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SuDS MAINTENANCE GUIDE

OWNERS MANUAL

Scheme name: The Coppers, Penny Lane, RG10 8PB

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On behalf of Infrastruct CS Ltd

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1.0 Introduction

This guidance provides best practice guidance on the maintenance of Sustainable Drainage Systems (SuDS) to facilitate their effective implementation within the extension re-development at The Coppers, in Penny Lane, Wargrave RG10 9PB.

Unlike conventional drainage systems, SuDS features are often visible and their function should be easily understood by those responsible for maintenance. When problems occur, they are generally obvious and can be remedied simply, using standard landscaping practice. If systems are properly monitored and maintained, any deterioration in performance can often be managed out.

Like any drainage system maintenance is a necessary and important consideration of SuDS design and sufficient thought should be given to long-term maintenance and its funding during feasibility and planning stages. In particular, the following requirements should be given full consideration:

1.1 Who is responsible for maintenance of the suds features used for this scheme

The cellular soakaways and the pipe network will be owned and maintained by the house owner or their representative if they have appointed a management company.

1.2 Owner's manual

SuDS are different from conventional drainage and require different maintenance regimes. This manual details the following:

- location of all SuDS techniques in a site
- brief summary of how the techniques work, their purpose and how they can be damaged
- maintenance requirements (a maintenance plan) and a maintenance record
- explanation of the consequences of not carrying out the maintenance that is specified
- identification of areas where certain activities are prohibited (for example stockpiling materials on pervious surfaces)
- an action plan for dealing with accidental spillages
- advice on what to do if alterations are to be made to a development, if service companies undertake excavations or other similar works carried out that could affect the SuDS.

1.3 LOCATION OF SUDS TECHNIQUES USED ON THE SCHEME

The location of the SuDS features is shown on drawing 6394-COPP-ICS-01-XX-DR-C-0200 attached at the back of this document.

1.4 SUDS techniques used on this scheme:

- Rainwater Harvesting
- Geocellular/Modular Systems
- Silt traps and catchpits

1.5 Summary of how the techniques work for the scheme

The main house and the outbuilding will have independent systems, based on the same infiltration principle. The roof runoff from the roofs will be conveyed via a piped network into cellular soakaways, located at least 5m away from the foundations, where it will percolate into the ground. The storage is sized to accommodate a 1 in 100 year storm with an allowance of 40% for climate change.

Rain water harvesting in the form of water butts can also be added to the system to address discharge volume and minimize water usage.

The cellular soakaways collect runoff from the roof areas and disperse the water into the ground. Roof runoff is discharged via a piped system into a plastic cellular 'crates'. These crates are wrapped in a filtration 'wrap' to prevent the ingress of soil and fines. The piped drainage system will have silt traps to intercept suspended solids.

1.6 Maintenance requirements

These are detailed in the appropriate section of this document.

1.7 Areas where activities are prohibited

Heavy loads should not be allowed in areas where cellular soakaways are located. Failure to do so may cause structural damage and collapse of the cellular units.

1.8 Accidental spillages

Health and safety consideration are a priority and addressing accidental spillages should only be attempted if the nature of the spillage is known and its potential hazardous properties understood. The source of the spillage should be stopped and excess surface spillage removed by suction tank or absorption mats. Silt traps and sumps should be emptied by suction tanker. Areas of affected permeable paving should have the surface and laying course removed. The surfacing blocks should be cleaned and re-laid on new bedding material. Heavy pollution of the sub-base will require removal and replacement of the sub-base.

1.9 Alterations

If any alterations are proposed to the development, the design Engineer must be notified so that the impact/implications of the work can be assessed. Utilities should be restricted in the designated service zone areas.

1.10 Health and safety

To comply with the Construction (Design and Management) Regulations (CDM) 2015, designers must assess all foreseeable risks during construction and maintenance and the design must minimise them by the following (in order of preference):

- 1. Avoid.**
- 2. Reduce.**
- 3. Identify and mitigate residual risks.**

CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated, reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

2.0 Operation and maintenance activity categories

There are likely to be three categories of maintenance activities:

1. **Regular maintenance** (including inspections and monitoring).
2. **Occasional maintenance.**
3. **Remedial maintenance.**

Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.

