Eric Wright Construction Ltd.

Clitheroe Care Home

Drainage Strategy

220018-JPS-XX-XX-RP-C-0001

Rev: P03

March 2023

JPS CIVIL + STRUCTURAL ENGINEERS

Document History

JPS Job Number: 113001		Document Ref: 220018-JPS-XX-XX-RP-C-0001		
P03	Site layout amended	JR	JP	27.03.2023
P02	Additional information added	JR	JP	15.02.2023
P01	Drainage Strategy	JR	JP	09.02.2023
Revision	Purpose Description	Originated	Authorised	Date

Contents

1 Introduction

1.1 Commission

JP Structural Design were appointed by Eric Wright Construction Ltd. to produce a Drainage Strategy for a new build care home with access and car parking area at Clitheroe, Lancashire.

1.2 Limitations

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The findings of this Strategy have been based on data available at the time of the study and on the review of available information that has been undertaken to date. They relate to the current proposed layout as outlined in **Appendix A**. Should the proposed end use of the site change after the completion of this assessment, then the findings of this report will need to be reviewed and updated accordingly.

2 Existing Site and Proposed Development

2.1 Existing Site

The site is located on land off Dyke Nook, Clitheroe, Lancashire. The centre of the site is at National Grid Reference SD748407. The proposed site covers an area of approximately 0.990 ha. See **Appendix B** for the Site Information Drawing.

The site is roughly triangular in shape and it is located to the south east of Clitheroe. The site is part of a wider proposed residential development within the area which will surround the site once completed. The site is currently agricultural land, there is a hedgerow in the north and a tree present in the centre of the site, there are no structures present.

A review of the topographical survey shows that the site falls in a northern direction. The survey indicates that the site has a high point of 103.850m (Above Ordnance Datum) AOD located in the south west of the site. The low point is located in the north west of the site at 101.300m AOD, with levels of 102.600m AOD and 103.280m AOD in the north east and south east corners respectively. Additionally, there is a 1.3-1.5m high earthworks mound located 15-20m from the west of the site boundary. The topographical survey of the site is provided in **Appendix C**.

2.2 Ground Conditions

The surface geology of the site has been reviewed from the British Geological Survey (BGS) online geology maps. The geology map indicates that the site is superficially underlain by "Till, Devensian - Diamicton. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period." The bedrock geology is described as "Clitheroe Limestone Formation and Hodder Mudstone Formation - Mudstone. Sedimentary bedrock formed between 346.7 and 337 million years ago during the Carboniferous period."

According to the Soilscapes soils dataset (http://www.landis.org.uk/soilscapes/), soil conditions at the site and within the surrounding area are slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage.

E3P carried out soakaway testing on 19 December 2022 in accordance with BRE365 to determine infiltration rates of the site. A summary of the findings are provided in **Appendix D**. The testing was undertaken in three locations on site. The E3P report states the following:

"Within all three locations, soakaway testing failed, with the water level failing to soakaway below 75% effective storage. As such, soakaway drainage is not unlikely to be suitable on the site."

No groundwater was encountered within any of the exploratory holes.

2.3 Existing Waterbodies

There is an unnamed watercourse to the west of the site that discharges to Pendleton Brook.

There are no other water bodies within the immediate vicinity of the site.

2.4 Existing Drainage

Public sewer records obtained from United Utilities (UU) (refer to **Appendix E**) indicate that there are public sewers serving the existing residential areas to the north and west of the site but that there are no public sewers within the immediate vicinity of the site.

The site is undeveloped greenfield, given site topography and ground conditions, surface water runoff would be expected to flow overland in a north west direction.

The Coopers Chartered Consulting Engineers drawings 6263 / sp-a-03-1,2,3 and 4 for the Spine Road of Phase A of the wider development have been reviewed as part of this assessment (refer to **Appendix F**). The drawings indicate the following:

- A system comprising 300mm, 375mm and 450mm diameter surface water sewers situated within the proposed spine road as shown on the existing drainage layout in **Appendix G**. The system appears to discharge to the unnamed watercourse to the west of the site that ultimately discharges to Pendleton Brook.
- A system comprising 150mm, 225mm and 300mm diameter foul water sewers situated within the proposed spine road as shown on the existing drainage layout in **Appendix G**. The system appears to discharge to the 225mm / 300mm diameter public combined sewer situated within Littlemoor Road to the west of the site.

