



MIRA Technology Park South Site

Flood Risk Assessment and Outline Drainage Strategy

August 2022

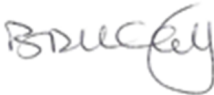
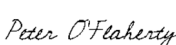
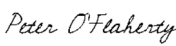
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Contents

1. Introduction.....	2
2. Planning Policy and Guidance.....	4
3. Sources of Potential Flooding.....	7
4. Surface Water Drainage Strategy.....	12
5. Proposed Foul Drainage Strategy.....	19
6. Conclusions	20
7. References	21

Figures

Figure 1: Site Location.....	2
Figure 2: Environment Agency Flood Risk from Surface Water.....	8
Figure 3: Catchment draining to ordinary watercourse	9

Tables

Table 1: Sustainable Drainage Techniques	13
Table 2: Impermeable area and limiting greenfield discharge rate from the Northern and Southern Catchments.....	15
Table 3: Attenuation Details	15
Table 4: Pollution hazard / mitigation indices	16
Table 5: Indicative SuDS Maintenance Regime.....	17
Table 6: Foul rate from proposed development based on Parameter Plans	19

Appendices

- A. Topographic Survey
- B. Development Proposals
- C. Historic Flood Records from Joint SFRA
- D. ReFH2 Checksheet (1 in 2 year event)
- E. Indicative Surface Water Drainage Strategy
- F. Surface Water Calculations
- G. Foul Water Calculations and Diversion information

Contents

Executive Summary

Waterman was commissioned by ERI MTP Limited to undertake a Flood Risk Assessment and Outline Drainage Strategy to support the planning application for construction of commercial units and access road on MIRA Technology Park South Site.

The proposals for development comprise the Extension of MIRA Technology Park to comprise advanced manufacturing (Class B2); associated office and service uses (Class E); and storage (Class B8); new spine road; car parking; landscaping; and enabling works.

It has been demonstrated there is a low risk of flooding from tidal, pluvial, fluvial, groundwater and artificial sources. The Site is located in Flood Zone 1, however, the Site is bisected by an ordinary watercourse. The relatively impermeable nature of the underlying ground conditions means the ordinary watercourse is predominantly driven by overland flow from the surrounding catchment. The EA's surface water mapping does not accurately represent the watercourse, and overestimates the risk of flooding in this location. Calculations of the flow rate within the channel show that the channel has sufficient capacity to manage the 1 in 100-year event including an allowance for climate change.

Changes to land levels across the Site mean that the area draining to the watercourse near Weddington will reduce as a result of the proposals, thereby reducing the risk of flooding to Weddington. The runoff from the proposed development will be restricted to QBAR through the use of SuDS.

It is proposed to utilise a range of SuDS including permeable paving, swales, filter strip, underground storage and detention basins to attenuate runoff from the development. Two outfalls are proposed into the ordinary watercourse at the Site; one to serve the land north of the watercourse, and the second to serve land south of the watercourse. The volume of attenuation required across the Site has been estimated using MicroDrainage Network based on the indicative masterplan for the Site, though the detailed drainage design will need to be developed further. This will need to accommodate the steeply sloping land levels across the Site with the requirement for check dams.

Using the CIRIA pollution indices methodology, it has been established that the development has a high hazard rating, but that the proposed SuDS will provide sufficient level of treatment for runoff from the development through the use of permeable surfacing and detention basins. In the event that runoff does not flow through both features before reaching the watercourse, additional measures, such as downstream defenders and petrol interceptors, will be required. A company will be appointed to manage the proposed SuDS, and details of typical maintenance measures have been included within this report.

The rate of foul discharge from each zone of the development, as set out in the Parameter Plan, has been calculated to total 24.0l/s. The proposals include the diversion of the existing foul sewer which currently runs alongside the eastern bank of the ordinary watercourse. Severn Trent Water has been consulted on the proposals which include connecting to a new foul trunk sewer being constructed to the south of the development Site.

In conclusion, the Site is at low risk of flooding and will not increase the risk of flooding elsewhere as a result of the proposed SuDS strategy, in line with the requirements of local and national planning policy.

1. Introduction

Waterman was commissioned by ERI MTP Limited to undertake a Flood Risk Assessment and Outline Drainage Strategy to support an outline planning application for construction of commercial units and an access road on MIRA Technology Park South Site.

Site Description

- 1.1. The Site covers an area of approximately 59.5 hectares (ha) and is currently occupied by a single residence in the eastern half, with the remainder of the Site being undeveloped. The Site is bound by the A5 to the north, residential properties to the west, farmland to the east, and the A444 to the south.

Development Proposals

- 1.2. The development proposals comprise the Extension of MIRA Technology Park to comprise advanced manufacturing (Class B2); associated office and service uses (Class E); and storage (Class B8); new spine road; car parking; landscaping; and enabling works. A parameter plan for the development is included in Appendix B. Figure 1 shows the location of the Site and indicative masterplan.

Figure 1: Site Location



Geology and Topography

- 1.3. Based on the Topographic Survey (Appendix A), land levels vary across the Site from 90.0m AOD to 82.2m AOD. Overall, land levels fall from north to south.

- 1.4. Reference to the British Geological Society (BGS) Geology of Britain viewer (1:50,000 scale) the underlying geology at the Site comprises Mercia Mudstone Group with strips of Gunthorpe Member (Siltstone, Dolomitic). This is overlain by a localised area of superficial deposits of Anker Sand and Gravel in the north-western area of the Site, and Alluvium (Clay, Silt, Sand and Gravel) along the course of the ordinary watercourse which bisects the Site.

Scope of Report

- 1.5. This report assesses the potential effects of tidal, fluvial, pluvial, groundwater and artificial sources of flooding upon the Development, in line with national and local planning policy. The management of surface water runoff is also assessed, so as not to have a detrimental effect to the Site or its surroundings. In addition, an assessment of foul drainage has also been included.

2. Planning Policy and Guidance

National Planning Policy Framework

- 2.1. The National Planning Policy Frameworkⁱ (NPPF) 2021 states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.
- 2.2. The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available Sites appropriate for the proposed development in areas with a lower risk of flooding.
- 2.3. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), it may be necessary to demonstrate through the Exception Test that:
 - The development would provide wider sustainability benefits to the community that outweigh the flood risk; and
 - The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 2.4. The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a Site-specific Flood Risk Assessment. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:
 - Within the Site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
 - The development is appropriately flood resistant and resilient;
 - It incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
 - Any residual risk can be safely managed; and
 - Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.
- 2.5. Major developments should incorporate SuDS unless there is clear evidence that this would be inappropriate. The systems used should:
 - Take account of advice from the lead local flood authority;
 - Have appropriate proposed minimum operational standards;
 - Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
 - Where possible, provide multifunctional benefits.
- 2.6. Flood risk vulnerability is split into five classifications in Annex 3 of the NPPF as follows:
 - Essential Infrastructure, e.g. essential transport and utility infrastructure, wind turbines;
 - Highly Vulnerable, e.g. emergency services (those required to be operational during flooding), basement dwellings;
 - More Vulnerable, e.g. residential dwellings, hospitals, schools, hotels, drinking establishments;

- Less Vulnerable, e.g. retail, offices, storage and distribution, leisure, restaurants; and
- Water-Compatible Development, e.g. docks, marinas, wharves.

Planning Practice Guidance

- 2.7. The Planning Practice Guidanceⁱⁱ (PPG) provides additional guidance to LPAs to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding.
- 2.8. The PPG states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of SuDS. Referencing information provided by the Environment Agency (EA), the PPG provides advice on taking account of climate change, setting out recommended contingency allowances for net sea level rise and peak rainfall intensities. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.
- 2.9. The PPG also includes advice on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:
- Zone 1 - low probability: less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year;
 - Zone 2 - medium probability: between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% to 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% to 0.1%) in any year;
 - Zone 3a - high probability: 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
 - Zone 3b - the functional floodplain: where water has to flow or be stored in times of flood; identification should take account of local circumstances but would typically flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme 1 in 1,000 (0.1%) flood.

Sequential and Exception Test

- 2.10. The Site is located within Flood Zone 1, and therefore neither the Sequential Test nor Exception Test is required to be applied.

North Warwickshire Local Plan

- 2.11. The North Warwickshire Borough Council Local Plan was adopted in September 2021ⁱⁱⁱ is the current adopted Local Plan and sets out the vision and spatial planning strategy for North Warwickshire and allocates sites for new homes and employment land to meet local community and business needs up to 2033.
- 2.12. Policy LP33 (Water and Flood Risk Management) states that development proposals must not detrimentally affect the ecological status of a waterbody and where appropriate, incorporate measures to improve its ecological value.
- 2.13. Water runoff from new development must be no more than natural greenfield runoff rates and developments should hold this water back on the development site through high quality Sustainable Urban Drainage (SuDS), reducing pollution and flood risk to nearby watercourses. The culverting of

watercourses will only be approved in exceptional circumstances.

- 2.14. In order to improve and protect water quality, infiltration measures are the preferred means of surface water disposal where ground conditions are appropriate and where practicable, the separation of surface water from sewers should be undertaken.

Warwickshire County Council, Stratford-on-Avon District Council, Rugby Borough Council and North Warwickshire Borough Council Level 1 Strategic Flood Risk Assessment

- 2.15. This 2013 Strategic Flood Risk Assessment^{iv} (SFRA) serves as an update to the Level 1 SFRA which was produced by Halcrow consultants for a sub-regional group comprising Coventry City Council, Solihull Metropolitan Borough Council and the County, Boroughs and District Councils of Warwickshire in January 2008. The update was produced in association with Stratford-on-Avon District Council, Warwickshire County Council & Rugby Borough Council.

- 2.16. Key aims of the SFRA include:

- To provide information required to apply the Sequential Test for identification of land suitable for development in line with the principles of the NPPF;
- Provide sufficient information to allow LPAs within the Study Area to assess the flood risk for specific development proposal sites, thereby setting out the requirements for site specific Flood Risk Assessments (FRAs);
- Where necessary, provide technical assessments to demonstrate that development located in flood risk areas are appropriate and in line with the requirements of the exception test; and
- Present sufficient information to inform each of the LPAs within the Study Area of acceptable flood risk in relation to emergency planning capability.

Warwickshire County Council Local Flood Risk Management Strategy

- 2.17. The Warwickshire County Council Local Flood Risk Management Strategy^v (LFRMS) was produced in April 2016. The LFRMS provides an overview and assessment of local flood risk in Warwickshire and how to manage and reduce local flood risk. It covers the county of Warwickshire comprising the five local authorities of: North Warwickshire, Nuneaton and Bedworth, Rugby, Stratford upon Avon, Warwick.

Warwickshire County Council Surface Water Management Plan

- 2.18. Finalised in August 2015, Warwickshire County Council's Surface Water Management Plan^{vi} (SWMP) aims to provide an evidence base for the LFRMS and to take a proactive approach to flood risk reduction through informed decision making.
- 2.19. The SWMP focused on establishing a risk-based assessment process to prioritise flooding locations across Warwickshire and develop a greater understanding of key flooding hotspot areas, risks and associated consequences.

3. Sources of Potential Flooding

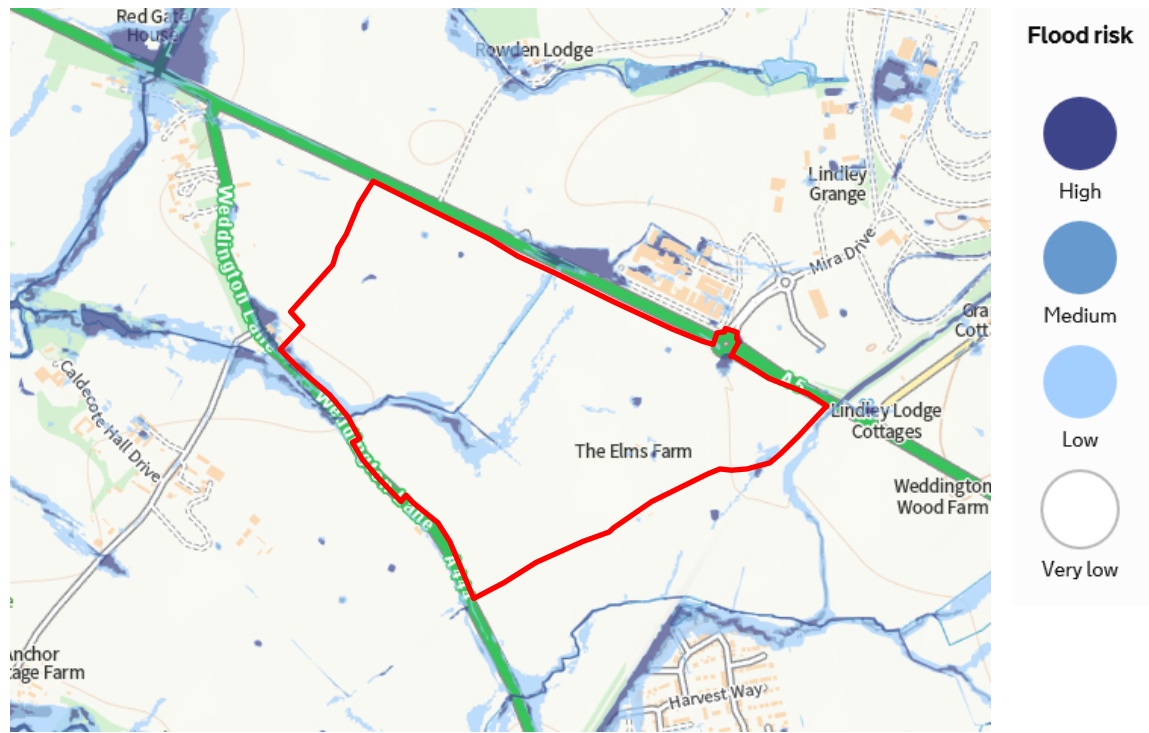
Pluvial

- 3.1. Pluvial flooding occurs when natural and engineered drainage systems lack capacity to manage the volume of rainfall. Pluvial flooding can occur in urban areas during an extreme, high intensity, low duration summer rainfall event which overwhelms the local surface water drainage systems. This flood water would then be conveyed via overland flow routes based on the local topography.

Overland Surface Water

- 3.2. Review of the EA's Flood Risk from Surface Water maps (Figure 2) indicates that the Site is at 'low' to 'high' risk of surface water flooding.
- 3.3. The topographic survey (Appendix A) confirms the localised areas at risk of flooding in the east of the Site are associated with existing ponds, and the linear extent of flooding at low risk to the east of the watercourse is attributed to artefacts within the EA's LiDAR (Light Detection and Ranging) mapping used to derive the surface water risk maps. Such depressions are not present in the topographic survey.
- 3.4. The mapping indicates that the majority of flood risk is shown alongside the route of the ordinary watercourse on the Site.
- 3.5. The underlying geology in this location (as set out in Section 1) is generally relatively impermeable, meaning that surface water runoff is likely to be generated following a heavy to extreme rainfall event, such as the events shown in Figure 2, as opposed to entirely infiltrating into the ground. The resulting runoff will flow overland following the topography where it is intercepted by the ordinary watercourse which bisects the Site, supported by the extent of flooding shown along the path of the watercourse in the EA's mapping.
- 3.6. However, the strategic nature of the EA's mapping means that the ability of the watercourse to drain the catchment is not inherently picked up with the high-level modelling techniques used to create the surface water risk maps. As a result, the extent of flooding in areas adjacent to watercourses is often over-predicted.
- 3.7. It is therefore concluded that the EA's mapping overestimates the risk of flooding from surface water. The risk of flooding from fluvial sources is examined in further detail below.

Figure 2: Environment Agency Flood Risk from Surface Water



Key



Site Location

High Risk – Chance of flooding greater than 1 in 30

Medium Risk – Chance of flooding between 1 in 30 and 1 in 100

Low Risk – Chance of flooding between 1 in 100 and 1 in 1000

Very Low Risk – Chance of flooding less than 1 in 1000

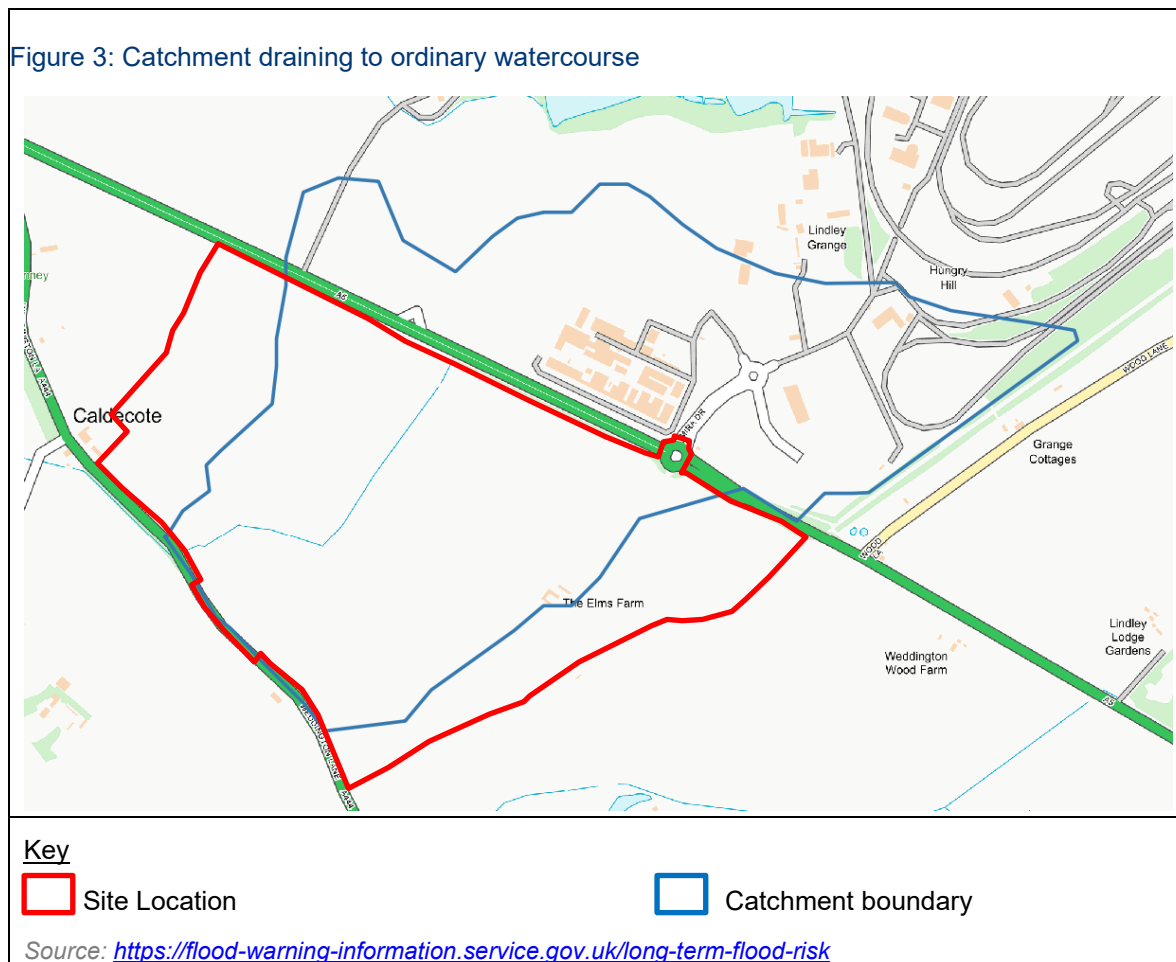
Source: <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

Sewer Flooding

- 3.8. There is an existing 225mm diameter public foul sewer which is located on the eastern side of the ordinary watercourse.
- 3.9. Figure A2 of the joint SFRA shows that there are no historic flooding records at this Site (Appendix C).
- 3.10. The sewer is proposed to be diverted as part of the proposals under a S185 agreement vampire with Severn Trent Water. (refer to Section 5). The new sewer will accept foul flows from the development Site, and discharge into a new Hinckley Trunk sewer proposed by Severn Trent Water to the south of the Site.
- 3.11. The proposals for development also include a surface water drainage system which will be designed to ensure no adverse impact from flooding to users of the Site.
- 3.12. The risk of flooding from sewers is therefore considered to be low.

Fluvial

- 3.13. According to the Environment Agency's (EA) Flood Map for Planning, the Site is located within Flood Zone 1, indicating a low probability (less than 1 in 1000 years) of fluvial flooding. However, as mentioned above, an ordinary watercourse bisects the development Site.
- 3.14. The watercourse flows from MIRA technology park to the north, beneath the A5, through the centre of the development Site. The watercourse exits the Site to the south via 2no. 900mm diameter brick culverts beneath the A444. The hydraulic properties of the watercourse have been assessed below in the absence of hydraulic modelling from the EA.
- 3.15. Based on a high-level review of the underlying geology in the section above, the watercourse is predominantly driven by surface water runoff from the surrounding catchment. The area draining to the watercourse has been established based on catchment information obtained from the Flood Estimation Handbook (FEH) online web service, adjusted based on a more detailed review of land levels using the EA's LiDAR (Light Detection and Radar) land level information (Figure 3).



- 3.16. The peak flow rate has been analysed using the Revitalised Flood Hydrograph method (ReFH2) to be 1.66m³/s for the 1 in 100 year event, including a 22% increase for climate change, as set out in the EA's climate change guidance. The rate is calculated to be 0.97m³/s for a 1 in 30 year event, and 0.43m³/s for the 1 in 2 year event. Calculation records for the 1 in 2 year event are included in Appendix D for reference.

- 3.17. During pre-application discussions, the LLFA raised concerns regarding historic flooding in the area of Weddington to the east of the Site. It can be seen from Figure 3 that part of the application Site sits within the catchment which drains to the east. However, the nature of the proposed industrial units would result in changes to the proposed land levels which will increase the catchment boundary, with the developed areas of the Site draining into the watercourse within the Site. As a result, there would be a reduction in the catchment area and hence volume of overland flow directed towards the watercourse at Weddington, thereby reducing the risk of flooding in this area.
- 3.18. The topographic survey identifies a tributary of the ordinary watercourse in the south of the Site. Given the relatively impermeable underlying ground conditions, and that the tributary follows an established field boundary, it is likely this tributary is a man-made land drainage ditch designed to drain runoff from the surrounding fields. The ditch is proposed to be infilled as part of the development, though any runoff which was managed by the ditch will now be captured by the formal drainage system and attenuated to QBAR.
- 3.19. As part of the proposals it will be necessary to provide a vehicular crossing across the ordinary watercourse. During pre-application discussions, the LLFA has specified that any culverted crossing should form a box culvert to reduce the risk of blockage otherwise attributed to single or double circular culverts. Calculations have confirmed that 1.2m diameter culvert will be sufficient and can be accommodated within the highway design with the appropriate cover.
- 3.20. Further to the above, no buildings are proposed within 8m of the bank of the watercourse, with a green buffer retained within 5m of the watercourse (except for drainage outfalls) as agreed with the LLFA during pre-application discussions.
- 3.21. In consideration of the above, the risk of flooding from fluvial sources is considered to be low.

