Appendix 10.4: Drainage Strategy

Title: **Drainage Strategy**

Project: NK018074 – Sussex EFW
Prepared for: Britaniacrest Recycling (Surrey)

Date: 13 March 2018

Our Ref: NK08074\WL

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Revision History

Rev.	Date	Description	Author	Checked
P01	14/02/18	First revision.	WL	SN
P02	01/06/17	Strategy revised following Regulation 22 comments and subsequent drainage survey; discharge is made via Culvert 'A' only. Catchment information updated and flow rate restricted to Q_{BAR}. Simulation summary added. Appendix III drawings updated.	WL	SN
P03	02/06/17	Appendix I drawings updated.	MF	WL
P04	14/02/18	Strategy updated to reflect the revised planning drawings contained in Appendix I. Supporting appendices also updated.	WL	SN
P05	13/03/18	Paragraph 2.3.2, Table A.1, Section 5.2 and Appendix I, II, III and V updated to suit revised site plan. Paragraph 4.5.3 amended. Paragraph 3.7.4 updated to include pumped foul discharge.	WL	SN

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EXECUTIVE SUMMARY

S1 This report has been prepared on behalf of Britaniacrest Recycling Ltd (Surrey) to provide details of the Surface Water Drainage Strategy relating to a full planning application for the development of a proposed Recycling, Recovery and Renewable Energy facility (3Rs Facility) at Wealden Brickworks, West Sussex in accordance with the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG) ID7.

S2 The site area covers approximately 3.8 hectares (9.4 acres) of land within the wider Warnham and Wealden Brickworks site and currently benefits from planning permission for a Waste Transfer Facility.

S3 Due to the inherent impermeable nature of the geology beneath the site, infiltration measures are considered unsuitable as the principal means of surface water disposal.

S4 The present flood risk has been identified in the RPS Flood Risk Assessment as "low".

S5 No drainage asset plans have been made available for the site.

S6 The need to consider 20% climate change enhancement during 1:100 yearly events in the management of flood risk and 40% uplift for exceedance to maximise resilience has been identified and included in the calculations appended.

S7 The Environment Agency (EA) and the Horsham Strategic Flood Risk Assessment (SFRA) note that there is no record of groundwater issuing at the surface in the area around the site. No groundwater levels within the immediate site area have been made available.

S8 Boldings Brook has previously been identified as the principal means of surface water disposal for the wider site.

S9 Discharge of existing surface run-off from site is currently unrestricted. The proposed drainage scheme would limit flows to the equivalent Q_{BAR} run-off rate, providing a suitable level of 'long term storage' in accordance with C753.

S10 Existing foul flows are treated by a septic tank prior to discharge into the on-site surface water system, prior to discharge in Boldings Brook. Existing permit EPR/CB3308TD confirms the terms of the consented discharge.

S11 It is proposed to construct a foul sewer network comprising 150mm diameter pipe work to convey domestic foul flows from the office / welfare areas, with additional connections provided to accommodate the storage / recycling area, gatehouse and transformer.

S12 Similarly to the existing foul system, treated foul flows will discharge into the on-plot surface water network. As the wastewater will discharge to the Boldings Brook watercourse, a Bio-disc package treatment plant has been specified to improve the quality of effluent in line with current standards prior to discharge.

S13 Further consultation between the client and the EA is required to confirm final effluent flows prior to commencement of operations on site.

1 INTRODUCTION

1.1 Purpose

1.1.1 This report has been prepared on behalf of Britaniacrest Recycling Ltd (Surrey) to provide details of the Surface Water Drainage Strategy relating to a full planning application for the development of a proposed Recycling, Recovery and Renewable Energy (3Rs) facility at Wealden Brickworks, West Sussex in accordance with the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG) ID7.

1.1.2 This document seeks to provide a surface and foul water drainage strategy in relation to the proposed facility to the satisfaction of the Environment Agency (EA) and Lead Local Flood Authority (LLFA) West Sussex County Council (WSCC).

1.2 Background

1.2.1 We understand a planning permission for a *"proposed Waste Transfer Facility to handle inert and non-inert waste with associated open air inert waste recycling operations landscape improvements and vehicle parking"* (Ref: WSCC/018/14/NH) at the site was granted subject to conditions on 1 July 2014. This permission allowed the upgrading and use of the existing brickworks building to enable the management of up to 200,00 tonnes per year of mixed waste and established the principle of the site's use as a waste transfer facility. Condition 4 and 5 attached to this permission required the approval of detailed surface and foul water drainage schemes respectively. The required schemes were prepared by SLR and formally submitted in October 2014 and subsequently approved.

1.3 Legislation and Guidance

National Planning Policy Framework, March 2012

1.3.1 The National Planning Policy Framework (NPPF) sets out Government planning policies for England and how these are expected to be applied. The framework acts as guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications. Further details are set out in Chapters 10 and 11 (paragraphs 93-125) of the NPPF.

1.3.2 The NPPF is accompanied by Planning Practice Guidance (PPG) relating to the consideration of climate change and flood risk and conserving the natural environment. Guidance on the minimum requirements for such assessment is contained in PPG ID7.

Horsham District Council: Horsham District Planning Framework – November 2015

1.3.3 The document is the overarching planning document for Horsham district and replaces the Core strategy and general development control policies documents which were adopted in 2007.

1.3.4 The planning framework is prepared to deliver the needs of the district and the wider area to which the district relates. The document sets out the vision, objectives and strategy for the district over the coming years, and contains strategic policies and general planning policies

which identify development locations to meet future housing, employment, retail and other needs in the district.

1.3.5 The policies relevant to this drainage strategy are outlined below:

Policy 35 – Climate Change

‘’Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district’s landscape. Developments should adapt to climate change using the following measures:

Provision of appropriate flood storage capacity in new building development;

Use of green infrastructure and dual use SuDS to help absorb heat, reduce surface water runoff, provide flood storage capacity and assist habitat migration.’’

Policy 38 – Flooding

‘’Development proposals will:

- *Where there is the potential to increase flood risk, proposals must incorporate the use of sustainable drainage systems (SuDS) where technically feasible, or incorporate water management measures which reduce the risk of flooding and ensure flood risk is not increased elsewhere.*
- *Consider the vulnerability and importance of local ecological resources such as water quality and biodiversity when determining the suitability of SuDS. New development should undertake more detailed assessments to consider the most appropriate SuDS methods for each site. Consideration should also be given to amenity value and green infrastructure.*
- *Utilise drainage techniques that mimic natural drainage patterns and manage surface water as close to its source as possible will be required where technically feasible.*
- *Be in accordance with the objective of the Water Framework Directive, and accord with the findings of the Gatwick Sub Region Water Cycle Study in order to maintain water quality and water availability in rivers and wetlands and wastewater treatment requirements.*

1.3.6 The Horsham District Planning Framework has identified the site as being within an area of employment use.

1.4 Climate Change

1.4.1 The RPS Flood Risk Assessment (FRA) report identifies the central and upper estimate for increases to rainfall intensity as a consequence of climate change compared to the 1961-1960 baseline as 20% and 40%.

1.4.2 This drainage strategy considers 20% climate change enhancement in the management of flood risk, whilst 40% uplift is considered for exceedance to maximise resilience.

2 DEVELOPMEMT SITE

2.1 Site Description

2.1.1 The site is located at the existing Wealden Brickworks site, Langhurst Wood Road at National Grid Reference 517113, 134308, to the north of Horsham.

2.1.2 The site area shown within the red line application boundary covers approximately 3.8 hectares (9.4 acres) of land within the wider Warnham and Wealden Brickworks site and currently benefits from planning permission for a Waste Transfer Facility. The Horsham to Dorking railway adjoins the western boundary of the site. The site's southern boundary is bordered by the internal access road and the Wienerberger brickworks factory (also known as Warnham Brickworks). The eastern boundary is bordered by an internal access road and a Mechanical and Biological Treatment (MBT) facility. Other former brickworks buildings and land lie to the north of the site and beyond that (to the north and north-east) is the active Brookhurst Wood Landfill Site.

2.1.3 Access to the site is gained via a private access road off Langhurst Wood Road.

2.2 Existing Development

2.2.1 The general site layout is shown on Existing Aerial Site Plan drawing **NK0184-RPS-ST-XX-A-DR-101**, included in **Appendix I.**

2.2.2 The site currently hosts a transfer station/materials recycling facility which processes construction, commercial and industrial waste, and inert materials, wood and green waste, as well as carrying out transfer and eventually baling operations on a c.3.27 ha parcel of land including:

Permeable area

- Grass / scrub / rubble 10,084m^2

Less Permeable area

- Buildings, concrete 22,620m^2

2.3 Proposed Development

2.3.1 The proposed development will comprise a Recycling, Recovery and Renewable Energy (3Rs) Facility to sort, separate and process up to 230,000 tonnes per annum of Commercial and Industrial (C&I) and construction, demolition and excavation waste with up to 180,000 tpa of the residual waste being used to generate being used to generate up to 21 megawatts (MW) of electricity per annum.

2.3.2 The proposed development will include the following contributing areas:

Permeable area

- Grass 3,006m^2

Contributing Impermeable areas

- Roof, concrete, footpaths, gravel 26,007m^2

2.3.3 The extent of surface water drainage works to be constructed under this submission is contained within the red line development boundary shown on the RPS Proposed Site Plan drawing **NK018074-RPS-ST-XX-A-DR-0100**, which can be found in **Appendix I**. Application Boundary Plan drawing **NK018074-RPS-ST-XX-A-DR-0103** and Ground Floor Plan drawing **NK018074-RPS-ST-XX-A-DR-0104** can also be found in **Appendix I**.

2.3.4 For the avoidance of doubt, the extent of surface water drainage works to be constructed under this submission are contained within the red line development boundary shown on the RPS Proposed Site Plan noted above.

2.4 Topography

2.4.1 An extensive survey of the proposed site and adjacent highway areas was undertaken in September 2014 to confirm existing site levels and features.

2.4.2 Survey levels indicate a reasonably level site covered by the existing building footprint and associated concrete hardstanding, generally in the region of 48.5m AOD to 49.0m AOD. However, it can be seen from the survey data that site levels are lower in the southwest and higher in the northeast, with levels around the 47.40m AOD and 51.60m AOD being recorded respectively.

2.4.3 A copy of the Topographical Survey drawing **NK018074-RPS-ST-XX-A-DR-0102** can be found in **Appendix II.**

2.4.4 Proposed site levels are shown on drawing **NK18074-RPS-EFW-XX-DR-C-0701**, which can also be found in **Appendix II.**

2.5 Ground Conditions

2.5.1 The British Geological Survey (BGS) online mapping indicates that the site is directly underlain by the Weald Clay Formation (Dark grey thinly-bedded mudstones (shales) and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone (e.g. Horsham Stone Member), shelly limestones (the so called "Paludina Limestones") and clay ironstones).

2.5.2 Weald Clay, a Lower Cretaceous sedimentary rock, is part of the Wealden Group of rocks.

2.6 Geology and Hydrogeology

2.6.1 The bedrock is classified by the EA under the Water Framework Directive as an unproductive stratum, defined as "…*rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow*".

2.6.2 The BGS Hydrogeology 1:625,000 scale map defines the bedrock under the application area as the Wealden Group. It characterises the bedrock as having essentially no groundwater.

2.6.3 The EA and the Horsham Strategic Flood Risk Assessment (SFRA) note that there is no record of groundwater issuing at the surface in the area around the site. No groundwater levels within the immediate site area have been made available.

2.6.4 Based on the information outlined above, the potential for groundwater flooding is considered to be low.

2.7 **Hydrology**

2.7.1 The closest watercourse to the proposed development is the Boldings Brook, which flows southwards in an open channel 100m west of the site and is a tributary of the River Arun.

2.7.2 A number of unnamed watercourses and ponds are within a 1 km vicinity of the application area. The FRA indicates that the site drains into a tributary of Boldings Brook located to the southwest of the proposed development.

2.8 **Infiltration**

2.8.1 As stated in paragraph 2.5.1 above, the site is underline by Weald Clay. Due to the inherent impermeable nature of this material, infiltration measures are considered unsuitable as the principal means of surface water disposal.

2.9 **Infrastructure Sewers**

2.9.1 No drainage asset plans have been made available for the site by the statutory undertaker; surface and foul water sewers are not present within the vicinity of the site.

2.10 **Flood Risk**

2.10.1 The present flood risk has been identified in the RPS FRA as “low”. The main risk of surface water flooding is therefore from direct rainfall on the site, or from run-off from the railway line that bounds the western edge of the application area.

3 SITE DRAINAGE

3.1 **Existing Surface Drainage**

3.1.1 Following a detailed drainage survey of the existing waste facility, it is evident the previous drainage scheme approved under the provisions of the extant planning permission at the site as noted in paragraphs 1.2.1 is not relevant. A number of outfalls are not present on site and it is for this reason a detailed drainage survey was commissioned and completed in April 2017.

3.1.2 The survey findings indicate existing surface run-off is directed into the underground system by a series of hardstanding gullies and roof rainwater pipes as noted on the survey drawings. Details of this survey are shown on Drainage Survey drawings UAK3101_C-LG [sheets 1-4], contained in **Appendix II.**

3.1.3 It can be seen from the RPS FRA that Boldings Brook has been identified as the principal means of surface water disposal for the site with upstream conveyance directing run-off to this watercourse via outfall chamber SW34 and the downstream 'Culvert A' structure. The culvert runs below the adjacent Network Rail northern line immediately west of site, which discharges into a tributary of the Boldings Brook. The principal watercourse is approximately 100m west of site. Existing outfall information is provided on drawing **NK018074-RPS-EFW-XX-DR-D-0305** contained in **Appendix III.**

3.1.4 There is no evidence of any flow control to limit discharge from site.

3.2 **Existing Foul Drainage**

3.2.1 A small foul water sewer network connects welfare facilities to an existing septic tank. It is evident from the survey that treated flows currently discharge into the surface water network, prior to discharge into Bolding Brook, as noted in Table S3.2 in EA permit **EPR/CB3308TD** (noted Bolling Brook). Site discharge is currently limited to 5m³/day as stated in Table S3.1 of the EA permit.

3.2.2 This bespoke permit authorises the operation of a non-hazardous waste transfer station with asbestos storage, currently operated by Britaniacrest Recycling at NGR TQ 17148 34313.

3.2.3 A copy of the existing permit to discharge can be found in **Appendix IV**.

3.3 **Proposed Surface Water Strategy**

3.3.1 The proposed surface water drainage scheme is shown on the Surface and Foul Water Drainage Layout drawing **NK018074-RPS-EFW-XX-DR-D-0300** contained in **Appendix III.** This includes building roof and external circulation and parking areas.

3.3.2 All surface run-off will be discharged the existing 300Ø outfall pipe noted above. It is likely existing chamber EX. SW34 will be re-built to suit the proposed scheme. All flows from this chamber are restricted by the upstream pump.

3.3.3 As stated in paragraph 2.10.1 above, the present flood risk has been identified as "low".

3.5 **Proposed Catchment Areas**

3.5.1 Site catchment areas have been identified on RPS drawing **NK018074-RPS-EFW-XX-DR-D-0301** contained in **Appendix III**.

3.5.2 The impermeable area shown represents all roof and external paved areas. The permeable areas shown consider all gravelled and grassed areas that contribute to the network. As indicated on the above drawing, a breakdown of the contributing areas for each pipe is shown; finished contours have also been added around the periphery of the site with directional arrows to accurately inform these figures.

3.5.3 Catchment 'hot-spots' that may result in an elevated risk of pollution on this site have been identified as the Storage / Recycling Area, which has been isolated with a linear 'cut-of' drain discharging into the on-site foul network. As such, a roof has been added to this area minimise any surface run-off.

3.6 **Proposed Surface Discharge Rate**

3.6.1 This drainage proposal seeks to control surface water discharge to the equivalent $\mathbf{Q_{BAR}}$ (mean annual flood) Greenfield run-off rate for all storms up to and including the 100 year + 20% climate change enhancement events. This philosophy will provide a significant betterment when considered against the existing drainage system in terms of flow rate and volume.

3.6.2 Table A.1 below summarises the Greenfield Run-off rates for the proposed site, considering the total contributing area. A copy of the Windes Greenfield Run-off calculation can be found in **Appendix V**.

Return Period	Q_{BAR} (l/s)	Q_2 (l/s)	Q_{30} (l/s)	Q_{100} (l/s)
Greenfield Run-off (l/s/ha)	14.9	13.1	33.8	47.5

Table A.1: Greenfield Run-off Rates

3.7 **Proposed Foul Strategy**

3.7.1 The proposed foul water drainage scheme is shown on the Surface and Foul Water Drainage Layout drawing **NK018074-RPS-EFW-XX-DR-D-0300** contained in **Appendix III.** This includes domestic flows from the office & welfare facilities and also includes connections from the storage / recycling area, gatehouse and transformer.

3.7.2 It is proposed to construct a foul sewer network comprising 150mm diameter pipe work to convey domestic foul flows from the office / welfare areas, with additional connections provided to accommodate the storage / recycling area, gatehouse and transformer.

3.7.3 Similarly to the existing foul system noted in 3.2.1, treated foul flows will discharge into the on-plot surface water network, upstream of Culvert A. As the wastewater will discharge to a watercourse, a Bio-disc package treatment plant has been specified to improve the quality of the effluent in line with current standards prior to pumped discharge into existing manhole SW34.

3.7.4 Due to the nature of the biological treatment process, over-sizing the plant to cope with a rainfall event hitting the storage area would reduce the effectiveness of the treatment of the typical

domestic wastewater flows, therefore, the storage recycling area will be covered with a roof to minimise surface run-off.

3.7.5 These works will render existing EA permit **EPR/CB3308TD** redundant. Referring to online guidance, a Standard Rules Permit is necessary when discharging treated wastewater to surface water at a rate of 5,000 to 20,000 litres per day. Based on a population of 50 people per day, the peak rate of foul discharge (6DWF+10% Infiltration) is estimated at 0.2 l/s, with a daily discharge no higher than 2,500 litres per day, suggesting that a new Standard Rules Permit would not be necessary for this development. However, this figure does not include any assessment of any operational flows at this time.

3.7.6 Further consultation between the client and the EA is required with regards to the disposal of trade effluent once final design flows are known, prior to commencement of operations on site.

3.7.7 A copy of the foul water drainage calculations can be found in **Appendix V**.

4 SuDS

4.1 Objectives

4.1.1 Surface water run-off should be managed at source, with flows controlled to mimic the natural pre-development rates to reduce downstream impact wherever possible. Water should be conveyed through SuDS components of the surface water Management Train to ensure effective pre-treatment and appropriate flow control prior to discharge from site, giving due consideration to **water quality** and **water quantity** whilst creating and sustaining better places for people and nature, considering the local **amenity** and **biodiversity**.

4.1.2 Sustainable drainage systems (SuDS) mimic natural drainage processes to reduce the effect on the quality and quantity of runoff from developments and provide benefit to amenity and biodiversity.

4.1.3 The NPPF and associated Planning Practice Guidance ID7, Ciria C753 SUDS Manual (2015) and also the Horsham District Planning Framework (2015) promote sustainable water management through the use of SuDS. A hierarchy of techniques is identified:

1) Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing);

2) Source Control – control of runoff at or very near its source (such as the use of rainwater harvesting);

3) Site Control – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site); and

4) Regional Control – management of runoff from several sites, typically in a detention pond or wetland.

4.1.4 The implementation of SuDS as opposed to conventional drainage systems, provides several benefits by:

- Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- Reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- Improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- Reducing potable water demand through rainwater harvesting;
- Improving amenity through the provision of public open spaces and wildlife habitat; and
- Replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

4.2 Strategy

4.2.1 The general drainage strategy for the proposed site is based on SuDS, in accordance with Ciria C753 'The SuDS Manual' to reduce the impact on the receiving watercourse.

4.3 Discharge Rates

4.3.1 Run-off from site will be restricted from site to the equivalent Q_{BAR} flow rate noted in Table A.1.

4.4 Attenuation

4.4.1 On site provision is proposed in the form of permeable paving and underground storage, swales and filter drains. These drainage features are to be provided as indicated on RPS drawing **NK018074-RPS-EFW-XX-DR-D-0300**. The type of underground structure will be agreed during the construction contract and is likely to be cellular, plastic arch or large diameter pipes, although other system suitability may be explored. The above drawing also identifies pipe size, gradient and flow controls and also further identifies individual pipe references to the surface water calculations.

4.4.2 Attenuation volumes have been determined using Micro Drainage simulation software. Calculations have been included in **Appendix V.**

4.5 Water Quantity and Water Quality / Pollution Control

4.5.1 As stated in paragraph 2.5.1, the site is underlain by Weald Clay which excludes infiltration techniques for surface water disposal. However, a small amount of interception is likely to be made by trans-evaporation.

4.5.2 We understand that client may explore the potential for rainwater harvesting techniques for grey water toilet flushing if deemed commercially viable. We also understand that that Britaniacrest intend to utilise attenuated run-off for the mechanical process contained within the building. However, it has not been possible to confirm quantities at present. The potential related interception is therefore not considered in the design.

4.5.3 Although there would be a slight increase in the positively drained impermeable area, the proposed restriction in discharge rate to Q_{BAR} complies with the requirements of C753, cl 24.10 'Designing for Long Term Storage'.

4.5.4 On-plot surface water treatment train components will be provided in the form of pervious paving to the car park area. External circulation areas will be drained by gullies, linear slot/channel drains and swales, with downstream hydrodynamic vortex separation or filter unit, or Class 1 bypass or full retention separators (to be agreed with the EA), with integral level alarms provided to ensure compliance with BS EN 858-1:2002, in accordance with Pollution Prevention Guideline document PPG3 '*Use and Design of Oil Separators in Surface Water Drainage Systems'.* Equally, proposed run-off quality control for the site may include any number/combination of other of SuDS features, including proprietary items, as noted in C753 that are deemed appropriate. Following final coordination of the proposed site layout with the chosen operator provide additional space for swales/filter drains, these may be used as conveyance in lieu of the underground pipe routes shown where practicable.

4.5.5 Table 26.2 of C753 extracted below identifies pollution hazard indices for the varying land usage pertinent to this application.

TABLE 26.2 Pollution hazard indices for different land use classifications

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

Notes

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

2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

4.5.6 Table 26.3 sets out indicative SuDS mitigation indices for discharges to surface waters.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

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

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

4.5.7 It can be seen from the information shown in Table B.1, Table B.2 and Table B.3 below that suitable pollution mitigation provision will be afforded, primarily in the form of sediment traps, swales and permeable paving.

4.5.8 The tables follow the simple index approach in accordance with Table 26.2 and Table 26.3 of C753 as appropriate.

Pollution	Pollution Hazard	SuDS Component	TSS	Metals	Hydro-carbons
Hazard Indices	Low	-	0.3	0.2	0.05
SuDS Mitigation	-	Aquaswirl™ vortex grit separator (O.S.A.)	0.8	0.5	0.7

Table B.1 – Pollution Mitigation Indices: Commercial Roofs

	Pollution Hazard	SuDS Component	TSS	Metals	Hydro-carbons
Hazard Indices	Low	-	0.5	0.4	0.4
SuDS Mitigation	-	Permeable Paving	0.7	0.6	0.7

Table B.1 – Pollution Mitigation Indices: External Car Parking Areas

Pollution	Pollution Hazard	SuDS Component	TSS	Metals	Hydro-carbons
Hazard Indices	High	-	0.8	0.8	0.9
SuDS Mitigation	-	Swale ***AND*** Aquaswirl™ vortex grit separator (O.S.A.) Total	0.5 0.8 / 2 = 0.4 0.9[1] (min)	0.6 0.5/2 = 0.25 0.85[1] (min)	0.6 0.7 / 2 = 0.35 0.9[1,2] (min)

Table B.3 – Pollution Mitigation Indices: External Circulation Areas

[1] When designing in accordance with the SuDS Manual (Ciria C753), when two devices are used in sequence to target the same pollutant, half of the mitigation index of the second component should be allowed in the calculation.

