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Consulting Engineers

Report on

Bartons Road, Havant

SuDS Maintenance Report

Southern
Brighouse
Midlands
Sheffield
Teesside

For Bellway Homes

Prepared by K Malik

Approved by K Tran

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FOR AND ON BEHALF OF JNP GROUP

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 jnpgroup have been commissioned by Bellway Homes to prepare a SuDS maintenance report to cover the drainage features for the proposed residential development at Land South of Bartons Road, Havant.

1.1.2 This report has been produced to accompany the SuDS features proposed as part of the development.

1.2 Location & Site Description

1.2.1 The site covers an area of approximately 7.2 hectares and is located south of Bartons Road, north-east of the town of Havant.

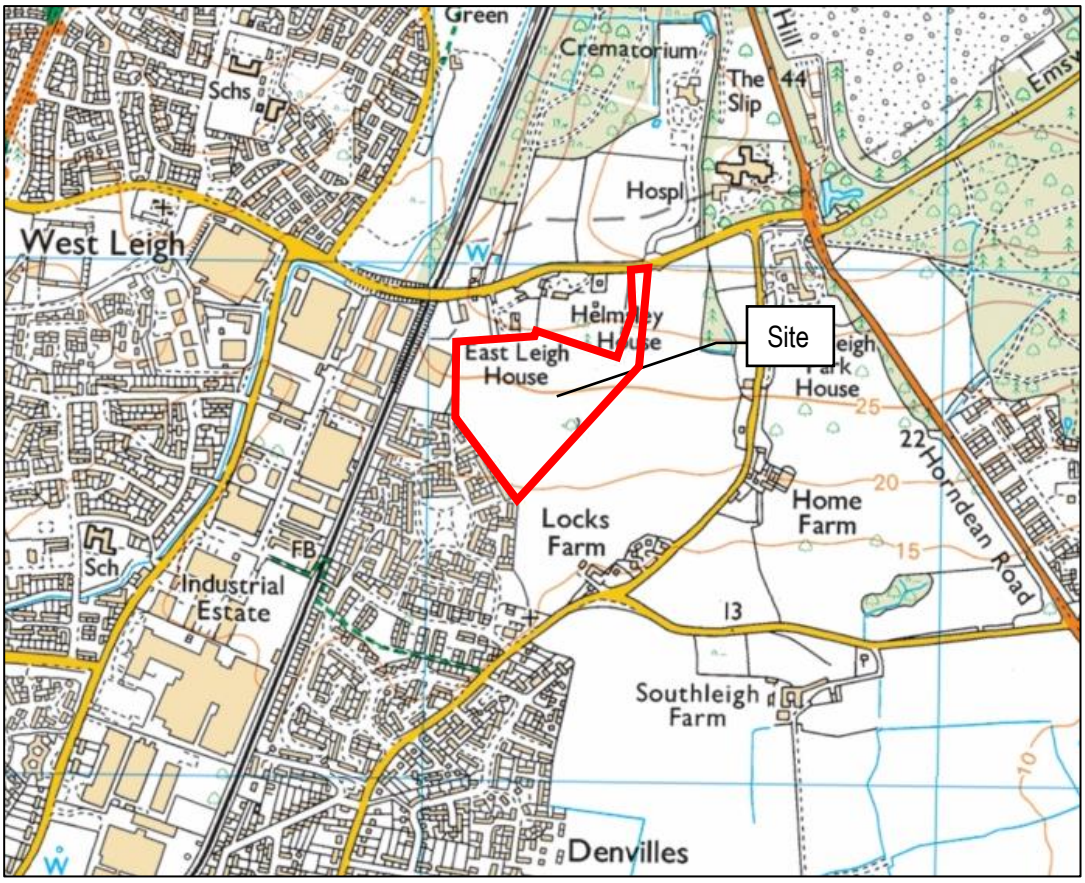

Fig.1 Site Location NTS
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1.2.2 The site comprises a large approximately triangular-shaped former agricultural field, with an extension area on its northern side. The site is situated on a gentle south-facing slope with a change in elevation of 11.24 metres from north to south.

1.2.3 The topographical survey is contained within Appendix A.

2 SUDS MANAGEMENT

2.1 SuDS Overview

2.1.1 Sustainable Drainage Systems (SuDS) are intended to mimic natural drainage processes within and around the development. This is achieved by slowing down and holding back the surface water runoff, allowing for the breakdown of pollutants, peak runoff control and runoff volume control. In doing so, SuDS facilitate the achievement of four main categories of benefits: water quantity, water quality, amenity and biodiversity.

