HADLOW DOWN COMMUNITY CENTRE COMMITTEE

MONSON

Structural Engineering
Roads & Car Parks
Traffic & Flood Risk Assessments
Water & Drainage Engineering
Technical Audits & Assessments

HADLOW DOWN COMMUNITY CENTRE SCHOOL LANE HADLOW TN22 4JE

DRAINAGE STRATEGY & SUSTAINABLE DRAINAGE MANAGEMENT AND MAINTENANCE PLAN

Issue: A

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Author: C. Maheshe

Verified by L.G. Leslie

Job No: 8600S

Registered No. FS 37624

Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF **(Registered Office)** Tel: (01892) 601370

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1.00 Introduction

1.01 Monson Engineering have been asked to prepare a Drainage Strategy and Sustainable Drainage Management and Maintenance Plan to accompany and support an outline planning application on behalf of Hadlow Down Community Centre Committee for the development of a new community centre to replace an existing village hall and sports pavilion in Hadlow Down.

1.02 The site is located in a rural area north of Hadlow Down village in the Wealden District of East Sussex. It is bordered to the south by a residential garden, to the north and west by open fields and to the east by School Lane where access to the site is through wooden gates. The approximate National Grid Reference of the site is TQ 52741 24501.

1.03 The current proposal is for the demolition of the existing village hall and sports pavilion and replace it with a new community centre served by an access road and a car parking area. The proposed site can be seen in the location plan provided in **Appendix A**.

1.04 Surface water at the new development would be disposed of by means of sustainable urban drainage systems (SUDS), with these SUDS installed prior to the occupation of the new development.

1.05 This site is situated within flood zone 1 having a less than 1 in 1,000 annual probability of river or sea flooding. As the site area is less than 1 hectare, a Flood Risk Assessment is not considered to be necessary for this development. Nonetheless, all other risks of flooding such as flooding from sewers, surface water or reservoirs have been considered by reviewing the Environment Agency flood maps, which indicate that there is no risk of flooding to the proposed development. The Environment Agency flood maps are included in **Appendix B**.

1.06 This report will conform to the National Planning Policy Framework published in July 2018, the National Planning Practice Guidance published in 2016, the Local Planning Authority local plan policies and East Sussex “Guide to Sustainable Drainage in East Sussex” as well as the “Water.People.Places. A guide for masterplanning Sustainable Drainage into Developments”.

2.00 Existing Drainage

2.01 MapInfo records indicate that there is a 150mm diameter public foul water pipe running under School Lane. There is no record of any local public storm water sewer in the vicinity; however there is an existing ditch that runs on the northern part of the site. Due to the topography of the site, this ditch appears to be a natural receptor of any surface water generated by this site.

2.02 An agreement under Section 106 of the Water Industry Act 1991 (application to connect to a public sewer) will be applied for prior to connection of any foul water sewers.

2.03 Plans showing the existing drainage assets in the area can be found in **Appendix C.**

3.00 Site Geology

3.01 A Desktop Study has shown that the site is underlain by the Tunbridge Wells Sands Formation – sandstone and siltstone interbedded. A plan showing the Bedrock Geology can be seen in **Appendix D**.

3.02 The Tunbridge Wells Sand formation is typically described by the British Geological Survey as predominantly fine - to medium - grained sandstone, siltstone and silty sand rhythms with finely-bedded mudstones and thin limestones.

3.03 A site investigation and BRE365 infiltration tests, which have been carried out in a nearby site (Hadlow Down Sports Field) in June 2013 by Southern Testing, indicate very poor soakage potential. Taking the above findings into consideration, it appears highly unlikely that the site has any possibility of shallow infiltration as a reliable method of disposing of surface water.

3.04 For the purposes of this document, a negligible infiltration has been assumed and the surface water drainage strategy will be solely based on an on-site surface water storage system in the form of an underground geo-cellular storage tank and a controlled discharge into the existing ditch at the north boundary of the site.

