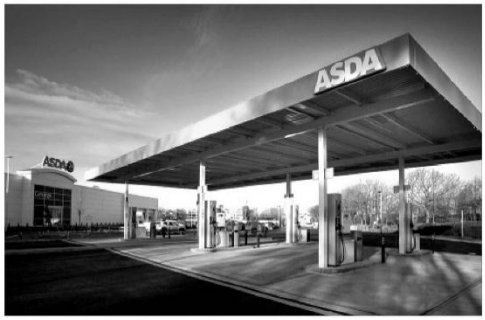
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CIVIL AND STRUCTURAL CONSULTING ENGINEERS











Flood Risk Assessment and Drainage Strategy
LNT Care Home – Huddersfield Blackmoorfoot

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Project Name:	LNT Care Home – Huddersfield Blackmoorfoot
Report Title:	Flood Risk Assessment and Drainage Strategy Report
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REVISION	SUITABILITY	DATE	AUTHOR	CHECKED	APPROVED	DESCRIPTION
P01	S2	04.06.26	AT	RP	RP	Initial issue
P02	S2	02.09.26	WD	AT	RP	Appendices updated to suit latest site layout

1.0 Introduction

1.1 Background

Adept Consulting Engineers Ltd were appointed by LNT Care Developments to carry out a Flood Risk Assessment (FRA) and Drainage Strategy for a new Care Home development in Blackmoorfoot, Huddersfield.

1.2 Methodology

The study consisted of data collection and review, desk based research and consultation with regulatory bodies and third parties in relation to flood risk and drainage.

The Study provides a risk based assessment of potential flooding to the site caused by various sources, including fluvial, tidal, surface water/pluvial, groundwater, surcharged sewers and other man made sources. Mitigation measures are identified to address the risk to the site and any potential future risk to other land.

2.0 Limitations of report

This report has been prepared by Adept Consulting Engineers Limited on behalf of LNT Care Developments in accordance with the background and methodology described above in sections 1.1 and 1.2.

Preliminary calculations and a concept drainage design have been undertaken as part of this study. The preliminary calculations and concept design are based on the information and assumptions covered in this report at the time of preparation and provide a concept design for points of connection and general design parameters only.

The report is based on the interpretation and assessment of data provided by third parties. Adept Consulting Engineers Limited cannot guarantee the reliability of the third party information obtained. The conclusions and findings of the report may change if the third party data is subsequently amended or updated.

3.0 Executive Summary

SECTION	SUMMARY	
Location	Blackmoorfoot Rd, Huddersfield, HD4 7AF	
Proposed Development	The proposed scheme consists of the construction of a new care home, together with associated infrastructure such as parking, landscaping and access.	
Land use	Greenfield	
Topography	Generally sloping from West to East, circa 7m level difference	
Site Boundaries	North	Residential Development
	East	Residential Development / Greenfield
	South	Blackmoorfoot Rd
	West	Felks Stile Rd
Sequential and Exception Tests	Not required	
Fluvial (River) flooding	Low	
Pluvial (Surface water) flooding	Low	
Flooding from artificial sources	Low	
Groundwater Flood Risk	Low	
Development Impacts on Flood Risk	Whilst the construction of hard standings and buildings without mitigation will theoretically increase flood risk to downstream properties, this risk can be, and will be, safely managed as demonstrated within this report.	
Flood Risk Mitigation/management	Where level access entrances are required, surrounding ground levels should be designed to fall away from the entrance to prevent water ingress.	
Surface Water Management	Surface water will be attenuated on site to accommodate 100 year event including 30% for climate change. A discharge rate of 2.8 L/s is proposed to connect to the surface water demarcation chamber located within the new residential development North of the care home.	
Foul Water Management	Foul water will discharge to the foul water demarcation chambers located within the new residential development North of the care home.	
Residual Risks	N/a	
Recommendations for Further work	N/a	
Maintenance	Maintenance schedule appended	

4.0 Description of the existing site

4.1 Site Location

The site is located on an Greenfield site located off Blackmoorfoot Rd, Huddersfield, HD4 7AF
Grid reference SE 11335 14389

A site location plan is appended.

SITE DESCRIPTION	
Total Site Area	0.76 ha
Existing Impermeable Area	N/A
Land use	Greenfield
Topography	Generally sloping from West to East, circa 7m level difference
Known Site Constraints	N/A

A topographical survey is appended.

4.2 Existing Drainage

The law regarding responsibility for drains and sewers changed on the 1st October 2011. On this date, the Government transferred the majority of drainage pipes that are either outside a property's boundary or are shared with other buildings to the sewage/water companies. However, not all transferred sewers may be shown on the sewer records.

There is no known existing surface water or foul water sewer crossing the proposed development.

Utilities survey appended for reference.

5.0 Hydrology, hydrogeology and geology

5.1 Hydrology

The closest body of water is the River Colne, located approximately 1.35 kilometre to the North of the site. This does not offer a viable point of discharge.

5.2 Hydrogeology

The site is not located within any source protection zones.

5.3 Soil

A Phase 2 site investigation has been carried out by Lithos. These logs show the site to be underlain by Top Soil between 0.00m and 0.3m, overlaying Granular Residual Soil between 0.3m and 0.9m thick, overlaying bedrock.

6.0 Proposed development

6.1 Development Outline

The proposed scheme consists of the construction of a new care home, together with associated infrastructure such as parking, landscaping and access.

Architectural plans are appended.

6.2 Proposed Surface Water Drainage Strategy

6.2.1 Surface Water Discharge Hierarchy

The surface water discharge hierarchy has been considered as follows:

1. *Rainwater reuse*
   In line with the latest DEFRA guidance, National Standards for Sustainable Drainage Systems, the scheme has considered rainwater harvesting. However, due to the unnecessary risks that could be introduced through the reuse of rainwater and greywater within a care home environment, the use of rainwater harvesting tanks has been discounted. Design considerations for rainwater harvesting have been provided in **Section 6.6.**

2. *Infiltration to ground*
   Infiltration has been assessed and discounted. The drainage scheme has been designed in accordance with the approved planning application (Ref. 2024/61/92365/W) and the technically approved Section 104 drainage design for the full Blackmoorfoot development.

3. *Discharge to watercourse*
   There is no suitable watercourse available to receive surface water discharges from the site.

4. *Discharge to surface water sewer*
   Discharge to the proposed surface water demarcation chamber has been agreed with LEAP and the LLFA. The drainage scheme has been designed in accordance with the approved planning application (Ref. 2024/61/92365/W) and the technically approved Section 104 drainage design for the full development.

5. *Discharge to combined sewer*
   Discharge to the proposed surface water network agreed. Therefore discharge to a combined sewer is not necessary.

6.2.2 Discharge Rate and Attenuation

A discharge rate of 2.8l/s has been proposed for the development. The proposed surface water from the care home development discharges into a proposed demarcation chamber which forms part of the wider residential development at Blackmoorfoot. The discharge rate and outfall location for the care home development has been designed in accordance with the approved planning drainage strategy drawings (Ref. 2024/61/92365/W) and the technically approved Section 104 drainage design for the full Blackmoorfoot development.

To achieve the restricted discharge rate, a hydrobrake will be required. Accordingly, protection measures should be incorporated within the hydrobrake chamber design and robust sediment management should be implemented throughout the wider surface water network.

Attenuation will be provided to store surface water runoff up to the 1 in 100 year plus climate change rainfall event, ensuring no increased flood risk downstream.

The key surface water drainage parameters and attenuation requirements for the proposed development are summarised in the table below.

Total impermeable area	0.27ha
Peak discharge from site	2.8 L/s
Maximum attenuation volume required to accommodate the peak 1 in 100 year + 30% CC storm	196 m^3

6.3 Hydraulic Calculations

The drainage strategy described above in section 6.2 has been hydraulically modelled using infodrainage. The surface water network for the development has been designed to the hydraulic standards of the Sewer Sector Guidance, these being:

- No surcharge of pipes for the 1 in 2-year storm return period.
- No flooding for the 1 in 30-year storm return period.
- Road, roofs and private hard standing areas have 100% impermeability (run-off coefficient) and full contribute to the flows in the surface water network.

The volumetric run-off values for both the summer and winter simulations have been set to 1.

A copy of the hydraulic results are appended.

6.4 Foul Drainage

Foul water discharge will be made via gravity into a proposed demarcation chamber which forms part of the wider residential development at Blackmoorfoot. The outfall location for the care home development has been designed in accordance with the approved planning drainage strategy drawings (Ref. 2024/61/92365/W) and the technically approved Section 104 drainage design for the full Blackmoorfoot development.

6.5 Sustainable Drainage Systems (SuDS) and Water Quality

Sustainable Drainage Systems (SuDS) have the ability to address four core objectives: water quantity, water quality, amenity and biodiversity. In accordance with the National Planning Policy Framework (NPPF), the Non-Statutory Technical Standards for Sustainable Drainage Systems (2018) and the SuDS Manual (CIRIA 753) SuDS should be specified wherever possible to manage surface water runoff generated onsite.

Consideration should therefore firstly be given to using sustainable drainage (SuDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water runoff from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. Approved document Part H of the Building Regulations (2015) sets out a hierarchy for the disposal of surface water which encourages a SuDS approach.

The order of priority according to the SuDS Manual, lists that surface water runoff that is not collected for use should follow in this order.

- Infiltration
- Discharge to Surface Waters (i.e. watercourse)
- Discharge to a surface water sewer, highway drain or another drainage system
- Discharge to a combined sewer.

SuDS are widely accepted as a better approach to managing rainfall than traditional drainage systems. They help create interesting places to learn, beautiful spaces and places for people and wildlife. It also helps to reduce the risk of waterlogging, local flooding, and water pollution. Developers are encouraged to incorporate SuDS for all developments where possible.

