

KCS Agricultural Ltd
North Park Rheda,
Phase 2.
Operation & Maintenance Plan for Sustainable
Drainage Systems



Civil Engineers
Structural Engineers
Project Managers

Document No: AA7281/8.4/DMP

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Issue	Name	Signature	Date
Original	William Milne		21st May 2024
Purpose of Issue	Planning Application		

21st May 2024

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Introduction

1.1 Asher Associates Ltd has been appointed by KCS Agricultural Ltd to provide an Operation and Maintenance plan for sustainable drainage systems for a proposed residential development at North Park Rheda. In reviewing the enclosed information, reference should be made to the latest revisions of the following Asher Associates drawings:

- AA7281/EW/03
- AA7281/EW/04
- AA7281/EW/05
- AA7281/EW/06
- AA7281/EW/07
- AA7281/EW/08
- AA7281/EW/10

1.2 SUDS COMPONENTS

The residential development utilises a series of SuDS features across the site to serve driveways / individual parking areas, roofs and access roads. These features include soakaways, infiltration trenches and blankets as part of the overall surface water drainage strategy for the site. The SuDS features have been designed to provide sufficient storage for the critical duration, **1 in 100-year design storm event with a 50% allowance for the future effects of climate change, a 10% allowance for urban creep.**

The basin shall remain private and shall be maintained by a third-party Management Company, appointed by KCS Agricultural Ltd.

All below ground pipework, including oversized pipes shall be offered for adoption under a S104 agreement with UU or a NAV. Pipework shall be adopted up to the basin headwalls, including the interconnecting pipework and flow controls. All diverted land drainage shall remain private and shall be maintained by a third-party management company.

Operation & Maintenance Requirements

As with all traditional drainage systems, SuDS need to be inspected and maintained regularly to ensure that they operate correctly and efficiently. If SuDS are not properly maintained, then there is a risk that the components become overloaded during periods of prolonged heavy rainfall potentially resulting in localised flooding within the development.

Recommendations for the maintenance of the SuDS components are detailed in the following section.

As part of this process, it is recommended that inspection and maintenance records are retained by the Management Company to track the progressive performance of the SuDS over time. The inspection records should include the following:

- Sediment condition and depth
- Water observations (sheen, smell, etc.)
- Unscheduled maintenance needs
- Components that do not meet performance criteria and require immediate maintenance
- Common problem areas, solutions and general observations
- Aesthetic conditions

For Health and Safety reasons as well as practicality, SuDS systems should be maintained during periods of dry weather wherever possible. Adhering to the recommended maintenance regimes outlined below will minimise the risk of maintenance activities being required when a fault becomes apparent, usually during a rainfall event.

2.1 Infiltration Systems: Soakaways, Infiltration Trenches & Blankets

Soakaways are excavations that are filled with a void-forming material that allows the temporary storage of water before it soaks into the ground. Historically, small soakaways draining runoff from a single property were either filled with rubble or lined with brickwork and were sited below gardens and drives with no formal provision for access and inspection. Many small soakaways are now constructed with geocellular units available from builders' merchants pre-wrapped in geotextile. The geocellular units provide good overall storage capacity compared to rubble fill, and they allow the size of the structure required for any application to be minimised.

Infiltration Trenches are simply linear soakaways. The advantages of trenches over cuboid soakaways is that they can often be kept shallower and, in variable soils, can help distribute the infiltration area so that the impact of less permeable areas of soil is less pronounced. A perforated pipe can be included, if required, to distribute water along the trench.

Infiltration blankets are large shallow systems that are typically constructed using permeable aggregate or geocellular units that act as extensive soakaway systems. Examples include below car parks where the storage layer is part of the car park pavement construction, below playgrounds or below sports pitches.

Infiltration systems will require regular maintenance to ensure continuing operation to design performance standards. An easement should be considered where multiple properties discharge to a single soakaway, to ensure long-term access for maintenance purposes.

