From: Matthew Brewer <matthew.brewer@rpsgroup.com>
Sent: 08 April 2019 17:03
To: Grandfield, Andy <Andy.Grandfield@eastleigh.gov.uk>
Cc: Louise Braine <Louise.Braine@rpsgroup.com>
Subject: RE: GE Hamble

Andy

Thank you for sending over the updated education contribution figures and the update from HCC. I understand that Nick at HCC was due to meet internally last week and would be grateful if you could confirm the outcome and whether we are now able to confirm HCCs position.

In respect to other outstanding matters, I attach the complete Natural England response. This goes through and provides response to the points raised in their consultation comments, and also updates in respect of the revised layout. I would be grateful if you could provide this to NE as soon as possible to get their confirmation on these points.

I believe that there no other outstanding information you are awaiting from me at this time.

In terms of the below, can you please confirm you will be providing this week:

- Response on the viability assessment;
- Final S106 Heads of Terms;
- Consultation response update;
- Any outstanding issues or matters which you believe are outstanding to be addressed to complete your committee report;
- Feedback on the LB application.

It would be great to establish an agenda and key participants this week for our meeting on the 25th.

I will give you a call tomorrow to catch up on the phone to ensure we are prepared for the 25th meeting and have all in hand to get to the June committee meeting.

Kind Regards
Matt

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Our Ref: 133255-R2(1)-Addendum
Natural England Ref: O/18/84191

08th April 2019

Andy Grandfield
Eastleigh Borough Council

Dear Andy,

Re: GE Aviation, Hamble-le-Rice

We refer to the Flood Risk Assessment report (RSK ref 133255-R1(2)-FRA, dated August 2018) and Ecological Surveys Summary report (857362 - GE Aviation - Ecological Surveys Summary Letter Rev00) prepared by RSK in support of the recently submitted planning application for a residential development at the above site.

Following submission of the report, we have since received comments from Natural England (NE) in their letter dated 19th November 2018. The letter states *"As submitted, the application could have potential significant effects on Solent & Southampton Water Special Protection Area (SPA) and ancient semi-natural woodland. Natural England requires further information in order to determine the significance of these impacts and the scope for mitigation.*

The following information is required:

- *Further detail on the proposed surface water drainage strategy and how impacts on European protected sites will be avoided and/or mitigated.*
- *Woodland management plan that demonstrates how impacts on ancient woodland and Lowland Mixed Deciduous Woodland priority habitat will be avoided and/or mitigated by the proposals."*

The response requests that the following comments are addressed as part of the layout and flood risk assessment:

NE Point 1: Solent & Southampton Water Special Protection Area (SPA) - Surface Water Drainage

"Step 3 under Section 26.7.1 of the SuDS manual outlines that the requirement for extra treatment should be considered in relation to discharge to environmentally protected sites. It states that 'an additional treatment component (i.e. over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance'.

Due to the proximity of the SPA, it is advised that further consideration is given to potential impacts via poor water quality. Further detail and/or clarification should be provided on the specific measures incorporated to remove oils and other pollutants such as heavy metals and particulates prior to discharge into the watercourse. It may be deemed that additional measures should be incorporated in line with the precautionary principle when undertaking the Habitats Regulations Assessment. Further features that may be incorporated could include the provision of rainwater harvesting features on site (to reduce run-off volume), oil interceptors and further opportunity for particulate settlement."

RSK response

We should note that the strategy proposes options for surface water drainage disposal rather than a definite solution, due to the outline nature of the planning application, and the lack of specific Site Investigation data at the time of writing to confirm infiltration feasibility. The formal point of surface water discharge would need to be confirmed pending further investigations at the detailed design stage.

To address NE concerns about potential impacts of discharge to the watercourse (if this option is selected), further information is provided as below.

National Standards for Sustainable Drainage

As quoted from the National Standards for Sustainable Drainage[1] '*the minimum number of treatment stages depends on the potential hazards on the site together with the sensitivity of the receiving water body to pollution*'. Table 1 classifies the hazard level of surface runoff from different sources.

Table 1: Water quality - level of hazard

Hazard	Example
Low	Roof drainage
Medium	Residential, amenity, commercial, industrial uses includes car parking and roads
High	Areas used for handling and storage of chemicals and fuels, handling and storage of waste (including scrap-yards). Lorry, bus or coach parking or turning areas

The following table indicates the number of treatment stages required before surface runoff should reach the water body. The minimum number of treatment stages must be in accordance with the following table.

Table 2: Minimum number of treatment stages to surface water

Hazard	Normal Surface Water	Sensitive Surface Water
Low	0	1
Medium	2	3
High	Consult the Environment Agency	

Given the presence of the SPA, and as stated within the original FRA report, the receiving waterbody could be considered as a sensitive surface water receptor. In accordance with Table 2, it is recommended that a minimum of 1-3 levels of treatment is required for runoff from the site into the ordinary watercourse near to the site, which ultimately discharges into Southampton Water/Solent.

SuDS Manual

In accordance with Table 4.3 of the SuDS Manual[2], the proposed development for the site can be summarised with the following pollution hazard levels and management requirements for discharge to the receiving surface water:

- Residential roofs – **Very Low** Pollution Hazard – Simple Index Approach; and
- Individual property driveways, roofs, residential car parks, low traffic roads, non-residential car parking with infrequent change (schools, offices) – **Low** Pollution Hazard – Simple Index Approach.

[1] DEFRA, 'National Standards for sustainable drainage systems – Designing, constructing, operating and maintaining drainage for surface runoff', December 2011.
[2] CIRIA, 'The SUDS Manual – C753', 2015.

It is therefore considered appropriate to use the Simple Index Approach (SIA) for the purpose of this assessment. The Simple Index Approach (SIA) to assessing water quality management requirements has been developed by CIRIA to support the implementation of the water quality management design methods set out in the SuDS Manual, with appropriate cross referencing to the relevant 'Design Conditions'. The CIRIA Susdrain website contains a spreadsheet based procedure that can be used for all the UK.

The notes for Table 4.3 of the SuDS Manual indicate that extra measures may be required for discharges to protected resources and points to Section 26.7.1 Step 3, which states 'where the discharge is to protected surface waters or groundwater, an additional treatment component or other equivalent protection is required'.

Simple Index Approach
Table 26.1 of the SUDS Manual indicates that for the Simple Index Approach:

- Simple pollution hazard indices should be based on land use (e.g. Table 26.2); and
- Risk reduction for Surface Water should be done using Simple SuDS hazard mitigation indices (e.g. Table 26.3)

Extracts of Tables 26.2 and 26.3 are replicated below, highlighting the relevant features applicable to this site:

Table 3: Extract of SuDS Manual Table 26.2: Pollution hazard indices for different land use classifications

Land Use	Pollution Hazard Level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, homezones and general access roads) and non-residential parking with in-frequent change (e.g. schools, offices) ie. <300 traffic movements a day	Low	0.5	0.4	0.4

Table 4: Extract of Table 26.3: Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation Indices		
Types of SuDS Component	TSS	Metals	Hydrocarbons
Swale	0.5	0.6	0.6
Permeable Paving	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

The SuDS Manual States:

Total SuDS mitigation index ≥ pollution hazard index
(for each contaminant type) (for each contaminant type)

Taking each land type use in turn:

- Residential roofs – a swale alone (mitigation 0.5-0.6) is sufficient to mitigate for any of the potential pollutants (indices 0.05-0.2); and
- Individual property driveways, residential car parks, low traffic roads, non-residential car parking with infrequent change (schools, offices) – permeable pavement alone (mitigation 0.6-0.7) is sufficient to mitigate for any of the potential pollutants (indices 0.4-0.5).

Summary

Although the Simple Index Approach matrices from the SuDS Manual initially indicate that one feature alone should provide adequate treatment, the sensitivity of the receiving watercourse indicates that additional levels of treatment will be required. Policy DM6 of the draft Local Plan 2016-2036 states *"All SuDS schemes should: manage surface water runoff as close to its source as possible and include at least three forms of naturalised filtration within the treatment train wherever feasible".*

As will be described further below, the surface water drainage strategy has been updated to reflect changes to the layout and as part of this update, additional treatment stages have been incorporated. All surface water runoff will pass through a minimum of three treatment stages in PC1, therefore satisfying the requirement for three treatment stages as highlighted in Table 2 and NE's requirements. Surface water runoff will pass through permeable paving, swales and detention/infiltration basins (where applicable). A petrol interceptor / proprietary treatment system has been included as a treatment stage to provide specific measures to remove oils and other pollutants such as heavy metals.

