

Technical Note

Project: Lawnswood Road, Ridgehill

Subject: Local Plan Promotion - Flood Risk & Drainage

Client:	Clowes Developments	Version:	P0
Project No:	06850	Author:	Phoebe Ryding / Andrea Nelmes
Date:	13 December 2022	Approved:	Alison Caldwell

1 Introduction

- 1.1.1 PJA has been commissioned by Clowes Developments to prepare a technical note to support the promotion of a proposed residential-led development at Lawnswood Road, Stourbridge. The purpose of this technical note is to expand on the Flood Risk Assessment and Drainage Strategy previously undertaken by WSP (December 2019) (herein referred to as the '2019 WSP FRA') in the context of current flood risk, drainage and planning policy.
- 1.1.2 This technical note forms an addendum to the 2019 WSP FRA and should be read in conjunction with this Report.

2 Site Context

- 2.1.1 'Land at Lawnswood Road, Wordsley', hereafter referred to as the 'Site', is located to the north and south of Lawnswood Road. The Site comprises two parcels, bound to the west by the A449 and to the east by an existing residential development, hereafter referred to as the northern and southern parcels respectively. Refer to Appendix A for a Site location plan, which also encompasses the existing drainage features.
- 2.1.2 The site boundary has not been altered since production of the 2019 WSP FRA. Nonetheless, the baseline conditions relating to flood risk within the Site may have changed and as such the following identifies any change in these baseline conditions and how they may impact the Site.

2.2 Topography

- 2.2.1 A topographical survey (refer to Appendix B) has been undertaken since the publication of the 2019 WSP FRA which provides further detailed information in terms of Site specific levels and

features to that provided by LiDAR. The elevations and profile of topography reported in the 2019 WSP FRA based on LiDAR data are largely consistent with the topographical survey.

- 2.2.2 The survey identifies a number of manholes within the Site, which are located within the south eastern corner of the southern parcel and along the western boundary of the northern parcel (near to the A449 and Ashwood Lower Lane junction). This aligns with the Severn Trent Water sewer asset mapping where foul and combined sewers (in addition to rising mains) are shown to be in these areas of the Site.

2.3 Existing Hydrological Regime

- 2.3.1 The topographical survey identifies the presence of an ordinary watercourse within the southern parcel. This is shown to be fed via a 150mm diameter pipe which is assumed to receive surface water runoff (and potentially highway runoff) from the properties located along Lawnswood road and/or provides an outlet to the ponds within the northern parcel. The topographical survey shows the watercourse to flow in a southerly direction along the western boundary of the southern Site and re-enter a 600mm diameter pipe. The external connectivity of this pipe is unknown, however given the size of the downstream pipe it is considered that this watercourse is potentially culverted through the southern parcel of the Site and continues to flow in a southerly direction beyond the Site.

- 2.3.2 These features are shown in Figure 2-1.

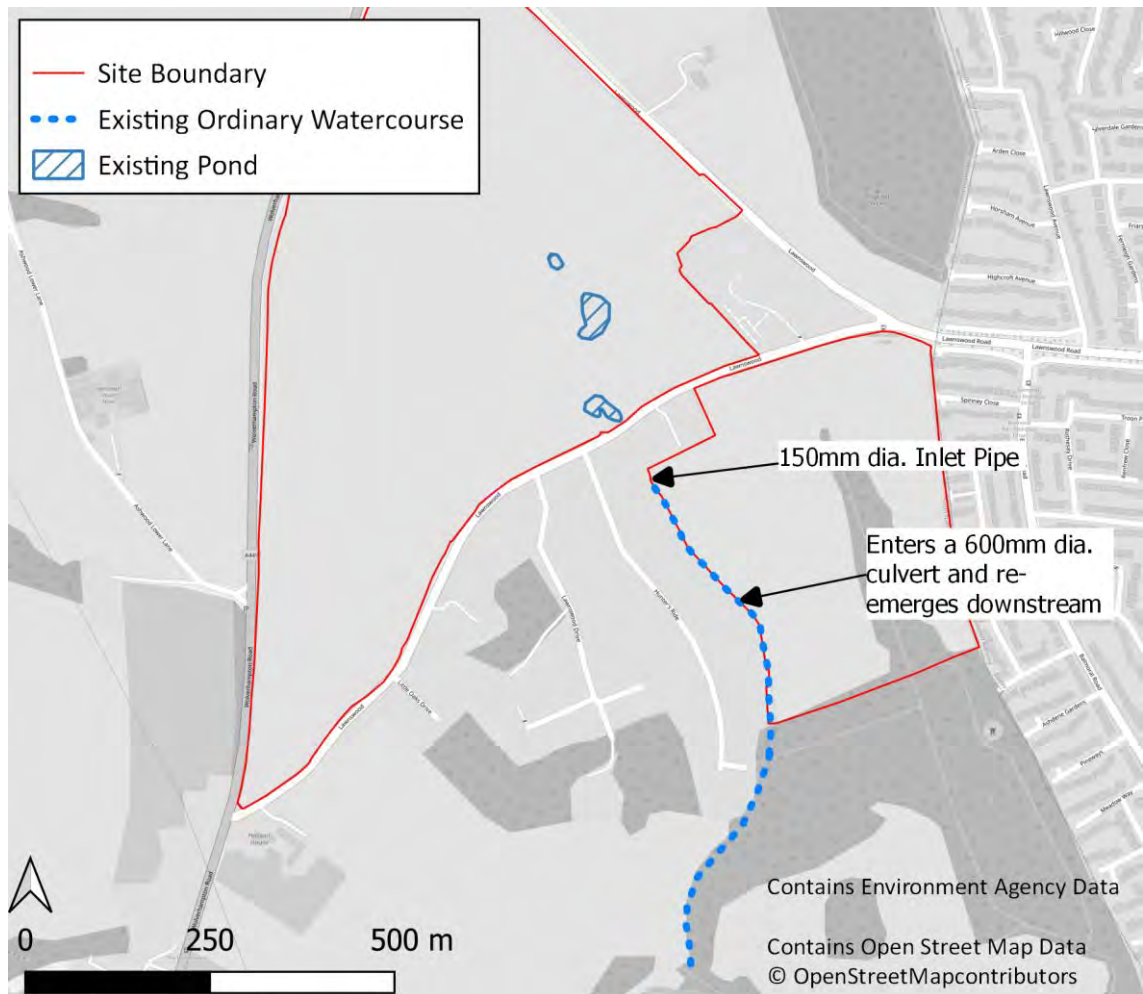


Figure 2-1 – Existing Drainage Features

2.3.3 It is recommended that the connectivity of this watercourse is investigated further at the next stage of design. In accordance with current guidance and policy, this flow route will need to be maintained through the Site, with any incoming surface water drainage from the surrounding residential development and any other third party assets maintained. An easement from the top of bank will also be required, where no built development is allowed to protect the riparian corridor.