The design of soakaways, infiltration trenches and blankets should include monitoring points where the water level in the system can be observed or measured. This can either be via an inspection well or inspection cover (where the attenuation storage space is a void). For larger installations the inspection access should provide a clear view of the infiltration surface (even if the storage zone is filled). For small, filled soakaways, a 50mm perforated pipe is adequate.

At the proposed development, the soakaways, infiltration trenches and blankets shall be maintained by a third-party Management Company, appointed by KCS Agricultural Ltd.

The maintenance activities are outlined in Table 2.1 and refer to the recommendations in The SuDS Manual (CIRIA C753), Chapter 13, Table 13.1 ^[1].

Table 2.1 Operation and Maintenance requirements for soakaways

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard-packed and require considerable effort to remove.

Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will give information on changes in infiltration rate and provide a warning of potential failure in the long term.

Roads and/or parking areas draining to infiltration components should be regularly swept to prevent silt being washed off the surface. This will minimise the need for maintenance.

2.2 Infiltration Systems: Infiltration Basins

Infiltration Basins are flat-bottomed, shallow landscape depressions that store runoff (allowing pollutants to settle and filter out) before infiltration into the subsurface soils. Regular inspection and maintenance are required to ensure their effective long-term operation. Regular mowing in and around infiltration basins is only required along maintenance access routes, amenity areas (e.g footpaths), across embankments and across the main storage area. The remaining areas can be managed as “meadow” or other appropriate vegetation, unless additional management is required for landscaping purposes. Grass cutting may need to accommodate specific sward mixes and specialist seed or turf recommendations. Deep-rooting vegetation can maintain infiltration rates and minimise the need for remedial maintenance. All vegetation management activities should take account of the need to maximise biosecurity and prevent the spread of invasive species. Adequate access should be provided to the infiltration basin for inspection and maintenance, including for appropriate equipment and vehicles such as mowing equipment.

At the proposed development, the infiltration basin shall be maintained by a third-party Management Company, appointed by KCS Agricultural Ltd.

The maintenance activities are outlined in Table 2.2 and refer to the recommendations in The SuDS Manual (CIRIA C753), Chapter 13, Table 13.2 ^[1].

Table 2.2 Operation and Maintenance requirements for infiltration basins

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional Maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