Tidal

- 3.22. According to the Environment Agency's (EA) Flood Map for Planning, the Site is located within Flood Zone 1, indicating a low probability (less than 1 in 1000 years) of tidal flooding.
- 3.23. The Site is located a significant distance from the coastline and is elevated above predicted tidal levels, now and in the future when considering an allowance for climate change.
- 3.24. The risk of flooding from tidal sources is therefore considered to be low.

Groundwater

- 3.25. Based on the underlying geology at the Site (set out in Section 1), the permeability of the ground will be limited. The EA's aquifer designation mapping shows the Site is located on a Secondary B aquifer, with strips of Secondary (undifferentiated) overlain with localised Secondary A aquifers within the superficial deposits. The aquifer is shown to have a low productivity (fissured) on the BGS hydrogeology mapping.
- 3.26. The above is supported by the absence of historic flooding records at the Site shown in the Level 1 joint SFRA.
- 3.27. The proposals for development also do not include any subterranean elements. On this basis, the risk of flooding due to groundwater sources is low.

Artificial Sources

- 3.28. The EA's Flood Risk from Reservoirs mapping (Figure 4) shows the Site to be outside of the area at

risk of flooding in the unlikely event of a failure of a reservoir. No other artificial sources of flooding have been identified in proximity to the Site from OS mapping or desktop searches.

3.29. The risk of flooding due to artificial sources is therefore considered to be low.

Summary

3.30. The Site is considered to be at a low risk of flooding from pluvial, fluvial, tidal, groundwater and artificial sources.

3.31. The SuDS measures proposed to limit the rate of runoff into the receiving watercourse and ensure no increase risk of pluvial flooding to the surrounding area are presented in Chapter 4.

4. Surface Water Drainage Strategy

Existing Drainage

- 4.1. Severn Trent Water sewer records (Appendix I) indicate that there is a 225mm diameter foul sewer crossing the Site from north to south, running adjacent to the eastern bank of the ordinary watercourse. Given the relatively impermeable underlying ground conditions, it is expected that infiltration of surface water runoff is limited. Therefore, the majority of surface water runoff from the Site currently flows overland and is intercepted by the ordinary watercourse which crosses the Site.

Proposed Surface Water Discharge

- 4.2. The proposed surface water drainage system would be designed to convey surface water only, with foul water being discharged separately. The design would be in accordance with BS EN 752 – Drain and Sewer Systems Outside Buildings, BS EN 12056 – Gravity Drainage Systems Inside Buildings, and Approved Document H of Building Regulations.
- 4.3. In line with Building Regulations and the PPG, the following hierarchy of surface water disposal should be adhered to, in decreasing order of preference.
- i. Discharge to ground;
 - ii. Discharge to surface water body;
 - iii. Discharge to a surface water sewer; and
 - iv. Discharge to a combined sewer.

Discharge to Ground

- 4.4. As noted previously, the underlying geology is considered to have low permeability which is expected to be too low to utilise infiltration. On this basis, management of surface water via infiltration is not considered feasible.

Discharge to a Surface Water Body

- 4.5. As noted previously, there is an ordinary watercourse which bisects the Site and intercepts surface water runoff from the pre-developed Site. It is therefore proposed that surface water would discharge to this watercourse.

Discharge to a Sewer

- 4.6. As noted above, the nearest sewers to the development are designated for foul water. As a preferable solution for managing surface water runoff has been identified, this option has been discounted.

Sustainable Drainage Systems

- 4.7. The most sustainable way to drain surface water runoff is through the use of SuDS, which need to be considered in relation to Site-specific constraints.
- 4.8. SuDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, and hence reduce the risk of flooding. In addition to reducing flood risk, SuDS features can improve water quality, and provide biodiversity and amenity benefits.
- 4.9. A variety of SuDS are available to reduce or temporarily hold back the discharge of surface water runoff. The potential for SuDS was considered throughout the design development. Table 2 outlines the potential SuDS devices and their constraints and opportunities at the Site.

Table 1: Sustainable Drainage Techniques

Device	Description	Constraints/Comments	✓/✗
Green/brown/blue roofs (source control)	Provide soft landscaping at roof level which reduces surface water runoff	Green roofs are not considered viable for the proposed lightweight commercial units.	✗
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration	The underlying geology precludes the potential for infiltration.	✗
Pervious surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer, from which it can either infiltrate and/or slowly release to sewers	Pervious surfacing would be maximised across the proposed car parks to provide a level of treatment for surface water in addition to attenuation within the sub-base. Due to the underlying geology these would likely be lined.	✓
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from the Site by reusing water for non-potable uses e.g. toilet flushing or water butts	There is deemed to be insufficient demand for water to facilitate rainwater harvesting.	✗
Swales (permeable conveyance)	Broad shallow channels that convey / store runoff, and allow infiltration (ground conditions permitting)	Swales can be utilised along the proposed road to convey surface water runoff and should be considered in furthering the drainage design	✓

Device	Description	Constraints/Comments	✓/✗
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration and/or slow release to sewers	Filter drains will be used as cut off drainage at the toe of any embankments resulting from the proposed changes to land levels.	✓
Filter Strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas	Filter strips can be utilised along the proposed road to convey surface water runoff and should be considered in furthering the drainage design.	✓
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base	Due to the underlying geology the inclusion of infiltration basins is not deemed feasible	✗
Bioretention Systems / Rain Garden (end of pipe treatment)	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils	Bioretention systems/rain gardens could be utilised adjacent to the highways and commercial units as an amenity feature though are expected to provide limited attenuation. Can be considered in furthering the drainage design.	✓
Detention Basins	Depressions in the surface designed to store runoff without infiltration through the base	Detention basins are proposed within the scheme to attenuate surface water whilst providing amenity and environmental benefits, including treating surface water runoff before discharging to the watercourse.	✓
Attenuation Underground (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level	A below ground geo-cellular attenuation tank is proposed to attenuate runoff.	✓

Proposed Surface Water Drainage Strategy

- 4.10. This report sets out the principles of the SuDS scheme, and the final strategy would be confirmed at the detailed design stage.
- 4.11. The total Site area within the red line boundary is 59.5ha. As the watercourse bisects the Site, it will be necessary to provide two outfalls which serve the areas to the north and south of the watercourse, henceforth referred to as the 'northern catchment' and 'southern catchment' respectively. The outline drainage strategy layout in Appendix E shows the indicative location of these outfalls.

- 4.12. The following strategy has been developed based on the indicative masterplan (Appendix B) which shows the development will increase the impermeable area within the Site.
- 4.13. All areas which remain permeable (undeveloped) have been excluded from the drainage strategy on the basis that they will continue to discharge to the watercourse at greenfield rates. It is proposed to utilise SuDS to attenuate runoff from the developed parts of the Site to greenfield runoff rates (QBAR).
- 4.14. The greenfield runoff rate calculated for the Site in line with the IoH124 method is 6.2l/s/ha. Based on the proposed impermeable area, the total rate of discharge from the Site should not exceed 248l/s.
- 4.15. To demonstrate whether there is sufficient space within the development to accommodate the appropriate SuDS, this rate has been pro-rated for the impermeable area of each catchment, see Table 2 and Appendix F for calculations.

Table 2: Impermeable area and limiting greenfield discharge rate from the Northern and Southern Catchments

	Impermeable Area (ha)	Greenfield runoff rate (l/s)
Northern Catchment	~13	80.6
Southern Catchment	~27	167.4
Total	~40	248

- 4.16. The required volume of attenuation has been established using MicroDrainage Network module based on a rainfall event of 1 in 100 year storm including a 40% allowance for climate change. The strategy has also been assessed for the 1 in 1 year and 1 in 30 year return period event. Refer to Table 3 below (and Appendix F) for details on the attenuation proposed.

Table 3: Attenuation Details

Catchment	Attenuation Volume Required (m³)
Northern	~12,588
Southern	~34,962
Total:	~50,550

- 4.17. The following assumptions have been made in deriving the outline drainage strategy:
- No urban creep allowance has been applied.
 - For the purposes of this assessment, the estimated total volume of attenuation has been specified in Table 3 above. At the detailed design stage, the volume of attenuation required in each catchment will need to be evaluated based the requirement of check dams for the voided sub base and attenuation tanks located within the steeply bank external car parking areas.
 - No above ground flooding occurs under the 1 in 30 year event. The preliminary calculations indicate flooding under the 1 in 100 year event including a 40% allowance for climate change, however the volumes are limited to <10m³ and can be addressed in the detailed design by either providing additional storage or designated areas within the car park or loading bays to facilitate

shallow flooding under such an event.

- Attenuation and flow restriction will be provided for each of the proposed development units.
- Additional attenuation will be provided in the detention basins to cater for the flow rates from the development units and the access road.

Water Quality

- 4.18. During normal operation of the Site, given the nature of the proposals the pollution hazard as outlined in Table 26.2 of the CIRIA SuDS Manual would be classed as medium to high. It is therefore very important that the proposed drainage strategy is designed to mitigate the potential for contamination.
- 4.19. Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would be achieved through the incorporation of pervious surfacing and detention basins. Where parts of the Site are not discharged through permeable paving in the detailed design stage, a biomat filtration system, downstream defender or other hard engineered solution could also be incorporated to ensure discharge is appropriately treated. The pollution hazard and proposed mitigation indices, based on the CIRIA SuDS manual, are set out in Table 4 below, this confirms that the quality of water discharged from the Site would be appropriate.

Table 4: Pollution hazard / mitigation indices

Pollutant	Hazard Indices (High)	Mitigation Indices Component 1 Permeable Paving	Mitigation Indices Component 2 Detention Basin	Total Mitigation Index = Component 1 + 0.5 (Component 2)
Total Suspended Solids	0.8	0.7	0.5	0.95
Metals	0.8	0.6	0.5	0.85
Hydro-carbons	0.9	0.7	0.6	1.0

Sustainable Drainage Systems Management Plan

- 4.45. The on-Site drainage network and SuDS would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately. The management company/operator would be appointed post-planning.
- 4.46. The PPG sets out the requirement for developers to consider the operation, management and maintenance of all SuDS.
- 4.47. Post construction, the MIRA Estates Team is likely to be responsible for the SuDS included in the scheme. Table 5 outlines what maintenance is anticipated for the proposed SuDS features.

Table 5: Indicative SuDS Maintenance Regime

SuDS	
Task	Frequency
Pervious Surfaces	
- Stabilise and mow contributing adjacent areas - Removal/management of weeds - Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving - Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
Initial sweeping	Monthly for 3 months after installation
Inspect for evidence of poor operation and/or weed growth	Three-monthly, 48 hours after large storms in first 6 months
Brushing and vacuuming	Once a year (after autumn) or as required
- Inspect silt accumulation rates and establish appropriate brushing frequencies - Monitor inspection chambers	Annually
Rehabilitation of surface and upped substructure removed by remedial sweeping	Every 10-15 years or as required
Detention Basin	
- Reseed areas of poor vegetation growth - Repair erosion or other damage by reseedling or re-turfing - Repair/rehabilitation of inlets, outlets and overflows - Relevel uneven surfaces and reinstate design levels	As required
- Remove litter and debris - Inspect inlets, outlets and overflows for blockages and clear if needed - Inspect banksides, structures, pipework etc for physical damage - Cut grass for access routes - Manage other vegetation and remove nuisance plants - Inspect inlets and facility surface for silt accumulation	Monthly
Cut grass in and around basin	Six monthly

SuDS	
Task	Frequency
• Check any penstocks and other mechanical devices • Tidy all dead growth before start of growing season • Remove sediment from inlets, outlet and forebay • Manage wetland plants where provided	Annually
• Remove sediment from inlets, outlets, forebay and main basins where required	Every 5 years or as required
Underground Attenuation	
• Inspection of silt traps, manholes and pipework, and remove any sediment/debris	Quarterly or as required
• Jetting of main structure to remove any sediment build up	Annually or as required

5. Proposed Foul Drainage Strategy

- 5.1. The proposed foul drainage would be designed in accordance with BS EN 752 – Drain and Sewer Systems Outside Buildings, BS EN 12056 – Gravity Drainage Systems Inside Buildings, and Approved Document H of Building Regulations.
- 5.2. The existing 225mm diameter foul sewer which follows the eastern bank of the watercourse is proposed to be diverted as part of the proposals under a Section 185 agreement. Severn Trent Water has been consulted on the proposed diversion. It is proposed to connect the diverted sewer into a new length of trunk sewer being constructed by Severn Trent Water. Plans showing the proposed diverted foul sewer are included in Appendix G.
- 5.3. The diverted sewer has been designed to accommodate foul effluent from the proposed development in addition to existing flows from the areas north of the A5. The rate of flow produced by the development has been estimated for each of the Zones indicated on the Parameter Plans shown in Appendix B. The rates are summarised in Table 6 below, and calculations records are included in Appendix G.

Table 6: Foul rate from proposed development based on Parameter Plans

	Area (m ²)	Foul discharge rate (l/s)
Zone 30	81,250	9.1
Zone 1	17,500	2.0
Zone 10	18,500	2.1
Zone 20	96,250	10.8
Total:		24.0

6. Conclusions

- 6.1. It has been demonstrated there is a low risk of flooding from tidal, pluvial, fluvial, groundwater and artificial sources. The Site is located in Flood Zone 1, however, the Site is bisected by an ordinary watercourse. The relatively impermeable nature of the underlying ground conditions means the ordinary watercourse is predominantly driven by overland flow from the surrounding catchment. The EA's surface water mapping does not accurately represent the watercourse, and overestimates the risk of flooding in this location. Calculations of the flow rate within the channel show that the channel has sufficient capacity to manage the 1 in 100 year event including an allowance for climate change.
- 6.2. Changes to land levels across the Site mean that the area draining to the watercourse near Weddington will reduce as a result of the proposals, thereby reducing the risk of flooding to Weddington. The runoff from the proposed development will be restricted to QBAR through the use of SuDS.
- 6.3. It is proposed to utilise a range of SuDS including permeable paving, swales, filter strip, underground storage and detention basins to attenuate runoff from the development. Two outfalls are proposed into the ordinary watercourse at the Site; one to serve the land north of the watercourse, and the second to serve land south of the watercourse. Using MicroDrainage Network it has been estimated that an overall volume of approximately 50,550m³ based on the indicative masterplan for the Site, though the detailed drainage design will need to be developed further. This will need to accommodate the steeply sloping land levels across the Site with the requirement for check dams.
- 6.4. Using the CIRIA pollution indices methodology, it has been established that the development has a high hazard rating, but that the proposed SuDS will provide sufficient level of treatment for runoff from the development through the use of permeable surfacing and detention basins. In the event that runoff does not flow through both features before reaching the watercourse, additional measures, such as downstream defenders and petrol interceptors, will be required. A company will be appointed to manage the proposed SuDS, and details of typical maintenance measures have been included within this report.
- 6.5. The rate of foul discharge from each zone of the development, as set out in the Parameter Plan, has been calculated to total 24.0l/s. The proposals include the diversion of the existing foul sewer which currently runs alongside the eastern bank of the ordinary watercourse. Severn Trent Water has been consulted on the proposals which include connecting to a new foul main sewer being constructed to the south of the development Site.
- 6.6. In conclusion, the Site is at low risk of flooding and will not increase the risk of flooding elsewhere as a result of the proposed SuDS strategy, in line with the requirements of local and national planning policy.

7. References

ⁱ Ministry of Housing, Communities and Local Government, February 2019. *National Planning Policy Framework*

ⁱⁱ Ministry of Housing, Communities and Local Government, March 2014. *Planning Practice Guidance*

ⁱⁱⁱ North Warwickshire Borough Council, September 2021. *Local Plan*

^{iv} North Warwickshire Borough Council. 2013. *Level 1 Strategic Flood Risk Assessment*

^v Warwickshire County Council, April 2016. *Local Flood Risk Management Strategy*

^{vi} Warwickshire County Council, August 2015. *Surface Water Management Plan*



APPENDICES

A. Topographic Survey

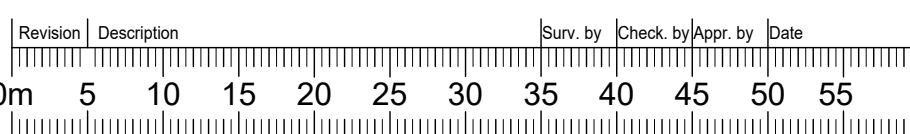
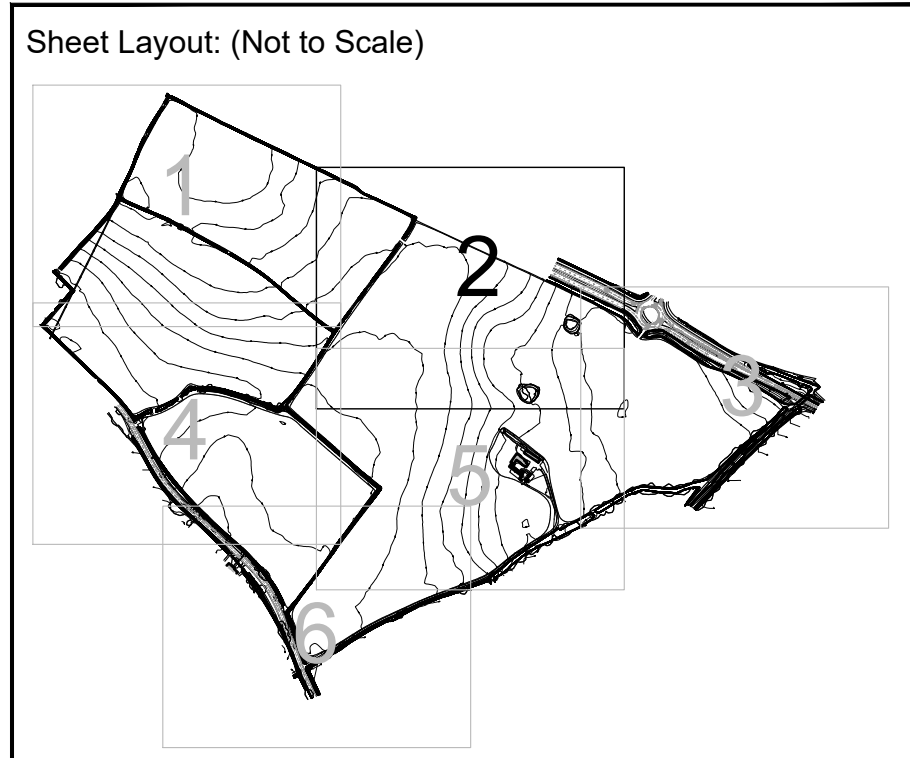
Appendices

MIRA Technology Park South Site
Project Number: EED13833
Document Reference: EED13833-118-R-2-4-3-FRA

Notes:
1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR OF 0.99961 APPLIED.

Coordinate Table			
Station	Description	Easting	Northing
M1	Nail	436238.011	295237.042
M10	Nail	436624.719	295028.104
M11	Nail	436700.170	295000.882
M11A	Nail	436779.990	294958.982
M11B	Nail	436708.800	295012.026
M12	Nail	436710.080	295015.561
M13	Nail	436685.538	294986.033
M14	Nail	436651.596	294961.870
M15	Nail	436606.782	294924.180
M16	Nail	436551.228	294863.907
M17	Nail	436511.741	294822.917
M18	Nail	436442.782	294792.099
M19	Nail	435519.661	295009.979
M2	Nail	436284.982	295214.974
M20	Nail	435562.895	294951.753
M21	Nail	435586.343	294912.928
M22	Nail	435608.967	294873.234
M23	Nail	435635.630	294838.364
M24	Nail	435663.052	294795.769
M25	Nail	435712.364	294768.079
M26	Nail	435753.309	294731.557
M27	Nail	435785.724	294694.789
M28	Nail	435811.330	294644.902
M29	Nail	435832.762	294592.169
M3	Nail	436331.113	295192.685
M30	Nail	435848.401	294543.225
M31	Nail	435876.128	294484.658
M4	Nail	436373.785	295171.201
M5	Nail	436412.468	295152.111
M6	Nail	436457.193	295129.607
M7	Nail	436494.185	295107.202
M8	Nail	436533.396	295082.679
M9	Nail	436576.872	295048.434

TOPOGRAPHICAL KEY	
SURVEY STATION	5
BANKING	TOP BOTTOM
HEDGE SPREADS	
WOODLAND CANOPY	
ARROW ON STEPS / RAMP INDICATES DIRECTION UPWARDS	
TREES	
GATE	
KERB CHANNEL	
ROAD UNBARRIED	
FOOTPATH	
FENCE	
WALL	
OVERHEAD ELECTRIC	
OVERHEAD TELECOM	
FOUL SEWER	
SURFACE SEWER	
P-TWAP	
BACK DROP (EXTERNAL)	
BACK DROP (INTERNAL)	
BUILDING	
OPEN SIZED BUILDING	
GLASSHOUSE	
CONTOUR	
SPOT LEVEL	
ROAD LEVEL	
BORR HOLE	
TRIAL HOLE	
GENERAL ABBREVIATIONS	
AIR CONDITIONING UNIT	ACU
AWNINGS	AW
BACK DROP	BD
BELUSHI BEACON	BB
BOLLARD	BL
BOLLARD LIGHT	BLK
BRICK	BR
BRICK TOP	BRK
CABLE RISE	CR
CABLE TV COVER	CRV
CABLES TO GROUND	CTG
CATCHPIT	CP
COVER LEVEL	CL
DRYING CONTROL BUTT	DCB
DRAINAGE CHANNEL	DC
DRAINAGE COVER	DCV
DRAINAGE POLE	DP
DRAINAGE	DR
ELECTRICITY POLE	EP
FIRE HYDRANT	FH
FOOTPATH	FP
FOUL WATER	FW
GAS VALVE	GV
HARD BED	HB
INSULATION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
LANDFILL	LF
MANHOLE	MH
MANHOUS POST	MP
METER	MT
METER VISIBLE	MV
ORDNANCE SURVEY BENCH MARK	OSBM
PIT	PT
POST BOX	PB
POST	PO
RAIN WATER PIPE	RWP
RETAINING WALL	RW
ROAD SIGN	RS
SOIL PIPE	SP
SOIL VENT PIPE	SV
SURFACE WATER	SW
TACTILE PAVING	TAC
TELECOM POLE	TEL
TELEPHONE CALL BOX	TCL
TICKET MACHINE	TM
TOILET	TO
TRAFFIC LIGHT	TLC
TRAFFIC LIGHT COVER	TLCV
UNABLE TO LOCATE	UTL
UNABLE TO SURVEY	UTS
VENT PIPE	VP
WATER LEVEL	WL
WATER METER	WM
WATER RIVER	WR
WATER TAP	WT
FENCE ABBREVIATIONS	
BARBED WIRE FENCE	BWF
CLOSE BOARD FENCE	CBF
CONCRETE PANEL FENCE	CPF
CORRUGATED IRON FENCE	CIF
CHAIN LINK FENCE	CLF
CHESTNUT PALING	CNP
IRON RAILINGS	IRF
LARCH LAMP FENCE	LLF
POST AND RAIL FENCE	PRF
POST AND WIRE FENCE	PWF
WIRE DEFENCE	WDF



