Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Tayler Evans
Site name:	336-006
Site location:	Corriemoillie

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	57.63709° N
Longitude:	4.76501° W
Reference:	2140770279
Date:	Nov 04 2024 15:27

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	3.014

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	5	5
HOST class:	N/A	N/A
SPR/SPRHOST:	0.53	0.53

Hydrological characteristics

	Default	Edited
SAAR (mm):	1276	1276
Hydrological region:	1	1
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.95	1.95
Growth curve factor 100 years:	2.48	2.48
Growth curve factor 200 years:	2.84	2.84

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

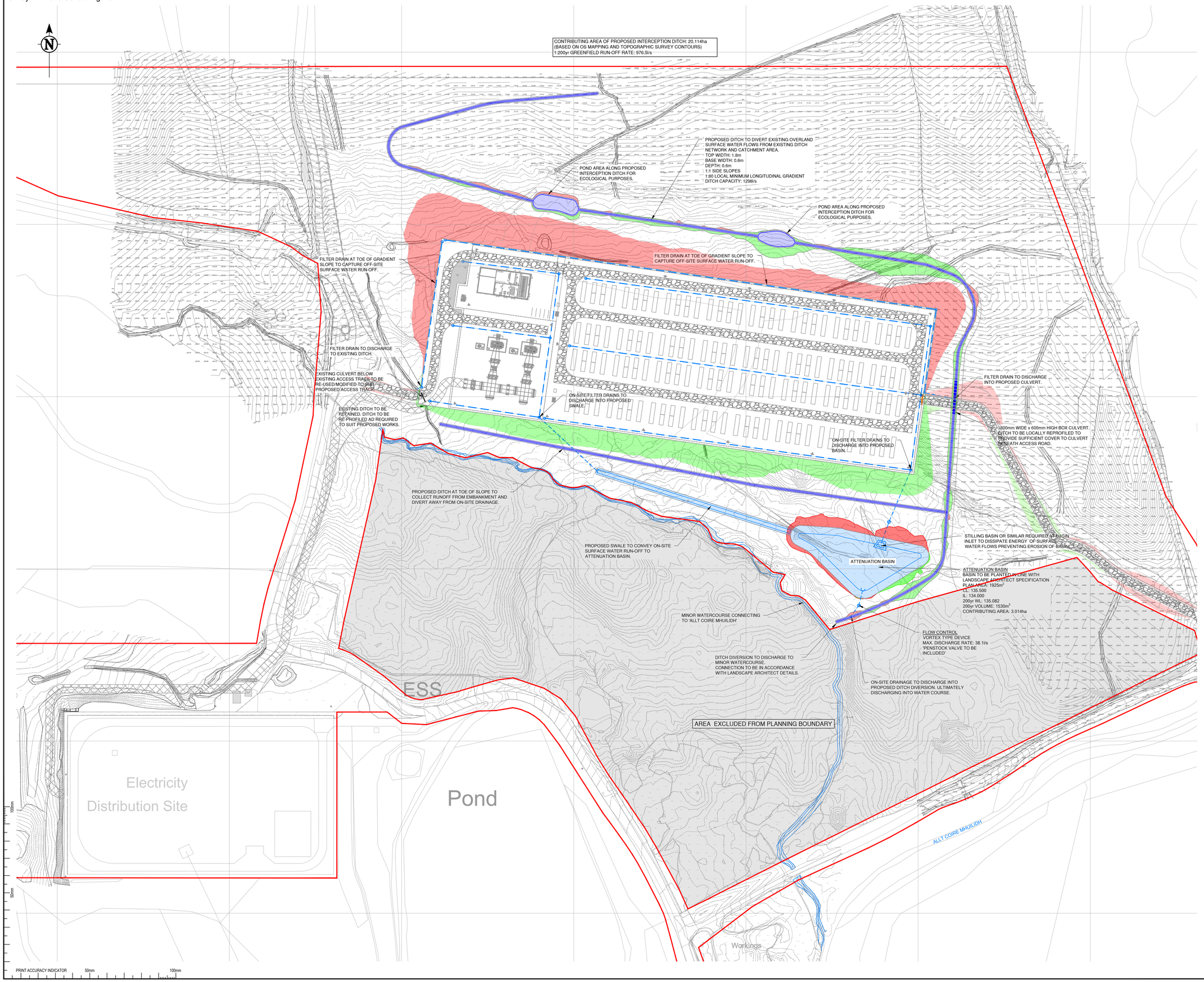
(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	38.12	38.12
1 in 1 year (l/s):	32.41	32.41
1 in 30 years (l/s):	74.34	74.34
1 in 100 year (l/s):	94.55	94.55
1 in 200 years (l/s):	108.27	108.27



