



# Land at Darton Lane, Barnsley For Duchy Homes

Report no: 4386/2

Date: April 2023



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## APPENDICES

### Appendix A – Drawings

Drawing	Revision	Issued by	Title
4386/14		Lithos	Local surface waters
4386/13	-	Lithos	Indicative Surface Water Management Plan
2239.01	T	Duchy Homes	Planning Layout
DR-CONS-001	1ST	Duchy Homes	Construction Management Plan
47509-ECE-XX-XX-DR-C-0001	01	Eastwood & Partners	Appraisal Layout

### Appendix B – SWMP Inspection sheet

# SURFACE WATER MANAGEMENT PLAN (SWMP) FOR THE LAND AT DARTON LANE, BARNLSLEY

## 1 INTRODUCTION

### 1.1 General

- 1.1.1 Duchy Homes have acquired the above land with a view to development with housing. A proposed layout has been made available (Drawing ref. 2239.01, dated 26<sup>th</sup> August 2022) which is reproduced in Appendix A to this document and shows 46 'traditional' two storey domestic dwellings, with associated gardens and adoptable roads and sewers.
- 1.1.2 Lithos Consulting have been commissioned to prepare this Surface Water Management Plan (SWMP) to support Duchy and their groundworker during the construction phase of the proposed development.
- 1.1.3 The requirement for a construction SWMP is based on the Developer's duty to ensure that surface water quality (and quantity if appropriate) is managed throughout the construction phase to mitigate impacts to key environmental receptors.
- 1.1.4 This report has been written for the benefit and use of Duchy, the Principal Contractor and any other person(s) responsible for management of day-to-day site operations.
- 1.1.5 This report outlines the mitigation measures proposed to protect surface water bodies, notably the River Dearne.
- 1.1.6 This SWMP also includes advice regarding surface water monitoring and emergency mitigation measures, should these be required. Examples of when emergency measures should be considered have also been included for reference, although these are not exhaustive.

### 1.2 Background

#### The site

- 1.2.1 The site is located off Darton Lane, about 4.5km northwest of Barnsley town centre, and comprises three fields which include an area of saturated, marshy ground and a gravel track. A former mineral railway runs along the site's southern boundary.
- 1.2.2 Access to the development, both during and on completion of construction, will be from the north of the site, off Darton Lane which runs along the site's northern boundary.
- 1.2.3 The site is crossed by an existing culvert in the north and a combined sewer; see Eastwood and Partners Appraisal Layout Drawing (ref. 47509-ECE-XX-XX-DR-C-0001, dated 6<sup>th</sup> February 2023) presented in Appendix A of this report.

#### Ground

- 1.2.4 Geological maps suggest that ground conditions to comprise Coal Measures (sandstone, mudstone and siltstone), with a named unit, "Barnsley Rock Sandstone", located in the far west and east of the site. Drift is absent.
- 1.2.5 In July 2022, Lithos undertook a ground investigation comprising 12 machine excavated trial pits (to between 1.9m and 3.5m depth), 6 hand dug pits (to between 0.1 and 0.4m depth) and 13 rotary open hold probeholes (to between 9 and 30m depth).

- 1.2.6 Made Ground was present across the majority of the site comprising:
- Cohesive Reworked Natural, located from the northwest to the east
  - Colliery Spoil, located in only one location in the east in the vicinity of possible outcrop workings
  - Made Ground Topsoil with plastic, brick and paper, located predominantly in the east
- 1.2.7 Underlying the Made Ground, cohesive residual soils were encountered to a maximum depth of over 3.5m, these in turn were underlain by Coal Measures bedrock.
- 1.2.8 A full record of ground conditions encountered is included in Lithos' Report Ref. 4386/1.