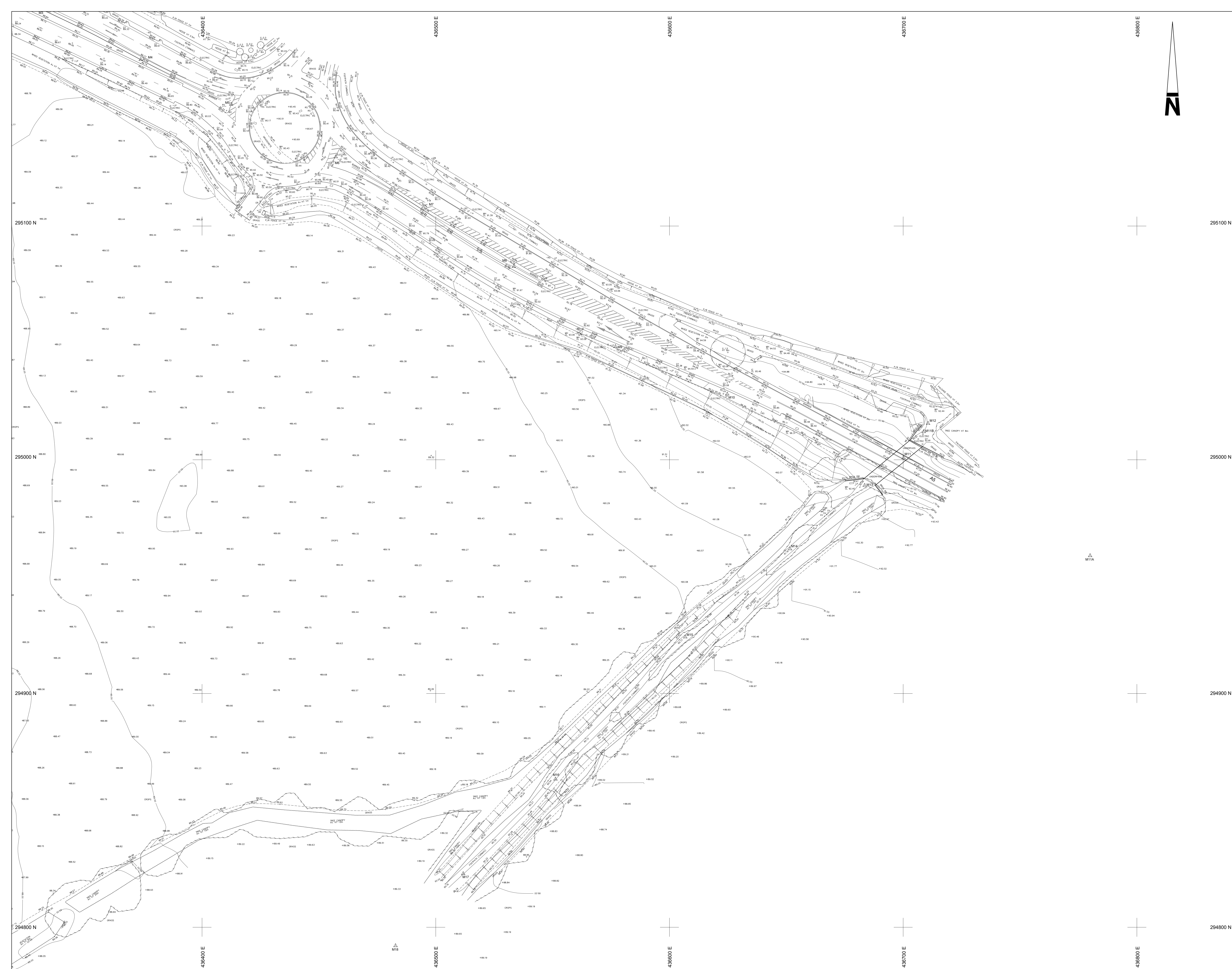
Topographical Survey



Southern Fields
Horiba MIRA
Watling Street
Nuneaton
CV10 0TU

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Project Number:	Rev:	Surveyed by:	Checked by:
30080	-	ML/MB/BP	TS

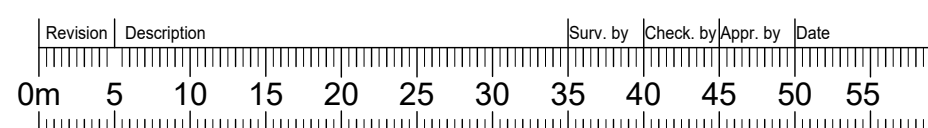
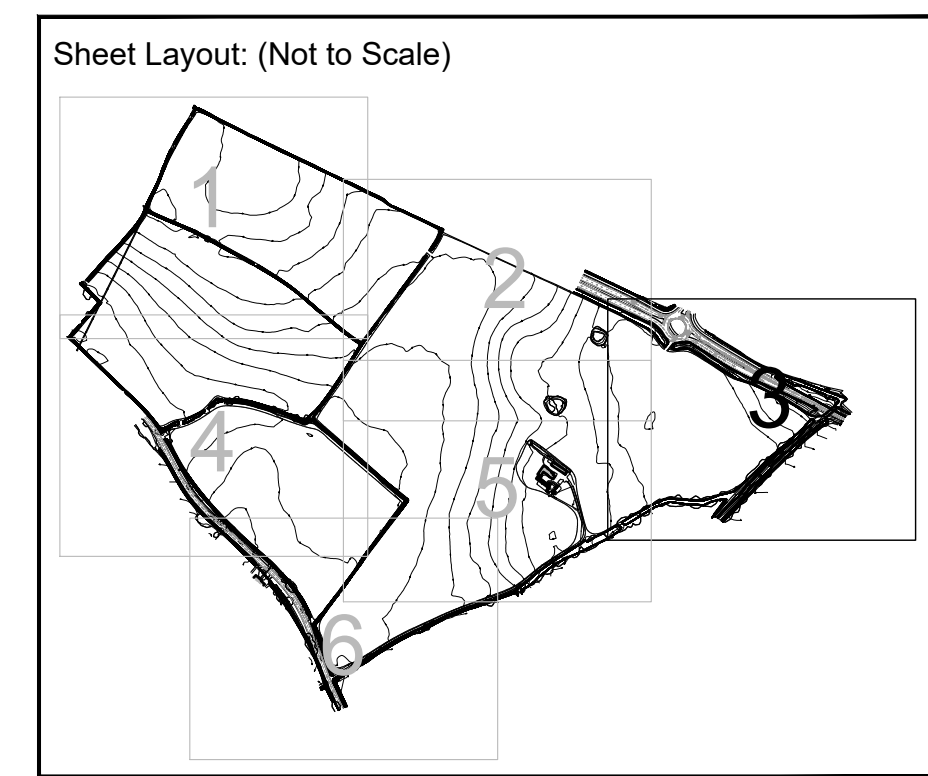




Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM. DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR OF 0.99991 APPLIED.

Coordinate Table				
Station	Description	Easting	Northing	Level
M1	Nail	436238.010	295237.042	87.743
M10	Nail	436719.719	295028.268	90.063
M11	Nail	436700.170	295000.882	91.771
M11A	Nail	436779.900	294568.962	95.588
M11B	Nail	436780.800	295012.102	95.588
M12	Nail	436700.160	295011.961	92.883
M13	Nail	436668.536	294989.033	92.569
M15	Nail	436681.596	294981.911	92.568
M17	Nail	436680.762	294924.180	90.805
M18	Nail	436682.728	294863.367	90.516
M19	Nail	436712.741	294822.122	90.516
M19	Nail	436682.728	294792.099	90.142
M19	Nail	436651.961	295009.979	78.685
M20	Nail	436562.985	295021.448	80.633
M21	Nail	436562.985	294951.753	79.280
M21	Nail	436566.343	294912.928	78.704
M22	Nail	436595.967	294873.734	81.336
M23	Nail	436538.630	294838.364	81.736
M24	Nail	436538.630	294795.769	82.814
M25	Nail	436537.364	294768.079	82.695
M26	Nail	435753.309	294731.557	82.014
M27	Nail	435752.724	294694.789	81.928
M28	Nail	435753.330	294644.644	81.928
M29	Nail	436866.762	294592.169	81.270
M3	Nail	436331.115	295192.885	88.566
M30	Nail	435348.401	294543.225	80.866
M31	Nail	436876.128	294464.658	80.724
M4	Nail	436357.785	295171.201	90.525
M5	Nail	436457.468	295152.112	90.525
M6	Nail	436473.193	295126.607	90.525
M7	Nail	436484.875	295107.242	91.603
M8	Nail	436484.875	295092.812	91.603
M9	Nail	436476.582	295048.434	93.505

[illegible]

Topographical Survey

Client:  MIRA

Southern Fields
Horiba MIRA
Watling Street
Nuneaton
CV10 0TU

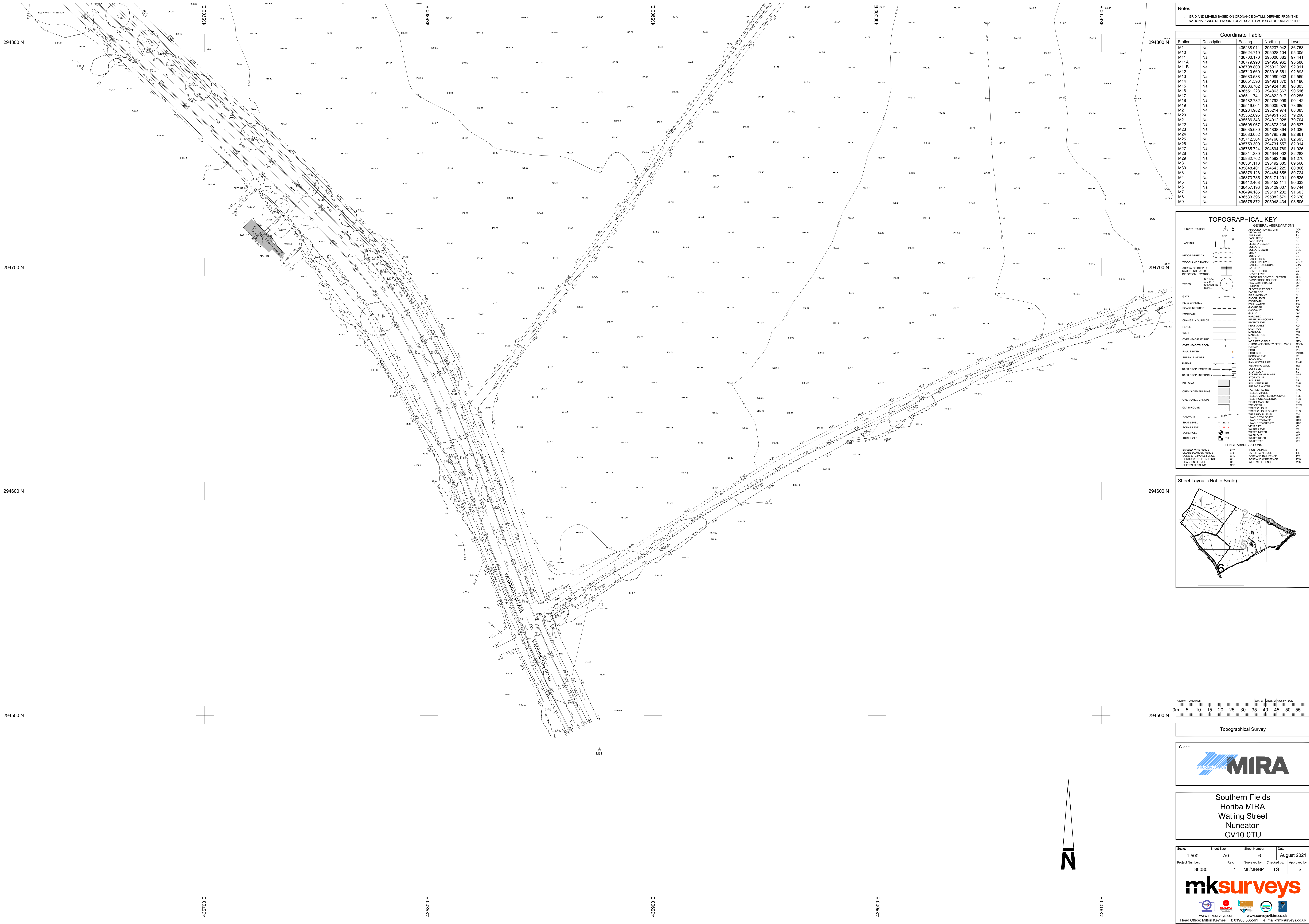
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Project Number: 30080	Rev: -	Surveyed by: ML/MB/BP	Checked by: TS	Approved by: TS	

mk surveys



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Head Office: Milton Keynes t: 01908 565561 e: mail@mksurveys.co.uk







B. Development Proposals

Appendices

MIRA Technology Park South Site
Project Number: EED13833
Document Reference: EED13833-118-R-2-4-3-FRA



F010 Area Schedule - Car Parking 1/70m2 Offices 1/100m2 production									
Unit	Production		Office			Total GIA		Cars	
	sq ft	m2	sq ft	m2	Stories	sq ft	m2		
1	170,000	15,793	17,000	1,579	3	187,000	17,372	179	-
	-	-	-	-	-	-	-	-	-
10	180,000	16,722	18,000	1,672	3	198,000	18,394	190	-
	-	-	-	-	-	-	-	-	-
20	256,000	23,782	25,600	2,378	3	281,600	26,161	270	-
21	370,000	34,373	37,000	3,437	3	407,000	37,810	390	-
22	315,000	29,264	31,500	2,926	1	346,500	32,190	332	-
	-	-	-	-	1	-	-	-	-
30	610,000	56,669	60,000	5,574	1	670,000	62,243	641	-
31	185,000	17,187	19,000	1,765	1	204,000	18,952	195	-
	-	-	-	-	1	-	-	-	-
	-	-	-	-	1	-	-	-	-
Sub Total:	2,086,000	193,789	208,100	19,332		2,294,100	213,122	2,196	

Red Line Boundary based on O/S Data and NOT confirmed as the Legal Boundary

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Rev	Date	By	Description
A	20/20/21	KC	unit 31 revised to 185k
B	05/11/2021	NV	unit 30 & 31 revised to increase A5 landscape buffer

SGP

Architects + Masterplanners

Waterfront House
2a Smith Way
Grove Park
Enderby
Leicester LE19 1SX

t: +44 (0)116 247 0557

www.stephengeorge.co.uk

MIRA South Site

Drawing Name:
Masterplan Option 10

Drawing Stage: PRELIMINARY

Suitability: S0 - Work In Progress

SGP File Ref: 21-092-F010a.dwg

21-092 06/08/21 NV IY 1:2500 @ A1 B
SGP Project No. Date: Drawn: Team: Scale: Rev:

Drawing Number: 21092 -SGP-XX- 00 - DR - A - 010100

Project Code Originator Volume Level Type Role Number



Key:

- Application boundary 59.5 Hectares
- Development Zones & parameters
- Existing hedgerows to be retained
- Existing hedgerows to be removed
- New structural landscape
- Attenuation ponds
- Entrance gateway features
- Link Road
- Link Road (limit of deviation)
- Indicative plot access (subject to detailed layout)
- Bus stops
- Cycle route
- Footpaths
- Informal footpaths / trim trail in landscape areas

Areas:

Application Site Area - 59.5 Hectares

Total Nett Developable Area - 41.9 Hectares

Total Gross Internal Floor Area - 213,500 m2

Rev	Date	By	Description
A	14/12/21	NV	Road base updated, limit of deviation added. Ridge heights updated.

SGP

Architects + Masterplanners

Waterfront House
2a Smith Way
Grove Park
Enderby
Leicester LE19 1SX

t: +44 (0)116 247 0557

www.stephengeorge.co.uk

MIRA South Site

Drawing Name:
Parameters Plan

Drawing Stage: PRELIMINARY

Suitability: S0 - Work In Progress

SGP File Ref: 21-092-P003-Parameters.dwg

21-092 06/08/21 NV IY 1:2500 @ A1 A

SGP Project No. Date: Drawn: Team: Scale: Rev:

Drawing Number: 21092 -SGP-XX- 00 - DR - A - 111003

Project Code Originator Volume Level Type Role Number



P005 Area Schedule - Car Parking 1/75m2 Offices 1/100m2 production										
Unit	Production		Office			Hub Office		Total GIA		Cars
	sq ft	m2	sq ft	m2	Stories	sq ft	m2	sq ft	m2	
1	175,000	16,258	20,000	1,858	3	-	-	195,000	18,116	187
10	201,000	18,673	20,000	1,858	3	3000	279	224,000	20,810	215
20	190,000	17,651	19,000	1,765	3	3,000	279	212,000	19,695	204
21	410,000	38,089	41,000	3,809	3	3,000	279	454,000	42,177	435
22	290,000	26,941	28,000	2,601	3	3,000	279	321,000	29,821	308
30	625,000	58,063	65,000	6,039	1	3,000	279	693,000	64,380	665
31	180,000	16,722	19,000	1,765	1	-	-	199,000	18,487	191
	-	-	-	-	1	-	-	-	-	-
	-	-	-	-	1	-	-	-	-	-
Sub Total:	2,071,000	192,396	212,000	19,695		15,000	1,394	2,298,000	213,484	2,205

Red Line Boundary based on O/S Data and NOT confirmed as the Legal Boundary

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Rev	Date	By	Description
A	31/03/22	NV	Masterplan updated.
D	08/04/22	IY	landscape buffer increased between A444 and Unit 22. Road junction on A444 revised to a priority junction.

SGP
Architects + Masterplanners

Waterfront House
2a Smith Way
Grove Park
Enderby
Leicester LE19 1SX

t: +44 (0)116 247 0557

www.stephengeorge.co.uk

MIRA South Site

Drawing Name:
Masterplan Option 10 B

Drawing Stage: PRELIMINARY

Suitability: S0 - Work In Progress

SGP File Ref: 21-092-P005e-Indic Mplan.dwg

21-092 25.03.22 NV IY 1:2500 @ A1 D
SGP Project No. Date: Drawn: Team: Scale: Rev:

Drawing Number: 21092 -SGP-XX- 00 - DR - A - 111010

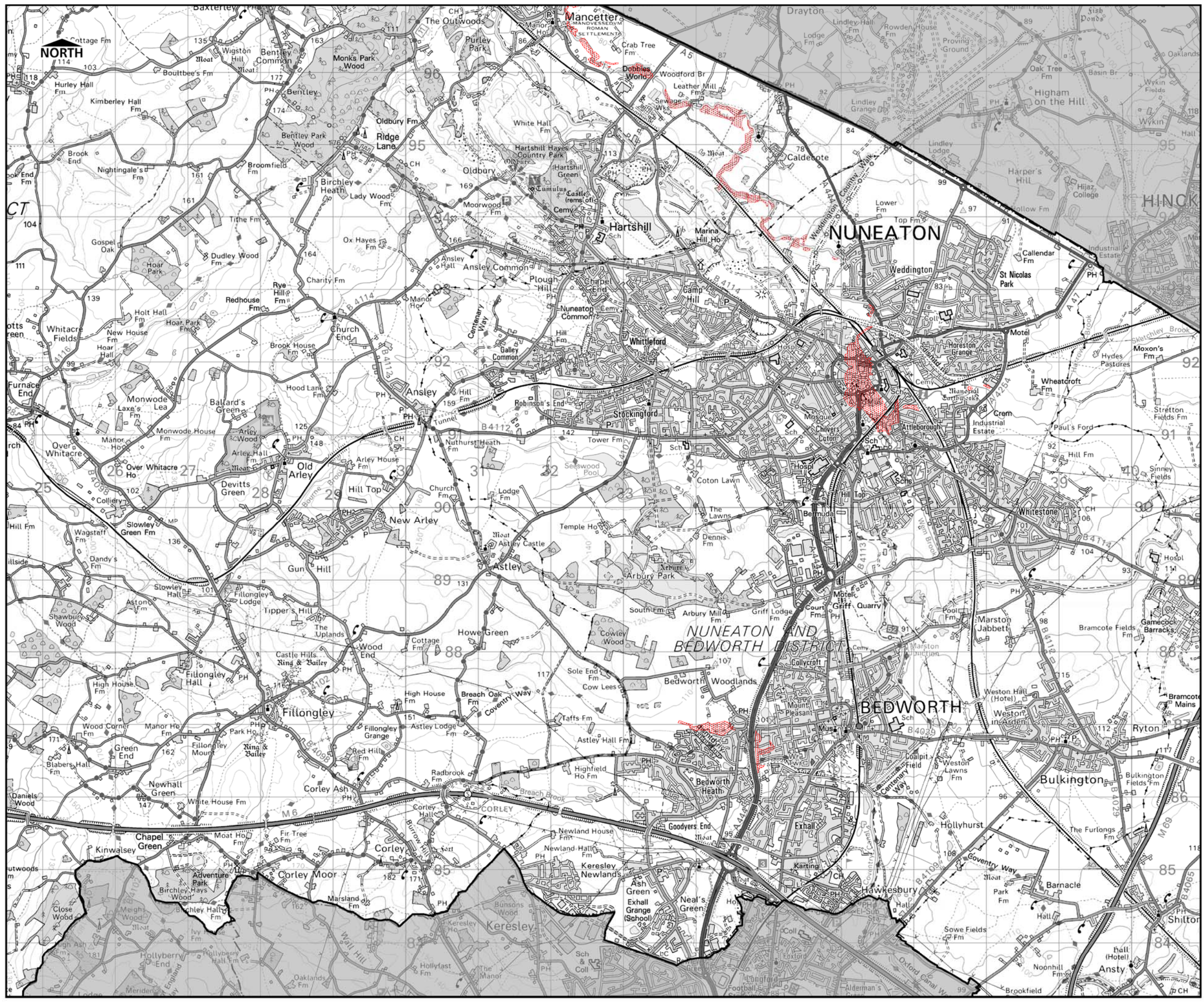
Project Code Originator Volume Level Type Role Number



C. Historic Flood Records from Joint SFRA

Appendices

MIRA Technology Park South Site
Project Number: EED13833
Document Reference: EED13833-118-R-2-4-3-FRA



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED

LEGEND

- Warwickshire CC
- Council Flooding Records
- Environment Agency Historic Fluvial Flooding Outline

OVERVIEW

NOTE

Flood incidents shown do not represent an exhaustive record of all flooding incidents which may have occurred within the study area. Flood incidents may have occurred which have not been recorded and are therefore not included.

