill Level	WS/L
Inspection Cover (Comms)	IC/COM	Window Head Level	WH/L
Cable TV	CAV	Springing Level	SL
Inspection Cover Traffic Signals	IC/TL	Arch Level	AL
Gully	G	Cable Level	CL
Kero Outlet	KO	Top of Well Level	TWL
Vent Pipe	VP	Underline of Beam Level	UBL
		General Height	HTL

SURVEY INFORMATION SHEET

Sell Pipe	e SWP		
Gas Pipe	o G-RPC		
Unusable in RT cover	UL		
Stop Tap	e ST		
Stop Valve	e SV		
Lampole	e LR		
Hydrant	o HD		

GEOTECHNICAL INFORMATION

Borehole	 BH
Trial Pit	TP
Monitor Pin	MCP
Probe Hole	 PH
Window Sample	WS

Sheet Index

1	2
3	4

[illegible]



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Accreditations








Client

SMR ARCHITECTS
FLOOR 2, THE EXCHANGE, STATION PARADE
HARROGATE, HG1 1TS

Project

THE BODY SHOP
NORWAY LANE, WICK
LITTLEHAMPTON BN17 6LS

Drawing Title

UNDERGROUND SERVICES

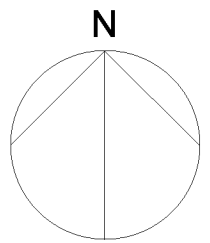
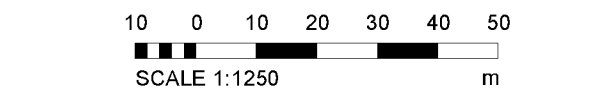
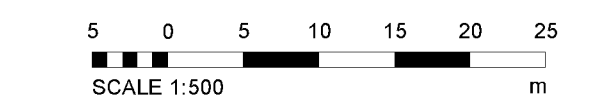
Drawn By	AP	05/03/19	Survey Date	FEBRUARY 2019
Checked by	DJ	05/03/19	Scale	A0@1:200

53168/2

Appendix C - Proposed Development Plans

Architects are to be notified of any discrepancies.
Contractors must check all dimensions on site.
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REFER TO
ARBORICULTURAL
REPORT FOR LOCATIONS
OF TREES AND
VEGETATION

NO NEW BOUNDARY
TREATMENTS

NO PUBLIC RIGHTS OF
WAY ACROSS SITE

EXISTING LANDSCAPED AREA
TO BE RETAINED: 2128 m²

LANDSCAPED AREA TO BE
REPLACED WITH VEHICLE
HARDSTANDING: 592 m²

KERBED AREA TO BE
REPLACED WITH VEHICLE
HARDSTANDING: 25 m²

P6	CANOPY ADJUSTED	04.04.19	JN	MB
P6	PEDESTRIAN BRIDGE REPLACED WITH CROSSING	26.03.19	MB	GR
P7	UPDATED TRACKING	12.03.19	BC	MB
P8	UPDATED VOSs	06.03.19	MB	GR
P9	REVISION AMENDED	20.2.19	MB	GR
P4	LANDSCAPE AREAS SHOWN	05.02.19	MB	GR
P3	REVIEWED AFTER PLANNING REVIEW	01.02.19	JN	MB
P2	REVIEWED FOLLOWING PLANNING CALL	26.01.19	MB	GR
P1	FIRST ISSUE	24.1.19	MB	GR
Rev	Description	Date	Drawn	Check

