

Hamble Airfield Quarry - Flood Risk Assessment



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Hamble Airfield Quarry - Flood Risk Assessment

Prepared for

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Contents

1	INTRODUCTION	1
1.1	Background	1
1.2	Scope of Work	1
1.3	Data Sources	1
1.4	Report structure	2
2	SITE DESCRIPTION	3
2.1	Site setting and surrounding area	3
2.2	Geology & hydrogeology	3
2.3	Hydrology	3
2.3.1	Rainfall	3
2.3.2	Surface water features	3
2.3.3	Surface water flow and levels	4
3	PROPOSED DEVELOPMENT	5
3.1	Proposal	5
3.2	Phasing Plan	5
3.2.1	Pre-extraction	5
3.2.2	Extraction	5
3.2.3	Post Extraction Infilling and Final Restoration	5
4	PRE-APPLICATION OPINION OF THE ENVIRONMENT AGENCY	7
4.1	Flood Zone 1	7
4.2	Surface Water Aspects of the Proposal (flood risk)	7
4.3	Pollution Prevention	7
4.4	Surface Water	8
5	FLOOD RISK TO THE SITE	9
5.1	Flood map for planning	9
5.2	Flood defences	9
5.3	Groundwater flooding	9
Report I	Reference: 66650R2	

5.4	Surface water (pluvial) flooding	10
5.5	Flooding in the event of reservoir failure	10
5.6	Historical Flooding	10
5.7	Climate change	10
6	PLANNING PRACTICE GUIDANCE	12
6.1	Proposed land use vulnerability classification	12
6.2	Exception and Sequential Tests	12
7	FLOOD RISK FROM THE PROPOSED DEVELOPMENT TO THE SURROUNDING AREA	13
7.1	Nearby Receptors	13
7.2	Climate change	13
7.3	Surface Run-Off Calculations	14
7.3.1	Run-off calculation methodology	14
7.3.2	Runoff destinations	15
7.3.3	Predicted Run-off - greenfield	19
7.3.4	Predicted run-off – operational & restored sites	20
7.4	Flood Risk during operational phase	21
7.5	Flood risk post-restoration	22
8	DRAINAGE STRATEGY	23
8.1	Performance requirements	23
8.2	Operational phase	23
8.2.1	Proposed drainage strategy – operational phase	23
8.2.2	Performance calculations	25
8.2.3	Exceedance flows	28
8.2.4	Residual flood risk	28
8.2.5	Water quality	28
8.3	Restoration phase	29
8.3.1	Proposed drainage strategy – post restoration	29
8.3.2	Performance calculations	31
8.3.3	Exceedance flows	34

Report Reference: 66650R2

8.3.4	Residual flood risk	35
8.3.5	Water quality	36
8.4	Maintenance	36
8.4.1	Plan details – operational phase	36
8.4.2	Contact information	36
8.4.3	Plan details - post restoration	36
8.5	Biodiversity and amenity	37
9	CONCLUSIONS	38
10	REFERENCES	39
FIGURE	S	

Figure 1.1 Map of area surrounding the Site	2
Figure 2.1 Surface water features	4
Figure 5.1 Flood risk – rivers and the sea	9
Figure 5.2 Risk of flooding from surface water	11
Figure 7.1 Runoff catchments – current	15
Figure 7.2 Runoff catchments – operational	16
Figure 7.3 Surface water runoff catchments – Restored phase	18
Figure 9.1 Proposed drainage strategy (operational phase – phase 4	24
Figure 9.2 Potential exceedance flow routes	35
Figure 9.3 Proposed drainage strategy (restored phase)	30

TABLES

Table 6.1 Flood risk vulnerability and flood zone compatibility	12
Table 7.1 Climate change allowances for rainfall intensity	14
Table 7.2 Hydrological catchment descriptors (CEH, 2021)	14
Table 7.3 Site catchment areas over time	19
Table 7.4 Greenfield runoff (1 in 1 year event)	20
Table 7.5 Greenfield runoff (1 in 30 year event)	20
Table 7.6 Greenfield runoff (1 in 100 year event)	20
Table 7.7 Predicted future runoff (1 in 1 year event)	21
Table 7.8 Predicted Predicted future runoff (1 in 30 year event)	21
Table 7.9 Predicted Predicted future runoff (1 in 100 year event)	21
Table 9.1 Dimensions of principal SUDS features (Operational phase).	26
Table 9.2 Performance of SuDS features under a 1 in 100 year + 10% storm event.	28
Table 9.3 Dimensions of principal SUDS features (Restored phase).	32
Table 9.4 Performance of restored phase SuDS features under a 1 in 100 year + 40% storm event.	34

APPENDICES

Appendix A Topographical site survey

Report Reference: 66650R2

- Appendix B Site development plans
- Appendix C Site restoration plans
- Appendix D RefH2 runoff calculations
- Appendix E MicroDrainage calculations

1 Introduction

1.1 Background

Hamble Airfield (the Site) is owned by Persimmon plc. (Persimmon). The Site location is shown on Figure 1.1.

CEMEX UK Operations Limited (CEMEX) is proposing to extract sand and gravel from the Site. Following the completion of the sand and gravel extraction, it is proposed to restore the site with in-situ overburden and soils, and imported restoration materials to grassland and grazing land with areas for drainage. The north-eastern part will be restored to parkland, used as public open space.

1.2 Scope of Work

This report constitutes a Flood Risk Assessment (FRA) that has been prepared on behalf of CEMEX in support of the planning application for mineral excavation at the Site and subsequent restoration. A Hydrogeological Impact Assessment (HIA) also supports the application and is included within Chapter 8 of the Environmental Statement for this application (CEMEX, 2021).

This FRA has been written in line with the National Planning Policy Framework (NPPF) (Department for Communities and Local Government, 2021) and the Planning Practice Guidance (PPG) (Department for Communities and Local Government, 2021) to satisfy both the Environment Agency (EA) and the lead local flood authority (Hampshire County Council) that all potential flood risks to and from the proposed development have been considered.

This assessment includes site-specific calculations to estimate surface water runoff for the restored Site to ensure the proposed restoration plans remain viable. These calculations also account for the effect of climate change using appropriate advice given in the PPG.

1.3 Data Sources

The principal sources of data used in this assessment are summarised below:

- Current topographical site survey provided by CEMEX (Appendix A);
- Proposed Phasing Plan provided by CEMEX (Appendix B);
- Proposed Site restoration plans (Appendix C);
- EA flood risk data;
- South Hampshire Strategic Flood Risk Assessment (Eastern Solent Coastal Partnership, 2016);
- Eastleigh Surface Water Management Plan (Hampshire County Council, 2012);
- Ordnance Survey mapping;
- Rainfall and catchment characteristics/rainfall data from the Centre for Ecology and Hydrology (CEH, 2021); and
- British Geological Survey (BGS) mapping for desk studies of geology and ground conditions (BGS, 2021).

1.4 Report structure

This FRA includes the following sections:

- a description of the site conditions and proposed development (Section 2);
- an outline of the proposed development (Section 3);
- a summary of pre-application discussions for the Site with regards to flood risk (Section 4);
- an assessment of flood risk to the development (Section 5);
- an assessment of the site's suitability for the development with regards to planning policy (Section 6);
- an assessment of flood risk from the development to the surrounding area (Section 7); and
- The proposed drainage strategies for the Site to alleviate any potential increase in flood risk (Section 8).

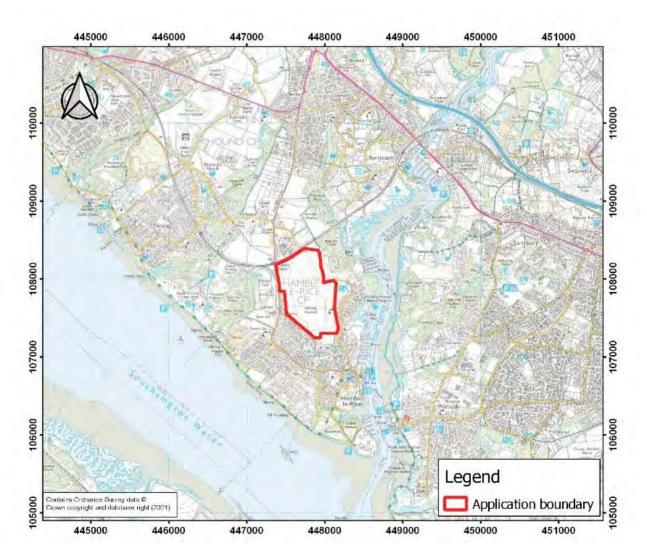


Figure 1.1 Map of area surrounding the Site

2 Site description

2.1 Site setting and surrounding area

The Site location can be seen on Figure 1.1 and the Site layout with topography data is shown in Appendix A.

The Site is a former grassland airfield. It is currently vacant and covered with grass. The Site area extends to c.62 ha and is located on an elevated area of land between Southampton Water and the River Hamble. Ground elevations at the Site range from c.23.9 mAOD to 13.3 mAOD with a topographical divide running approximately north to south through the centre.

Runoff from the Site currently flows down topographical gradients to the eastern, western and southern margins of the Site, towards the River Hamble, Southampton Water and other minor surface water courses. Combined sewers carry runoff from the roads which bound the Site, namely Hamble Road and Satchell Lane.

The Site is bounded to the east by housing and the River Hamble and to the south by housing, an oil terminal and Southampton Water. To the east lie playing fields and recreation grounds together with allotments and a school.

2.2 Geology & hydrogeology

The solid geology at the Site comprises the Selsey Sand Formation (SSF), Marsh Farm Formation (MFF) and Earnley Sand Formation (ESF). These are underlain by clays from the Wittering Formation. These formations are within the Bracklesham Group.

The superficial geology comprises River Terrace Deposits (RTD) (3rd Terrace). Refer to HIA (CEMEX, 2021) for a more detailed description.

The RTD consist of brown sandy gravel, with clay lenses and localised areas where clay dominates. This is underlain by the more permeable SSF across the majority of the Site (CEMEX, 2021). The RTD vary in thickness across the Site between 0.8 and 7.7 m, with an average thickness of 4.3 m.

Groundwater is around 3-5 m below the ground surface across most of the Site on average (CEMEX, 2021).

2.3 Hydrology

2.3.1 Rainfall

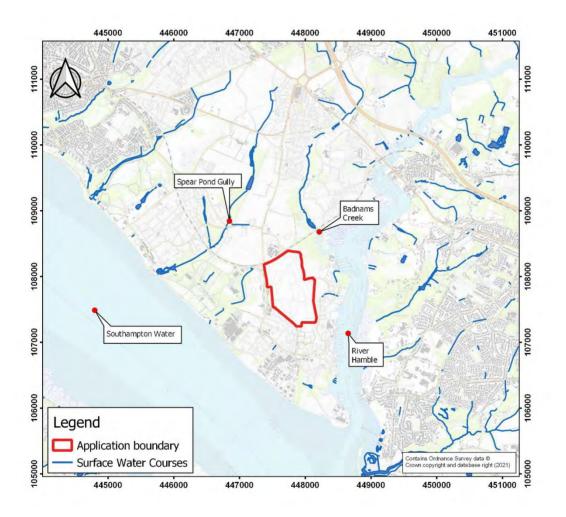
The Standard Average Annual Rainfall (SAAR) for the Site is 767 mm (CEH, 2021). The Meteorological Office reports an annual average rainfall of 779.4 mm at Southampton Weather Centre (WC) rain gauge, about 6 km to the northwest of the Site, for the period 1981-2010.

2.3.2 Surface water features

Surface water features are shown in Figure 2.1. The two main water features are the River Hamble, located c.300 m east of the Site at its closest approach and Southampton Water, located c.900 m to the south west. Southampton Water is a tidal estuary and the River Hamble Report Reference: 66650R2

flows from north to south into Southampton Water; both ultimately discharging into The Solent. The River Hamble is a Main River as defined by the EA. Badnams Creek and Spear Pond Gully are also classified as Main Rivers and are located to the north east and north west of the Site respectively.

There is a small water feature that lies within a steeply incised valley to the west of the Site. This is fed from a spring that lies just beyond the Site's north western corner and discharges into Southampton Water. Refer to CEMEX (2021) for a more detailed description.





2.3.3 Surface water flow and levels

Southampton Water and the River Hamble are tidal watercourses. Flows are not measured anywhere within close proximity to the Site. Water levels are measured by the Environment Agency at Hamble (Station ID 9200, approximate location SU 48756 05662). The tidal range is approximately between 2.5 mAOD and -2 mAOD. The highest level on record is 2.8 mAOD (06 December 2013). This is significantly below the level of the Site at between 23.9 mAOD to 13.3 mAOD.

3 Proposed development

3.1 Proposal

The proposal is to extract c.1.7 Mt of sand and gravel from the 62 ha Site, with restoration to grassland and grazing land with some public access in the north-eastern corner, using a combination of in-situ overburden and soils and imported restoration materials. The development is expected to take around 12 years in its entirety.

3.2 Phasing Plan

A phased working plan (Appendix B) and restoration scheme (Appendix C) have been prepared to ensure that the minerals are recovered in an efficient and systematic manner enabling the continued phased working and restoration of the Site in accordance with good practice. The scheme has been designed to take into account the best practice guidance detailed in the Development and Implementation Supplementary Planning Guidance (SPG) adopted by the MPA. The capacity and context of the environs surrounding the Site have been considered at all times of the design leading to an iterative process that is considerate of the setting. The Site is expected to be worked in seven phases, as shown on the phasing drawings (included as Appendix B).

3.2.1 Pre-extraction

Prior to the commencement of extraction operations within the proposed extension, it will be necessary to undertake a number of pre-extraction operations. These comprise:

- Installation of groundwater monitoring points and collection of baseline data to continue to inform the setting of the Site ;
- Establishment of plant area and haul road(s) to accommodate the importation of inert restoration material using road-going heavy goods vehicles; and
- Establish the water management regime for the Site. This includes installation of the freshwater lagoon (for water supply) and silt lagoon (for water treatment) in the north of the Site.

3.2.2 Extraction

Once the above infrastructure has been established, this will then allow the commencement of sand and gravel extraction operations. By reference to the plans in Appendix B, it can be seen that the mineral resource will be recovered in seven phases of working. Progressive working and restoration techniques will be used to ensure the timely restoration of preceding areas of extraction.

3.2.3 Post Extraction Infilling and Final Restoration

Post extraction, and in accordance with the phasing plans, the Site will be progressively restored (using a combination of in-situ overburden and imported restoration materials) to original ground levels over a further c.4 year period to provide local biodiversity and landscape enhancements.

Report Reference: 66650R2 Report Status: Final On completion of filling, the stripped soils will be carefully replaced using appropriate soil handling and storage techniques followed by a 5 year restoration and aftercare period. Following completion of restoration, the surface of the Site will be inspected within 12 months and any localised settlement features that are found will be filled using suitable soils. Settlement when inert restoration materials are used is usually insignificant so it is envisaged that these operations will be minimal.

4 Pre-application opinion of the Environment Agency

A preliminary opinion was obtained from the Environment Agency (EA) in June 2016. The following comments were received from the EA:

4.1 Flood Zone 1

EA Comment: The site is located in Flood Zone 1, defined by the National Planning Policy Framework (NPPF) as having a low probability of flooding from rivers or the sea.

It is a requirement of the NPPF that any planning application submitted for development that is over 1 hectare in size in Flood Zone 1 is accompanied by a Flood Risk Assessment (FRA). Guidance on the requirements for undertaking an FRA can be found online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/311502/LIT_9 193.pdf

Our response: This report provides the FRA for the development as requested.

4.2 Surface Water Aspects of the Proposal (flood risk)

EA comment: Amendments to the Development Management Procedure Order (DMPO) came into effect on 15 April 2015. As a result, we are no longer a statutory consultee on 'development of land over 1 hectare' (Para zf of DMPO 2010, Schedule 5) and will therefore no long provide comment on the surface water aspects of these proposals in relation to flood risk.

Hampshire County Council as the Lead Local Flood Authority (LLFA) are now statutory consultee for 'Major development with Surface Water Drainage' in terms of flood risk, we therefore recommend that you consult them.

Our response: This report provides the FRA that the LLFA will require for assessment.

4.3 Pollution Prevention

EA comment: We recommend you incorporate pollution prevention measures to protect ground and surface water. We have produced a range of guidance notes which can be viewed at:

https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg

Should the works propose any intrusive works that go below the water table and/or dewatering processes we would require detailed assessment of the potential impacts on the hydrology of the area to ensure that there is no detrimental impact on the water environment.

Our response: There is no significant dewatering proposed (see CEMEX, 2021 - small quantities of water would need to be pumped from one part of the Site to another in order to facilitate construction of a basal geological barrier / attenuation layer when needed. There will be no off-site pumped discharge).

Report Reference: 66650R2

Risks to groundwater quality are considered separately in the Water Environment and Flood Risk chapter of the Environmental Statement (CEMEX, 2021).

4.4 Surface Water

EA comment: We would also recommend that a clear surface water management system is put in place to ensure that water discharging from this development does not impact receiving waters and cause an increase in suspended solids within the receiving waterbody as this could have a significant impact on the quality of the receiving waterbody.

We would recommend that you refer to the CIRIA SuDS manual for further guidance:

http://www.ciria.org/Resources/Free publications/SuDS manual C753.aspx

Our response: This report includes a drainage strategy for the operational phase of the development and post restoration. SuDS features providing water quality treatment are included in each scheme. Full details are provided in Section 8 of this report.

5 Flood Risk to the Site

5.1 Flood map for planning

The Site is located in Flood Zone 1 (see Figure 5.1) which means it has a low probability of flooding from rivers or the sea.

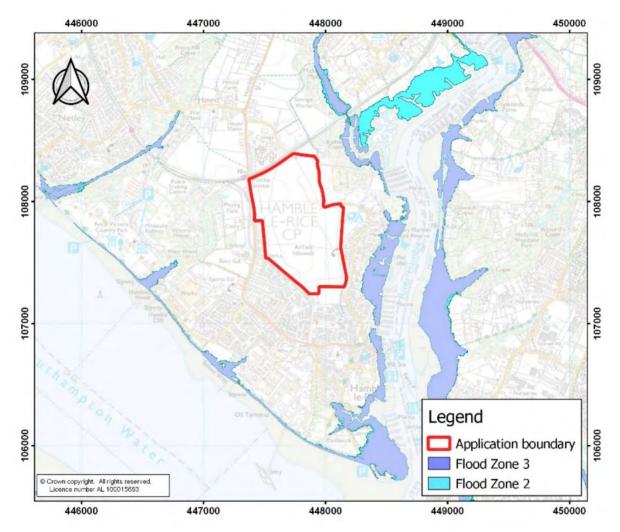


Figure 5.1 Flood risk – rivers and the sea

5.2 Flood defences

There are no flood defences recorded on the River Hamble according to the Environment Agency data for the area.

5.3 Groundwater flooding

Groundwater flooding occurs when the water table rises above the ground surface or into manmade ground.

Groundwater flood risk at the Site is considered to be low given the depth of groundwater below the surface (CEMEX, 2021).

Report Reference: 66650R2 Report Status: Final Operations at the Site may be undertaken partly below the water table within parts of the quarry void (although no significant dewatering will be employed). Health and safety measures will be designed for the operational Site, for working below the water table and working near water (such as barriers, signage and site induction material) to mitigate the risk posed by any open water bodies or from flooding by returning groundwater.

5.4 Surface water (pluvial) flooding

Surface water (pluvial) flooding is usually associated with intense rainfall events but may also occur when rain falls on land that is already saturated or has a low permeability. Rainfall that is unable to infiltrate into the ground generates overland flow which can lead to flooding or 'ponding' in localised topographical depressions before the runoff is able to enter the drainage system or watercourse.

The risk of surface water flooding for the Site is demonstrated to be low, as shown in Figure 5.2 where no flooding is anticipated even in the 1 in 1000 year flood event aside from two small depressions near the centre of the Site.

5.5 Flooding in the event of reservoir failure

The Site is not at risk of flooding as a result of reservoir failure.

5.6 Historical Flooding

The Site is not thought to have experienced flooding historically according to EA data.

5.7 Climate change

The minimum ground elevation of the Site is c. 13.3 mAOD – in the south-western corner. The estimated elevation of Flood Zone 2 at the most proximal location is 3.22 mAOD (estimated from LiDAR data). This gives over 10 m elevation between the minimum Site elevation and flood levels from rivers and the sea at present. This is well above any expected rise in sea level rise, extreme wave height of peak river flow in the area over the duration of the development (13/14 years) as defined in the EA guidance for climate change allowances (EA, 2021).

The impacts of climate change on rainfall intensity and surface water runoff is considered in Section 7.3.

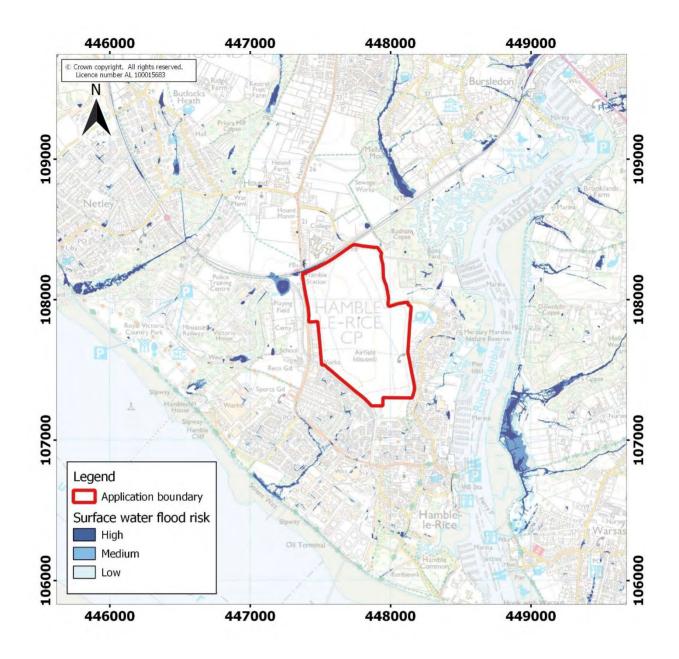


Figure 5.2 Risk of flooding from surface water

6 Planning Practice Guidance

6.1 Proposed land use vulnerability classification

Sand and gravel working is considered by the PPG as a "Water Compatible" land use and the proposed development is considered to be appropriate for this location, as shown in Table 6.1.

6.2 Exception and Sequential Tests

The Sequential Test, outlined in the PPG (DCLG, 2021), identifies that development should be directed to areas at the lowest probability of flooding. The Site is classified by the Environment Agency as being located within Flood Zone 1 and is therefore an appropriate location for the proposed development with regards to flood risk.

v	Flood risk rulnerability lassification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
	Zone 1	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
zone	Zone 2	\checkmark	✓	Exception Test required	\checkmark	V
Flood ze	Zone 3a	Exception Test required	\checkmark	x	Exception Test required	\checkmark
	Zone 3b functional floodplain	Exception Test required	✓	x	x	x

 Table 6.1 Flood risk vulnerability and flood zone compatibility

√Development is appropriate.

x Development should not be permitted.

Data source: National Planning Policy Guidance (NPPG) (DCLG, 2021).

7 Flood risk from the proposed development to the surrounding area

7.1 Nearby Receptors

Potential receptors in the vicinity of the Site are given below. The proposed development must not increase flood risk to any of the receptors identified.

Property

- Residential properties to the east of the Site along Satchell Lane and cul-de sacs from it.
- Residential properties to the south of the Site.
- The Roy Underdown Pavillion and adjacent facilities to the south.
- Residential properties to the west along Hamble Lane and associated access roads.
- Hamble Sports Complex and The Hamble School and associated facilities to the north.
- Hamble Primary School to the southwest.
- Business premises to the southwest along Hamble Lane; and
- Hamble Sea Scouts Headquarters to the west along Hamble Lane.

Infrastructure

- A passenger train line lies on the north-western boundary and Hamble station is located at the intersection with Hamble Lane.

Water features

- River Hamble east of the Site.
- Small water feature within a steeply incised valley to the west of the Site.

7.2 Climate change

Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRAs (Department for Communities and Local Government, 2021). Projections of future climate change in the UK suggest that short-duration, high-intensity rainfall and periods of long duration rainfall will become more frequent. This needs to be accounted for when considering the impacts of a given development on off-site flood risk.

Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows have been calculated (Environment Agency, 2021). The recommended national precautionary sensitivity ranges for peak rainfall intensity are shown in Table 7.1. The operational period of the proposed development is anticipated to be around 12 years Report Reference: 66650R2

commencing in 2023 (expected to be complete by 2029 followed by a further 4-year phase for final restoration tasks) (CEMEX 2021).

Return Period (yrs)	2015-2039	2040-2069	2070-2115
Central band	5%	10%	20%
Upper end	10%	20%	40%

Table 7.1 Climate change allowances for rainfall intensity

Climate change allowances for peak river flow or sea level rise are not applicable in this assessment given that the Site is defined as being "Water Compatible" (see Section 5.7) and is not within a floodplain.

Future climate change has been accounted for in runoff calculations with an increase of +10% applied to the rainfall in accordance with the Technical Guidance of the NPPF for an anticipated duration of mineral extraction until 2029 (7 year duration). Following the restoration phase, where the quarry void will be filled to the original formation level, future climate change has been accounted for with an increase of +40% applied to the rainfall. Runoff calculations are set out below.

7.3 Surface Run-Off Calculations

7.3.1 Run-off calculation methodology

The proportion of rainfall converted to overland flow is a function of several key factors including slope gradient, soil type, and land cover type. There are numerous methodologies for calculating runoff rates and volumes for a given catchment and the suitability of each depends upon the catchment characteristics. The Revitalised Flood Hydrograph (ReFH2) method is considered appropriate for establishing runoff rates and volumes for both greenfield and developed sites (CIRIA, 2015).

The ReFH2 program generates a total runoff hydrograph (i.e. the summation of surface runoff and baseflow) for a given storm event based upon the catchment descriptors. This allows total runoff volumes and peak runoff rates to be calculated.

The values of Standard Annual Average Rainfall (SAAR) SAAR and Base Flow Index (BFI) used in the runoff calculations have been taken from the hydrological point descriptors for the Site (Table 7.2).

Descriptor	Value
NGR	SU 47816 07820
BFI (HOST 2019)	0.622
PROPWET	0.33
SAAR	760 (mm)

Table 7.2	Hydrological	catchment	descriptors	(CEH, 2021)
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7.3.2 Runoff destinations

Current

Figure 7.1 shows surface elevation (LiDAR data and OS Contours) data across the Site and includes inferred surface water flow directions and sub-catchment areas under the current conditions, which have been labelled for identification in the following rainfall runoff calculations (the existing catchments have the prefix 'C').

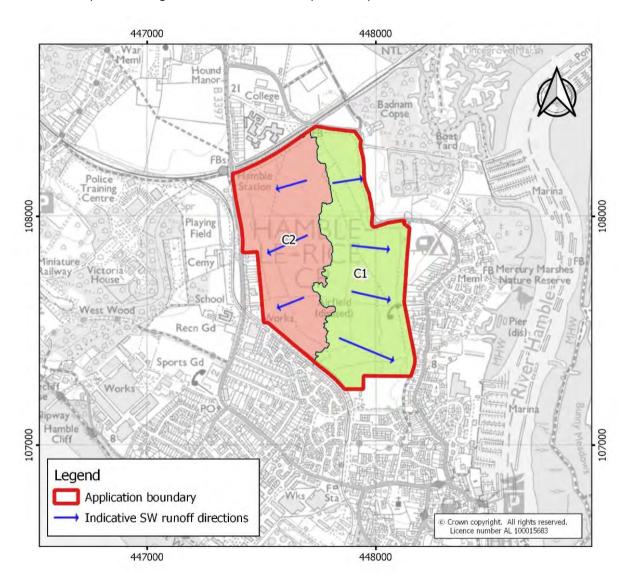


Figure 7.1 Runoff catchments – current

As previously discussed, a surface water divide exists along the centre of the Site, with runoff being directed to the lower elevation ground to the east and west. These current surface water catchment areas have been termed C1 and C2 in this assessment.

Operational Phase

Once development of the Site commences (i.e. the 'operational phase' begins) the topography will be altered as excavations are expanded and bunds are created. The runoff regime of the

Report Reference: 66650R2 Report Status: Final Site will be in a state of change as it is progressively developed and restored. Sub-catchments associated with the excavations will be enlarged over this time.

At the start of the operational phase, runoff will be directed to new lagoons created in the northern part of the Site (the details of which are discussed further below). Through phases 1 to 7, runoff from the southern part of the Site will be directed to the active quarry void (which will migrate around the Site as operations continue). Once runoff enters the voids and lagoons, it will infiltrate to the sand and gravel aquifer below the Site. Existing catchments C1 and C2 will reduce in size considerably to the periphery of the Site, outside of the bunded area.

The operational runoff catchment areas (prefixed 'O') are presented in Figure 7.2. The figure shows expected catchment areas at phase 4, which has been used as a snapshot to represent the Site in a reasonably advanced state of the operational phase (i.e. with some areas having been restored and some with active excavations).

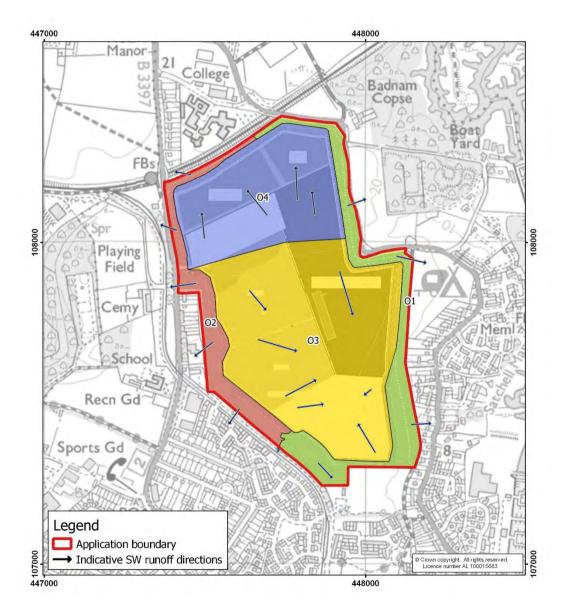


Figure 7.2 Runoff catchments – operational

Report Reference: 66650R2 Report Status: Final

Restoration Phase

As shown in the restoration plan (Appendix C), a shallow valley will be created in the northern part of the Site, including a wetland area and pond. Losses from this sub-catchment will be mainly via evapotranspiration, with limited infiltration to ground owing the lower permeability fill material utilised for the restoration phase. Overflows from the pond and wetland will convey surplus water to infiltration features located outside the fill material (as described in Section 8) but no off-site runoff is expected from this area. A second pond is also included in the southeast of the Site and will be drained in a similar fashion to the northern pond and wetland described above.