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Level 1 Strategic Flood Risk Assessment

Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC, Rugby BC

Contains Ordnance Survey Data.
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Ordnance Survey 100019520.
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Scale at A3 1:50,000	Date Sept 2013	Drawn by: EB Approved by: GH
-------------------------	-------------------	---------------------------------

Historic Flood Records

Consultants

URS
6 - 8 Greencoat Place
London
SW1P 1PL

Figure A2 iv

Version 1

D. ReFH2 Checksheet (1 in 2 year event)

Appendices

UK Design Flood Estimation

Generated on 26 November 2021 12:03:39 by csms1
Printed from the ReFH2 Flood Modelling software package, version 3.2.7650.24314

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 1FFF-DF8E

Site name: FEH_Catchment_Descriptors_435550_295000

Easting: 435550

Northing: 295000

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.81

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 1 year

Summary of results

Rainfall - FEH 2013 model (mm):	19.51	Total runoff (ML):	6.49
Total Rainfall (mm):	18.87	Total flow (ML):	15.32
Peak Rainfall (mm):	6.69	Peak flow (m ³ /s):	0.39

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	04:30:00	No
Timestep (hh:mm:ss)	00:30:00	No
SCF (Seasonal correction factor)	0.99	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	104.84	No
Cmax (mm)	268.97	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	2.87	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.02	No
BL (hr)	26.71	No
BR	1.35	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km ²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.557	0.000	0.218	0.000	0.022	0.022
00:30:00	0.912	0.000	0.359	0.001	0.021	0.022
01:00:00	1.574	0.000	0.627	0.004	0.021	0.025
01:30:00	3.046	0.000	1.239	0.012	0.021	0.033
02:00:00	6.687	0.000	2.841	0.028	0.021	0.049
02:30:00	3.046	0.000	1.349	0.063	0.022	0.084
03:00:00	1.574	0.000	0.711	0.115	0.023	0.139
03:30:00	0.912	0.000	0.416	0.175	0.027	0.201
04:00:00	0.557	0.000	0.256	0.235	0.031	0.266
04:30:00	0.000	0.000	0.000	0.290	0.037	0.327
05:00:00	0.000	0.000	0.000	0.330	0.044	0.374
05:30:00	0.000	0.000	0.000	0.337	0.052	0.389
06:00:00	0.000	0.000	0.000	0.320	0.059	0.379
06:30:00	0.000	0.000	0.000	0.291	0.066	0.357
07:00:00	0.000	0.000	0.000	0.257	0.071	0.328
07:30:00	0.000	0.000	0.000	0.220	0.076	0.296
08:00:00	0.000	0.000	0.000	0.186	0.080	0.266
08:30:00	0.000	0.000	0.000	0.159	0.083	0.242
09:00:00	0.000	0.000	0.000	0.137	0.085	0.221
09:30:00	0.000	0.000	0.000	0.116	0.086	0.203
10:00:00	0.000	0.000	0.000	0.097	0.087	0.184
10:30:00	0.000	0.000	0.000	0.078	0.088	0.166
11:00:00	0.000	0.000	0.000	0.060	0.088	0.149
11:30:00	0.000	0.000	0.000	0.043	0.088	0.131
12:00:00	0.000	0.000	0.000	0.027	0.087	0.114
12:30:00	0.000	0.000	0.000	0.014	0.086	0.100
13:00:00	0.000	0.000	0.000	0.007	0.085	0.091
13:30:00	0.000	0.000	0.000	0.003	0.083	0.086
14:00:00	0.000	0.000	0.000	0.001	0.082	0.083
14:30:00	0.000	0.000	0.000	0.000	0.080	0.080
15:00:00	0.000	0.000	0.000	0.000	0.079	0.079
15:30:00	0.000	0.000	0.000	0.000	0.077	0.077
16:00:00	0.000	0.000	0.000	0.000	0.076	0.076
16:30:00	0.000	0.000	0.000	0.000	0.074	0.074
17:00:00	0.000	0.000	0.000	0.000	0.073	0.073

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:30:00	0.000	0.000	0.000	0.000	0.072	0.072
18:00:00	0.000	0.000	0.000	0.000	0.070	0.070
18:30:00	0.000	0.000	0.000	0.000	0.069	0.069
19:00:00	0.000	0.000	0.000	0.000	0.068	0.068
19:30:00	0.000	0.000	0.000	0.000	0.067	0.067
20:00:00	0.000	0.000	0.000	0.000	0.065	0.065
20:30:00	0.000	0.000	0.000	0.000	0.064	0.064
21:00:00	0.000	0.000	0.000	0.000	0.063	0.063
21:30:00	0.000	0.000	0.000	0.000	0.062	0.062
22:00:00	0.000	0.000	0.000	0.000	0.061	0.061
22:30:00	0.000	0.000	0.000	0.000	0.059	0.059
23:00:00	0.000	0.000	0.000	0.000	0.058	0.058
23:30:00	0.000	0.000	0.000	0.000	0.057	0.057
24:00:00	0.000	0.000	0.000	0.000	0.056	0.056
24:30:00	0.000	0.000	0.000	0.000	0.055	0.055
25:00:00	0.000	0.000	0.000	0.000	0.054	0.054
25:30:00	0.000	0.000	0.000	0.000	0.053	0.053
26:00:00	0.000	0.000	0.000	0.000	0.052	0.052
26:30:00	0.000	0.000	0.000	0.000	0.051	0.051
27:00:00	0.000	0.000	0.000	0.000	0.050	0.050
27:30:00	0.000	0.000	0.000	0.000	0.049	0.049
28:00:00	0.000	0.000	0.000	0.000	0.048	0.048
28:30:00	0.000	0.000	0.000	0.000	0.047	0.047
29:00:00	0.000	0.000	0.000	0.000	0.047	0.047
29:30:00	0.000	0.000	0.000	0.000	0.046	0.046
30:00:00	0.000	0.000	0.000	0.000	0.045	0.045
30:30:00	0.000	0.000	0.000	0.000	0.044	0.044
31:00:00	0.000	0.000	0.000	0.000	0.043	0.043
31:30:00	0.000	0.000	0.000	0.000	0.042	0.042
32:00:00	0.000	0.000	0.000	0.000	0.042	0.042
32:30:00	0.000	0.000	0.000	0.000	0.041	0.041
33:00:00	0.000	0.000	0.000	0.000	0.040	0.040
33:30:00	0.000	0.000	0.000	0.000	0.039	0.039
34:00:00	0.000	0.000	0.000	0.000	0.039	0.039
34:30:00	0.000	0.000	0.000	0.000	0.038	0.038
35:00:00	0.000	0.000	0.000	0.000	0.037	0.037

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
35:30:00	0.000	0.000	0.000	0.000	0.037	0.037
36:00:00	0.000	0.000	0.000	0.000	0.036	0.036
36:30:00	0.000	0.000	0.000	0.000	0.035	0.035
37:00:00	0.000	0.000	0.000	0.000	0.035	0.035
37:30:00	0.000	0.000	0.000	0.000	0.034	0.034
38:00:00	0.000	0.000	0.000	0.000	0.033	0.033
38:30:00	0.000	0.000	0.000	0.000	0.033	0.033
39:00:00	0.000	0.000	0.000	0.000	0.032	0.032
39:30:00	0.000	0.000	0.000	0.000	0.031	0.031
40:00:00	0.000	0.000	0.000	0.000	0.031	0.031
40:30:00	0.000	0.000	0.000	0.000	0.030	0.030
41:00:00	0.000	0.000	0.000	0.000	0.030	0.030
41:30:00	0.000	0.000	0.000	0.000	0.029	0.029
42:00:00	0.000	0.000	0.000	0.000	0.029	0.029
42:30:00	0.000	0.000	0.000	0.000	0.028	0.028
43:00:00	0.000	0.000	0.000	0.000	0.028	0.028
43:30:00	0.000	0.000	0.000	0.000	0.027	0.027
44:00:00	0.000	0.000	0.000	0.000	0.027	0.027
44:30:00	0.000	0.000	0.000	0.000	0.026	0.026
45:00:00	0.000	0.000	0.000	0.000	0.026	0.026
45:30:00	0.000	0.000	0.000	0.000	0.025	0.025
46:00:00	0.000	0.000	0.000	0.000	0.025	0.025
46:30:00	0.000	0.000	0.000	0.000	0.024	0.024
47:00:00	0.000	0.000	0.000	0.000	0.024	0.024
47:30:00	0.000	0.000	0.000	0.000	0.023	0.023
48:00:00	0.000	0.000	0.000	0.000	0.023	0.023
48:30:00	0.000	0.000	0.000	0.000	0.022	0.022
49:00:00	0.000	0.000	0.000	0.000	0.022	0.022
49:30:00	0.000	0.000	0.000	0.000	0.022	0.022

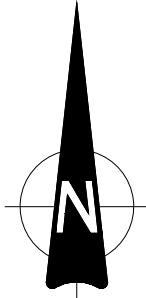
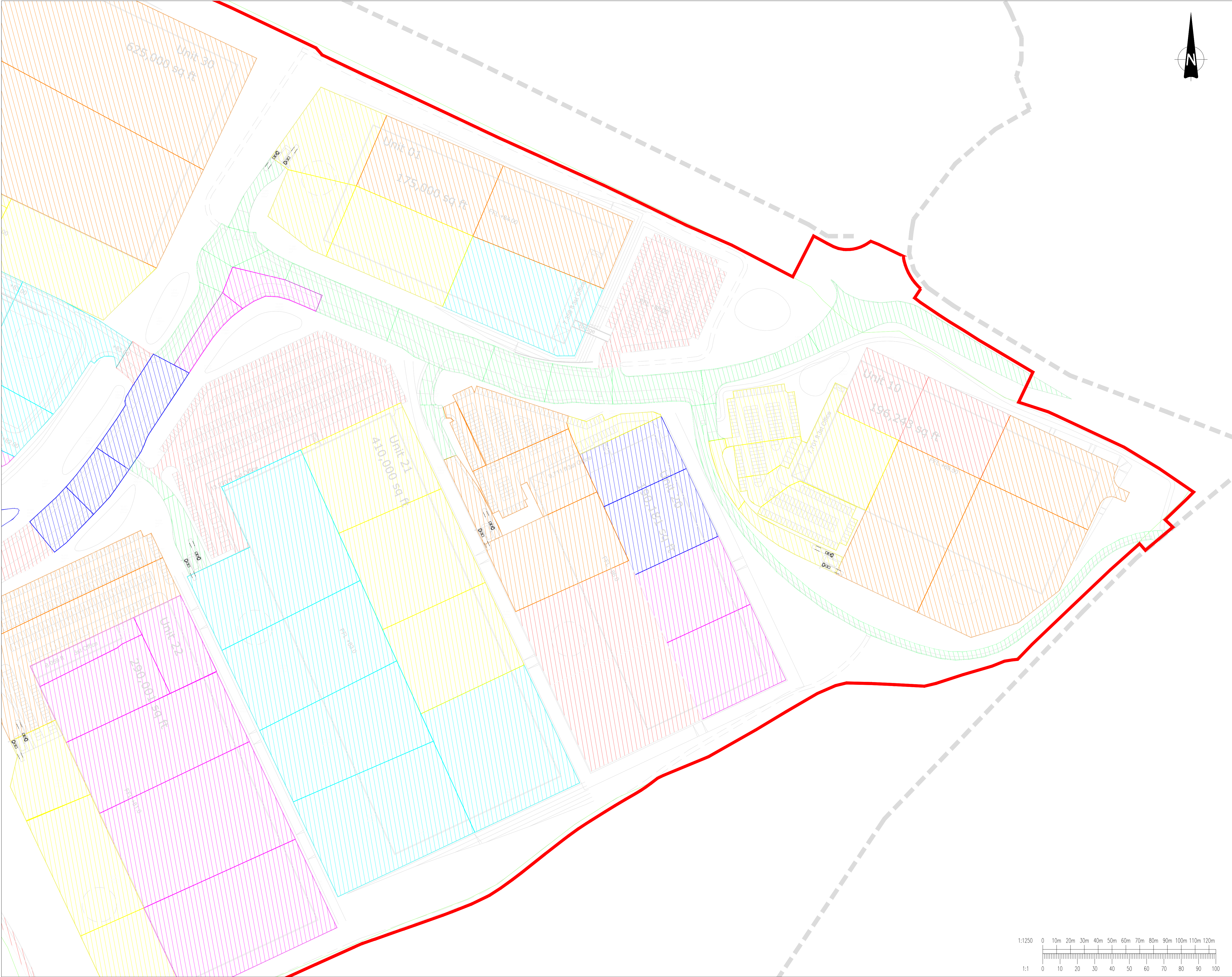
Appendix

Catchment descriptors

Name	Value	User-defined value used?
Area (km ²)	0.81	No
ALTBAR	89	No
ASPBAR	256	No
ASPVAR	0.69	No
BFIHOST	0.34	No
BFIHOST19	0.33	No
DPLBAR (km)	0.89	No
DPSBAR (mkm ⁻¹)	17	No
FARL	1	No
LDP	2.02	No
PROPWET (mm)	0.3	No
RMED1H	10.5	No
RMED1D	31.8	No
RMED2D	39.2	No
SAAR (mm)	636	No
SAAR4170 (mm)	678	No
SPRHOST	45.48	No
Urbext2000	0	No
Urbext1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.36	No
DDF parameter D2	0.33	No
DDF parameter D3	0.25	No
DDF parameter E	0.3	No
DDF parameter F	2.38	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.36	No
DDF parameter D2 (1km grid value)	0.33	No
DDF parameter D3 (1km grid value)	0.24	No
DDF parameter E (1km grid value)	0.3	No
DDF parameter F (1km grid value)	2.39	No

E. Indicative Surface Water Drainage Strategy

Appendices



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PD3	02.08.22	UPDATED SITE LAYOUT	KS
PD2	06.05.22	UPDATED LAYOUT	KS
PD1	12.01.22	FIRST ISSUE	KT
Rev	Date	Description	By

Amendments
Project
MIRA Technology Park South Site

Title
MIRA Southern Manufacturing Sector Surface Water Drainage Catchments Southern Catchments

Client
ERI MTP Limited

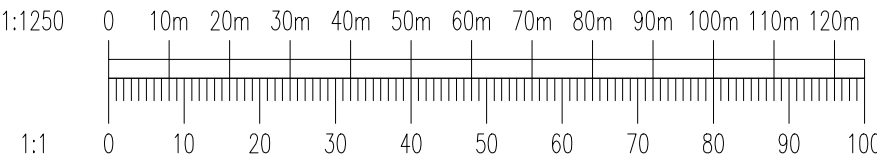


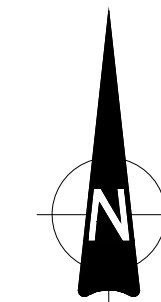
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Status
PRELIMINARY

Designed By	KT	Checked By	HC	Waterman Ref	EED13833
Drawn By	KT	Date	Jan 2022	Scales @ A1	1:1250

Project	Originator	Volume	Level	Type	Role	Number	Revision
13833-WIE-ZZ-XX-DR-92001							P03





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P03	02.08.22	UPDATED SITE LAYOUT		KS
P02	06.05.22	UPDATED LAYOUT		KS
P01	12.01.22	FIRST ISSUE		KT
Rev	Date	Description		By

	Amendments
--	------------

Project	
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MIRA Technology Park South Site

Title

MIRA Southern Manufacturing Sector
Surface Water Drainage Catchments
Northern Catchments

Client **ERI MTP Limited**



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Status	
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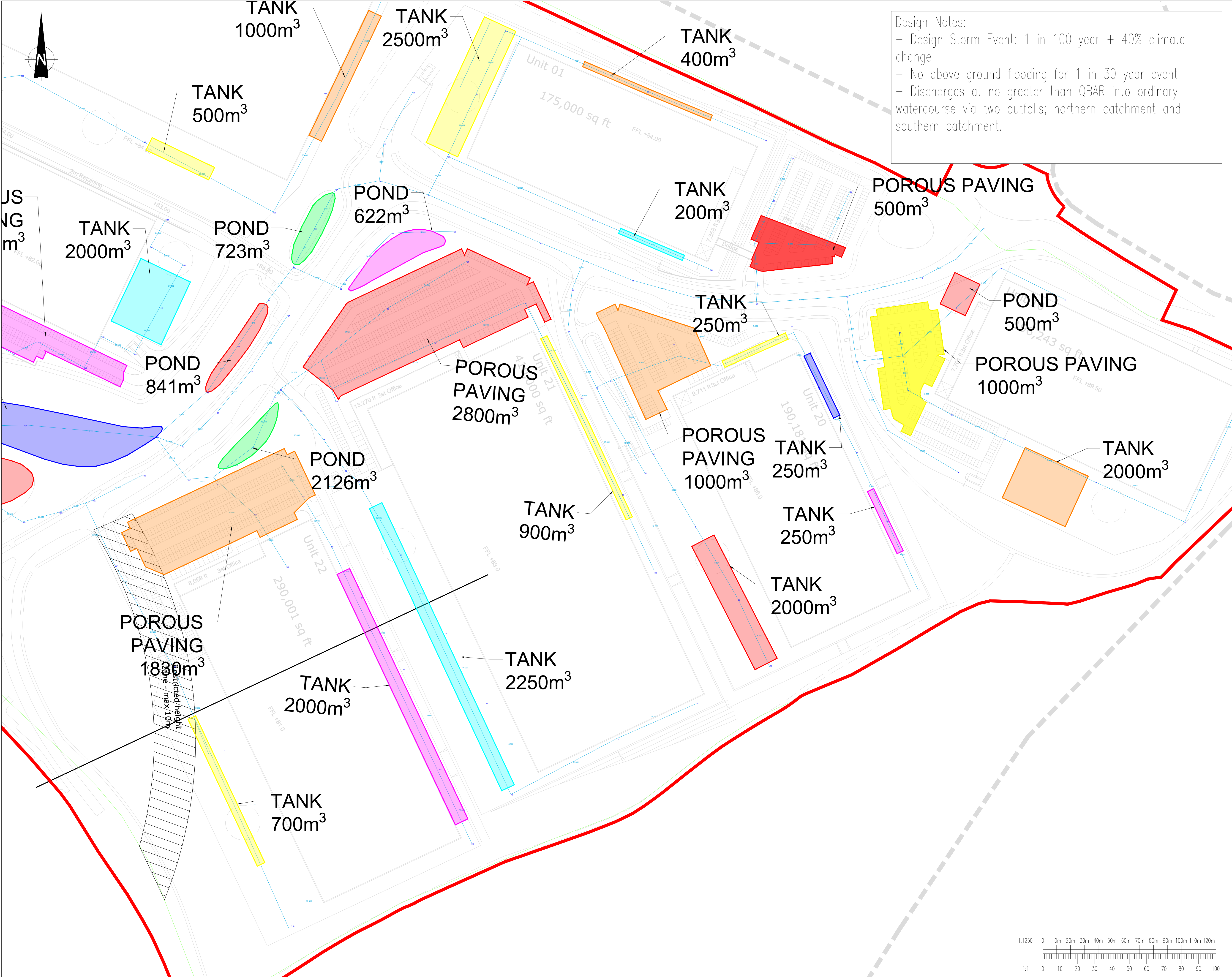
Designed By	KT	Checked By	HC	Waterman Ref	EED13833
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Drawn By	KT	Date	Jan 2022	Scales @ A1	1:1250
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Project - Originator - Volume - Level - Type - Role - Number	Revision
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P03

13833-WIE-ZZ-XX-M1-D-92001, 21-092-P005e-Indic Mplan, A1-Wat-S



Design Notes:

- Design Storm Event: 1 in 100 year + 40% climate change
- No above ground flooding for 1 in 30 year event
- Discharges at no greater than QBAR into ordinary watercourse via two outfalls; northern catchment and southern catchment.

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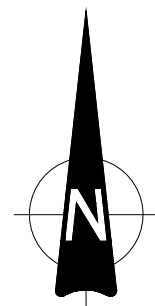
P04	02.08.22	UPDATED SITE LAYOUT	KS
P03	06.05.22	UPDATED LAYOUT	KS
P02	25.02.22	ATTENUATION AMENDMENTS	KT
P01	14.01.22	FIRST ISSUE	KT

Rev	Date	Description	By
Amendments			
Project			
MIRA Technology Park South Site			
Title			
MIRA Southern Manufacturing Sector Surface Water Attenuation Summary Southern Catchments			
Client			
ERI MTP Limited			

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Status			
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Designed By	Checked By	Waterman Ref	EED13833
KT	HC		
Drawn By	Date	Scales @ A1	1:1250
KT	Jan 2022		
Project - Originator - Volume - Level - Type - Role - Number			Revision
13833-WIE-ZZ-XX-DR-92003			P04

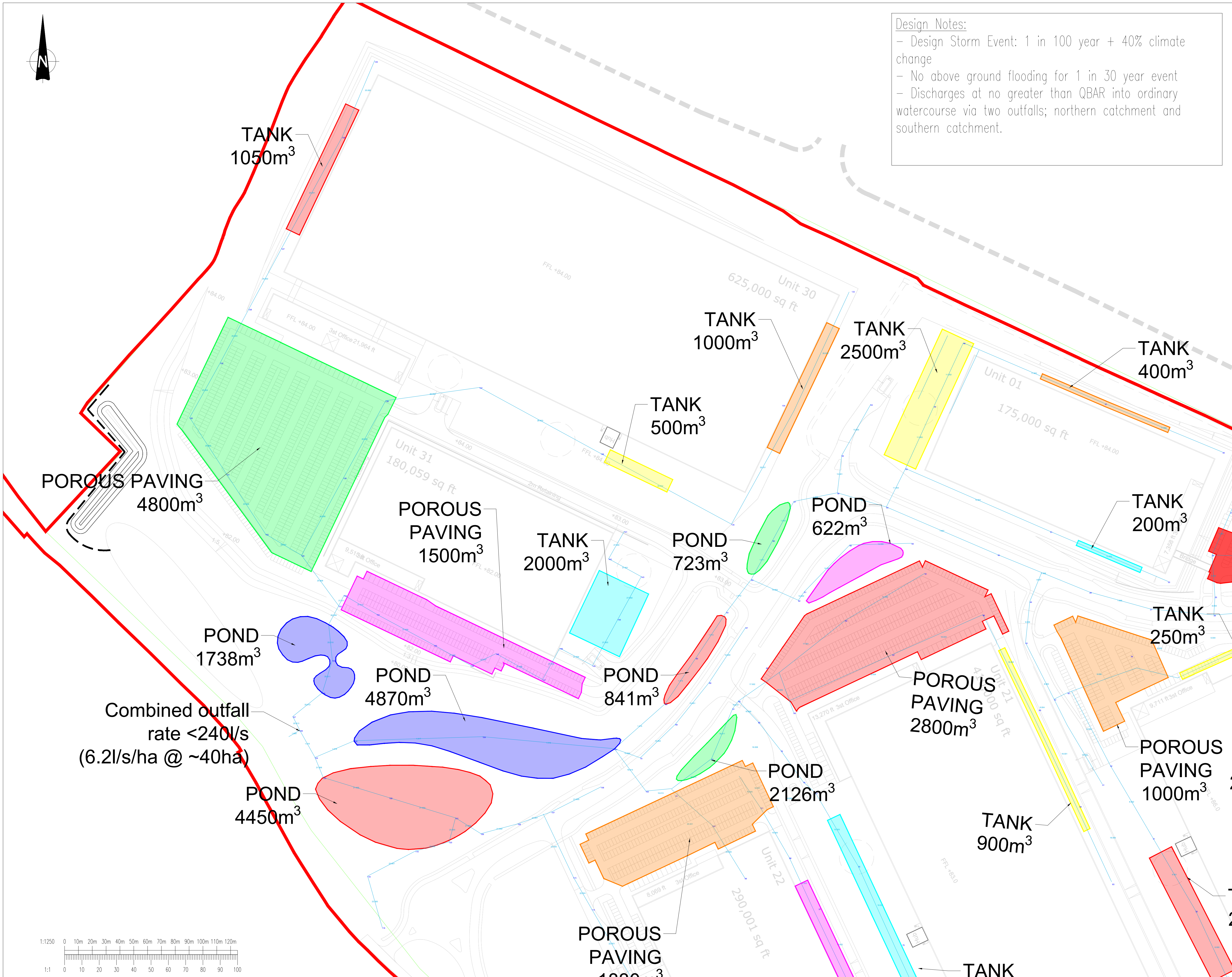
13833-WIE-ZZ-XX-M1-D-92003, 21-092-P005-4Indic Mplan, A1-Wat-S



Design Notes:

- Design Storm Event: 1 in 100 year + 40% climate change
- No above ground flooding for 1 in 30 year event
- Discharges at no greater than QBAR into ordinary watercourse via two outfalls; northern catchment and southern catchment.

