

**From:** Stuart Corbey  
**Sent:** 17 April 2019 13:40  
**To:** Planning.Responses  
**Subject:** LU/59/19/PL - Land at Watersmead Business Park, Littlehampton

Please upload the attached documents as

1. Drainage survey
2. FRA

---

**From:** Aarti O'Leary [REDACTED]  
**Sent:** 17 April 2019 09:51  
**To:** Stuart Corbey  
**Cc:** Laura Gibbons; Planning; Serena Page  
**Subject:** Application Ref: LU/59/19/PL - Land at Watersmead Business Park, Littlehampton

Dear Stuart

To address the comments raised in the consultation response from the Drainage Engineer, we hereby submit an updated Flood Risk Assessment and Drainage Strategy report.

We would be grateful if you could confirm receipt of these documents.

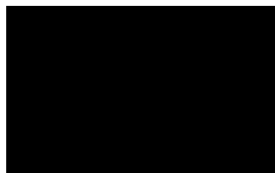
We trust the details contained in the reports address the matters raised in relation to surface water drainage.

Kind Regards

Aarti O'Leary  
BSc (Hons), MA (Merit), MRTPI  
Associate



Chartered Surveyors & Town Planners  
6 New Bridge Street  
London  
EC4V 6AB



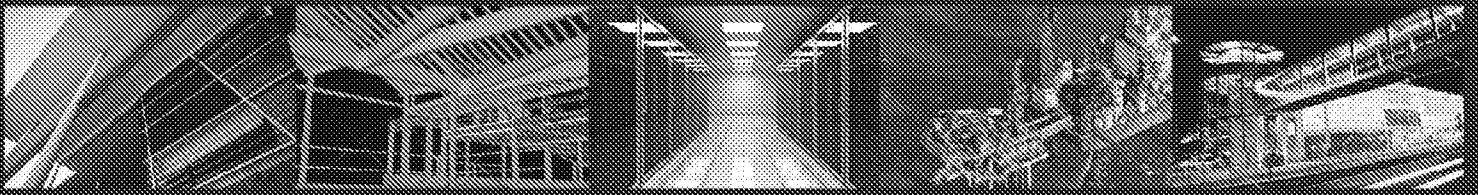
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## **Drainage Strategy Report**

**LITTLE HAMPTON, Land at Watersmead Business Park**

16 April 2019

**Prepared for:**

**amazon**logistics

**STRUCTURAL · CIVIL · DUE DILIGENCE · ENGINEERING MASTERPLANNING  
FLOOD MANAGEMENT · INFRASTRUCTURE DESIGN  
PRE-DEVELOPMENT ENGINEERING · BIM · TRANSPORTATION**

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## APPROVALS

|             | Name         | Position       | Date     |
|-------------|--------------|----------------|----------|
| Prepared by | Andrew Quinn | Civil 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      | Andrew Quinn | 15.04.19 | For Comment |
|        |              |          |             |
|        |              |          |             |
|        |              |          |             |

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# 1 INTRODUCTION

Pinnacle Consulting Engineers Ltd have been commissioned by Amazon to carry out a Drainage Strategy report 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.

## 1.1 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)

## 1.2 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.

## 1.3 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<br>(Made Ground)       | Artificial deposits delineated in available Dynamic Sampler on site identify Made Ground prove to approximately 0.45m bgl.                                                                                                                                                                                 |
| Superficial Deposits<br>(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 1.0 – Geological Ground Conditions**

## 1.4 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 D.

## **2 EXISTING SURFACE WATER MANAGEMENT**

### **2.1 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 Ø375mm and the other discharges immediately to the east of the central service yard via a Ø1050mm 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.

The Environmental Agency's Flood map for planning indicates that the site is located mostly in 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 rainfall event).

### **3 PROPOSED DRAINAGE**

#### **3.1 Surface Water Discharge Location**

Traditional approaches to urban drainage have comprised of underground tanks and pipe networks. More recently, the benefits and opportunities to use Sustainable Drainage Systems (SuDS) have been realised and encouragement to use such systems is promoted throughout Flood Risk Management policy at all levels. SuDS is a term which encompasses a variety of approaches to managing surface water in a way which is more sympathetic to the natural and human environment than conventional piped drainage systems. Management of surface water is an essential element for reducing flood risk and SuDS techniques are often designed to achieve this in a way that mimics the natural environment.

The Building Regulations (H3) states the priority for discharging surface water runoff from a development is as follows:

1. Infiltration into the ground;
2. Discharge into a watercourse;
3. Discharge into a sewer.

Therefore, the preferred solution would be to replicate the natural drainage regime and to infiltrate surface water runoff into the ground. It is imperative that a site-specific infiltration test to BRE Digest 365 is commissioned at a number of locations around the site, to ascertain whether infiltration would be a suitable method of surface water management.

#### **3.2 Proposed Development Runoff Rate**

It can be seen from the enclosed drawings in Appendix C that the existing impermeable area for the site and therefore the existing positively drained area is 24,647m<sup>2</sup>. The proposed impermeable area is 25,436m<sup>2</sup>, resulting in an increase of 789m<sup>2</sup> of impermeable area.

Despite the greenfield runoff rate calculations (Appendix E) yielding a discharge rate of 0.3l/s QBar, such a restriction is not deemed to be practicable and therefore 5l/s is proposed as this is to ensure that there will be no adverse effect on the existing drainage infrastructure.

#### **3.3 Proposed Development Surface Water Drainage Strategy**

As part of the proposed drainage strategy it is assumed that the majority of the infrastructure will remain un-altered. It is also important to note the existing warehouse buildings have a fully operational, positive drainage system that discharges into the aforementioned pond as described in section 2.1.

As part of the proposal, an additional impermeable area of 789m<sup>2</sup> will be produced by extending the kerb line along the northern perimeter. The proposed drainage channel along this area will collect surface water runoff to be attenuated, before being conveyed into the existing network at a restricted rate of 5l/s via a hydrobrake.

#### **3.4 Surface Water Discharge Rate and Attenuation**

As mentioned in section 3.2, the proposed impermeable area compared to the original design will increase by approximately 789m<sup>2</sup>. Based on calculations for all storms up to a 1 in 30 year rainfall event, it is deduced that additional attenuation storage is needed. An additional required attenuation storage volume of 14m<sup>3</sup> has been estimated quick storage estimate through MicroDrainage, the results of which are included in Appendix E.

The proposed network will collect the surface water from the site via rainwater downpipes and drainage channels, passing through petrol interceptor where necessary. Flows from the additional impervious

areas to the north of the site will be attenuated by the proposed tank and discharge via a Ø150mm pipe into the existing private sewer network. The proposed drainage layout is included as Appendix F.

### 3.5 SuDS Features

The proposed Geolight (or equivalent) attenuation tank includes a perforated/ slotted distribution pipe surrounded by granular material providing filtration and treatment for surface water flows. This in conjunction with the proposed oil separator, deep trapped gullies and a catchpit manhole (silt trap) is considered appropriate for the scale and nature of the development.

Refer to Appendix F for proposed the proposed drainage layout.

### 3.6 Attenuation Tank

The proposed Geolight (or equivalent) attenuation tank includes a perforated/ slotted distribution pipe surrounded by granular material providing filtration and treatment for surface water flows. This in conjunction with the proposed catchpit manhole (silt trap) is considered appropriate for the scale and nature of the development.

### 3.7 Maintenance Requirements

It is anticipated that a private management company will be employed to maintain the completed drainage network for the development incorporating the following activities and frequency for each SuDS component.

#### 3.7.1 Gullies/Channels/Pipes/Manholes

All components are to be periodically cleaned of foreign particles and silt accumulation, on a quarterly basis. Components located in unadopted areas will be maintained by the landowner. Those located in adopted areas will be maintained by the adopting authority.

#### 3.7.2 Proprietary Systems

Proprietary systems will require routine maintenance by the owner to ensure continuing operation to design performance standards. A typical maintenance schedule is detailed below in table 14.2 from the CIRIA SuDS manual.

| <b>TABLE 14.2 An example of operation and maintenance requirements for a proprietary treatment system</b> |                             |                                                                                   |                                                                                           |
|-----------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                                                                           | <b>Maintenance schedule</b> | <b>Required action</b>                                                            | <b>Typical frequency</b>                                                                  |
|                                                                                                           | Routine maintenance         | Remove litter and debris and inspect for sediment, oil and grease accumulation    | Six monthly                                                                               |
|                                                                                                           |                             | Change the filter media                                                           | As recommended by manufacturer                                                            |
|                                                                                                           |                             | Remove sediment, oil, grease and floatables                                       | As necessary – indicated by system inspections or immediately following significant spill |
|                                                                                                           | Remedial actions            | Replace malfunctioning parts or structures                                        | As required                                                                               |
|                                                                                                           | Monitoring                  | Inspect for evidence of poor operation                                            | Six monthly                                                                               |
|                                                                                                           |                             | Inspect filter media and establish appropriate replacement frequencies            | Six monthly                                                                               |
|                                                                                                           |                             | Inspect sediment accumulation rates and establish appropriate removal frequencies | Monthly during first half year of operation, then every six months                        |

## **4 CONCLUSION**

The proposed development is centred 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 development site is relatively flat with ground levels falling in a southerly direction from approximately 5.20m to 4.28m Above Ordnance Datum (AOD).

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 site has two fully operational, primary, positive surface water networks, with separate discharge locations. Both networks are assumed to discharge into the pond situated 20m to the east of the site. The rate of discharge from the additional drainage infrastructure will be restricted to 5l/s. Discharge of the existing networks will remain unrestricted.

## **Appendix A – Site Location Plan**





### GENERAL NOTES

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.

### LEGEND

— SITE BOUNDARY

0 50MM ON A1 DWG. 50

|     |             |    |     |          |
|-----|-------------|----|-----|----------|
| TI  | FOR TENDER  | RW | JJ  | 01-03-19 |
| REV | DESCRIPTION | BY | CHK | DATE     |

CLIENT

amazonlogistics

PROJECT  
LITTLEHAMPTON  
DBN3 REFURBISHMENT

DRAWING TITLE  
SITE LOCATION

**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<br>1:2000                  | DATE<br>FEB '19 | DRAWN BY<br>RW | CHECKED<br>JJ |
| DRG NO.<br>190213-PIN-00-XX-DR-C-0200 | REVISION<br>TI  |                |               |

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## **Appendix B – GPR Survey**



Sheet Index

The diagram shows a 2x2 grid of cells. The top-left cell is labeled '1', the top-right cell is labeled '2', the bottom-left cell is labeled '3', and the bottom-right cell is labeled '4'. The cell labeled '1' is highlighted with a thick black border, indicating it is the active cell.



**MALCOLM  
HUGHES**

**CHARTERED  
LAND SURVEYORS**

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M33 7NF, Tel: 0161 925 1265  
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Accreditations



