

Maple Place, Eastleigh

Flood Risk & Drainage Strategy

L251040

27/05/2026



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1.0 Introduction

AKSWard Ltd has been commissioned by Eastleigh Borough Council to produce a Flood Risk Assessment and Drainage Strategy (FRADS) to support the proposed redevelopment of the land at Maple Place, within the area of Eastleigh Borough comprising of 12 new units, in a mix of family houses and apartments, alongside on plot parking and associated landscape works.

This report describes the existing site and its context, assesses the risk of flooding from all relevant sources, and sets out a sustainable foul and surface water drainage strategy for the development. It demonstrates that the scheme can be delivered in accordance with national and local planning policy, without increasing flood risk on site or elsewhere over the lifetime of the development.

2.0 Planning Policy and Guidance

2.1 Overview

The assessment and proposed drainage strategy have been developed with regard to the National Planning Policy Framework (NPPF) 2024, the Strategic Flood Risk Assessment (SFRA) for Eastleigh Borough Council (EBC) and Hampshire's Local Flood Risk Management Strategy (LFRMS) 2018. Relevant guidance issued by the Environment Agency (EA) and the Lead Local Flood Authority (LLFA) has also been considered in developing this report.

2.2 National Planning Policy Framework

Section 14 of the NPPF outlines the requirements for determining if a Flood Risk Assessment is required to be undertaken for new developments. A site-specific FRA should be provided for all sites which are located in Flood Zone 2 and 3; and for certain categories of development in Flood Zone 1, including: sites larger than 1 ha, sites in Critical Drainage Areas, sites identified as being at increased future flood risk in an SFRA, or sites subject to other sources of flooding where more vulnerable uses are proposed.

- An FRA should be provided for sites located in Flood Zone 1 where:
- The development site area > 1ha.
- The site has been identified by the EA or LLFA as being located within a Critical Drainage Area (CDA); or
- The site has been identified in an SFRA as being at increased flood risk in future; or

Land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

The Maple Place site lies within Flood Zone 1 (low probability) and has a total area of approximately 0.10 ha. Strictly, an FRA is not required on size grounds; however, this combined Flood Risk & Drainage Strategy has been prepared to accompany the planning application and to demonstrate that flood risk is appropriately managed and that a sustainable drainage solution can be achieved.

The NPPF sets out the strategy throughout the UK for future development. The key policy provision states that:

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.

All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change so as to avoid, where possible, flood risk to people and property.

All plans and decisions should apply a sequential, risk-based approach to the location of development, taking account of current and future impacts of climate change, so as to avoid flood risk to people and property where possible and manage any residual risk appropriately.

2.3 Local Policies

The site is within the administrative area of Eastleigh Borough Council, with Hampshire County Council acting as Lead Local Flood Authority. The SFRA for Eastleigh Borough and the Hampshire LFRMS provide local guidance on flood risk, surface water management and the application of SuDS, and have been used to inform this assessment.

2.4 Statutory Authority Consultation

The site is located within an area served by Southern Water. Engagement with Southern Water will be undertaken to confirm points of connection and any requirements associated with the proposed foul and surface water discharge arrangements.

3.0 Planning Policy Context

A site-specific FRA should be carried out to demonstrate how flood risk will be managed now and over the development's lifetime, taking into account climate change and with regards to the vulnerability of its users.

In order to adequately consider and demonstrate how the flood risk will be managed, we need to identify what the probability is of the site flooding, what the site is going to be used for, the associated flood risk vulnerability, and the compatibility between the flood risk vulnerability and the flood zones.

This section details how the planning policy is applied to this site-specific FRA. Items highlighted in 'Orange' in the following tables detail the site-specific information.

3.1 Flood Zones

The flood zones refer to the probability of river and sea flooding, ignoring the presence of defences.

Flood Zone	Probability	Definition
Flood Zone 1	Low	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)
Flood Zone 2	Medium	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)
Flood Zone 3a	High	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)
Flood Zone 3b	Functional Flood Plain	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)

Table 1 – Flood Zones

The particular flood zone(s) for the development are detailed on the EA 'Flood Risk Assessment Data', please see Section 7 of this report.

3.2 Flood Risk Vulnerability Classification

The different types of flood risk vulnerability classifications are detailed in Table 2 below:

Classification	Description
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 residential 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.

Classification	Description
Water Compatible	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 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.

Table 2 - Flood Risk Vulnerability Classification

3.3 Flood Risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability Classification					
Flood Zone	Essential Infra	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✗	✓	✓	✓	✓
Flood Zone 3a†	Exception Test	✗	Exception Test	✓	✓
Flood Zone 3b*	Exception Test	✗	✗	✗	✓*

Table 3 - Flood Risk Vulnerability and Flood Zone Compatibility

- ✓ Development Appropriate
- ✗ Development Should not be Permitted
- † 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.

3.4 Sequential Test & Exception Test

Where the construction site does not lie within flood zones 2 or 3, an exception test is not necessary, and the site would be acceptable in terms of vulnerability. For the properties closest on site, it would be deemed necessary to analyse the proposed layout/design to ensure that they do remain out of risk for the potential of flooding.

4.0 Assessment of Flood Risk

4.1 Fluvial and Tidal Flooding

Flood mapping published by the Environment Agency and included within the previous Flood Screening Report confirms that the site lies within Flood Zone 1, defined as land having a less than 1 in 1,000 annual probability of fluvial or tidal flooding. The nearest fluvial feature is Monks Brook, located approximately 900m to the west of the site and at a +5m lower elevation.

On this basis, the site is not considered to be at risk of fluvial flooding in the design or extreme events, and residential development (classified as 'more vulnerable') is appropriate in Flood Zone 1 in accordance with the NPPF.

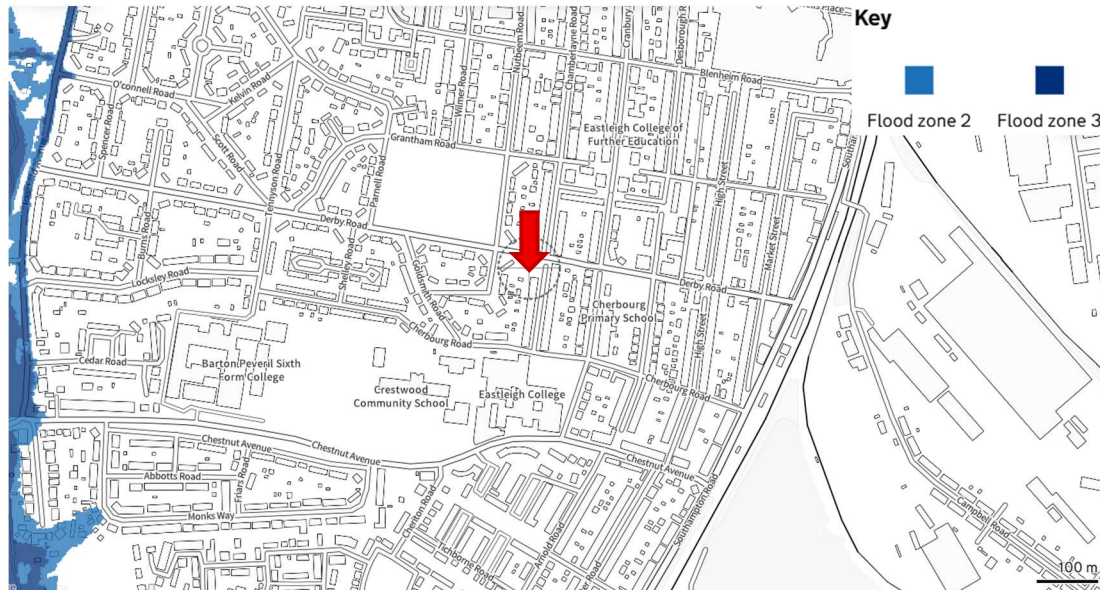


Figure 1 - EA Flood Zone Map (2025)

The future potential flood risk from rivers, watercourses and tidal sources at the site is therefore negligible.

4.2 Flooding from Surface Water (Pluvial)

The EA surface water flood mapping shows no identified risk of surface water flooding at the site for events up to and including the 1 in 1,000 year return period.

In the event of excessive rainfall, where the ground has become saturated and rainfall is not able to infiltrate into the ground, the overland flow would typically flow towards the surrounding highway network, such that surface water ponding is unlikely to occur in its current or proposed configuration. Review of the pre-demolition topographical survey confirms that the site is not located in a local depression.

The site is considered to be at very low risk of pluvial (surface water) flooding.

4.3 Groundwater Flooding

There are typically seven sources, or mechanisms, of groundwater flooding. These were described by Defra (Jacobs 2007) as:

- The rise of typically high groundwater levels to extreme levels due to prolonged extreme rainfall;
- The rise of groundwater levels in aquifers in hydraulic continuity with high in-bank river levels or extreme tidal conditions;
- The increase in groundwater levels and change of ground water flow paths due to artificial obstructions or pathways, like foundations, and the loss of natural storage and drainage paths;
- Rising groundwater levels due to a reduction in ground water extraction in Urban areas;
- Rising groundwater levels due to leaking sewers, drains and water mains;
- Faulty borehole headworks or casings causing upward leakage of groundwater through confining layers driven by artesian heads; and
- Subsidence of the ground surface below the current groundwater level.

Of the above-mentioned potential causes of groundwater flooding, the first two are directly affected as a result of environmental conditions. The remaining five potential causes of groundwater flooding are mainly the result of man-made activities, or the stopping of such activities.

There are no works currently being undertaken at the development site or planned to be undertaken at the development site that would have an impact on the five man-made causes of ground water flooding. As such, this FRA will review the impact on groundwater flooding based on the environmental conditions at the site.

Intrusive ground investigation undertaken for the previous planning application identified underlying strata of gravelly clay with very low infiltration potential, with BRE365 testing indicating a notional infiltration rate of the order of 1.6×10^{-6} m/s. Whilst this confirms that soakaway-type SuDS are not viable, it also indicates that groundwater levels are not expected to rise to a level that would pose a significant flood risk to the proposed development.

The overall risk of groundwater flooding to the site is therefore assessed as negligible to low.

4.4 Flooding from Public Sewers/Highway Drains

Sewer flooding can occur when sewer systems become overloaded. Flooding usually happens when either; flood water backs up in the pipes and surcharges into low lying area or where the capacity of the system is exceeded and water discharges from the manholes and runs overland.

It has traditionally been thought that in areas where the groundwater level is high, the risk of groundwater entering the sewer network through pipe joints and cracks is high. As a result, the capacity of the pipe network is reduced. As has been discussed above in Section 4.3, the risk of groundwater flooding to the development site area is low and as such, the risk of sewer flooding is also low.

Modern construction techniques and Building Regulations stipulate that the foul water sewer system is to be installed watertight to prevent the ingress of ground water to the foul water system.

The Proposed site has a very low risk of internal flooding from the ingress of ground water to the system. Further to this, the risk of internal foul water flooding to the development is low.

4.5 Flooding from Artificial Sources

There are no reservoirs located nearby the following site and so there is a low risk of flooding from the failure of reservoirs in the surrounding area.

4.6 High ++ Allowances for Climate Change

The EA defines High ++ Allowances as to “only apply in assessments for developments that are very sensitive to flood risk, and with lifetimes beyond the end of the century. For example, infrastructure projects or developments that significantly change existing settlement patterns. This includes urban extensions and new settlements.” Although the life expectancy of the proposed development will extend into the next century, we do not believe that this development meets the requirements for a High ++ Allowance and as such have not included for this allowance.

4.7 Peak Rainfall Intensity Allowance for Climate Change

Having reviewed the Department for Environment, Climate Change Allowances, Peak Rainfall Allowances, we have assumed a climate change allowance of +45% CC increase for the proposed onsite surface water drainage design, please see figure 2 below:

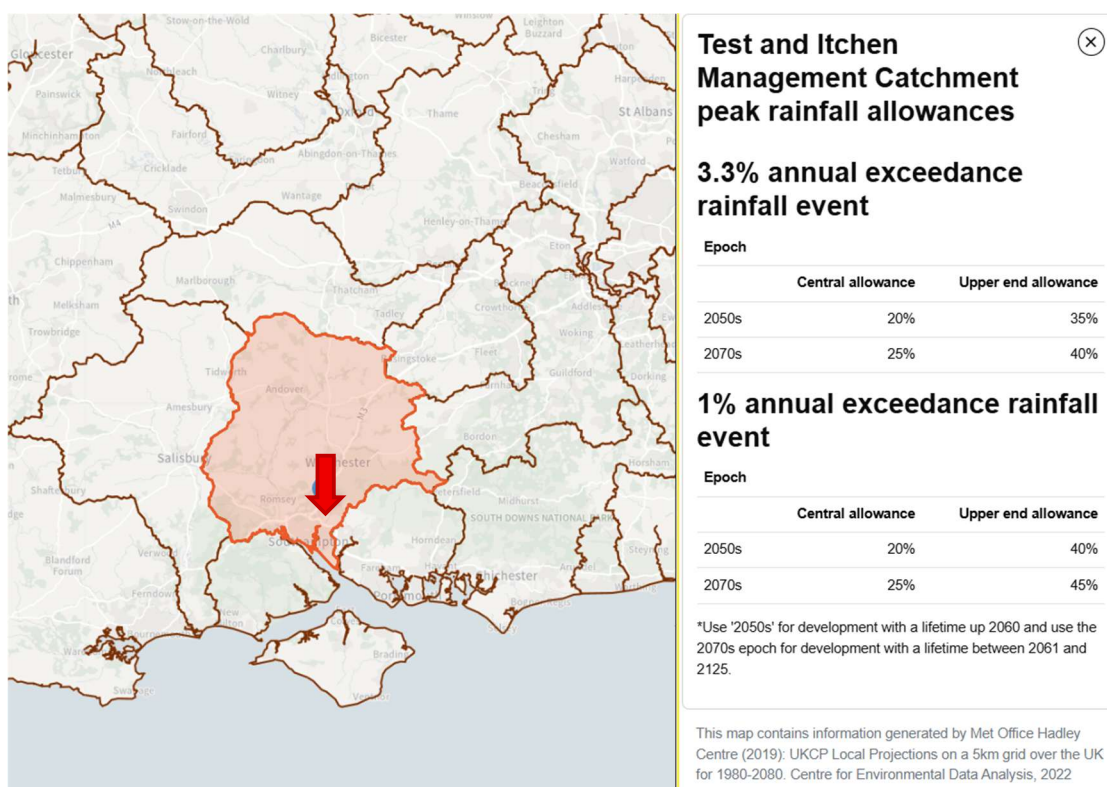


Figure 2 - Department for Environment, Climate Change Allowances

4.8 Urban Creep

In line with best practice guidance and local LLFA requirements, an allowance has been made for future “urban creep” to reflect the potential for incremental increases in hardstanding (e.g. house extensions, garden buildings and patios) over the lifetime of the development.

For the purposes of the surface water drainage design, a 10% increase in impermeable roof area has been applied to the proposed development, with the contributing area within the hydraulic calculations increased accordingly. This ensures that the attenuation and flow control measures provide sufficient capacity not only for the baseline layout but also for reasonable future intensification of built footprint.

The urban creep allowance has been included within the network modelling for the critical storm events (up to and including the 1 in 100 year plus 45% climate change event), so that the resulting storage volumes and discharge rates remain robust for the design life of the scheme.

5.0 Proposed Drainage Strategy

5.1 Sustainable Drainage Systems (SuDS)

The SuDS manual (Ciria C753) identifies that “Surface water is a valuable resource, and this should be reflected in the way it is managed and used in the built environment. It can add to and enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate”.

The Philosophy for the use of utilising SuDS is to maximise the benefits and minimise the negative impacts of surface water run-off from developed areas. The approach that SuDS takes on is to reduce the quantity and velocity of surface water from a developed area to manage pollution and downstream flood risk.

This approach is achieved by harvesting, infiltrating, slowing, storing, conveying and treating run-off on site and where possible, on the surface rather than underground. The implementation of SuDS mimics as closely as possible the natural drainage of the site before the development.

SuDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used in a management train that reinforces and, where possible, follows the natural pattern of drainage. The management train incorporates a hierarchy of techniques. These are:

- Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (examples include minimising paved areas and the use of sweeping to remove surface dust from car parks),
- Source control – control of runoff at or very near its source (such as the use of rainwater harvesting, pervious pavements, green roofs or soakaways for individual houses).
- Site control – management of water from several sub-catchments (including routeing water from roofs and car parks to one large soakaway or infiltration basin for the whole site).
- Regional control – management of runoff from several sites, typically in a detention pond or wetland.

Adopting a holistic approach towards surface water drainage provides the benefits of combined water quality and quantity control, as well as increased amenity value. This is accomplished by managing the increased flows and pollution from surface water runoff that can arise from development. Ideally, the system should utilise a management train and should achieve equal standing in all three of these areas. However, specific site considerations may mean that a balance of benefits is not always achieved.

The priority for the discharge of surface water run-off should be:

- Infiltration;
- Discharge to surface waters;
- Discharge to a surface water sewer, highway drain or another drainage system;
- Discharge to a combined sewer.

In order to manage surface water sustainably, the use of SuDS is recommended. There are a number of different options available. Various SuDS systems have been assessed to determine their suitability for the proposed development site.

Based on the above assessment, the outline drainage strategy for the development could include some of the following SuDS features within the design (subject to detail design and agreement with the local authority, LLFA and the EA):

- Pervious Pavements;
- Cellular Attenuation.

5.2 Existing Surface Water Drainage

Pre-demolition topographical survey and sewer records show that the historic site was fully developed as commercial buildings and hardstanding, with surface water drained via gullies and below-ground pipework into the surrounding public sewer network operated by Southern Water.

The previous FRA established that the impermeable area of the former site was approximately 0.105 ha, with runoff discharged unattenuated to the public surface water sewers. For a 50 mm/hr rainfall event, peak runoff from the historic arrangement could have been of the order of 14.5 l/s.