2.5 Existing Flood Risk

The Environment Agency Flood Map for Planning (Rivers and Sea) indicates the site is located in flood zone 1. Flood zones refer to the probability of river and sea flooding. Table 1 of the NPPG defines flood zones as follows:

- Flood zone 1: Low Probability. Land having a less than 1 in 1,000 annual probability of river or sea flooding.
- Flood zone 2: Medium Probability. Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
- Flood zone 3a: High Probability. Land having a 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability of sea flooding.
- Flood zone 3b: Functional Floodplain. Land where water has to flow or be stored in times of flood.

The management of surface water run-off generated by the post development site will be the principal flood risk associated with this scheme, therefore reduction of any flood risk is discussed in Section 3 of this report.

2.6 Proposed Development

The scheme consists of the construction of a new 2 storey 68 bed care home over in Clitheroe. The development will include a new building, landscaped areas and vehicular parking area. See **Appendix A** for proposed site layout.

3 Drainage Proposals

3.1 Foul Drainage

The proposed peak foul discharge generated by the development has been calculated based upon an occupancy rate of 1.5 persons per 1 bedroom, (allowing for residents and support staff) which equates to 102 persons. Therefore, allowing a typical usage of 350 l/person/day over a 24-hour day with a peak factor of 6, generates a peak foul flow of 2.5 l/s.

As the existing site is greenfield the peak foul flows from the proposed development will be greater than the existing.

It is proposed to discharge foul flows from the site to the existing manhole F10 via the existing 150mm diameter spur connection currently present in the south of the site as indicated on the preliminary drainage layout presented in **Appendix H**.

3.2 Surface Water Drainage

It is acknowledged that the satisfactory collection, control and discharge of storm water is now a principle planning and design consideration. Part H of the Building Regulations 2002 recommends that surface water run-off shall discharge to one of the following, listed in order of priority:

a) an adequate soakaway or some other adequate infiltration system, or where that is not reasonably practicable,

b) a watercourse, or, where that is not reasonably practicable,

c) a sewer.

It is necessary to identify the most appropriate method of controlling and discharging surface water. The design should seek to improve the local run-off profile by using systems that can either attenuate run-off and reduce peak flow rates or positively impact on the existing flood profile.

3.2.1 Ground Infiltration Techniques

As detailed in Section 2, infiltration testing has been undertaken by E3P in accordance with the guidelines in BRE365. However, within all three locations, soakaway testing failed. As such the disposal of surface water via infiltration has been discounted for the site.

3.2.2 Discharge To Watercourse

It is therefore proposed to discharge surface water runoff from the site to the existing manhole S11 via the existing 150mm diameter spur connection currently present in the south of the site. This is indicated on the preliminary drainage layout presented in **Appendix H.** The existing system discharges to the unnamed watercourse to the west of the site that ultimately discharges to Pendleton Brook.

3.3 Surface Water Calculations

3.3.1 Proposed Discharge Rate

The Coopers Chartered Consulting Engineers drawings 6263 / sp-a-03-1,2,3 and 4 for the Spine Road of Phase A of the wider development have been reviewed as part of this assessment (refer to **Appendix F**). The plans indicate the surface water sewers situated within the proposed spine road have been designed to accommodate a proposed discharge rate of 11 l/s from this development. Accordingly, it is proposed to restrict runoff from impermeable surfaces of the development to 11 l/s.

3.3.2 Attenuation Storage

Attenuation storage will be provided to restrict surface water runoff generated across roofs and hardstanding.

The attenuation storage facility has been modelled using Causeway Flow (refer to **Appendix I**). The required storage volume has been sized to store the 1:100 rainfall event including a 40% increase in rainfall intensity to allow for climate change in accordance with Environment Agency guidance.

Based on a peak discharge rate of 11 l/s, a total storage volume of 259.9 m^3 would be required. It is proposed that this storage is provided in a geo-cellular attenuation tank with a plan area of 171 m^2 and a depth of 1.6 m.