- This drawing should not be scaled. Dimensions to be verified on site. Any discrepancies should be referred to the Engineer prior to work being put in hand.
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PO4	02.08.22	UPDATED SITE LAYOUT	KS
PO3	06.05.22	UPDATED LAYOUT	KS
PO2	25.02.22	ATTENUATION AMENDMENTS	KS
PO1	14.01.22	FIRST ISSUE	KT
Rev	Date	Description	By

Amendments

Project
MIRA Technology Park South Site

Title
MIRA Southern Manufacturing Sector Surface Water Attenuation Summary Northern Catchments

Client
ERI MTP Limited



Status PRELIMINARY			
Designed By KT	Checked By HC	Waterman Ref EED13833	
Drawn By KT	Date Jan 2022	Scales @ A1 1:1250	
Project 13833-WIE-ZZ-XX-DR-92004	Volume M1-D-92003	Level 21-092-P005-4ndic Mplan, A1-Wat-S	Revision P04



F. Surface Water Calculations

Appendices

MIRA Technology Park South Site
Project Number: EED13833
Document Reference: EED13833-118-R-2-4-3-FRA

Waterman Group		Page 1
Pickfords Wharf Clink Street London, SE1 9DG		
Date 14/01/2022 12:32 File 211126_Storage estimate...	Designed by CSKT1 Checked by	
Innovyze Source Control 2020.1.3		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	935	Region Number	Region 4

Results 1/s

QBAR Rural	6.2
QBAR Urban	6.2
Q100 years	15.8
Q1 year	5.1
Q30 years	12.1
Q100 years	15.8

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Waterman Group		Page 1
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
1.000	29.776	0.418	71.2	0.089	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	28.167	0.169	166.7	0.051	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	56.167	1.304	43.1	0.085	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	51.285	0.228	224.9	0.319	5.00	0.0	0.600	o	450	Pipe/Conduit	
2.001	52.741	0.234	225.4	0.242	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.002	52.189	0.232	225.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	50.454	0.224	225.2	0.362	5.00	0.0	0.600	o	450	Pipe/Conduit	
3.001	50.454	0.224	225.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.002	71.034	0.316	224.8	0.655	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.003	72.588	0.323	224.7	0.649	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.004	42.415	0.189	224.4	0.649	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.005	28.266	0.126	224.3	0.133	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.006	24.843	0.216	115.0	0.098	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	17.446	0.103	169.4	0.164	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.003	33.644	0.150	224.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	58.583	0.450	130.2	0.095	5.00	0.0	0.600	o	225	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)
1.000	0.00	5.21	88.400	0.089	0.0	0.0	0.0	2.41	383.5	0.0
1.001	0.00	5.50	87.982	0.140	0.0	0.0	0.0	1.57	250.0	0.0
1.002	0.00	5.81	87.813	0.225	0.0	0.0	0.0	3.10	493.8	0.0
2.000	0.00	5.63	87.276	0.319	0.0	0.0	0.0	1.35	214.9	0.0
2.001	0.00	6.28	87.048	0.561	0.0	0.0	0.0	1.35	214.7	0.0
2.002	0.00	6.93	86.814	0.561	0.0	0.0	0.0	1.35	214.9	0.0
3.000	0.00	5.62	87.700	0.362	0.0	0.0	0.0	1.35	214.8	0.0
3.001	0.00	6.25	87.476	0.362	0.0	0.0	0.0	1.35	214.8	0.0
3.002	0.00	7.12	87.252	1.017	0.0	0.0	0.0	1.35	215.0	0.0
3.003	0.00	8.02	86.936	1.666	0.0	0.0	0.0	1.35	215.0	0.0
3.004	0.00	8.54	86.613	2.315	0.0	0.0	0.0	1.35	215.2	0.0
3.005	0.00	8.89	86.424	2.448	0.0	0.0	0.0	1.35	215.2	0.0
3.006	0.00	9.11	86.298	2.546	0.0	0.0	0.0	1.89	301.4	0.0
4.000	0.00	5.29	87.925	0.164	0.0	0.0	0.0	1.00	39.8	0.0
2.003	0.00	9.52	86.082	3.271	0.0	0.0	0.0	1.35	215.2	0.0
5.000	0.00	5.85	88.525	0.095	0.0	0.0	0.0	1.14	45.5	0.0

Waterman Group		Page 2
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
5.001	49.594	0.600	82.7	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.004	47.603	0.212	224.5	0.301	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	65.344	3.035	21.5	0.142	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	33.512	0.137	244.6	0.135	5.00	0.0	0.600	o	450	Pipe/Conduit	
6.001	33.683	0.398	84.6	0.099	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.000	42.464	0.173	245.5	0.185	5.00	0.0	0.600	o	450	Pipe/Conduit	
7.001	51.923	0.362	143.4	0.079	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.002	30.132	0.123	245.0	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.003	13.278	0.054	245.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	46.235	0.600	77.1	0.121	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	45.485	0.900	50.5	0.125	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	71.671	1.100	65.2	0.199	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.000	60.979	0.271	225.0	0.770	5.00	0.0	0.600	o	450	Pipe/Conduit	
8.001	60.979	0.271	225.0	0.672	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
5.001	0.00	6.43	88.075	0.137	0.0	0.0	0.0	1.44	57.2	0.0
2.004	0.00	10.11	85.932	3.709	0.0	0.0	0.0	1.35	215.1	0.0
1.003	0.00	10.35	85.720	4.076	0.0	0.0	0.0	4.40	699.3	0.0
6.000	0.00	5.43	86.500	0.135	0.0	0.0	0.0	1.30	206.0	0.0
6.001	0.00	5.69	86.363	0.234	0.0	0.0	0.0	2.21	351.7	0.0
7.000	0.00	5.55	86.500	0.185	0.0	0.0	0.0	1.29	205.7	0.0
7.001	0.00	6.06	86.327	0.264	0.0	0.0	0.0	1.70	269.7	0.0
6.002	0.00	6.45	85.965	0.521	0.0	0.0	0.0	1.29	205.9	0.0
6.003	0.00	6.67	85.842	0.521	0.0	0.0	0.0	1.00	70.6	0.0
1.004	0.00	10.69	82.685	4.718	0.0	0.0	0.0	2.32	368.6	0.0
1.005	0.00	10.95	82.085	4.843	0.0	0.0	0.0	2.87	455.7	0.0
1.006	0.00	11.42	81.185	5.042	0.0	0.0	0.0	2.52	401.1	0.0
8.000	0.00	5.75	84.200	0.770	0.0	0.0	0.0	1.35	214.9	0.0
8.001	0.00	6.50	83.929	1.442	0.0	0.0	0.0	1.35	214.9	0.0

Waterman Group		Page 3
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
8.002	60.968	0.271	225.0	0.621	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.003	60.968	0.271	225.0	0.119	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	54.181	0.241	224.8	0.095	5.00	0.0	0.600	o	450	Pipe/Conduit	
9.001	54.181	0.241	224.8	0.368	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.002	54.035	0.240	225.1	0.366	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.003	54.035	0.240	225.1	0.352	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.004	35.700	0.088	405.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.005	43.119	0.254	169.8	0.123	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.006	52.876	0.355	148.9	0.356	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.004	42.514	0.764	55.6	0.198	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	49.536	0.291	170.2	0.119	5.00	0.0	0.600	o	225	Pipe/Conduit	
8.005	67.003	0.298	224.8	0.118	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.006	30.085	0.134	224.5	0.074	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.007	34.082	0.151	225.7	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	87.646	0.219	400.2	0.182	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
8.002	0.00	7.26	83.658	2.063	0.0	0.0	0.0	1.35	214.9	0.0
8.003	0.00	8.01	83.387	2.182	0.0	0.0	0.0	1.35	214.9	0.0
9.000	0.00	5.67	84.550	0.095	0.0	0.0	0.0	1.35	215.0	0.0
9.001	0.00	6.34	84.309	0.463	0.0	0.0	0.0	1.35	215.0	0.0
9.002	0.00	7.00	84.068	0.829	0.0	0.0	0.0	1.35	214.8	0.0
9.003	0.00	7.67	83.828	1.181	0.0	0.0	0.0	1.35	214.8	0.0
9.004	0.00	8.26	83.588	1.181	0.0	0.0	0.0	1.00	159.5	0.0
9.005	0.00	8.98	83.500	1.304	0.0	0.0	0.0	1.00	39.8	0.0
9.006	0.00	9.81	83.246	1.660	0.0	0.0	0.0	1.07	42.5	0.0
8.004	0.00	10.06	82.666	4.040	0.0	0.0	0.0	2.73	434.2	0.0
10.000	0.00	5.83	83.075	0.119	0.0	0.0	0.0	1.00	39.7	0.0
8.005	0.00	10.89	81.902	4.277	0.0	0.0	0.0	1.35	215.0	0.0
8.006	0.00	11.26	81.604	4.351	0.0	0.0	0.0	1.35	215.1	0.0
8.007	0.00	11.68	81.470	4.372	0.0	0.0	0.0	1.35	214.6	0.0
1.007	0.00	13.13	80.085	9.596	0.0	0.0	0.0	1.01	160.6	0.0

Waterman Group			Page 4
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833		
Date 11/01/2022	Designed by AS		
File SURFACE WATER DRAINAGE ...	Checked by HC		
Innovyze	Network 2020.1.3		

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
11.000	92.007	0.409	225.0	0.550	5.00	0.0	0.600	o	450	Pipe/Conduit	
11.001	111.365	0.495	225.0	0.507	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.002	50.443	0.224	225.2	0.351	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.003	49.563	0.220	225.3	0.255	0.00	0.0	0.600	o	450	Pipe/Conduit	
12.000	92.570	0.411	225.2	0.573	5.00	0.0	0.600	o	450	Pipe/Conduit	
12.001	114.081	0.507	225.0	0.507	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.004	31.092	0.138	225.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	36.823	0.164	224.5	0.048	0.00	0.0	0.600	o	450	Pipe/Conduit	
13.000	42.323	0.249	170.0	0.070	5.00	0.0	0.600	o	225	Pipe/Conduit	
13.001	27.380	0.161	170.1	0.084	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.009	32.029	0.080	400.4	0.050	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	32.092	0.080	401.2	0.072	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	32.186	0.080	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
14.000	44.759	0.500	89.5	0.116	5.00	0.0	0.600	o	225	Pipe/Conduit	
14.001	47.142	1.000	47.1	0.062	0.00	0.0	0.600	o	225	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)
11.000	0.00	6.13	82.275	0.550	0.0	0.0	0.0	1.35	214.9	0.0
11.001	0.00	7.51	81.866	1.057	0.0	0.0	0.0	1.35	214.9	0.0
11.002	0.00	8.13	81.371	1.408	0.0	0.0	0.0	1.35	214.8	0.0
11.003	0.00	8.74	81.147	1.663	0.0	0.0	0.0	1.35	214.8	0.0
12.000	0.00	6.14	82.350	0.573	0.0	0.0	0.0	1.35	214.8	0.0
12.001	0.00	7.55	81.939	1.080	0.0	0.0	0.0	1.35	214.9	0.0
11.004	0.00	9.13	80.927	2.743	0.0	0.0	0.0	1.35	214.8	0.0
1.008	0.00	13.58	79.866	12.387	0.0	0.0	0.0	1.35	215.1	0.0
13.000	0.00	5.71	81.575	0.070	0.0	0.0	0.0	1.00	39.8	0.0
13.001	0.00	6.16	81.326	0.154	0.0	0.0	0.0	1.00	39.7	0.0
1.009	0.00	14.11	79.702	12.591	0.0	0.0	0.0	1.01	160.6	0.0
1.010	0.00	14.64	79.622	12.663	0.0	0.0	0.0	1.01	160.5	0.0
1.011	0.00	15.17	79.542	12.663	0.0	0.0	0.0	1.01	160.7	0.0
14.000	0.00	5.54	82.075	0.116	0.0	0.0	0.0	1.38	55.0	0.0
14.001	0.00	5.95	81.575	0.178	0.0	0.0	0.0	1.91	75.9	0.0

Waterman Group		Page 5
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
14.002	7.536	0.044	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
14.003	37.226	0.344	108.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.012	29.639	0.074	400.5	0.041	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.013	39.855	0.100	398.6	0.084	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.014	39.878	0.100	398.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.015	49.110	1.186	41.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
15.000	47.887	0.500	95.8	0.225	5.00	0.0	0.600	o	600	Pipe/Conduit	
15.001	38.722	0.300	129.1	0.110	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.002	35.243	0.300	117.5	0.108	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.003	19.928	0.112	177.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
16.000	62.845	0.157	400.3	0.645	5.00	0.0	0.600	o	450	Pipe/Conduit	
16.001	68.166	0.170	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.002	69.406	0.174	400.0	0.812	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.003	58.712	0.147	400.0	0.667	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.004	65.055	0.163	400.0	0.711	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.005	61.206	0.153	400.0	0.943	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.006	38.979	0.097	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.007	24.009	0.060	400.0	0.248	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
14.002	0.00	6.08	80.575	0.178	0.0	0.0	0.0	1.00	39.8	0.0
14.003	0.00	6.57	80.531	0.178	0.0	0.0	0.0	1.26	49.9	0.0
1.012	0.00	15.66	79.462	12.882	0.0	0.0	0.0	1.01	160.6	0.0
1.013	0.00	16.32	79.388	12.966	0.0	0.0	0.0	1.01	161.0	0.0
1.014	0.00	16.97	79.288	12.966	0.0	0.0	0.0	1.01	160.9	0.0
1.015	0.00	17.23	79.188	12.966	0.0	0.0	0.0	3.17	503.6	0.0
15.000	0.00	5.32	80.600	0.225	0.0	0.0	0.0	2.49	703.7	0.0
15.001	0.00	5.62	80.100	0.335	0.0	0.0	0.0	2.14	605.7	0.0
15.002	0.00	5.88	79.800	0.443	0.0	0.0	0.0	2.25	635.0	0.0
15.003	0.00	6.07	79.500	0.443	0.0	0.0	0.0	1.82	515.3	0.0
16.000	0.00	6.04	80.341	0.645	0.0	0.0	0.0	1.01	160.6	0.0
16.001	0.00	7.16	80.184	0.645	0.0	0.0	0.0	1.01	160.7	0.0
16.002	0.00	8.31	80.014	1.457	0.0	0.0	0.0	1.01	160.7	0.0
16.003	0.00	9.28	79.840	2.124	0.0	0.0	0.0	1.01	160.7	0.0
16.004	0.00	10.35	79.693	2.835	0.0	0.0	0.0	1.01	160.7	0.0
16.005	0.00	11.36	79.531	3.778	0.0	0.0	0.0	1.01	160.7	0.0
16.006	0.00	12.00	79.378	3.778	0.0	0.0	0.0	1.01	160.7	0.0
16.007	0.00	12.40	79.280	4.026	0.0	0.0	0.0	1.01	160.7	0.0

Waterman Group		Page 6
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
16.008	36.804	0.092	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.009	20.805	0.052	400.1	0.050	0.00	0.0	0.600	o	450	Pipe/Conduit	
17.000	66.842	0.500	133.7	0.239	5.00	0.0	0.600	o	450	Pipe/Conduit	
17.001	66.625	2.464	27.0	0.224	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.000	66.408	0.166	400.0	0.448	5.00	0.0	0.600	o	450	Pipe/Conduit	
18.001	73.759	0.184	400.9	0.504	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.002	79.779	0.199	400.9	0.443	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.003	65.094	0.163	399.3	0.431	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.004	50.512	0.126	400.9	0.232	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.005	38.188	0.246	155.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
17.002	31.460	0.185	170.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.010	6.892	0.017	405.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.011	39.332	0.098	401.3	0.213	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.012	37.215	0.093	400.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.013	21.674	0.096	225.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
19.000	65.385	0.163	401.1	0.779	5.00	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
16.008	0.00	13.00	79.220	4.026	0.0	0.0	0.0	1.01	160.7	0.0
16.009	0.00	13.35	79.128	4.076	0.0	0.0	0.0	1.01	160.7	0.0
17.000	0.00	5.63	82.075	0.239	0.0	0.0	0.0	1.76	279.4	0.0
17.001	0.00	5.92	81.575	0.463	0.0	0.0	0.0	3.92	623.7	0.0
18.000	0.00	6.10	80.195	0.448	0.0	0.0	0.0	1.01	160.7	0.0
18.001	0.00	7.31	80.029	0.952	0.0	0.0	0.0	1.01	160.5	0.0
18.002	0.00	8.63	79.845	1.395	0.0	0.0	0.0	1.01	160.5	0.0
18.003	0.00	9.70	79.646	1.826	0.0	0.0	0.0	1.01	160.8	0.0
18.004	0.00	10.54	79.483	2.058	0.0	0.0	0.0	1.01	160.5	0.0
18.005	0.00	10.93	79.357	2.058	0.0	0.0	0.0	1.63	259.1	0.0
17.002	0.00	11.27	79.111	2.521	0.0	0.0	0.0	1.56	247.5	0.0
16.010	0.00	13.46	78.926	6.597	0.0	0.0	0.0	1.00	159.6	0.0
16.011	0.00	14.11	78.909	6.810	0.0	0.0	0.0	1.01	160.4	0.0
16.012	0.00	14.73	78.811	6.810	0.0	0.0	0.0	1.01	160.7	0.0
16.013	0.00	15.07	78.718	6.810	0.0	0.0	0.0	1.04	73.7	0.0
19.000	0.00	6.08	79.200	0.779	0.0	0.0	0.0	1.01	160.5	0.0

Waterman Group		Page 8
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
22.000	70.021	0.175	400.1	0.507	5.00	0.0	0.600	o	450	Pipe/Conduit	
22.001	91.226	0.228	400.1	0.628	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.002	69.611	0.174	400.1	0.490	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.003	57.350	0.143	401.0	0.550	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.004	26.674	0.067	398.1	0.367	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.005	52.489	0.131	400.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
23.000	38.457	0.096	400.6	0.444	5.00	0.0	0.600	o	600	Pipe/Conduit	
24.000	24.712	0.062	398.6	0.166	5.00	0.0	0.600	o	600	Pipe/Conduit	
23.001	39.158	0.098	399.6	0.140	0.00	0.0	0.600	o	600	Pipe/Conduit	
23.002	25.124	0.063	398.8	0.064	0.00	0.0	0.600	o	600	Pipe/Conduit	
23.003	17.903	0.045	397.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
21.004	49.967	0.125	399.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
21.005	49.981	0.125	399.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
21.006	15.761	0.070	225.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.019	22.477	0.056	401.4	0.000	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
22.000	0.00	6.16	79.275	0.507	0.0	0.0	0.0	1.01	160.7	0.0
22.001	0.00	7.66	79.100	1.135	0.0	0.0	0.0	1.01	160.7	0.0
22.002	0.00	8.81	78.872	1.625	0.0	0.0	0.0	1.01	160.7	0.0
22.003	0.00	9.76	78.698	2.175	0.0	0.0	0.0	1.01	160.5	0.0
22.004	0.00	10.20	78.555	2.542	0.0	0.0	0.0	1.01	161.1	0.0
22.005	0.00	11.06	78.488	2.542	0.0	0.0	0.0	1.01	160.5	0.0
23.000	0.00	5.53	79.234	0.444	0.0	0.0	0.0	1.21	342.3	0.0
24.000	0.00	5.34	79.200	0.166	0.0	0.0	0.0	1.21	343.1	0.0
23.001	0.00	6.07	79.138	0.750	0.0	0.0	0.0	1.21	342.7	0.0
23.002	0.00	6.41	79.040	0.814	0.0	0.0	0.0	1.21	343.0	0.0
23.003	0.00	6.66	78.977	0.814	0.0	0.0	0.0	1.21	343.4	0.0
21.004	0.00	11.89	78.071	3.692	0.0	0.0	0.0	1.01	160.7	0.0
21.005	0.00	12.71	77.946	3.692	0.0	0.0	0.0	1.01	160.7	0.0
21.006	0.00	12.96	77.806	3.692	0.0	0.0	0.0	1.04	73.8	0.0
1.019	0.00	24.52	77.670	27.351	0.0	0.0	0.0	1.01	160.4	0.0

Waterman Group		Page 9
Pickfords Wharf	MIRA	
Clink Street	LAND SOUTH OF A5	
London, SE1 9DG	EED13833	
Date 11/01/2022	Designed by AS	
File SURFACE WATER DRAINAGE ...	Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
25.000	77.088	0.751	102.6	1.671	5.00	0.0	0.600	o	450	Pipe/Conduit	
25.001	91.717	0.894	102.6	1.509	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.002	49.797	0.485	102.6	0.291	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.003	43.931	0.428	102.6	0.380	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.004	45.404	0.442	102.7	0.246	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.005	48.846	0.122	400.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.006	51.699	0.129	400.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.007	30.176	0.075	402.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.000	94.637	0.237	399.3	1.669	5.00	0.0	0.600	o	450	Pipe/Conduit	
26.001	93.663	0.234	400.3	1.510	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.002	97.803	0.245	399.2	0.521	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.003	100.000	0.250	400.0	0.597	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.004	68.495	0.171	400.6	0.374	0.00	0.0	0.600	o	600	Pipe/Conduit	
26.005	63.429	0.759	83.6	1.255	0.00	0.0	0.600	o	600	Pipe/Conduit	
26.006	63.826	1.129	56.5	0.436	0.00	0.0	0.600	o	600	Pipe/Conduit	
25.008	45.298	1.818	24.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.000	22.854	0.057	400.9	0.679	5.00	0.0	0.600	o	450	Pipe/Conduit	
27.001	26.875	0.067	401.1	0.000	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
25.000	0.00	5.64	83.200	1.671	0.0	0.0	0.0	2.01	319.2	0.0
25.001	0.00	6.40	82.449	3.180	0.0	0.0	0.0	2.01	319.2	0.0
25.002	0.00	6.82	81.555	3.471	0.0	0.0	0.0	2.01	319.2	0.0
25.003	0.00	7.18	81.069	3.851	0.0	0.0	0.0	2.01	319.2	0.0
25.004	0.00	7.56	80.641	4.097	0.0	0.0	0.0	2.01	319.0	0.0
25.005	0.00	8.36	80.199	4.097	0.0	0.0	0.0	1.01	160.6	0.0
25.006	0.00	9.22	80.077	4.097	0.0	0.0	0.0	1.01	160.5	0.0
25.007	0.00	9.72	79.948	4.097	0.0	0.0	0.0	1.01	160.2	0.0
26.000	0.00	6.56	83.200	1.669	0.0	0.0	0.0	1.01	160.8	0.0
26.001	0.00	8.11	82.963	3.179	0.0	0.0	0.0	1.01	160.6	0.0
26.002	0.00	9.72	82.729	3.700	0.0	0.0	0.0	1.01	160.8	0.0
26.003	0.00	11.37	82.484	4.297	0.0	0.0	0.0	1.01	160.7	0.0
26.004	0.00	12.31	82.084	4.671	0.0	0.0	0.0	1.21	342.3	0.0
26.005	0.00	12.71	81.913	5.926	0.0	0.0	0.0	2.67	753.6	0.0
26.006	0.00	13.03	81.154	6.362	0.0	0.0	0.0	3.24	917.0	0.0
25.008	0.00	13.22	79.873	10.459	0.0	0.0	0.0	4.09	649.9	0.0
27.000	0.00	5.38	82.200	0.679	0.0	0.0	0.0	1.01	160.5	0.0
27.001	0.00	5.82	82.143	0.679	0.0	0.0	0.0	1.01	160.5	0.0