2.1.2 The proposed drainage strategy follows the SuDS Management Train and consists of a number of components with specific functions:

- Conveyance Swale – vegetated swale intended to slow down and treat runoff, as well as providing amenity and enhance biodiversity
- Permeable Paving - tanked pervious pavement systems intended to treat and store runoff
- Flow Control – hydraulic flow controls intended to reduce flows to greenfield runoff rates
- Catchpits – a chamber incorporating a sediment collection sump that the runoff flows through
- Cellular Storage - below ground facilities intended to store runoff

2.1.3 The proposed SuDS components and management details are shown on the Phase 1 and Phase 2 drainage layout plans Ref: C85850-D101 and D131, Contained in Appendix B.

2.1.4 The associated bodies responsible for the maintenance of the various systems are outlined in Table 1 below and covered in the Surface Water Drainage Strategy Technical Note Ref: TN01/KT:

Table.1 – Drainage & SuDs Maintenance & Management Responsibilities

Feature	Location	Function	Management & Maintenance Responsibility
Large Diameter Attenuation Pipes	Access roads	Convey and store surface water runoff	Phase 1 – Southern Water Phase 2 – Private Management Company
Swales	Open spaces	Treat, store & convey surface water runoff	Private Management Company
Permeable Pavements	Parking courts & shared access drives	Treat, store & convey surface water runoff	Private Management Company
Ponds	Open space	Store surface water runoff	Private Management Company
Below Ground Tanks	Open spaces, parking courts & shared access drives	Store surface water runoff	Private Management Company
Conveyance / Connecting Pipework	Access roads, open spaces, parking courts & shared access drives	Convey surface water runoff	Phase 1 – Southern Water Phase 2 – Private Management Company

3 SUDS MAINTENANCE REGIME

3.1 Introduction

3.1.1 The maintenance regime in this section has been based on information provided in C753 'The SuDS Manual' by Ciria, dated 2015.

3.1.2 All maintenance actions described hereafter should take into account the protection of habitats and associated ecology. The maintenance regimes should be assessed regularly to ensure that the actions and frequencies are appropriate for the drainage and landscape.

3.2 Inspections and Reporting

3.2.1 An initial pre-handover inspection will be required to ensure that the SuDS elements have been constructed in accordance with the design.

3.2.2 All inspections and maintenance activities shall be carried out by staff with an appropriate level of experience in SuDS maintenance. All inspections shall be recorded, and records kept for future reference.

3.2.3 During the first year of SuDS operation, inspections shall be carried out at least monthly and after significant storms, to ensure correct functioning of all components.

3.3 Conveyance Swale

3.3.1 Many of the specific maintenance activities for swales can be undertaken as part of a general landscaping contract with a small amount of extra work required, if any. Therefore, if landscape management is already required at the site, basin maintenance should have marginal cost implications.

3.3.2 Sediments excavated from swales that receive runoff from residential or standard road and roof areas are generally not toxic or hazardous material and can be safely disposed of by either land application or landfilling. However, consultation should take place with the environmental regulator to confirm appropriate protocols. Sediment testing may be required before sediment excavation to determine its classification and appropriate disposal methods. The management company employed should be familiar with these requirements and act according to them at all times.

3.3.3 It is presumed that all of the management and maintenance of this SuDS system is undertaken by an approved management company.

3.3.4 Details of the maintenance regime for swales are provided in Table 2 below.

Table 2: Maintenance Regime – Swale

Maintenance Regime	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season) or as required
	Manage other vegetation, remove nuisance plants	Monthly at start, then as required
	Inspect inlets and outlets for blockages, clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly

Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial Maintenance	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to break up silt deposits and prevent compaction of the soil surface	As required
	Remove and dispose of oils or petrol residues using safe standard procedures	As required

3.4 Permeable Paving

3.4.1 Many of the specific maintenance activities for permeable paving can be undertaken as part of a general site cleaning contract for roads and car parks. Therefore, if litter management is already required at the site, permeable paving maintenance should have marginal cost implications.

3.4.2 Prior to permeable paving hand-over to the client, the system should be inspected for clogging, litter, weeds and water ponding, and all defects rectified.

3.4.3 To ensure infiltration capacity of the permeable paving, the surface should be regularly cleaned of silt and other sediment. A brush and suction cleaner should be used; alternatively, lightweight rotating brush cleaners with power spraying hot water can be used. Care should be taken in adjusting the vacuuming equipment to ensure that jointing material is not removed; any lost material should be replaced.

3.4.4 During cold weather, permeable paving generally requires less frequent gritting to prevent ice formation. In addition, there is less risk of ice formation after the melting of snow, as the melt water drains directly into the underlying sub-base and does not have chance to refreeze. If frost occurs on the surface of the permeable pavement, this can be dealt with by the application of salt if necessary.