The proposed attenuation tank is to be located within the car park area to the south of the proposed building.

Additional storage is provided in the proposed network of pipes and manholes. A preliminary surface water drainage layout is provided in **Appendix H**.

4 Planning Requirements

4.1 Water Quality

The proposed sump gullies and proposed vortex flow control catch pit manhole are deemed to be sufficient to remove the suspended sediments from the roof and car park surface water for a development of this size and nature.

4.2 Exceedance Events

Flooding is not expected to occur in the 1:100 year rainfall event plus 40% climate change for the site. It is anticipated that flood flows from rainfall events above this will be directed towards the access road and car parking areas respectively, with the site being profiled to ensure that flood flows are directed away from built development.

4.3 O&M Manuals

During the detail design stage & construction, full details of the final design will be submitted and included in the O&M manuals to ensure the drainage system is regularly maintained with particular regards to the surface water system. This will include manufacturer's guidelines for maintenance and replacement and full details of the flow control device as well as means to operate the drain down features in a blockage situation.

5 Conclusions

The proposed development is not expected to be affected by general objections in respect to draining the site. There will be suitable conditions imposed to ensure that the drainage proposals are designed and constructed in accordance with relevant statutory requirements, including Building Regulations 2010 and the requirements of Lancashire Lead Local Flood Authority.

Appendix A – Proposed Layout

Proposed Site Plan

1 : 500

BOUNDARY TREATMENTS KEY:

LOW HEIGHT STONE WALL

1800MM HIGH METAL HOOP TOP RAILINGS

1800MM HIGH CLOSE BOARDED TIMBER FENCE

EXISTING GREEN MESH FENCE TO SCHOOL BOUNDARY

HEDGING

NEW 1800MM HIGH MESH FENCING

NOTE: PLAN PRODUCED USING ALMAGATED INFORMATION FROM PLANNING APPLICATIONS:

21/0957
22/0116
21/0951

AND SUBJECT TO CHANGE.

PLEASE SEE DRAWING BY SUMO SERVICES SU-MO-10800 FOR LEVEL INFORMATION WITHIN RED LINE BOUNDARY.

NOTE: For final landscaping proposals refer to TEL Landscape drawings ref MR22-142/101 & MR22-142/102.

DRAWING REVISIONS

REV	DESCRIPTION	DATE	BY	CHK
A	Drawings updated to suit general comments from client. Amendments include riser positions being indicated, additional doors being added & re-conguigaration of the servery and dining layout.	18.01.23	JA	TE
B	Service road redcued to single lane at a width of 3.7m. Additional path added at the side of service road for staff access.	10.02.23	JA	TE
C	Close boarded fencing to the east boundary omitted and replaced with metal mesh fencing. Change made to suit client comments.	20.02.23	JA	TE
D	Proposed sub-station location indicated on drawing in green hatch with annotation & dimensions to suit.	07.03.23	JA	TE
E	Footpath location amended	16.03.23	JA	TE
F	General amendments made including wall vent locations indicatively shown on drawing. PV panel numbers updated as guided by M&E Consultant. Landscaping co-ordinated to suit TEL Landscape drawings.	24.03.23	JA	TE

NOTES

DO NOT SCALE, USE FIGURED DIMENSIONS ONLY.

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ISO 9001 : 2015 REGISTERED
Certificate No.FM53026

CLIENT
Eric Wright Group

PROJECT
Proposed Care Home, Standen
Central Site, Clitheroe

DRAWING TITLE
Proposed Site Plan

DWA PROJECT NO.	DWA DWG NO.	REV
G5709	192	F

DRAWING STATUS
PLANNING

SCALE	DATE	DRAWN BY	CHECKED BY
As indicated @ A1	21.12.22	JA	TE.