[2] The test procedures applied to manufactured treatment devices do not include measurement of hydrocarbon removal. Therefore, we have estimated that the Aquaswirl™ removes free-phase hydrocarbons by flotation, and also removes hydrocarbons that are adhered to suspended solids. However, hydrocarbons are known to preferentially adhere to the smaller particles so the Aquafilter™ will remove a higher proportion of those hydrocarbons as it is more effective at removing smaller suspended particles.

4.5.9 Due to the absence of agreed formal testing standards, most proprietary SuDS manufacturers have not provided pollution mitigation indices figures (with the exception of SDS). Alternative pollution mitigation systems to the SuDS treatment train may be provided during the construction period, with the prior formal approval of the LLFA. These may be any of the 'natural' components contained within C753, or any alternative proprietary product demonstrated to be suitable for the specific risk environment.

4.5.10 It may be possible to replace the 'Aquaswirl^{TM} Vortex' separator with a Class 1 Bypass separator with integral level alarm to BS EN 858-1:2002, in accordance with Pollution Prevention Guideline document PPG3 '*Use and Design of Oil Separators in Surface Water Drainage Systems'*.

4.5.11 The external storage / recycling area may need to be drained through a separator prior to discharge into the on-site Bio-disc treatment plant, if required by the LLFA / EA. Further consultation is required post determination of planning.

4.5.12 Additional pollution control measures will be provided in the form of an emergency stop device, with control(s) located in the gatehouse, reception or other suitable location as required by the client. The device will stop all, or individual, surface water pump flows. In this scenario, discharge from site is temporarily terminated providing on-site emergency storage in the underground drainage system to avoid a potential pollution incident.

4.6 Designing for Exceedance

4.6.1 The surface water drainage network has been designed to accommodate run-off from all storms up to and including the 100 year +20% climate change enhanced event within the site boundary. The design also considers the 100 year +40% climate change enhanced storms to build in resilience.

4.6.2 It is evident from the simulation results that a volume of temporary flooding occurs, as identified in Section 5.2. However, all flooded volumes are contained on site at acceptable depths.

4.6.3 Due to site levels restrictions, surface water discharge is pumped from site. To minimise risk of flooding from pump failure, duty and standby pumps are to be provided. Furthermore, discharge will be automatically switched to alternate the operation between pumps to avoid a standby pump seizing up. Additional measures are to be put in place to ensure continuous pump operation by linking power back to mains electricity supply and the proposed EFW facility.

4.6.4 Foul emergency storage is provided, upstream of the pump chamber to provide 6 hour peak flow capacity. To avoid surface flooding backing up the foul system, all manholes are to be provided with double seals with lockable covers. The pump chamber inlet pipe from the foul system will also include a non-return valve to avoid flood waters backing up pipes and washing out foul water.

5 DRAINAGE DESIGN

5.1 Surface Water Drainage Design Parameters

5.1.1 Drainage elements are to be designed to the criteria stated below in accordance with the requirements of the LLFA (WSCC).

This includes:

- The new surface water drainage system has been designed using current analysis software, Micro Drainage by XP Solutions, ensuring EA and LLFA requirements are satisfied to prevent uncontrolled flooding of the site and surrounding areas;
- The surface network has been designed in 'System 1', with further rainfall simulation checks completed;
- The 600mmØ discharge pipe linking the attenuation structure to the pump chamber has not been modelled.
- As swales are essentially conveyance structures, it has not been possible to model these drainage features due to the limitations of 'Simulation'. Detailed design will therefore be completed during the construction process;
- Flooding shall not be permitted in any areas prior to 1:30 year return period storms;
- For storms in excess of 1:30 year events, controlled temporary overland flooding is permitted with depths restricted to consider Health & Safety;
- No flooding detrimental to buildings shall occur during any storm event;
- Surface water run-off from paved or other impervious surfaces shall not be permitted to escape onto the surface of adjacent sites or highways;
- Site discharge is restricted to the equivalent Q_{BAR} Greenfield Run-off rate for all storms;
- Design Return Periods: 2 year; 30 year; 100 year plus 20% climate change enhancement.
- Additional exceedance sensitivity check for the 100 year plus 40% climate change enhancement storms has also been included;
- Rainfall: Storm intensities are based upon Flood Studies Report (FSR) data;
- M5-60: 20.0mm;
- Ratio 'r': 0.35;
- Volumetric Runoff Coefficient Cv: 0.793 (summer), 0.837 (winter);
- Global time of entry: 4mins;
- Velocity: 1.0 m/s for self-cleansing of pipes where practicable, 0.75 m/s minimum;

- Pipe roughness: 0.6mm;
- Backdrops: Allow in design; maximum depth of 1.5m wherever practicable
- No surcharge of pipes for all 2 year return period storms, where practicable; and
- Surcharged Outfall: Minimum depth of 10% pipe diameter is assumed in the software.

5.1.2 The site drainage features have been checked against the storm intensities and durations stated in Table C.1 below:

Return Period	FSR Rainfall Analysis
Q_2	15-1440mins
Q_{30}	15-1440mins
Q_{100} +20% CC	15-1440mins
Q_{100} +40% CC	15-1440mins

Table C.1 – Simulation

5.2 **Simulation Results Summary**

5.2.1 **1:2 year:**

Results indicate surcharging is only present at the attenuation structure and pump chamber. No other pipes are surcharged during any 2 year return period storm.

Pumped discharge from site is restricted to 14.9 l/s.

5.2.2 **1:30 year + 30% climate change:**

Surcharged pipes are present across the network during the 30 year storm events, with no flooding present.

Pumped discharge from site is restricted to 14.9 l/s.

5.2.3 **1:100 year + 20% climate change:**

Flooding is present at two locations; to the north east of site adjacent to external covered storage area and north service yard east of the Waste Processing Hall, as identified in the simulation output shown below. These volumes are contained locally at depths of 0.030m and 0.070m respectively.

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
10.000	ACO	15 minute 100 year Summer I+20%	47.370	47.373	0.628	2.778	1.11	113.5	FLOOD
21.002	S20	15 minute 100 year Summer I+20%	47.440	47.442	0.877	2.575	1.77	63.8	FLOOD

Pumped discharge from site is restricted to 14.9 l/s.

5.2.4 **1:100 year + 40% climate change:**

Flooding is present at several locations across site, as identified in the simulation output below. PN1.001 and PN21.002 volumes combine to provide a temporary flooded volume of 12.8m, at a depth of 0.160m. PN5.000 flooded depth is 0.120m and PN10.000 flooded depth is 0.060m. Depths have not been calculated at PN9.000 & PN27.001 as volumes are less than 1.0m³.

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
1.000	ACO	15 minute 100 year Winter Q+40%	47.350	47.356	0.831	6.459	1.90	30.5	FLOOD
5.000	ACO	960 minute 100 year Winter Q+40%	47.270	47.273	0.853	3.048	0.40	6.0	FLOOD
9.000	ACO	960 minute 100 year Winter Q+40%	47.275	47.276	0.851	0.528	0.14	2.4	FLOOD
10.000	ACO	15 minute 100 year Summer Q+40%	47.370	47.382	0.637	11.713	1.21	123.1	FLOOD
21.002	S20	15 minute 100 year Summer Q+40%	47.440	47.446	0.881	6.378	1.91	68.9	FLOOD
27.001	SDP	15 minute 100 year Summer Q+40%	52.650	52.651	0.201	0.652	0.97	118.9	FLOOD

Pumped discharge from site remains restricted to 14.9 l/s.

5.2.5 As noted on drawing Temporary Overland Flood Volumes Plan drawing **NK018074-RPS-EFW-XX-DR-D-0302**. Volume, depth and location information is shown on the above drawing, contained in **Appendix IV**.

5.2.6 All drainage calculations are provided in **Appendix V**.

6 MAINTENANCE

6.1 Operation and Maintenance

6.1.1 The regime included in this section of the report has been provided to assist the necessary maintenance giving due consideration to access and CDM requirements. Britaniacrest Recycling Ltd will assume all responsibility for maintenance of drainage related items within the confines of the development site noted in Section 2.

6.1.2 Paragraph 32.2 of Ciria C753 'The SuDS Manual' v1 states:

"Those responsible for SuDS within a development (owner, tenant, local authority, water company etc), should ideally be provided with an operation and maintenance manual by the designer. This could be part of the documentation provided under CDM (part of the health and safety File)".

6.1.3 This drainage strategy will therefore be provided as part of the O+M manual package of information, specifically highlighting this section of the report.

6.1.4 The above mentioned paragraph later states:

"It is important on industrial estates to clearly identify to everyone which areas drain to SuDS and which to foul sewer. For example, gullies and manhole covers could be colour coded or marked".

6.1.5 Following this guidance, manholes will be marked blue or red to identify the sewer as surface or foul water drainage respectively.

6.2 Operation and Maintenance Activity Categories

6.2.1 As stated in C753, maintenance activities can be broadly defined as follows:

- Regular maintenance (including inspections);
- Occasional maintenance; and
- Remedial maintenance.

6.2.2 There may also be one-off requirements sometimes referred to as "establishment maintenance", particularly for planting (e.g. weeding and watering). [These requirements will be defined in the landscape proposals]. Regular maintenance consists of basic tasks carried out on a frequent and predictable schedule, including inspections/monitoring, silt or oil removal (if required more frequently than once per year), vegetation management, sweeping of surfaces and litter/debris removal.

6.2.3 Occasional maintenance comprises tasks that are likely to be require periodically, but on a much less frequent and predictable basis that the regular tasks. Table 32.1 below summarises the likely maintenance activities required for a range of SuDS components; guidance on the components pertinent to this drainage proposal is detailed in Section 6.3.

6.2.4 Remedial maintenance the intermittent tasks that may be required to rectify faults associated with system, although the likelihood of faults can be minimised by good design, construction and regular maintenance activities. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, so timings are difficult to predict.

TABLE 32.1 Typical key SuDS components operation and maintenance activities (for full specifications, see Chapters 11–23)

Operation and maintenance activity	SuDS component												
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/ trees	Filter strip	Green roofs	Proprietary treatment systems
Regular maintenance													
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■		□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■		
Weed and invasive plant control	□	□	□	□		□	□		□		□	■	
Shrub management (including pruning)	□	□	□	□					□	□	□		
Shoreline vegetation management	■	■	□										
Aquatic vegetation management	■	■	□										
Occasional maintenance													
Sediment management[1]	■	■	■	■	■	■	■	■	■	■	■		■
Vegetation replacement	□	□	□	□						□	□	■	
Vacuum sweeping and brushing									■				
Remedial maintenance													
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□	
Infiltration surface reconditioning				□	□	□	□		□	□	□		

Key

■ will be required

□ may be required

Notes

1 Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

6.3 Operation and Maintenance

6.3.1 An initial pre-handover inspection of the final development should be completed to ensure the design detail has been implemented on site. Regular inspection will then help to determine future maintenance activities, help establish system performance and allow identification of potential performance failures.

6.3.2 In addition to general cleaning of roof gutters downstream sediment traps, Table 16.1, Table 17.1 and Table 20.15 indicate the minimum required maintenance regime that needs to be implemented post construction for filter drawings and areas of pervious paving – see extracts from C753 below.

TABLE 16.1 Operation and maintenance requirements for filter drains

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	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
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

APPENDIX I

Proposed Architectural Drawings

- **NK018074-RPS-ST-XX-A-DR-0100** Proposed Site Plan
- **NK018074-RPS-ST-XX-A-DR-0101** Existing Aerial Site Plan
- **NK018074-RPS-ST-XX-A-DR-0103** Application Boundary Plan
- **NK018074-RPS-ST-XX-A-DR-0104** Ground Floor Plan
- **NK018074-RPS-ST-XX-A-DR-0106** Roof Plan

Notes

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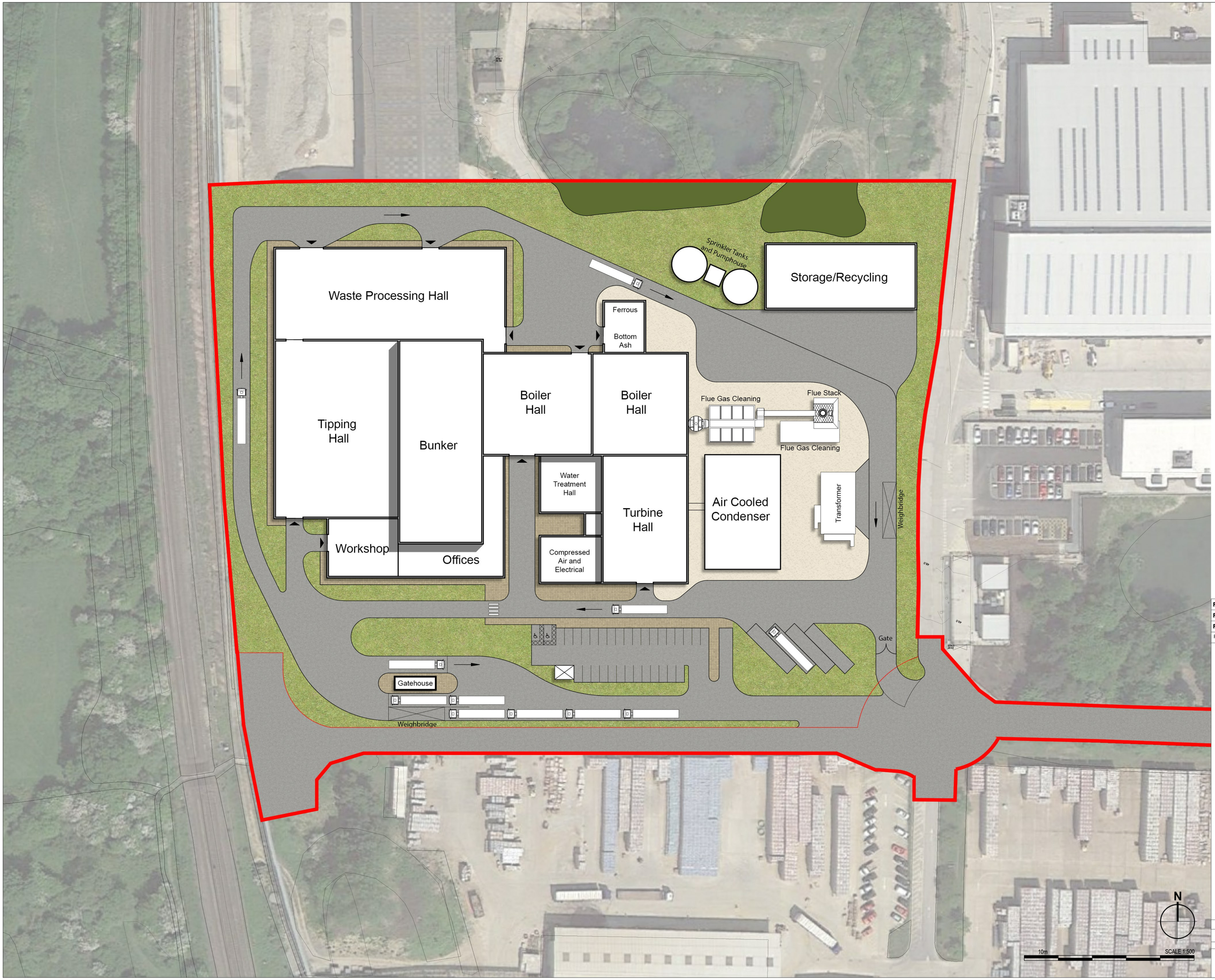

P04	Updates to suit new design	DEC	MJH	14.03.18
P03	Issued for Planning	JT	RJF	03.11.16
P02	ACC location amended, Boiler Hall Roof revised	KM	RJF	13.10.16
Rev	Description	By	Ckd	Date

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Client BRITANNIAGREST RECYCLING

Project Sussex EFW

Title Proposed Site Plan

Status	Scale	Date Created
Preliminary	1:500 @A1	05/09/16
Project Leader	**Drawn By**	**Checked by**
RJF	JT	RJF

Document Number	Revision	Suitability
NK018074-RPS-ST-XX-A-DR-0100	P04	S0
Project Number	Originator - Zone - Level - Type - Role - Drawing Number	

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Key

- Development Boundary
- Ownership Boundary
- Shared Right of Way

Pond
Pond
Pond
Site 1
56.9m
N
0m
SCALE 1:1000

Rev	Description	By	Ckd	Date
P02	Updates to suit new design	DEC	MJH	14.03.18
P01	Issued for Planning	KLM	RJF	03.11.16

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Client Britaniagrest Recycling

Project Sussex EFW

Title Existing Aerial Site Plan

Status	Scale	Date Created
Preliminary	1:1000 @A1	08/07/16
Project Leader	Drawn By	Checked by
RJF	KLM	RJF

Document Number	Revision	Suitability
NK018074 - RPS-ST-XX-A-DR-0101	P02	S0
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Key

- Development Boundary
- Ownership Boundary
- Shared Right of Way

Tanks

Biffa

Existing Building

Pond

Pond

Pond

Railway Lines

ED & Ward Bdy

CR

Langhurstwood Road

LANGHURSTWOOD ROAD

Level Crossing

Bramblehurst

Wienerberger (Brickworks)

STN 1

STN 2

STN 3

N

10m

SCALE 1:1000

Rev	Description	By	Ckd	Date
P02	Updates to suit new design	DEC	MJH	14.03.18
P01	Issued for planning	JH	RJF	03.11.16

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Project Sussex EFW

Title Site Location Plan

Status	Scale	Date Created
Preliminary	1:1000 @A1	26/08/16
Project Leader	Drawn By	Checked by
RJF	JH	RJF

Document Number	Revision	Suitability
NK018074 - RPS-ST-XX-A-DR-0103	P02	S0

Project Number | Originator - Zone - Level - Type - Role - Drawing Number

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Waste Processing Hall
1821m²
67499
30462

Tipping Hall
1873m²
36112
51874

Bunker
1432m²
24150
59299

Workshop
348m²

Offices
448m²

Boiler Hall
940m²
31800
29575

Boiler Hall
817m²
27628
29575

Bottom Ash
174m²
11700
14850

Water Treatment Hall
296m²
17919
16519

Compressed Air and Electrical
239m²
17919
13364

Turbine Hall
916m²
24636
37174

Flue Gas Cleaning
148m²
13502
10988

Flue Gas Cleaning
110m²
17460
6300

Air Cooled Condenser
753m²
22299
33750

Transformer Enclosure
187m²
10250
18222

Storage/Recycling
822m²
43849
18744

Gatehouse
44m²

Notes

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N

5m SCALE 1:250

Rev	Description	By	Ckd	Date
P02	Updates to suit new design	DEC	MJH	14.03.18
P01	Issued for Planning	JH	RJF	03.11.16

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Client BRITANNIACREST RECYCLING

Project Sussex EFW

Title Ground Floor Plan

Status	Scale	Date Created
Preliminary	1:250 @A1	09/08/16
Project Leader	Drawn By	Checked by
RJF	JH	RJF

Document Number	Revision	Suitability
NK018074 - RPS-MB-GF-A-DR-0104	P02	S0

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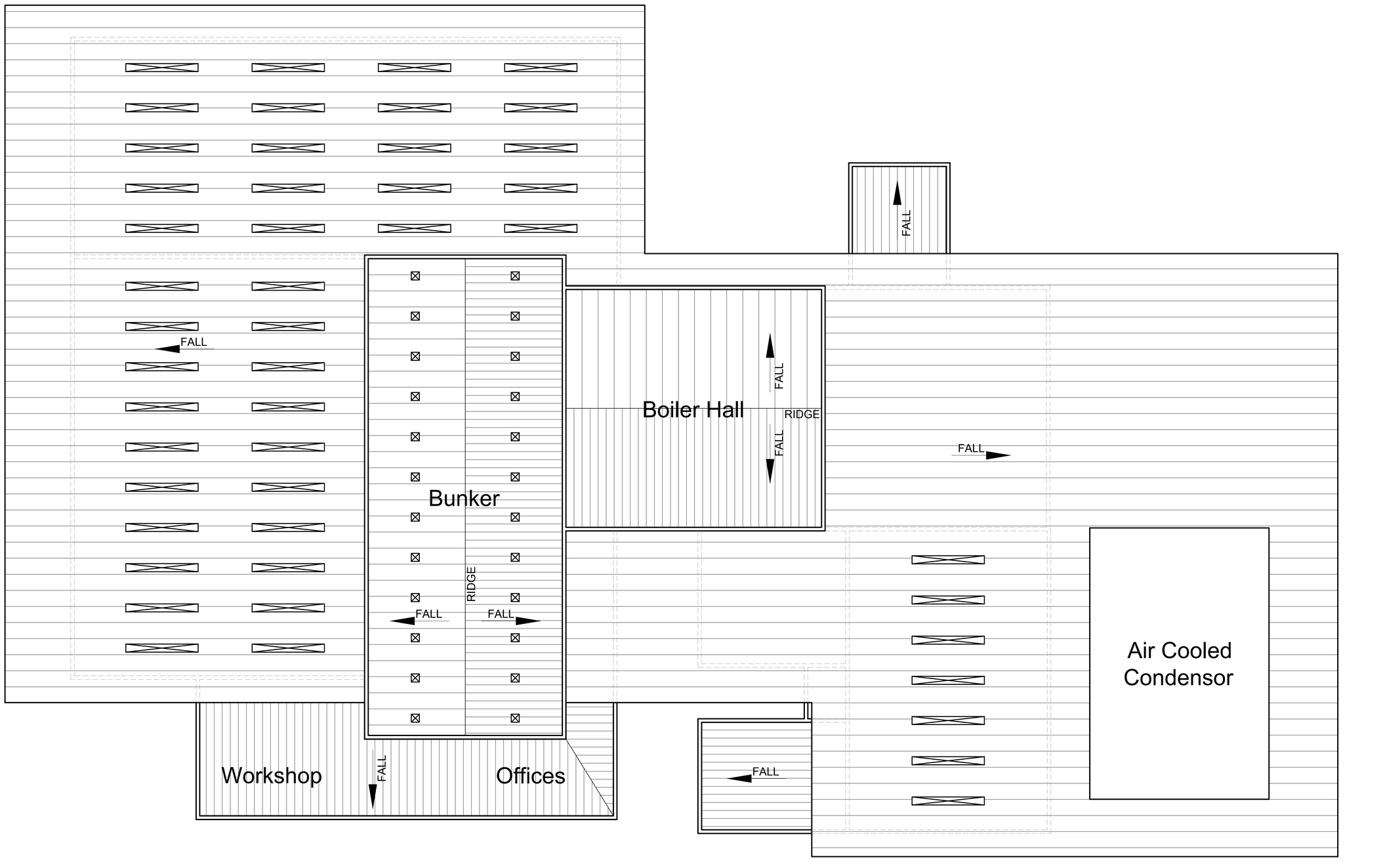
Key

Rooflight

Heat vent



N

5m

SCALE 1:250

Rev	Description	By	Ckd	Date
P02	Updates to suit new design	DEC	MJH	14.03.18
P01	Issued for Planning	JH	RJF	03.11.16

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Client BRITANIAGREST RECYCLING

Project Sussex EFW

Title Roof Plan

Status	Scale	Date Created
Preliminary	1:250 @A1	09/09/16
Project Leader	Drawn By	Checked by
RJF	JH	RJF

Document Number	Revision	Suitability
NK018074 - RPS-MB-RF-A-DR-0106	P02	S0
Project Number / Originator - Zone - Level - Type - Role - Drawing Number		