There are no existing SuDS features on the site, and no evidence of on-site surface water storage or treatment; the proposed strategy therefore represents a significant improvement over the historic drainage regime.

5.3 Proposed Surface Water Drainage Strategy

The proposed development will introduce roofs, private gardens and parking/driveway areas in place of the previous commercial buildings and hardstanding, with a greater opportunity for permeable surfacing and on-site attenuation. Surface water runoff from roofs will be collected via rainwater pipes and discharged into the on-site surface water network, whilst external paved areas will drain via permeable paving and road gullies as appropriate.

Please see Table 4 and Table 5 to show the comparison in permeable/impermeable areas, below:

Item	Description	Area (m ²)
1.	Existing Permeable Area	0
2.	Existing Impermeable Area	1,024
Total		1,024

Table 4 – Existing Development Surface Coverage

Proposed permeable and impermeable areas for the development site are summarised below in table 5:

Item	Description	Area (m ²)
1.	Development Permeable Area	424
2.	Development Impermeable Area	600
Total		1,024

Table 5 – Proposed Permeable and Impermeable Surface Areas

In line with national policy and LLFA guidance, the strategy is to continue discharging surface water to the existing public surface water sewer network, but with peak flows restricted as close as is practicable to pre-development greenfield runoff rates, with on-site attenuation provided to manage the 1 in 100 year plus 45% climate change event. Please refer to **Appendix B** for the surface water calculations.

Greenfield runoff rates for the 0.105 ha site have been calculated using the HR Wallingford Greenfield runoff rate estimation, as set out in the previous FRA. The calculated rates are:

QBAR:	0.6 l/s
1 in 1 year (QBAR) return period:	0.5 l/s
1 in 30 years return period (3.3% AEP):	1.3 l/s
1 in 100 years return period (1% AEP):	1.9 l/s

Greenfield runoff rates can be found in **Appendix C**.

These flows are very small and in practice cannot be reliably controlled without an increased risk of blockage of the flow control device. The earlier design therefore adopted a minimum practicable orifice diameter of 50 mm, resulting in a QBAR discharge rate of approximately 2.1 l/s and a 1 in 100 year +45% CC discharge rate of approximately 4.5 l/s. Given the modest

site area and historic unattenuated discharge rate of around 14.5 l/s, these controlled rates represent a substantial reduction in peak flows to the public sewer system.

Attenuation for the proposed development will be provided through a combination of permeable paving sub-bases within parking and hardstanding areas and a below-ground cellular storage tank located within the car parking/driveway zone, as indicated on the below-ground drainage layout. The storage volume has been sized using hydraulic modelling (Causeway Flow) to ensure that no surface flooding occurs within the site for events up to and including the 1 in 100 year plus 45% climate change allowance, with flows restricted to the agreed discharge rates at the point of connection to the public surface water sewer.

An allowance for future “urban creep” has been included in the hydraulic design by increasing the contributing impermeable roof area by 10%, thereby ensuring that the attenuation system has sufficient capacity to accommodate reasonable increases in hardstanding over the lifetime of the development. Critical storm events have been re-run with this allowance and the adopted climate change uplift to confirm the robustness of the design.

Flow control will be provided by a simple orifice plate installed within the final downstream manhole, with access provisions for inspection and maintenance. To reduce the risk of blockage, the orifice will be protected by upstream treatment and debris interception measures, including permeable paving (which filters runoff from parking areas) and a proprietary pre-treatment device including the use of a catchpit within the chamber of the flow control device.

Overland exceedance routes have been considered as part of the site layout and levels strategy, such that in the unlikely event of blockage or extreme rainfall beyond the design standard, flows are directed away from building thresholds and towards the adjacent highway or landscaped areas where they can be safely contained.

5.4 Surface Water Discharge Quality

The quality of surface water collected and discharged to the surrounding environment, by direct discharge to watercourses or by infiltration into the ground water, should be managed such that the receiving bodies are protected from pollution. The implementation and installation of suitable SuDS features within the overall surface water drainage network can improve water quality through the removal of pollutants.

‘The SuDS Manual’ (CIRIA 753) has been developed which includes details of the pollution hazard indices for various land uses. The types of pollution hazards assessed include Total Suspended Solids (TSS), Metals and Hydrocarbons. The pollution indices range between 0 (no pollution) and 1 (high pollution) and are included in Table 26.2 of the SuDS Manual as replicated in table 6.

The various SuDS features available have been assessed for their suitability and effectiveness for the removal of pollutants from surface water discharge within table 7. These pollution mitigation indices are included in Table 26.3 of the SuDS Manual.

In order to deliver sufficient treatment, the proposed SuDS features should provide a total pollution mitigation index equal to or that exceed the pollution hazard index for each contaminant type. (The pollution mitigation and pollution index should always be assessed for each contaminant type) The proposed development site has been assessed, and the relevant pollution indices present on the developed site have been highlighted below in ‘Orange’ in table 6, which is reproduced from Table 26.2 of the SuDS Manual.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial)	Low	0.3	0.2-0.8 (where metal has the potential to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. Cul de sacs, home-zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e.<300 traffic movements per day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemical and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured: industrial sites: trunk roads and motoreways ¹	High	0.8 ²	0.8 ²	0.9 ²

Table 6 – Pollution Hazard Indices for Different Land Use Classifications

Note ¹ Motorways and Trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

Note ² These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types table 4.3. When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice.

This will help determine the most appropriate approach to the development of a design solution

The layout of the proposed development site and the availability of open space within the development allows for the inclusion of a number of different SuDS features to control both the discharge volume and water quality. The proposed SuDS features that have been included in the surface water drainage strategy have been highlighted below in 'Orange in Table 7. (This table is reproduced from Table 26.3 of the SuDS Manual).

Type of SuDS Component	Mitigation Indices ¹		
	TSS	Metals	Hydrocarbons
Filter strips	0.4	0.4	0.4
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 area.		

Table 7 – Indicative SuDS Mitigation Indices for Discharges to Surface Waters

The proposed surface water drainage treatment system is considered suitable and sufficient to allow for the discharge to the proposed outfall.

As an extra form of treatment where the site discharges to a watercourse, all water that is collected should pass through at least two forms of treatment before it reaches the outfall with most of the site passing through three separate treatments.

The main pollution sources on the site relate to roof runoff (very low pollution hazard) and parking/driveway areas (low pollution hazard). Permeable paving to the parking areas will provide primary treatment of runoff through filtration and temporary storage within the sub-base, with further treatment afforded by the below-ground storage and a proprietary treatment device upstream of the flow control, with a vortex flow separator chamber to be installed upstream of the outfall flow control chamber. Please refer to **Appendix D** for the below-ground drainage layout.

The combination of these measures is considered sufficient to ensure that the pollution mitigation indices for Total Suspended Solids, metals and hydrocarbons meet or exceed the relevant pollution hazard indices for the proposed land uses, and that discharges to the public surface water sewer do not pose an unacceptable water quality risk.

5.5 Foul Water Drainage

Southern Water is the statutory sewerage undertaker for the area, and their records indicate existing foul sewers within the surrounding highway network adjacent to the site. Prior to demolition, foul flows from the former commercial units drained to these public sewers via existing lateral connections.

It is proposed that foul water from the new dwellings and apartments will be collected via a conventional gravity foul drainage network and discharged to the existing public foul sewer, re-using existing laterals where practicable or constructing new connections subject to agreement with Southern Water.

The redevelopment is expected to result in an increase in foul flows compared with the historic commercial use; however, there are no known capacity issues within the receiving foul network, and Southern Water is required under Ofwat's charging rules to provide the necessary off-site capacity to serve new development, funded through infrastructure charges.

All new foul drainage will be designed and constructed in accordance with Building Regulations Part H, BS EN 752, the Sewerage Sector Guidance and relevant Southern Water adoption standards where applicable. The system will be watertight, with appropriate manhole access for maintenance and with backflow protections as required to minimise the risk of internal foul flooding to the development.

6.0 Maintenance & Management

This covers the maintenance and management of drainage system and SuDS features

Drainage Feature	Maintenance Actions	Monitoring Plan
Drainage Channels / Gullies	Inspections to be frequent and thorough ensuring that all components are in satisfactory conditions and any debris / silt build up is removed to ensure the network can optimally operate. Inspections are to span out to include the drainage component surround so that the adjacent paving / surround will not have a negative consequence on the drainage component's ability to perform. At every inspection, channels should be jetted and gully traps to be cleaned out and pipes jittered with traps correctly fitted back afterwards.	Inspect every Quarter or after every storm
Manhole, Inspection Chamber, Rodding Eyes and Pipes	Inspection chambers will be checked every six months for the accumulation of debris and silt and cleaned as necessary. Inspection of pipes and joints for structural integrity, damage, leaks to be undertaken every 6 months of after a large storm. Any defects to be remedially actioned promptly.	Inspect every six months or after a large storm.
Permeable paving / permeable sub-base	Permeable paving to be inspected three times a year (end of winter, mid-summer and in autumn at the end of leaf fall) or after a large storm. Brushing and washing of paving to be actioned during inspections, checking that the grout is not blocked or ponding. Weeds to be removed via appropriate means, ensure to check manufacturing guidelines on weed /vegetation removal. Checking of any depressed, rutting or broken blocks and remediating any defects in the paving area during each inspection.	Every three months or after a large storm
Flow Control Chamber (Orifice Plate)	Chambers to be inspected every 3 months for the accumulation of debris posing a blockage potential. Cleaned as per manufacturing recommendation. Chambers to be inspected 3 months or after a large storm to check that the flow control device is for any damaged. Remedial action to be actioned if damage to be reported	Inspect every three months or after a large storm.
Cellular Tanks	Inspection and identify and areas that are not operating correctly. If required take remedial action. Inspect all inlets, outlets, overflows and vents to ensure they are in good working condition and operating as designed. Survey inside of tank for sediment build up and remove if necessary	Inspect every month for 3 months then annually Inspect for sediment every 5 years or as required

Table 8 – Maintenance and management of drainage systems

7.0 Conclusion & Recommendations

This Flood Risk Assessment and Drainage Strategy has been prepared in accordance with the NPPF, relevant Environment Agency guidance, Eastleigh Borough Council's Strategic Flood Risk Assessment and Hampshire's Local Flood Risk Management Strategy. The assessment demonstrates that the Maple Place site is suitable for the proposed residential development in flood risk terms.

Flood mapping and supporting data confirm that the site lies within Flood Zone 1 (low probability), with a less than 1 in 1,000 annual probability of fluvial or tidal flooding. The site is also at very low risk from surface water, groundwater and sewer flooding, and residential (more vulnerable) use is therefore appropriate with no requirement for Sequential or Exception Tests.

The historic commercial site was almost entirely impermeable and drained unattenuated to the public sewer network, with peak flows estimated to be around 14.5 l/s for a 50 mm/hr rainfall event. The proposed strategy substantially improves on this by restricting discharge rate to allow for the smallest practicable orifice plate available whilst mitigating blockages.

Surface water runoff from roofs and external paved areas will be collected via rainwater pipes, permeable paving and local drainage channels and conveyed through the on-site network to the attenuation system before controlled discharge to the public surface water sewer. The system has been designed to accommodate the 1 in 100 year rainfall event plus a 45% increase in intensity for climate change, with an additional allowance for urban creep applied to the contributing roof area.

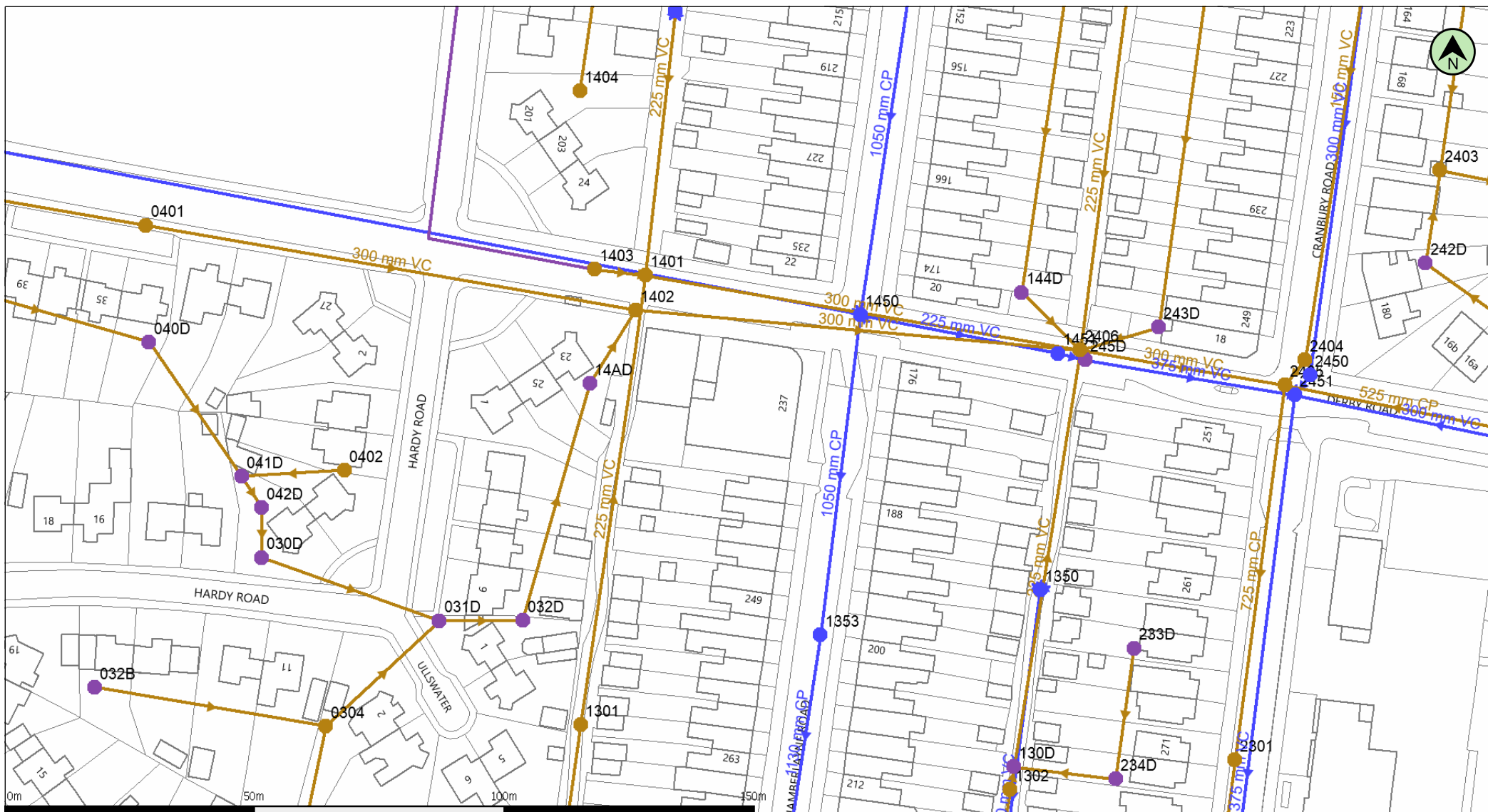
SuDS components incorporated within the scheme (principally permeable paving and sub-surface attenuation, with provision for pre-treatment upstream of the flow control) provide both quantity and quality benefits and are sufficient to meet or exceed the relevant pollution mitigation indices for the proposed land uses. Exceedance routing and site levels have been considered so that any residual surface water flows in extreme or blockage scenarios are directed away from building thresholds and towards areas where they can be safely contained.

Foul water from the development will drain via a gravity foul network to the existing public foul sewer, re-using or replacing existing laterals as agreed with Southern Water. While the redevelopment will increase foul flows relative to the former use, Southern Water is obliged under Ofwat's charging rules to ensure adequate off-site capacity, with any reinforcement funded through infrastructure charges.

A maintenance and management regime has been set out for the lifetime of the development, covering routine inspection and cleaning of gullies, manholes, permeable paving, flow controls and cellular storage. Implementation of this regime by the appointed management company will be essential to ensure that the drainage system continues to perform as designed and that residual flood risk remains low.

On the basis of the evidence and mitigation measures presented, it is concluded that the proposed development at Maple Place is not at an unacceptable risk of flooding and, with the proposed surface water and foul water strategies in place, will not increase flood risk elsewhere. The scheme therefore complies with the requirements of the NPPF, associated technical guidance and local planning policy with respect to flood risk and drainage.