A new infiltration basin will be sited in the northwest of the Site, on the edge of the proposed fill area. Two-thirds of this feature will be located on the fill (with limited infiltration). For this reason an infiltration trench has also been included to join this feature and maximise the infiltration potential in this area.

All features are shown in Figure 8.2. Infiltration trenches also be installed around the periphery of the Site to intercept and infiltrate runoff from the remaining catchment areas to prevent any increase in off-site runoff that could arise as a result of using less permeable fill material for the Site restoration (see Section 8).

The runoff catchment areas for the restored site (prefixed 'R') are shown in Figure 7.3.

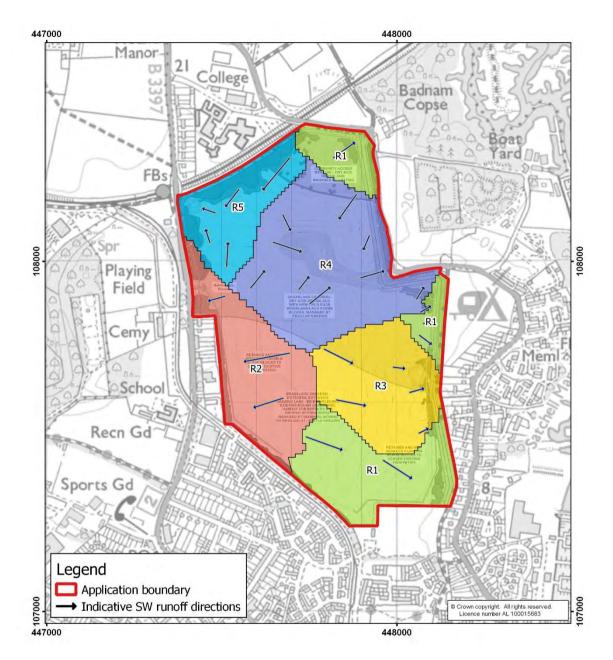


Figure 7.3 Surface water runoff catchments – Restored phase

Summary

A summary has been provided below of the catchment areas over the lifetime of the development and post restoration. A prefix of 'C', 'O' and 'R' has been used to denote catchment areas within the current, operational, and restored phases of the development, respectively.

As evident from a review of Table 7.3, catchments C1 and C2 (which contribute to direct off-Site runoff to the east and west respectively), reduce in size over the operational phase and post restoration. This is owing to the introduction of the new on-site sub-catchments during the operational and restored phases (catchments 3 to 5).

Report Reference: 66650R2

Phase	Catchment	Area (ha)	Notes
Greenfield/	C1	32.21	Eastern catchment
Current	C2	28.89	Western catchment
	O1	8.31	Eastern catchment
Operational	O2	6.10	Western catchment
Operational	O3	30.62	Southern catchment draining to active void
	O4	16.06	Northern catchment draining to lagoons
	R1	14.17	Eastern catchment (draining to infiltration trenches)
	R2	11.44	Western catchment (draining to infiltration trenches)
Restored	R3	10.19	Catchment draining to southern water feature
	R4	17.95	Catchment draining to large central water feature
	R5	7.31	Catchment draining to north-western infiltration basin and trench

Table 7.3	Site	catchment	areas	over time
	Sile	catciment	areas	

7.3.3 Predicted Run-off - greenfield

Table 7.4 to Table 7.6 give the calculated greenfield run-off for catchments C1 and C2 for a 6hr storm duration event. These are output data from ReFH2, with raw data included in Appendix D.

The DEFRA (2015) non-statutory guidance for SuDS design stipulates that the greenfield runoff rates and volumes for the 1 in 1 and 1 in 100 year storm events should not be exceeded post development, with an appropriate allowance for climate change over the lifetime of the proposed development.

Catchment	6 hour rainfall (mm)	Site peak rate (I/s)	Total runoff volume (m³)
C1	21.61	61.27	815
C2	21.61	53.09	706

Table 7.4 Greenfield runoff (1 in 1 year event)

Table 7.5 Greenfield runoff (1 in 30 year event)

	Catchment	6 hour rainfall (mm)	Site peak rate (I/s)	Total runoff volume (m ³)
	C1	46.16	148.88	2,064
_	C2	46.16	129.02	1,789

Table 7.6 Greenfield runoff (1 in 100 year event)

Catchment	6 hour rainfall (mm)	Site peak rate (I/s)	Total runoff volume (m³)
C1	56.82	194.38	2,713
C2	56.82	168.47	2,351

7.3.4 Predicted run-off – operational & restored sites

The attenuation storage volume is the required storage to manage additional runoff caused by a development compared with the greenfield scenario.

Table 7.7 to Table 7.9 compare the predicted runoff for the operational and restored phases with the greenfield runoff for the 1 in 1 year, 1 in 30 year and 1 in 100 year, 6 hour storm event plus 10% (operational phase) and 40% (restoration phase) climate change allowances.

It is important to note that this covers direct runoff only from catchments 1 and 2 during the operational phase (i.e. catchments O1 and O2). Catchments O3, O4 and all restored catchments will drain to SuDS and separate calculations have been undertaken for these features using MicroDrainage software in Section 8.

As catchments O1 and O2 will be undeveloped, the variables used in the runoff calculations (see Table 7.2) have been retained as per the greenfield calculations. A 10% increase in rainfall intensity was included to account for climate change.

Catchment	Scenario	Peak runoff rate (l/s)	Change in rate (I/s)	Runoff volume (m ³)	Change in volume (m³)
C1	Greenfield Runoff	61.27	N/A	815	N/A
01	Operational inc. CC (10%)	13.32	-47.94	167	-648
C2	Greenfield Runoff	53.09	N/A	706	N/A
02	Operational inc. CC (10%)	12.41	-40.68	171	-536

Table 7.7 Predicted future runoff (1 in 1 year event)

Table 7.8 Predicted future runoff (1 in 30 year event)

Catchment	Scenario	Peak runoff rate (I/s)	Change in rate (I/s)	Runoff volume (m³)	Change in volume (m ³)
C1	Greenfield Runoff	148.88	N/A	2,064	N/A
01	Operational inc. CC (10%)	32.81	-116.07	411	-1,653
C2	Greenfield Runoff	129.02	N/A	1,789	N/A
02	Operational inc. CC (10%)	28.13	-100.89	404	-1385

 Table 7.9 Predicted future runoff (1 in 100 year event)

Catchment	Scenario	Peak runoff rate (I/s)	Change in rate (I/s)	Runoff volume (m³)	Change in volume (m ³)
C1	Greenfield Runoff	194.38	N/A	2,713	N/A
01	Operational inc. CC (10%)	42.75	-151.63	535	-2177
C2	Greenfield Runoff	168.47	N/A	2,351	N/A
02	Operational inc. CC (10%)	35.90	-132.57	519	-1832

The results above show that off-site runoff is expected to decrease over the operational phase, as expected given the large reduction in contributing runoff areas. The SuDS strategies for the operational and restored phases are included in Section 8.

7.4 Flood Risk during operational phase

Given that off-site runoff rates and volumes are predicted to decline during the operational phase, for the reasons stated above, there will be no increase in off-site flood risk over this time.

The introduction of the quarry voids and lagoons provides a significant reduction in off-site storm runoff rates and volumes. The performance of these features during storm events is assessed in Section 8.

7.5 Flood risk post-restoration

The restoration of the Site has the potential to increase runoff relative to the greenfield scenario. This is mainly due to the use of less permeable fill material for the restoration stage. This effect is mitigated by the restoration phase SuDS strategy described below.

8 Drainage Strategy

8.1 Performance requirements

Runoff rates and volumes from the Site under the greenfield, developed/operational and restored scenarios have been calculated above (Section 7.3). These calculations are based on a six-hour storm duration storm as recommended in the national guidance for quantifying stormwater runoff volumes.

The total runoff from the Site (i.e. the sum of outflow from features included in the SuDS strategy and direct rainfall runoff) must not exceed the greenfield scenario runoff rates in order to avoid increasing flood risk.

8.2 Operational phase

8.2.1 Proposed drainage strategy – operational phase

An illustrative design has been provided in Figure 8.1 demonstrating an outline strategy for management of surface water on the Site, following the principles of the DEFRA non-statutory guidance and the SuDS manual.

It is proposed that water (rainfall runoff) will be allowed to collect in the active quarry void during each operational phase, allowing settlement to occur before infiltrating to ground. There will be no significant dewatering occurring over the lifespan of the quarry. Calculations of the performance of the voids under the design storm event are provided in Section 8.2.2.

Runoff from the processing plant area and undeveloped northern part of the Site will be directed to the northern lagoons (Freshwater Lagoon and Silt Lagoon). Water will either infiltrate to ground or be abstracted for use in the processing plant.

Further details of the SuDS features and layout will be provided in the detailed drainage design phase.

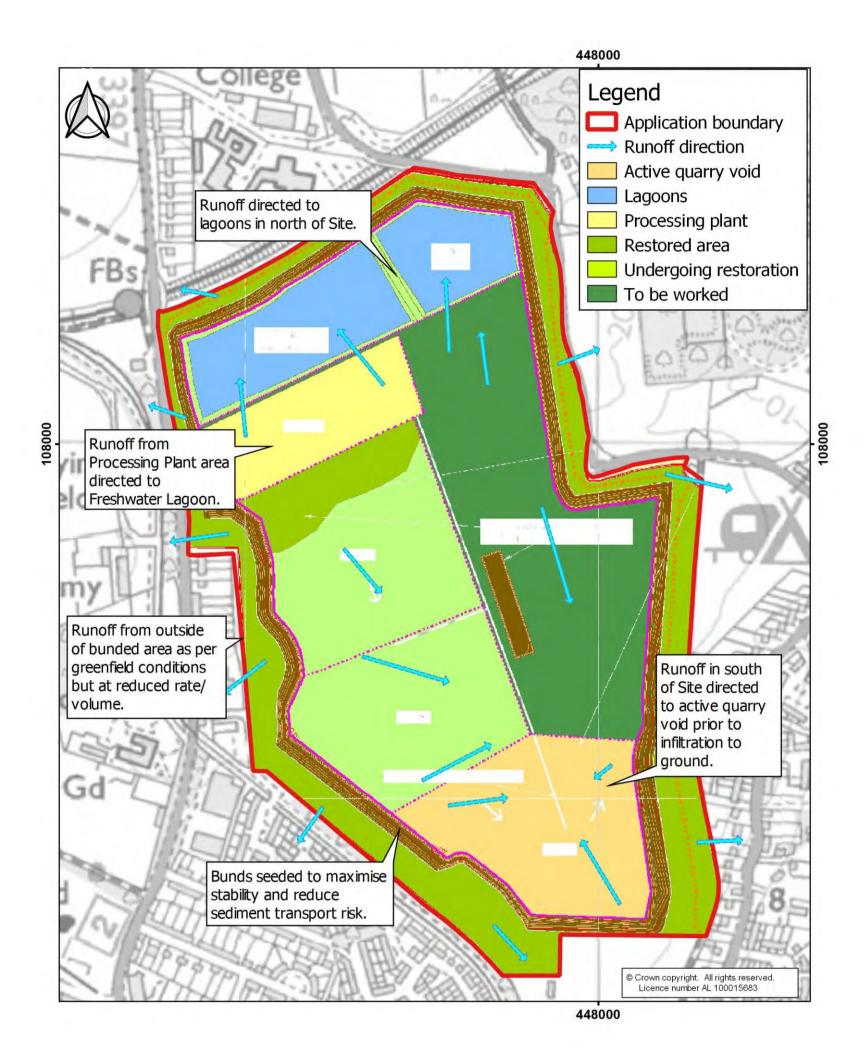


Figure 8.1 Proposed drainage strategy (operational phase – phase 4)

Report Reference: 66650R2



8.2.2 Performance calculations

To demonstrate the feasibility of the proposed operational phase drainage scheme, MicroDrainage models have been created to represent the features in the SuDS scheme. The methodology and results are presented below.

The scenario used for the calculation is phase 4 of the development (see Appendix B) which represents the Site at a moderately advanced stage of development and is considered a representative snapshot of the operational lifespan of the development. The overall SuDS strategy during other phases will follow the same principles, utilising the large storage capacity in the active quarry void and allowing infiltration to ground.

For simplicity, only the Freshwater Lagoon has been modelled as the receiving SuDS feature for the northern part of the Site. In reality both the Freshwater Lagoon and Silt Lagoon will share this runoff, but these calculations demonstrate that there is ample storage capacity on Site for stormwater.

Geometry

The geometry of the phase 4 void and the Freshwater Lagoon has been established from the phasing plans in Appendix A and additional information provided by CEMEX. This information is summarised in Table 8.1.

Report Reference: 66650R2



Table 8.1 Dimensions of principal SUDS features (Operational phase).

Feature	Catchment area (ha)	lmp. area (ha)*	Bank elevation (m AOD)	Feature invert level (m AOD)	Feature Depth (m)	Area of base (m²)	Surface area at bank (m²)	Total volume (m³)	Outfall type
Phase 4 void	30.62	4.65	c. 20	c. 17**	3	46,515	63,314	155,635	None, infiltration only
Freshwater Lagoon	16.06	6.55	c. 20	c. 17**	3	35,609	44,321	119,657	None, infiltration only

* Includes large open water bodies (in lagoons and active void)

** Invert level set as rest water level in feature. Inferred groundwater level in feature is shallow (3 mbgl) to represent high winter levels. Based on observed GW levels discussed in CEMEX (2021)

Report Reference: 66650R2



Inflows

Given that some of the southern part of the Site will have been restored (using a lower permeability fill material), the BFI value used in the runoff calculations was reduced from 0.62 (greenfield value) to 0.48 for catchment O3. This was achieved using a weighted mean approach using the 0.62 values for the undeveloped part of the catchment and a value of 0.312 for the restored part of the catchment. The BFI value of 0.312 represents soil HOST Class 24 (Institute of Hydrology, 1995) – "Slowly permeable, seasonally waterlogged soils over slowly permeable substrates with negligible storage capacity" which has been utilised to represent the restored Site surface conditions in this instance.

Given the presence of the plant area in the northern part of the Site, an impermeable area of $33,765 \text{ m}^2$ was included in the runoff calculations for catchment O4. The lagoons in catchment O4 were also treated as impermeable areas (a total area of $65,490 \text{ m}^2$) to represent the increase in runoff volume entering these features as direct rainfall input, as was the base of the phase 4 void $(46,515\text{m}^2)$.

The ReFH method was used via the MicroDrainage additional hydrograph module to generate storm hydrographs for the phase 4 catchments (O3 and O4) under the 1 in 100 year event for a range of storm durations including a 10% uplift in rainfall intensity for climate change. Simulations were run for storm durations from 15 minutes to 10,080 minutes. The RefH2 method cannot currently be utilised within MicroDrainage to include climate change uplifts.

Infiltration

An infiltration coefficient of 1 m/hr has been applied for the River Terrace Deposits in line with industry standard values (Innovyze, 2021).

Infiltration via the base of the void is assumed to be zero in this instance given that the water table will be exposed in the base of the void (note that the base of the feature has been set at the maximum expected groundwater water elevation).

Results

The MicroDrainage results for this scenario are presented in Appendix E. A maximum water level of 17.20 mAOD is calculated in the phase 4 void (i.e. a depth of just 20 cm in the base of the void).

A maximum water level of 17.11 mAOD is calculated in the Freshwater Lagoon (i.e. 11 cm depth in total).

Given the large remaining freeboard, no requirement for a high-level overflow from the quarry void or Freshwater Lagoon is anticipated.



Report Reference: 66650R2

Feature	Critical duration (mins)	Max. water level (m AOD)	Min. freeboard remaining (m)	Half drain times (min)
Freshwater Lagoon	2,160	17.11	2.89	1,130
Phase 4 void	2,880	17.20	2.80	719

 Table 8.2 Performance of SuDS features under a 1 in 100 year + 10% storm event.

8.2.3 Exceedance flows

As can be demonstrated by the MicroDrainage calculations above, there is a significant depth of freeboard remaining even under the 1 in 100 year + 10% climate change allowance and an exceedance of the capacity of the features seems highly unlikely. If this were to occur, the bunds around the periphery would prevent runoff offsite around the majority of the Site perimeter.

8.2.4 Residual flood risk

The calculations above demonstrate that the on-site features (quarry voids and lagoons) are easily capable of storing stormwater runoff prior to infiltration. On site flood risk will therefore be negligible over the operational phase. Given that the runoff from catchments 1 and 2 (which contribute to offsite runoff) will reduce relative to the greenfield/current scenario, the development will provide betterment with regards to off-site flood risk.

8.2.5 Water quality

This section provides details of the potential of the proposed development to cause a reduction in water quality and the measures proposed mitigate this.

SuDS techniques can be used by way of a treatment train process to effectively manage the quality of surface water flowing across a site. Different methods can be used to intercept pollutants and allow them to degrade or be retained in situ without impacting the quality of water further downstream.

The proposed development will see some stockpiles of overburden and sand and gravel around the Site. Although the Site runoff will infiltrate to ground via the open voids and lagoon, the CIRIA SuDS manual (CIRIA, 2015) qualitative indices approach to designing a SuDS scheme has been applied to quantify the influence of the proposed SuDS features on Site runoff.

Suspended solids are the only pollutant specifically considered in this assessment given the nature of the development, although other pollutants and best practice measures are included in the scheme (see below). Based upon the nature of the development, using the index methodology for water quality assessment, a pollution index of 0.7 - 0.8 for Total Suspended Solids would seem appropriate (Chapter 4 of CIRIA, 2015).

The following measures are included in the operational (construction) phase drainage strategy to mitigate any potential increase in sediment loads within on-site runoff. Removal indices are included in the brackets.

Report Reference: 66650R2



• Ponds (0.7) – the quarry voids and lagoons.

Water used in mineral washing at the processing plant will be discharged to the Silt Lagoon for settlement and infiltration to ground.

Sediment collecting in the lagoons will be periodically removed from the base of the features and utilised in the site restoration process.

Bunds and stockpiles will be seeded with grass to prevent erosion and minimise sediment transportation.

8.3 Restoration phase

8.3.1 Proposed drainage strategy – post restoration

An illustrative design is shown in Figure 8.2 demonstrating an outline strategy for management of surface water at the Site post restoration. The restored site will eventually be covered with vegetation (trees and grassland) and two drainage ponds.

Much of the Site will drain to two new pond features within the site boundary (see Section 7.3.2). Infiltration to ground is unlikely to be feasible in these areas given the likely low permeability of the fill material. Flow control devices will allow discharge from these features to linear infiltration trenches along the boundary of the Site (outside of the excavation/infilled zone). These will be square section channels, around 2 m deep by 1 m wide, lined with a permeable membrane and filled with gravel.

An infiltration basin will be positioned in the northwest of the Site, outside of the fill area, to attenuate and discharge runoff from this part of the Site to ground.

In-situ soakaway testing is recommended in due course to validate the water balance calculations undertaken in this assessment. This can be undertaken as part of the detailed drainage design work.



Report Reference: 66650R2

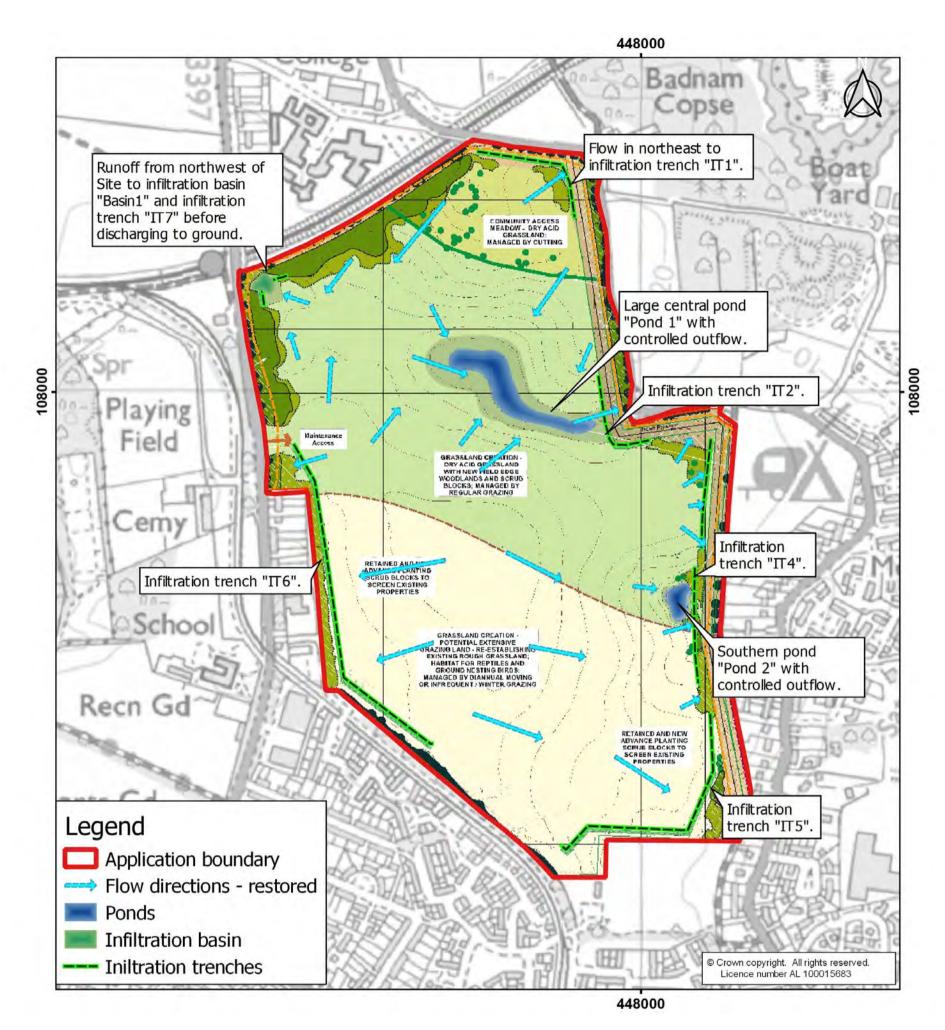


Figure 8.2 Proposed drainage strategy (restored phase)

Report Reference: 66650R2

Report Status: Final



8.3.2 Performance calculations

Further MicroDrainage models have been created to represent the features in the restored site SuDS scheme. The methodology and results are presented below.

A separate model was created for each SuDS feature. Where the proposed ponds/basins (Pond 1, Pond 2 and Basin 1) flow into the downgradient infiltration trenches (IT2, IT4 and IT7) the cascade functionality was applied to link the output hydrographs from the features to the trenches.

Geometry

The geometry of the proposed SuDS features and other pertinent information used in the MicroDrainage calculations is summarised in Table 8.3. The infiltration trenches have been modelled as fairly level single features for simplicity at this stage. They will likely be staggered along their reach, with check dams to maximise storage, given the topography of the restored Site.

Hydro-Brake® discharge rates have been set to maximise the use of available storage in the upgradient features.

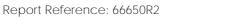








Table 8.3 Dimensions of principal SUDS features (Restored phase).

Feature(s)	Catchment area (ha)	BFI*	Bank elevation (m AOD)	Feature invert level (m AOD)	Feature Depth (m)	Area of base (m²)	Surface area at bank (m²)	Storage volume (m³)	Outfall
Infiltration trench "IT1"	4.28	0.46	21.7	19.7	2	215	215	430	None
Pond 1	25.13	0.35	18.5	17**	1.5	4619	6930	8,604	Hydro-Brake ® Invert: 17 mAOD Design flow 125 l/s
Infiltration trench "IT2"	0 (cascade from Pond1)	n/a	18.3	15.3	3	244.5	245	734	None
Infiltration trench "IT3"	1.71	0.51	19.0	17	2	168	168	336	None
Pond 2	25.13	0.36	16.5	15**	1.5	487	1270	1,272	Hydro-Brake ® Invert: 15 mAOD Design flow :175l/s
Infiltration trench "IT4"	0 (cascade from Pond 2)	n/a	16.3	13.3	3	177	177	531	None
Infiltration trench "IT5"	9.41	0.48	17.7	15.7	2	402	402	804	None
Infiltration trench "IT6"			21	19	2	545	545	1,090	None
Infiltration Basin "Basin 1"	7.31	0.38	18.5	17	1.5	164	643	571	Overflow weir set at 18.10 mAOD
Infiltration trench "IT7"	0 (cascade from Basin1)	n/a	18.5	15.5	3	108	108	324	None

* Calculated using weighted mean approach ** Invert level set to outfall invert (i.e. base of usable storage)

Report Reference: 66650R2



Report Status: Final

Inflows

The ReFH method was used via the MicroDrainage additional hydrograph module to generate storm hydrographs for the restored catchments under the 1 in 100 year event for a range of storm durations including a 40% uplift in rainfall intensity for climate change. Simulations were run for storm durations from 15 minutes to 10,080 minutes.

The BFI value used in the runoff calculations was reduced using a weighted mean approach using the 0.62 values for the undeveloped part of the catchment and a value of 0.312 for the restored part of the catchment as per the operational phase calculations. Utilised BFI values are included in Table 8.3.

Infiltration

An infiltration coefficient of 1 m/hr has been applied for the River Terrace Deposits in line industry standard values (Innovyze, 2021). This was applied to the walls and bed of the infiltration trenches. This value was reduced by 30% for the infiltration basin as it will be partially underlain with fill material.

Infiltration via the ponds is assumed to be zero in this instance given the presence of the underlying restoration fill.

Results

The MicroDrainage results for this scenario are presented in Appendix E and have been summarised in in Table 8.4



Report Reference: 66650R2

Report Status: Final

Table 8.4 Performance of restored phase SuDS features under a 1 in 100 year + 40%
storm event.

Feature/catchment	Critical duration (mins)		Min. freeboard remaining (m)	
Lake 1	960	18.20	0.8	c.300
Lake 2	480	16.18	0.32	c. 250
IT1	360	20.81	0.89	6
IT2	4320	17.60	0.70	9
IT3	360	18.08	0.92	6
IT4	600	15.97	0.33	10
IT5	360	17.04	0.66	8
IT6	360	20.28	0.72	7
IT7	480	17.88	0.67	3
Infiltration Basin 1	360	18.12	0.38	35

8.3.3 Exceedance flows

In the event that the capacity of the SuDS features described here are exceeded, exceedance flows would be eastwards and westward, radially from the Site, as per the greenfield runoff regime. This is illustrated in Figure 8.3



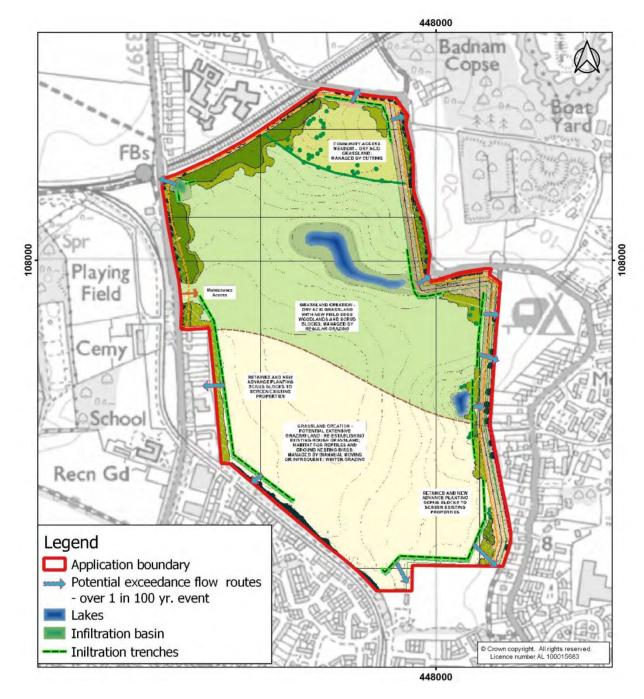


Figure 8.3 Potential exceedance flow routes

8.3.4 Residual flood risk

The residual flood risk is that remaining after taking into consideration the measures set out in the SuDS scheme. The performance calculations for the SuDS features demonstrate that they would be capable of attenuating all incoming runoff from a 1 in 100 year plus 40% storm event without surcharging water off-site. Off-Site runoff would therefore be limited to the small residual areas around the SuDS features – the trenches are not immediately adjacent to the Site boundary. This residual catchment area is far smaller in extent and would result in a large net reduction in runoff rates and off-Site flood risk.

Report Reference: 66650R2



Report Status: Final

8.3.5 Water quality

Post-restoration there will be no pollution sources at the Site and therefore, no risk posed by the Site for water quality deterioration. The SuDS features included in the restoration phase SuDS scheme (see below) are largely for water quantity management as well as biodiversity and amenity benefits, although they do offer this potential as demonstrated below.

The following measures are included in the restored phase SuDS strategy to mitigate any potential increase in sediment loads within on-site and off-site runoff. Removal indices are included in the brackets adjacent to each feature type.

- Ponds (0.7).
- Infiltration Basin (0.5)
- Infiltration trench (0.4)

A combination of ponds, infiltration trenches and an infiltration basin have been included in the restored Site SuDS strategy which will provide some water treatment functionality to the restored Site.

8.4 Maintenance

8.4.1 Plan details – operational phase

The drainage strategy for the operational Site is simple and does not include many complicated features. As such, the maintenance requirements for the Site will be low. The proposed requirements for the scheme are set out below for the operational life of the quarry. Note that the quarry void is not included in this section as its geometry will be changing throughout the operational phase of the development and will be managed as per the normal good management techniques for a sand gravel quarry site.

Lagoons

- Inspect and clear out quarterly
- Vegetation management quarterly
- Remove sediment from bed annually or as required

Sediment would be utilised as part of the restoration process.

8.4.2 Contact information

The quarry manager or operational manager for the Site will be responsible for the SuDS scheme. Exact contact details will be provided when the quarry is operational.