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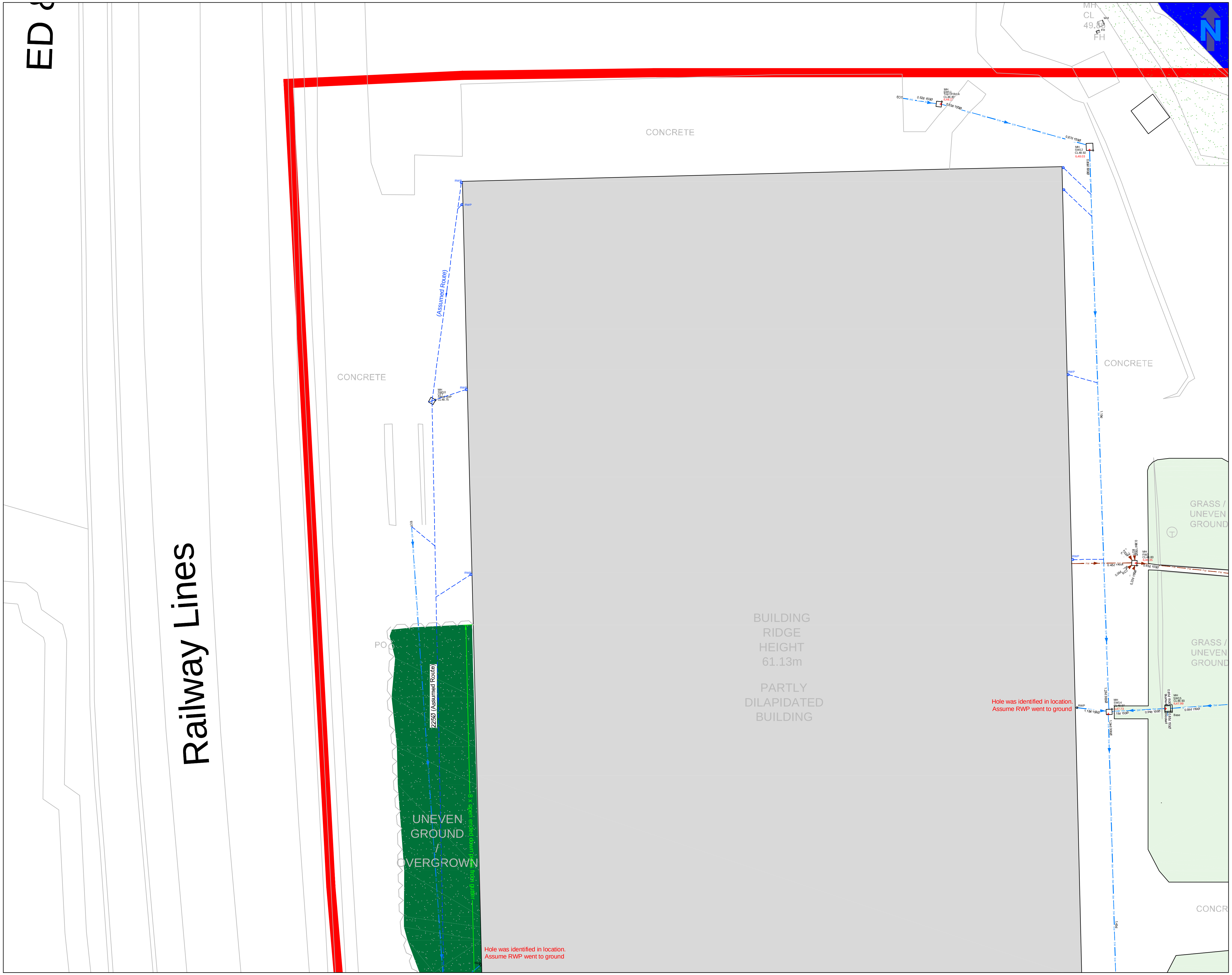
APPENDIX II

Topographical / Survey Drawings

- **UAK3101_C-LG [Sheets 1-4]** Drainage Survey
- **NK018074-RPS-ST-XX-A-DR-0102** Topographical Survey
- **NK018074-RPS-EFW-XX-DR-C-0701** Finished Site Levels



Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

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A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
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BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
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CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
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Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
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Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
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EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
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FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Underground Utility Linestyles:

(line)	SURVEY EXTENTS	D=1.00m 1.00d	DEPTH INFORMATION
BT	BRITISH TELECOM	HW	HOT WATER
BT(r)	TAKEN FROM RECORDS	HW(r)	TAKEN FROM RECORDS
CTV	CATV CABLE	O/F	OPTIC FIBRE
CTV(r)	TAKEN FROM RECORDS	O/F(r)	TAKEN FROM RECORDS
CTV	CCTV CABLE	OIL	OIL PIPELINE
CTV(r)	TAKEN FROM RECORDS	OIL(r)	TAKEN FROM RECORDS
CW	COMBINED WATER	PWR	POWER FEATURE
CW(r)	TAKEN FROM RECORDS	SW	SURFACE WATER
DUC	EMPTY DUCT	SW(r)	TAKEN FROM RECORDS
DUC(r)	TAKEN FROM RECORDS	T	TELECOMMUNICATION CABLE
EA	EARTHING FEATURE	T(r)	TAKEN FROM RECORDS
EA(r)	TAKEN FROM RECORDS	TLM	TELEMETRY CABLE
E	ELECTRIC CABLE	TRA	TRAFFIC SIGNALS
E(r)	TAKEN FROM RECORDS	TRA(r)	TAKEN FROM RECORDS
FL	FUEL LINE	UK	UNKNOWN SERVICE
FL(r)	TAKEN FROM RECORDS	UK(r)	TAKEN FROM RECORDS
FW	FOUL WATER	VNT	VENT
FW(r)	TAKEN FROM RECORDS	VNT(r)	TAKEN FROM RECORDS
GAS	GAS	W	WATER
GAS(r)	TAKEN FROM RECORDS	W(r)	TAKEN FROM RECORDS
GPR	GPR FEATURE	11kV	11KV HV ELECTRIC
GPR(r)	TAKEN FROM RECORDS	11kV(r)	TAKEN FROM RECORDS
Helium	HELIUM FEATURE	REF:GPR02	REFERENCE TO GPR DATA IN REPORT
Helium(r)	TAKEN FROM RECORDS		

Grid:
Existing Grid Origins Supplied By Client

Datum:
Existing Datum Reference Supplied By Client

Revision:	Amendments:	Date:	Name:
-	-	-	-
C	ADDITIONAL COMMENTS	Apr'17	DL
B	SHEET LAYOUTS AMENDED	Apr'17	SP
A	ORIGINAL ISSUE	Apr '17	CL/DL

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Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB
THE SURVEY ASSOCIATION

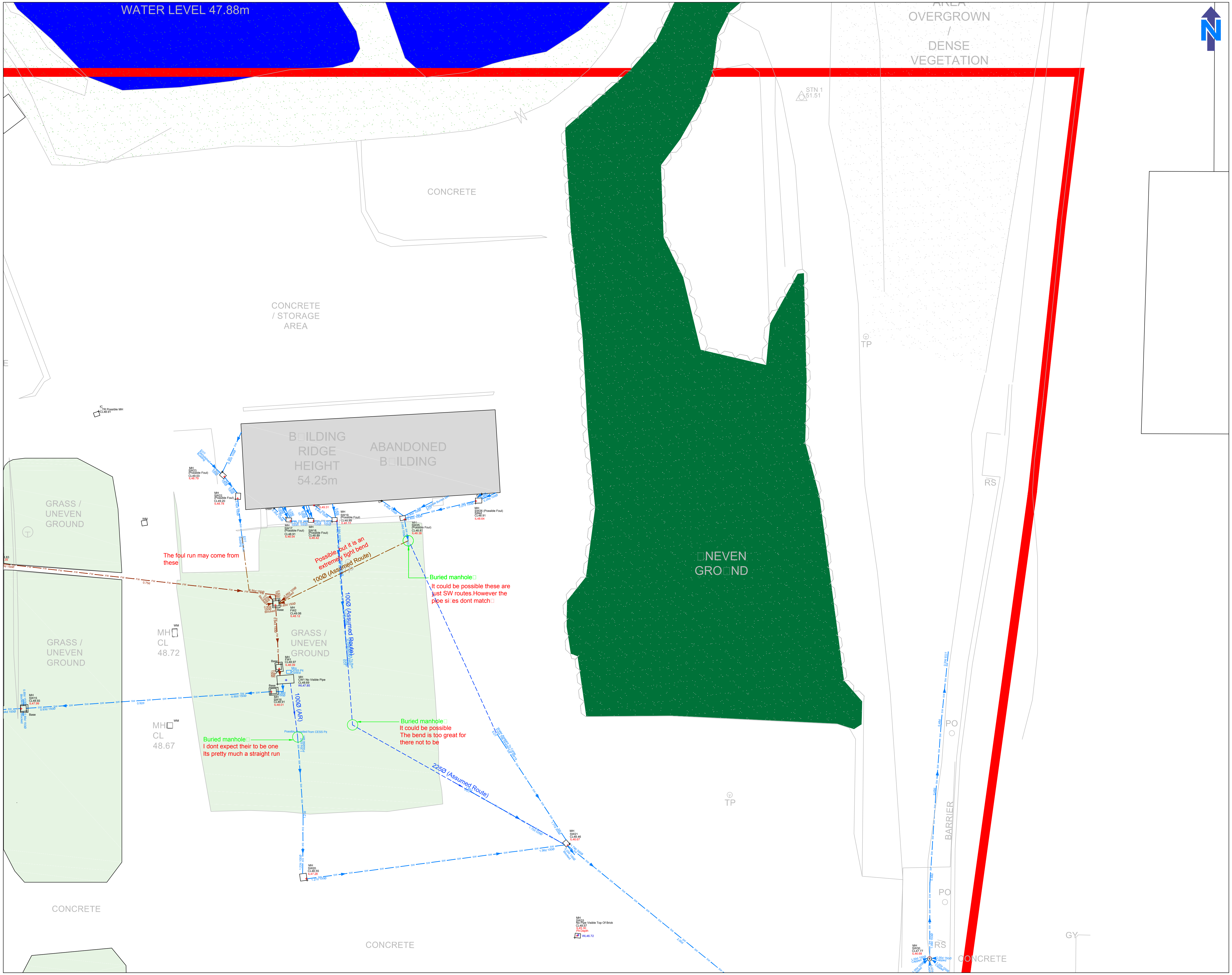
CLIENT:
RPS P&D
Sherwood House, Sherwood Avenue
Newark, Nottinghamshire

PROJECT:
Horsham Drainage

TITLE:
Drainage Survey

Drawn: CL/DL/AO	Checked: SP
Date: April 2017	Scale: 1:200 @ A1
Drg No: UAK3101_C-LG.dwg	Sheet: 1 of 4

GEOMATICS



Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design □ Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only □ should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only □ as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design □ planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets □ visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
S□RVE□S OF LAND , B□ILDING □ □TILIT□ SERVICES AT SCALES 1:500 □ LARGER, 3rd EDITION.

□tility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar e□uipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the e□uipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

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B Pvg	BLOCK PAVING	KO	KERB O□TLET	ST	STAND PIPE / S□PPL□ TAP
BRck	BIC□CLE RACK	Lby	LIFEB□O□	Sti	STILE
BS	B□S STOP	Lck	LOCK GATE	STL	STR□CT□RE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STA□ POST
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CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORAR□ BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	M□	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	O□TSIDE S□RVE□ AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGRO□ND COND□IT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE □nidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD COND□IT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTR□	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STR□CT□RE	Tr	TRO□GH
Cul	C□LVERT	OHT	OVERHEAD TELECOMS	□TL	□NABLE TO LOCATE
CW	CONCRETE WALL	P	POST	□TR	□NABLE TO RAISE
Di	D□CTILE IRON	PB	POST BOX	□TS	□NABLE TO S□RVE□
(dilap)	DILAPIDATED	PC	SEC□RIT□ CAMERA	□TT	□NABLE TO TRACE (utilities)
(dis)	DIS□SED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLA□
DPC	DAMP PROOF CO□RSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL P□MP	VP	VENT PIPE
DSW	DR□STONE WALL	P/R	POST □ RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICIT□ COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GA□GE
EOT	END OF TRACE (utility)	Pyl	P□LON	WL	WATER LEVEL
EP	ELECTRICIT□ POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING E□E	W/M	WIRE MESH FENCE
ESP	ELECTRICIT□ S□PPL□ POINT	RG	RAIN GA□GE	WO	WASHO□T COVER
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□nderground □tility Linestyles:

	S□RVE□ EXTENTS	D=1.00m 1.00d	DEPTH INFORMATION
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BT(r)	TAKEN FROM RECORDS	HW(r)	TAKEN FROM RECORDS
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CTV(r)	TAKEN FROM RECORDS	O/F(r)	TAKEN FROM RECORDS
CTV	CCTV CABLE	OIL	OIL PIPELINE
CTV(r)	TAKEN FROM RECORDS	OIL(r)	TAKEN FROM RECORDS
CW	COMBINED WATER	PWR	POWER FEAT□RE
CW(r)	TAKEN FROM RECORDS	SW	S□RFACE WATER
D□C	EMPT□ D□CT	SW(r)	TAKEN FROM RECORDS
D□C(r)	TAKEN FROM RECORDS	T	TELECOMM□NICATION CABLE
EA	EARTHING FEAT□RE	T(r)	TAKEN FROM RECORDS
EA(r)	TAKEN FROM RECORDS	TLM	TELEMETR□ CABLE
E	ELECTRIC CABLE	TRA	TRAFFIC SIGNALS
E(r)	TAKEN FROM RECORDS	TRA(r)	TAKEN FROM RECORDS
FL	F□EL LINE	□K	□NKNOWN SERVICE
FL(r)	TAKEN FROM RECORDS	□K(r)	TAKEN FROM RECORDS
FW	FO□L WATER	VNT	VENT
FW(r)	TAKEN FROM RECORDS	VNT(r)	TAKEN FROM RECORDS
GAS	GAS	W	WATER
GAS(r)	TAKEN FROM RECORDS	W(r)	TAKEN FROM RECORDS
GPR	GPR FEAT□RE	11kV	11KV HV ELECTRIC
GPR(r)	TAKEN FROM RECORDS	11kV(r)	TAKEN FROM RECORDS
Helium	HELI□M FEAT□RE	REF:GPR02	REFERENCE TO GPR DATA IN REPORT
Helium(r)	TAKEN FROM RECORDS		

Grid: Existing Grid Origins Supplied By Client

Datum: Existing Datum Reference Supplied By Client

Revision:	Amendments:	Date:	Name:
-	-	-	-
C	ADDITIONAL COMMENTS	Apr'17	DL
B	SHEET LA□O□TS AMENDED	Apr'17	SP
A	ORIGINAL ISS□E	Apr '17	CL/DL

RPS

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Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

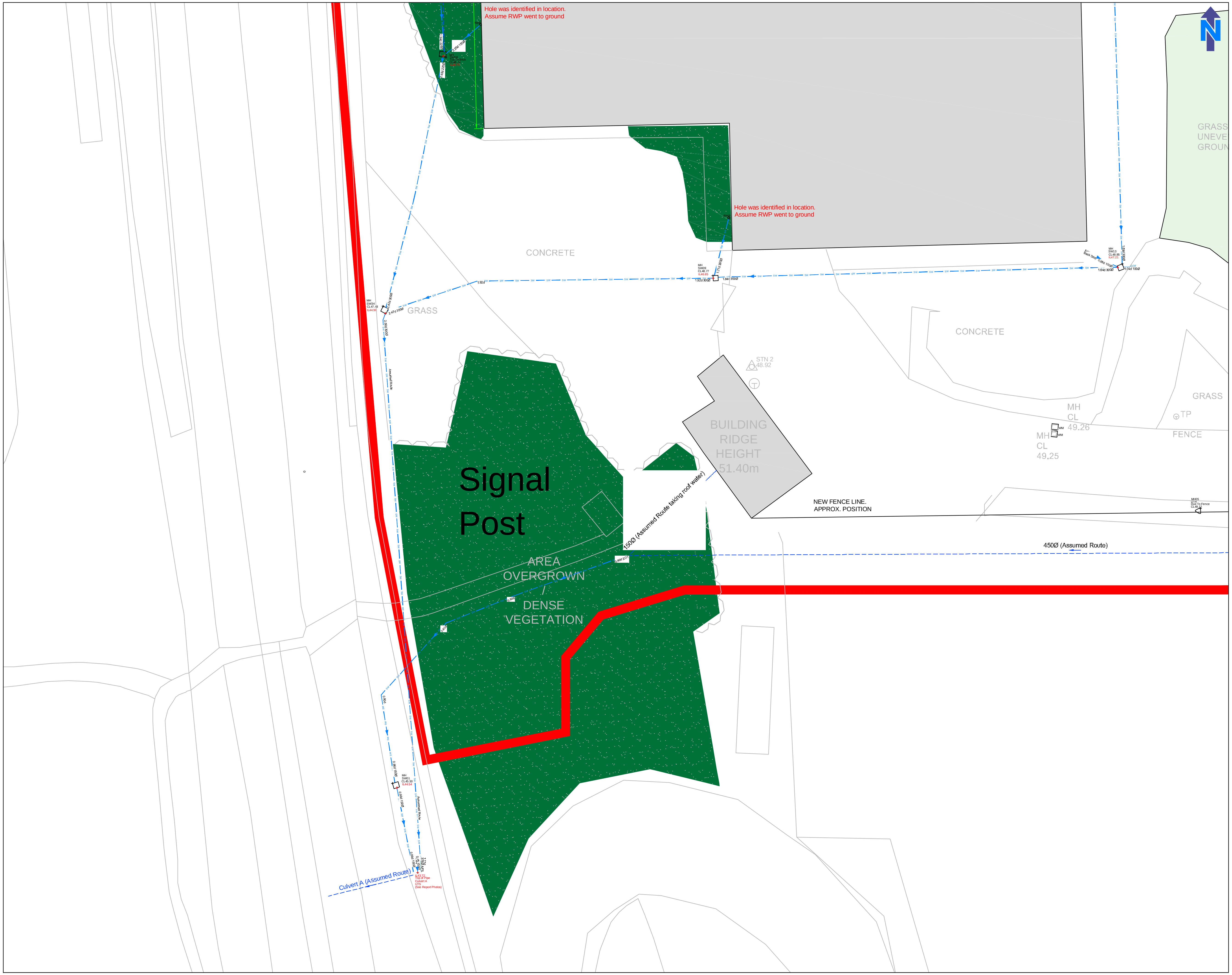
CLIENT:
RPS P□D
Sherwood House, Sherwood Avenue
Newark, Nottinghamshire

PRO□ECT:
Horsham Drainage

TITLE:
Drainage Survey

Drawn:	CL/DL/AO	Checked:	SP
Date:	April 2017	Scale:	1:200 @ A1
Drg No:	□AK3101□C-LG.dwg	Sheet:	2 of 4

GEOMATICS



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(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
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EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
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FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Underground Utility Linestyles:

(line)	SURVEY EXTENTS	D=1.00m 1.00d	DEPTH INFORMATION
BT	BRITISH TELECOM	HW	HOT WATER
BT(r)	TAKEN FROM RECORDS	HW(r)	TAKEN FROM RECORDS
CTV	CATV CABLE	O/F	OPTIC FIBRE
CTV(r)	TAKEN FROM RECORDS	O/F(r)	TAKEN FROM RECORDS
CTV	CCTV CABLE	OIL	OIL PIPELINE
CTV(r)	TAKEN FROM RECORDS	OIL(r)	TAKEN FROM RECORDS
CW	COMBINED WATER	PWR	POWER FEATURE
CW(r)	TAKEN FROM RECORDS	SW	SURFACE WATER
DUC	EMPTY DUCT	SW(r)	TAKEN FROM RECORDS
DUC(r)	TAKEN FROM RECORDS	T	TELECOMMUNICATION CABLE
EA	EARTHING FEATURE	T(r)	TAKEN FROM RECORDS
EA(r)	TAKEN FROM RECORDS	TLM	TELEMETRY CABLE
E	ELECTRIC CABLE	TRA	TRAFFIC SIGNALS
E(r)	TAKEN FROM RECORDS	TRA(r)	TAKEN FROM RECORDS
FL	FUEL LINE	UK	UNKNOWN SERVICE
FL(r)	TAKEN FROM RECORDS	UK(r)	TAKEN FROM RECORDS
FW	FOUL WATER	VNT	VENT
FW(r)	TAKEN FROM RECORDS	VNT(r)	TAKEN FROM RECORDS
GAS	GAS	W	WATER
GAS(r)	TAKEN FROM RECORDS	W(r)	TAKEN FROM RECORDS
GPR	GPR FEATURE	11kV	11KV HV ELECTRIC
GPR(r)	TAKEN FROM RECORDS	11kV(r)	TAKEN FROM RECORDS
Helium	HELIUM FEATURE	REF:GPR02	REFERENCE TO GPR DATA IN REPORT
Helium(r)	TAKEN FROM RECORDS		

Grid:
Existing Grid Origins Supplied By Client

Datum:
Existing Datum Reference Supplied By Client

Revision:	Amendments:	Date:	Name:
-	-	-	-
C	ADDITIONAL COMMENTS	Apr'17	DL
B	SHEET LAYOUTS AMENDED	Apr'17	SP
A	ORIGINAL ISSUE	Apr '17	CL/DL

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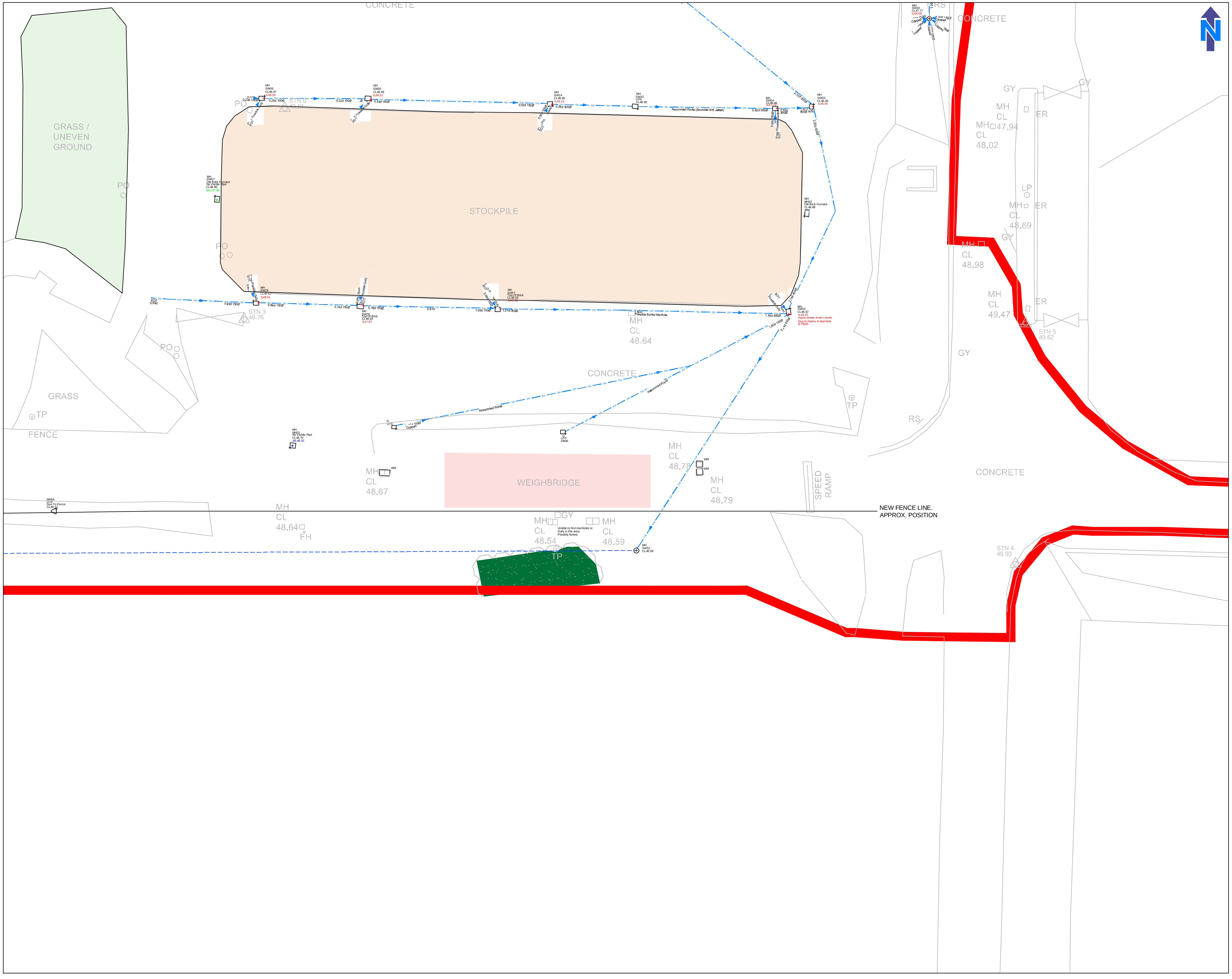
CLIENT:
RPS P&D
Sherwood House, Sherwood Avenue
Newark, Nottinghamshire