TECHNIQUE	DESCRIPTION	SuDS FEATURE	FEASIBILITY Y / N / M (MAYBE)
Rainwater Harvesting	Elements that capture rainwater and facilitate its use within the building or local environment	Rain Garden and Green Roof	N
Porous and pervious surface materials	Structural surfaces that allow water to penetrate, thus reducing the amount of runoff that is conveyed to the drainage system	Permeable or pervious surfaces	Y
Infiltration Systems	Elements that facilitate the infiltration of water into the ground. These often include temporary storage areas which allow water to slowly soak into the soil	Infiltration Drain and Basins	N
Conveyance Systems	Elements which convey flows to downstream storage	Swales and watercourses	N
Storage Systems	Elements which store surface water. This can infiltrate or discharge to local drainage systems	Wetlands, Ponds and Blue Roof	N
Treatment Systems	Elements that remove or facilitate the degradation of contaminants in the surface water runoff	Tree pits and land drainage	N

The surface water discharge train has been assessed in line with the SuDS manual and scored accordingly. The provisions are detailed below:

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

The site falls under the highlighted category in table 26.2 above – pollution hazard level is considered to be 'low'.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

As demonstrated in Table 26.3 above, the use of permeable pavement for the car parking bays mitigates the pollution hazard indices identified in Table 26.2. building.

6.6 Rainwater Harvesting in Care Homes Environments – Design Considerations

It is considered that the re-use of non-potable water, such as rainwater or greywater, within a Care Home environment could introduce unnecessary risks, when compared to, say, an office building. Care Homes provide a secure environment to vulnerable occupants, so it is vitally important that strict hygiene requirements are enforced, and avoid unnecessary higher operational complexity. Listed below are key considerations that have been taken into consideration when considering Rainwater Harvesting within Care Homes:

1 – Health and Hygiene Risks

Immunocompromised residents: Elderly people and those with medical conditions can be significantly more susceptible to pathogens (e.g. Legionella, E. coli, Pseudomonas). Even incidental contact (splashes, aerosols) from toilets, laundry, or irrigation could pose a significant risk to their health,

Cross-connection risk: Any accidental connection between potable and non-potable systems could contaminate drinking water. In care homes, the tolerance for this risk needs to be zero,

Aerosol generation: Toilets and washing machines produce fine droplets that can spread microorganisms, which would raise infection control concerns.

2 – Operational Reliability

Maintenance burden: Non-potable systems require regular inspections, filter changes, disinfection, flushing, and monitoring. Care homes operators wouldn't have the in-house technical expertise or resources for this. Filtration, UV, or chlorination units require frequent checks. — often impractical for a care home that isn't staffed with specialist staff.

System downtime: If the rainwater system fails or requires maintenance, a backup potable water supply would be required, adding further concern and complexity.

Water quality variability: Rainwater quality depends on roof materials, debris, bird droppings, seasonal changes etc; these are all very difficult to control in a consist manner.

Emergency management: In case of water contamination, even if only short-term, flushing and disinfection would be compromised, complex and disruptive.

Dual pipework systems: Requires extra space, clear labelling, and strict segregation of potable/non-potable supplies. This increases design, installation, and maintenance costs.

Water quality instability: Rainwater tanks can accumulate organic debris, sediment, and microbial growth. If these systems are not expertly managed, they could degrade rapidly.

3 – Regulatory and Compliance Challenges

Strict regulations: Care Home facilities fall under much stricter water regulations than most commercial premises. Whilst it is accepted that some local authorities wish to encourage non-potable reuse, our operators will often prohibit or strongly discourage non-potable reuse,

Insurance liability: Care Homes operators may struggle with insurance liability cover if a non-potable system is installed; any serious health outbreak would undoubtedly be legally complex.

Audit burden: Additional water safety plan requirements, more documentation, and possible inspections would increase compliance workload. In a busy environment, where our residents health and wellbeing is our primary concern, this is not viable.

4 – Laundry Concerns

High hygiene standards: Care home laundry (bed linen, residents' clothes, incontinence products) requires reliable hot water and disinfectants. Using rainwater could complicate disinfection or equipment warranties.

Scale and mineral content: Non-potable water may increase scaling/corrosion, reducing machine lifespan.

5 – Risk Perception and Liability

Staff training: Care staff already work under pressure and in emotionally draining environments — adding a specialist system increases risks of mistakes (valve mis-operation, mislabelling, etc.). The staff would need to understand what the water can and can't be used for, to prevent misuse.

Resident safety perception: Families and regulators may see non-potable reuse as a risk rather than a sustainability benefit. It is not unreasonable to expect they may be uncomfortable with the idea of "non-drinking" water being used in the building, even if technically safe. In a care environment, perception matters almost as much as actual risk. If a resident became ill and non-potable water was even suspected, it could seriously damage the care home's reputation.

Accidental misuse: Residents with dementia or reduced cognition might access outlets (e.g. garden taps) and try to drink the non-potable water.

Sector conservatism: The Care Home sectors often adopt a "precautionary principle" — sticking with proven, low-risk options rather than innovative but complex solutions.

6 – Practicality Vs. Benefit Economic / Sustainability Trade-offs

Demand mismatch: Rainwater harvesting may not meet demand consistently, especially in dry seasons, so potable top-up is still needed.

Cost vs. saving: The extra cost of safe storage, treatment, monitoring, staff training and compliance would outweigh water bill savings in a care home context. Water bills in our Care Homes are significant; when you factor in capital cost, monitoring, maintenance, and regulatory compliance, the return on investment wouldn't be a worthwhile consideration,

Energy use: Pumps and treatment equipment may offset some sustainability benefits,

Alternative measures may be simpler: We already promote the use of low-flow toilets, water-efficient laundry equipment, leak detection, and behavioural changes amongst our staff, which typically save more water, with far less risk.

7.0 Flood risk sources and extents

7.1 Summary

A summary of the sources and level of flood risk (low, medium or high) is given in Table 7.1 below.

SOURCE	RISK LEVEL
Fluvial	Very Low
Tidal - Coastal	Low
Surface Water / Pluvial	Very Low
Groundwater	Low
Surcharged Sewers	N/a
Other Man Made Sources	Low

The sources and level of flood risk are demonstrated below.

7.2 Flood Zone Definitions

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site, as indicated in the table below.

FLOOD ZONE	DEFINITION
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

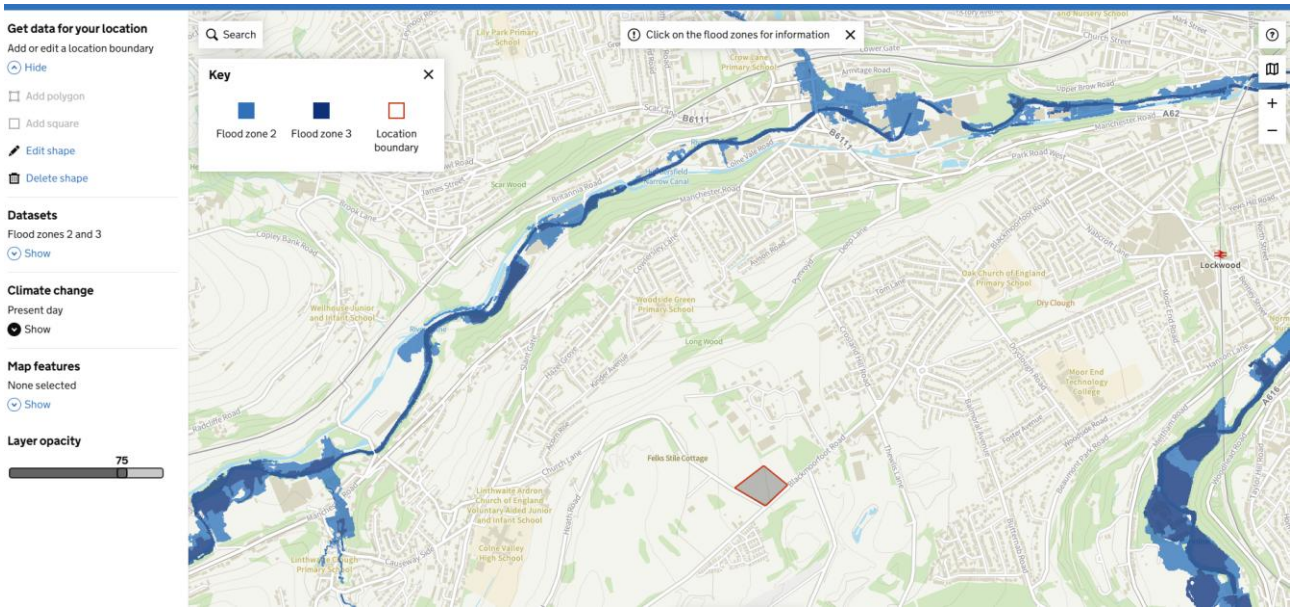
7.3 Fluvial

Fluvial flooding is when a river is surcharged and can happen when water exceeds the river banks in low lying land. The Environment Agency created Flood Map for Planning in 2004 using national generalised modelling to identify the level of risk for new developments against fluvial flooding. The model is routinely updated and revised using the results from catchment studies, topographical surveys and hydrological and/or hydraulic modelling as well as previous flood events.

Flood defences can be installed to protect vulnerable areas by forcing the water to overflow into less desirable areas. Whilst flood defences reduce the level of risk, they don't completely remove it as they can be overtopped or fail due to extreme weather or poor maintenance, therefore the Environment Agency website 'Risk of flooding from Rivers and Sea' map does not take into account the presence of any flood defences.

The proposed development is situated in Flood Zone 1, no further discussion required.