### Watercourses

- 1.2.9 Eastwood and Partners record an existing **culvert** in the north of the site. As part of the development this is to be diverted through the site flowing south, see Eastwood and Partners Appraisal Layout Drawing (ref. 47509-ECE-XX-XX-DR-C-0001, dated 6<sup>th</sup> February 2023) presented in Appendix A of this report).
- 1.2.10 The site lies within a Water Framework Directive (WFD) catchment for the **River Dearne** from Cawthorne Dyke to Lundwood. Environment Agency data indicates that the catchment has a chemical quality of failing and an ecological quality of moderate.
- 1.2.11 The nearest, open surface watercourse is an un-named **tributary** of the River Dearne located approximately 15m from the site's southern boundary flowing in a southerly direction, see Drawing 4386/14 presented in Appendix A of this report.
- 1.2.12 Given the distance to the un-named tributary it is unlikely that construction activities will present a direct risk to surface water, provided that run-off is contained and managed on site.
- 1.2.13 However, migration of surface water run-off onto adjacent land could cause a nuisance and could also enter a surface water drain and/or the on-site culvert which ultimately discharges into the River Dearne. Surface water runoff from site is a key aspect that needs managing.

## 1.3 Good practice guidance

- 1.3.1 Whilst this report deals specifically with surface water management, it is recommended that construction phase groundworkers follow good environmental practice to minimise spillage, leakage etc with reference, but not limited, to the following documents:
- CIRIA C502 'Environmental Good Practice on Site'
  - EA Pollution Prevention Guidelines:
    - PPG6 - Working at construction and demolition sites
    - PPG2 - Above ground oil storage tank
    - PPG7 – The safe operation of refuelling facilities.
    - PPG21 – Incident Response Planning
- 1.3.2 Lithos are aware that some of the EA PPG documents have been withdrawn from the gov.uk website. However, PPGs provided a summary of current UK guidance; the principles are still relevant and provide a useful, concise overview. Lithos would still recommend reference to these in the first instance via the national archive, the relevant links are provided on the new Environment Agency webpages.

- 1.3.3 Reference should also be made to the site Construction Environment Management Plan (CEMP), most notably with respect to with respect to appropriate areas for:
- Plant & vehicle maintenance & refuelling
  - Fuel & chemicals storage
  - Concrete washing
  - Wheel washing

## 2 MANAGEMENT OF SURFACE WATER AND SILT DURING CONSTRUCTION

### 2.1 Outline of SWMP

- 2.1.1 Land generally falls to the south, with the western half of the site also sloping down to the southwest. Consequently, topography suggests that surface water run-off will naturally flow to the south.
- 2.1.2 To prevent surface water run-off (and silt) migrating off-site, such water should be directed to, and collected in, an attenuation pond. The attenuation pond should ideally be constructed within the footprint of the proposed attenuation basin as shown on Eastwood's Drawing Ref. 47509-ECE-XX-XX-DR-C-0001, Rev P01, dated 06/02/2023.
- 2.1.3 If constructed elsewhere, perhaps temporarily due to a phased build commencing much farther east, the pond should be located downhill of the area from surface water run-off is anticipated. A temporary pond beyond the footprint of the proposed attenuation basin could be constructed using a peripheral clay bund (rather than by excavation).
- 2.1.4 In the event of heavy and sustained rainfall resulting in the attenuation pond not operating appropriately, or operating close to maximum capacity, additional temporary storage will be required and could be achieved by the means of a second attenuation pond. The secondary attenuation pond would ideally be downhill from the primary pond, but if this is not possible pumping will be required.
- 2.1.5 Dimensions of the construction phase attenuation ponds should be determined by the Drainage Engineer.
- 2.1.6 Unless infiltration is reasonably good, periodically water from the attenuation pond will need to be discharged from site. Discharge could be achieved by pumping from the attenuation pond, possibly via a silt trap(see Section 4.2), to either:
- The agreed surface water outfall for the development (to be confirmed by the Drainage Engineer), subject to:
    - Discharge at the agreed rate (to be confirmed by the Drainage Engineer)
    - Discharge waters being "clean" (i.e. not contaminated), essentially clear & colourless (i.e. not laden with silt)
  - A connection point in the existing on-site combined sewer, subject to obtaining and complying with an approved trade effluent licence.
  - Tankers for haulage off-site.
- 2.1.7 The western portion of the site will drain naturally by gravity to the attenuation pond. However, channels (grips) will be needed in the eastern portion to promote the flow of surface water to the attenuation pond.
- 2.1.8 A pump should be kept on site to facilitate the movement of the water from the east towards the pond (to prevent pooling of water during periods of heavy rain) and to allow periodic removal of water from the attenuation pond.

