

R10/R14 LINK ROAD – SOUTH WOKINGHAM SDL
DRAINAGE STATEMENT

MILLER HOMES, KIER VENTURES AND KINGACRE ESTATES LTD

22 SEPTEMBER 2025



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1.0 Introduction

Context

- 1.1. This report has been prepared by Abley Letchford Partnership Limited, on behalf of Miller Homes, Kier Ventures and Kingacre Estates to provide highway, drainage and infrastructure support in respect of the progression of a series of planning applications to facilitate development at the South Wokingham Strategic Development Location (SDL).
- 1.2. The SDL site is an urban extension of Wokingham in Berkshire and is bisected by an existing railway line linking Wokingham and Bracknell. The SDL proposals comprise of approximately 2,500 homes, a new South Wokingham Distributor Road and other facilities such as two primary schools and a community centre.
- 1.3. Planning permission for the South Wokingham SDL has been granted by Wokingham District Council at different times for the various phases of the SDL.
- 1.4. The first phase of the South Wokingham SDL is located at Montague Park located in the north-east area of the South Wokingham SDL. This phase of development was granted planning permission (ref: O/2010/1712) and has been subsequently constructed and includes approximately 620 dwellings. A section of road between Montague Park heading south over the railway line to a new four arm roundabout with Waterloo Road was subsequently approved in 2019 (WBC Planning Reference: 172934) and constructed. The road over the railway line is named William Heelas Way and the new roundabout junction with Waterloo Road is known as the Eastern Gateway roundabout.
- 1.5. The second phase of the South Wokingham SDL is split into Phase 2a (WBC Planning Reference: 190914) and Phase 2b (WBC Planning Reference: 191068) and they are both located south of the railway line and include proposals for 215 and 1,434 dwellings respectively.
- 1.6. The new South Wokingham Distributor Road was approved in 2021 (WBC Planning Reference: 192928). It routes east to west through the larger Phase 2b parcel and will ultimately connect Finchampstead Road at the west to the Eastern Gateway roundabout.
- 1.7. Parcel R10 is located at the eastern end of Phase 2b, adjacent to the Eastern Gateway roundabout. Parcel R14 is then located within Phase 2a further to the east. The SDL proposals involve the stopping up of the existing Waterloo Road alignment and the provision of an alternative Link Road between the southern arm of the Eastern Gateway roundabout and Waterloo Road, routing through parcels R10 and R14.
- 1.8. This full detailed application includes details of the proposed R10-R14 Link Road which is approximately 520m in length and will also facilitate access to the future residential parcels in the area. The extent of the Link Road is identified on General Arrangement Drawing A389-LRDD-101 which is attached in **Appendix A**.
- 1.9. The site lies within the administrative area of Wokingham Borough Council. The overall catchment area for the Link Road is 0.601 hectares (Ha) and the National Grid Reference of the site is SU 83301 67955. Refer to **Appendix A** for the Surface Water Catchment Plan Drawing A389-LRDD-502.



Report Aims and Formation

- 1.10. This report has taken cognisance of the original Flood Risk Assessment (FRA) carried out by WSP in August 2020, Ref: 70001684-FRA-SDL-001, and presents a detailed drainage design to ensure that the guiding principles are upheld.
- 1.11. The aim of this Report is to propose a suitable drainage system for the Link Road, whilst taking cognisance of the surrounding parcel's requirements, to demonstrate compliance therefore allowing the drainage to be discharged.

Report Structure

- 1.12. This report addresses the following aspects:
- Section 2: Surface Water Strategy
 - Section 3: Foul Water Strategy
 - Section 4: Water Quality and enhancement
 - Section 5: Adoption, Maintenance and Management
 - Section 6: Summary

Basis of Report

- 1.13. Abley Letchford Partnership Ltd follows accepted procedure in providing professional services, but given the residual risk associated with any prediction and the variability which can be experienced in flood condition, Abley Letchford Partnership Ltd takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the service. This report has been prepared for the purposes of planning approval only and is to assist our client and the Local Planning Authority (LPA) to make an informed decision on the flood risks associated with the development of the Site under consideration.



2.0 Surface Water Drainage Strategy

Introduction

- 2.1. This chapter provides details on the proposed surface water drainage strategy and measures to drain the proposed Link Road.

Methodology

- 2.2. The proposed drainage strategy has been designed to meet the requirements of the NPPF by providing a drainage system which embraces the SuDS philosophy and key principles. The utilisation of Sustainable Drainage Systems (SuDS) not only provides the benefit of controlling waters at source and online treatment of collected surface water, but also allows enhanced aesthetics through improved landscaping, biodiversity, and ecological opportunities.
- 2.3. Additionally, the Drainage Strategy meets the requirements of Wokingham Borough Council's Standards and Guidance documents. References to how the scheme reflects the relevant individual National and Local Standards is included where appropriate.

Existing Drainage Conditions

- 2.4. The area for the development of the Link Road at present drains via infiltration and overland flows towards the boundaries.

Sustainable Drainage Systems (SuDS)

- 2.5. Sustainable water management measures should be used to control the surface water runoff from the proposed development site therefore, managing the flood risk to the site and surrounding areas from surface water runoff.
- 2.6. Current guidance, CIRIA (2004) Report C609, provides that a hierarchy of techniques should be identified, namely:
- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g., minimise areas of hard standing).
 - **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting).
 - **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site).
 - **Regional Control** – management of runoff from several sites, typically in a detention pond or wetland.
- 2.7. In 2015, CIRIA published The SuDS Manual (C753) providing best practice guidance on the planning, design, construction, operation and maintenance of SuDS.
- 2.8. The SuDS Manual provides guidance to ensure SuDS are planned and designed to maximise the opportunities and benefits of surface water management.



2.9. The four main categories of benefits that can be achieved by SuDS, referred to as the four pillars of SuDS design, are:

- **Water quantity** – control the quantity of runoff to support the management of flood risk and maintain and protect the natural water cycle.
- **Water quality** – manage the quality of the runoff to prevent pollution.
- **Amenity** – create and sustain better places for people.
- **Biodiversity** – Create and sustain better places for nature.

Post Development Areas & Rates

- 2.10. To quantify any potential increase in surface water runoff, the existing Greenfield/Pre-Development runoff rate from the site must be determined. The rates of runoff have been established as part of the original Flood Risk Assessment (FRA) carried out by WSP in August 2020, Ref: 70001684-FRA-SDL-001. Therefore, the proposed greenfield runoff rate (QBAR) is going to be 4.4l/ha/s.
- 2.11. The total area of the proposed Link Road is approximately 0.601ha and the impermeable area of the Link Road is approximately 0.503ha.
- 2.12. To comply with best practice as stipulated in EA Report SC030219 'Rainfall Runoff Management for Developments', proposed discharge rates should be restricted for all storms up to and including the 1 in a 100-year storm event (1% AEP) plus a 40% allowance for climate change.

Surface Water Proposals and Rationale

- 2.13. As part of the Outline Permission, the approved Flood Risk Assessment (FRA) dated August 2020 by WSP (Ref: 70001684-FRA-SDL-001) provided a surface water drainage strategy dependant on a discharge rate of 4.4l/ha/s.
- 2.14. As part of the Link Road drainage strategy, it is proposed to provide a network of pipes and Sustainable Drainage (SuDS) features to collect and attenuate the surface water runoff from the impermeable areas. The conventional drainage system will work in combination with SuDS such as rain garden/tree pits, swales and detention basins to provide attenuation storage and high-quality water benefits.
- 2.15. Half of the proposed Link Road drainage network will collect and transfer surface water to the R10 Basin located to the west of the Link Road and close to the western border of Catchment R10. The R10 Basin has been designed to attenuate the impermeable area of R10 catchment and the half the impermeable area of the Link Road. This allows the basin to be constructed as a single entity from the outlet. Refer to drawing A389-LRDD-501 Drainage Strategy in **Appendix A** for more information.
- 2.16. The remaining half of the proposed Link Road drainage network will collect and transfer surface water to the R14a Basin, which is located next to the western border of the R14 Basin Catchment and north of the R14a Pipe Catchment. Refer to Drawing A389-LDDR-501 Drainage Strategy and Surface Water Catchment Plan A389-LRDD-502 in **Appendix A** for more information.
- 2.17. The R14a Basin has been designed to attenuate the surface water from the following impermeable areas:
- R14a Basin Catchment



- R14a Pipe Catchment
 - Eastern Part of the proposed Link Road
- 2.18. Taking into account the number of dwellings divided by the area of land they occupy; the impermeable area of the proposed catchments has been estimated using a 65% density ratio (this includes 10% urban creep). Drawing A389-LRDD-501 Drainage Strategy and Surface Water Catchment Plan A389-LRDD-502 provide an overview of these areas.
- 2.19. The proposed swales and basins will be lined (geomembrane or clay) and will provide attenuation only and not infiltration.
- 2.20. The manhole chambers of the proposed network could utilise strategic catchpits or proprietary devices, to minimize the amount of silt reaching the basins.
- 2.21. All conveyance systems will be designed to cater for the 1 in 30-year storm event (3.3% AEP), in accordance with industry standard, with all attenuation features designed to allow for the 1 in 100-year storm event (1% AEP) plus 40% climate change allowance.
- 2.22. Hydraulic calculations for the proposed Link Road can be found in **Appendix B**. The Microdrainage modelling has considered additional areas and pipes from R10 Catchment, R14a Basin Catchment and R14a Pipe Catchment, in order to size up the surface sewers under the Link Road sufficiently, as the sewers under the Link Road will be part of the Primary Infrastructure.
- 2.23. Hydraulic calculations should be read along with the A389-LRDD-501 Drainage Strategy drawing to identify the pipes that are related to the Link Road only. Potential flooding to the rest of the pipes that are not included in the Microdrainage calculations, should be ignored as part of this drainage strategy as they will be dealt individually within the development parcels via separate planning applications.
- 2.24. The proposals draw reference to the DEFRA document Sustainable Drainage Systems, Non-statutory technical standards for sustainable drainage systems March 2015, as well as CIRIA C753 The SuDS Manual.

Exceedance Flood Routing

- 2.25. Flows in excess of the above design storms, which may flood from the network for storms in excess of the 1 in 100-year storm event (1% AEP) plus 40% climate change, will be contained within the carriageway of the Link Road, until they are directed to the swale and basins.

Safe Access

- 2.26. The site is located outside of the fluvial and surface water flood extents. Continuous safe access is therefore available during a flood event.



3.0 Foul Water Drainage Strategy

Introduction

- 3.1. This chapter provides details on the proposed foul water drainage strategy and measures to convey effluent. Refer to drawing A389-LRDD-501 Drainage Strategy in **Appendix A**.

Existing Drainage Conditions

- 3.2. No foul network is present in the area that the Link Road is proposed to be built.

Foul Water Drainage Strategy

- 3.3. A gravity fed system will be provided as part of the Link Road, which will receive flows from the R14 Catchment and will discharge to a pumping station within the R10 Catchment. The pumping station within R10 Catchment will also receive the foul flows from the future development parcels and will pump them to the nearest public Thames Water sewer. The exact discharge point of the pumping station will be presented in the planning application for the R10 development parcel.
- 3.4. The proposed foul water sewers comprise part of the Primary Infrastructure works and will be designed in collaboration with IWNL as approving body in accordance with the new Sewerage Sector Guidance (SSG) and will be offered to IWNL for adoption under Section 104 Agreement of the Water Industry Act.
- 3.5. The drainage system to be designed to the appropriate standards including the new Sewerage Sector Guidance (SSG), the Building Regulations and British Standards.

4.0 Water Quality Enhancement

- 4.1. CIRIA report C753 The SuDS Manual outlines the methodology for assessing water quality risks associated with new development. This is a simple index approach which provides a high-level scoping analysis of the land usage and gives guidelines for appropriate treatment stages.
- 4.2. This process identifies features necessary to provide adequate substance removal in line with Environment Agency requirements. This is a three-step process of Allocation, Mitigation and Review.
- 4.3. Surfaces generating runoff are 'graded' on their potential to contribute to various harmful pollutants and gives each surface a risk of pollution from each element. An extract of Table 26.2 within the SuDS Manual is set out in **Figure 1**.