Waterman Group		Page 10
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
27.002	35.077	0.088	398.6	0.483	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.003	38.260	0.096	398.5	0.280	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.004	26.766	0.067	399.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.005	25.827	1.051	24.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.006	38.476	0.096	400.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.007	20.122	0.050	402.4	0.085	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.008	30.535	0.076	401.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.009	46.912	0.117	401.0	0.189	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.010	27.436	1.084	25.3	0.132	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.011	8.510	0.022	386.8	0.150	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.009	15.362	0.038	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.010	25.956	0.065	399.3	0.174	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.011	24.650	0.062	397.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.012	27.341	0.122	224.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
25.013	11.199	0.050	224.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.020	9.176	0.023	399.0	0.000	0.00	0.0	0.600	\	-2	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)
27.002	0.00	6.40	82.076	1.162	0.0	0.0	0.0	1.01	161.0	0.0
27.003	0.00	7.03	81.988	1.442	0.0	0.0	0.0	1.01	161.0	0.0
27.004	0.00	7.47	81.892	1.442	0.0	0.0	0.0	1.01	160.8	0.0
27.005	0.00	7.57	81.825	1.442	0.0	0.0	0.0	4.11	654.4	0.0
27.006	0.00	8.21	80.774	1.442	0.0	0.0	0.0	1.01	160.5	0.0
27.007	0.00	8.54	80.678	1.527	0.0	0.0	0.0	1.01	160.2	0.0
27.008	0.00	9.05	80.628	1.527	0.0	0.0	0.0	1.01	160.3	0.0
27.009	0.00	9.82	80.552	1.716	0.0	0.0	0.0	1.01	160.5	0.0
27.010	0.00	9.94	80.435	1.848	0.0	0.0	0.0	4.05	644.8	0.0
27.011	0.00	10.07	79.351	1.998	0.0	0.0	0.0	1.03	163.4	0.0
25.009	0.00	13.47	78.055	12.457	0.0	0.0	0.0	1.01	160.7	0.0
25.010	0.00	13.90	78.017	12.631	0.0	0.0	0.0	1.01	160.8	0.0
25.011	0.00	14.31	77.952	12.631	0.0	0.0	0.0	1.01	161.2	0.0
25.012	0.00	14.74	77.890	12.631	0.0	0.0	0.0	1.05	73.9	0.0
25.013	0.00	14.92	77.768	12.631	0.0	0.0	0.0	1.05	74.0	0.0
1.020	0.00	24.59	77.600	39.982	0.0	0.0	0.0	2.40	3594.3	0.0

Waterman Group		Page 11
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.089	0.089	0.089
1.001	-	-	100	0.051	0.051	0.051
1.002	-	-	100	0.085	0.085	0.085
2.000	-	-	100	0.319	0.319	0.319
2.001	-	-	100	0.242	0.242	0.242
2.002	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.362	0.362	0.362
3.001	-	-	100	0.000	0.000	0.000
3.002	-	-	100	0.655	0.655	0.655
3.003	-	-	100	0.649	0.649	0.649
3.004	-	-	100	0.649	0.649	0.649
3.005	-	-	100	0.133	0.133	0.133
3.006	-	-	100	0.098	0.098	0.098
4.000	-	-	100	0.164	0.164	0.164
2.003	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.095	0.095	0.095
5.001	-	-	100	0.042	0.042	0.042
2.004	-	-	100	0.301	0.301	0.301
1.003	-	-	100	0.142	0.142	0.142
6.000	-	-	100	0.135	0.135	0.135
6.001	-	-	100	0.099	0.099	0.099
7.000	-	-	100	0.185	0.185	0.185
7.001	-	-	100	0.079	0.079	0.079
6.002	-	-	100	0.023	0.023	0.023
6.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.121	0.121	0.121
1.005	-	-	100	0.125	0.125	0.125
1.006	-	-	100	0.199	0.199	0.199
8.000	-	-	100	0.770	0.770	0.770
8.001	-	-	100	0.672	0.672	0.672
8.002	-	-	100	0.621	0.621	0.621
8.003	-	-	100	0.119	0.119	0.119
9.000	-	-	100	0.095	0.095	0.095
9.001	-	-	100	0.368	0.368	0.368
9.002	-	-	100	0.366	0.366	0.366
9.003	-	-	100	0.352	0.352	0.352
9.004	-	-	100	0.000	0.000	0.000
9.005	-	-	100	0.123	0.123	0.123
9.006	-	-	100	0.356	0.356	0.356
8.004	-	-	100	0.198	0.198	0.198
10.000	-	-	100	0.119	0.119	0.119
8.005	-	-	100	0.118	0.118	0.118
8.006	-	-	100	0.074	0.074	0.074
8.007	-	-	100	0.021	0.021	0.021
1.007	-	-	100	0.182	0.182	0.182
11.000	-	-	100	0.550	0.550	0.550
11.001	-	-	100	0.507	0.507	0.507
11.002	-	-	100	0.351	0.351	0.351
11.003	-	-	100	0.255	0.255	0.255
12.000	-	-	100	0.573	0.573	0.573
12.001	-	-	100	0.507	0.507	0.507

Waterman Group		Page 12
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
11.004	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.048	0.048	0.048
13.000	-	-	100	0.070	0.070	0.070
13.001	-	-	100	0.084	0.084	0.084
1.009	-	-	100	0.050	0.050	0.050
1.010	-	-	100	0.072	0.072	0.072
1.011	-	-	100	0.000	0.000	0.000
14.000	-	-	100	0.116	0.116	0.116
14.001	-	-	100	0.062	0.062	0.062
14.002	-	-	100	0.000	0.000	0.000
14.003	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.041	0.041	0.041
1.013	-	-	100	0.084	0.084	0.084
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
15.000	-	-	100	0.225	0.225	0.225
15.001	-	-	100	0.110	0.110	0.110
15.002	-	-	100	0.108	0.108	0.108
15.003	-	-	100	0.000	0.000	0.000
16.000	-	-	100	0.645	0.645	0.645
16.001	-	-	100	0.000	0.000	0.000
16.002	-	-	100	0.812	0.812	0.812
16.003	-	-	100	0.667	0.667	0.667
16.004	-	-	100	0.711	0.711	0.711
16.005	-	-	100	0.943	0.943	0.943
16.006	-	-	100	0.000	0.000	0.000
16.007	-	-	100	0.248	0.248	0.248
16.008	-	-	100	0.000	0.000	0.000
16.009	-	-	100	0.050	0.050	0.050
17.000	-	-	100	0.239	0.239	0.239
17.001	-	-	100	0.224	0.224	0.224
18.000	-	-	100	0.448	0.448	0.448
18.001	-	-	100	0.504	0.504	0.504
18.002	-	-	100	0.443	0.443	0.443
18.003	-	-	100	0.431	0.431	0.431
18.004	-	-	100	0.232	0.232	0.232
18.005	-	-	100	0.000	0.000	0.000
17.002	-	-	100	0.000	0.000	0.000
16.010	-	-	100	0.000	0.000	0.000
16.011	-	-	100	0.213	0.213	0.213
16.012	-	-	100	0.000	0.000	0.000
16.013	-	-	100	0.000	0.000	0.000
19.000	-	-	100	0.779	0.779	0.779
19.001	-	-	100	0.833	0.833	0.833
19.002	-	-	100	0.610	0.610	0.610
19.003	-	-	100	0.362	0.362	0.362
19.004	-	-	100	0.202	0.202	0.202
20.000	-	-	100	0.168	0.168	0.168
20.001	-	-	100	0.000	0.000	0.000
19.005	-	-	100	0.000	0.000	0.000
16.014	-	-	100	0.000	0.000	0.000

Waterman Group		Page 13
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.016	-	-	100	0.486	0.486	0.486
1.017	-	-	100	0.000	0.000	0.000
1.018	-	-	100	0.000	0.000	0.000
21.000	-	-	100	0.205	0.205	0.205
21.001	-	-	100	0.067	0.067	0.067
21.002	-	-	100	0.064	0.064	0.064
21.003	-	-	100	0.000	0.000	0.000
22.000	-	-	100	0.507	0.507	0.507
22.001	-	-	100	0.628	0.628	0.628
22.002	-	-	100	0.490	0.490	0.490
22.003	-	-	100	0.550	0.550	0.550
22.004	-	-	100	0.367	0.367	0.367
22.005	-	-	100	0.000	0.000	0.000
23.000	-	-	100	0.444	0.444	0.444
24.000	-	-	100	0.166	0.166	0.166
23.001	-	-	100	0.140	0.140	0.140
23.002	-	-	100	0.064	0.064	0.064
23.003	-	-	100	0.000	0.000	0.000
21.004	-	-	100	0.000	0.000	0.000
21.005	-	-	100	0.000	0.000	0.000
21.006	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
25.000	-	-	100	1.671	1.671	1.671
25.001	-	-	100	1.509	1.509	1.509
25.002	-	-	100	0.291	0.291	0.291
25.003	-	-	100	0.380	0.380	0.380
25.004	-	-	100	0.246	0.246	0.246
25.005	-	-	100	0.000	0.000	0.000
25.006	-	-	100	0.000	0.000	0.000
25.007	-	-	100	0.000	0.000	0.000
26.000	-	-	100	1.669	1.669	1.669
26.001	-	-	100	1.510	1.510	1.510
26.002	-	-	100	0.521	0.521	0.521
26.003	-	-	100	0.597	0.597	0.597
26.004	-	-	100	0.374	0.374	0.374
26.005	-	-	100	1.255	1.255	1.255
26.006	-	-	100	0.436	0.436	0.436
25.008	-	-	100	0.000	0.000	0.000
27.000	-	-	100	0.679	0.679	0.679
27.001	-	-	100	0.000	0.000	0.000
27.002	-	-	100	0.483	0.483	0.483
27.003	-	-	100	0.280	0.280	0.280
27.004	-	-	100	0.000	0.000	0.000
27.005	-	-	100	0.000	0.000	0.000
27.006	-	-	100	0.000	0.000	0.000
27.007	-	-	100	0.085	0.085	0.085
27.008	-	-	100	0.000	0.000	0.000
27.009	-	-	100	0.189	0.189	0.189
27.010	-	-	100	0.132	0.132	0.132
27.011	-	-	100	0.150	0.150	0.150
25.009	-	-	100	0.000	0.000	0.000

Waterman Group		Page 14
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
25.010	-	-	100	0.174	0.174	0.174
25.011	-	-	100	0.000	0.000	0.000
25.012	-	-	100	0.000	0.000	0.000
25.013	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				39.982	39.982	39.982

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.020		78.680	77.577	0.000	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	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 Storage Structures	47
Number of Online Controls	22	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

Waterman Group		Page 15
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	
<u>Online Controls for Storm</u> <u>Orifice Manhole: 11, DS/PN: 3.004, Volume (m³): 16.1</u> Diameter (m) 0.062 Discharge Coefficient 0.600 Invert Level (m) 86.613 <u>Orifice Manhole: 18, DS/PN: 2.004, Volume (m³): 12.3</u> Diameter (m) 0.106 Discharge Coefficient 0.600 Invert Level (m) 85.932 <u>Orifice Manhole: 25, DS/PN: 6.003, Volume (m³): 7.8</u> Diameter (m) 0.049 Discharge Coefficient 0.600 Invert Level (m) 85.842 <u>Orifice Manhole: 31, DS/PN: 8.002, Volume (m³): 13.3</u> Diameter (m) 0.157 Discharge Coefficient 0.600 Invert Level (m) 83.658 <u>Orifice Manhole: 39, DS/PN: 9.006, Volume (m³): 6.3</u> Diameter (m) 0.157 Discharge Coefficient 0.600 Invert Level (m) 83.246 <u>Orifice Manhole: 42, DS/PN: 8.005, Volume (m³): 13.0</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 81.902 <u>Orifice Manhole: 52, DS/PN: 11.004, Volume (m³): 30.7</u> Diameter (m) 0.157 Discharge Coefficient 0.600 Invert Level (m) 80.927 <u>Orifice Manhole: 62, DS/PN: 14.003, Volume (m³): 1.9</u> Diameter (m) 0.157 Discharge Coefficient 0.600 Invert Level (m) 80.531 <u>Orifice Manhole: 63, DS/PN: 1.012, Volume (m³): 10.1</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 79.462 <u>Orifice Manhole: 66, DS/PN: 1.015, Volume (m³): 6.2</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 79.188 <u>Orifice Manhole: 77, DS/PN: 16.006, Volume (m³): 14.5</u> Diameter (m) 0.140 Discharge Coefficient 0.600 Invert Level (m) 79.378		
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Waterman Group		Page 16
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	
<u>Orifice Manhole: 86, DS/PN: 18.003, Volume (m³): 20.6</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 79.646 <u>Orifice Manhole: 89, DS/PN: 17.002, Volume (m³): 22.6</u> Diameter (m) 0.157 Discharge Coefficient 0.600 Invert Level (m) 79.111 <u>Orifice Manhole: 93, DS/PN: 16.013, Volume (m³): 10.6</u> Diameter (m) 0.201 Discharge Coefficient 0.600 Invert Level (m) 78.718 <u>Orifice Manhole: 101, DS/PN: 19.005, Volume (m³): 11.1</u> Diameter (m) 0.140 Discharge Coefficient 0.600 Invert Level (m) 78.482 <u>Orifice Manhole: 105, DS/PN: 1.018, Volume (m³): 6.6</u> Diameter (m) 0.253 Discharge Coefficient 0.600 Invert Level (m) 77.814 <u>Orifice Manhole: 115, DS/PN: 22.005, Volume (m³): 9.3</u> Diameter (m) 0.140 Discharge Coefficient 0.600 Invert Level (m) 78.488 <u>Orifice Manhole: 123, DS/PN: 21.006, Volume (m³): 7.9</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 77.806 <u>Orifice Manhole: 140, DS/PN: 25.008, Volume (m³): 27.5</u> Diameter (m) 0.278 Discharge Coefficient 0.600 Invert Level (m) 79.873 <u>Orifice Manhole: 145, DS/PN: 27.004, Volume (m³): 9.3</u> Diameter (m) 0.140 Discharge Coefficient 0.600 Invert Level (m) 81.892 <u>Orifice Manhole: 152, DS/PN: 27.011, Volume (m³): 7.0</u> Diameter (m) 0.297 Discharge Coefficient 0.600 Invert Level (m) 79.351 <u>Orifice Manhole: 156, DS/PN: 25.012, Volume (m³): 3.9</u> Diameter (m) 0.247 Discharge Coefficient 0.600 Invert Level (m) 77.890		
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Waterman Group		Page 17																																																																								
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833																																																																									
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC																																																																									
Innovyze	Network 2020.1.3																																																																									
<u>Storage Structures for Storm</u> <u>Tank or Pond Manhole: 6, DS/PN: 2.002</u> Invert Level (m) 86.814 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 10, DS/PN: 3.003</u> Invert Level (m) 86.936 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 11, DS/PN: 3.004</u> Invert Level (m) 86.613 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 15, DS/PN: 2.003</u> Invert Level (m) 86.582 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 25, DS/PN: 6.003</u> Invert Level (m) 85.842 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 29, DS/PN: 8.000</u> Invert Level (m) 84.200 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> ©1982-2020 Innovyze			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	500.0	1.000	500.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	500.0	1.000	500.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					

Waterman Group		Page 18																																																																								
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833																																																																									
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC																																																																									
Innovyze	Network 2020.1.3																																																																									
<u>Tank or Pond Manhole: 31, DS/PN: 8.002</u> Invert Level (m) 83.658 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 35, DS/PN: 9.002</u> Invert Level (m) 84.068 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>250.0</td><td>1.000</td><td>250.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 37, DS/PN: 9.004</u> Invert Level (m) 83.588 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>250.0</td><td>1.000</td><td>250.0</td><td>1.050</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 39, DS/PN: 9.006</u> Invert Level (m) 83.247 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>250.0</td><td>1.000</td><td>250.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 42, DS/PN: 8.005</u> Invert Level (m) 82.352 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 47, DS/PN: 11.001</u> Invert Level (m) 81.866 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 48, DS/PN: 11.002</u> Invert Level (m) 81.371			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	250.0	1.000	250.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	250.0	1.000	250.0	1.050	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	250.0	1.000	250.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	250.0	1.000	250.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	250.0	1.000	250.0	1.050	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	250.0	1.000	250.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	200.0	1.000	200.0	1.001	0.0																																																																					
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<u>Tank or Pond Manhole: 48, DS/PN: 11.002</u> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 51, DS/PN: 12.001</u> Invert Level (m) 81.939 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 52, DS/PN: 11.004</u> Invert Level (m) 80.927 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>2500.0</td><td>1.000</td><td>2500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 61, DS/PN: 14.002</u> Invert Level (m) 80.575 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>622.0</td><td>0.500</td><td>622.0</td><td>0.501</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 63, DS/PN: 1.012</u> Invert Level (m) 79.462 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>723.0</td><td>1.500</td><td>723.0</td><td>1.501</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 66, DS/PN: 1.015</u> Invert Level (m) 79.188 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>841.0</td><td>1.500</td><td>841.0</td><td>1.501</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 73, DS/PN: 16.002</u> Invert Level (m) 80.014 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>750.0</td><td>1.000</td><td>750.0</td><td>1.001</td><td>0.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	2500.0	1.000	2500.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	622.0	0.500	622.0	0.501	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	723.0	1.500	723.0	1.501	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	841.0	1.500	841.0	1.501	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	750.0	1.000	750.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	200.0	1.000	200.0	1.001	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	200.0	1.000	200.0	1.001	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	2500.0	1.000	2500.0	1.001	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	622.0	0.500	622.0	0.501	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	723.0	1.500	723.0	1.501	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	841.0	1.500	841.0	1.501	0.0																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																	
0.000	750.0	1.000	750.0	1.001	0.0																																																																																	
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<u>Tank or Pond Manhole: 75, DS/PN: 16.004</u> Invert Level (m) 79.693 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>750.0</td><td>1.000</td><td>750.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 77, DS/PN: 16.006</u> Invert Level (m) 79.378 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>750.0</td><td>1.000</td><td>750.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 84, DS/PN: 18.001</u> Invert Level (m) 80.029 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 85, DS/PN: 18.002</u> Invert Level (m) 79.845 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 86, DS/PN: 18.003</u> Invert Level (m) 79.646 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>200.0</td><td>1.000</td><td>200.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 88, DS/PN: 18.005</u> Invert Level (m) 79.357 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1400.0</td><td>1.000</td><td>1400.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 89, DS/PN: 17.002</u> Invert Level (m) 79.111			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	750.0	1.000	750.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	750.0	1.000	750.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	200.0	1.000	200.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1400.0	1.000	1400.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	750.0	1.000	750.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	750.0	1.000	750.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	200.0	1.000	200.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	200.0	1.000	200.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	200.0	1.000	200.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1400.0	1.000	1400.0	1.001	0.0																																																																					
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<u>Tank or Pond Manhole: 89, DS/PN: 17.002</u> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1400.0</td><td>1.000</td><td>1400.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 93, DS/PN: 16.013</u> Invert Level (m) 78.718 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>2126.0</td><td>1.000</td><td>2126.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 95, DS/PN: 19.001</u> Invert Level (m) 79.037 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 97, DS/PN: 19.003</u> Invert Level (m) 78.693 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.101</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 101, DS/PN: 19.005</u> Invert Level (m) 78.482 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1500.0</td><td>1.000</td><td>1500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 105, DS/PN: 1.018</u> Invert Level (m) 77.814 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>4870.0</td><td>1.000</td><td>4870.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 111, DS/PN: 22.001</u> Invert Level (m) 79.100 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>350.0</td><td>1.000</td><td>350.0</td><td>1.001</td><td>0.0</td></tr></table>			Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	1400.0	1.000	1400.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	2126.0	1.000	2126.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	500.0	1.000	500.0	1.101	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	1500.0	1.000	1500.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	4870.0	1.000	4870.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	350.0	1.000	350.0	1.001	0.0
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	1400.0	1.000	1400.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	2126.0	1.000	2126.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	500.0	1.000	500.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	500.0	1.000	500.0	1.101	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	1500.0	1.000	1500.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	4870.0	1.000	4870.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	350.0	1.000	350.0	1.001	0.0																																																																																	
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Waterman Group		Page 22																																																																								
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<u>Tank or Pond Manhole: 113, DS/PN: 22.003</u> Invert Level (m) 78.698 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>350.0</td><td>1.000</td><td>350.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 115, DS/PN: 22.005</u> Invert Level (m) 78.488 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1830.0</td><td>1.000</td><td>1830.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 123, DS/PN: 21.006</u> Invert Level (m) 77.806 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>4450.0</td><td>1.000</td><td>4450.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 125, DS/PN: 25.000</u> Invert Level (m) 83.200 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>350.0</td><td>1.000</td><td>350.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 126, DS/PN: 25.001</u> Invert Level (m) 82.449 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>350.0</td><td>1.000</td><td>350.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 127, DS/PN: 25.002</u> Invert Level (m) 81.555 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>350.0</td><td>1.000</td><td>350.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 130, DS/PN: 25.005</u> Invert Level (m) 80.200			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	350.0	1.000	350.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1830.0	1.000	1830.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	4450.0	1.000	4450.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	350.0	1.000	350.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	350.0	1.000	350.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	350.0	1.000	350.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	350.0	1.000	350.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	1830.0	1.000	1830.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	4450.0	1.000	4450.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	350.0	1.000	350.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	350.0	1.000	350.0	1.001	0.0																																																																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																					
0.000	350.0	1.000	350.0	1.001	0.0																																																																					
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Waterman Group		Page 23																																																																																				
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833																																																																																					
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC																																																																																					
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<u>Tank or Pond Manhole: 130, DS/PN: 25.005</u> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>2000.0</td><td>1.000</td><td>2000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 133, DS/PN: 26.000</u> Invert Level (m) 83.200 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 134, DS/PN: 26.001</u> Invert Level (m) 82.963 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 135, DS/PN: 26.002</u> Invert Level (m) 82.729 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>500.0</td><td>1.000</td><td>500.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 140, DS/PN: 25.008</u> Invert Level (m) 79.873 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>2550.0</td><td>1.000</td><td>2550.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 143, DS/PN: 27.002</u> Invert Level (m) 82.076 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table> <u>Tank or Pond Manhole: 145, DS/PN: 27.004</u> Invert Level (m) 81.892 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1000.0</td><td>1.000</td><td>1000.0</td><td>1.001</td><td>0.0</td></tr></table>			Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	2000.0	1.000	2000.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	500.0	1.000	500.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	2550.0	1.000	2550.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	1000.0	1.000	1000.0	1.001	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	1000.0	1.000	1000.0	1.001	0.0
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	2000.0	1.000	2000.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	500.0	1.000	500.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	500.0	1.000	500.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	500.0	1.000	500.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	2550.0	1.000	2550.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																																	
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)																																																																																	
0.000	1000.0	1.000	1000.0	1.001	0.0																																																																																	
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Waterman Group		Page 24																								
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833																									
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC																									
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<u>Tank or Pond Manhole: 152, DS/PN: 27.011</u> Invert Level (m) 79.351 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>1500.0</td><td>1.000</td><td>1500.0</td><td>1.001</td><td>0.0</td></tr></tbody></table> <u>Tank or Pond Manhole: 156, DS/PN: 25.012</u> Invert Level (m) 77.890 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>1738.0</td><td>1.000</td><td>1738.0</td><td>1.001</td><td>0.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1500.0	1.000	1500.0	1.001	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1738.0	1.000	1738.0	1.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																					
0.000	1500.0	1.000	1500.0	1.001	0.0																					
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																					
0.000	1738.0	1.000	1738.0	1.001	0.0																					
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Waterman Group		Page 25
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