Appendix A – Asset Location Plan



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Date: 11/08/20

Scale: 1:1080

Map Centre: 445135,118427

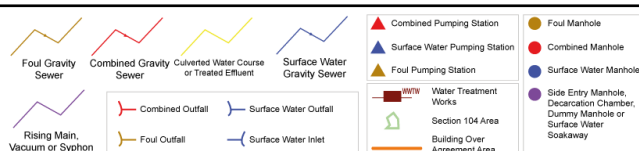
Data updated: 15/06/20

Wastewater Plan A4

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



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Appendix B – Proposed Surface Water Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	3.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
SW01	0.005	3.00	14.550	450	445137.443	118441.311	0.450	14.100
SW02	0.005	3.00	14.550	450	445115.830	118444.642	0.669	13.881
SW03	0.005	3.00	14.600	450	445114.237	118433.488	0.832	13.768
SW04	0.005	3.00	14.700	450	445126.828	118431.242	1.060	13.640
SW05	0.005	3.00	14.700	450	445127.878	118429.131	1.134	13.566
SW06	0.005	3.00	14.600	450	445147.519	118429.339	0.675	13.925
SW07	0.005	3.00	14.500	450	445145.433	118414.046	0.739	13.761
SW08	0.005	3.00	14.600	450	445126.133	118416.803	1.029	13.571
SW09	0.000	3.00	14.600	450	445125.231	118421.257	0.636	13.964
SW10(CP)	0.005	3.00	14.600	450	445127.039	118423.206	1.094	13.506
SW12(OFC)			14.500	1200	445113.783	118425.097	1.022	13.478
RE1		3.00	14.450		445111.758	118423.284	0.350	14.100
Outfall			14.500		445110.989	118425.618	1.166	13.334
SW11(VTS)			14.500	1300	445115.897	118424.795	1.000	13.500
Model Junction			14.600		445126.887	118422.135	1.083	13.517
Storage Node_IN			14.600		445125.797	118423.381	1.115	13.485
Storage Node_OUT		3.00	14.600		445116.870	118424.657	1.090	13.510
Storage Node_Perm Paving01	0.015	3.00	14.600		445125.265	118415.858	0.400	14.200
Storage Node_Perm Paving02	0.015	3.00	14.700		445125.815	118430.911	0.400	14.300

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SW01	SW02	21.868	0.600	14.100	13.881	0.219	100.0	150	3.36	50.0
1.001	SW02	SW03	11.267	0.600	13.881	13.768	0.113	100.0	150	3.55	50.0
1.002	SW03	SW04	12.790	0.600	13.768	13.640	0.128	100.0	150	3.76	50.0
1.003	SW04	SW05	2.358	0.600	13.640	13.566	0.074	31.9	150	3.78	50.0
1.004	SW05	SW10(CP)	5.984	0.600	13.566	13.506	0.060	99.7	150	3.88	50.0
3.000	SW06	SW07	15.435	0.600	13.925	13.761	0.164	94.1	150	3.25	50.0
3.001	SW07	SW08	19.496	0.600	13.761	13.571	0.190	102.6	150	3.58	50.0
3.002	SW08	Model Junction	5.385	0.600	13.571	13.517	0.054	99.7	150	3.67	26.4
3.003	Model Junction	SW10(CP)	1.082	0.600	13.517	13.506	0.011	98.3	150	3.68	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.005	17.8	0.9	0.300	0.519	0.005	0.0	23	0.527
1.001	1.005	17.8	1.8	0.519	0.682	0.010	0.0	33	0.649
1.002	1.005	17.8	2.7	0.682	0.910	0.015	0.0	40	0.727
1.003	1.789	31.6	6.3	0.910	0.984	0.035	0.0	45	1.401
1.004	1.006	17.8	7.2	0.984	0.944	0.040	0.0	67	0.954
3.000	1.036	18.3	0.9	0.525	0.589	0.005	0.0	23	0.535
3.001	0.992	17.5	1.8	0.589	0.879	0.010	0.0	33	0.641
3.002	1.006	17.8	2.9	0.879	0.933	0.030	0.0	41	0.741
3.003	1.013	17.9	5.4	0.933	0.944	0.030	0.0	57	0.889

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
5.001	SW09	Model Junction	1.874	0.600	13.964	13.517	0.447	4.2	150	3.23	50.0
5.000	RE1	SW09	13.625	0.600	14.100	13.964	0.136	100.0	150	3.23	50.0
1.005	SW10(CP)	Storage Node_IN	1.254	0.600	13.506	13.485	0.021	60.0	150	3.90	50.0
6.000	Storage Node_OUT	SW11(VTS)	1.000	0.600	13.510	13.500	0.010	100.0	150	3.02	50.0
6.002	SW12(OFC)	Outfall	2.842	0.600	13.478	13.334	0.144	19.7	100	3.08	50.0
2.000	Storage Node_Perm Paving02	SW04	1.066	0.600	14.300	13.640	0.660	1.6	100	3.00	50.0
4.000	Storage Node_Perm Paving01	SW08	1.283	0.600	14.200	13.751	0.449	2.9	100	3.00	50.0
6.001	SW11(VTS)	SW12(OFC)	2.135	0.600	13.500	13.478	0.022	97.1	150	3.05	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
5.001	4.956	87.6	0.0	0.486	0.933	0.000	0.0	0	0.000
5.000	1.005	17.8	0.0	0.200	0.486	0.000	0.0	0	0.000
1.005	1.301	23.0	13.6	0.944	0.965	0.075	0.0	83	1.353
6.000	1.005	17.8	0.0	0.940	0.850	0.000	0.0	0	0.000
6.002	1.746	13.7	0.0	0.922	1.066	0.000	0.0	0	0.000
2.000	6.137	48.2	2.7	0.300	0.960	0.015	0.0	16	3.290
4.000	4.609	36.2	2.7	0.300	0.749	0.015	0.0	18	2.689
6.001	1.020	18.0	0.0	0.850	0.872	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	21.868	100.0	150	Circular	14.550	14.100	0.300	14.550	13.881	0.519
1.001	11.267	100.0	150	Circular	14.550	13.881	0.519	14.600	13.768	0.682
1.002	12.790	100.0	150	Circular	14.600	13.768	0.682	14.700	13.640	0.910
1.003	2.358	31.9	150	Circular	14.700	13.640	0.910	14.700	13.566	0.984
1.004	5.984	99.7	150	Circular	14.700	13.566	0.984	14.600	13.506	0.944
3.000	15.435	94.1	150	Circular	14.600	13.925	0.525	14.500	13.761	0.589
3.001	19.496	102.6	150	Circular	14.500	13.761	0.589	14.600	13.571	0.879
3.002	5.385	99.7	150	Circular	14.600	13.571	0.879	14.600	13.517	0.933
3.003	1.082	98.3	150	Circular	14.600	13.517	0.933	14.600	13.506	0.944
5.001	1.874	4.2	150	Circular	14.600	13.964	0.486	14.600	13.517	0.933
5.000	13.625	100.0	150	Circular	14.450	14.100	0.200	14.600	13.964	0.486
1.005	1.254	60.0	150	Circular	14.600	13.506	0.944	14.600	13.485	0.965
6.000	1.000	100.0	150	Circular	14.600	13.510	0.940	14.500	13.500	0.850
6.002	2.842	19.7	100	Circular	14.500	13.478	0.922	14.500	13.334	1.066
2.000	1.066	1.6	100	Circular	14.700	14.300	0.300	14.700	13.640	0.960
4.000	1.283	2.9	100	Circular	14.600	14.200	0.300	14.600	13.751	0.749

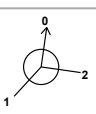
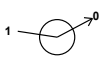
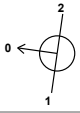
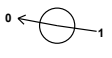
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW01	450	Manhole	Adoptable	SW02	450	Manhole	Adoptable
1.001	SW02	450	Manhole	Adoptable	SW03	450	Manhole	Adoptable
1.002	SW03	450	Manhole	Adoptable	SW04	450	Manhole	Adoptable
1.003	SW04	450	Manhole	Adoptable	SW05	450	Manhole	Adoptable
1.004	SW05	450	Manhole	Adoptable	SW10(CP)	450	Manhole	Adoptable
3.000	SW06	450	Manhole	Adoptable	SW07	450	Manhole	Adoptable
3.001	SW07	450	Manhole	Adoptable	SW08	450	Manhole	Adoptable
3.002	SW08	450	Manhole	Adoptable	Model Junction		Junction	
3.003	Model Junction		Junction		SW10(CP)	450	Manhole	Adoptable
5.001	SW09	450	Manhole	Adoptable	Model Junction		Junction	
5.000	RE1		Junction		SW09	450	Manhole	Adoptable
1.005	SW10(CP)	450	Manhole	Adoptable	Storage Node_IN		Junction	
6.000	Storage Node_OUT		Junction		SW11(VTS)	1300	Manhole	Adoptable
6.002	SW12(OFC)	1200	Manhole	Adoptable	Outfall		Junction	
2.000	Storage Node_Perm Paving02		Junction		SW04	450	Manhole	Adoptable
4.000	Storage Node_Perm Paving01		Junction		SW08	450	Manhole	Adoptable

Pipeline Schedule

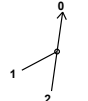
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.001	2.135	97.1	150	Circular	14.500	13.500	0.850	14.500	13.478	0.872

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.001	SW11(VTS)	1300	Manhole	Adoptable	SW12(OFC)	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW01	445137.443	118441.311	14.550	0.450	450				
						0	1.000	14.100	150
SW02	445115.830	118444.642	14.550	0.669	450				
						0	1.001	13.881	150
SW03	445114.237	118433.488	14.600	0.832	450				
						0	1.002	13.768	150
SW04	445126.828	118431.242	14.700	1.060	450				
						0	1.003	13.640	150
SW05	445127.878	118429.131	14.700	1.134	450				
						0	1.004	13.566	150
SW06	445147.519	118429.339	14.600	0.675	450				
						0	3.000	13.925	150
SW07	445145.433	118414.046	14.500	0.739	450				
						0	3.001	13.761	150
SW08	445126.133	118416.803	14.600	1.029	450				
						0	3.002	13.571	150
SW09	445125.231	118421.257	14.600	0.636	450				
						0	5.000	13.964	150
SW10(CP)	445127.039	118423.206	14.600	1.094	450				
						0	3.003	13.506	150
						0	1.004	13.506	150
SW12(OFC)	445113.783	118425.097	14.500	1.022	1200				
						0	1.005	13.506	150
						1	6.001	13.478	150
RE1	445111.758	118423.284	14.450	0.350					
						0	6.002	13.478	100
						0	5.000	14.100	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Outfall	445110.989	118425.618	14.500	1.166		 1	6.002	13.334	100
SW11(VTS)	445115.897	118424.795	14.500	1.000	1300	 1	6.000	13.500	150
						0	6.001	13.500	150
Model Junction	445126.887	118422.135	14.600	1.083		 1	5.001	13.517	150
						2	3.002	13.517	150
						0	3.003	13.517	150
Storage Node_IN	445125.797	118423.381	14.600	1.115		 1	1.005	13.485	150
Storage Node_OUT	445116.870	118424.657	14.600	1.090		 0	6.000	13.510	150
Storage Node_Perm Paving01	445125.265	118415.858	14.600	0.400		 0	4.000	14.200	100
Storage Node_Perm Paving02	445125.815	118430.911	14.700	0.400		 0	2.000	14.300	100

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume
Winter CV	1.000	Additional Storage (m ³ /ha)	20.0	

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0
30	40	0	0				

Node SW12(OFC) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.760	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	4.5		
Invert Level (m)	13.478	Diameter (m)	0.050		

Node Storage Node_OUT Tank Storage Structure

Invert Level (m)	13.510	Time to half empty (mins)	48	Analyse flow through structure	x
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Inlets

Storage Node_IN

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	29.9	0.400	29.9

Node Storage Node Perm Paving01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	14.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	46

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	62.5	0.0	0.300	62.5	0.0

Node Storage Node Perm Paving02 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	14.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	29