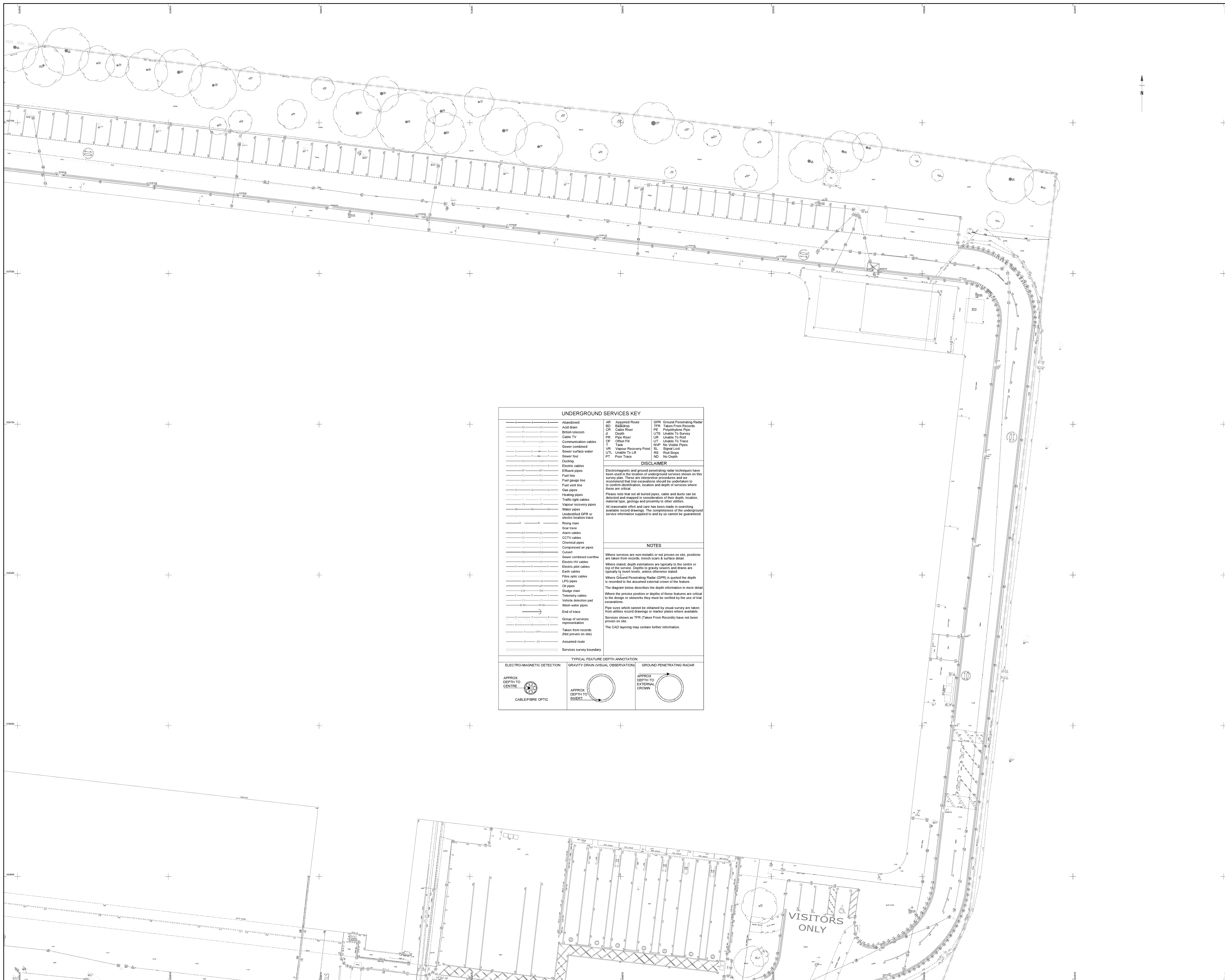





Project

THE BODY SHOP  
NORWAY LANE, WICK  
LITTLEHAMPTON BN17 6LS





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

Notes

### Topographical Survey Legend

| BUILDINGS AND WALLS |                                                                                     | GENERAL INFORMATION |                              |
|---------------------|-------------------------------------------------------------------------------------|---------------------|------------------------------|
| Building            |  | Panel Pump          | <input type="checkbox"/> PF  |
| Water Tank          |  | Blower/Light        | <input type="checkbox"/> BL  |
| Run                 |  | Full/Empty          | <input type="checkbox"/> FE  |
| Alarm               |  | Gas Type Channel    | <input type="checkbox"/> GTC |
| Pumpset             |  | Slide Type Channel  | <input type="checkbox"/> STC |
| Well with Height    |  | Slide Type Channel  | <input type="checkbox"/> STC |
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## ROADS

STREET FURNITURE

|  |                                    | Hand-drawn sketches                                                                            |
|--|------------------------------------|------------------------------------------------------------------------------------------------|
|  | Balancing Beacons                  | + BB                                                                                           |
|  | Buo Site                           | + BS                                                                                           |
|  | Bulwark                            | + B                                                                                            |
|  | Cable Gate                         | + CG                                                                                           |
|  | Cool Chute                         | + CC                                                                                           |
|  | Covered Churn/Turb                 | + CCHV                                                                                         |
|  | Ditch                              | + D                                                                                            |
|  | Electricity Pole                   | + EP                                                                                           |
|  | Flood Light                        | + FL                                                                                           |
|  | Flag Mast                          | + FM                                                                                           |
|  | Lamp Post                          | + LP                                                                                           |
|  | Letter Box                         | + LB                                                                                           |
|  | Non-Permeable Surface              | + NPS                                                                                          |
|  | Mourning Ring                      | + MR                                                                                           |
|  | Mile Post or Warning Post          | + MP                                                                                           |
|  | Semaphore Station                  | + SS                                                                                           |
|  | Main Street                        | + MS                                                                                           |
|  | Hedge                              |             |
|  | Edge of wood/bushes                |             |
|  | Scump                              | + SCUMP<br> |
|  | Individual Tree                    |             |
|  | Stones with height greater than 1m |             |
|  | Golf Course                        |             |
|  | Marsh                              |             |
|  | Sea Wall                           |             |
|  | Roads                              |             |

## LEVEL AND HEIGHT INFORMATION

| LEVEL AND HEIGHT INFORMATION |           |
|------------------------------|-----------|
| Headset                      | ± 6P      |
| Receiving Eye                | ± 6P      |
| Road Sign                    | ± 6P/CM   |
| Speed Camera                 | ± 6SEN    |
| Information Sign             | ± 6P/CM   |
| Sign                         | ± 6P/CM   |
| Traffic Light                | ± 11L     |
| Telegraph Pole               | ± 11L/2   |
| Telegraph Mast Buffer Post   | ± 12L     |
| Traffic Light Pole           | ± 11L/2   |
| Control Box                  | ± C/BOX   |
| British Telecom Box          | ± B/BOX   |
| Overhead Cable               | ± 12L     |
| Gas Box                      | ± G/BOX   |
| Standard Post Height         | ± 123.45  |
| Pressure Sign Weight         | ± 123.456 |
| Water Level                  | ± 123.456 |
| Water Level                  | ± 123.456 |
| Soil Level                   | ± 123.456 |
| Water Level                  | ± 123.456 |
| Cover Level                  | ± 123.456 |
| Invert Level                 | ± 123.45  |
| Water Level                  | ± 123.456 |
| Flow Level                   | ± 123.456 |
| Finished Floor Level         | ± 123.456 |
| Top of Foot Path             | ± 123.456 |
| Level Level                  | ± 123.456 |

## INSPECTION CHAMBERS AND PIPE

|                                |                                 |                           |            |
|--------------------------------|---------------------------------|---------------------------|------------|
| Inspection Cover               | <input type="checkbox"/> IC     | Flat Head Level           | £198.7,00  |
| Inspection Cover (Dais)        | <input type="checkbox"/> IC/D   | Top of Canopy Level       | £100/07,00 |
| Telephone                      | <input type="checkbox"/> M/T    | Underline of Canopy Level | £507/00,00 |
| British Telecom Cover          | <input type="checkbox"/> BT     | Window Sill Level         | £1818,00   |
| Inspection Cover (Comms)       | <input type="checkbox"/> IC/COM | Window Head Level         | £1613,00   |
| Cable TV                       | <input type="checkbox"/> C/TV   | Springing Level           | £1218,50   |
| Inspection Cover Traffic Signs | <input type="checkbox"/> IC/TI  | Arch Level                | £17,00     |
| Gully                          | <input type="checkbox"/> G      | Cable Level               | £1078,50   |
| Kerb Outlet                    | <input type="checkbox"/> KO     | Top of Wall Level         | £1616,00   |
| Vent Pipe                      | <input type="checkbox"/> VP     | Underline of Beam Level   | £128,50    |
|                                |                                 | General Height            | £175,00    |

CLIENT INFORMATION PAGE

| SURVEY INFORMATION SIGNS  |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|
| Penetration Ground Marker |  |
| O.S. Trig Station         |  |
| O.S. Bench Mark           |  |

|           |       |
|-----------|-------|
| Hydrazine | 0.100 |
| Earth Rod | 0.01  |
| Blue Rod  | 0.01  |

|                                 |      |
|---------------------------------|------|
| Gas Valve                       | o DV |
| Water Meter                     | o RM |
| Water/Out                       | o RO |
| Rodding Cyl                     | o RE |
| <b>GEOTECHNICAL INFORMATION</b> |      |
| Denshole                        | o DH |
| Test Pit                        | o TP |
| Monitor Pit                     | o MP |
| Probe Hole                      | o PH |
| Window Sample                   | o WS |

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Sheet Index

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|---------------------------------------------------------------------------------------|-----------------------|
|  | <p>Accreditations</p> |
|---------------------------------------------------------------------------------------|-----------------------|

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65 Orosa Street, Sale, Manchester  
M33 7HF. Tel: 0161 505 1205  
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[survey@mhhs.co.uk](mailto:survey@mhhs.co.uk)

 **RICS**

 **THE SURVEY  
ASSOCIATION**

 **THE  
I.C.S.**





13 14 25

Client

SMR ARCHITECTS  
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HARROGATE, HG1 1TS