Figure 1 – Extract from Table 26.2 SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other Roofs	Low	0.3	0.2-0.8	0.05
Low traffic residential roads and non-residential parking with infrequent change.	Low	0.5	0.4	0.4
Commercial yard, parking with frequent change, other roads,	Medium	0.7	0.6	0.7
Sites with heavy pollution	High	0.8	0.8	0.9

- 4.4. Historically, PPG3 documentation would recommend that pollutants were removed utilising oil separators, but since its superseding, more recent guidance has shifted to the use of SuDS features to remove pollutants; thereby providing significant improvements in treatment.
- 4.5. The use of non-mechanical features decreases the requirements for maintenance and increase natural biodiversity. That said, the SuDS Manual does not remove the possibility of utilising separators, so long as they are considered in partnership with a comprehensive overall SuDS regime.
- 4.6. Without adequate treatment, the pollutants would cause damage if they were to enter the watercourse or water table in large volumes. The use of SuDS features to slow down and degrade these pollutants is critical to the provision of an acceptable discharge.
- 4.7. The proposed Link Road is classified as "Medium" in accordance with the Pollution Hazard Level, which equals to Total Suspended Solids: 0.7, Metals: 0.6 and Hydrocarbons: 0.7.
- 4.8. The respective cleansing abilities of common SuDS features are given by corresponding mitigation indices within the SuDS Manual. An extract of Table 26.3 is set out below and is set out in **Figure 2**.

Figure 2 – Extract from Table 26.3 SuDS Manual

Type of SuDS component	Total Suspended Solids	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable Paving	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8

- 4.9. For the purposes of the water quality assessment, benefits drawn from the inclusion of rain garden/tree pits whilst positive, are supplemental to the primary features set out below.
- 4.10. The western half of the proposed Link Road primarily utilises a swale (TSS:0.5, Metals:0.6, Hydrocarbons:0.6) and a basin (R14a Basin - TSS:0.5, Metals:0.5, Hydrocarbons:0.6) and they together offer adequate pollution mitigation measures for the western half of the proposed Link Road.
- 4.11. The eastern half of the proposed Link Road utilises a basin (R10 Basin - TSS:0.5, Metals:0.5, Hydrocarbons:0.6) and also a swale(TSS:0.5, Metals:0.6, Hydrocarbons:0.6). Therefore, the combination provides an adequate pollution mitigation measure for the eastern half of the proposed Link Road.



5.0 Adoption, Maintenance and Management

- 5.1. This section of the strategy considers the maintenance requirements of the drainage provisions during the construction phase and post construction phase of the development lifecycle.

Construction Phase

- 5.2. To supplement the Construction Management Plan document, the requirement to manage surface water during the construction phase of the development requires mitigation to protect against adverse effects on surface water quality and to provide pollution control.
- 5.3. CIRIA C532 Control of Water Pollution from Construction Sites and CIRIA C753 The SuDS Manual provide specific measures for the protection of surface water quality during construction activities, including:
- Management of construction works to comply with the necessary surface water quality standards and any consent conditions from planning approval.
 - Surface water run-off from the road will be managed through a temporary and/or permanent drainage infrastructure, including measures for removing suspended solids and potential contaminants.
 - Plant machinery and vehicles to be maintained in a good working condition, with wheel washing and dust suppression measures at all entry and exit points used to prevent the migration of pollutants (particularly in relation to works using concrete and with areas where dust and mud can build up);
 - Areas at risk of spillage will be carefully sited and protected (e.g., bunds and impervious walls and floor) to minimise the risk of hazardous substances affecting surface water quality – this may include vehicle maintenance and storage areas for hazardous materials.
 - The movement of plant machinery and vehicles and the storage of materials during the construction works will be limited near to surface water features.
 - Excavation activities will carefully be monitored and coordinated with forecasted dry periods, where possible, with excavation works covered during periods of heavy rain to minimise the entry and collection of rainwater and transport of pollutants; and
 - The movement of plant and machinery over bare soil areas will be limited to avoid soil compaction and smearing, with suitable preparatory works included where this cannot be avoided so as to minimise effects on the surface water runoff regime.
- 5.4. Temporary onsite drainage facilities will be provided during the construction phase to ensure the controlled discharge of surface water run-off, until such a time as the permanent surface water drainage strategy is implemented.
- 5.5. During the construction phase, the Developer will be responsible for all surface water matters especially water quality and pollution control. They or their Principal Contractor will undertake all necessary maintenance until such time as the assets are passed over for adoption or management.



Post Construction Phase

- 5.6. Whilst the drainage system has been designed to the appropriate standards including Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code", 2021), the Building Regulations and the requirement of the National Planning Policy Framework, ongoing maintenance will be required to all drainage elements.

Surface Water Adoption

- 5.7. The onsite main drainage provision including traditional sewers and manholes are expected to be offered to IWNL for adoption under Section 104 of the Water Industry Act. Ultimately these assets will become owned and maintained in perpetuity by IWNL upon vesting.
- 5.8. The shallow swale and basins will remain in private ownership and will be maintained by a private Management Company.
- 5.9. Onsite highways are envisaged to be adopted by Wokingham Borough Council, therefore the rain garden/tree pits, highway gullies and connections to the underlying sewer system will be maintained by the Local Authority.
- 5.10. Smaller private drains and manholes within dwelling curtilages will be conveyed to purchasers, wherein responsibility for ongoing maintenance will lie with the homeowner.

Foul Water Adoption

- 5.11. The onsite main drainage provision including the pumping station traditional sewers and manholes are expected to be offered to IWNL for adoption under Section 104 of the Water Industry Act. Ultimately these assets will become owned and maintained in perpetuity by IWNL upon vesting.
- 5.12. Smaller private drains and manholes within dwelling curtilages will be conveyed to purchasers, wherein responsibility for ongoing maintenance will lie with the homeowner.

SuDS Feature Maintenance

- 5.13. Regular maintenance/replacement of the fundamental SuDS features, and associated drainage assets requires careful consideration.
- 5.14. Rain garden/tree pits will be maintained by Wokingham Borough Council as highway features, with the above ground SuDS features such as basins and swales also being maintained Wokingham Borough Council as part of the open space provision. Refer to **Table 1 and 2** for an indicative maintenance schedule for the basins and swale.

Management Company

- 5.15. As part of the development, the private management company will be formed by the Master Developer and will be funded by annual service charge receipts from residents.
- 5.16. The private management company will be responsible for the day to day operation and maintenance of shared permeable paving driveways. Suitable adoption and maintenance regimes for these features would be submitted in support of the Reserved Matters applications.

Table 1: Maintenance Schedule for Detention Basin

Maintenance Schedule	Required action	Frequency
Regular Maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets, and overflows for blockages, and clear if required	Monthly
	Inspect bank sides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year) then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlets, and forebays	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every two years, or as required
	Remove sediment from inlets, outlets, forebays, and main basin when required.	Every five years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required



Maintenance Schedule	Required action	Frequency
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets, and overflows	As required
	Re-level uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly/after large storms.
	Inspect bank sides, structures, pipework etc for evidence of physical damage.	Monthly/after large storms.
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.
	Check penstocks and other mechanical devices.	Half yearly.

Table 2: Maintenance Schedule for Swales

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Swales	Regular Maintenance	Remove litter and debris	Monthly
		Cut grass - for spillways and access routes	Monthly (during growing season), or as required
		Cut grass – meadow grass in and around swale	Half yearly (spring – before nesting season, and autumn)
		Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
		Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
		Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
		Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
		Check any penstocks and other mechanical devices	Annually
		Tidy all dead growth before start of growing season	Annually
		Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Occasional Maintenance	Reseed areas of poor vegetation growth	As required
		Prune and trim any trees and remove cuttings	Every 2 years, or as required
		Remove sediment from inlets, outlets, forebay when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
	Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
		Realignment of rip-rap	As required
		Repair/rehabilitation of inlets, outlets and overflows	As required
		Relevel uneven surfaces and reinstate design levels	As required



6.0 Summary

- 6.1. The discharge rate of 4.4l/ha/s is proposed in this surface water drainage strategy, which has been established by the Flood Risk Assessment (FRA) dated August 2020 and produced by WSP (Ref: 70001684-FRA-SDL-001), as part of the Outline Permission.
- 6.2. The Drainage Strategy encompasses SuDS to mitigate and manage surface water flows from the proposed Link Road.
- 6.3. The proposed surface water drainage strategy will manage the flood risk posed by uncontrolled surface water runoff from the Link Road. Any increase in surface water run-off can be managed using SuDS as well as attenuation features to provide storage in extreme storm events.
- 6.4. The site is located outside of the fluvial and surface water flood extents. Continuous safe access is therefore available during a flood event.
- 6.5. All the water quality parameters have been considered to enhance the water quality of the proposed surface water network in accordance with The SuDS Manual 2015 (C753).
- 6.6. Surface water attenuation for all storm events is provided within the proposed surface water drainage network for all storm events up to and including the 1 in 100-year storm event (1% AEP) plus the allowance for a 40% increase in rainfall intensities as a result of climate change.
- 6.7. An efficient gravity foul water network is proposed, which will comprise part of the primary infrastructure network. This network is expected to be offered for adoption to IWNL.
- 6.8. Detailed adoption, maintenance and management schedules have been provided for the proposed SuDS in accordance with The SuDS Manual 2015 (C753).
- 6.9. The proposed Link Road complies with national and local planning policy in response to flood risk. The risk of flooding is adequately managed, and the offsite flood risk is not increase.
- 6.10. The proposed Link Road is therefore deemed appropriate in this location in terms of flood risk and drainage.



Appendices



Appendix A – Proposed Drawings

General Arrangement Drawing A389-LRDD-101

A389-LRDD-501 Drainage Strategy

A389-LRDD-502 Surface Water Catchment Plan



Junction White Lining					
DIAG 1003A DIAG 1009A					
NOTES					
1. All lining to be in accordance with Traffic Signs and General Directions 2016 and any subsequent additions and/or amendments.					
DIAG No.	MARKING TYPE	MARK	GAP	WIDTH	REMARKS
1003A	Proposed Lining	005	200	200	
1009A	Proposed Lining	400	1000	100	6000 m/min
1009A	Proposed Lining	005	200	200	

- © ABLEY LETCHFORD PARTNERSHIP LTD.
This drawing should not be reproduced without consent.
- GENERAL NOTES:
- Do not scale.
 - Refer to all other Project Drawings and supporting notes.
 - The Contractor is to check and verify all buildings and site dimensions and levels, including sewer invert levels, before works start on site. The Contractor is to comply in all aspects with the current building legislation, British standards, building regulations etc.
 - Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work.
 - This drawing is to be read in conjunction with and checked against all other drawings, Engineering details, Specification and any structural, Geotechnical or other specialist document provided.
 - Any anomaly or contradiction between any of the above is to be reported to the Engineer.
 - This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.
 - Traffic management and safety measures shall comply in all respects to Chapter 8 of the Traffic Signs Manual published by HMG. The Contractor shall submit his proposals for the approval of the Engineer and Local Highway Authority prior to commencing any work.
 - The Contractor shall contact all utilities companies prior to commencing and excavation. It is the Contractor's responsibility to locate the exact position of all underground and overhead services, cables, pipes etc prior to the excavations and to take all necessary protective measures.
 - The Contractor shall make good any damage caused to walls, fences, kerbing, surfacing, road signs etc at his own expense as instructed by the Highway Authority.
 - The Contractor shall indemnify the Client, Engineer and Local Authority against damage to any highway authority property, statutory undertakers plant and any costs associated with the diversion of services and the repair/replacement of the damaged plant. No work on site shall commence until written evidence of the above indemnity has been submitted to and accepted by the Engineer.
 - Highway Inspector to be present during inspections/CIR testing.
 - The Contractor shall maintain access to all properties affected by the works.
 - Appropriate shared pedestrian/cycle signage to be provided. For further details, see drawing A389-LR-1201.
 - All proposed traffic signs to be reletterised.