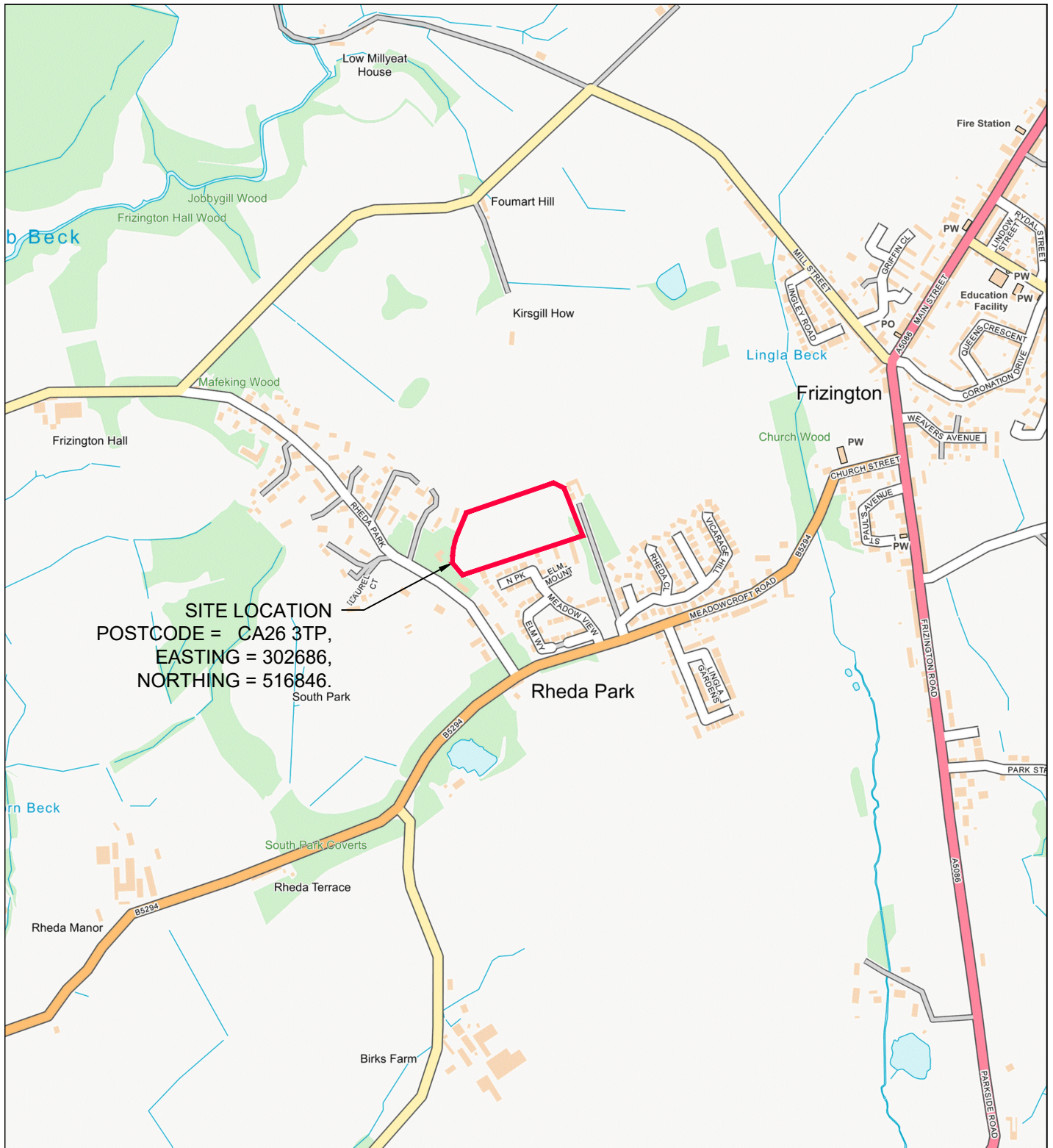
References

- [1] CIRIA, The SuDS Manual, Report C753, 2015.

Appendices

Appendix A

Asher Associates Drawing No. AA7281/EW/100 - Site Location Plan



LOCATION PLAN

KEY :