2.1.9 Waters removed from the attenuation pond should be taken from just below the surface (to avoid "pulling-up" silt/sediment from the pond bottom). It would be prudent to excavate a sump within the pond to assist with this.

## 2.2 Programme of works

2.2.1 The project is a single phase development with the build route moving from west to east, as shown on Duchy Homes Construction Management Plan Drawing (Ref. DR-CONS-001, dated 09/03/23) in Appendix A.

2.2.2 In terms of managing surface water and silt it is recommended that a phased approach is taken to site clearance and construction.

- **Phase 1** - Construction of surface water management measures, including:
  - excavation and construction of the surface water attenuation pond in the west
  - construction of the main leg of the surface water drainage sewer (i.e. between SW1 to SW7 and SW7 to 13), with the exception of the connection to the culvert
  - placement of a silt barrier, or similar, along the southern boundary
- **Phase 2** – Clearance, topsoil strip and any necessary earthworks regrade of the eastern area
- **Phase 3** – Clearance, topsoil strip and any necessary earthworks regrade of the western area

2.2.3 Phase 1 surface water management measures must be in place prior to the Phase 2 and Phase 3 clearance and strip commencing.

2.2.4 During Phase 1 topsoil should be stripped from along the line of the surface water drains and attenuation pond only.

2.2.5 A barrier should be constructed along the entire southern boundary up to the western extent of the attenuation pond, leaving a 10m easement where possible and no less than 2m where development requirements dictate. Vegetation and topsoil should not be removed from within the easement area. The barrier should take the form of a silt fence, a trench could also be used to channel run off water into the attenuation pond.

2.2.6 Prior to construction, topsoil and vegetation will form a natural barrier and limit any run off. During the construction phase topsoil and vegetation should be retained on the land to the south and west of the attenuation pond.

2.2.7 It would also be prudent to retain topsoil and vegetation in the west (across Phase 3), other than along the line of proposed roads & sewers, until construction is due to commence in this area.

2.2.8 Following site clearance and any necessary earthworks regrade to allow the creation of a development platform(s), some surface infiltration may be achieved. However, the presence of cohesive residual soils is likely to restrict any effective infiltration, and this will be exacerbated by compaction by site traffic and surface weathering.

2.2.9 Topsoil and made ground generated on site will need to be placed in stockpiles in an area agreed with the Principal Contractor. The stockpiles must not be located adjacent to the attenuation pond or along the southern boundary. Wash out from the stockpiles could result in increased pressure on the boundary management systems and fill the pond with silt/sediment, reducing the capacity and effectiveness of the attenuation measures.

2.2.10 Duchy have provided details of the surface water management scheme that is to be adopted during development. This is summarised below together with the anticipated order of works.

	Action	Remarks
1	Excavate and install the <b>main leg</b> of the surface water drainage sewer (i.e. between SW1 to SW7 and SW7 to SW13).	The use of development drains should prevent the discharge of silt or contaminated waters and provide holding capacity. However all entry points should be protected by bails, gully bags or similar to prevent silting up.
2	Excavate and install the <b>attenuation pond</b> (both primary and secondary).	The attenuation pond/s will provide holding capacity for surface water run off during the construction phase.
3	The surface water <b>inlet</b> to the attenuation pond should be gravity fed where possible. Any discharge to the surface water outfall or existing onsite combined sewer from the pond will be controlled by a pump.	Allows entry into the attenuation pond/s via gravity flow.
4	Install <b>silt barrier</b> (or similar along with length of the southern boundary to the western extent of the attenuation pond). The barrier should be installed leaving a minimum of 2m (ideally 10m) easement from the from the boundary fence.	Precautionary measure to provide protection against silty water escaping site. Continual inspection and maintenance required to sustain filtering capacity.
5	<b>Strip</b> topsoil and made ground from site and <b>stockpile</b> in location away from the southern boundary and the attenuation pond. Seal the surface of the stockpiles with membrane or smearing.	The presence of topsoil will restrict the runoff of surface water whilst Measures 1 to 4 are implemented.
6	Temporary <b>pumping</b> of standing water across the site may be required in low spots or extra drainage channels added.	This will prevent standing water across the site and improve working conditions.
7	Complete the daily visual inspection checklist of control measures.	Enable early detection of broken or non-functioning mitigation measures, e.g. damaged silt fences. Provide an early indication if max. holding capacity is neared.