It is worth noting that PC2 is proposed to drain via a surface water sewer. However, this sewer has the potential to drain into Southampton Water, which forms part of the Solent and Southampton Water SPA. Therefore, the surface water drainage strategy for this catchment will also need to satisfy more stringent water quality requirements. As this catchment only contains non-residential car parking and low traffic roads, permeable paving alone (mitigation 0.6-0.7) should be sufficient to mitigate for any potential pollutants (hazard indices 0.4-0.5), under the Simple Index Approach. However, in line with Step 3 under Section 26.7.1 of the SuDS manual, an extra treatment stage should be considered due to the sensitive nature of the water body. A swale and petrol interceptor / proprietary treatment system have therefore been included in the updated indicative surface water drainage strategy before surface water is discharged to the sewer as to provide additional treatment stages specifically to remove oils and other pollutants.

Additional proprietary treatment systems (including catch pits and interceptors where applicable) could provide additional levels of treatment, to be considered at the detailed design stage, when more information is available.

It is therefore considered that, the inclusion of the sustainable drainage features as detailed, provides sufficient treatment of surface water before discharge to the watercourse, even considering the presence of the SPA. Any further requirements for additional treatment could be incorporated within an appropriately worded planning condition, which would be addressed at reserved matters stage.

NE Point 2: Ancient woodland and Lowland Mixed Deciduous Woodland priority habitat – 20m buffer

> *"It is advised that further information is provided that clearly demonstrates how ancient woodland will be protected by the proposals, considering impacts including those outlined above. The 20m buffer of semi natural habitat should be incorporated into the design layout, and measures for protecting and enhancing the adjacent woodland should be provided (e.g. strengthening of boundary to prevent formation of desire lines, provision of enhancement features for woodland species etc.)."*

RSK Response
The layout has been updated to include the 20m buffer from the western site boundary as requested by NE. **Appendix A** contains the latest site proposed layout (Fluid drawing no. FD16-1431-56 Indicative Site Plan dated June 2017). The inclusion of this buffer ensures no built footprint encroaches within 20m of the western site boundary, beyond which lies priority habitat.

NE Point 3: Ancient woodland and lowland mixed deciduous woodland priority habitat: surface water drainage

> *"Consideration should also be given to potential impacts arising from the proposed surface water drainage strategy. It is noted that a detention basin (or infiltration basin) is proposed along the western boundary adjacent to the ancient woodland. Further detail should be provided that outlines how changes to local hydrology will not impact this site, along with any associated works or infrastructure. If it cannot be ascertained that impacts will be avoided (e.g. through amending the proposed strategy), then measures for mitigation of impacts and compensation for any habitat loss should be outlined in detail."*

RSK Response
RSK have reviewed the revised layout (**Appendix A**) and can provide the following revisions to the surface water drainage strategy:

Development Proposals
Amendments to the masterplan show that although 148 units have been retained, the reconfiguration of the site has decreased the proposed impermeable area of PC1. PC2 has roughly remained the same. The red line boundary has been extended slightly in the southeast of PC2, however as with the playing fields, this is assumed to drain as is so no additional calculations are provided for this area.

The approximate land uses for the updated proposal are summarised in Table 1 below.

Table 5: Proposed site land uses

	Updated Proposal	
Land use	**Area (m^2)**	**Percentage**
PC1		
Impermeable	18,044	39%
Permeable	28,483	61%
Sub-total	46,527	-
PC2		
Impermeable	17,378	63%
Permeable	9,867	37%
Sub-total	27,245	-
Whole site – excluding Sydney House and sports pitches		
Impermeable	35,422	48%
Permeable	38,350	52%
Total	**73,772**	**100%**

Surface Water Drainage Strategy

As a result of the updated masterplan, the configuration of the units in PC1 has changed significantly, therefore making the drainage calculations and surface water drainage strategy contained within 133255-R1(2)-FRA obsolete for this catchment. Although the layout of PC2 has not changed significantly, it is also necessary to update the drainage calculations and surface water drainage strategy for this area as to meet water quality requirements.

Storage Estimates

Following the same principles set out in the original FRA report, calculations for PC1 have been undertaken assuming discharge to the watercourse restricted to the QBar Greenfield runoff rate. Calculations for PC1 have been re-run using a discharge rate of 18.5l/s and an impermeable area of 18,044m^2.

Again, following the principles set out in the original FRA report, calculations for PC2 have been undertaken assuming discharge to Southampton Water via a sewer though the wider site, restricted to 50l/s, a 61% reduction on the existing calculated QBar flow (130l/s). Calculations for PC2 have been re-run using a discharge rate of 50l/s and an impermeable area of 17,378m^2.

No allowance is included in the calculations for infiltration and therefore the results illustrate a worst-case scenario. Updated calculations can be found in **Appendix B**.

Table 6 and 7 indicate the storage requirements for PC1 and PC2 respectively. The northeast corner of the site, Sydney House and the entrance road areas are assumed to remain as per the existing scenario and have been excluded from the calculations.

Table 6: PC1 Quick Storage Estimates

Return period	Quick Storage volume (m^3)
1 in 30 year	661
1 in 100 year	910
1 in 100 year + 40% CC	1,406

Table 7: PC2 Quick Storage Estimates

Return period	Quick Storage volume (m^3)
1 in 30 year	443
1 in 100 year	633
1 in 100 year + 40% CC	987

Proposed Drainage Strategy

As a result of the increased storage requirement, treatment requirements and altered layout, the proposed drainage strategy has been updated.

The proposed SuDS for the site include a combination of porous surfaces, modular storage, swales and detention basins. The proposed SuDS features are designed to provide approximately 1,680m^3 of storage in PC1 and 1269m^3 in PC2. This is in excess of the required storage volumes to retain the 1 in 100 plus 40% climate change event on site: 1,406m^3 and 987m^3 for PC1 and PC2 respectively. The SuDS measures are outlined in the Indicative Surface Water Strategy as attached in **Appendix C**.

In principle, the strategy contains the following features and criteria:

- Porous surfacing has been considered within tertiary road networks. This will reduce the site impermeable area and will provide water quality benefits;
- Detention basins providing attenuation, amenity and biodiversity benefits;
- Swales to be used as both attenuation and conveyance channels to transfer surface water flows to larger attenuation features;
- As the development proposals are refined, consideration should be given to green roofs and rainwater harvesting;
- Indicative SuDS features cover more than 23% of the site (PC1 & PC2) (which is in excess of the 10% requirement from EBC);
- Petrol interceptors are to be included at points of discharge to provide additional levels of treatment as part of the response to NE Point 1; and
- As outlined above, the points of discharge are to remain as previously proposed in the original FRA.

The dimensions, volumes and location of the SuDS features will need to be revised as the masterplan develops during the detailed planning stage. Detailed design of individual features is not part of the scope of this addendum or the original FRA document. Preliminary design criteria have been based upon guidance given in the CIRIA publication 'The SuDS Manual'[2].

Maintenance of SuDS features should be undertaken in line with maintenance schedules outlined in the SuDS Manual[2]. Full maintenance schedules should be confirmed at the detailed design stage in consultation with appropriate product suppliers. Any existing and new manholes should be kept accessible as part of the development proposals to ensure access is available for future maintenance. These details should all be covered as part of the reserved matters submissions once the detail is known.

Temporary drainage should be established for the construction phase of development to prevent silt mobilisation, potentially impacting on flow regimes and silt pollution downstream. The construction of SuDS should be considered in the early stages of site design.

Habitat protection

NE's comment echoes Ancient Woodland Guidance[3] which states that '*development should avoid including sustainable drainage schemes in buffer zones unless they respect root protection areas and any change to the water tables does not adversely affect ancient woodland or ancient and veteran trees'*. The site-specific Tree Report[4] indicates the RPA for the ancient woodland to be 5.4m. As a worst-case scenario, assuming the outermost trees are positioned right up to the boundary, the SuDS features have been offset from the western site boundary in line with this to ensure no impact on the ancient woodland. This SuDS basin location is shown within the Indicative Surface Water Drainage Strategy (**Appendix C**).

With regard to altering the water table in such a way that would impact the ancient woodland, as the SuDS features have been located outside of the RPAs, it is likely that the trees themselves would not be affected by the change of regime.