2.4 Geological & Hydrogeological Context

2.4.1 A review of British Geological Survey (BGS) published mapping shows there to be no change in the geological and hydrogeological properties identified at the Site. The Site is still located within Source Protection Zone 3 which has changed in its definition, but essentially still identifies this

total area or zone as being needed to support the abstraction or discharge from the protected groundwater source.

- 2.4.2 As such, it is considered that an infiltration led surface water drainage system may be suitable, subject to percolation testing being undertaken as identified in the 2019 WSP FRA.

2.5 Sewer Records

- 2.5.1 Sewer records were provided in Appendix C of the 2019 WSP FRA and identify a number of existing sewers within the vicinity of the Site, including a 160mm diameter and 80mm diameter foul rising mains crossing the southern parcel of the Site and a 450mm diameter combined rising main which crosses the far west of the northern parcel of the Site.

- 2.5.2 From a review of publicly available satellite imagery, no new development appears to have been bought forward in the vicinity of the Site since this asset mapping was provided. As such, it is unlikely that any new sewer infrastructure is present in comparison to these asset maps.

3 Planning Context

3.1 National Planning Policy Framework

- 3.1.1 The revised National Planning Policy Framework (NPPF) was published by the Ministry of Housing, Communities and Local Government in July 2018 and, most recently, updated in 2021.

- 3.1.2 The primary policy requirement is to identify the Flood Zones and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

- 3.1.3 Further to this, paragraph 169 of the NPPF sets out that major development should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

- (a) take account of advice from the lead local flood authority;*
- (b) have appropriate proposed minimum operational standards;*
- (c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and*
- (d) where possible, provide multifunctional benefits.*

3.2 Planning Practice Guidance (PPG)

3.2.1 The NPPF's Flood Risk and Coastal Change Planning Practice Guidance (PPG) supports the Framework and is an online resource that is frequently updated, most recently updated in August 2022.

3.2.2 The recent key changes within the PPG predominantly refer to:

- Interaction between all sources of flood risk
- Functional Floodplain definition
- Management of surface water and associated surface water flood risk
- Natural Flood Management measures
- Safe for the lifetime of the development

3.3 South Staffordshire Level 2 Strategic Flood Risk Assessment (November 2022)

3.3.1 A Level 2 Strategic Flood Risk Assessment (SFRA) was published in November 2022. Whilst the Site is not specifically assessed within the Report, the watercourse catchment which the Site lies within (*Smestow Brook – Wom-Penn Brook to conf River Stour*). This identifies 1-2 flood incidents to have occurred along Lawnswood Road within the vicinity of the Site but does not provide any details on the sources and scale of these incidents.

3.3.2 The SFRA also notes the importance of ensuring that surface water runoff does not increase in the future. The SuDS proposal outlined in the 2019 WSP FRA aims to meet these requirements by committing to attenuating surface water flows to the existing greenfield runoff rates up to the 1 in 100 year plus 40% climate change event.

3.3.3 As such, the proposed development and previously supporting surface water drainage strategy meets the recommendations set out for the Smestow Brook – Wom-Penn Brook to conf River Stour catchment, as set out in the Level 2 SFRA document.

3.4 Southern Staffordshire Councils Water Cycle Study – Phase I Scoping Study (February 2020)

3.4.1 A Phase 1 Scoping Water Cycle Study was published in February 2020 which identifies that whilst a certain level of growth within the South Staffordshire County area can be accommodated with minimal additional infrastructure, to support significant growth new treatment works coupled with upgrades to existing infrastructure will be required.

3.4.2 Should any future planning application come forward for the Site, liaison with Severn Trent Water is recommended to understand the local waste water network’s current capacity and the requirements that would be needed to upgrade the existing network to accommodate the proposed development as necessary. Severn Trent Water typically only undertake hydraulic modelling to facilitate these works once a planning application for the proposed development Site is submitted.

3.5 Local Plan Review Publication Plan (Regulation 19) (November 2022)

3.5.1 South Staffordshire published a Local Plan Review Publication Plan (Regulation 19) in November 2022. This contains Policy NB7: Managing Flood Risk, Sustainable Drainage Systems & Water Quality.

3.5.2 The Site meets the three requirements of Policy NB7 as set out in Table 3-1.

Table 3-1 - Requirements of Policy NB7

Policy Point	Policy Met	How the Application Site Meets this Requirement
Managing Flood Risk – Development should be located in Flood Zone 1	✓	The Site is located wholly within Flood Zone 1 in accordance with the publicly available Flood Map for Planning
SuDS – All new major development should incorporate SuDS	✓	The 2019 WSP FRA demonstrates a SuDS strategy to manage water quantity and quality can be bought forwards for the proposed development Site
Water Quality - Development should not adversely affect the quality or quantity of water, either directly through pollution of surface or ground water, or indirectly through the treatment of wastewater.	✓	A SuDS Strategy which provides a sufficient treatment train and complies with the Simple Index Approach set out in CIRIA C753 'The SuDS Manual' can be bought forwards on Site to ensure surface water quality is maintained. Surface water is not proposed to discharge to the existing public surface water sewer system, but to the nearest receiving watercourse instead. As such the surface water drainage strategy proposed within the 2019 WSP FRA is not expected to impact the surrounding Severn Trent Water infrastructure and cause a water quality issue via Severn Trent’s Waste Water Treatment Works.