PROJECT:
Horsham Drainage

TITLE:
Drainage Survey

Drawn:	CL/DL/AO	Checked:	SP
Date:	April 2017	Scale:	1:200 @ A1
Drg No: UAK3101_C-LG.dwg		Sheet:	3 of 4

GEOMATICS



Notes:

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The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
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GIS	GAS INLET POINT	SB	SIGN BOARD		

Underground Utility Linestyles:

	SURVEY EXTENTS	D=1.00m 1.00d	DEPTH INFORMATION
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EA(r)	TAKEN FROM RECORDS	TLM	TELEMETRY CABLE
E	ELECTRIC CABLE	TRA	TRAFFIC SIGNALS
E(r)	TAKEN FROM RECORDS	TRA(r)	TAKEN FROM RECORDS
FL	FUEL LINE	UK	UNKNOWN SERVICE
FL(r)	TAKEN FROM RECORDS	UK(r)	TAKEN FROM RECORDS
FW	FOUL WATER	VNT	VENT
FW(r)	TAKEN FROM RECORDS	VNT(r)	TAKEN FROM RECORDS
GAS	GAS	W	WATER
GAS(r)	TAKEN FROM RECORDS	W(r)	TAKEN FROM RECORDS
GPR	GPR FEATURE	11kV	11KV HV ELECTRIC
GPR(r)	TAKEN FROM RECORDS	11kV(r)	TAKEN FROM RECORDS
Helium	HELIUM FEATURE	REF:GPR02	REFERENCE TO GPR DATA IN REPORT
Helium(r)	TAKEN FROM RECORDS		

Grid:
Existing Grid Origins Supplied By Client

Datum:
Existing Datum Reference Supplied By Client

Revision:	Amendments:	Date:	Name:
-	-	-	-
C	ADDITIONAL COMMENTS	Apr'17	DL
B	SHEET LAYOUTS AMENDED	Apr'17	SP
A	ORIGINAL ISSUE	Apr '17	CL/DL

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CLIENT:
RPS P&D
Sherwood House, Sherwood Avenue
Newark, Nottinghamshire

PROJECT:
Horsham Drainage

TITLE:
Drainage Survey

Drawn: CL/DL/AO	Checked: SP
Date: April 2017	Scale: 1:200 @ A1
Drg No: UAK3101_C-LG.dwg	Sheet: 4 of 4

GEOMATICS

Notes

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Key

- Development Boundary
- Ownership Boundary
- Shared Right of Way

N 134404.401
E 517002.224

N 134405.301
E 517021.725

N 134405.601
E 517044.052

N 134405.601
E 517221.266

STN 1

N 134402.520
E 517193.020

N 134375.893
E 517003.132

N 134369.652
E 517217.388

N 134358.564
E 517216.450

N 134339.543
E 517005.037

N 134337.065
E 517212.721

N 134326.364
E 517211.336

N 134315.788
E 517210.733

N 134311.681
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E 517210.606

N 134287.258
E 517210.830

N 134271.417
E 517210.500

N 134271.417
E 517217.904

N 134265.751
E 517210.500

N 134267.850
E 517217.904

N 134266.959
E 517010.420

N 134261.731
E 517023.668

N 134266.959
E 517023.668

STN 2
N 134262.898
E 517055.251

STN 3

N 134252.242
E 517233.401

N 134245.560
E 517012.230

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N 134232.477
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E 517198.177

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N 134231.852
E 517204.700

N 134223.375
E 517221.574

N 134220.719
E 517033.768

N 134223.497
E 517209.520

N 134217.502
E 517017.655

Pond

Pond
WATER LEVEL 47.88m

Pond
WATER LEVEL 47.88m

AREA OVERGROWN / DENSE VEGETATION

AREA OVERGROWN / DENSE VEGETATION

AREA OVERGROWN / DENSE VEGETATION

AREA OVERGROWN / DENSE VEGETATION

Signal Post

Level Crossing

SUB STATION

STOCKPILE

SPEED RAMP

CONCRETE

GRASS

FENCE

BARRIER

10m

SCALE 1:500

Rev	Description	By	Ckd	Date

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Client

BRITANIAGREST RECYCLING

Project Sussex EFW

Title Topographical Survey

Status	Scale	Date Created
Preliminary	1:500 @A1	19/02/18
Project Leader	Drawn By	Checked by
KRP	DEC	MH

Document Number	Revision	Suitability
NK018074 - RPS-ST-XX-A-DR-0102	-	S0

Project Number | Originator - Zone - Level - Type - Role - Drawing Number

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Notes

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. For Site Sections, please refer to drawing NK018074-RPS-EFW-XX-DR-C-0705.

Key

- Site Boundary
- Concrete / Sheet Piled Retaining Wall

Finished Levels
Scale 1:500

10m SCALE 1:500

Rev	Description	By	Ckd	Date
P04	Levels updated to suit revised site layout.	MF	WL	13.03.18
P03	Finished levels updated in line with current Site Layout.	MF	WL	15.02.18
P02	Levels updated in eastern circulation road adjacent Transformer layby.	MF	WL	31.05.17

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Client BRITANIAGREST RECYCLING

Project Sussex EfW

Title Finished Levels

Status	Scale	Date Created
Preliminary	1:500 @A1	10.11.2016
Project Leader	Drawn By	Checked by
DM	WL	DM

Document Number	Revision	Suitability
NK018074 - RPS-EFW-XX-DR-C-0701	P04	S3
Project Number / Originator - Zone - Level - Type - Role - Drawing Number		

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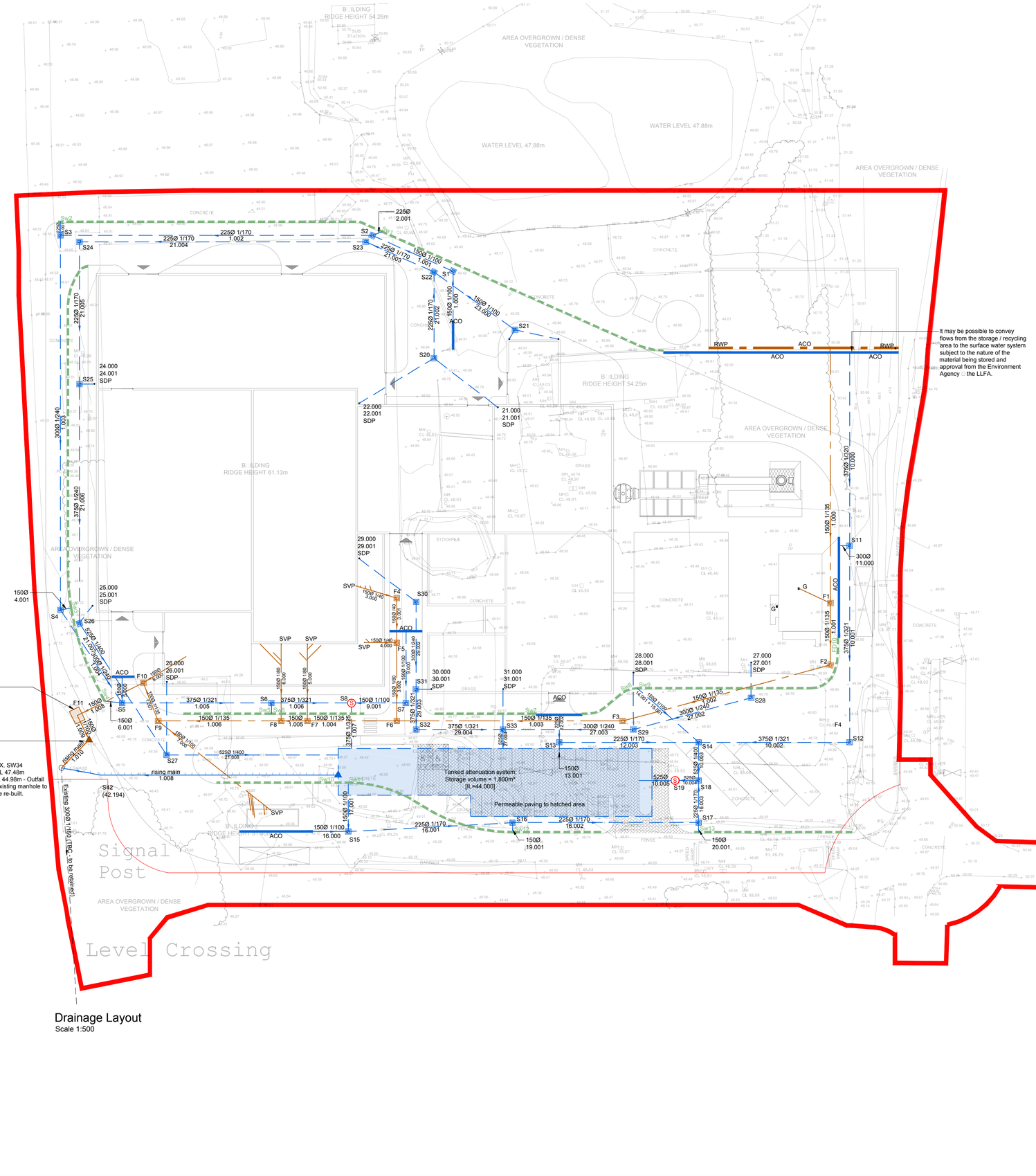
APPENDIX III

Proposed Drainage Strategy Drawings

- **NK018074-RPS-EFW-XX-A-DR-0300** Surface and Foul Water Drainage Layout
- **NK018074-RPS-EFW-XX-A-DR-0301** Surface Water Catchment Plan
- **NK018074-RPS-EFW-XX-A-DR-0302** Temporary Overland Flooded Volumes Plan
- **NK018074-RPS-EFW-XX-DR-D-0305** Existing Outfall Details



Drainage Layout
Scale 1:500

10m SCALE 1:500

N

Gravel areas indicated on the Architect's layout have been taken as 100% impermeable within the drainage model, due to the lack of filtration in the underlying Wealden Clay strata. This allowance simulates the gravel areas being fully saturated prior to the modelled storm events.

The surface water attenuation has currently been designed using cellular storage, although other forms of attenuation may be suitable. Soakaways have not been used in the design. Refer to paragraph 2.8 of the RPS Surface Water Drainage Strategy **NK018074-RPS-EFW-XX-RP-D-DS001**

The contractor is to survey all drainage connection points to satisfy himself all inverts used in the design are accurate. Any descrepancies are to be reported to the engineer immendiately where further advice will be given.

All slot drains to be Gatic CastSlot (concrete service yard) or Gatic □nislot (all other locations), with access and silt boxes as re□uired by the manufacturer - e.g. head of runs, at pipe outlets etc.

All drainage branch lines to be a 150Ø minimum unless noted otherwise.

All internal drainage to have rocker pipe installed on the line of the external envelope to accommodate any potential differential settlement.

The M+E engineer is to ensure that all internal branch lines have roddable access points with air admitance valves / ventillaiton stacks to atmosphere to ensure blockages do not occur. All fittings to be double sealed.

All foul and/or internal manholes to have double sealed covers. All covers located within floor slab or pedestrian areas to have recessed covers with infill to match surrounding finish.

Notes

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Site Boundary

Key:

- ***mmØ 1/300 / 9.001 — SW Sewer (I/D □ Gradient)
- Perforated Filter Drain
- Swale
- SW HDPE Rising Main (O/D □ Gradient)
- S2 — SW Manhole
- (11.60) — SW Pumping Station with Inlet Invert
- ***mmØ 1/300 — Existing Surface Water pipe
- ***mmØ 1/100 / 9.001 — FW Sewer (I/D □ Gradient)
- F2 — FW Manhole
- SW Slot Drain
- FW Slot Drain
- 9.001 — MicroDrainage model pipe number
- S — Separator - Vortex or Class 1 Bypass (refer to RPS drainage strategy report **NK018074-RPS-EFW-XX-D-DS001** - Section 4.5
- Non-return valve
- G — Trapped Gully
- SDP — Syphonic Primary Downpipe
- SVP — Soil Vent Pipe
- CL — Cover Level
- IL — Invert Level
- BD — Back Drop

P04	Drainage layout updated to reflect revised Site Layout.	MF	WL	13.03.18
P03	Drainage proposals amended to reflect the revised Proposed Site Layout.	LAM	WL	14.02.18
P02	Drainage outfall strategy revised to single outfall at Culvert A following comments made by the LLFA and subse□uent drainage survey. Proposed discharge restricted to QBar e□uivalent Greenfield Runoff Rate for all storms; proposed attenuation volume increased to suit. Temporary flooded volumes indicated. Slotdrain added at Gatehouse.	LAM	WL	31.05.17
Rev	Description	By	Ckd	Date

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Client BRITANIAGREST RECYCLING

Project Sussex EfW

Title Drainage Layout

Status	Scale	Date Created
Preliminary	1:500 @A1	16.11.2016
Project Leader	**Drawn By**	**Checked by**
DM	LAM	WL

Document Number	Revision	Suitability
NK018074 - RPS-EFW-XX-DR-D-0300	P04	S3
Project Number / Originator - Zone - Level - Type - Role - Drawing Number		

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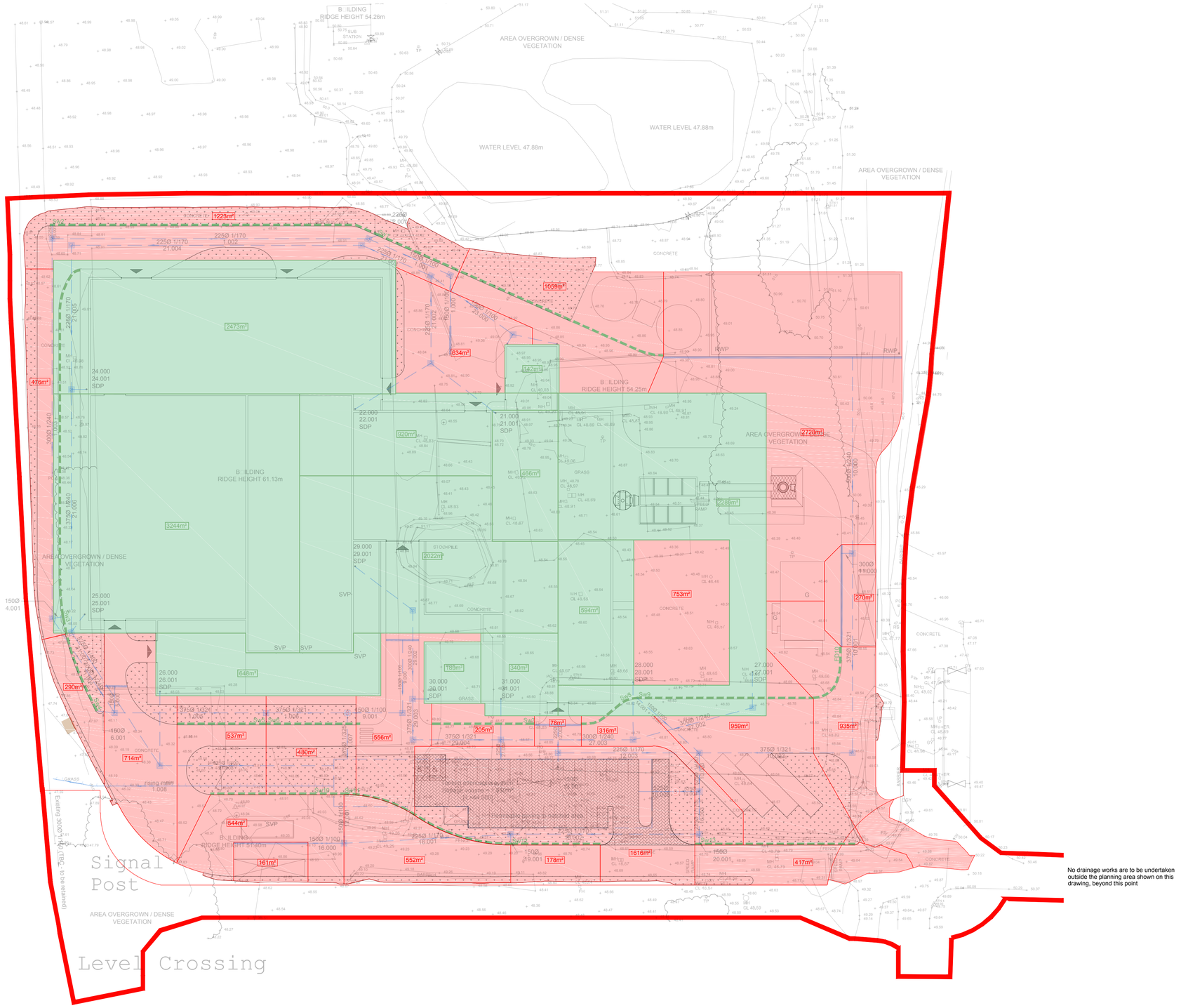

Surface Water Catchment Areas
Scale 1:500

Notes

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N

Surface Water Catchment Key:

- Extents of Tanked Permeable Paving
- 13,327m² — Roof
- 15,686m² — Hardstanding (Includes Landscaped Areas)
- 3,008m² — Total Contributing Landscaping (Included in Hardstanding Areas)
- Site Boundary

Rev	Description	By	Ckd	Date
P04	Drainage layout updated to reflect revised Site Layout.	MF	WL	13.03.18
P03	Drainage proposals amended to reflect the revised Proposed Site Layout.	LAM	WL	15.02.18
P02	Revised based on receipt of new drainage survey information; fall arrows added from 3D ground model.	LAM	WL	26.05.17

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Client BRITANNIACREST RECYCLING

Project Sussex EfW

Title Surface Water Catchment Areas

Status	Scale	Date Created
Preliminary	1:500 @A1	16.11.2016
Project Leader	**Drawn By**	**Checked by**
DM	LAM	WL

Document Number	Revision	Suitability
NK018074-RPS-EFW-XX-DR-D-0301	P04	S2

Project Number | Originator - Zone - Level - Type - Role - Drawing Number

10m SCALE 1:500

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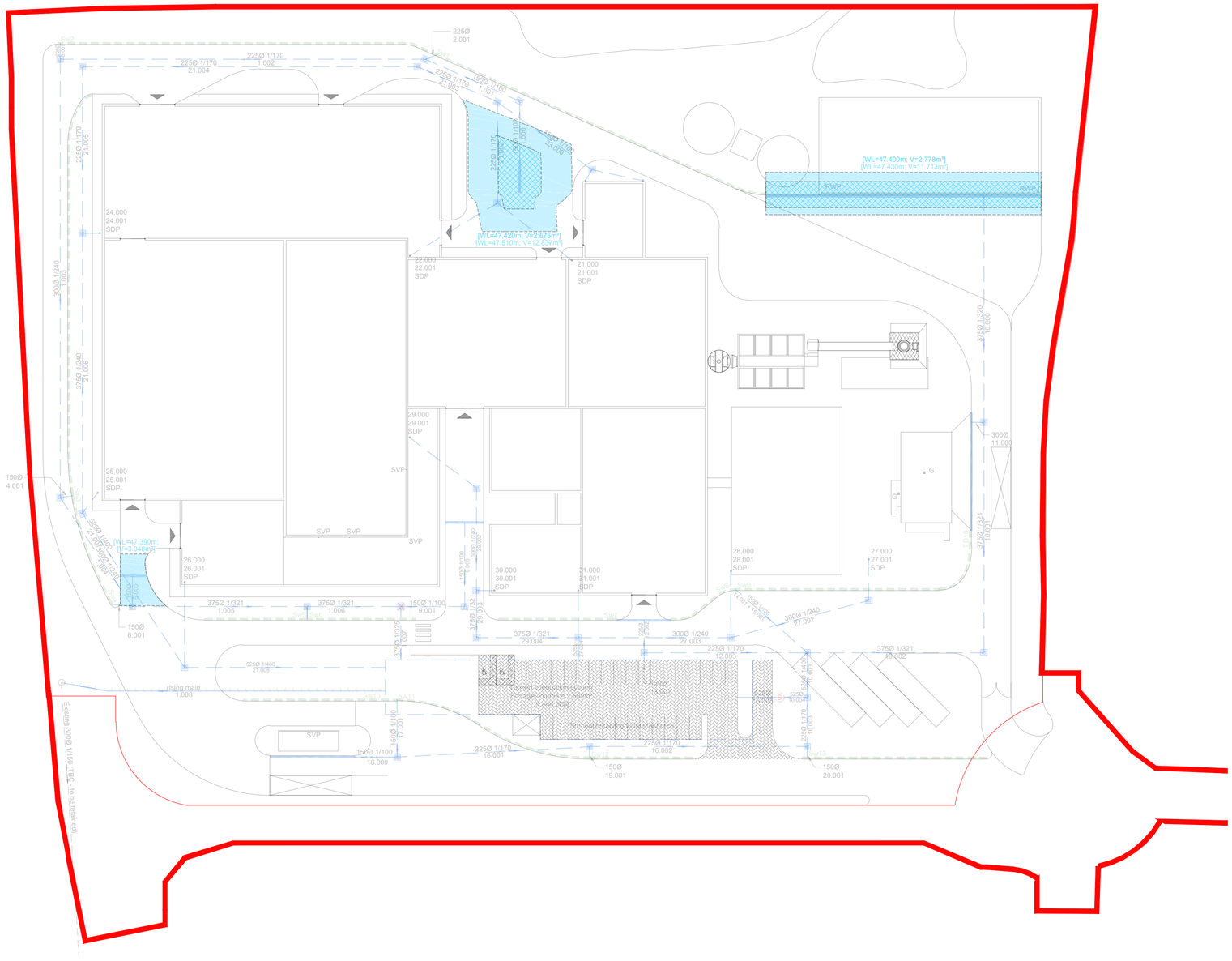
N

Site Boundary

Key

Temporary Flooding (100yr + 20%)

Temporary Flooding (100yr + 40%)



Temporary Overland Flooded Volumes Plan
Scale 1:500

10m SCALE 1:500

Rev	Description	By	Ckd	Date
P02	Flooded volumes updated in line with revised drainage strategy.	MF	WL	13.03.18

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Client BRITANNIACREST RECYCLING

Project Sussex EfW

Title Temporary Overland Flooded Volumes Plan

Status	Scale	Date Created
Preliminary	1:500 @A1	19.02.2018
Project Leader	Drawn By	Checked by
DM	MF	WL