BIM JOB NO. 220018
SUITABILITY CODE
SUITABILITY DESCRIPTION

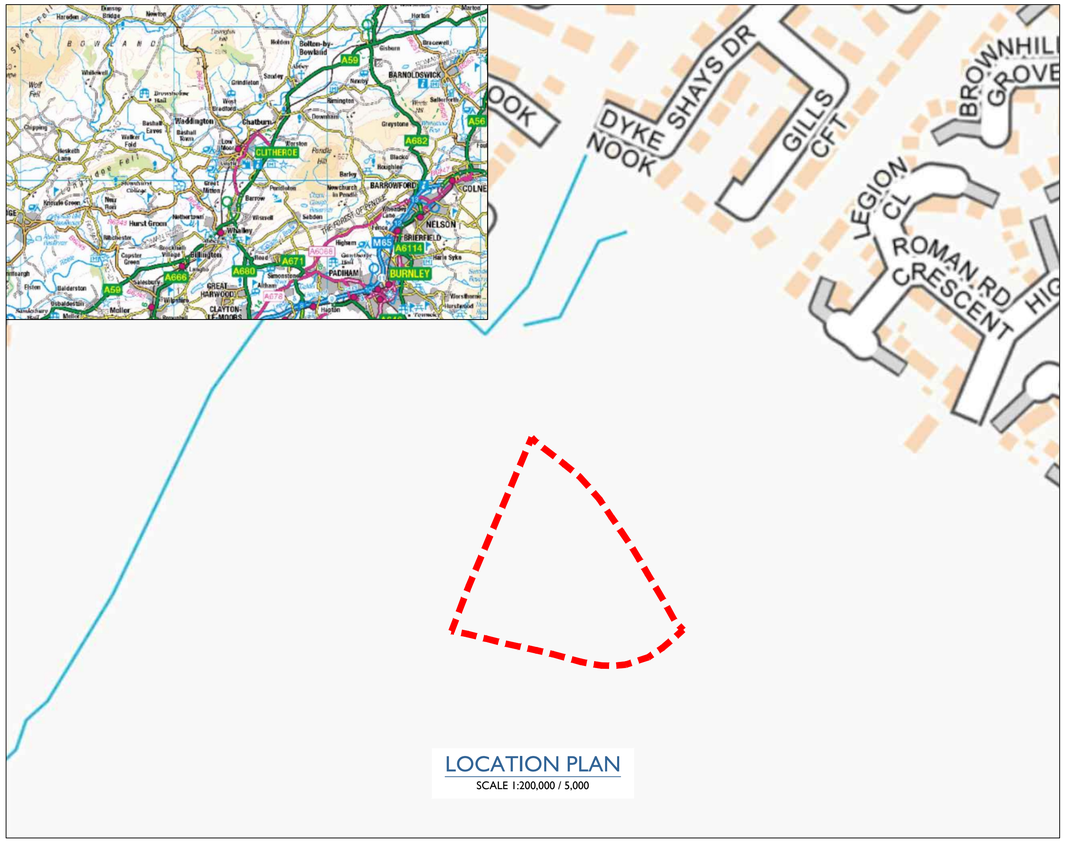
DOCUMENT NAME (BS EN ISO 19650)
220018-DWA-XX-XX-DR-A-192-F-Proposed Site Plan