NE Point 4: Ancient woodland and lowland mixed deciduous woodland priority habitat: woodland habitat

> *"Additionally it is noted from the proposed layout plan that a small area of lowland mixed deciduous woodland habitat may require removal for the car parking in the south-western corner of the site, adjacent to the ancient woodland. Clarification should be given regarding any loss of priority habitat*

[3] Forestry Commission and Natural England, 'Ancient woodland, ancient trees and veteran trees: protecting them from development', 5 November 2018.
[4] Camps Environmental Services, 'BS5837 2012 Trees in Relation To Design, Demolition and Construction Tree Report at GE Aviation Site, Hamble, Southampton', February 2018, revised July 2018.

with appropriate justification and proposed mitigation/compensation where its loss cannot be first avoided.

RSK Response
The proposed layout (**Appendix A**) has been updated to show that there will be no loss of woodland habitat and that a 20m buffer has been incorporated into the design to protect the ancient woodland. A woodland management plan, landscape plan and construction environmental management will be produced which will outline the protection, enhancement and on-going management measures of the woodland. The woodland management plan will be included as a reserved matter and will be produced and provided to Natural England for approval before any works take place on site. These matters can all be conditioned to ensure they are appropriately addressed at the detailed design stage as part of the reserved matters.

NE Point 5: Net gain

"The application does not appear to demonstrate how net biodiversity gain will be achieved by the development.
In order for your authority to be assured that the proposal meets the requirements of Natural England standing advice on ancient woodland and European Protected Species and the additional requirements for biodiversity enhancement and net gain as set out in National Planning Policy Framework paragraphs 8, 118, 170, 174 and 175d, Natural England recommends that the application is supported by a Biodiversity Mitigation and Enhancement Plan (BMEP), or equivalent, that has been agreed by the Council's Ecology Specialist."

RSK Response
The proposed indicative scheme has been developed with ecology and biodiversity improvements in mind from first principles. The habitats due to be lost are common and widespread, they are also heavily managed or derive from ornamental planting which reduces their importance for nature conservation.

The scheme retains the football field, bowling green and the trees which front Hamble Road and the footpath to the north. Sydney Lodge is reduced in scale with a number of large extensions removed, and these areas will be landscaped allowing for biodiversity improvements to the grounds of the house. The indicative scheme for the proposed residential element of the site retains a suitable buffer to the ancient woodland to the west, with the tree belt to the northern boundary of the site retained. The indicative scheme also includes the provision of ecological corridors through the site, with landscaped connections linking across the site from east to west and north to south with the surrounding environments.

These key elements of the indicative scheme provide the framework for the detailed proposals at reserved matters stage to develop a Biodiversity Mitigation and Enhancement Plan (BEMP) and secure the required net biodiversity gain, which will be delivered at the detailed design stage and can be secured by an appropriately worded condition.

A BEMP will be submitted and agreed by the Council's Ecology Specialist prior to any works taking place on site. The BEMP will specify and quantify the habitats on site that will be either permanently or temporarily lost and will also include the mitigation for the habitats and the mitigation measures already outlined in existing reports. It has been recommended by the Councils Ecology Specialist that the DEFRA Biodiversity Metric is used to assist with this management plan.

It has been discussed with the case officer, that the BEMP is included as a reserved matter at detailed design stage. This will allow for the detailed landscape management plan and the agreed SuDS features to be included within the management plan.

Conclusions
This letter provides additional evidence and explanation to demonstrate that the updated layout for the development will not increase the risk of flooding post development and will not impact upon the Solent &

Southampton Water Special Protection Area (SPA) and ancient semi-natural woodland. The site has been designed to accommodate surface water flows up to the 1 in 100 year plus 40% climate change storm event in line with current best practice and industry guidance and the appropriate levels of treatment have been incorporated to protect water quality and the sensitive nearby receptors. It is our opinion that the proposed discharge rate and indicative SuDS features are justified, and the indicative surface water drainage strategy presents suitable treatment of the surface water before it is directed to the Solent and Southampton Water SPA to the south of the site.

A new layout has been provided to show that no woodland habitat will be removed, and a 20m buffer will be incorporated into the scheme in order to protect the ancient woodland. A woodland management plan and BEMP will be produced in accordance with the guidelines provided by Natural England and the Council's Ecology Specialist.

If you require any additional information, please do not hesitate to contact the writer.

Yours sincerely,

Sophie Thorpe
Graduate Hydrologist
RSK LDE Ltd

Errol Ibrahim
Senior Ecological Consultant
RSK Environment Ltd

Jemma Looney
Principal Hydrologist
RSK LDE Ltd

Appendices
Appendix A – Latest Proposed Site Layout
Appendix B – Surface Water Drainage Calculations
Appendix C – Indicative Surface Water Drainage Strategy

Planning

This drawing is produced for PLANNING PURPOSES ONLY and isnot to be used for construction.

Not for approval

Notes

	Area (m2)	Number
1 Bed	50 - 55	15
2 Bed	70 - 80	37
3 Bed	84 - 102	79
4 Bed	110-130	17
Total		148

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Client: GE Aviation

Project: GE Aviation
Kings Avenue
Hamble
Southampton, SO31 4NF

Title: Indicative coloured Site Plan

Status: PLANNING

Scale: 1:1000 **Date:** 06/2017

Revision: / **Sheet:** A1

Drg No: FD 16 - 1431 - 56

PC1

RSK Ltd		Page 1
18 Frogmore Road Hemel Hempstead Hertfordshire		
Date 04/04/2019 08:43 File	Designed By SThorpe Checked By	
Elstree Computing Ltd	Source Control W.12.5	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	4.653	Urban	0.000
SAAR (mm)	800	Region Number	Region 7

Results	**l/s**
QBAR Rural	18.5
QBAR Urban	18.5
Q1 year	15.7
Q1 year	15.7
Q30 years	41.9
Q100 years	59.0

PC2

RSK Ltd		Page 1
18 Frogmore Road Hemel Hempstead Hertfordshire		
Date 04/04/2019 08:45 File	Designed By SThorpe Checked By	
Elstree Computing Ltd	Source Control W.12.5	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	2.725	Urban	0.000
SAAR (mm)	800	Region Number	Region 7

Results	**l/s**
QBAR Rural	10.8
QBAR Urban	10.8
Q1 year	9.2
Q1 year	9.2
Q30 years	24.6
Q100 years	34.6

Point data – 133255 – GE Aviation, Hamble

Qbar rainfall depth

1 in 30 year rainfall depth

RAINFALL MODELLING FOR 132891 - GE AVIATION, HAMBLE

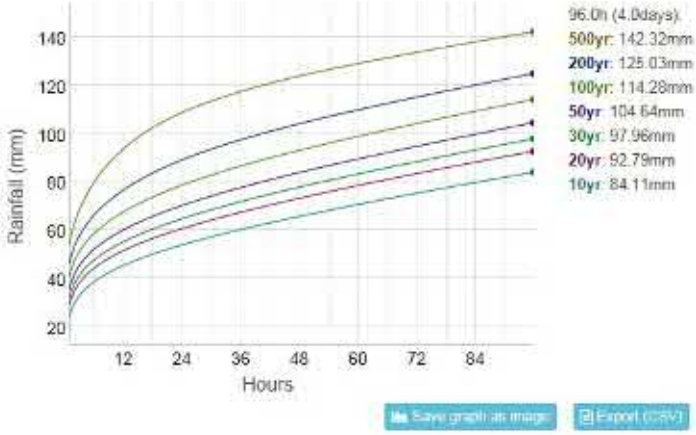
FEH 2013

Point rainfall at 447188, 107265

Design Rainfall Event Rarity

Duration	1	Hours
Return period	30	Years
Depth	31.9	mm

Calculate



Save graph as image Export (CSV)

A design rainfall of 31.9 mm was calculated.

This design rainfall has been calculated for a return period on the annual maximum scale.

Return period options
- Annual maximum
- Peaks over threshold

Duration options
- Fixed
- Sliding

1 in 100 year rainfall depth

RAINFALL MODELLING FOR 132891 - GE AVIATION, HAMBLE

FEH 2013

Point rainfall at 447188, 107265

Design Rainfall Event Rarity

Duration	1	Hours
Return period	100	Years
Depth	40.73	mm

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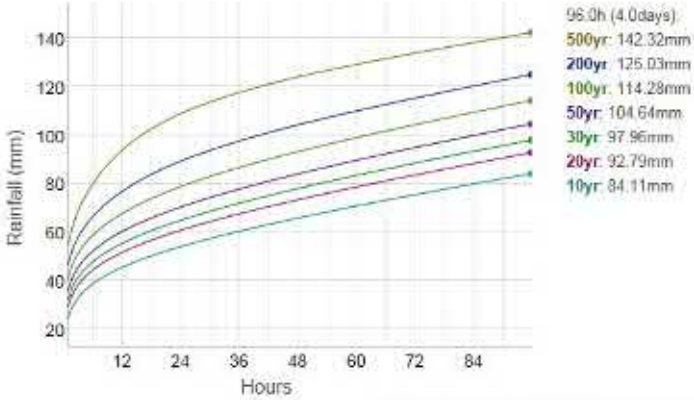

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A design rainfall of 40.73 mm was calculated.