Document Number	Revision	Suitability
NK018074-RPS-EFW-XX-DR-D-0302	P02	S3

Project Number | Originator - Zone - Level - Type - Role - Drawing Number

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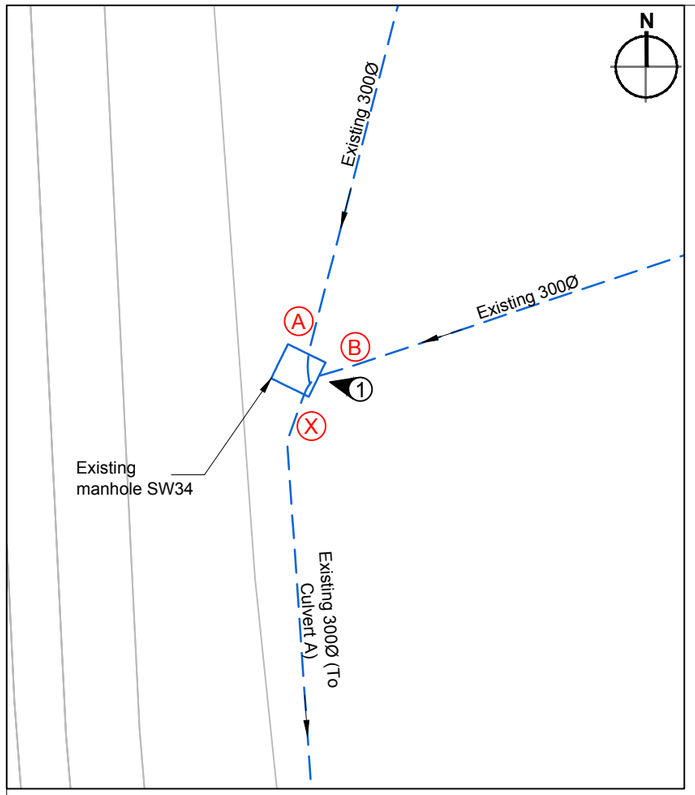
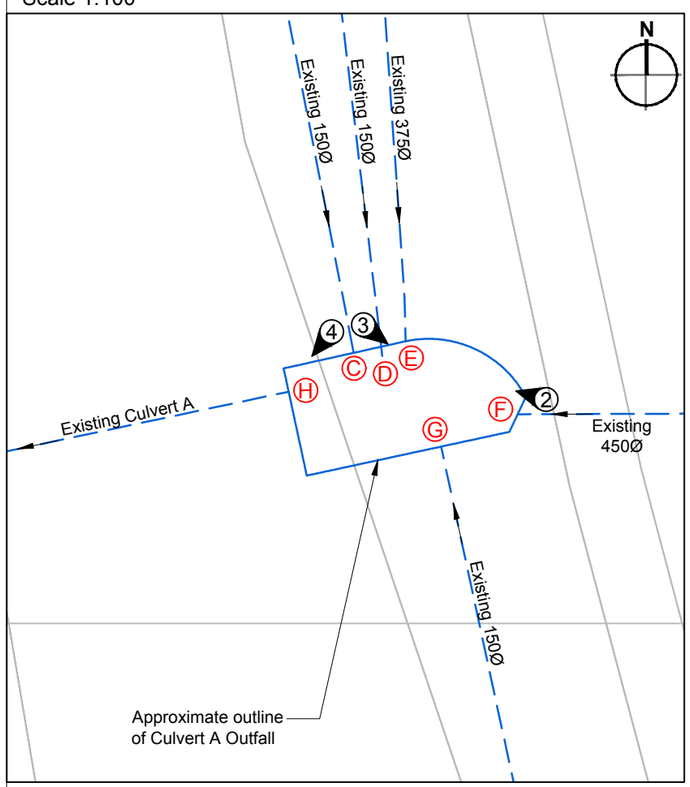
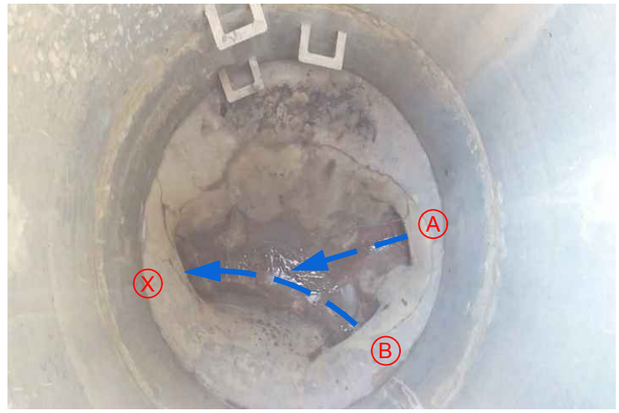


Viewport A - Existing Manhole SW34
Scale 1:100



Viewport B - Outfall into Culvert A
Scale 1:100



Photograph 1

Photograph 2

Photograph 3

Photograph 4

1m SCALE 1:100

Notes

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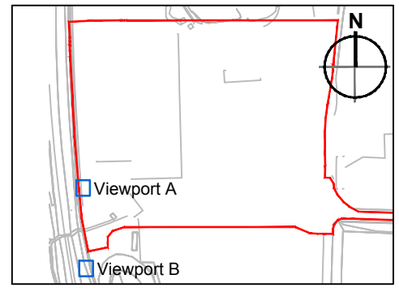
2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key

E Pipe Reference

3 Photograph Location □ Direction

Direction of Flow



Key Plan
Scale 1:5,000

Rev	Description	By	Ckd	Date

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Client BRITANIAGREST RECYCLING

Project Sussex EfW

Title Existing Outfall Details

Status	Scale	Date Created
Preliminary	1:100 @A3	17/05/2017
Project Leader	**Drawn By**	**Checked by**
WL	LAM	WL

Document Number	Revision	Suitability
NK018074 - RPS-XX-DR-D-0305	P01	S0
Project Number / Originator - Zone - Level - Type - Role - Drawing Number		

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APPENDIX IV

Existing EA Permit to Discharge

- **Ref: EPR/CB3308TD** Former Wealden Brickworks Waste Transfer Station Permit

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Britaniacrest Recycling Limited

Former Wealden Brickworks Waste Transfer Station
Langhurst Wood Road
Horsham
West Sussex
RH12 4QD

Permit number

EPR/CB3308TD

Former Wealden Brickworks Waste Transfer Station
Permit number EPR/CB3308TD

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

This is a bespoke permit that authorises the operation of a non-hazardous waste transfer station with asbestos storage at the former Wealden Brickworks in Horsham, West Sussex. The National Grid reference is TQ 17148 34313. The nearest major watercourse is the Bolding Brook approximately 100 to the West of the site.

The waste will originate from a range of sources including household commercial, industrial and construction and demolition waste. Waste will undergo manual and mechanical sorting or separation, screening, washing, shredding, baling and crushing of waste. The annual throughput will be less than 200,000 tonnes.

An improvement condition has been included in the permit which requires the operator to install a sewage treatment plant within 12 months of permit issue. This will allow operator to discharge treated sewage effluent from the welfare facilities on site either to surface water or into the ground via an infiltration field.

A pre-operational condition has also been included which requires the operator to provide a fire action plan to be submitted to the Agency before the site becomes operational

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application EPR/CB3308TD/A001	Duly made 18/11/2014	Application for a Non- Hazardous waste transfer facility with Asbestos storage.
Additional Information	28/01/2015	Amend Site Plan
Permit determined EPR/CB3308TD	03/02/2015	Permit issued to Britaniacrest Limited.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/CB3308TD

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Britaniacrest Recycling Limited ("the operator"),

whose registered office is

26 Reigate Road
Hookwood
Horley
Surrey
RH6 0HJ

Company registration number 02798579

to operate waste operations at

Former Wealden Brickworks Waste Transfer Station
Langhurst Wood Road
Horsham
West Sussex
RH12 4QD

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Helen Rowlands	**03/02/2015**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the requirements of an approved competence scheme.

1.2 Avoidance, recovery and disposal of wastes produced by the activities

1.2.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.2.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit and the discharge shall be made at the point marked on the site plan and as listed in table S3.2 (discharge points).

2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.3 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.1; and

(b) it conforms to the description in the documentation supplied by the producer and holder.

2.3.4 The sewage treatment plant shall conform to all relevant British Standards in force at the time of installation

2.4 Technical requirements

Hazardous waste storage and treatment

2.4.1 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless it is authorised by schedule 1 table S1.1 and appropriate measures are taken.

2.5 Improvement programme

2.5.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.5.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.6 Pre-operational conditions

2.6.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4 have been completed.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1,

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) surface water specified in table S3.1;

3.6 Pests

3.6.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.

3.6.2 The operator shall:

(a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution, hazard or annoyance from pests;

(b) implement the pests management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit; or

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

In any other case:

(a) the death of any of the named operators (where the operator consists of more than one named individual);

(b) any change in the operator's name(s) or address(es); and

(c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "without delay", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities		
Activity reference	**Description of activities for waste operations**	**Limits of activities**
A1 Waste Transfer Station	R3: Recycling/reclamation of organic substances which are not used as solvents R4: Recycling/reclamation of metals and metal compounds R5: Recycling/reclamation of other inorganic compounds R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) D9**:**Physico-chemical treatment not specified elsewhere in Annex IIA which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D8 and D10 to D12 D14: Repackaging prior to submission to any of the operations numbered D1 to D13 D15: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced)	Physical treatment including manual and mechanical sorting or separation, screening, washing, shredding, crushing and baling of waste for disposal (no more than 50 tonnes per day) or recovery. Wastes shall be stored for no longer than 1 year prior to disposal or 3 years prior to recovery. All wastes shall be stored and treated on an impermeable surface with sealed drainage system. Rain and uncontaminated surface water shall be kept separate from contaminated water and other liquids. **Asbestos Storage** No more than 10 tonnes of Asbestos waste to be stored on site at any one time. Asbestos shall be double bagged and kept in clearly identified, segregated, secure lockable containers. There shall be no treatment of asbestos waste. Waste types as specified in Table S2.1

Table S1.1 activities		
Activity reference	**Description of activities for waste operations**	**Limits of activities**
Water Discharge IP1	Discharge of treated sewage effluent via outlet 1.	The outlet shall only be used for the discharge of treated sewage effluent. The outlet shall not contain any substance in a concentration such as will cause the waters to be poisonous or injurious to fish or their spawning grounds, spawn or food of fish. The rate of discharge shall not exceed 5m3.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Documents listed in response to table 3a – technical standards, Part B4 of the application form.	01/07/2014
TGN	How to comply with your Environmental Permit	-

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IP1	The operator shall install and operate a sewage treatment plant conforming to all relevant British Standards in force at the time of installation and sized in accordance with "Flows and Loads 4" The plant should be installed within 12 months of the permit being issued.	03/02/2016

Table S1.4A Pre-operational measures	
Reference	**Pre-operational measures**
1	The operator is required to submit a fire action plan using the Environment Agency's Technical Guidance Note 7.01 Reducing Waste Fire Risk to aid you. This plan is to include what methods would be used for the containment of fire water run-off and the removal of the contained water to an authorised disposal facility. The plan should be submitted before the site becomes operational.

Schedule 2 - Waste types, raw materials and fuels

Table S2.1. Permitted waste types and quantities for Waste Transfer Station	
Maximum quantity	The total quantity of waste accepted at the site shall be less than 200,000 tonnes per annum
Exclusions Wastes having any of the following characteristics shall not be accepted : • Consisting solely or mainly of dusts, powders or loose fibres • Wastes that are in a form which is either sludge or liquids	
Waste code	Description
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS
01 01	**wastes from mineral excavation**
01 01 01	wastes from mineral metalliferous excavation
01 01 02	wastes from mineral non- metalliferous excavation
01 03	**wastes from physical and chemical processing of metalliferous minerals**
01 03 06	tailings other than those mentioned in 01 03 04 and 01 03 05
01 03 09	red mud from alumina production other than the wastes mentioned in 01 03 07
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
01 04 11	wastes from potash and rock salt processing other than those mentioned in 01 04 07
01 04 12	tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07
02	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**
02 01 03	plant-tissue waste
02 01 04	waste plastics (except packaging)
02 01 07	wastes from forestry
02 01 10	waste metal
02 02	**wastes from the preparation and processing of meat, fish and other foods of animal origin**
02 02 03	materials unsuitable for consumption or processing
02 03	**wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing conserve production yeast and yeast extract production, molasses preparation and fermentation**
02 03 04	materials unsuitable for consumption or processing
02 04	**wastes from sugar processing**
02 04 01	soil from cleaning and washing beet
02 04 02	off-specification calcium carbonate
02 05	**wastes from the dairy products industry**
02 05 01	materials unsuitable for consumption or processing
02 06	**wastes from the baking and confectionery industry**
02 06 01	materials unsuitable for consumption or processing
02 06 02	wastes from preserving agents
02 07	**wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)**

02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials
02 07 02	wastes from spirits distillation
02 07 04	materials unsuitable for consumption or processing
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD
03 01	**wastes from wood processing and the production of panels and furniture**
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	**wastes from pulp, paper and cardboard production and processing**
03 03 01	waste bark and wood
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES
04 01	**wastes from the leather and fur industry**
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
04 01 09	wastes from dressing and finishing
04 02	**wastes from the textile industry**
04 02 21	wastes from unprocessed textile fibres
04 02 22	wastes from processed textile fibres
06	WASTES FROM INORGANIC CHEMICAL PROCESSES
06 09	**wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes**
06 09 02	phosphorous slag
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03
06 11	**wastes from the manufacture of inorganic pigments and opacificiers**
06 11 01	calcium-based reaction wastes from titanium dioxide production
07	WASTES FROM ORGANIC CHEMICAL PROCESSES
07 02	**wastes from the MFSU of plastics, synthetic rubber and man-made fibres**
07 02 13	waste plastic
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
09 01	**wastes from the photographic industry**
09 01 07	photographic film and paper containing silver or silver compounds
09 01 08	photographic film and paper free of silver or silver compounds
09 01 10	single-use cameras without batteries
09 01 12	single-use cameras containing batteries other than those mentioned in 09 01 11
10	WASTES FROM THERMAL PROCESSES
10 01	**wastes from power stations and other combustion plants (except 19)**
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)
10 01 05	calcium-based reaction wastes from flue-gas desulphurisation in solid form
10 01 07	calcium-based reaction wastes from flue-gas desulphurisation in sludge form
10 01 15	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14
10 01 19	wastes from gas cleaning other than those mentioned in 10 01 05, 10 01 07 and 10 01 18
10 01 24	sands from fluidised beds
10 02	**wastes from the iron and steel industry**
10 02 01	wastes from the processing of slag
10 02 02	unprocessed slag
10 02 08	Solid wastes from gas treatment other than those mentioned in 10 02 07
10 02 10	mill scales
10 02 14	sludges and filter cakes from gas treatment other than those mentioned in 10 02 13

10 02 15	other sludges and filter cakes
10 03	**wastes from aluminium thermal metallurgy**
10 03 02	anode scraps
10 03 05	waste alumina
10 03 16	skimmings other than those mentioned in 10 03 15
10 03 18	carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17
10 03 24	solid wastes from gas treatment other than those mentioned in 10 03 23
10 03 26	sludges and filter cakes from gas treatment other than those mentioned in 10 03 25
10 03 28	wastes from cooling-water treatment other than those mentioned in 10 03 27
10 03 30	wastes from treatment of salt slags and black drosses other than those mentioned in 10 03 29
10 04	**wastes from lead thermal metallurgy**
10 04 10	wastes from cooling-water treatment other than those mentioned in 10 04 09
10 05	**wastes from zinc thermal metallurgy**
10 05 01	slags from primary and secondary production
10 05 09	wastes from cooling-water treatment other than those mentioned in 10 05 08
10 05 11	dross and skimmings other than those mentioned in 10 05 10
10 06	**wastes from copper thermal metallurgy**
10 06 01	slags from primary and secondary production
10 06 02	dross and skimmings from primary and secondary production
10 06 10	wastes from cooling-water treatment other than those mentioned in 10 06 09
10 07	**wastes from silver, gold and platinum thermal metallurgy**
10 07 01	slags from primary and secondary production
10 07 02	Dross and skimmings from primary and secondary production
10 07 03	solid wastes from gas treatment
10 07 05	sludges and filter cakes from gas treatment
10 07 08	wastes from cooling-water treatment other than those mentioned in 10 07 07
10 08	**wastes from other non-ferrous thermal metallurgy**
10 08 09	other slags
10 08 11	dross and skimmings other than those mentioned in 10 08 10
10 08 13	carbon-containing wastes from anode manufacture other than those mentioned in 10 08 12
10 08 14	anode scrap
10 08 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 08 17
10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19
10 09	**wastes from casting of ferrous pieces**
10 09 03	furnace slag
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07
10 09 14	waste binders other than those mentioned in 10 09 13
10 09 16	waste crack-indicating agent other than those mentioned in 10 09 15
10 10	**wastes from casting of non-ferrous pieces**
10 10 03	furnace slag
10 10 06	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05
10 10 08	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07
10 10 14	waste binders other than those mentioned in 10 10 13
10 10 16	waste crack-indicating agent other than those mentioned in 10 10 15
10 11	**wastes from manufacture of glass and glass products**
10 11 03	waste glass-based fibrous materials
10 11 10	waste preparation mixture before thermal processing, other than those mentioned in 10 11 09

10 11 12	waste glass other than those mentioned in 10 11 11
10 11 16	solid wastes from flue-gas treatment other than those mentioned in 10 11 15
10 11 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 11 17
10 12	**wastes from manufacture of ceramic goods, bricks, tiles and construction products**
10 12 01	waste preparation mixture before thermal processing
10 12 05	sludges and filter cakes from gas treatment
10 12 06	discarded moulds
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09
10 12 12	wastes from glazing other than those mentioned in 10 12 11
10 13	**wastes from manufacture of cement, lime and plaster and articles and products made from them**
10 13 01	waste preparation mixture before thermal processing
10 13 04	wastes from calcination and hydration of lime
10 13 07	sludges and filter cakes from gas treatment
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12
10 13 14	waste concrete and concrete sludge
11	WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY
11 01	**wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphatising, alkaline degreasing, anodising)**
11 01 10	sludges and filter cakes other than those mentioned in 11 01 09
11 01 14	degreasing wastes other than those mentioned in 11 01 13
11 02	**wastes from non-ferrous hydrometallurgical processes**
11 02 03	wastes from the production of anodes for aqueous electrolytical processes
11 02 06	wastes from copper hydrometallurgical processes other than those mentioned in 11 02 05
11 05	**wastes from hot galvanising processes**
11 05 01	hard zinc
11 05 02	zinc ash
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS
12 01	**wastes from shaping and physical and mechanical surface treatment of metals and plastics**
12 01 01	ferrous metal filings and turnings
12 01 03	non-ferrous metal filings and turnings
12 01 05	plastics shavings and turnings
12 01 13	welding wastes
12 01 17	waste blasting material other than those mentioned in 12 01 16
12 01 21	spent grinding bodies and grinding materials other than those mentioned in 12 01 20
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01	**packaging (including separately collected municipal packaging waste)**
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 04	metallic packaging
15 01 05	composite packaging
15 01 06	mixed packaging

15 01 07	glass packaging
15 01 09	textile packaging
15 02	**absorbents, filter materials, wiping cloths and protective clothing**
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
16	**WASTES NOT OTHERWISE SPECIFIED IN THE LIST**
16 01	**end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**
16 01 03	end-of-life tyres
16 02	**wastes from electrical and electronic equipment**
16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13
16 02 16	Components removed from discarded equipment other than those mentioned in 16 02 15
16 03	**off-specification batches and unused products**
16 03 04	inorganic wastes other than those mentioned in 16 03 03
16 03 06	organic wastes other than those mentioned in 16 03 05
16 06	Batteries and accumulators
16 06 04	Alkalane batteries (except 16 06 03)
16 06 05	Other batteries and accumulators
16 11	**waste linings and refractories**
16 11 02	carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01
16 11 04	other linings and refractories from metallurgical processes other than those mentioned in 16 11 03
16 11 06	linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	**concrete, bricks, tiles and ceramics**
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	**wood, glass and plastic**
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 03	**bituminous mixtures, coal tar and tarred products**
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 04	**metals (including their alloys)**
17 04 01	copper, bronze, brass
17 04 02	aluminium
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 04 11	cables other than those mentioned in 17 04 10
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	**insulation materials and asbestos-containing construction materials**
17 06 01*	insulation materials containing asbestos – bonded asbestos only

17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	construction materials containing asbestos – bonded asbestos only
17 08	**gypsum-based construction material**
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01
17 09	**other construction and demolition wastes**
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 01	**wastes from incineration or pyrolysis of waste**
19 01 02	ferrous materials removed from bottom ash
19 01 12	bottom ash and slag other than those mentioned in 19 01 11
19 01 18	pyrolysis wastes other than those mentioned in 19 01 17
19 01 19	sands from fluidised beds
19 02	**wastes from physico/chemical treatments of waste (including dechromatation decyanidation, neutralisation)**
19 02 03	premixed wastes composed only of non-hazardous wastes
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09
19 04	**vitrified waste and wastes from vitrification**
19 04 01	vitrified waste
19 05	**wastes from aerobic treatment of solid wastes**
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 01	paper and cardboard
19 12 02	ferrous metal
19 12 03	non-ferrous metal
19 12 04	plastic and rubber
19 12 05	glass
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 09	minerals (for example sand, stones)
19 12 10	combustible waste (refuse derived fuel)
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (generally packaging waste or mixed refuse)
19 13	**wastes from soil and groundwater remediation**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 01	**separately collected fractions (except 15 01)**
20 01 01	paper and cardboard
20 01 02	glass
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 34	Batteries and accumulators other than those mentioned in 20 01 33
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35

20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 40	metals
20 01 41	wastes from chimney sweeping
20 02	**garden and park wastes (including cemetery waste)**
20 02 01	biodegradable waste
20 02 02	soil and stones
20 03	**other municipal wastes**
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 07	bulky waste

Schedule 3 – Emissions and monitoring

Table S3.1 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements						
Discharge source and discharge point ref. & location	**Parameter**	**Limit (including unit)**	**Reference Period**	**Limit of effective range**	**Monitoring frequency**	**Compliance Statistic**
Treated sewage effluent via outlet 1	Maximum daily flow	5m3/day	Total daily volume	N/A	N/A	Maximum
	Visual appearance	The discharge must be clear	Instantaneous (Spot sample)	N/A	N/A	Clear
	Visual appearance	The discharge must have no adverse visible effect on the receiving water, the bed of the watercourse or any plants or animals within the watercourse	Instantaneous (Spot sample)	N/A	N/A	No adverse effect
	Visible oil or grease	No significant trace present	Instantaneous (Spot sample)	N/A	N/A	No significant trace

Table S3.2 Discharge points			
Effluent Name	**Discharge Point**	**Discharge point NGR**	**Receiving water/Environment**
Treated sewage effluent	Outlet 1	At Grid TQ 1715 3432	Bolling Brook via culvert

Table S3.3 Monitoring points			
Effluent(s) and discharge point(s)	**Monitoring type**	**Monitoring point NGR**	**Monitoring point reference**
Treated sewage effluent via outlet 1	Effluent sampling	NGR 1715 3432	Outlet 1

Schedule 4 – Reporting

There is no reporting under this schedule.

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

adverse visible effect” means dead or distressed fish, other animals or plants in the vicinity of the discharge, appreciable deposit of solid material; growth of sewage fungus; or appreciable discolouration.

“Annex I” means Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Annex II” means Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“building” means a construction that has the objective of providing sheltering cover and minimising emissions of noise, particulate matter, odour and litter.

“D” means a disposal operation provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“emissions to land” includes emissions to groundwater.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“hazardous waste” has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 No.894, the Hazardous Waste (Wales) Regulations 2005 No. 1806 (W.138), the List of Wastes (England) Regulations 2005 No.895 and the List of Wastes (Wales) Regulations 2005 No. 1820 (W.148).