An extract from the gov.uk website is shown below,



7.4 Tidal

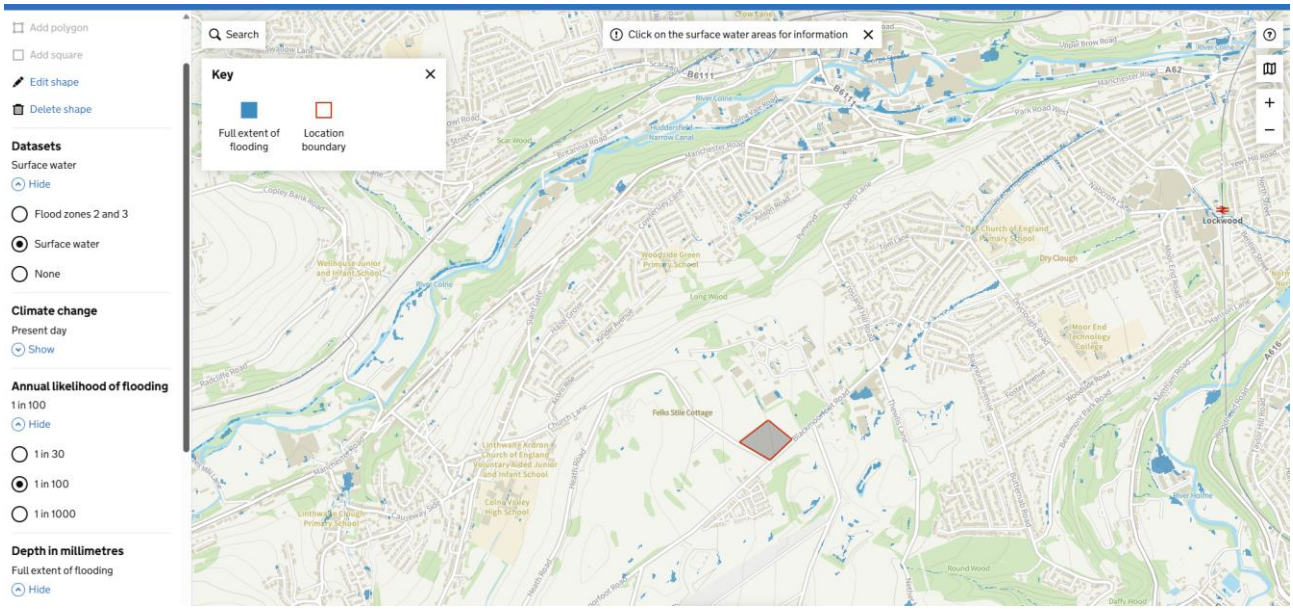
Tidal Flooding is the temporary flooding of coastal areas during exceptionally high tides or storm surges. The risk of tidal flooding can happen at any time and is not solely as a result of a rainfall event. The Environment Agency are estimating that there is an average of 1.33m across the country by year 2125.

The site is not at risk of tidal flooding

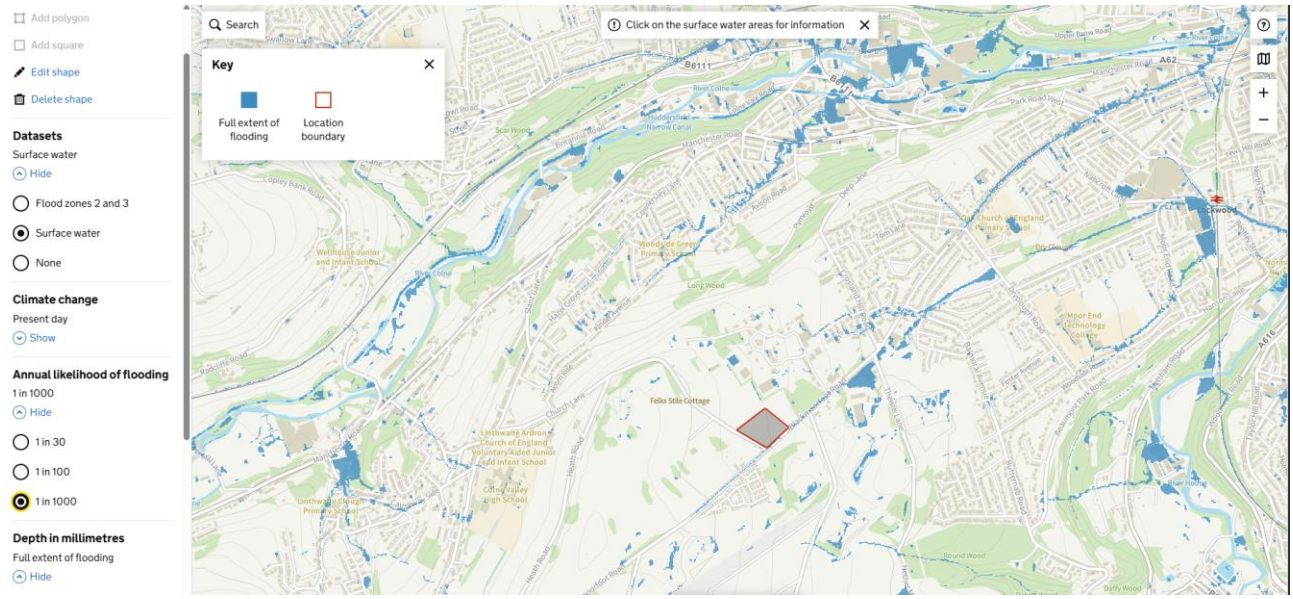
7.5 Surface Water / Pluvial

When the infiltration capacity of land or the drainage capacity of a local sewer network is exceeded, excess rainwater flows overland. This water will collect in topographical depressions and at obstructions, which can inundate development in low lying areas. The severity of the rainfall event, the degree of saturation of the soil before the event, the permeability of soils and geology, and the gradient of the surrounding land and it's use; all contribute to and affect the severity of overland flow.

The Environment Agency Flood Map for Surface Water can be used to see the approximate areas that would experience surface water flooding from a range of AEP's. Surface water flood risk mapping shows that there is no risk of surface water flooding on the site for the 1in100 year storm event.



During the 1 in 1000 year event, there is also no risk of surface water flooding.



7.6 Groundwater Flooding

Groundwater flooding can occur when groundwater levels rise above ground surface levels. The underlying geology has a major influence on where this type of flooding takes place; it is most likely to occur in low lying areas underlain by permeable rocks (aquifers).

The site is not perceived to be at risk of groundwater flooding according to the gov.uk website.

Other flood risks	More about groundwater and reservoirs
Groundwater	Flooding from groundwater is unlikely in this area.
Reservoirs	Flooding from reservoirs is unlikely in this area.

7.7 Surcharged Sewers

Sewer and surface water flooding are often interconnected; insufficient drainage capacity in the sewer network can result in extensive surface water flooding and, by the same rationale, large volumes of surface water can overload the public sewers, causing the sewer network to back up, surcharge and ultimately flood.

Adopted sewerage is the responsibility of the statutory sewerage undertaker and therefore beyond the influence of this design.

7.8 Other Man Made Sources

Flood events can occur from a sudden release of large volumes of water from reservoirs, canals and artificial structures. The Reservoir Act defines a large reservoir as one that holds over 25,000 cubic metres of water. According to the Environment Agency's Flood Mapping the site is not at risk of reservoir or canal flooding.

7.9 Vulnerability

Defining or classifying flood risk vulnerability helps to determine the viability of a new development this also helps to understand if any additional considerations should be taken into account during future drainage strategy designs.

Assessing the vulnerability classifications below the proposed development can be considered 'more vulnerable'.

VULNERABILITY CLASSIFICATION	TYPE OF DEVELOPMENT
Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.

Highly Vulnerable	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable	• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

FLOOD ZONES	**FLOOD RISK VULNERABILITY CLASSIFICATION**				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Key:

✓ Development is appropriate.

X Development should not be permitted.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.
” * “ In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

7.10 Sequential Test

The Sequential Test aims to steer developments and redevelopments to areas of lower flood risk. The test compares the proposed development site with other available sites, in terms of flood risk, to aid the steering process.

The developed parts of the site all lies with in flood zone 1 and is in the most sequentially preferable location.

7.11 Exception Test

Where the Sequential Test is undertaken and alternative sites of lower flood risk are not available, then the proposed development may require an Exception Test in order to be granted planning permission. Where the exception test is required, it should be applied as soon as possible to all local development document allocations for developments and all planning applications other than for minor developments.

All three elements of the exception test have to be passed before development is allocated or permitted. For the exception test to be passed:

It must demonstrate that the development provides wider sustainability benefits to the community that outweigh the flood risk, informed by an SRFA, where one has been prepared;

The development should be on developed land or on previously developed land;

A flood risk assessment must demonstrate that the development will be safe without increasing flood risk elsewhere, and where possible will reduce the overall flood risk.

As the development passes the sequential test, the exception test is not required.

7.12 Climate Change

A climate change factor of 30% has been applied in line with the approved planning application (Ref. 2024/61/92365/W).

7.13 Design Consideration and Flood Mitigation

Levels around the site should be set to provide clear flow paths for overland flows so as not to impact new buildings or adversely affect neighboring properties. At thresholds where level access is required, falls away from entrances should be afforded.

8.0 Communications

Discussions with Environment Agency	*N/a*
Discussions with the Lead Local Flood Authority	*Via planning process*
Discussions with Sewerage Undertaker	*S104 Technical approval granted for residential development and care home out.*

9.0 Conclusions

9.1 Existing Drainage

There is no known existing surface water or foul water sewer crossing the proposed development.

9.2 Proposed Drainage Strategy

The proposed surface water drainage strategy provides a compliant and sustainable solution for the care home development. Surface water runoff will be restricted to a discharge rate of 2.8 l/s in accordance with the approved planning drainage strategy and the technically approved Section 104 drainage design for the wider Blackmoorfoot development. Attenuation storage has been sized to accommodate runoff up to the 1 in 100 year plus climate change rainfall event, ensuring that post-development runoff rates are appropriately controlled and that there is no increase in flood risk to downstream receptors. Subject to the incorporation of suitable hydrobrake protection measures and ongoing sediment management within the drainage network, the proposed drainage scheme is considered acceptable and fit for purpose.

9.3 Flood Risk

The site is located in flood zone 1 and is not considered to be at risk of flooding.

