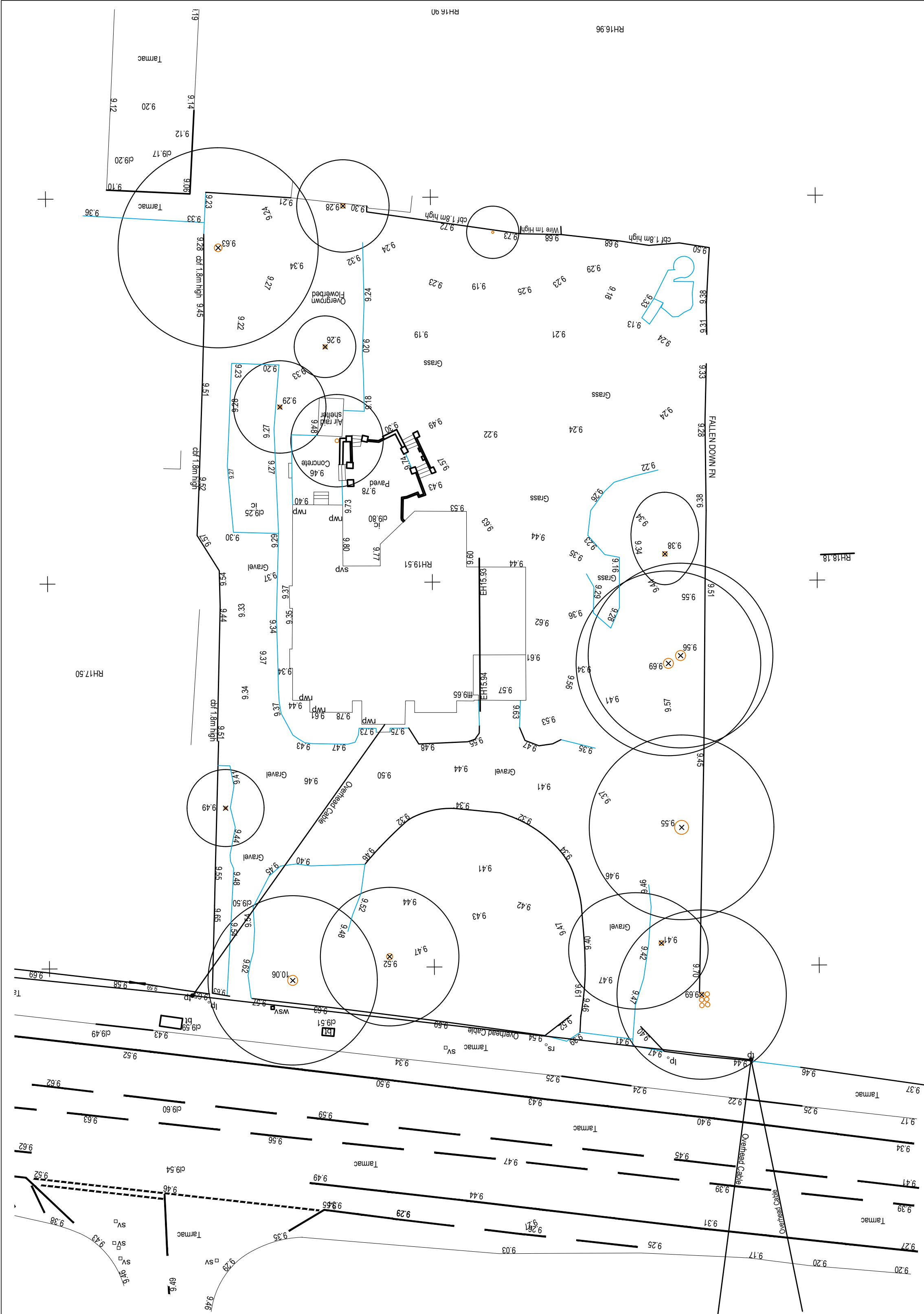


Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	0.32	0.5
1 in 1 year (l/s):	0.27	0.42
1 in 30 years (l/s):	0.73	1.15
1 in 100 year (l/s):	1.01	1.59
1 in 200 years (l/s):	1.18	1.86