Status
PLANNING

SMR
SMALLEY MARSEY RISPIN

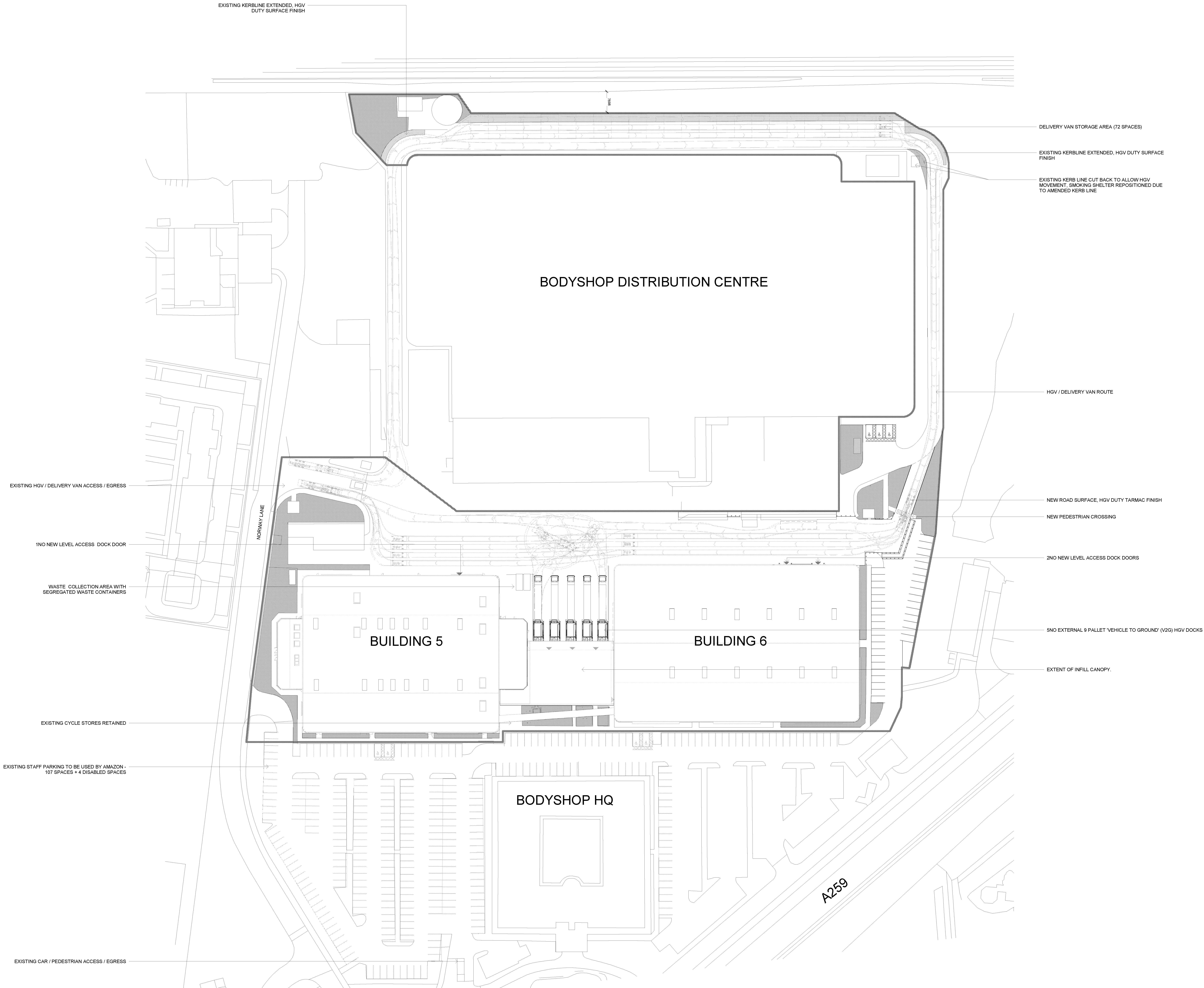
ARCHITECTS
Floor 2, The Exchange, Station Parade, Harrogate, HG1 1TS
01423 707 757
admin@smrarchitects.co.uk