4.00 Development Drainage Proposals

4.01 For the consideration of surface water drainage for this development, the main factors are the access road, car parking areas and the impermeable roofs of the building.

4.02 The current proposal is for the site to accommodate a new community centre building which will be served by an access road and parking areas.

4.03 The impermeable roof areas are intended to be drained with conventional roof guttering and downpipes, which will be directed through a surface water drainage system to catch-pits before entering the underground geocellular attenuation unit positioned at the north east part of the site. The catch-pit will allow the sediment to settle, therefore reducing the amount of silt entering the underground storage tank. Water will be drained to the storage tank via pipes laid at an appropriate gradient to ensure that self-cleansing velocities are achieved.

4.04 It is understood at this stage that the access road and the car parking areas will be a tarmacadam surface finish. Surface water generated from the access road and the car parking areas will be collected via conventional road gullies and catch pits with trapped outlets to reduce the risk of contaminants and/or litter entering the system. The water will then be directed to the underground geocellular attenuation unit. Water will be drained to the storage tank via pipes laid at an appropriate gradient to ensure that self-cleansing velocities are achieved.

4.05 A Hydro-brake® positioned at the attenuation unit's outfall will control the discharge rate to the ditch and restrict it to the site's Qbar (mean annual flood flow from the catchment, approximately 2.3 year return period) which is 3.9 l/s, as shown on the calculations included in **Appendix E**.

4.06 The underground attenuation tank will be designed to provide sufficient storage for the 1 in 100 years + 40% annual probability storm event, allowing for climate change in the critical storm. The underground storage tank will also be located ≥ 5m from any building or structure.

4.07 The size of the attenuation tank has been calculated using the software package MicroDrainage®. Calculations attached in **Appendix F** demonstrate the adequacy of the attenuation tank size for any rainfall duration in 1 to 100 year event + 40% climate change (starting with 30 minutes and finishing with 24 hours storm).

4.08 Surface water drainage general proposed arrangements can be seen in **Appendix G**.

4.09 The surface water drainage layout should be designed in accordance with the ‘’Sewers for Adoption, 7th Edition’’. The surface water drainage system should be designed to be able to accommodate and dispose of surface water without an increase to on-site or off-site flood risk.

5.00 Infiltration

5.01 Mapping on the Environment Agency's web site confirms that the site is situated outside of any Groundwater Source Protection Zones therefore any infiltration at this site would not be deemed a risk to aquifers. A map showing the ground water protection zones is contained within **Appendix H**.

5.02 Given the site investigation carried out by Southern Testing at a nearby site, it is highly unlikely that the site has any possibility of shallow infiltration as a reliable method of disposing of surface water. However, should another BRE365 soakage test on site at the detailed design stage show good infiltration potential, any infiltration system will be designed to cater for a 1 in 100 year annual probability storm event, allowing an additional 40% for climate change for the critical storm.

6.00 Maintenance of the Attenuation Tank

6.01 To ensure the long term effectiveness of the attenuation tank asset, the sediment that accumulates within the SUDS system must periodically be removed to prevent it from entering the cellular units and slowing down the functionality of the system. The frequency of this maintenance operation will vary depending on the density of the site, vegetation, design of the drainage system, other impermeable areas and if the site is pre or post construction.

6.02 Replacement of the geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will provide a warning of potential failure in the long term.

6.03 Maintenance responsibility should be placed with an appropriate organisation, and maintenance schedules should be developed during the detailed design phase. All maintenance operations are to be carried out in accordance with the manufacturer's recommendations.