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

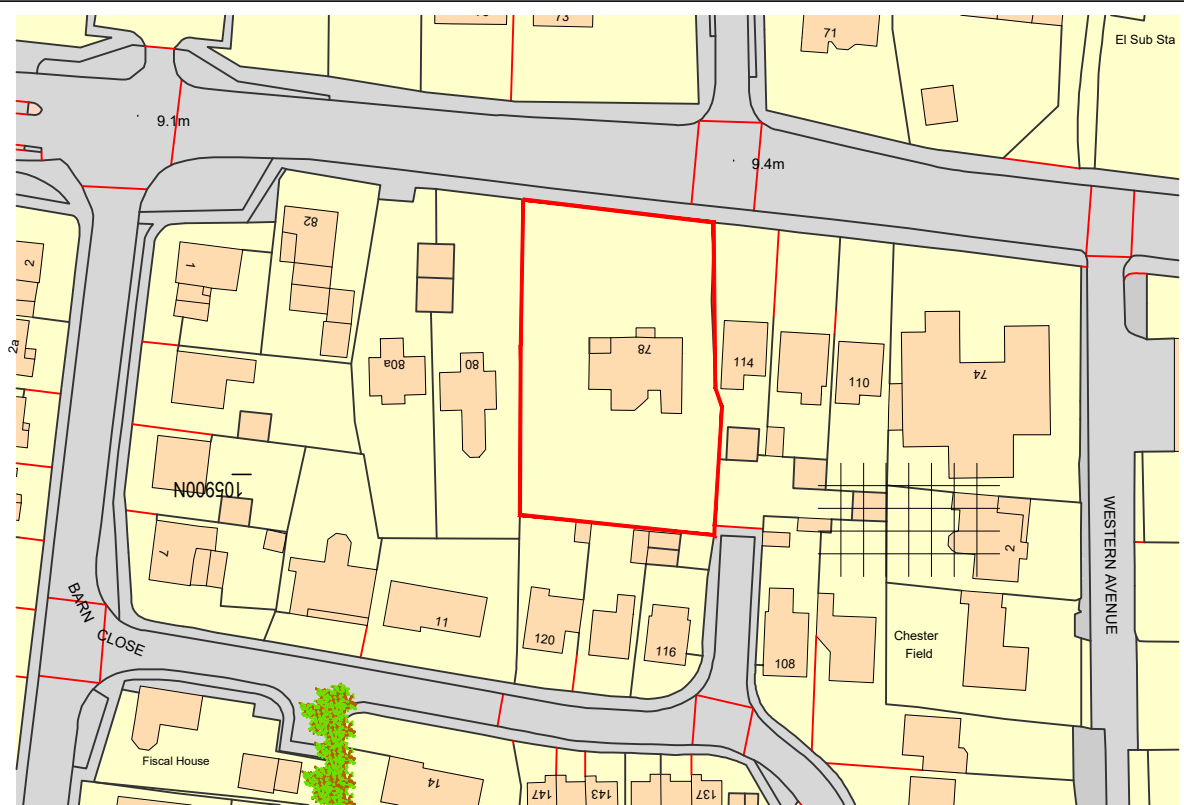
Appendix D



existing site plan
scale A1 1:200, A3 1:400



proposed site plan
scale A1 1:200, A3 1:400



location plan
scale A1 1:1250, A3 1:2500

- Road**
Tarmac as indicated within site
- New Gardens**
Mostly grass and soft landscaping
- Landscaped Areas**
with planting.
- Paving - vehicular**
permeable gravel paving to parking areas
- New landscaped buffer**
variety of low shrubs and planting.
- New trees**
Semi mature trees in key location within the site and on perimeter.
- Existing Trees**
Indicative areas of existing trees and RPA as Arboricultural Report
- Removed Trees**
Trees removed following receipt of Arboricultural Report
- Existing Dwelling**
Outline of existing dwelling to be demolished
- New landscaping**
Indicative areas of flowers and low shrubs within semi private and private areas of site.
- New landscaping**
Indicative areas of Hedgerow 'of native species' within areas of site to screen boundary.
- Site Boundary - 0.15 ha (1505m sq)**
- Access points**
Proposed entrances to site
- Electric vehicle charging point**
- Proposed levels**
2x Secure Visitors Cycle Space
- min. 8 Proposed parking spaces**

SCHEDULE OF ACCOMMODATION

Proposed Units - 5 no. 2 Bed flats
- 4 no. 1 Bed flats

TOTAL NEW UNITS 9 & ancillary accommodation.