Project
DBN3 - NEW COURTWICK LANE, LITTLEHAMPTON

Client
amazonlogistics

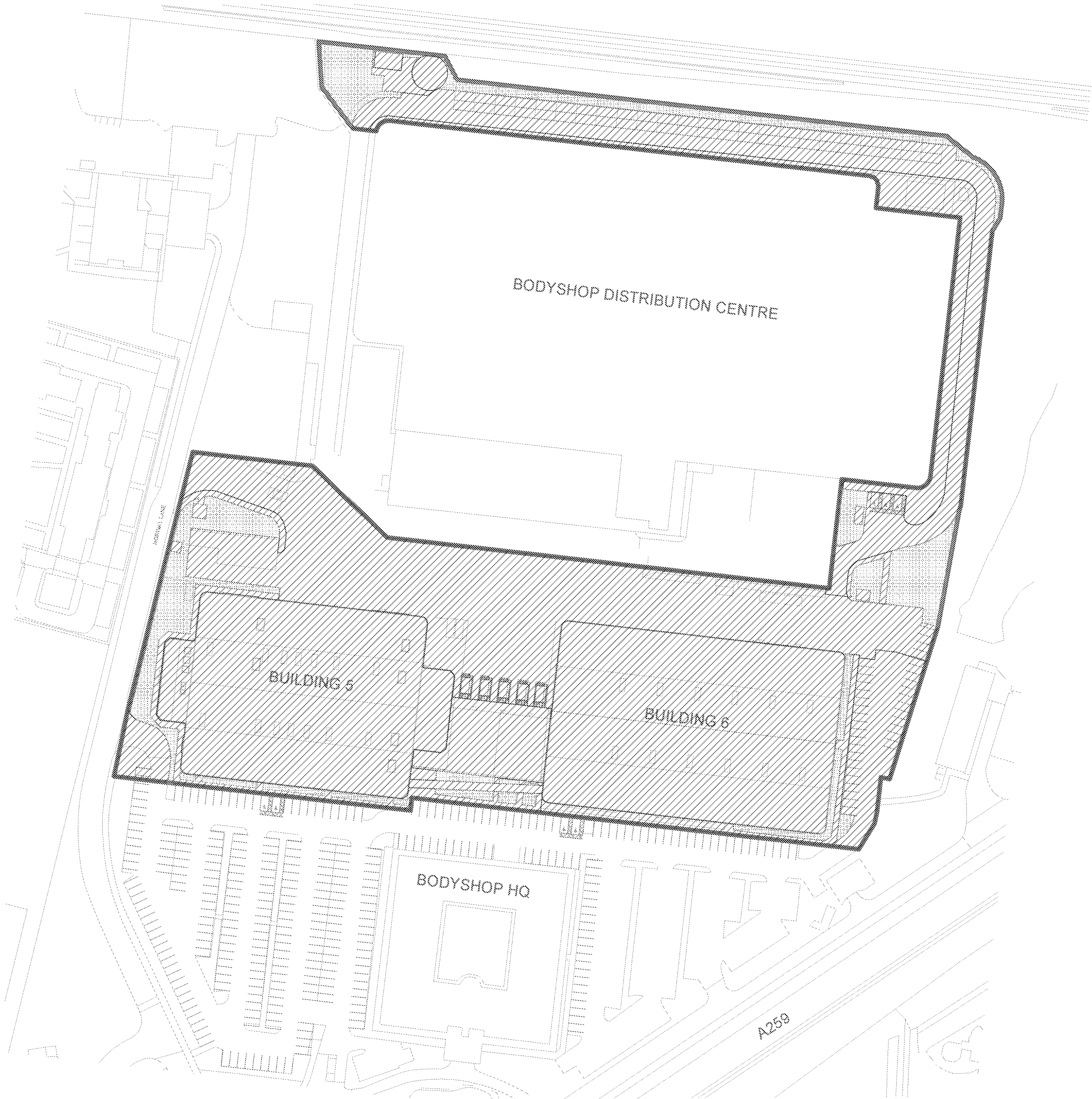
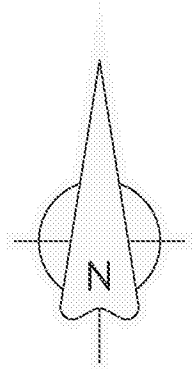
Drawing Title
PROPOSED SITE BLOCK PLAN