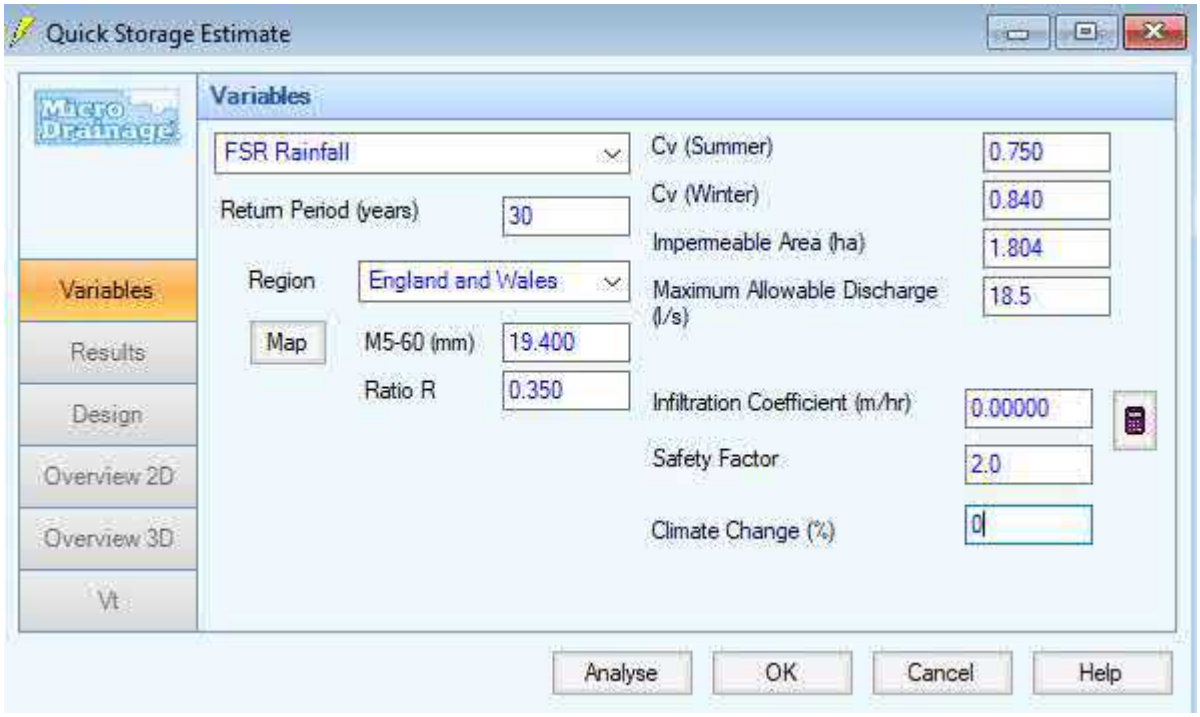
This design rainfall has been calculated for a return period on the annual maximum scale.

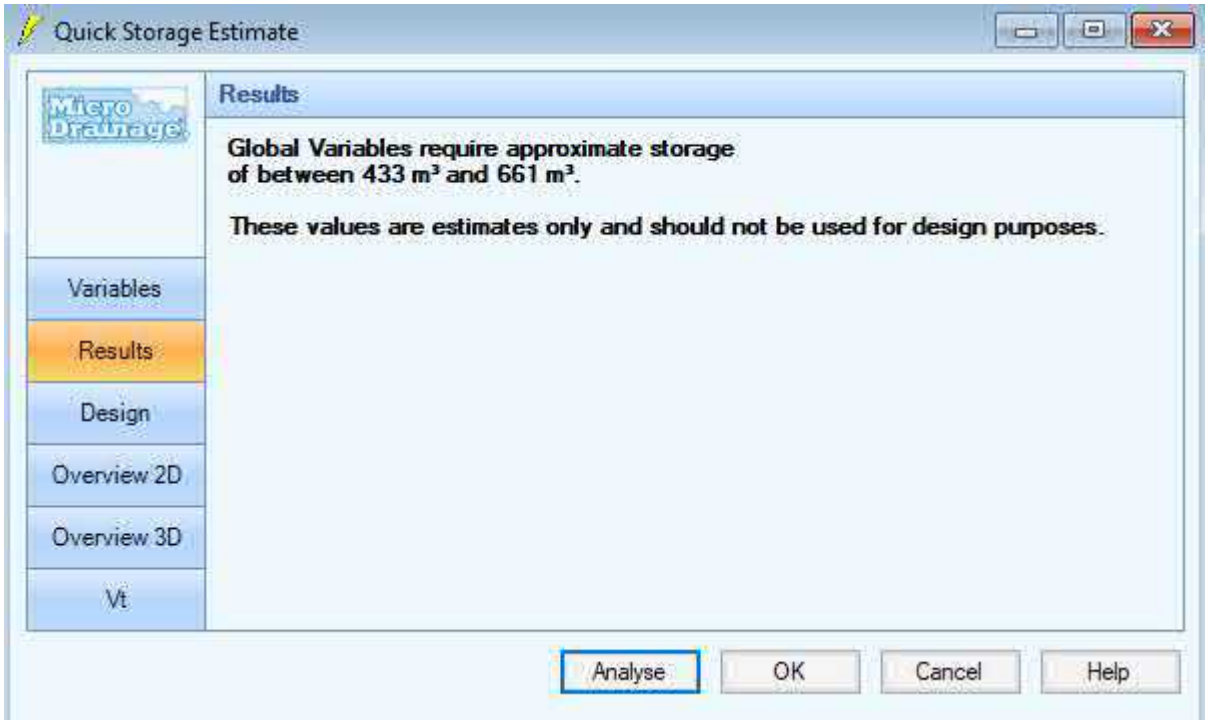
Return period options
- Annual maximum
- Peaks over threshold