### 3 MONITORING

#### 3.1 General

- 3.1.1 Monitoring the surface water management system is critical and can provide an early indication of potential problems, allowing these to be addressed before they escalate and result in problems on neighbouring land.
- 3.1.2 Monitoring must include review of the weather forecast and visual inspections, with some active sampling where required to comply with discharge permit conditions. Whilst ultimate responsibility will lie with the Principal Contractor, the role can be delegated, providing the delegate is well briefed with an appropriate toolbox talk and can demonstrate an understanding of the different aspects of this surface water management plan. A record of all appropriate training should be held on site.

#### 3.2 Weather forecasting

- 3.2.1 The Principal Contractor, or alternative delegated personnel, must review a reliable 7 day weather forecast at the start of each week. The meteorological office provide useful short and long term forecasts, based on a network of weather stations, this can be found at <https://www.metoffice.gov.uk/>.
- 3.2.2 A copy of weekly forecasts should be displayed in the site office.
- 3.2.3 Where heavy or persistent rain is forecast, consideration must be given to available capacity in the attenuation pond/s to prevent possible overflowing.
- 3.2.4 If extended periods of rain have already occurred and the capacity in the attenuation pond/s presents a concern, consideration should be given to emergency measures (see Section 4 below).

#### 3.3 Visual inspections

- 3.3.1 The surface water management infrastructure should be visually inspected at the start of each working day and at the end of the last working day of each week. Early identification and repair is critical.
- 3.3.2 Inspection should include, but not be limited to:
- a walk along all boundaries to check for evidence of surface water run off leaving site, damage to the silt fence, or excessive silt build up
  - visual inspection of whole site for areas of standing water
  - visual inspection of the attenuation pond/s to review build-up of silt, clarity of the water and holding capacity
  - visual inspection and photographs of discharge water leaving the site (after passing through the silt trap where necessary)
- 3.3.3 Each inspection should be recorded, and a copy held in the site office for a period of two weeks. An electronic copy should be retained for the duration of the project. A suggested record sheet is included in Appendix B to this report.
- 3.3.4 Discharged water may be slightly discoloured but should be clear; i.e. if the discharge is placed in a clear bottle, a label should be easily read when placed behind it (example included in Appendix B).
- 3.3.5 Cloudy water is usually due to suspended solids. If water begins to appear cloudy discharge should be ceased and the matter reported to the Principal Contractor; see also options for secondary treatment in Section 4.2 below.

- 3.3.6 If waters are discharged into the existing combined sewer, the discharge licence may include limits on suspended solids. Limits will need to be achieved prior to final discharge from site. It may be necessary to recover and analyse water samples in order to confirm whether or not discharge criteria can be complied with.

## 4 EMERGENCY PROCEDURES

### 4.1 Maximum capacity of the attenuation pond

- 4.1.1 In the event of heavy and sustained rainfall resulting in the attenuation pond not operating appropriately (i.e. high flow preventing effective settlement of suspended solids), or operating close to maximum capacity, additional temporary storage will be required and could be achieved by the means of a second attenuation pond.
- 4.1.2 The secondary holding area should be situated in a location suitable to allow excess water to be pumped to it for storage.
- 4.1.3 Tankering should only be used to remove excess water when absolutely necessary.