Proj Ref	Origin	Zone	Level	Type	Rev	Notes	Rev
7260 - SMR	- 00 - 22 - DR	- A -	2001	- S3 - P9			
SMR Job Ref	Sheet	Drawn	Scale	Notes	Drawn	Rev	
7260-00-2001	A0	NOTED			MB		



PROPOSED SITE PLAN
1 : 500

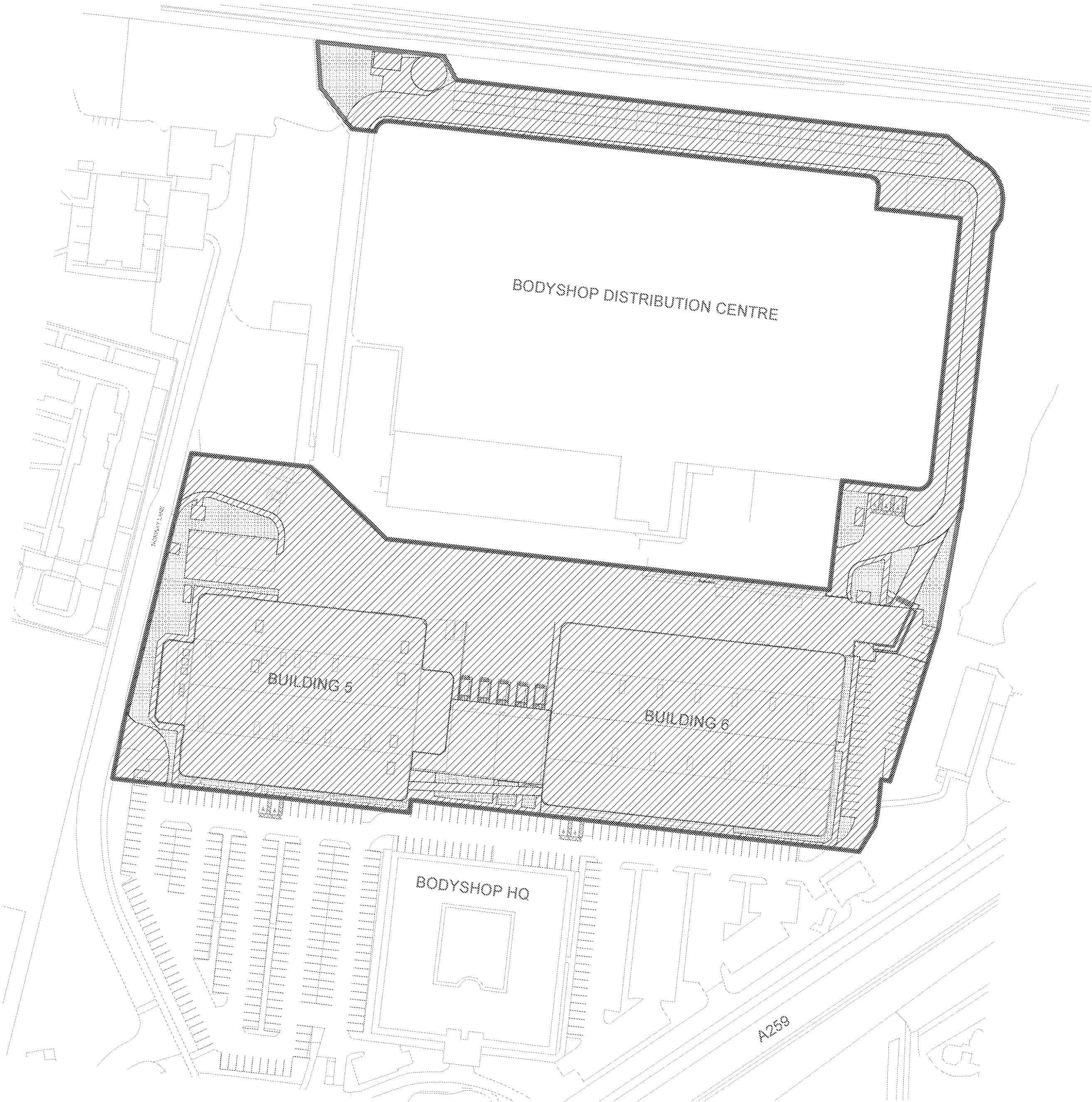
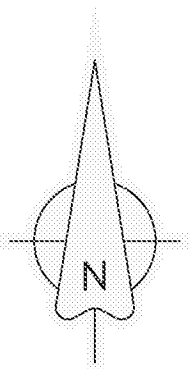
Appendix D - Existing & Proposed Impermeable Areas