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	62.5	0.0	0.300	62.5	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW01	9	14.122	0.022	0.9	0.0084	0.0000	OK
15 minute summer	SW02	9	13.911	0.030	1.7	0.0093	0.0000	OK
15 minute summer	SW03	10	13.805	0.037	2.5	0.0103	0.0000	OK
15 minute summer	SW04	10	13.689	0.049	5.2	0.0123	0.0000	OK
15 minute summer	SW05	10	13.633	0.067	6.0	0.0166	0.0000	OK
15 minute summer	SW06	9	13.947	0.022	0.9	0.0068	0.0000	OK
15 minute summer	SW07	9	13.791	0.030	1.7	0.0089	0.0000	OK
120 minute summer	SW08	76	13.629	0.058	1.9	0.0148	0.0000	OK
15 minute summer	SW09	1	13.964	0.000	0.0	0.0000	0.0000	OK
120 minute summer	SW10(CP)	76	13.629	0.123	4.6	0.0307	0.0000	OK
120 minute summer	SW12(OFC)	76	13.621	0.143	1.8	0.1622	0.0000	SURCHARGED
15 minute summer	RE1	1	14.100	0.000	0.0	0.0000	0.0000	OK
120 minute summer	Outfall	76	13.359	0.025	1.8	0.0000	0.0000	OK
120 minute summer	SW11(VTS)	76	13.622	0.122	1.9	0.1616	0.0000	OK
120 minute summer	Model Junction	76	13.629	0.112	1.9	0.0000	0.0000	OK
120 minute summer	Storage Node_IN	76	13.628	0.143	4.5	0.0000	0.0000	OK
120 minute summer	Storage Node_OUT	76	13.622	0.112	3.1	3.3427	0.0000	OK
15 minute summer	Storage Node_Perm Paving01	10	14.217	0.017	2.6	0.3176	0.0000	OK
15 minute summer	Storage Node_Perm Paving02	10	14.314	0.014	2.6	0.2599	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	SW02	0.8	0.403	0.047	0.0451	
15 minute summer	SW02	1.001	SW03	1.6	0.536	0.088	0.0330	
15 minute summer	SW03	1.002	SW04	2.4	0.577	0.133	0.0532	
15 minute summer	SW04	1.003	SW05	5.3	0.852	0.168	0.0148	
15 minute summer	SW05	1.004	SW10(CP)	6.1	0.698	0.343	0.0538	
15 minute summer	SW06	3.000	SW07	0.8	0.413	0.046	0.0320	
15 minute summer	SW07	3.001	SW08	1.6	0.419	0.090	0.0783	
120 minute summer	SW08	3.002	Model Junction	1.9	0.440	0.105	0.0546	
15 minute summer	SW09	5.001	Model Junction	0.0	0.000	0.000	0.0096	
120 minute summer	SW10(CP)	1.005	Storage Node_IN	4.5	0.452	0.194	0.0205	
120 minute summer	SW12(OFC)	6.002	Outfall	1.8	1.176	0.131	0.0043	8.6
15 minute summer	RE1	5.000	SW09	0.0	0.000	0.000	0.0000	
120 minute summer	SW11(VTS)	6.001	SW12(OFC)	1.8	0.290	0.100	0.0349	
120 minute summer	Model Junction	3.003	SW10(CP)	1.8	0.286	0.099	0.0159	
120 minute summer	Storage Node_OUT	6.000	SW11(VTS)	1.9	0.478	0.105	0.0147	
15 minute summer	Storage Node_Perm Paving01	4.000	SW08	1.9	2.375	0.054	0.0011	
15 minute summer	Storage Node_Perm Paving02	2.000	SW04	2.2	1.089	0.045	0.0024	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW01	9	14.140	0.040	2.9	0.0153	0.0000	OK
60 minute summer	SW02	46	14.022	0.141	3.2	0.0436	0.0000	OK
60 minute summer	SW03	46	14.022	0.254	4.8	0.0710	0.0000	SURCHARGED
60 minute summer	SW04	46	14.022	0.382	10.2	0.0968	0.0000	SURCHARGED
60 minute summer	SW05	46	14.022	0.456	11.2	0.1126	0.0000	SURCHARGED
60 minute summer	SW06	46	14.022	0.097	1.6	0.0296	0.0000	OK
60 minute summer	SW07	46	14.022	0.261	3.2	0.0766	0.0000	SURCHARGED
60 minute summer	SW08	46	14.022	0.451	9.5	0.1154	0.0000	SURCHARGED
60 minute summer	SW09	46	14.021	0.057	0.4	0.0091	0.0000	OK
60 minute summer	SW10(CP)	46	14.021	0.515	20.5	0.1288	0.0000	SURCHARGED
60 minute summer	SW12(OFC)	46	14.004	0.526	3.9	0.5950	0.0000	SURCHARGED
15 minute summer	RE1	1	14.100	0.000	0.0	0.0000	0.0000	OK
60 minute summer	Outfall	46	13.369	0.035	3.6	0.0000	0.0000	OK
60 minute summer	SW11(VTS)	46	14.006	0.506	4.4	0.6716	0.0000	SURCHARGED
60 minute summer	Model Junction	46	14.021	0.504	9.0	0.0000	0.0000	SURCHARGED
60 minute summer	Storage Node_IN	46	14.020	0.535	19.9	0.0000	0.0000	OK
60 minute summer	Storage Node_OUT	46	14.007	0.497	11.6	11.6598	0.0000	SURCHARGED
15 minute summer	Storage Node_Perm Paving01	9	14.234	0.034	8.7	0.6448	0.0000	OK
15 minute summer	Storage Node_Perm Paving02	10	14.326	0.026	8.7	0.4970	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	SW02	2.8	0.546	0.158	0.1130	
60 minute summer	SW02	1.001	SW03	3.2	0.628	0.180	0.1961	
60 minute summer	SW03	1.002	SW04	4.2	0.613	0.236	0.2252	
60 minute summer	SW04	1.003	SW05	9.6	0.841	0.304	0.0415	
60 minute summer	SW05	1.004	SW10(CP)	10.7	0.608	0.602	0.1053	
60 minute summer	SW06	3.000	SW07	1.6	0.480	0.087	0.2283	
60 minute summer	SW07	3.001	SW08	2.9	0.387	0.167	0.3432	
60 minute summer	SW08	3.002	Model Junction	9.0	0.509	0.504	0.0948	
60 minute summer	SW09	5.001	Model Junction	-0.4	-0.037	-0.005	0.0223	
60 minute summer	SW10(CP)	1.005	Storage Node_IN	19.9	1.132	0.867	0.0221	
60 minute summer	SW12(OFC)	6.002	Outfall	3.6	1.422	0.266	0.0073	24.5
15 minute summer	RE1	5.000	SW09	0.0	0.000	0.000	0.0000	
60 minute summer	SW11(VTS)	6.001	SW12(OFC)	3.9	0.480	0.216	0.0376	
60 minute summer	Model Junction	3.003	SW10(CP)	8.4	0.476	0.468	0.0190	
60 minute summer	Storage Node_OUT	6.000	SW11(VTS)	4.4	0.529	0.246	0.0176	
15 minute summer	Storage Node_Perm Paving01	4.000	SW08	8.3	3.289	0.228	0.0062	
15 minute summer	Storage Node_Perm Paving02	2.000	SW04	7.9	1.396	0.164	0.0050	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SW01	55	14.343	0.243	2.4	0.0926	0.0000	FLOOD RISK
60 minute summer	SW02	50	14.342	0.461	4.6	0.1426	0.0000	FLOOD RISK
60 minute summer	SW03	50	14.339	0.571	6.1	0.1594	0.0000	FLOOD RISK
60 minute summer	SW04	50	14.333	0.693	13.5	0.1753	0.0000	SURCHARGED
60 minute summer	SW05	50	14.331	0.765	14.8	0.1889	0.0000	SURCHARGED
60 minute summer	SW06	50	14.327	0.402	2.3	0.1234	0.0000	FLOOD RISK
60 minute summer	SW07	50	14.326	0.565	4.6	0.1662	0.0000	FLOOD RISK
60 minute summer	SW08	48	14.325	0.754	12.1	0.1931	0.0000	FLOOD RISK
60 minute summer	SW09	50	14.326	0.362	2.6	0.0575	0.0000	FLOOD RISK
60 minute summer	SW10(CP)	50	14.326	0.820	26.5	0.2050	0.0000	FLOOD RISK
60 minute summer	SW12(OFC)	50	14.303	0.825	5.9	0.9331	0.0000	FLOOD RISK
60 minute winter	RE1	48	14.325	0.225	1.4	0.0000	0.0000	FLOOD RISK
60 minute summer	Outfall	50	13.374	0.040	4.6	0.0000	0.0000	OK
60 minute summer	SW11(VTS)	50	14.306	0.806	8.2	1.0700	0.0000	FLOOD RISK
60 minute summer	Model Junction	50	14.326	0.809	11.5	0.0000	0.0000	FLOOD RISK
60 minute summer	Storage Node_IN	50	14.324	0.839	25.8	0.0000	0.0000	OK
60 minute summer	Storage Node_OUT	50	14.308	0.798	22.5	11.8256	0.0000	FLOOD RISK
60 minute summer	Storage Node_Perm Paving01	48	14.327	0.127	6.9	2.4672	0.0000	FLOOD RISK
15 minute summer	Storage Node_Perm Paving02	10	14.334	0.034	12.2	0.6595	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SW01	1.000	SW02	2.3	0.518	0.130	0.3850	
60 minute summer	SW02	1.001	SW03	4.0	0.634	0.223	0.1984	
60 minute summer	SW03	1.002	SW04	4.9	0.607	0.274	0.2252	
60 minute summer	SW04	1.003	SW05	12.7	0.817	0.402	0.0415	
60 minute summer	SW05	1.004	SW10(CP)	14.0	0.797	0.789	0.1053	
60 minute summer	SW06	3.000	SW07	2.3	0.485	0.124	0.2717	
60 minute summer	SW07	3.001	SW08	3.4	0.345	0.192	0.3432	
60 minute summer	SW08	3.002	Model Junction	11.5	0.656	0.650	0.0948	
60 minute summer	SW09	5.001	Model Junction	-2.6	-0.150	-0.030	0.0330	
60 minute summer	SW10(CP)	1.005	Storage Node_IN	25.8	1.466	1.123	0.0221	
60 minute summer	SW12(OFC)	6.002	Outfall	4.6	1.509	0.337	0.0087	33.9
60 minute winter	RE1	5.000	SW09	-1.4	-0.102	-0.078	0.2399	
60 minute summer	SW11(VTS)	6.001	SW12(OFC)	5.9	0.511	0.325	0.0376	
60 minute summer	Model Junction	3.003	SW10(CP)	10.9	0.618	0.608	0.0190	
60 minute summer	Storage Node_OUT	6.000	SW11(VTS)	8.2	0.526	0.464	0.0176	
60 minute summer	Storage Node_Perm Paving01	4.000	SW08	6.8	2.864	0.187	0.0100	
15 minute summer	Storage Node_Perm Paving02	2.000	SW04	10.5	1.783	0.219	0.0054	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SW01	47	14.262	0.162	2.1	0.0617	0.0000	FLOOD RISK
60 minute summer	SW02	47	14.262	0.381	4.2	0.1176	0.0000	FLOOD RISK
60 minute summer	SW03	47	14.261	0.493	6.1	0.1377	0.0000	SURCHARGED
60 minute summer	SW04	47	14.261	0.621	12.9	0.1571	0.0000	SURCHARGED
60 minute summer	SW05	47	14.260	0.694	13.7	0.1714	0.0000	SURCHARGED
60 minute summer	SW06	59	14.261	0.336	2.3	0.1031	0.0000	SURCHARGED
60 minute summer	SW07	46	14.261	0.500	4.2	0.1470	0.0000	FLOOD RISK
60 minute summer	SW08	49	14.259	0.688	11.8	0.1762	0.0000	SURCHARGED
60 minute summer	SW09	48	14.259	0.295	2.0	0.0469	0.0000	SURCHARGED
60 minute summer	SW10(CP)	48	14.259	0.752	24.6	0.1881	0.0000	SURCHARGED
60 minute summer	SW12(OFC)	48	14.237	0.759	5.2	0.8585	0.0000	FLOOD RISK
60 minute summer	RE1	48	14.259	0.159	1.1	0.0000	0.0000	FLOOD RISK
60 minute summer	Outfall	48	13.373	0.039	4.4	0.0000	0.0000	OK
60 minute summer	SW11(VTS)	48	14.240	0.740	6.8	0.9821	0.0000	FLOOD RISK
60 minute summer	Model Junction	48	14.259	0.742	10.9	0.0000	0.0000	SURCHARGED
60 minute summer	Storage Node_IN	48	14.257	0.772	23.8	0.0000	0.0000	OK
60 minute summer	Storage Node_OUT	48	14.242	0.732	19.2	11.7889	0.0000	SURCHARGED
60 minute summer	Storage Node_Perm Paving01	49	14.259	0.059	6.2	1.1443	0.0000	OK
15 minute summer	Storage Node_Perm Paving02	10	14.329	0.029	10.8	0.5643	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SW01	1.000	SW02	2.1	0.518	0.118	0.3850	
60 minute summer	SW02	1.001	SW03	4.0	0.639	0.225	0.1984	
60 minute summer	SW03	1.002	SW04	4.9	0.616	0.277	0.2252	
60 minute summer	SW04	1.003	SW05	11.6	0.830	0.367	0.0415	
60 minute summer	SW05	1.004	SW10(CP)	12.6	0.715	0.708	0.1053	
60 minute summer	SW06	3.000	SW07	2.1	0.484	0.115	0.2717	
60 minute summer	SW07	3.001	SW08	3.6	0.361	0.203	0.3432	
60 minute summer	SW08	3.002	Model Junction	10.9	0.618	0.612	0.0948	
60 minute summer	SW09	5.001	Model Junction	-2.0	-0.113	-0.023	0.0330	
60 minute summer	SW10(CP)	1.005	Storage Node_IN	23.8	1.352	1.035	0.0221	
60 minute summer	SW12(OFC)	6.002	Outfall	4.4	1.493	0.322	0.0084	30.8
60 minute summer	RE1	5.000	SW09	-1.1	-0.108	-0.060	0.2399	
60 minute summer	SW11(VTS)	6.001	SW12(OFC)	5.2	0.507	0.291	0.0376	
60 minute summer	Model Junction	3.003	SW10(CP)	10.0	0.571	0.561	0.0190	
60 minute summer	Storage Node_OUT	6.000	SW11(VTS)	6.8	0.517	0.384	0.0176	
60 minute summer	Storage Node_Perm Paving01	4.000	SW08	6.1	2.785	0.168	0.0081	
15 minute summer	Storage Node_Perm Paving02	2.000	SW04	9.8	1.690	0.203	0.0052	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SW01	56	14.491	0.391	3.4	0.1489	0.0000	FLOOD RISK
60 minute winter	SW02	56	14.491	0.610	4.2	0.1884	0.0000	FLOOD RISK
60 minute winter	SW03	56	14.490	0.722	5.8	0.2016	0.0000	FLOOD RISK
60 minute winter	SW04	56	14.490	0.850	11.3	0.2150	0.0000	FLOOD RISK
60 minute winter	SW05	56	14.489	0.923	12.3	0.2279	0.0000	FLOOD RISK
60 minute winter	SW06	58	14.488	0.563	2.4	0.1730	0.0000	FLOOD RISK
60 minute winter	SW07	56	14.488	0.727	3.6	0.2138	0.0000	FLOOD RISK
60 minute winter	SW08	57	14.488	0.917	10.5	0.2347	0.0000	FLOOD RISK
60 minute winter	SW09	57	14.487	0.523	3.9	0.0832	0.0000	FLOOD RISK
60 minute winter	SW10(CP)	57	14.487	0.981	22.1	0.2452	0.0000	FLOOD RISK
60 minute winter	SW12(OFC)	57	14.461	0.983	5.8	1.1122	0.0000	FLOOD RISK
60 minute summer	RE1	41	14.450	0.350	3.5	0.0000	0.0000	FLOOD RISK
60 minute winter	Outfall	57	13.376	0.042	5.1	0.0000	0.0000	OK
60 minute winter	SW11(VTS)	57	14.465	0.965	8.1	1.2810	0.0000	FLOOD RISK
60 minute winter	Model Junction	57	14.487	0.970	9.8	0.0000	0.0000	FLOOD RISK
60 minute winter	Storage Node_IN	57	14.485	1.000	21.5	0.0000	0.0000	OK
60 minute winter	Storage Node_OUT	57	14.467	0.957	19.2	11.9132	0.0000	FLOOD RISK
60 minute winter	Storage Node_Perm Paving01	57	14.489	0.289	11.7	5.6201	0.0000	FLOOD RISK
60 minute winter	Storage Node_Perm Paving02	57	14.490	0.190	6.2	3.7051	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SW01	1.000	SW02	2.2	0.488	0.121	0.3850	
60 minute winter	SW02	1.001	SW03	4.0	0.609	0.224	0.1984	
60 minute winter	SW03	1.002	SW04	5.4	0.614	0.305	0.2252	
60 minute winter	SW04	1.003	SW05	10.3	0.833	0.326	0.0415	
60 minute winter	SW05	1.004	SW10(CP)	11.3	0.643	0.636	0.1053	
60 minute winter	SW06	3.000	SW07	1.8	0.464	0.097	0.2717	
60 minute winter	SW07	3.001	SW08	3.0	0.370	0.174	0.3432	
60 minute winter	SW08	3.002	Model Junction	9.8	0.557	0.552	0.0948	
60 minute winter	SW09	5.001	Model Junction	-3.9	-0.224	-0.045	0.0330	
60 minute winter	SW10(CP)	1.005	Storage Node_IN	21.5	1.219	0.933	0.0221	
60 minute winter	SW12(OFC)	6.002	Outfall	5.1	1.544	0.369	0.0093	44.8
60 minute summer	RE1	5.000	SW09	-3.5	-0.247	-0.196	0.2399	
60 minute winter	SW11(VTS)	6.001	SW12(OFC)	5.8	0.569	0.321	0.0376	
60 minute winter	Model Junction	3.003	SW10(CP)	9.2	0.520	0.511	0.0190	
60 minute winter	Storage Node_OUT	6.000	SW11(VTS)	8.1	0.554	0.458	0.0176	
60 minute winter	Storage Node_Perm Paving01	4.000	SW08	-6.2	2.777	-0.170	0.0100	
60 minute winter	Storage Node_Perm Paving02	2.000	SW04	5.9	1.239	0.123	0.0083	

Appendix C – Existing Greenfield Runoff Rate

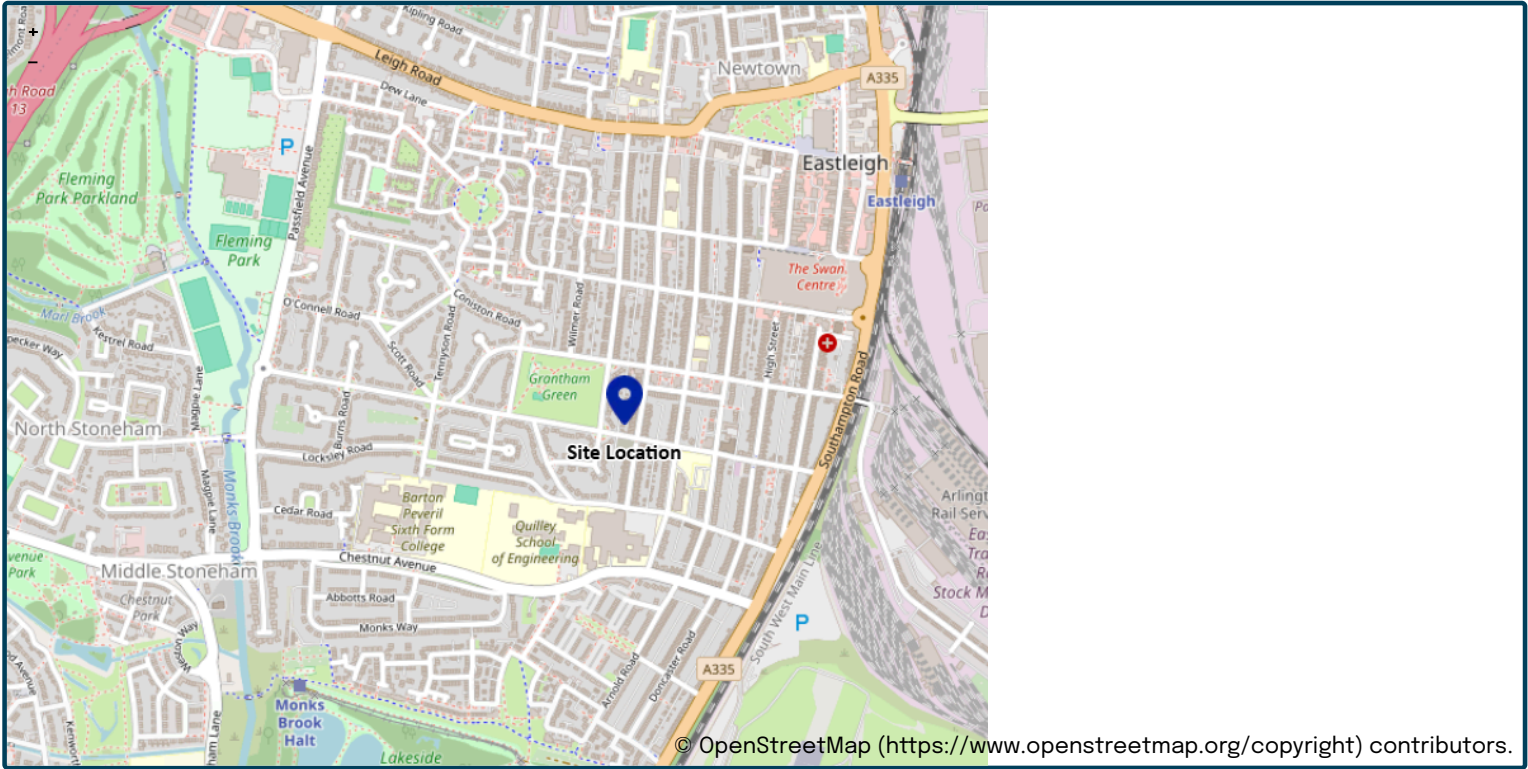
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	30/03/2026
Calculated by	Max Waddup
Reference	
Model version	2.2.3

Location

Site name	Maple Place, Eastleigh
Site location	



Site easting (British National Grid)	445130
Site northing (British National Grid)	118425

Site details

Total site area (ha)	0.105	ha
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Greenfield runoff

Method

Method	IH124
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IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	793	mm	793
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.6	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

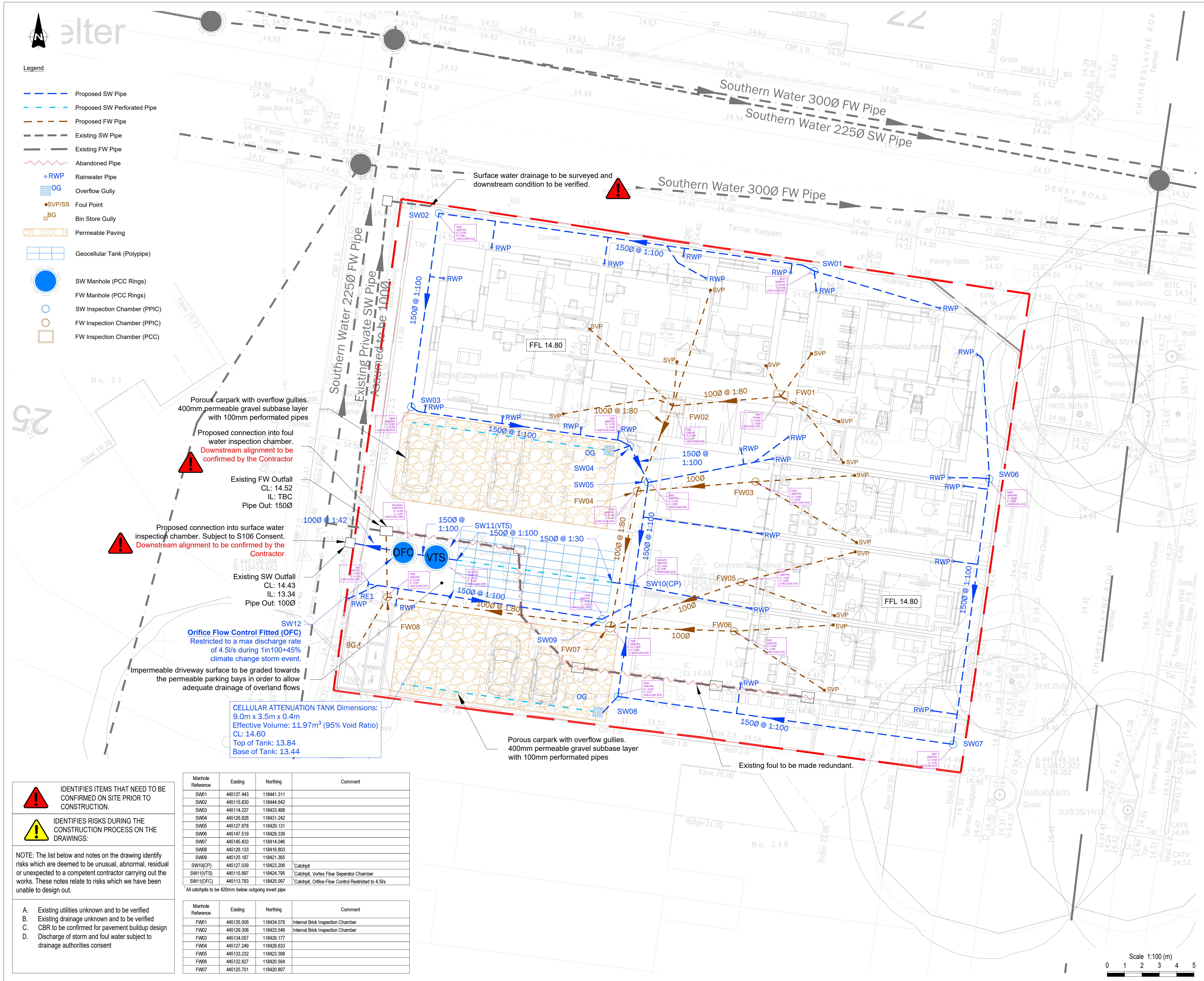
Method	IH124	
Flow rate 1 year (l/s)	0.5	l/s
Flow rate 2 year (l/s)	0.5	l/s
Flow rate 10 years (l/s)	1.0	l/s
Flow rate 30 years (l/s)	1.3	l/s
Flow rate 100 years (l/s)	1.9	l/s
Flow rate 200 years (l/s)	2.2	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix D – Proposed Drainage Layout