Occasional maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the regular tasks (e.g. sediment removal or filter replacement). Table 2 summarises the likely maintenance activities required for each SuDS component and guidance on specific maintenance activities is given in the following sections.

Remedial maintenance describes the intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design, construction and regular maintenance activities. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and so timings are difficult to predict. Remedial maintenance can comprise activities such as:

- inlet/outlet repairs
- erosion repairs
- reinstatement or realignment of edgings, barriers, rip-rap or other erosion control
- infiltration surface rehabilitation
- replacement of blocked filter fabrics
- construction stage sediment removal (although this activity should have been undertaken before the start of the maintenance contract)
- system rehabilitation immediately following a pollution event.

It is important to note that these remedial activities will not be required for all systems, but for the purpose of estimating whole life maintenance costs, a contingency sum of 15-20% should be added to the annual regular and occasional maintenance costs to cover the risk of these activities being required.

Table 2 - Typical key SuDS components operation and maintenance activities
For full specifications, see individual chapters.

O & M activity	SuDS component																	
	Pond/wetland	Detention basin	Infiltration basin	Silt traps and catchpits	Soakaway	Infiltration trench	Filter trench	Modular storage	Pervious pavement	Swale/bioretention/green roofs	Filter strip	Sand filter	Pre-treatment systems	Perforated ring soakaways	Bio retention areas	Rain gardens	Oil interceptors	Flow control devices
Regular maintenance																		
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter/debris removal	■	■	■	□	□	■	■	□	■	■	■	■	■	■	■	■	□	□
Grass cutting	■	■	■	□	□	■	■	□	□	■	■	□	□		■		□	□
Weed/invasive plant control	□	□	□			□	□		□	□	□	□	□		□	■		
Shrub management	□	□	□						□	□	□		□		□	■		
Shoreline vegetation management	■	□											□					
Aquatic vegetation management	■	□											□					
Irregular maintenance																		
Sediment management (*)	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■
Vegetation/plant replacement	□	□	□							□	□		□		□	□		
Vacumn sweeping and brushing									■									
Remedial maintenance																		
Structure rehabilitation/repair	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Infiltration surface reconditioning			□		□	□	□		□	□	□	□		□	□	□		

■ Will be required

□ May be required

* Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

The maintenance regime of a site also needs to consider the response to extreme pollution events. A response action plan should be developed and communicated to all those involved in the operation of a site, so that if a spillage occurs it can be prevented from causing pollution to receiving waters.

2.1 Regular maintenance activities

Inspections and reporting

Regular SuDS scheme inspections will:

- help determine optimum future maintenance activities
- confirm hydraulic, water quality, amenity and ecological performance
- allow identification of potential system failures, e.g. blockage, poor infiltration, poor water quality etc.

Inspections can generally be required at monthly site visits (e.g. for grass cutting) for little additional cost, and should, therefore, be subsumed into regular maintenance requirements. During the first year of operation, inspections should ideally be carried out after every significant storm event to ensure proper functioning, but in practice this may be difficult or impractical to arrange.

Typical routine inspection questions that will indicate when occasional or remedial maintenance activities are required, and/or when water quality requires investigation include:

- are inlets or outlets blocked?
- does any part of the system appear to be leaking (especially ponds and wetlands)?
- is the vegetation healthy?
- is there evidence of poor water quality (e.g. algae, oils, milky froth, odour, unusual colourings)?
- is there evidence of sediment build-up?
- is there evidence of ponding above an infiltration surface?
- is there any evidence of structural damage that requires repair?
- are there areas of erosion or channelling over vegetated surfaces?

Litter/debris removal

This is an integral part of SuDS maintenance and reduces the risks of inlet and outlet blockages, retains amenity value and minimises pollution risks. High litter removal frequencies may be required at high profile commercial/retail parks where aesthetics are a major driver.

2.2 Irregular maintenance activities

Sediment removal

To ensure long-term effectiveness, the sediment that accumulates in SuDS should be removed periodically. The required frequency of sediment removal is dependent on many factors including:

- design of upstream drainage system
- type of system
- design storage volume
- characteristics of upstream catchment area (eg land use, level of imperviousness, upstream construction activities, erosion control management and effectiveness of upstream pre-treatment).