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
2. DO NOT SCALE FROM THIS DRAWING MANUALLY OR ELECTRONICALLY. WRITTEN PERMISSION MUST BE OBTAINED FROM HAYDN EVANS PRIOR TO SCALING ELECTRONICALLY OR USING THIS ELECTRONIC FILE.
3. SITE LAYOUT BASED ON DRG. BTGBCOR01, PROVIDED BY FIELD ENERGY ON 16/10/2024. TOPOGRAPHIC SURVEY BASED ON DRG. BTGBCOR01 - XREF TOPO, UNDERTAKEN BY CASTLE SURVEYS ON 28/09/2022. EXTENDED TOPOGRAPHIC SURVEY FROM HIGHLAND SURVEYORS LTD REF: 24019-01-COR EXTENDED TOPO, DATED 18/06/2024.
4. DRAINAGE LEVELS ARE BASED ON COMPOUND LEVELS PROVIDED BY FIELD.
5. THIS DRAINAGE STRATEGY DRAWING SHOWS HOW SURFACE WATER RUN-OFF COULD BE MANAGED ON SITE WITH A RESTRICTED OFF-SITE DISCHARGE, FOR ALL RAINFALL EVENTS UP TO AND INCLUDING THE 200 YEAR RETURN PERIOD EVENT TO ENSURE NO INCREASED FLOOD RISK TO OTHERS AS A RESULT OF THE PROPOSED DEVELOPMENT.

   THIS IS NOT INTENDED TO BE A DETAILED DESIGN AT THIS STAGE. PLEASE NOT THAT THE FINAL LAYOUT MAY BE SUBJECT TO REFINEMENT TO MEET CERTAIN TECHNICAL CRITERIA.

KEY

- PLANNING BOUNDARY
- SITE GRADING - CUT
- SITE GRADING - FILL
- PROPOSED DITCH DIVERSION ROUTE
- PROPOSED CULVERT
- PROPOSED FILTER DRAIN
- PROPOSED CATCHPIT CHAMBERS
- PROPOSED SURFACE WATER PIPE
- EXISTING DITCH (TAKEN FROM TOPOGRAPHIC SURVEY)
- EXISTING WATERCOURSE

Rev'n	Date	Description	Drawn	Chk'd	App'd
P06	07.11.24	RED LINE BOUNDARY UPDATED	TE	BH	-
P05	04.11.24	RED LINE BOUNDARY UPDATED	TE	BP	-
P04	17.10.24	AMENDED TO SUIT LATEST SITE LAYOUT	TW	BP	-
P03	16.10.24	DITCH EXTENDED	BP	-	-
P02	24.09.24	PONDS ADDED ALONG INTERCEPTION DITCH	BP	-	-
P01	06.09.24	DRAFT ISSUE	TE	BP	-

Status: PRELIMINARY

HAYDN EVANS
Second Floor, Hyde Park House
Crown Street, Ipswich, IP1 3LG
01473 236550
www.haydnevans.co.uk
mail@haydnevans.co.uk

Client: FIELD

Project: CORRIEMOILLIE BESS

Drawing title: SURFACE WATER DRAINAGE STRATEGY

Scale	Drawn	Checked	Approved	Date
1:1000 @ A1	THW	BP	JRC	SEPT 24

Drawing no.: 336-006-D003

Revision: P06

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SUBSTATION	0.705	5.00	151.100	1350	234979.890	864087.958	1.950
COMPOUND	2.117	5.00	146.500	1500	235195.636	864057.386	2.100
Basin	0.192	5.00	135.500	1800	235179.709	864018.057	1.500
Outfall	0.000		135.500	1200	235165.591	863978.743	1.517

Links

Name	US Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)
1.000	SUBSTATION	168.400	0.600	149.150	134.000	15.150	11.1	450	5.46
2.000	COMPOUND	50.000	0.600	144.400	134.000	10.400	4.8	600	5.07
1.001	Basin	5.000	0.600	134.000	133.983	0.017	300.0	300	5.55

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	SUBSTATION	Basin	6.123	973.8	127.4	1.500	1.050	0.705	0.0	109	4.285
2.000	COMPOUND	Basin	11.152	3153.1	382.5	1.500	0.900	2.117	0.0	140	7.679
1.001	Basin	Outfall	0.902	63.8	544.6	1.200	1.217	3.014	0.0	300	0.914

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
200	0	0	0

Node Basin Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	134.000	Product Number	CTL-SHE-0260-3810-1200-3810
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	38.1	Min Node Diameter (mm)	1800

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	5.0	Invert Level (m)	134.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1123.0	0.0	1.500	1925.0	0.0

Results for 200 year Critical Storm Duration. Lowest mass balance: 99.61%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SUBSTATION	33	149.328	0.178	330.4	0.2543	0.0000	OK
60 minute summer	COMPOUND	32	144.625	0.225	992.1	0.3975	0.0000	OK
240 minute winter	Basin	236	135.082	1.081	340.7	1529.8780	0.0000	SURCHARGED
60 minute summer	Outfall	1	133.983	0.000	38.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SUBSTATION	1.000	330.5	4.420	0.339	18.2379	
60 minute summer	COMPOUND	2.000	992.3	7.890	0.315	9.3579	
240 minute winter	Basin	Hydro-Brake®	38.1				880.6

HAYDN
EVANS