4 Flood Risk Review

4.1 Fluvial Flood Risk

4.1.1 Review of the Flood Map for Planning identifies that the Site continues to lie within Flood Zone 1, outside the extents of flooding from any nearby Main Rivers. An extract of this mapping is contained in Figure 4-1.

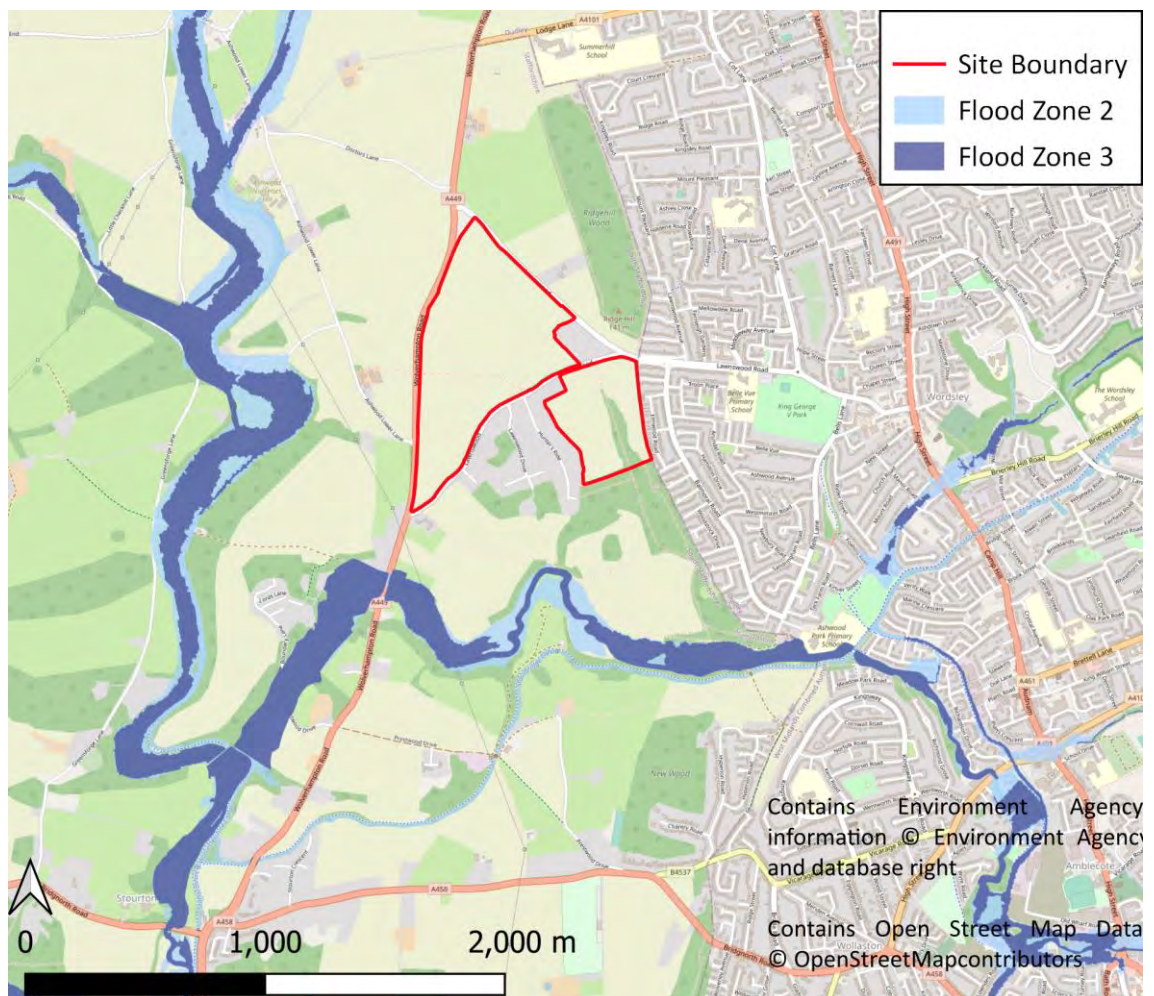


Figure 4-1 – Flood Map for Planning Extract

4.1.2 Fluvial climate change allowances were updated by the Environment Agency in July 2021 to now follow a Management Catchment Approach. The updated Climate Change Allowances for the Severn Middle Worcestershire Management Catchment have been provided in Table 4-1.

Table 4-1 - Severn Middle Worcestershire Management Catchment Peak River Flow Allowances

Epoch	Central	Higher	Upper
2020s	12%	16%	24%
2050s	15%	21%	38%
2080s	30%	40%	68%

4.1.3 Given the topography and distance from any fluvial flood sources to the Site, it may be considered that there will be negligible impact on the Site from fluvial flood risk and associated climate change.

4.1.4 As such, flood risk from fluvial sources may be considered to be low.

4.2 Surface Water Flood Risk

4.2.1 Review of the publicly available Long-Term Flood Risk Information, Flood Risk from Surface Water Map has identified that there have been no updates to the mapping in this area in comparison to those reviewed as part of the 2019 WSP FRA. A copy of this mapping is shown on Figure 4-2.

4.2.2 This identifies that the majority of the Site is at very low risk from surface water flooding. There are some small, localised areas of surface water ponding, most notably against the A449 to the east and Lawnswood to the south of the northern parcel of the development.

4.2.3 As noted within the 2019 WSP FRA, where the surface water ponding is identified along the western boundary of the northern parcel, an existing culvert, passing under the A449, has been identified which is assumed to allow surface water to flow west, away from the Site.