8.4.3 Plan details - post restoration

The proposed requirements for the scheme are set out below for the restored Site SuDS features:

Report Reference: 66650R2

Report Status: Final



Hydro-Brake ®

• Check Hydro-Brake for signs of damage/blockages/wear – annually or as per manufacturers recommendation

Ponds & infiltration basin

- Inspect and clear out quarterly
- Vegetation management quarterly
- Remove sediment from bed annually or every three years

Infiltration trenches require negligible maintenance once installed. An annual inspection to ensure the top of the feature is not becoming covered with debris should be undertaken.

An easement around the features will be maintained to allow access for maintenance. Invasive maintenance work such as vegetation removal would only be required intermittently, but it should be sympathetic to the requirements of wildlife in the ponds.

8.5 Biodiversity and amenity

The restoration schemes present an opportunity to enhance habitat for wildlife on-site and with the aim of improving biodiversity in the vicinity. Lakes and infiltration basins are landscape assets that have amenity value and improve the aesthetics more than conventional drainage systems. Ecological diversity will be maximised through the restoration strategy for creating a range of habitat types.



Report Reference: 66650R2

9 Conclusions

CEMEX is proposing to extract sand and gravel from the former Hamble Airfield Site near Southampton, Hampshire. The Site would be progressively worked and restored back to levels comparable with the current topography. The Site would be worked wet, with no dewatering employed.

The Site is currently vacant and covered with grass - now effectively a greenfield site.

Stantec has reviewed the potential flood risk to the Site and from the proposed development to neighbouring receptors. The Site lies within Flood Zone 1 and is therefore not at risk of flooding from rivers or the sea. Sand and gravel extraction is considered by the NPPF to be a water compatible land use and the proposed development is therefore appropriate for this location with no Exception Test required.

The risk of surface water flooding for the Site is demonstrated to be low. No flooding is anticipated even in the 1 in 1000 year flood event aside from two small depressions near the centre of the Site.

The Site is not at risk of flooding as a result of reservoir failure and the risk of groundwater flooding in the area is low.

A drainage scheme has been proposed which principally includes the large quarry void and northern lagoons over the operational phase of the quarry, which provide a very large stormwater attenuation capacity. Attenuated water will discharge to ground. Runoff and water balance (MicroDrainage) calculations have been undertaken for phase 4 of the development to demonstrate the validity of the scheme, although the principles of the SuDS scheme apply to all phases of the operational phase of the development (the location of the active void will move around the Site during the operational life of the quarry).

Following restoration, runoff will attenuate in some newly formed SuDS features (ponds and an infiltration basin) distributed across the Site. From the ponds, water would infiltrate to the sand and gravel aquifer (where it remains around the Site perimeter), via some infiltration trenches. Discharge to ground from the infiltration basin will be via the bank and base of the feature directly. Calculated off-site discharge (runoff and discharge from SuDS features) is well below the calculated greenfield rates and volumes with all SuDS features able to attenuate and discharge receiving runoff to ground. This illustrates that the SuDS schemes would provide some betterment with regards to off-site flood risk. Further in-situ soakaway testing is recommended in due course to validate the water balance calculation undertaken in this assessment.



Report Reference: 66650R2



10 REFERENCES

British Geological Society, 2021. GeoIndex - online geological mapping. http://www.bgs.ac.uk/GeoIndex/

Centre of Ecology and Hydrology, 2021. Flood Estimation Handbook Website

Department for Communities and Local Government , 2021. National Planning Policy Framework (NPPF)

Department for Communities and Local Government, 2021. National Planning Policy Guidance (NPPG)

Eastern Solent Coastal Partnership, 2016. South Hampshire Strategic Flood Risk Assessment

Eastleigh Borough Council, 2018. Eastleigh Local Plan.

Environment Agency, 2021. Flood risk assessments: climate change allowances.

Hampshire County Council, 2012. Eastleigh Surface Water Management Plan

Hampshire County Council, 2013. Hampshire Minerals and Waste Plan

Innovyze 2021. Literature values of infiltration rates for geological strata. MicroDrainage accompanying literature.

CEMEX, 2021. Environmental Statement – Hamble Quarry

APPENDICES

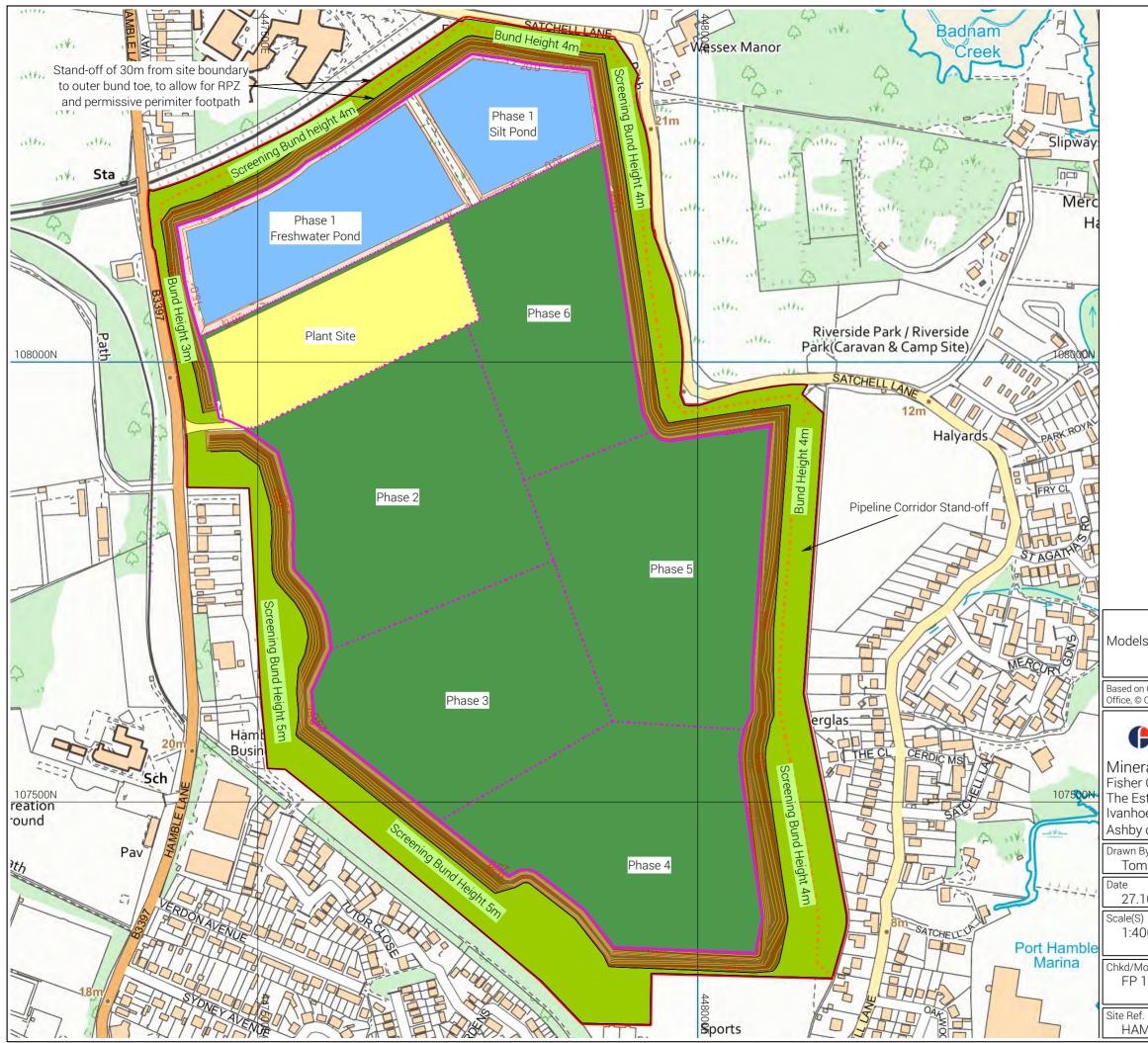
Appendix A Topographical Site Survey



Original A3 File Reference

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Appendix B Site Development Plans





	Drawn from	21-10_HAMBLE_PHASING OVERVIEW.LSS
	Overlay 1	OS Landline.LSS
els	Overlay 2	
	Overlay 3	
	Overlay 4	
	Revision Notes	Method of Working : Version 4
on Ordnance Survey data with the permission of Her Majesty's Stationery		

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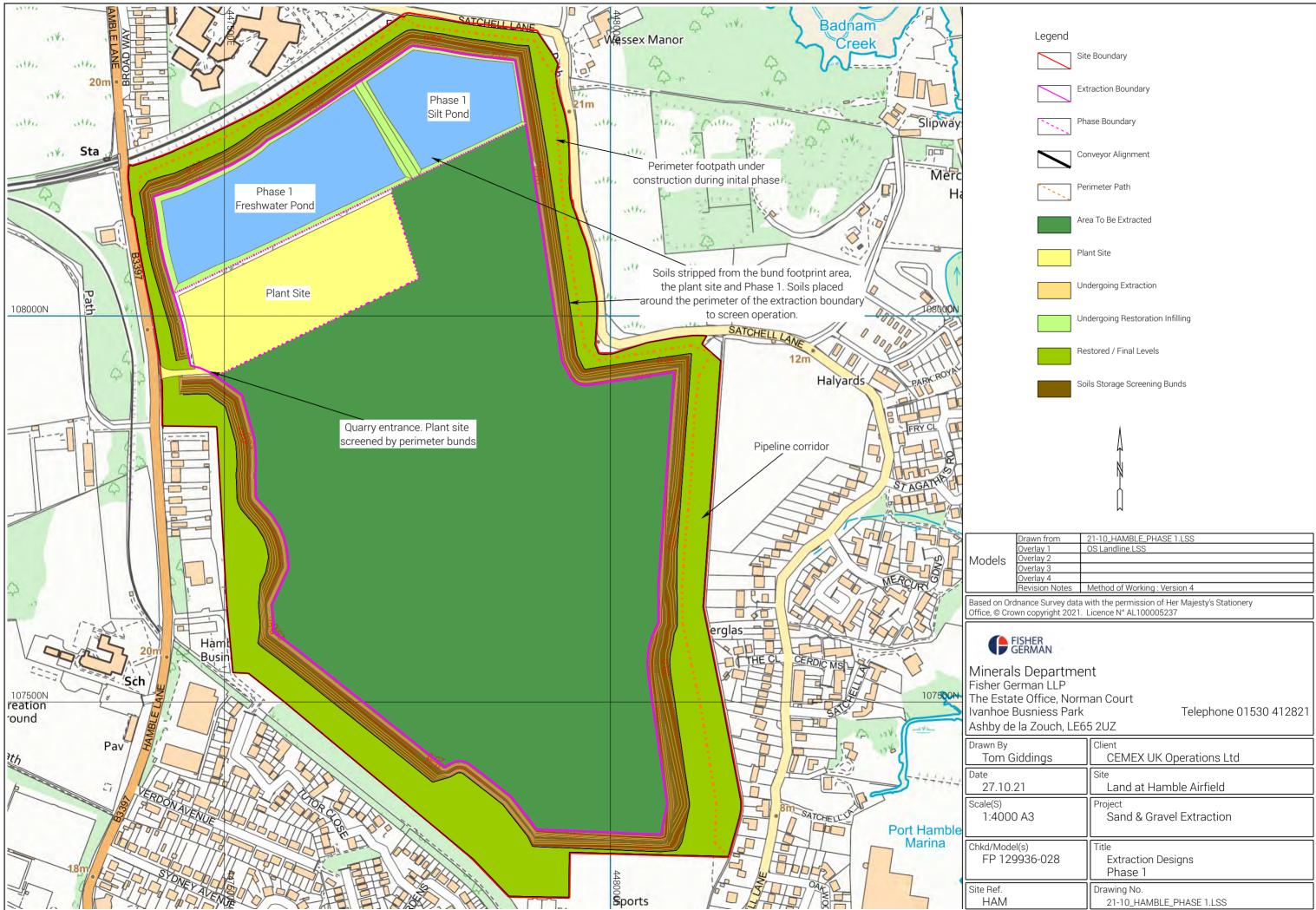
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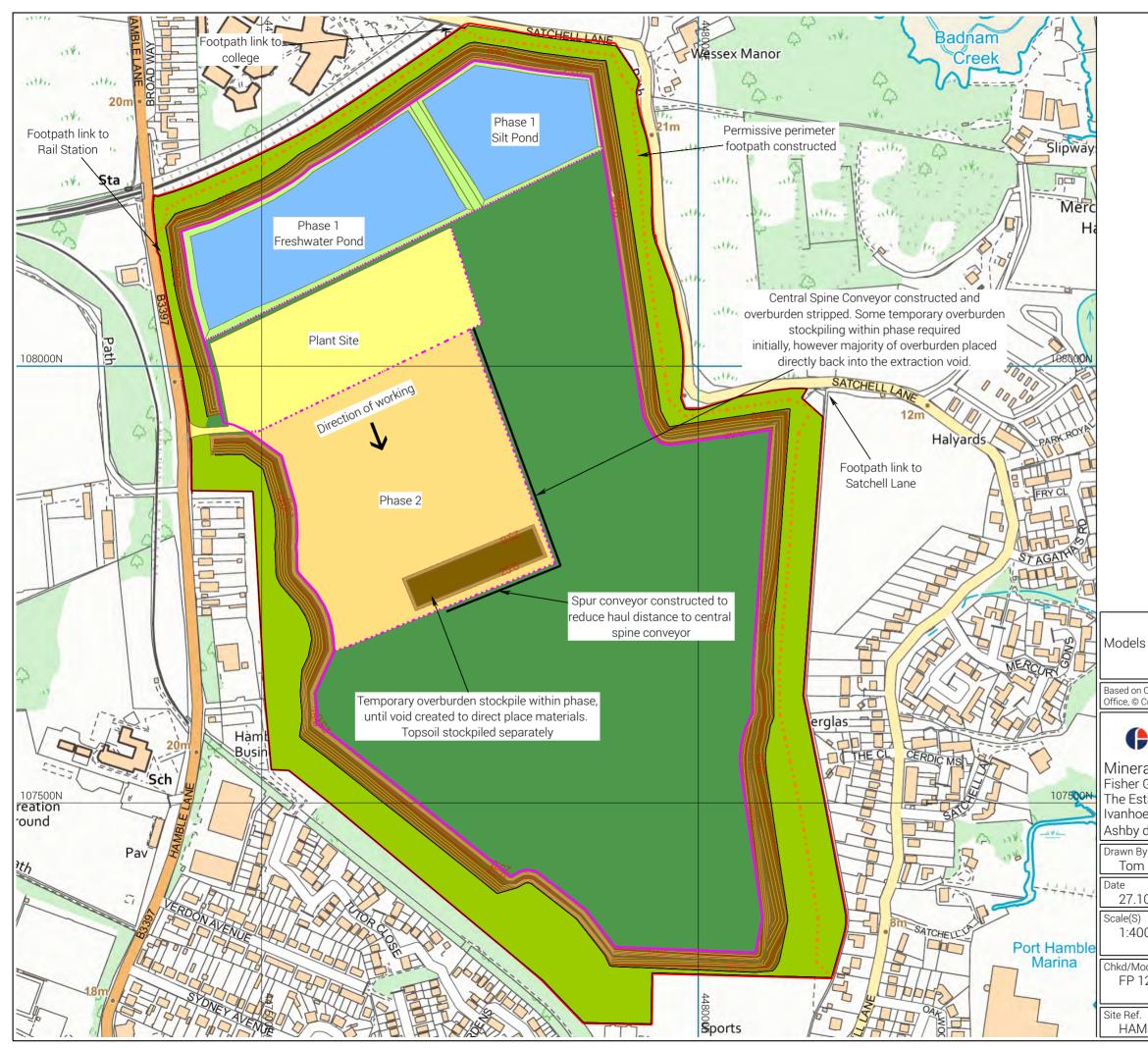
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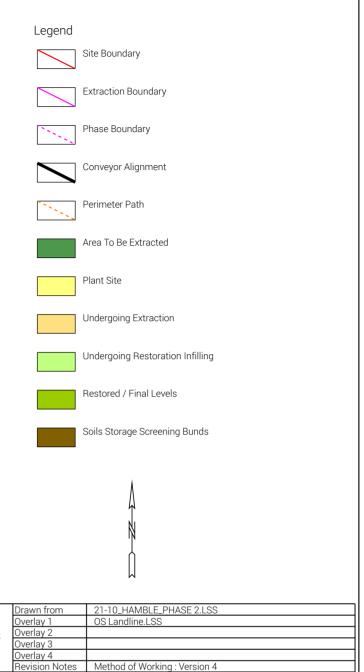
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m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phasing Overview		
f.	Drawing No.		
M	21-10_HAMBLE_PHASING OVERVIEW.LSS		



^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phase 1		
f.	Drawing No.		
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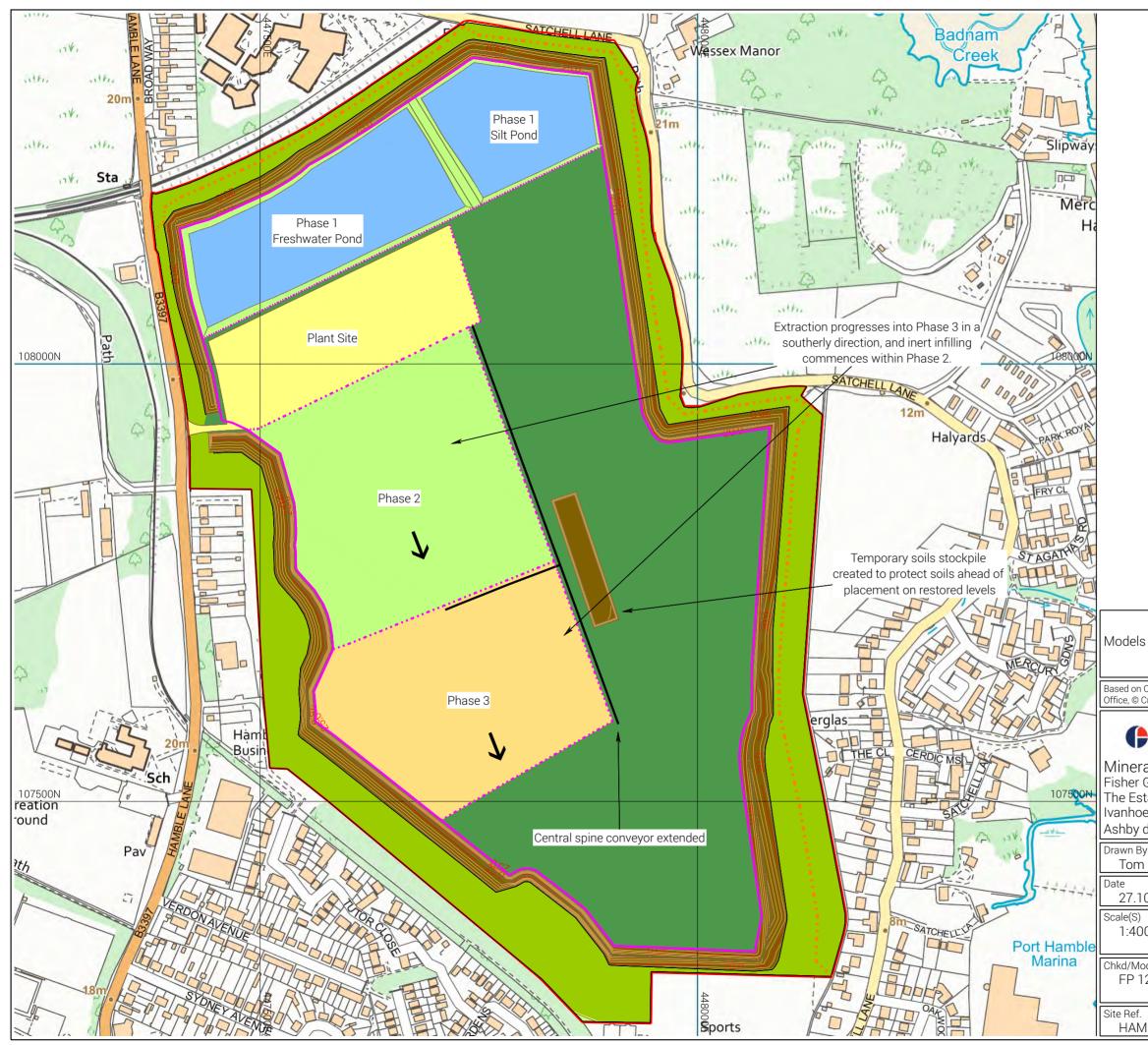
Minerals Department

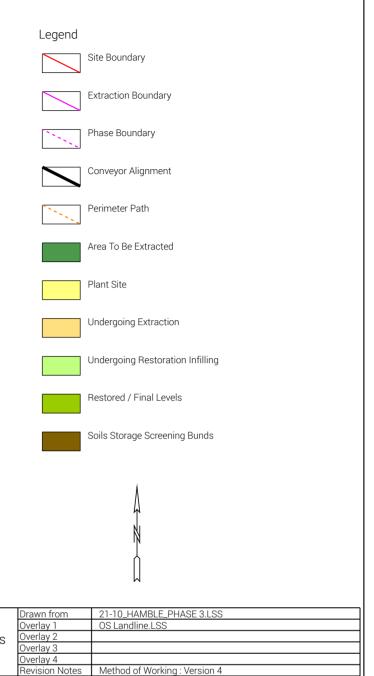
Fisher German LLP

The Estate Office, Norman Court Ivanhoe Busniess Park

Ashby de la Zouch, LE65 2UZ

^{By}	Client			
m Giddings	CEMEX UK Operations Ltd			
10.21	Site Land at Hamble Airfield			
s)	Project			
000 A3	Sand & Gravel Extraction			
^{Nodel(s)} 129936-028	Title Extraction Designs Phase 2			
f.	Drawing No.			
M	21-10_HAMBLE_PHASE 2.LSS			





FISHER GERMAN

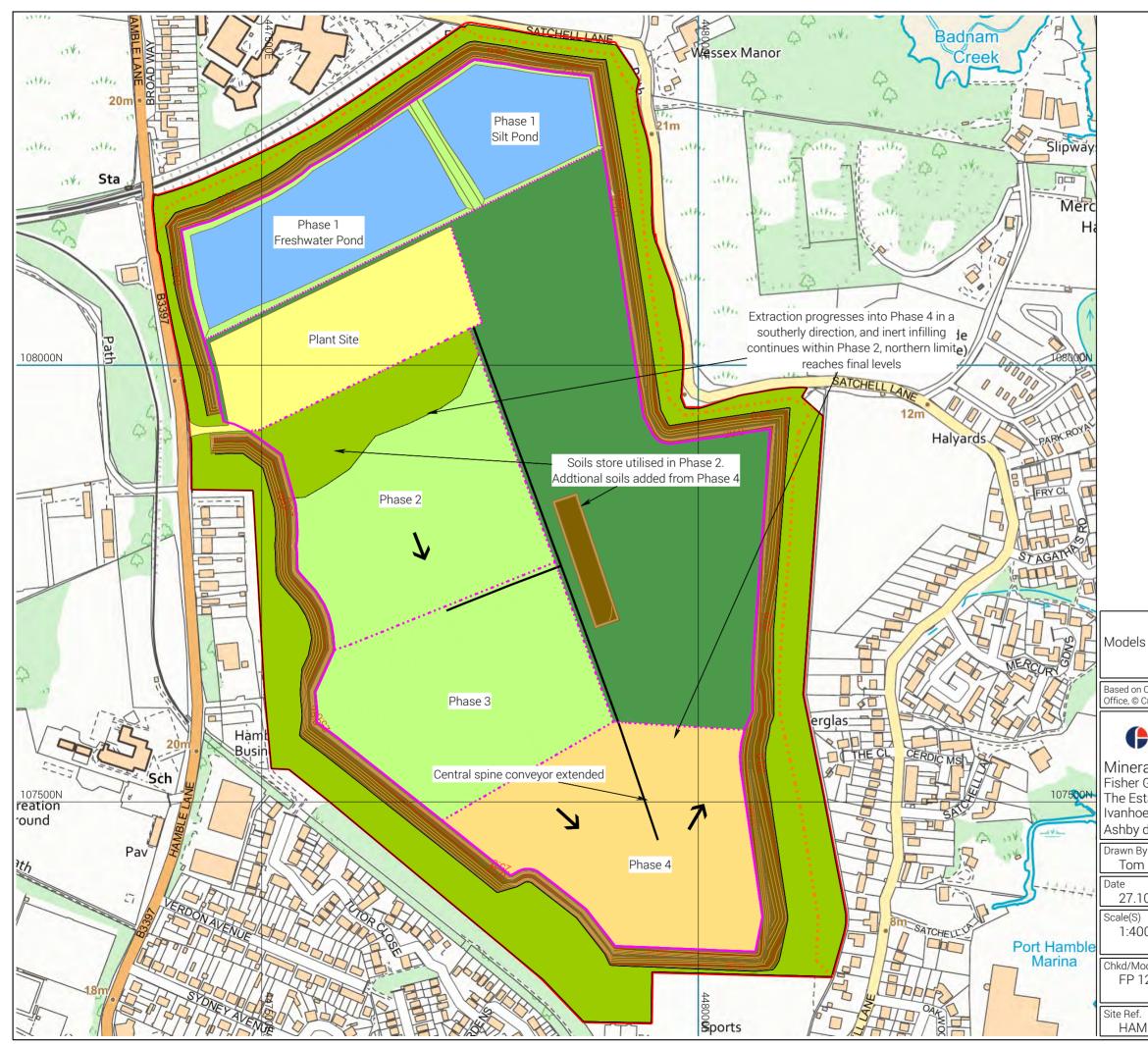
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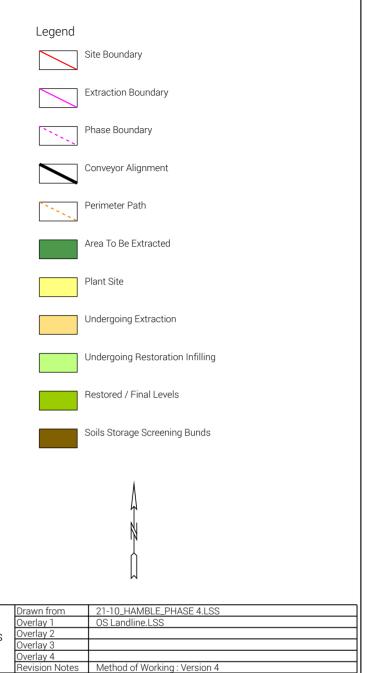
Fisher German LLP

The Estate Office, Norman Court Ivanhoe Busniess Park

Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
^{Nodel(s)} 129936-028	Title Extraction Designs Phase 3		
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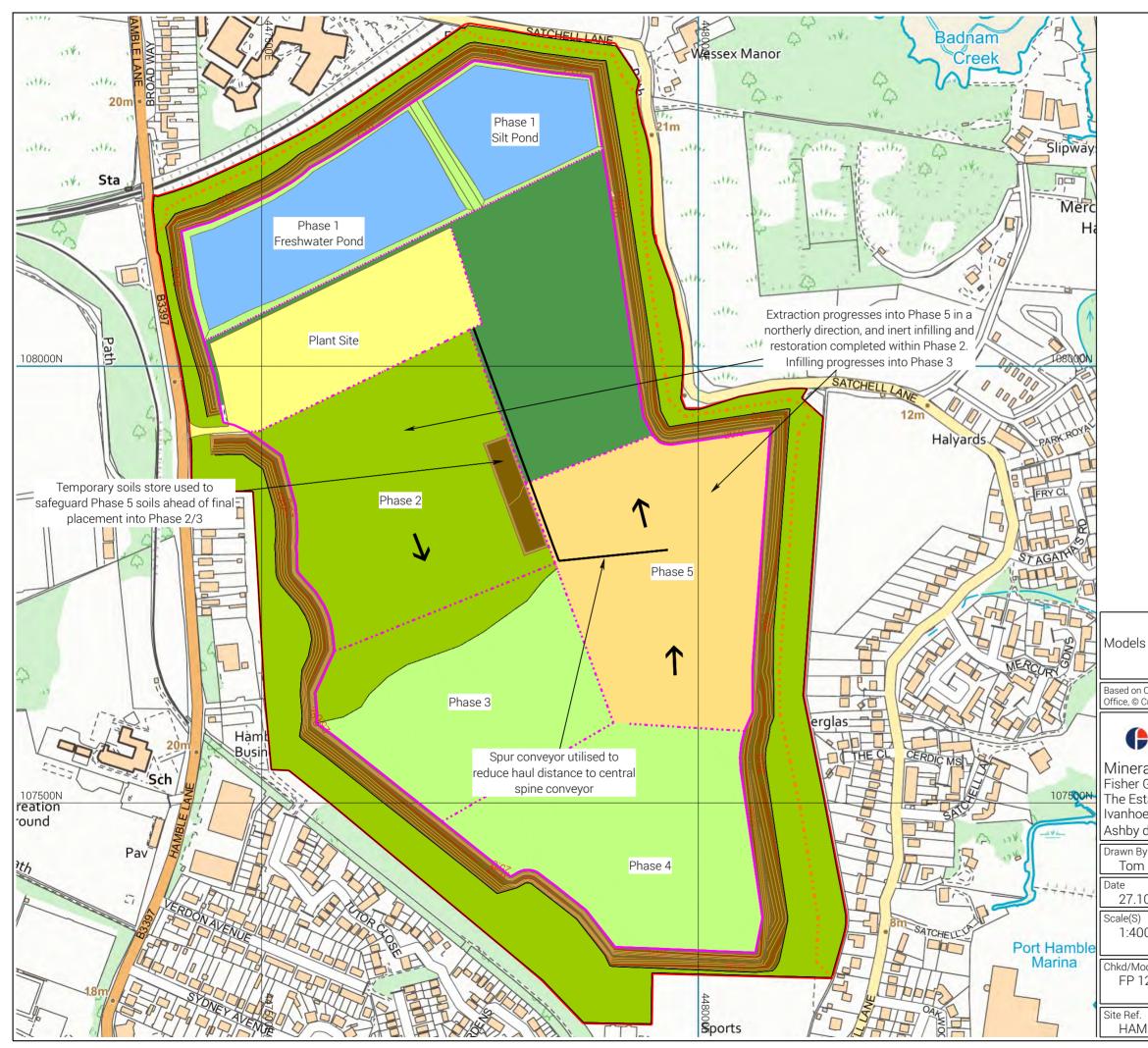
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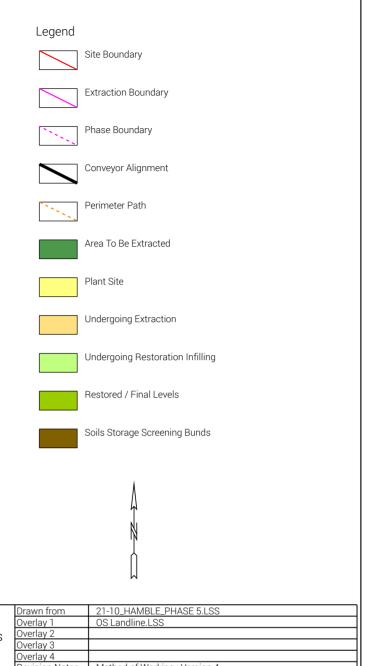
Fisher German LLP