Table 1 *– Attenuation Tank Maintenance Activities – By Management Company*

Maintenance Activity	Inspection Frequency
• Inspection for sediment and debris in pre-treatment components and floor of inspection tube or chamber • Trimming any roots that may be causing blockages	Annually (or as required based on inspections)
• Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber	As required, based on inspections
• Reconstruct tank and/or replace or clean void fill, if performance deteriorates or failure occurs • Replacement of deteriorated liner (will require reconstruction of tank)	As required
• Inspect silt traps and note rate of sediment accumulation	Annually
• CCTV inspection at every inspection point is recommended	Following all significant storm events

7.00 Maintenance of Access Road & Car Parking Areas

7.01 The proposed surface finish to the access road and the car parking areas is anticipated to be an impermeable tarmacadam surface and will therefore need to be drained via conventional gullies and catch pits.

7.02 Where this surface water has been collected, it will be done so via trapped gullies to reduce the risk of contaminants and/or litter being allowed to enter the system and discharge to the attenuation tank. Any surface water will also be directed via pipes laid at an appropriate gradient to ensure that self-cleansing velocities are achieved.

7.03 To ensure the long term effectiveness of the drainage asset, the sediment that accumulates within this system must periodically be removed to prevent it from entering key parts of the network and slowing the operation of the system. The frequency of this maintenance operation will vary depending on the density of the site, vegetation, design of the drainage system and if the site is pre or post construction.

7.04 The ongoing maintenance activities for this system are tabulated below in Table 2.

Table 2 *– Gully and Catch-pit Maintenance Activities - Residents & Management Company*

Maintenance Activity	Inspection Frequency
• Inspect Gullies and Catch-pits • Clear any sediment or detritus found in the chamber(s). If sediment has built up within the pipe network, this should be cleared with rodding equipment or professional jetting techniques	Quarterly
• Inspect and carry out essential recovery works to return the feature to full working order	Following all significant storm events

8.00 Maintenance of the Drainage Ditch

8.01 The ditch will require regular maintenance to ensure continuing operation to design performance standards. Regular inspection is important for its effective operation. Maintenance responsibility should always be placed with an appropriate management company, however the owners should be educated on their routine maintenance needs of the ditch that falls within the site boundary, and should understand the long-term maintenance plan and any legally binding maintenance agreement.