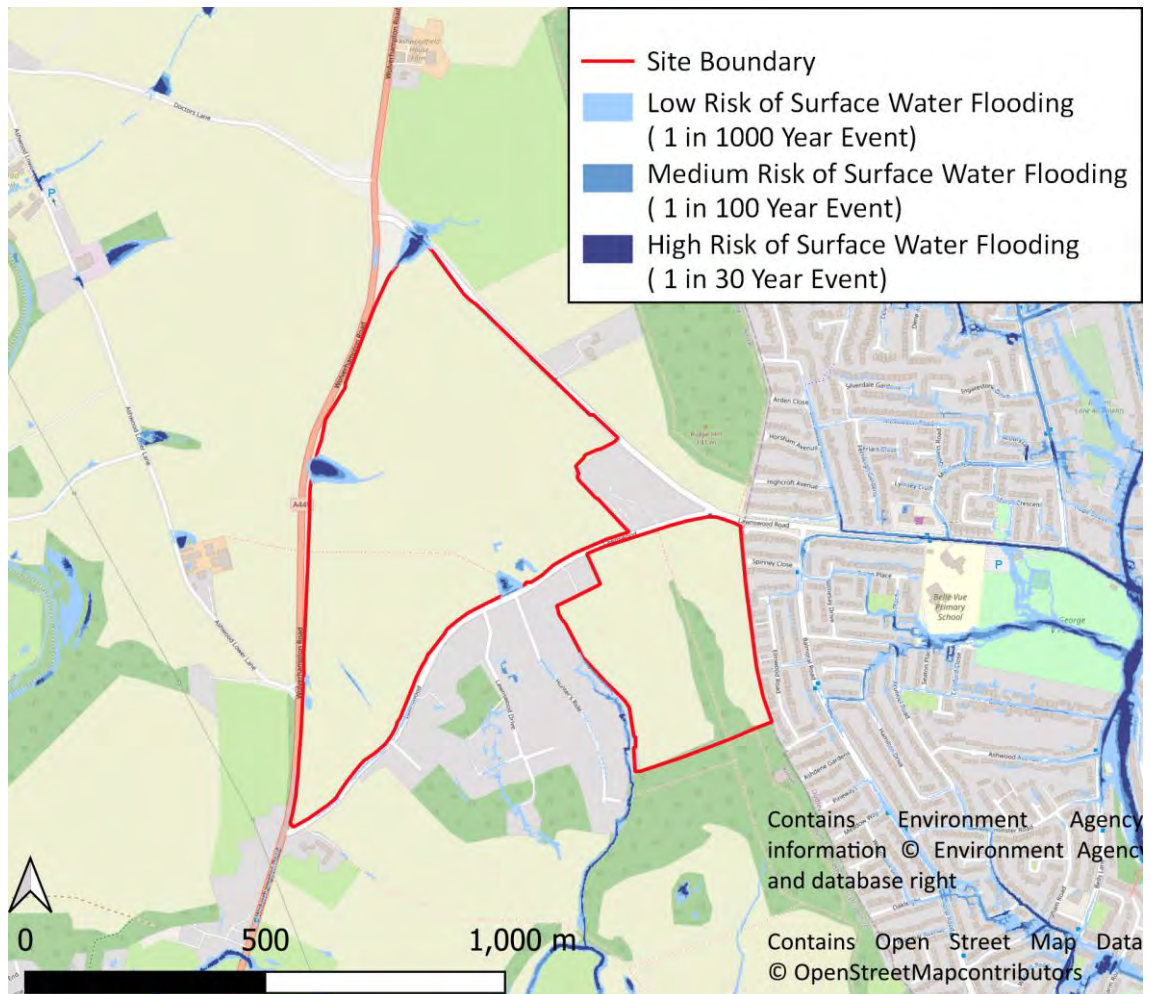


Figure 4-2 – Long-Term Flood Risk Information (Surface Water Flood Risk) Map Extract

4.2.4 A sequential approach to masterplanning of the Proposed Development has been undertaken which ensures that development is not located within the identified areas of surface water ponding.

4.2.5 As such, flood risk from surface water may be considered to be low.

4.3 Groundwater Flood Risk

4.3.1 Groundwater flooding is typically caused by high groundwater levels. It occurs where excess water emerges at the ground surface via springs or within manmade structures such as basements. The risk of groundwater flooding depends on the nature of the geological strata underlying the Site, as well as on the local topography.

4.3.2 While a Level 2 SFRA has been published, the groundwater data information, published in the Southern Staffordshire Council Level 1 Strategic Flood Risk Assessment (SFRA) (dated October 2019), as considered in the 2019 WSP FRA remains most appropriate for consideration.

4.3.3 Further to this, no additional borehole data has been made available on the BGS Geoindex Portal.

4.3.4 As such, groundwater flood risk may be considered to be low.

5 Surface Water Drainage Strategy Review

5.1.1 The following design parameters were utilised within the 2019 WSP FRA surface water drainage strategy:

- 40% climate change allowance applied to peak rainfall allowance
- QMED discharge rate of 1.58l/s/ha
- Discharge rates rounded to 2l/s where a drainage catchment discharge rate falls below 2l/s
- FEH Rainfall data
- Discharge to existing watercourses on Site
- Attenuation volumes provided for 1 in 100 year + 40% CC allowance
- Assessed for 10% development creep applicable to residential development
- Above ground conveyance identified
- Attenuation basins identified as 1m deep, 1:3 side slopes with 300mm freeboard

5.1.2 A Sustainable Drainage System (SuDS) Strategy which aligns with Lead Local Flood Authority (LLFA) requirements, manages surface water up to the 1 in 100 year plus 40% climate change event and has the potential to be developed at the next design stage to provide further multifunctional benefits including biodiversity net gain, carbon reduction and amenity space has been proposed within the 2019 WSP FRA.

5.1.3 Further to this, the 2019 WSP FRA also sets out operation and maintenance information for the proposed SuDS Scheme. It is therefore considered that the surface water drainage strategy proposed within the 2019 WSP FRA still meets the requirements of the NPPF.

5.1.4 In May 2022, the Environment Agency updated the peak climate change allowances applied to peak rainfall intensity. This now follows a management catchment approach and also requires climate change to be applied to the 3.3% (1 in 30 year) storm event. The Site sits within the Severn Middle Worcestershire Management Catchment and the climate allowances for this area are contained in Table 5-1 and Table 5-2.

