

Project Name : Bilsham Road, Yapton

Job No : 19-326

Note Title : Drainage Strategy and MMP

Author : JW

Checked : NA

Approved : GG

Date : August 2021

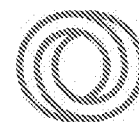
1.0 INTRODUCTION

1.1 *Background*

1.1.1 Odyssey has been commissioned by Bilsham Road Development LLP to undertake a surface water and foul drainage strategy to support a reserved matters application associated with the proposed residential development at Bilsham Road, Yapton.

1.1.2 A planning application was submitted to Arun District Council (ADC) in December 2017 (reference Y/91/17/OUT) along with a Flood Risk Assessment (FRA) and Drainage Strategy completed by Odyssey. Outline planning permission was granted in April 2019, subject to selected conditions. This drainage statement addresses conditions 9, 10 and 12 relating to surface water drainage, Sustainable Drainage Systems (SuDS) maintenance and foul drainage respectively. The decision notice is provided in **Appendix A**.

1.1.3 Comments were received from ADC in February 2021 in relation to the reserved matters application (Ref. Y/152/20/RES) for the above site; these comments have also been addressed in the revised development proposals. A copy of the previous ADC comments is provided in **Appendix B**.



2.0 PROPOSED SURFACE WATER DRAINAGE

2.1.1 As previously agreed with the ADC Drainage Engineer as part of the outline planning approval, the potential utilisation of infiltration has been further investigated to inform the drainage strategy.

2.1.2 Shallow infiltration testing at the site was undertaken by BRD Environmental in February 2019. The tests were carried out in 18 trial pits across the site at depths between 0.6 metres below ground level (m bgl) and 1.2m bgl. The permeability was too low to calculate a soil infiltration rate in all 18 trial pits. The Soakaway Feasibility Report notes that shallow standing groundwater was recorded at the site during the previous site investigation and in the subsequent groundwater monitoring, and concludes that the use of infiltration alone cannot dispose of all the surface water runoff generated by the proposed development. The Soakaway Feasibility Report is presented in **Appendix C**.

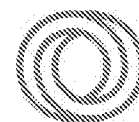
2.1.3 In accordance with the ADC Drainage Engineer's recommendations, it is proposed that a hybrid approach is adopted, where surface water runoff would be attenuated on site and discharged at the approved Q_{BAR} rate, whilst allowing infiltration in areas where the SuDS features are above recorded groundwater levels.

2.1.4 Surface water runoff would be attenuated within attenuation basins prior to restricted discharge to the culvert located to the south of the site. Areas of permeable paving are proposed within private driveways and parking courtyards, which would attenuate some of the surface water flows upstream of the attenuation basins. A cellular storage tank is also proposed to provide additional storage volume within the network. Orifice and vortex flow controls would be utilised to restrict the flows from the SuDS structures.

2.1.5 Any storage structures which could be designed above the peak recorded groundwater levels would incorporate permeable liners to make use of any possible infiltration. Any storage structures below the peak groundwater levels would be lined with an impermeable membrane and would be checked against floatation.

2.1.6 The proposed attenuation basins have been designed to accommodate the 1 in 100 year plus 40% climate change storm event. An additional 10% impermeable roof area has been included within the calculations to account for urban creep and surcharged outfalls included in the outfalls to an open watercourse. Flotation calculations have been undertaken and included in **Appendix D**.

2.1.7 The proposed surface water drainage strategy is shown in **Drawings 19-326/009 and 19-326/010** in **Appendix D**, along with the Micro Drainage calculations.



2.1.8 Exceedance flow routes have been considered for the proposed development and are presented in **Drawings 19-326/013** and **19-326/014** in **Appendix E**.

2.1.9 The impermeable catchment areas are shown in **Drawings 19-326/015** and **19-326/016** in **Appendix F**. The catchment areas for each manhole and SuDS feature are also provided within the Micro Drainage calculations. The proposed surface water discharge rate is based upon the impermeable areas presented.

2.1.10 The “*Pollution hazard indices for different land use classifications*” table has been extracted from CIRIA C753 The SuDS Manual and applied to the development proposals, as shown in **Table 2.1**.

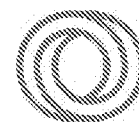
Table 2.1: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4

2.1.11 The proposed attenuation basins would provide treatment for the surface water runoff generated by the development. The SuDS mitigation indices are presented in **Table 2.2**, in accordance with the guidance contained in The SuDS Manual.

Table 2.2: SuDS Mitigation Indices

SuDS Component	TSS	Metals	Hydrocarbons
Detention Basin	0.5	0.5	0.6



2.1.12 **Table 2.2** demonstrates that the mitigation indices of the attenuation basins would exceed the pollution hazard indices for the development, and therefore provide an appropriate level of surface water runoff treatment.

2.1.13 The maintenance of the onsite drainage system would be carried out by a private recognised management company through the implementation of an approved maintenance management plan to minimise the residual risk of drainage system blockage. The operation and maintenance requirements for the surface water drainage system are detailed in **Appendix G**.

3.0 PROPOSED FOUL DRAINAGE

3.1.1 It is proposed that foul flows from the site would connect into the existing Southern Water public foul manhole (ref. 8501) to the east of the site, on Bilsham Road.

3.1.2 Owing to the topography of the site, it would not be possible to achieve a gravity connection into the existing Southern Water network for the entire site. It is therefore proposed that the majority of foul flows would drain by gravity to a foul pumping station to the south of the site, which would pump flows in an eastern direction towards the existing Southern Water network.

3.1.3 The proposed foul drainage strategy is presented in **Appendix D**.

APPENDIX A

Decision Notice



Town & Country Planning Act 1990 (as amended)
Town & country Planning (Development Management
Procedure) (England) Order 2015 - Article 5
Application for Outline Consent
DECISION NOTICE

Application Ref: Y/91/17/OUT

To Addressee

Nexus Planning
 Suite A, 3 Weybridge Business Park
 Addlestone Road
 Weybridge
 Surrey
 KT15 2BW

Site Address

Land at Bilsham Road
 Yapton

Description of Development

Outline application for the development of up to 250 residential dwellings (Class C3), vehicular access, public open space, ancillary works and associated infrastructure. Departure from the Development Plan

In pursuance of their powers under this Act and related Orders and Regulations the Council **PERMIT** this development to be carried out in accordance with the application and plans and subject to compliance with the following conditions and Section 106 Agreement.

- 1 The permission hereby granted is an outline permission under s92 of the Town and Country Planning Act 1990 (as amended) and an application for the approval of the Local Planning Authority to the following matters must be made not later than the expiration of 3 years beginning with the date of this permission:-

- (a) Layout;
- (b) Scale;
- (c) Appearance;
- (d) Landscaping.

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990 (as amended).

- 2 The development hereby permitted shall be begun before the expiration of 5 years from the date of this permission, or before the expiration of 2 years from the date of the approval of the last of the reserved matters to be approved, whichever is the later.

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990 (as amended).

- 3 The development hereby permitted shall be carried out in accordance with the following approved plans:

Site Location Plan - 1244G.01

Parameter Plan - 1244G.02

Proposed Site Access B2132 Bilsham Road - 14-111/201 Rev A

Reason: For the avoidance of doubt and in the interests of amenity and the environment in accordance with policy D DM1 of the Arun Local Plan (2011-2031).

- 4 No development shall take place until a detailed scheme of phasing for the construction of the dwellings and associated highways and public areas has been submitted to and approved in writing by the Local Planning Authority. The scheme shall include a schedule identifying the order of anticipated commencement and completion within each phase of construction.

Reason: For the avoidance of doubt and in the interests of amenity and the environment in accordance with Policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because the phasing of the development needs to be satisfactory before work commences.

- 5 No development in any phase shall be carried out unless and until a schedule of materials and finishes to be used for that phase for external walls and roofs of the proposed buildings has been submitted to and approved by the Local Planning Authority. No development in any phase shall be carried out unless and until a 'statement of detail' for that phase has been submitted to and approved setting out details of proposed windows and doors, the materials and 'statement of details' so approved shall be used in the construction of the buildings.

Reason: To enable the Local Planning Authority to control the development in detail in the interests of amenity by endeavouring to achieve buildings of visual quality in accordance with Policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because the use of satisfactory external materials goes to the heart of the planning permission.

- 6 Prior to the submission of any reserved matters application a design code masterplan shall be submitted to, and approved in writing, by the Local Planning Authority. This document shall demonstrate how the detailed proposals will reflect the objectives of the;

Illustrative Site Layout Plan - 1244G.03A
Design and Access Statement - 19th October 2018

The design code masterplan will provide further details on matters such as character areas, street hierarchy, building typologies, key buildings, the approach to car parking, structural planting, street furniture, lighting and treatment of the public realm. The development shall be carried out in accordance with the approved design code.

Reason: To enable the Local Planning Authority to control the development in details in the interests of amenity by endeavouring to achieve buildings of visual quality in accordance with Policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because the design of the scheme goes to the heart of the planning permission.

- 7 The landscaping and layout particulars to be submitted in accordance with Condition 1 shall include:

- i. Details of all existing trees and hedgerows on the land, showing which are to be retained and which removed;
- ii. Details of the positions, height, design, materials and type of boundary treatment to be provided;
- iii. Details of any proposed alterations in existing ground levels, and of the position of any proposed excavation, within the crown spread of any retained tree
- iv. The detailed landscape design for the development including the layout and design of the public realm within the development;
- v. Details of the surfacing, and signage of all footpaths, and a phasing plan for their provision;

No hedge or tree shall be felled, uprooted or otherwise removed before, during or after the construction period except where removal is indicated on a plan approved by the Local Planning Authority.

Reason: In the interests of amenity and of the environment of the development in accordance with Policy ENV DM4 of the Arun Local Plan.

- 8 Prior to the commencement of each phase of the development an Arboricultural Method Statement and Tree Protection Plan shall be submitted for that phase to and approved in writing by the Local Planning Authority and the development shall be undertaken in strict accordance with the details so approved.

Reason: To ensure the retention and maintenance of trees and vegetation which are an important feature of the area in accordance with Policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition as the protection and retention of trees goes to the heart of the planning permission.

9

Prior to the approval of any reserved matter full details of the proposed surface water drainage scheme shall be submitted to and approved in writing by the local planning authority, and shall include;

- Winter groundwater monitoring to established highest annual ground water levels and percolation testing to BRE 365, or similar approved, will be required to support the design of any infiltration drainage.
- Details of any discharge of any flows to watercourses, the culverting or diversion, infilling or obstruction of any watercourses on the site.
- Arrangements for future access and maintenance of any watercourse or culvert (piped watercourse) crossing or abutting the site.