- KEY
- Planning Application [240892] boundary
 - Existing Tree Root Protection Area
 - 43m Junction Visibility Splay (30mph, M5)
 - 43m Forward Sight Stopping Distance Visibility Splay (30mph, M5)
 - 17m Cyclist Visibility Splay (20mph, LTN 1/20)
 - 43m Visibility Splay to Pedestrian Crossing Points on Link Road (30mph, M5)
 - 43m Visibility Splay to Pedestrian Crossing Points on Minor Arms (30mph, M5)
 - Tactile paving at dropped crossing
 - Curbside paving
 - Proposed Tree Pit
 - Proposed Rain Garden Tree Pit
 - Proposed road gully
 - Proposed Block Paving
 - Proposed Carriageway - Tarmacadam
 - Proposed Footway - Tarmacadam
 - Proposed Footway - No-dig Tarmacadam
 - Proposed Shared Footway/Cycleway - Tarmacadam
 - Proposed Shared Footway/Cycleway - No-dig Tarmacadam
 - Proposed Verge
 - Proposed Street Lighting Column
 - Existing Street Lighting Column
 - Proposed Traffic Sign
 - Temporary Traffic Sign

0 5 10 15 20 25m			
Scale 1:200			
COO R5.25	AMENDMENTS TO VISIBILITY SPLAYS	RG	RF
COO R5.25	RESPONSE TO WBS COMMENTS	RG	RF
COO R7.25	R10 PLOT ACCESS ANNOTATED	RG	RF
COO R8.25	FOR SECTION 73 APPROVAL	RG	RF
COO R5.25	CONSTRUCTION ISSUE FOLLOWING TECHNICAL APPROVAL BY WBS	RG	RF
Rev	Description	Drawn	Checked

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Client

MILLER HOMES
KIER VENTURES
KINGACRE ESTATES LTD.

Project

SOUTH WOKINGHAM SDL
R10-R14 LINK ROAD
DETAILED DESIGN

Title

GENERAL ARRANGEMENT

Status

FOR CONSTRUCTION

Scale	Date	Project	Checked
1:500 @ A0	MAY 2025	RG	RF

Drawing No. A389-LRDD-101

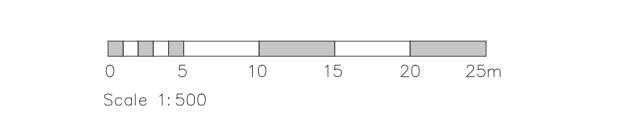
Revision C05



EASTERN
GATEWAY
APPROVED
UNDER
APPLICATION
NUMBER
192928

1. Do not scale.
2. Refer to all other Project Drawings and supporting notes.
3. All adoptable drainage works to be constructed as detailed in Design and Construction Guidance or as stipulated in the Water Authorities Addendum.
4. All public sewers are to be the subject of a Section 106 agreement of the Water Industry Act 1991.
5. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
6. The Contractor is responsible for maintaining continuity of flow for all existing sewers within the site boundary and limit of works for the duration of the project.
7. All drainage ironwork to comply with BS EN124, and be stamped with his trademark, covers to suit loading as below:
- Carriageways and Roads - D400 (supplies to be approved by WRC, otherwise R600 to be used)
- Driveways and Verges - C250
- Footways and Pedestrian Areas - B125
- Gardens/Landscaping - A15
8. All sewer pipes, up to, and including 600mm are to be verified clay or PVC-U to BS EN295 and BS EN1424 respectively. All sewer pipes 675mm diameter and above to be concrete pipes to BS EN1916.
9. All drainage shall be installed and tested strictly in accordance with the Manufacturers' printed instructions, BS EN 12, BS EN 1262, Local Water Authority requirements and the Building Regulations.
10. All bedding shall be Class 5 unless noted otherwise.
11. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted Type 1 granular sub-base material.
12. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 100mm of cover shall be encased in concrete bed and surround with associated movement joints. Drainage laid beneath paths, footways and pedestrian areas with less than 900mm of cover shall be similarly treated.
13. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
14. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
15. All gully connections to use a minimum diameter pipe of 150mm and to be surrounded by a minimum of 150mm of grade C25/30 concrete over its full length (which should not exceed 15m) and its connection to the carrier system.
16. All sewers to be abandoned must be surveyed to identify any lateral connections that are still live with any found to be reported to the Engineer.
17. All foul and storm water drains which are not to be adopted as public sewers shall be in accordance with Document H of the Building Regulations, together with INRS Standards Chapter 5.3 and BS3801.
18. Where pipes pass through footings, retaining or screen walls, lines to be provided over drains.
19. Where inverts are less than 0.6m deep inspection chambers (min dia. 1500mm) or access fittings (125 x 1500mm) to be used, elsewhere proprietary plastic, brick or pcc is to be used and used in accordance with Table 11 of Document H of the Building Regulations (<0.6m to invert min DN300, >0.6m to invert min DN475).
20. All gullies connected direct to drains to be roddable.
21. Adequate precautions in accordance with Approved Document H and manufacturer's recommendations to be taken to protect drains (particularly plastic) at shallow depths.
22. Trees and shrubs of a large size or heavy canopy with a moderate or high water demand must not be planted within any sewer easement.
23. Gullies within and adjacent to area of site works to be suction cleaned at commencement and completion of work.
24. 1m deep root barrier of an approved type to be installed vertically along the back edge of kerb of all areas of footway/demarcation to protect from both proposed and future plantation.

- STORM
- Proposed adoptable sewer & MH
 - Highway gully and 150mmØ connection
 - Brickwork headwall refer to A389-LR00-S12 for detail
 - Proposed Basin/Seawall
 - Proposed Rain Garden Tree Pit and Outfall refer to A389-LR00-S12 for detail
 - Proposed Beamy Block Kerb and Outlet or similar approved
 - Proposed ACO 305 Kerb Drain or similar approved
 - Existing Surface Water Sewer
 - Existing Ditch
- FOUL
- Proposed Sewer (not for adoption)
 - Proposed Manhole (not for adoption)



C02	06.25	FOR SECTION 73 APPROVAL	RG	RF
C01	06.25	CONSTRUCTION ISSUE FOLLOWING TECHNICAL APPROVAL BY WRC	RG	RF
Rev	Date	Description	Drawn	Checked



Client
**MILLER HOMES
KIER VENTURES
KINGACRE ESTATES LTD.**

Project
**SOUTH WOKINGHAM SDL
R10-R14 LINK ROAD
DETAILED DESIGN**

Title
DRAINAGE STRATEGY

Status
FOR CONSTRUCTION

Scale	Date	Drawn	Checked
1:500 @ A0	MAY 2025	RG	RF
Drawn by	Revised		
A389-LR00-501	C02		



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DRAINAGE NOTES:
 1. Do not scale.
 2. Refer to all other Project Drawings and supporting notes.
 3. All adoptable drainage works to be constructed as detailed in Design and Construction Guidance or as stipulated in the Water Authorities Addendum.
 4. All public sewers are to be the subject of a Section 104 agreement of the Water Industry Act 1991.
 5. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
 6. The Contractor is responsible for maintaining continuity of flow for all existing sewers within the site boundary and limit of works for the duration of the project.
 7. All drainage networks to comply with BS EN 12434, and be stamped with BS Kitemark. Covers to suit loading as below:
 - Carriageways and Roads - 1500
 - Driveways and Verges - C250
 - Footways and Pedestrian Areas - B125
 - Gardens/Landscaping - A15
 8. All sewer pipes, up to, and including 600mm are to be verified clay or PVC-U to BS EN252 and BS EN404 respectively. All sewer pipes 675mm diameter and above to be concrete pipes to BS EN335.
 9. All drainage shall be installed and tested strictly in accordance with the Manufacturer's printed instructions, BS EN 752, BS EN 1601, Local Water Authority requirements and the Building Regulations.
 10. All bedding shall be Class S unless noted otherwise.
 11. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted Type 1 granular sub-base material.
 12. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 1200mm of cover shall be encased in concrete bed and surround with associated movement joints. Drainage laid beneath paths, footways and pedestrian areas, with less than 900mm of cover shall be similarly treated.
 13. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
 14. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
 15. All gully connections to use a minimum diameter pipe of 150mm and to be surrounded by a minimum of 150mm of grade CA/C20 concrete over its full length (which should not exceed 15m) and its connection to the carrier system.
 16. All sewers to be abandoned must be surveyed to identify any lateral connections that are still live with any found to be reported to the Engineer.
 17. All laterals to be 150mm laid at 1:80 (surface) or 1:60 (foul) unless otherwise stated.
 18. All private drains to be 100mm diameter unless otherwise stated.
 19. All foul and storm water drains which are not to be adopted as public sewers shall be in accordance with Document H of the Building Regulations, together with NBS Standards Chapter 5.3 and BS8302.
 20. Where pipes pass through footings, retaining or screen walls, inlets to be provided over drains.
 21. Where inverts are less than 0.6m deep inspection chambers (min dia. 1200mm) or access fittings (225 x 300mm) to be used, elsewhere proprietary plastic, brick or pcc to be used and sized in accordance with Table 11 of Document H of the Building Regulations (x0.6m to invert min DN300, +0.6m to invert min DN475).
 22. All gullies connected direct to drains to be roddable.
 23. Rainwater downpipes to be easily removable for rodding or to be provided with rodding access at ground level.
 24. Unless noted otherwise SW IC's and R's to be 0.6m below DPC level, SW IC's and R's to be 0.45m.
 25. Adequate precautions in accordance with Approved Document H and manufacturer's recommendations to be taken to protect drains (particularly plastic) at shallow depths.
 26. Catchpits to be as IC's but with 300mm sump below outgoing pipe invert level except where detailed elsewhere.
 27. Trees and shrubs of a large size or heavy canopy with a moderate or high water demand must not be planted within any sewer easement.
 28. Gullies within and adjacent to area of site works to be suction cleaned at commencement and completion of works.
 29. 1m deep root barrier of an approved type to be installed vertically along the back edging kerb of all areas of footway/ pavement to protect from both proposed and future plantation.
 30. Foul water IC's to be 750mm below FFL, unless noted otherwise.
 31. Surface water IC's to be laid 600mm below external level, unless noted otherwise.
 32. Rodding eye's to be laid 450mm below external level, unless noted otherwise.

KEY

- Proposed adoptable sewer & MII
- Highway gully and 150mm pipe connection
- Proposed Rain Garden Tree Pit
- Link road drainage area
- R10 catchment area
- R14 catchment area

0 5 10 15 20 25m

Scale 1:500

C02	PRJ	FOR SECTION 73 APPROVAL	RG	RF
C02	PRJ	FOR SECTION 73 APPROVAL	RG	RF
C02	PRJ	FOR SECTION 73 APPROVAL	RG	RF

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Client:
**MILLER HOMES
KIER VENTURES
KINGACRE ESTATES LTD.**

Project:
**SOUTH WOKINGHAM SDL
R10-R14 LINK ROAD
DETAILED DESIGN**

Title:
**SURFACE WATER
CATCHMENT PLAN**

Status:
FOR CONSTRUCTION

Scale	Date	Project	Client
1:500 @ A0	MAY 2025	RG	RF

Drawing No: **A389-LRDD-502**

Revision: **C02**



Appendix B – Hydraulic Calculations

Abley Letchford Partnership Ltd		Page 0
3 Tealgate, Charnham Park Hungerford Berkshire, RG17 0YT	A389-01 02 Kier Miller Link Road (R10)-West Part 100%,3.3% & 1%& AEP plus 40%C	
Date 30/08/2024 File A389 - Link Road B.MDX	Designed by GR Checked by GR	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network B

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 482607 167931 SU 82607 67931
Data Type	Point
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network B

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.425	4-8	0.255

Total Area Contributing (ha) = 0.680

Total Pipe Volume (m³) = 40.357

Network Design Table for Surface Network B

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow	k (l/s)	HYD SECT	DIA (mm)	Section Type	Auto Design
S-B-7.000	22.685	0.455	49.9	0.030	5.00	0.0	0.600	o	225	Pipe/Conduit	
S-B-7.001	44.339	0.560	79.2	0.167	0.00	0.0	0.600	o	300	Pipe/Conduit	
S-B-7.002	17.290	0.167	103.5	0.049	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-7.003	19.150	0.396	48.4	0.027	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-8.000	11.117	0.246	45.2	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S-B-7.000	64.20	5.20	64.791	0.030	0.0	0.0	0.0	1.86	73.8	7.0
S-B-7.001	62.11	5.62	64.180	0.197	0.0	0.0	0.0	1.77	125.0	44.2
S-B-7.002	61.41	5.77	63.470	0.246	0.0	0.0	0.0	2.00	317.8	54.6
S-B-7.003	60.90	5.87	63.303	0.273	0.0	0.0	0.0	2.93	465.9	60.0
S-B-8.000	64.83	5.08	63.303	0.000	0.0	0.0	0.0	2.35	165.8	0.0