Table 5-1 – 3.3% Annual Exceedance Rainfall Event Climate Change Allowances

Epoch	Central Allowance	Upper End Allowance
2050s	20%	35%
2070s	25%	35%

Table 5-2 – 1% Annual Exceedance Rainfall Event Climate Change Allowances

Epoch	Central Allowance	Upper End Allowance
2050s	20%	40%
2070s	25%	40%

- 5.1.5 The revised climate change allowances provided by the Environment Agency do not identify any increase from the previously applied 40% climate change allowances. Based on this and the other design parameters applied, it is not anticipated that there would be any significant changes to the surface water drainage strategy proposed.
- 5.1.6 When a detailed surface water drainage network is developed and surface water drainage calculations are updated at a later design stage, climate change allowances should be considered for both the 3% AEP and 1% AEP in line with the updated Environment Agency Guidance.
- 5.1.7 It is therefore considered that the surface water drainage strategy is considered largely acceptable and remains policy compliant at this stage.

6 Conclusions

- 6.1.1 This Technical Note sets out our understanding of the Site and the key principles proposed to bring forward the proposed residential development as detailed in 2019 WSP FRA.
- 6.1.2 A review of the latest updates in National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG) and current local planning policy compared with the findings and drainage design criteria adopted within 2019 WSP FRA, demonstrates that the approach to flood risk and drainage remains compliant and valid in the context of flood risk and drainage policy and guidance.
- 6.1.3 This preliminary assessment considers that the development at Lawnswood Road, Ridgehill may be delivered sustainably without increasing flood risk or having a detrimental effect on water quality.

7 Limitations

7.1 Purpose

- 7.1.1 This document has been prepared for Clowes Developments for their sole and specific use.
- 7.1.2 PJA Civil Engineering Ltd. accepts no responsibility or liability for any use that is made of this document other than by Clowes Developments for the purposes for which it was originally commissioned and prepared.
- 7.1.3 The conclusions and recommendations contained herein are limited by the availability of background information and the planned use for the Site.
- 7.1.4 Third party information has been used in the preparation of this report, which PJA Civil Engineering Ltd, by necessity assumes is correct at the time of writing. Whilst all reasonable checks have been made on data sources and the accuracy of the data, PJA Civil Engineering Ltd accepts no liability for same.
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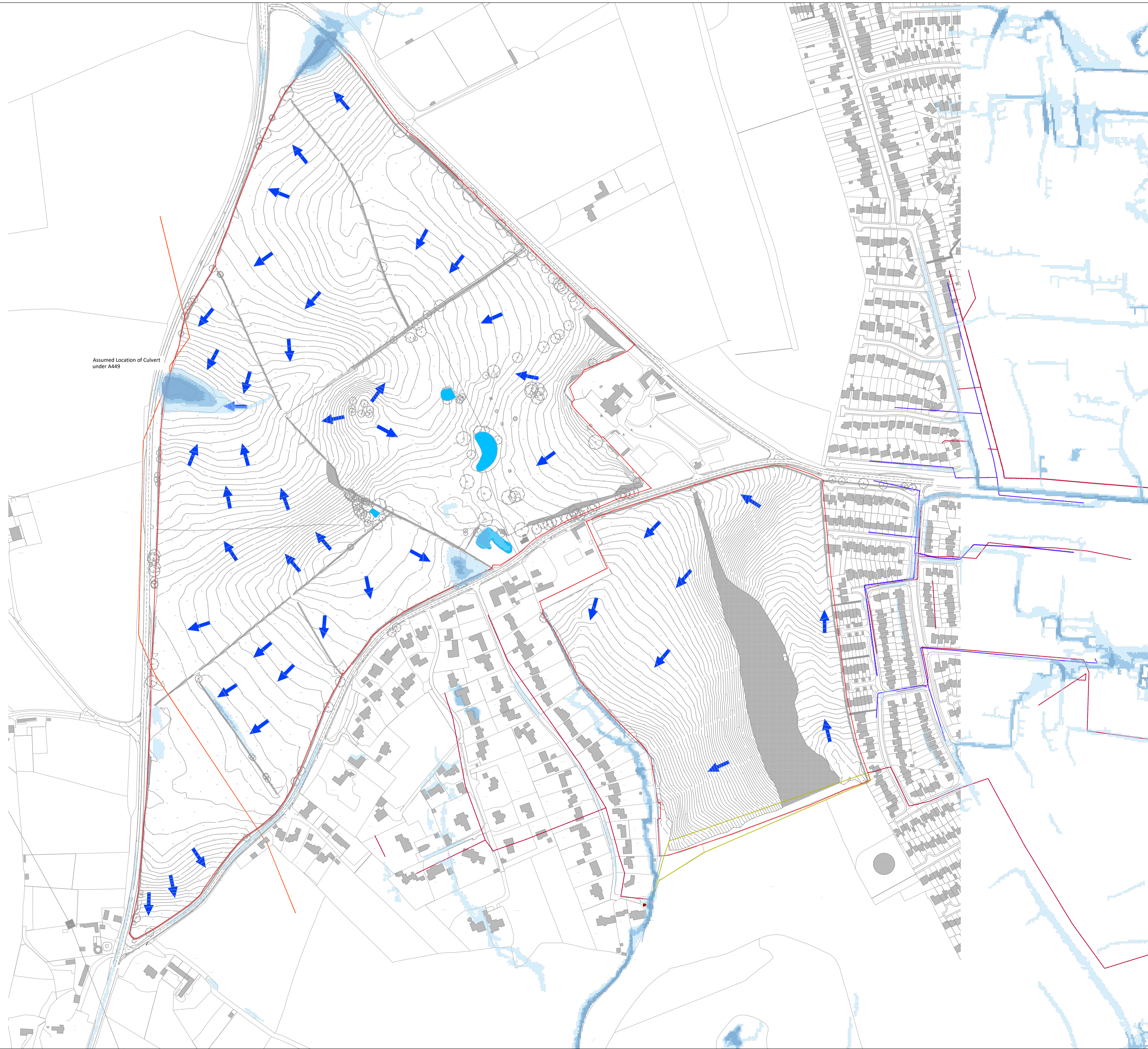
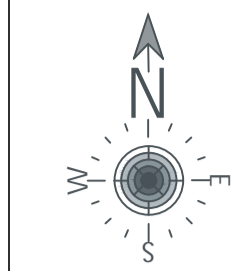
7.2 CDM

- 7.2.1 The revised Construction (Design and Management) Regulations 2015 (CDM Regulations) came into force on April 2015 to update certain duties on all parties involved in a construction project, including those promoting the development. One of the designer's responsibilities under clause 9 (1) is to ensure that the client organisation, in this instance Clowes Developments, is made aware of their duties under the CDM Regulations.