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© This drawing is the copyright of AKS Ward, it may not be copied altered or reproduced in any way without their written authority.
This drawing must not be scaled. Use figured dimensions only. If in doubt ASK!
This drawing is to be read in conjunction with all relevant AKSWard drawings and specifications prefixed L251040

- Notes:
- Invert levels and positions of existing drains / chambers / sewers where new connections are to be made must be checked and confirmed to the engineer prior to the commencement of any works.
 - Any part of the existing drainage system to be retained as part of the new scheme shall be cleaned and inspected. Any structural defects shall be repaired using appropriate and approved means.
 - All drainage works shall be carried out in accordance with the requirements of the Local Authority and in conjunction with all relevant British Standards, Code for Adoption and Sewerage Sector Guidance May 2021 and any Anglian Water addendums as appropriate.
 - All drainage shall comply with the typical details and the requirements of BS EN 752 and Part H of the Building Regulations.
 - For setting-out dimensions of SVP's, RWP's etc, refer to Architect's or Mechanical Engineer's drawings. Positions shown are indicative and subject to final design.
 - All runs connecting into the public drainage network to be vitrified clay, extra length to BS EN 295 or BS65 with plain sleeved or socketed flexible joints.
 - All precast concrete units used in the drainage works shall be manufactured using sulphate resisting cement.
 - Manhole covers and frames shall be to BS EN 124 and shall be Kitemarked. Covers and frames shall be heavy duty D400 in carriageways and vehicular areas and medium duty B125 in footways and soft landscaping. All Adoptable Manhole Covers shall be heavy duty D400.
 - MH covers in paved areas to have cover & frame orientated 'square' with paving to minimise cut slabs or blocks. Blocks to be bedded in epoxy resin mortar. All recessed covers shall in accordance with the FACTA specification and load ratings.
 - Cover levels are to be adjusted locally to suit finished ground levels.
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 - All new drainage to be jetted and CCTV surveyed on completion and tested in for water tightness by a suitable method in accordance with Part H of the Building Regulations and the Specification. Contractor to make sure that the drainage is fully operational. Refer to drainage maintenance manual for maintenance details.
 - Refer to drainage maintenance manual for maintenance requirements.
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P02 Updated to suit LLFA comments.	MW	KL	27/05/26
P01 First issue for planning	MW	KL	20/03/26
Rev. Amendment	Dm	Chkd	Date
Drg Status	PRELIMINARY		Suitability S2

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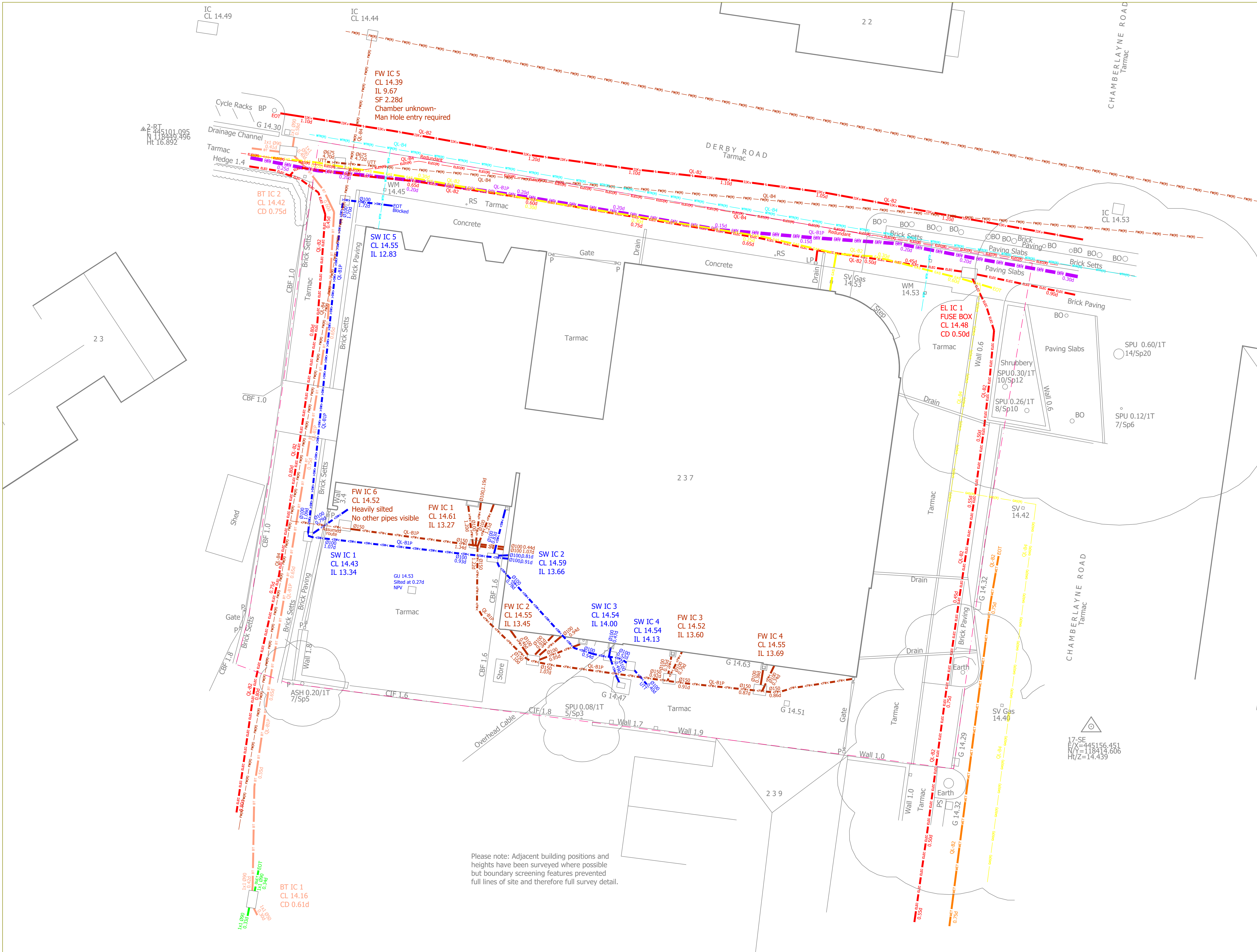
Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

Title **Below Ground Drainage Layout**

Scales A1 @ 1:100	Project No. L251040
Reviewed Scheme KL	Date 20/03/2026
Reviewed Final -	Date -
Project Ref	Originator Zone Level Type Role DrgNo Rev.
MPE - AKSW-XX - XX-DR - C - 9201 - P02	

Appendix E – Topographical / Existing Utilities Survey



NOTES:

- The base topographical survey has been supplied by Encompass Surveys.
- A number of technologies were used to obtain the information shown on this drawing. Varying ground conditions can affect the performance of these systems, therefore 100% detection is not guaranteed. Always Exercise Caution When Excavating.
- Thin line types represent assumed utility positions (as annotated).
- Where electric & metallic services are illustrated on this drawing as a single utility line, these may represent multiple pipes/cables.
- Possible radar targets show the position of suspected underground linear features, these features have produced an inconsistent response to the radar.
- It is not always possible to differentiate between construction features and pipes, it is therefore possible that some of the features shown are not pipes or cables.
- Every care has been taken to ensure the correct identification of the utility types, however these should be independently verified prior to use in any design/building works.
- All pipe diameters and levels are assumed to be correct, however due to non entry to inspection chambers, these should be verified before any works commence.
- Depths shown with the suffix (RD) have been measured using radio frequency locators and are to the centre of pipes/cables. Depths shown with the suffix (S) have been measured to a radio frequency sewer sonde and are to the invert of pipes. Therefore these depths are indicative only.
- All utility depths are in metres unless otherwise stated.
- All pipe/duct sizes are in millimetres unless otherwise stated.
- Information provided should not be altered or modified in any way. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of Encompass Surveys.
- Encompass Surveys cannot accept any responsibility for any damage to computer systems which may result from viruses which may be contained in the data provided.
- If the Autocad drawing is being read by any system other than Autocad it should be checked against a hard copy. Encompass Surveys cannot accept liability for omissions.
- Scale indicated is only applicable when plotted at sheet size.

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LINE-TYPE KEY

Electricity	British Telecom
Water	Gas
Foul Water	Storm Water
Metallic	Telecom
Empty Duct	Mercury Comms
Fibre Optics	Earth Stops
Virgin Media	Cable TV
Low Voltage	11kV High Voltage
23kV High Voltage	Electricity Records
Gas Records	Foul Water Records
Water Records	Strong Radar Target
Weak Radar Target	

GPR Detected Anomaly
GPR Detected Reinforcing
Extents of Chamber
Scan Area
Unable to Scan Area

ABBREVIATIONS

AV Air Valve	IRS Illuminated Road Sign
BB Bellisha Beacon	LP Lamp Post
BCD Bottom of Chamber Depth	MH Manhole
BH Borehole	MM Marker
BL Basement Light	MMW Monitoring Well
BM Bench Mark	P Post
BO Borehole	PE Polyethylene
BS Bus Stop	RE Rodding Eye
BT British Telecom Cover	RG Rain Gully
CAB Cabinet	RS Road Sign
CATV Cable Television Cover	SF Soffit
CCTV Closed Circuit TV	SI Spun Iron
CD Chamber Depth	SP Sign Post
CL Cover Level	ST Steel
CO Concrete (Pre-Cast)	STN Survey Station
D Down Pipe	SWCP Surface Water Catch Pit
EB Electricity Junction Box	SWSA Surface Water Soak Away
EOT End Of Trace	SW Surface Water
EP Electricity Pole	TCS Telephone Call Box
FB Flower Bed	TCD Top of Chamber Depth
FL Flood Light	TL Traffic Light
FW Foul Water	TLCB Traffic Light Control Box
FMP Foul Water Pipe	UTL Unable To Lift
GI Gas Pipe	UTT Unable To Trace
GV Gas Valve	VP Vent Pipe
IC Inspection Cover	WLD Water Level Depth
ID Invert Depth	WM Water Meter
IL Invert Level	WSC Water Stop Cock
	WSV Water Stop Valve
	WWO Water Wash Out

Drawing orientation

Level Datum:
Levels are related to OSGB15 derived from the GPS network

Grid:
Grid is related to OSGB15 derived from the GPS network

Northpoint:
The Northpoint position shown on this drawing has been located as accurately as possible, but is only indicative of true North

ENCOMPASS SURVEYS

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Hampshire SO30 3RS

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Email: info@encompass-surveys.co.uk
Website: encompass-surveys.co.uk

Client: Eastleigh Borough Council

Survey Location: 237 Chamberlayne Road
Eastleigh
SO50 5HX

Survey type: Utility	Scale: 1:100 @ A1
Drawing ref: ENC/231121/U3D6	Date: Nov 21
Drawn/QA: MH/DS	Revision: -

Please note: Adjacent building positions and heights have been surveyed where possible but boundary screening features prevented full lines of site and therefore full survey detail.

Appendix F – Other Civils Design Information



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P01	Issued for Information	MW	KL	27/05/26
Rev.	Amendment	Drn	Chkd	Date

Drg Status	PRELIMINARY	Suitability	S2
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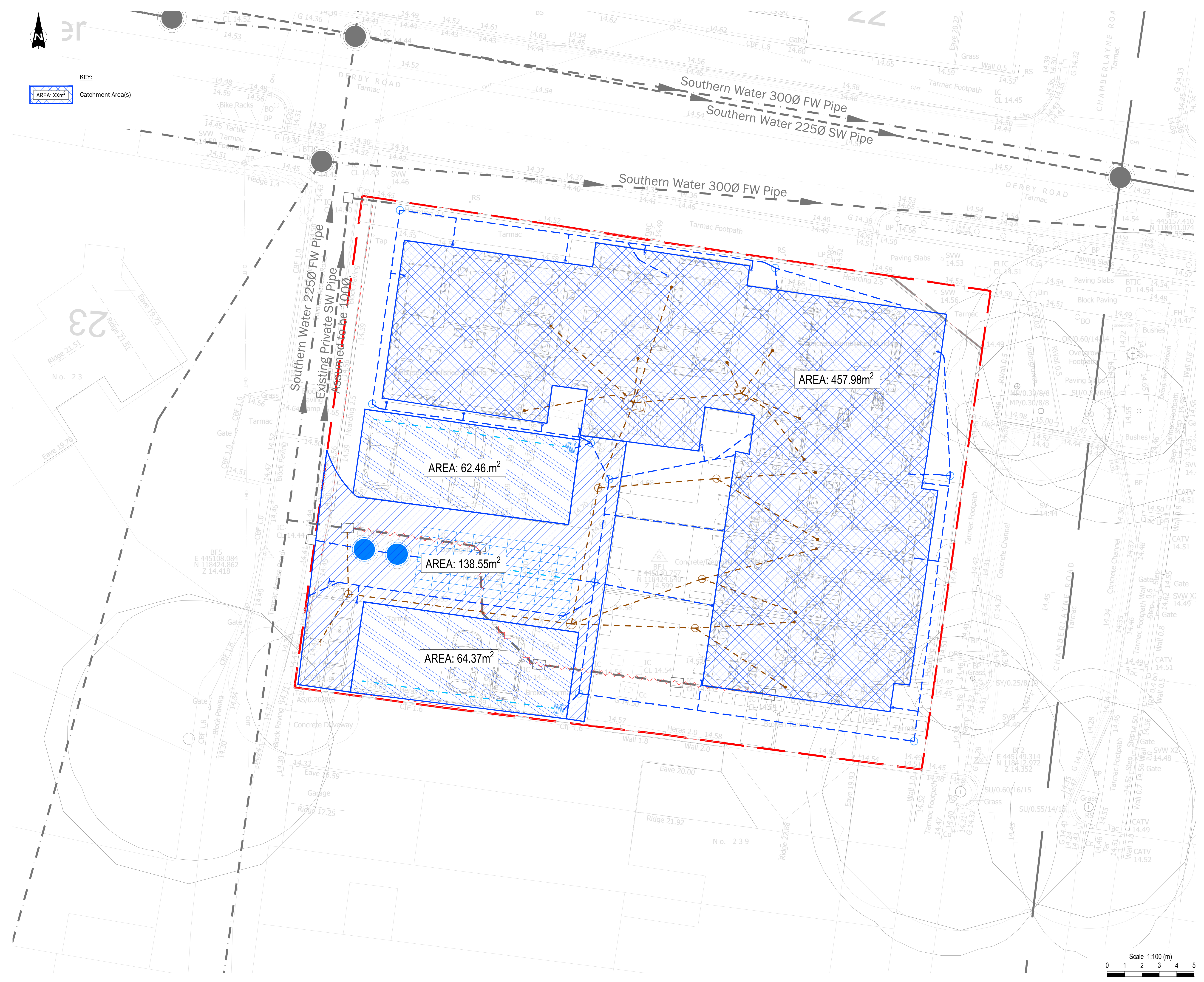
Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

Title **Flood Exceedance Flow Route**

Scales	A1 @ 1:100	Project No.	L251040
Reviewed Scheme	KL	Date	27/05/2026
Reviewed Final	-	Date	-

Project Ref	Originator	Zone	Level	Type	Role	DrgNo	Rev.
MPE - AKSW-XX - XX-DR - C - 9220	-P01						



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P01	Issued for Information	MW	KL	27/05/26
Rev.	Amendment	Drn	Chkd	Date