Abley Letchford Partnership Ltd		Page 1
3 Tealgate, Charnham Park Hungerford Berkshire, RG17 0YT	A389-01 02 Kier Miller Link Road (R10)-West Part 100%,3.3% & 1% AEP plus 40%C	
Date 30/08/2024	Designed by GR	
File A389 - Link Road B.MDX	Checked by GR	
Innovyze	Network 2020.1.3	

Network Design Table for Surface Network B

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S-B-7.004	32.390	0.463	70.0	0.088	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-7.005	19.076	0.273	69.9	0.047	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-7.006	18.646	0.266	70.1	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-7.007	10.923	0.156	70.0	0.029	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-7.008	9.232	0.050	184.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S-B-9.000	13.154	0.180	73.1	0.000	5.00	0.0	0.600	o	375	Pipe/Conduit	
S-B-10.000	19.215	0.113	170.0	0.081	5.00	0.0	0.600	o	225	Pipe/Conduit	
S-B-10.001	19.763	0.142	139.2	0.050	0.00	0.0	0.600	o	225	Pipe/Conduit	
S-B-9.001	37.514	0.510	73.6	0.048	0.00	0.0	0.600	o	375	Pipe/Conduit	
S-B-9.002	12.017	0.170	70.7	0.037	0.00	0.0	0.600	o	375	Pipe/Conduit	
S-B-9.003	11.295	0.140	80.7	0.006	0.00	0.0	0.600	o	375	Pipe/Conduit	
S-B-9.004	31.566	0.100	315.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S-B-7.009	19.700	0.039	505.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S-B-7.004	59.87	6.10	62.907	0.361	0.0	0.0	0.0	2.43	387.0	78.0
S-B-7.005	59.28	6.23	62.444	0.408	0.0	0.0	0.0	2.43	387.2	87.3
S-B-7.006	58.71	6.35	62.171	0.429	0.0	0.0	0.0	2.43	386.6	91.0
S-B-7.007	58.39	6.43	61.905	0.458	0.0	0.0	0.0	2.43	386.8	96.6
S-B-7.008	57.94	6.53	61.750	0.458	0.0	0.0	0.0	1.49	237.4	96.6
S-B-9.000	64.71	5.10	62.800	0.000	0.0	0.0	0.0	2.12	234.3	0.0
S-B-10.000	63.60	5.32	63.025	0.081	0.0	0.0	0.0	1.00	39.8	18.6
S-B-10.001	62.13	5.62	62.912	0.131	0.0	0.0	0.0	1.11	44.0	29.4
S-B-9.001	60.71	5.91	62.620	0.179	0.0	0.0	0.0	2.11	233.6	39.2
S-B-9.002	60.28	6.01	62.110	0.216	0.0	0.0	0.0	2.16	238.3	47.0
S-B-9.003	59.85	6.10	61.940	0.222	0.0	0.0	0.0	2.02	223.0	48.0
S-B-9.004	57.58	6.62	61.800	0.222	0.0	0.0	0.0	1.01	112.0	48.0
S-B-7.009	55.90	7.03	61.700	0.680	0.0	0.0	0.0	0.80	88.3«	137.3

Manhole Schedules for Surface Network B

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S-B-25	66.419	1.628	Open Manhole	1200	S-B-7.000	64.791	225				
S-B-26	65.843	1.663	Open Manhole	1200	S-B-7.001	64.180	300	S-B-7.000	64.336	225	81
S-B-28	65.122	1.652	Open Manhole	1350	S-B-7.002	63.470	450	S-B-7.001	63.620	300	
S-B-29	64.947	1.644	Open Manhole	1350	S-B-7.003	63.303	450	S-B-7.002	63.303	450	
S-B-37	64.706	1.403	Open Manhole	1200	S-B-8.000	63.303	300				
S-B-38	64.723	1.816	Open Manhole	1350	S-B-7.004	62.907	450	S-B-7.003	62.907	450	
								S-B-8.000	63.057	300	
S-B-39	64.531	2.087	Open Manhole	1350	S-B-7.005	62.444	450	S-B-7.004	62.444	450	
S-B-40	64.278	2.107	Open Manhole	1350	S-B-7.006	62.171	450	S-B-7.005	62.171	450	
S-B-41	63.969	2.064	Open Manhole	1350	S-B-7.007	61.905	450	S-B-7.006	61.905	450	
S-B-42	63.700	1.951	Open Manhole	1350	S-B-7.008	61.750	450	S-B-7.007	61.749	450	
S-B-75	64.983	2.183	Open Manhole	1350	S-B-9.000	62.800	375				
S-B-76	64.493	1.468	Open Manhole	1200	S-B-10.000	63.025	225				
S-B-77	64.400	1.488	Open Manhole	1200	S-B-10.001	62.912	225	S-B-10.000	62.912	225	
S-B-78	64.600	1.980	Open Manhole	1350	S-B-9.001	62.620	375	S-B-9.000	62.620	375	
								S-B-10.001	62.770	225	
S-B-79	64.014	1.904	Open Manhole	1350	S-B-9.002	62.110	375	S-B-9.001	62.110	375	
S-B-80	63.737	1.797	Open Manhole	1350	S-B-9.003	61.940	375	S-B-9.002	61.940	375	
S-B-81	63.700	1.900	Open Manhole	1350	S-B-9.004	61.800	375	S-B-9.003	61.800	375	
S-B-BASIN	63.700	2.000	Open Manhole	1350	S-B-7.009	61.700	375	S-B-7.008	61.700	450	
								S-B-9.004	61.700	375	
S-B-	63.700	2.039	Open Manhole	0		OUTFALL		S-B-7.009	61.661	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S-B-25	483292.749	167958.539	483292.749	167958.539	Required	
S-B-26	483271.681	167950.128	483271.681	167950.128	Required	
S-B-28	483230.768	167933.037	483230.768	167933.037	Required	
S-B-29	483215.047	167925.840	483215.047	167925.840	Required	
S-B-37	483207.188	167905.453	483207.188	167905.453	Required	
S-B-38	483200.029	167913.959	483200.029	167913.959	Required	
S-B-39	483172.596	167931.179	483172.596	167931.179	Required	

Manhole Schedules for Surface Network B

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S-B-40	483153.656	167933.456	483153.656	167933.456	Required	
S-B-41	483135.011	167933.235	483135.011	167933.235	Required	
S-B-42	483124.096	167932.840	483124.096	167932.840	Required	
S-B-75	483169.354	167854.339	483169.354	167854.339	Required	
S-B-76	483186.413	167895.452	483186.413	167895.452	Required	
S-B-77	483177.371	167878.497	483177.371	167878.497	Required	
S-B-78	483162.451	167865.536	483162.451	167865.536	Required	
S-B-79	483136.227	167892.362	483136.227	167892.362	Required	
S-B-80	483124.698	167895.753	483124.698	167895.753	Required	
S-B-81	483114.522	167900.655	483114.522	167900.655	Required	
S-B-BASIN	483114.885	167932.218	483114.885	167932.218	Required	
S-B-	483095.201	167931.410			No Entry	

Abley Letchford Partnership Ltd		Page 4
3 Tealgate, Charnham Park Hungerford Berkshire, RG17 0YT	A389-01 02 Kier Miller Link Road (R10)-West Part 100%,3.3% & 1%& AEP plus 40%C	
Date 30/08/2024	Designed by GR	
File A389 - Link Road B.MDX	Checked by GR	
Innovyze	Network 2020.1.3	

PIPELINE SCHEDULES for Surface Network B

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S-B-7.000	o	225	S-B-25	66.419	64.791	1.403	Open Manhole	1200
S-B-7.001	o	300	S-B-26	65.843	64.180	1.363	Open Manhole	1200
S-B-7.002	o	450	S-B-28	65.122	63.470	1.202	Open Manhole	1350
S-B-7.003	o	450	S-B-29	64.947	63.303	1.194	Open Manhole	1350
S-B-8.000	o	300	S-B-37	64.706	63.303	1.103	Open Manhole	1200
S-B-7.004	o	450	S-B-38	64.723	62.907	1.366	Open Manhole	1350
S-B-7.005	o	450	S-B-39	64.531	62.444	1.637	Open Manhole	1350
S-B-7.006	o	450	S-B-40	64.278	62.171	1.657	Open Manhole	1350
S-B-7.007	o	450	S-B-41	63.969	61.905	1.614	Open Manhole	1350
S-B-7.008	o	450	S-B-42	63.700	61.750	1.500	Open Manhole	1350
S-B-9.000	o	375	S-B-75	64.983	62.800	1.808	Open Manhole	1350
S-B-10.000	o	225	S-B-76	64.493	63.025	1.243	Open Manhole	1200
S-B-10.001	o	225	S-B-77	64.400	62.912	1.263	Open Manhole	1200
S-B-9.001	o	375	S-B-78	64.600	62.620	1.605	Open Manhole	1350
S-B-9.002	o	375	S-B-79	64.014	62.110	1.529	Open Manhole	1350
S-B-9.003	o	375	S-B-80	63.737	61.940	1.422	Open Manhole	1350
S-B-9.004	o	375	S-B-81	63.700	61.800	1.525	Open Manhole	1350
S-B-7.009	o	375	S-B-BASIN	63.700	61.700	1.625	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S-B-7.000	22.685	49.9	S-B-26	65.843	64.336	1.282	Open Manhole	1200
S-B-7.001	44.339	79.2	S-B-28	65.122	63.620	1.202	Open Manhole	1350
S-B-7.002	17.290	103.5	S-B-29	64.947	63.303	1.194	Open Manhole	1350
S-B-7.003	19.150	48.4	S-B-38	64.723	62.907	1.366	Open Manhole	1350
S-B-8.000	11.117	45.2	S-B-38	64.723	63.057	1.366	Open Manhole	1350
S-B-7.004	32.390	70.0	S-B-39	64.531	62.444	1.637	Open Manhole	1350
S-B-7.005	19.076	69.9	S-B-40	64.278	62.171	1.657	Open Manhole	1350
S-B-7.006	18.646	70.1	S-B-41	63.969	61.905	1.614	Open Manhole	1350
S-B-7.007	10.923	70.0	S-B-42	63.700	61.749	1.501	Open Manhole	1350
S-B-7.008	9.232	184.6	S-B-BASIN	63.700	61.700	1.550	Open Manhole	1350
S-B-9.000	13.154	73.1	S-B-78	64.600	62.620	1.605	Open Manhole	1350
S-B-10.000	19.215	170.0	S-B-77	64.400	62.912	1.263	Open Manhole	1200
S-B-10.001	19.763	139.2	S-B-78	64.600	62.770	1.605	Open Manhole	1350
S-B-9.001	37.514	73.6	S-B-79	64.014	62.110	1.529	Open Manhole	1350
S-B-9.002	12.017	70.7	S-B-80	63.737	61.940	1.422	Open Manhole	1350
S-B-9.003	11.295	80.7	S-B-81	63.700	61.800	1.525	Open Manhole	1350
S-B-9.004	31.566	315.7	S-B-BASIN	63.700	61.700	1.625	Open Manhole	1350
S-B-7.009	19.700	505.1	S-B-	63.700	61.661	1.664	Open Manhole	0

Setting Out Information - True Coordinates (Surface Network B)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)
S-B-7.000	S-B-25	1200		483292.749	167958.539	483292.749	167958.539	
S-B-7.001	S-B-26	1200		483271.681	167950.128	483271.681	167950.128	
S-B-7.002	S-B-28	1350		483230.768	167933.037	483230.768	167933.037	
S-B-7.003	S-B-29	1350		483215.047	167925.840	483215.047	167925.840	
S-B-8.000	S-B-37	1200		483207.188	167905.453	483207.188	167905.453	
S-B-7.004	S-B-38	1350		483200.029	167913.959	483200.029	167913.959	
S-B-7.005	S-B-39	1350		483172.596	167931.179	483172.596	167931.179	
S-B-7.006	S-B-40	1350		483153.656	167933.456	483153.656	167933.456	
S-B-7.007	S-B-41	1350		483135.011	167933.235	483135.011	167933.235	
S-B-7.008	S-B-42	1350		483124.096	167932.840	483124.096	167932.840	
S-B-9.000	S-B-75	1350		483169.354	167854.339	483169.354	167854.339	
S-B-10.000	S-B-76	1200		483186.413	167895.452	483186.413	167895.452	
S-B-10.001	S-B-77	1200		483177.371	167878.497	483177.371	167878.497	
S-B-9.001	S-B-78	1350		483162.451	167865.536	483162.451	167865.536	
S-B-9.002	S-B-79	1350		483136.227	167892.362	483136.227	167892.362	
S-B-9.003	S-B-80	1350		483124.698	167895.753	483124.698	167895.753	
S-B-9.004	S-B-81	1350		483114.522	167900.655	483114.522	167900.655	
S-B-7.009	S-B-BASIN	1350		483114.885	167932.218	483114.885	167932.218	