Sediment accumulation will typically be rapid for the entire construction period (including time required for the building, turfing and landscaping of all upstream development plots). Once a catchment is completely developed and all vegetation is well-established, sediment mobility and accumulation is likely to drop significantly.

2.3 Remedial maintenance

Structure rehabilitation/repair

There will come a time with most SuDS techniques when a major overhaul of the system is required to remove clogged filters, geotextiles, gravel etc. This will typically be between 10 and 25 years, depending on the technique and factors such as the type of catchment and sediment load. The SuDS design allows for vehicle access to undertake this work and consider the need for the overhaul without causing major disruption. For example, the use of geotextiles close to the surface in pervious surfaces traps the majority of sediment in a relatively easily accessible location. Reconstruction of the surface layer and bedding layer is all that is required, rather than reconstruction of the whole pavement depth.

Major overhaul is most likely to be required on techniques that rely on filtration through soils or aggregates, such as sand filters and infiltration devices. Other SuDS techniques are unlikely to need major overhaul if routine maintenance is undertaken as required (for example ponds and wetlands). Rehabilitation activities for each SuDS component are described in the individual component chapters. The requirements should be identified in the owner's manual.

3.0 Applications of the principles of landscape maintenance

In contrast to conventional drainage, which comprises mainly of sub-surface pipework and associated infrastructure, SuDS are predominantly surface systems. A key feature of SuDS is their integration within the local landscape and their amenity contribution, and it is appropriate therefore that landscape maintenance practice is applied to their management.

Landscape maintenance documentation

Typical landscape maintenance documentation and its potential relevance to SuDS systems is summarised below:

(A) Management plan – describing the management objectives for a site over time, and the management strategies that should be employed to realise these objectives and reconcile any potential conflicts that may arise.

Management plans are most appropriate for application in major parks and open spaces, wherever there are alternative choices for future action, and potential conflicts of purpose and priorities that need to be resolved. The following extract from *A guide to management plans for parks and open spaces* (Barber, 1991) sets out the types of management plans that can be prepared:

(i) Management plan

This predicts a degree of physical change, and therefore should present design proposals in its recommendations. It puts the emphasis on the presentation of anticipated physical change with much of the documentation being in support.

(ii) Outline plan

This is generally accepted as a more appropriate title for a management plan that wishes to establish the guiding principles, without providing detailed proposals which might constrain future options for achieving the outline objectives.

(iii) Maintenance plan

This is appropriate if the principal interest is in establishing the best way of maintaining an area, or where there is a need to match maintenance aspirations to a secure financial base. Planned maintenance programmes over longer timescales can be made more secure by the more public exposure of the need and the commitment that the Maintenance Plan should be able to guarantee. A Maintenance Plan can also establish changes in maintenance regimes that may be required to match a change in objectives e.g. the need to adapt operation and maintenance practices to accommodate specific wildlife habitats that may develop.

For a SuDS scheme, the maintenance plan will generally be the most appropriate type of management plan to use. The document should include an explanation of the function of the SuDS scheme and why it is being used on the site.

Where the drainage system has an impact on the wildlife value or public use of a site, it would be prudent to develop this simple explanation further to explain habitat enhancement goals, health and safety issues and long-term management implications.

Sites with special wildlife or amenity interest may require detailed management plans, which monitor habitat development, infrastructure changes or damage to sites and ensure rapid responses to such changes, should they occur.

It is common for smaller commercial, industrial and housing sites to have a simple maintenance statement. In this case, a single page explaining the site management (including the sustainable drainage system) would be useful for all parties involved in the care of the development.

(B) Conditions of contract – appropriate conditions will be required. Advice can be sought from the Landscape Institute. Guidance is also provided in CIRIA publication C625 (Shaffer *et al*, 2004).

(C) Specification – detailing the materials to be used and the standard of work required.

A specification, usually preceded by preliminaries, details how work shall be carried out and contains clauses that give general instructions to the contractor. Specific SuDS maintenance clauses may be included in a general specification or as a separate “Sustainable drainage maintenance specification” section.

(D) Schedule of work – itemising the tasks to be undertaken and the frequency at which they will be performed.