EXISTING SITE

TOTAL IMPERMEABLE AREA = 24,647M²

TOTAL PERMEABLE AREA = 2,927M²



PROPOSED SITE

TOTAL IMPERMEABLE AREA = 25,436M²

TOTAL PERMEABLE AREA = 2,132M²

GENERAL NOTES

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2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.

LEGEND

	SITE BOUNDARY
	PERMEABLE AREA
	IMPERMEABLE AREA

0 50MM ON A1 DWG. 50

TI	FOR TENDER	AO	JJ	XX.04.19
REV	DESCRIPTION	BY	CHK	DATE
CLIENT				

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PROJECT
LITTLEHAMPTON
DBN3 REFURBISHMENT

DRAWING TITLE
EXISTING AND PROPOSED
IMPERMEABLE AREAS

PINNACLE
CONSULTING ENGINEERS

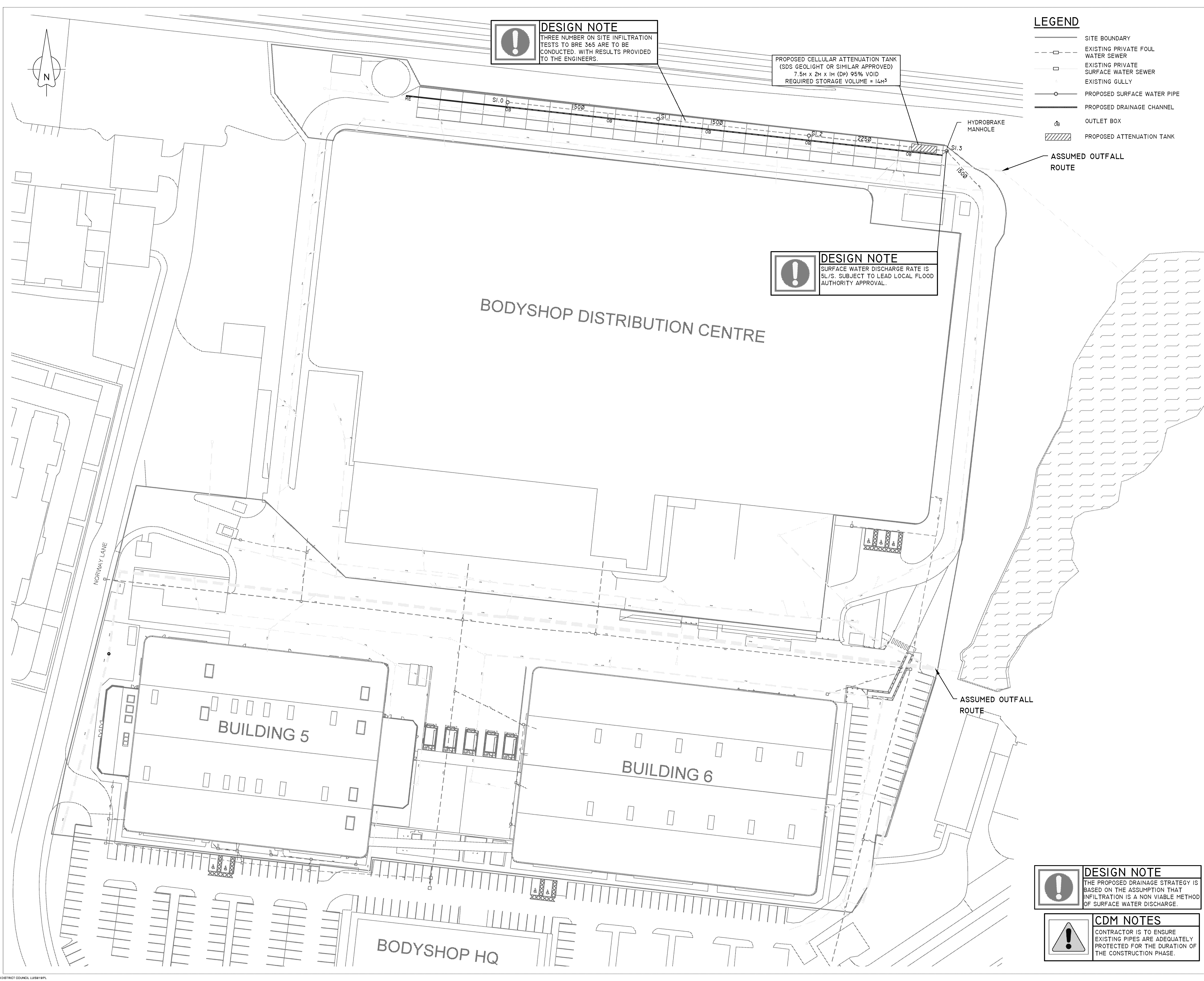
ALCHEMY,
BESSEMER ROAD,
WELWYN GARDEN CITY,
HERTS
AL7 1HE. TELEPHONE: 01707 527 830
NORWICH | LONDON | DUBLIN | THE HAGUE