7.3 Copyright

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Appendix A Site Location Plan



Assumed Location of Culvert under A449

NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9.

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- Drawing should be read in conjunction with all other relevant scheme drawings.
- Drawing includes:
 - Topographic Survey by BMB received December 2022
 - Sewer Asset Mapping received July 2019
 - Surface Water data from the Environment Agency received December 2022

KEY

- Site Boundary
- Existing Foul Water Sewer
- Existing Surface Water Sewer
- Existing Combined Rising Main
- Existing Foul Rising Main
- Existing Overland Flow Route
- Existing Ponds
- Existing Unnamed Ordinary Watercourse
- ▲ Existing Pumping Station
- Risk of Surface Water 1 in 30 Year
- Risk of Surface Water 1 in 100 Year
- Risk of Surface Water 1 in 1000 Year
- 1m Contours

REV	DATE	REVISION NOTE	BY
P1	12/12/2022	DRAFT FOR COMMENT	MT

PJA Seven House, High Street, Longbridge, Birmingham, B31 2UQ, UK. Tel: 0121 475 0234. Birmingham, Bristol, Exeter, London, Reading. pja.co.uk

CLIENT
Clowes Developments

PROJECT
Lawnswood Road, Stourbridge

DRAWING TITLE
Existing Drainage Features Plan

DRAWING ISSUE STATUS
INFORMATION

PJA JOB NO: 06850 - SUB-CODE: WR-0500 - DRAWING NO: P1 - REVISION: P1

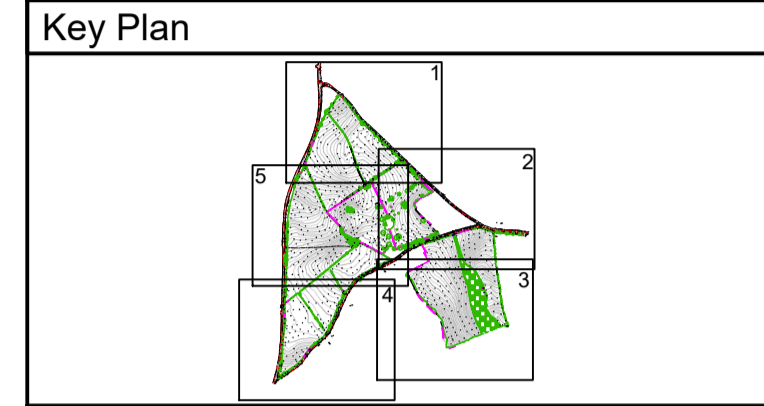
SCALE	DRAWN	REVIEWED	DATE
A1@1:2500	MT	PR	12/12/2022

Appendix B Topographic Survey



Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	388044.764	287208.565	104.757
BWB02	387962.076	287209.574	104.239
BWB03	387815.764	287295.724	102.845
BWB04	387907.308	287223.373	100.904
BWB05	387790.164	287203.929	95.379
BWB06	387644.539	287147.070	91.288
BWB07	387473.930	287046.092	89.175
BWB08	387388.715	287003.690	89.895
BWB09	387344.138	286955.787	88.844
BWB11	387249.111	286763.194	84.401

- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 - All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
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 - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
 - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
 - OS license number: 100022432



Legend

OS Buildings	Contour Lines	Inspection Chamber
Surveyed Buildings	0.25 Flow direction and pipe diameter	Station and Name
Building	BH 1 Monitoring Borehole	Tree / Bush / Sapling
Wall	Area of Vegetation/ Extent of Tree Canopy	Hedge
Kerb Channel Line	Body of Water	Body of Water from OS
Edge of Surface	Spot Level	Assumed Surface
Top of Kerb	Water Drainage Line	
Top of Bank		
Bottom of Bank		
Canopy / Overhang		
Line Marking		
Centre Line		
Watercourse		
Centre Line		
Barrier		
Fence		
Gate		
Overhead Powerline		
Overhead Utilities		

AP Anchor Point	FBW Fence Barbed Wire	LB Litter Bin
BG Back Gully	FCB Fence Closed Board	LP Lamp Post
BO Bollard	FCL Fence Chain Link	MH Manhole
BS Bus Stop	FEL Fence Electric	Mkr Service Marker
BT British Telecom	FMP Fence Metal Panel	PB Post Box
C Crest	FMR Fence Metal Railing	PT Post
CL Cover Level	FOB Fence Open Board	RE Rodding Eye
CMP Cable Marker	FPW Fence Post & Wire	SP Sign Post
Post	FSP Fence Steel Palisade	ST Stop Tap
CCTV Security Camera	FWM Fence Wire Mesh	SV Stop Valve
CTV Cable TV	FFL Finished Floor Level	TCB Telephone
DC Drainage Channel	FP Flagpole	Call Box
DK Drop Kerb	Gas Gas	THL Threshold Level
DP Down Pipe	GV Gas Valve	TL Traffic Light
Elec Electric	GY Gully	TP Telegraph Post
EP Electricity Post	Ht Height	TS Traffic Signal
ER Earth Rod	IC Inspection Chamber	UTS Unable to Survey
FH Fire Hydrant	IFL Internal Floor Level	WL Water Level
FL Floodlight	IL Invert Level (as a reduced level)	WM Water Meter
		WO Wash Out

P1	03.12.19	First Issue	DG	SS
Rev	Date	Details of issue / revision	Dw	Rev

Issues & Revisions

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Client
Savills (UK) Ltd

Project Title
Clowes Land, Lawnswood Road, Stourbridge

Drawing Title
Existing Site Plan Sheet 1 of 5

Drawn:	D.Gibbons	Reviewed:	S.Shreeves
BWB Ref:	NTM2169	Date:	03.12.19
Scale:	A1: 1:1000		