Project

THE BODY SHOP  
NORWAY LANE, WICK  
LITTLEHAMPTON BN17 6LS

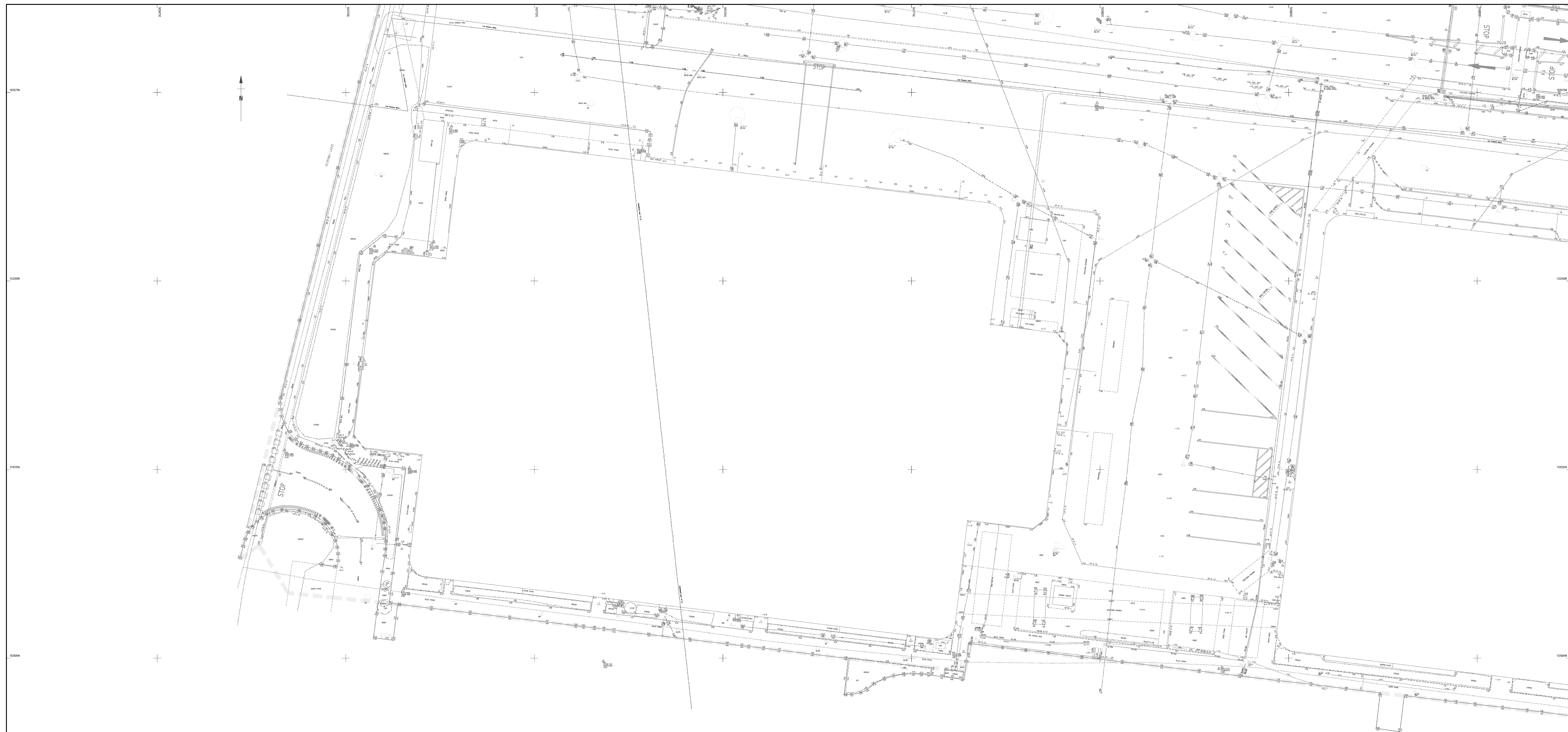
Drawing Title

UNDERGROUND SERVICES

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

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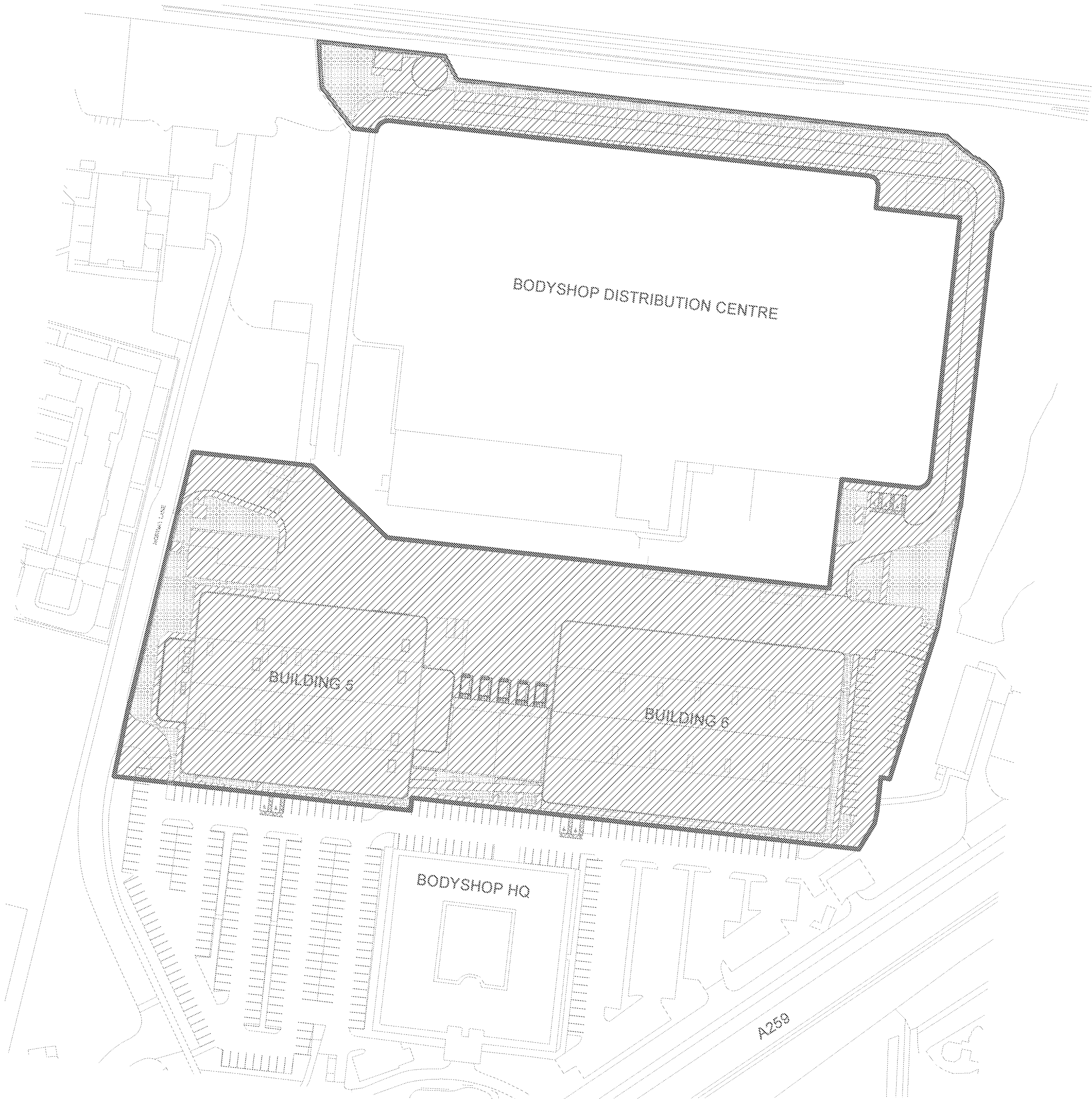
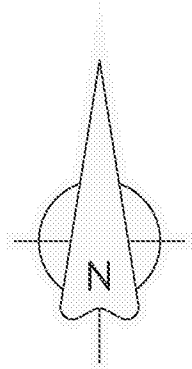


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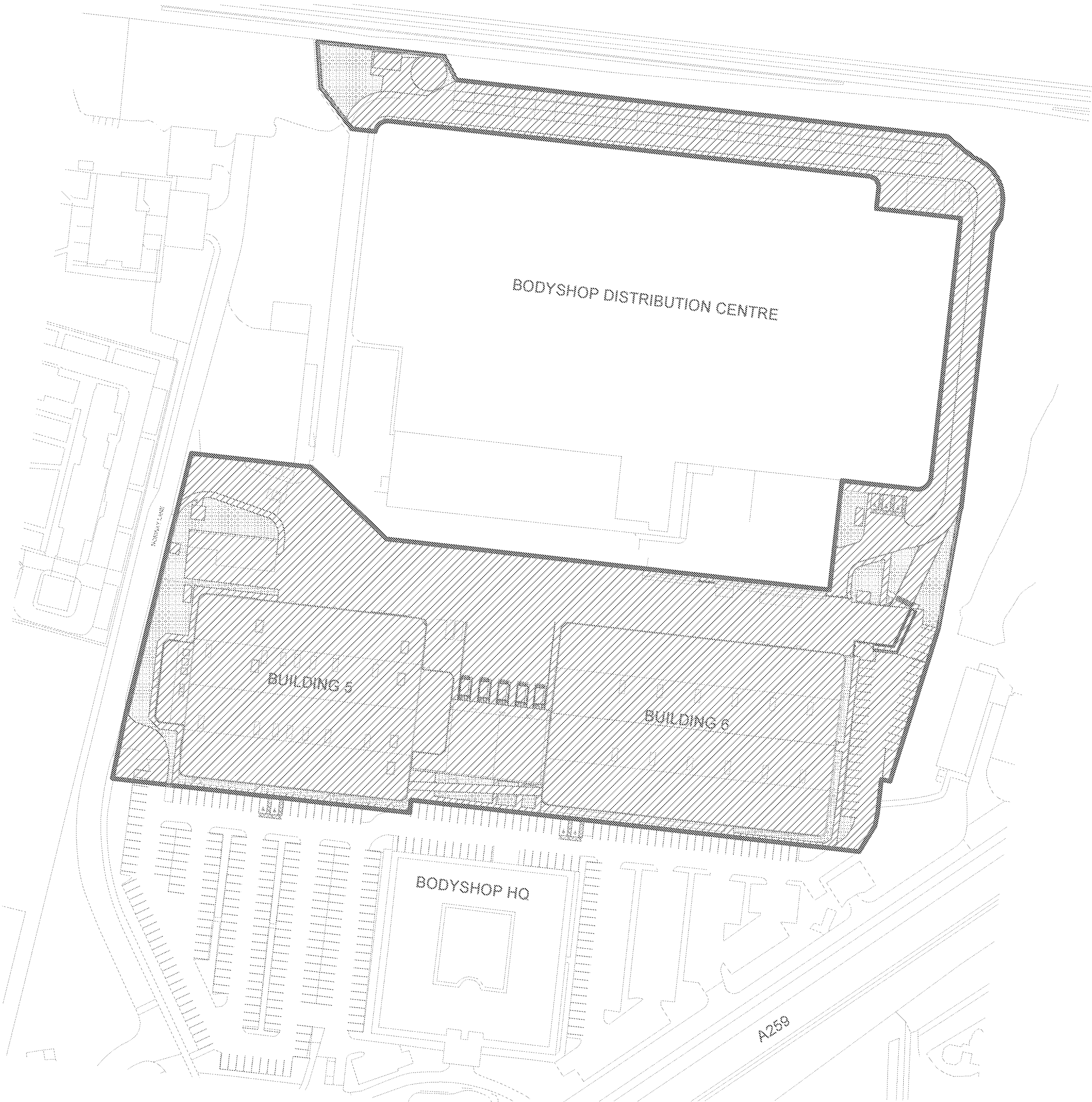
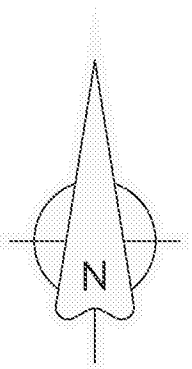
## **Appendix C – Existing & Proposed Impermeable Areas**





EXISTING SITE

TOTAL IMPERMEABLE AREA = 24,647M<sup>2</sup>  
TOTAL PERMEABLE AREA = 2,927M<sup>2</sup>



PROPOSED SITE

TOTAL IMPERMEABLE AREA = 25,436M<sup>2</sup>  
TOTAL PERMEABLE AREA = 2,132M<sup>2</sup>

GENERAL NOTES

- 1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
- 2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
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- 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

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WELWYN GARDEN CITY,  
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NORWICH | LONDON | DUBLIN | THE HAGUE

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

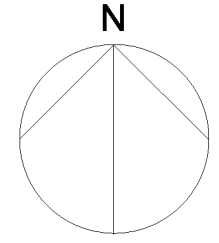
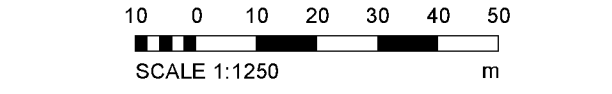
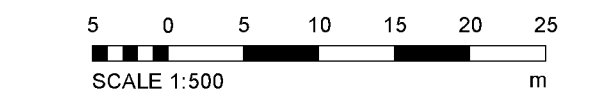
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REF: 190213