ABBREVIATIONS	
2D	Two Dimensional
3D	Three Dimensional
AEP	Annual Exceedance Probability
bgl	Below Ground Level
CC	Climate Change
FFL	Finished Flood Level
FRA	Flood Risk Assessment
Ha	Hectare
IDB	Internal Drainage Board
LLFA	Lead Local Floor Authority
mAOD	Metres Above Ordnance Datum
NPPF	National Planning Policy Framework
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems

Appendix A

- Location Plan
- Proposed Architectural Site Plans
- Topographical Survey
- Residential Development Drainage Strategy



Do Not Scale

Drawing Notes

Drawing & schedule based on the following information:

Architect's drawing/model:	**HD4 7AF - A-03 - PROPOSED SITE PLAN - 260824**
Revision:	
Received:	
Topographic Survey:	**3606-SU001-005_ZS Surveys Ltd - Sitewide Topo with Added Trees (October 2023)_For Information_A_1**
Revision:	
Received:	

Residual Hazards

Health, Safety & Environmental Notes

KEY

Site Boundary

Address: Felks Stile Road,
Crosland Hill,
Cowlersley,
Kirklees,
West Yorkshire,
HD4 7AF

Easting: 411356
Northing: 414390

Date	Description	By	Chk	Rev
03.09.26	Updated to suit latest site plan	WD	AT	P2
05.06.26	Initial Issue	WD	AT	P1

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Project
Felks Stile Rd Care Home

Title
Location Plan

Client
LNT Care Developments

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:1000	WD	AT	RP	May '26

Status	Purpose	Adept Project Number
S2	Preliminary	08.24008

Project-Originator-Functional Breakdown-Spatial Breakdown-Form-Discipline-Number: 08.24008-ACE-00-ZZ-D-C-3000 Rev. P2



PROPOSED SITE PLAN

1 : 250

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0 1 2 5 10 20 m

NORTH

PROPOSED 03-STOREY 66-BED CARE HOME

SITE AREA	7629 m² 1.89 acres
BUILDING FOOTPRINT	1165 m²
EXTERNAL AMENITY SPACE	1197 m²

30No. CAR PARKING SPACES INCLUDING:
06No. ELECTRIC VEHICLE CHARGING POINTS
02No. ACCESSIBLE SPACES
08No. CYCLE SPACES

SURFACE TYPE

- TARMAC ENTRANCE ROAD & CAR PARK
- TARMAC FOOTPATH

BOUNDARY TREATMENTS

- 1800H RAILINGS
- 1800H STONE WALL WITH HIT & MISS FENCE
- EXISTING DRY STONE WALL
- 550H TIMBER KNEE RAIL

*All proposed levels shown are indicative and subject to variation of up to ±500mm during detailed design and construction.
*All landscaping shown on this drawing is indicative only. For accurate and up-to-date landscaping design, refer to the most recent revision of the approved landscaping scheme or drawings prepared by the appointed landscape architect.

REVISIONS

LNT Construction
Unit 2, Helios 47, Isabella Road, Garforth, Leeds, LS25 2DY
Tel: 0113 385 3850

PROJECT
LAND BETWEEN BLACKMOORFOOT ROAD AND FELKS STILE ROAD, HUDDERSFIELD, HD4 7AE

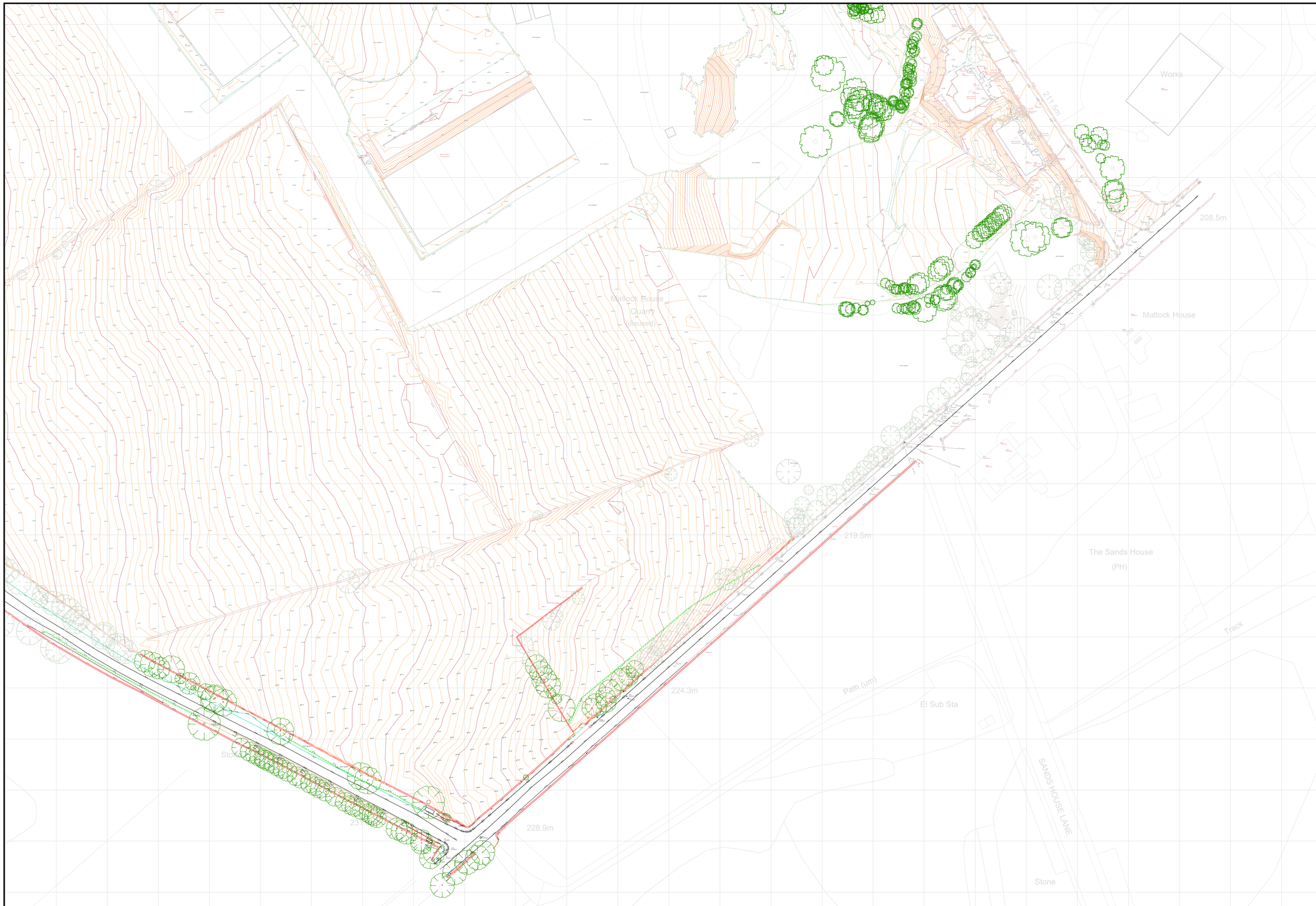
TITLE
SITE PLAN

SCALE	DATE
As indicated @ A1	24/08/2026 16:10:48

DWG NUMBER	DRAWN	REVIEWED
HD4 7AE - A-03	JS	TS

STATUS
FOR PLANNING APPROVAL

REVISION



NORTH

Topographic Legend

- Bottom of Bank
- Top of Banking
- Building
- Building Canopy
- Concrete Base
- Contour Major
- Contour Minor
- Fences
- General
- Kerb Bottom
- Kerb Drop
- Kerb Top
- OH Comms
- OH Electric
- Railway Line
- Road Centre
- Road Markings
- SC Hard:Hard
- SC Hard:Soft
- SC Soft:Soft
- Steps
- Tree Canopy
- Vegetation
- Visible Trench
- Walls
- Water Edge

Topographic Abbreviations

AV	Air Valve	PB	Pedestrian Beacon
BH	Borehole	PBox	Post Box
BQ(IL)	Bollard (Illuminated)	PGR	Pedestrian Guard Rail
BS	Bus Stop	PM	Parking Meter
Cab	Cabinet	PO	Post
CL=	Cover Level	RE	Rodding Eye
COL	Column	RS(IL)	Road Sign (Illuminated)
Conc	Concrete	RWP	Rain Water Pipe
DC	Drainage Channel	SP(IL)	Sign Post (Illuminated)
DFBin	Dog Foul Bin	SPCam	Speed Camera
DP	Down Pipe	ST	Stop Tap
EP	Electricity Pole	SV	Sluice Valve
ER	Earth Rod	SVP	Soil Vent Pipe
FFL=	Finished Floor Level	TBox	Telephone Box
FH	Fire Hydrant	TL	Traffic Light
FP	Flag Pole	TOF=	Top of Fence Level
GP	Gate Post	TOW=	Top of Wall Level
GV	Gas Valve	TP	Telecomms Pole
GY	Gully	VP	Vent Pipe
IC	Inspection Cover	WB	Waste Bin
KO	Kerb Outlet	WB=	Window Bottom Level
LP	Lamp Post	WM	Water Meter
MH	Manhole	WO	Wash Out
Mkr	Marker	WT=	Window Top Level
MP	Marker Post	WV	Water Valve
	MW Monitoring Well		

Measured Building Legend

- External Building Line
- Internal Building Line
- Building Overheads
- Stairs/Steps
- Doors
- Windows
- Sanitaryware
- Kitchen Furniture
- Direction of Stairs (Arrow points up)
- Drection of Sloped Ceiling (Arrow points down)
- Sill=0.00 Head=0.00 Window Sill and Head Height
- Double door — CH=0.00 Ceiling Height
- Single door — FCH=0.00 False Ceiling Height
- Window — FFL=0.00 Finished Floor Level

Utility Legend

- Air Line
- Alarm Cable
- BT Cable
- CATV Cable
- Chamber Extent
- Comms Cable
- CWD Sewer
- Earth Wire/Tape
- Electric Cable
- Fibre Optic Cable
- Fuel Line
- FWD Sewer
- Gas Pipe
- Band of Cables
- Empty Service Duct
- SWD Sewer
- Survey Extents
- Heating Pipe
- HV Electric Cable
- Kingston Comms
- Oil Pipe
- Rising Main
- Traffic Control
- IC Detection
- Vent Pipe
- GPR Detection
- Assumed Route
- Records Route
- Cable Riser
- Drainage Backdrop

Utility Abbreviations

CP	Cathodic Protection	LoS	Loss of Signal
Cut	Disconnected Utility	MDPE	Middle Density PE
DI	Ductile Iron	SI	Spun Iron
DoB	Depth of Bottom	TLC	Traffic Light Control
DoC	Depth of Cover	UDI	Unreliable Depth Info
ED	Empty Duct		Unplasticised
EoT	End of Trace	uPVC	Polyvinyl Chloride
PE	Polyethylene	UTR	Unable to Raise
HDPE	High Density PE	VC	Vitrified Clay

Manufacturer Stated Depths

- Detected Using Electromagnetic Location Methods e.g. Any metallic pipe/cable. Accuracy ± 2.5% of depth reading.
- Detected Using Electromagnetic Location Methods eg. Using a Sonde to locate drainage pipework Accuracy ± 2.5% of depth reading.
- Detected Using Ground Penetrating Radar e.g. A plastic pipe or service not located by other means. Accuracy depends on ground conditions.