The Estate Office, Norman Court Ivanhoe Busniess Park

Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phase 4		
f.	Drawing No.		
M	21-10_HAMBLE_PHASE 4.LSS		





 Revision Notes
 Method of Working : Version 4

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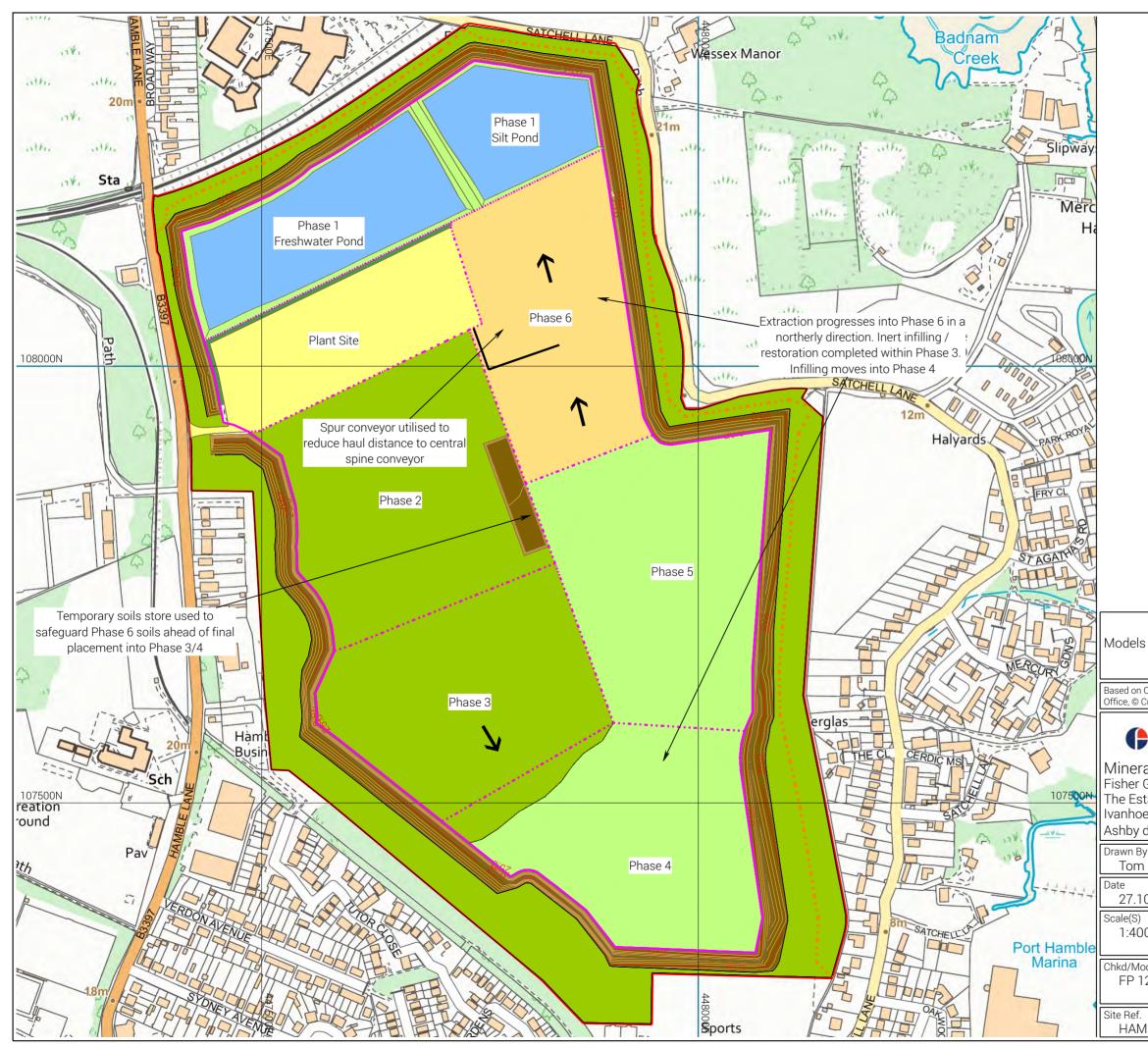
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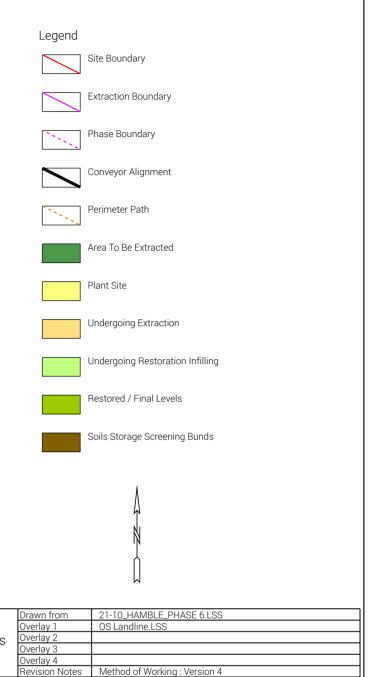
Fisher German LLP

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Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phase 5		
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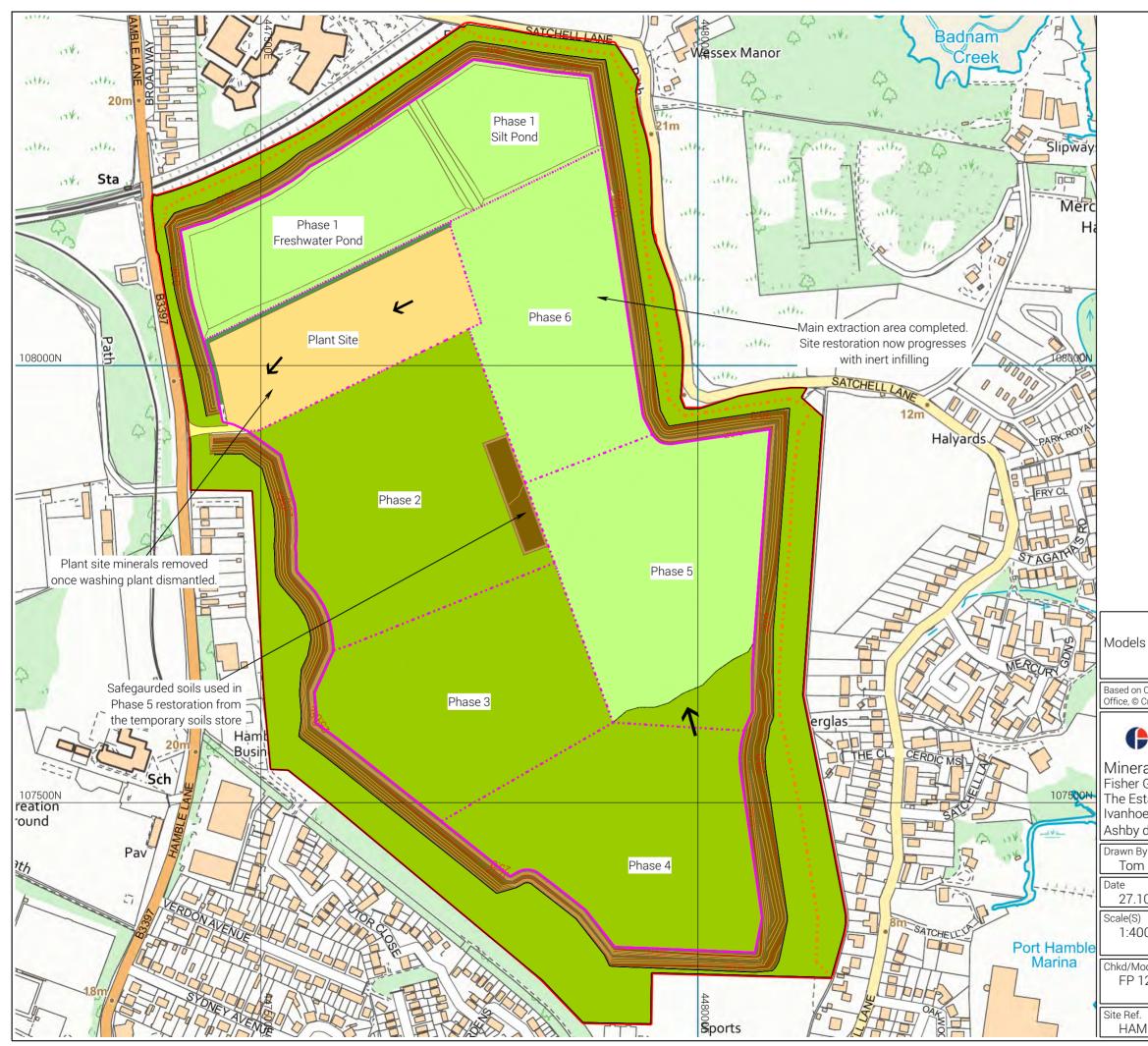
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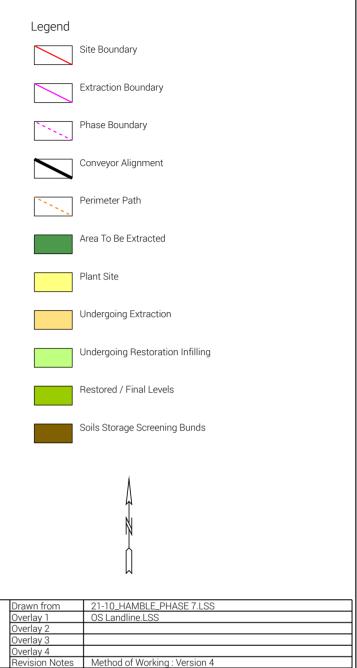
Fisher German LLP

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Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phase 6		
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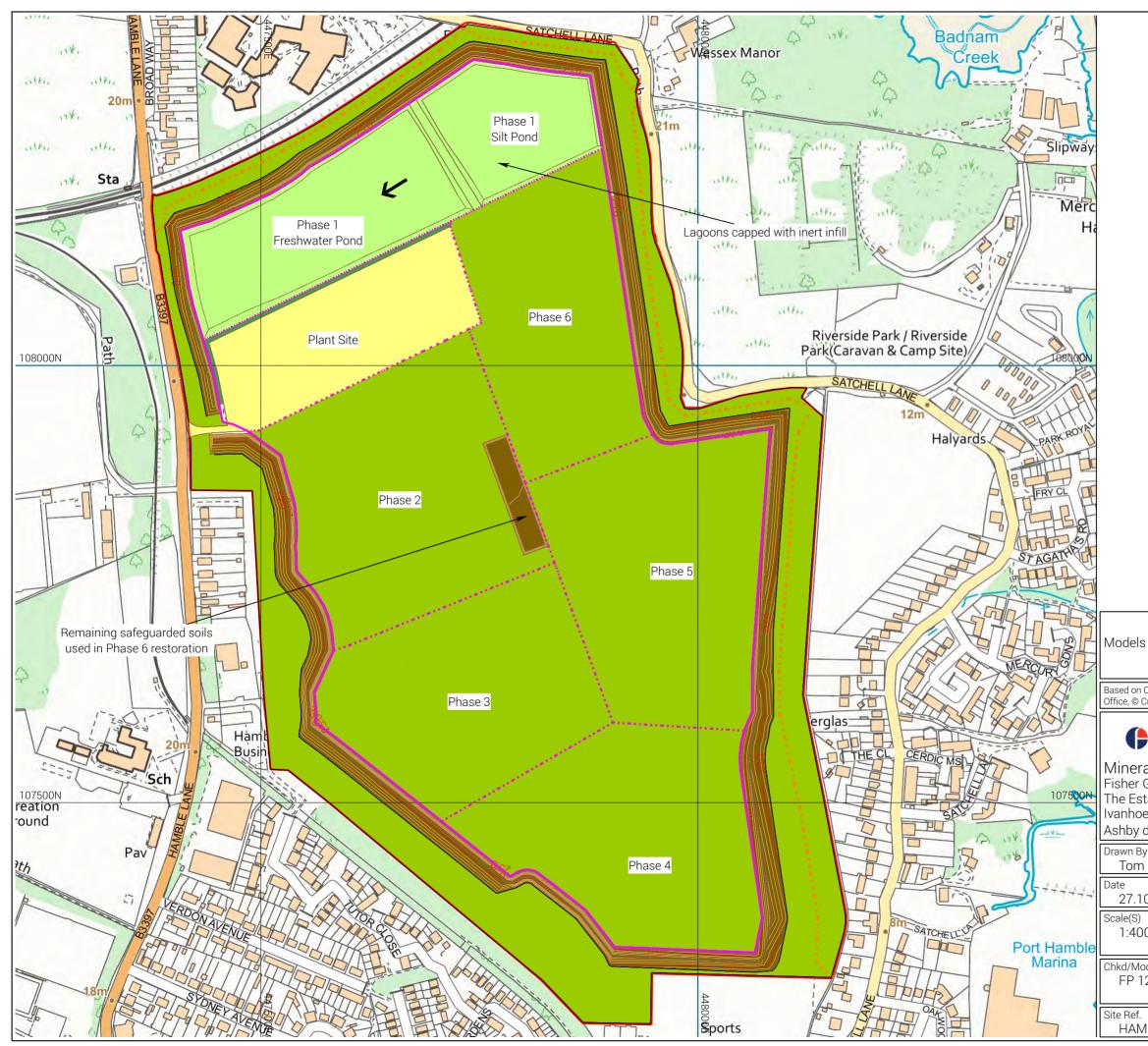
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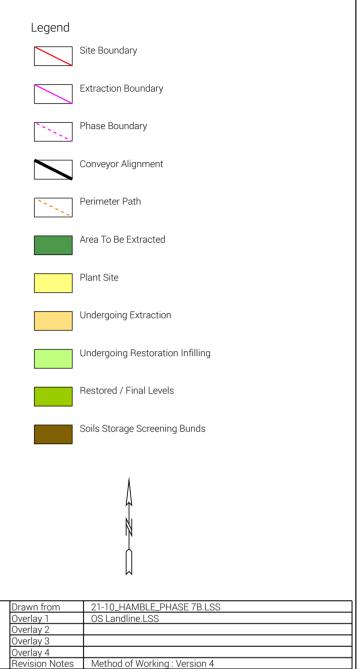
Fisher German LLP

The Estate Office, Norman Court Ivanhoe Busniess Park

Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
Nodel(s) 129936-028	Title Extraction Designs Phase 7		
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M	21-10_HAMBLE_PHASE 7.LSS		





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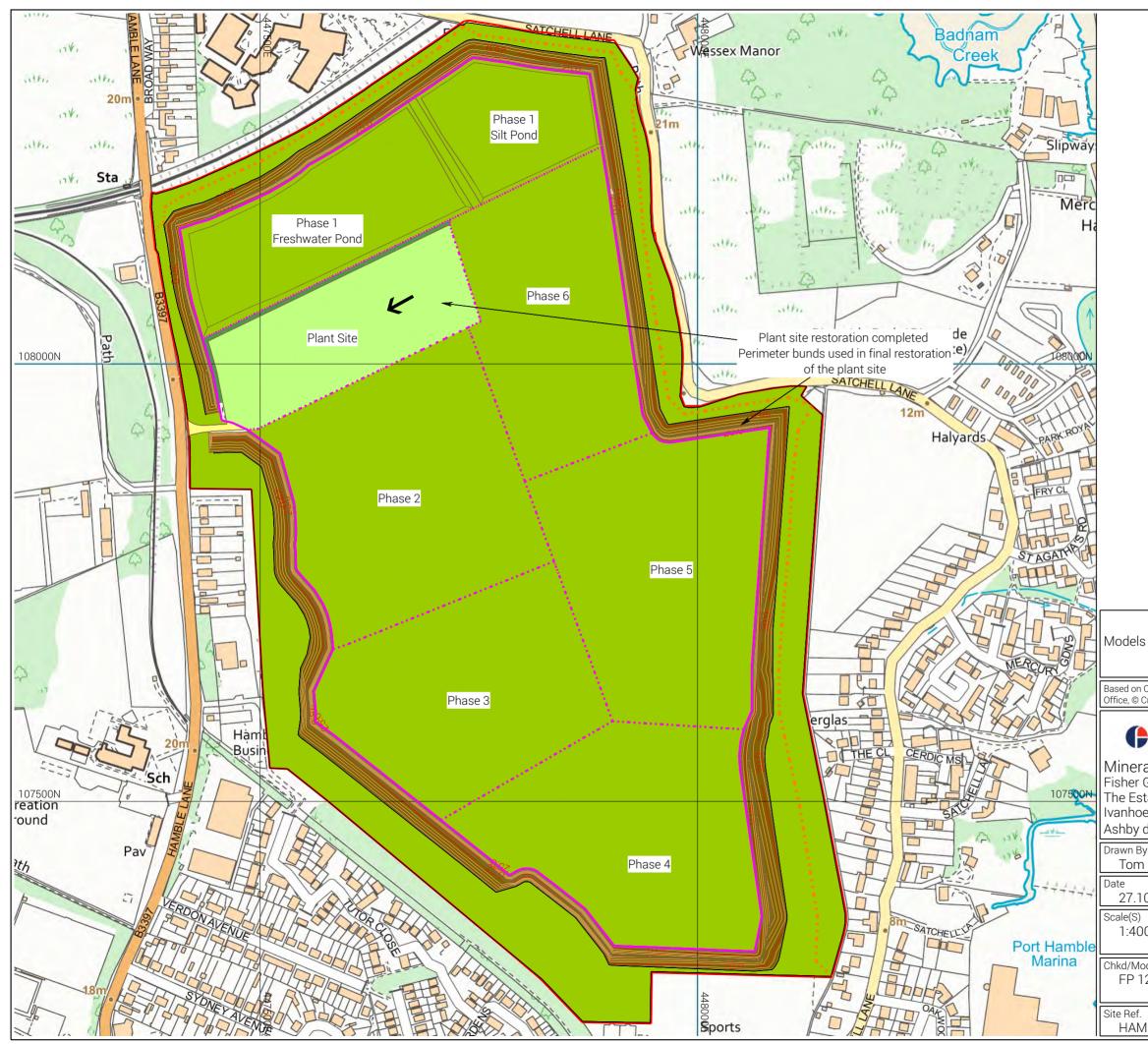
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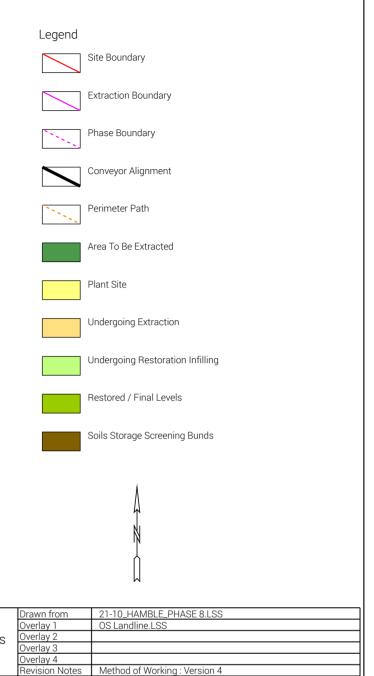
Fisher German LLP

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Ashby de la Zouch, LE65 2UZ

^{By}	Client		
m Giddings	CEMEX UK Operations Ltd		
10.21	Site Land at Hamble Airfield		
³⁾	Project		
000 A3	Sand & Gravel Extraction		
^{Nodel(s)} 129936-028	Title Extraction Designs Phase 7b		
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M	21-10_HAMBLE_PHASE 7B.LSS		





FISHER GERMAN

Minerals Department

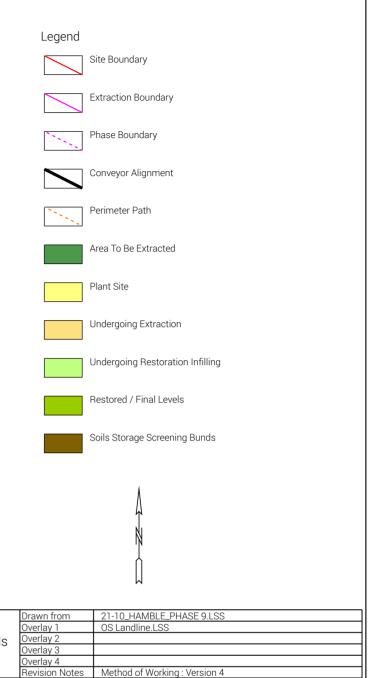
Fisher German LLP

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Ashby de la Zouch, LE65 2UZ

^{By}	Client	
m Giddings	CEMEX UK Operations Ltd	
10.21	Site Land at Hamble Airfield	
³⁾	Project	
000 A3	Sand & Gravel Extraction	
Nodel(s) 129936-028	Title Extraction Designs Phase 8	
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M	21-10_HAMBLE_PHASE 8.LSS	





FISHER GERMAN

Minerals Department

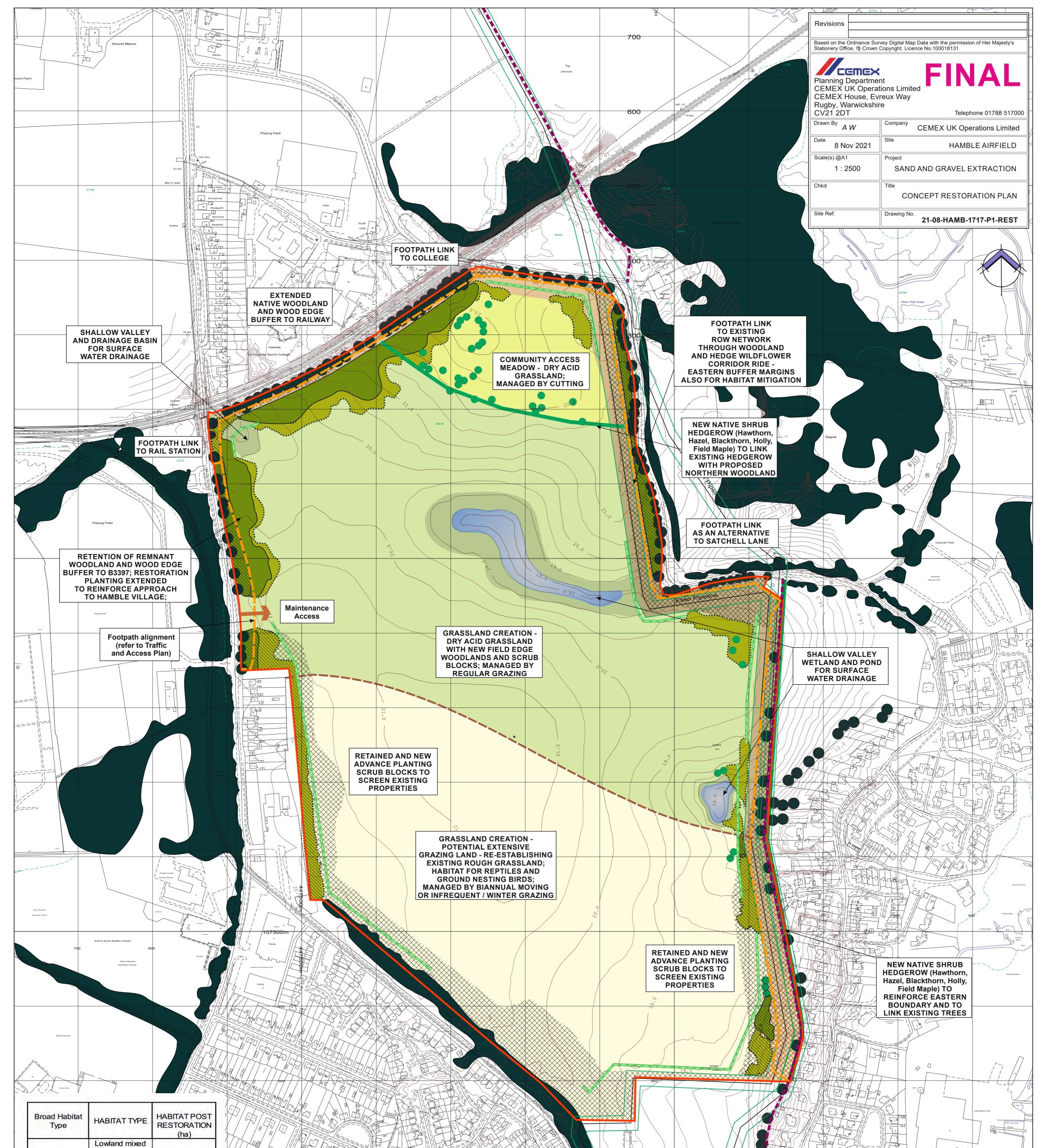
Fisher German LLP

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Ashby de la Zouch, LE65 2UZ

^{By}	Client	
m Giddings	CEMEX UK Operations Ltd	
10.21	Site Land at Hamble Airfield	
³⁾	Project	
000 A3	Sand & Gravel Extraction	
Nodel(s) 129936-028	Title Extraction Designs Phase 9	
f.	Drawing No.	
M	21-10_HAMBLE_PHASE 9.LSS	

Appendix C Site Restoration Plans



Woodland and forest	deciduous woodland (including retained woodland areas)	2.80				
Heathland and shrub	Mixed scrub	3.42				
Grassland	Other lowland acid grassland - south of site	22.80				
Grassland	Other lowland acid grassland - Enhancement to unworked margins	6.70	KEY:	APPLICATION BOUNDARY		PROPOSED DRAINAGE INFILTRATION ZONE (Trench backfilled with permeable material)
Grassland	Other lowland acid grassland - north of site	22.83		EXISTING VEGETATION		DENOTES GRASSLAND RETAINED AND MANAGED DURING THE OPERATIONAL PHASE; SOURCE FOR NATURAL RECOLONISATION OF ADJACENT GRASSLAND AREAS
Lakes	Temporary lakes, ponds and pools	0.75		PROPOSED CONTOURS m.A.O.D (1.0m INTERVALS)		FOOTPATH CORRIDOR - EXISTING AND NEW HEDGEROW WITH WILDFLOWER GROUND FLORA RETAINED AND EXTENDED BY NATURAL COLONISATION
Wetland	Fens (upland and lowland)	0.74		EXISTING Public Right of Way		LAND RESTORED TO GRASSLAND PADDOCK BY NATURAL COLONISATION FROM ADJACENT RETAINED GRASSLANDS OR SEEDING WITH AN APPROPRIATE MIX
Urban	Urban Tree	0.15			1	LAND RESTORED TO DRY ACID GRASSLAND BY NATURAL
1000		HABITAT POST RESTORATION		PROPOSED PERMISSIVE PATH - grassed surface		COLONISATION FROM ADJACENT RETAINED GRASSLANDS OR SPREADING GREEN HAY OR SEEDING WITH AN APPROPRIATE MIX
Lin de energe	New Native	(linear km)		DENOTES PLANTING WHICH CAN BE CARRIED OUT AS WORKS AT START OF OPERATIONAL PHASE		SPECIES RICH ACID GRASSLAND - PARKLAND For Community Access
Hedgerow	Species Rich Hedgerow	0.68	$\mathbf{\hat{v}}$	NEW NATIVE HEDGEROW (Hawthorn, Hazel, Blackthorn, Holly) Includes a proportion of Feathered trees to provide shade for grazing animals		SHALLOW POND (UP TO 1.5-2.0m) For surface water drainage - periodically dry. Marginal vegetation to
Hedgerow	Enhancement of Native Species Rich Hedgerow with trees	0.18		WOOD EDGE / DRY HEATH SHRUB SCRUB - Hawthorn, Blackthorn, Holly, Gorse, Broom; to deter access, to direct path users. Planted as small 10-100m ² clumps within designated areas to give an overall 50% cover		 establish by natural colonisation, seeding and plug planting FEN / MIRE ACROSS LOW LYING RESTORED AREAS (SEASONALLY WET, NATURAL COLONISATION eg: Sedges and Rushes)
Hedgerow	Enhancement of Native Species Rich Hedgerow with trees	0.55		WOOD AND WOOD EDGE - Oak, Rowan, Birch, Hawthorn; Planted as medium 100-1000m ² clumps within designated areas to give an overall 75% cover		 Microtopography - Localised Scrapes and Shallows +/- 0.3-1.0m to create additional habitat PROPOSED POST AND RAIL FENCING (For Main Field Areas) - Timber or Metail Estate Fencing; NB all planting and hedgerows to be timber post and stockproof wire fenced on the field side

Appendix D ReFH2 runoff calculations Catchment C1

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:32:11 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 36FD-1C7F

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.32 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3

Site description: None

Model run: 1 year

Summary of results

Rainfall - FEH 2013 model (mm):	22.29	Total runoff (ML):	0.82
Total Rainfall (mm):	21.60	Total flow (ML):	2.77
Peak Rainfall (mm):	1.48	Peak flow (m³/s):	0.06

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1.9 [1.68]	Yes
Up	0.65	No
Uk	0.8	No
Baseflow model parameters		
Name	Value	User-defined?
BF0 (m ³ /s)	0	No
BL (hr)	45.7 [44.18]	Yes
BR	2.4	No
Urbanisation parameters		
Name	Value	User-defined?
Urban area (km ²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:33:20 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 36FD-1C7F

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.32 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3 Site description: None

Model run: 30 year

Summary of results

Rainfall - FEH 2013 model (mm):	47.61	Total runoff (ML):	2.06
Total Rainfall (mm):	46.13	Total flow (ML):	7.00
Peak Rainfall (mm):	3.17	Peak flow (m³/s):	0.15