“impermeable surface” means a surface or pavement constructed and maintained to a standard sufficient to prevent the transmission of liquids beyond the pavement surface, and should be read in conjunction with the term “sealed drainage system” (below).

“Industry Standard Protocol” means “A standardised protocol for the monitoring of bioaerosols at open composting facilities” published by the Association for Organics Recycling and developed in conjunction with the Environment Agency

“pests” means Birds, Vermin and Insects.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“R” means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“sealed drainage system” is a drainage system with impermeable components which does not leak and which will ensure that no liquids will run off a surfaced area other than via the system. Except where they are lawfully discharged, all liquids entering the system should be collected in a sealed sump.

significant pollution” means a category 1 or category 2 incident indicated by the Common Incident

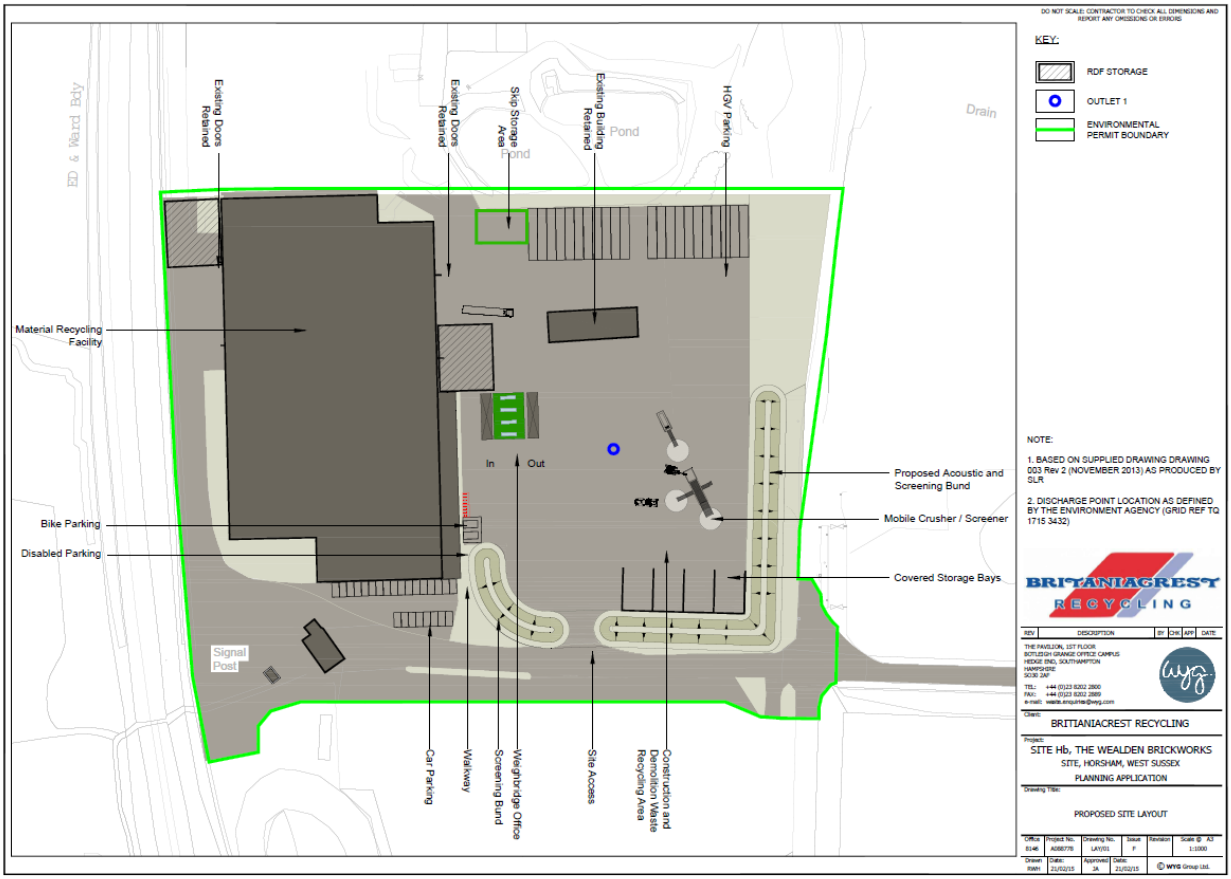
Classification Scheme (CICS).

“Waste code” means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

“year” means calendar year ending 31 December.

Schedule 7 – Site plan



END OF PERMIT

APPENDIX V

Proposed Drainage Calculations

- **NK018074-RPS-EFW-XX-CA-D-TN001** Cv and Q_{BAR} Calculations
- **NK018074-RPS-EFW-XX-CA-D-SWC001** Surface Water Drainage Calculations
- **NK018074-RPS-EFW-XX-CA-D-SWC001-40** Surface Water Drainage Calculations
- **NK018074-RPS-EFW-XX-CA-D-FWC001** Foul Water Drainage Calculations

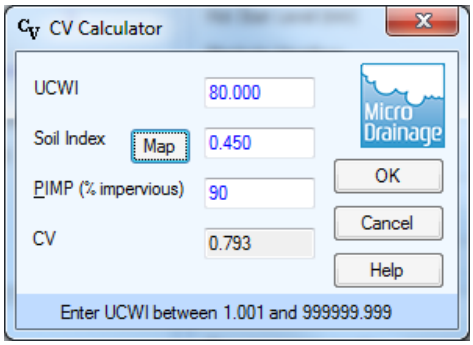
Project:	NK018074 - Sussex - 3Rs Facility, Wealden Works		
Prepared for:	Britaniacrest Recycling Ltd (Surrey)		
Title:	Technical Note: Cv and Q_{BAR} Calculation		
Reference:	**NK018074-RPS-EFW-XX-CA-D-TN001**		
Revision:	P02	Suitability: S2	Date: 13.03.18

TECHNICAL NOTE TN001: Cv and Q_{BAR} Calculation

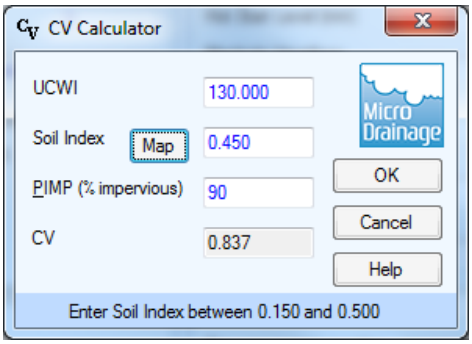
NK018074-RPS-EFW-XX-CA-D-TN001

- **CV** = PR/PIMP where:
- **PR** = 0.829 PIMP + 25.0 SOIL + 0.078 UCWI – 20.7
- **PIMP** = surface intended to drain to the storm sewer [21,426m²/25,460m² = 0.84]
- **SOIL** = 0.45
- **UCWI** = antecedent wetness conditions (mm) [80 for summer, 130 for winter]

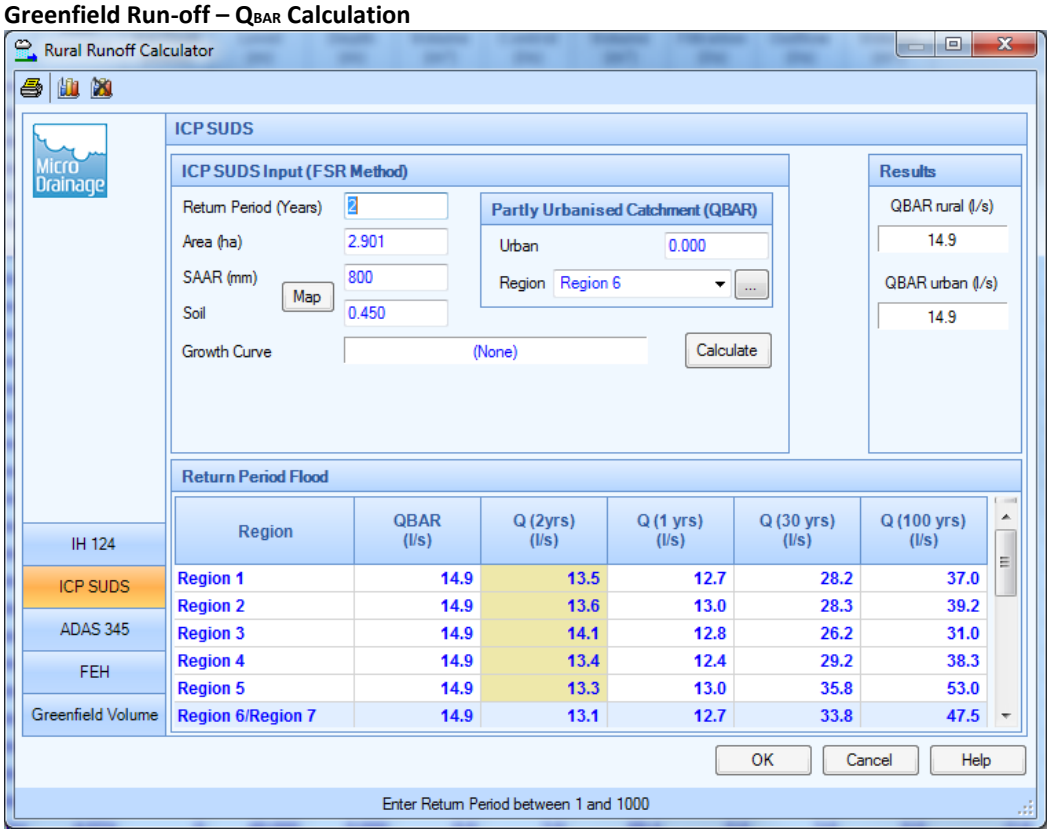
Summer CV



Winter CV



Greenfield Run-off – Q_{BAR} Calculation



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Foul Sewage (l/s/ha)	0.000	Min Design Depth for Optimisation (m)	1.200
M5-60 (mm)	20.000	Volumetric Runoff Coeff.	0.750	Min Vel for Auto Design only (m/s)	1.00
Ratio R	0.350	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Rainfall (mm/hr)	65	Minimum Backdrop Height (m)	0.000		
Maximum Time of Concentration (mins)	30	Maximum Backdrop Height (m)	1.500		

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - 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	11.792	0.118	100.0	0.063	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	20.804	0.208	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	2.475	0.015	170.0	0.106	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	73.579	0.433	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	3.250	0.019	170.0	0.122	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	88.303	0.368	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	2.556	0.026	100.0	0.048	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	26.354	0.110	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.000	6.225	0.062	100.4	0.071	4.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
6.001	4.177	0.042	100.0	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	35.226	0.110	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
7.001	2.484	0.025	100.0	0.054	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	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	65.00	4.20	46.375	0.063	0.0	0.0	0.0	1.00	17.8	11.1
1.001	65.00	4.54	46.257	0.063	0.0	0.0	0.0	1.00	17.8	11.1
2.000	65.00	4.20	46.575	0.000	0.0	0.0	0.0	0.82	14.5	0.0
2.001	65.00	4.24	46.433	0.106	0.0	0.0	0.0	1.00	39.8	18.7
1.002	61.81	5.77	45.974	0.169	0.0	0.0	0.0	1.00	39.8	28.3
3.000	65.00	4.20	46.525	0.000	0.0	0.0	0.0	0.82	14.5	0.0
3.001	65.00	4.26	46.383	0.122	0.0	0.0	0.0	1.00	39.8	21.5
1.003	55.88	7.22	45.466	0.291	0.0	0.0	0.0	1.01	71.4	44.0
4.000	65.00	4.20	46.600	0.000	0.0	0.0	0.0	0.82	14.5	0.0
4.001	65.00	4.25	46.533	0.048	0.0	0.0	0.0	1.00	17.8	8.4
1.004	54.36	7.66	45.098	0.339	0.0	0.0	0.0	1.01	71.4	49.9
5.000	65.00	4.10	46.270	0.071	0.0	0.0	0.0	1.00	17.7	12.5
6.000	65.00	4.20	46.550	0.000	0.0	0.0	0.0	0.82	14.5	0.0
6.001	65.00	4.27	46.483	0.029	0.0	0.0	0.0	1.00	17.8	5.1
1.005	52.47	8.24	44.913	0.439	0.0	0.0	0.0	1.01	111.1	62.4
7.000	65.00	4.20	46.605	0.000	0.0	0.0	0.0	0.82	14.5	0.0
7.001	65.00	4.24	46.538	0.054	0.0	0.0	0.0	1.00	17.8	9.5
8.000	65.00	4.20	46.605	0.000	0.0	0.0	0.0	0.82	14.5	0.0

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
8.001	2.484	0.025	100.0	0.048	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	18.888	0.059	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.000	16.961	0.170	100.0	0.056	4.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	12.835	0.128	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	10.734#	0.033	325.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.000	45.510	0.190	239.5	0.273	4.00	0.0	0.600	o	300	Pipe/Conduit	
11.000	5.000#	0.021	240.0	0.121	4.00	0.0	0.600	o	300	Pipe/Conduit	
10.001	46.371	0.144	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.002	35.598	0.111	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
12.000	10.000#	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
12.001	0.500#	0.005	100.0	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
12.002	6.453#	0.038	169.8	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.000	2.000#	0.020	100.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
13.001	2.000#	0.020	100.0	0.162	0.00	0.0	0.600	o	150	Pipe/Conduit	
12.003	32.867	0.193	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
14.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
14.001	19.276	0.193	99.9	0.032	0.00	0.0	0.600	o	150	Pipe/Conduit	
15.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
15.001	19.276	0.193	99.9	0.171	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.003	9.000	0.023	400.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
16.000	8.367	0.084	100.0	0.016	4.00	0.0	0.600	o	150	Pipe/Conduit	
17.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
17.001	11.550	0.116	100.0	0.054	0.00	0.0	0.600	o	150	Pipe/Conduit	
18.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
18.001	11.550	0.116	100.0	0.055	0.00	0.0	0.600	o	150	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)
8.001	65.00	4.24	46.538	0.048	0.0	0.0	0.0	1.00	17.8	8.4
1.006	51.51	8.55	44.804	0.541	0.0	0.0	0.0	1.01	111.1	75.5
9.000	65.00	4.28	46.275	0.056	0.0	0.0	0.0	1.00	17.8	9.9
9.001	65.00	4.49	46.105	0.056	0.0	0.0	0.0	1.00	17.8	9.9
1.007	50.99	8.73	44.745	0.597	0.0	0.0	0.0	1.00	110.3	82.4
10.000	65.00	4.75	46.370	0.273	0.0	0.0	0.0	1.01	71.5	48.1
11.000	65.00	4.08	47.100	0.121	0.0	0.0	0.0	1.01	71.4	21.3
10.001	62.98	5.52	46.105	0.394	0.0	0.0	0.0	1.01	111.1	67.2
10.002	60.29	6.11	45.961	0.394	0.0	0.0	0.0	1.01	111.1	67.2
12.000	65.00	4.20	46.605	0.000	0.0	0.0	0.0	0.82	14.5	0.0
12.001	65.00	4.21	46.538	0.021	0.0	0.0	0.0	1.00	17.8	3.7
12.002	65.00	4.32	46.458	0.029	0.0	0.0	0.0	1.00	39.8	5.1
13.000	65.00	4.03	47.180	0.000	0.0	0.0	0.0	1.00	17.8	0.0
13.001	65.00	4.03	46.580	0.000	5.0	0.0	0.0	1.00	17.8	5.0
12.003	65.00	4.87	46.420	0.029	5.0	0.0	0.0	1.00	39.8	10.1
14.000	65.00	4.20	46.455	0.000	0.0	0.0	0.0	0.82	14.5	0.0
14.001	65.00	4.52	46.388	0.032	0.0	0.0	0.0	1.01	17.8	5.6
15.000	65.00	4.20	46.455	0.000	0.0	0.0	0.0	0.82	14.5	0.0
15.001	65.00	4.45	46.313	0.171	0.0	0.0	0.0	1.31	52.0	30.1
10.003	59.71	6.24	45.700	0.626	5.0	0.0	0.0	1.11	241.1	106.2
16.000	65.00	4.14	47.120	0.016	0.0	0.0	0.0	1.00	17.8	2.8
17.000	65.00	4.20	47.010	0.000	0.0	0.0	0.0	0.82	14.5	0.0
17.001	65.00	4.40	46.943	0.054	0.0	0.0	0.0	1.00	17.8	9.5
18.000	65.00	4.20	47.010	0.000	0.0	0.0	0.0	0.82	14.5	0.0
18.001	65.00	4.40	46.943	0.055	0.0	0.0	0.0	1.00	17.8	9.7

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
16.001	38.801	0.228	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
19.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
19.001	2.250	0.023	100.0	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
16.002	43.879	0.258	170.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
20.000	10.000	0.067	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
20.001	2.251	0.023	100.0	0.042	0.00	0.0	0.600	o	150	Pipe/Conduit	
16.003	9.962	0.059	168.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.004	5.533	0.014	400.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
10.005	8.500#	0.021	400.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
21.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	225	Pipe/Conduit	
21.001	18.992	5.685	3.3	0.047	0.00	0.0	0.600	o	150	Pipe/Conduit	
22.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	225	Pipe/Conduit	
22.001	20.651	5.760	3.6	0.092	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.002	20.325	0.120	169.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
23.000	23.462	0.235	99.8	0.014	4.00	0.0	0.600	o	150	Pipe/Conduit	
21.003	17.578	0.103	170.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.004	67.527	0.397	170.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.005	33.574	0.197	170.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
24.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	150	Pipe/Conduit	
24.001	3.450	5.475	0.6	0.247	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.006	56.402	0.235	240.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
25.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	300	Pipe/Conduit	
25.001	5.102	5.360	1.0	0.324	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.007	37.221	0.074	500.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
26.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	150	Pipe/Conduit	
26.001	17.184	7.749	2.2	0.065	0.00	0.0	0.600	o	150	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)
16.001	65.00	5.04	46.753	0.125	0.0	0.0	0.0	1.00	39.8	22.0
19.000	65.00	4.20	47.300	0.000	0.0	0.0	0.0	0.82	14.5	0.0
19.001	65.00	4.24	47.233	0.018	0.0	0.0	0.0	1.00	17.8	3.2
16.002	61.78	5.77	46.525	0.143	0.0	0.0	0.0	1.00	39.7	23.9
20.000	65.00	4.20	47.495	0.000	0.0	0.0	0.0	0.82	14.5	0.0
20.001	65.00	4.24	47.428	0.042	0.0	0.0	0.0	1.00	17.8	7.4
16.003	61.03	5.94	46.267	0.185	0.0	0.0	0.0	1.00	39.9	30.6
10.004	59.36	6.33	45.677	0.811	5.0	0.0	0.0	1.11	241.1	135.4
10.005	58.84	6.45	45.663	0.811	5.0	0.0	0.0	1.11	241.1	135.4
21.000	65.00	2.26	52.400	0.000	0.0	0.0	0.0	0.65	25.8	0.0
21.001	65.00	2.31	52.375	0.047	0.0	0.0	0.0	5.55	98.2	8.3
22.000	65.00	2.26	52.400	0.000	0.0	0.0	0.0	0.65	25.8	0.0
22.001	65.00	2.31	52.375	0.092	0.0	0.0	0.0	6.96	276.7	16.2
21.002	65.00	2.65	46.340	0.139	0.0	0.0	0.0	1.00	39.8	24.5
23.000	65.00	4.39	46.900	0.014	0.0	0.0	0.0	1.01	17.8	2.5
21.003	65.00	4.68	46.220	0.153	0.0	0.0	0.0	1.00	39.7	26.9
21.004	61.62	5.81	46.117	0.153	0.0	0.0	0.0	1.00	39.7	26.9
21.005	59.18	6.37	45.720	0.153	0.0	0.0	0.0	1.00	39.7	26.9
24.000	65.00	2.34	52.325	0.000	0.0	0.0	0.0	0.50	8.8	0.0
24.001	65.00	2.34	52.225	0.247	0.0	0.0	0.0	16.62	660.8	43.5
21.006	56.05	7.18	45.373	0.400	0.0	0.0	0.0	1.17	128.7	60.7
25.000	65.00	2.21	52.250	0.000	0.0	0.0	0.0	0.78	55.1	0.0
25.001	65.00	2.22	52.225	0.324	0.0	0.0	0.0	13.52	537.6	57.0
21.007	53.89	7.80	44.400	0.724	0.0	0.0	0.0	0.99	215.4	105.7
26.000	65.00	2.34	52.475	0.000	0.0	0.0	0.0	0.50	8.8	0.0
26.001	65.00	2.38	52.450	0.065	0.0	0.0	0.0	6.82	120.5	11.4

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
21.008	40.457#	0.081	500.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
27.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	150	Pipe/Conduit	
27.001	8.252	5.080	1.6	0.229	0.00	0.0	0.600	o	150	Pipe/Conduit	
27.002	28.743	0.120	239.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
28.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	100	Pipe/Conduit	
28.001	13.384	5.555	2.4	0.059	0.00	0.0	0.600	o	150	Pipe/Conduit	
27.003	30.773	0.128	240.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
29.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	100	Pipe/Conduit	
29.001	16.917	5.610	3.0	0.202	0.00	0.0	0.600	o	225	Pipe/Conduit	
29.002	20.648	0.086	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
30.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	100	Pipe/Conduit	
30.001	3.626	5.735	0.6	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
29.003	9.467	0.029	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
29.004	20.469	0.064	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
31.000	10.000	0.025	400.0	0.000	2.00	0.0	0.600	o	100	Pipe/Conduit	
31.001	9.450	6.000	1.6	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
27.004	4.500#	0.011	409.1	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.008	65.447#	-0.550	-119.0	0.000	0.00	0.0	0.600	o	150	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)
21.008	51.75	8.48	44.326	0.789	0.0	0.0	0.0	0.99	215.4	110.6
27.000	65.00	2.34	52.325	0.000	0.0	0.0	0.0	0.50	8.8	0.0
27.001	65.00	2.35	52.300	0.229	0.0	0.0	0.0	7.97	140.9	40.3
27.002	65.00	2.83	46.770	0.229	0.0	0.0	0.0	1.01	71.5	40.3
28.000	65.00	2.44	52.400	0.000	0.0	0.0	0.0	0.38	3.0	0.0
28.001	65.00	2.47	52.325	0.059	0.0	0.0	0.0	6.54	115.6	10.4
27.003	65.00	3.33	46.620	0.288	0.0	0.0	0.0	1.01	71.4	50.7
29.000	65.00	2.44	52.325	0.000	0.0	0.0	0.0	0.38	3.0	0.0
29.001	65.00	2.48	52.175	0.202	0.0	0.0	0.0	7.59	301.8	35.6
29.002	65.00	2.82	46.490	0.202	0.0	0.0	0.0	1.01	71.4	35.6
30.000	65.00	2.44	52.400	0.000	0.0	0.0	0.0	0.38	3.0	0.0
30.001	65.00	2.44	52.250	0.019	0.0	0.0	0.0	16.59	659.7	3.3
29.003	65.00	2.97	46.329	0.221	0.0	0.0	0.0	1.01	111.1	38.9
29.004	65.00	3.31	46.299	0.221	0.0	0.0	0.0	1.01	111.1	38.9
31.000	65.00	2.44	52.325	0.000	0.0	0.0	0.0	0.38	3.0	0.0
31.001	65.00	2.46	52.175	0.034	0.0	0.0	0.0	10.51	417.8	6.0
27.004	65.00	3.40	45.875	0.543	0.0	0.0	0.0	1.10	238.4	95.6
1.008	37.27	15.77	43.800	0.000	14.9	0.0	0.0	0.09	1.6«	14.9