No building shall be occupied in any phase until the complete surface water drainage system serving it has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with Policies D DM1, W DM2 and W DM3 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition to ensure that the surface water disposal scheme is agreed before construction commences and to protect existing watercourses prior to the commencement of development.

10

Prior to the occupation of each phase full details of the maintenance and management of the surface water drainage system is set out in a site-specific maintenance manual for that phase and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with Policies D DM1, W DM2 and W DM3 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition to ensure that the future maintenance and funding arrangements for the surface water disposal scheme are agreed before construction commences.

- 11 Prior to any building being occupied in a phase, and after completed construction of the surface water drainage system serving it, the owner or management company shall either provide the local planning authority with an updated copy of the management manual incorporating any changes as a result of construction/implementation or confirm in writing that no changes are required to the manual.
- No further changes shall be made to the approved surface water drainage system Maintenance & Management Plan/Regime including the management company responsible or the financial arrangements between the owners of the dwellings & the management company other than with the written consent of the Local Planning Authority.
- The owner or management company shall thereafter strictly adhere to and implement the recommendations contained within the manual to ensure that the system is maintained in perpetuity.
- Reason: To ensure the efficient maintenance and on-going operation of the surface water drainage system and to ensure the best practice in line with guidance set out in 'The SuDS Manual' CIRIA publication ref: C753 Chapter 32, in accordance with Policies D DM1, W DM2 and W DM3 of the Arun Local Plan.
- 12 Prior to the approval of any reserved matter details of a proposed foul drainage system shall be submitted to and approved in writing by the Local Planning Authority (including details of its siting, design and subsequent management/maintenance, if appropriate) and no dwelling shall be occupied until works for the disposal of sewage relating to that dwelling have been fully implemented in accordance with the approved details.
- Reason: To ensure adequate infrastructure is provided to enable the scheme to be satisfactorily drained in accordance with Policies D DM1, W DM1 and W SP1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition as the foul drainage system goes to the heart of the planning permission.
- 13 Prior to the commencement of construction works or any preparatory works for any phase an Ecological Management and Mitigation Plan including a Schedule of Works for that phase shall be submitted to the Local Planning Authority for approval. All approved details shall then be implemented in full and in accordance with the agreed timings and details.
- Reason: This condition is necessary to ensure the protection of wildlife and supporting habitat and secure opportunities for the enhancement of the nature conservation value of the site in line with national guidance and Policy ENV SP1 and ENV DM5 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because of the need ensure measures are in place to protect wildlife and habitats on site prior to any disturbance.

- 14 Prior to the commencement of development the mitigation strategy for reptiles shall be implemented in accordance with the details specified within the 'Detailed Reptile Survey Report (June 2016)'.

Reason: This condition is necessary to ensure the protection of reptiles and supporting habitat in accordance with Policy ENV SP1 and ENV DM5 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because of the need to ensure measures are in place to protect reptiles and their habitat on site prior to any disturbance.

- 15 Prior to the occupation of any dwelling of a particular phase, a scheme for external lighting for that phase shall be submitted and approved in writing by the Local Planning Authority. The scheme shall ensure that the lighting is sensitive to bats by minimising the lighting of the woodland along the southern and western boundaries and shall comply with Institution of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light, Obtrusive Light Limitations for Exterior Lighting Installations for Zone E2.

Reason: To control the residential amenities of the local environment in accordance with Policies D DM1 and QE DM2 of the Arun Local Plan.

- 16 Prior to the commencement of development in each phase, including any works of demolition, a Construction Management Plan shall be submitted for approval in writing by the Local Planning Authority. Thereafter the approved Plan shall be implemented and adhered to throughout the entire construction period of that phase. The Plan shall provide details as appropriate but not necessarily be restricted to the following matters:

- The anticipated number, frequency and types of vehicles used during construction,
- The method of access and routing of vehicles during construction,
- Full details of the construction compound,
- Soil resources plan,
- Dust mitigation measures,
- Noise reduction measures,
- The parking of vehicles by site operatives and visitors,
- The loading and unloading of plant, materials and waste,
- The storage of plant and materials used in construction of the development,
- The erection and maintenance of security hoarding,
- The provision of effective wheel washing facilities and other works required to mitigate the impact of construction upon the public highway (including the provision of temporary Traffic Regulation Orders),
- Details of public engagement both prior to and during construction works.

Reason: In the interests of highway safety and the amenities of the area in accordance with Policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because of the safety and amenity issues that need to be addressed.

- 17 During the construction phase no machinery/vehicles or plant shall be operated on the site, no process shall be carried out and no deliveries taken at or despatched except between the hours of:
- 7.00 a.m. and 6.00 p.m. on Mondays to Fridays inclusive
8.00 a.m. and 1.00 p.m. on Saturday
Not at any time on Sundays or Public Holidays
- Reason: In the interests of amenity in accordance with Policies D DM1 and QE DM1 of the Arun Local Plan.
- 18 No raw materials, finished or unfinished products or parts, crates, packing materials or waste shall be stacked or stored on the site except within the storage areas identified in the Construction Management Plan at any time approved by the Local Planning Authority.
- Reason: To safeguard the amenities of neighbouring properties in accordance with Policy D DM1 of the Arun Local Plan.
- 19 Prior to commencement of development for each phase the applicant shall prepare and submit for approval an Employment and Skills Plan for the construction of each phase of the development. Following approval of the Employment and Skills Plan the developer will implement and promote the objectives of the approved plan.
- Reason: In accordance with Policy SKILLS SP1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition to as it relates to the construction phase of development.
- 20 No part of the development shall be first occupied until such time as the vehicular access serving the development has been constructed in accordance with the details shown on the drawing titled 'Proposed Site Access B2132 Bilsham Road' and numbered 14-111/201 Rev A.
- Reason: In the interests of amenity and to avoid unacceptable harm to highway safety in accordance with policies T SP1 and D DM1 of the Arun District Local Plan. It is considered necessary for this to be a pre-commencement condition as establishing an access to the site goes to the heart of the planning permission.
- 21 No part of the development shall be first occupied until a Travel Plan has been submitted to and approved in writing by the Local Planning Authority. The Travel Plan once approved shall thereafter be implemented as specified within the approved document. The Travel Plan shall be completed in accordance with the latest guidance and good practice documentation as published by the Department for Transport or as advised by the Highway Authority.
- Reason: To encourage and promote sustainable transport in accordance with Policies D DM1 and T SP1 of the Arun Local Plan.

22

Before development commences on any phase a scheme identifying the principles to be incorporated into detailed building design as the means of energy conservation, together with on-site energy renewable devices for that phase, shall be submitted to and agreed with the Local Planning Authority. Such scheme as is submitted shall seek as a target the provision of on-site renewable energy which will generate an estimated 10% of annual energy requirements of the buildings granted planning permission. In determining the provision of on-site energy generation account will be taken of the impact on the viability of the development. Such scheme as is approved will be implemented in accordance with the scheme for that phase.

Reason: In accordance with Policy ECC SP2 of the Arun Local Plan. It is considered necessary for this be a pre-commencement condition as sustainability goes to the heart of the approval.

23

Prior to the commencement of each phase of the development, a strategy for the provision or facilitation of broadband provision to future occupants of the site in that phase shall be submitted to and approved in writing by the Local Planning Authority. The strategy shall seek to ensure that upon occupation of a dwelling in that phase, either a landline or ducting to facilitate the provision of a broadband service to that dwelling from a site-wide network, is in place and provided as part of the initial highway works and in the construction of frontage thresholds to dwellings that abut the highway. Unless evidence is put forward and agreed in writing by the Local Planning Authority that technological advances for the provision of a broadband service for the majority of potential customers will no longer necessitate below ground infrastructure, the development of the site shall be carried out in accordance with the approved strategy.

Reason: To ensure that the needs of future residents to connect to the internet does not necessarily entail engineering works to an otherwise finished and high quality living environment in accordance with Policy TEL SP1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because the provision of broadband needs to be incorporated into the design for the site.

24

No development shall take place until the applicant has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Local Planning Authority.

Reason: The site has the potential to contain unknown remains of archaeological importance therefore in accordance with Policies D DM1 and HER DM6 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition because archaeology can only be investigated before construction commences.

- 25 Prior to the commencement of any phase of development, an Electric Vehicle Charging Strategy will be prepared and submitted to the Local Planning Authority which identifies the nature, form and location of electric charging infrastructure to be provided across the development. The electric vehicle strategy shall then be implemented in accordance with the approved details and maintained in perpetuity.

Reason: New petrol and diesel cars/vans will not be sold beyond 2040, and to mitigate against any potential adverse impact of the development on local air quality, in accordance with Policy D DM1 and Policy QE DM3 (c) of the Arun Local Plan and the NPPF. It is considered necessary for this to be a pre-commencement condition to ensure that the requisite charging infrastructure is designed into the housing development and it is implemented.

- 26 At least twenty-five percent (25%) of all 1, 2 and 3 bedroom dwellings shall be designed and constructed to Lifetime Homes standards or equivalent current standard to be agreed in writing with the Local Planning Authority.

Reason: To ensure that dwellings are adaptable and meet the diverse needs of future occupiers in accordance with policy H3 of the Yapton Neighbourhood Plan, policy D DM1 of the Arun Local Plan and Paragraph 61 of the NPPF.

- 27 No development shall commence on any phase until plans of the site showing details of the existing and proposed ground levels, proposed finished floor levels, levels of any paths, drives, garages and parking areas and the proposed completed height of the development and any retaining walls for that phase have been submitted to, and approved in writing by, the Local Planning Authority. The details shall clearly identify the relationship of the proposed ground levels and proposed completed height with adjacent buildings. The development thereafter shall be carried out in accordance with the approved details for that phase.

Reason: To ensure that a satisfactory relationship results between the new development and adjacent buildings and public areas in accordance with policy D DM1 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition as these details relate to the construction of the development and thus go to the heart of the planning permission.

28

Prior to the commencement of development the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the Local Planning Authority

1. A preliminary risk assessment which has identified:
all previous uses potential contaminants associated with those uses
a conceptual model of the site indicating sources, pathways and receptors
potentially unacceptable risks arising from contamination at the site.
2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.
3. The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the express consent of the Local Planning Authority. The scheme shall be implemented as approved.

Where demolition is required 1. and 2. above should be submitted prior to demolition. Parts 3. and 4. can take place post demolition if necessary.

Reason: To ensure that the development complies with approved details in the interests of protection of the environment and prevention of harm to human health in accordance with Arun Local Plan policies QE SP1 and QE DM4. This is required to be a pre-commencement condition because these details have to be agreed and in place before any work commences.