Duration options
- Fixed
- Sliding

133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC1

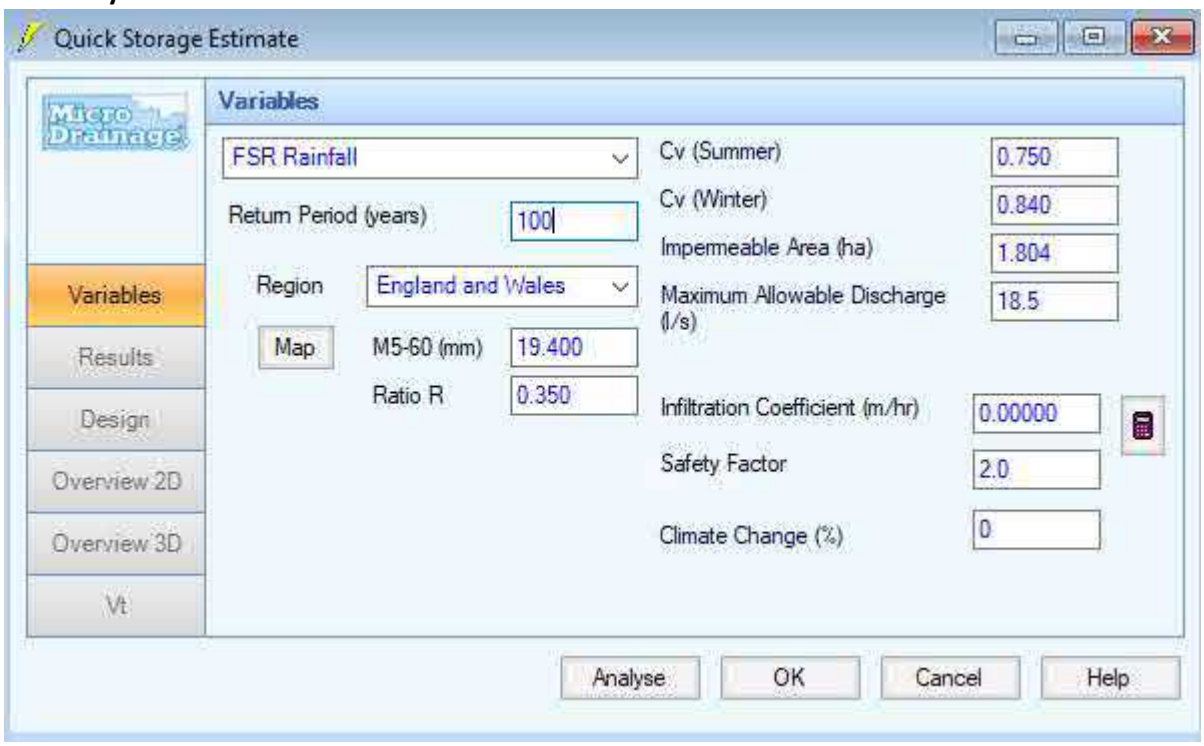
1 in 30 year event

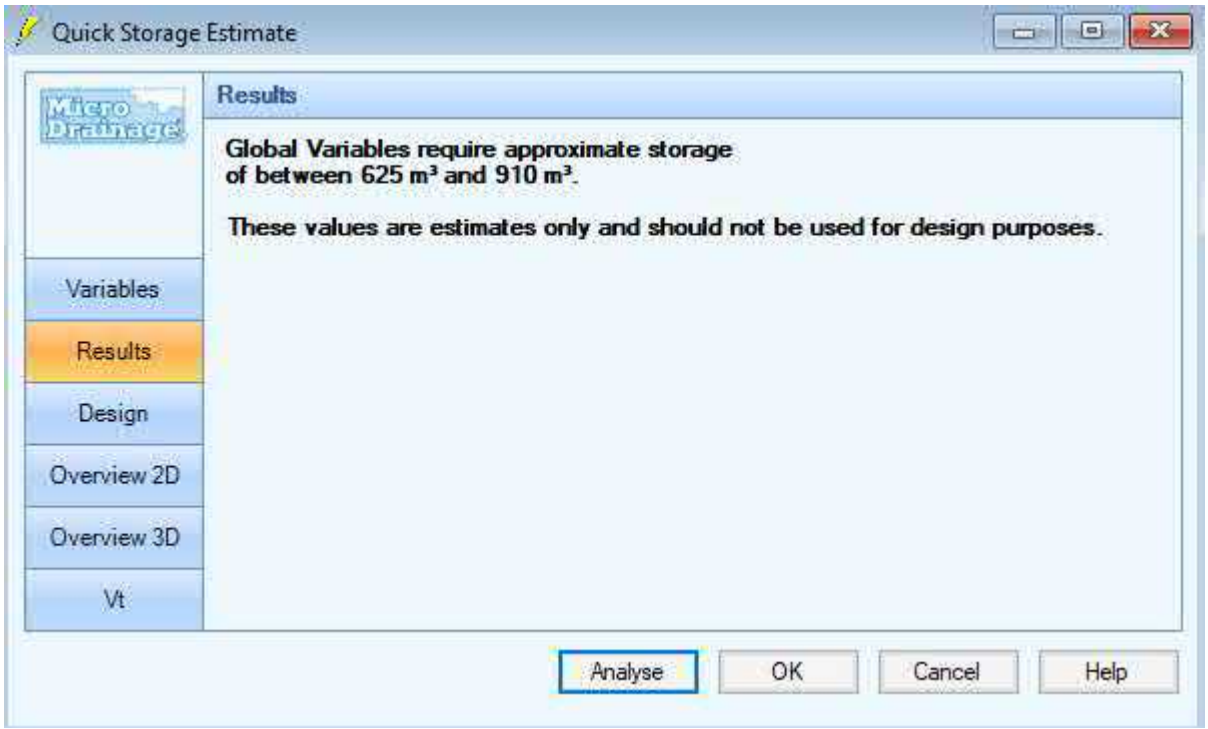




133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC1