### 4.2 High suspended solids in discharge waters

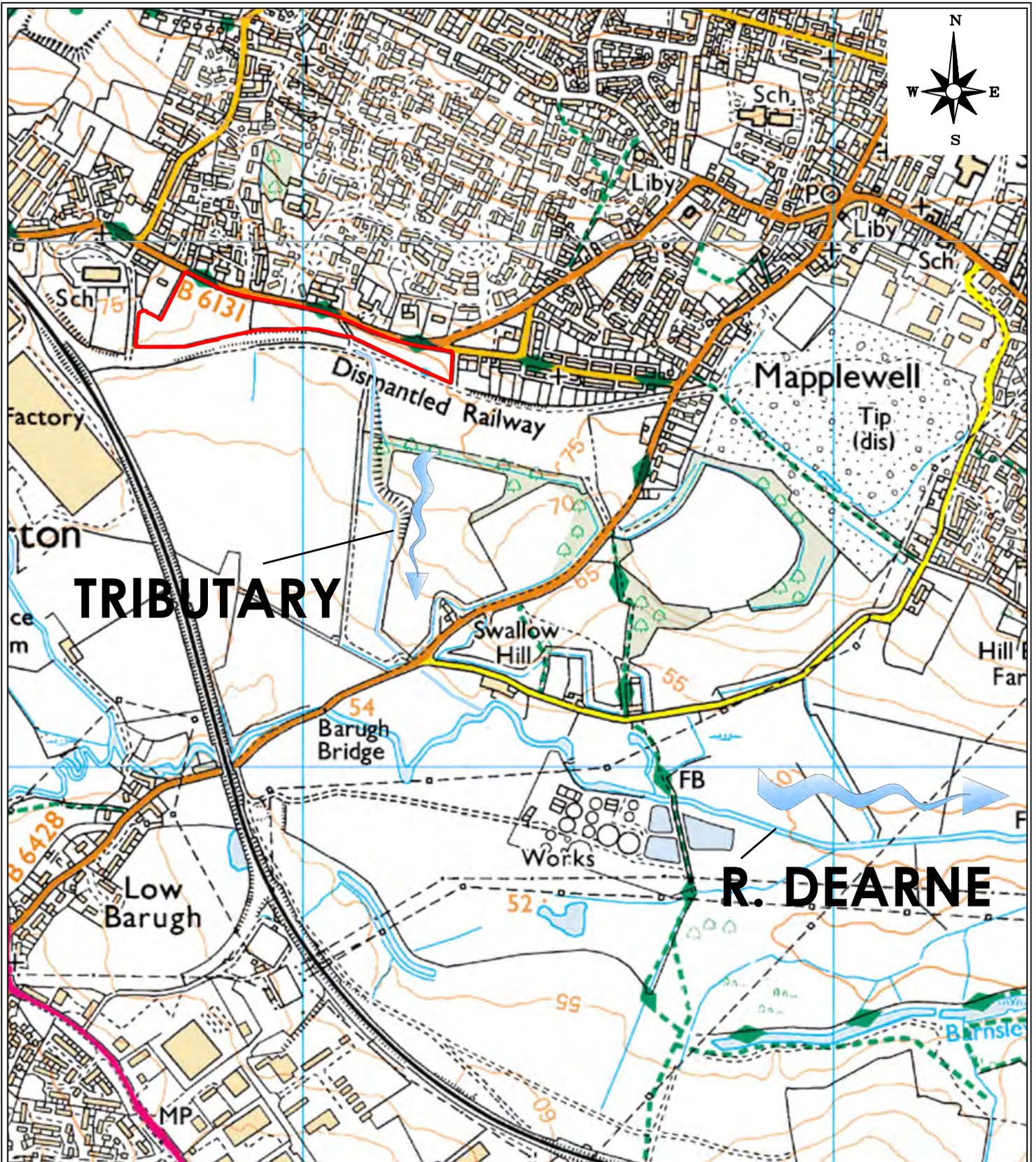
- 4.2.1 If visual inspection indicates significant amounts of suspended solids in the discharge water from the attenuation basin, some secondary treatment should be considered.
- 4.2.2 Secondary treatment is likely to comprise a further settlement option. Selection of appropriate secondary treatment should be agreed with the manufacturer. Points to consider include:
- Silt bags are provided with different mesh size. Laboratory data should provide an indication of particle size within the sediment, this information is needed to ensure the silt bag is effective. Silt bags also need to be inspected and changed regularly.
  - Silt 'busters' are mobile settlement tanks, but are highly sensitive to flow rates. The maximum anticipated flow rate should be used to determine the size of unit required.
  - Settlement tanks must be installed on a solid level surface to ensure they operate correctly.