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Setting Out Information - True Coordinates (Surface Network B)

PN	DSMH	Dia/Len	Width	DS	Easting	DS	Northing	Layout
Name		(mm)	(mm)		(m)		(m)	(North)
S-B-7.009	S-B-		0		483095.201		167931.410	



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Area Summary for Surface Network B

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
7.000	-	-	100	0.030	0.030	0.030
7.001	-	-	100	0.167	0.167	0.167
7.002	-	-	100	0.049	0.049	0.049
7.003	-	-	100	0.027	0.027	0.027
8.000	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.088	0.088	0.088
7.005	-	-	100	0.047	0.047	0.047
7.006	-	-	100	0.021	0.021	0.021
7.007	-	-	100	0.029	0.029	0.029
7.008	-	-	100	0.000	0.000	0.000
9.000	-	-	100	0.000	0.000	0.000
10.000	-	-	100	0.081	0.081	0.081
10.001	-	-	100	0.050	0.050	0.050
9.001	-	-	100	0.048	0.048	0.048
9.002	-	-	100	0.037	0.037	0.037
9.003	-	-	100	0.006	0.006	0.006
9.004	-	-	100	0.000	0.000	0.000
7.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.680	0.680	0.680

Network Classifications for Surface Network B

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S-B-7.000	S-B-25	225	1.282	1.403	Unclassified	1200	0	1.403	Unclassified
S-B-7.001	S-B-26	300	1.202	1.363	Unclassified	1200	0	1.363	Unclassified
S-B-7.002	S-B-28	450	1.194	1.241	Unclassified	1350	0	1.202	Unclassified
S-B-7.003	S-B-29	450	1.194	1.366	Unclassified	1350	0	1.194	Unclassified
S-B-8.000	S-B-37	300	1.103	1.366	Unclassified	1200	0	1.103	Unclassified
S-B-7.004	S-B-38	450	1.366	1.637	Unclassified	1350	0	1.366	Unclassified
S-B-7.005	S-B-39	450	1.637	1.657	Unclassified	1350	0	1.637	Unclassified
S-B-7.006	S-B-40	450	1.614	1.657	Unclassified	1350	0	1.657	Unclassified
S-B-7.007	S-B-41	450	1.501	1.614	Unclassified	1350	0	1.614	Unclassified
S-B-7.008	S-B-42	450	1.500	1.550	Unclassified	1350	0	1.500	Unclassified
S-B-9.000	S-B-75	375	1.541	1.808	Unclassified	1350	0	1.808	Unclassified
S-B-10.000	S-B-76	225	1.211	1.281	Unclassified	1200	0	1.243	Unclassified
S-B-10.001	S-B-77	225	1.263	1.605	Unclassified	1200	0	1.263	Unclassified
S-B-9.001	S-B-78	375	1.529	1.605	Unclassified	1350	0	1.605	Unclassified
S-B-9.002	S-B-79	375	1.422	1.529	Unclassified	1350	0	1.529	Unclassified
S-B-9.003	S-B-80	375	1.422	1.525	Unclassified	1350	0	1.422	Unclassified
S-B-9.004	S-B-81	375	1.525	1.625	Unclassified	1350	0	1.525	Unclassified
S-B-7.009	S-B-BASIN	375	1.625	1.664	Unclassified	1350	0	1.625	Unclassified

Free Flowing Outfall Details for Surface Network B

Outfall Pipe Number	Outfall C. Level Name	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S-B-7.009 S-B- 63.700 61.661 0.000 0 0

Simulation Criteria for Surface Network B

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	D1 (1km)	0.000	Summer Storms	Yes
Return Period (years)	2	D2 (1km)	0.000	Winter Storms	Yes
FEH Rainfall Version	1999	D3 (1km)	0.000	Cv (Summer)	1.000
Site Location		E (1km)	0.000	Cv (Winter)	0.840
C (1km)	0.000	F (1km)	0.000	Storm Duration (mins)	30

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Online Controls for Surface Network B

Hydro-Brake® Optimum Manhole: S-B-BASIN, DS/PN: S-B-7.009, Volume (m³): 7.5

Unit Reference	MD-SHE-0074-3000-1600-3000
Design Head (m)	1.600
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	74
Invert Level (m)	61.700
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	3.0	Kick-Flo®	0.661	2.0
Flush-Flo™	0.323	2.5	Mean Flow over Head Range	-	2.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	0.800	2.2	2.000	3.3	4.000	4.6	7.000	6.0
0.200	2.4	1.000	2.4	2.200	3.5	4.500	4.9	7.500	6.2
0.300	2.5	1.200	2.6	2.400	3.6	5.000	5.1	8.000	6.4
0.400	2.5	1.400	2.8	2.600	3.8	5.500	5.3	8.500	6.5
0.500	2.4	1.600	3.0	3.000	4.0	6.000	5.6	9.000	6.7
0.600	2.2	1.800	3.2	3.500	4.3	6.500	5.8	9.500	6.9

Storage Structures for Surface Network B

Tank or Pond Manhole: S-B-BASIN, DS/PN: S-B-7.009

Invert Level (m) 61.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	763.1	2.000	1688.0

Manhole Headloss for Surface Network B

PN	US/MH Name	US/MH Headloss
S-B-7.000	S-B-25	0.500
S-B-7.001	S-B-26	0.500
S-B-7.002	S-B-28	0.500
S-B-7.003	S-B-29	0.500
S-B-8.000	S-B-37	0.500
S-B-7.004	S-B-38	0.500
S-B-7.005	S-B-39	0.500
S-B-7.006	S-B-40	0.500
S-B-7.007	S-B-41	0.500
S-B-7.008	S-B-42	0.500
S-B-9.000	S-B-75	0.500
S-B-10.000	S-B-76	0.500
S-B-10.001	S-B-77	0.500
S-B-9.001	S-B-78	0.500
S-B-9.002	S-B-79	0.500
S-B-9.003	S-B-80	0.500
S-B-9.004	S-B-81	0.500
S-B-7.009	S-B-BASIN	0.500

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CASDeF Controller for Surface Network B

PN	US/MH Name	Level Not Exceeded	Modify Control	Modify Pipe Size	Max Pipe Diameter	No. Pipe Failures	Add Storage	No. Storage Failures	Use CASDeF
S-B-7.000	S-B-25	66.419	Yes	No	1350	0	Yes	0	Yes
S-B-7.001	S-B-26	65.843	Yes	No	1350	0	Yes	0	Yes
S-B-7.002	S-B-28	65.122	Yes	No	1475	0	Yes	0	Yes
S-B-7.003	S-B-29	64.947	Yes	No	1494	0	Yes	0	Yes
S-B-8.000	S-B-37	64.706	Yes	No	1253	0	Yes	0	Yes
S-B-7.004	S-B-38	64.723	Yes	No	1666	0	Yes	0	Yes
S-B-7.005	S-B-39	64.531	Yes	No	1937	0	Yes	0	Yes
S-B-7.006	S-B-40	64.278	Yes	No	1900	0	Yes	0	Yes
S-B-7.007	S-B-41	63.969	Yes	No	1800	0	Yes	0	Yes
S-B-7.008	S-B-42	63.700	Yes	No	1800	0	Yes	0	Yes
S-B-9.000	S-B-75	64.983	Yes	No	1825	0	Yes	0	Yes
S-B-10.000	S-B-76	64.493	Yes	No	1318	0	Yes	0	Yes
S-B-10.001	S-B-77	64.400	Yes	No	1338	0	Yes	0	Yes
S-B-9.001	S-B-78	64.600	Yes	No	1750	0	Yes	0	Yes
S-B-9.002	S-B-79	64.014	Yes	No	1625	0	Yes	0	Yes
S-B-9.003	S-B-80	63.737	Yes	No	1647	0	Yes	0	Yes
S-B-9.004	S-B-81	63.700	Yes	No	1750	0	Yes	0	Yes
S-B-7.009	S-B-BASIN	63.700	Yes	No	1850	0	Yes	0	Yes

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 482607 167931 SU 82607 67931 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

										Water Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
S-B-7.000	S-B-25	15 Summer	2	+0%	100/15 Summer				64.837	-0.179
S-B-7.001	S-B-26	15 Summer	2	+0%	100/15 Summer				64.294	-0.186
S-B-7.002	S-B-28	15 Summer	2	+0%	100/15 Summer				63.604	-0.316
S-B-7.003	S-B-29	15 Summer	2	+0%	100/15 Summer				63.414	-0.339
S-B-8.000	S-B-37	15 Summer	2	+0%	100/15 Summer				63.303	-0.300
S-B-7.004	S-B-38	15 Summer	2	+0%	100/15 Summer				63.040	-0.317
S-B-7.005	S-B-39	15 Summer	2	+0%	100/15 Summer				62.595	-0.299
S-B-7.006	S-B-40	15 Summer	2	+0%	100/15 Summer				62.327	-0.294
S-B-7.007	S-B-41	15 Summer	2	+0%	30/15 Summer				62.091	-0.264
S-B-7.008	S-B-42	15 Summer	2	+0%	30/15 Summer				61.975	-0.225
S-B-9.000	S-B-75	15 Summer	2	+0%					62.800	-0.375
S-B-10.000	S-B-76	15 Summer	2	+0%	30/15 Summer				63.134	-0.116
S-B-10.001	S-B-77	15 Summer	2	+0%	30/15 Summer				63.044	-0.093
S-B-9.001	S-B-78	15 Summer	2	+0%					62.720	-0.275
S-B-9.002	S-B-79	15 Summer	2	+0%	100/15 Summer				62.236	-0.249
S-B-9.003	S-B-80	15 Summer	2	+0%	100/15 Summer				62.074	-0.241
S-B-9.004	S-B-81	15 Summer	2	+0%	100/15 Summer				61.967	-0.208
S-B-7.009	S-B-BASIN	600 Winter	2	+0%	30/360 Summer				61.910	-0.165

		Flooded		Half Drain		Pipe			
PN	US/MH Name	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
S-B-7.000	S-B-25	0.000	0.09			6.3	OK		
S-B-7.001	S-B-26	0.000	0.30			35.3	OK		
S-B-7.002	S-B-28	0.000	0.19			43.9	OK		
S-B-7.003	S-B-29	0.000	0.14			48.8	OK		
S-B-8.000	S-B-37	0.000	0.00			0.0	OK		
S-B-7.004	S-B-38	0.000	0.19			63.9	OK		
S-B-7.005	S-B-39	0.000	0.24			72.0	OK		

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

PN	US/MH Name	Flooded		Half Drain	Pipe	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	
S-B-7.006	S-B-40	0.000	0.26		75.6	OK
S-B-7.007	S-B-41	0.000	0.36		80.1	OK
S-B-7.008	S-B-42	0.000	0.49		79.7	OK
S-B-9.000	S-B-75	0.000	0.00		0.0	OK
S-B-10.000	S-B-76	0.000	0.46		16.6	OK
S-B-10.001	S-B-77	0.000	0.64		25.4	OK
S-B-9.001	S-B-78	0.000	0.16		33.5	OK
S-B-9.002	S-B-79	0.000	0.25		39.7	OK
S-B-9.003	S-B-80	0.000	0.28		40.4	OK
S-B-9.004	S-B-81	0.000	0.41		40.6	OK
S-B-7.009	S-B-BASIN	0.000	0.04		2.4	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 482607 167931 SU 82607 67931 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