revision	notes	date	drawn	check	revision	notes	date	drawn	check	revision	notes	date	drawn	check	client	notes
A	Revised as per planners comments sent 28/06/2022	30/06/2022	MSC													this drawing is the copyright of HRP Architects Ltd and must not be reproduced in whole or part or used for the execution of works without their permission.
B	Bin and cycle stores revised. Footprint of 80 amended	28/09/2022	mJw	mmh												all dimensions to be checked on site prior to commencement of construction works and the architect notified of any discrepancy.
C	Revised as per comments	17/10/2022	MSC													figured dimensions are to be used in preference to scaled dimensions.
																no deviation from this drawing will be permitted without prior consent of the architect.
																all drawings are prepared subject to a full measured and structural survey of the buildings and site.
																all structural work is subject to the appointment of a structural engineer to confirm and agree the structural proposals.
																os promap licence no. 100022432.

hrp architects ltd			18 Limerline Spur hilsae, portsmouth, hampshire, po3 5hj		
tel: 023 9269 1843 fax: 023 9263 9722 email: info@hrp-architects.com website: hrp-architects.com					
project	Proposed development at 78 Havant Rd, Emsworth	drawn	MMH MSC	checked	
date	Mar 22	status	Planning		
detail	Proposed site plan & location plan	a1 scale	as shown	a3 scale	rev
					C

Appendix E

Paul Basham Associates				Page 1																																																																																																																																																																																																																			
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K</td></tr><tr><td>600 min Summer</td><td>7.741</td><td>0.291</td><td>0.1</td><td>23.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>7.748</td><td>0.298</td><td>0.1</td><td>24.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>7.756</td><td>0.306</td><td>0.1</td><td>24.7</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>7.760</td><td>0.310</td><td>0.1</td><td>25.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>7.758</td><td>0.308</td><td>0.1</td><td>24.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>7.752</td><td>0.302</td><td>0.1</td><td>24.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>7.736</td><td>0.286</td><td>0.1</td><td>23.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>7.717</td><td>0.267</td><td>0.1</td><td>21.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>7.697</td><td>0.247</td><td>0.1</td><td>19.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>7.678</td><td>0.228</td><td>0.1</td><td>18.3</td><td>O 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Lancaster Court Fareham Hampshire, PO15 5TU					
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<u>Summary of Results for 10 year Return Period (+45%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	7.579	0.129	0.1	10.4	O K
60 min Winter	7.615	0.165	0.1	13.3	O K
120 min Winter	7.654	0.204	0.1	16.5	O K
180 min Winter	7.678	0.228	0.1	18.4	O K
240 min Winter	7.694	0.244	0.1	19.7	O K
360 min Winter	7.716	0.266	0.1	21.5	O K
480 min Winter	7.731	0.281	0.1	22.6	O K
600 min Winter	7.741	0.291	0.1	23.5	O K
720 min Winter	7.748	0.298	0.1	24.0	O K
960 min Winter	7.757	0.307	0.1	24.8	O K
1440 min Winter	7.761	0.311	0.1	25.1	O K
2160 min Winter	7.755	0.305	0.1	24.6	O K
2880 min Winter	7.746	0.296	0.1	23.8	O K
4320 min Winter	7.719	0.269	0.1	21.7	O K
5760 min Winter	7.688	0.238	0.1	19.2	O K
7200 min Winter	7.657	0.207	0.1	16.7	O K
8640 min Winter	7.628	0.178	0.1	14.3	O K
10080 min Winter	7.600	0.150	0.1	12.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	52.086	0.0	33		
60 min Winter	33.048	0.0	62		
120 min Winter	20.460	0.0	122		
180 min Winter	15.333	0.0	180		
240 min Winter	12.457	0.0	240		
360 min Winter	9.277	0.0	356		
480 min Winter	7.521	0.0	472		
600 min Winter	6.388	0.0	588		
720 min Winter	5.589	0.0	702		
960 min Winter	4.525	0.0	926		
1440 min Winter	3.357	0.0	1356		
2160 min Winter	2.488	0.0	1708		
2880 min Winter	2.011	0.0	2164		
4320 min Winter	1.489	0.0	3072		
5760 min Winter	1.202	0.0	3928		
7200 min Winter	1.019	0.0	4760		
8640 min Winter	0.890	0.0	5536		
10080 min Winter	0.793	0.0	6352		
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Date 17/08/2023 10:02 File storage calcs.SRCX		Designed by MicroDrainage Checked by			
Innovyze		Source Control 2020.1.3			
Summary of Results for 100 year Return Period (+45%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	7.675	0.225	0.1	18.2	O K
60 min Winter	7.741	0.291	0.1	23.5	O K
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180 min Winter	7.850	0.400	0.1	32.2	O K
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480 min Winter	7.937	0.487	0.1	39.3	O K
600 min Winter	7.955	0.505	0.1	40.8	O K
720 min Winter	7.969	0.519	0.1	41.9	O K
960 min Winter	7.987	0.537	0.1	43.3	O K
1440 min Winter	8.003	0.553	0.1	44.6	O K
2160 min Winter	8.002	0.552	0.1	44.5	O K
2880 min Winter	7.986	0.536	0.1	43.2	O K
4320 min Winter	7.950	0.500	0.1	40.3	O K
5760 min Winter	7.912	0.462	0.1	37.2	O K
7200 min Winter	7.872	0.422	0.1	34.0	O K
8640 min Winter	7.833	0.383	0.1	30.9	O K
10080 min Winter	7.796	0.346	0.1	27.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	86.782	0.0	34		
60 min Winter	55.699	0.0	64		
120 min Winter	34.527	0.0	122		
180 min Winter	25.719	0.0	182		
240 min Winter	20.720	0.0	240		
360 min Winter	15.232	0.0	358		
480 min Winter	12.240	0.0	476		
600 min Winter	10.322	0.0	594		
720 min Winter	8.975	0.0	710		
960 min Winter	7.191	0.0	942		
1440 min Winter	5.252	0.0	1398		
2160 min Winter	3.828	0.0	2056		
2880 min Winter	3.055	0.0	2680		
4320 min Winter	2.218	0.0	3328		
5760 min Winter	1.765	0.0	4216		
7200 min Winter	1.478	0.0	5120		
8640 min Winter	1.279	0.0	5968		
10080 min Winter	1.132	0.0	6856		
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Lancaster Court Fareham Hampshire, PO15 5TU		
Date 17/08/2023 10:02 File storage calcs.SRCX	Designed by MicroDrainage Checked by	
Innovyze		Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