3.4.5 Details of the maintenance regime for permeable paving is provided in Table 3 below.

Table 3: Maintenance Regime – Permeable Paving

Maintenance Regime	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations. Particular attention required to areas where water runs off from adjacent impermeable areas – these areas are likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly to weeds by an applicator, rather than spraying	As required – once per year on less frequently used pavements

Remedial Actions	Remediate any landscaping, which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of the surface and the upper sub-structure by remedial sweeping	Every 10 to 15 years as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 months after installation
	Inspect for evidence of poor operation and weed growth, take remedial action if required	3-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually

3.4.6 Permeable paving may require specific maintenance as advised by the manufacturer. Maintenance contracts are commonly available from the manufacturers of SuDS products.

3.5 Flow Controls

3.5.1 4 no. flow control chambers are proposed to restrict the flow of surface water into the existing Southern Water surface water sewer at greenfield runoff rates. The flow control chamber will incorporate a Hydrobrake vortex control device or similar.

3.5.2 The maintenance requirements for the Hydrobrake are as follows:

- Normally little maintenance of the Hydrobrake is required as there are no moving parts. Hydrobrake flow controls are fitted with a pivoting bypass door which allows the chamber to be drained down should blockages occur.
- Following installation of the Hydrobrake it is vitally important that any extraneous material, i.e. building materials, are removed from the unit and drainage system.
- After the system is made live, and assuming that the Hydrobrake is performing satisfactory, it is recommended that each unit is inspected for monthly for three months and thereafter at 6 monthly intervals with a hose down if required.

3.6 Catchpits

3.6.1 Numerous catchpit chambers are specified to remove silts nts from runoff prior to discharging to the underground cellular storage tanks.

3.6.2 The maintenance requirements for the catchpit chambers are as follows:

- During the first few months after installation, the catchpits should be visually inspected after rainfall events, and the amount of deposition measured to give the operator an idea of the expected rate of sediment deposition. After this initial period, the catchpits should be inspected every 3 months to verify the appropriate level of maintenance. During these inspections, any floating debris should be removed.
- Silt should be removed when it reaches 75% of the capacity of the sump below the pipe invert level. In most situations, the catchpits should be fully cleaned out at least annually. If there is a significant spill of oil (or other pollutant) the catchpits should be cleaned immediately.

3.7 Cellular Storage Systems

3.7.1 Details of the maintenance regime for cellular storage systems are provided in Table 4 below.

Table 4: Maintenance Regime – Cellular Storage Systems

Maintenance Regime	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas which are not operating properly, take remedial action if required	Monthly for 3 months, then annually
	Remove debris from the catchment surface where it might cause risk to performance	Monthly
	Remove sediment from pre-treatment structures	Annually or as required
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows, vents etc.	As required
Monitoring	Inspect inlets, outlets, overflows, vents etc. to ensure correct operation in accordance with design and in good condition	Annually
	Survey inside for sediment build-up and remove if necessary	Every 5 years or as required

3.7.2 Cellular storage systems may require specific maintenance as advised by the manufacturer. Maintenance contracts are commonly available from the manufacturers of SuDS products.

Appendix A

Topographical Survey

TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
HO	Holm Oak
HW	Hawthorn
HY	Holly
JM	Japanese Maple
LB	Labournum
LM	Lime
LO	Locust Tree
LR	Laurel
M	Maple
MG	Magnolia
OK	Oak
P	Pine
PA	Palm
PL	Plane
PM	Plum
PO	Poplar
PP	Pissardii Plum
PR	Pear
R	Redwood
RD	Red Oak
RH	Rhododendron
RO	Rowan
SB	Silver Birch
SC	Sweet Chestnut
SP	Scots Pine
SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