									Water	Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
S-B-7.000	S-B-25	15 Summer	30	+0%	100/15 Summer				64.862	-0.154
S-B-7.001	S-B-26	15 Summer	30	+0%	100/15 Summer				64.403	-0.077
S-B-7.002	S-B-28	15 Summer	30	+0%	100/15 Summer				63.715	-0.205
S-B-7.003	S-B-29	15 Summer	30	+0%	100/15 Summer				63.504	-0.249
S-B-8.000	S-B-37	15 Summer	30	+0%	100/15 Summer				63.303	-0.300
S-B-7.004	S-B-38	15 Summer	30	+0%	100/15 Summer				63.153	-0.204
S-B-7.005	S-B-39	15 Summer	30	+0%	100/15 Summer				62.741	-0.153
S-B-7.006	S-B-40	15 Summer	30	+0%	100/15 Summer				62.620	-0.001
S-B-7.007	S-B-41	15 Summer	30	+0%	30/15 Summer				62.445	0.090
S-B-7.008	S-B-42	15 Summer	30	+0%	30/15 Summer				62.288	0.088
S-B-9.000	S-B-75	15 Summer	30	+0%					62.800	-0.375
S-B-10.000	S-B-76	15 Summer	30	+0%	30/15 Summer				63.458	0.208
S-B-10.001	S-B-77	15 Summer	30	+0%	30/15 Summer				63.335	0.198
S-B-9.001	S-B-78	15 Summer	30	+0%					62.787	-0.208
S-B-9.002	S-B-79	15 Summer	30	+0%	100/15 Summer				62.331	-0.154
S-B-9.003	S-B-80	15 Summer	30	+0%	100/15 Summer				62.206	-0.109
S-B-9.004	S-B-81	15 Summer	30	+0%	100/15 Summer				62.156	-0.019
S-B-7.009	S-B-BASIN	600 Winter	30	+0%	30/360 Summer				62.094	0.019

		Flooded			Half Drain	Pipe		
PN	US/MH Name	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
S-B-7.000	S-B-25	0.000	0.22			14.6	OK	
S-B-7.001	S-B-26	0.000	0.90			104.7	OK	
S-B-7.002	S-B-28	0.000	0.57			130.8	OK	
S-B-7.003	S-B-29	0.000	0.41			144.2	OK	
S-B-8.000	S-B-37	0.000	0.00			0.0	OK	
S-B-7.004	S-B-38	0.000	0.56			189.6	OK	
S-B-7.005	S-B-39	0.000	0.72			210.7	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

PN	US/MH Name	Flooded		Half Drain		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)				
S-B-7.006	S-B-40	0.000	0.73		213.4			OK	
S-B-7.007	S-B-41	0.000	1.01		224.2			SURCHARGED	
S-B-7.008	S-B-42	0.000	1.37		221.3			SURCHARGED	
S-B-9.000	S-B-75	0.000	0.00		0.0			OK	
S-B-10.000	S-B-76	0.000	1.06		38.0			SURCHARGED	
S-B-10.001	S-B-77	0.000	1.54		61.4			SURCHARGED	
S-B-9.001	S-B-78	0.000	0.40		84.3			OK	
S-B-9.002	S-B-79	0.000	0.63		102.4			OK	
S-B-9.003	S-B-80	0.000	0.70		103.1			OK	
S-B-9.004	S-B-81	0.000	1.00		99.2			OK	
S-B-7.009	S-B-BASIN	0.000	0.04		2.5			SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 482607 167931 SU 82607 67931 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

										Water Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
S-B-7.000	S-B-25	15 Summer	100	+40%	100/15 Summer				65.265	0.249
S-B-7.001	S-B-26	15 Summer	100	+40%	100/15 Summer				65.211	0.731
S-B-7.002	S-B-28	15 Summer	100	+40%	100/15 Summer				64.043	0.123
S-B-7.003	S-B-29	15 Summer	100	+40%	100/15 Summer				63.918	0.165
S-B-8.000	S-B-37	15 Summer	100	+40%	100/15 Summer				63.700	0.097
S-B-7.004	S-B-38	15 Summer	100	+40%	100/15 Summer				63.704	0.347
S-B-7.005	S-B-39	15 Summer	100	+40%	100/15 Summer				63.409	0.515
S-B-7.006	S-B-40	15 Summer	100	+40%	100/15 Summer				63.126	0.505
S-B-7.007	S-B-41	15 Summer	100	+40%	30/15 Summer				62.818	0.463
S-B-7.008	S-B-42	15 Summer	100	+40%	30/15 Summer				62.471	0.271
S-B-9.000	S-B-75	15 Summer	100	+40%					62.870	-0.305
S-B-10.000	S-B-76	15 Summer	100	+40%	30/15 Summer				64.359	1.109
S-B-10.001	S-B-77	15 Summer	100	+40%	30/15 Summer				63.974	0.837
S-B-9.001	S-B-78	15 Summer	100	+40%					62.895	-0.100
S-B-9.002	S-B-79	15 Summer	100	+40%	100/15 Summer				62.681	0.196
S-B-9.003	S-B-80	15 Summer	100	+40%	100/15 Summer				62.510	0.195
S-B-9.004	S-B-81	960 Summer	100	+40%	100/15 Summer				62.398	0.223
S-B-7.009	S-B-BASIN	960 Summer	100	+40%	30/360 Summer				62.398	0.323

		Flooded			Half Drain	Pipe			
PN	US/MH Name	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
S-B-7.000	S-B-25	0.000	0.43			29.2	SURCHARGED		
S-B-7.001	S-B-26	0.000	1.47			172.1	SURCHARGED		
S-B-7.002	S-B-28	0.000	0.90			208.4	SURCHARGED		
S-B-7.003	S-B-29	0.000	0.60			212.7	SURCHARGED		
S-B-8.000	S-B-37	0.000	0.03			3.2	SURCHARGED		
S-B-7.004	S-B-38	0.000	0.79			264.4	SURCHARGED		
S-B-7.005	S-B-39	0.000	0.99			292.8	SURCHARGED		

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network B

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S-B-7.006	S-B-40	0.000	1.05		306.6		SURCHARGED	
S-B-7.007	S-B-41	0.000	1.46		325.0		SURCHARGED	
S-B-7.008	S-B-42	0.000	2.02		326.3		SURCHARGED	
S-B-9.000	S-B-75	0.000	0.01		0.9		OK	
S-B-10.000	S-B-76	0.000	1.86		66.6		FLOOD RISK	
S-B-10.001	S-B-77	0.000	2.61		103.8		SURCHARGED	
S-B-9.001	S-B-78	0.000	0.65		137.6		OK	
S-B-9.002	S-B-79	0.000	0.99		159.6		SURCHARGED	
S-B-9.003	S-B-80	0.000	1.12		163.5		SURCHARGED	
S-B-9.004	S-B-81	0.000	0.15		15.3		SURCHARGED	
S-B-7.009	S-B-BASIN	0.000	0.04		2.5		SURCHARGED	

Abley Letchford Partnership Ltd		Page 0
3 Tealgate, Charnham Park Hungerford Berkshire, RG17 0YT	A389-01 02 Kier Miller Link Road (R10)-West Part 100%,3.3% & 1%& AEP plus 40%C	
Date 30/08/2024 File A389 - Link Road B.MDX	Designed by GR Checked by GR	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network A

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model		
Return Period (years)		2
FEH Rainfall Version		2013
Site Location	GB 482607 167931	SU 82607 67931
Data Type		Point
Maximum Rainfall (mm/hr)		550
Maximum Time of Concentration (mins)		30
Foul Sewage (l/s/ha)		0.000
Volumetric Runoff Coeff.		1.000
PIMP (%)		100
Add Flow / Climate Change (%)		0
Minimum Backdrop Height (m)		0.200
Maximum Backdrop Height (m)		1.500
Min Design Depth for Optimisation (m)		1.200
Min Vel for Auto Design only (m/s)		1.00
Min Slope for Optimisation (1:X)		500

Designed with Level Soffits

Time Area Diagram for Surface Network A

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.249	4-8	0.626	8-12	0.017

Total Area Contributing (ha) = 0.892

Total Pipe Volume (m³) = 67.529

Network Design Table for Surface Network A

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow	k (l/s)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S-A-2.000	17.962	0.108	166.3	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit		
S-A-2.001	36.052	0.094	383.5	0.140	0.00	0.0	0.600	o	375	Pipe/Conduit		
S-A-3.000	17.932	1.437	12.5	0.019	5.00	0.0	0.600	o	300	Pipe/Conduit		
S-A-2.002	33.220	0.086	385.0	0.058	0.00	0.0	0.600	o	450	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S-A-2.000	63.73	5.30	65.598	0.045	0.0	0.0	0.0	1.01	40.2	10.4
S-A-2.001	60.55	5.95	65.340	0.185	0.0	0.0	0.0	0.92	101.5	40.4
S-A-3.000	64.90	5.07	66.759	0.019	0.0	0.0	0.0	4.47	316.3	4.5
S-A-2.002	58.14	6.49	65.172	0.262	0.0	0.0	0.0	1.03	163.8	55.0

A389-01 02 Kier Miller
Link Road (R10)-West Part
100%, 3.3% & 1% AEP plus 40% C



Designed by GR
Checked by GR

Network 2020.1.3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S-A-2.003	58.279	0.351	166.0	0.166	0.00	0.0	0.600	o	450	Pipe/Conduit		
S-A-2.004	8.168	0.018	453.8	0.193	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-2.005	37.964	0.383	99.1	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-2.006	12.415	0.069	179.9	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-4.000	11.207	0.047	238.4	0.013	5.00	0.0	0.600	o	300	Pipe/Conduit		
S-A-4.001	25.009	0.105	238.0	0.006	0.00	0.0	0.600	o	300	Pipe/Conduit		
S-A-4.002	20.855	0.088	238.0	0.130	0.00	0.0	0.600	o	300	Pipe/Conduit		
S-A-4.003	27.024	0.070	385.0	0.122	0.00	0.0	0.600	o	450	Pipe/Conduit		
S-A-2.007	12.682	0.375	33.8	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-2.008	72.657	0.185	392.7	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-2.009	28.190	0.440	64.1	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
S-A-2.010	20.239	0.052	389.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S-A-2.003	55.60	7.10	65.086	0.428	0.0	0.0	0.0	1.57	250.5	85.9
S-A-2.004	55.10	7.23	65.470	0.621	0.0	0.0	0.0	1.04	226.2	123.6
S-A-2.005	54.04	7.52	65.452	0.621	0.0	0.0	0.0	2.25	487.1	123.6
S-A-2.006	53.58	7.64	65.069	0.621	0.0	0.0	0.0	1.67	360.8	123.6
S-A-4.000	64.29	5.18	65.535	0.013	0.0	0.0	0.0	1.01	71.7	3.0
S-A-4.001	62.24	5.59	65.488	0.019	0.0	0.0	0.0	1.01	71.7	4.2
S-A-4.002	60.60	5.94	65.383	0.149	0.0	0.0	0.0	1.01	71.7	32.6
S-A-4.003	58.63	6.37	65.145	0.271	0.0	0.0	0.0	1.03	163.8	57.3
S-A-2.007	53.39	7.69	65.000	0.892	0.0	0.0	0.0	3.86	835.9	171.9
S-A-2.008	49.81	8.77	64.625	0.892	0.0	0.0	0.0	1.12	243.3	171.9
S-A-2.009	49.30	8.94	64.440	0.892	0.0	0.0	0.0	2.80	606.5	171.9
S-A-2.010	48.05	9.37	64.000	0.892	0.0	0.0	0.0	0.79	55.9	171.9