29

If during development, contamination not previously identified, is found to be present at the site then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for, an amendment to the remediation strategy detailing how this unsuspected contamination shall be dealt with.

Reason: To ensure that the development complies with approved details in the interests of protection of the environment and prevention of harm to human health in accordance with Arun Local Plan policies QE SP1 and QE DM4.

- 30 Prior to commencement of development, a verification report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved, in writing, by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the Local Planning Authority.

Reason: To protect the environment and prevent harm to human health by ensuring that the remediated site has been reclaimed in an appropriate standard in accordance with Arun Local Plan policies QE SP1 and QE DM4. This is required to be a pre-commencement condition because these details have to be agreed and in place before any work commences.

- 31 No more than 95% of the total dwellings to be provided on this site shall be occupied until such time as the primary route (Residential Street as defined in the DAS dated October 2018) has been constructed linking Main Road with the boundary of the site with Y/92/17/OUT.

Reason: The Burndell Road and Blisham Road mini roundabout has been shown to be approaching capacity in sensitivity tests when the through road has not been constructed and the developments are fully occupied. Therefore, this condition is considered necessary in the interests of highway capacity and safety in accordance with policies T SP1 and D DM1 of the Arun District Local Plan.

INFORMATIVE: The applicant is required to obtain all appropriate consents from West Sussex County Council, as Highway Authority, to cover the off-site highway works. The applicant is requested to contact The Implementation Team Leader (01243 642105) to commence this process. The applicant is advised that it is an offence to undertake any works within the highway prior to the agreement being in place.

INFORMATIVE: The applicant should note that under Part 1 of the Wildlife and Countryside Act 1981, with only a few exceptions, it is an offence for any person to intentionally take, damage or destroy the nest of any wild birds while the nest is in use or being built. Birds nest between March and September and therefore removal of dense bushes, ivy or trees or parts of trees etc. during this period could lead to an offence under the act.

INFORMATIVE: This notice does not give authority to destroy or damage a bat roost or disturb a bat. Bat species are protected under Section 39 of the 1994 Conservation (Natural Habitats etc) Regulations (as amended), the 1981 Wildlife and Countryside Act (as amended) and the 2000 Countryside and Rights of Way Act. It is illegal to damage or destroy any bat roost, whether occupied or not, or disturb or harm a bat. If you are aware that bats roost in a tree(s) for which work is planned, you should take further advice from Natural England (via the Bat Conservation Trust on 0845 1300228) or an ecological consultant before you start. If bats are discovered during the work, you must stop immediately and contact Natural England before continuing.

INFORMATIVE: Statement pursuant to Article 35 of the Town and Country Planning (Development Management Procedure)(England) Order 2015. The Local Planning Authority has acted positively and proactively in determining this application by identifying matters of concern within the application (as originally submitted) and negotiating, with the Applicant, acceptable amendments to the proposal to address those concerns. As a result, the Local Planning Authority has been able to grant planning permission for an acceptable proposal, in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.



Neil Crowther
Group Head of Planning

Case Officer: Mr D Easton

Date of Decision:

4 April 2019

Arun District Council
The Arun Civic Centre
Maltravers Road
Littlehampton
West Sussex BN17 5LF

IT IS IMPORTANT THAT YOU READ THE NOTES ATTACHED TO THIS DOCUMENT

APPEALS TO THE SECRETARY OF STATE

If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.

If this is a decision on a planning application relating to the same or substantially the same land and development as is already the subject of an enforcement notice, and you want to appeal against this planning application decision, then you must do so within 28 days of the date of this notice.

If an enforcement notice is served relating to the same or substantially the same land and development as in your application and you want to appeal against this planning application decision, then you must do so within 28 days of the date of service of the enforcement notice, or within 12 weeks of the date of this notice, whichever period expires earlier.

Otherwise, if you want to appeal against this decision then you must do so within 6 months of the date of this notice.

Appeals must be using a form which you can get from the Secretary of State at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN (Tel: 0303 444 5000) or online at <http://acp.planninginspectorate.gov.uk>

The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

PURCHASE NOTICES

If either the local planning authority or the Secretary of State refused permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (that is, where the land is situated in a National Park, the National Park authority for the Park, or in any other case the district council in whose area the land is situated).

This notice will require the Council to purchase the owner's interest in the land in accordance with the provisions of Chapter 1 of Part VI of the Town & Country Planning Act 1990.

Please note that this decision notice only relates to matters under the Planning Acts and does not give consent under any other legislation that may apply to the development. You will need to carry out your own checks to determine whether any other consents or permissions are required. For example, the Building Regulations are likely to apply to most developments, and a Highways Licence may be required from West Sussex County Council for any development within the public highway (including the placing of skips on highway land).

APPENDIX B

Arun District Council Comments

From: Amanda Scholes on behalf of Planning.Responses
Sent: 17 February 2021 10:16
To: Planning Scanning
Subject: FW: Planning Consultation on: Y/3/21/DOC

Amanda Scholes

T: 01903 737453
E: amanda.scholes@arun.gov.uk



To register to receive notification of planning applications in your area please go to
www.arun.gov.uk/planning

Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

Sign up to our newsletter **[here](#)**



From: Laura Gibbons <Laura.Gibbons@arun.gov.uk>
Sent: 16 February 2021 15:43
To: Planning.Responses <Planning.Responses@arun.gov.uk>
Cc: Simon Davis <Simon.Davis@arun.gov.uk>
Subject: RE: Planning Consultation on: Y/3/21/DOC

Dear Simon,

Thank you for consulting us on this application to discharge conditions, we have the following comments on condition 9 surface water drainage.

1. Infiltration testing was completed in February 2019. Only one test was completed in each location and tests were abandoned quickly. It can be observed that some test pits did show a decrease in water level over the monitoring period and the tests appear to have been terminated because of time constraints rather than evidence of water not falling. I note that in previous correspondence with the applicant it was agreed to ignore infiltration in site design. In the future it should be noted that a greater allowance of time should be given for infiltration testing.
2. Groundwater monitoring results must be provided and should be overlaid on detailed drainage layout drawings.
3. Detailed layout plans must be provided.
 - a. All pipes must be labelled with diameters and falls.

- b. Manhole invert and cover levels must be provided.
 - c. Catchpits must be clearly identified.
 - d. Finish and formation levels of permeable paving must be detailed on plan.
 - e. Layout plans must show connections from roads, driveways and plots to the drainage network.
 - f. Hydrobrake unit references must be detailed on plans and construction detail drawings.
 - g. The invert level of the proposed connections to the culvert and watercourse must be provided, along with the invert level of these existing features at the proposed points of connection. Upstream and downstream bed levels of watercourses must also be provided on plans.
4. A surcharged outfall should be included in calculations where discharge is to open watercourse.
 5. Greenfield runoff rate calculations must be supplied. These calculations must be based upon the proposed impermeable area which is to be positively drained, not entire site area.
 6. An impermeable areas diagram/ catchment plan must be provided.
 7. Calculations must use latest FEH rainfall, or apply a cv of 1.
 8. Results have not been included within calculation printouts. Please include full calculation printouts.
 9. A detailed review of calculations has not yet been undertaken due to the above. Please ensure that pipe reference numbers are included on layouts to facilitate review.
 10. 300mm freeboard must be provided on all basins.
 11. Construction detail drawings must be supplied. Please supply construction detail drawings of basins, permeable paving, manholes, catchpits, flow control devices, headwalls, pipe bed and surround, etc. Basin construction details must include a minimum of two perpendicular cross sections per basin. Details should be site specific.
 12. Please clearly identify which features are to be lined and which are not. Please supply flotation calculations for lined features.
 13. Exceedance flow route drawings must be provided.
 14. A maintenance manual must be submitted which is site specific and details maintenance requirements for all proposed drainage features. It must give a brief outline of the drainage strategy used, detail who will complete maintenance and how this will be funded, detail actions and frequencies for maintenance of all drainage elements, and detail expected design lifetimes/ requirements for replacement of elements.
 15. Root potential areas of trees must not conflict with basins which require liners. Proposed trees must not be located over or in close proximity to the surface water drainage network.
 16. As previously discussed with the Principal Drainage Engineer, please include details of your proposed improvements to the main river behind the millers within the information supplied. This should include removal of the undersized culvert and replacement with a bridge.
 17. Note to be added to drawing to state that watercourses will be cleared of vegetation and silt as part of works. These works must be completed near the beginning of construction to ensure the free flow of water.
 18. Details of how the proposed surface water drainage scheme will provide adequate treatment of surface water prior to discharge should be provided.

We would recommend that the applicant refers to our checklist for full details of our requirements for information at DOC stage. The checklist can be found here: <https://www.arun.gov.uk/surfacewater> .

In summary, we do not recommend discharge of Condition 9 at this time.

Kind regards,

Laura Gibbons

Drainage Engineer

Engineering Services

Please note that I work Tuesdays 08:00-16:00 for Arun only.



T: 01903 221374

E: laura.gibbons@arun.gov.uk

Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF

From: Planning.Responses <Planning.Responses@arun.gov.uk>

Sent: 13 January 2021 16:49

To: Land Drainage <Land.Drainage@arun.gov.uk>

Subject: Planning Consultation on: Y/3/21/DOC

To: Engineers (Drainage)

NOTIFICATION FROM ARUN DISTRICT COUNCIL

TOWN AND COUNTRY PLANNING ACT 1990

Application No: Y/3/21/DOC

Registered: 11th January 2021

Site Address: Land at Bilsham Road

Description of Works: Approval of details reserved by condition imposed under Y/91/17/OUT relating to conditions 9-surface water drainage scheme & 12-foul drainage scheme.

The Council have received the above application to discharge conditions. I shall be pleased to receive any observations you may wish to make in respect of those conditions relating to your field of expertise.

[Click here to view the Discharge of Condition application](#)

[Click here to view conditions on original application - click on decision tab](#)

Should you wish to make any comments click on the link www.arun.gov.uk/planning and click into ?Enter Comment? or if this is not possible email your response to planning.responses@arun.gov.uk by **27th January 2021**.

Please be aware that any comments you may make will be available on our website so please do not insert personal details or signatures on your reply.

In the absence of a reply within the period stated, I shall assume that you have no observations to make.