— SITE BOUNDARY

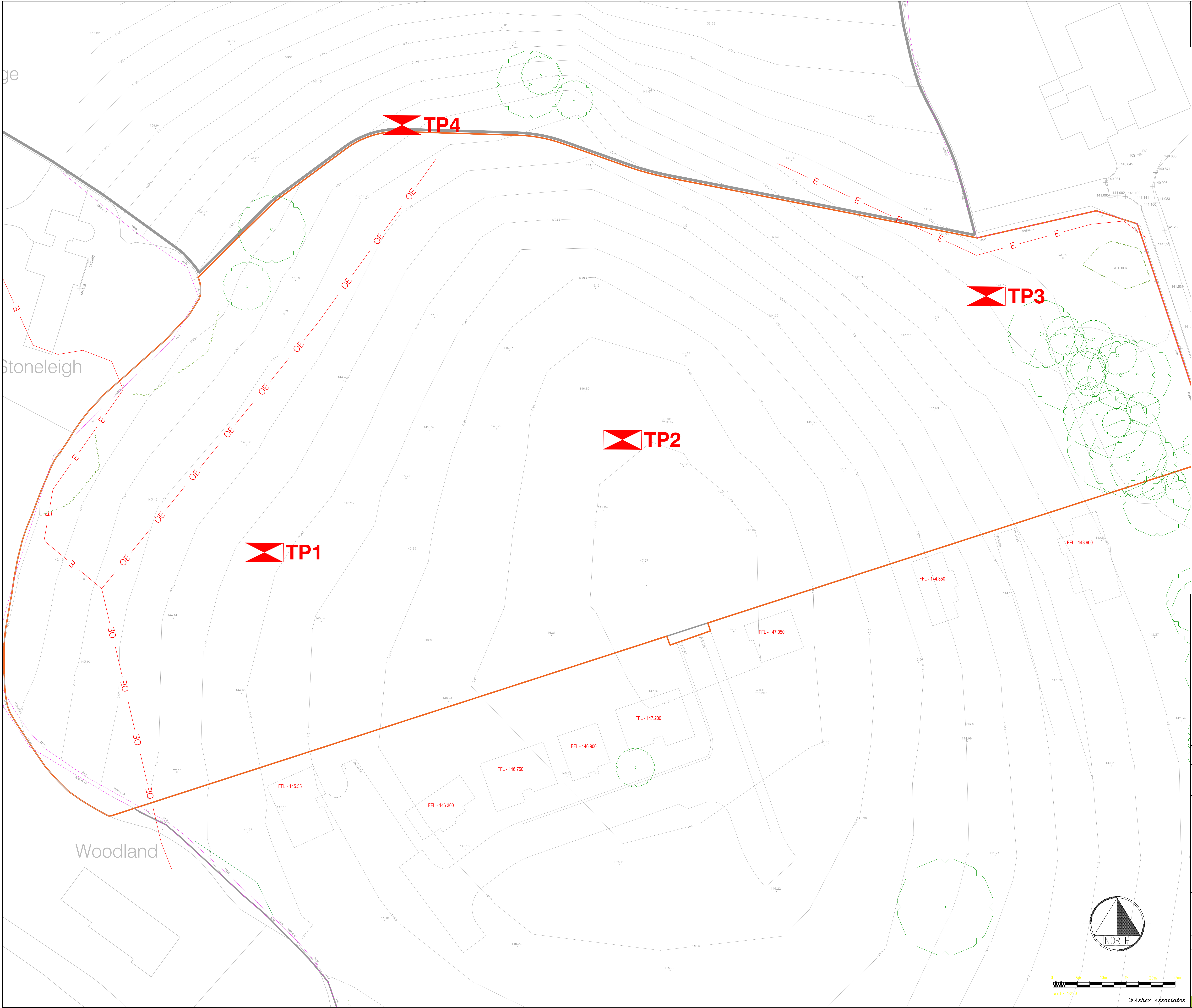
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Rev.	Original A4 Drawing	ROM	21.05.24	WAM	21.05.24	WAM	21.05.24
	Amendment	Drawn	Date	Checked	Date	Apprd	Date

Client	KCS AGRICULTURAL LTD	 asher ASSOCIATES CIVIL ENGINEERS STRUCTURAL ENGINEERS PROJECT MANAGERS	Scales 1:10,000	
			Job No. AA7281	
Project Title	NORTH PARK RHEDA, PHASE 2.	32 George Street, Dumfries DG1 1EH Tel 01387 250644 www.asherassociates.co.uk	Drg. No. AA7281/EW/100	
			Rev.	

Appendix B

Asher Associates Drawing No AA7281/EW/01 – Existing Layout and Services



NOTES.

KEY:

EXISTING OVERHEAD ELECTRIC

EXISTING UNDERGROUND ELECTRIC

INFILTRATION TEST LOCATIONS

EXISTING LEVELS

TP2

12.304

Rev.	Amendment	By	Checked	Approved	Date
FOR APPROVAL					
Status		Appd.	Date		
Client		KCS AGRICULTURAL LTD			
Project		NORTH PARK RHEDA, PHASE 2			
Title		EXISTING LAYOUT AND SERVICES			
Drawn	Date	Checked	Date	Approved	Date
ROM	23.05.24	WAM	23.05.24	WAM	23.05.24
Scales		1:250 @ A0			
Job No.		AA7281			
Client Drawing No.					
Drawing No.		AA7281/EW/01			

0 5m 10m 15m 20m 25m

Scale 1:250

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