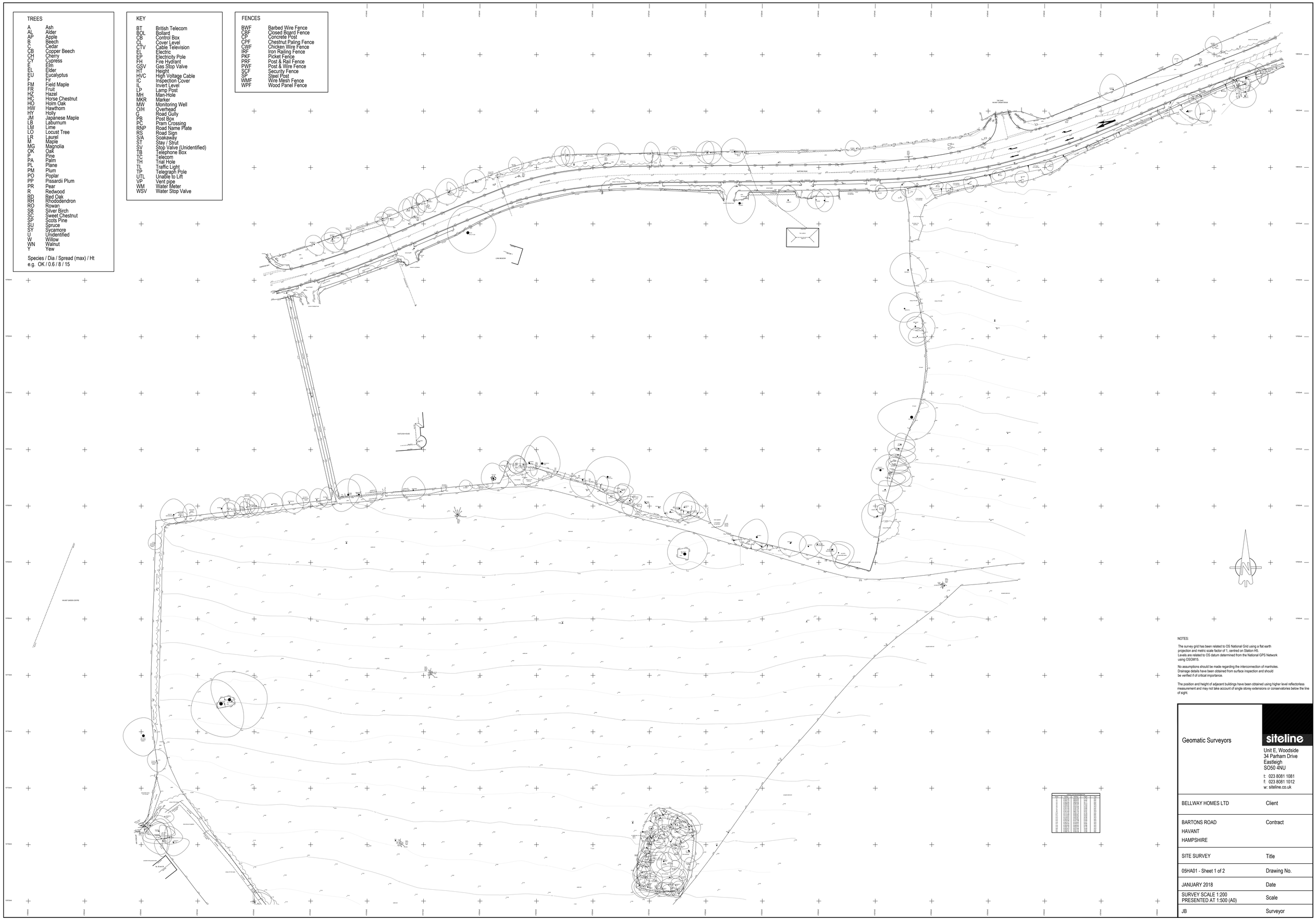
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

KEY

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
FH	Fire Hydrant
GSV	Gas Stop Valve
HT	Height
HVC	High Voltage Cable
IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
G	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
S/A	Soakaway
ST	Stay / Strut
SV	Stop Valve (Unidentified)
TB	Telephone Box
TC	Telecom
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable to Lift
VP	Vent pipe
WM	Water Meter
WSV	Water Stop Valve

FENCES

BWF	Barbed Wire Fence
CBF	Closed Board Fence
CP	Concrete Post
CPF	Chestnut Paling Fence
CWF	Chicken Wire Fence
IRF	Iron Railing Fence
PKF	Picket Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
SCF	Security Fence
SP	Steel Post
WMF	Wire Mesh Fence
WPF	Wood Panel Fence