The tasks required to maintain the site and the frequency necessary to achieve an acceptable standard should be set out in the schedule of work.

Smaller sites will usually have simple specification notes given to a contractor as a basis for maintenance on a performance basis. Examples of performance criteria are items such as:

- length of grass
- tidiness
- extent of weed growth, etc.

This document will often form the basis of a pricing mechanism and can also act as a checklist to ensure the work has been carried out satisfactorily.

For additional information on the development of appropriate schedules, reference should be made to *the operation and maintenance of sustainable drainage systems* (HR Wallingford, 2004).

4.0 Frequency of maintenance tasks

Landscape maintenance contract periods are usually of one to three years' duration.

The three-year period is increasingly common to ensure continuity and commitment to long-term landscape care. The frequency of regular landscape maintenance tasks in a contract period can range from daily to once in the contract period. In practice most site tasks are based on monthly or fortnightly site visits, except where grass or weed growth requires a higher frequency of work. In many cases a performance specification is used with terms such as “beds shall be maintained weed-free” or “grass shall be cut to a height of 50 mm with a minimum height of 25 mm and a maximum height of 100 mm” to obtain the required standards.

Frequency can be specified within the schedule to include irregular items such as “‘meadow grass’ cut two times annually in July and September to a height of 50 mm, all arisings raked off and removed to wildlife features, compost facility or to tip”, which provides flexibility for work that is not critical to the management of the site.

Maintenance tasks which suit a performance approach commonly include plant growth, grass cutting, pruning and tree maintenance. However, work tasks such as sweeping paths, regular litter collection and cleaning road surfaces will require work at an agreed frequency with more specific timings such as weekly, monthly or annually.

Where the frequency and timing of tasks is critical, a mixture of performance and frequency specification is necessary to provide effective maintenance.

SuDS maintenance generally tends towards a frequency requirement to ensure a predicable standard of care which can be recorded on site and which provides a reasonable basis for pricing work. A convenient frequency for many tasks is at a monthly inspection as this is the usual minimum site attendance required in a landscape specification. The monthly frequency should provide for an inspection of all SuDS features and checking all inlets and outlets.

Certain SuDS maintenance tasks however fall outside this monthly cycle and need to be accommodated in the contract. The two most obvious are:

- wetland vegetation maintenance
- silt management.

There are other tasks associated with ensuring the long-term performance of the systems that may be more difficult to predict and could even fall outside any contract period. It may therefore be more appropriate to review requirements for system rehabilitation at interim periods, when contracts are falling due for renewal.

5.0 References

- CIRIA C753 (2015) – The SuDS Manual
- Wildfowl & Wetlands Trust guidance (2012) – Maximising the potential for people and wildlife
- HR WALLINGFORD (2004). Whole Life Costing for Sustainable Drainage. Report SR 627.
- DEFRA (2010). Surface Water Management Plan Technical Guidance.
- Environment Agency (2015) - Cost estimation for SUDS. Summary of evidence.

RAINWATER HARVESTING

DESCRIPTION

Rainwater harvesting (RWH) is the collection of rainwater runoff for use. Runoff can be collected from roofs and other impermeable areas, stored, treated (where required) and then used as a supply of water for domestic, commercial, industrial and for institutional properties.

OPERATION AND MAINTENANCE REQUIREMENTS

Any property with an RWH system installed should be provided with appropriate information as to what equipment has been installed, its purpose, its operation and maintenance requirements, the actions needed to address any potential failure and the expected performance of the system. Information on the options for external maintenance support should also be provided.

Most systems require periodic checking and maintenance to ensure trouble-free and reliable operation. There are wide differences in the extent of maintenance required for different systems, and manufacturers' guidelines should always be followed. The table below provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

Maintenance requirements are largely dependent on the runoff source and the runoff use (and thus treatment processes provided). This will range from weekly input through to rare intervention. Routine inspection of the filter system at quarterly annual intervals is advised, even if they do not appear to need specific intervention. Pumps need very little attention, but their design life is generally regarded as only being 10 years. Where automatic provision of potable water occurs (if and when rainwater is either not available or the system has failed), it is useful to have sensor warnings relayed in such a manner as to inform the user of the current status of the system.