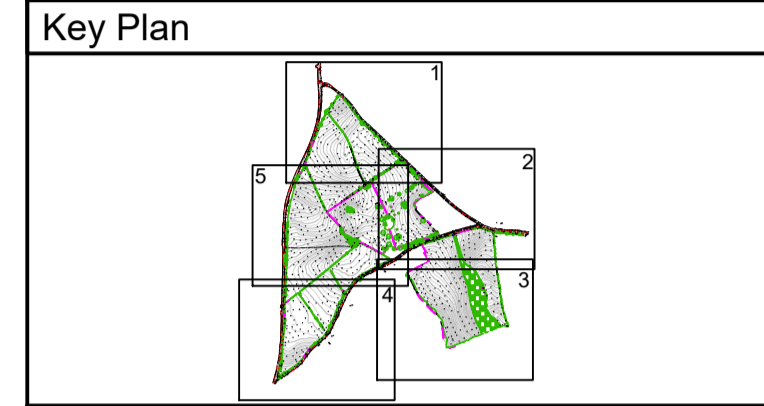
INFORMATION

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LRS-BWB-00-01-DR-G-0001	S2	P1



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P1	03.12.19	First Issue	DG	SS
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Issues & Revisions

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Project Title
Clowes Land, Lawnswood Road, Stourbridge

Drawing Title
Existing Site Plan Sheet 2 of 5

Drawn:	D.Gibbons	Reviewed:	S.Shreeves
BWB Ref:	NTM2169	Date:	03.12.19
Scale@A1:	1:1000		

INFORMATION

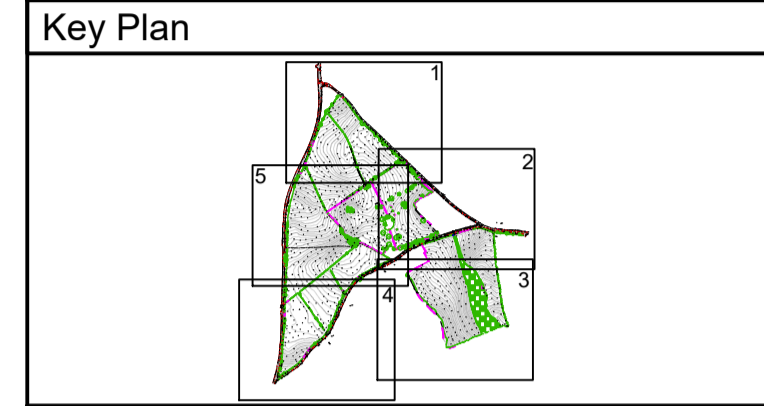
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Canopy / Overhang	Gate	Overhead Powerline
Line Marking	Overhead Utilities	Contour Lines
Centre Line	Watercourse	Centre Line
Fence	Barrier	Gate
Gate	Overhead Powerline	Overhead Utilities
Overhead Powerline	Overhead Utilities	Contour Lines
Overhead Utilities	Contour Lines	Centre Line

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
BO	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
BT	British Telecom	FMP	Fence Metal Panel	PB	Post Box
C	Crest	FMR	Fence Metal Railing	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Rodding Eye
CMP	Cable Marker	FOW	Fence Post & Wire	SE	Sign Post
Post		FSP	Fence Steel Palisade	SP	Stop Sign
CCTV	Security Camera	FVM	Fence Wire Mesh	SV	Stop Valve
Cable TV		FVL	Finished Floor Level	TCB	Telephone
DC	Drainage Channel	FP	Flagpole	Call Box	
DK	Drop Kerb	Gas	Gas	THL	Threshold Level
DP	Down Pipe	GV	Gas Valve	TL	Traffic Light
Elec	Electric	GY	Gully	TP	Telegraph Post
EP	Electricity Post	Ht	Height	TS	Traffic Signal
ER	Earth Rod	IC	Inspection Chamber	UTS	Unable to Survey
FH	Fire Hydrant	IFL	Internal Floor Level	WL	Water Level
FL	Floodlight	IL	Invert Level (as a reduced level)	WM	Water Meter
				WO	Wash Out