North

0m 10m 20m 30m 40m 50m

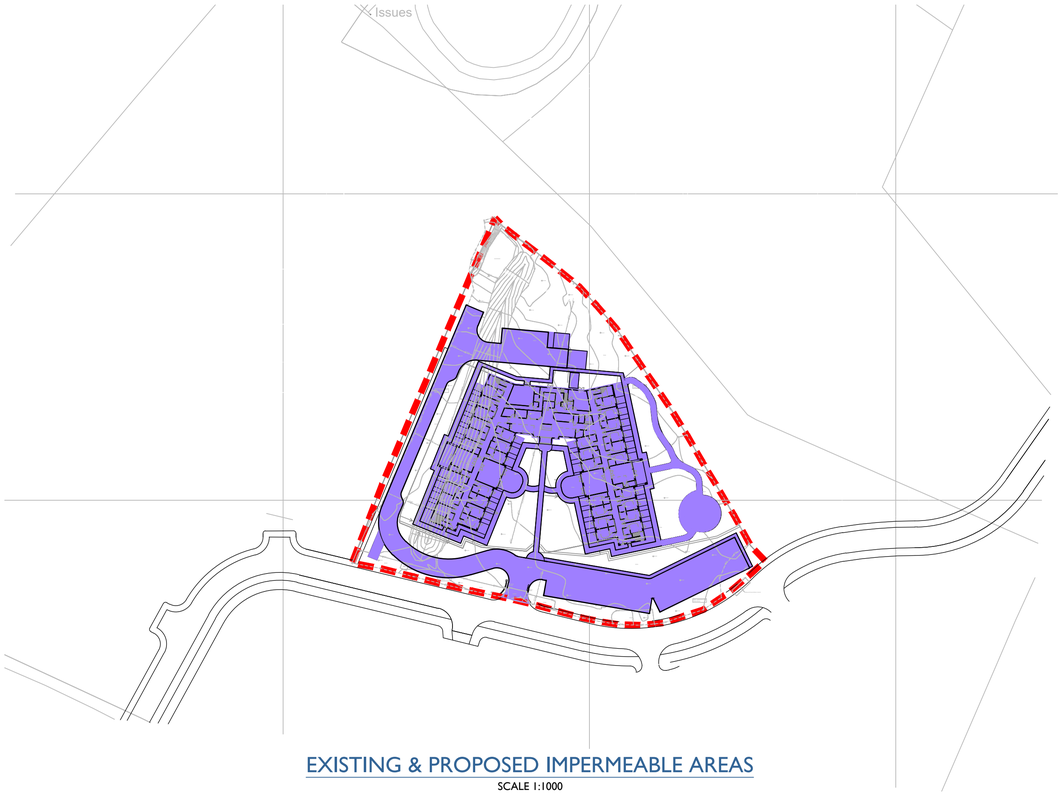
VISUAL SCALE 1:500

Appendix B – Site Information Drawing



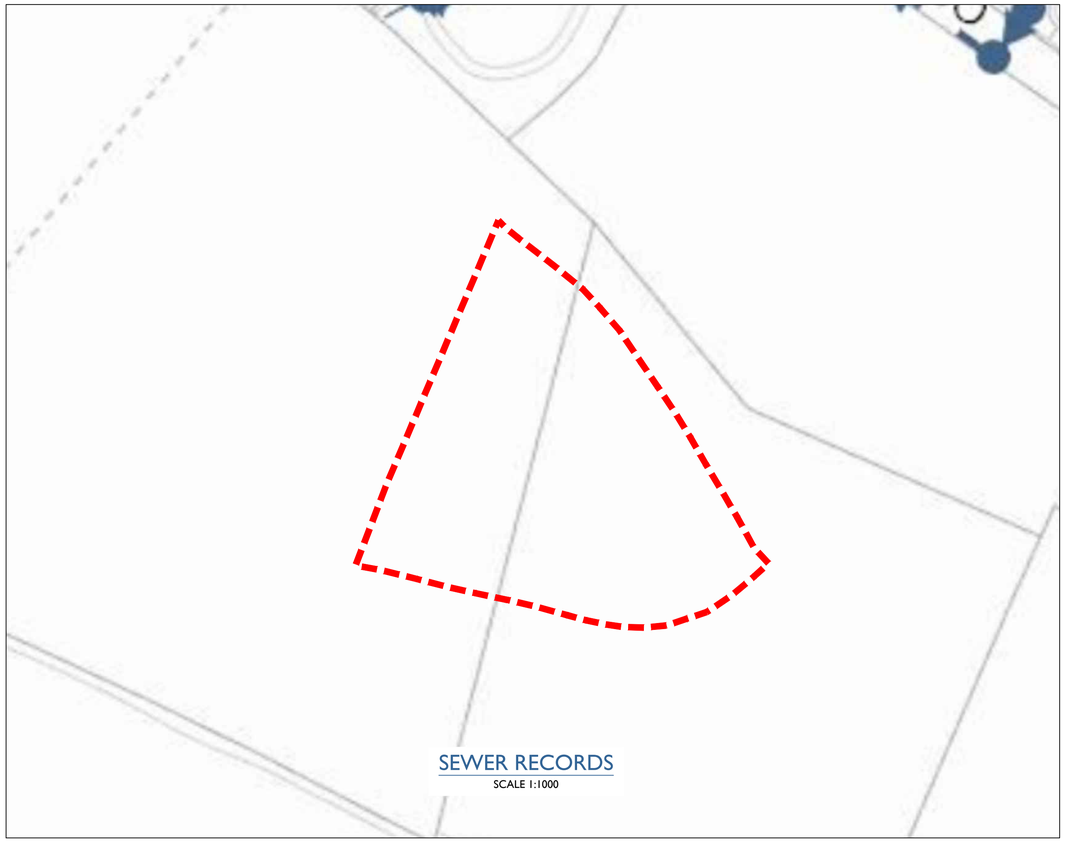
LOCATION PLAN

SCALE 1:200,000 / 5,000



EXISTING & PROPOSED IMPERMEABLE AREAS

SCALE 1:1000



SEWER RECORDS

SCALE 1:1000

SATELITE IMAGE OF THE SITE

SCALE 1:1000

NOTE

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.

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SITE CO-ORDINATES

OS X (Eastings)	374889
OS Y (Northings)	440726
Nearest Post Code	BB7 1FZ
Nat Grid	SD748407 / SD7488940726