CAUTION LIVE SERVICES PRESENT – EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING

ZS Surveys Ltd., and their agents or partners, are not responsible for any situation, incident or loss resulting from actions or planning resulting from total reliance upon this drawing or accompanying information. The completeness of the underground network information cannot be wholly guaranteed and as such no guarantees or warranties are provided or implied.The location and/or identification of a service will not positively indicate whether it is live or dead. A service indicated from records that has not been located or identified on site does not necessarily imply that it does not exist or is dead, however, its presence should be anticipated.
The results of Electro Magnetic and GPR detection techniques are not infallibe and ground proofing for the actual position and depth of services should be established.

If this drawing and any associated drawings should be used in relation to works, we advise that the users of this information follow the principles detailed by the Health and Safety Executive guidance directive HS(G) 47, "Avoiding Danger from Underground Services". Further details of this directive are available at www.hse.gov.uk <http://www.hse.gov.uk/>

Notes

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ALL LEVELS RELATED OSTN15 GRID PROJECTION.

ALL DIMENSIONS SHOULD BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.

ALL HATCHING IS FOR PRESENTATIONAL PURPOSES ONLY.

Client	Bovis Homes / Linden Homes — Part of the Vistry Group
Site Location:	Blackmoorfoot Road Huddersfield HD4 7AE
Drawing Type:	Topographical

Surveyed:	DR	Drawn:	DR
Checked:	ZH	Authorised:	SS
Date:	02/10/23	Scale:	1:500@A0

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Achilles UVDB SILVER PLUS
CHAS

Project Number:	3606
Sheet Number:	SU005

Refer to drawing "08.24007-ACE-00-ZZ-D-C-1203"

Refer to drawing "08.24007-ACE-00-ZZ-D-C-1202"

Shared Drive

Local Centre

Care Home

Millers / Vistry land ownership boundary

Drainage to be adopted under separate S104 agreement

Private FW drainage stub pipes to serve care home. Location and invert of pipe stubs TBC by Care Home design Engineer following Care Home parcel detailed design.

SW discharge from Care home to be restricted to 2.8L/s. SW attenuation design TBC by Care Home parcel design Engineer.

Private FW drainage stub pipes to serve Local Centre. Location and invert of pipe stubs TBC by Local Centre design Engineer following Local Centre detailed design package.

Private SW drainage stub pipe to serve Local Centre. Location and invert of pipe stubs TBC by Local Centre design Engineer following Local Centre detailed design package.

SW to discharge from Local Centre at an unrestricted rate. BMF attenuation tank volume has been sized to cater for 2020m² of impermeable area.

Refer to Drawing 1351 - 'S104 Agreement drainage details - sheet 1' for standard drainage notes

Do Not Scale

Drawing Notes

Drawing & schedule based on the following information:

Architect's drawing/model:	**AWSM - Countryside Collection Layout 22.01.2026**
Revision:	
Received:	
Topographic Survey:	**3606-SU001-005_ZS Surveys Ltd - Sitewide Topo with Added Trees (October 2023)_For Information_8_1**
Revision:	
Received:	

Residual Hazards

Health, Safety & Environmental Notes

General Notes

1. All Coordinates relate to Topographical survey coordination
2. All Dimension in mm unless notified otherwise
3. All Levels in mAOD in relation to Topographical survey coordination unless notified otherwise.
4. This drawing should be read in conjunction with Adept specification for drainage works and any other subsequent additions to this list.
5. All levels of the existing sewers have been checked on site and are correct as shown.
6. Sewers designed in accordance with SSG.

Key

- Site Boundary
- Millers / Vistry Land ownership boundary
- Drainage to be adopted under S38 agreement
- Drainage to be adopted under separate S104/S106 agreement
- Adoptable SW drain/sewer
- Adoptable FW drain/sewer
- Adoptable CW drain/sewer
- Existing Combined Sewer
- S38 Gully and leg
- S104 sewer easement
- S104 Attenuation Tank
- Vehicle Access Track

Date	Description	By	Chk	Rev
20.05.26	B-SWDC16 Location updated as per client comments	WD	AT	P9
23.04.26	Gullies updated to align with S38	AT	RP	P8
06.03.25	Updated to suit Leep comments dated 25.02.26	AT	RP	P7
06.02.25	Site boundary updated to solid green line and FFL's added	WD	AT	P6
24.11.25	Cover levels and gullies updated	CS	AT	P5
29.09.25	Drawing updated to suit latest drainage design	AT	RP	P4
18.06.25	Updated to suit latest architectural layout	WD	AT	P3
20.05.25	Drawing updated to suit new highway levels and FW outfall	AT	RP	P2
07.02.25	Initial Issue	WD	AT	P1

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Project
Blackmoorfoot, Huddersfield

Title
S104 BMF - Drainage Layout Sheet 1 of 4

Client
Countryside Partnerships

Scale @ A0	Initial author	Initial checker	Approver	Initial Date
1:250	WD	AT	RP	Feb '25

Status	Purpose	Adept Project Number
S2	Preliminary	08.24007

Project-Originator-Functional Breakdown-Spatial Breakdown-Form-Discipline-Number: 08.24007-ACE-00-ZZ-D-C-1201 — Rev. P9

Appendix B

- Care Home Drainage Strategy
- Impermeable Area Plan
- Overland Flow Route Plan
- InfoDrainage Calculations
- Drainage Asset Maintenance Schedule



Do Not Scale

Drawing Notes

Drawing & schedule based on the following information:

Architect's drawing/model:	**HD4 7AF - A-03 - PROPOSED SITE PLAN - 260824**
Revision:	
Received:	
Topographic Survey:	**3606-SU001-005_ZS Surveys Ltd - Sitewide Topo with Added Trees (October 2023)_For Information_A_1**
Revision:	
Received:	

Residual Hazards

Health, Safety & Environmental Notes

KEY

- Site Boundary
- Proposed Foul Water Drain (PCC Manhole / PPIC)
- Proposed Surface Water Drain (PCC Manhole / PPIC)
- SW Sewer adopted by IWNL (PCC Manhole / PPIC)
- FW Sewer adopted by IWNL (PCC Manhole / PPIC)
- Proposed Foul Gully
- Proposed Channel Drain
- Proposed Attenuation Tank
- Proposed Pervious Paving
- Proposed Underdrain

Date	Description	By	Chk	Rev
02.09.26	Updated to suit latest site layout	WD	AT	P3
04.06.26	Updated to suit client comments and latest site layout	WD	AT	P2
29.05.26	Initial Issue	WD	AT	P1

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Project
Felks Stile Rd Care Home

Title
Drainage Plan

Client
LNT Care Developments

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:200	WD	AT	RP	May '26

Status	Purpose	Adept Project Number
S2	Preliminary	08.24008

Project-Originator-Functional Breakdown-Spatial Breakdown-Form-Discipline-Number: 08.24008-ACE-00-ZZ-D-C-1000 — Rev. P3



Do Not Scale

Drawing Notes

Drawing & schedule based on the following information:

Architect's drawing/model:	**HD4 7AF - A-03 - PROPOSED SITE PLAN - 260824**
Revision:	
Received:	
Topographic Survey:	**3606-SU001-005_ZS Surveys Ltd - Sitewide Topo with Added Trees (October 2023)_For Information_A_1**
Revision:	
Received:	

Residual Hazards

Health, Safety & Environmental Notes

KEY

Site Boundary

Impermeable Area = 2650m²

Date	Description	By	Chk	Rev
02.09.26	Updated to suit latest site layout	WD	AT	P2
04.06.26	Initial Issue	WD	AT	P1

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Project
Felks Stile Rd Care Home

Title
Impermeable Area Plan

Client
LNT Care Developments

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:200	WD	AT	RP	May '26

Status	Purpose	Adept Project Number
S2	Preliminary	08.24008

Project-Originator-Functional Breakdown-Spatial Breakdown-Form-Discipline-Number: 08.24008-ACE-00-ZZ-D-C-1050 | Rev. P2



Do Not Scale

Drawing Notes

Drawing & schedule based on the following information:

Architect's drawing/model:	**HD4 7AF - A-03 - PROPOSED SITE PLAN - 260824**
Revision:	
Received:	
Topographic Survey:	**3606-SU001-005_ZS Surveys Ltd -**
Revision:	**Sitewide Topo with Added Trees**
Received:	**(October 2023)_For Information_A_1**

Residual Hazards

Health, Safety & Environmental Notes

KEY

Site Boundary

Overland Flow Route

Date	Description	By	Chk	Rev
02.09.26	Updated to suit latest site layout	WD	AT	P2
04.06.26	Initial Issue	WD	AT	P1

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Project
Felks Stile Rd Care Home

Title
Overland Flow Plan

Client
LNT Care Developments

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:200	WD	AT	RP	May '26

Status	Purpose	Adept Project Number
S2	Preliminary	08.24008

Project-Originator-Functional Breakdown-Spatial Breakdown-Form-Discipline-Number: 08.24008-ACE-00-ZZ-D-C-1020 Rev. P2