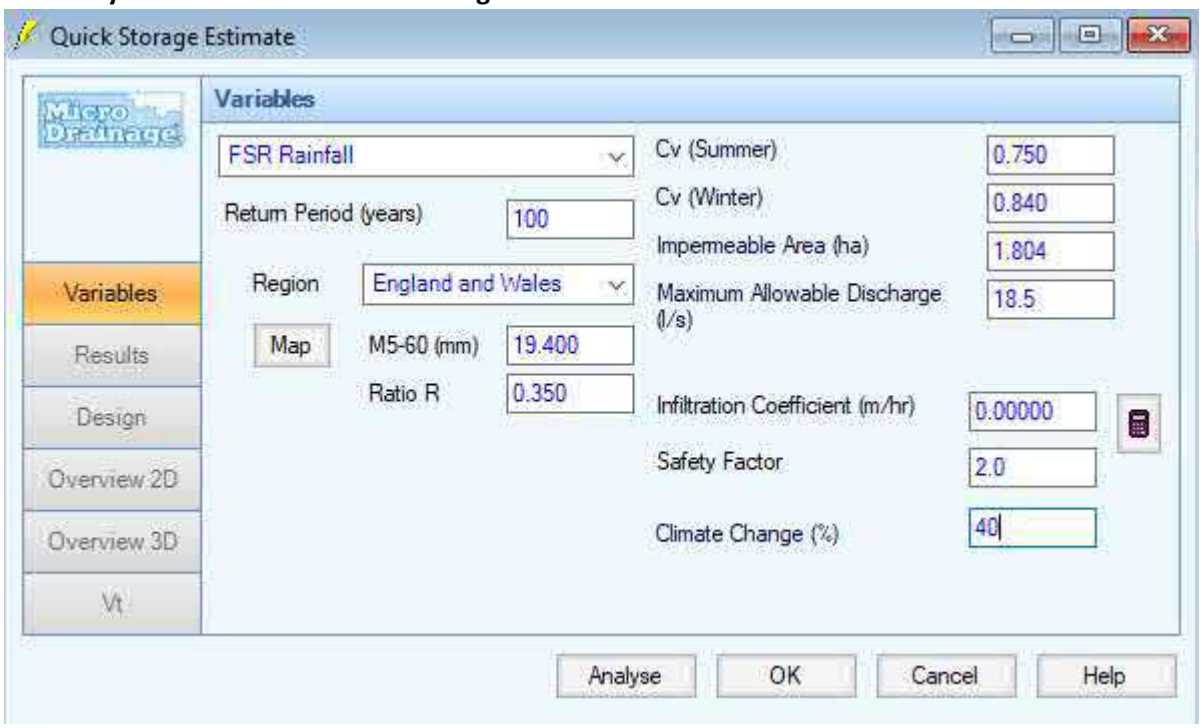
1 in 100 year event

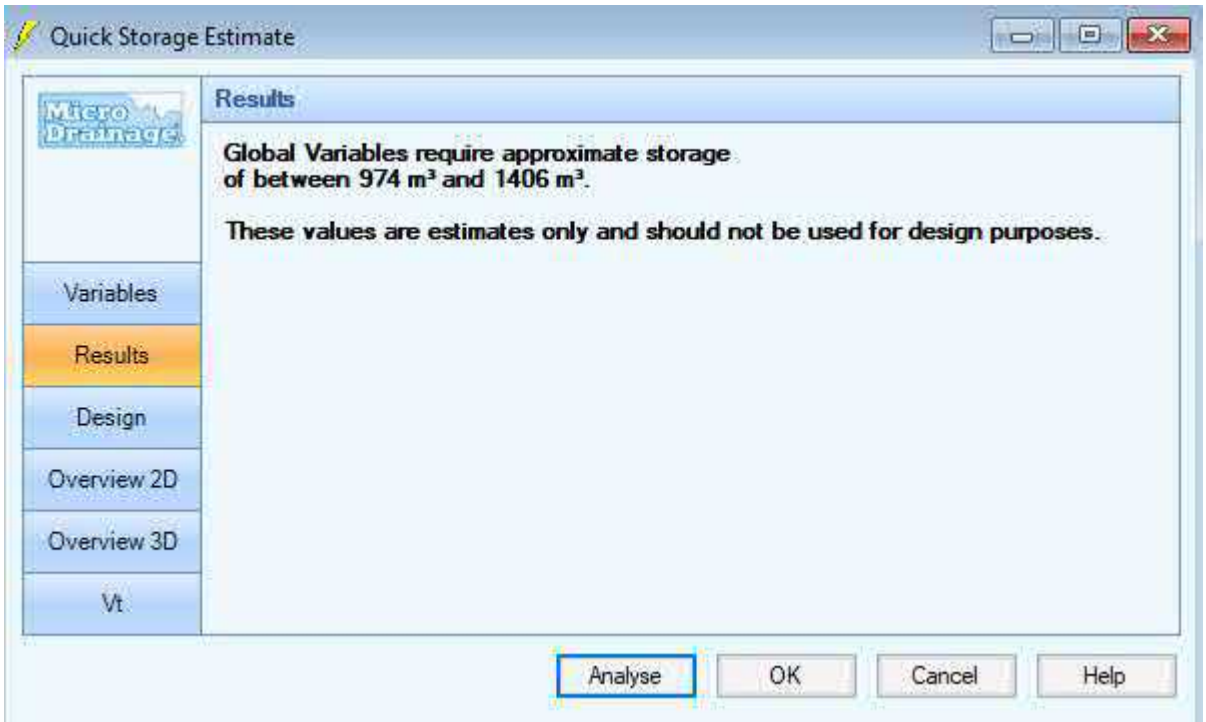




133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC1

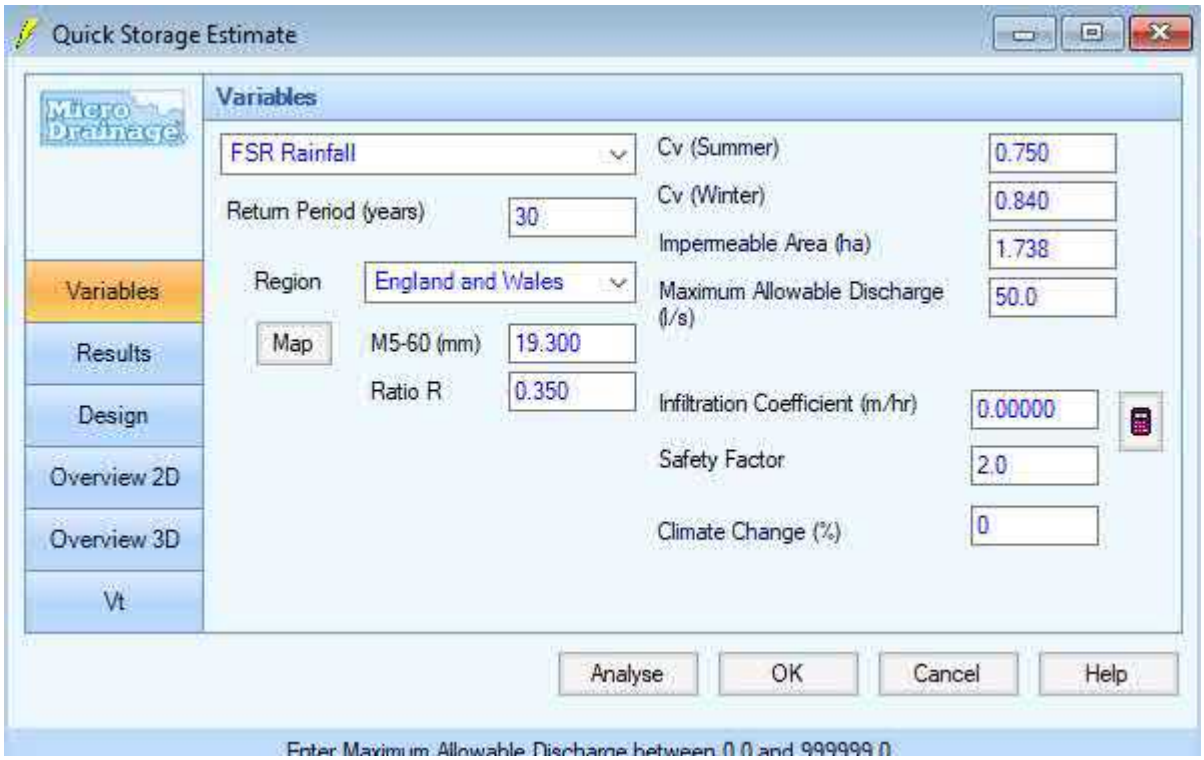
1 in 100 year event + 40% climate change