## **Appendix D – Proposed Development Plans**





REFER TO  
ARBORICULTURAL  
REPORT FOR LOCATIONS  
OF TREES AND  
VEGETATION

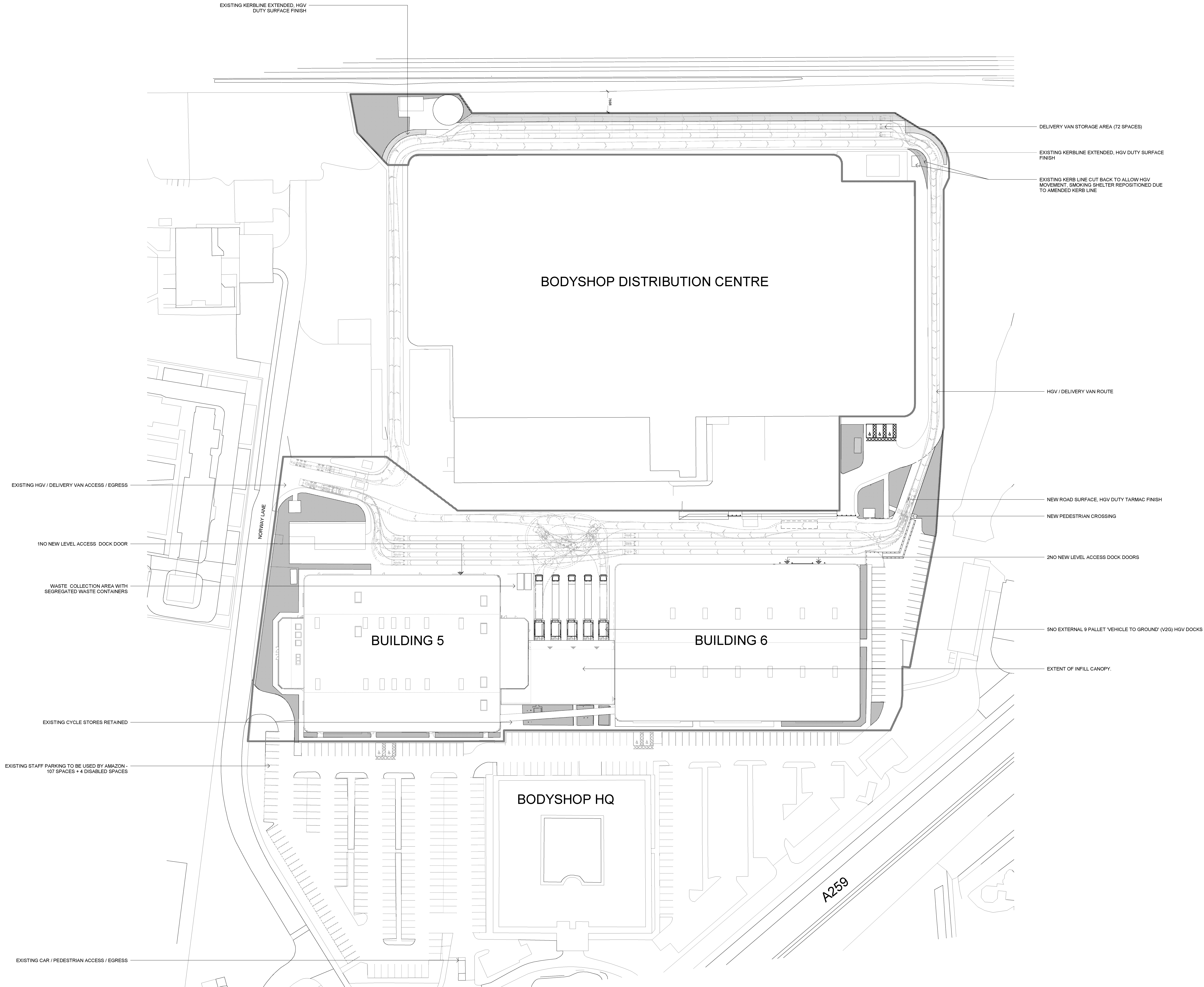
NO NEW BOUNDARY  
TREATMENTS

NO PUBLIC RIGHTS OF  
WAY ACROSS SITE

EXISTING LANDSCAPED AREA  
TO BE RETAINED: 2128 m<sup>2</sup>

LANDSCAPED AREA TO BE  
REPLACED WITH VEHICLE  
HARDSTANDING: 592 m<sup>2</sup>

KERBED AREA TO BE  
REPLACED WITH VEHICLE  
HARDSTANDING: 25 m<sup>2</sup>



|     |                                          |          |     |     |
|-----|------------------------------------------|----------|-----|-----|
| P9  | CANOPY ADJUSTED                          | 04.04.19 | JN  | MB  |
| P8  | PEDESTRIAN BRIDGE REPLACED WITH CROSSING | 26.03.19 | MB  | GR  |
| P7  | UPDATED TRACKING                         | 12.03.19 | BC  | MB  |
| P6  | UPDATED VOSIS                            | 06.03.19 | MB  | GR  |
| P5  | KERBING AMENDED                          | 20.2.19  | MB  | GR  |
| P4  | LANDSCAPE AREAS SHOWN                    | 05.02.19 | MB  | GR  |
| P3  | REVISED AFTER PLANNING REVIEW            | 01.02.19 | JN  | MB  |
| P2  | REVISED FOLLOWING PLANNING CALL          | 26.01.19 | NDR | GR  |
| P1  | FIRST ISSUE                              | 24.1.19  | MB  | GR  |
| Rev | Description                              | Date     | By  | Old |

Status

PLANNING

**SMR**  
SMALLEY MARSEY RISPIN

**ARCHITECTS**

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admin@smrarchitects.co.uk

Project

DBN3 - NEW COURTWICK LANE, LITTLEHAMPTON

Client

**amazon**logistics

Drawing Title

PROPOSED SITE BLOCK PLAN

Proj Ref Origin Zone Level Type Role Num Status Rev

-- 7260 - SMR - 00 - 22 - DR - A - 2001 - S3 - P9

SMR Job Ref Sheet A0 Scale NOTED Drawn MAB

7260-00-2001

PROPOSED SITE PLAN  
1 : 500



## **Appendix E – Drainage Calculations**

Calculated by:

Site name:

Site location:

Site coordinates

Latitude:

Longitude:

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", WS-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Reference:

Date:

|             |       |
|-------------|-------|
| Methodology | IH124 |
|-------------|-------|

## Site characteristics

|                      |     |
|----------------------|-----|
| Total site area (ha) | 0.1 |
|----------------------|-----|

## Methodology

|                        |                             |        |
|------------------------|-----------------------------|--------|
| Qbar estimation method | Calculate from SPR and SAAR |        |
| SPR estimation method  | Calculate from SOIL type    |        |
|                        | Default                     | Edited |
| SOIL type              | 3                           | 3      |
| HOST class             | ---                         | ---    |
| SPR/SPRHOST            | 0.37                        | 0.37   |

## Hydrological characteristics

|                               |         |        |
|-------------------------------|---------|--------|
|                               | Default | Edited |
| SAAR (mm)                     | 722     | 722    |
| Hydrological region           | 7       | 7      |
| Growth curve factor: 1 year   | 0.85    | 0.85   |
| Growth curve factor: 30 year  | 2.3     | 2.3    |
| Growth curve factor: 100 year | 3.19    | 3.19   |

## Notes:

(1) Is  $Q_{BAR} < 2.0$  l/s/ha?

(2) Are flow rates  $< 5.0$  l/s?

Where flow rates are less than 5.0 l/s consents are usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements.

(3) Is  $SPR/SPRHOST \leq 0.3$ ?

## Greenfield runoff rates

|                      |         |        |
|----------------------|---------|--------|
|                      | Default | Edited |
| Qbar (l/s)           | 0.3     | 0.3    |
| 1 in 1 year (l/s)    | 0.25    | 0.25   |
| 1 in 30 years (l/s)  | 0.69    | 0.69   |
| 1 in 100 years (l/s) | 0.95    | 0.95   |



Quick Storage Estimate

Variables

FSR Rainfall:

Return Period (years):

Region:

Map: M5-60 (mm):

Ratio R:

Cv (Summer):

Cv (Winter):

Impermeable Area (ha):

Maximum Allowable Discharge (l/s):

Infiltration Coefficient (m/hr):

Safety Factor:

Climate Change (%):

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Results

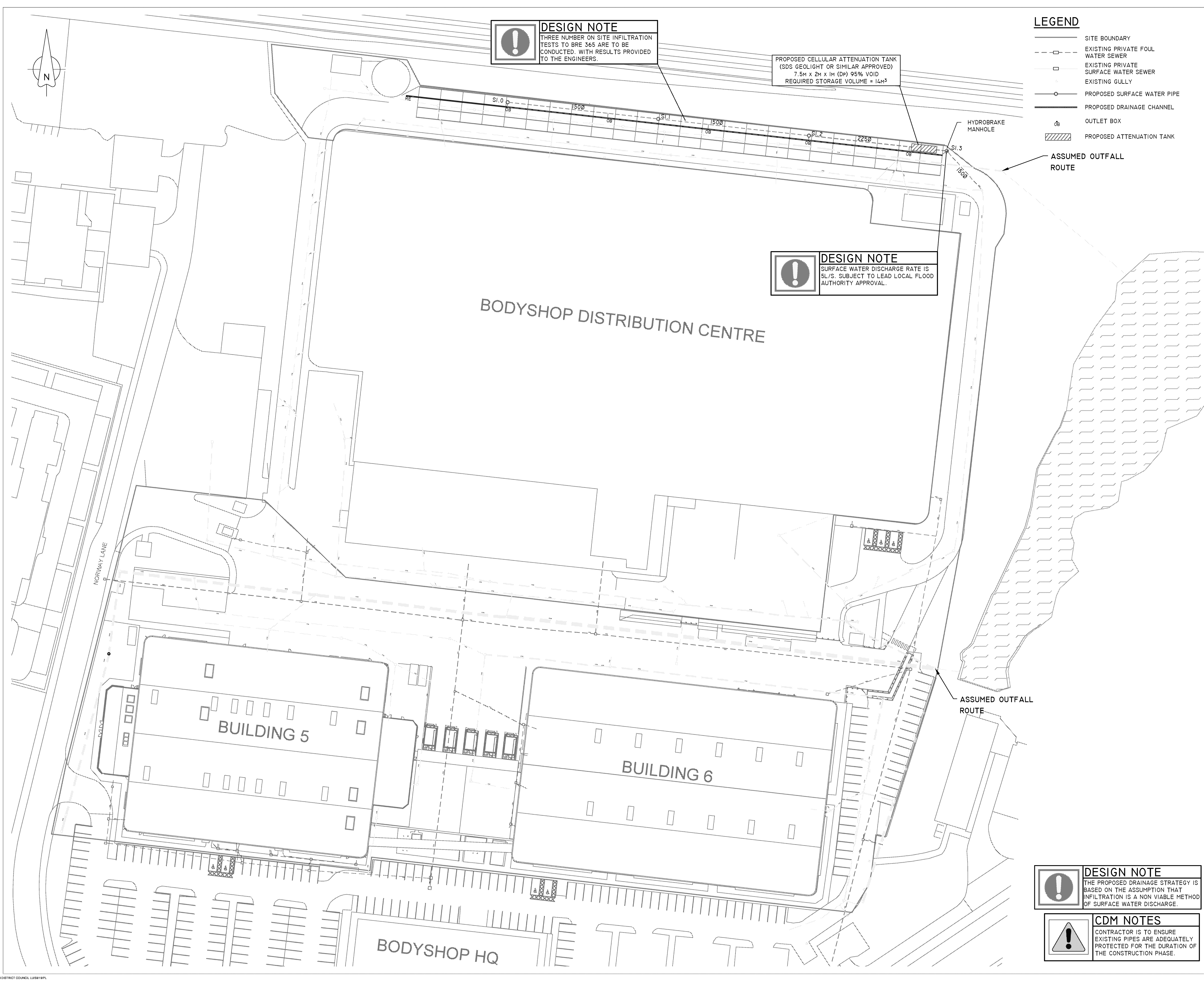
Global Variables require approximate storage of between 7.3 m<sup>3</sup> and 14 m<sup>3</sup>.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

## **Appendix F – 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.
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- 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     |

CLIENT

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PROJECT  
LITTLEHAMPTON  
DBN3 REFURBISHMENT

DRAWING TITLE  
PROPOSED DRAINAGE  
STRATEGY

PINNACLE  
CONSULTING ENGINEERS

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| DRAWING STATUS             |          |          |         |
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| 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 = 14M<sup>3</sup>

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

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

BUILDING 6

BUILDING 5

BODYSHOP DISTRIBUTION CENTRE

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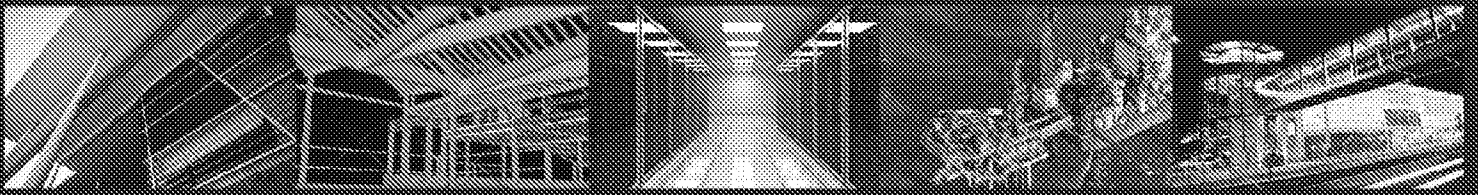
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## **Flood Risk Assessment**

**LITTLE HAMPTON, Land at Watersmead Business Park**

16 April 2019

**Prepared for: Amazon**

**STRUCTURAL · CIVIL · DUE DILIGENCE · ENGINEERING MASTERPLANNING  
FLOOD MANAGEMENT · INFRASTRUCTURE DESIGN  
PRE-DEVELOPMENT ENGINEERING · BIM · TRANSPORTATION**

## CONTACT DETAILS

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|--------------|--------------------|------------------------|---------------|--------------|
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| David Meigh  | Director           | David.m@ukpinnacle.com | 01707 527 635 | 07770 550712 |

## APPROVALS

|             | Name         | Position           | Date     |
|-------------|--------------|--------------------|----------|
| Prepared by | Jawsy Jabbar | 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      | Jawsy Jabbar | 04.02.19 | For Comment |
| 2      | Andrew Quinn | 15.04.19 | For Comment |
|        |              |          |             |
|        |              |          |             |

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# 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<br>(Made Ground)       | Artificial deposits delineated in available Dynamic Sampler on site identify Made Ground proven to approximately 0.45m bgl.                                                                                                                                                                                |
| Superficial Deposits<br>(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 Ø375mm and the other discharges immediately to the east of the central service yard via a Ø1050mm 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.