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

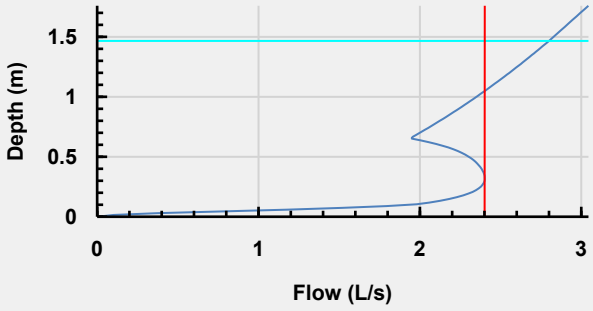
Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SW01	Manhole	411312.330	414405.450	233.011	1.324	231.687	Circular	1.350
SW02	Manhole	411326.886	414409.629	232.258	1.379	230.879	Circular	1.350
SW03	Manhole	411300.782	414374.991	231.685	1.140	230.545	Circular	0.450
RE1	Manhole	411314.381	414367.939	231.462	0.764	230.698	Circular	0.315
SW05	Manhole	411313.226	414391.933	231.458	1.165	230.293	Circular	0.450
RE2	Manhole	411319.870	414365.093	231.468	0.782	230.686	Circular	0.315
SW08	Manhole	411351.055	414348.921	231.456	1.121	230.335	Circular	0.450
SW04	Manhole	411305.292	414390.825	231.451	1.078	230.373	Circular	0.450
SW07	Manhole	411344.548	414382.230	231.428	1.482	229.946	Circular	0.450
SW06	Manhole	411336.723	414379.750	231.396	1.368	230.028	Circular	0.450
SW10	Manhole	411353.270	414399.047	231.346	1.752	229.594	Circular	0.450
SW09	Manhole	411372.008	414389.327	231.111	1.231	229.880	Circular	0.450
SW11	Manhole	411361.509	414425.254	230.487	2.053	228.434	Circular	1.350
SW02a	Manhole	411341.797	414401.773	231.457	1.560	229.897	Circular	1.200
B-SWDC16	Manhole	411360.427	414435.034	230.519	3.021	227.498	Circular	1.200
SW03a	Manhole	411300.018	414380.657	231.451	0.963	230.488	Circular	0.450
SW08a	Manhole	411362.597	414371.180	231.455	1.371	230.084	Circular	0.450
SW10a	Manhole	411357.588	414407.373	231.262	0.988	230.274	Circular	0.450

Name	Part Family	Lock
SW01		None
SW02		None
SW03		None
RE1		None
SW05		None
RE2		None
SW08		None
SW04		None
SW07		None
SW06		None
SW10		None
SW09		None
SW11		None
SW02a		None
B-SWDC16		None
SW03a		None
SW08a		None
SW10a		None

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	4.000	Free Discharge
SW02	Outlet	4.001	Free Discharge
SW03	Outlet	3.001	Free Discharge
RE1	Outlet	3.000	Free Discharge
SW05	Outlet	3.004	Free Discharge
RE2	Outlet	1.000	Free Discharge
SW08	Outlet	1.001	Free Discharge
SW04	Outlet	3.003	Free Discharge
SW07	Outlet	3.006	Free Discharge
SW06	Outlet	3.005	Free Discharge
SW10	Outlet	1.004	Free Discharge
SW09	Outlet	1.003	Free Discharge
SW11	Outlet (1)	1.006	Hydro-Brake®
	Invert Level (m)	228.434	
	Design Depth (m)	1.466	
	Design Flow (L/s)	2.8	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0073-2800-1466-2800	
SW02a	Outlet	4.002	Free Discharge
SW03a	Outlet	3.002	Free Discharge
SW08a	Outlet	1.002	Free Discharge
SW10a	Outlet	2.000	Free Discharge



Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: S104 SW Network	Company Address:		



Care Home Tank

Type : Tank

Dimensions

Exceedance Level (m)	231.100
Depth (m)	2.400
Base Level (m)	228.700
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	187.110

Depth (m)	Area (m²)	Volume (m³)
0.000	163.079	59.849
1.200	163.079	59.849

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	4.002
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	1.004
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.005
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	22.759

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: S104 SW Network	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (m²)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (m²)
Catchment Area	SW08a		Time of Concentration	143.161	100	0	100	143.161
Catchment Area (1)	SW09		Time of Concentration	99.076	100	0	100	99.076
Catchment Area (2)	SW09		Time of Concentration	61.789	100	0	100	61.789
Catchment Area (3)	SW10		Time of Concentration	99.066	100	0	100	99.066
Catchment Area (4)	SW06		Time of Concentration	255.412	100	0	100	255.412
Catchment Area (5)	SW05		Time of Concentration	193.353	100	0	100	193.353
Catchment Area (6)	SW04		Time of Concentration	35.115	100	0	100	35.115
Catchment Area (7)	RE1		Time of Concentration	164.638	100	0	100	164.638
Catchment Area (8)	RE2		Time of Concentration	238.480	100	0	100	238.480
Catchment Area (9)	SW08		Time of Concentration	96.142	100	0	100	96.142
Catchment Area (10)	SW02		Time of Concentration	144.058	100	0	100	144.058
Catchment Area (11)	SW01		Time of Concentration	142.629	100	0	100	142.629
Catchment Area (12)	SW02		Time of Concentration	43.381	100	0	100	43.381
Catchment Area (13)	SW02a		Time of Concentration	64.152	100	0	100	64.152
Catchment Area (14)	SW10a		Time of Concentration	55.874	100	0	100	55.874
Catchment Area (15)	SW11		Time of Concentration	23.245	100	0	100	23.245
Catchment Area (16)	SW02a		Time of Concentration	172.969	100	0	100	172.969
Catchment Area (17)	SW02a		Time of Concentration	44.834	100	0	100	44.834
Catchment Area (18)	SW10a		Time of Concentration	572.463	100	0	100	572.463
TOTAL		**0.0**		**2649.836**				**2649.836**

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 100 years: Increase Rainfall (%): +30: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 100 years: +30 %: 15 mins: Summer	233.011	231.687	231.734	0.047	9.0	0.068	0.000	8.9	3.907	OK
SW02	FSR: 100 years: +30 %: 15 mins: Summer	232.258	230.879	230.952	0.073	20.7	0.104	0.000	20.3	9.042	OK
SW03	FSR: 100 years: +30 %: 30 mins: Summer	231.685	230.545	230.766	0.221	7.1	0.035	0.000	6.9	6.224	Surcharged
RE1	FSR: 100 years: +30 %: 30 mins: Summer	231.462	230.698	230.787	0.089	7.2	0.007	0.000	7.1	6.225	OK
SW05	FSR: 100 years: +30 %: 30 mins: Summer	231.458	230.293	230.730	0.437	15.2	0.069	0.000	14.8	14.858	Surcharged
RE2	FSR: 100 years: +30 %: 30 mins: Summer	231.468	230.686	230.915	0.229	10.4	0.018	0.000	10.1	8.991	Surcharged
SW08	FSR: 100 years: +30 %: 30 mins: Summer	231.456	230.335	230.803	0.468	14.3	0.074	0.000	13.3	12.626	Surcharged
SW04	FSR: 100 years: +30 %: 30 mins: Summer	231.451	230.373	230.744	0.371	8.5	0.059	0.000	7.7	7.548	Surcharged
SW07	FSR: 100 years: +30 %: 15 mins: Summer	231.428	229.946	230.344	0.398	25.8	0.063	0.000	25.8	17.825	Surcharged
SW06	FSR: 100 years: +30 %: 15 mins: Summer	231.396	230.028	230.562	0.534	28.6	0.085	0.000	25.8	17.759	Surcharged
SW10	FSR: 100 years: +30 %: 15 mins: Summer	231.346	229.594	229.967	0.373	90.7	0.059	0.000	90.4	55.177	Surcharged
SW09	FSR: 100 years: +30 %: 15 mins: Summer	231.111	229.880	230.422	0.542	28.0	0.086	0.000	25.0	17.505	Surcharged
SW11	FSR: 100 years: +30 %: 480 mins: Winter	230.487	228.434	229.867	1.433	3.0	2.050	0.000	2.8	138.507	Surcharged
SW02a	FSR: 100 years: +30 %: 15 mins: Summer	231.457	229.897	230.040	0.143	38.1	0.162	0.000	36.9	16.769	OK
B-SWDC16	FSR: 100 years: +30 %: 480 mins: Winter	230.519	227.498	227.521	0.023	2.8	0.000	0.000	2.8	138.482	OK
SW03a	FSR: 100 years: +30 %: 30 mins: Summer	231.451	230.488	230.757	0.269	6.9	0.043	0.000	6.9	6.223	Surcharged
SW08a	FSR: 100 years: +30 %: 30 mins: Summer	231.455	230.084	230.655	0.571	19.5	0.091	0.000	18.9	18.039	Surcharged
SW10a	FSR: 100 years: +30 %: 15 mins: Summer	231.262	230.274	230.417	0.143	39.7	0.023	0.000	35.8	17.210	OK

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 100 years: Increase Rainfall (%): +30: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Care Home Tank	FSR: 100 years: +30 %: 480 mins: Winter	229.868	229.868	1.168	1.168	21.7	180.880	0.000	0.000	3.0	138.264	3.329	OK