Drg Status	PRELIMINARY	Suitability	S2
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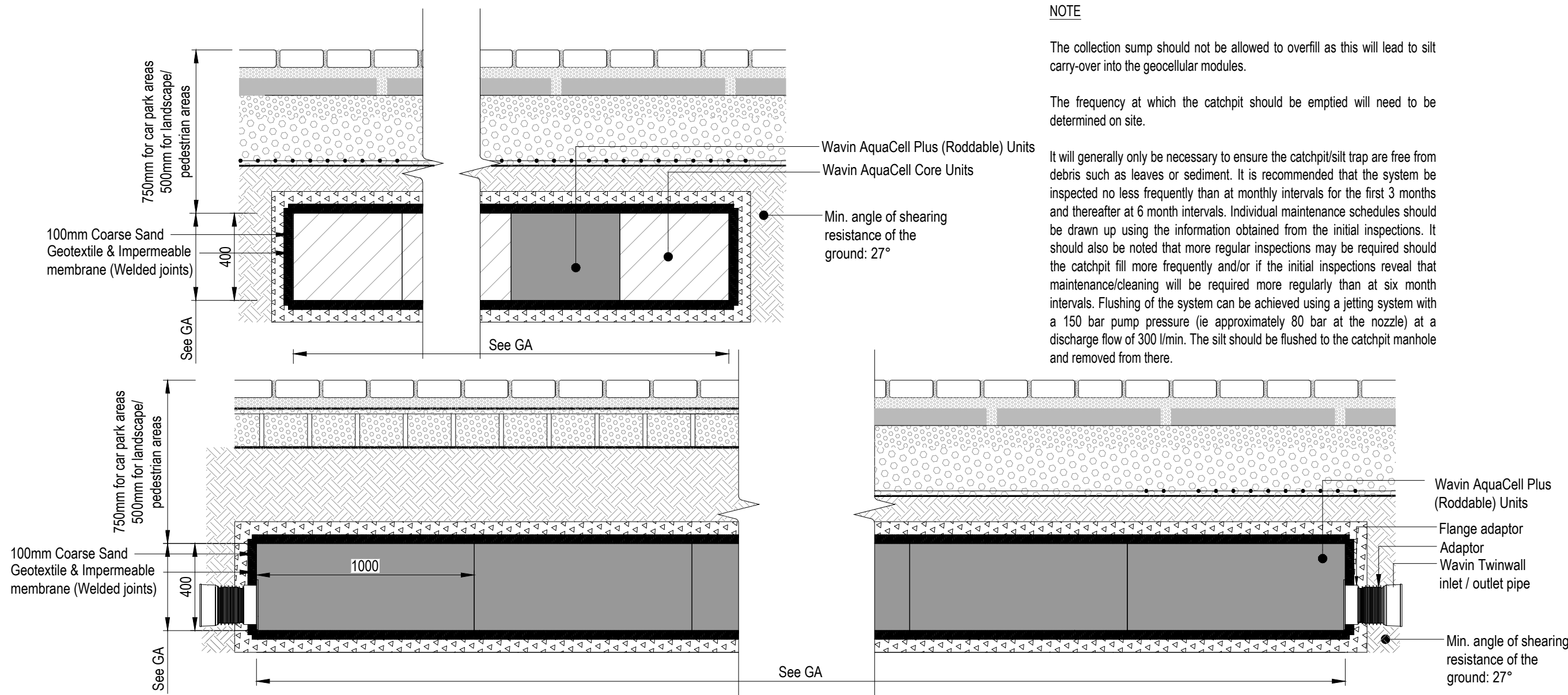
Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

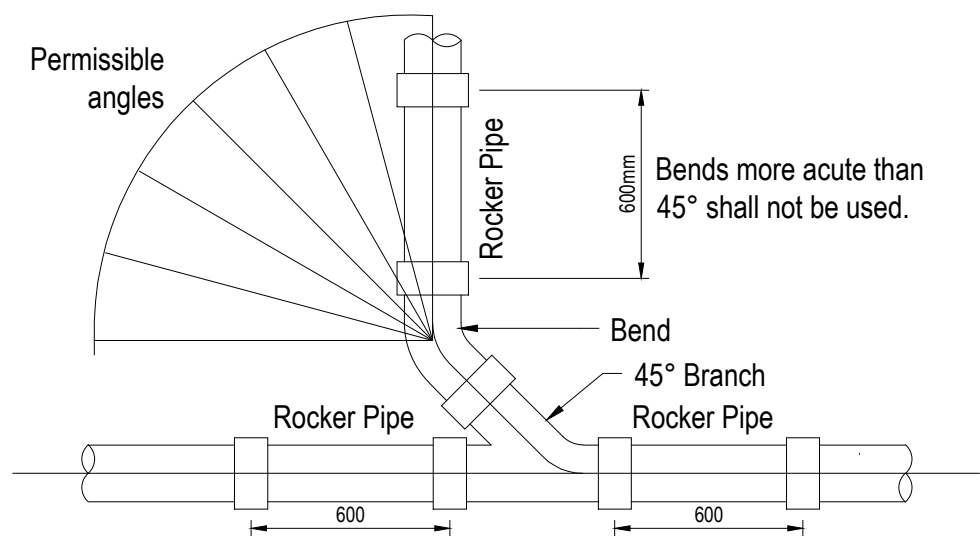
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Scales	A1 @ 1:100	Project No.	L251040
Reviewed Scheme	KL	Date	27/05/2026
Reviewed Final	-	Date	-

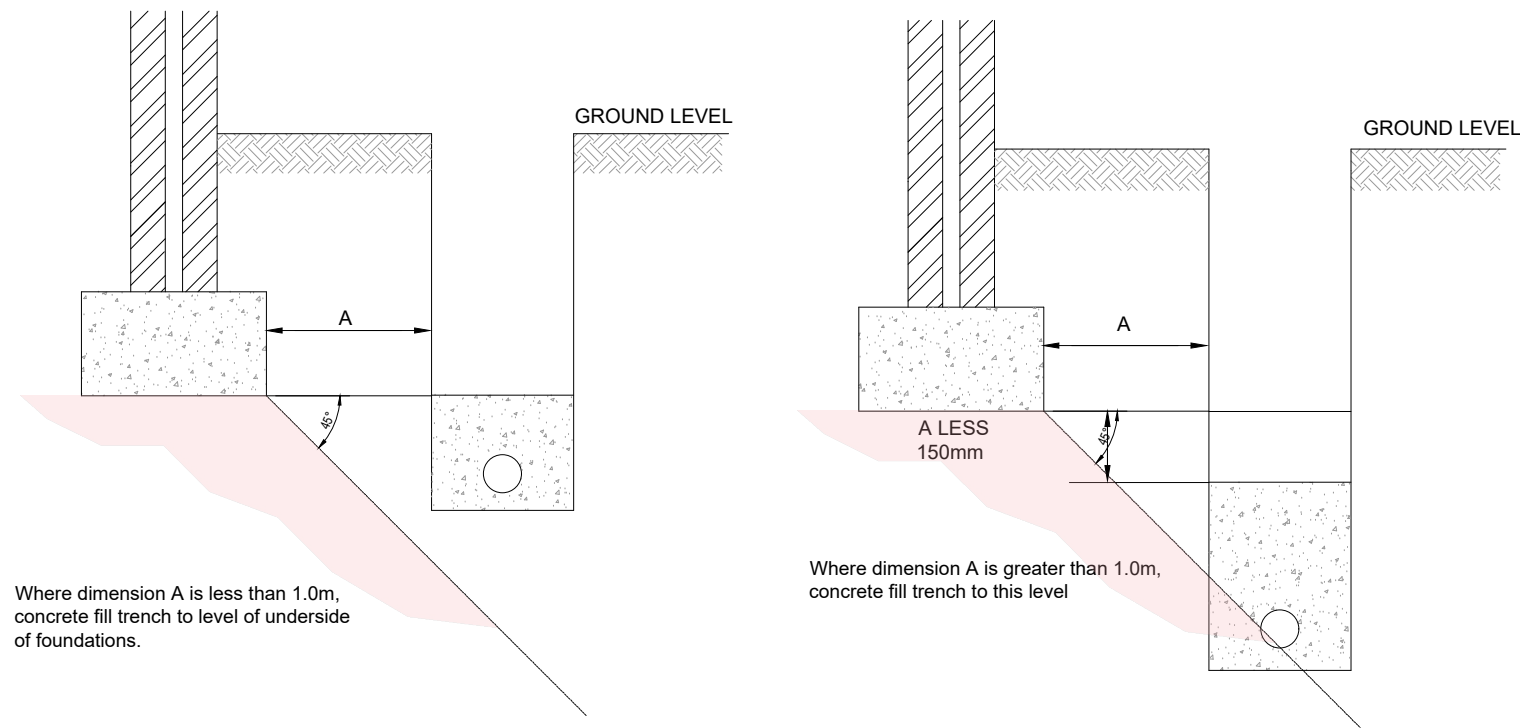
Project Ref	Originator	Zone	Level	Type	Role	DrgNo	Rev.
MPE - AKSW-XX - XX-DR - C - 9230	-P01						



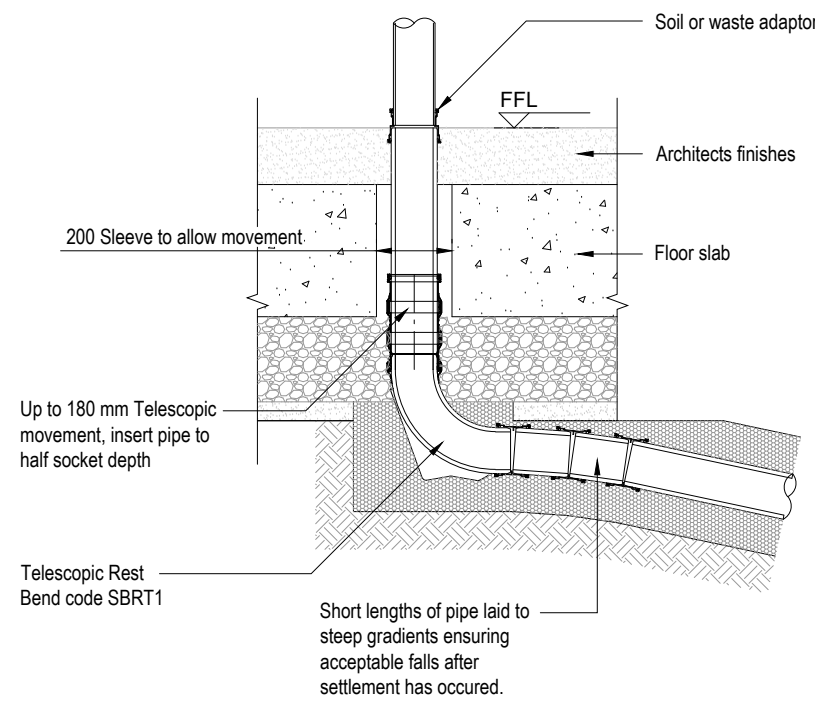
Typical Attenuation Construction
[WAVIN CELLULAR UNITS]



Oblique Junction Arrangement



Pipes Near Building Foundations



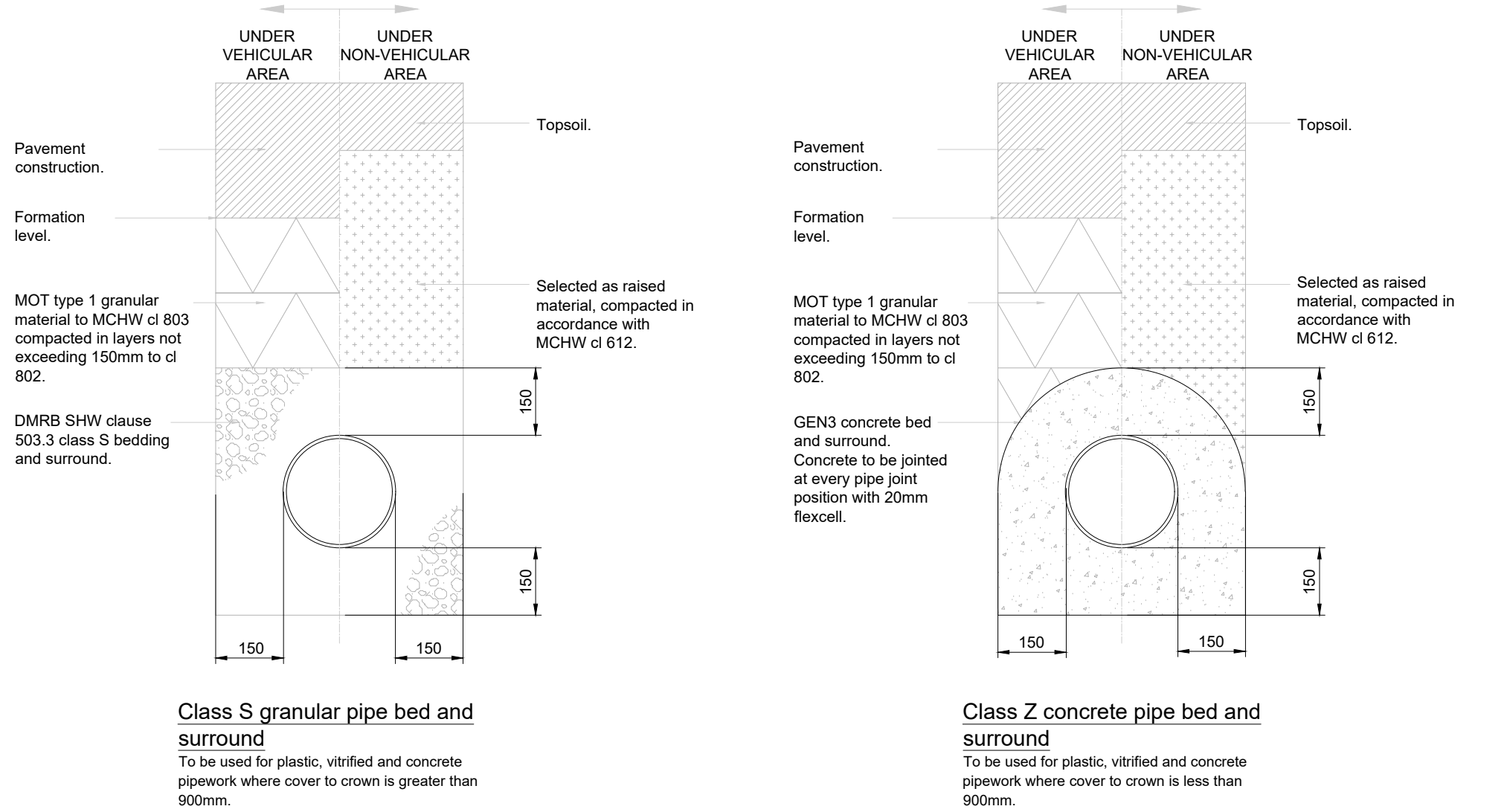
Telescopic Rest Bend Connection Detail
Where telescopic flexible movement length sits within slab

NOTE

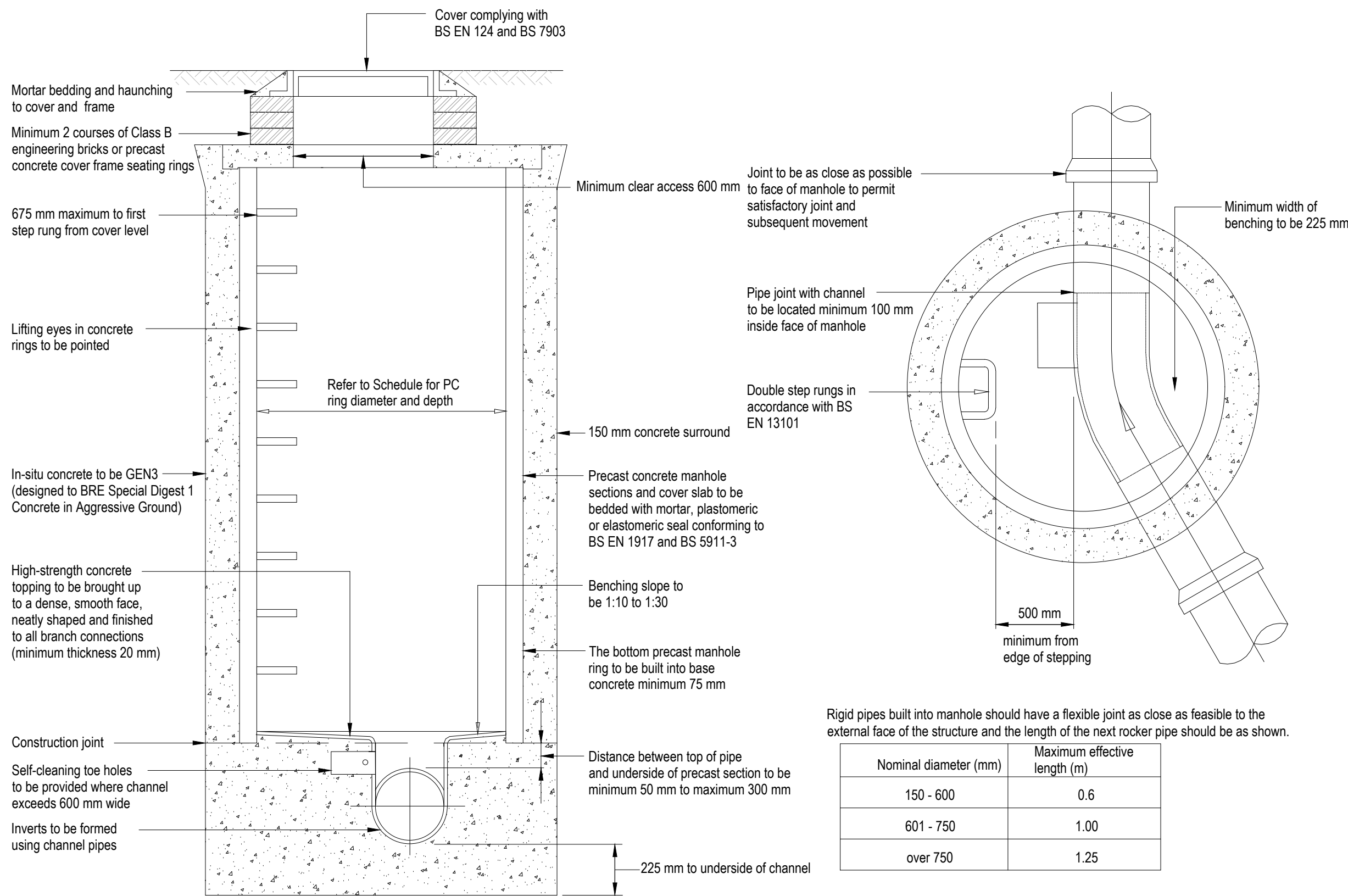
The collection sump should not be allowed to overflow as this will lead to silt carry-over into the geocellular modules.

The frequency at which the catchpit should be emptied will need to be determined on site.

It will generally only be necessary to ensure the catchpit/silt trap are free from debris such as leaves or sediment. It is recommended that the system be inspected no less frequently than at monthly intervals for the first 3 months and thereafter at 6 month intervals. Individual maintenance schedules should be drawn up using the information obtained from the initial inspections. It should also be noted that more regular inspections may be required should the catchpit fill more frequently and/or if the initial inspections reveal that maintenance/cleaning will be required more regularly than at six month intervals. Flushing of the system can be achieved using a jetting system with a 150 bar pump pressure (ie approximately 80 bar at the nozzle) at a discharge flow of 300 l/min. The silt should be flushed to the catchpit manhole and removed from there.