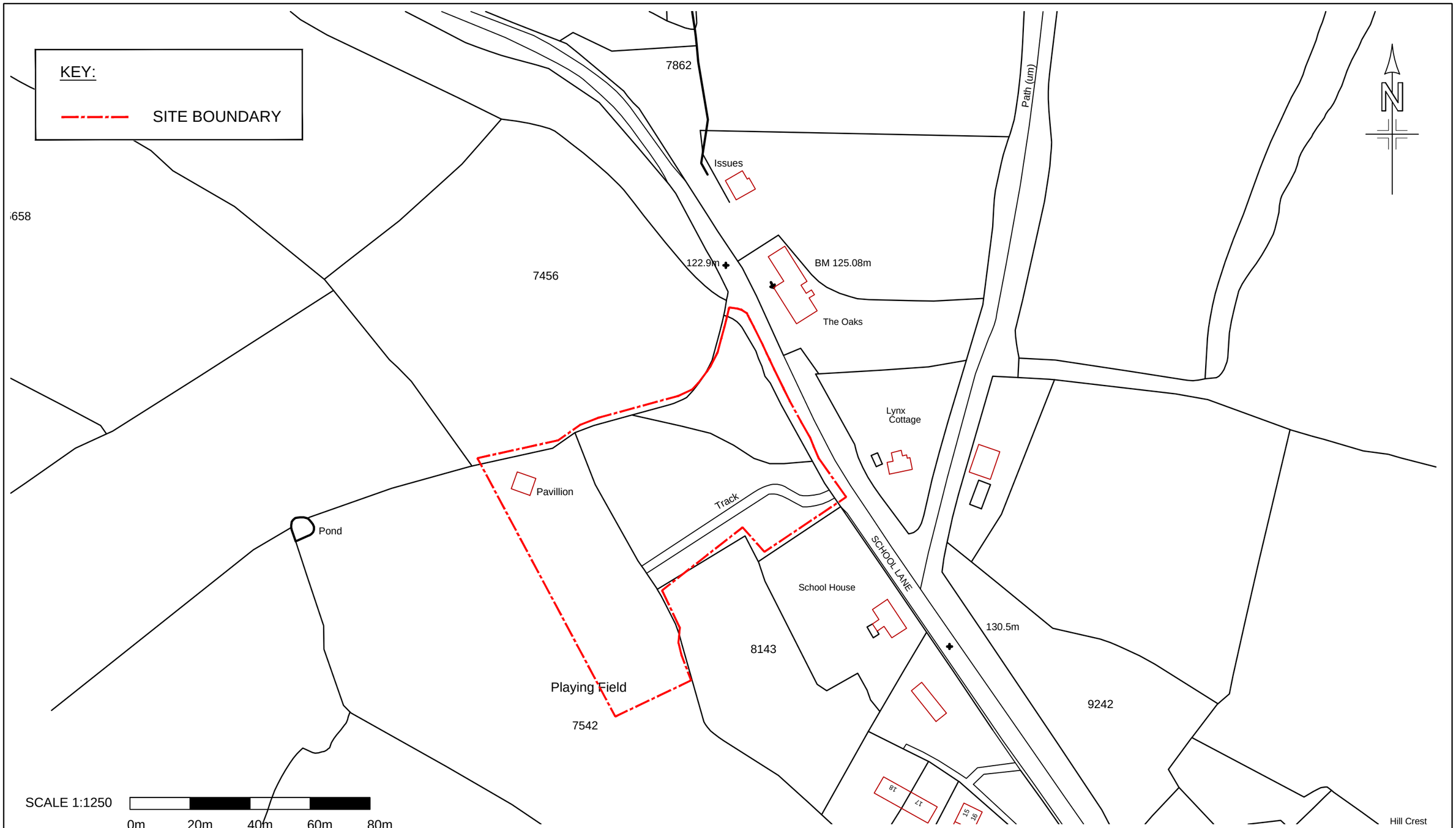
8.02 Adequate access should be provided to all ditch areas within the site boundary for inspection and maintenance. Litter and debris removal should be undertaken as part of general landscape maintenance for the site and before any other SUDS management task. All litter should be removed from the site.

8.03 Typical on-going maintenance activities are tabulated in the following page in Table 3.

***Table 3** – Ditch Maintenance Activities – Residents & Management Company*

Maintenance Activity	Inspection Frequency
• Remove litter and debris	Monthly or as required
• Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
• Manage other vegetation and remove nuisance plants	Monthly at start, then as required
• Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
• Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
• Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
• Repair erosion or other damage by re-turfing or reseeding	As required
• Re-level uneven surfaces and reinstate design levels	As required
• Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
• Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
• Remove and dispose of oils or petrol residues using safe standard practices	As required

Appendix A - Site Location Plan & Development Proposal



Notes:

1. This drawing to be read in conjunction with all other relevant Monson drawings and specifications, any discrepancies to be reported to Monson prior to any fabrication or work commencing on site.

2. Do not scale this drawing use figured dimensions only

3. All dimensions in millimetres, all levels in metres.

Issue	By	Date	Amendments
A	DT	09/10/18	Original issue

MONSON

Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project:
Hadlow Down Community Centre
School Lane
Hadlow Down
TN22 4JE

Description:
Site Location Plan

Original Drawing:	Prepared	DT	Approved	GL	
Origin:	Crowborough		Size	A3	
Current Issue:	Approved	GL	Date	08/10/18	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:1250	8600S/302	A