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1.9 [1.68]	Yes
Up	0.65	No
Uk	0.8	No
Baseflow model parameters		
Name	Value	User-defined?
BF0 (m³/s)	0	No
BL (hr)	45.7 [44.18]	Yes
BR	2.39	No
Urbanisation parameters		
Name	Value	User-defined?
Urban area (km²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

Page 2 of 37

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:34:06 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 36FD-1C7F

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.32 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3

Site description: None

Model run: 100 year

Summary of results

Rainfall - FEH 2013 model (mm):	58.59	Total runoff (ML):	2.71
Total Rainfall (mm):	56.78	Total flow (ML):	9.19
Peak Rainfall (mm):	3.90	Peak flow (m³/s):	0.19

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?		
Tp (hr)	1.9 [1.68]	Yes		
Up	0.65	No		
Uk	0.8	No		
Baseflow model parameters				
Name	Value	User-defined?		
BF0 (m³/s)	0	No		
BL (hr)	45.7 [44.18]	Yes		
BR	2.39	No		
Urbanisation parameters				
Name	Value	User-defined?		
Urban area (km²)	0	No		
Urbext 2000	0	No		
Impervious runoff factor	0.7	No		
Imperviousness factor	0.4	No		
Tp scaling factor	0.75	No		
Depression storage depth (mm)	0.5	No		
Exporting drained area (km ²)	0.00	Yes		
Sewer capacity (m ³ /s)	0.00	Yes		

Page 2 of 40

Catchment C2

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:41:26 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 24B8-BE94

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.28 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3

Site description: None

Model run: 1 year

Summary of results

Rainfall - FEH 2013 model (mm):	22.29	Total runoff (ML):	0.71
Total Rainfall (mm):	21.61	Total flow (ML):	2.40
Peak Rainfall (mm):	1.48	Peak flow (m³/s):	0.05

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1.9 [1.61]	Yes
Up	0.65	No
Uk	0.8	No
Baseflow model parameters		
Name	Value	User-defined?
BF0 (m ³ /s)	0	No
BL (hr)	45.68 [43.7]	Yes
BR	2.4	No
Urbanisation parameters		
Name	Value	User-defined?
Urban area (km ²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:40:56 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 24B8-BE94

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.28 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3 Site description: None

Model run: 30 year

Summary of results

Rainfall - FEH 2013 model (mm):	47.61	Total runoff (ML):	1.79
Total Rainfall (mm):	46.16	Total flow (ML):	6.06
Peak Rainfall (mm):	3.17	Peak flow (m³/s):	0.13

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1.9 [1.61]	Yes
Up	0.65	No
Uk	0.8	No
Baseflow model parameters		
Name	Value	User-defined?
BF0 (m³/s)	0	No
BL (hr)	45.68 [43.7]	Yes
BR	2.39	No
Urbanisation parameters		
Name	Value	User-defined?
Urban area (km²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

UK Design Flood Estimation

Generated on Friday, January 10, 2020 12:40:04 PM by hekelly Printed from the ReFH2 Flood Modelling software package, version 3.0.7257.30020

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

Checksum: 24B8-BE94

Site details Site name: FEH_Point_Descriptors_447816_107820 Easting: 447816 Northing: 107820 Country: England, Wales or Northern Ireland Catchment Area (km²): 0.28 [0.03]* Using plot scale calculations: Yes Model: ReFH2.3 Site description: None

Model run: 100 year

Summary of results

Rainfall - FEH 2013 model (mm):	58.59	Total runoff (ML):	2.35
Total Rainfall (mm):	56.82	Total flow (ML):	7.96
Peak Rainfall (mm):	3.90	Peak flow (m³/s):	0.17

Parameters

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

* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH 2013 model)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:05:00 [02:45:00]*	Yes
Timestep (hh:mm:ss)	00:05:00 [00:15:00]*	Yes
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	55.38	No
Cmax (mm)	564.32	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1.9 [1.61]	Yes
Up	0.65	No
Uk	0.8	No
Baseflow model parameters		
Name	Value	User-defined?
BF0 (m³/s)	0	No
BL (hr)	45.68 [43.7]	Yes
BR	2.39	No
Urbanisation parameters		
Name	Value	User-defined?
Urban area (km²)	0	No
Urbext 2000	0	No
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No
Exporting drained area (km ²)	0.00	Yes
Sewer capacity (m ³ /s)	0.00	Yes

Page 2 of 40

Catchment O1

Catchment O2

Appendix E MicroDrainage output Operational phase

- 1 1							Page 1
Dominion House						-	
Varrington							Sec. 1
							Mirco
Date 24/11/2021	1 08:29		Designed	d by hekel	lv		Micro
File Operationa			Checked		-1		Drainag
					20 1		
Innovyze			source (Control 20	20.1		
G			100	Determined	Dest	-1 (.100)	
Sun	mmary of Resul	ts ic	or 100 y	ear Return	1 Perio	od (+10%)	
	II.a.]	f Deci	m Time ·	1130 minutes	~		
	Hal	I Drai	n iime •	1130 minutes	j .		
	Storm	Max	Max	Max	Max	Status	
	Event	Level	. Depth I	nfiltration	Volume		
		(m)	(m)	(l/s)	(m³)		
	15 min Gummon	17 02	0 0 0 2 0	10 0	1707 5	0 7	
	15 min Summer 30 min Summer				1797.5 2078.6	ОК	
	60 min Summer				2381.4		
	120 min Summer				2780.1		
	180 min Summer				3054.6		
	240 min Summer	17.07	0 0.070	32.2	3271.1	O K	
	360 min Summer				3607.5		
	480 min Summer				3857.8		
	600 min Summer				4053.0	-	
	720 min Summer				4211.4		
	960 min Summer 1440 min Summer				4411.6 4569.5	ОК	
	2160 min Summer				4655.7		
	2880 min Summer				4685.8		
	4320 min Summer				4711.1		
	5760 min Summer	17.09	9 0.099	45.7	4632.1	ОК	
	7200 min Summer	17.09	7 0.097	45.0	4581.2	ΟK	
	8640 min Summer				4519.4		
	15 min Winter 30 min Winter				1934.3 2225.1		
	50 mill wincer	17.04	/ 0.01/	21.0	222J.I	0 K	
	Stor	rm	Rain	Flooded Ti			
	Sto: Eve			Flooded Tin Volume (
	_						
	Eve	nt	(mm/hr)	Volume ((m³)	mins)		
	Even 15 min	nt Summe:		Volume ((m³) 0.0			
	Even 15 min	nt Summe: Summe:	(mm/hr) r 184.560 r 105.022	Volume ((m ³) 0.0 0.0	mins) 266		
	Even 15 min 30 min	Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761	Volume ((m ³) 0.0 0.0 0.0	mins) 266 286		
	15 min 30 min 60 min 120 min 180 min	Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0	mins) 266 286 306 352 392		
	15 min 30 min 60 min 120 min 180 min 240 min	Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	mins) 266 286 306 352 392 432		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	mins) 266 286 306 352 392 432 514		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	mins) 266 286 306 352 392 432 514 596		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min	Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453 r 2.779 r 1.986	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188 3024		
	Even 15 min 30 min 60 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453 r 2.779 r 1.986 r 1.565	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188 3024 3864		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453 r 2.779 r 1.986 r 1.565 r 1.301	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188 3024 3864 4688		
	Even 15 min 30 min 60 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453 r 2.779 r 1.986 r 1.565 r 1.301 r 1.118	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188 3024 3864 4688 5536		
	Even 15 min 30 min 60 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min 15 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 184.560 r 105.022 r 59.761 r 34.006 r 24.453 r 19.351 r 13.915 r 11.011 r 9.184 r 7.918 r 6.371 r 4.690 r 3.453 r 2.779 r 1.986 r 1.565 r 1.301	Volume ((m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	mins) 266 286 306 352 392 432 514 596 686 768 962 1440 1812 2188 3024 3864 4688		

Stantec UK							Page 2
Dominion House							
Warrington							The second
							Mirco
Date 24/11/2021	08:29	I	Designed	d by hekel	ly		Micro
File Operational			Checked	-	1		Drainac
Innovyze	110011100			Control 20	20 1		
тшоууде		L	JOUICE	CONCLOSE ZO	20.1		
Camm	mary of Resul	ta fo	m 100 m	oor Doturr	Dorio	d (108)	
Sulli	lary of Resul	.15 10.	r too ye	ear Return	l Perio	a (+10%)	
	Storm	Max	Max	Max	Max	Status	
	Event			nfiltration		Status	
	2,010	(m)	(m)	(1/s)	(m ³)		
		()	()	(_/_/	()		
	60 min Winter				2556.7	ΟK	
	120 min Winter				3027.7	ΟK	
	180 min Winter				3344.0	ОК	
	240 min Winter				3601.0	ОК	
	360 min Winter				4016.1	ОК	
	480 min Winter 600 min Winter				4280.6	ОК	
	720 min Winter				4487.2 4655.4	ОК ОК	
	960 min Winter				4884.2	O K O K	
	440 min Winter				5085.3	ОК	
	160 min Winter				5132.0	ОК	
	880 min Winter				5122.1	ОК	
4	320 min Winter	17.106	0.106	49.1	5000.1	ОК	
5'	760 min Winter	17.102	0.102	47.1	4774.3	ОК	
7.	200 min Winter	17.098	0.098	45.2	4587.1	ОК	
8	640 min Winter	17.094	0.094	43.4	4405.5	O K	
	Sto: Eve		Rain (mm/hr)	Flooded Tin Volume (me-Peak mins)		
				(m ³)			
	60 min	Winter	59.761	0.0	280		
	60 min 120 min		59.761 34.006	0.0	280 336		
		Winter	34.006				
	120 min	Winter Winter	34.006 24.453	0.0	336		
	120 min 180 min	Winter Winter Winter	34.006 24.453 19.351	0.0	336 380		
	120 min 180 min 240 min 360 min 480 min	Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011	0.0 0.0 0.0 0.0 0.0	336 380 420 506 586		
	120 min 180 min 240 min 360 min 480 min 600 min	Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184	0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min	Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918	0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min	Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min	Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796		
	120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148		
	120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		
	120 min 180 min 240 min 360 min 480 min 720 min 720 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter Winter	34.006 24.453 19.351 13.915 11.011 9.184 7.918 6.371 4.690 3.453 2.779 1.986 1.565 1.301	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	336 380 420 506 586 674 754 952 1384 1796 2224 3148 4032 4904		

Stantec UK		Page 3
Dominion House		
Warrington		Micro
Date 24/11/2021 08:29	Designed by hekelly	
File Operational - Freshwate	Checked by	Drainage
Innovyze	Source Control 2020.1	-1
Ra	infall Details	
	-]	
Rainfall Mode Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 573600 157200 TQ 73600 57200	
C (lkr Dl (lkr		
D2 (1km		
D3 (1km		
E (1kr F (1kr		
F (IKT Summer Storn		
Winter Storm		
Cv (Summer		
Cv (Winter Shortest Storm (mins		
Longest Storm (mins		
Climate Change	8 +10	
Tin	ne Area Diagram	
Tota	al Area (ha) 4.690	
	ime (mins) Area om: To: (ha)	
	0 4 4.690	
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Stantec UK		Page 4
Dominion House		_
Warrington		Mirco
Date 24/11/2021 08:29	Designed by hekelly	Micro Drainage
File Operational - Freshwate	Checked by	Diamage
Innovyze	Source Control 2020.1	·
<u></u>	Model Details	
Storage is On	line Cover Level (m) 20.000	
Infiltra	tion Basin Structure	
Inver Infiltration Coefficient Infiltration Coefficient		
Depth (m) Are	ea (m²) Depth (m) Area (m²)	
0.000 4	46859.0 3.000 57065.0	

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Stantec UK							Page 1
Dominion Hou	ise						
Warrington							The second
							Micro
Date 24/11/2	2021 07:50		Designe	d by heke	llv		
	ional - Phase 4 v		Checked				Drainac
	Ional Fliase +				0.0.0 1		-
Innovyze			Source	Control 2	1020.l		
	Summary of Resul	lts fo	or 100 y	ear Retur	n Peric	od (+10%)	
	Hal	lf Drai	n Time :	719 minute	es.		
	Storm	Max	Max	Max	Max	Status	
	Event			infiltratio		Status	
	Livenc	(m)	(m)	(1/s)	(m ³)		
		(11)	(111)	(1)0)	()		
	15 min Summer	17.078	3 0.078	56.	9 3657.1	O K	
	30 min Summer			63.	8 4110.3	O K	
	60 min Summer				5 4592.3	O K	
	120 min Summer				4 5294.5	ОК	
	180 min Summer				1 5803.8		
	240 min Summer				3 6202.7	ОК	
	360 min Summer				8 6805.7		
	480 min Summer				4 7232.5	ОК	
	600 min Summer				2 7551.7		
	720 min Summer				8 7791.6	ОК	
	960 min Summer				4 8203.8	ОК	
	1440 min Summer				0 8622.8	ОК	
	2160 min Summer				9 8746.5	ОК	
	2880 min Summer				4 8927.2	ОК	
	4320 min Summer 5760 min Summer				6 8810.9 1 8899.4	ОК	
	7200 min Summer				0 8640.9		
	8640 min Summer				0 8368.8	0 K	
	15 min Winter				5 3366.0		
	30 min Winter				8 3852.8		
	Stor	~m	Rain	Flooded T	imo-Boak		
	Sto: Eve			Volume	(mins)		
	210.		((m ³)	(11110)		
			113.582		203		
		Summer			210		
		Summer			228		
	120 min				266		
	180 min				308		
	240 min 360 min				354		
	360 min 480 min				452 556		
	480 min 600 min				664		
					776		
		Summer			990		
	720 min		6 1 9 3				
	720 min 960 min	Summer					
	720 min 960 min 1440 min	Summer Summer	4.467	0.0	1440		
	720 min 960 min 1440 min 2160 min	Summer Summer Summer	4.467 3.222	0.0	1440 1788		
	720 min 960 min 1440 min 2160 min 2880 min	Summer Summer Summer	4.467 3.222 2.556	0.0 0.0 0.0	1440 1788 2164		
	720 min 960 min 1440 min 2160 min	Summer Summer Summer Summer	4.467 3.222 2.556 1.903	0.0 0.0 0.0 0.0	1440 1788 2164 2972		
	720 min 960 min 1440 min 2160 min 2880 min 4320 min	Summer Summer Summer Summer Summer	4.467 3.222 2.556 1.903 1.543	0.0 0.0 0.0 0.0 0.0	1440 1788 2164		
	720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min	Summer Summer Summer Summer Summer Summer	4.467 3.222 2.556 1.903 1.543 1.312	0.0 0.0 0.0 0.0 0.0 0.0	1440 1788 2164 2972 3792		
	720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	Summer Summer Summer Summer Summer Summer	4.467 3.222 2.556 1.903 1.543 1.312	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1440 1788 2164 2972 3792 4608		
	720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	Summer Summer Summer Summer Summer Summer Summer	4.467 3.222 2.556 1.903 1.543 1.312 1.149 113.582	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1440 1788 2164 2972 3792 4608 5416		

Stantec UK								Page 2
Dominion H	louse							
Varringtor	1							100
								Micro
Date 24/11	/2021 07:50		I	Designe	d by hekel	ly		Draina
File Opera	tional - Phas	se 4 v	0	Checked	by			Dialitia
Innovyze			C.	Source	Control 20	20.1		
	Summary of	Result	s fo	r 100 y	ear Return	n Peric	od (+10%)	
	Storr Event		Max Level	Max Depth I	Max infiltration	Max	Status	
		-	(m)	(m)	(1/s)	(m ³)		
				0 005	60 0			
	60 min V 120 min V					4443.1 5522.0	ОК	
	120 min V 180 min V					6213.9	-	
	240 min V					6786.2	ОК	
	360 min V	Vinter 1	17.164	0.164	119.7	7719.1	ОК	
	480 min V	Vinter 2	17.174	0.174	127.1	8178.5	O K	
	600 min V					8518.9	O K	
	720 min V					8773.7	O K	
	960 min V					9175.8	O K	
	1440 min V 2160 min V					9548.6 9490.7	<mark>ок</mark> ок	
	2880 min V					9454.4	0 K	
	4320 min V					8921.0	ОК	
	5760 min W	Vinter 2	17.183	0.183	133.7	8617.4	ОК	
	7200 min V	Vinter 2	17.172	0.172	125.2	8056.3	O K	
	8640 min W	Vinter 1	17.161	0.161	117.2	7550.7	ОК	
		Stori Event		Rain (mm/hr)		me-Peak mins)		
					(m ³)			
				43.543		226		
		20 min V				266		
		30 min 1 10 min 1				306		
		40 min ¥ 50 min ¥				352 446		
		30 min V 30 min V				544		
)0 min V				648		
		20 min V				752		
		50 min V				960		
		40 min V				1372		
		50 min ¥ 30 min ¥				1728 2180		
		20 min V 20 min V				3068		
						3928		
		50 min 🏻	ATHCET					
	57	50 min V 00 min V		1.312	0.0	4760		
	57) 72)		√inter			4760 5600		
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Stantec UK		Page 3
Dominion House		
Warrington		Sec. 1
		Micro
Date 24/11/2021 07:50	Designed by hekelly	
File Operational - Phase 4 v	Checked by	Drainage
Innovyze	Source Control 2020.1	
Ra	linfall Details	
Rainfall Mod	el FEH	
Return Period (year		
FEH Rainfall Versi		
Site Locati C (1kı	on GB 447250 107950 SU 47250 07950 m) -0.026	
D1 (1ki		
D2 (1kr		
D3 (1ki		
E (1kı F (1kı		
Summer Store		
Winter Stor	ms Yes	
Cv (Summe		
Cv (Winte: Shortest Storm (min.		
Longest Storm (min		
Climate Change	8 +10	
Tir	me Area Diagram	
	al Area (ha) 4.650	
	ime (mins) Area	
	rom: To: (ha)	
	0 4 4.650	
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Stantec UK		Page 4
Dominion House		
Warrington		Mirco
Date 24/11/2021 07:50	Designed by hekelly	Micro Drainage
File Operational - Phase 4 v	Checked by	Diamage
Innovyze	Source Control 2020.1	
<u>n</u>	Model Details	
Storage is On	line Cover Level (m) 20.000	
Infiltra	tion Basin Structure	
Inver Infiltration Coefficient Infiltration Coefficient		
Depth (m) Are	ea (m²) Depth (m) Area (m²)	
0.000 4	46515.0 3.000 63314.0	
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Restored phase

							Page 1
Dominion House							
Warrington							Sec. 1
							Mirco
Date 08/09/2021	08:56		Designe	d by hekel	lv		Micro
File Restored -			Checked				Drainac
	III. SRCA			-	00.1		
Innovyze			Source	Control 20)20.1		
Sum	mary of Resul	lts fo	or 100 y	year Returi	n Peric	od (+40%)	-
	Ha	alf Dra	ain Time	: 6 minutes.			
	Storm	Max	Max	Max	Max	Status	
	Event			Infiltration		beacab	
		(m)	(m)	(1/s)	(m ³)		
		()	()	(_/_/	()		
	15 min Summer			19.7		ΟK	
	30 min Summer			23.3		O K	
	60 min Summer			24.5			
	120 min Summer			27.8			
	180 min Summer 240 min Summer			29.4		ОК	
	360 min Summer			30.2 30.9			
	480 min Summer			30.9			
	600 min Summer			31.2			
	720 min Summer			31.0			
	960 min Summer			28.9			
-	1440 min Summer			25.6			
;	2160 min Summer	20.56	2 0.862	22.4	11.1	ОК	
:	2880 min Summer	20.49	3 0.793	19.9	9.4	O K	
	4320 min Summer			17.5		ΟK	
	5760 min Summer			15.5			
	7200 min Summer			14.4		ОК	
2	8640 min Summer 15 min Winter			13.6 18.0			
	30 min Winter			21.0			
	Sto	rm	Rain	Flooded Ti	me-Peak		
			/ /1				
	Eve	nt	(mm/nr) Volume	(mins)		
	Eve	nt	(mm/nr) Volume (m³)	(mins)		
				(m³)			
	15 min	Summer	r 144.558	(m³) 8 0.0	122		
		Summer	r 144.558 r 89.500	(m³) 8 0.0 6 0.0	122 133		
	15 min 30 min	Summer Summer Summer	r 144.558 r 89.500 r 55.419	(m³) 8 0.0 6 0.0 9 0.0	122		
	15 min 30 min 60 min	Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.313	(m ³) 8 0.0 6 0.0 9 0.0 3 0.0	122 133 150		
	15 min 30 min 60 min 120 min	Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.313 r 25.923	(m ³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0	122 133 150 182		
	15 min 30 min 60 min 120 min 180 min	Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.313 r 25.923 r 21.246	(m ³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 5 0.0	122 133 150 182 214		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 0 0.0	122 133 150 182 214 248 314 380		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 3 0.0 5 0.0 3 0.0	122 133 150 182 214 248 314 380 446		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min	Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 3 0.0 5 0.0 3 0.0 5 0.0 3 0.0 5 0.0 3 0.0	122 133 150 182 214 248 314 380 446 512		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938 r 7.882	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 3 0.0 5 0.0 3 0.0 5 0.0 3 0.0 2 0.0	122 133 150 182 214 248 314 380 446 512 642		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938 r 7.882 r 5.680	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 3 0.0 5 0.0 3 0.0 5 0.0 5 0.0 5 0.0 6 0.0 5 0.0 6 0.0 7 0.0 8 0.0 9	122 133 150 182 214 248 314 380 446 512 642 898		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938 r 7.882 r 5.680 r 4.101	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 3 0.0 5 0.0 3 0.0 5 0.0 5 0.0 3 0.0 5 0.0 1 0.0	122 133 150 182 214 248 314 380 446 512 642 898 1280		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938 r 7.882 r 5.680 r 4.100 r 3.251	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 3 0.0 8 0.0 2 0.0 6 0.0 1 0.0 3 0.0	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.31 r 25.923 r 21.240 r 16.050 r 13.159 r 11.273 r 9.938 r 7.883 r 5.680 r 4.100 r 3.253 r 2.422	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 8 0.0 8 0.0 2 0.0 6 0.0 1 0.0 3 0.0 2 0.0 2 0.0	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652 2408		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.311 r 25.921 r 21.240 r 16.050 r 13.159 r 11.271 r 9.938 r 7.882 r 5.680 r 4.100 r 3.251 r 2.422 r 1.964	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 5 0.0 8 0.0 2 0.0 5 0.0 1 0.0 3 0.0 4 0.0	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652 2408 3160		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.31; r 25.92; r 21.240 r 16.050 r 13.159 r 11.27; r 9.938 r 7.88; r 5.680 r 4.100; r 3.25; r 2.42; r 1.964 r 1.670	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 5 0.0 6 0.0 5 0.0 6 0.0 5 0.0 1 0.0 5 0.0 6 0.0 1 0.0 2 0.0 4 0.0 0 .0 0 .0 1 0.0 3 0.0 0 .0 0	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652 2408		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.31 r 25.923 r 21.240 r 16.050 r 13.159 r 11.273 r 9.938 r 7.883 r 5.680 r 4.100 r 3.255 r 2.422 r 1.964 r 1.670	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 5 0.0 8 0.0 2 0.0 5 0.0 1 0.0 3 0.0 2 0.0 4 0.0 3 0.0 3 0.0 3 0.0 3 0.0 3 0.0 4 0.0 3 0.0 5	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652 2408 3160 3912		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	r 144.558 r 89.500 r 55.419 r 34.31; r 25.92; r 21.240 r 16.050 r 13.159 r 11.27; r 9.938 r 7.88; r 5.680 r 4.100; r 3.25; r 2.42; r 1.964 r 1.670 r 1.46; r 144.558	(m ³) 8 0.0 9 0.0 3 0.0 3 0.0 5 0.0 5 0.0 5 0.0 5 0.0 8 0.0 2 0.0 6 0.0 1 0.0 3 0.0 2 0.0 4 0.0 3 0.0 5	122 133 150 182 214 248 314 380 446 512 642 898 1280 1652 2408 3160 3912 4608		

e - IT1.SRCX mmary of Res Storm Event	sults f Max	Checked Source	Control 20			Micro Drainag
- IT1.SRCX mmary of Res Storm		Checked Source	l by Control 20			Micro Drainag
- IT1.SRCX mmary of Res Storm		Checked Source	l by Control 20			
mmary of Res Storm		Source	Control 20	20.1		Digiliar
Storm				20.1		
Storm		or 100 y	rear Return			
Storm		or 100 y	vear Return			
	Max			1 Perio	d (+40%)	
	han	Max	Max	Max	Status	
	Leve		Infiltration		beacab	
	(m)	(m)	(1/s)	(m³)		
CO min Mint	20 F(22 F	11 0	0.17	
60 min Wint 120 min Wint			22.5 27.2		ОК ОК	
180 min Wint			27.2		ОК	
			30.9		ОК	
360 min Wint	er 20.80)7 1.107	32.6	18.4	ОК	
			31.9		O K	
			31.1		ОК	
			19.0		ОК	
2880 min Wint	er 20.39	92 0.692	16.4	7.2	ОК	
			13.8		O K	
					ОК	
		Rain				
E	vent	(mm/nr)		mins)		
			(==)			
				150		
				324		
				390		
600 m	nin Winte	er 11.273		460		
				528		
				1728		
				2532		
			4 0.0	3336		
				4160		
8640 m	un Winte	er 1.463	3 0.0	4944		
	360 min Wint 480 min Wint 600 min Wint 720 min Wint 960 min Wint 1440 min Wint 2160 min Wint 2880 min Wint 4320 min Wint 5760 min Wint 5760 min Wint 8640 mi	360 min Winter 20.80 480 min Winter 20.75 600 min Winter 20.75 960 min Winter 20.75 960 min Winter 20.68 1440 min Winter 20.68 1440 min Winter 20.35 2160 min Winter 20.35 4320 min Winter 20.35 7200 min Winter 20.25 7200 min Winter 20.25 7200 min Winter 20.15 8640	Event (mm/hr) 60 min Winter 55.419 120 min Winter 34.313 180 min Winter 25.923 240 min Winter 21.246 360 min Winter 16.050 480 min Winter 13.155 600 min Winter 11.273 720 min Winter 9.938 960 min Winter 7.882 1440 min Winter 5.686 2160 min Winter 3.253 4320 min Winter 2.422 5760 min Winter 1.964 7200 min Winter 1.964 7200 min Winter 1.964	360 min Winter 20.807 1.107 32.6 480 min Winter 20.793 1.093 31.9 600 min Winter 20.773 1.073 31.1 720 min Winter 20.753 1.053 30.2 960 min Winter 20.685 0.985 27.3 1440 min Winter 20.580 0.880 23.1 2160 min Winter 20.392 0.692 16.4 4320 min Winter 20.313 0.613 13.8 5760 min Winter 20.254 0.554 12.0 7200 min Winter 20.219 0.519 11.0 8640 min Winter 20.191 0.491 10.2 Storm Rain Flooded Tim (mm/hr) Volume (m³) 60 min Winter 34.313 0.0 120 min Winter 34.313 0.0 120 min Winter 12.246 0.0 180 min Winter 13.155 0.0 240 min Winter 13.155 0.0 480 min Winter 13.273 0.0 700 min Winter 12.273 0.0 700 min Winter 7.882 0.0	360 min Winter 20.807 1.107 32.6 18.4 480 min Winter 20.793 1.093 31.9 17.9 600 min Winter 20.773 1.073 31.1 17.3 720 min Winter 20.753 1.053 30.2 16.6 960 min Winter 20.685 0.985 27.3 14.5 1440 min Winter 20.692 16.4 7.2 4320 min Winter 20.392 0.692 16.4 7.2 4320 min Winter 20.313 0.613 13.8 5.6 5760 min Winter 20.219 0.519 11.0 4.0 8640 min Winter 20.191 0.491 10.2 3.6 60 min Winter 55.419 0.0 150 120 min Winter 34.313 0.0 184 180 min Winter 25.923 0.0 218 240 min Winter 13.155 0.0 390 600 min Winter 13.155 0.0 390 600 min Winter 13.155 0.0 390 600 min Winter 12.273 <td< td=""><td>360 min Winter 20.807 1.107 32.6 18.4 O K 480 min Winter 20.773 1.073 31.9 17.9 O K 600 min Winter 20.773 1.073 31.1 17.3 O K 720 min Winter 20.753 1.053 30.2 16.6 O K 960 min Winter 20.685 0.985 27.3 14.5 O K 1440 min Winter 20.470 0.770 19.0 8.9 O K 280 min Winter 20.392 0.692 16.4 7.2 O K 4320 min Winter 20.254 0.554 12.0 4.6 O K 7200 min Winter 20.219 0.519 11.0 4.0 O K 8640 min Winter 20.219 0.519 11.0 4.0 O K 8640 min Winter 20.191 0.491 10.2 3.6 O K 120 min Winter 20.191 0.491 10.2 3.6 O K 8640 min Winter 20.191 0.491 10.2 3.6 O K 120 min Winter 16.050 0.0 150 120 120 1431 0.0 184 180 min Winter 13.155 0.0 390 390 390 60</td></td<>	360 min Winter 20.807 1.107 32.6 18.4 O K 480 min Winter 20.773 1.073 31.9 17.9 O K 600 min Winter 20.773 1.073 31.1 17.3 O K 720 min Winter 20.753 1.053 30.2 16.6 O K 960 min Winter 20.685 0.985 27.3 14.5 O K 1440 min Winter 20.470 0.770 19.0 8.9 O K 280 min Winter 20.392 0.692 16.4 7.2 O K 4320 min Winter 20.254 0.554 12.0 4.6 O K 7200 min Winter 20.219 0.519 11.0 4.0 O K 8640 min Winter 20.219 0.519 11.0 4.0 O K 8640 min Winter 20.191 0.491 10.2 3.6 O K 120 min Winter 20.191 0.491 10.2 3.6 O K 8640 min Winter 20.191 0.491 10.2 3.6 O K 120 min Winter 16.050 0.0 150 120 120 1431 0.0 184 180 min Winter 13.155 0.0 390 390 390 60