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

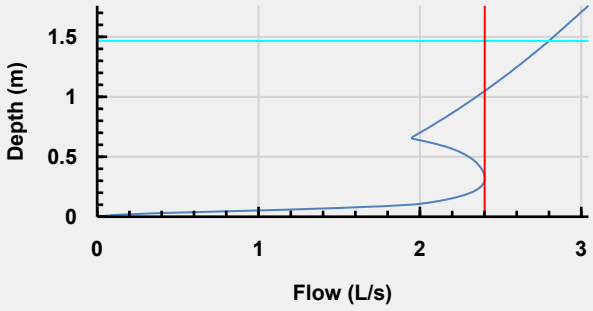
Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SW01	Manhole	411312.330	414405.450	233.011	1.324	231.687	Circular	1.350
SW02	Manhole	411326.886	414409.629	232.258	1.379	230.879	Circular	1.350
SW03	Manhole	411300.782	414374.991	231.685	1.140	230.545	Circular	0.450
RE1	Manhole	411314.381	414367.939	231.462	0.764	230.698	Circular	0.315
SW05	Manhole	411313.226	414391.933	231.458	1.165	230.293	Circular	0.450
RE2	Manhole	411319.870	414365.093	231.468	0.782	230.686	Circular	0.315
SW08	Manhole	411351.055	414348.921	231.456	1.121	230.335	Circular	0.450
SW04	Manhole	411305.292	414390.825	231.451	1.078	230.373	Circular	0.450
SW07	Manhole	411344.548	414382.230	231.428	1.482	229.946	Circular	0.450
SW06	Manhole	411336.723	414379.750	231.396	1.368	230.028	Circular	0.450
SW10	Manhole	411353.270	414399.047	231.346	1.752	229.594	Circular	0.450
SW09	Manhole	411372.008	414389.327	231.111	1.231	229.880	Circular	0.450
SW11	Manhole	411361.509	414425.254	230.487	2.053	228.434	Circular	1.350
SW02a	Manhole	411341.797	414401.773	231.457	1.560	229.897	Circular	1.200
B-SWDC16	Manhole	411360.427	414435.034	230.519	3.021	227.498	Circular	1.200
SW03a	Manhole	411300.018	414380.657	231.451	0.963	230.488	Circular	0.450
SW08a	Manhole	411362.597	414371.180	231.455	1.371	230.084	Circular	0.450
SW10a	Manhole	411357.588	414407.373	231.262	0.988	230.274	Circular	0.450

Name	Part Family	Lock
SW01		None
SW02		None
SW03		None
RE1		None
SW05		None
RE2		None
SW08		None
SW04		None
SW07		None
SW06		None
SW10		None
SW09		None
SW11		None
SW02a		None
B-SWDC16		None
SW03a		None
SW08a		None
SW10a		None

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	4.000	Free Discharge
SW02	Outlet	4.001	Free Discharge
SW03	Outlet	3.001	Free Discharge
RE1	Outlet	3.000	Free Discharge
SW05	Outlet	3.004	Free Discharge
RE2	Outlet	1.000	Free Discharge
SW08	Outlet	1.001	Free Discharge
SW04	Outlet	3.003	Free Discharge
SW07	Outlet	3.006	Free Discharge
SW06	Outlet	3.005	Free Discharge
SW10	Outlet	1.004	Free Discharge
SW09	Outlet	1.003	Free Discharge
SW11	Outlet (1)	1.006	Hydro-Brake®
	Invert Level (m)	228.434	
	Design Depth (m)	1.466	
	Design Flow (L/s)	2.8	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0073-2800-1466-2800	
SW02a	Outlet	4.002	Free Discharge
SW03a	Outlet	3.002	Free Discharge
SW08a	Outlet	1.002	Free Discharge
SW10a	Outlet	2.000	Free Discharge



Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: S104 SW Network	Company Address:		



Care Home Tank

Type : Tank

Dimensions

Exceedance Level (m)	231.100
Depth (m)	2.400
Base Level (m)	228.700
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	187.110

Depth (m)	Area (m²)	Volume (m³)
0.000	163.079	59.849
1.200	163.079	59.849

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	4.002
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	1.004
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.005
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	22.759

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: S104 SW Network	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (m²)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (m²)
Catchment Area	SW08a		Time of Concentration	143.161	100	0	100	143.161
Catchment Area (1)	SW09		Time of Concentration	99.076	100	0	100	99.076
Catchment Area (2)	SW09		Time of Concentration	61.789	100	0	100	61.789
Catchment Area (3)	SW10		Time of Concentration	99.066	100	0	100	99.066
Catchment Area (4)	SW06		Time of Concentration	255.412	100	0	100	255.412
Catchment Area (5)	SW05		Time of Concentration	193.353	100	0	100	193.353
Catchment Area (6)	SW04		Time of Concentration	35.115	100	0	100	35.115
Catchment Area (7)	RE1		Time of Concentration	164.638	100	0	100	164.638
Catchment Area (8)	RE2		Time of Concentration	238.480	100	0	100	238.480
Catchment Area (9)	SW08		Time of Concentration	96.142	100	0	100	96.142
Catchment Area (10)	SW02		Time of Concentration	144.058	100	0	100	144.058
Catchment Area (11)	SW01		Time of Concentration	142.629	100	0	100	142.629
Catchment Area (12)	SW02		Time of Concentration	43.381	100	0	100	43.381
Catchment Area (13)	SW02a		Time of Concentration	64.152	100	0	100	64.152
Catchment Area (14)	SW10a		Time of Concentration	55.874	100	0	100	55.874
Catchment Area (15)	SW11		Time of Concentration	23.245	100	0	100	23.245
Catchment Area (16)	SW02a		Time of Concentration	172.969	100	0	100	172.969
Catchment Area (17)	SW02a		Time of Concentration	44.834	100	0	100	44.834
Catchment Area (18)	SW10a		Time of Concentration	572.463	100	0	100	572.463
TOTAL		**0.0**		**2649.836**				**2649.836**

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 30 years: +0 %: 15 mins: Summer	233.011	231.687	231.723	0.036	5.4	0.052	0.000	5.3	2.326	OK
SW02	FSR: 30 years: +0 %: 15 mins: Summer	232.258	230.879	230.933	0.054	12.3	0.078	0.000	12.0	5.386	OK
SW03	FSR: 30 years: +0 %: 15 mins: Summer	231.685	230.545	230.610	0.065	6.1	0.010	0.000	5.9	2.686	OK
RE1	FSR: 30 years: +0 %: 15 mins: Summer	231.462	230.698	230.761	0.063	6.2	0.005	0.000	6.1	2.688	OK
SW05	FSR: 30 years: +0 %: 15 mins: Summer	231.458	230.293	230.396	0.103	14.2	0.016	0.000	13.3	6.398	OK
RE2	FSR: 30 years: +0 %: 15 mins: Summer	231.468	230.686	230.761	0.075	9.0	0.006	0.000	8.6	3.897	OK
SW08	FSR: 30 years: +0 %: 15 mins: Summer	231.456	230.335	230.425	0.090	12.3	0.014	0.000	11.8	5.451	OK
SW04	FSR: 30 years: +0 %: 15 mins: Summer	231.451	230.373	230.443	0.070	7.1	0.011	0.000	6.9	3.249	OK
SW07	FSR: 30 years: +0 %: 15 mins: Summer	231.428	229.946	230.083	0.137	21.9	0.022	0.000	21.0	10.587	OK
SW06	FSR: 30 years: +0 %: 15 mins: Summer	231.396	230.028	230.251	0.223	22.9	0.035	0.000	21.9	10.568	Surcharged
SW10	FSR: 30 years: +0 %: 15 mins: Summer	231.346	229.594	229.820	0.226	67.5	0.036	0.000	65.6	32.883	Surcharged
SW09	FSR: 30 years: +0 %: 15 mins: Summer	231.111	229.880	230.084	0.204	19.8	0.032	0.000	19.2	10.455	Surcharged
SW11	FSR: 30 years: +0 %: 360 mins: Winter	230.487	228.434	229.303	0.869	2.8	1.243	0.000	2.4	87.247	Surcharged
SW02a	FSR: 30 years: +0 %: 15 mins: Summer	231.457	229.897	229.989	0.092	22.6	0.104	0.000	22.2	9.994	OK
B-SWDC16	FSR: 30 years: +0 %: 30 mins: Summer	230.519	227.498	227.519	0.021	2.4	0.000	0.000	2.4	6.689	OK
SW03a	FSR: 30 years: +0 %: 15 mins: Summer	231.451	230.488	230.550	0.062	5.9	0.010	0.000	5.8	2.683	OK
SW08a	FSR: 30 years: +0 %: 15 mins: Summer	231.455	230.084	230.210	0.126	17.2	0.020	0.000	13.8	7.787	OK
SW10a	FSR: 30 years: +0 %: 15 mins: Summer	231.262	230.274	230.352	0.078	23.7	0.012	0.000	23.5	10.256	OK

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Care Home Tank	FSR: 30 years: +0 %: 360 mins: Winter	229.303	229.303	0.603	0.603	15.9	93.459	0.000	0.000	2.8	87.420	50.051	OK

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

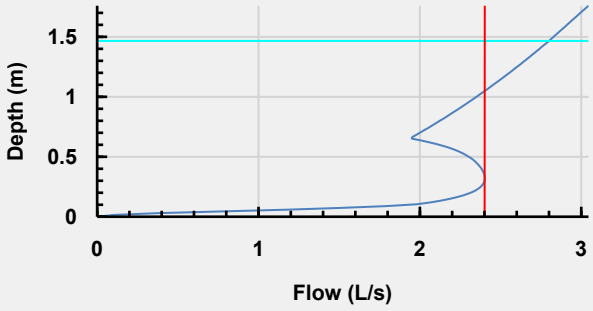
Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SW01	Manhole	411312.330	414405.450	233.011	1.324	231.687	Circular	1.350
SW02	Manhole	411326.886	414409.629	232.258	1.379	230.879	Circular	1.350
SW03	Manhole	411300.782	414374.991	231.685	1.140	230.545	Circular	0.450
RE1	Manhole	411314.381	414367.939	231.462	0.764	230.698	Circular	0.315
SW05	Manhole	411313.226	414391.933	231.458	1.165	230.293	Circular	0.450
RE2	Manhole	411319.870	414365.093	231.468	0.782	230.686	Circular	0.315
SW08	Manhole	411351.055	414348.921	231.456	1.121	230.335	Circular	0.450
SW04	Manhole	411305.292	414390.825	231.451	1.078	230.373	Circular	0.450
SW07	Manhole	411344.548	414382.230	231.428	1.482	229.946	Circular	0.450
SW06	Manhole	411336.723	414379.750	231.396	1.368	230.028	Circular	0.450
SW10	Manhole	411353.270	414399.047	231.346	1.752	229.594	Circular	0.450
SW09	Manhole	411372.008	414389.327	231.111	1.231	229.880	Circular	0.450
SW11	Manhole	411361.509	414425.254	230.487	2.053	228.434	Circular	1.350
SW02a	Manhole	411341.797	414401.773	231.457	1.560	229.897	Circular	1.200
B-SWDC16	Manhole	411360.427	414435.034	230.519	3.021	227.498	Circular	1.200
SW03a	Manhole	411300.018	414380.657	231.451	0.963	230.488	Circular	0.450
SW08a	Manhole	411362.597	414371.180	231.455	1.371	230.084	Circular	0.450
SW10a	Manhole	411357.588	414407.373	231.262	0.988	230.274	Circular	0.450