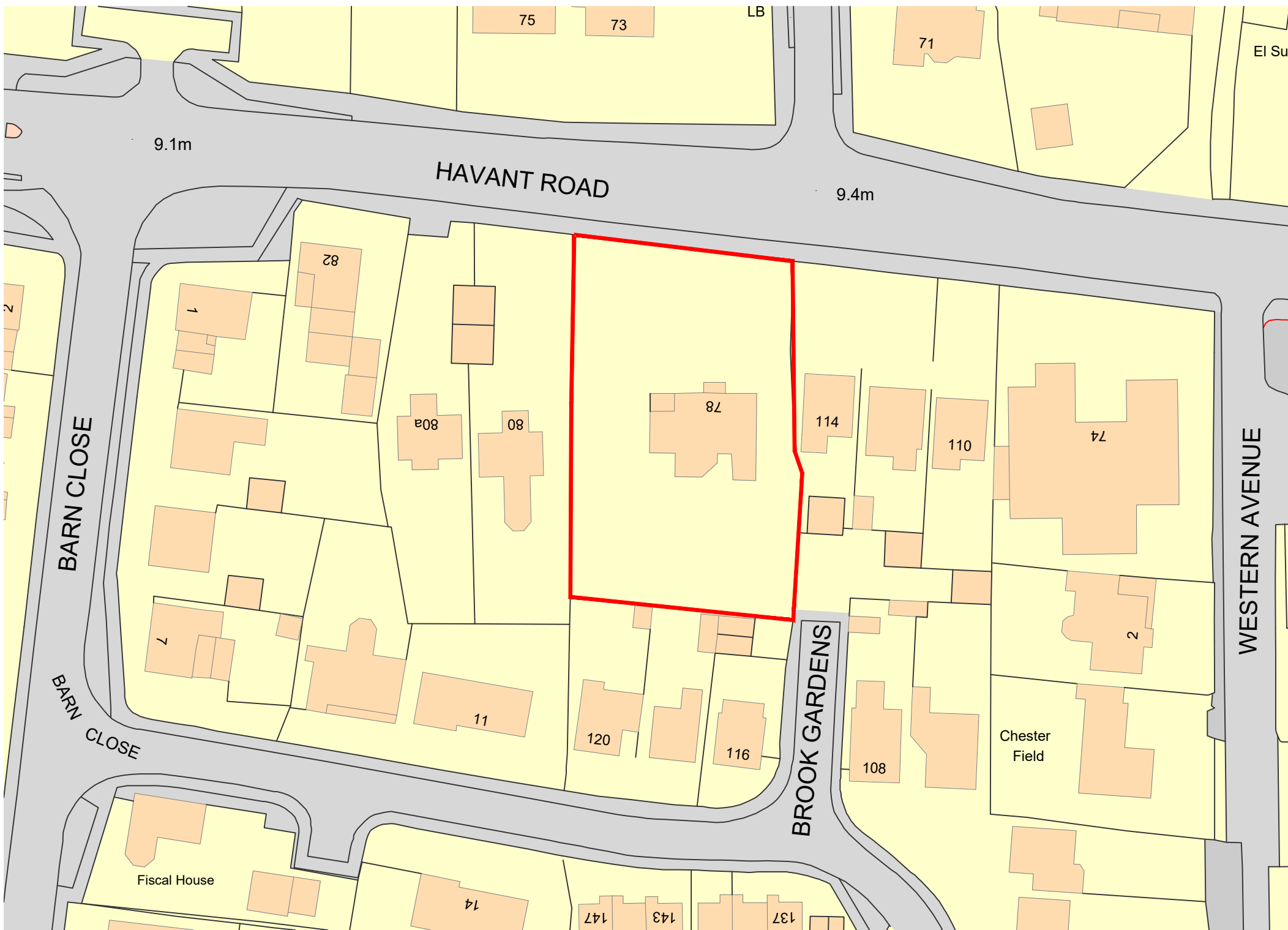
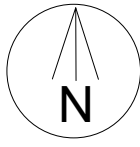