THE OAKS
HAVANT CHRISTIAN CHURCH
BARTONS ROAD
LONG MEADOW
SWITCHED HOUSE
HAVANT GARDEN CENTRE
No. 30 Lodge
LOWER PORTSWOOD FARM
LOWER PORTSWOOD FARM
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155	2.000	0.000	0.000	0.000
156	2.000	0.000	0.000	0.000
157	2.000	0.000	0.000	0.000
158	2.000	0.000	0.000	0.000
159	2.000	0.000	0.000	0.000
160	2.000	0.000	0.000	0.000
161	2.000	0.000	0.000	0.000
162	2.000	0.000	0.000	0.000
163	2.000	0.000	0.000	0.000
164	2.000	0.000	0.000	0.000
165	2.000	0.000	0.000	0.000
166	2.000	0.000	0.000	0.000
167	2.000	0.000	0.000	0.000
168	2.000	0.000	0.000	0.000
169	2.000	0.000	0.000	0.000
170	2.000	0.000	0.000	0.000
171	2.000	0.000	0.000	0.000
172	2.000	0.000	0.000	0.000
173	2.000	0.000	0.000	0.000
174	2.000	0.000	0.000	0.000
175	2.000	0.000	0.000	0.000
176	2.000	0.000	0.000	0.000
177	2.000	0.000	0.000	0.000
178	2.000	0.000	0.000	0.000
179	2.000	0.000	0.000	0.000
180	2.000	0.000	0.000	0.000
181	2.000	0.000	0.000	0.000
182	2.000	0.000	0.000	0.000
183	2.000	0.000	0.000	0.000
184	2.000	0.000	0.000	0.000
185	2.000	0.000	0.000	0.000
186	2.000	0.000	0.000	0.000
187	2.000	0.000	0.000	0.000
188	2.000	0.000	0.000	0.000
189	2.000	0.000	0.000	0.000
190	2.000	0.000	0.000	0.000
191	2.000	0.000	0.000	0.000
192	2.000	0.000	0.000	0.000
193	2.000	0.000	0.000	0.000
194	2.000	0.000	0.000	0.000
195	2.000	0.000	0.000	0.000
196	2.000	0.000	0.000	0.000
197	2.000	0.000	0.000	0.000
198	2.000	0.000	0.000	0.000
199	2.000	0.000	0.000	0.000
200	2.000	0.000	0.000	0.000

NOTES:

The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station H5.
Levels are related to OS datum determined from the National GPS Network using OSGM15.

No assumptions should be made regarding the interconnection of manholes.
Drainage details have been obtained from surface inspection and should be verified if of critical importance.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.

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BELLWAY HOMES LTD	Client
BARTONS ROAD HAVANT HAMPSHIRE	Contract
SITE SURVEY	Title
05HA01 - Sheet 2 of 2	Drawing No.
JANUARY 2018	Date
SURVEY SCALE 1:200 PRESENTED AT 1:500 (A0)	Scale
JB	Surveyor

Appendix B

Phase 1 & Phase 2 Drainage Layouts

Drainage & Road Layout Standard Drawing Notes

1. The contractor is to check and verify all buildings, site dimensions and levels, including sewer invert levels, before works start on site.

2. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.

3. The contractor is to check the level of existing sewers which are to be used as an out-fall prior to commencement of any onsite drainage works. Any discrepancies are to be reported to the Engineer.

4. This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, specifications and any structural, geotechnical or other specialist document provided.

5. Any anomaly or contradiction between any of the above or difference between actual and drawn details is to be reported to Bellway Homes (Wessex)

6. Drainage to be adopted under Section 104 of the Water Industries Act 1991, shall be constructed and tested in accordance with Sewers for Adoption 6th Edition published by WRC plc and the combined addendum to SFA.

7. Roads, footpaths and parking areas which form part of the highway to be adopted under Section 278 or 38 of the Highways Act 1980 shall comply with the Hampshire County Council's Highway Specification and Standard Details.

8. All substrata structures and unconsolidated material within the road construction width to be removed

9. Formation preparation to be in accordance with Highways Agency Specification for Highway Works (SHW) cl. 616. No prepared formation to be continuously exposed to rain causing degradation below design CBR or to be left uncovered overnight.

10. Any soft, damaged or weak spots including peat contaminated material are to be excavated and replaced with SHW Type 1 in accordance with SHW cl.803 laid and compacted to cl.802, Table 8/4

11. Where ground conditions are deemed to be frost susceptible, refer to Ground Investigation report, carriageway thickness shall be 450mm minimum thickness. All material within 450mm of road construction to be non-frost susceptible.

12. Positions of existing services/statutory undertaker's apparatus adjacent to or crossing proposed sewers are to be checked by the contractor prior to starting work.

All adoptable drainage and highway works to be installed in accordance with;

- S104 & S185 Sewers - Sewers for Adoption 6th edition, including all applicable local Southern Water addendums
- S278 and S38 Highways - Hampshire County Council Specification and Standard Details.

Existing Utilities

The contractor shall refer to the existing and proposed services information, provided by Bellway Homes (Wessex).

It is the Contractor's responsibility to liaise with all relevant services companies to ensure that all existing services are accurately located and adequately protected during construction.

It is the Contractor's responsibility to liaise with the Developer and all relevant services companies to ensure that all new and diverted services are accurately located and adequately protected during construction.

All works to existing services to be undertaken as required by the Developer. Refer to Developer design.