Yours sincerely

Mr S Davis

Planning Case Officer- Arun District Council

Telephone: 01903 737874

Email: Simon.Davis@arun.gov.uk

PLCONDOC (CDE) 2020

APPENDIX C

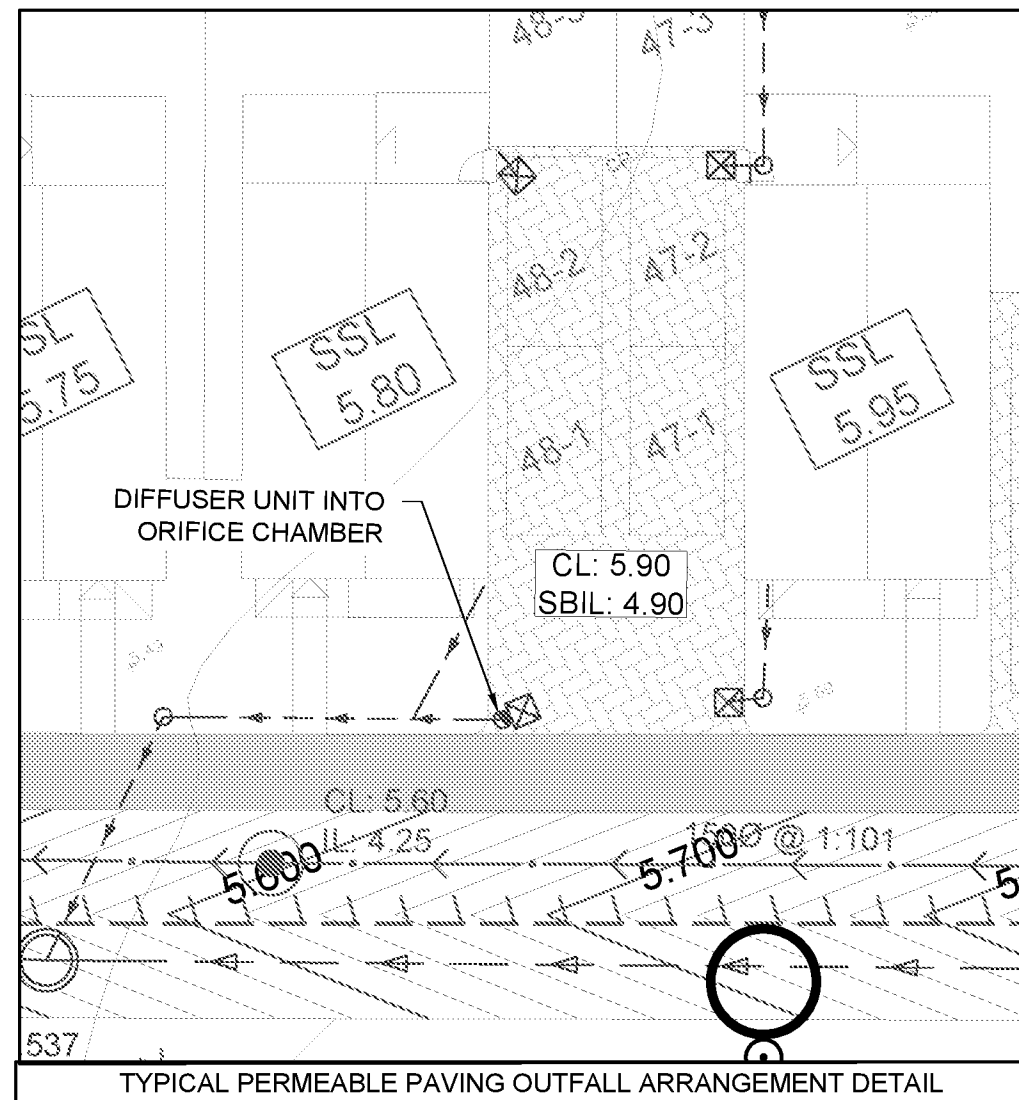
Soakaway Feasibility Report

APPENDIX D

Drainage Strategy, Micro Drainage Calculations and Floatation Calculations



P:19-326 - Bisham Road, Varon RMTech\Acad\Drawings\000 Series\19-326-006 Preliminary Engineering Layout Sheet 1 of 2.dwg



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- NOTES
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 - ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES.
 - CULVERTED DITCH LEVELS HAVE BEEN INTERPOLATED FROM SURVEY UNDER TAKEN BY LIGHTSOURCE SURVEYS LTD IN APRIL 2018.
 - PROPOSALS ARE INDICATIVE ONLY TO DEMONSTRATE DRAINAGE STRATEGY AND ARE SUBJECT TO EVOLVE THROUGH DETAILED DESIGN.
 - THE LEVELS SHOWN ON THIS DRAWING ARE PRELIMINARY AND SUBJECT TO CHANGE, EXCEPT FOR LEVELS SHOWN ON THE EDGE OF THE FLOODPLAIN. NOTE: THERE COULD BE A VARIANCE OF +/- 300mm BETWEEN PRELIMINARY LEVELS AND DETAILED DESIGN LEVELS.
 - LIGHTING DESIGN WILL ALL BE 6m COLUMNS WITH PHILLIPS BGP702 MICRO LUMA LUMINAIRE, AS RECOMMENDED BY SSE.
 - WATERCOURSES WOULD BE CLEARED OF VEGETATION AND SILT AS PART OF WORKS. THESE WORKS WOULD BE COMPLETED NEAR THE BEGINNING OF CONSTRUCTION TO ENSURE THE FREE FLOW OF WATER.

- LEGEND
- SITE BOUNDARY
 - PROPOSED ROAD CONTOUR
 - PROPOSED STRUCTURAL SLAB LEVEL
 - PROPOSED FOUL SEWER & MANHOLE
 - EXISTING CULVERTED WATERCOURSE
 - PROPOSED SURFACE WATER SEWER & MANHOLE
 - VORTEX FLOW CONTROL
 - PROPOSED RISING MAIN
 - PROPOSED PERMEABLE PAVING
 - PROPOSED HEADWALL
 - INDICATIVE ATTENUATION BASIN
 - BASIN FREEBOARD
 - BASIN EARTHWORKS EXTENT
 - ROOT PROTECTION ZONE
 - SERVICE MARGIN
 - CULVERT
 - PROPOSED STREET LIGHTING COLUMN, REFER TO NOTE 6.
 - GROUNDWATER LEVELS AT CORRESPONDING BOREHOLE

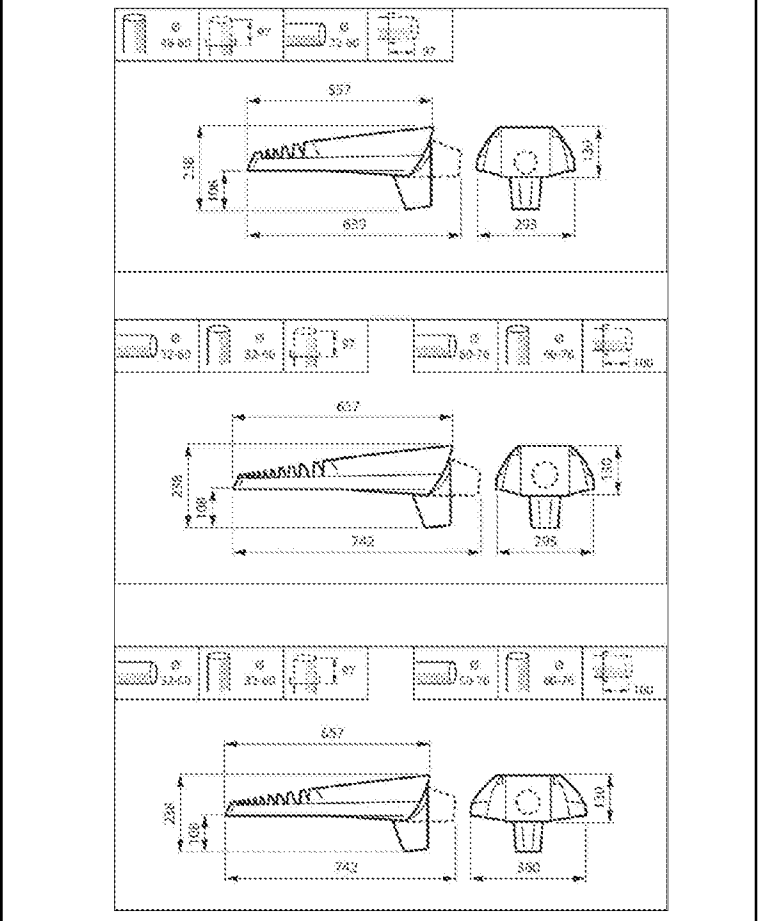
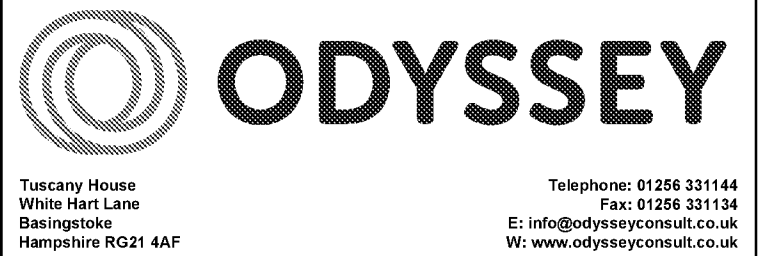