Name	Part Family	Lock
SW01		None
SW02		None
SW03		None
RE1		None
SW05		None
RE2		None
SW08		None
SW04		None
SW07		None
SW06		None
SW10		None
SW09		None
SW11		None
SW02a		None
B-SWDC16		None
SW03a		None
SW08a		None
SW10a		None

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: S104 SW Network	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	4.000	Free Discharge
SW02	Outlet	4.001	Free Discharge
SW03	Outlet	3.001	Free Discharge
RE1	Outlet	3.000	Free Discharge
SW05	Outlet	3.004	Free Discharge
RE2	Outlet	1.000	Free Discharge
SW08	Outlet	1.001	Free Discharge
SW04	Outlet	3.003	Free Discharge
SW07	Outlet	3.006	Free Discharge
SW06	Outlet	3.005	Free Discharge
SW10	Outlet	1.004	Free Discharge
SW09	Outlet	1.003	Free Discharge
SW11	Outlet (1)	1.006	Hydro-Brake®
	Invert Level (m)	228.434	
	Design Depth (m)	1.466	
	Design Flow (L/s)	2.8	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0073-2800-1466-2800	
SW02a	Outlet	4.002	Free Discharge
SW03a	Outlet	3.002	Free Discharge
SW08a	Outlet	1.002	Free Discharge
SW10a	Outlet	2.000	Free Discharge



Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: S104 SW Network	Company Address:		



Care Home Tank

Type : Tank

Dimensions

Exceedance Level (m)	231.100
Depth (m)	2.400
Base Level (m)	228.700
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	187.110

Depth (m)	Area (m²)	Volume (m³)
0.000	163.079	59.849
1.200	163.079	59.849

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	4.002
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	1.004
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.005
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	22.759

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: S104 SW Network	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (m²)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (m²)
Catchment Area	SW08a		Time of Concentration	143.161	100	0	100	143.161
Catchment Area (1)	SW09		Time of Concentration	99.076	100	0	100	99.076
Catchment Area (2)	SW09		Time of Concentration	61.789	100	0	100	61.789
Catchment Area (3)	SW10		Time of Concentration	99.066	100	0	100	99.066
Catchment Area (4)	SW06		Time of Concentration	255.412	100	0	100	255.412
Catchment Area (5)	SW05		Time of Concentration	193.353	100	0	100	193.353
Catchment Area (6)	SW04		Time of Concentration	35.115	100	0	100	35.115
Catchment Area (7)	RE1		Time of Concentration	164.638	100	0	100	164.638
Catchment Area (8)	RE2		Time of Concentration	238.480	100	0	100	238.480
Catchment Area (9)	SW08		Time of Concentration	96.142	100	0	100	96.142
Catchment Area (10)	SW02		Time of Concentration	144.058	100	0	100	144.058
Catchment Area (11)	SW01		Time of Concentration	142.629	100	0	100	142.629
Catchment Area (12)	SW02		Time of Concentration	43.381	100	0	100	43.381
Catchment Area (13)	SW02a		Time of Concentration	64.152	100	0	100	64.152
Catchment Area (14)	SW10a		Time of Concentration	55.874	100	0	100	55.874
Catchment Area (15)	SW11		Time of Concentration	23.245	100	0	100	23.245
Catchment Area (16)	SW02a		Time of Concentration	172.969	100	0	100	172.969
Catchment Area (17)	SW02a		Time of Concentration	44.834	100	0	100	44.834
Catchment Area (18)	SW10a		Time of Concentration	572.463	100	0	100	572.463
TOTAL		**0.0**		**2649.836**				**2649.836**

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 2 years: +0 %: 15 mins: Summer	233.011	231.687	231.713	0.026	2.8	0.038	0.000	2.8	1.231	OK
SW02	FSR: 2 years: +0 %: 15 mins: Summer	232.258	230.879	230.918	0.039	6.5	0.055	0.000	6.3	2.849	OK
SW03	FSR: 2 years: +0 %: 15 mins: Summer	231.685	230.545	230.590	0.045	3.2	0.007	0.000	3.1	1.420	OK
RE1	FSR: 2 years: +0 %: 15 mins: Summer	231.462	230.698	230.743	0.045	3.3	0.003	0.000	3.2	1.423	OK
SW05	FSR: 2 years: +0 %: 15 mins: Summer	231.458	230.293	230.359	0.066	7.4	0.011	0.000	7.1	3.389	OK
RE2	FSR: 2 years: +0 %: 15 mins: Summer	231.468	230.686	230.738	0.052	4.8	0.004	0.000	4.6	2.064	OK
SW08	FSR: 2 years: +0 %: 15 mins: Summer	231.456	230.335	230.396	0.061	6.5	0.010	0.000	6.0	2.891	OK
SW04	FSR: 2 years: +0 %: 15 mins: Summer	231.451	230.373	230.421	0.048	3.7	0.008	0.000	3.6	1.720	OK
SW07	FSR: 2 years: +0 %: 15 mins: Summer	231.428	229.946	230.027	0.081	11.7	0.013	0.000	11.2	5.587	OK
SW06	FSR: 2 years: +0 %: 15 mins: Summer	231.396	230.028	230.125	0.097	12.2	0.015	0.000	11.7	5.593	OK
SW10	FSR: 2 years: +0 %: 15 mins: Summer	231.346	229.594	229.732	0.138	36.3	0.022	0.000	35.9	17.365	OK
SW09	FSR: 2 years: +0 %: 15 mins: Summer	231.111	229.880	229.969	0.089	11.6	0.014	0.000	10.7	5.506	OK
SW11	FSR: 2 years: +0 %: 240 mins: Summer	230.487	228.434	228.957	0.523	2.9	0.749	0.000	2.4	60.827	Surcharged
SW02a	FSR: 2 years: +0 %: 15 mins: Summer	231.457	229.897	229.957	0.060	11.9	0.068	0.000	11.7	5.282	OK
B-SWDC16	FSR: 2 years: +0 %: 30 mins: Summer	230.519	227.498	227.519	0.021	2.4	0.000	0.000	2.4	6.759	OK
SW03a	FSR: 2 years: +0 %: 15 mins: Summer	231.451	230.488	230.531	0.043	3.1	0.007	0.000	3.0	1.417	OK
SW08a	FSR: 2 years: +0 %: 15 mins: Summer	231.455	230.084	230.159	0.075	8.9	0.012	0.000	8.4	4.124	OK
SW10a	FSR: 2 years: +0 %: 15 mins: Summer	231.262	230.274	230.330	0.056	12.5	0.009	0.000	12.4	5.421	OK

Project:	Date: 21/10/2024		
	Designed by: will.dawson	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: S104 SW Network	Company Address:		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Care Home Tank	FSR: 2 years: +0 %: 240 mins: Summer	228.958	228.958	0.258	0.258	17.2	39.948	0.000	0.000	2.9	61.138	78.650	OK

Drainage Asset Maintenance Schedule

Surface Foul

Maintenance Activity	Drainage Component	Required Action	Typical Frequency
Visual Inspection	Gully Sump unit Catch pit / silt trap Attenuation structures Channel drain Flow control chamber Pipework	Inspect for sediment and debris Inspect inlets and outlets for blockage (where applicable)	Monthly for first year and twice yearly thereafter, after severe storm Twice yearly
Monitoring	Attenuation structures	Check attenuation inspection points to ensure emptying is occurring (little to no water should be present after consecutive days of dry weather)	Twice yearly, once after heavy rainfall and once after consecutive dry weather
Litter and Debris Removal	Manhole Pervious paving All sump units (gullies, channel drains and catch pits) Access chambers and pre-treatment devices Flow control chamber Gutters & leaf guards	Remove all litter and debris	Twice yearly or after severe storm Twice yearly (spring, start of winter), or as required
Jet Wash	Pipework	High pressure jet-wash any pipe work which has silt accumulation. Care must be taken that any silts within the pipework are not unnecessarily flushed into the attenuation structures (use of bungs and jet-vac of chamber prior to removal of bungs)	Twice yearly, or as required

		Attenuation structures	High pressure jet-wash all perforated pipework and or access points. All water to be jet vac to remove any suspended silts within the water	Five yearly, or as required
	Sweeping	Pervious paving	Pervious surfaces need to be regularly cleaned of silt and sediment to preserve their infiltration capacity	Yearly, often less where inspections indicate that it is not required
	Silt and Rubber Cleaning	Pervious paving	Jet wash if visible signs of silt and rubber build up. Further maintenance options include locally removing block and geotextile, removing the silt/rubber and replacing as before	Paving to be inspected every spring (when dry)
	Sediment Management and Removal	ALL SUDS	Sediment accumulation should be monitored as part of the inspection regime, rate of sediment accumulation noted	Appropriate frequencies determined upon inspection
	Inspection	Pipework Manhole	Check if functioning correctly	Once site is fully operational: twice yearly for 1st year, annually after.

Additional notes:

- Any defects (broken/misaligned pipes, root infestation, damage to soakaways, missing parts, etc.) that are identified during inspections/maintenance should be reported back to the property/site owner so that the remedial actions can be undertaken promptly to repair these defects.
- SuDS maintenance based on CIRIA 2015 Chapter 32 where further information can also be found.
- Refer to manufacturer guidance for maintenance schedules of all propriety treatment systems.