RWH systems should be designed so that when there is an absence of rain, or a need to disconnect the system for maintenance or repair, that potable water is safely available for all appliances to avoid inconvenience. Tanks should be accessible for internal inspection, and the cover should preferably be lockable. For more guidance on operation and maintenance of RWH systems, see SS 8515:2009+A1:2013.

The maintenance responsibility for an RWH system is usually with the owner of the property, but any communal systems require the participating community to be informed of the system, as detailed, but also be provided with information of who the organisation is that is maintaining the system and any financial commitments and any legally binding maintenance agreement.

Rainwater Harvesting operation and maintenance requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspection of the tank for debris and sediment buildup, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank., inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial Actions	Repair of overflow erosion damage or damage to tank.	As required
	Pump repairs	As required

GEOCELLULAR/MODULAR SYSTEMS

DESCRIPTION

Modular plastic geocellular systems with a high void ratio, that can be used to create a below ground infiltration (soakaway) or storage structure.

OPERATION AND MAINTENANCE REQUIREMENTS

Regular inspection and maintenance is required to ensure the effective long-term operation of below ground modular storage systems. Maintenance responsibility for systems should be placed with a responsible organization. Maintenance requirements for modular systems are described in the table below. Maintenance plans and schedules should be developed during the design phase. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

Modular systems – operation and maintenance requirements

Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms

SILT TRAPS AND CATCHPITS

DESCRIPTION

Silt traps and catch pits are circular or rectangular manholes and /or chambers with a sump in them to collect suspended solids. Some chambers have removeable silt buckets to assist with the removal of accumulated silt deposits. Catch pits are usually concrete ring or segment structures and silt traps preformed plastic chambers.

OPERATION AND MAINTENANCE REQUIREMENTS

Regular inspection and maintenance is required to ensure the effective long-term operation of below ground silt traps and catch pits systems. Maintenance responsibility for systems should be placed with a responsible organization. Maintenance requirements are described in the table below. Maintenance plans and schedules should be developed during the design phase. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

Silt traps and catch pits – operation and maintenance requirements

Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Inspection of silt traps and catch pits to assess silt accumulation	Monthly (and after large storms)
	Removal of accumulated silt from silt trap and catch pit sumps	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms

APPENDIX A - MONITORING AND MAINTENANCE RECORD

You need to keep a record of the checks you have completed that are set out in the checklist below along with any additional checks you have made.

If you have a maintenance contract with a contractor, keep a record of any work carried out on your pond system by them. If invoices state the work carried out, these will be sufficient.

If you do the checks you should enter:

- The check or maintenance job
- Who did it;
- The result (for example when abnormal noise heard, called in specialist to investigate).

Action	Date and Time	Carried out by	Result
For example, inlet and outlet pipes checked	06/04/2012 09.30	Mr A N Other	Obstruction cleared.

APPENDIX B - ACCIDENT AND INCIDENT RECORD

You should record any accidents, other incidents or near misses relating to the operation of the SUDS system for example untreated sewage being released into the ponds. The form could also be used to record health and safety incidents.

"Other incidents" covers impacts on the environment that are not accidents, such as failing to maintain the system, or vandals causing damage to the detention pond.