DRAWING STATUS			
TENDER			
SCALE @ A1 1:1000	DATE APR'19	DRAWN BY AO	CHECKED JJ
DRG NO. 190213-PIN-00-XX-DR-C-0205	REVISION TI		

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Appendix E – Proposed Drainage Strategy



LEGEND

- SITE BOUNDARY
- EXISTING PRIVATE FOUL WATER SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING GULLY
- PROPOSED SURFACE WATER PIPE
- PROPOSED DRAINAGE CHANNEL
- OUTLET BOX
- PROPOSED ATTENUATION TANK

GENERAL NOTES

- DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
- FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
- ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.

DRAINAGE NOTES

- CONTRACTOR TO CONFIRM THE APPROVAL FOR THE TYPE OF PIPE AND BEDDING BEING USED WITH THE PERMITTING AUTHORITY PRIOR TO ANY CONSTRUCTION COMMENCING.
- ANY TRAFFIC MANAGEMENT REQUIRED TO UNDERTAKE WORKS IN THE PUBLIC HIGHWAY MUST BE APPROVED BY THE LOCAL AUTHORITY PRIOR TO THESE WORKS COMMENCING.
- ALL WORKS IN THE PUBLIC HIGHWAY MUST BE CARRIED OUT WITH THE PRIOR APPROVAL AND TO THE SATISFACTION OF THE LOCAL AUTHORITY.
- THE CONTRACTOR IS TO LIAISE WITH THE WATER AUTHORITY ENGINEER, AFFORDING THEM REASONABLE NOTICE TO INSPECT THE WORKS DURING CONSTRUCTION.
- THE CONTRACTOR IS TO ALLOW FOR JET WASHING ALL LENGTHS OF EXISTING SEWERS WHICH ARE TO BE RETAINED.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH BS EN 752.
- THE CONTRACTOR MUST CHECK THE LEVELS AND CONDITION OF ALL EXISTING MANHOLES AND DRAINAGE OUTFALLS PRIOR TO CONSTRUCTION OF ANY DRAINAGE, UNLESS OTHERWISE AGREED, TO ENSURE THE PROPOSED DESIGN MAY BE ACHIEVED. ANY DISCREPANCIES MUST BE REPORTED TO PINNACLE IMMEDIATELY.
- ALL RWP POSITIONS ARE TO BE CONFIRMED BY THE ARCHITECT.
- WHERE RWPS ARE CONNECTED DIRECT TO THE DRAIN, RODDING ACCESS PLATES ARE TO BE PROVIDED.
- CONTRACTOR IS TO ALLOW FOR ALL ABANDONED DRAINAGE RUNS AND MANHOLES / SOAKWAYS TO BE FULLY GROUTED UP OR REMOVED AS NECESSARY.
- ALL BURIED MANHOLES TO BE REINSTATED AND INVERT LEVELS SUPPLIED TO PINNACLE. MANHOLE COVERS ARE TO BE BROUGHT UP TO THE REQUIRED LEVELS.
- ALL GULLIES TO BE SET 5mm LOWER THAN THE PROPOSED FINISHED LEVELS.
- ALL SURFACE WATER AND RAIN WATER PIPEWORK TO BE Ø150mm, LAID TO A MINIMUM FALL OF 1 IN 100 U.N.O.