Manhole Schedules for Surface Network A

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdri (mm)
S-A-3	67.887	2.289	Open Manhole	1200	S-A-2.000	65.598	225				
S-A-4	67.836	2.496	Open Manhole	1350	S-A-2.001	65.340	375	S-A-2.000	65.490	225	
S-A-7	68.200	1.441	Open Manhole	1200	S-A-3.000	66.759	300				
S-A-8	68.150	2.978	Open Manhole	1350	S-A-2.002	65.172	450	S-A-2.001	65.246	375	
								S-A-3.000	65.322	300	
S-A-9	67.918	2.832	Open Manhole	1350	S-A-2.003	65.086	450	S-A-2.002	65.086	450	
S-A-11	66.987	2.252	Open Manhole	1500	S-A-2.004	65.470	525	S-A-2.003	64.735	450	
S-A-HW-01	66.915	1.463	Junction		S-A-2.005	65.452	525	S-A-2.004	65.452	525	
S-A-HW-02	66.810	1.741	Junction		S-A-2.006	65.069	525	S-A-2.005	65.069	525	
S-A-16	67.799	2.264	Open Manhole	1200	S-A-4.000	65.535	300				
S-A-17	67.687	2.199	Open Manhole	1200	S-A-4.001	65.488	300	S-A-4.000	65.488	300	
S-A-18	67.274	1.891	Open Manhole	1200	S-A-4.002	65.383	300	S-A-4.001	65.383	300	
S-A-19	67.061	1.916	Open Manhole	1350	S-A-4.003	65.145	450	S-A-4.002	65.295	300	
S-A-20	66.733	1.733	Open Manhole	1500	S-A-2.007	65.000	525	S-A-2.006	65.000	525	
								S-A-4.003	65.075	450	
S-A-HW-03	66.200	1.575	Junction		S-A-2.008	64.625	525	S-A-2.007	64.625	525	
S-A-HW-04	66.000	1.560	Junction		S-A-2.009	64.440	525	S-A-2.008	64.440	525	
S-A-R14 Basin	66.000	2.000	Open Manhole	1500	S-A-2.010	64.000	300	S-A-2.009	64.000	525	
S-A-OUTFALL	66.000	2.052	Open Manhole	0		OUTFALL		S-A-2.010	63.948	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S-A-3	483428.838	167859.962	483428.838	167859.962	Required	
S-A-4	483414.023	167870.117	483414.023	167870.117	Required	
S-A-7	483413.734	167908.869	483413.734	167908.869	Required	
S-A-8	483397.174	167901.990	483397.174	167901.990	Required	
S-A-9	483384.452	167932.677	483384.452	167932.677	Required	
S-A-11	483331.450	167908.444	483331.450	167908.444	Required	
S-A-HW-01	483327.220	167915.432			No Entry	
S-A-HW-02	483311.550	167950.011			No Entry	
S-A-16	483378.461	167947.353	483378.461	167947.353	Required	

Manhole Schedules for Surface Network A

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S-A-17	483373.830	167957.558	483373.830	167957.558	Required	
S-A-18	483353.784	167972.512	483353.784	167972.512	Required	
S-A-19	483332.967	167971.263	483332.967	167971.263	Required	
S-A-20	483307.654	167961.799	483307.654	167961.799	Required	
S-A-HW-03	483303.213	167973.678			No Entry	
S-A-HW-04	483293.177	168045.639			No Entry	
S-A-R14 Basin	483302.752	168072.154	483302.752	168072.154	Required	
S-A-OUTFALL	483288.653	168086.674			No Entry	

PIPELINE SCHEDULES for Surface Network A

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S-A-2.000	o	225	S-A-3	67.887	65.598	2.064	Open Manhole	1200
S-A-2.001	o	375	S-A-4	67.836	65.340	2.121	Open Manhole	1350
S-A-3.000	o	300	S-A-7	68.200	66.759	1.141	Open Manhole	1200
S-A-2.002	o	450	S-A-8	68.150	65.172	2.528	Open Manhole	1350
S-A-2.003	o	450	S-A-9	67.918	65.086	2.382	Open Manhole	1350
S-A-2.004	o	525	S-A-11	66.987	65.470	0.992	Open Manhole	1500
S-A-2.005	o	525	S-A-HW-01	66.915	65.452	0.938	Junction	
S-A-2.006	o	525	S-A-HW-02	66.810	65.069	1.216	Junction	
S-A-4.000	o	300	S-A-16	67.799	65.535	1.964	Open Manhole	1200
S-A-4.001	o	300	S-A-17	67.687	65.488	1.899	Open Manhole	1200
S-A-4.002	o	300	S-A-18	67.274	65.383	1.591	Open Manhole	1200
S-A-4.003	o	450	S-A-19	67.061	65.145	1.466	Open Manhole	1350
S-A-2.007	o	525	S-A-20	66.733	65.000	1.208	Open Manhole	1500
S-A-2.008	o	525	S-A-HW-03	66.200	64.625	1.050	Junction	
S-A-2.009	o	525	S-A-HW-04	66.000	64.440	1.035	Junction	
S-A-2.010	o	300	S-A-R14 Basin	66.000	64.000	1.700	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S-A-2.000	17.962	166.3	S-A-4	67.836	65.490	2.121	Open Manhole	1350
S-A-2.001	36.052	383.5	S-A-8	68.150	65.246	2.529	Open Manhole	1350
S-A-3.000	17.932	12.5	S-A-8	68.150	65.322	2.528	Open Manhole	1350
S-A-2.002	33.220	385.0	S-A-9	67.918	65.086	2.382	Open Manhole	1350
S-A-2.003	58.279	166.0	S-A-11	66.987	64.735	1.802	Open Manhole	1500
S-A-2.004	8.168	453.8	S-A-HW-01	66.915	65.452	0.938	Junction	
S-A-2.005	37.964	99.1	S-A-HW-02	66.810	65.069	1.216	Junction	
S-A-2.006	12.415	179.9	S-A-20	66.733	65.000	1.208	Open Manhole	1500
S-A-4.000	11.207	238.4	S-A-17	67.687	65.488	1.899	Open Manhole	1200
S-A-4.001	25.009	238.0	S-A-18	67.274	65.383	1.591	Open Manhole	1200
S-A-4.002	20.855	238.0	S-A-19	67.061	65.295	1.465	Open Manhole	1350
S-A-4.003	27.024	385.0	S-A-20	66.733	65.075	1.208	Open Manhole	1500
S-A-2.007	12.682	33.8	S-A-HW-03	66.200	64.625	1.050	Junction	
S-A-2.008	72.657	392.7	S-A-HW-04	66.000	64.440	1.035	Junction	
S-A-2.009	28.190	64.1	S-A-R14 Basin	66.000	64.000	1.475	Open Manhole	1500
S-A-2.010	20.239	389.2	S-A-OUTFALL	66.000	63.948	1.752	Open Manhole	0

Setting Out Information - True Coordinates (Surface Network A)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)
S-A-2.000	S-A-3	1200		483428.838	167859.962	483428.838	167859.962	
S-A-2.001	S-A-4	1350		483414.023	167870.117	483414.023	167870.117	
S-A-3.000	S-A-7	1200		483413.734	167908.869	483413.734	167908.869	
S-A-2.002	S-A-8	1350		483397.174	167901.990	483397.174	167901.990	
S-A-2.003	S-A-9	1350		483384.452	167932.677	483384.452	167932.677	
S-A-2.004	S-A-11	1500		483331.450	167908.444	483331.450	167908.444	
S-A-2.005	S-A-HW-01			483327.220	167915.432			
S-A-2.006	S-A-HW-02			483311.550	167950.011			
S-A-4.000	S-A-16	1200		483378.461	167947.353	483378.461	167947.353	
S-A-4.001	S-A-17	1200		483373.830	167957.558	483373.830	167957.558	
S-A-4.002	S-A-18	1200		483353.784	167972.512	483353.784	167972.512	
S-A-4.003	S-A-19	1350		483332.967	167971.263	483332.967	167971.263	
S-A-2.007	S-A-20	1500		483307.654	167961.799	483307.654	167961.799	
S-A-2.008	S-A-HW-03			483303.213	167973.678			
S-A-2.009	S-A-HW-04			483293.177	168045.639			
S-A-2.010	S-A-R14 Basin	1500		483302.752	168072.154	483302.752	168072.154	
PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)		
S-A-2.010	S-A-OUTFALL		0	483288.653	168086.674			

Area Summary for Surface Network A

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
2.000	-	-	100	0.045	0.045	0.045
2.001	-	-	100	0.140	0.140	0.140
3.000	-	-	100	0.019	0.019	0.019
2.002	-	-	100	0.058	0.058	0.058
2.003	-	-	100	0.166	0.166	0.166
2.004	-	-	100	0.193	0.193	0.193
2.005	-	-	100	0.000	0.000	0.000
2.006	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.013	0.013	0.013
4.001	-	-	100	0.006	0.006	0.006
4.002	-	-	100	0.130	0.130	0.130
4.003	-	-	100	0.122	0.122	0.122
2.007	-	-	100	0.000	0.000	0.000
2.008	-	-	100	0.000	0.000	0.000
2.009	-	-	100	0.000	0.000	0.000
2.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.892	0.892	0.892

Network Classifications for Surface Network A

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S-A-2.000	S-A-3	225	2.063	2.121	Unclassified	1200	0	2.064	Unclassified
S-A-2.001	S-A-4	375	2.121	2.529	Unclassified	1350	0	2.121	Unclassified
S-A-3.000	S-A-7	300	1.141	2.528	Unclassified	1200	0	1.141	Unclassified
S-A-2.002	S-A-8	450	2.382	2.528	Unclassified	1350	0	2.528	Unclassified
S-A-2.003	S-A-9	450	1.802	2.502	Unclassified	1350	0	2.382	Unclassified
S-A-2.004	S-A-11	525	0.938	0.992	Unclassified	1500	0	0.992	Unclassified
S-A-2.005	S-A-HW-01	525	0.938	1.216	Unclassified				Junction
S-A-2.006	S-A-HW-02	525	1.140	1.216	Unclassified				Junction
S-A-4.000	S-A-16	300	1.842	1.964	Unclassified	1200	0	1.964	Unclassified
S-A-4.001	S-A-17	300	1.591	1.899	Unclassified	1200	0	1.899	Unclassified
S-A-4.002	S-A-18	300	1.465	1.591	Unclassified	1200	0	1.591	Unclassified
S-A-4.003	S-A-19	450	1.208	1.466	Unclassified	1350	0	1.466	Unclassified
S-A-2.007	S-A-20	525	1.050	1.604	Unclassified	1500	0	1.208	Unclassified
S-A-2.008	S-A-HW-03	525	1.035	1.050	Unclassified				Junction
S-A-2.009	S-A-HW-04	525	1.035	1.475	Unclassified				Junction
S-A-2.010	S-A-R14 Basin	300	1.700	1.752	Unclassified	1500	0	1.700	Unclassified

Free Flowing Outfall Details for Surface Network A

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S-A-2.010	S-A-OUTFALL	66.000	63.948	0.000	0	0

Simulation Criteria for Surface Network A

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	2
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	D1 (1km)	0.000	Summer Storms	Yes
Return Period (years)	2	D2 (1km)	0.000	Winter Storms	Yes
FEH Rainfall Version	1999	D3 (1km)	0.000	Cv (Summer)	1.000
Site Location		E (1km)	0.000	Cv (Winter)	0.840
C (1km)	0.000	F (1km)	0.000	Storm Duration (mins)	30

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Online Controls for Surface Network A

Hydro-Brake® Optimum Manhole: S-A-R14 Basin, DS/PN: S-A-2.010, Volume (m³): 9.5

Unit Reference	MD-SHE-0085-3900-1600-3900
Design Head (m)	1.600
Design Flow (l/s)	3.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	64.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	3.9	Kick-Flo®	0.761	2.8
Flush-Flo™	0.375	3.4	Mean Flow over Head Range	-	3.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	0.800	2.8	2.000	4.3	4.000	6.0	7.000	7.8
0.200	3.2	1.000	3.1	2.200	4.5	4.500	6.3	7.500	8.0
0.300	3.4	1.200	3.4	2.400	4.7	5.000	6.6	8.000	8.3
0.400	3.4	1.400	3.7	2.600	4.9	5.500	6.9	8.500	8.5
0.500	3.4	1.600	3.9	3.000	5.2	6.000	7.2	9.000	8.8
0.600	3.3	1.800	4.1	3.500	5.6	6.500	7.5	9.500	9.0

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Storage Structures for Surface Network A

Complex Manhole: S-A-HW-01, DS/PN: S-A-2.005

Swale

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	38.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	500.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	65.452	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

Tank or Pond Manhole: S-A-R14 Basin, DS/PN: S-A-2.010

Invert Level (m) 64.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1300.8	2.000	2646.0

Manhole Headloss for Surface Network A

PN	US/MH Name	US/MH Headloss
S-A-2.000	S-A-3	0.500
S-A-2.001	S-A-4	0.500
S-A-3.000	S-A-7	0.500
S-A-2.002	S-A-8	0.500
S-A-2.003	S-A-9	0.500
S-A-2.004	S-A-11	0.500
S-A-2.005	S-A-HW-01	0.000
S-A-2.006	S-A-HW-02	0.000
S-A-4.000	S-A-16	0.500
S-A-4.001	S-A-17	0.500
S-A-4.002	S-A-18	0.500
S-A-4.003	S-A-19	0.500
S-A-2.007	S-A-20	0.500
S-A-2.008	S-A-HW-03	0.000
S-A-2.009	S-A-HW-04	0.000
S-A-2.010	S-A-R14 Basin	0.500