Legend

- Indicative site application boundary
- Proposed highway drain and manhole to be adopted by HCC under S38. To be constructed in accordace with HCC standard details.
- Proposed S104 surface water sewer and manhole to be constructed in accordance with Sewers for adoption 6th Edition. To be adopted by Southern Water
- Proposed S104/S185 foul water sewer to be constructed in accordance with Sewers for adoption 6th Edition. To be adopted by Southern Water
- Proposed S104 adoptable foul water lateral and demarcation chamber. Refer to drawing no. C85850-D164 - D166 Private Drainage Layout
- Proposed S104 adoptable surface water lateral and demarcation chamber. Refer to drawing no. C85850-D164 - D166 Private Drainage Layout
- S38 Deep trapped road gully to be adopted by highways authority
- Existing Southern Water public foul water sewer
- Existing Southern Water public surface water sewer
- Sewer easement 3m either side of pipe centreline
- 21.00 Proposed road contours
- Existing contours
- 28.000 Proposed plot finished floor level
- Proposed private attenuation tank. Versavoid tank by ESS or similar approved. To be installed in strict accordance with ESS design and installation instructions

jnpgroup

For S278 design refer to drawing no C85850-D200 - D206.

Existing Onsite Drainage

All existing drainage found on site during the works shall be investigated, its operational status confirmed, and the following applied:-

a. Inoperative drainage shall be cut back and pipe runs filled with concrete grout.
b. 'Live' drainage shall be temporarily re-routed to allow the new drainage to be constructed.

Any land drains serving offsite areas shall be referred to Bellway Homes. No land drains shall connect to the public water sewer network.

Existing Public Surface Foul & Water Capacity & Connections

Surface Water - Connection to the public surface water sewer shown is indicative only and subject to capacity check and upgrade works to be confirmed by Southern Water. No construction works shall be undertaken prior to formal capacity, connection and S104 approval has been issued by Southern Water.

Foul Water - The existing public foul water sewer crossing the site shall be diverted via S185 Sewer Diversion application with Southern Water. Refer to S185 drawing nos C85850-D120-D121 Foul Sewer Diversion Layout. Proposed site connections to S185 subject to capacity check and upgrade proposals by Southern Water. No construction works shall be undertaken prior to formal capacity, S106 sewer connection application, S104 and S185 approval has been issued by Southern Water.

Twin Wall Attenuation Pipes by Weholite or similar approved. Refer to manufacturers design, TBC. To be installed in strict accordance with manufacturers requirements.

Existing foul water sewer to be diverted as part of the S185 diversion, shown indicatively only. Refer to existing public sewer capacity & connection note.

Attenuation Tank 2
11.55m W x 13.05m L x 1.55m H
Design Storm Event - 100yr + 30% Climate Change
CL 26.84 - 27.60
Max. Cover -1.85m
Min. Cover - 0.89m
Laid at 1:300 to Outlet
Outlet Invert Level - 24.400
Min. Net Volume - 220m³ (includes 95% porosity allowance)
Refer to ESS drawing no. AQST - 4.0 - 4.1 Attenuation Tank Details & Layout
To be installed in strict accordance with manufacturers requirements.

Existing Surface Water Sewer Crossing:

The Contractor is to confirm depth of the existing surface water sewer to ensure no clashing with the proposed surface water sewer at all crossings. Minimum cover to existing sewer to be 1.2m. Where cover is less than 1.2m, concrete bridge slab to be provided in accordance with detail on drawing no C85850-D107. Contractor to confirm following sewer investigation on site.

Attenuation pipes shown indicatively only and subject to detail design by manufacturer.

Offline weir in manhole with crest level set at 1:30 year top water level. Overflow connection to Attenuation Tank1.

Attenuation Tank 1
9.05m W x 12.05m L x 1.30m H
Design Storm Event - 100yr + 30% Climate Change
CL 26.53 - 27.28
Max. Cover - 1.30m
Min. Cover - 0.60m
Laid at 1:300 to Outlet
Outlet Invert Level - 24.660
Min. Net Volume - 133m³ (includes 95% porosity allowance)
Refer to ESS drawing no. AQST- 3.0 - 3.1 Attenuation Tank Details & Layout
To be installed in strict accordance with manufacturers requirements.

Foul pipes 1.000 - 1.016 to be adopted under a S185 sewer diversion agreement. For S185 foul water sewer diversion, refer to drawing no C85850-D120 - D121. No S185 diversion works to be undertaken prior to Southern Water approval.

PHASE 2 PRIVATE DEVELOPMENT

Phase 1 Adoptable

Phase 2 Private

Proposed connection to existing surface water sewer via new manhole. Refer to existing public sewer capacity and connection notes.