### 4.3 Spillage of fuel or any potentially hazardous liquid

- 4.3.1 In the event of a significant spill of fuel, or any potentially hazardous liquid, the site should have at least one person who is trained and competent to use spill response equipment. *Significant effort should be made to ensure the spillage does not enter the surface water management system.*
- 4.3.2 The Principal Contractor should ensure that all site personnel are made aware of the content and requirements of the **Spill Response Plan** (SRP). Records to verify that this training has been provided should be retained in the site office for the duration of the project.
- 4.3.3 The following steps should be taken to manage a hazardous material spill on site:
- Assess release
  - Isolate spilt materials
  - Contain spilt materials
  - Absorb spilt materials
  - Dispose of waste materials
  - Order replacement spill response materials

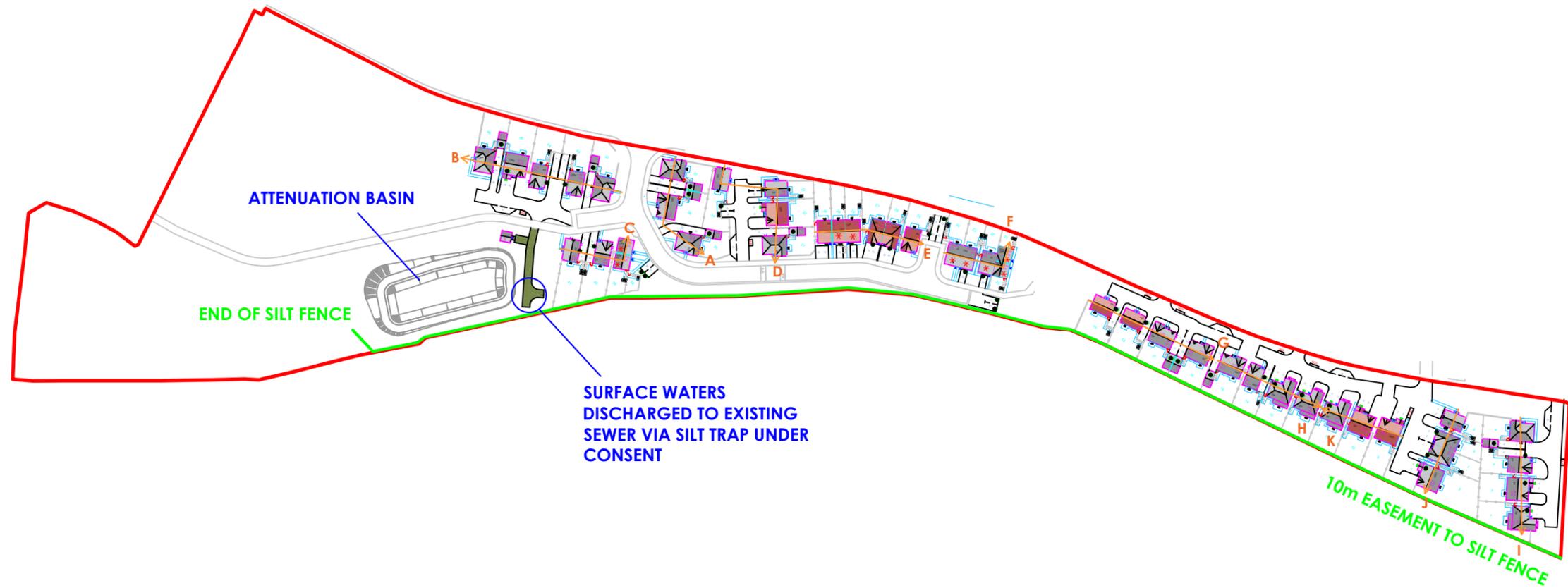
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- 4.3.4 Reference should also be made to the following publication: *Pollution Prevention Guideline: Incident Response Planning: PPG21*.
  - 4.3.5 If contamination does enter the surface water sewers, channels (grips), or attenuation pond, discharge to the surface water outfall or combined sewer should cease immediately and advice should be sought from a suitably qualified geoenvironmental consultant, such as Lithos.
  - 4.3.6 Yorkshire Water should be informed immediately.
  - 4.3.7 Some tankering and offsite disposal may be required.