Stantec UK		Page 3
Dominion House		
Warrington		Micro
Date 08/09/2021 08:56	Designed by hekelly	Drainage
File Restored - IT1.SRCX	Checked by	Diamage
Innovyze	Source Control 2020.1	
Ra	infall Details	
Rainfall Mode	el FEH	
Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950 m) -0.026	
C (1kı D1 (1kı	,	
D2 (1kr		
D3 (1km		
E (1kı F (1kı		
Summer Store	,	
Winter Store		
Cv (Summe: Cv (Winte:		
Shortest Storm (min		
Longest Storm (min		
Climate Change	8 +40	
~1.0		
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Stantec UK			Page 4
Dominion House Warrington			Mirco
Date 08/09/2021 08:56	Designed b	y hekelly	Dcainago
File Restored - IT1.SRCX	Checked by		Drainage
Innovyze	Source Con	trol 2020.1	
- Storage is On	Model Detai line Cover Le	evel (m) 21.700	
Infiltration Coefficient Base (m			
Infiltration Coefficient Side (m	n/hr) 1.00000 actor 2.0	5	
	osity 0.30	_	
	-	Cap Infiltration Depth (m	

Stantec UK								Page 1
Dominion House	_			_		_		
Warrington								and the second
								Mirco
Date 08/09/2021 0	8:50		Des	ianed	by hek	ellv		- Micro
File Cascade - Por		+ o TTP 2		cked k	-	.crry		Draina
		112.			-	2020	1	
Innovyze			Sou	rce Co	ontrol	2020	• 1	
			_			_	_	
Cascad	le Sum	mary of	Result	ts for	Resto	red -	- Pond 1.SF	RCX
	Upstr		Outflow	ТО	0 ⁻	verflo	w To	
5	Struct	ires						
	(N	one) Rest	ored - ·	TT2.SRC	X Resto	red -	IT2.SRCX	
	(10		orea .	112.010	n nebeo.	Lea	112.0100	
	St	orm	Max	Max	Max	Max	Status	
	Ev	vent	Level	Depth	Control	Volur	ne	
			(m)	(m)	(l/s)	(m³))	
	1 -	- C	10 000	0 000		1 2 6 6	0 0	
		n Summer				1390		
		ln Summer In Summer			98.8 116.5	1655		
		in Summer In Summer			123.7		-	
		in Summer			123.7			
		in Summer			124.9			
		ln Summer			125.0			
		n Summer			125.0			
	600 mi	ln Summer	18.012	1.012	125.0	5420	.5 ОК	
	720 mi	In Summer	18.079	1.079	125.0	5834	. 3 ОК	
	960 mi	ln Summer	18.104	1.104	125.0	5989	.4 ОК	
		n Summer			125.0			
		ln Summer			125.0			
		n Summer			125.0			
		ln Summer In Summer			125.0 125.0			
		in Summer			125.0			
		in Summer			125.0			
	St	orm	Rain			arge	Time-Peak	
	Ev	ent	(mm/hr)				(mins)	
				(m³)	(m	3)		
	15 mi	n Summer	144.558	Ο	.0 26	99.4	264	
		n Summer	89.506			55.0	266	
		n Summer	55.419			90.7	282	
		n Summer	34.313			97.6	344	
		n Summer	25.923		.0 72	205.4	396	
		n Summer	21.246			070.8	444	
		n Summer	16.050			52.0	538	
		n Summer	13.155			59.6	634	
		n Summer	11.273			11.9	738	
	/20 mi	n Summer	9.938			46.1	842	
	060 '		7.882			575.3 573.7	1062 1476	
	960 mi 440 mi		5 606	0	.0 140	1.2.1		
1	440 mi	n Summer	5.686 4.101		0 194	03 4	IXXN	
1	440 mi 160 mi	n Summer n Summer	4.101	0.		03.4	1880 2284	
1 2 2	440 mi 160 mi 880 mi	n Summer n Summer n Summer	4.101 3.253	0 . 0 .	.0 209	08.7	2284	
1 2 2 4	440 mi 160 mi 880 mi 320 mi	n Summer n Summer n Summer n Summer	4.101	0 . 0 . 0 .	.0 209 .0 240			
1 2 2 4 5	440 mi 160 mi 880 mi 320 mi 760 mi	n Summer n Summer n Summer	4.101 3.253 2.422	0 . 0 . 0 . 0 .	.0 209 .0 240 .0 291	08.7 65.9	2284 3148	
1 2 2 4 5 7	440 mi 160 mi 880 mi 320 mi 760 mi 200 mi	n Summer n Summer n Summer n Summer n Summer	4.101 3.253 2.422 1.964	0 . 0 . 0 . 0 .	.0 209 .0 240 .0 291 .0 321	08.7 65.9 97.6	2284 3148 4024	
1 2 2 4 5 7	440 mi 160 mi 880 mi 320 mi 760 mi 200 mi	n Summer n Summer n Summer n Summer n Summer	4.101 3.253 2.422 1.964 1.670	0 . 0 . 0 . 0 .	.0 209 .0 240 .0 291 .0 321	008.7 065.9 .97.6 .83.8	2284 3148 4024 4888	

Stantec UK						Page 2
ominion House						
arrington						100 M
						Micro
ate 08/09/2021 08	:50	Des	igned b	y hekelly		
File Cascade - Pon	d 1 to IT2	Che	cked by			Draina
Innovyze		Sou	rce Con	trol 2020	.1	
Cascade	e Summary o	f Result	ts for 1	Restored	- Pond 1.9	SRCX
	Storm	Max	Max	Max Max		
	Event	Level (m)		ontrol Volu (l/s) (m³		
		(111)	(11)	(1/6) (m	,	
	15 min Winte			71.4 1321		
	30 min Winte 60 min Winte			90.5 1554 111.1 1824		
3	20 min Winte			124.1 2604		
	180 min Winte			125.0 3266		
	240 min Winte			125.0 3883		
	360 min Winte			125.0 5021		
	180 min Winte 500 min Winte			125.0 5632 125.0 6087		
	720 min Winte			125.0 6453		
	960 min Winte			125.0 6593		
14	140 min Winte	r 18.196	1.196	125.0 6573	.4 ОК	
	160 min Winte			125.0 6166		
	380 min Winte 320 min Winte			125.0 5635 125.0 4901		
	760 min Winte			125.0 4901		
	200 min Winte			125.0 3104		
86	540 min Winte	r 17.515	0.515	124.0 2569	.6 ОК	
	Storm Event	Rain (mm/hr)	Volume	Discharge Volume	Time-Peak (mins)	
	Event	(mm/hr)	Volume (m³)	-		
	Event 15 min Winter	(mm/hr)	Volume (m³) 0.0	Volume (m ³) 2652.4	(mins) 270	
	Event 15 min Winter 30 min Winter	(mm/hr) 144.558 89.506	Volume (m ³) 0.0 0.0	Volume (m ³) 2652.4 3232.2	(mins) 270 270	
	Event 15 min Winter	(mm/hr) 144.558 89.506 55.419	Volume (m ³) 0.0 0.0 0.0	Volume (m ³) 2652.4 3232.2 4893.7	(mins) 270 270 282	
1	Event 15 min Winter 30 min Winter 60 min Winter	(mm/hr) 144.558 89.506 55.419 34.313	Volume (m ³) 0.0 0.0 0.0 0.0	Volume (m ³) 2652.4 3232.2 4893.7 6637.8	(mins) 270 270	
1 1 2	Event 15 min Winter 30 min Winter 60 min Winter 20 min Winter 80 min Winter 40 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246	Volume (m ³) 0.0 0.0 0.0 0.0 0.0	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3	(mins) 270 270 282 346	
1 1 2 3	Event 15 min Winter 30 min Winter 20 min Winter 80 min Winter 40 min Winter 60 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8	(mins) 270 282 346 400 450 552	
1 1 2 3 4	Event 15 min Winter 30 min Winter 60 min Winter 20 min Winter 80 min Winter 40 min Winter 60 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9	(mins) 270 282 346 400 450 552 644	
1 1 2 3 4 6	Event 15 min Winter 30 min Winter 60 min Winter 20 min Winter 80 min Winter 40 min Winter 60 min Winter 80 min Winter 80 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0	(mins) 270 282 346 400 450 552 644 738	
1 1 2 3 4 6 7	Event 15 min Winter 30 min Winter 60 min Winter 20 min Winter 80 min Winter 40 min Winter 60 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3	(mins) 270 282 346 400 450 552 644	
1 1 2 3 4 6 7 9 14	Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter 50 min Winter 20 min Winter 50 min Winter 50 min Winter 50 min Winter 50 min Winter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4	(mins) 270 282 346 400 450 552 644 738 838 1046 1460	
1 1 2 3 4 6 7 9 14 14 21	Event 15 min Winter 30 min Winter 30 min Winter 20 min Winter 30 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900	
1 1 2 3 4 6 7 9 14 14 21 28	Event 15 min Winter 30 min Winter 30 min Winter 20 min Winter 30 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356	
1 1 2 3 4 6 7 9 14 21 28 43	Event 15 min Winter 30 min Winter 30 min Winter 20 min Winter 30 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 2.422	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264	
1 1 2 3 4 6 7 9 14 21 28 43 57	Event 15 min Winter 30 min Winter 30 min Winter 20 min Winter 30 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	
1 1 2 3 4 4 6 7 9 14 21 28 43 57 72	Event Event 15 min Winter 30 min Winter 20 min Winter 20 min Winter 40 min Winter 50 min Winter	(mm/hr) (mm/hr) (mm/hr) (144.558 89.506 55.419 34.313 25.923 (21.246 16.050 13.155 (11.273 9.938 7.882 5.686 4.101 3.253 (2.422 1.964 1.670	Volume (m ³) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³) 2652.4 3232.2 4893.7 6637.8 7869.3 8976.6 10974.8 12173.9 13209.0 14124.3 15015.6 16105.4 21027.2 22337.2 24993.1 29480.1 31927.6 33970.1	(mins) 270 270 282 346 400 450 552 644 738 838 1046 1460 1900 2356 3264 4032 4800	

Stantec UK		Page 3
Dominion House		
Warrington		The second
		Micro
Date 08/09/2021 08:50	Designed by hekelly	Drainage
File Cascade - Pond 1 to IT2	Checked by	brainage
Innovyze	Source Control 2020.1	
Connodo Dointall Dat	the few performed pand 1 apar	
Cascade Rainiali Det	cails for Restored - Pond 1.SRCX	
Rainfall Mode	el FEH	
Return Period (years		
FEH Rainfall Versio	on	
C (1kr		
D1 (1kr		
D2 (1kr D3 (1kr		
E (1kr		
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Summer Storr Winter Storr		
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Shortest Storm (mins Longest Storm (mins		
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	0.0000 7	
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Stantec UK												Page	e 4
Dominion House													
Warrington												1	4
												Mid	T(I)
Date 08/09/202	1 08:5	0			Desig	ned by	y he	ekell	У				inage
File Cascade -	Pond	1 to 2	ΙТ2.		Check	ed by						DIC	maye
Innovyze					Sourc	e Cont	trol	202	0.1				
	~ 1					_		-	- 1	1			
0	Cascad	e Mode	et D	Detai	ls io	r Res	tore	ed -	Pond	1.SRC	X		
		Stora	ge i	s Onl	ine Co	ver Le	vel	(m) 1	8.500				
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			1	Inver	t Level	L (m) 1	L7.00	00					
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		sign He											1.200
	Desig	yn Flow Flus										Colar	125.0
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Minimum Outlet Suggested Ma	-				to Spo	aifia	Dogi	an (C	ontoat	Uudro	Tnt	ornoti	450
Suggested Ma	iniore i			l Poi	_			-	om (1/s	-	IIIC	ernaer	.01141 /
	-												
	D	esign F	oint		lculate lush-Fl	,	1.20		124. 125.				
					lush-Fl (ick-Fl		0.98		113.				
	М	ean Flo	vo wo				0.20	-	97.				
The hydrologica	al calcu	ulation	s ha	ive be	en bas	ed on	the	Head/I	Discha	rge re	lati	onship	for the
Hydro-Brake® Op Hydro-Brake Opt		-					-	-					
invalidated	. intante i	Je utii	TPEO	t chen	LIESE	Stora	ge I	oucing	y carc	uiació	.15 W.		
Depth (m) Flow	/(1/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)
0.100	11.5		200		124.9		.000		195.3		.000		296.0
0.200	41.6		400		134.7		.500		210.6		.500		306.2
0.300 0.400	81.9 119.8		600 800		143.7 152.2		.000		224.9 238.3		.000		316.0 325.6
0.400	123.7		000		160.2		.000		250.9		.000		334.9
0.600	125.0		200		167.9		.500		262.9		.500		343.9
0.800	122.4		400		175.1		.000		274.4				51515
1.000	114.3		600		182.1		.500		285.4				
				©198'	2-2020) Innc	\\/\/	e					
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Stantec UK							Page 1
Dominion House							
Warrington							The second
							Micro
Date 08/09/2021 08:4				v hekelly	Y		Drainage
File Cascade - Pond	1 to 112		ked by	1 000	0 1		
Innovyze		Sour	ce Cont	rol 2020	0.1		
Cascade	e Summary o	f Resul	lts for	Restore	d - IT2	SRCX	
		11004	200 202	11000010	<u>a 111</u>		
	Upstre		Outflo	w To Over	flow To		
	Structu	res					
F	Restored - Po	nd 1.SRC	X (N	one)	(None)		
	Half	Drain T	ime : 9 r	minutes.			
Storm	Max Max	Ма	ıx	Max	Max	Max	Status
Event	Level Depth						
	(m) (m)	(1/	S)	(l/s)	(l/s)	(m³)	
15 min Summer			76.7	0.0	76.7	57.7	ОК
30 min Summer			98.2	0.0	98.2	80.9	ОК
60 min Summer 120 min Summer			116.0 123.7	0.0	116.0	99.9 108.1	ОК
180 min Summer			123.7	0.0	123.7 124.9	108.1	ок ок
240 min Summer			124.9	0.0	124.9	109.5	0 K
360 min Summer			124.9	0.0	124.9	109.5	ОК
480 min Summer			124.9	0.0	124.9	109.5	ОК
600 min Summer	17.595 2.29	5	124.9	0.0	124.9	109.5	ОК
720 min Summer	17.595 2.29	5	124.9	0.0	124.9	109.5	ОК
960 min Summer			124.9	0.0	124.9	109.5	ОК
1440 min Summer			124.9	0.0	124.9	109.5	ОК
2160 min Summer 2880 min Summer			124.9 124.9	0.0	124.9 124.9	109.5 109.5	0 K 0 K
4320 min Summer			124.9	0.0	124.9	109.5	0 K
5760 min Summer			125.0	0.0	125.0	109.5	ОК
7200 min Summer	17.596 2.290	5	125.0	0.0	125.0	109.5	ОК
	Storm	Rain		Overflow		k	
	Event	(mm/hr)	Volume (m³)	Volume (m³)	(mins)		
1	5 min Summer	144 550	0.0	0.0	28	4	
	0 min Summer	89.506	0.0	0.0	28		
	0 min Summer	55.419	0.0	0.0	30		
	0 min Summer	34.313		0.0	36		
18	0 min Summer	25.923	0.0	0.0	40	б	
	0 min Summer	21.246		0.0	58		
	0 min Summer	16.050		0.0	85		
	0 min Summer 0 min Summer	13.155	0.0	0.0	110		
	0 min Summer 0 min Summer	11.273 9.938		0.0	134 156		
	0 min Summer	7.882		0.0	182		
	0 min Summer	5.686		0.0	226		
	0 min Summer	4.101	0.0	0.0	289		
288	0 min Summer	3.253	0.0	0.0	344	0	
	0 min Summer	2.422		0.0	458		
		1.964	0.0	0.0	534	4	
576	0 min Summer					c	
576	0 min Summer 0 min Summer	1.670	0.0	0.0	613	6	
576						6	

Dominion House							Page 2	
larrington							1000	
							Micro	
Date 08/09/2021 08:	48	Desi	.gned b	y hekelly	Y			
File Cascade - Pond	1 to IT2.	. Chec	ked by				Draina	y
Innovyze		Sour	ce Con	trol 2020	0.1			
Cascad	e Summary c	of Resul	lts for	Restore	d - IT2	.SRCX		
Storm	Max Max	Ma		Max	Max	Max	Status	
Event	Level Dept							
	(m) (m)	(1/	s)	(l/s)	(1/s)	(m³)		
8640 min Summer	17.596 2.29	5	125.0	0.0	125.0	109.5	O K	
15 min Winter			71.0	0.0	71.0	51.6	ΟK	
30 min Winter			90.1	0.0	90.1	72.1	ОК	
60 min Winter 120 min Winter			110.6 124.1	0.0	110.6 124.1	94.1 108.6	ок ок	
120 min Winter 180 min Winter			124.1	0.0	124.1	108.6	0 K 0 K	
240 min Winter			124.9	0.0	123.0	109.5	ОК	
360 min Winter			124.9	0.0	124.9	109.5	O K	
480 min Winter	17.595 2.29	5	124.9	0.0	124.9	109.5	O K	
600 min Winter			124.9	0.0	124.9	109.5	O K	
720 min Winter			124.9	0.0	124.9	109.5	ОК	
960 min Winter			124.9	0.0	124.9	109.5	ОК	
1440 min Winter 2160 min Winter			124.9 124.9	0.0	124.9 124.9	109.5 109.5	ок ок	
2880 min Winter			124.9	0.0	124.9	109.5	ОК	
4320 min Winter			125.0	0.0	125.0	109.5	O K	
5760 min Winter	17.596 2.29	5	125.0	0.0	125.0	109.5	ОК	
7200 min Winter	17.596 2.29	5	125.0	0.0	125.0	109.6	ОК	
8640 min Winter	17.575 2.27	5	124.0	0.0	124.0	108.5	O K	
	Storm	Rain		Overflow		k		
	Event	(mm/hr)	Volume (m³)	Volume (m³)	(mins)			
			(m ³ )	(m ³ )				
864	10 min Summer	1.463	0.0	0.0	684	0		
	5 min Winter		0.0		28			
-	30 min Winter	89.506	0.0	0.0	29	1		
						0		
6	50 min Winter	55.419	0.0	0.0	30			
6 12	20 min Winter	34.313	0.0	0.0	30 36	6		
6 12 18	20 min Winter 30 min Winter	34.313 25.923	0.0 0.0 0.0	0.0 0.0 0.0	30 36 47	6 8		
6 12 18 24	20 min Winter	34.313	0.0	0.0 0.0 0.0 0.0	30 36	6 8 4		
6 12 18 24 36 48	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter	34.313 25.923 21.246	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130	6 8 4 6 8		
6 12 18 24 36 48 60	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 90 min Winter	34.313 25.923 21.246 16.050 13.155 11.273	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152	6 8 4 6 8 6		
6 12 18 24 36 48 60 72	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 20 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172	6 8 4 6 8 6 2		
6 12 18 24 36 48 60 72 96	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 50 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197	6 8 4 6 8 6 2 0		
6 12 18 24 36 48 60 72 96 14	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 50 min Winter 50 min Winter 40 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240	6 8 4 6 8 6 2 0 2		
6 12 18 24 36 48 60 72 96 144 216	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 50 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197	6 8 4 6 8 6 2 0 2 4		
6 12 18 24 36 48 60 72 96 144 216 288	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 50 min Winter 40 min Winter 50 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294	6 8 4 6 8 6 2 0 2 4 6		
6 12 18 24 36 48 60 72 96 144 216 288 432	20 min Winter 30 min Winter 40 min Winter 50 min Winter 30 min Winter 20 min Winter 20 min Winter 50 min Winter 50 min Winter 50 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341	6 8 4 6 8 6 2 0 2 4 6 2		
6 12 18 24 36 48 60 72 96 144 216 288 432 576 720	20 min Winter 30 min Winter 40 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 <b>2.422</b> 1.964 1.670	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341 251 458 488	6 8 4 6 8 6 2 0 2 4 6 2 4 6 2 4 0		
6 12 18 24 36 48 60 72 96 144 216 288 432 576 720	20 min Winter 30 min Winter 40 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422 1.964	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341 251 458	6 8 4 6 8 6 2 0 2 4 6 2 4 6 2 4 0		
6 12 18 24 36 48 60 72 96 144 216 288 432 576 720	20 min Winter 30 min Winter 40 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 <b>2.422</b> 1.964 1.670	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341 251 458 488	6 8 4 6 8 6 2 0 2 4 6 2 4 6 2 4 0		
6 12 18 24 36 48 60 72 96 144 216 288 432 576 720	20 min Winter 30 min Winter 40 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 <b>2.422</b> 1.964 1.670	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341 251 458 488	6 8 4 6 8 6 2 0 2 4 6 2 4 6 2 4 0		
6 12 18 24 36 48 60 72 96 144 216 288 432 576 720	20 min Winter 30 min Winter 40 min Winter 50 min Winter	34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 <b>2.422</b> 1.964 1.670	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	30 36 47 67 104 130 152 172 197 240 294 341 251 458 488	6 8 4 6 8 6 2 0 2 4 6 2 4 6 2 4 0		

Stantec UK	Page 3
Dominion House	
Warrington	The second
	Micro
Date 08/09/2021 08:48 Designed by hekelly	Drainage
File Cascade - Pond 1 to IT2 Checked by	Diamaye
Innovyze Source Control 2020.1	_
Cascade Rainfall Details for Restored - IT2.SRCX	
Rainfall Model FEH	
Return Period (years)100FEH Rainfall Version1999	
Site Location GB 447250 107950 SU 47250 07950	
C (1km) -0.026	
D1 (1km) 0.428	
D2 (1km) 0.314 D3 (1km) 0.392	
E (1km) 0.299	
F (1km) 2.303	
Summer Storms Yes Winter Storms Yes	
Winter StormsYesCv (Summer)0.750	
Cv (Winter) 0.840	
Shortest Storm (mins) 15	
Longest Storm (mins) 8640 Climate Change % +40	
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Stantec UK		Page 4
Dominion House		
Warrington		Micro
Date 08/09/2021 08:48	Designed by hekelly	Drainage
File Cascade - Pond 1 to IT2	Checked by	Diamage
Innovyze	Source Control 2020.1	
Cascade Model Det	cails for Restored - IT2.SRCX	
Storage is On	line Cover Level (m) 18.300	
Infiltrat	tion Trench Structure	
	/hr) 1.00000 Trench Length (m)	) 165.0 ) 1000.0 ) 0.000
Weir	Overflow Control	
Discharge Coef 0 544 Wid	dth (m) 75.000 Invert Level (m) 17.950	
	(,	

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<u> </u>							Page 1
Dominion House							
Warrington							The second
							Mirco
Date 08/09/2021	08:58		Designe	d by heke	11v		Micro
File Restored -			Checked				Drainag
	115.500			Control 2	100 1		
Innovyze			source	Control 2	JZU.1		
0	manna of Dogul	<b>.</b>	100 -	Det	- Davida		
Sum	mary of Resul	LTS IC	or IUU y	Zear Retur	n Perio	ba (+40%)	-
	Ha	alf Dra	in Time	: 6 minutes	_		
	Storm	Max	Max Denth	Max Tafiltation	Max	Status	
	Event	Level (m)	(m)	Infiltratior (1/s)	(m ³ )		
		(111)	(ш)	(1/5)	(111-)		
	15 min Summer	17.77	5 0.776	19.2	9.0	ОК	
	30 min Summer			22.8			
	60 min Summer			23.9			
	120 min Summer			27.1			
	180 min Summer			28.7			
	240 min Summer 360 min Summer			29.5 30.3			
	480 min Summer			30.5			
	600 min Summer			30.5			
	720 min Summer			30.4			
	960 min Summer	18.01	1 1.011	28.4	15.3	ОК	
:	1440 min Summer	17.93	2 0.932	25.1	. 13.0	ΟK	
	2160 min Summer			22.1	. 10.9	ОК	
	2880 min Summer			19.6			
	4320 min Summer			17.3		ОК	
	5760 min Summer 7200 min Summer			15.4 14.4		ОК	
	8640 min Summer			13.6			
·	15 min Winter			17.4			
	30 min Winter			20.1			
	Stor	rm	Rain	Flooded T	me-Peak		
	Stor		Rain (mm/hr)	Flooded Ti ) Volume			
	Stor Ever			Flooded T: ) Volume (m³)			
	Eve	nt	(mm/hr)	) Volume (m³)	(mins)		
	Eve	nt Summe:	(mm/hr)	) Volume (m³) 8 0.0	(mins) 122		
	Even 15 min	nt Summer Summer	(mm/hr) r 144.558 r 89.506	) Volume (m³) 8 0.0 5 0.0	(mins)		
	Even 15 min 30 min	Summer Summer Summer	(mm/hr) r 144.558 r 89.506 r 55.419	) Volume (m ³ ) 8 0.0 5 0.0 9 0.0	(mins) 122 133		
	Even 15 min 30 min 60 min 120 min 180 min	Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.506 r 55.419 r 34.313 r 25.923	) Volume (m ³ ) 8 0.0 5 0.0 9 0.0 3 0.0	(mins) 122 133 150		
	Even 15 min 30 min 60 min 120 min 180 min 240 min	Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.506 r 55.419 r 34.313 r 25.923 r 21.246	Volume           (m³)           8         0.0           5         0.0           9         0.0           3         0.0           3         0.0           5         0.0	(mins) 122 133 150 182 214 248		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min	Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.506 r 55.419 r 34.313 r 25.923 r 21.246 r 16.050	Volume           (m³)           8         0.0           5         0.0           9         0.0           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0	(mins) 122 133 150 182 214 248 316		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.313 r 25.923 r 21.246 r 16.050 r 13.155	Volume (m³)           B         0.0           6         0.0           9         0.0           3         0.0           5         0.0           5         0.0	(mins) 122 133 150 182 214 248 316 380		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min	Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.313 r 25.923 r 21.246 r 16.050 r 13.159 r 11.273	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         3       0.0	(mins) 122 133 150 182 214 248 316 380 446		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min	nt Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe: Summe:	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.159 r 11.273 r 9.938	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         6       0.0         5       0.0         5       0.0         6       0.0         5       0.0         5       0.0         3       0.0         5       0.0         8       0.0	(mins) 122 133 150 182 214 248 316 380 446 512		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.313 r 25.923 r 21.246 r 16.050 r 13.155 r 11.273 r 9.938 r 7.882	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         6       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         2       0.0	(mins) 122 133 150 182 214 248 316 380 446		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.273 r 9.938 r 7.882 r 5.686	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         6       0.0         5       0.0         5       0.0         6       0.0         5       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.273 r 9.938 r 7.882 r 5.686 r 4.102	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.272 r 9.938 r 7.882 r 5.686 r 4.101 r 3.252 r 2.422	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0         3       0.0         2       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900 1284 1652 2408		
	Even 15 min 30 min 60 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.273 r 9.938 r 7.882 r 5.686 r 4.101 r 3.253 r 2.422 r 1.964	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0         2       0.0         4       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900 1284 1652 2408 3168		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.272 r 9.938 r 5.686 r 4.101 r 3.252 r 2.422 r 1.964 r 1.670	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         6       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0         2       0.0         4       0.0         0       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900 1284 1652 2408 3168 3912		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.312 r 25.922 r 21.246 r 16.050 r 13.155 r 11.272 r 9.938 r 7.882 r 5.686 r 4.101 r 3.252 r 2.422 r 1.964 r 1.462	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         6       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0         2       0.0         4       0.0         0       0.0         3       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900 1284 1652 2408 3168 3912 4680		
	Even 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	nt Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	(mm/hr) r 144.558 r 89.500 r 55.419 r 34.311 r 25.922 r 21.246 r 16.050 r 13.155 r 11.273 r 9.938 r 5.686 r 4.101 r 3.255 r 2.422 r 1.964 r 1.465	Volume (m³)         8       0.0         5       0.0         9       0.0         3       0.0         5       0.0         5       0.0         5       0.0         6       0.0         5       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         1       0.0         2       0.0         4       0.0         0       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0	(mins) 122 133 150 182 214 248 316 380 446 512 644 900 1284 1652 2408 3168 3912		