FIG 001: Luma gen2 BGP701-705

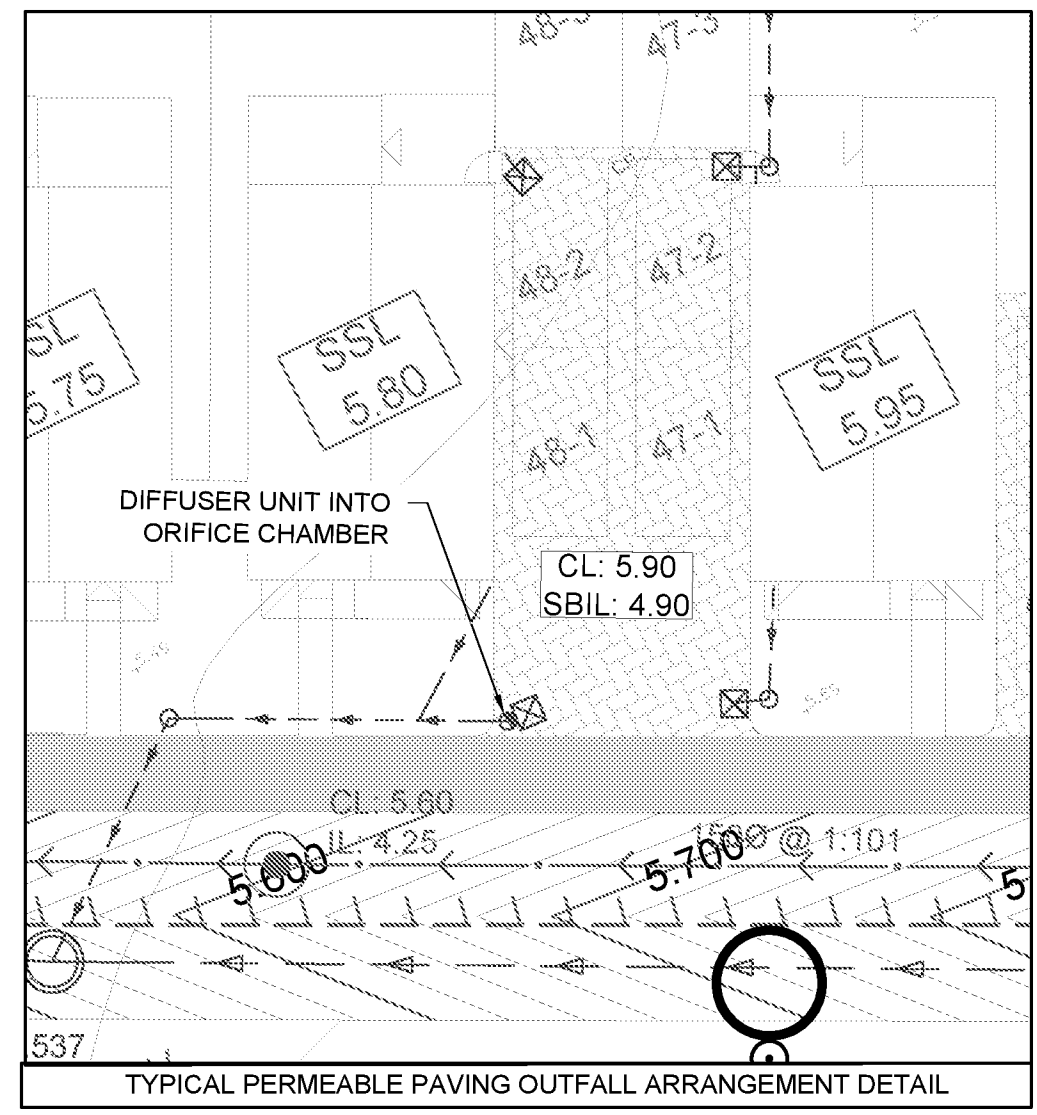
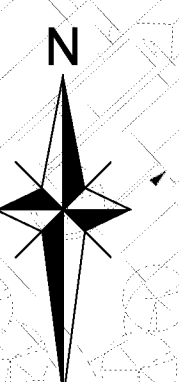
DRAFT

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M	UPDATED DRAINAGE STRATEGY	HM	NA	GG	30.04.21
L	UPDATED TO SUIT NEW SITE LAYOUT	HM	NA	GG	22.03.21
K	UPDATED DRAINAGE STRATEGY	HM	NA	GG	08.03.21
J	ADDED STREET LIGHTING DETAILS	HM	NA	GG	25.01.21
Y	UPDATED TO SUIT NEW SITE LAYOUT	MO	NA	GG	12.11.20
G	UPDATED TO CLIENT COMMENTS	LS	RM	GG	23.10.20
F	UPDATED TO SUIT NEW SITE LAYOUT	LS	NA	GG	16.10.20
E	UPDATED TO CLIENT COMMENTS	JA	NA	GG	07.10.20
D	PPS UPDATED	JA	NA	GG	24.09.20
C	SURFACE WATER STRATEGY UPDATED TO SUIT LEAP CONSTRAINTS	TH	AM	GG	15.09.20
B	UPDATED TO SUIT NEW SITE LAYOUT	NR	AM	GG	03.09.20
A	UPDATED TO CLIENT COMMENTS	NA	GG	GG	30.08.20
Rev	amendments	Des	CHK	App	Date



BILSHAM ROAD, YAPTON		
Drawing Title: PRELIMINARY ENGINEERING LAYOUT. SHEET 1 OF 2		
Client: BILSHAM ROAD DEVELOPMENT LLP		
Scale: 1:500 @A0	Date: FEB 20	Designed: NA
Drawn: LS	Checked: JH	Approved: GG
Job No: 19-326	Drawing No: 19-326/009	Rev: N



NOTES

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LEGEND

- SITE BOUNDARY
- PROPOSED ROAD CONTOUR
- PROPOSED STRUCTURAL SLAB LEVEL
- PROPOSED FOUL SEWER & MANHOLE
- EXISTING CULVERTED WATERCOURSE
- PROPOSED SURFACE WATER SEWER & MANHOLE
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- SERVICE MARGIN
- CULVERT
- PROPOSED STREET LIGHTING COLUMN, REFER TO NOTE 6.
- GROUNDWATER LEVELS AT CORRESPONDING BOREHOLE

FIG 001: Luma gen2 BGP701-705

DRAFT

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N	UPDATED TO SUIT NEW SITE LAYOUT	LS	NA	GG	27.08.21
M	UPDATED DRAINAGE STRATEGY	HM	NA	GG	30.04.21
L	UPDATED TO SUIT NEW SITE LAYOUT	HM	NA	GG	22.03.21
K	UPDATED DRAINAGE STRATEGY	HM	NA	GG	09.03.21
J	ADDED STREET LIGHTING DETAILS	HM	NA	GG	25.01.21
H	UPDATED TO SUIT NEW SITE LAYOUT	MS	NA	GG	12.11.20
G	UPDATED TO CLIENT COMMENTS	LS	RM	GG	23.10.20
F	UPDATED TO SUIT NEW SITE LAYOUT	LS	NA	GG	16.10.20
E	UPDATED TO CLIENT COMMENTS	JA	NA	GG	07.10.20
D	FEL'S UPDATED	JA	NA	GG	24.09.20
C	NOTES ADDED TO DRAWING	THAM	GG	13.09.20	
B	UPDATED TO SUIT NEW SITE LAYOUT	KR	AM	GG	03.09.20
A	UPDATED TO CLIENT COMMENTS	NA	GG	GG	30.09.20

Rev	Amendments	Des	Chk	App	Date
1					

ODYSSEY

Technical House
White Hill Lane
Barnsley
Telephone: 01226 321144
E: info@odysseyconsult.co.uk
W: www.odysseyconsult.co.uk

BILSHAM ROAD, YAPTON

Drawing Title:
PRELIMINARY ENGINEERING LAYOUT. SHEET 2 OF 2

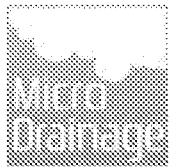
Client:
BILSHAM ROAD DEVELOPMENT LLP

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Drawn	Checked	Approved
LS	JH	GG
Job No	Drawing No	Rev
19-326	19-326/010	N

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FOR CONTINUATION SEE DRAWING 19-326/010

Odyssey Markides LLP		Page 1
Tuscany House	Bilsham Road	
White Hart Lane	Yapton	
Basingstoke RG21 4AF	Greenfield Runoff Rates	
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File	Checked by GG	
Innovyze	Source Control 2020.1	
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Odyssey Markides LLP		Page 1
Tuscany House White Hart Lane Basingstoke RG21 4AF		
Date 26/08/2021 18:46	Designed by BASPC1	
File 2021-08-17 Network - NA...	Checked by	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 497526 102719 SU 97526 02719	
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.623	4-8	2.399	8-12	2.255	12-16	0.193

Total Area Contributing (ha) = 5.470

Total Pipe Volume (m³) = 324.110

Network Design Table for Storm

« - Indicates pipe capacity < flow

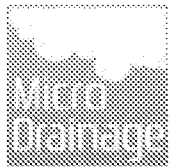
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	29.623	0.182	162.8	0.041	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.40	5.469	0.041	0.0	0.0	0.0	1.23	86.9	5.6