N

INDICATIVE ONLY

GRASS

DITCH

DITCH

GRASS

PIPE IL

PIPE IL

PIPE IL

STUMPS

DITCH

CYCLE STORE

BIN STORE

GRASS

GRASS

GRASS

EP

STAY WIRE

HWM

GRASS

MH

SCHOOL LANE

PWM

TARMAC

SETTS

TARMAC

PR

EP

PWM

PEG

PWM

PWM

PWM

PIPE IL

PIPE IL

PIPE IL

PWM

GRASS

GRAVEL

NEW PLAY AREA

RTW

SP

CL

EMERGENCY VEHICLE ACCESS ONTO FIELD

0 1 2 4 6 8 10 20 METRES

mjb architecture
www.mjbarch.co.uk

DATE:
APRIL 2018

NEW COMMUNITY HALL

HADLOW DOWN VILLAGE HALL,
SCHOOL LANE, HADLOW DOWN, EAST SUSSEX

Appendix B – Environment Agency Flood Maps

Environment Agency

Flood map for planning

Your reference
8600S

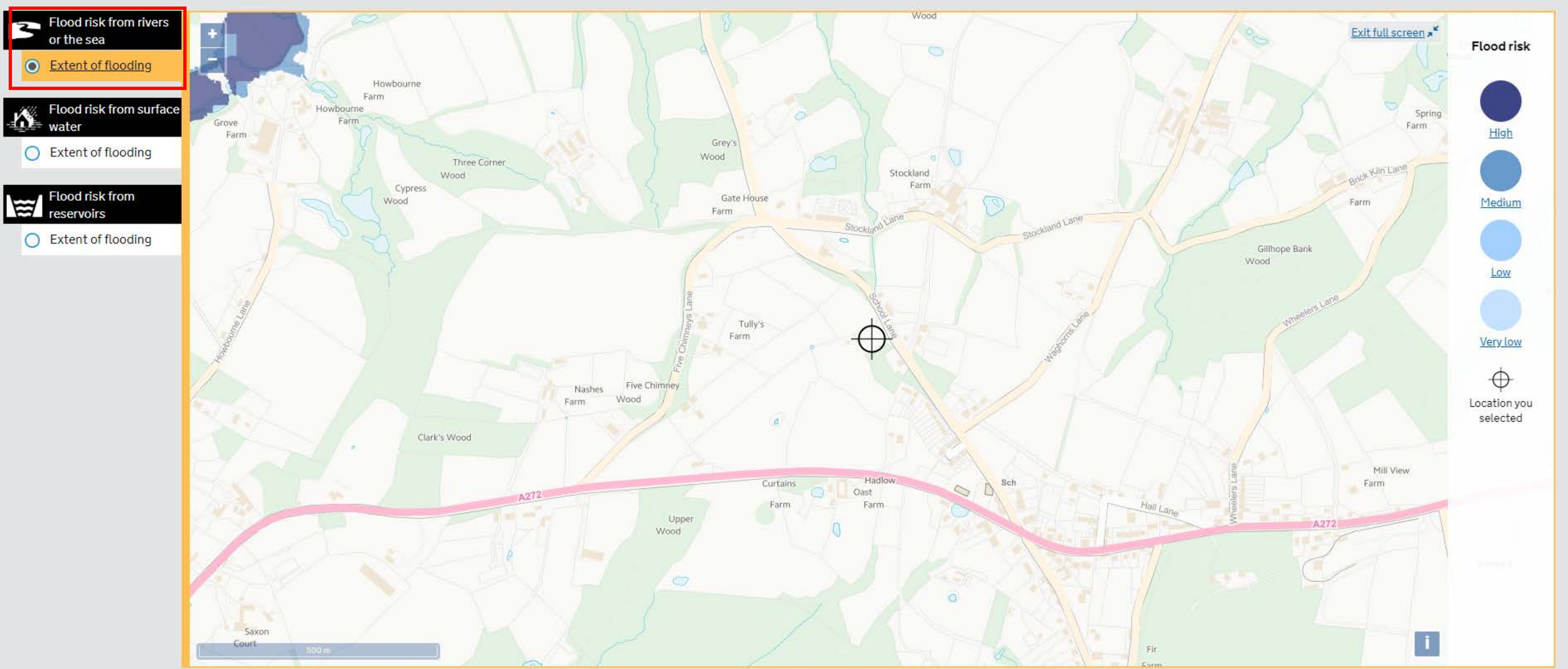
Location (easting/northing)
552792/124506