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
ACO	47.350	0.975	Open Manhole	1200	1.000	46.375	150				
S1	47.440	1.183	Open Manhole	1200	1.001	46.257	150	1.000	46.257	150	
Dummy	47.400	0.825	Open Manhole	1200	2.000	46.575	150				
Sw1	47.400	0.967	Open Manhole	1200	2.001	46.433	225	2.000	46.508	150	
S2	47.415	1.441	Open Manhole	1200	1.002	45.974	225	1.001	46.049	150	
								2.001	46.419	225	445
Dummy	47.350	0.825	Open Manhole	1200	3.000	46.525	150				
Sw2	47.350	0.967	Open Manhole	1200	3.001	46.383	225	3.000	46.458	150	
S3	47.410	1.944	Open Manhole	1200	1.003	45.466	300	1.002	45.541	225	
								3.001	46.364	225	823
Dummy	47.425	0.825	Open Manhole	1200	4.000	46.600	150				
Sw3	47.425	0.892	Open Manhole	1200	4.001	46.533	150	4.000	46.533	150	
S4	47.480	2.382	Open Manhole	1200	1.004	45.098	300	1.003	45.098	300	
								4.001	46.508	150	1259
ACO	47.270	1.000	Open Manhole	1200	5.000	46.270	150				
Dummy	47.375	0.825	Open Manhole	1200	6.000	46.550	150				
Sw4	47.375	0.892	Open Manhole	1200	6.001	46.483	150	6.000	46.483	150	
S5	47.375	2.462	Open Manhole	1350	1.005	44.913	375	1.004	44.988	300	
								5.000	46.208	150	1070
								6.001	46.442	150	1303
Dummy	47.430	0.825	Open Manhole	1200	7.000	46.605	150				
Sw5	47.430	0.892	Open Manhole	1200	7.001	46.538	150	7.000	46.538	150	
Dummy	47.430	0.825	Open Manhole	1200	8.000	46.605	150				
Sw6	47.430	0.892	Open Manhole	1200	8.001	46.538	150	8.000	46.538	150	
S6	47.555	2.751	Open Manhole	1350	1.006	44.804	375	1.005	44.804	375	
								7.001	46.513	150	1485
								8.001	46.513	150	1485
ACO	47.275	1.000	Open Manhole	1200	9.000	46.275	150				
S7	47.355	1.250	Open Manhole	1200	9.001	46.105	150	9.000	46.105	150	
S8	47.555	2.810	Open Manhole	1350	1.007	44.745	375	1.006	44.745	375	
								9.001	45.977	150	1007
ACO	47.370	1.000	Open Manhole	1200	10.000	46.370	300				
ACO	48.100	1.000	Open Manhole	1200	11.000	47.100	300				
S11	48.160	2.055	Open Manhole	1350	10.001	46.105	375	10.000	46.180	300	
								11.000	47.079	300	899
S12	48.760	2.799	Open Manhole	1350	10.002	45.961	375	10.001	45.961	375	
Dummy	47.430	0.825	Open Manhole	1200	12.000	46.605	150				
Sw7	47.430	0.892	Open Manhole	1200	12.001	46.538	150	12.000	46.538	150	
ACO	47.430	0.972	Open Manhole	1200	12.002	46.458	225	12.001	46.533	150	
Dummy	47.630	0.450	Open Manhole	1200	13.000	47.180	150				
Porous CP	47.630	1.050	Open Manhole	1200	13.001	46.580	150	13.000	47.160	150	580
S13	47.715	1.295	Open Manhole	1200	12.003	46.420	225	12.002	46.420	225	
								13.001	46.560	150	65
Dummy	47.280	0.825	Open Manhole	1200	14.000	46.455	150				
Sw8	47.280	0.892	Open Manhole	1200	14.001	46.388	150	14.000	46.388	150	
Dummy	47.280	0.825	Open Manhole	1200	15.000	46.455	150				
Sw9	47.280	0.967	Open Manhole	1200	15.001	46.313	225	15.000	46.388	150	
S14	47.935	2.235	Open Manhole	1500	10.003	45.700	525	10.002	45.850	375	
								12.003	46.227	225	227
								14.001	46.195	150	121
								15.001	46.120	225	121
ACO	48.120	1.000	Open Manhole	1200	16.000	47.120	150				
Dummy	47.835	0.825	Open Manhole	1200	17.000	47.010	150				
Sw10	47.835	0.892	Open Manhole	1200	17.001	46.943	150	17.000	46.943	150	
Dummy	47.835	0.825	Open Manhole	1200	18.000	47.010	150				
Sw11	47.835	0.892	Open Manhole	1200	18.001	46.943	150	18.000	46.943	150	
S15	48.120	1.367	Open Manhole	1200	16.001	46.753	225	16.000	47.036	150	208
								17.001	46.828	150	
								18.001	46.828	150	
Dummy	48.125	0.825	Open Manhole	1200	19.000	47.300	150				
Sw12	48.125	0.892	Open Manhole	1200	19.001	47.233	150	19.000	47.233	150	
S16	48.265	1.740	Open Manhole	1200	16.002	46.525	225	16.001	46.525	225	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								19.001	47.211	150	611
Dummy	48.320	0.825	Open Manhole	1200	20.000	47.495	150				
Sw13	48.420	0.992	Open Manhole	1200	20.001	47.428	150	20.000	47.428	150	
S17	48.450	2.183	Open Manhole	1200	16.003	46.267	225	16.002	46.267	225	
								20.001	47.406	150	1064
S18	48.325	2.648	Open Manhole	1500	10.004	45.677	525	10.003	45.677	525	
								16.003	46.208	225	230
S19	48.000	2.337	Open Manhole	1500	10.005	45.663	525	10.004	45.663	525	
Dummy	52.650	0.250	Open Manhole	1200	21.000	52.400	225				
SDP	52.650	0.275	Open Manhole	1200	21.001	52.375	150	21.000	52.375	225	
Dummy	52.650	0.250	Open Manhole	1200	22.000	52.400	225				
SDP	52.650	0.275	Open Manhole	1200	22.001	52.375	225	22.000	52.375	225	
S20	47.440	1.100	Open Manhole	1200	21.002	46.340	225	21.001	46.690	150	275
								22.001	46.615	225	275
S21	47.650	0.750	Open Manhole	1200	23.000	46.900	150				
S22	47.485	1.265	Open Manhole	1200	21.003	46.220	225	21.002	46.220	225	
								23.000	46.665	150	370
S23	47.460	1.343	Open Manhole	1200	21.004	46.117	225	21.003	46.117	225	
S24	47.440	1.720	Open Manhole	1200	21.005	45.720	225	21.004	45.720	225	
Dummy	52.650	0.325	Open Manhole	1200	24.000	52.325	150				
SDP	52.650	0.425	Open Manhole	1200	24.001	52.225	225	24.000	52.300	150	
S25	47.575	2.202	Open Manhole	1350	21.006	45.373	375	21.005	45.523	225	
								24.001	46.750	225	1227
Dummy	52.650	0.400	Open Manhole	1200	25.000	52.250	300				
SDP	52.650	0.425	Open Manhole	1200	25.001	52.225	225	25.000	52.225	300	
S26	47.565	3.165	Open Manhole	1500	21.007	44.400	525	21.006	45.138	375	588
								25.001	46.865	225	2165
Dummy	52.650	0.175	Open Manhole	1200	26.000	52.475	150				
SDP	52.650	0.200	Open Manhole	1200	26.001	52.450	150	26.000	52.450	150	
S27	47.670	3.344	Open Manhole	1500	21.008	44.326	525	21.007	44.326	525	
								26.001	44.701	150	
Dummy	52.650	0.325	Open Manhole	1200	27.000	52.325	150				
SDP	52.650	0.350	Open Manhole	1200	27.001	52.300	150	27.000	52.300	150	
S28	47.970	1.200	Open Manhole	1200	27.002	46.770	300	27.001	47.220	150	300
Dummy	52.650	0.250	Open Manhole	1200	28.000	52.400	100				
SDP	52.650	0.325	Open Manhole	1200	28.001	52.325	150	28.000	52.375	100	
S29	47.520	0.900	Open Manhole	1200	27.003	46.620	300	27.002	46.650	300	30
								28.001	46.770	150	
Dummy	52.650	0.325	Open Manhole	1200	29.000	52.325	100				
SDP	52.650	0.475	Open Manhole	1200	29.001	52.175	225	29.000	52.300	100	
S30	47.390	0.900	Open Manhole	1200	29.002	46.490	300	29.001	46.565	225	
Dummy	52.650	0.250	Open Manhole	1200	30.000	52.400	100				
SDP	52.650	0.400	Open Manhole	1200	30.001	52.250	225	30.000	52.375	100	
S31	47.340	1.011	Open Manhole	1350	29.003	46.329	375	29.002	46.404	300	
								30.001	46.515	225	36
S32	47.515	1.216	Open Manhole	1350	29.004	46.299	375	29.003	46.299	375	
Dummy	52.650	0.325	Open Manhole	1200	31.000	52.325	100				
SDP	52.650	0.475	Open Manhole	1200	31.001	52.175	225	31.000	52.300	100	
S33	47.515	1.640	Open Manhole	1500	27.004	45.875	525	27.003	46.492	300	392
								29.004	46.236	375	211
								31.001	46.175	225	
Attenuation	47.630	3.830	Open Manhole	1500	1.008	43.800	150	1.007	44.712	375	1137
								10.005	45.642	525	2217
								21.008	44.245	525	820
								27.004	45.864	525	2439
	48.000	3.650	Open Manhole	0		OUTFALL		1.008	44.350	150	

Setting Out Information - True Coordinates (Storm)

- Indicates pipe length does not match coordinates

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	ACO	1200		517105.244	134374.809	
1.001	S1	1200		517105.244	134386.601	
2.000	Dummy	1200				
2.001	Sw1	1200		517088.534	134395.922	
1.002	S2	1200		517086.225	134395.031	
3.000	Dummy	1200				
3.001	Sw2	1200		517012.646	134398.281	
1.003	S3	1200		517012.646	134395.031	
4.000	Dummy	1200				
4.001	Sw3	1200		517015.169	134307.138	
1.004	S4	1200		517012.646	134306.728	
5.000	ACO	1200		517027.196	134290.979	
6.000	Dummy	1200				
6.001	Sw4	1200		517023.050	134285.258	
1.005	S5	1350		517027.196	134284.754	
7.000	Dummy	1200				
7.001	Sw5	1200		517062.422	134282.270	
8.000	Dummy	1200				
8.001	Sw6	1200		517062.422	134282.270	
1.006	S6	1350		517062.422	134284.754	
9.000	ACO	1200		517094.145	134301.715	
9.001	S7	1200		517094.145	134284.754	
1.007	S8	1350		517081.310 #	134284.770 #	
10.000	ACO	1200		517198.783	134367.402	
11.000	ACO	1200		517196.283 #	134321.892 #	
10.001	S11	1350		517198.783	134321.892	
10.002	S12	1350		517198.783	134275.520	
12.000	Dummy	1200				
12.001	Sw7	1200				
12.002	ACO	1200		517130.318 #	134285.020 #	
13.000	Dummy	1200		517130.318 #	134273.520 #	
13.001	Porous CP	1200				

Setting Out Information - True Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
12.003	S13	1200		517130.318	134275.520	
14.000	Dummy	1200				
14.001	Sw8	1200		517148.729	134288.270	
15.000	Dummy	1200				
15.001	Sw9	1200		517148.729	134288.270	
10.003	S14	1500		517163.185	134275.520	
16.000	ACO	1200		517072.195	134254.458	
17.000	Dummy	1200				
17.001	Sw10	1200		517080.562	134266.008	
18.000	Dummy	1200				
18.001	Sw11	1200		517080.562	134266.008	
16.001	S15	1200		517080.562	134254.458	
19.000	Dummy	1200				
19.001	Sw12	1200		517119.306	134254.308	
16.002	S16	1200		517119.306	134256.558	
20.000	Dummy	1200				
20.001	Sw13	1200		517163.185	134254.308	
16.003	S17	1200		517163.185	134256.558	
10.004	S18	1500		517163.185	134266.520	
10.005	S19	1500		517157.652 #	134266.520 #	
21.000	Dummy	1200				
21.001	SDP	1200		517115.808	134354.520	
22.000	Dummy	1200				
22.001	SDP	1200		517083.058	134355.420	
21.002	S20	1200		517100.743	134366.084	
23.000	S21	1200		517119.852	134372.794	
21.003	S22	1200		517100.744	134386.409	
21.004	S23	1200		517084.673	134393.531	
21.005	S24	1200		517017.146	134393.531	
24.000	Dummy	1200				
24.001	SDP	1200		517020.596	134359.957	
21.006	S25	1350		517017.146	134359.957	
25.000	Dummy	1200				

Setting Out Information - True Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
25.001	SDP	1200		517020.146	134307.682	
21.007	S26	1500		517017.146	134303.555	
26.000	Dummy	1200				
26.001	SDP	1200		517037.695	134289.704	
21.008	S27	1500		517037.695 #	134272.520 #	
27.000	Dummy	1200				
27.001	SDP	1200		517175.570	134294.272	
27.002	S28	1200		517175.570	134286.020	
28.000	Dummy	1200				
28.001	SDP	1200		517147.759	134291.904	
27.003	S29	1200		517147.823	134278.520	
29.000	Dummy	1200				
29.001	SDP	1200		517083.058	134318.825	
29.002	S30	1200		517096.562	134308.635	
30.000	Dummy	1200				
30.001	SDP	1200		517100.135	134287.987	
29.003	S31	1350		517096.509	134287.987	
29.004	S32	1350		517096.581	134278.520	
31.000	Dummy	1200				
31.001	SDP	1200		517117.050	134287.970	
27.004	S33	1500		517117.050 #	134278.520 #	
1.008	Attenuation	1500		517074.195 #	134266.779 #	

- Indicates pipe length does not match coordinates

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.008		0		517012.858 #	134269.461 #	

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)
1.008		48.000	44.350	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.837	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000	Cv (Summer)	0.837
Return Period (years)	2	Ratio R	0.350	Cv (Winter)	0.837
Region	England and Wales	Profile Type	Winter	Storm Duration (mins)	30

Online Controls for Storm

Pump Manhole: Attenuation, DS/PN: 1.008, Volume (m^3): 18.4

Invert Level (m) 43.800

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	14.9000	1.200	14.9000	2.200	14.9000	3.200	14.9000	4.200	14.9000	5.200	14.9000
0.400	14.9000	1.400	14.9000	2.400	14.9000	3.400	14.9000	4.400	14.9000	5.400	14.9000
0.600	14.9000	1.600	14.9000	2.600	14.9000	3.600	14.9000	4.600	14.9000	5.600	14.9000
0.800	14.9000	1.800	14.9000	2.800	14.9000	3.800	14.9000	4.800	14.9000	5.800	14.9000
1.000	14.9000	2.000	14.9000	3.000	14.9000	4.000	14.9000	5.000	14.9000	6.000	14.9000

Storage Structures for Storm

Porous Car Park Manhole: Porous CP, DS/PN: 13.001

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	40.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	46.580	Depression Storage (mm)	5
Max Percolation (l/s)	262.2	Width (m)	59.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.340

Cellular Storage Manhole: Attenuation, DS/PN: 1.008

Invert Level (m)	43.800	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.97
Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1027.5	0.0	1.650	1027.5	0.0	1.651	0.0	0.0

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR | M5-60 (mm) 20.000 | Cv (Summer) 0.793
Region England and Wales | Ratio R 0.350 | Cv (Winter) 0.837

Margin for Flood Risk Warning (mm) 100.0 | DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) | Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 20

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Maximum Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
1.000	ACO	15 minute 100 year Winter I+20%	47.350	47.349	0.824	0.000	1.097	1.3	21.6	FLOOD RISK
1.001	S1	15 minute 100 year Summer I+20%	47.440	47.318	0.911	0.000	1.381	1.4	23.6	SURCHARGED
2.000	Dummy	15 minute 100 year Winter I+20%	47.400	47.321	0.596	0.000	0.838	0.4	-4.3	FLOOD RISK
2.001	Sw1	15 minute 100 year Summer I+20%	47.400	47.334	0.676	0.000	1.169	1.2	48.0	FLOOD RISK
1.002	S2	15 minute 100 year Summer I+20%	47.415	47.263	1.064	0.000	1.849	1.3	48.5	SURCHARGED
3.000	Dummy	15 minute 100 year Summer I+20%	47.350	46.825	0.150	0.000	0.334	0.3	-3.1	SURCHARGED
3.001	Sw2	15 minute 100 year Summer I+20%	47.350	46.840	0.232	0.000	0.667	1.7	68.5	SURCHARGED
1.003	S3	15 minute 100 year Summer I+20%	47.410	46.713	0.947	0.000	4.364	1.4	89.8	SURCHARGED
4.000	Dummy	15 minute 100 year Summer I+20%	47.425	46.836	0.086	0.000	0.261	0.2	-1.8	SURCHARGED
4.001	Sw3	15 minute 100 year Summer I+20%	47.425	46.837	0.154	0.000	0.494	1.5	26.1	SURCHARGED
1.004	S4	15 minute 100 year Winter I+20%	47.480	46.120	0.721	0.000	7.306	1.5	106.8	SURCHARGED
5.000	ACO	15 minute 100 year Summer I+20%	47.270	46.795	0.375	0.000	0.588	2.2	38.3	SURCHARGED
6.000	Dummy	15 minute 100 year Summer I+20%	47.375	46.646	-0.054	0.000	0.103	0.2	1.0	OK
6.001	Sw4	15 minute 100 year Summer I+20%	47.375	46.651	0.017	0.000	0.305	0.9	15.9	SURCHARGED
1.005	S5	960 minute 100 year Winter I+20%	47.375	45.983	0.694	0.000	3.296	0.7	16.0	SURCHARGED
7.000	Dummy	15 minute 100 year Summer I+20%	47.430	46.887	0.132	0.000	0.314	0.2	-2.3	SURCHARGED
7.001	Sw5	15 minute 100 year Summer I+20%	47.430	46.889	0.201	0.000	0.547	1.7	29.1	SURCHARGED
8.000	Dummy	15 minute 100 year Summer I+20%	47.430	46.842	0.087	0.000	0.262	0.2	-1.8	SURCHARGED
8.001	Sw6	15 minute 100 year Summer I+20%	47.430	46.843	0.155	0.000	0.495	1.5	26.1	SURCHARGED
1.006	S6	960 minute 100 year Winter I+20%	47.555	45.981	0.802	0.000	5.420	0.6	19.7	SURCHARGED
9.000	ACO	15 minute 100 year Summer I+20%	47.275	46.900	0.475	0.000	0.701	1.5	26.6	SURCHARGED
9.001	S7	15 minute 100 year Summer I+20%	47.355	46.465	0.210	0.000	0.679	1.5	26.2	SURCHARGED
1.007	S8	960 minute 100 year Winter I+20%	47.555	45.980	0.860	0.000	3.718	0.6	21.8	SURCHARGED
10.000	ACO	15 minute 100 year Summer I+20%	47.370	47.375	0.705	5.248	6.296	1.6	107.3	FLOOD
11.000	ACO	15 minute 100 year Summer I+20%	48.100	47.442	0.042	0.000	0.382	1.0	69.7	SURCHARGED
10.001	S11	15 minute 100 year Summer I+20%	48.160	47.118	0.638	0.000	4.578	1.5	159.1	SURCHARGED
10.002	S12	15 minute 100 year Summer I+20%	48.760	46.839	0.503	0.000	6.223	1.4	148.8	SURCHARGED
12.000	Dummy	15 minute 100 year Summer I+20%	47.430	46.699	-0.056	0.000	0.100	0.3	0.8	OK
12.001	Sw7	15 minute 100 year Winter I+20%	47.430	46.713	0.024	0.000	0.320	0.7	10.8	SURCHARGED
12.002	ACO	15 minute 100 year Winter I+20%	47.430	46.709	0.026	0.000	0.279	0.7	14.8	SURCHARGED
13.000	Dummy	15 minute 30 year Winter I+0%	47.630	47.180	-0.150	0.000	0.000	0.0	0.0	OK
13.001	Porous CP	30 minute 100 year Winter I+20%	47.630	46.849	0.119	0.000	25.866	1.4	23.9	SURCHARGED
12.003	S13	15 minute 100 year Winter I+20%	47.715	46.701	0.056	0.000	0.524	1.0	32.3	SURCHARGED
14.000	Dummy	15 minute 100 year Winter I+20%	47.280	46.647	0.042	0.000	0.211	0.3	-1.8	SURCHARGED
14.001	Sw8	15 minute 100 year Winter I+20%	47.280	46.649	0.111	0.000	0.445	1.1	16.4	SURCHARGED
15.000	Dummy	15 minute 100 year Summer I+20%	47.280	47.040	0.435	0.000	0.656	0.3	-4.2	SURCHARGED
15.001	Sw9	15 minute 100 year Summer I+20%	47.280	47.050	0.511	0.000	0.983	2.2	84.5	SURCHARGED
10.003	S14	15 minute 100 year Winter I+20%	47.935	46.583	0.358	0.000	7.530	1.2	250.8	SURCHARGED
16.000	ACO	15 minute 100 year Summer I+20%	48.120	47.448	0.178	0.000	0.365	0.9	8.7	SURCHARGED
17.000	Dummy	15 minute 100 year Summer I+20%	47.835	47.588	0.428	0.000	0.649	0.3	-4.0	SURCHARGED
17.001	Sw10	15 minute 100 year Summer I+20%	47.835	47.603	0.509	0.000	0.896	1.2	20.4	SURCHARGED
18.000	Dummy	15 minute 100 year Summer I+20%	47.835	47.596	0.436	0.000	0.658	0.3	-4.0	SURCHARGED
18.001	Sw11	15 minute 100 year Summer I+20%	47.835	47.611	0.517	0.000	0.905	1.2	20.8	SURCHARGED
16.001	S15	15 minute 100 year Summer I+20%	48.120	47.431	0.453	0.000	1.253	1.1	43.1	SURCHARGED
19.000	Dummy	15 minute 100 year Summer I+20%	48.125	47.335	-0.115	0.000	0.034	0.2	0.3	OK
19.001	Sw12	15 minute 100 year Summer I+20%	48.125	47.347	-0.036	0.000	0.198	0.7	10.1	OK
16.002	S16	15 minute 100 year Winter I+20%	48.265	47.137	0.387	0.000	2.182	1.2	48.7	SURCHARGED
20.000	Dummy	15 minute 100 year Summer I+20%	48.320	47.692	0.047	0.000	0.217	0.2	-1.9	SURCHARGED
20.001	Sw13	15 minute 100 year Summer I+20%	48.420	47.693	0.115	0.000	0.449	1.3	22.9	SURCHARGED
16.003	S17	15 minute 100 year Winter I+20%	48.450	46.706	0.214	0.000	2.138	1.7	65.2	SURCHARGED
10.004	S18	15 minute 100 year Summer I+20%	48.325	46.480	0.278	0.000	3.372	1.5	316.1	SURCHARGED
10.005	S19	15 minute 100 year Summer I+20%	48.000	46.311	0.123	0.000	2.008	1.5	314.0	SURCHARGED
21.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.423	-0.202	0.000	0.021	0.1	0.1	OK
21.001	SDP	15 minute 100 year Summer I+20%	52.650	52.430	-0.095	0.000	0.111	4.6	26.9	OK
22.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.440	-0.185	0.000	0.040	0.1	0.2	OK
22.001	SDP	15 minute 100 year Summer I+20%	52.650	52.445	-0.155	0.000	0.142	5.0	52.7	OK
21.002	S20	15 minute 100 year Summer I+20%	47.440	47.442	0.877	2.575	3.698	1.7	63.8	FLOOD
23.000	S21	15 minute 100 year Summer I+20%	47.650	47.258	0.208	0.000	0.399	0.9	7.3	SURCHARGED
21.003	S22	15 minute 100 year Summer I+20%	47.485	47.224	0.779	0.000	2.284	1.5	59.3	SURCHARGED
21.004	S23	15 minute 100 year Winter I+20%	47.460	46.986	0.644	0.000	1.628	1.4	54.0	SURCHARGED
21.005	S24	15 minute 100 year Winter I+20%	47.440	46.202	0.257	0.000	2.861	1.4	55.5	SURCHARGED
24.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.325	-0.150	0.000	0.000	0.0	0.0	OK
24.001	SDP	15 minute 100 year Summer I+20%	52.650	52.328	-0.122	0.000	0.116	8.0	142.1	OK
21.006	S25	960 minute 100 year Winter I+20%	47.575	45.983	0.235	0.000	2.150	0.8	14.6	SURCHARGED
25.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.347	-0.203	0.000	0.104	0.1	-0.7	OK