Odyssey Markides LLP											Page 2	
Tuscany House White Hart Lane Basingstoke RG21 4AF												
Date 26/08/2021 18:46 File 2021-08-17 Network - NA...												
Innovyze Network 2020.1												
<u>Network Design Table for Storm</u>												
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
2.000	26.224	0.110	238.4	0.149	5.00	0.0	0.600	o	375	Pipe/Conduit		
2.001	15.003	0.063	238.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		
1.001	15.735	0.050	313.0	0.100	0.00	0.0	0.600	o	375	Pipe/Conduit		
1.002	34.637	0.174	199.1	0.037	0.00	0.0	0.600	o	375	Pipe/Conduit		
3.000	22.261	0.221	100.7	0.080	5.00	0.0	0.600	o	375	Pipe/Conduit		
3.001	8.782	0.122	72.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		
1.003	28.730	0.075	383.1	0.138	0.00	0.0	0.600	o	450	Pipe/Conduit		
1.004	27.193	0.137	198.5	0.095	0.00	0.0	0.600	o	450	Pipe/Conduit		
1.005	16.213	0.116	139.8	0.101	0.00	0.0	0.600	o	450	Pipe/Conduit		
4.000	22.527	0.072	312.9	0.046	5.00	0.0	0.600	o	375	Pipe/Conduit		
1.006	108.735	0.234	464.7	0.115	0.00	0.0	0.600	o	600	Pipe/Conduit		
5.000	34.516	0.173	199.5	0.206	5.00	0.0	0.600	o	300	Pipe/Conduit		
5.001	11.951	0.050	239.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
5.002	42.967	0.181	237.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
5.003	19.007	0.173	109.9	0.146	0.00	0.0	0.600	o	375	Pipe/Conduit		
<u>Network Results Table</u>												
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)		
2.000	50.00	5.37	5.385	0.149	0.0	0.0	0.0	1.17	129.1	20.2		
2.001	50.00	5.59	5.275	0.149	0.0	0.0	0.0	1.17	129.2	20.2		
1.001	50.00	5.85	5.212	0.290	0.0	0.0	0.0	1.02	112.5	39.3		
1.002	50.00	6.30	5.162	0.327	0.0	0.0	0.0	1.28	141.4	44.3		
3.000	50.00	5.21	5.331	0.080	0.0	0.0	0.0	1.81	199.4	10.8		
3.001	50.00	5.27	5.110	0.080	0.0	0.0	0.0	2.14	236.1	10.8		
1.003	50.00	6.76	4.913	0.545	0.0	0.0	0.0	1.03	164.2	73.8		
1.004	50.00	7.07	4.838	0.640	0.0	0.0	0.0	1.44	228.9	86.7		
1.005	50.00	7.23	4.793	0.741	0.0	0.0	0.0	1.72	273.2	100.3		
4.000	50.00	5.37	4.732	0.046	0.0	0.0	0.0	1.02	112.5	6.2		
1.006	50.00	8.85	4.435	0.902	0.0	0.0	0.0	1.12	317.5	122.1		
5.000	50.00	5.52	5.800	0.206	0.0	0.0	0.0	1.11	78.4	27.9		
5.001	50.00	5.72	5.627	0.206	0.0	0.0	0.0	1.01	71.6	27.9		
5.002	50.00	6.42	5.577	0.206	0.0	0.0	0.0	1.02	71.8	27.9		
5.003	50.00	6.60	5.321	0.352	0.0	0.0	0.0	1.73	190.9	47.7		
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Odyssey Markides LLP											Page 3	
Tuscany House White Hart Lane Basingstoke RG21 4AF												
Date 26/08/2021 18:46												
File 2021-08-17 Network - NA...												
Innovyze						Designed by BASPC1 Checked by Network 2020.1						
<u>Network Design Table for Storm</u>												
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	
6.000	42.648	0.200	213.2	0.109	5.00	0.0	0.600	o	300	Pipe/Conduit		
6.001	6.210	0.050	124.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
6.002	6.407	0.027	237.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
5.004	26.102	0.068	385.0	0.016	0.00	0.0	0.600	o	450	Pipe/Conduit		
5.005	27.205	0.219	124.0	0.072	0.00	0.0	0.600	o	450	Pipe/Conduit		
7.000	39.044	0.355	110.0	0.082	5.00	0.0	0.600	o	375	Pipe/Conduit		
7.001	9.832	0.259	38.0	0.103	0.00	0.0	0.600	o	375	Pipe/Conduit		
5.006	24.581	0.150	163.9	0.063	0.00	0.0	0.600	o	525	Pipe/Conduit		
5.007	21.692	0.171	126.9	0.036	0.00	0.0	0.600	o	525	Pipe/Conduit		
8.000	14.072	0.057	246.9	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit		
5.008	14.285	0.060	238.1	0.064	0.00	0.0	0.600	o	525	Pipe/Conduit		
9.000	15.131	0.097	156.0	0.104	5.00	0.0	0.600	o	225	Pipe/Conduit		
5.009	22.656	0.129	175.6	0.035	0.00	0.0	0.600	o	525	Pipe/Conduit		
<u>Network Results Table</u>												
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)		
6.000	50.00	5.66	5.500	0.109	0.0	0.0	0.0	1.07	75.8	14.8		
6.001	50.00	5.74	5.300	0.109	0.0	0.0	0.0	1.41	99.6	14.8		
6.002	50.00	5.84	5.250	0.109	0.0	0.0	0.0	1.02	71.8	14.8		
5.004	50.00	7.03	5.073	0.477	0.0	0.0	0.0	1.03	163.8	64.6		
5.005	50.00	7.27	5.005	0.549	0.0	0.0	0.0	1.82	290.2	74.3		
7.000	50.00	5.38	5.475	0.082	0.0	0.0	0.0	1.73	190.7	11.1		
7.001	50.00	5.43	5.120	0.185	0.0	0.0	0.0	2.95	325.5	25.1		
5.006	50.00	7.51	4.711	0.797	0.0	0.0	0.0	1.75	378.2	107.9		
5.007	50.00	7.69	4.561	0.833	0.0	0.0	0.0	1.99	430.2	112.8		
8.000	50.00	5.37	4.822	0.041	0.0	0.0	0.0	0.64	11.2	5.6		
5.008	50.00	7.86	4.390	0.938	0.0	0.0	0.0	1.45	313.3	127.0		
9.000	50.00	5.24	4.727	0.104	0.0	0.0	0.0	1.04	41.5	14.1		
5.009	50.00	8.08	4.330	1.077	0.0	0.0	0.0	1.69	365.2	145.8		
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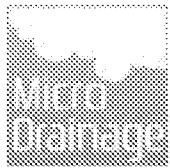
Network Design Table for Storm

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
10.000	10.994	0.103	107.0	0.107	5.00	0.0	0.600	o	300	Pipe/Conduit	
10.001	36.167	0.116	313.0	0.104	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.002	33.536	0.107	313.0	0.061	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.003	31.399	0.100	314.0	0.096	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.004	16.139	0.154	105.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.005	16.741	0.053	313.0	0.169	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.006	38.524	0.368	104.7	0.054	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	35.029	0.068	515.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	5.284	0.014	377.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	42.278	0.110	384.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	14.131	0.037	381.9	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	9.197	0.024	383.2	0.056	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.012	11.526	0.030	384.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.013	32.608	0.292	111.7	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.000	38.334	0.225	170.0	0.153	5.00	0.0	0.600	o	300	Pipe/Conduit	
11.001	7.265	0.049	148.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.014	29.639	0.077	385.0	0.058	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.015	33.280	0.086	385.0	0.052	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)
10.000	50.00	5.12	5.277	0.107	0.0	0.0	0.0	1.52	107.4	14.5
10.001	50.00	5.71	5.099	0.211	0.0	0.0	0.0	1.02	112.5	28.6
10.002	50.00	6.26	4.984	0.272	0.0	0.0	0.0	1.02	112.5	36.8
10.003	50.00	6.78	4.877	0.368	0.0	0.0	0.0	1.02	112.3	49.8
10.004	50.00	6.93	4.777	0.368	0.0	0.0	0.0	1.77	195.3	49.8
10.005	50.00	7.20	4.623	0.537	0.0	0.0	0.0	1.02	112.5	72.7
10.006	50.00	7.56	4.569	0.591	0.0	0.0	0.0	1.77	195.6	80.0
1.007	50.00	9.50	4.201	2.570	0.0	0.0	0.0	0.89	141.4	348.0
1.008	50.00	9.59	4.133	2.570	0.0	0.0	0.0	1.04	169.5	348.0
1.009	50.00	10.27	4.119	2.570	0.0	0.0	0.0	1.03	164.0	348.0
1.010	50.00	10.50	4.009	2.616	0.0	0.0	0.0	1.03	164.5	354.2
1.011	50.00	10.65	3.972	2.672	0.0	0.0	0.0	1.03	164.2	361.8
1.012	50.00	10.83	3.948	2.672	0.0	0.0	0.0	1.03	164.0	361.8
1.013	50.00	11.12	3.918	2.712	0.0	0.0	0.0	1.92	305.9	367.2
11.000	50.00	5.53	4.050	0.153	0.0	0.0	0.0	1.20	85.0	20.7
11.001	50.00	5.63	3.825	0.153	0.0	0.0	0.0	1.29	91.1	20.7
1.014	50.00	11.59	3.626	2.923	0.0	0.0	0.0	1.03	163.8	395.8
1.015	50.00	12.13	3.549	2.975	0.0	0.0	0.0	1.03	163.8	402.9

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<u>Network Design Table for Storm</u>											
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
12.000	21.226	0.214	99.2	0.046	5.00	0.0	0.600	o	225	Pipe/Conduit	
13.000	11.599	0.125	93.0	0.029	5.00	0.0	0.600	o	300	Pipe/Conduit	
13.001	8.661	0.080	108.3	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
13.002	29.592	0.124	238.0	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.001	23.632	0.099	238.0	0.067	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.002	16.754	0.070	238.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.003	17.691	0.057	313.0	0.051	0.00	0.0	0.600	o	375	Pipe/Conduit	
12.004	30.500	0.124	246.0	0.019	0.00	0.0	0.600	o	450	Pipe/Conduit	
14.000	8.115	0.034	238.0	0.115	5.00	0.0	0.600	o	300	Pipe/Conduit	
12.005	19.159	0.050	385.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
12.006	64.550	0.171	377.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
15.000	10.566	0.044	238.0	0.090	5.00	0.0	0.600	o	300	Pipe/Conduit	
15.001	21.828	0.196	111.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
15.002	11.956	0.102	117.2	0.091	0.00	0.0	0.600	o	300	Pipe/Conduit	
16.000	19.906	0.260	76.6	0.072	5.00	0.0	0.600	o	300	Pipe/Conduit	
16.001	12.505	0.122	102.2	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
<u>Network Results Table</u>											
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)	
12.000	50.00	5.27	5.805	0.046	0.0	0.0	0.0	1.31	52.2	6.2	
13.000	50.00	5.12	5.845	0.029	0.0	0.0	0.0	1.63	115.3	3.9	
13.001	50.00	5.21	5.720	0.079	0.0	0.0	0.0	1.51	106.8	10.7	
13.002	50.00	5.70	5.640	0.101	0.0	0.0	0.0	1.01	71.7	13.7	
12.001	50.00	6.09	5.516	0.214	0.0	0.0	0.0	1.01	71.7	29.0	
12.002	50.00	6.36	5.417	0.214	0.0	0.0	0.0	1.01	71.7	29.0	
12.003	50.00	6.65	5.272	0.265	0.0	0.0	0.0	1.02	112.5	35.9	
12.004	50.00	7.05	5.140	0.284	0.0	0.0	0.0	1.29	205.5	38.5	
14.000	50.00	5.13	5.200	0.115	0.0	0.0	0.0	1.01	71.7	15.6	
12.005	50.00	7.36	5.016	0.399	0.0	0.0	0.0	1.03	163.8	54.0	
12.006	50.00	8.39	4.966	0.399	0.0	0.0	0.0	1.04	165.5	54.0	
15.000	50.00	5.17	5.640	0.090	0.0	0.0	0.0	1.01	71.7	12.2	
15.001	50.00	5.42	5.596	0.090	0.0	0.0	0.0	1.49	105.3	12.2	
15.002	50.00	5.56	5.400	0.181	0.0	0.0	0.0	1.45	102.6	24.5	
16.000	50.00	5.18	5.680	0.072	0.0	0.0	0.0	1.80	127.1	9.7	
16.001	50.00	5.32	5.420	0.123	0.0	0.0	0.0	1.56	109.9	16.7	
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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
15.003	20.466	0.298	68.7	0.042	0.00	0.0	0.600	o	375	Pipe/Conduit	🔧
15.004	21.142	0.130	162.6	0.120	0.00	0.0	0.600	o	375	Pipe/Conduit	🔧
12.007	33.565	0.087	385.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
12.008	24.805	0.064	385.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
12.009	26.253	0.068	385.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
17.000	15.513	0.140	110.8	0.136	5.00	0.0	0.600	o	300	Pipe/Conduit	🔧
17.001	9.427	0.040	235.7	0.044	0.00	0.0	0.600	o	300	Pipe/Conduit	🔧
17.002	36.243	0.260	139.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	🔧
17.003	19.704	0.174	113.2	0.163	0.00	0.0	0.600	o	300	Pipe/Conduit	🔧
12.010	24.041	0.412	58.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
12.011	35.682	0.414	86.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
12.012	40.766	0.200	203.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
12.013	6.269	0.087	72.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔧
1.016	16.777	0.037	450.0	0.183	0.00	0.0	0.600	o	525	Pipe/Conduit	🔧
1.017	28.335	0.063	450.0	0.081	0.00	0.0	0.600	o	525	Pipe/Conduit	🔧
18.000	5.866	0.013	451.2	0.000	5.00	0.0	0.600	o	525	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)
15.003	50.00	5.71	5.223	0.346	0.0	0.0	0.0	2.19	241.8	46.9
15.004	50.00	5.96	4.925	0.466	0.0	0.0	0.0	1.42	156.6	63.1
12.007	50.00	8.93	4.795	0.865	0.0	0.0	0.0	1.03	163.7	117.1
12.008	50.00	9.34	4.798	0.865	0.0	0.0	0.0	1.03	163.8	117.1
12.009	50.00	9.76	4.644	0.865	0.0	0.0	0.0	1.03	163.8	117.1
17.000	50.00	5.17	5.340	0.136	0.0	0.0	0.0	1.49	105.5	18.4
17.001	50.00	5.33	5.280	0.180	0.0	0.0	0.0	1.02	72.1	24.4
17.002	50.00	5.78	5.160	0.180	0.0	0.0	0.0	1.33	94.0	24.4
17.003	50.00	6.00	4.900	0.343	0.0	0.0	0.0	1.48	104.4	46.4
12.010	50.00	9.91	4.576	1.208	0.0	0.0	0.0	2.67	423.9	163.6
12.011	50.00	10.18	4.164	1.208	0.0	0.0	0.0	2.19	348.5	163.6
12.012	50.00	10.66	3.750	1.208	0.0	0.0	0.0	1.42	225.9	163.6
12.013	50.00	10.70	3.550	1.208	0.0	0.0	0.0	2.40	381.3	163.6
1.016	50.00	12.40	3.388	4.366	0.0	0.0	0.0	1.05	227.2	591.2
1.017	50.00	12.85	3.351	4.447	0.0	0.0	0.0	1.05	227.2	602.2
18.000	50.00	5.09	3.301	0.000	0.0	0.0	0.0	1.05	226.8	0.0