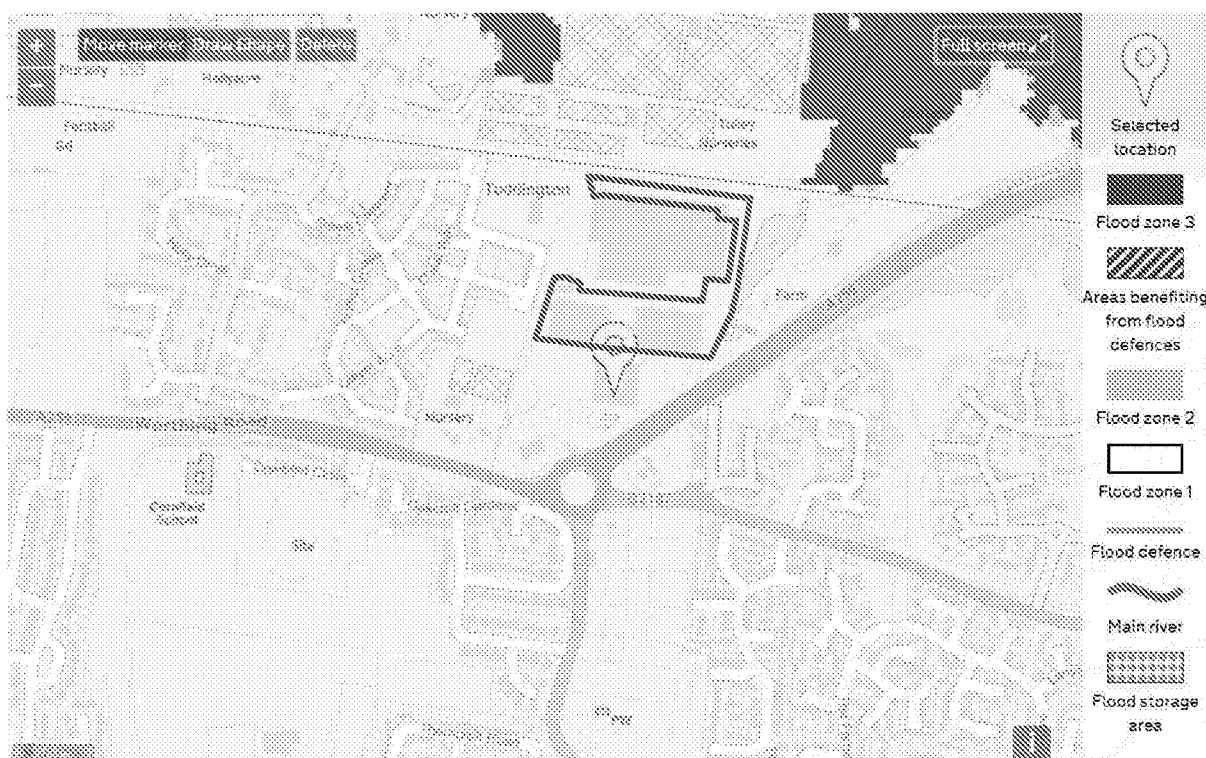
### **4.1 Flooding from rivers (fluvial flooding) & sea (tidal flooding)**

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.

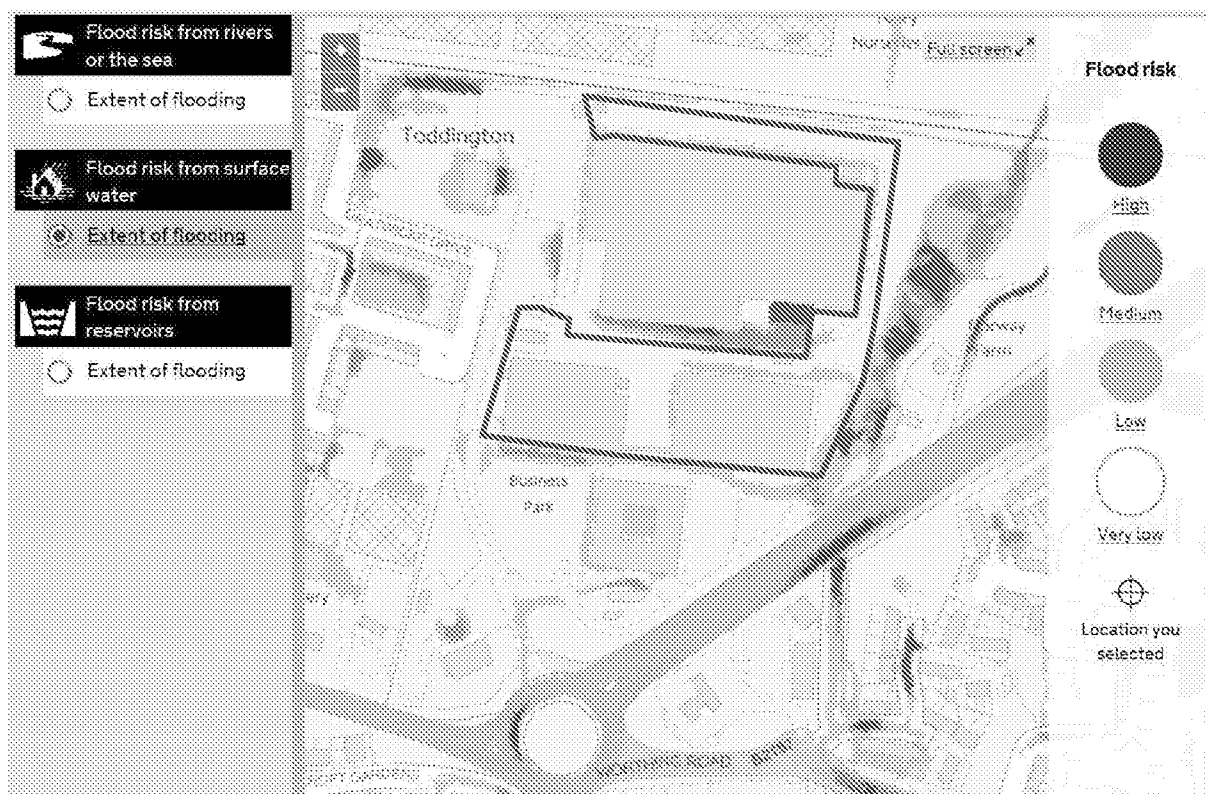




**Figure 4.1 – Environment Agency Online Flood Map Extract for Planning (Approximate Site Extents Edged Red)**

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

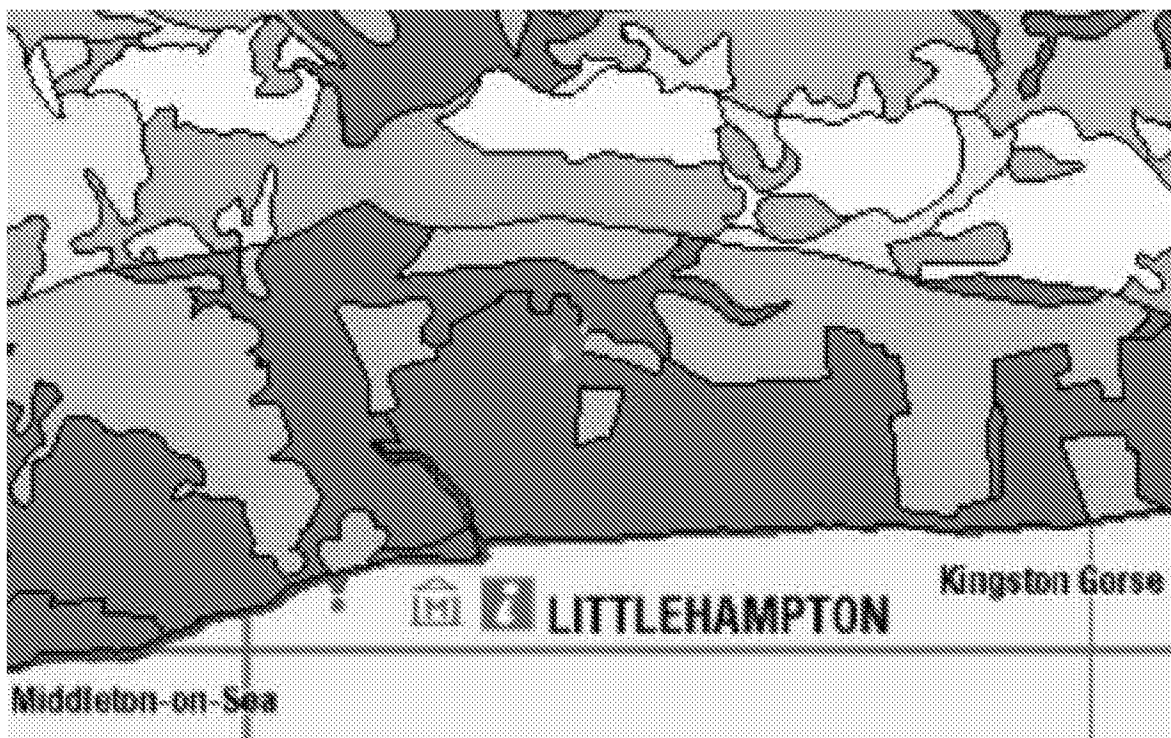
## 4.2 Flooding from land & sewers



**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.

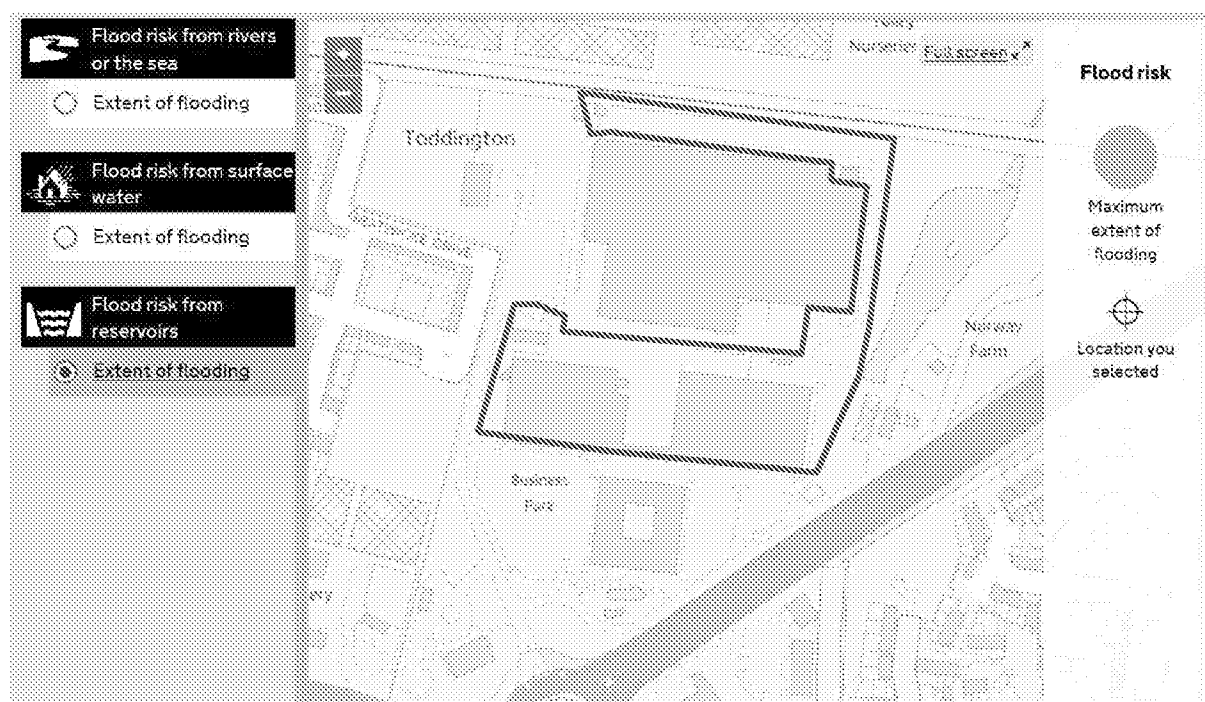
#### **4.3 Flooding from groundwater**



**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).

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Essential Infrastructure</b>     | <p>Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk</p> <p>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</p> <p>Wind Turbines</p>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Highly Vulnerable</b>            | <p>Police stations, Ambulance stations, Fire stations, Command Centres and telecommunications installations required to be operational during flooding</p> <p>Emergency dispersal points</p> <p>Basement dwellings</p> <p>Caravans, mobile homes and park homes intended for permanent residential use</p> <p>Installations requiring hazardous substances consent</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>More Vulnerable</b>              | <p>Hospitals</p> <p>Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels</p> <p>Buildings used for dwelling houses; student halls of residence, drinking establishments, nightclubs and hotels.</p> <p>Non-residential uses for health services, nurseries and educational establishments</p> <p>Landfill and sites used for waste management facilities for hazardous waste.</p> <p>Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.</p>                                                                                                                                                                                                                                                                        |
| <b>Less Vulnerable</b>              | <p>Police, ambulance and fire stations which are not required to be operational during flooding.</p> <p>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.</p> <p>Land and buildings used for agriculture and forestry.</p> <p>Waste treatment (except landfill and hazardous waste facilities).</p> <p>Minerals working and processing (except for sand and gravel working).</p> <p>Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place).</p> <p>Sewage treatment works (if adequate measures to control pollution and manage sewage during flood events are in place).</p> |
| <b>Water-compatible Development</b> | <p>Flood control infrastructure.</p> <p>Water transmission infrastructure, pumping stations.</p> <p>Sewage transmission infrastructure and pumping stations.</p> <p>Sand and gravel workings.</p> <p>Docks, marinas, wharves</p> <p>Navigation facilities.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>MOD defence installations.</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.</p> <p>Water-based recreation (excluding sleeping accommodation).</p> <p>Lifeguard and coastguard stations.</p> <p>Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.</p> |
| <p><b>Notes</b></p> <p>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.</p> <p>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.</p> <p>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.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Table 5.1 – Flood Risk Vulnerability Classification**

| Vulnerability Classification                                                                       |         | Essential Infrastructure | Water-compatible | Highly Vulnerable | More Vulnerable | Less Vulnerable |
|----------------------------------------------------------------------------------------------------|---------|--------------------------|------------------|-------------------|-----------------|-----------------|
| Flood Zone                                                                                         | Zone 1  | ✓                        | ✓                | ✓                 | ✓               | ✓               |
|                                                                                                    | Zone 2  | ✓                        | ✓                | Exception Test    | ✓               | ✓               |
|                                                                                                    | Zone 3a | Exception Test           | ✓                | ✗                 | Exception Test  | ✓               |
|                                                                                                    | Zone 3b | Exception Test           | ✓                | ✗                 | ✗               | ✗               |
| <p><b>Key</b></p> <p>✓ Development is appropriate</p> <p>✗ Development should not be permitted</p> |         |                          |                  |                   |                 |                 |

**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 789m<sup>2</sup> (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 789m<sup>2</sup> 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**





GENERAL NOTES

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.