Notes:-

1. Where this drawing has been issued in electronic .dwg format it has been done so in good faith. jnpgroup do not take any responsibility for any inaccuracies in the electronic data, which should be checked against the paper (or .pdf) drawing issue. Any apparent discrepancies should be immediately reported to jnpgroup. The electronic .dwg file should not be assumed to be to scale and should not be used for 'overlaying', setting out or checking of any third party information. All dimensions should be taken from the paper (or .pdf) version of the drawing. Electronic drawings may contain third party information. jnpgroup take no responsibility for this information, which should be checked against the originators paper drawing(s).
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3. Do not scale.
4. Any discrepancies between drawings of different scales, and between drawings and specification where appropriate to be notified to The Engineer for decision.
5. Copyright reserved. This drawing may only be used for The Client and location specified in the title block. It may not be copied or disclosed to any third party without the prior written consent of jnpgroup.
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Health and Safety Note:
The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

Hazard Identification

1. Contact with traffic
2. Deep excavations
3. Existing services
4. Contact with raw sewage

This drawing is based on the following information provided by others:

- Topographical Survey undertaken by Siteline Geomatic Surveyors, ref. 05HA01, dated January 2018.
- Site Layout plan by OSP Architecture, ref. 17300 - P101 Rev B, dated July 2018.
- Tree Survey by Bernie Harverson, ref. 0787 - BJH 01/02, dated October 2015.

Rev.	Date	Amendment	By	Chk.
E	22.10.18	Highway drainage colour revised to black.	CT	KM
D	12.10.18	Colours revised to Southern Water instruction.	CT	KM
C	28.09.18	Revised to suit Weholite oversize pipe design. Sewer easement added.	CT	KM
B	13.09.18	Field access surface and notes added.	CT	KT
A	10.09.18	Box culverts revised to oversized twin wall pipework. Revised to construction issue.	CT	KT

Status: Construction

Bellway

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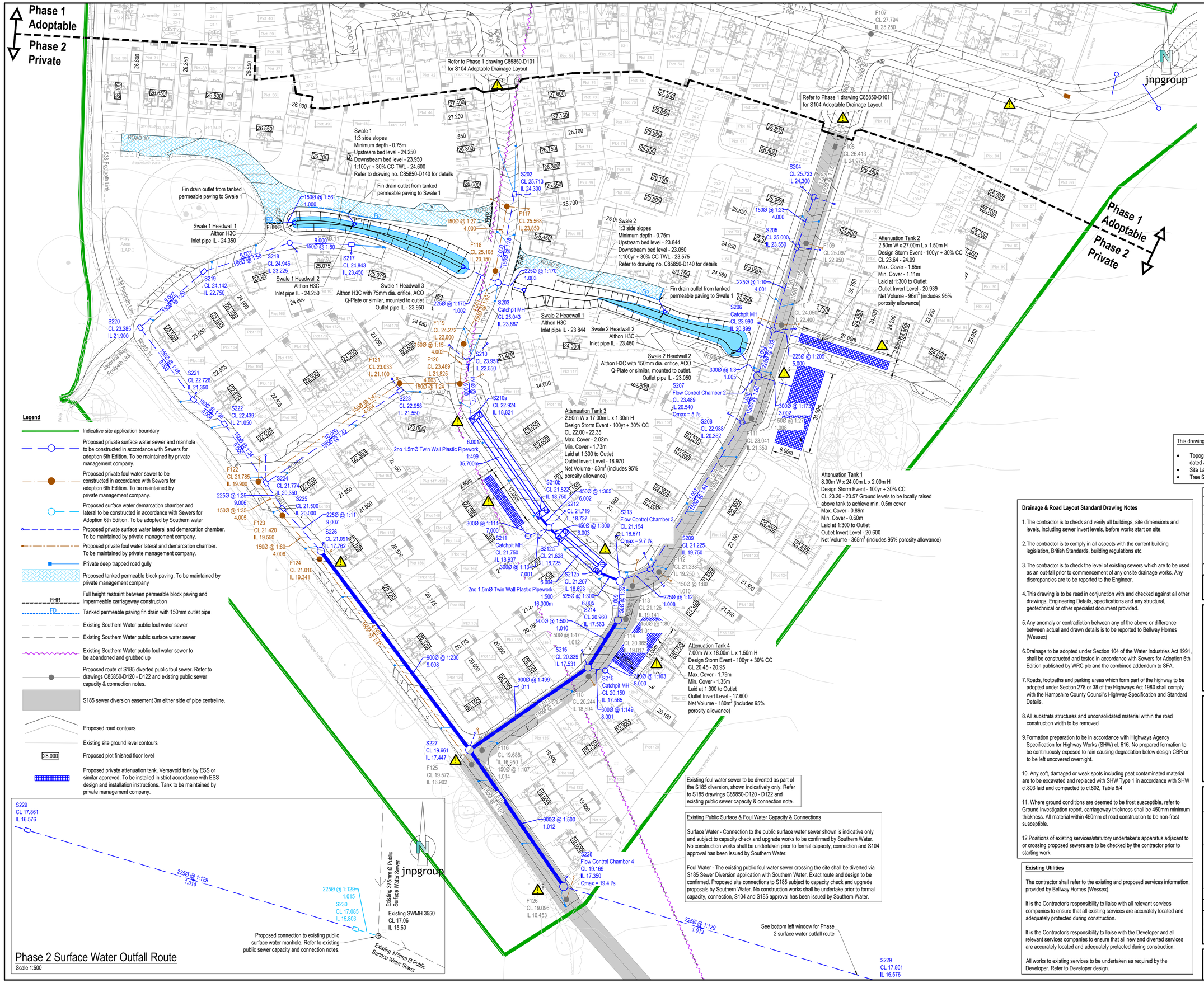
Tel: 01926 889955 E-mail: leamingtonspa@jnpgroup.co.uk