AREAS

SITE BOUNDARY
9,900m² (0.990 ha)

ADDITIONAL IMPERMEABLE AREA
5,440m² (0.544 ha)

REV	DESCRIPTION	BY	CHK	APR	DATE
P02	SITE LAYOUT AMENDED	JR	RH	MM	27.03.2023

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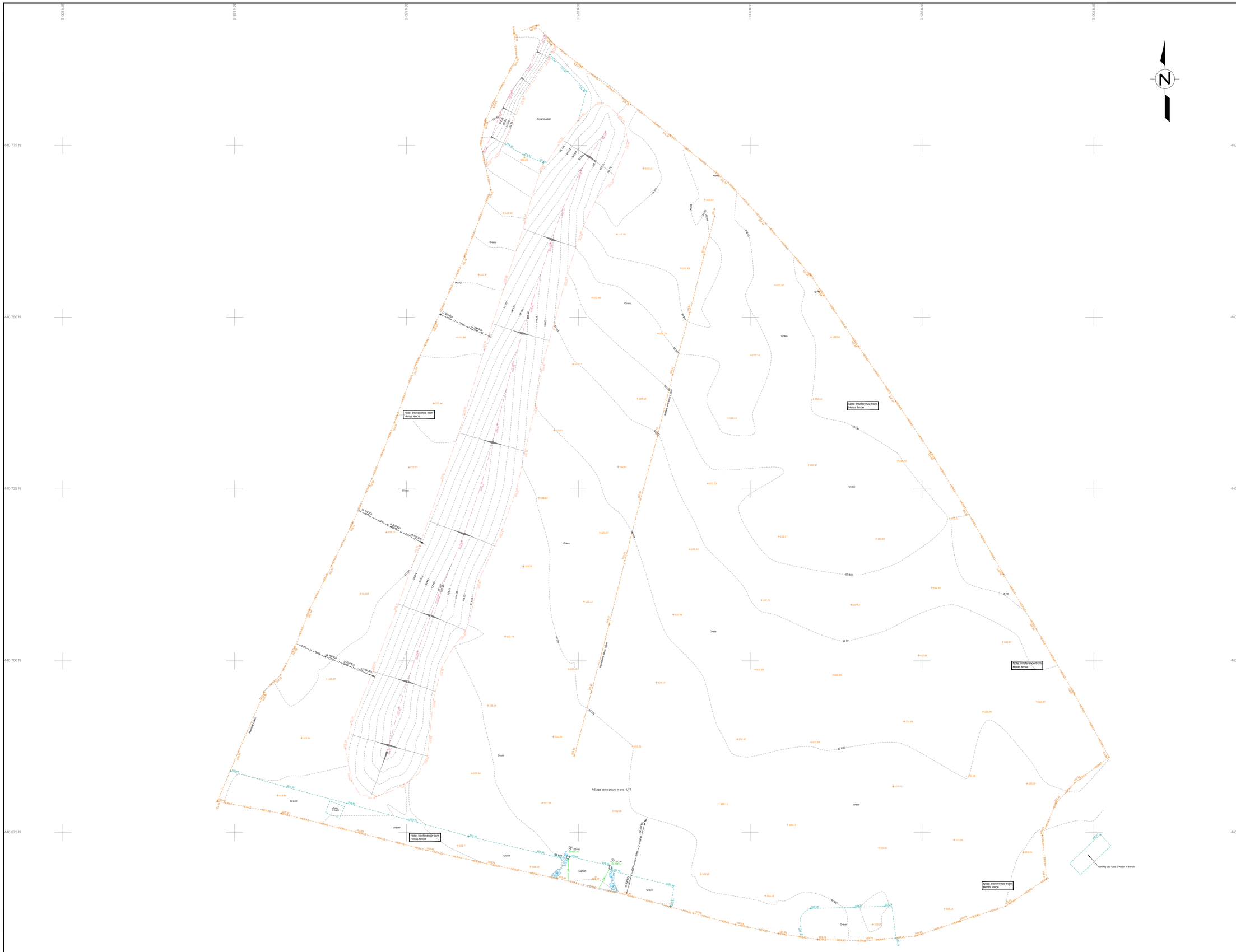
PURPOSE OF ISSUE: STAGE 2	STATUS: S2
PROJECT: CLITHEROE CARE HOME	
TITLE: DRAINAGE SCHEME SITE INFORMATION	
CLIENT: ERIC WRIGHT CONSTRUCTION LTD	
DRAWN BY: JR	CHECKED BY: RH / APPROVED BY: MM
DATE: 08.02.2023	SCALE (@ A1): AS SHOWN / PROJECT NUMBER: 113001
DRAWING NUMBER: 220018-JPS-ZZ-ZZ-DR-C-00500	REV: P02