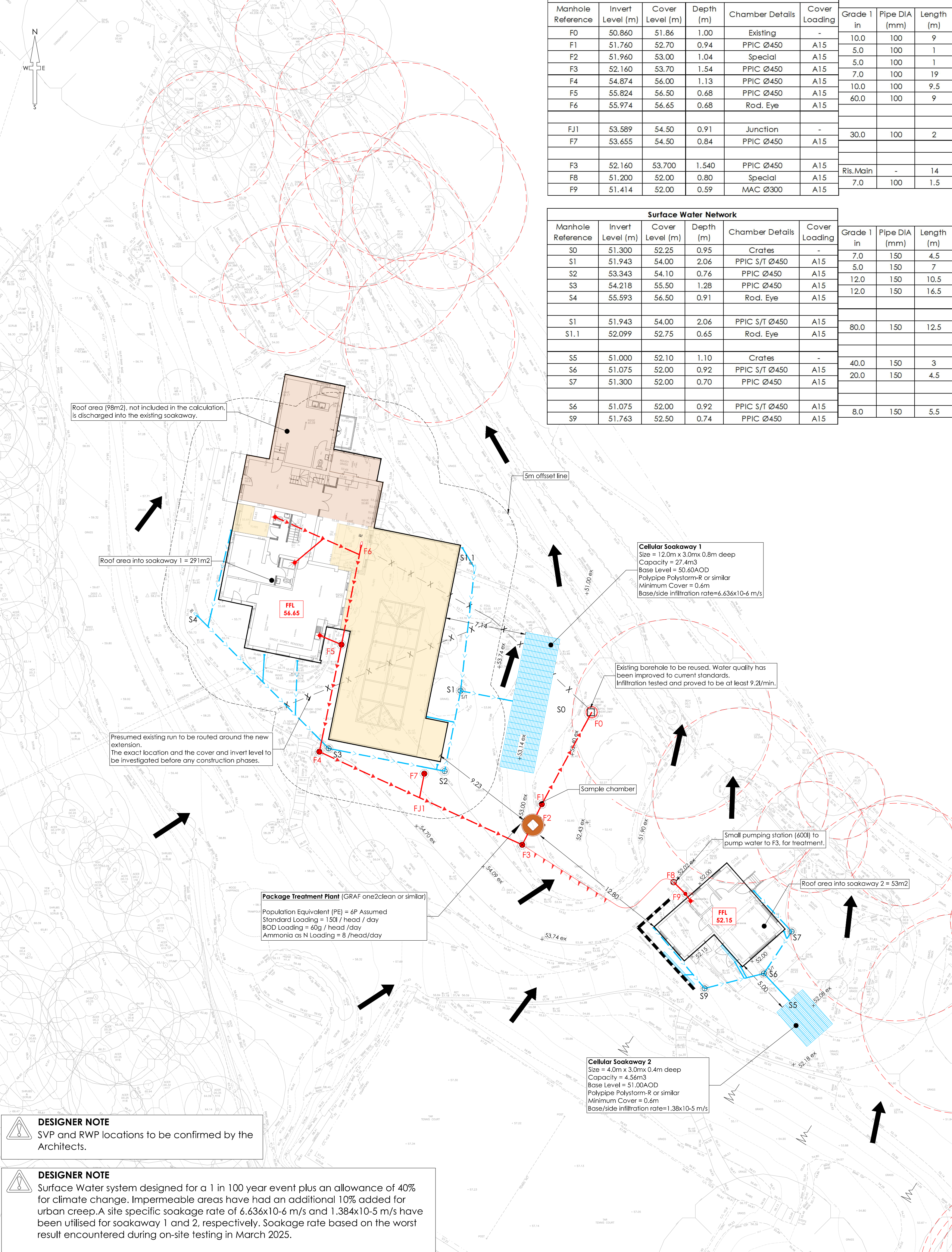
Date and time of the incident	
What happened, what was it about?	
Was anyone else aware of this – other witnesses? If so who?	
What caused it?	
What action did you take to fix the problem?	
What have you done to make sure that it does not happen again?	
Was there any significant pollution – for example: untreated sewage being discharged into a drain, river or stream? Yes / No If yes, what pollution occurred?	
If there was significant pollution then you must notify the Environment Agency on 0800 807060 as soon as possible. Have you done so?	Yes/No/not applicable At what time did you phone? EA Incident reference no.
You must also write or send an email to confirm this to the local office (see your accident management plan for the address). Have you done so?	Yes/No/not applicable
Please print your name, sign and date.	