**Appendix A**  
**Drawings**



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 info@lithos.co.uk www.lithos.co.uk Tel 01937 545330	CLIENT	JOB TITLE	DRAWING TITLE	DRAWN	DATE
	DUCHY HOMES	DARTON LANE, BARNSLY	WATERCOURSES	REG	10 04 23
				CHECKED	DATE
				JHR	10 04 23
			STATUS FOR COMMENT <input type="checkbox"/> DRAFT <input type="checkbox"/> FOR APPROVAL <input type="checkbox"/> FINAL <input checked="" type="checkbox"/>		
			SCALE	SHEET	DRAWING NO.
			1:10,000	A4	4386/14
				REVISION	



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CLIENT

DUCHY HOMES

JOB TITLE

DARTON LANE,  
BARNSELY

DRAWING TITLE

SURFACE WATER PLAN

NOTES

— LINE OF SILT FENCE WITH 10m EASEMENT

← PROPOSED BUILD DIRECTION

— APPROXIMATE SITE BOUNDARY

LAYOUT REPRODUCED FROM DUCHY HOMES DRAWING 'DARTON LANE, DARTON - PLANNING LAYOUT' DRAWING REF. 2239.01, REV. U, DATED 26/08/2022

REV.	DESCRIPTION	DATE

STATUS

FOR COMMENT  FOR APPROVAL  DRAFT  FINAL

DRAWN GLM	DATE 31/03/2023
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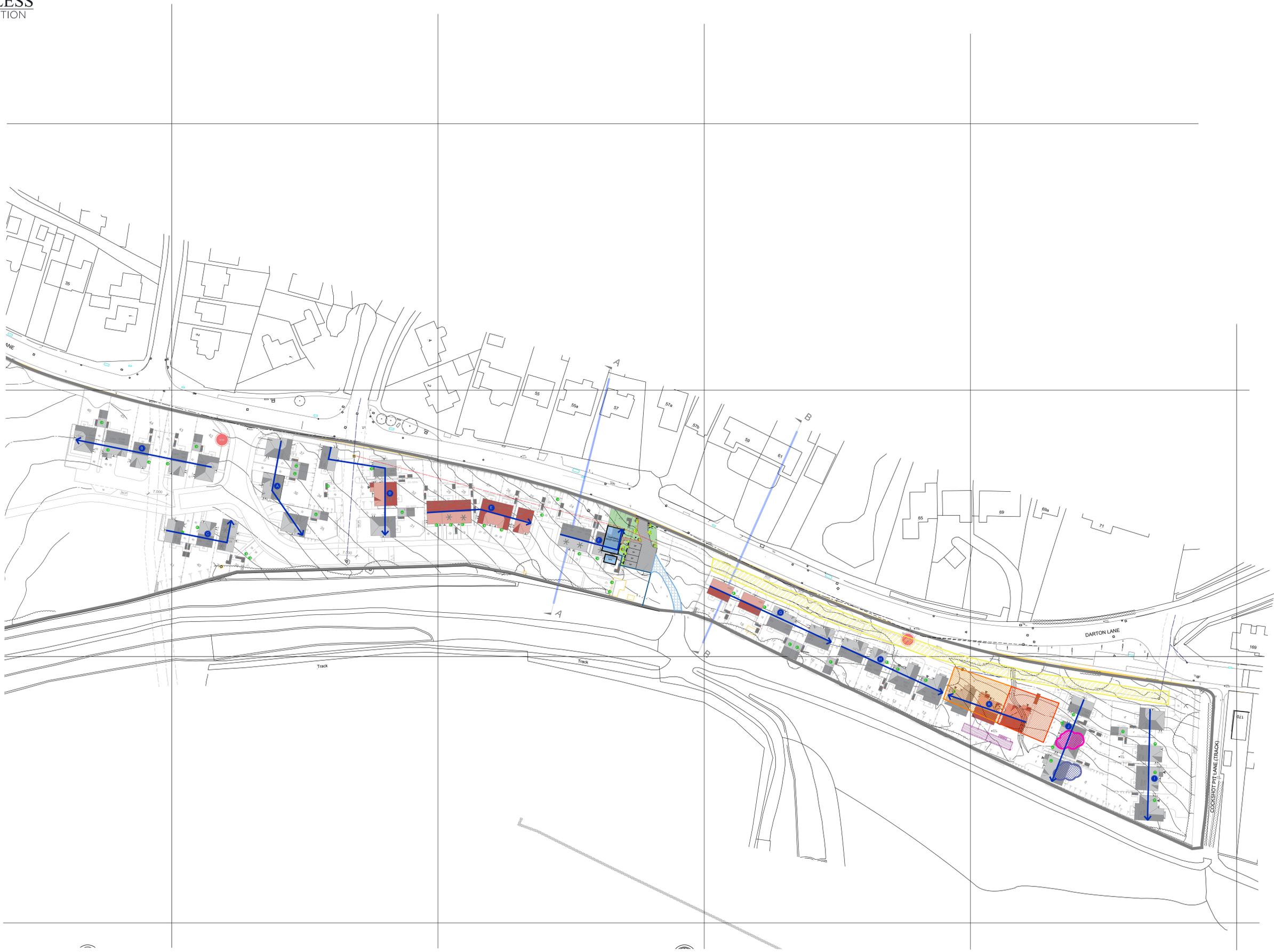
APPROVED JR	DATE 31/03/2023
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SCALE 1:2,000	SHEET A3
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DRAWING NO. 4386/13	REVISION
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Darton Lane, Darton



- CONSTRUCTION MANAGEMENT PLAN KEY:**