PIPE BEDDING DETAILS



Typical Manhole Type B Detail

Maximum depth from cover level to soffit of pipe 3.0 m

All pipes entering the bottom of the manhole to have soffits level UNO.

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P01	First issue for planning	MW	KL	20/03/26
Rev.	Amendment	Dm	Chkd	Date

Drg Status **PRELIMINARY** Suitability **S2**

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Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

Title **Drainage Details
Sheet 1**

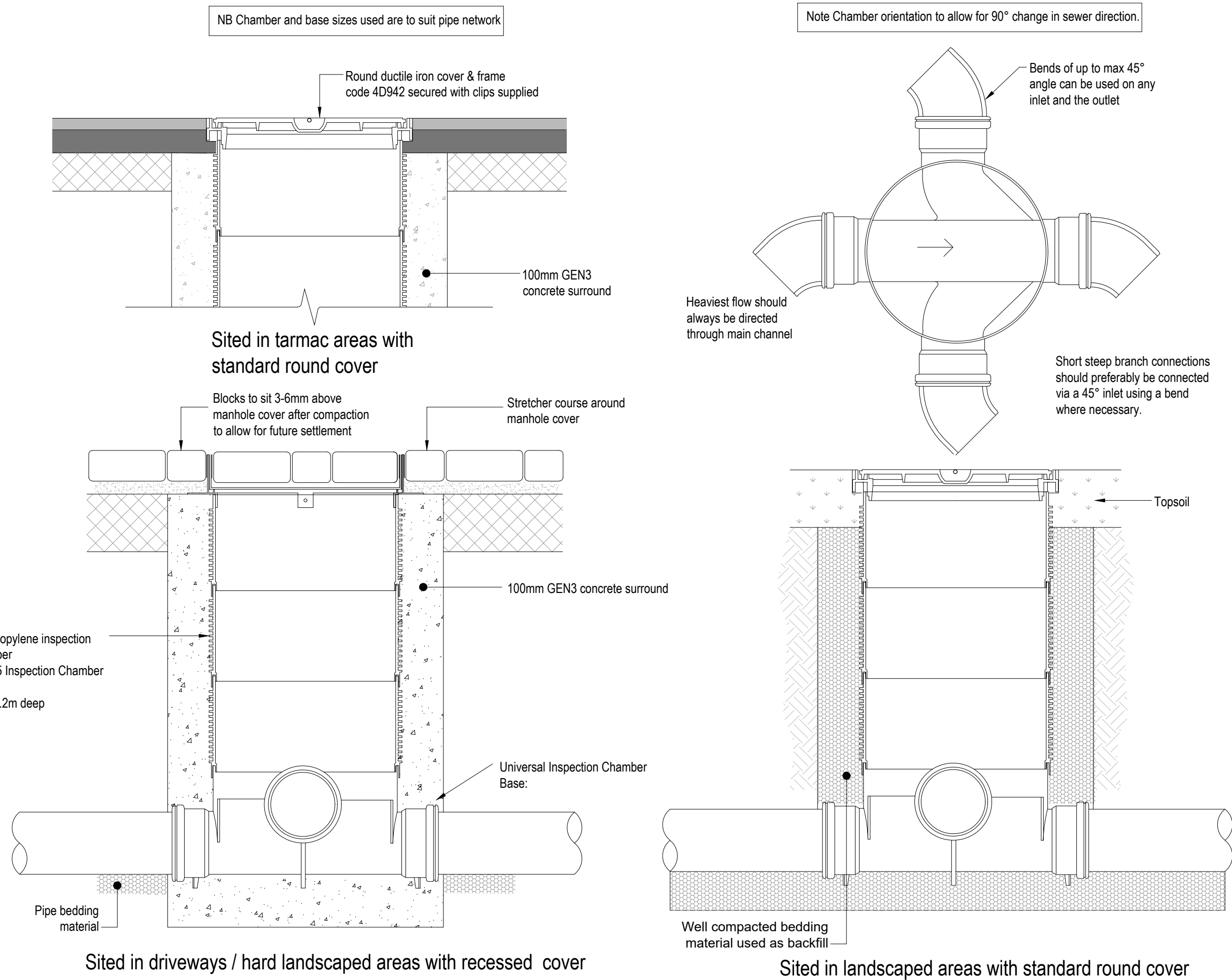
Scales **A1 @ NTS** Project No. **L251040**

Reviewed Scheme **KL** Date **20/03/2026**

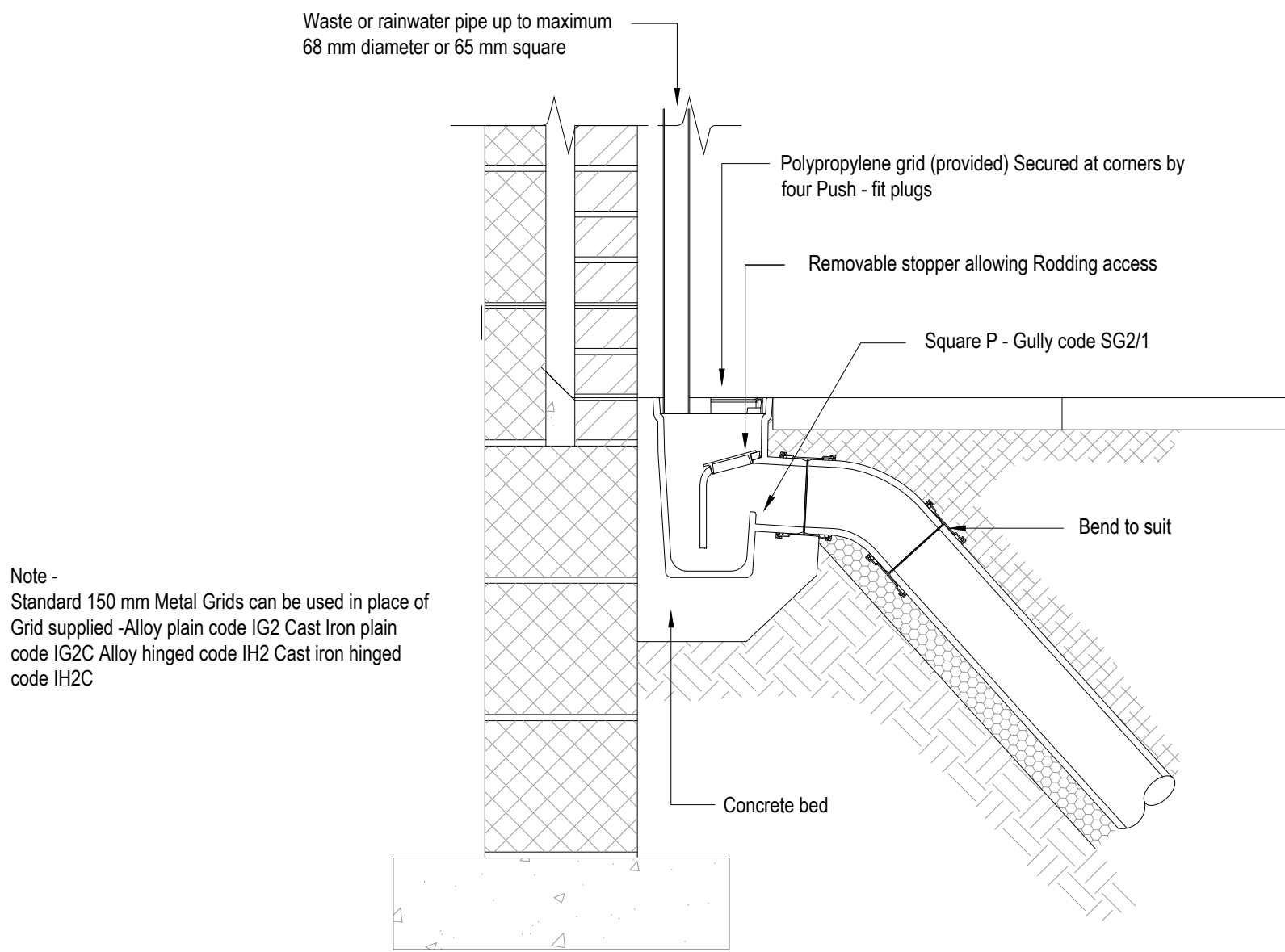
Reviewed Final **-** Date **-**

Project Ref **Originator Zone Level Type Role DrgNo Rev.**

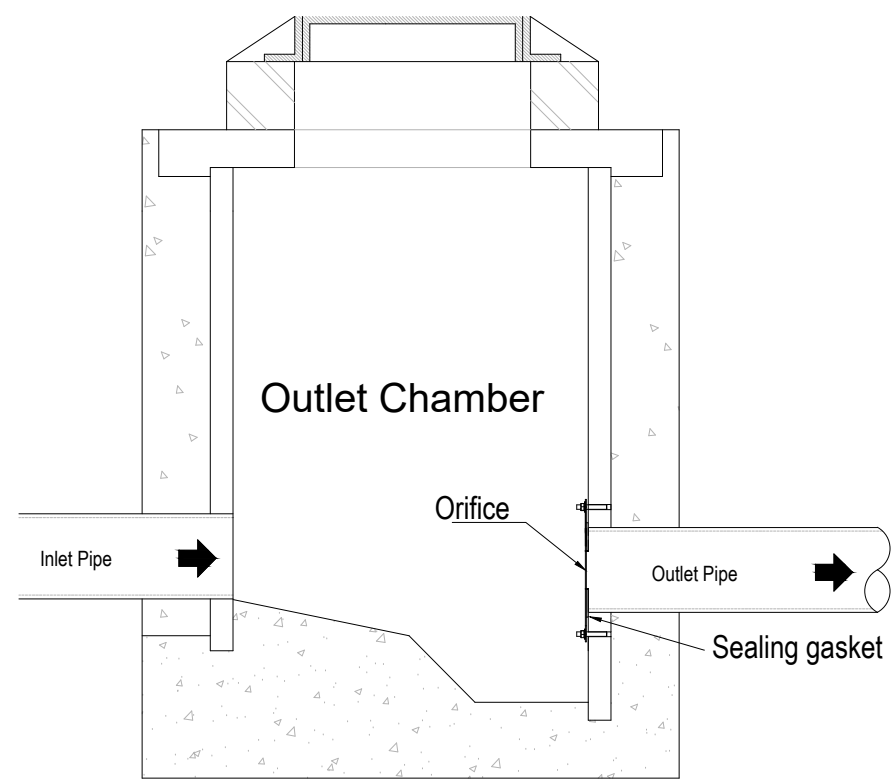
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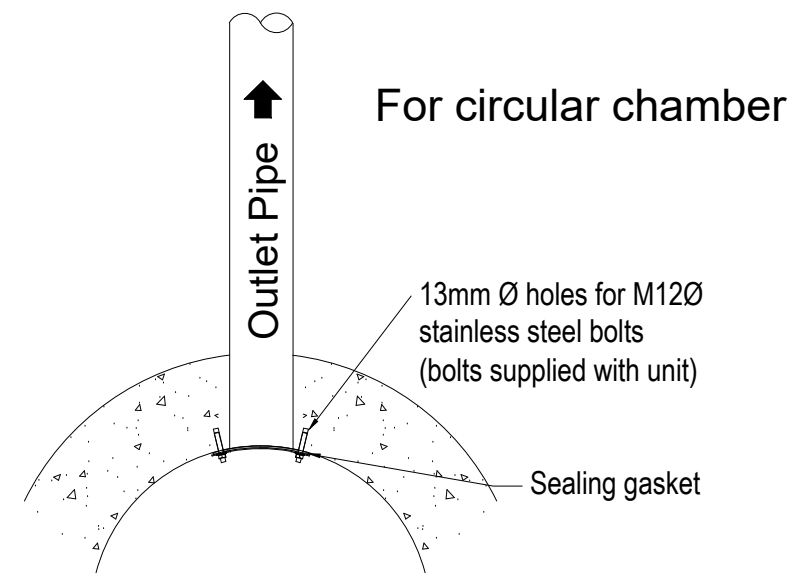
POLYPROPYLENE INSPECTION CHAMBER



EXTERNAL RAINWATER PIPE W/TRAPPED GULLY CONNECTION DETAIL

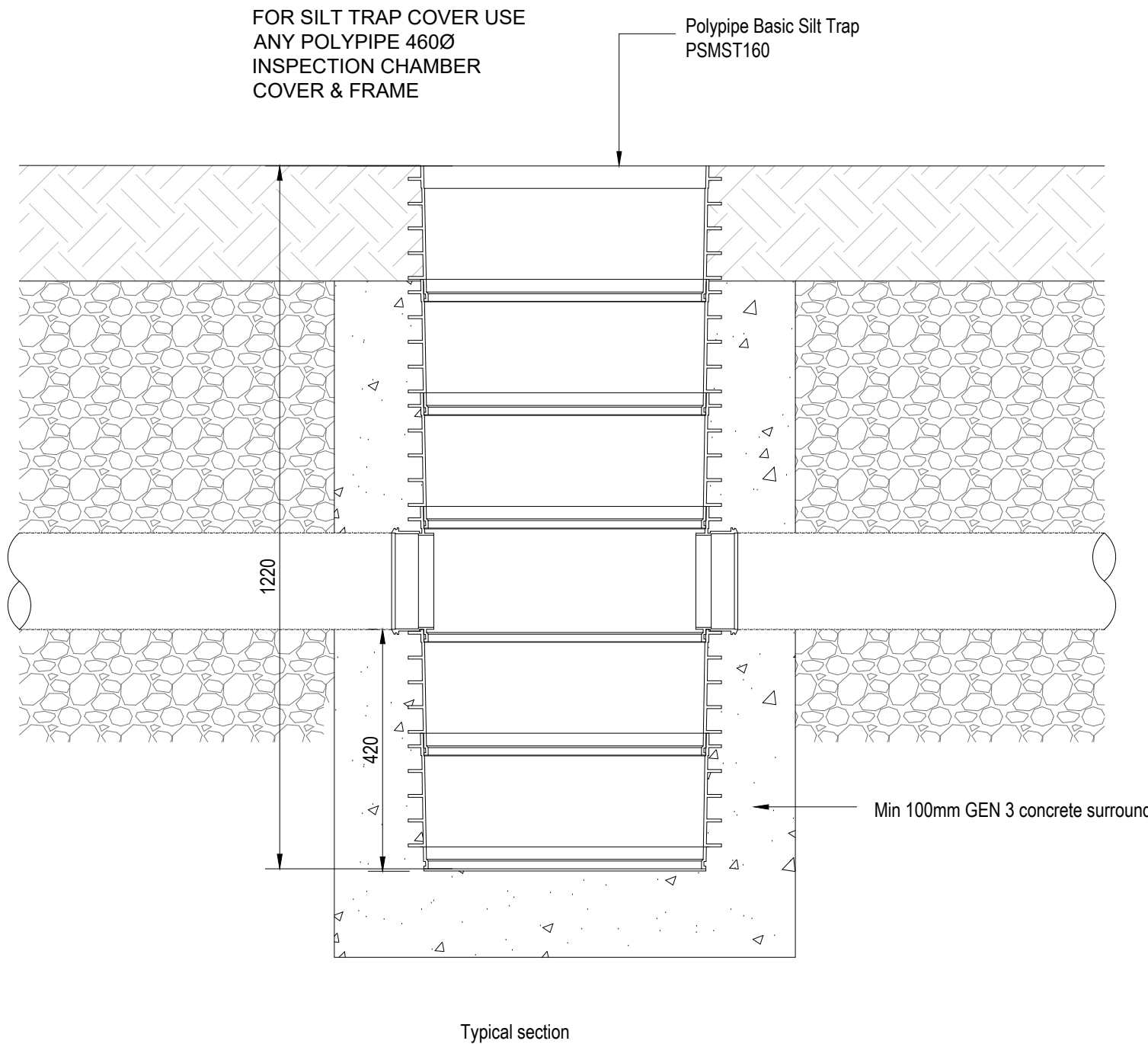


TYPICAL ORIFICE FLOW CONTROL DEVICE CONSTRUCTION

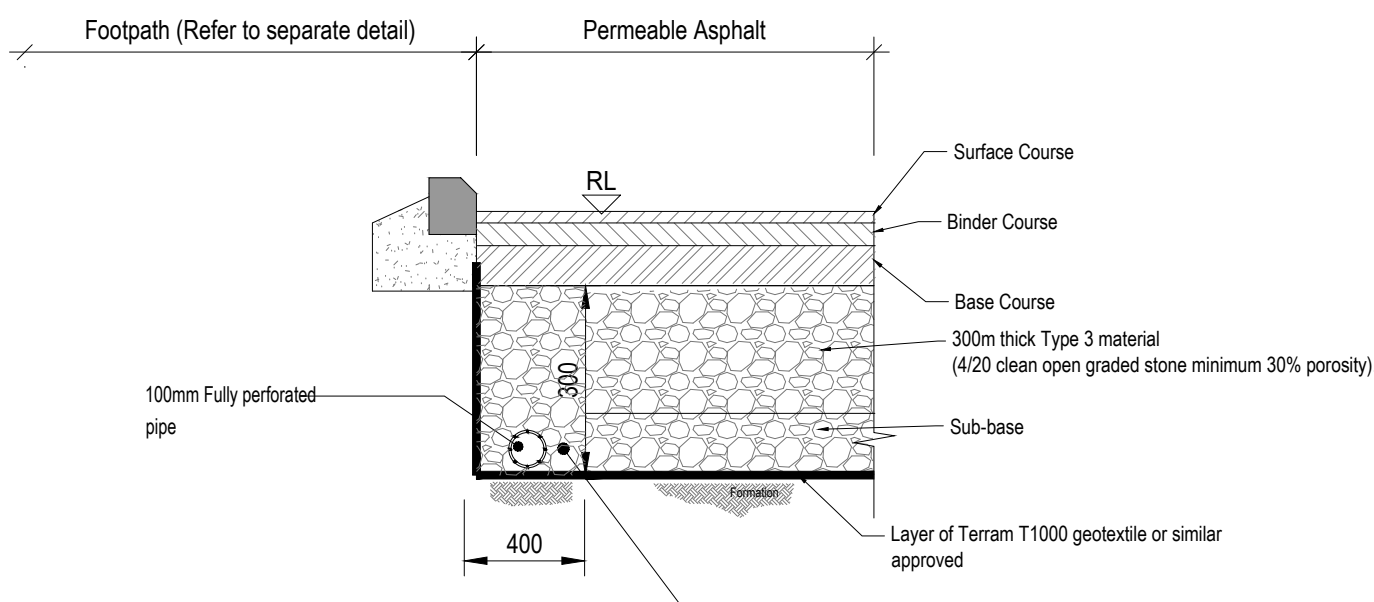


NOTE

FOR SILT TRAP COVER USE ANY POLYPIPE 460Ø INSPECTION CHAMBER COVER & FRAME



POLYPROPYLENE INSPECTION CHAMBER CATCHPIT DETAIL



PERMEABLE CAR PARKING BAY CONSTRUCTION

- Construct the chamber that is to house the ACO Q-Plate.
- Offer the ACO Q-Plate unit up to the outlet pipe. Ensure the unit is upright (arrow pointing vertically up). Mark the position of the fixing holes on the chamber wall. Remove the unit and drill the fixing holes, to suit the M12 bolts supplied with the unit. (Note bolts are Rawlbolt R-XPT-S stainless steel M12 bolts requiring a hole 13mm diameter and 60mm deep).
- Place bolts into the drilled holes. Locate the ACO Q-Plate onto the bolts (again check it is upright). Ensure that the gasket is flat against the wall. Fit the nuts and tighten them to pull the unit against the gasket and seal it against the wall.