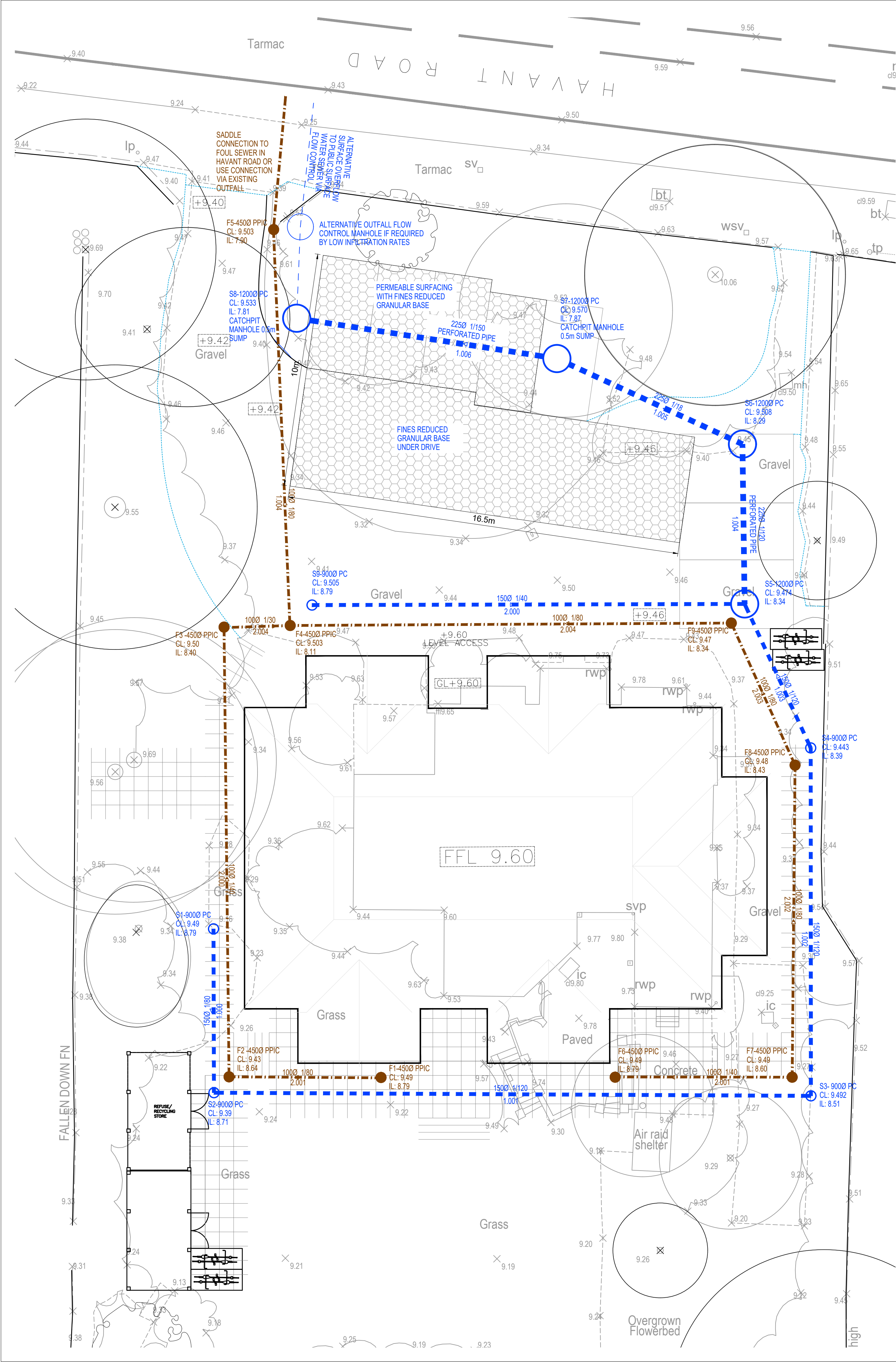
Total Area (ha) 0.045