- PEDESTRIAN ROUTE
  - POST & RAIL
  - CAR PARK
  - MATERIAL STORE
  - RIGHT OF WAY TO REMAIN
  - HAUL ROAD
  - BLOCK AND MESH
  - PF2 MATERIAL
  - USABLE FILL MATERIAL FROM R&S EXCAVATION
  - LOADING BAY
  - STAR TOWER
  - SILO
  - BUILD ROUTE AND PHASE
  - WHEEL WASH STATION
  - Site compound

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	Date	Amendments	Rev



Duchy Homes Ltd.  
3125 Century Way, Thorne Park, Leek, LS15 8ZB.

DEVELOPMENT:  
Darton Lane, Darton,  
Barnsley

TITLE:  
Construction Management plan

DATE: 09/03/2023	SCALE: 1:500 @ A0	DRAWN: LF
DRAWING NO: DR-CONS-001	REV: 1ST	



**Appendix B**  
**Inspections Sheets**

## SURFACE WATER MANAGEMENT INSPECTION SHEET

<b>Job Reference and Phase</b>		<b>Site:</b>	Darton Lane, Barnsley
<b>Inspection completed by:</b>		<b>Principal Contractor:</b>	
<b>Date</b>		<b>Time</b>	

Action	Remarks	Yes	No
Visual inspection of silt fence	Any gaps/holes evident?		
	Gaps below fence evident?		
	Fence leaning?		
Visual inspection of all drains across the site	Any damage evident?		
	Surface water present?		
	Obstructions observed?		
Visual inspection of attenuation pond/s	Water discoloured?		
	Close to capacity?		
	Photographs taken?		
Visual inspection of water leaving site	Water flowing?		
	Water clear?		
	Photographs taken?		

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