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ouse										
							Misco			
2021 08:58			Designed	d by hekel	ly		Micro			
ed - IT3.SP	RCX		Checked	Drainag						
			Source (	Control 20	20.1					
Summary of	Resul	ts fo	or 100 y	ear Returr	n Perio	d (+40%)				
Sto	rm	Max	Max	Max	Max	Status				
						beacab				
		(m)	(m)	(l/s)	(m³)					
60 min	Wintor	17 0/1	0 0 0 4 0	21 6	10 6	O K				
				28.3	15.3	ок				
240 min	Winter	18.04	1 1.041	29.7	16.3	ОК				
360 min	Winter	18.08	0 1.080	31.3	17.5	O K				
					17.1	ОК				
				18.6	8.6	ОК				
2880 min	Winter	17.68	2 0.682	16.0	7.0	O K				
				13.6	5.5	O K				
			Rain							
	Evei	10	(mm/nr)		mins)					
				( )						
				0.0	150					
				0.0	392					
	600 min	Winter	r 11.273	0.0	460					
	720 min	Winter		0.0	530					
				-						
	960 min				662					
1	960 min 440 min	Winter	r 5.686	0.0	930					
1	960 min	Winter Winter	r 5.686 r 4.101	0.0	930 1332					
1 2 2	960 min 440 min 160 min	Winter Winter Winter	r 5.686 r 4.101 r 3.253	0.0	930					
1 2 2 4 5	960 min 440 min 160 min 880 min 320 min 760 min	Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964	0.0 0.0 0.0 0.0	930 1332 1728					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
1 2 2 4 5 7	960 min 440 min 160 min 880 min 320 min 760 min 200 min	Winter Winter Winter Winter Winter	r 5.686 r 4.101 r 3.253 r 2.422 r 1.964 r 1.670	0.0 0.0 0.0 0.0 0.0 0.0	930 1332 1728 2540 3344 4200					
	Summary of Stor Even 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	red - IT3.SRCX Summary of Resul Storm Event 60 min Winter 120 min Winter 120 min Winter 180 min Winter 240 min Winter 360 min Winter 480 min Winter 720 min Winter 1440 min Winter 2160 min Winter 280 min Winter 280 min Winter 280 min Winter 360 min Winter 5760 min Winter 5760 min Winter 8640 min Winter	Summary of Results for         Storm       Max         Event       Level         (m)       60 min Winter 17.844         120 min Winter 17.95'       180 min Winter 18.004         240 min Winter 18.044       360 min Winter 18.044         360 min Winter 18.044       360 min Winter 18.044         720 min Winter 18.022       960 min Winter 17.962         1440 min Winter 17.862       2160 min Winter 17.662         2160 min Winter 17.663       4320 min Winter 17.655         7200 min Winter 17.556       7200 min Winter 17.512         8640 min Winter 17.493       Storm         Event       60 min Winter         120 min Winter 17.493       360 min Winter         8640 min Winter 17.493       Storm         60 min Winter 17.493       360 min Winter         120 min Winter 17.493       360 min Winter         120 min Winter       17.493	Checked           Source (           Summary of Results for 100 yr           Storm         Max         Max           Event         Level         Depth I           (m)         (m)         (m)           60 min Winter 17.840         0.840           120 min Winter 17.957         0.957           180 min Winter 18.008         1.008           240 min Winter 18.008         1.008           240 min Winter 18.041         1.041           360 min Winter 18.048         1.048           720 min Winter 18.048         1.048           720 min Winter 17.964         0.964           1440 min Winter 17.682         0.682           2160 min Winter 17.662         0.682           4320 min Winter 17.550         0.550           7200 min Winter 17.550         0.550           7200 min Winter 17.517         0.517           8640 min Winter 17.491         0.491           60 min Winter 17.491         0.491           60 min Winter 34.313         180 min Winter 34.313           180 min Winter 25.923         240 min Winter 34.313           180 min Winter 34.050         360 min Winter 34.55	Checked by         Source Control 20         Source Control 20         Summary of Results for 100 year Return         Storm       Max       Max         Max       Max       Max         Storm       (m) Winter 17.957       0.957       266         10.02       29.2       960       min Winter 18.041       1.048       3.0.0       2.4         2.6       1.029       2.9.2       960       min Winter 17.964       0.962       2.2.4       2.160         2.8       0.60       2.9       960 <th c<="" td=""><td>Tred - IT3.SRCX       Checked by         Source Control 2020.1         Summary of Results for 100 year Return Perio         Storm       Max         Storm       Rain       Flooded Time-Peak         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max       <td <="" colspan="2" td=""><td>Checked by         Source Control 2020.1         Source Control 2020.1         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max&lt;</td></td></td></th>	<td>Tred - IT3.SRCX       Checked by         Source Control 2020.1         Summary of Results for 100 year Return Perio         Storm       Max         Storm       Rain       Flooded Time-Peak         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max       <td <="" colspan="2" td=""><td>Checked by         Source Control 2020.1         Source Control 2020.1         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max&lt;</td></td></td>	Tred - IT3.SRCX       Checked by         Source Control 2020.1         Summary of Results for 100 year Return Perio         Storm       Max         Storm       Rain       Flooded Time-Peak         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max       Max         Max       Max <td <="" colspan="2" td=""><td>Checked by         Source Control 2020.1         Source Control 2020.1         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max&lt;</td></td>	<td>Checked by         Source Control 2020.1         Source Control 2020.1         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max&lt;</td>		Checked by         Source Control 2020.1         Source Control 2020.1         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max<

Stantec UK		Page 3
Dominion House		
Warrington		Micro
Date 08/09/2021 08:58	Designed by hekelly	Drainage
File Restored - IT3.SRCX	Checked by	Diamage
Innovyze	Source Control 2020.1	
Ra	infall Details	
Rainfall Mod	el FEH	
Return Period (year		
FEH Rainfall Versi	on 1999	
	on GB 447250 107950 SU 47250 07950	
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Stantec UK			Page 4					
Dominion House								
Warrington			The second					
			Micro					
Date 08/09/2021 08:58	Designed b	y hekelly	Drainage					
File Restored - IT3.SRCX	Checked by	7	Diamage					
Innovyze	Source Cor	trol 2020.1						
<u> </u>	Model Detai	ls						
Stavara is or	line Generat							
Storage is on	LINE Cover L	evel (m) 19.000						
Infiltrat	Infiltration Trench Structure							
Infiltration Coefficient Base (m	, ,		,					
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-	actor 2.0							
	osity 0.30							
Invert Level	L (m) 17.000	Cap Infiltration Depth (	m) 0.000					

n · · ·							Page 1
Dominion House							
Warrington							Sec. 1
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Date 08/09/2021	08:55	Des	signed r	y hekel	lv		
File Cascade - 1			ecked by		-1		Drainag
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Innovyze		Sot	irce con	itrol 20	20.1		
a	1 9					1.0.07	
Casc	ade Summary	r of Resul	ts for	Restored	1 - P	ond 2.SP	RCX
			_	_		_	
	Upstream	Outflow	V TO	Over	flow :	Го	
	Structures						
	(None)	Restored -	IT4.SRCX	Restored	- IT4	4.SRCX	
	Storm	Max	Max			Status	
	Event	Level	-	ontrol Vo			
		(m)	(m)	(l/s) (	m³)		
	15 min Su	mmer 15.376	0.376	132.4 2	12.6	ОК	
		mmer 15.431			48.9	ОК	
		mmer 15.461			69.7	ОК	
	120 min Su	mmer 15.572	0.572	173.4 3	49.2	ОК	
		mmer 15.683		174.8 4	34.4	O K	
		mmer 15.780			13.9	ОК	
		mmer 15.932		174.8 6		ОК	
		mmer 16.032			45.3	ОК	
		mmer 16.081			94.1	ОК	
		mmer 16.110 mmer 15.979			23.4	ок ок	
	1440 min Su				94.1 54.7	0 K	
	2160 min Su				90.6	ОК	
	2880 min Su				43.2	ОК	
	4320 min Su				17.0	ОК	
	5760 min Su	mmer 15.352	0.352	120.0 1	97.4	ОК	
	7200 min Su	mmer 15.334	0.334	111.0 1	86.1	ОК	
	8640 min Su	mmer 15.321	0.321	104.3 1	77.8	ОК	
	Storm	Rain	Flooded	Discharg	je Tim	ne-Peak	
	Storm Event		Flooded ) Volume	-	-	me-Peak mins)	
				Volume	-		
	Event	(mm/hr)	) Volume (m³)	Volume (m³)	()	mins)	
	<b>Event</b> 15 min Sum	(mm/hr)	) Volume (m ³ ) 3 0.0	Volume (m ³ ) 1751.	(1 . 2	<b>mins)</b> 125	
	<b>Event</b> 15 min Sun 30 min Sun	(mm/hr) nmer 144.558 nmer 89.506	Volume (m ³ ) 0.0 5 0.0	Volume (m ³ ) 1751. 2139.	(1 . 2 . 7	<b>mins)</b> 125 136	
	<b>Event</b> 15 min Sum 30 min Sum 60 min Sum	(mm/hr) nmer 144.558 nmer 89.506 nmer 55.419	Volume           (m³)           3         0.0           5         0.0           9         0.0	Volume (m ³ ) 1751. 2139. 2924.	(1 .2 .7 .2	<b>mins)</b> 125 136 156	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313	Volume (m ³ )           3         0.0           5         0.0           9         0.0           3         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677.	(1 .2 .7 .2 .2	<b>mins)</b> 125 136 156 212	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923	Volume (m ³ )           3         0.0           5         0.0           6         0.0           9         0.0           3         0.0           3         0.0           3         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257.	(1 .2 .7 .2 .2 .2	mins) 125 136 156 212 266	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun 240 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923	Volume (m ³ )           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0           3         0.0           3         0.0           3         0.0           5         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755.	(1 .2 .7 .2 .2 .2 .2	<b>mins)</b> 125 136 156 212	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun 240 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050	Volume (m ³ )           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607.	(1 .2 .2 .2 .2 .2 .2 .2 .7	mins) 125 136 156 212 266 316	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun 240 min Sun 360 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155	Volume (m³)           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0           9         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304.	(1 .2 .2 .2 .2 .2 .2 .7 .0	mins) 125 136 156 212 266 316 414	
	<b>Event</b> 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun 240 min Sun 360 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273	Volume (m³)           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0           3         0.0           5         0.0           6         0.0           5         0.0           5         0.0           5         0.0           6         0.0           7         0.0           7         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912.	(1 .2 .2 .2 .2 .2 .2 .2 .7 .0 .5	mins) 125 136 156 212 266 316 414 504	
	<b>Event</b> 15 min Sun 30 min Sun 60 min Sun 120 min Sun 180 min Sun 240 min Sun 360 min Sun 480 min Sun 600 min Sun 720 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882	Volume (m³)           3         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0           3         0.0           3         0.0           5         0.0           5         0.0           5         0.0           5         0.0           6         0.0           7         0.0           8         0.0           9         0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952.	(1 .2 .2 .2 .2 .2 .2 .2 .7 .0 .5 .6 .6	mins) 125 136 156 212 266 316 414 504 572 636 762	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 120 min Sun 240 min Sun 360 min Sun 480 min Sun 600 min Sun 720 min Sun 960 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631.	(1 .2 .2 .2 .2 .2 .2 .2 .7 .0 .5 .6 .6 .3	mins) 125 136 156 212 266 316 414 504 572 636 762 984	
	Event 15 min Sun 30 min Sun 60 min Sun 120 min Sun 120 min Sun 240 min Sun 360 min Sun 480 min Sun 720 min Sun 960 min Sun 1440 min Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.103	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .7 .0 .5 .6 .6 .3 .8	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324	
	Event 15 min Sum 30 min Sum 60 min Sum 120 min Sum 120 min Sum 240 min Sum 360 min Sum 480 min Sum 720 min Sum 960 min Sum 1440 min Sum 2160 min Sum	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.101 amer 3.253	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086. 11962.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324 1664	
	Event 15 min Sum 30 min Sum 60 min Sum 120 min Sum 120 min Sum 240 min Sum 360 min Sum 480 min Sum 720 min Sum 960 min Sum 1440 min Sum 240 min Sum 360 min Sum	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.101 amer 3.253 amer 2.422	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086. 11962. 13831.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324 1664 2412	
	Event 15 min Sum 30 min Sum 60 min Sum 120 min Sum 120 min Sum 240 min Sum 360 min Sum 360 min Sum 360 min Sum 720 min Sum 960 min Sum 1440 min Sum 2480 min Sum 340 min Sum 340 min Sum 340 min Sum 340 min Sum	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.101 amer 3.253 amer 2.422 amer 1.964	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086. 11962. 13831. 16496.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324 1664 2412 3168	
	Event 15 min Sum 30 min Sum 60 min Sum 120 min Sum 120 min Sum 240 min Sum 360 min Sum 480 min Sum 720 min Sum 960 min Sum 1440 min Sum 2160 min Sum 2880 min Sum	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.101 amer 3.253 amer 2.422 amer 1.964 amer 1.670	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086. 11962. 13831. 16496. 18200.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324 1664 2412	
	Event           15         min         Sun           30         min         Sun           60         min         Sun           120         min         Sun           120         min         Sun           120         min         Sun           120         min         Sun           140         min         Sun           1400         min         Sun           1400         min         Sun           1400         min         Sun           1400         min         Sun           1500         min         Sun           1400         min         Sun           1500         min         Sun           1400         min         Sun           1400         min         Sun           1400         min         Sun           14320         min         Sun           14320         min         Sun           14320         min         Sun           14320         min         Sun	(mm/hr) amer 144.558 amer 89.506 amer 55.419 amer 34.313 amer 25.923 amer 21.246 amer 16.050 amer 13.155 amer 11.273 amer 9.938 amer 7.882 amer 5.686 amer 4.101 amer 3.253 amer 2.422 amer 1.964 amer 1.670	Volume (m³)         3       0.0         5       0.0         6       0.0         7       0.0         8       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0         9       0.0	Volume (m ³ ) 1751. 2139. 2924. 3677. 4257. 4755. 5607. 6304. 6912. 7455. 7952. 8631. 11086. 11962. 13831. 16496. 18200.	(1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	mins) 125 136 156 212 266 316 414 504 572 636 762 984 1324 1664 2412 3168 3912	

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Dominion House									
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Date 08/09/2021 0	8:55	5		Des	igned	by hek	ellv		— Micro
File Cascade - Po			T.Ψ.4		cked b				Drainad
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Gamma	1- 0			D ] /		Devis		Derel 0	an av
Cascad	te Si	ummar	cy of	Result	ts Ior	Resto	red -	Pond 2.	SRCX
		<b>a</b> +		Ver	Ver	Marr	Marr	(totur	
		Storm Event		Max	Max	Max Control	Max	Status	
		LVCIIC		(m)	(m)		(m ³ )		
				()	()	(=/2/	( )		
				15.355		121.8	199.6	ΟK	
				15.402		145.4			
				15.437		161.2			
				15.589 15.742		173.8 174.8	361.4 482.7		
				15.742		174.8			
				16.150		174.8	865.9		
				16.180		174.8			
				16.175		174.8	891.7	ОК	
				16.155		174.8	870.7		
-				15.924		174.8			
				15.544 15.407		172.5 148.0	328.1 233.4		
				15.407		148.0			
				15.324		105.8			
				15.296		91.4			
5	7200	min W	inter	15.279	0.279	82.8	152.3	ОК	
8	8640	min W	inter	15.267	0.267	76 6	144.5	ОК	
						/0.0	111.5		
		Storm Event		Rain (mm/hr)	Floode	ed Disch	arge T	ime-Peak	
		Storm Event		Rain (mm/hr)	Floode	ed Disch e Vol	ume		
	1	Event		(mm/hr)	Floode Volum (m³)	ed Disch e Vol (m	uarge T: ume ³ )	ime-Peak (mins)	
	<b>і</b> 15 г	<b>Event</b> min Wi		(mm/hr)	Floode Volum (m³)	ed Disch e Vol (m	aarge T: ume 3) 243.6	<b>ime-Peak</b> (mins) 125	
	15 r 30 r	<b>Event</b> min Wi min Wi	inter	(mm/hr) 144.558 89.506	Floode Volum (m ³ ) 0.	ed Disch e Vol (m .0 17 .0 20	<b>arge T</b> : ume 3) 243.6 287.2	<b>ime-Peak</b> (mins) 125 136	
	15 r 30 r 60 r	<b>Event</b> min Wi	inter inter	(mm/hr)	Floode Volum (m ³ ) 0. 0. 0.	ed Disch e Vol (m .0 17 .0 20 .0 29	aarge T: ume 3) 243.6	<b>ime-Peak</b> (mins) 125	
	15 r 30 r 60 r 120 r	<b>Event</b> min Wi min Wi min Wi	inter inter inter	(mm/hr) 144.558 89.506 55.419	Floode Volum (m ³ ) 0. 0. 0. 0.	ed Disch e Vol (m .0 17 .0 20 .0 29 .0 39	<b>arge T</b> : ume 3) 243.6 087.2 042.7	<b>ime-Peak</b> (mins) 125 136 154	
	15 r 30 r 60 r 120 r 180 r	Event min Wi min Wi min Wi	inter inter inter inter	(mm/hr) 144.558 89.506 55.419 34.313	Floode Volum (m ³ ) 0. 0. 0. 0. 0.	ed Disch e Vol (m .0 17 .0 20 .0 29 .0 39 .0 46	<b>arge T</b> : ume ³ ) 243.6 087.2 042.7 046.8	<b>ime-Peak</b> (mins) 125 136 154 214	
	15 r 30 r 60 r 120 r 180 r 240 r 360 r	Event nin Wi nin Wi nin Wi nin Wi nin Wi nin Wi	inter inter inter inter inter inter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050	Floode Volum (m ³ ) 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	ed Disch e Vol (m 0 17 0 20 0 29 0 39 0 46 0 52 0 64	<b>arge T</b> : <b>ume</b> <b>3</b> ) <b>43.6</b> <b>87.2</b> <b>42.7</b> <b>46.8</b> <b>55.0</b> <b>291.5</b> <b>40.0</b>	<b>ime-Peak</b> (mins) 125 136 154 214 270 328 426	
	15 r 30 r 60 r 120 r 180 r 240 r 360 r 480 r	Event nin Wi nin Wi nin Wi nin Wi nin Wi nin Wi nin Wi	inter inter inter inter inter inter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155	Floode Volum (m ³ ) 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	ed Disch e Vol (m 0 17 0 20 0 29 0 39 0 46 0 52 0 64 0 71	<b>arge T</b> : <b>ume</b> <b>3</b> ) <b>4</b> 3.6 <b>8</b> 7.2 <b>4</b> 2.7 <b>4</b> 42.7 <b>4</b> 40.8 <b>5</b> 5.0 <b>5</b> 40.0 <b>5</b> 40.0 <b></b>	<b>ime-Peak</b> (mins) 125 136 154 214 270 328 426 504	
	15 r 30 r 120 r 120 r 180 r 360 r 480 r 600 r	Event nin Wi nin Wi nin Wi nin Wi nin Wi nin Wi nin Wi	inter inter inter inter inter inter inter	(mm/hr) 144.558 89.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273	Floode Volum (m ³ ) 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	ed Disch e Vol (m 0 17 0 20 0 29 0 39 0 46 0 52 0 64 0 71 0 77	<b>arge T</b> : <b>ume</b> <b>3</b> ) <b>4</b> 3.6 <b>8</b> 7.2 <b>4</b> 2.7 <b>4</b> 42.7 <b>4</b> 40.8 <b>5</b> 5.0 <b>5</b> 40.0 <b>3</b> 1.9 <b>7</b> 31.8	ime-Peak (mins) 125 136 154 214 270 328 426 504 576	
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	Mea	an Flo	ro w		Kick-Fl ead Rar		1.02	25 -	162. 131.				
						-							
The hydrological of Hydro-Brake® Optim Hydro-Brake Optim invalidated	mum as	s spec	ifie	ed. S	Should	anothe	r ty	pe of	contr	ol dev	ice d	other	than a
Depth (m) Flow ()	1/s)   I	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)
	12.5		200		175.0		.000		273.9		.000		415.3
	46.1		400		188.6		.500		295.4		.500		429.6
	93.3		600 800		201.3 213.3		.000		315.4 334.2		.000		443.5 457.0
	70.6		000		224.5		.000		351.9		.000		470.0
	74.1		200		235.3		.500		368.8		.500		482.7
0.800 1	73.2	2.	400		245.5	6.	.000		384.9				
1.000 10	64.0	2.	600		255.3	6.	500		400.4				
			(	©198	2-2020	) Innc	ovyz	е					

Stantec UK							Page 1
Dominion House							
Warrington							Misco
Date 08/09/2021 08:5	54	Desi	aned by	/ hekell	V		Micro
File Cascade - Pond			ked by		2		Drainage
Innovyze				rol 202	0.1		
Cascade	e Summary o	f Resul	lts for	Restore	d - IT4	.SRCX	
	Upstre	am	Outflo	w To Over	flow To		
	Structu	res					
F	Restored - Po	nd 2.SRC	X (N	lone )	(None)		
	Half	Drain Ti	.me : 10	minutes.			
Storm	Max Max	Ма		Max	Max	Max	Status
Event	Level Depth (m) (m)	1 Infilt: (1/		verflow Σ (l/s)	Outflow (1/s)	Volume (m ³ )	
		•	.,	(1/6)	(1/0)		
15 min Summer			114.0	0.0	114.0	96.1	ОК
30 min Summer 60 min Summer			139.9 151.4	0.0	139.9 175.1	123.8 136.2	ок ок
120 min Summer			151.4 151.4	23.7 29.3	1/5.1	136.2	-
180 min Summer			151.4	35.4	186.9	136.3	0 K
240 min Summer			151.4	35.4	186.9	136.4	-
360 min Summer			151.4	35.4	186.9	136.4	ОК
480 min Summer			151.4	35.4	186.9	136.4	ОК
600 min Summer	15.954 2.654	ł	151.4	35.4	186.9	136.4	ОК
720 min Summer	15.954 2.654	ł	151.4	35.4	186.9	136.4	ОК
960 min Summer	15.954 2.654	1	151.4	35.4	186.9	136.4	ОК
1440 min Summer	15.954 2.654	ł	151.4	35.4	186.9	136.4	ОК
2160 min Summer	15.954 2.654	ł	151.4	29.3	180.8	136.5	ОК
2880 min Summer	15.951 2.651	L	151.3	5.6	156.9	136.2	O K
4320 min Summer			135.6	0.0	135.6	119.3	ОК
5760 min Summer			119.9	0.0	119.9	102.4	
7200 min Summer	15.136 1.836	)	111.0	0.0	111.0	92.8	ОК
	Storm	Dain	Floodod	Overflow	Time Dee	1-	
	Storm Event	Rain (mm/hr)	Volume	Overflow Volume	(mins)	v	
	livenc	(1111)	(m ³ )	(m ³ )	(111111)		
1	5 min Summer	144.558	0.0	0.0	14	4	
30	0 min Summer	89.506	0.0	0.0	15	6	
61	0 min Summer	55.419	0.0	13.4	17	6	
120	0 min Summer	34.313	0.0	107.1	23	8	
	0 min Summer	25.923	0.0	185.4	26		
	0 min Summer	21.246	0.0	244.2	31		
	0 min Summer	16.050	0.0	306.9	31		
	0 min Summer	13.155	0.0	317.4	62		
	0 min Summer	11.273	0.0	355.0	42		
	0 min Summer	9.938	0.0	394.1	47		
	0 min Summer 0 min Summer	7.882	0.0	399.3 364 3	61 92		
	0 min Summer 0 min Summer	5.686	0.0	364.3 198.5	92 129		
	0 min Summer	4.101 3.253		198.5	129		
	0 min Summer	2.422	0.0	0.0	242		
	0 min Summer	1.964		0.0	317		
	0 min Summer	1.670	0.0	0.0	392		

								Page 2
ominion House								
arrington								100
ate 08/09/2021 08	:54		Desi	aned by	/ hekelly	J		MICLO
ile Cascade - Pon		т4		ked by		2		Drainac
nnovyze				-	rol 2020	0.1		
Casca	de Summa:	ry of	Resul	ts for	Restore	d - IT4	.SRCX	
Storm	Max	Max	Ma	x	Max	Max	Max	Status
Event	Level	Depth 1	Infiltr	cation O	verflow $\Sigma$	Outflow	Volume	
	(m)	(m)	(1/	s)	(l/s)	(l/s)	(m³)	
8640 min Summe	er 14.995	1.695		104.0	0.0	104.0	85.3	O K
15 min Winte	er 15.025	1.725		105.5	0.0	105.5	86.9	ОК
30 min Winte	er 15.489	2.189		128.5	0.0	128.5	111.6	O K
60 min Winte	er 15.918	2.618		149.6	0.0	149.6	134.3	O K
120 min Winte	er 15.954	2.654		151.4	35.4	186.9	136.3	O K
180 min Winte	er 15.954	2.654		151.4	35.4	186.9	136.4	O K
240 min Winte				151.4	29.3	180.8	136.4	O K
360 min Winte				151.4	29.3	180.8	136.4	O K
480 min Winte				151.4	35.4	186.9	136.4	ОК
600 min Winte	er 15.954	2.654		151.4	29.3	180.8	136.4	ОК
720 min Winte				151.4	35.4	186.9	136.4	ОК
960 min Winte				151.4	35.4	186.9	136.4	ОК
1440 min Winte				151.4	29.3	180.8	136.4	ΟK
2160 min Winte				147.8	0.0	147.8	132.3	ΟK
2880 min Winte				126.5	0.0	126.5	109.4	ΟK
4320 min Winte				105.8	0.0	105.8	87.2	O K
5760 min Winte				91.3	0.0	91.3	71.6	ОК
7200 min Winte 8640 min Winte				82.8 76.6	0.0	82.8 76.6	62.6 55.9	ОК ОК
	Storm	:	Rain	Flooded	Overflow	Time-Pea	k	
	Storm Event			Volume	Volume	Time-Pea (mins)	k	
							k	
86	Event	(n mmer	<b>nm/hr)</b> 1.463	Volume (m ³ ) 0.0	<b>Volume</b> (m ³ ) 0.0	<b>(mins)</b> 464	.0	
86	Event 640 min Sur 15 min Win	(m mmer nter 14	<b>nm/hr)</b> 1.463 44.558	Volume (m ³ ) 0.0 0.0	Volume (m ³ ) 0.0 0.0	<b>(mins)</b> 464 14	0 4	
86	Event 540 min Sun 15 min Win 30 min Win	(m mmer nter 14 nter 8	1.463 44.558 39.506	Volume (m ³ ) 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0	(mins) 464 14 15	:0 :4 :4	
	Event 640 min Sun 15 min Win 30 min Win 60 min Win	(n mmer nter 14 nter 8 nter 5	1.463 44.558 39.506 55.419	Volume (m ³ ) 0.0 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0 0.0	(mins) 464 14 15 17	0 4 4 6	
1	<b>Event</b> 640 min Sum 15 min Win 30 min Win 60 min Win 120 min Win	(m mmer nter 14 nter 8 nter 5 nter 3	1.463 14.558 39.506 55.419 34.313	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0 0.0 120.3	(mins) 464 14 15 17 26	0 4 4 6 0	
1	<b>Event</b> 640 min Sun 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win	(m mmer nter 14 nter 8 nter 3 nter 2	1.463 44.558 39.506 55.419 34.313 25.923	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2	(mins) 464 14 15 17 26 28	0 4 4 6 0 8	
	<b>Event</b> 640 min Sum 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 240 min Win	(m mmer nter 14 nter 5 nter 3 nter 2 nter 2	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0	(mins) 464 14 15 17 26 28 26	0 4 6 0 8 8	
	Event 640 min Sum 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 240 min Win 360 min Win	(m mmer nter 14 nter 5 nter 3 nter 2 nter 2 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 L6.050	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1	(mins) 464 14 15 17 26 28 26 28 26 28	0 4 6 0 8 8 8 2	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 240 min Win 360 min Win 480 min Win	(m mmer nter 14 nter 2 nter 2 nter 2 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9	(mins) 464 14 15 17 26 28 26 28 26 28 63	0 4 6 0 8 8 8 2 8	
	<b>Event</b> 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 360 min Win 480 min Win	(m mmer nter 14 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9	(mins) 464 14 15 17 26 28 26 28 26 28 63 41	0 4 6 0 8 8 8 2 8 0	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 360 min Win 480 min Win 500 min Win	(m mmer nter 14 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4	(mins) 464 14 15 17 26 28 26 28 26 28 63 41 60	0 4 6 0 8 8 8 2 8 0 8	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 180 min Win 360 min Win 480 min Win 500 min Win 720 min Win	(m mmer nter 14 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9	(mins) 464 14 15 17 26 28 26 28 63 41 60 68	0 4 6 0 8 8 8 2 8 0 8 2 8 0 8 2	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 500 min Win 720 min Win 960 min Win	(mmer nter 14 nter 2 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4	(mins) 464 14 15 17 26 28 26 28 26 28 63 41 60 68 94	0 4 6 0 8 8 2 8 0 8 2 8 0 8 2 4	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 480 min Win 720 min Win 960 min Win 440 min Win	(mmer nter 14 nter 2 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 436.9 455.4 455.9 291.4 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134	0 4 6 0 8 8 2 8 0 8 2 8 0 8 2 4 8	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 480 min Win 720 min Win 960 min Win 440 min Win 380 min Win	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1 nter 1	1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0	(mins) 464 14 15 17 26 28 26 28 26 28 63 41 60 68 94 134 173	0 4 6 0 8 8 2 8 0 8 2 8 0 8 2 4 8 2 4 8 2	
	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 480 min Win 500 min Win 5	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254	0 4 6 0 8 8 2 8 0 8 2 8 0 8 2 4 8 2 4 8 2 4	
14 21 24 14 21 28 43 57	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 360 min Win 720 min Win 960 min Win 380 min Win 320 min Win 760 min Win	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422 1.964</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 436.9 455.4 455.9 291.4 0.0 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254 333	0 4 6 0 8 8 2 8 0 8 2 8 0 8 2 4 8 2 4 8 2 4 6	
14 21 22 24 21 24 35 72	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 480 min Win 500 min Win 5	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254	0 4 6 0 8 8 2 8 0 8 2 4 8 2 4 8 2 4 6 2	
14 21 22 24 21 24 35 72	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 360 min Win 480 min Win 960 min Win 320 min Win 320 min Win 320 min Win 320 min Win	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422 1.964 1.670</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254 333 419	0 4 6 0 8 8 2 8 0 8 2 4 8 2 4 8 2 4 6 2	
14 21 22 24 21 24 35 72	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 360 min Win 480 min Win 960 min Win 320 min Win 320 min Win 320 min Win 320 min Win	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422 1.964 1.670</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254 333 419	0 4 6 0 8 8 2 8 0 8 2 4 8 2 4 8 2 4 6 2	
14 21 22 24 21 24 35 72	Event 540 min Sur 15 min Win 30 min Win 60 min Win 120 min Win 120 min Win 240 min Win 360 min Win 360 min Win 480 min Win 960 min Win 320 min Win 320 min Win 320 min Win 320 min Win	(mmer nter 14 nter 14 nter 2 nter 2 nter 1 nter 1	<pre>1.463 44.558 39.506 55.419 34.313 25.923 21.246 16.050 13.155 11.273 9.938 7.882 5.686 4.101 3.253 2.422 1.964 1.670</pre>	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Volume (m ³ ) 0.0 0.0 120.3 217.2 278.0 347.1 403.9 436.9 455.4 455.9 291.4 0.0 0.0 0.0	(mins) 464 14 15 17 26 28 26 28 63 41 60 68 94 134 173 254 333 419	0 4 6 0 8 8 2 8 0 8 2 4 8 2 4 8 2 4 6 2	

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Stantec UK		Page 3
Dominion House		
Warrington		The second
		Micro
Date 08/09/2021 08:54	Designed by hekelly	Drainage
File Cascade - Pond 2 to IT4	Checked by	Diamage
Innovyze	Source Control 2020.1	
<u>Cascade Rainfall D</u>	etails for Restored - IT4.SRCX	
	- ]	
Rainfall Mode Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950	
C (1kr D1 (1kr		
D2 (1kr		
D3 (1kr		
E (1kr F (1kr		
Summer Storr		
Winter Storr		
Cv (Summer Cv (Winter		
Shortest Storm (mins		
Longest Storm (mins		
Climate Change	* +40	
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Stantec UK		Page 4
Dominion House		
Warrington		
		Micro
Date 08/09/2021 08:54	Designed by hekelly	Drainage
File Cascade - Pond 2 to IT4	Checked by	Brannage
Innovyze	Source Control 2020.1	
Cascade Model Det	tails for Restored - IT4.SRCX	
	line Cover Level (m) 16.300	
Infiltrat	tion Trench Structure	
	/hr) 1.00000 Trench Length (m	) 177.0 ) 1000.0 ) 0.000
Weir	Overflow Control	
Discharge Coer 0.344 Wit	dth (m) 75.000 Invert Level (m) 15.950	