CASDeF Controller for Surface Network A

PN	US/MH Name	Level Not Exceeded	Modify Control	Modify Pipe Size	Max Pipe Diameter	No. Pipe Failures	Add Storage	No. Storage Failures	Use CASDeF
S-A-2.000	S-A-3	67.887	Yes	No	2139	0	Yes	0	Yes
S-A-2.001	S-A-4	67.836	Yes	No	2346	0	Yes	0	Yes
S-A-3.000	S-A-7	68.200	Yes	No	1291	0	Yes	0	Yes
S-A-2.002	S-A-8	68.150	Yes	No	2675	0	Yes	0	Yes
S-A-2.003	S-A-9	67.918	Yes	No	2100	0	Yes	0	Yes
S-A-2.004	S-A-11	66.987	Yes	No	1300	0	Yes	0	Yes
S-A-2.005	S-A-HW-01	66.915	Yes	No	1313	0	Yes	0	Yes
S-A-2.006	S-A-HW-02	66.810	Yes	No	1575	0	Yes	0	Yes
S-A-4.000	S-A-16	67.799	Yes	No	2025	0	Yes	0	Yes
S-A-4.001	S-A-17	67.687	Yes	No	1725	0	Yes	0	Yes
S-A-4.002	S-A-18	67.274	Yes	No	1600	0	Yes	0	Yes
S-A-4.003	S-A-19	67.061	Yes	No	1500	0	Yes	0	Yes
S-A-2.007	S-A-20	66.733	Yes	No	1425	0	Yes	0	Yes
S-A-2.008	S-A-HW-03	66.200	Yes	No	1400	0	Yes	0	Yes
S-A-2.009	S-A-HW-04	66.000	Yes	No	1410	0	Yes	0	Yes
S-A-2.010	S-A-R14 Basin	66.000	Yes	No	1850	0	Yes	0	Yes

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 482607 167931 SU 82607 67931 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S-A-2.000	S-A-3	30 Summer	2	+0%	2/15 Summer				65.961
S-A-2.001	S-A-4	30 Summer	2	+0%	2/15 Summer				65.950
S-A-3.000	S-A-7	15 Summer	2	+0%	100/15 Summer				66.780
S-A-2.002	S-A-8	30 Summer	2	+0%	2/15 Summer				65.931
S-A-2.003	S-A-9	30 Summer	2	+0%	2/15 Summer	30/2880 Winter			65.915
S-A-2.004	S-A-11	30 Summer	2	+0%	30/15 Summer				65.777
S-A-2.005	S-A-HW-01	30 Summer	2	+0%	100/15 Summer				65.593
S-A-2.006	S-A-HW-02	30 Summer	2	+0%					65.268
S-A-4.000	S-A-16	15 Summer	2	+0%	100/15 Summer				65.578
S-A-4.001	S-A-17	15 Summer	2	+0%	100/15 Summer				65.547
S-A-4.002	S-A-18	15 Summer	2	+0%	30/15 Summer				65.518
S-A-4.003	S-A-19	15 Summer	2	+0%	100/15 Summer				65.327
S-A-2.007	S-A-20	30 Summer	2	+0%	100/15 Summer				65.172
S-A-2.008	S-A-HW-03	30 Summer	2	+0%					64.872
S-A-2.009	S-A-HW-04	30 Summer	2	+0%					64.603
S-A-2.010	S-A-R14 Basin	720 Summer	2	+0%	30/480 Summer				64.160

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S-A-2.000	S-A-3	0.138	0.000	0.19			6.9	SURCHARGED	
S-A-2.001	S-A-4	0.235	0.000	0.28			25.3	SURCHARGED	
S-A-3.000	S-A-7	-0.279	0.000	0.01			4.0	OK	
S-A-2.002	S-A-8	0.309	0.000	0.24			34.5	SURCHARGED	
S-A-2.003	S-A-9	0.379	0.000	0.24			55.5	SURCHARGED	
S-A-2.004	S-A-11	-0.218	0.000	0.63			79.8	OK	
S-A-2.005	S-A-HW-01	-0.384	0.000	0.16		8	76.9	OK*	
S-A-2.006	S-A-HW-02	-0.326	0.000	0.31			76.7	OK*	
S-A-4.000	S-A-16	-0.257	0.000	0.05			2.6	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	Time (mins)	Flow (l/s)		
S-A-4.001	S-A-17	-0.241	0.000	0.06			3.6	OK	
S-A-4.002	S-A-18	-0.165	0.000	0.41			26.0	OK	
S-A-4.003	S-A-19	-0.268	0.000	0.34			46.9	OK	
S-A-2.007	S-A-20	-0.353	0.000	0.24			110.7	OK	
S-A-2.008	S-A-HW-03	-0.278	0.000	0.44			107.1	OK*	
S-A-2.009	S-A-HW-04	-0.362	0.000	0.21			106.4	OK*	
S-A-2.010	S-A-Rl4 Basin	-0.140	0.000	0.06			3.0	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	2
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 482607 167931 SU 82607 67931	Cv (Winter)	1.000
Margin for Flood Risk Warning (mm)	300.0	DVD Status	ON
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		
Profile(s)	Summer and Winter		
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080		
Return Period(s) (years)	2, 30, 100		
Climate Change (%)	0, 0, 40		

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S-A-2.000	S-A-3	15 Summer	30	+0%	2/15 Summer				66.543
S-A-2.001	S-A-4	15 Summer	30	+0%	2/15 Summer				66.499
S-A-3.000	S-A-7	15 Summer	30	+0%	100/15 Summer				66.795
S-A-2.002	S-A-8	15 Summer	30	+0%	2/15 Summer				66.408
S-A-2.003	S-A-9	15 Summer	30	+0%	2/15 Summer	30/2880 Winter			66.346
S-A-2.004	S-A-11	15 Summer	30	+0%	30/15 Summer				66.088
S-A-2.005	S-A-HW-01	15 Summer	30	+0%	100/15 Summer				65.726
S-A-2.006	S-A-HW-02	15 Summer	30	+0%					65.521
S-A-4.000	S-A-16	15 Summer	30	+0%	100/15 Summer				65.725
S-A-4.001	S-A-17	15 Summer	30	+0%	100/15 Summer				65.721
S-A-4.002	S-A-18	15 Summer	30	+0%	30/15 Summer				65.712
S-A-4.003	S-A-19	15 Summer	30	+0%	100/15 Summer				65.538
S-A-2.007	S-A-20	15 Summer	30	+0%	100/15 Summer				65.478
S-A-2.008	S-A-HW-03	15 Summer	30	+0%					65.150
S-A-2.009	S-A-HW-04	30 Summer	30	+0%					64.744
S-A-2.010	S-A-R14 Basin	720 Summer	30	+0%	30/480 Summer				64.310

PN	US/MH Name	Surcharged Flooded			Half Drain		Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	
S-A-2.000	S-A-3	0.720	0.000	0.59			21.3	SURCHARGED	
S-A-2.001	S-A-4	0.784	0.000	0.93			84.8	SURCHARGED	
S-A-3.000	S-A-7	-0.264	0.000	0.03			9.2	OK	
S-A-2.002	S-A-8	0.786	0.000	0.82			116.5	SURCHARGED	
S-A-2.003	S-A-9	0.810	0.000	0.80			185.1	SURCHARGED	
S-A-2.004	S-A-11	0.093	0.000	2.14			272.9	SURCHARGED	
S-A-2.005	S-A-HW-01	-0.251	0.000	0.54		6	255.4	OK*	
S-A-2.006	S-A-HW-02	-0.073	0.000	0.99			246.8	OK*	
S-A-4.000	S-A-16	-0.110	0.000	0.12			6.6	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

PN	US/MH Name	Surcharged Flooded		Half Drain		Pipe		Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S-A-4.001	S-A-17	-0.067	0.000	0.19			12.4		OK
S-A-4.002	S-A-18	0.029	0.000	1.15			72.4	SURCHARGED	
S-A-4.003	S-A-19	-0.057	0.000	0.96			132.9		OK
S-A-2.007	S-A-20	-0.047	0.000	0.71			333.4		OK
S-A-2.008	S-A-HW-03	0.000	0.000	1.32			321.8	SURCHARGED*	
S-A-2.009	S-A-HW-04	-0.221	0.000	0.63			321.9		OK*
S-A-2.010	S-A-R14 Basin	0.010	0.000	0.07			3.4	SURCHARGED	

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Date 30/08/2024	Designed by GR	
File A389 - Link Road B.MDX	Checked by GR	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	2
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 482607 167931 SU 82607 67931	Cv (Winter)	1.000
Margin for Flood Risk Warning (mm)	300.0	DVD Status	ON
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		
Profile(s)	Summer and Winter		
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080		
Return Period(s) (years)	2, 30, 100		
Climate Change (%)	0, 0, 40		

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S-A-2.000	S-A-3	15 Summer	100	+40%	2/15 Summer				67.675
S-A-2.001	S-A-4	15 Summer	100	+40%	2/15 Summer				67.591
S-A-3.000	S-A-7	15 Summer	100	+40%	100/15 Summer				67.333
S-A-2.002	S-A-8	15 Summer	100	+40%	2/15 Summer				67.322
S-A-2.003	S-A-9	15 Summer	100	+40%	2/15 Summer	30/2880 Winter			67.145
S-A-2.004	S-A-11	15 Summer	100	+40%	30/15 Summer				66.386
S-A-2.005	S-A-HW-01	30 Summer	100	+40%	100/15 Summer				66.089
S-A-2.006	S-A-HW-02	15 Summer	100	+40%					65.594
S-A-4.000	S-A-16	15 Summer	100	+40%	100/15 Summer				66.349
S-A-4.001	S-A-17	15 Summer	100	+40%	100/15 Summer				66.344
S-A-4.002	S-A-18	15 Summer	100	+40%	30/15 Summer				66.335
S-A-4.003	S-A-19	15 Summer	100	+40%	100/15 Summer				65.989
S-A-2.007	S-A-20	15 Summer	100	+40%	100/15 Summer				65.811
S-A-2.008	S-A-HW-03	15 Summer	100	+40%					65.150
S-A-2.009	S-A-HW-04	30 Summer	100	+40%					64.804
S-A-2.010	S-A-R14 Basin	960 Summer	100	+40%	30/480 Summer				64.556

PN	US/MH Name	Surcharged Flooded			Half Drain		Pipe	Level	
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Exceeded
S-A-2.000	S-A-3	1.852	0.000	1.14			41.2	FLOOD RISK	
S-A-2.001	S-A-4	1.876	0.000	1.63			148.9	FLOOD RISK	
S-A-3.000	S-A-7	0.274	0.000	0.08			20.5	SURCHARGED	
S-A-2.002	S-A-8	1.700	0.000	1.45			207.4	SURCHARGED	
S-A-2.003	S-A-9	1.609	0.000	1.41			325.6	SURCHARGED	
S-A-2.004	S-A-11	0.391	0.000	3.79			482.1	SURCHARGED	
S-A-2.005	S-A-HW-01	0.112	0.000	0.61		11	287.4	SURCHARGED*	
S-A-2.006	S-A-HW-02	0.000	0.000	1.20			298.7	SURCHARGED*	
S-A-4.000	S-A-16	0.514	0.000	0.24			13.5	SURCHARGED	

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Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network A

PN	US/MH Name	Surcharged Flooded		Half Drain		Pipe		Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S-A-4.001	S-A-17	0.556	0.000	0.30			19.0	SURCHARGED	
S-A-4.002	S-A-18	0.652	0.000	1.94			122.2	SURCHARGED	
S-A-4.003	S-A-19	0.394	0.000	1.62			224.8	SURCHARGED	
S-A-2.007	S-A-20	0.286	0.000	0.90			423.7	SURCHARGED	
S-A-2.008	S-A-HW-03	0.000	0.000	1.70			414.2	SURCHARGED*	
S-A-2.009	S-A-HW-04	-0.161	0.000	0.82			416.9	OK*	
S-A-2.010	S-A-R14 Basin	0.256	0.000	0.07			3.4	SURCHARGED	

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