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 Storage Structures 47
 Number of Online Controls 22 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440
 Return Period(s) (years) 1, 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.
1.000	1	15 Winter	100	+40%				
1.001	2	15 Winter	100	+40%				
1.002	3	15 Winter	100	+40%				
2.000	4	15 Winter	100	+40%	100/15 Summer			
2.001	5	15 Winter	100	+40%	100/15 Summer			
2.002	6	240 Winter	100	+40%				
3.000	7	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
3.001	8	15 Winter	100	+40%	30/15 Winter			
3.002	9	15 Winter	100	+40%	30/15 Summer			
3.003	10	1440 Winter	100	+40%	100/60 Winter			
3.004	11	1440 Winter	100	+40%	30/120 Summer			
3.005	12	240 Winter	100	+40%	30/30 Winter			
3.006	13	240 Winter	100	+40%	30/15 Summer			
4.000	14	15 Winter	100	+40%	30/15 Summer			
2.003	15	240 Winter	100	+40%	1/15 Summer			
5.000	16	15 Winter	100	+40%	100/15 Summer			
5.001	17	15 Winter	100	+40%	100/15 Summer			
2.004	18	60 Winter	100	+40%	1/15 Summer			
1.003	19	15 Winter	100	+40%				

Waterman Group		Page 26
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

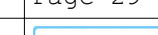
Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	88.524	-0.326	0.000	0.17		55.3	OK
1.001	2	88.185	-0.247	0.000	0.41		87.5	OK
1.002	3	87.988	-0.275	0.000	0.31		141.5	OK
2.000	4	88.145	0.419	0.000	0.96		187.3	SURCHARGED
2.001	5	87.928	0.430	0.000	1.63		318.8	SURCHARGED
2.002	6	87.100	-0.164	0.000	0.30		58.1	OK
3.000	7	89.354	1.204	3.859	0.88		172.2	FLOOD
3.001	8	89.251	1.325	0.000	0.87		169.0	FLOOD RISK
3.002	9	89.100	1.398	0.000	2.28		457.6	FLOOD RISK
3.003	10	87.756	0.370	0.000	0.18		35.2	SURCHARGED
3.004	11	87.759	0.696	0.000	0.04		7.9	SURCHARGED
3.005	12	87.102	0.228	0.000	0.10		19.1	SURCHARGED
3.006	13	87.099	0.351	0.000	0.12		30.2	SURCHARGED
4.000	14	88.820	0.670	0.000	2.75		97.8	SURCHARGED
2.003	15	87.095	0.563	0.000	0.14		26.7	SURCHARGED
5.000	16	89.232	0.482	0.000	1.17		51.2	SURCHARGED
5.001	17	88.606	0.306	0.000	1.23		67.6	SURCHARGED
2.004	18	87.331	0.949	0.000	0.12		23.6	SURCHARGED
1.003	19	85.952	-0.218	0.000	0.40		256.2	OK

PN	US/MH Name	Level Exceeded
1.000	1	
1.001	2	
1.002	3	
2.000	4	
2.001	5	
2.002	6	
3.000	7	1
3.001	8	
3.002	9	
3.003	10	
3.004	11	
3.005	12	
3.006	13	
4.000	14	
2.003	15	
5.000	16	
5.001	17	
2.004	18	
1.003	19	

Waterman Group		Page 27						
Pickfords Wharf Clink Street London, SE1 9DG		MIRA LAND SOUTH OF A5 EED13833						
Date 11/01/2022 File SURFACE WATER DRAINAGE ...		Designed by AS Checked by HC						
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Summary of Critical Results by Maximum Level (Rank 1) for Storm								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
6.000	20	15 Winter	100	+40%				
6.001	21	15 Winter	100	+40%				
7.000	22	15 Winter	100	+40%				
7.001	23	15 Winter	100	+40%				
6.002	24	15 Winter	100	+40%	100/15 Summer			
6.003	25	600 Winter	100	+40%	30/180 Winter			
1.004	26	15 Winter	100	+40%	100/15 Summer			
1.005	27	15 Winter	100	+40%	30/15 Winter			
1.006	28	15 Winter	100	+40%	30/15 Summer			
8.000	29	180 Winter	100	+40%				
8.001	30	15 Winter	100	+40%	100/15 Summer			
8.002	31	240 Winter	100	+40%	100/30 Summer			
8.003	32	15 Winter	100	+40%				
9.000	33	15 Winter	100	+40%	100/15 Summer			
9.001	34	15 Winter	100	+40%	100/15 Summer			
9.002	35	120 Winter	100	+40%	100/15 Summer			
9.003	36	120 Winter	100	+40%	30/60 Winter			
9.004	37	120 Winter	100	+40%	30/30 Summer			
9.005	38	60 Winter	100	+40%	1/60 Winter			
9.006	39	180 Winter	100	+40%	1/30 Winter			
8.004	40	15 Winter	100	+40%				
10.000	41	15 Winter	100	+40%	30/15 Winter			
8.005	42	720 Winter	100	+40%	1/15 Winter			
8.006	43	15 Winter	100	+40%	30/15 Winter			
8.007	44	15 Winter	100	+40%	30/15 Summer			
1.007	45	15 Winter	100	+40%	1/15 Summer			
11.000	46	15 Winter	100	+40%	100/15 Summer			
11.001	47	30 Winter	100	+40%	100/15 Summer			
11.002	48	60 Winter	100	+40%	100/15 Summer			
11.003	49	1440 Winter	100	+40%	100/15 Summer			
12.000	50	15 Winter	100	+40%	100/15 Summer			
12.001	51	30 Winter	100	+40%	100/15 Summer			
11.004	52	1440 Winter	100	+40%	100/60 Winter			
1.008	53	15 Winter	100	+40%	1/15 Winter			
13.000	54	15 Winter	100	+40%	100/15 Summer			
13.001	55	15 Winter	100	+40%	30/15 Summer			
1.009	56	15 Winter	100	+40%	1/15 Summer			
1.010	57	1440 Summer	100	+40%				
1.011	58	1440 Summer	100	+40%				
14.000	59	15 Winter	100	+40%				
14.001	60	15 Winter	100	+40%				
14.002	61	1440 Summer	100	+40%	100/120 Winter			
14.003	62	960 Winter	100	+40%	30/360 Winter			
1.012	63	960 Winter	100	+40%	1/120 Summer			
1.013	64	1440 Summer	100	+40%				
1.014	65	1440 Winter	100	+40%	30/120 Summer			
1.015	66	1440 Winter	100	+40%	30/120 Summer			
15.000	67	15 Winter	100	+40%	100/15 Winter			
15.001	68	15 Winter	100	+40%	100/15 Summer			
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Waterman Group						Page 28			
Pickfords Wharf Clink Street London, SE1 9DG			MIRA LAND SOUTH OF A5 EED13833						
Date 11/01/2022 File SURFACE WATER DRAINAGE ...			Designed by AS Checked by HC						
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
6.000	20	86.725	-0.225	0.000	0.45			81.4	OK
6.001	21	86.652	-0.161	0.000	0.43			133.1	OK
7.000	22	86.778	-0.172	0.000	0.60			111.0	OK
7.001	23	86.708	-0.069	0.000	0.59			144.1	OK
6.002	24	86.582	0.167	0.000	1.57			278.4	SURCHARGED
6.003	25	86.486	0.344	0.000	0.07			3.9	SURCHARGED
1.004	26	85.735	2.600	0.000	0.74			247.4	SURCHARGED
1.005	27	85.446	2.911	0.000	0.72			294.5	SURCHARGED
1.006	28	84.990	3.355	0.000	0.99			370.3	SURCHARGED
8.000	29	84.501	-0.149	0.000	0.34			66.7	OK
8.001	30	84.692	0.313	0.000	1.43			283.1	SURCHARGED
8.002	31	84.381	0.273	0.000	0.21			41.3	SURCHARGED
8.003	32	83.592	-0.245	0.000	0.42			83.4	OK
9.000	33	85.117	0.117	0.000	0.28			54.2	SURCHARGED
9.001	34	85.008	0.249	0.000	1.37			268.6	SURCHARGED
9.002	35	84.818	0.300	0.000	0.58			114.7	SURCHARGED
9.003	36	84.810	0.532	0.000	0.83			163.4	SURCHARGED
9.004	37	84.746	0.708	0.000	0.35			48.9	SURCHARGED
9.005	38	84.691	0.966	0.000	1.45			55.1	SURCHARGED
9.006	39	84.447	0.976	0.000	1.19			48.6	SURCHARGED
8.004	40	82.919	-0.197	0.000	0.58			223.7	OK
10.000	41	83.941	0.641	0.000	1.79			68.0	SURCHARGED
8.005	42	82.715	0.363	0.000	0.40			79.7	SURCHARGED
8.006	43	83.748	1.694	0.000	0.67			124.7	SURCHARGED
8.007	44	83.821	1.901	0.000	0.64			119.9	SURCHARGED
1.007	45	83.883	3.348	0.000	2.55			386.9	SURCHARGED
11.000	46	83.372	0.647	0.000	1.50			305.7	SURCHARGED
11.001	47	82.640	0.324	0.000	1.11			229.0	SURCHARGED
11.002	48	82.066	0.245	0.000	1.20			235.1	SURCHARGED
11.003	49	81.893	0.296	0.000	0.24			46.7	SURCHARGED
12.000	50	83.530	0.730	0.000	1.55			315.9	SURCHARGED
12.001	51	82.697	0.308	0.000	1.28			264.0	SURCHARGED
11.004	52	81.891	0.514	0.000	0.18			32.5	SURCHARGED
1.008	53	82.393	2.077	0.000	1.80			341.7	SURCHARGED
13.000	54	82.561	0.761	0.000	0.97			36.5	SURCHARGED
13.001	55	82.375	0.824	0.000	2.22			81.7	SURCHARGED
1.009	56	81.850	1.698	0.000	3.02			421.0	SURCHARGED
1.010	57	80.072	0.000	0.000	0.94			150.7	SURCHARGED*
1.011	58	79.992	0.000	0.000	0.94			150.6	SURCHARGED*
14.000	59	82.300	0.000	0.000	1.13			62.2	SURCHARGED*
14.001	60	81.800	0.000	0.000	1.20			90.9	SURCHARGED*
14.002	61	81.076	0.276	0.000	0.36			10.9	SURCHARGED*
14.003	62	81.550	0.795	0.000	0.21			10.0	SURCHARGED
1.012	63	81.543	1.632	0.000	0.83			113.8	SURCHARGED
1.013	64	79.838	0.000	0.000	0.69			111.3	SURCHARGED*
1.014	65	80.805	1.067	0.000	0.75			107.8	SURCHARGED
1.015	66	80.689	1.051	0.000	0.17			83.7	SURCHARGED*
15.000	67	81.401	0.201	0.000	0.21			130.0	SURCHARGED
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Waterman Group		Page 29
Pickfords Wharf	MIRA	
Clink Street	LAND SOUTH OF A5	
London, SE1 9DG	EED13833	
Date 11/01/2022	Designed by AS	
File SURFACE WATER DRAINAGE ...	Checked by HC	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water	Surcharged	Flooded			Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
15.001	68	81.150	0.450	0.000	0.31			161.4	SURCHARGED

	US/MH	Level
PN	Name	Exceeded
6.000	20	
6.001	21	
7.000	22	
7.001	23	
6.002	24	
6.003	25	
1.004	26	
1.005	27	
1.006	28	
8.000	29	
8.001	30	
8.002	31	
8.003	32	
9.000	33	
9.001	34	
9.002	35	
9.003	36	
9.004	37	
9.005	38	
9.006	39	
8.004	40	
10.000	41	
8.005	42	
8.006	43	
8.007	44	
1.007	45	
11.000	46	
11.001	47	
11.002	48	
11.003	49	
12.000	50	
12.001	51	
11.004	52	
1.008	53	
13.000	54	
13.001	55	
1.009	56	
1.010	57	
1.011	58	
14.000	59	
14.001	60	
14.002	61	

Waterman Group		Page 30
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze		Network 2020.1.3
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>		
	US/MH	Level
PN	Name	Exceeded
14.003		62
1.012		63
1.013		64
1.014		65
1.015		66
15.000		67
15.001		68
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Waterman Group		Page 31						
Pickfords Wharf Clink Street London, SE1 9DG		MIRA LAND SOUTH OF A5 EED13833						
Date 11/01/2022 File SURFACE WATER DRAINAGE ...		Designed by AS Checked by HC						
Innovyze		Network 2020.1.3						
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
15.002	69	15 Winter	100	+40%	100/15 Summer			
15.003	70	15 Winter	100	+40%	100/15 Summer			
16.000	71	15 Winter	100	+40%	30/15 Summer			
16.001	72	15 Winter	100	+40%	30/15 Summer			
16.002	73	360 Winter	100	+40%	100/15 Summer			
16.003	74	360 Winter	100	+40%	100/15 Summer			
16.004	75	360 Winter	100	+40%	30/120 Winter			
16.005	76	180 Winter	100	+40%	30/15 Summer			
16.006	77	180 Winter	100	+40%	30/30 Winter			
16.007	78	1440 Winter	100	+40%	100/15 Summer			
16.008	79	1440 Winter	100	+40%	100/15 Summer			
16.009	80	1440 Winter	100	+40%	100/15 Summer			
17.000	81	15 Winter	100	+40%				
17.001	82	15 Winter	100	+40%				
18.000	83	120 Winter	100	+40%	100/15 Summer			
18.001	84	120 Winter	100	+40%	100/15 Summer			
18.002	85	120 Winter	100	+40%	30/30 Winter			
18.003	86	120 Winter	100	+40%	30/15 Summer			
18.004	87	1440 Winter	100	+40%	100/960 Winter			
18.005	88	1440 Winter	100	+40%	100/600 Winter			
17.002	89	1440 Winter	100	+40%	100/120 Winter			
16.010	90	1440 Winter	100	+40%	30/360 Winter			
16.011	91	1440 Winter	100	+40%	30/360 Winter			
16.012	92	1440 Winter	100	+40%	30/360 Summer			
16.013	93	1440 Winter	100	+40%	1/480 Winter			
19.000	94	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
19.001	95	1440 Winter	100	+40%	100/15 Summer			
19.002	96	1440 Winter	100	+40%	30/15 Summer			
19.003	97	1440 Winter	100	+40%	30/360 Winter			
19.004	98	1440 Winter	100	+40%	30/240 Winter			
20.000	99	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
20.001	100	1440 Winter	100	+40%	30/15 Summer			
19.005	101	1440 Winter	100	+40%	30/120 Winter			
16.014	102	1440 Winter	100	+40%	1/15 Summer			
1.016	103	1440 Winter	100	+40%	1/15 Summer			
1.017	104	15 Summer	1	+0%				
1.018	105	1440 Winter	100	+40%	1/480 Summer			
21.000	106	15 Winter	100	+40%	100/15 Summer			
21.001	107	15 Winter	100	+40%	100/15 Summer			
21.002	108	15 Winter	100	+40%	100/15 Summer			
21.003	109	15 Winter	100	+40%	100/15 Summer			
22.000	110	15 Winter	100	+40%	30/15 Summer			
22.001	111	60 Winter	100	+40%	100/15 Summer			
22.002	112	60 Winter	100	+40%	30/30 Winter			
22.003	113	60 Winter	100	+40%	30/30 Winter			
22.004	114	60 Winter	100	+40%	30/30 Winter			
22.005	115	480 Winter	100	+40%	100/60 Winter			
23.000	116	15 Winter	100	+40%	100/15 Summer			
24.000	117	15 Winter	100	+40%	100/15 Summer			
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Waterman Group							Page 32		
Pickfords Wharf Clink Street London, SE1 9DG				MIRA LAND SOUTH OF A5 EED13833					
Date 11/01/2022				Designed by AS					
File SURFACE WATER DRAINAGE ...				Checked by HC					
Innovyze				Network 2020.1.3					
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
		Water	Surcharged	Flooded			Half Drain	Pipe	
PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status
15.002	69	81.009	0.609	0.000	0.38			199.6	SURCHARGED
15.003	70	80.867	0.767	0.000	0.64			220.5	SURCHARGED
16.000	71	82.316	1.525	0.000	2.35			349.5	SURCHARGED
16.001	72	81.364	0.730	0.000	2.23			333.3	SURCHARGED
16.002	73	80.903	0.439	0.000	0.48			71.6	SURCHARGED
16.003	74	80.917	0.627	0.000	0.80			117.8	SURCHARGED
16.004	75	80.917	0.773	0.000	0.51			75.6	SURCHARGED
16.005	76	81.158	1.178	0.000	1.40			207.5	SURCHARGED
16.006	77	81.160	1.333	0.000	0.32			46.0	SURCHARGED
16.007	78	80.205	0.475	0.000	0.30			40.8	SURCHARGED
16.008	79	80.195	0.525	0.000	0.28			40.3	SURCHARGED
16.009	80	80.183	0.605	0.000	0.31			40.8	SURCHARGED
17.000	81	82.321	-0.204	0.000	0.56			144.9	OK
17.001	82	81.802	-0.223	0.000	0.49			283.7	OK
18.000	83	81.326	0.681	0.000	0.58			87.2	SURCHARGED
18.001	84	81.309	0.830	0.000	0.66			99.3	SURCHARGED
18.002	85	81.270	0.975	0.000	0.60			89.9	SURCHARGED
18.003	86	81.194	1.098	0.000	0.78			116.1	SURCHARGED
18.004	87	80.069	0.136	0.000	0.37			54.5	SURCHARGED
18.005	88	80.069	0.262	0.000	0.17			38.1	SURCHARGED
17.002	89	80.069	0.508	0.000	0.10			22.2	SURCHARGED
16.010	90	80.173	0.797	0.000	0.60			61.0	SURCHARGED
16.011	91	80.172	0.813	0.000	0.47			66.3	SURCHARGED
16.012	92	80.170	0.908	0.000	0.47			66.2	SURCHARGED
16.013	93	80.167	1.149	0.000	0.43			27.9	SURCHARGED
19.000	94	80.853	1.203	3.206	2.80			416.5	FLOOD
19.001	95	80.276	0.789	0.000	0.27			40.2	SURCHARGED
19.002	96	80.271	0.978	0.000	0.38			56.8	SURCHARGED
19.003	97	80.265	1.122	0.000	0.42			60.3	SURCHARGED
19.004	98	80.258	1.221	0.000	0.46			65.8	SURCHARGED
20.000	99	80.853	1.203	3.200	1.91			72.5	FLOOD
20.001	100	80.254	0.866	0.000	0.13			4.8	SURCHARGED
19.005	101	80.252	1.320	0.000	0.10			14.3	SURCHARGED
16.014	102	80.144	1.672	0.000	0.51			35.0	SURCHARGED
1.016	103	79.988	1.686	0.000	3.03			104.8	SURCHARGED*
1.017	104	78.207	0.000	0.000	1.95			67.4	SURCHARGED*
1.018	105	78.552	0.438	0.000	1.16			85.6	SURCHARGED*
21.000	106	80.678	0.878	0.000	0.47			125.3	SURCHARGED
21.001	107	80.503	1.053	0.000	0.72			151.6	FLOOD RISK
21.002	108	80.381	1.085	0.000	0.96			176.0	FLOOD RISK
21.003	109	80.280	1.107	0.000	0.32			143.9	SURCHARGED
22.000	110	80.279	0.554	0.000	1.90			284.5	SURCHARGED
22.001	111	79.960	0.410	0.000	0.90			137.6	SURCHARGED
22.002	112	79.787	0.465	0.000	1.40			209.1	SURCHARGED
22.003	113	79.526	0.378	0.000	1.59			235.1	SURCHARGED
22.004	114	79.186	0.181	0.000	1.99			270.9	SURCHARGED
22.005	115	79.159	0.221	0.000	0.22			31.7	SURCHARGED
23.000	116	80.446	0.612	0.000	0.87			252.3	SURCHARGED
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Waterman Group		Page 33
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

		Water	Surcharged	Flooded		Half Drain	Pipe	
PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Status
24.000	117	80.411	0.611	0.000	0.33		89.3	SURCHARGED

PN	US/MH Name	Level Exceeded
15.002	69	
15.003	70	
16.000	71	
16.001	72	
16.002	73	
16.003	74	
16.004	75	
16.005	76	
16.006	77	
16.007	78	
16.008	79	
16.009	80	
17.000	81	
17.001	82	
18.000	83	
18.001	84	
18.002	85	
18.003	86	
18.004	87	
18.005	88	
17.002	89	
16.010	90	
16.011	91	
16.012	92	
16.013	93	
19.000	94	2
19.001	95	
19.002	96	
19.003	97	
19.004	98	
20.000	99	3
20.001	100	
19.005	101	
16.014	102	
1.016	103	
1.017	104	
1.018	105	
21.000	106	
21.001	107	
21.002	108	
21.003	109	
22.000	110	

Waterman Group		Page 34
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833	
Date 11/01/2022	Designed by AS	
File SURFACE WATER DRAINAGE ...	Checked by HC	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Level Exceeded
22.001		111
22.002		112
22.003		113
22.004		114
22.005		115
23.000		116
24.000		117