Stantec UK							Page 1
Dominion House							
Warrington							1
Date 08/09/2021	08:59		Deciana	ed by heke	111		- Micro
File Restored -					стту		Drainac
	115.SRCA		Checked		000 1		
Innovyze			Source	Control 2	2020.1		
Summ	ary of Result	ts fo	or 100 v	vear Retur	n Peric	od (+40%)	
Dania						<u>, a († 100)</u>	
	Hal	lf Dra	in Time	: 8 minutes	3.		
	Storm Event	Max	Max	Max Infiltratio	Max Nolumo	Status	
	Evenc	(m)	(m)	(1/s)	(m ³ )		
	15 min Summer	16 220		102	7 51 6	0 7	
	30 min Summer			103. 122.		ОК	
	60 min Summer			131.			
-	120 min Summer			151.			
2	180 min Summer	16.846	5 1.146	161.			
	240 min Summer	16.898	3 1.198	167.	5 120.3	O K	
3	360 min Summer	16.953	3 1.253	173.	6 126.9	O K	
4	180 min Summer	16.973	3 1.273	175.	9 129.3	ΟK	
6	500 min Summer	16.978	3 1.278	176.	4 129.9	ΟK	
	720 min Summer			176.	1 129.5	ОК	
	960 min Summer			164.		O K	
	140 min Summer			145.			
	160 min Summer			128.			
	380 min Summer			113.			
	320 min Summer 760 min Summer			100. 89.			
	200 min Summer			83.			
	540 min Summer			78.			
01	15 min Winter				2 43.5		
	30 min Winter			110.			
	Stor	m	Rain	Flooded I	'ime-Peak		
	Even	t	(mm/hr		(mins)		
				(m³)			
	15 min :	Summer	144.55	8 0.0	123		
	30 min :				135		
	60 min :				152		
	120 min :				186		
	180 min :				220		
	240 min :				254		
	360 min 480 min 4				322		
	480 min :				388		
	600 min 720 min				454 520		
	960 min :				650		
	200 1111				908		
	1440 min		2.00		1288		
	1440 min : 2160 min :		c 4.10	I 0.0	0		
		Summer			1664		
	2160 min 3	Summeı Summeı	3.25	3 0.0	1664 2412		
	2160 min 2 2880 min 2	Summer Summer Summer	a 3.25 a 2.42	3 0.0 2 0.0			
	2160 min 2880 min 4320 min	Summer Summer Summer Summer	3.25 2.42 1.96	3 0.0 2 0.0 4 0.0	2412		
	2160 min 2880 min 4320 min 5760 min	Summer Summer Summer Summer Summer	a 3.25 a 2.42 a 1.96 a 1.67	3       0.0         2       0.0         4       0.0         0       0.0	2412 3168		
	2160 min 2880 min 4320 min 5760 min 7200 min 8640 min 15 min	Summer Summer Summer Summer Summer Summer	3.25 2.42 1.96 1.67 1.46 144.55	3       0.0         2       0.0         4       0.0         0       0.0         3       0.0         8       0.0	2412 3168 3920 4672 123		
	2160 min : 2880 min : 4320 min : 5760 min : 7200 min : 8640 min :	Summer Summer Summer Summer Summer Summer	3.25 2.42 1.96 1.67 1.46 144.55	3       0.0         2       0.0         4       0.0         0       0.0         3       0.0         8       0.0	2412 3168 3920 4672		

Stantec UK						Page 2
Dominion House						
Warrington						The second
Date 08/09/2021 08:59		Designe	d by hekel	lv		Micro
File Restored - IT5.SRCX		Checked	-	-1		Drainago
Innovyze			Control 20	20 1		
Summary of Resul	ts fo	or 100 y	year Return	n Perio	od (+40응)	
					<b>-</b>	
Storm Event	Max Level	Max Depth	Max Infiltration	Max	Status	
	(m)	(m)	(1/s)	(m ³ )		
60 min Winter			120.8	70.0	ОК	
120 min Winter 180 min Winter			149.4 163.3		ОК	
240 min Winter			172.5	125.7	ОК	
360 min Winter	17.03	9 1.339	183.3	137.3	ОК	
480 min Winter			180.2		O K	
600 min Winter			175.8		O K	
720 min Winter 960 min Winter			171.2 155.0	124.2 106.9	ОК	
1440 min Winter			131.5	81.6	O K O K	
2160 min Winter			108.7	57.0	ОК	
2880 min Winter	16.23	9 0.539	93.7	40.8	ОК	
4320 min Winter			79.4		O K	
5760 min Winter			69.3			
7200 min Winter 8640 min Winter			63.5 59.1		ОК	
Stor Ever		Rain	Flooded Tim ) Volume (	me-Peak mins)		
Ever		(1111/111)	(m ³ )	, millis )		
60 min	Winte	r 55.419	9 0.0	152		
120 min				188		
180 min				224		
240 min	Winte	r 21.246	5 0.0	260		
360 min				330		
480 min 600 min				398 466		
600 min 720 min				466 534		
960 min				670		
1440 min	Winte	r 5.686		934		
2160 min				1332		
2880 min				1728		
4320 min 5760 min				2540 3344		
7200 min				4200		
8640 min				5024		
	©198	2-2020	Innovyze			

Stantec UK		Page 3
Dominion House		
Warrington		Micro
Date 08/09/2021 08:59	Designed by hekelly	Drainage
File Restored - IT5.SRCX	Checked by	Diamage
Innovyze	Source Control 2020.1	
Ra	infall Details	
Rainfall Mode	el FEH	
Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950	
C (1kı D1 (1kı		
D2 (1ki		
D3 (1km		
E (1kı F (1kı		
Summer Store		
Winter Stor		
Cv (Summe: Cv (Winte:		
Shortest Storm (min		
Longest Storm (min		
Climate Change	8 +40	
©198	82-2020 Innovyze	

Stantec UK		Page 4
Dominion House		
Warrington		The second
		Mirco
Date 08/09/2021 08:59	Designed by hekelly	Desinado
File Restored - IT5.SRCX	Checked by	Drainage
Innovyze	Source Control 2020.1	

## Model Details

Storage is Online Cover Level (m) 17.700

## Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	1.00000	Trench Width (m) 1.0
Infiltration Coefficient Side (m/hr)	1.00000	Trench Length (m) 402.0
Safety Factor	2.0	Slope (1:X) 1000.0
Porosity	0.30	Cap Volume Depth (m) 0.000
Invert Level (m)	15.700 Cap	p Infiltration Depth (m) 0.000

							Page 1
Dominion House							C
Warrington							The -
							Micco
Date 08/09/2021	. 09:01		Designe	ed by hekel	llv		Micro
File Restored -			Checked		7		Drainac
Innovyze	110101011			Control 20	120 1		
тшоууде			SOULCE	CONCLUS ZO	120.1		
Cum	mary of Resul	ta fo	vr 100 t	COR Potur	n Doric	A (+108)	
<u>Suit</u>	illary or Resul	LS IU		year Keturi	I PELIC	Ja (+40%)	-
	Ha	alf Dra	ain Time	: 7 minutes			
	Storm	Max	Max	Max	Max	Status	
	Event			Infiltration		Status	
		(m)	(m)	(1/s)	(m ³ )		
	15 min Summer			133.7		O K	
	30 min Summer			154.4			
	60 min Summer 120 min Summer			164.2 188.0			
	120 min Summer 180 min Summer			200.9			
	240 min Summer			200.9			
	360 min Summer			215.6			
	480 min Summer			218.4			
	600 min Summer			219.0			
	720 min Summer	20.214	4 1.214	218.5	154.0	ОК	
	960 min Summer	20.120	0 1.120	204.3	138.6	ΟK	
	1440 min Summer			180.9			
	2160 min Summer			158.8			
	2880 min Summer 4320 min Summer			141.0			
	5760 min Summer			124.5 110.8			
	7200 min Summer			102.9			
	8640 min Summer			96.8			
	15 min Winter	19.600	0.600	125.3	53.5	ОК	
	30 min Winter	19.702	2 0.702	140.8	70.1	ΟK	
	Stor	~~~	Dain		ma Dook		
	Stoj Ever		Rain (mm/hr	Flooded Ti ) Volume			
	Stor Ever			Flooded Ti ) Volume (m³)			
	Ever	nt	(mm/hr	) Volume (m³)	(mins)		
	Ever 15 min	nt Summei	(mm/hr r 144.55	) Volume (m ³ ) 8 0.0	(mins) 123		
	Ever	Summer Summer	(mm/hr r 144.55 r 89.50	) Volume (m ³ ) 8 0.0 6 0.0	(mins)		
	Even 15 min 30 min	Summer Summer Summer	(mm/hr r 144.55 r 89.50 r 55.41	) Volume (m ³ ) 8 0.0 6 0.0 9 0.0	(mins) 123 134		
	Ever 15 min 30 min 60 min 120 min 180 min	Summer Summer Summer Summer Summer	(mm/hr r 144.555 r 89.500 r 55.41 r 34.31 r 25.92	) Volume (m ³ ) 8 0.0 6 0.0 9 0.0 3 0.0	(mins) 123 134 152		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min	Summer Summer Summer Summer Summer	(mm/hr 144.555 144.555 144.555 55.41 15.41 15.92 12.24	<pre>) Volume (m³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0</pre>	(mins) 123 134 152 184 220 254		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min	Summer Summer Summer Summer Summer Summer	(mm/hr 144.555 144.555 55.41 55.41 1 25.92 1.24 16.05	<pre>) Volume (m³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 6 0.0 0 0.0</pre>	(mins) 123 134 152 184 220 254 322		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summer Summer Summer Summer Summer Summer Summer	(mm/hr 144.555 189.500 155.41 134.31 15.92 12.24 16.05 13.15	<pre>) Volume (m³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 6 0.0 0 0.0 5 0.0</pre>	(mins) 123 134 152 184 220 254 322 388		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min	Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.555 144.555 144.555 155.41 14.31 15.92 12.24 16.055 13.15 11.27	<pre>) Volume (m³) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 6 0.0 0 0.0 5 0.0 3 0.0</pre>	(mins) 123 134 152 184 220 254 322 388 454		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min	Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55 89.50 55.41 34.31 25.92 12.24 16.05 13.15 11.27 r 9.93	Volume (m ³ ) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 6 0.0 0 0.0 5 0.0 3 0.0 8 0.0	(mins) 123 134 152 184 220 254 322 388 454 520		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 55.41 55.41 125.92 12.24 16.05 13.15 11.27 19.93 r 7.88	Volume (m ³ ) 8 0.0 6 0.0 9 0.0 3 0.0 3 0.0 6 0.0 0 0.0 5 0.0 3 0.0 5 0.0 3 0.0 8 0.0 2 0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min	Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 55.41 55.41 125.92 12.24 16.05 13.15 11.27 19.93 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.28 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.27 1.28 1.27 1.28 1.27 1.27 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.27 1.27 1.28 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.28 1.27 1.27 1.27 1.28 1.27 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.28 1.27 1.27 1.28 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         6       0.0         5       0.0         3       0.0         5       0.0         3       0.0         5       0.0         2       0.0         6       0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650 908		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 144.55) 144.55) 155.41 15.592 12.24 16.05) 13.15 11.27 19.93 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.2	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         6       0.0         5       0.0         3       0.0         5       0.0         3       0.0         5       0.0         6       0.0         2       0.0         6       0.0         1       0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min	summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 144.55) 144.55) 155.41 15.592 12.24 16.05) 13.15 11.27 19.93 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.2	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         6       0.0         5       0.0         3       0.0         5       0.0         3       0.0         5       0.0         6       0.0         2       0.0         6       0.0         1       0.0         3       0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650 908 1288		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min	summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 144.55) 144.55) 155.41 125.92 121.24 16.05) 13.15 11.27 19.93 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         6       0.0         5       0.0         3       0.0         5       0.0         3       0.0         5       0.0         6       0.0         2       0.0         6       0.0         1       0.0         3       0.0         2       0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650 908 1288 1664		
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	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen Summen	(mm/hr 144.55) 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.41 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44 5	Volume (m³)         8       0.0         6       0.0         9       0.0         3       0.0         6       0.0         3       0.0         5       0.0         3       0.0         5       0.0         3       0.0         2       0.0         1       0.0         2       0.0         4       0.0         0       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0         3       0.0	(mins) 123 134 152 184 220 254 322 388 454 520 650 908 1288 1664 2412 3152 3904		

Stantec UK						Page 2
Dominion House						
Warrington						The second
Date 08/09/2021 09:01		Designe	d by hekel	ly		Micro
File Restored - IT6.SRCX		Checked	by			Drainago
Innovyze			 Control 20	20.1		
Summary of Resul	ts fo	or 100 y	ear Return	Perio	d (+40%)	
Storm	Max	Max	Max	Max	Status	
Event	Level	Depth 1	Infiltration	Volume		
	(m)	(m)	(l/s)	(m³)		
60 min Winter	19 77	6 0 776	152.0	82.2	ОК	
120 min Winter			186.4		ОК	
180 min Winter	20.11	5 1.115	203.5	137.8	ОК	
240 min Winter			214.9	150.1	O K	
360 min Winter			228.2	164.4	O K	
480 min Winter 600 min Winter			224.3 218.8	160.2 154.2	ок ок	
720 min Winter			218.8	154.2	O K O K	
960 min Winter			192.8	126.3	ОК	
1440 min Winter	19.85	2 0.852	163.5	94.7	ОК	
2160 min Winter			135.0	63.9	O K	
2880 min Winter			116.4		ОК	
4320 min Winter 5760 min Winter			98.4 85.8		ок ок	
7200 min Winter			78.5		ОК	
8640 min Winter			73.1		ОК	
Sto: Ever		Rain (mm/hr)		me-Peak mins)		
			(m ³ )			
60 min				152		
120 min				188		
180 min 240 min				224 260		
360 min				330		
480 min	Winte	r 13.155		398		
600 min				466		
720 min 960 min				534 670		
960 min 1440 min				670 934		
2160 min				1332		
2880 min	Winte	r 3.253		1724		
4320 min				2536		
5760 min 7200 min				3336		
7200 min 8640 min				4152 5032		
	©198	2-2020	Innovyze			

Stantec UK		Page 3
Dominion House		
Warrington		Micro
Date 08/09/2021 09:01	Designed by hekelly	Drainage
File Restored - IT6.SRCX	Checked by	Diamage
Innovyze	Source Control 2020.1	
Ra	infall Details	
Rainfall Mode	el FEH	
Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950 m) -0.026	
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D2 (1kr		
D3 (1km		
E (1ku F (1ku		
Summer Store	,	
Winter Store		
Cv (Summe: Cv (Winte:		
Shortest Storm (min		
Longest Storm (min		
Climate Change	8 +40	
~1.0		
©198	32-2020 Innovyze	

Stantec UK		Page 4
Dominion House		
Warrington		The second
		Mirco
Date 08/09/2021 09:01	Designed by hekelly	Drainago
File Restored - IT6.SRCX	Checked by	Drainage
Innovyze	Source Control 2020.1	1

## Model Details

Storage is Online Cover Level (m) 21.000

## Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	1.00000	Trench Width (m) 1.0
Infiltration Coefficient Side (m/hr)	1.00000	Trench Length (m) 545.0
Safety Factor	2.0	Slope (1:X) 1000.0
Porosity	0.30	Cap Volume Depth (m) 0.000
Invert Level (m)	19.000 Ca	p Infiltration Depth (m) 0.000

Stantec UK								Page 1
ominion He	ouse							
Marrington								
Date 07/09	/2021 17:1	3	Des	igned b	y hekelly	v		Micro
File Cascad	de - Basir	1 to IT.		cked by		•		Draina
Innovyze					trol 2020	0.1		
	Cascade	Summary o	f Result	s for H	Restored	- Basi	n1.SRC	ĽX
	-	stream	Outflow	То	Overfl	Low To		
	Str	uctures						
		(None) Res				- 117.SRG	2X	
			f Drain T					
	Storm Event			lax	Max Control Σ	Max	Max	Status
	HVCIIL	-		(/s)	(1/s)	(1/s)	(m ³ )	
			, ,	,				
	min Summer min Summer			58.0 68.3	0.0 0.0	58.0 68.3	171.9 241.3	ОК ОК
	min Summer min Summer			68.3 77.0	0.0	68.3 77.0	241.3 304.9	-
	min Summer			91.8	0.0	91.8		
180	min Summer	18.106 1.1	L06	100.2	14.9	115.0	493.9	O K
	min Summer			100.6	40.7	141.2		-
	min Summer			100.8	61.0	161.9		ОК
	min Summer min Summer			100.9 100.9	67.4 67.4	168.2 168.2		
	min Summer			100.9	70.6	171.5	500.4	0 K
	min Summer			100.8	58.0	158.7		-
1440	min Summer	18.111 1.1	L11	100.5	38.0	138.5	497.1	ОК
	min Summer			100.2	18.9	119.1	494.4	
	min Summer min Summer			96.9	0.0	96.9 88.2		ОК ОК
	min Summer			88.2 79.7	0.0 0.0	88.2 79.7		-
7200	min Summer	17.743 0.7	743	74.6	0.0	74.6	287.1	ОК
		Storm	Rain	Flooded	Discharge	Time-Pe	ak	
		Event	(mm/hr)	Volume	Volume	(mins	)	
				(m³)	(m³)			
		min Summer		0.0	1243.8		.64	
		min Summer		0.0	1516.1		.80	
		min Summer min Summer		0.0	2071.3 2600.1		204 244	
		min Summer		0.0	3007.0		274	
		min Summer		0.0	3356.0		84	
		min Summer		0.0	3952.9		32	
		min Summer		0.0	4439.7		90 50	
		min Summer min Summer		0.0	4864.9 5243.9		52 12	
		min Summer			5589.6		38	
	1440	min Summer		0.0	6059.4		10	
		min Summer		0.0	7807.3		16	
		min Summer			8417.8		68	
		min Summer min Summer			9715.4 11615.2		24 72	
		min Summer			12809.6		16	

Stantec UK									Page 2
Dominion H									8
larrington									
Data 07/00	/2021 17:1	2		Deria		- b-l11.			Micro
						y hekell	Y		Draina
	de - Basin				ted by	1 000	0 1		
Innovyze				Sourc	ce Con	trol 202	0.1		
	Cascade S	Zummary	of Pe	aulta	for F	Pestored	- Bagiı	1 GPC	v
	<u>Cascaue</u>	OI KE	SUILS	IOLI	lescoreu	- Dasi	II. SKC	<u>^</u>	
	Storm	Max	Max	Max	ĸ	Max	Max	Max	Status
	Event		-			Control $\Sigma$			
		(m)	(m)	(1/:	S)	(l/s)	(l/s)	(m³)	
8640	) min Summer	17.683	0.683		70.5	0.0	70.5	257.6	ОК
	5 min Winter				54.9	0.0	54.9	152.2	ОК
	) min Winter				64.1	0.0	64.1	212.3	ОК
	) min Winter				73.8	0.0	73.8	281.0	ОК
	) min Winter				93.8	0.0	93.8	439.1	ОК
	) min Winter				100.5	35.4	135.8		ОК
	) min Winter				100.8	61.0	161.9	499.9	O K
	) min Winter ) min Winter				101.0	80.6 77 2	181.6	501.5 501.2	OK
	) min Winter ) min Winter				101.0	77.2 70.6	178.2 171.5	501.2	ОК ОК
	) min Winter ) min Winter				100.9 100.9	70.6 67.4	1/1.5	500.6	O K O K
	) min Winter ) min Winter				100.9	67.4 49.1	168.2 149.7	498.4	0 K 0 K
	) min Winter				100.7	25.5	125.9	498.4	0 K
	) min Winter				96.0	0.0	96.0	458.2	ОК
	) min Winter				84.4	0.0	84.4	361.7	ОК
	) min Winter				72.2	0.0	72.2		ОК
	) min Winter				62.9	0.0	62.9	204.5	ОК
7200	) min Winter	17.485	0.485		57.4	0.0	57.4	168.2	ОК
8640	) min Winter	17.420	0.420		53.2	0.0	53.2	141.8	ОК
		Storm	7-		1	Dischause		- <b> </b> -	
		Event			Volume	Discharge Volume	(mins		
		Lvenc	(1111)	/ /	(m ³ )	(m ³ )	(1111)	,	
								60	
	0.540		-			1 2 2 2 1 2		68	
		min Sum		.463	0.0	13831.8			
	15	min Win	ter 144	.558	0.0	1248.0	1	62	
	15 30	min Win min Win	ter 144 ter 89	.558 .506	0.0 0.0	1248.0 1489.0	1	62 78	
	15 30 60	min Win	ter 144 ter 89 ter 55	.558 .506 .419	0.0 0.0 0.0	1248.0 1489.0 2096.5	1 1 2	62 78 02	
	15 30 60 120	min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34	.558 .506 .419 .313	0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4	1 1 2 2	62 78 02 44	
	15 30 60 120 180	min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25	.558 .506 .419	0.0 0.0 0.0	1248.0 1489.0 2096.5	1 1 2 2 2 2	62 78 02	
	15 30 60 120 180 240	min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21	.558 .506 .419 .313 .923	0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8	1 1 2 2 2 2 2	62 78 02 44 52	
	15 30 60 120 180 240 <b>360</b>	min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16	.558 .506 .419 .313 .923 .246	0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5	1 1 2 2 2 2 2 2 3	62 78 02 44 52 66	
	15 30 60 120 180 240 <b>360</b> 480	min Win min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13	.558 .506 .419 .313 .923 .246 .050	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8	1 1 2 2 2 2 2 2 2 3 3 3	62 78 02 44 52 66 20	
	15 30 60 120 180 240 <b>360</b> 480 600	min Win min Win min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11	.558 .506 .419 .313 .923 .246 .050 .155	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 <b>4551.8</b> 5036.5	1 1 2 2 2 2 2 3 3 3 4	62 78 02 44 52 66 20 76	
	15 30 60 120 180 240 360 480 600 720 960	min Win min Win min Win min Win min Win min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 <b>4551.8</b> 5036.5 5456.2 5829.7 6205.5	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42	
	15 30 60 120 180 240 360 480 600 720 960 1440	min Win min Win min Win min Win min Win min Win min Win min Win min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5	1 1 2 2 2 2 2 3 3 3 4 5 6 9 9	62 78 02 44 52 66 20 76 42 22 42 12	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1 ter 1 te	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964 .670		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1 ter 1 te	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1 ter 1 te	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964 .670		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1 ter 1 te	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964 .670		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 2 ter 1 ter 1 te	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964 .670		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24 24	
	15 30 60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Win min Win	ter 144 ter 89 ter 55 ter 34 ter 25 ter 21 ter 16 ter 13 ter 11 ter 9 ter 7 ter 5 ter 4 ter 3 ter 1 ter 1 ter 1 ter 1 ter 1 ter 1 ter 1	.558 .506 .419 .313 .923 .246 .050 .155 .273 .938 .882 .686 .101 .253 .422 .964 .670 .463		1248.0 1489.0 2096.5 2802.4 3299.8 3746.5 4551.8 5036.5 5456.2 5829.7 6205.5 6754.5 8492.4 9026.4 10121.7 11779.7 12763.6 13593.3	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	62 78 02 44 52 66 20 76 42 22 42 12 28 24 24 24 24	

Stantec UK		Page 3
Dominion House		
Warrington		the second
		Micro
Date 07/09/2021 17:13	Designed by hekelly	Drainage
File Cascade - Basin 1 to IT	Checked by	Diamage
Innovyze	Source Control 2020.1	
<u>Cascade Rainfall Det</u>	ails for Restored - Basin1.SRCX	
Rainfall Mode		
Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950	
C (1km D1 (1km		
D2 (1km	n) 0.314	
D3 (1km		
E (1kn F (1kn		
Summer Storn	ns Yes	
Winter Storm		
Cv (Summer Cv (Winter		
Shortest Storm (mins	s) 15	
Longest Storm (mins		
Climate Change	°€ +40	

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Stantec UK		Page 4
Dominion House		
Warrington		Sec. 1
		Micro
Date 07/09/2021 17:13	Designed by hekelly	Drainage
File Cascade - Basin 1 to IT	Checked by	Diamaye
Innovyze	Source Control 2020.1	-
<u>Cascade Model Deta</u>	ils for Restored - Basin1.SRCX	
Storage is On	line Cover Level (m) 18.500	
Infiltra	tion Basin Structure	
	rt Level (m) 17.000 Safety Factor 2.0	
Infiltration Coefficient Infiltration Coefficient		
Depth (m) Are	ea (m ² ) Depth (m) Area (m ² )	
0.000	280.0 1.500 800.0	
Weir	Outflow Control	
Discharge Coef 0.544 Wid	dth (m) 20.000 Invert Level (m) 18.100	

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Stantec UK							Page 1
Dominion House		T					
Warrington							The second
							Mirco
Date 07/09/2021 1	L7:12	I	Designe	d by hek	elly		Dcaina
File Cascade - Ba	asin 1 to I7	r   c	Checked	by			Digitig
Innovyze		S	Source	Control	2020.1		
Casc	ade Summary	of Re	esults	for Rest	ored - I	T7.SRCX	
	-	tream	Οι	itflow To (	Overflow 1	<b>'</b> 0	
	Struc	ctures					
	Restored -	Basinl	.SRCX	(None)	(None	e)	
	Ha	lf Drai	n Time :	: 13 minute	es.		
	Storm Event	Max	Max Dopth 1	Max Infiltratio	Max Nolumo	Status	
	Evenc	(m)	(m)	(1/s)	(m ³ )		
				(_/0)	( <u> </u>		
	15 min Summer				.0 0.0	ОК	
	30 min Summer 50 min Summer				.0 0.0 .0 0.0	ОК ОК	
	20 min Summer				.0 0.0	ОК	
18	80 min Summer	15.566	0.066	14	.3 1.0	O K	
	40 min Summer			27		ΟK	
	50 min Summer 30 min Summer			41 48		ок ок	
	00 min Summer			40 52		0 K	
	20 min Summer			54		ОК	
	50 min Summer			46		O K	
	40 min Summer 50 min Summer			31 16		ОК ОК	
	30 min Summer				.0 0.0	0 K	
432	20 min Summer	15.500	0.000	0	.0 0.0	ОК	
	50 min Summer				.0 0.0	ОК	
/20	00 min Summer	15.500	0.000	U	.0 0.0	ОК	
	Stor	~ <b>m</b>	Rain	Floodod	Time-Peak		
	Sto: Eve:		(mm/hr)		(mins)		
	-			(m ³ )			
	15 min	Summore	144.558	3 0.0	0		
		Summer			0		
		Summer			0		
	120 min				0		
	180 min 240 min				276		
	240 min 360 min				306 368		
	480 min				426		
	600 min				486		
	720 min				554		
	960 min 1440 min				680 944		
	2160 min				1332		
	2880 min				0		
	4320 min				0		
	5760 min				0		
	7200 min	Summer	1.670	0.0	0		
		©1982	-2020	Innovyze			

Stantec UK Dominion Hou	90					
arrington						
ate 07/09/2	021 17:12		Designe	d by hek	ellv	
	- Basin 1 to II		Checked		.ciiy	
Innovyze				Control	2020 1	
iiiiovy2c			Dource	000000	2020.1	
	Cascade Summary	of F	Results	for Rest	cored - I	T7.SRC
	Storm	Max	Max	Max	Max	Status
	Event	Level	Depth :	Infiltrati	on Volume	
		(m)	(m)	(1/s)	(m³)	
	8640 min Summer	15.50	0.000	0	.0 0.0	ОК
	15 min Winter	15.50	0.000	0	.0 0.0	ОК
	30 min Winter				.0 0.0	ОК
	60 min Winter				.0 0.0	ОК
	120 min Winter				.0 0.0	ОК
	180 min Winter 240 min Winter				.0 12.8 .0 41.2	ОК
	360 min Winter				.8 74.2	-
	480 min Winter				.9 76.0	ОК
	600 min Winter				.4 73.6	ОК
	720 min Winter			58	.6 69.2	O K
	960 min Winter				.5 46.7	O K
	1440 min Winter				.9 12.5	ОК
	2160 min Winter 2880 min Winter				.0 0.0 .0 0.0	ОК
	4320 min Winter				.0 0.0	ОК
	5760 min Winter				.0 0.0	ОК
	7200 min Winter	15.50	0.000	0	.0 0.0	ОК
	8640 min Winter	15.50	0.000	0	.0 0.0	ОК
	Stor	m	Rain	Flooded	Time-Peak	
	Ever	it	(mm/hr)	) Volume (m³)	(mins)	
	8640 min				0	
	15 min 30 min		r 144.558 r 89.506		0	
	60 min				0	
	120 min				0	
	180 min				270	
	240 min	Winter	r 21.246	5 0.0	296	
	360 min				358	
	480 min				422	
	600 min 720 min				488	
	720 min 960 min				554 690	
	1440 min				964	
	2160 min				0	
	2880 min	Winter			0	
	4320 min			2 0.0	0	
	5760 min				0	
	7200 min				0	
	8640 min	Winter	r 1.463	3 0.0	0	

Stantec UK		Page 3
Dominion House		
Warrington		The second
		Micro
Date 07/09/2021 17:12	Designed by hekelly	Drainage
File Cascade - Basin 1 to IT	Checked by	Diamage
Innovyze	Source Control 2020.1	
<u>Cascade Rainfall D</u>	etails for Restored - IT7.SRCX	
	- ]	
Rainfall Mode Return Period (years		
FEH Rainfall Versio	on 1999	
	on GB 447250 107950 SU 47250 07950	
C (1kı D1 (1kı		
D2 (1kt		
D3 (1km		
E (1ki		
F (1ku Summer Store		
Winter Store	ns Yes	
Cv (Summe:		
Cv (Winte: Shortest Storm (min:		
Longest Storm (min		
Climate Change	8 +40	
	22 2020 Tanor	
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Stantec UK		Page 4
Dominion House Warrington		Micro
Date 07/09/2021 17:12	Designed by hekelly	Drainage
File Cascade - Basin 1 to IT	Checked by	Diamage
Innovyze	Source Control 2020.1	
Storage is Or <u>Infiltrat</u> Infiltration Coefficient Base (m Infiltration Coefficient Side (m Safety Fa Poro	/hr) 1.00000 Trench Length (m)	) 72.0 ) 1000.0 ) 0.000