LEGEND

— SITE BOUNDARY

0 50MM ON A1 DWG. 50

|     |             |    |     |          |
|-----|-------------|----|-----|----------|
| TI  | FOR TENDER  | RW | JJ  | 01-03-19 |
| REV | DESCRIPTION | BY | CHK | DATE     |

CLIENT

PROJECT  
LITTLEHAMPTON  
DBN3 REFURBISHMENT

DRAWING TITLE  
SITE LOCATION

**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<br>1:2000                  | DATE<br>FEB '19 | DRAWN BY<br>RW | CHECKED<br>JJ |
| DRG NO.<br>190213-PIN-00-XX-DR-C-0200 | REVISION<br>TI  |                |               |

COPYRIGHT PINNACLE

©GOOGLE MAPS 2019

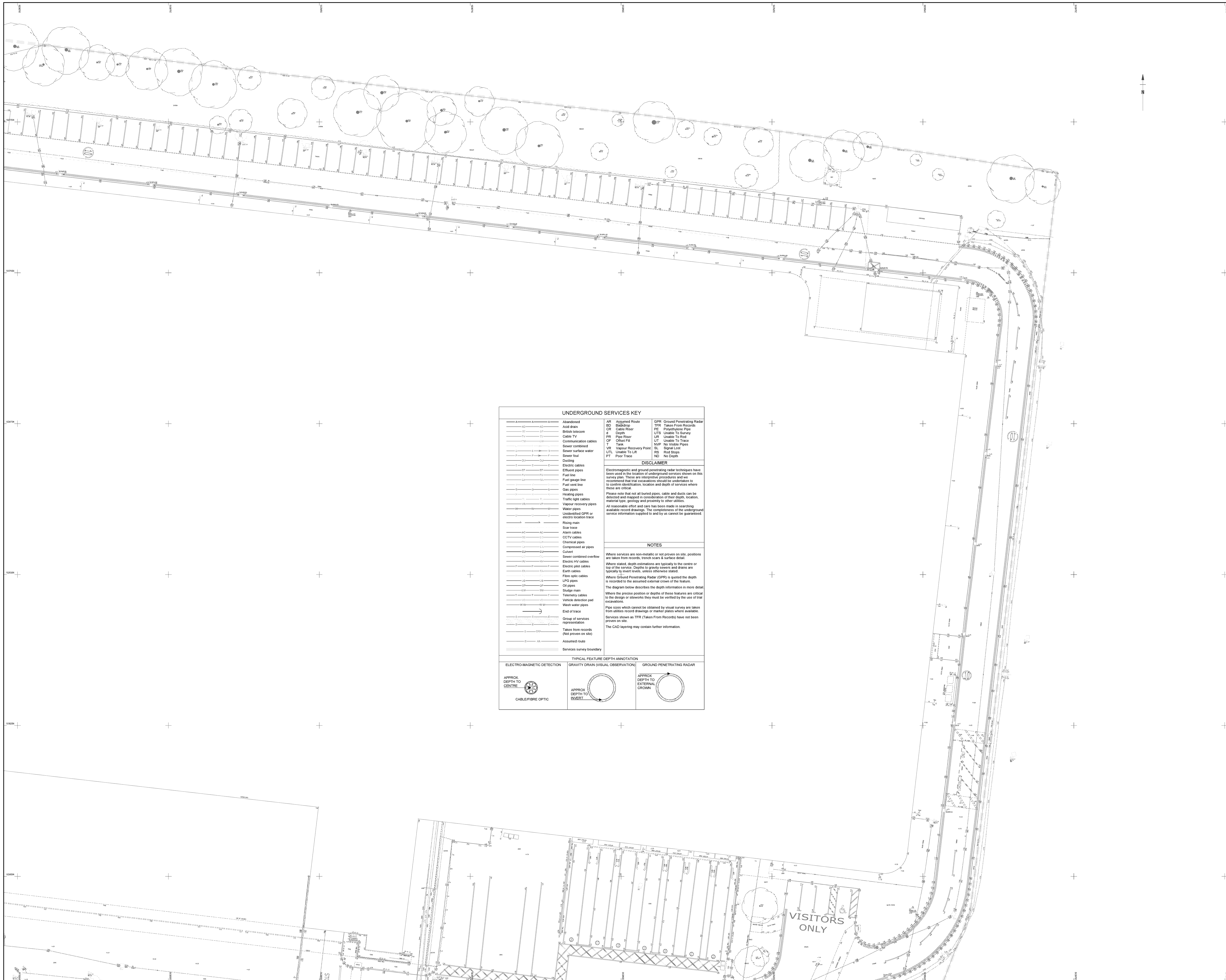


## **Appendix B – GPR Survey**









**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               |  |
|---------------------|--|
| Karta               |  |
| Edge of Surfacing   |  |
| Pedestrian Crossing |  |
| Track               |  |
| Footpath            |  |

| STREET FURNITURE          | RELIEF AND VEGETATION |
|---------------------------|-----------------------|
| Belgian Beacon            | = BS                  |
| Box Tree                  | = BT                  |
| Bollard                   | = B                   |
| Cafe Cane                 | = CC                  |
| Cool Shade                | = CS                  |
| Covered Cane/Tr           | = CC/Tr               |
| Crested                   | = CR                  |
| Electricity Pole          | = EP                  |
| Flame Light               | = FL                  |
| Frog Street               | = FS                  |
| Lattice Pole              | = LP                  |
| Lattice Box               | = LBP                 |
| Normal Pole (Street)      | = NP                  |
| Showering Ring            | = SR                  |
| Wine Post or Mooring Post | = WP                  |
| Service Mast              | = SM                  |
| Mast Tower                | = MT                  |
|                           | = MS                  |
|                           | Bridge                |
|                           | Edge of Road/Water    |
|                           | Slump                 |
|                           | Individual Tree       |
|                           | Shrubs with Height    |
|                           | Grass 1m              |
|                           | Cliff Face            |
|                           | Marsh                 |
|                           | Reeds                 |

| LEVEL AND HEIGHT INFORMATION |            |
|------------------------------|------------|
| Puist                        | e +P       |
| Parking Water                | e +P       |
| Waterlevel                   | e +BP      |
| Roofing Edge                 | e +R5      |
| Andal Sign                   | e +R5      |
| Spoken Letters               | e +R5/SM   |
| Information Edge             | e +SM/N    |
| Sky                          | e +SM      |
| Traffic Light                | e +TL      |
| Telephone Post               | e +TP      |
| Telephone Push Button        | e +TP/SL   |
| Traffic Light Control        | e +TL/CP   |
| Control Box                  | e +C/BOX   |
| British Telecom Box          | e +BT BOX  |
| Overhead Sign                | e +OS      |
| Gas Box                      | e +GAS BOX |
| Standard Spot Height         | +123.45    |
| Precisions Spot Height       | +123.456   |
| Bed Level                    | +662.93    |
| Water Level                  | +162.22    |
| Soil/L Level                 | +32.812    |
| Threshold Level              | +710.08    |
| Chamber Level                | +0.245     |
| Invert Level                 | +1.2515    |
| Pipe SoL/L Level             | +193.00    |
| Pipe Level                   | +19.00     |
| Finished Chalk Level         | +177.60    |
| Top of Sock Level            | +77.00     |
| Top Level                    | +0.00      |

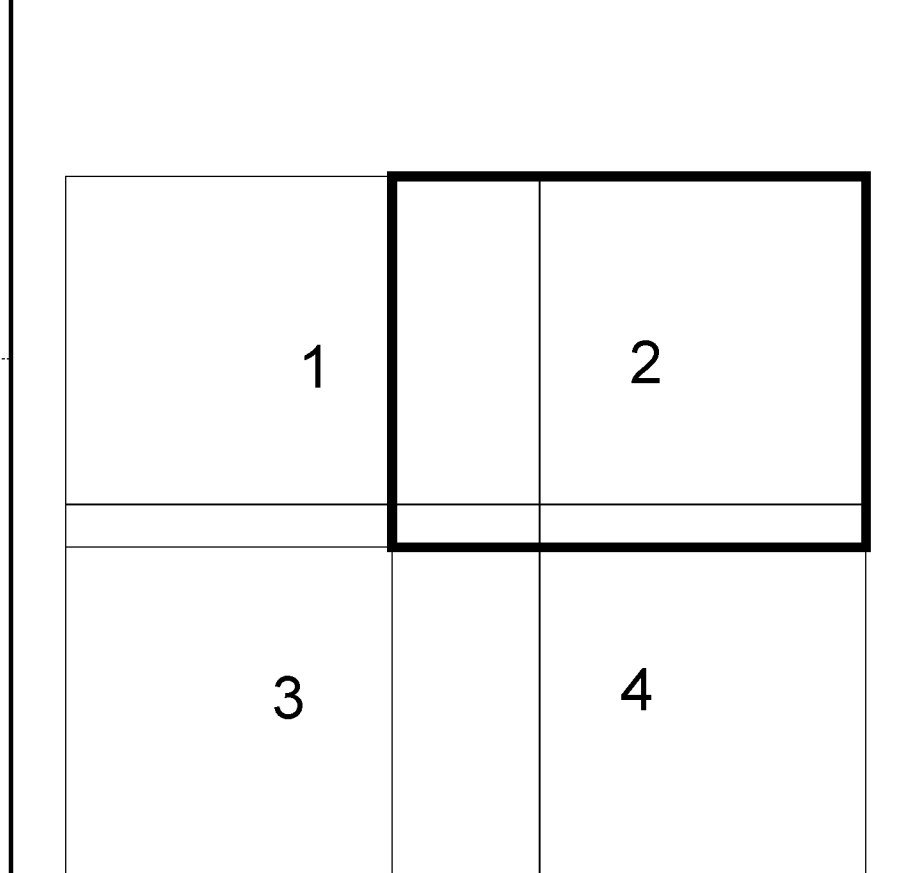
| INSPECTION CHAMBERS AND PIPES    |                                |                            |
|----------------------------------|--------------------------------|----------------------------|
| Inspection Cover                 | <input type="checkbox"/> C     | Ridge Line                 |
| Inspection Cover (DWC)           | <input type="checkbox"/> C/DL  | Flat Roof Line             |
| Manhole                          | <input type="checkbox"/> M     | Flat Roof Line             |
| Brickish Trench Cover            | <input type="checkbox"/> BT    | Top of Canopy Level        |
| Inspection Cover (Common)        | <input type="checkbox"/> C/DOM | Underneath of Canopy Level |
| Cable TV                         | <input type="checkbox"/> CTV   | Window Sill Level          |
| Inspection Cover Traffic Signals | <input type="checkbox"/> CTV   | Window Sill Level          |
| Gully                            | <input type="checkbox"/> G     | Springing Level            |
| Key Plot                         | <input type="checkbox"/> KP    | Arch Level                 |
| Vent Pipe                        | <input type="checkbox"/> VP    | Cable Guide                |
|                                  |                                | Top of Wall Level          |
|                                  |                                | Underneath of Beam Level   |
|                                  |                                | General Height             |

|                     |         |                                                                                                                                |
|---------------------|---------|--------------------------------------------------------------------------------------------------------------------------------|
| Drain Pipe          | OD      | <div>SURVEY INFORMATION SIGNS</div> <div>Permanent Ground Marker</div> <div>O.S. Trig Station</div> <div>O.S. Bench Mark</div> |
| Main Water Pipe     | WWP     |                                                                                                                                |
| Salt Pipe           |         |                                                                                                                                |
| Gas Pipe            | G-GP(G) |                                                                                                                                |
| Warning to WH cover | WL      |                                                                                                                                |
| Stop Tap            | ST      |                                                                                                                                |
| Stop Valve          | SV      |                                                                                                                                |
| Lampole             | LH      |                                                                                                                                |
| Hydrant             | HD      |                                                                                                                                |

|                          |
|--------------------------|
| GEOTECHNICAL INFORMATION |
|--------------------------|

|               |                                                                                          |
|---------------|------------------------------------------------------------------------------------------|
| Borehole      |  BH |
| Total Pin     |  TP |
| Monitor Pin   |  MP |
| Probe Hole    |  PH |
| Window Sample |  WS |