APPENDIX C - KEY SITE AND EMERGENCY CONTACTS

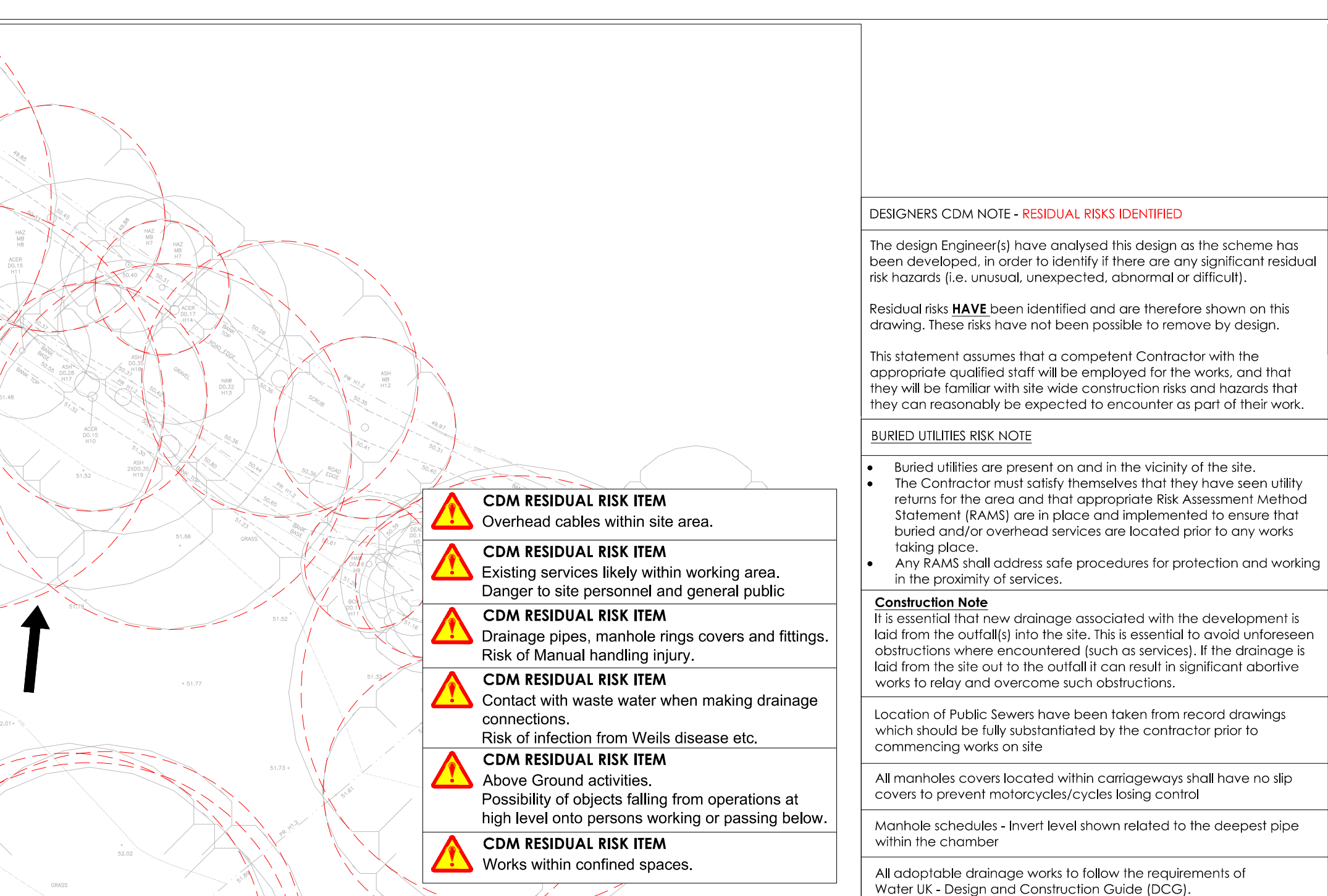
This table contains information and contacts you may need in an emergency

SITE DETAILS		
Address:		
Postcode:		
Site access grid reference:		
SITE CONTACTS	Office Hours (specify)	Out of hours
Owner:		
General manager:		
Site manager:		
Site supervisor:		
Security contact:		
Landowner / agent:		
EMERGENCY SERVICES	Office Hours	Out of hours
Emergency		
Medical:		
Police:		
Fire:		
REGULATORS	Office Hours	Out of hours
Health and Safety Executive (HSE):		
Local Authority:		
Environment Agency	General number:	08708 506 506
	24 hour emergency hotline:	0800 80 70 60
Natural England/Countryside Council for Wales		0800 80 70 60
OTHER KEY CONTACTS	Office Hours	Out of hours
Adjacent landowners:		
Neighbours:		
Specialist advisors:		