Time (mins)	Area
From:	To: (ha)
0	4 0.045

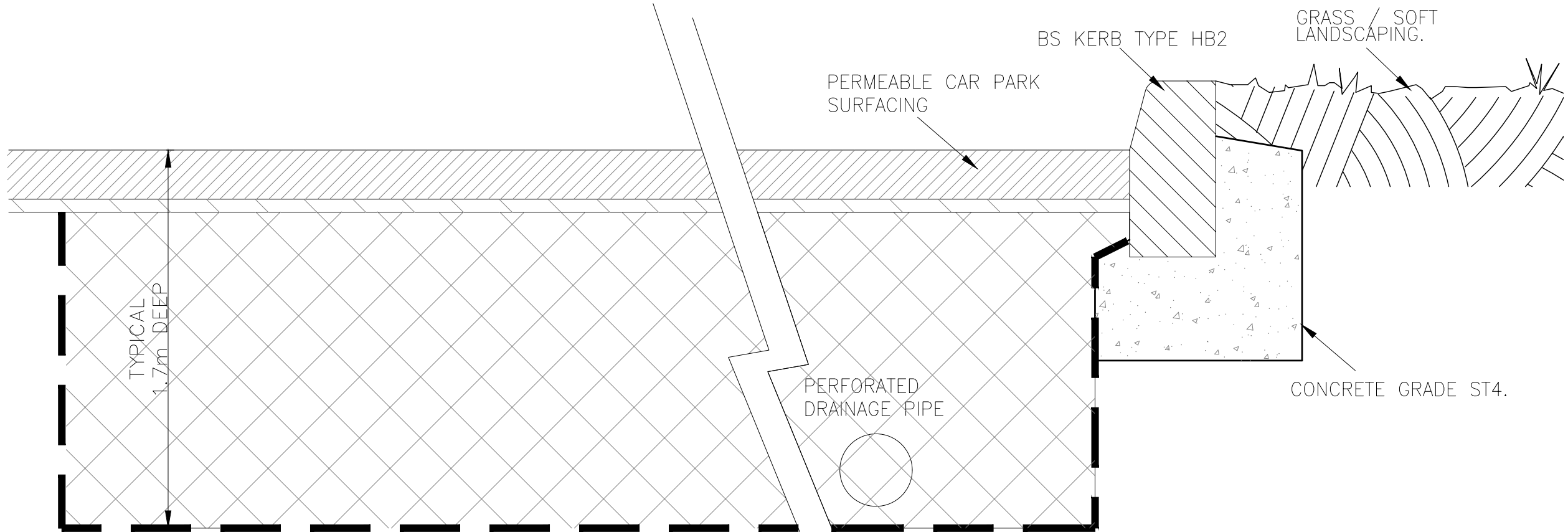
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Appendix F



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SOAKAWAY FILL MATERIAL 1.7m DEEP
TO BE A 20/40mm FINES REDUCED, ROUNDED TO SUB
ROUNDED GRAVEL (void ratio min 0.35) IN ACCORDANCE
WITH BS EN 13242:2002
TRENCH TO BE LINED WITH A TERRAM 100 NON WOVEN
GEOTEXTILE (OR SIMILAR)