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<u>Network Design Table for Storm</u>											
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
1.018	23.040	0.039	590.8	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.019	15.210	0.034	447.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.020	58.087	0.731	79.5	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
19.000	27.788	0.093	300.0	0.122	5.00	0.0	0.600	o	450	Pipe/Conduit	
20.000	35.481	0.113	313.0	0.145	5.00	0.0	0.600	o	375	Pipe/Conduit	
20.001	8.071	0.373	21.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
19.001	55.215	0.143	385.0	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	
19.002	10.549	0.052	204.5	0.071	0.00	0.0	0.600	o	450	Pipe/Conduit	
21.000	28.079	0.118	238.0	0.126	5.00	0.0	0.600	o	300	Pipe/Conduit	
21.001	8.510	0.563	15.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
19.003	52.174	0.136	385.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.000	21.192	0.127	166.9	0.116	5.00	0.0	0.600	o	225	Pipe/Conduit	
22.001	9.468	0.590	16.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
19.004	16.548	0.043	384.8	0.110	0.00	0.0	0.600	o	450	Pipe/Conduit	
<u>Network Results Table</u>											
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)	
1.018	50.00	13.27	3.288	4.447	0.0	0.0	0.0	0.91	197.9	602.2	
1.019	50.00	13.51	3.249	4.447	0.0	0.0	0.0	1.05	227.8	602.2	
1.020	50.00	13.90	3.215	4.447	0.0	0.0	0.0	2.51	544.3	602.2	
19.000	50.00	5.40	4.407	0.122	0.0	0.0	0.0	1.17	185.8	16.5	
20.000	50.00	5.58	4.875	0.145	0.0	0.0	0.0	1.02	112.5	19.6	
20.001	50.00	5.61	4.762	0.145	0.0	0.0	0.0	3.91	431.9	19.6	
19.001	50.00	6.51	4.314	0.307	0.0	0.0	0.0	1.03	163.8	41.6	
19.002	50.00	6.63	4.171	0.378	0.0	0.0	0.0	1.42	225.5	51.2	
21.000	50.00	5.46	4.950	0.126	0.0	0.0	0.0	1.01	71.7	17.1	
21.001	50.00	5.50	4.832	0.126	0.0	0.0	0.0	4.06	287.3	17.1	
19.003	50.00	7.48	4.119	0.521	0.0	0.0	0.0	1.03	163.8	70.5	
22.000	50.00	5.35	4.925	0.116	0.0	0.0	0.0	1.01	40.1	15.7	
22.001	50.00	5.40	4.798	0.116	0.0	0.0	0.0	3.28	130.5	15.7	
19.004	50.00	7.74	3.983	0.747	0.0	0.0	0.0	1.03	163.9	101.2	
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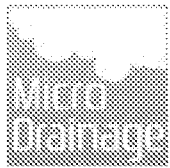
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Network Design Table for Storm

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
19.005	49.152	0.128	385.0	0.058	0.00	0.0	0.600	o	450	Pipe/Conduit	
19.006	27.544	0.072	385.0	0.148	0.00	0.0	0.600	o	450	Pipe/Conduit	
19.007	18.709	0.552	33.9	0.070	0.00	0.0	0.600	o	450	Pipe/Conduit	
19.008	20.031	0.629	31.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.021	10.643	0.025	425.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

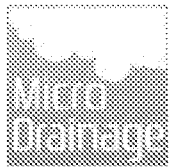
Network Results Table

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)
19.005	50.00	8.54	3.940	0.805	0.0	0.0	0.0	1.03	163.8	109.0
19.006	50.00	8.99	3.812	0.953	0.0	0.0	0.0	1.03	163.8	129.0
19.007	50.00	9.07	3.740	1.023	0.0	0.0	0.0	3.50	556.9	138.5
19.008	50.00	9.17	3.188	1.023	0.0	0.0	0.0	3.61	574.6	138.5
1.021	50.00	14.05	2.409	5.470	0.0	0.0	0.0	1.17	331.9	740.7

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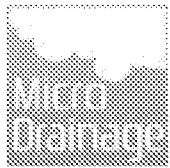
Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.969	1.500	Open Manhole	1200	1.000	5.469	300				
2	6.660	1.275	Open Manhole	1350	2.000	5.385	375				
3	6.850	1.575	Open Manhole	1350	2.001	5.275	375	2.000	5.275	375	
4	6.929	1.717	Open Manhole	1350	1.001	5.212	375	1.000	5.287	300	
								2.001	5.212	375	
5	6.846	1.684	Open Manhole	1350	1.002	5.162	375	1.001	5.162	375	
6	6.906	1.575	Open Manhole	1350	3.000	5.031	375				
7	6.685	1.575	Open Manhole	1350	3.001	5.110	375	3.000	5.110	375	
8	6.563	1.650	Open Manhole	1350	1.003	4.913	450	1.002	4.988	375	
								3.001	4.988	375	
9	6.314	1.476	Open Manhole	1350	1.004	4.838	450	1.003	4.838	450	
10	6.051	1.350	Open Manhole	1350	1.005	4.701	450	1.004	4.701	450	
11	6.307	1.575	Open Manhole	1350	4.000	4.782	375				
12	5.984	1.549	Open Manhole	1500	1.006	4.435	600	1.005	4.585	450	
								4.000	4.660	375	
13	7.000	1.200	Open Manhole	1200	5.000	5.800	300				
14	7.250	1.623	Open Manhole	1200	5.001	5.627	300	5.000	5.627	300	
15	7.066	1.489	Open Manhole	1200	5.002	5.577	300	5.001	5.577	300	
16	6.762	1.441	Open Manhole	1350	5.003	5.321	375	5.002	5.396	300	
17	6.700	1.200	Open Manhole	1200	6.000	5.500	300				
18	6.800	1.500	Open Manhole	1200	6.001	5.300	300	6.000	5.300	300	
19	6.750	1.500	Open Manhole	1200	6.002	5.250	300	6.001	5.250	300	
20	6.567	1.494	Open Manhole	1350	5.004	5.073	450	5.003	5.148	375	
								6.002	5.223	300	
21	6.374	1.369	Open Manhole	1350	5.005	5.005	450	5.004	5.005	450	
22	6.750	1.275	Open Manhole	1350	7.000	5.475	375				
23	6.400	1.280	Open Manhole	1350	7.001	5.120	375	7.000	5.120	375	
24	6.155	1.444	Open Manhole	1500	5.006	4.711	525	5.005	4.786	450	
								7.001	4.861	375	
25	6.005	1.444	Open Manhole	1500	5.007	4.561	525	5.006	4.561	525	
26	5.872	1.050	Open Manhole	1200	8.000	4.822	150				
27	5.834	1.444	Open Manhole	1500	5.008	4.390	525	5.007	4.390	525	
								8.000	4.765	150	
28	5.952	1.225	Open Manhole	1200	9.000	4.727	225				
29	5.755	1.425	Open Manhole	1500	5.009	4.330	525	5.008	4.330	525	
								9.000	4.630	225	
30	6.777	1.500	Open Manhole	1200	10.000	5.277	300				
31	6.674	1.575	Open Manhole	1350	10.001	5.099	375	10.000	5.174	300	