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Maximum Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
25.001	SDP	15 minute 100 year Summer I+20%	52.650	52.347	-0.103	0.000	0.288	8.5	186.5	OK
21.007	S26	960 minute 100 year Winter I+20%	47.565	45.981	1.056	0.000	8.857	0.5	26.3	SURCHARGED
26.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.501	-0.124	0.000	0.023	0.1	-0.1	OK
26.001	SDP	15 minute 100 year Summer I+20%	52.650	52.509	-0.091	0.000	0.111	5.7	37.3	OK
21.008	S27	960 minute 100 year Winter I+20%	47.670	45.980	1.129	0.000	10.691	0.6	27.5	SURCHARGED
27.000	Dummy	15 minute 100 year Summer I+20%	52.650	52.489	0.014	0.000	0.180	0.2	1.8	SURCHARGED
27.001	SDP	15 minute 100 year Summer I+20%	52.650	52.495	0.045	0.000	0.365	7.8	117.7	SURCHARGED
27.002	S28	15 minute 100 year Summer I+20%	47.970	47.840	0.770	0.000	1.218	1.7	116.9	SURCHARGED
28.000	Dummy	15 minute 30 year Winter I+0%	52.650	52.400	-0.100	0.000	0.000	0.0	0.0	OK
28.001	SDP	15 minute 100 year Summer I+20%	52.650	52.383	-0.092	0.000	0.073	5.4	33.9	OK
27.003	S29	15 minute 100 year Summer I+20%	47.520	47.449	0.529	0.000	2.903	2.1	148.0	FLOOD RISK
29.000	Dummy	15 minute 30 year Winter I+0%	52.650	52.325	-0.100	0.000	0.000	0.0	0.0	OK
29.001	SDP	15 minute 100 year Summer I+20%	52.650	52.278	-0.122	0.000	0.111	6.5	116.2	OK
29.002	S30	15 minute 100 year Summer I+20%	47.390	47.108	0.318	0.000	0.740	1.6	114.0	SURCHARGED
30.000	Dummy	15 minute 30 year Winter I+0%	52.650	52.400	-0.100	0.000	0.000	0.0	0.0	OK
30.001	SDP	15 minute 100 year Summer I+20%	52.650	52.276	-0.199	0.000	0.024	4.2	10.9	OK
29.003	S31	15 minute 100 year Summer I+20%	47.340	46.811	0.107	0.000	2.042	1.1	122.6	SURCHARGED
29.004	S32	15 minute 100 year Summer I+20%	47.515	46.707	0.032	0.000	1.454	1.1	124.0	SURCHARGED
31.000	Dummy	15 minute 30 year Winter I+0%	52.650	52.325	-0.100	0.000	0.000	0.0	0.0	OK
31.001	SDP	15 minute 100 year Summer I+20%	52.650	52.209	-0.191	0.000	0.033	5.1	19.5	OK
27.004	S33	15 minute 100 year Summer I+20%	47.515	46.506	0.106	0.000	2.471	1.3	288.1	SURCHARGED
1.008	Attenuation	960 minute 100 year Winter I+20%	47.630	45.979	2.029	0.000	1659.031	1.5	14.9	SURCHARGED

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales Ratio R 0.350 Cv (Winter) 0.837
Return Period (years) 100 M5-60 (mm) 20.000 Cv (Summer) 0.793

Margin for Flood Risk Warning (mm) 100.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Sensitivity flows(s) (%) 0, +40

PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	ACO	15 Winter	+40%	+0%/15 Summer	+40%/15 Summer			47.356	0.831	6.459	1.90		30.5	FLOOD
1.001	S1	15 Summer	+40%	+0%/15 Summer				47.362	0.955	0.000	1.81		30.3	FLOOD RISK
2.000	Dummy	15 Winter	+40%	+0%/15 Summer				47.395	0.670	0.000	-0.50		-6.4	FLOOD RISK
2.001	Sw1	15 Winter	+40%	+0%/15 Summer				47.400	0.741	0.000	1.67		46.6	FLOOD RISK
1.002	S2	15 Summer	+40%	+0%/15 Summer				47.355	1.156	0.000	1.29		49.9	FLOOD RISK
3.000	Dummy	960 Winter	+40%	+0%/15 Summer				47.284	0.609	0.000	-0.03		-0.4	FLOOD RISK
3.001	Sw2	960 Winter	+40%	+0%/15 Summer				47.285	0.676	0.000	0.20		5.2	FLOOD RISK
1.003	S3	960 Winter	+40%	+0%/15 Summer				47.284	1.518	0.000	0.18		12.4	SURCHARGED
4.000	Dummy	960 Winter	+40%	+0%/15 Summer				47.281	0.531	0.000	-0.03		-0.4	SURCHARGED
4.001	Sw3	960 Winter	+40%	+0%/15 Summer				47.281	0.598	0.000	0.19		2.0	SURCHARGED
1.004	S4	960 Winter	+40%	+0%/15 Summer				47.280	1.882	0.000	0.23		14.5	SURCHARGED
5.000	ACO	960 Winter	+40%	+0%/15 Summer	+40%/960 Winter			47.273	0.853	3.048	0.40		6.0	FLOOD
6.000	Dummy	960 Winter	+40%	+40%/360 Winter				47.278	0.578	0.000	-0.03		-0.4	FLOOD RISK
6.001	Sw4	960 Winter	+40%	+40%/15 Summer				47.278	0.645	0.000	0.10		1.2	FLOOD RISK
1.005	S5	960 Winter	+40%	+0%/15 Summer				47.278	1.990	0.000	0.19		18.7	FLOOD RISK
7.000	Dummy	960 Winter	+40%	+0%/15 Summer				47.277	0.522	0.000	-0.03		-0.4	SURCHARGED
7.001	Sw5	960 Winter	+40%	+0%/15 Summer				47.277	0.589	0.000	0.21		2.3	SURCHARGED
8.000	Dummy	960 Winter	+40%	+0%/15 Summer				47.277	0.522	0.000	-0.03		-0.4	SURCHARGED
8.001	Sw6	960 Winter	+40%	+0%/15 Summer				47.277	0.589	0.000	0.19		2.0	SURCHARGED
1.006	S6	960 Winter	+40%	+0%/15 Summer				47.277	2.098	0.000	0.25		23.1	SURCHARGED
9.000	ACO	960 Winter	+40%	+0%/15 Summer	+40%/960 Winter			47.276	0.851	0.528	0.14		2.4	FLOOD
9.001	S7	960 Winter	+40%	+0%/15 Summer				47.276	1.020	0.000	0.15		2.4	FLOOD RISK
1.007	S8	960 Winter	+40%	+0%/15 Summer				47.276	2.156	0.000	0.32		25.5	SURCHARGED
10.000	ACO	15 Summer	+40%	+0%/15 Summer	+40%/15 Summer			47.382	0.637	11.713	1.21		123.1	FLOOD
11.000	ACO	15 Summer	+40%	+40%/15 Summer				47.472	0.072	0.000	1.72		81.5	SURCHARGED
10.001	S11	15 Summer	+40%	+0%/15 Summer				47.372	0.769	0.000	1.67		170.8	SURCHARGED
10.002	S12	960 Winter	+40%	+0%/15 Summer				47.279	0.820	0.000	0.17		16.8	SURCHARGED
12.000	Dummy	960 Winter	+40%	+40%/15 Summer				47.280	0.525	0.000	-0.03		-0.4	SURCHARGED
12.001	Sw7	960 Winter	+40%	+40%/15 Summer				47.280	0.592	0.000	0.08		0.9	SURCHARGED
12.002	ACO	960 Winter	+40%	+40%/15 Summer				47.280	0.597	0.000	0.04		1.2	SURCHARGED
13.000	Dummy	960 Winter	+40%					47.281	-0.049	0.000	0.01		0.1	OK
13.001	Porous CP	960 Winter	+40%	+0%/15 Summer				47.281	0.551	0.000	-1.09		-11.8	SURCHARGED
12.003	S13	960 Winter	+40%	+40%/15 Summer				47.280	0.635	0.000	-0.32		-11.9	SURCHARGED
14.000	Dummy	960 Winter	+40%	+40%/15 Summer				47.276	0.671	0.000	0.04		0.6	FLOOD RISK
14.001	Sw8	960 Winter	+40%	+0%/15 Summer				47.277	0.739	0.000	0.08		1.4	FLOOD RISK
15.000	Dummy	960 Winter	+40%	+0%/15 Summer				47.276	0.671	0.000	0.13		1.7	FLOOD RISK
15.001	Sw9	15 Summer	+40%	+0%/15 Summer				47.278	0.739	0.000	1.93		90.4	FLOOD RISK
10.003	S14	960 Winter	+40%	+0%/15 Summer				47.277	0.932	0.000	0.25		33.6	SURCHARGED
16.000	ACO	15 Summer	+40%	+40%/15 Summer				47.704	0.434	0.000	0.60		9.3	SURCHARGED
17.000	Dummy	15 Summer	+40%	+0%/15 Summer				47.830	0.670	0.000	-0.34		-4.3	FLOOD RISK
17.001	Sw10	15 Winter	+40%	+0%/15 Summer				47.834	0.740	0.000	1.30		20.8	FLOOD RISK
18.000	Dummy	15 Summer	+40%	+0%/15 Summer				47.830	0.670	0.000	-0.34		-4.3	FLOOD RISK
18.001	Sw11	15 Winter	+40%	+0%/15 Summer				47.834	0.740	0.000	1.33		21.3	FLOOD RISK
16.001	S15	15 Summer	+40%	+0%/15 Summer				47.682	0.704	0.000	1.18		44.4	SURCHARGED
19.000	Dummy	15 Summer	+40%					47.384	-0.066	0.000	0.07		0.9	OK
19.001	Sw12	15 Summer	+40%	+40%/15 Summer				47.398	0.014	0.000	1.00		10.9	SURCHARGED
16.002	S16	15 Summer	+40%	+0%/15 Summer				47.386	0.636	0.000	1.35		51.3	SURCHARGED
20.000	Dummy	15 Summer	+40%	+40%/15 Summer				47.745	0.100	0.000	-0.16		-2.0	SURCHARGED
20.001	Sw13	15 Summer	+40%	+0%/15 Summer				47.746	0.167	0.000	2.48		26.9	SURCHARGED
16.003	S17	960 Winter	+40%	+0%/15 Summer				47.278	0.786	0.000	0.24		7.9	SURCHARGED
10.004	S18	960 Winter	+40%	+0%/15 Summer				47.276	0.954	0.000	0.26		41.5	SURCHARGED
10.005	S19	960 Winter	+40%	+0%/15 Summer				47.276	0.967	0.000	0.32		41.5	SURCHARGED
21.000	Dummy	15 Summer	+40%					52.429	-0.196	0.000	0.01		0.2	OK
21.001	SDP	15 Summer	+40%					52.435	-0.090	0.000	0.34		31.5	OK
22.000	Dummy	15 Summer	+40%					52.449	-0.176	0.000	-0.02		-0.3	OK
22.001	SDP	15 Summer	+40%					52.450	-0.150	0.000	0.25		61.7	OK
21.002	S20	15 Summer	+40%	+0%/15 Summer	+40%/15 Summer			47.446	0.881	6.378	1.91		68.9	FLOOD
23.000	S21	15 Summer	+40%	+0%/15 Summer				47.325	0.275	0.000	0.44		7.4	SURCHARGED
21.003	S22	960 Winter	+40%	+0%/15 Summer				47.289	0.844	0.000	0.18		6.5	SURCHARGED
21.004	S23	960 Winter	+40%	+0%/15 Summer				47.287	0.945	0.000	0.17		6.5	SURCHARGED
21.005	S24	960 Winter	+40%	+0%/15 Summer				47.283	1.338	0.000	0.17		6.5	SURCHARGED
24.000	Dummy	15 Summer	+40%					52.328	-0.147	0.000	0.00		0.0	OK
24.001	SDP	15 Summer	+40%					52.338	-0.112	0.000	0.50		166.2	OK
21.006	S25	960 Winter	+40%	+0%/15 Summer				47.281	1.533	0.000	0.14		17.1	SURCHARGED
25.000	Dummy	15 Summer	+40%					52.360	-0.190	0.000	-0.02		-0.8	OK
25.001	SDP	15 Summer	+40%					52.360	-0.090	0.000	0.67		218.2	OK

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

PN	US/MH Name	Level Exceeded
1.000	ACO	4
1.001	S1	
2.000	Dummy	
2.001	Sw1	
1.002	S2	
3.000	Dummy	
3.001	Sw2	
1.003	S3	
4.000	Dummy	
4.001	Sw3	
1.004	S4	
5.000	ACO	1
6.000	Dummy	
6.001	Sw4	
1.005	S5	
7.000	Dummy	
7.001	Sw5	
8.000	Dummy	
8.001	Sw6	
1.006	S6	
9.000	ACO	1
9.001	S7	
1.007	S8	
10.000	ACO	4
11.000	ACO	
10.001	S11	
10.002	S12	
12.000	Dummy	
12.001	Sw7	
12.002	ACO	
13.000	Dummy	
13.001	Porous CP	
12.003	S13	
14.000	Dummy	
14.001	Sw8	
15.000	Dummy	
15.001	Sw9	
10.003	S14	
16.000	ACO	
17.000	Dummy	
17.001	Sw10	
18.000	Dummy	
18.001	Sw11	
16.001	S15	
19.000	Dummy	
19.001	Sw12	
16.002	S16	
20.000	Dummy	
20.001	Sw13	
16.003	S17	
10.004	S18	
10.005	S19	
21.000	Dummy	
21.001	SDP	
22.000	Dummy	
22.001	SDP	
21.002	S20	5
23.000	S21	
21.003	S22	
21.004	S23	
21.005	S24	
24.000	Dummy	
24.001	SDP	
21.006	S25	
25.000	Dummy	
25.001	SDP	

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

PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
21.007	S26	960 Winter	+40%	+0%/15 Summer				47.279	2.354	0.000	0.17		30.9	SURCHARGED
26.000	Dummy	15 Summer	+40%					52.508	-0.117	0.000	0.03		0.2	OK
26.001	SDP	15 Summer	+40%					52.515	-0.085	0.000	0.39		43.6	OK
21.008	S27	960 Winter	+40%	+0%/15 Summer				47.277	2.426	0.000	0.18		33.2	SURCHARGED
27.000	Dummy	15 Summer	+40%	+40%/15 Summer				52.645	0.170	0.000	0.50		3.6	FLOOD RISK
27.001	SDP	15 Summer	+40%	+40%/15 Summer	+40%/15 Summer			52.651	0.201	0.652	0.97		118.9	FLOOD
27.002	S28	15 Summer	+40%	+0%/15 Summer				47.911	0.841	0.000	1.85		120.0	FLOOD RISK
28.000	Dummy	480 Winter	+0%					52.400	-0.100	0.000	0.00		0.0	OK
28.001	SDP	15 Summer	+40%					52.388	-0.087	0.000	0.38		39.7	OK
27.003	S29	15 Summer	+40%	+0%/15 Summer				47.514	0.594	0.000	2.37		154.2	FLOOD RISK
29.000	Dummy	480 Winter	+0%					52.325	-0.100	0.000	0.00		0.0	OK
29.001	SDP	15 Summer	+40%					52.288	-0.112	0.000	0.51		135.9	OK
29.002	S30	15 Summer	+40%	+0%/15 Summer				47.297	0.507	0.000	2.13		133.1	FLOOD RISK
30.000	Dummy	480 Winter	+0%					52.400	-0.100	0.000	0.00		0.0	OK
30.001	SDP	15 Summer	+40%					52.278	-0.197	0.000	0.04		12.8	OK
29.003	S31	960 Winter	+40%	+0%/15 Summer				47.277	0.573	0.000	0.12		9.4	FLOOD RISK
29.004	S32	960 Winter	+40%	+40%/15 Summer				47.276	0.602	0.000	0.10		9.4	SURCHARGED
31.000	Dummy	480 Winter	+0%					52.325	-0.100	0.000	0.00		0.0	OK
31.001	SDP	15 Summer	+40%					52.213	-0.187	0.000	0.07		22.9	OK
27.004	S33	960 Winter	+40%	+0%/15 Summer				47.276	0.876	0.000	0.14		23.2	SURCHARGED
1.008	Attenuation	960 Winter	+40%	+0%/15 Summer				47.275	3.325	0.000	2.77		14.9	SURCHARGED

PN	US/MH Name	Level Exceeded
21.007	S26	
26.000	Dummy	
26.001	SDP	
21.008	S27	
27.000	Dummy	
27.001	SDP	1
27.002	S28	
28.000	Dummy	
28.001	SDP	
27.003	S29	
29.000	Dummy	
29.001	SDP	
29.002	S30	
30.000	Dummy	
30.001	SDP	
29.003	S31	
29.004	S32	
31.000	Dummy	
31.001	SDP	
27.004	S33	
1.008	Attenuation	

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Unit

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Domestic (l/s/ha)	0.00	Maximum Backdrop Height (m)	20.000
Industrial Peak Flow Factor	0.00	Domestic Peak Flow Factor	6.00	Min Design Depth for Optimisation (m)	1.200
Calculation Method	EN 752	Add Flow / Climate Change (%)	0	Min Vel for Auto Design only (m/s)	0.75
Frequency Factor	0.00	Minimum Backdrop Height (m)	0.200	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	60.211	0.446	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
2.000	8.233	0.061	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.001	14.576	0.108	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.002	50.759	0.376	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.003	53.299	0.395	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
3.000	10.110	0.253	40.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
3.001	10.518	0.078	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
4.000	7.626	0.191	39.9	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
3.002	18.457	0.137	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.004	21.077	0.156	135.1	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
5.000	18.118	0.226	80.2	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.005	6.179	0.046	134.3	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
6.000	18.137	0.227	79.9	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.006	29.034	0.215	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
7.000	33.774	0.422	80.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.007	9.674	0.072	135.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
8.000	11.831	0.148	80.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.008	17.438	0.129	135.2	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
1.009	6.400	0.047	136.2	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	46.220	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
2.000	47.350	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
1.001	45.774	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
1.002	45.666	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
1.003	45.290	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
3.000	46.600	0.000	0.0	0.0	0.0	0	0.00	1.60	28.2	0.0
3.001	46.347	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
4.000	46.600	0.000	0.0	0.0	0.0	0	0.00	1.60	28.2	0.0
3.002	46.269	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
1.004	44.895	0.000	0.0	0.0	0.0	0	0.00	0.86	15.2	0.0
5.000	46.600	0.000	0.0	0.0	0.0	0	0.00	1.12	19.9	0.0
1.005	44.739	0.000	0.0	0.0	0.0	0	0.00	0.87	15.3	0.0
6.000	46.600	0.000	0.0	0.0	0.0	0	0.00	1.13	19.9	0.0
1.006	44.693	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
7.000	46.915	0.000	0.0	0.0	0.0	0	0.00	1.12	19.9	0.0
1.007	44.478	0.000	0.0	0.0	0.0	0	0.00	0.86	15.3	0.0
8.000	46.600	0.000	0.0	0.0	0.0	0	0.00	1.12	19.9	0.0
1.008	44.406	0.000	0.0	0.0	0.0	0	0.00	0.86	15.2	0.0
1.009	44.277	0.000	0.0	0.0	0.0	0	0.00	0.86	15.2	0.0

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.010	4.535	0.034	133.4	0.000	0.0	0.0	46.220	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.010	44.230	0.000	0.0	0.0	0.0	0	0.00	0.32	5.7	0.0

Manhole Schedules for Foul - Unit

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
ACO	47.370	1.150	Open Manhole	1200	1.000	46.220	150				
Gully	48.350	1.000	Open Manhole	1200	2.000	47.350	150				
F1	48.150	2.376	Open Manhole	1200	1.001	45.774	150	1.000	45.774	150	
								2.000	47.289	150	1515
F3	48.300	2.634	Open Manhole	1200	1.002	45.666	150	1.001	45.666	150	
F4	47.470	2.180	Open Manhole	1200	1.003	45.290	150	1.002	45.290	150	
SVP	47.650	1.050	Open Manhole	1200	3.000	46.600	150				
F5	47.470	1.123	Open Manhole	1200	3.001	46.347	150	3.000	46.347	150	
SVP	47.650	1.050	Open Manhole	1200	4.000	46.600	150				
F6	47.320	1.051	Open Manhole	1200	3.002	46.269	150	3.001	46.269	150	
								4.000	46.409	150	140
F7	47.470	2.575	Open Manhole	1200	1.004	44.895	150	1.003	44.895	150	
								3.002	46.132	150	1237
SVP	47.650	1.050	Open Manhole	1200	5.000	46.600	150				
F8	47.470	2.731	Open Manhole	1200	1.005	44.739	150	1.004	44.739	150	
								5.000	46.374	150	1635
SVP	47.650	1.050	Open Manhole	1200	6.000	46.600	150				
F9	47.470	2.777	Open Manhole	1200	1.006	44.693	150	1.005	44.693	150	
								6.000	46.373	150	1680
SVP	47.965	1.050	Open Manhole	1200	7.000	46.915	150				
F10	47.470	2.992	Open Manhole	1200	1.007	44.478	150	1.006	44.478	150	
								7.000	46.493	150	2015
SVP	47.650	1.050	Open Manhole	1200	8.000	46.600	150				
F11	47.500	3.094	Open Manhole	1200	1.008	44.406	150	1.007	44.406	150	
								8.000	46.452	150	2046
F12	47.660	3.383	Open Manhole	1200	1.009	44.277	150	1.008	44.277	150	
F13	47.680	3.450	Open Manhole	1200	1.010	44.230	150	1.009	44.230	150	
	47.930	3.734	Open Manhole	0		OUTFALL		1.010	44.196	150	

Setting Out Information - True Coordinates (Foul - Unit)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	ACO	1200		517194.284	134368.552	
2.000	Gully	1200		517186.803	134311.778	
1.001	F1	1200		517194.284	134308.341	
1.002	F3	1200		517194.284	134293.765	
1.003	F4	1200		517145.284	134280.520	
3.000	SVP	1200		517082.308	134312.424	
3.001	F5	1200		517091.984	134309.495	
4.000	SVP	1200		517084.358	134298.977	
3.002	F6	1200		517091.984	134298.977	
1.004	F7	1200		517091.985	134280.520	
5.000	SVP	1200		517070.908	134298.638	
1.005	F8	1200		517070.908	134280.520	
6.000	SVP	1200		517064.729	134298.657	
1.006	F9	1200		517064.729	134280.520	
7.000	SVP	1200		517062.157	134259.533	
1.007	F10	1200		517035.695	134280.520	
8.000	SVP	1200		517042.314	134295.721	
1.008	F11	1200		517032.221	134289.549	
1.009	F12	1200		517016.594	134281.810	
1.010	F13	1200		517019.434	134276.075	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.010		0		517021.447	134272.011	

Free Flowing Outfall Details for Foul - Unit

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010		47.930	44.196	0.000	0	0