Appendix C – Topographic Survey



TOPOGRAPHIC LEGEND

- Barrier (symbol - sized)
- Bollards Beacon (symbol)
- Bollard (symbol)
- Borehole (symbol)
- BTIC — British Telecoms IC (sized)
- Building (incomplete detail)
- Cable into Ground (symbol)
- CCTV — Cable TV Box (symbol)
- CCTV Camera (symbol)
- CL 50.00 — Cover Level in metres
- Direction of Flow (Drainage)
- DB — Distribution Board (symbol)
- ER — Earth Rod (symbol)
- EC — Electric Cabinet (sized)
- EP — Electric Pole (symbol)
- ES — Electric Sign (symbol)
- Embankment Slope (symbol)
- FP — Feeder Pillar (sized)
- FH — Fire Hydrant (sized)
- FP — Flag Pole (symbol)
- FL — Flood Light (symbol)
- GV — Gas Valve (symbol)
- Gate
- GL 50.00 — Ground Level in metres
- GU — Gulley (sized)
- IC — Inspection Cover (sized)
- IL 50.00 — Invert Level in metres
- JB BT — Junction Box - BT (sized)
- JB COM — Junction Box - Comms (sized)
- JB — Junction Box - Elec (sized)
- LP — Lamp Post (symbol)
- LB — Light Bollard (symbol)
- LG — Light in ground (symbol)
- MH — Manhole (sized)
- MCP — Manhole Capped Port
- PL 50.00 — Parapet Level (m)
- 100 — Pipe Diameter (mm)
- Pipe into Ground (symbol)
- PO — Post (symbol)
- RWP — Rain Water Pipe (symbol)
- RS — Road Sign (symbol)
- RE — Rodding Eye (symbol)
- Sapling (symbol)
- SSP — Sign Post (symbol)
- SL — Spot Light (symbol)
- 50.00 + — Spot Height
- SC — Stop Cock (symbol)
- SV — Stop Valve (symbol)
- Survey Station (symbol)
- TP — Telephone Pole (symbol)
- B — Traffic Bollard (symbol)
- Tree (dimensions in metres - e.g.)
  - Dia. 0.3 Ht. 2.5 — Diameter at 1mh. (bole)
  - Ht. 10.2 Maple — Height:
  - Species:
- TL — Traffic Light (symbol)
- UV — Unknown Valve (symbol)
- VP — Vent Pipe (symbol)
- Wall
- WP — Waste Pipe (symbol)
- WM — Water Meter (symbol)
- WV — Water Valve (symbol)
- Building Canopy
- Crash Barrier
- Drainage Channel
- Drop Kerb (level in metres)
- Edge Detail (level in metres)
- Footpath (level in metres)
- Fence
- Heras Fence
- Kerb channel (m)
- Kerb top (m)
- OHS — Overhead Service Line
- Pedestrian Railing