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P01	First issue for planning	MW	KL	20/03/26
Rev.	Amendment	Dm	Chkd	Date

Drg Status	PRELIMINARY	Suitability	S2
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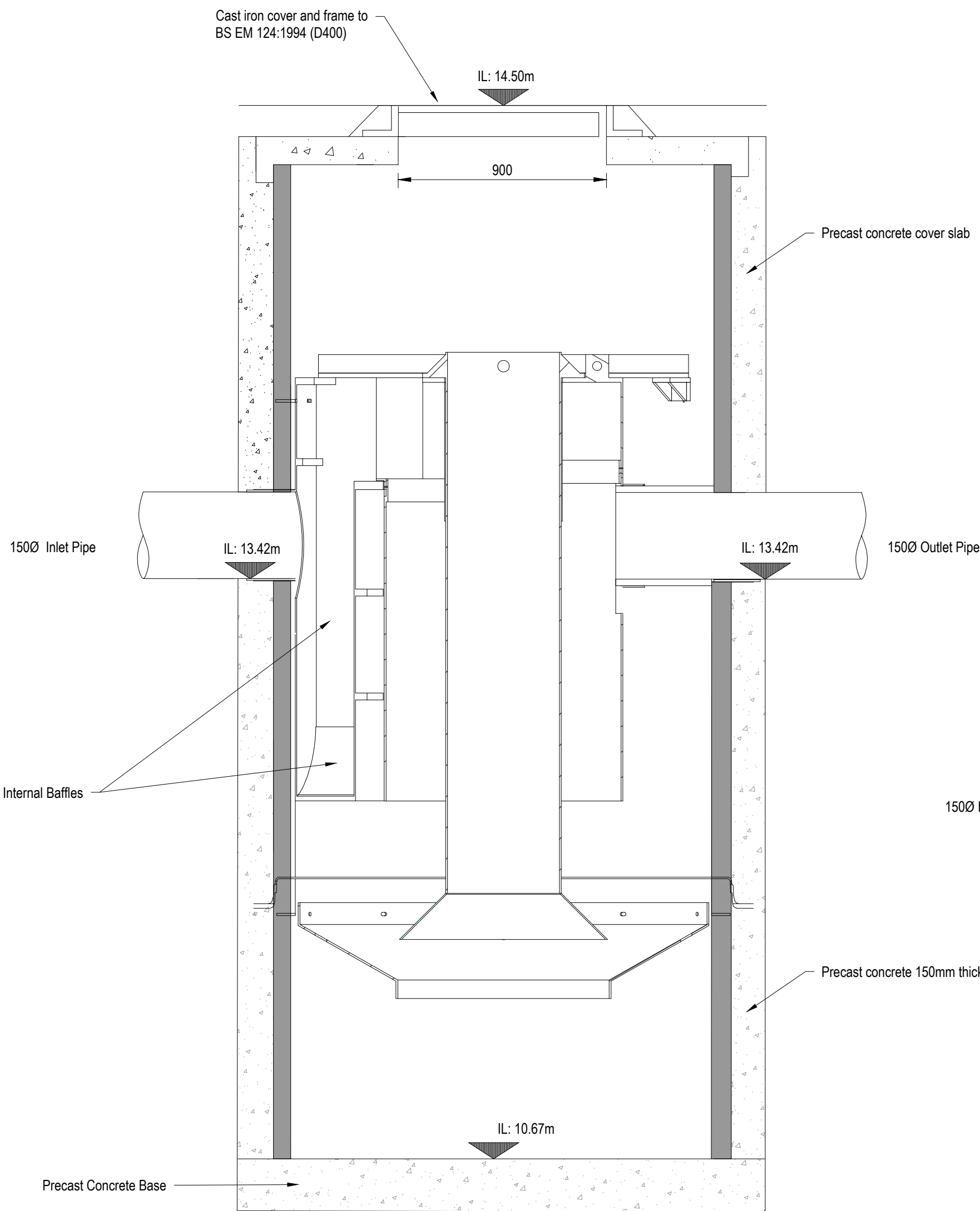
Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

Title **Drainage Details
Sheet 2**

Scales	A1 @ NTS	Project No.	L251040
Reviewed Scheme	KL	Date	20/03/2026
Reviewed Final	-	Date	-

Project Ref	Originator	Zone	Level	Type	Role	Drg No	Rev.
MPE - AKSW-XX - XX-DR - C - 9252	-P01						

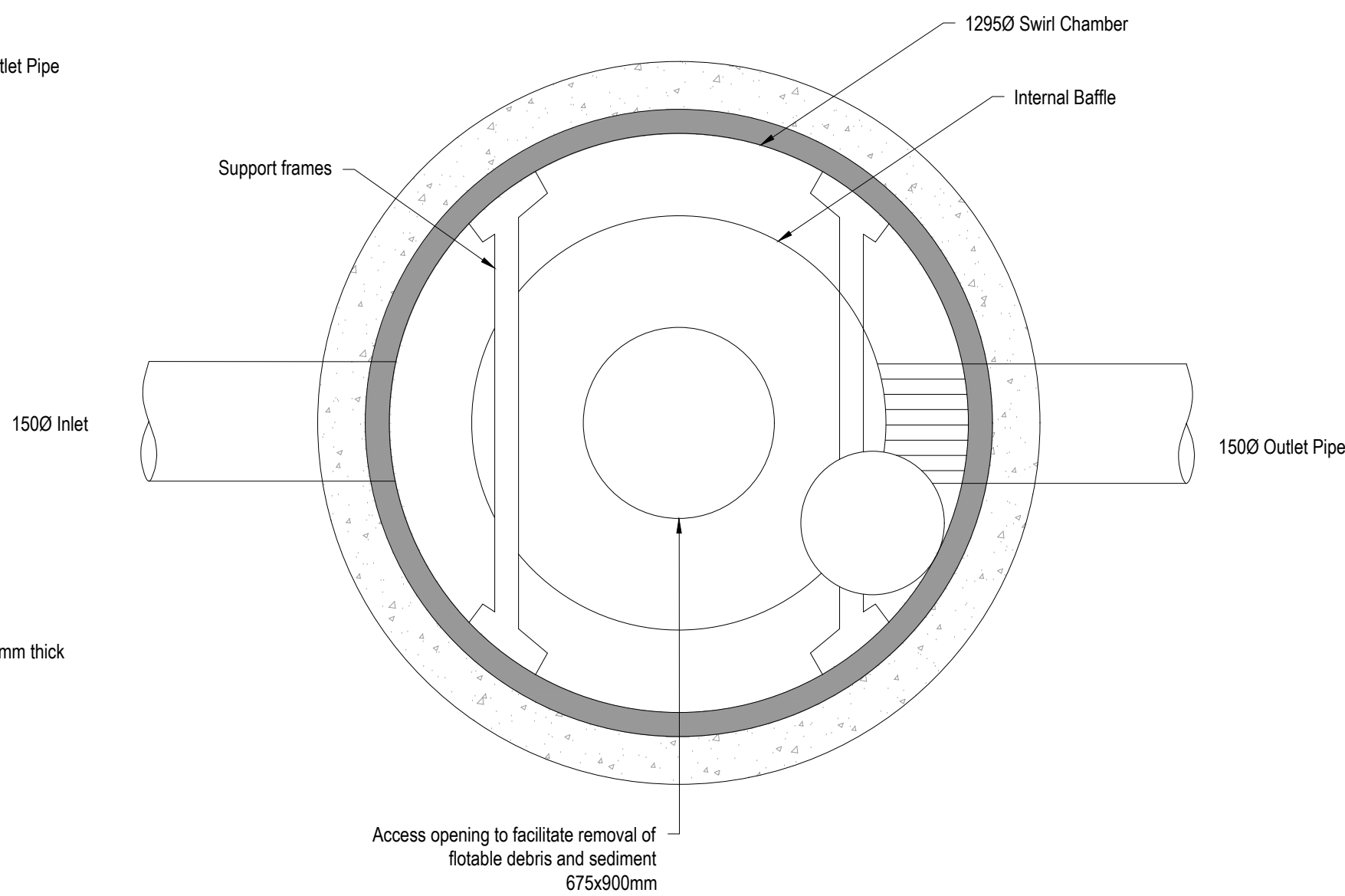


SPECIFICATION REQUIREMENTS:

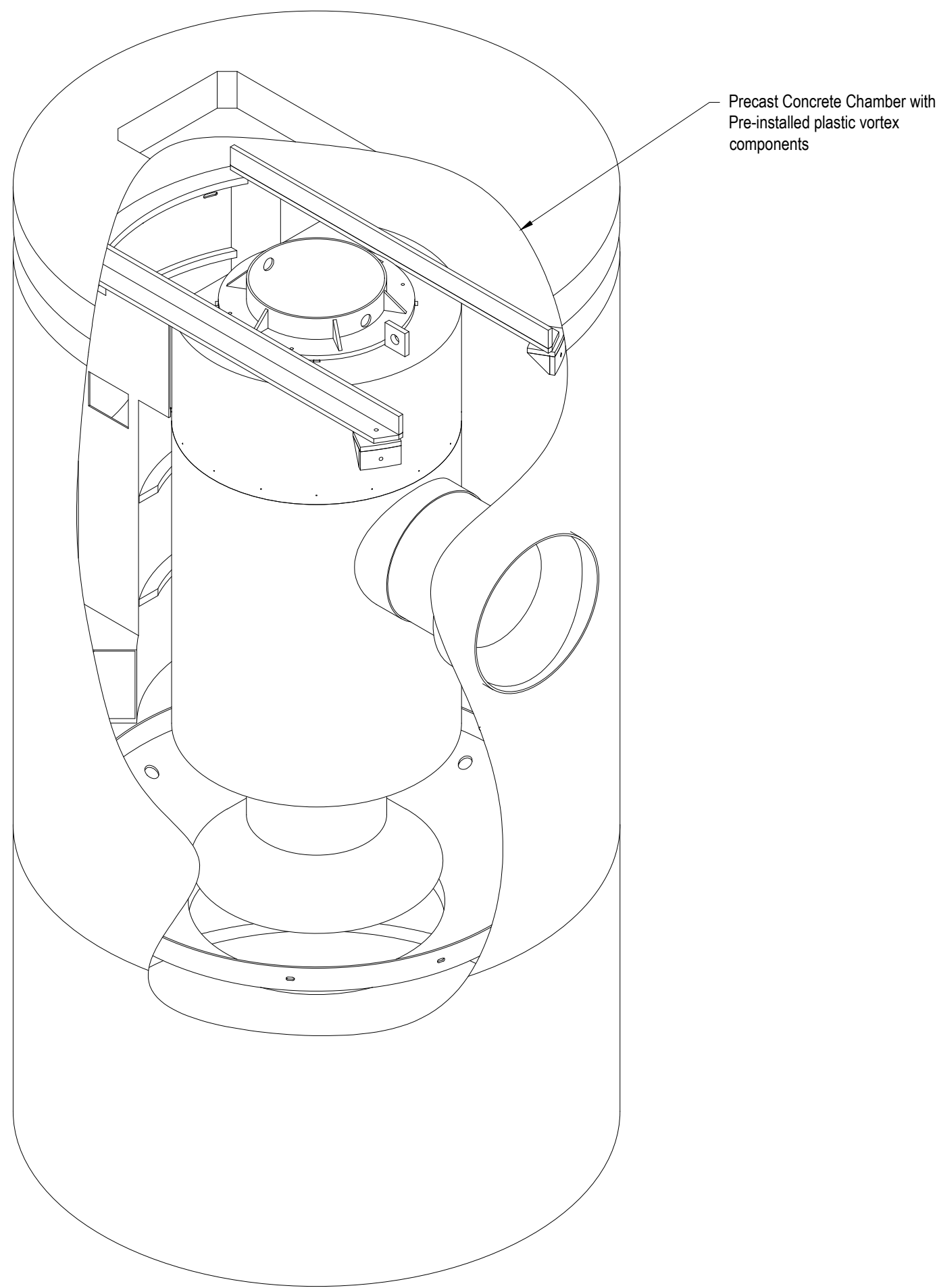
- The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
- The treatment system shall remove 80% or greater of TSS at the WQF.
- The treatment system shall treat all flows up to PTFR without bypass or loss stored pollutants.
- The Max. Headloss shall not be exceeded at PTFR with max. inlet pipe diameter.

DETAIL NOTES:

- A acceptable pipe coupler shall be used to connect the Hydrodynamic Vortex Separator Manhole's internal outlet stub to the storm drain.
- The diameter of the Hydrodynamic Vortex Separator Manhole's outlet stub is not adjustable. Any reducers required to match different stormdrain diameter must occur outside of the vortex chamber.
- The inlet pipe diameter must not be larger than the outlet pipe diameter.
- The tangential inlet pipe angle is not site specific. Refer to manhole schedules drawing.



Treatment System Specifications	
SDS Aqua-Swirl Model BYP	AS-4
Swirl Chamber Internal Diameter	1295mm
MAX Sub-out Pipe Outer Diameter BYP	660mm
Working Quality Treatment OK110 avg 110 micron	91.0 l/s
Working Quality Treatment OK110 avg 67 micron	45.0 l/s
Oil/Debris Storage Capacity	719 l
Sediment Storage	0.91 m3



INDICATIVE HYDRODYNAMIC VORTEX SEPARATOR MANHOLE

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This drawing is to be read in conjunction with all relevant AKSWard drawings and specifications prefixed L251040

Notes:

- Invert levels and positions of existing drains / chambers / sewers where new connections are to be made must be checked and confirmed to the engineer prior to the commencement of any works.
- Any part of the existing drainage system to be retained as part of the new scheme shall be cleaned and inspected. Any structural defects shall be repaired using appropriate and approved means.
- All drainage works shall be carried out in accordance with the requirements of the Local Authority and in conjunction with all relevant British Standards, Code for Adoption and Sewerage Sector Guidance May 2021 and any Anglian Water addendums as appropriate.
- All drainage shall comply with the typical details and the requirements of BS EN 752 and Part H of the Building Regulations.
- For setting-out dimensions of SVP's, RWP's etc, refer to Architect's or Mechanical Engineer's drawings. Positions shown are indicative and subject to final design.
- All runs connecting into the public drainage network to be vitrified clay, extra length to BS EN 295 or BS65 with plain sleeved or socketed flexible joints.
- All precast concrete units used in the drainage works shall be manufactured using sulphate resisting cement.
- Manhole covers and frames shall be to BS EN 124 and shall be Kitemarked. Covers and frames shall be heavy duty D400 in carriageways and vehicular areas and medium duty B125 in footways and soft landscaping. All Adoptable Manhole Covers shall be heavy duty D400.
- MH covers in paved areas to have cover & frame orientated 'square' with paving to minimise cut slabs or blocks. Blocks to be bedded in epoxy resin mortar. All recessed covers shall in accordance with the FACTA specification and load ratings.
- Cover levels are to be adjusted locally to suit finished ground levels.
- All threshold drainage channels to be ACO MD100SD and general drainage channels to be ACO MD100D.
- Where new sewers are constructed within 5m of a new or existing tree the sewer shall be concrete encased against root intrusion. Refer to drainage details.
- All new drainage to be jetted and CCTV surveyed on completion and tested in for water tightness by a suitable method in accordance with Part H of the Building Regulations and the Specification. Contractor to make sure that the drainage is fully operational. Refer to drainage maintenance manual for maintenance details.
- Refer to drainage maintenance manual for maintenance requirements.
- HEALTH AND SAFETY:** The works shall be carried out by specialist competent and experienced contractors who are members of a recognised national organisation. Operatives shall have received full and appropriate training for the operations they are to undertake. All work shall be carried out in accordance with all pertinent Health and Safety Regulations.

P01	First issue for planning	MW	KL	27/05/26
Rev.	Amendment	Dm	Chkd	Date

Drg Status	PRELIMINARY	Suitability	S2
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Client **Eastleigh Borough Council**

Project **Maple Place
Chamberlayne Road, Eastleigh
SO50 5HX**

Title **Drainage Details
Sheet 3**

Scales A1 @ NTS Project No. **L251040**

Reviewed Scheme KL Date 27/05/2026

Reviewed Final - Date -

Project Ref Originator Zone Level Type Role Drg.No Rev.

MPE - AKSW-XX - XX-DR - C - 9253 - P01