P1	03.12.19	First Issue		DG	SS
Rev	Date	Details of issue / revision		Dw	Rev

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Client
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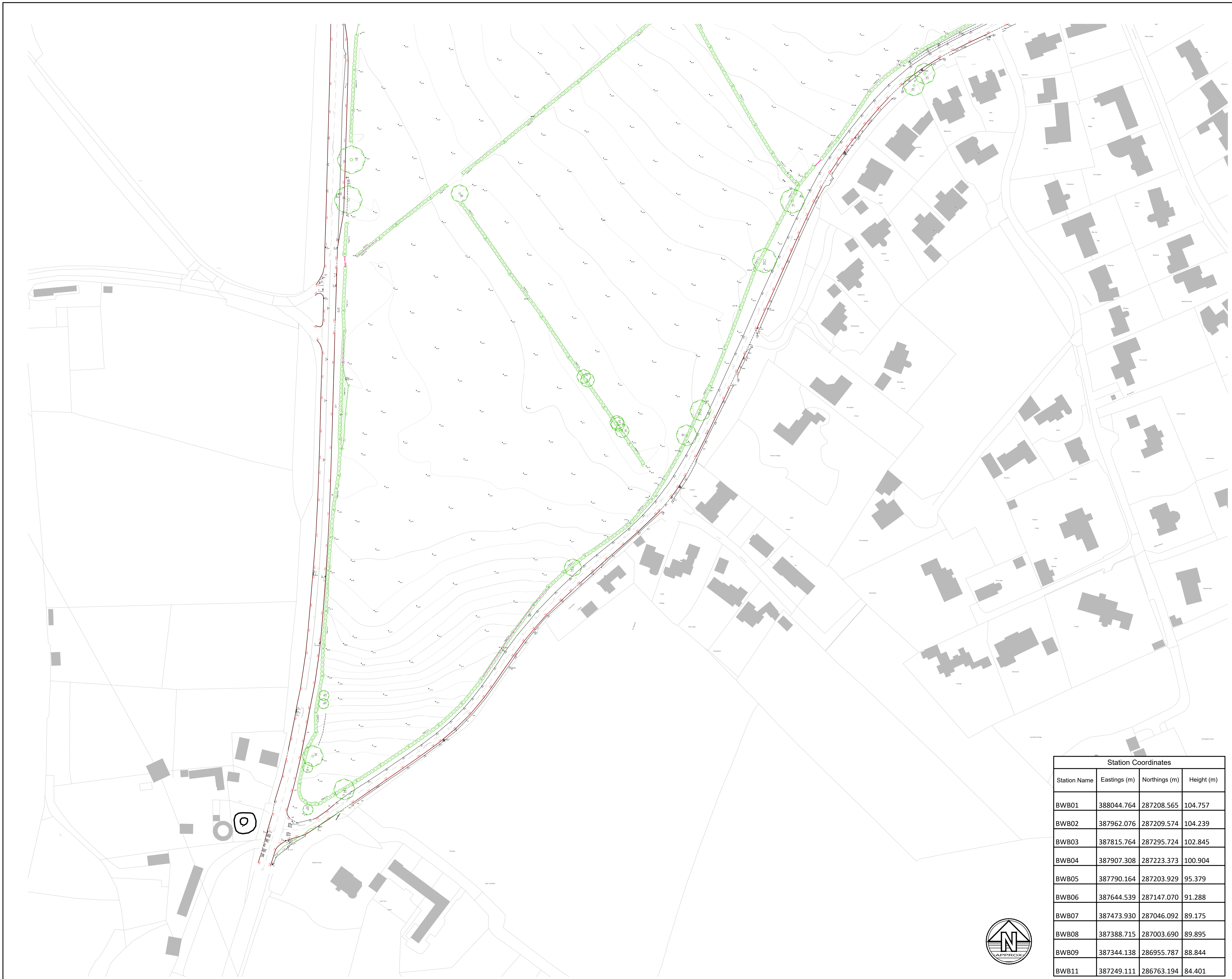
Project Title
Clowes Land, Lawnswood Road, Stourbridge

Drawing Title
Existing Site Plan Sheet 3 of 5

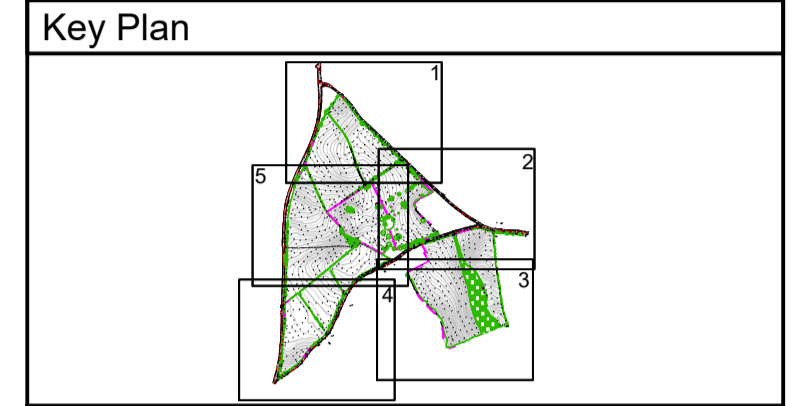
Drawn:	D.Gibbons	Reviewed:	S.Shreeves
BWB Ref:	NTM2169	Date:	03.12.19
Scale@A1:	1:1000		

INFORMATION

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LRS-BWB-00-03-DR-G-0001	S2	P1



- ### Notes
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 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
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 5. No scale factor has been applied to this survey, therefore the OS coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
 6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
 7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
 8. OS license number: 100022432



Legend

OS Buildings	Contour Lines	Inspection Chamber
Surveyed Buildings	Flow direction and pipe diameter	Station and Name
Building	Monitoring Borehole	Tree / Bush / Sapling
Wall	Area of Vegetation/ Extent of Tree Canopy	Hedge
Kerb Channel Line	Body of Water	Body of Water from OS
Top of Kerb	Spot Level	Assumed Surface
Edge of Surface	Water Drainage Line	Surface Water Drainage Line
Top of Bank	Watercourse	Centre Line
Bottom of Bank	Barrier	Fence
Canopy / Overhang	Gate	Overhead Powerline
Line Marking	Overhead Utilities	Overhead Utilities
Centre Line	Overhead Utilities	Overhead Utilities

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
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CMP	Cable Marker	FPW	Fence Post & Wire	SP	Sign Post
Post	Post	FSP	Fence Steel Palisade	ST	Stop Tap
CCTV	Security Camera	FWM	Fence Wire Mesh	SV	Stop Valve
CTV	Cable TV	FFL	Finished Floor Level	TCB	Telephone
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Client
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Project Title
Clowes Land, Lawnswood Road, Stourbridge

Drawing Title
Existing Site Plan Sheet 4 of 5

Drawn:	D.Gibbons	Reviewed:	S.Shreeves
BWB Ref:	NTM2169	Date:	03.12.19
Scale@A1:	1:1000		

INFORMATION

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LRS-BWB-00-04-DR-G-0001	S2	P1

Station Coordinates

Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	388044.764	287208.565	104.757
BWB02	387962.076	287209.574	104.239
BWB03	387815.764	287295.724	102.845
BWB04	387907.308	287223.373	100.904
BWB05	387790.164	287203.929	95.379
BWB06	387644.539	287147.070	91.288
BWB07	387473.930	287046.092	89.175
BWB08	387388.715	287003.690	89.895
BWB09	387344.138	286955.787	88.844
BWB11	387249.111	286763.194	84.401



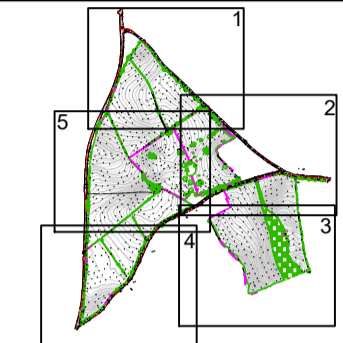
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Key Plan



Legend

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Barrier		
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Project Title
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