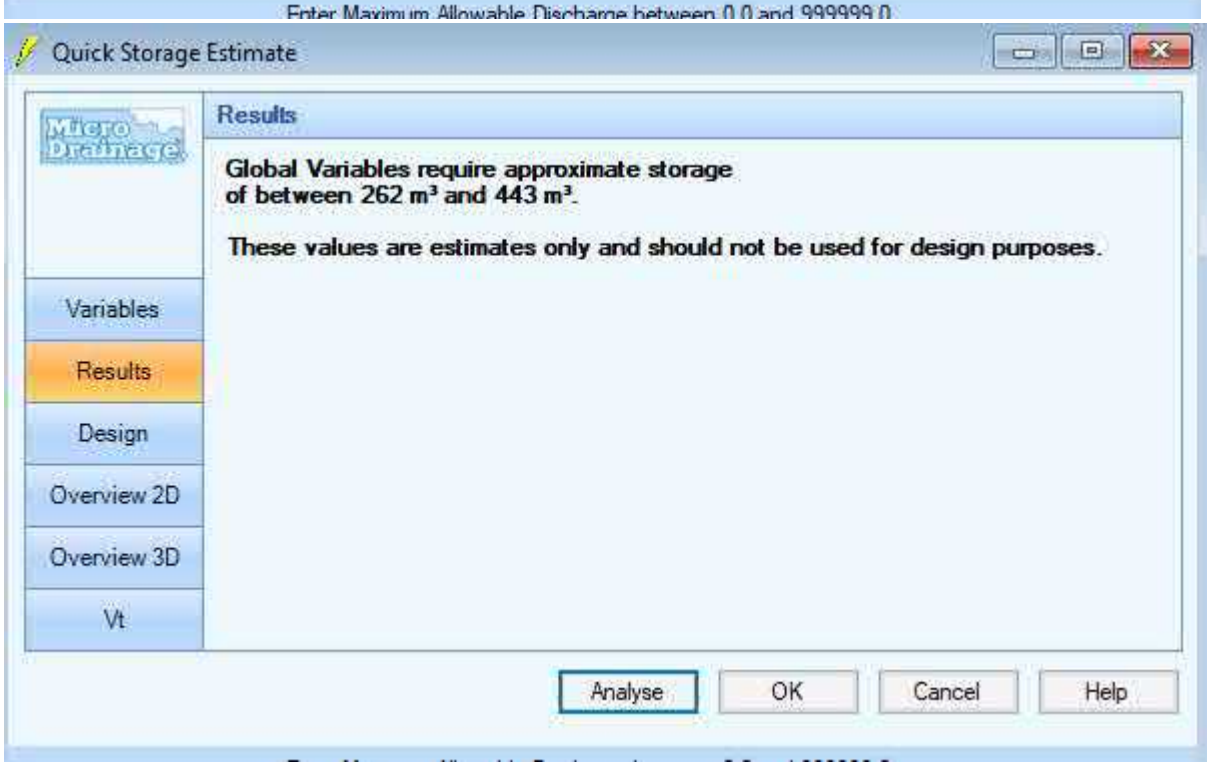




133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC2

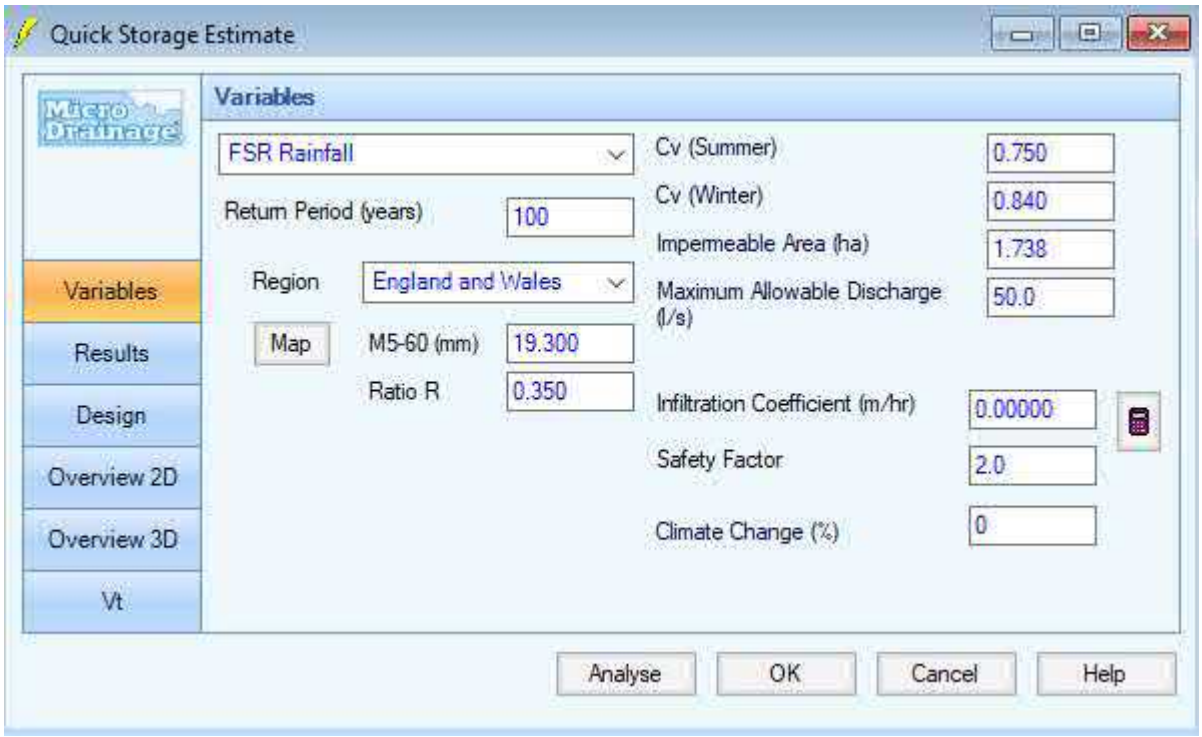
1 in 30 event

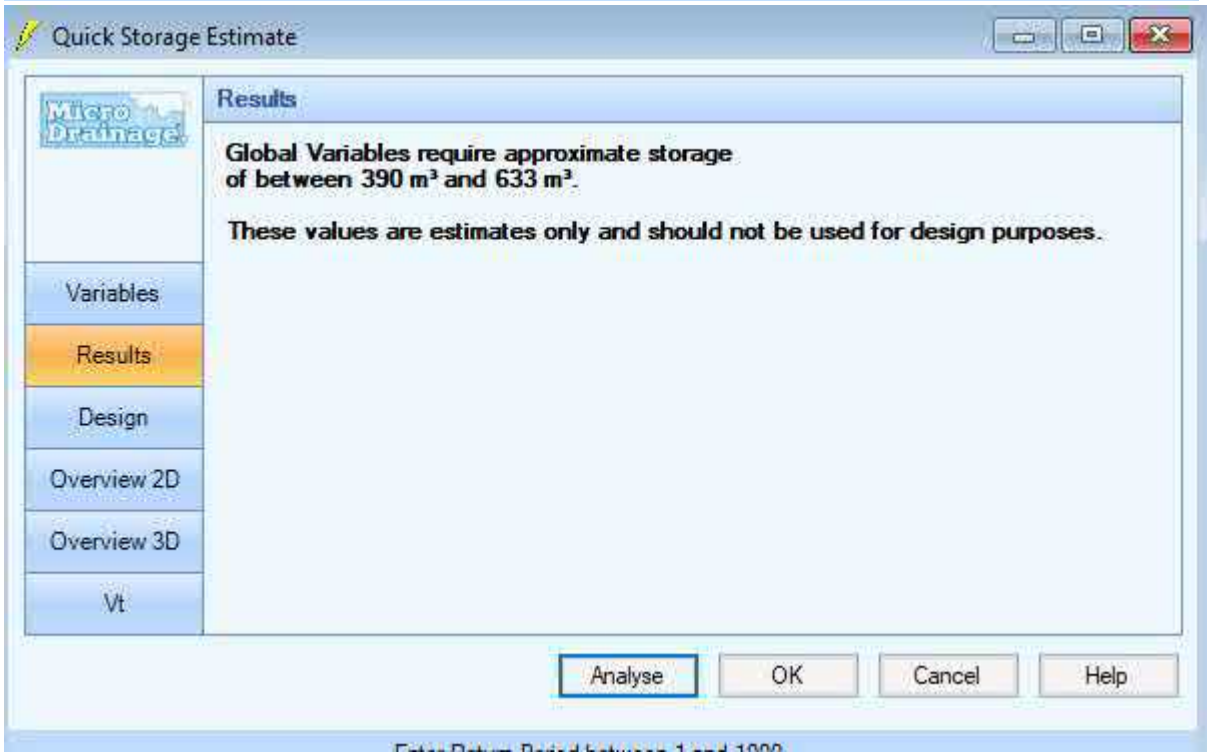




133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC2

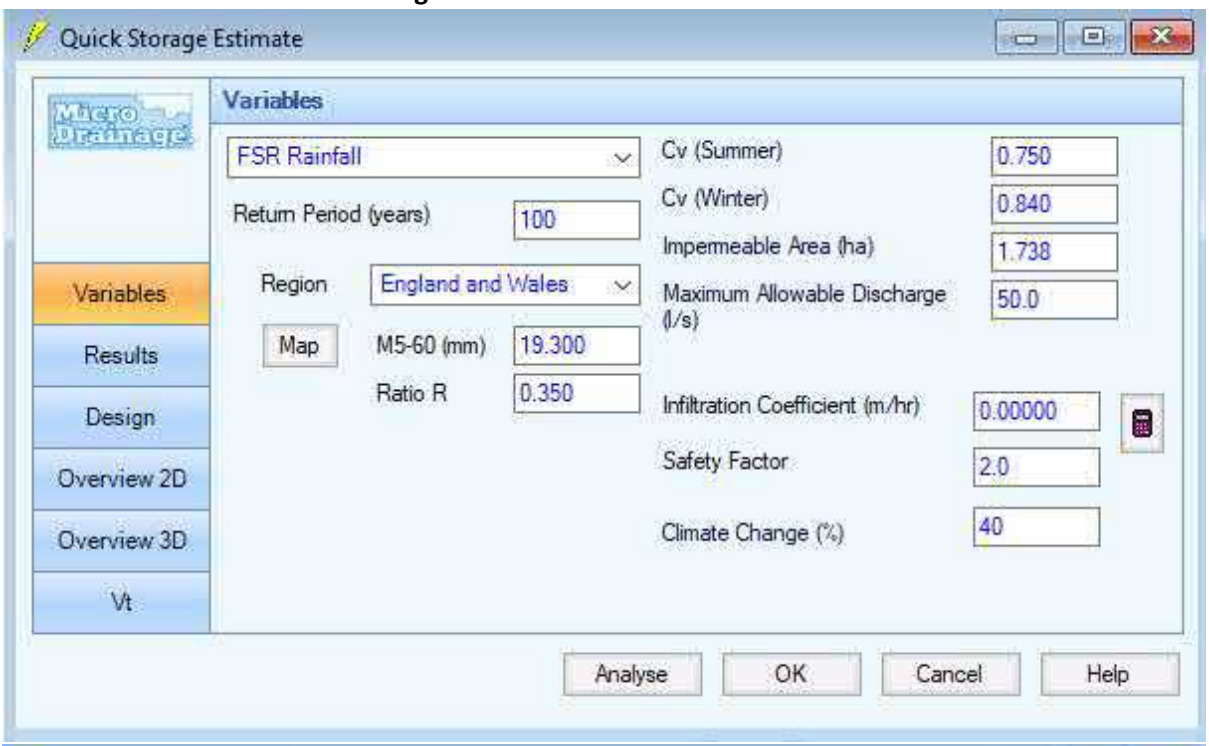
1 in 100 event

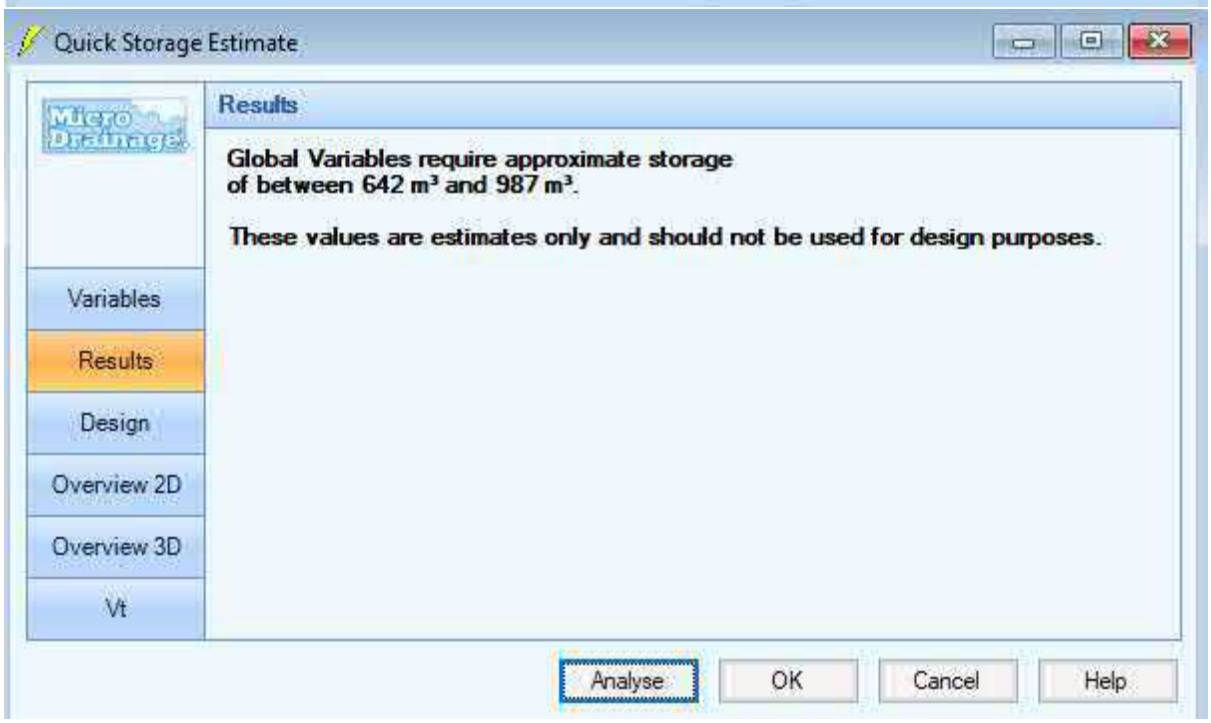


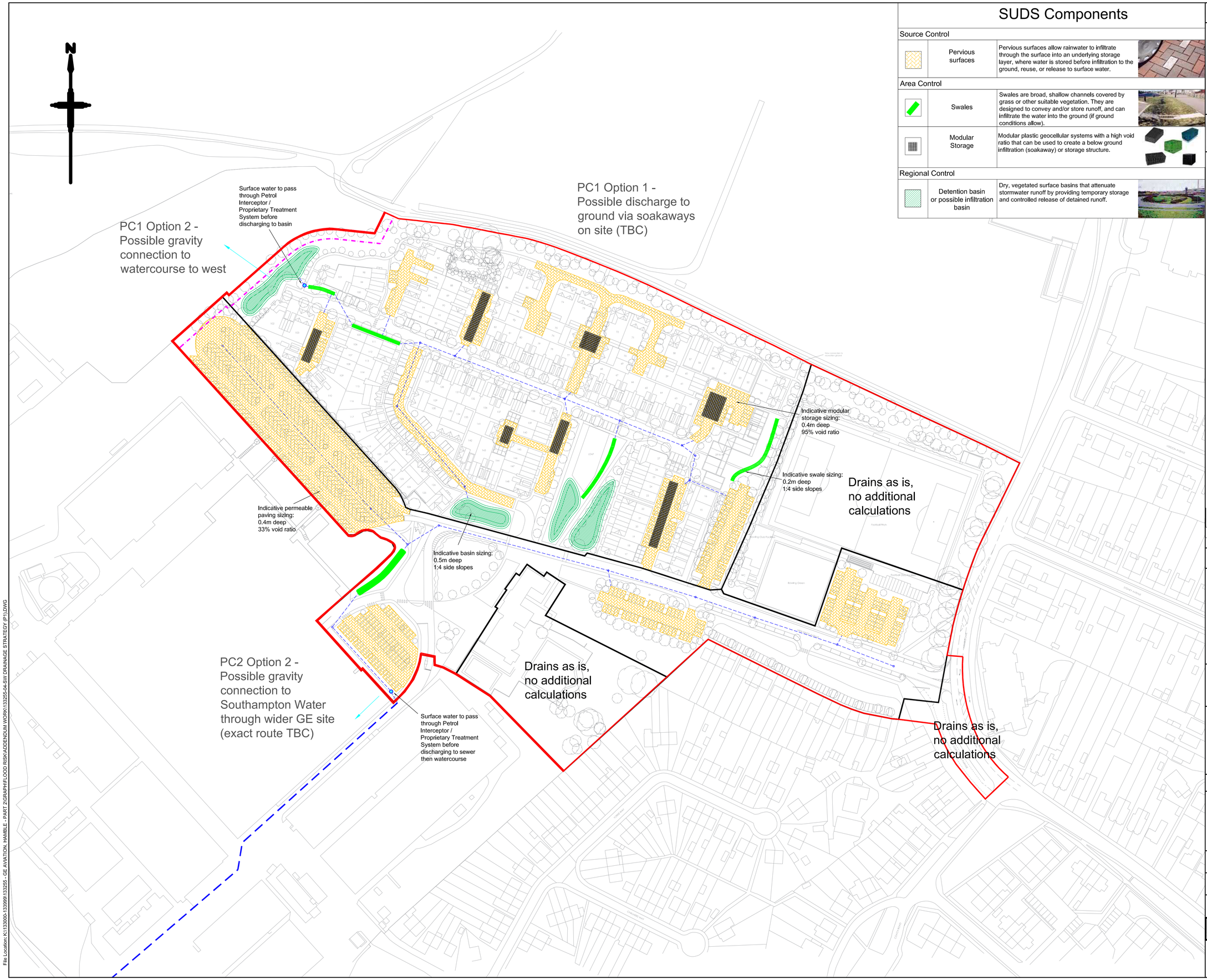


133255 – GE Aviation, Hamble-le-Rice
Quick storage estimates
PC2

1 in 100 event + 40% climate change







SUDS Components

Source Control			
	Pervious surfaces	Pervious surfaces allow rainwater to infiltrate through the surface into an underlying storage layer, where water is stored before infiltration to the ground, reuse, or release to surface water.	
Area Control			
	Swales	Swales are broad, shallow channels covered by grass or other suitable vegetation. They are designed to convey and/or store runoff, and can infiltrate the water into the ground (if ground conditions allow).	
	Modular Storage	Modular plastic geocellular systems with a high void ratio that can be used to create a below ground infiltration (soakaway) or storage structure.	
Regional Control			
	Detention basin or possible infiltration basin	Dry, vegetated surface basins that attenuate stormwater runoff by providing temporary storage and controlled release of detained runoff.	

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Key:

- Site boundary
- Drainage catchment boundary
- Indicative surface water drainage network (gravity drain)