0 50MM ON A1 DWG. 50

P02	FOR INFORMATION	AO	JJ	16.04.19
P01	FOR INFORMATION	AO	JJ	15.04.19
T1	FOR TENDER	RW	JJ	01.03.19
REV	DESCRIPTION	BY	CHK	DATE

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PROJECT
LITTLEHAMPTON
DBN3 REFURBISHMENT

DRAWING TITLE
PROPOSED DRAINAGE
STRATEGY

PINNACLE
CONSULTING ENGINEERS

ALCHEMY,
BESSEMER ROAD,
MELWYN GARDEN CITY,
HERTS
AL7 1HE. TELEPHONE: 01707 527 630
NORWICH | LONDON | DUBLIN | THE HAGUE

DRAWING STATUS			
INFORMATION			
SCALE @ A1	DATE	DRAWN BY	CHECKED
1:500	FEB '19	RW	JJ
DRG NO.	REVISION		
190213-PIN-00-XX-DR-C-0220	P02		

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DESIGN NOTE
THREE NUMBER ON SITE INFILTRATION TESTS TO BRE 365 ARE TO BE CONDUCTED. WITH RESULTS PROVIDED TO THE ENGINEERS.

PROPOSED CELLULAR ATTENUATION TANK
(SDS GEOLIGHT OR SIMILAR APPROVED)
7.5M X 2M X 1M (DP) 95% VOID
REQUIRED STORAGE VOLUME = 14M³

DESIGN NOTE
SURFACE WATER DISCHARGE RATE IS SL/S. SUBJECT TO LEAD LOCAL FLOOD AUTHORITY APPROVAL.

ASSUMED OUTFALL ROUTE

ASSUMED OUTFALL ROUTE

DESIGN NOTE
THE PROPOSED DRAINAGE STRATEGY IS BASED ON THE ASSUMPTION THAT INFILTRATION IS A NON VIABLE METHOD OF SURFACE WATER DISCHARGE.

CDM NOTES
CONTRACTOR IS TO ENSURE EXISTING PIPES ARE ADEQUATELY PROTECTED FOR THE DURATION OF THE CONSTRUCTION PHASE.

BODYSHOP HQ

BODYSHOP DISTRIBUTION CENTRE

BUILDING 5

BUILDING 6

NORWICH
Pinnacle House
3 Meridian Way
Norwich
NR7 0TA

WELWYN GARDEN CITY
Alchemy
Bessemer Road
Welwyn Garden City
AL7 1HE

LONDON
Woolverstone House
61 Berners Street
London
W1T 3NJ

DUBLIN
Grosvenor Court
67 Patrick Street
Dun Laoghaire
County Dublin

THE HAGUE
Business Suite 5.01 D-1
Business Center, WTC
Prinses Margrietplantsoen 33
2595 AM, The Hague
Netherlands