## Sheet Index

[illegible]



**MALCOLM  
HUGHES**

**CHARTERED  
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survey@mhsl.co.uk

**Accreditations**








Client

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HARROGATE, HG1 1TS

Project

THE BODY SHOP  
NORWAY LANE, WICK  
LITTLEHAMPTON BN17 6LS

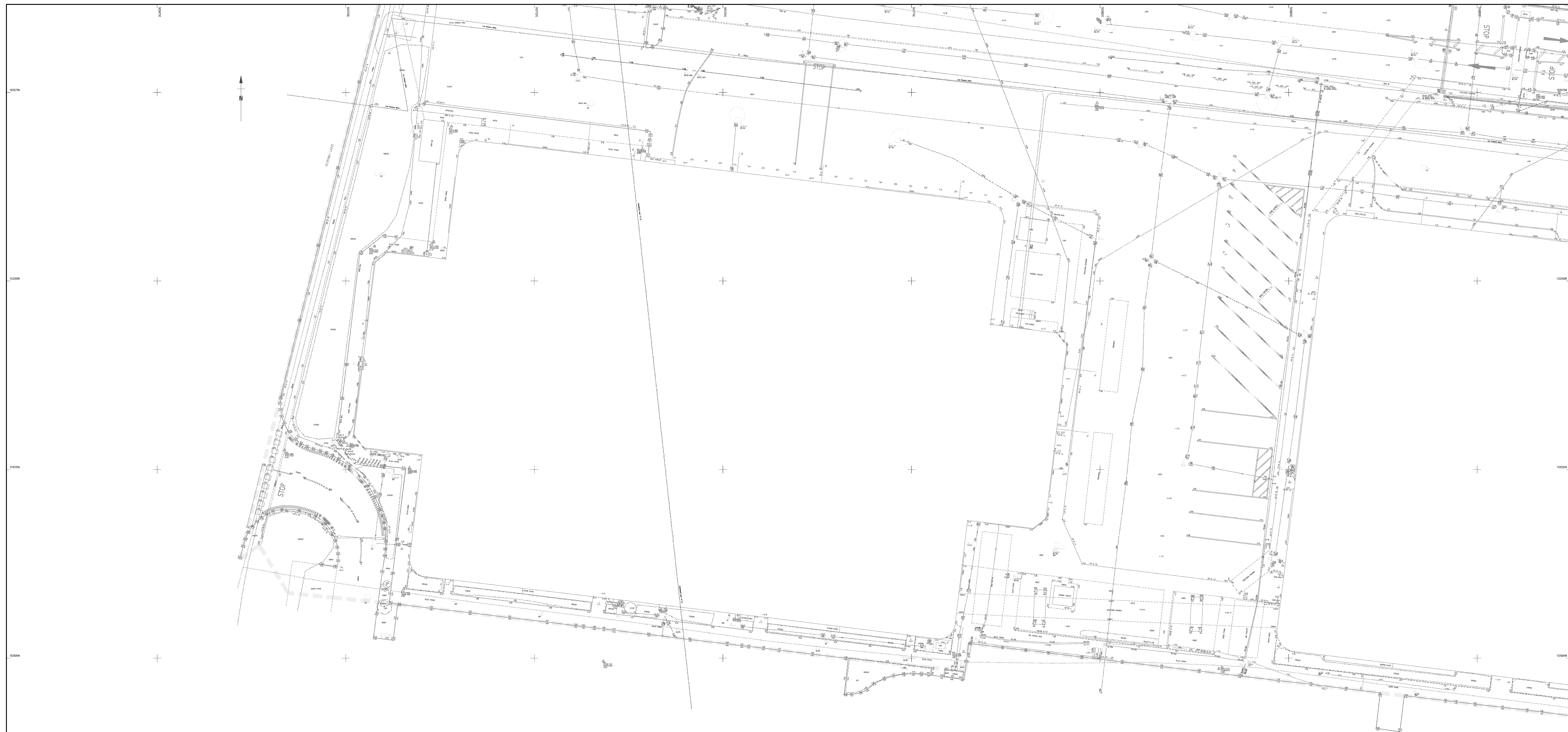
Drawing Title

UNDERGROUND SERVICES

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

53168/2





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Sheet Index

|   |   |
|---|---|
| 1 | 2 |
| 3 | 4 |

| Rev | Date | Description |
|-----|------|-------------|
|     |      |             |
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Drawing Title

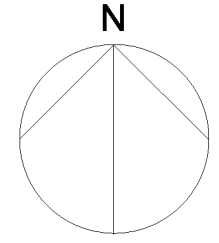
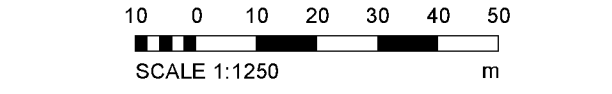
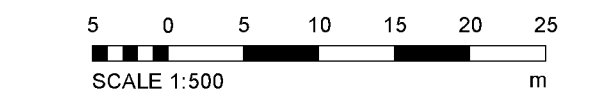
UNDERGROUND SERVICES

|             |         |          |              |               |
|-------------|---------|----------|--------------|---------------|
| Drawn By:   | AP      | 05/03/19 | Survey Date: | FEBRUARY 2019 |
| Checked by: | DJ      | 05/03/19 | Scale:       | A0@1:200      |
| Drawing No: | 53168/4 |          |              | Revision:     |



## **Appendix C – Proposed Development Plans**





REFER TO  
ARBORICULTURAL  
REPORT FOR LOCATIONS  
OF TREES AND  
VEGETATION

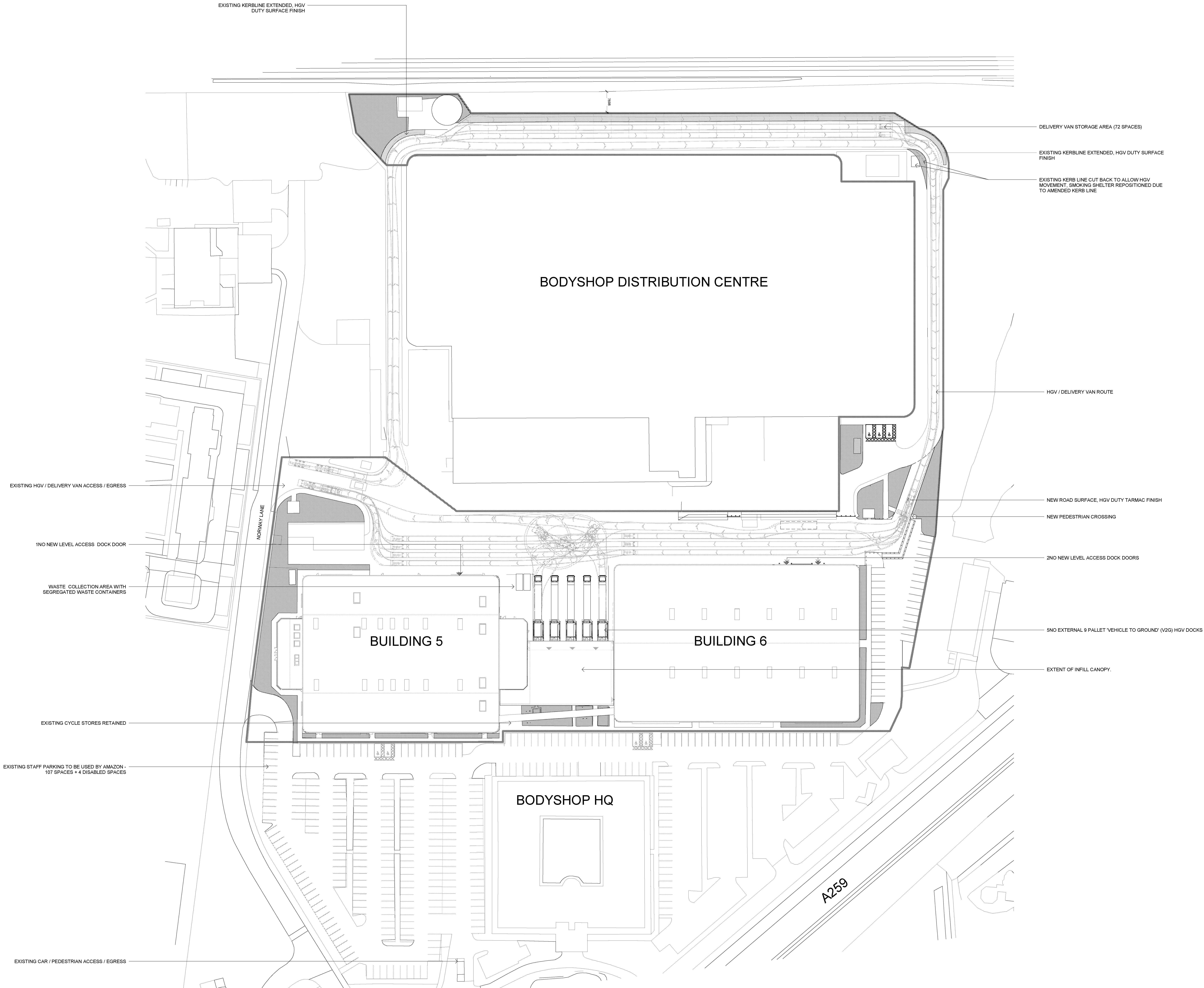
NO NEW BOUNDARY  
TREATMENTS

NO PUBLIC RIGHTS OF  
WAY ACROSS SITE

EXISTING LANDSCAPED AREA  
TO BE RETAINED: 2128 m<sup>2</sup>

LANDSCAPED AREA TO BE  
REPLACED WITH VEHICLE  
HARDSTANDING: 592 m<sup>2</sup>

KERBED AREA TO BE  
REPLACED WITH VEHICLE  
HARDSTANDING: 25 m<sup>2</sup>



PROPOSED SITE PLAN  
1 : 500

|     |                                          |          |     |     |
|-----|------------------------------------------|----------|-----|-----|
| P9  | CANOPY ADJUSTED                          | 04.04.19 | JN  | MB  |
| P8  | PEDESTRIAN BRIDGE REPLACED WITH CROSSING | 26.03.19 | MB  | GR  |
| P7  | UPDATED TRACKING                         | 12.03.19 | BC  | MB  |
| P6  | UPDATED VOSs                             | 06.03.19 | MB  | GR  |
| P5  | KERBING AMENDED                          | 20.2.19  | MB  | GR  |
| P4  | LANDSCAPE AREAS SHOWN                    | 05.02.19 | MB  | GR  |
| P3  | REVISED AFTER PLANNING REVIEW            | 01.02.19 | JN  | MB  |
| P2  | REVISED FOLLOWING PLANNING CALL          | 26.01.19 | NDR | GR  |
| P1  | FIRST ISSUE                              | 24.1.19  | MB  | GR  |
| Rev | Description                              | Date     | By  | Old |

Status

PLANNING

**SMR**  
SMALLEY MARSEY RISPIN

**ARCHITECTS**

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Project

DBN3 - NEW COURTWICK LANE, LITTLEHAMPTON

Client

**amazon**logistics

Drawing Title

PROPOSED SITE BLOCK PLAN

Proj Ref: Origin: Zone: Level: Type: Date: Status: Rev:

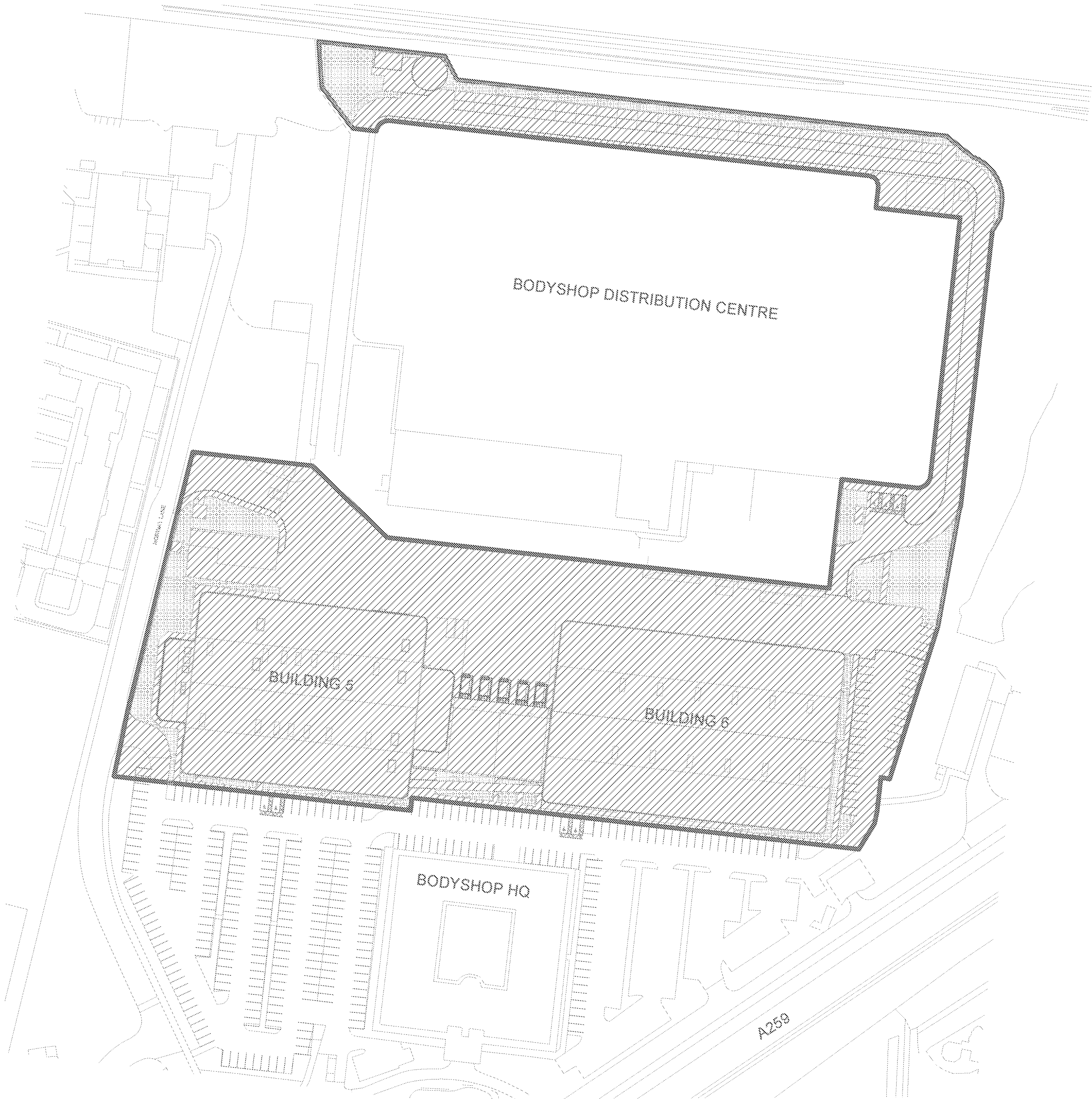
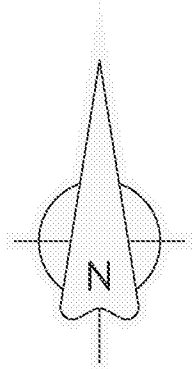
7260 - SMR - 00 - 22 - DR - A - 2001 - S3 - P9

SMR Job Ref: Sheet: A0 Scale: NOTED Drawn: MAB

7260-00-2001

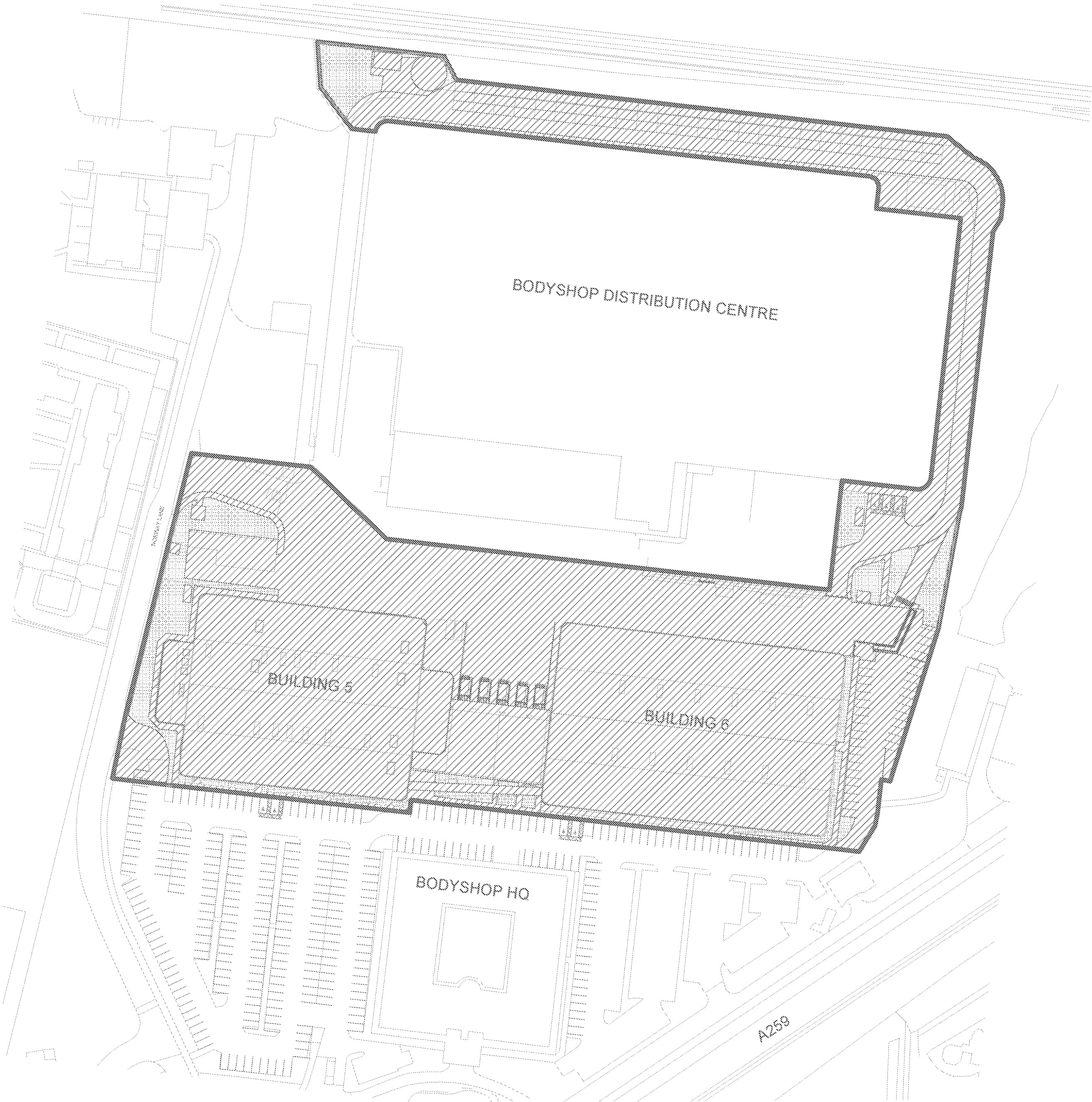
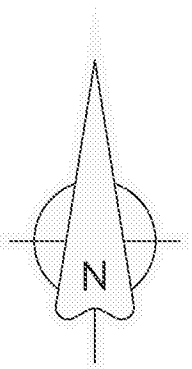


## **Appendix D –Existing & Proposed Impermeable Areas**



EXISTING SITE

TOTAL IMPERMEABLE AREA = 24,647M<sup>2</sup>  
TOTAL PERMEABLE AREA = 2,927M<sup>2</sup>



PROPOSED SITE

TOTAL IMPERMEABLE AREA = 25,436M<sup>2</sup>  
TOTAL PERMEABLE AREA = 2,132M<sup>2</sup>

GENERAL NOTES

- 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.

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

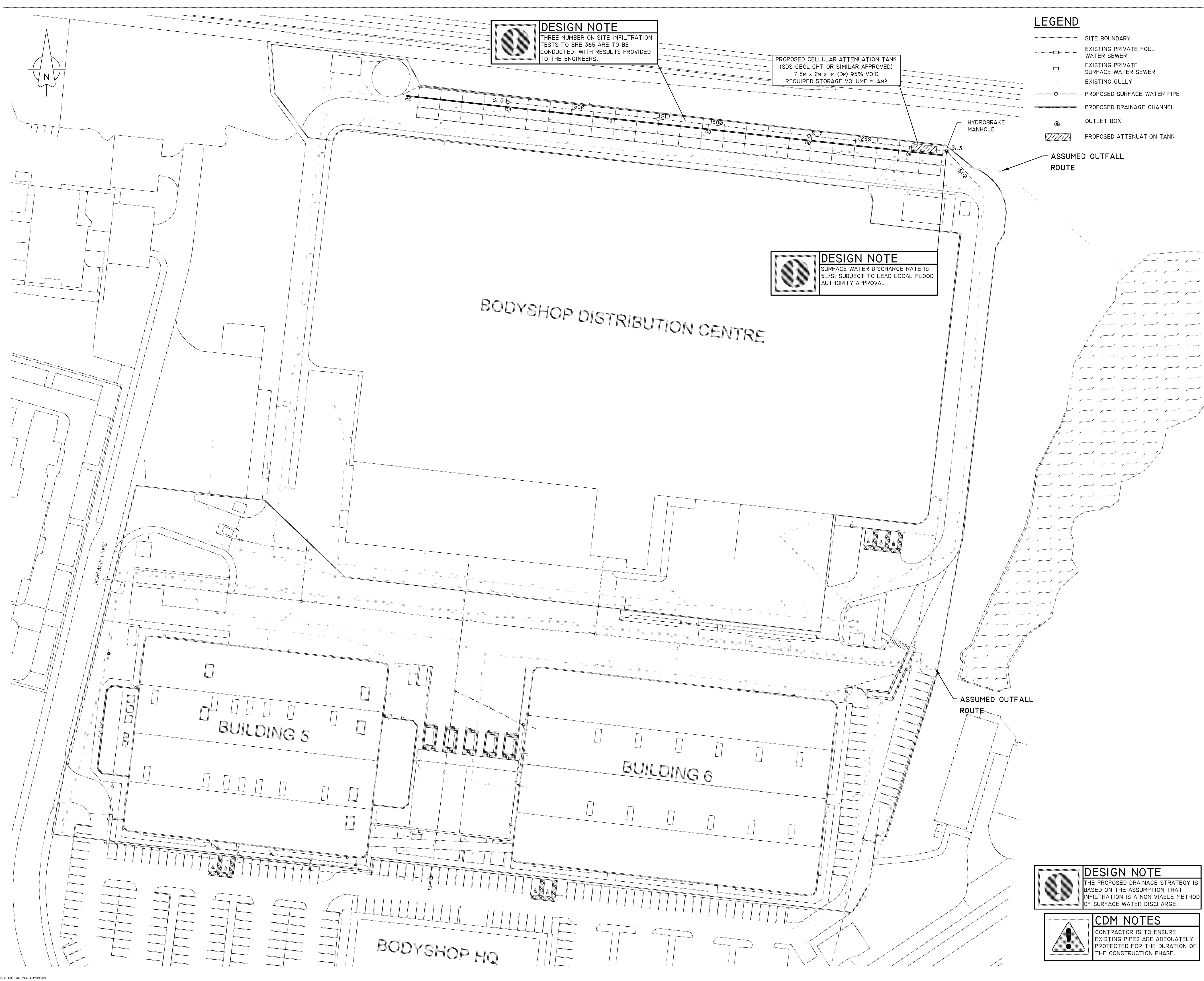
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| DRAWING STATUS                        |                |                |               |
| TENDER                                |                |                |               |
| SCALE @ A1<br>1:1000                  | DATE<br>APR'19 | DRAWN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

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REF: 190213

## **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     |

CLIENT

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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 = 14M<sup>3</sup>

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

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

BUILDING 6

BUILDING 5

BODYSHOP DISTRIBUTION CENTRE

ASSUMED OUTFALL ROUTE

ASSUMED OUTFALL ROUTE

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