- Indicative new sewer corridor route
- Ecological Buffer (5.4m from boundary)
- Petrol interceptor / Proprietary treatment system

Notes:

1. This drawing shows the requirements and possible solutions for surface water control. This drawing should be read in conjunction with the RSK Flood Risk Assessment report Addendum (133255-R2(0)-Addendum), dated April 2019.
2. Proposed Site Layout taken from Fluid 'Indicative Site Design' drawing no. FD16-1431-56, dated June 2017.
3. Information presented here is for planning purposes only. Not to be used for construction.
4. The drainage strategy illustrated on this plan is indicative. The drainage network will need to be fully designed at the detailed design stage.
5. RSK will not accept any liability for any inaccuracies associated with survey information provided by others.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
P2	29.03.19	Amended PC2 strategy	SLT	JL	JL
P1	20.03.19	Draft	SLT	JL	JL

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Client
GE AVIATION

Project Title
GE AVIATION,
HAMBLE-LE-RICE

Status
DRAFT

Drawing Title
INDICATIVE SURFACE WATER DRAINAGE STRATEGY

Drawn	Date	Checked	Date	Approved	Date
SLT	03.04.19	JL	03.04.19	JL	03.04.19

Scale	Orig Size	Dimensions
1:1000	A1	m

Project No.	Drawing File
133255	04-SW Drainage Strategy

Drawing No.	Rev.
04-SW Drainage Strategy	P2

Scale 1:1000
0 10 20 30 40 50m

File Location: K:\133000-133999\133255 - GE AVIATION, HAMBLE - PART 2\GRAPHIFLOOD RISK\ADDENDUM WORK\133255-04-SW DRAINAGE STRATEGY (P1).DWG