Client	Bellway Homes
Job	Bartons Road Havant, Hampshire
Title	Adoptable Drainage Layout
Scale 1:500 @ A1	Date July 2018
Drawn by CT	Checked by KT / Approved by KT

Drawing No. C85850-D101 Rev. E

QA Ref: QD019 Rev D



Legend

- Indicative site application boundary
- Proposed private surface water sewer and manhole to be constructed in accordance with Sewers for adoption 6th Edition. To be maintained by private management company.
- Proposed private foul water sewer to be constructed in accordance with Sewers for adoption 6th Edition. To be maintained by private management company.
- Proposed surface water demarcation chamber and lateral to be constructed in accordance with Sewers for Adoption 6th Edition. To be adopted by Southern water
- Proposed private surface water lateral and demarcation chamber. To be maintained by private management company.
- Proposed private foul water lateral and demarcation chamber. To be maintained by private management company.
- Private deep trapped road gully
- Proposed tanked permeable block paving. To be maintained by private management company
- FHR — Full height restraint between permeable block paving and impermeable carriageway construction
- FD — Tanked permeable paving fin drain with 150mm outlet pipe
- Existing Southern Water public foul water sewer
- Existing Southern Water public surface water sewer
- Existing Southern Water public foul water sewer to be abandoned and grubbed up
- Proposed route of S185 diverted public foul sewer. Refer to drawings C85850-D120 - D122 and existing public sewer capacity & connection notes.
- S185 sewer diversion easement 3m either side of pipe centreline.
- Proposed road contours
- Existing site ground level contours
- 28.000 — Proposed plot finished floor level
- Proposed private attenuation tank. Versavoid tank by ESS or similar approved. To be installed in strict accordance with ESS design and installation instructions. Tank to be maintained by private management company.

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7. Roads, footpaths and parking areas which form part of the highway to be adopted under Section 278 or 38 of the Highways Act 1980 shall comply with the Hampshire County Council's Highway Specification and Standard Details.
8. All substrata structures and unconsolidated material within the road construction width to be removed
9. Formation preparation to be in accordance with Highways Agency Specification for Highway Works (SHW) cl. 616. No prepared formation to be continuously exposed to rain causing degradation below design CBR or to be left uncovered overnight.
10. Any soft, damaged or weak spots including peat contaminated material are to be excavated and replaced with SHW Type 1 in accordance with SHW cl.803 laid and compacted to cl.802, Table 8/4
11. Where ground conditions are deemed to be frost susceptible, refer to Ground Investigation report, carriageway thickness shall be 450mm minimum thickness. All material within 450mm of road construction to be non-frost susceptible.
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All works to existing services to be undertaken as required by the Developer. Refer to Developer design.

Rev.	Date	Amendment	By	Chk.
B	22.10.18	Pipe notes in legend updated.	KM	KT
A	04.10.18	Existing pond removed from surface water drainage network. Attenuation tank 2 increased in size to offset loss in volume from removal of pond.	KM	KT

Status: Preliminary

Bellway

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Client	Bellway Homes
Job	Bartons Road Havant, Hampshire
Title	Phase 2 Mains Private Drainage Layout
Scale 1:500 @ A1	Date August 2018
Drawn by KM	Checked by / Approved by

Drawing No. C85850-D131 Rev. B

QA Ref: QD019 Rev D