HIGHEST LEVEL OF GROUNDWATER 2.2m BGL

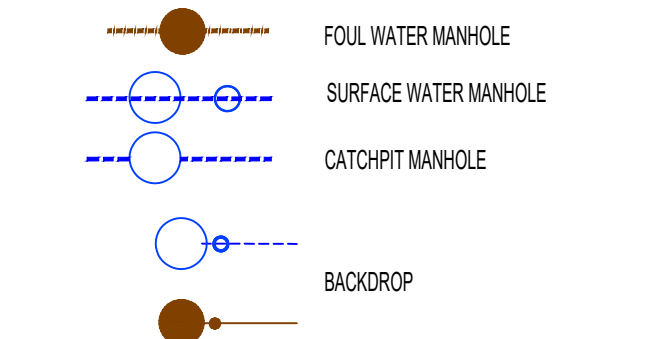
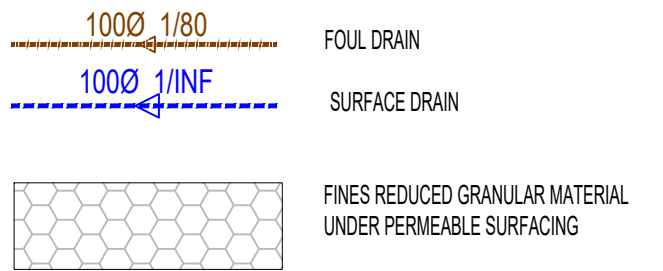
PERMEABLE CAR PARK CONSTRUCTION (NTS)

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DRAINAGE SYMBOLS



PRELIMINARY

DRAWING/DESIGN IS STILL 'IN DEVELOPMENT'
YOU ARE ADVISED TO MAKE DUE ALLOWANCE

CDM Regulations 2015 : Reg. 9

None of the below is deemed to relieve any contractor of his obligations under all applicable health and safety legislation.

In preparing the design shown on this and related drawings Paul Basham Associates has considered and, where reasonably practicable, eliminated foreseeable risks. Any further abnormal or unusual risks, which remain, are numbered below and identified thus 'A' and should be given particular attention by all those carrying out construction or of future maintenance works.

- Abnormal or unusual risks
-
-

Rev	Description	Date	By	App'd
P01	FIRST ISSUE	03.08.2023	BG	COH



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Client

PRIVATE CLIENT

Project Name
78 HAVANT ROAD, EMSWORTH

Title
DRAINAGE STRATEGY
LAYOUT AND DETAILS

Project Phase
FOR PLANNING

Date Created	Drawn By	Approved By	Suitability Code
21.07.2023	BG	COH	-

PBA Project Number	Scale	(AT A1)
020.0859	1:100	

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Appendix G

SIMPLE INDEX APPROACH: TOOL



HRW shall not be liable for any direct or indirect damage, loss, cost, expense or liability whatsoever arising out of the use or impossibility to use the tool, even when HRW has been informed of the possibility of the same. The user hereby releases HRW from and against any damage claims, loss, expense or liability resulting from any action taken against HRW that is related in any way to the use of the tool or any reliance made in respect of the output of such use by any person whatsoever. HRW does not guarantee that the tool's functions meet the requirements of any person, nor that the tool is free from errors.

- The steps set out in the tool should be applied for each inflow or 'runoff area' (ie each impermeable surface area separately discharging to a SuDS component).
- The supporting 'Design Conditions' stated by the tool must be fully considered and implemented in all cases.
- Relevant design examples are included in the SuDS Manual Appendix C.
- Each of the steps below are part of the process set out in the flowchart on Sheet 3.

Sheet 4 summarises the selections made below and indicates the acceptability of the proposed SuDS components.

DROP DOWN LIST	RELEVANT INPUTS NEED TO BE SELECTED FROM THESE LISTS, FOR EACH STEP
USER ENTRY	USER ENTRY CELLS ARE ONLY REQUIRED WHERE INDICATED BY THE TOOL

STEP 1: Determine the Pollution Hazard Index for the runoff area discharging to the proposed SuDS scheme

This step requires the user to select the appropriate land use type for the area from which the runoff is occurring

If the land use varies across the 'runoff area', either:

- use the land use type with the highest Pollution Hazard Index
- apply the approach for each of the land use types to determine whether the proposed SuDS design is sufficient for all. If it is not, consider collecting more hazardous runoff separately and providing additional treatment

If the generic land use types suggested are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in the row below the drop down lists.