UTILITY LEGEND

UTILITY LINETYPES

- BT — British Telecom
- CATV — Cable Television
- CCTV — Closed Circuit Television
- C — Communications
- DR — Drainage
- CW — Drainage - Combined Water
- FW — Drainage - Foul Water
- SW — Drainage - Storm Water
- ED — Empty Duct
- E — Electric
- FH — Fire Hydrant Main
- FO — Fibre Optic
- FUEL — Fuel
- G — Gas
- HP — Heating Pipes
- HV — HV Cables
- MSR — Multiple Services Route
- OIL — Oil
- OXY — Oxygen
- SL — Street Lighting
- TSL — Traffic Signal Loop
- GPR — U — Unknown found by GPR
- U — Unknown
- UC — Unknown Cable
- UPL — Unknown Pipeline
- W — Water

Assumed Service Route - See GENERAL NOTES (Using abbreviation of service and colour as above)

ASR — XXX — ASR — XXX

UTILITY SURVEY INFORMATION

- AOC — Area of Concern
- TAY AREA — Contracted Survey Area
- PREVIOUS — Previous Survey Area
- GPR Survey — Post processed GPR Area
- (0.60d) — Depth to Top of Service (m)
- UTS — Unable to Survey
- UTL — Unable to Lift (cover)
- Unable to Trace
- Unable to Trace (due to blockage)
- Unable to Trace Further
- End of Trace

ABREVIATIONS used on a PAS 128 Survey

(0.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

GENERAL NOTES

Irrespective of the information provided by a utility survey and statutory plans, excavation work should be undertaken with extreme caution and in accordance with HSE Guidelines - HSG47 Avoiding Danger from Underground Services

Only sub-surface utility information is provided. Above ground utility information may be shown where it assists with positional referencing.

Utilities may continue outside of the survey area. Any paint marks outside of the area are for investigative purposes only and may not represent the full extent of the sub-surface utilities.

Where logic indicates a utility exists but which cannot be positively confirmed with the technology, an assumed route (ASR) is recorded. All assumed service routes (ASR) have been highlighted with a background yellow colour for visual enhancement.

Sewer and manhole details shown on this drawing have been obtained by observation and measurement from the surface and as such cannot be guaranteed

Vertical & Horizontal Position - Vertical position (depth) is indicative to the top of the utility/feature and is recorded as (x.xxd) i.e. (1.25d) - (depth to top of service) and should not be taken as exact, as this could be the surround to the service rather than the service itself. Where depth information from the technology is unclear, depth is not shown. Drains and pipes/ducts may have been detected using threading and the depth indicated could be between the top (soffit) and the bottom (invert). Horizontal position is indicative to the centre of the utility/feature and should not be taken as exact.

Warranty - Biodegradable paints are used to mark-out the position of the utilities. Markings may become illegible quickly depending on ground, weather and traffic conditions. No warranty is given in respect of the durability of the paint markings and that they are a complete representation of the sub-surface utilities, therefore, this drawing should be used as the primary reference for the survey results.

This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive techniques only and the performance can be adversely affected by ground, weather and site conditions outside of SUMO's control, therefore, some utilities may be undetectable. While SUMO uses reasonable endeavours to detect all utilities, it does not warrant that 100% detection will be achieved and that approximate depth penetration of the technologies SUMO uses will not be greater than two metres.

Rev	Notes	Drawn	Date

Notes:

Survey is referenced to OS Grid and Level Datum.

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Title: Utilities & Topographical Details

Client: Eric Wright Construction Ltd

Project: Standen Hall, Clitheroe, Lancashire

Date Completed:	06 December 2022	Post Code:	BB7 1PR

Surveyed:	TB, RW	Scale:	1/250 (A1 Sheet)
Drawn:	PC		
Checked:	RW		

Dwg No:	Job No:	Rev:
Sheet 01	SU<MO-10800=1	