GROUND FLOOR



LOWER GROUND FLOOR



NOTES	
1.	All dimensions and levels are in metres unless otherwise noted
2.	This drawing is to be read in conjunction with the relevant Architect's/Engineer's drawings, specifications and CDM documentation
3.	This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE - EXCEPT FOR PLANNING PURPOSES). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
4.	This drawing contains coloured lines / information that may not be clear if reproduced in black and white.
5.	Digital copies of this plan can only be considered accurate if supplied directly by Infrastruct CS Ltd.
Drainage Key	
Sewers	
	Foul water drain (private/non adoptable)
	Surface water drain (private/non adoptable)
	Foul rising main
	Foul Water - Internal, by others
	Existing foul water drain (private/non adopted)
	Redundant sewer
Chamber Key	
FW/SW	
	Mini access chamber (mac) - 300mmØ
	PPIC - 475mmØ*
	P.C.C. units/brick*
* General note (Refer to standard details & longitudinal sections for chamber sizes. Size may need to increase dependant on number of incoming pipes/size of incoming pipes)	
	Rodding eye
	Rain water down pipe (roddable access)
	Soil vent pipe/soil stack
	Silt trap (ST) with removable silt bucket
	Manhole reference number
	Cellular storage (refer to drawing for sizes)
	Tree root protection zone (RPZ)
	Finished Floor Level (FFL)
	New Extension
	Flood exceedance routing

DESIGNERS CDM NOTE - RESIDUAL RISKS IDENTIFIED

The design Engineer(s) have analysed this design as the scheme has been developed, in order to identify if there are any significant residual risk hazards (i.e. unusual, unexpected, abnormal or difficult).

Residual risks **HAVE** been identified and are therefore shown on this drawing. These risks have not been possible to remove by design.

This statement assumes that a competent Contractor with the appropriate qualified staff will be employed for the works, and that they will be familiar with site wide construction risks and hazards that they can reasonably be expected to encounter as part of their work.

BURIED UTILITIES RISK NOTE

- Buried utilities are present on and in the vicinity of the site.
- The Contractor must satisfy themselves that they have seen utility returns for the area and that appropriate Risk Assessment Method Statement (RAMS) are in place and implemented to ensure that buried and/or overhead services are located prior to any works taking place.
- Any RAMS shall address safe procedures for protection and working in the proximity of services.

Construction Note

It is essential that new drainage associated with the development is laid from the outfall(s) into the site. This is essential to avoid unforeseen obstructions where encountered (such as services). If the drainage is laid from the site out to the outfall it can result in significant abortive works to relay and overcome such obstructions.

Location of Public Sewers have been taken from record drawings which should be fully substantiated by the contractor prior to commencing works on site

All manholes covers located within cartiageways shall have no slip covers to prevent motorcycles/cycles losing control

Manhole schedules - Invert level shown related to the deepest pipe within the chamber

All adoptable drainage works to follow the requirements of Water UK - Design and Construction Guide (DCG).

- CDM RESIDUAL RISK ITEM**
Overhead cables within site area.
- CDM RESIDUAL RISK ITEM**
Existing services likely within working area. Danger to site personnel and general public
- CDM RESIDUAL RISK ITEM**
Drainage pipes, manhole rings covers and fittings. Risk of Manual handling injury.
- CDM RESIDUAL RISK ITEM**
Contact with waste water when making drainage connections. Risk of infection from Weils disease etc.
- CDM RESIDUAL RISK ITEM**
Above Ground activities. Possibility of objects falling from operations at high level onto persons working or passing below.
- CDM RESIDUAL RISK ITEM**
Works within confined spaces.

P02	AA	MBD	Foul water route updated	17/04/25
P01	AA	MBD	Initial issue	10/04/25
REV	DRAWN	CHECK	REVISION COMMENTS	ISSUE DATE
Drainage Design				SHEET NO. 1/1
PROJECT				
The Coppers Penny Lane, Wargrave Wokingham, RG10 8PB				
CLIENT				
Andrew Pearson				
Infrastruct CS Ltd				
SCALE @ A1				
1:200				
PROJECT NUMBER				
6394				
STATUS				
S2				
ISSUE PURPOSE				
INFORMATION				
PROJECT	ORIGIN	PHASE	LEVEL	TYPE
COPP	ICS	01	XX	DR
ROLE	NO.	REVISION		
C	0200	P02		