Runoff Area Land Use Description	Pollution Hazard Indices			
	Pollution Hazard	Total Suspended	Metals	Hydrocarbons
Low traffic roads (e.g. residential roads and general access roads, <500 traffic movements/day)	Low	0.5	0.4	0.4
Landuse Pollution Hazard Index				
Low 0.5 0.4 0.4				

DESIGN CONDITIONS	
1	2

STEP 2A: Determine the Pollution Mitigation Index for the proposed SuDS components

This step requires the user to select the proposed SuDS components that will be used to treat runoff - before it is discharged to a receiving surface waterbody or downstream infiltration component. If the runoff is discharged directly to an infiltration component, without upstream treatment, select 'None' for each of the 3 SuDS components and move to Step 2B

This step should be applied to evaluate the water quality protection provided by proposed SuDS components for discharges to receiving surface waters or downstream infiltration components (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

If you have fewer than 3 components, select 'None' for the components that are not required

If the proposed component is bespoke and/or a proprietary treatment product and not generically described by the suggested components, then 'Proprietary treatment system' or 'User defined index' should be selected and a description of the component and agreed user defined indices should be entered in the row below the drop down lists

SuDS Component Description	Pollution Mitigation Indices			
	Total Suspended	Metals	Hydrocarbons	
Select SuDS Component 1 (i.e. the upstream SuDS component) from the drop down list:				
None				
Select SuDS Component 2 (i.e. the second SuDS component in a series) from the drop down list:				
None				
Select SuDS Component 3 (i.e. the third SuDS component in a series) from the drop down list:				
None				
If the proposed SuDS components are bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary treatment system' or 'User defined index' and enter description of the component and agreed user defined indices in these rows:				
Aggregated Surface Water Pollution Mitigation Index				
0 0 0				

DESIGN CONDITIONS		
1	2	3

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at "<0.50". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

Is the runoff now discharged to an infiltration component?

Yes ? Go to Step 2B
No ? Go to Step 2C

STEP 2B: Determine the Pollution Mitigation Index for the proposed Groundwater Protection

This step requires the user to select the type of groundwater protection that is either part of the SuDS component or that lies between the component and the groundwater

This step should be applied where a SuDS component is specifically designed to infiltrate runoff (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

'Groundwater protection' describes the proposed depth of soil or other material through which runoff will flow between the runoff surface and the underlying groundwater.

Where the discharge is to surface waters and risk to groundwater need not be considered, select 'None'

If the proposed groundwater protection is bespoke and/or a proprietary product and not generically described by the suggested measures, then a description of the protection and agreed user defined indices should be entered in the row below the drop down lists

Select type of groundwater protection from the drop down list:	Pollution Mitigation Indices			
	Total Suspended Solids	Metals	Hydrocarbons	
Permeable pavement underlain by 500 mm minimum depth of soils with good contamination attenuation potential	0.7	0.6	0.7	
If no proposed groundwater protection is bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary product' or 'User defined index' and enter description of the protection and agreed user defined indices in this row:				
Groundwater Protection Pollution Mitigation Index				
0.7 0.6 0.7				

DESIGN CONDITIONS			
1	2	3	4
All designs must include a minimum of 1 m unsaturated depth of subsoil or aggregate material between the infiltration surface and the maximum likely groundwater level. The underlying soils must provide good contaminant attenuation potential (eg as recommended in SuDS 2006 (4a and 5a) / Scott (2012) or other appropriate guidance). Alternative depth and soil combinations must provide equivalent protection to the underlying groundwater.			

STEP 2C: Determine the Combined Pollution Mitigation Indices for the Runoff Area

This is an automatic step which combines the proposed SuDS Pollution Mitigation Indices with any Groundwater Protection Pollution Mitigation Indices

Combined Pollution Mitigation Indices			
Total Suspended	Metals	Hydrocarbons	
Combined Pollution Mitigation Indices for the Runoff Area			
0.7 0.6 0.7			

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at "<0.50". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

STEP 2D: Determine Sufficiency of Pollution Mitigation Indices for Selected SuDS Components

This is an automatic step which compares the Combined Pollution Mitigation Indices with the Land Use Hazard Indices, to determine whether the proposed components are sufficient to manage each pollutant category type

When the combined mitigation index exceeds the land use pollution hazard index, then the proposed components are considered sufficient in providing pollution risk mitigation.

In England and Wales, where the discharge is to protected surface waters or groundwater, an additional treatment component (in row 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. Protected surface waters are those designated for drinking water abstraction. In England and Wales, protected groundwater resources are defined as Source Protection Zone 1. In Northern Ireland, a more precautionary approach may be required and this should be checked with the environmental regulator or a site by site basis.

Sufficiency of Pollution Mitigation Indices			
Low Suspended	Metals	Hydrocarbons	
Sufficient Sufficient Sufficient			

Reference to local planning documents should also be made to clarify any additional protection required for site due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on water resources primarily in an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered in consultation with relevant conservation bodies such as Natural England.