Waterman Group								Page 35	
Pickfords Wharf Clink Street London, SE1 9DG				MIRA LAND SOUTH OF A5 EED13833					
Date 11/01/2022				Designed by AS					
File SURFACE WATER DRAINAGE ...				Checked by HC					
Innovyze				Network 2020.1.3					
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
23.001	118	15 Winter	100	+40%	100/15 Summer				
23.002	119	15 Winter	100	+40%	100/15 Summer				
23.003	120	15 Winter	100	+40%	100/15 Summer				
21.004	121	15 Winter	100	+40%	30/15 Summer				
21.005	122	15 Winter	100	+40%					
21.006	123	1440 Winter	100	+40%	30/1440 Winter				
1.019	124	1440 Winter	100	+40%					
25.000	125	30 Winter	100	+40%	100/15 Summer				
25.001	126	30 Winter	100	+40%	30/15 Summer				
25.002	127	60 Winter	100	+40%	30/30 Winter				
25.003	128	600 Winter	100	+40%	30/30 Winter				
25.004	129	600 Winter	100	+40%	30/30 Winter				
25.005	130	600 Winter	100	+40%	30/240 Winter	100/360 Winter			
25.006	131	600 Winter	100	+40%	30/120 Winter	100/480 Winter			
25.007	132	600 Winter	100	+40%	30/120 Summer	100/480 Winter			
26.000	133	60 Winter	100	+40%	100/15 Summer				
26.001	134	60 Winter	100	+40%	30/30 Summer				
26.002	135	120 Winter	100	+40%	30/60 Winter				
26.003	136	15 Winter	100	+40%	30/60 Winter				
26.004	137	15 Winter	100	+40%	100/15 Summer				
26.005	138	15 Winter	100	+40%	100/15 Summer				
26.006	139	15 Winter	100	+40%	100/15 Summer				
25.008	140	480 Winter	100	+40%	30/60 Summer	100/600 Winter			
27.000	141	15 Winter	100	+40%	30/15 Summer				
27.001	142	15 Winter	100	+40%	30/15 Summer				
27.002	143	60 Winter	100	+40%					
27.003	144	60 Winter	100	+40%					
27.004	145	240 Winter	100	+40%					
27.005	146	240 Winter	100	+40%					
27.006	147	15 Winter	100	+40%					
27.007	148	15 Winter	100	+40%					
27.008	149	15 Winter	100	+40%					
27.009	150	15 Winter	100	+40%					
27.010	151	15 Winter	100	+40%					
27.011	152	960 Winter	100	+40%	100/240 Winter				
25.009	153	960 Winter	100	+40%	1/960 Winter				
25.010	154	1440 Summer	100	+40%					
25.011	155	1440 Summer	100	+40%					
25.012	156	1440 Summer	100	+40%	1/180 Winter				
25.013	157	960 Winter	100	+40%	30/180 Summer				
1.020	158	1440 Winter	100	+40%					
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
23.001	118	80.387	0.649	0.000	1.38			401.9	SURCHARGED
23.002	119	80.265	0.625	0.000	1.51			410.0	SURCHARGED
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Waterman Group		Page 36
Pickfords Wharf	MIRA	
Clink Street	LAND SOUTH OF A5	
London, SE1 9DG	EED13833	
Date 11/01/2022	Designed by AS	
File SURFACE WATER DRAINAGE ...	Checked by HC	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
23.003	120	80.136	0.559	0.000	1.65		395.0	SURCHARGED
21.004	121	79.532	1.011	0.000	2.62		420.9	SURCHARGED*
21.005	122	78.396	0.000	0.000	2.62		421.6	SURCHARGED*
21.006	123	78.132	0.026	0.000	0.52		34.4	SURCHARGED*
1.019	124	77.979	-0.141	0.000	0.81		107.2	OK
25.000	125	84.353	0.703	0.000	0.96		287.4	SURCHARGED
25.001	126	84.239	1.341	0.000	1.47		445.5	SURCHARGED
25.002	127	82.534	0.529	0.000	1.16		337.3	SURCHARGED
25.003	128	82.266	0.747	0.000	0.76		217.8	SURCHARGED
25.004	129	82.153	1.061	0.000	0.80		230.1	SURCHARGED
25.005	130	82.024	1.375	2.927	0.79		114.6	FLOOD
25.006	131	82.003	1.476	3.057	0.76		111.5	FLOOD
25.007	132	82.001	1.603	0.919	0.80		110.8	FLOOD
26.000	133	84.145	0.495	0.000	0.95		145.6	SURCHARGED
26.001	134	84.099	0.686	0.000	1.57		239.1	SURCHARGED
26.002	135	83.627	0.448	0.000	1.34		204.2	SURCHARGED
26.003	136	83.870	0.936	0.000	1.11		169.6	SURCHARGED
26.004	137	83.787	1.103	0.000	1.02		315.6	SURCHARGED
26.005	138	83.654	1.141	0.000	1.28		869.2	FLOOD RISK
26.006	139	82.392	0.638	0.000	1.25		1028.5	SURCHARGED
25.008	140	81.991	1.668	0.000	0.39		225.4	FLOOD RISK
27.000	141	83.590	0.940	0.000	2.98		394.8	FLOOD RISK
27.001	142	83.075	0.482	0.000	2.88		391.2	SURCHARGED
27.002	143	82.469	-0.057	0.000	0.84		118.9	OK
27.003	144	82.408	-0.030	0.000	1.00		142.5	OK
27.004	145	82.321	-0.021	0.000	0.18		24.5	OK
27.005	146	81.886	-0.389	0.000	0.04		24.5	OK
27.006	147	81.026	-0.198	0.000	0.11		15.2	OK
27.007	148	81.026	-0.102	0.000	0.35		45.6	OK
27.008	149	80.986	-0.092	0.000	0.39		53.2	OK
27.009	150	80.940	-0.062	0.000	0.98		141.8	OK
27.010	151	80.636	-0.249	0.000	0.40		219.3	OK
27.011	152	80.173	0.372	0.000	0.90		86.2	SURCHARGED
25.009	153	80.282	1.777	0.000	1.96		212.1	SURCHARGED
25.010	154	78.467	0.000	0.000	1.13		182.4	SURCHARGED*
25.011	155	78.402	0.000	0.000	1.13		182.3	SURCHARGED*
25.012	156	78.891	0.701	0.000	1.86		137.8	SURCHARGED*
25.013	157	78.354	0.286	0.000	2.46		145.2	SURCHARGED
1.020	158	77.851	-0.749	0.000	0.08		247.8	OK

PN	US/MH Name	Level Exceeded
23.001	118	
23.002	119	
23.003	120	
21.004	121	

Waterman Group		Page 37																																																																																																																	
Pickfords Wharf Clink Street London, SE1 9DG	MIRA LAND SOUTH OF A5 EED13833																																																																																																																		
Date 11/01/2022 File SURFACE WATER DRAINAGE ...	Designed by AS Checked by HC																																																																																																																		
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>																																																																																																																			
	<table><tr><th>PN</th><th>US/MH Name</th><th>Level Exceeded</th></tr><tr><td>21.005</td><td>122</td><td></td></tr><tr><td>21.006</td><td>123</td><td></td></tr><tr><td>1.019</td><td>124</td><td></td></tr><tr><td>25.000</td><td>125</td><td></td></tr><tr><td>25.001</td><td>126</td><td></td></tr><tr><td>25.002</td><td>127</td><td></td></tr><tr><td>25.003</td><td>128</td><td></td></tr><tr><td>25.004</td><td>129</td><td></td></tr><tr><td>25.005</td><td>130</td><td>4</td></tr><tr><td>25.006</td><td>131</td><td>2</td></tr><tr><td>25.007</td><td>132</td><td>2</td></tr><tr><td>26.000</td><td>133</td><td></td></tr><tr><td>26.001</td><td>134</td><td></td></tr><tr><td>26.002</td><td>135</td><td></td></tr><tr><td>26.003</td><td>136</td><td></td></tr><tr><td>26.004</td><td>137</td><td></td></tr><tr><td>26.005</td><td>138</td><td></td></tr><tr><td>26.006</td><td>139</td><td></td></tr><tr><td>25.008</td><td>140</td><td></td></tr><tr><td>27.000</td><td>141</td><td></td></tr><tr><td>27.001</td><td>142</td><td></td></tr><tr><td>27.002</td><td>143</td><td></td></tr><tr><td>27.003</td><td>144</td><td></td></tr><tr><td>27.004</td><td>145</td><td></td></tr><tr><td>27.005</td><td>146</td><td></td></tr><tr><td>27.006</td><td>147</td><td></td></tr><tr><td>27.007</td><td>148</td><td></td></tr><tr><td>27.008</td><td>149</td><td></td></tr><tr><td>27.009</td><td>150</td><td></td></tr><tr><td>27.010</td><td>151</td><td></td></tr><tr><td>27.011</td><td>152</td><td></td></tr><tr><td>25.009</td><td>153</td><td></td></tr><tr><td>25.010</td><td>154</td><td></td></tr><tr><td>25.011</td><td>155</td><td></td></tr><tr><td>25.012</td><td>156</td><td></td></tr><tr><td>25.013</td><td>157</td><td></td></tr><tr><td>1.020</td><td>158</td><td></td></tr></table>	PN	US/MH Name	Level Exceeded	21.005	122		21.006	123		1.019	124		25.000	125		25.001	126		25.002	127		25.003	128		25.004	129		25.005	130	4	25.006	131	2	25.007	132	2	26.000	133		26.001	134		26.002	135		26.003	136		26.004	137		26.005	138		26.006	139		25.008	140		27.000	141		27.001	142		27.002	143		27.003	144		27.004	145		27.005	146		27.006	147		27.007	148		27.008	149		27.009	150		27.010	151		27.011	152		25.009	153		25.010	154		25.011	155		25.012	156		25.013	157		1.020	158	
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G. Foul Water Calculations and Diversion information

Appendices



Project Title: MIRA South - Existing
Calculations Title: Existing Foul Flow Estimate

Sheet No: 1 of 5
By: K. Tolson
Checked: H. Chetty
Project No: EED13833
Date: 14.01.2021
Date: 14.01.2021

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential				2.12	24	
Existing property = 160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units			0.000
New property = 125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	0 proposed units			0.000
Occupancy = 2.5 persons						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.000
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.000
Offices	750.0 litres per 100m ²	Jones (1992)	m ²	3	10	0.000
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	8	0.000
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	16	0.000
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.000
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.000
Hospital	750.0 litres per bed	Jones (1992)	0 beds	3	3 DWF Flat	0.000
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.000
Restaurant	30.0 litres per cover	British Water (2013)	0 covers	3	8	0.000
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	12	0.000
Warehouse	150.0 litres per 100m ²	Jones (1992)	m ²	3	3 DWF Flat	0.000
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Commercial	300.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
SUB TOTAL						0.0
Infiltration percentage	8%					0.0
TOTAL						0.0

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



Project Title: MIRA South - Zone 30
Calculations Title: Proposed Foul Flow Estimate

Sheet No: 2 of 5 Project No: EED13833
By: K. Tolson Date: 14.01.2021
Checked: H. Chetty Date: 14.01.2021

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential				2.12	24	
Existing property = 160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units			0.000
New property = 125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	0 proposed units			0.000
Occupancy = 2.5 persons						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.000
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.000
Offices	750.0 litres per 100m ²	Jones (1992)	m ²	3	10	0.000
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	8	0.000
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	16	0.000
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.000
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.000
Hospital	750.0 litres per bed	Jones (1992)	0 beds	3	3 DWF Flat	0.000
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.000
Restaurant	30.0 litres per cover	British Water (2013)	0 covers	3	8	0.000
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	12	0.000
Warehouse	150.0 litres per 100m ²	Jones (1992)	m ²	3	3 DWF Flat	0.000
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Commercial	300.0 litres per 100m ²	Jones (1992)	81250 m ²	3	3 DWF Flat	8.464
SUB TOTAL						8.5
Infiltration percentage	8%					0.7
TOTAL						9.1

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



Project Title: MIRA South - Zone 1
Calculations Title: Proposed Foul Flow Estimate

Sheet No: 3 of 5 Project No: EED13833
By: K. Tolson Date: 14.01.2021
Checked: H. Chetty Date: 14.01.2021

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential				2.12	24	
Existing property = 160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units			0.000
New property = 125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	0 proposed units			0.000
Occupancy = 2.5 persons						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.000
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.000
Offices	750.0 litres per 100m ²	Jones (1992)	m ²	3	10	0.000
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	8	0.000
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	16	0.000
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.000
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.000
Hospital	750.0 litres per bed	Jones (1992)	0 beds	3	3 DWF Flat	0.000
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.000
Restaurant	30.0 litres per cover	British Water (2013)	0 covers	3	8	0.000
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	12	0.000
Warehouse	150.0 litres per 100m ²	Jones (1992)	m ²	3	3 DWF Flat	0.000
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Commercial	300.0 litres per 100m ²	Jones (1992)	17500 m ²	3	3 DWF Flat	1.823
SUB TOTAL						1.8
Infiltration percentage	8%					0.1
TOTAL						2.0

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



Project Title: MIRA South - Zone 10
Calculations Title: Proposed Foul Flow Estimate

Sheet No: 4 of 5 Project No: EED13833
By: K. Tolson Date: 14.01.2021
Checked: H. Chetty Date: 14.01.2021

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential				2.12	24	
Existing property = 160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units			0.000
New property = 125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	0 proposed units			0.000
Occupancy = 2.5 persons						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.000
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.000
Offices	750.0 litres per 100m ²	Jones (1992)	m ²	3	10	0.000
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	8	0.000
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	16	0.000
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.000
Boarding School	175.0 litres per pupil	British Water (2013)	pupils	3	24	0.000
Hospital	750.0 litres per bed	Jones (1992)	0 beds	3	3 DWF Flat	0.000
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.000
Restaurant	30.0 litres per cover	British Water (2013)	0 covers	3	8	0.000
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	12	0.000
Warehouse	150.0 litres per 100m ²	Jones (1992)	m ²	3	3 DWF Flat	0.000
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Commercial	300.0 litres per 100m ²	Jones (1992)	18500 m ²	3	3 DWF Flat	1.927
SUB TOTAL						1.9
Infiltration percentage	8%					0.2
TOTAL						2.1

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



Project Title: MIRA South - Zone 20
Calculations Title: Proposed Foul Flow Estimate

Sheet No: 5 of 5 Project No: EED13833
By: K. Tolson Date: 14.01.2021
Checked: H. Chetty Date: 14.01.2021

	Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential				2.12	24	
Existing property = 160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units			0.000
New property = 125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	0 proposed units			0.000
Occupancy = 2.5 persons						
Hotel	500.0 litres per room	British Water (2013)	0 rooms	3	24	0.000
Student Accommodation	200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.000
Offices	750.0 litres per 100m ²	Jones (1992)	m ²	3	10	0.000
Retail	400.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Cinema	10.0 litres per seat	Jones (1992)	0 seats*	3	8	0.000
Health Club/Sports Centre	50.0 litres per customer	British Water (2013)	0 customers**	3	16	0.000
Day School	90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.000
Boarding School	175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.000
Hospital	750.0 litres per bed	Jones (1992)	0 beds	3	3 DWF Flat	0.000
Nursing Home	350.0 litres per bed	British Water (2013)	0 beds	3	24	0.000
Restaurant	30.0 litres per cover	British Water (2013)	0 covers	3	8	0.000
Pub/Club	15.0 litres per customer	Butler and Davies (2004)	0 customers***	3	12	0.000
Warehouse	150.0 litres per 100m ²	Jones (1992)	m ²	3	3 DWF Flat	0.000
Manufacturing	550.0 litres per 100m ²	Jones (1992)	0 m ²	3	3 DWF Flat	0.000
Commercial	300.0 litres per 100m ²	Jones (1992)	96250 m ²	3	3 DWF Flat	10.026
SUB TOTAL						10.0
Infiltration percentage	8%					0.8
TOTAL						10.8

* Foul flow rate needs to be calculated based on number of seats. An allowance of 4m² has been made for each seat.

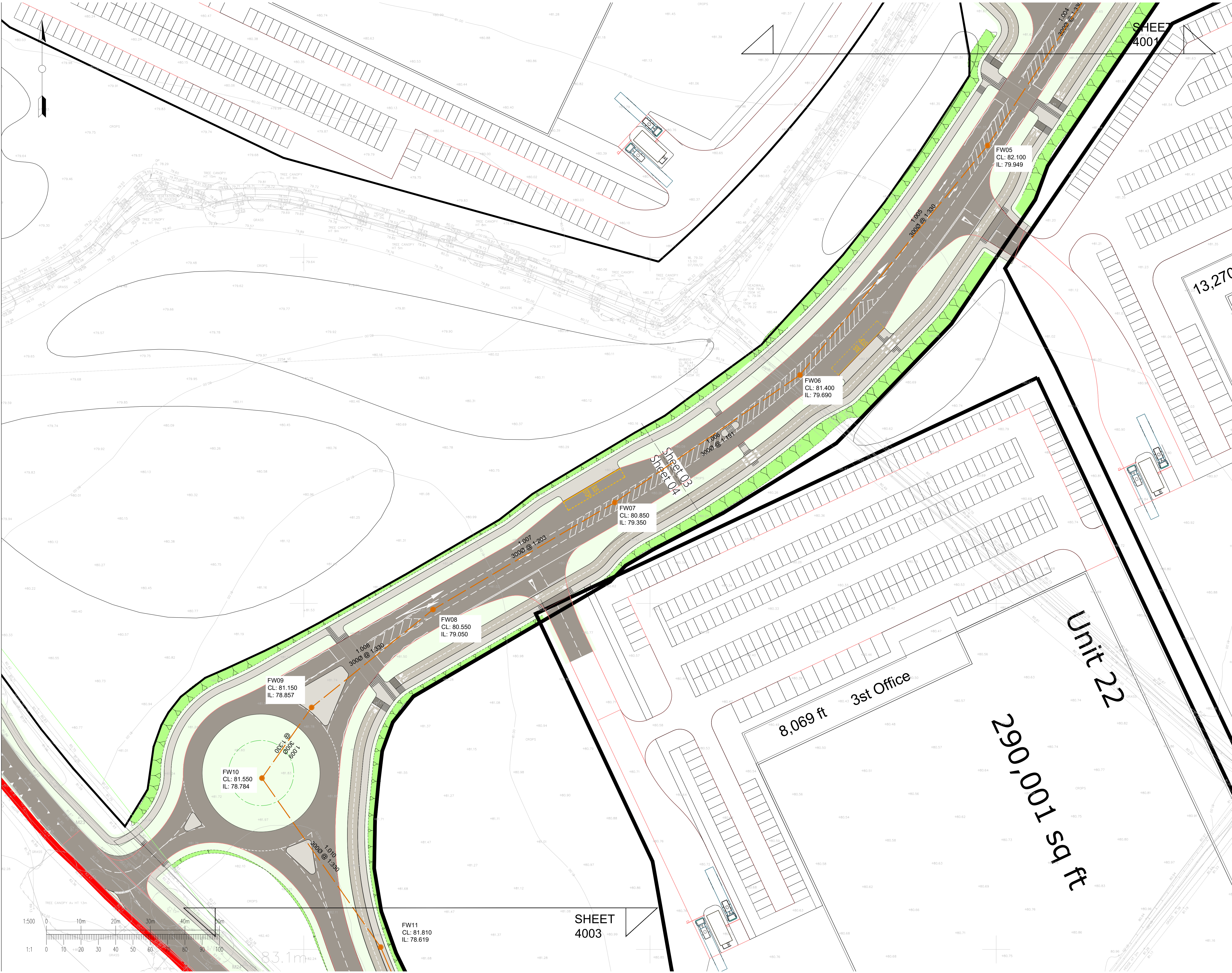
Floor area = 0 m² 4 m² per person

** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person

*** Foul flow rate needs to be calculated based on number of customers. An allowance of 4m² has been made for each customer.

Floor area = 0 m² 4 m² per person



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KEY

PROPOSED FOUL PRIVATE DRAINAGE SYSTEM

Rev	Date	Description	By
A03	03.08.22	MASTER PLAN UPDATED.	AKL
A02	24.05.22	DRAINAGE REVISED TO SUIT NEW LAYOUT.	AKL
A01	21.12.21	FIRST ISSUE	AS

Amendments

Project	Title	Client
MIRA Technology Park	MIRA Southern Manufacturing Sector Proposed Foul Water Layout S185 Diversion - Sheet 2 of 3	HORIBA MIRA

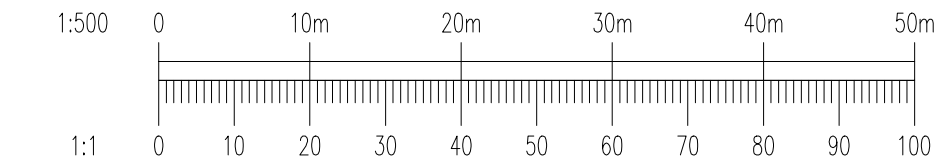
Waterman

Pickfords Wharf Clink Street London SE1 9DG
1 020 7928 7888
mail@watermangroup.com www.watermangroup.com

Designed By	Checked By	Waterman Ref
AS	HC	WIB13833

Drawn By	Date	Scales @ A1
AS	DEC 2021	1:500

Project	Originator	Volume	Level	Type	Role	Number	Revision
13833-WIB-SMS-XX-DR-C-04002							A03



SHEET
4002

CL: 81.810
IL: 78.619

FW12
CL: 81.770
IL: 78.414

FW13
CL: 81.450
IL: 78.160

FW14
CL: 81.430
IL: 77.930

FW15
CL: 81.000
IL: 77.724

S38
CL: 81.000
IL: 77.542

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KEY

PROPOSED FOUL PRIVATE DRAINAGE SYSTEM

A03	03.08.22	MASTER PLAN UPDATED.	AKL
A02	24.05.22	DRAINAGE REVISED TO SUIT NEW LAYOUT.	AKL
A01	21.12.21	FIRST ISSUE	AS
Rev	Date	Description	By

Amendments	
Project	MIRA Technology Park
Title	MIRA Southern Manufacturing Sector Proposed Foul Water Layout S185 Diversion - Sheet 3 of 3
Client	HORIBA MIRA



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Designed By	AS	Checked By	HC	Waterman Ref	WIB13833
Drawn By	AS	Date	DEC 2021	Scales @ A1	1:500
Project - Originator - Volume - Level - Type - Role - Number					Revision
13833-WIB-SMS-XX-DR-C-04003					A03



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- ALL CONNECTIONS TO PUBLIC SEWERS TO BE AGREED WITH SEVERN TRENT WATER PRIOR TO CONSTRUCTION.

KEY

PROPOSED FOUL PRIVATE DRAINAGE SYSTEM

Rev	Date	Description	By
A03	03.08.22	MASTER PLAN UPDATED.	AKL
A02	24.05.22	DRAINAGE REVISED TO SUIT NEW LAYOUT.	AKL
A01	21.12.21	FIRST ISSUE	AS

Amendments

Project	MIRA Technology Park
Title	MIRA Southern Manufacturing Sector Proposed Foul Water Layout S185 Diversion - Sheet 1 of 3
Client	HORIBA MIRA

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Designed By	AS	Checked By	HC	Waterman Ref	WIB13833
Drawn By	AS	Date	DEC 2021	Scales @ A1	1:500
Project - Originator - Volume - Level - Type - Role - Number					Revision
13833-WIB-SMS-XX-DR-C-04001					A03

UK and Ireland Office Locations