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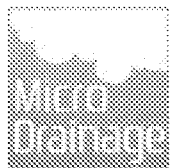
Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
32	7.054	2.070	Open Manhole	1350	10.002	4.984	375	10.001	4.984	375	
33	6.721	1.844	Open Manhole	1350	10.003	4.877	375	10.002	4.877	375	
34	6.362	1.585	Open Manhole	1350	10.004	4.777	375	10.003	4.777	375	
35	6.198	1.575	Open Manhole	1350	10.005	4.623	375	10.004	4.623	375	
36	6.237	1.668	Open Manhole	1350	10.006	4.569	375	10.005	4.569	375	
BASIN 1	5.900	1.699	Open Manhole	1500	1.007	4.201	450	1.006	4.201	600	
								5.009	4.201	525	
								10.006	4.201	375	
38	6.242	2.109	Open Manhole	1350	1.008	4.133	450	1.007	4.133	450	
39	6.472	2.353	Open Manhole	1350	1.009	4.119	450	1.008	4.119	450	
40	6.318	2.309	Open Manhole	1350	1.010	4.009	450	1.009	4.009	450	
41	6.174	2.202	Open Manhole	1350	1.011	3.972	450	1.010	3.972	450	
42	6.077	2.129	Open Manhole	1350	1.012	3.948	450	1.011	3.948	450	
43	5.967	2.049	Open Manhole	1350	1.013	3.918	450	1.012	3.918	450	
44	5.250	1.200	Open Manhole	1200	11.000	4.050	300				
45	5.750	1.925	Open Manhole	1200	11.001	3.825	300	11.000	3.825	300	
46	5.687	2.061	Open Manhole	1350	1.014	3.626	450	1.013	3.626	450	
								11.001	3.776	300	
47	5.372	1.823	Open Manhole	1350	1.015	3.549	450	1.014	3.549	450	
48	7.030	1.225	Open Manhole	1200	12.000	5.805	225				
49	7.345	1.500	Open Manhole	1200	13.000	5.845	300				
50	7.220	1.500	Open Manhole	1200	13.001	5.720	300	13.000	5.720	300	
51	7.140	1.500	Open Manhole	1200	13.002	5.640	300	13.001	5.640	300	
52	6.850	1.334	Open Manhole	1200	12.001	5.516	300	12.000	5.591	225	
								13.002	5.516	300	
53	6.650	1.233	Open Manhole	1200	12.002	5.417	300	12.001	5.417	300	
54	6.850	1.578	Open Manhole	1350	12.003	5.272	375	12.002	5.347	300	
55	6.400	1.260	Open Manhole	1350	12.004	5.140	450	12.003	5.215	375	
56	6.400	1.200	Open Manhole	1200	14.000	5.200	300				
57	6.232	1.216	Open Manhole	1350	12.005	5.016	450	12.004	5.016	450	
								14.000	5.166	300	
58	6.150	1.214	Open Manhole	1350	12.006	4.966	450	12.005	4.966	450	
59	7.140	1.500	Open Manhole	1200	15.000	5.640	300				
60	7.130	1.524	Open Manhole	1200	15.001	5.596	300	15.000	5.596	300	
61	6.900	1.500	Open Manhole	1200	15.002	5.400	300	15.001	5.400	300	
62	7.130	1.500	Open Manhole	1200	16.000	5.680	300				
63	6.920	1.500	Open Manhole	1200	16.001	5.420	300	16.000	5.420	300	
64	6.800	1.577	Open Manhole	1350	15.003	5.223	375	15.002	5.298	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
65	6.566	1.575	Open Manhole	1350	15.004	4.925	375	16.001	5.298	300	
BASIN 2	6.615	1.220	Open Manhole	1350	12.007	4.795	450	15.003	4.925	375	
								12.006	4.795	450	
								15.004	4.795	375	
67	6.337	1.629	Open Manhole	1350	12.008	4.708	450	12.007	4.708	450	
68	6.369	1.725	Open Manhole	1350	12.009	4.644	450	12.008	4.644	450	
69	6.840	1.500	Open Manhole	1200	17.000	5.340	300				
70	6.760	1.500	Open Manhole	1200	17.001	5.200	300	17.000	5.200	300	
71	6.680	1.520	Open Manhole	1200	17.002	5.160	300	17.001	5.160	300	
72	6.400	1.500	Open Manhole	1200	17.003	4.900	300	17.002	4.900	300	
73	6.031	1.455	Open Manhole	1350	12.010	4.576	450	12.009	4.576	450	
								17.003	4.726	300	
BASIN 3	5.664	1.500	Open Manhole	1350	12.011	4.164	450	12.010	4.164	450	
75	5.480	1.650	Open Manhole	1350	12.012	3.750	450	12.011	3.750	450	
76	5.100	1.550	Open Manhole	1350	12.013	3.550	450	12.012	3.550	450	
77	5.054	1.666	Open Manhole	1500	1.016	3.388	525	1.015	3.463	450	
								12.013	3.463	450	
78	4.912	1.561	Open Manhole	1500	1.017	3.351	525	1.016	3.351	525	
TANK	5.101	1.800	Open Manhole	1500	18.000	3.301	525				
80	4.991	1.703	Open Manhole	1500	1.018	3.288	525	1.017	3.288	525	
								18.000	3.288	525	
BASIN 4	5.070	1.821	Open Manhole	1500	1.019	3.249	525	1.018	3.249	525	
82	4.914	1.699	Open Manhole	1500	1.020	3.215	525	1.019	3.215	525	
83	5.757	1.350	Open Manhole	1350	19.000	4.407	450				
84	6.150	1.275	Open Manhole	1350	20.000	4.875	375				
85	6.300	1.538	Open Manhole	1350	20.001	4.762	375	20.000	4.762	375	
86	6.248	1.934	Open Manhole	1350	19.001	4.314	450	19.000	4.314	450	
								20.001	4.389	375	
87	6.822	2.651	Open Manhole	1350	19.002	4.171	450	19.001	4.171	450	
88	6.450	1.500	Open Manhole	1200	21.000	4.950	300				
89	6.800	1.968	Open Manhole	1200	21.001	4.832	300	21.000	4.832	300	
90	6.689	2.570	Open Manhole	1350	19.003	4.119	450	19.002	4.119	450	
								21.001	4.269	300	
91	6.350	1.425	Open Manhole	1200	22.000	4.925	225				
92	6.300	1.502	Open Manhole	1200	22.001	4.798	225	22.000	4.798	225	
93	6.169	2.186	Open Manhole	1350	19.004	3.983	450	19.003	3.983	450	
								22.001	4.208	225	
94	6.029	2.089	Open Manhole	1350	19.005	3.940	450	19.004	3.940	450	

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Manhole Schedules for Storm

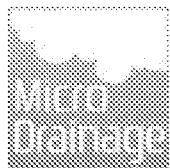
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
95	5.537	1.725	Open Manhole	1350	19.006	3.812	450	19.005	3.812	450	
96	5.269	1.529	Open Manhole	1350	19.007	3.740	450	19.006	3.740	450	
BASIN 5	5.188	1.992	Open Manhole	1350	19.008	3.188	450	19.007	3.188	450	
98	4.758	2.349	Open Manhole	1500	1.021	2.489	600	1.020	2.484	600	
	4.829	2.445	Open Manhole	0		OUTFALL		1.021	2.384	600	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	497552.231	103029.538	497552.231	103029.538	Required	
2	497539.610	103077.088	497539.610	103077.088	Required	
3	497559.350	103059.824	497559.350	103059.824	Required	
4	497571.935	103051.657	497571.935	103051.657	Required	
5	497585.164	103043.136	497585.164	103043.136	Required	
6	497590.660	103000.100	497590.660	103000.100	Required	
7	497604.372	103017.637	497604.372	103017.637	Required	
8	497612.241	103021.537	497612.241	103021.537	Required	
9	497635.255	103004.339	497635.255	103004.339	Required	
10	497655.721	102986.433	497655.721	102986.433	Required	
11	497641.332	102952.267	497641.332	102952.267	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
12	497654.913	102970.239	497654.913	102970.239	Required	
13	497499.484	103039.625	497499.484	103039.625	Required	
14	497525.876	103017.381	497525.876	103017.381	Required	
15	497535.009	103009.673	497535.009	103009.673	Required	
16	497513.640	102972.397	497513.640	102972.397	Required	
17	497467.397	102997.137	497467.397	102997.137	Required	
18	497498.214	102967.655	497498.214	102967.655	Required	
19	497502.042	102962.765	497502.042	102962.765	Required	
20	497503.260	102956.475	497503.260	102956.475	Required	
21	497523.608	102940.127	497523.608	102940.127	Required	
22	497574.498	102962.839	497574.498	102962.839	Required	
23	497551.443	102931.329	497551.443	102931.329	Required	
24	497545.274	102923.674	497545.274	102923.674	Required	
25	497564.994	102908.999	497564.994	102908.999	Required	
26	497575.928	102884.866	497575.928	102884.866	Required	
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<u>Manhole Schedules for Storm</u>						
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
27	497583.062	102896.995	497583.062	102896.995	Required	
28	497608.318	102908.311	497608.318	102908.311	Required	
29	497597.317	102897.924	497597.317	102897.924	Required	
30	497477.886	102927.975	497477.886	102927.975	Required	
31	497471.231	102919.225	497471.231	102919.225	Required	
32	497499.441	102896.593	497499.441	102896.593	Required	
33	497526.695	102877.052	497526.695	102877.052	Required	
34	497551.262	102857.498	497551.262	102857.498	Required	
35	497566.357	102851.788	497566.357	102851.788	Required	
36	497580.671	102843.107	497580.671	102843.107	Required	
BASIN 1	497601.326	102875.626	497601.326	102875.626	Required	
38	497593.413	102841.502	497593.413	102841.502	Required	
39	497590.111	102837.377	497590.111	102837.377	Required	
40	497622.499	102810.202	497622.499	102810.202	Required	
41	497628.078	102797.219	497628.078	102797.219	Required	
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<u>Manhole Schedules for Storm</u>						
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
42	497628.354	102788.026	497628.354	102788.026	Required	
43	497625.563	102776.844	497625.563	102776.844	Required	
44	497569.564	102777.070	497569.564	102777.070	Required	
45	497601.540	102755.926	497601.540	102755.926	Required	
46	497606.360	102750.490	497606.360	102750.490	Required	
47	497588.701	102726.686	497588.701	102726.686	Required	
48	497390.455	102929.884	497390.455	102929.884	Required	
49	497411.973	102888.160	497411.973	102888.160	Required	
50	497400.701	102890.896	497400.701	102890.896	Required	
51	497393.545	102895.774	497393.545	102895.774	Required	
52	497373.311	102917.367	497373.311	102917.367	Required	
53	497353.872	102903.929	497353.872	102903.929	Required	
54	497341.517	102892.612	497341.517	102892.612	Required	
55	497328.861	102880.251	497328.861	102880.251	Required	
56	497354.944	102862.405	497354.944	102862.405	Required	
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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
57	497348.767	102857.142	497348.767	102857.142	Required	
58	497361.122	102842.499	497361.122	102842.499	Required	
59	497438.881	102887.624	497438.881	102887.624	Required	
60	497434.362	102878.074	497434.362	102878.074	Required	
61	497434.499	102856.246	497434.499	102856.246	Required	
62	497467.446	102844.989	497467.446	102844.989	Required	
63	497447.541	102844.852	497447.541	102844.852	Required	
64	497435.048	102844.303	497435.048	102844.303	Required	
65	497435.734	102823.848	497435.734	102823.848	Required	
BASIN 2	497418.106	102812.176	497418.106	102812.176	Required	
67	497440.059	102786.785	497440.059	102786.785	Required	
68	497460.095	102772.162	497460.095	102772.162	Required	
69	497505.438	102818.775	497505.438	102818.775	Required	
70	497517.882	102809.512	497517.882	102809.512	Required	
71	497525.135	102803.490	497525.135	102803.490	Required	
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