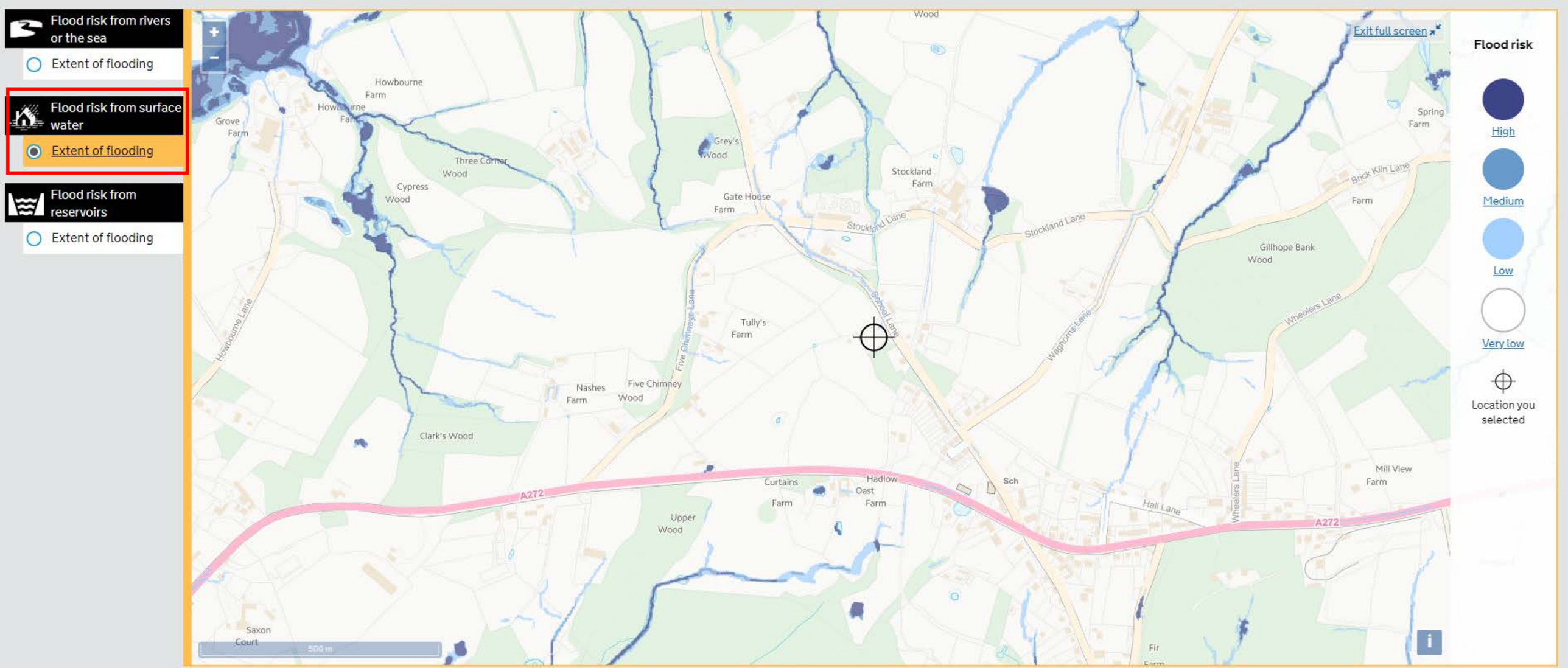
Scale
1:2500

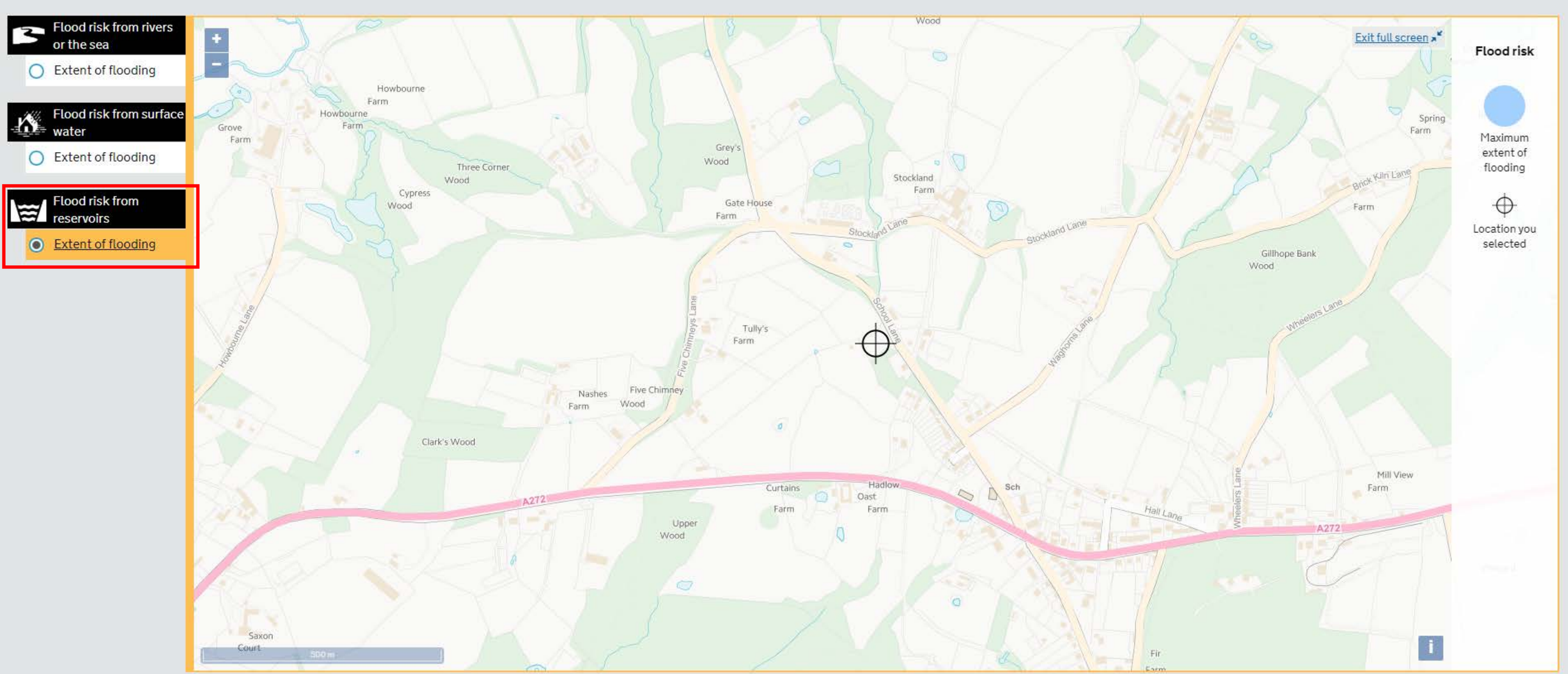
Created
8 Oct 2018 2:50

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m


Flood risk from rivers or the sea
Extent of flooding
Flood risk from surface water
Extent of flooding
Flood risk from reservoirs
Extent of flooding
Exit full screen
Flood risk
High
Medium
Low
Very low
Location you selected
Howbourne Farm
Howbourne Farm
Grove Farm
Three Corner Wood
Cypress Wood
Grey's Wood
Gate House Farm
Stockland Farm
Stockland Lane
Stockland Lane
Spring Farm
Brick Kiln Lane
Farm
Gillhope Bank Wood
Wheelers Lane
Howbourne Lane
Five Chimneys Lane
Tully's Farm
School Lane
Waghorns Lane
Nashes Farm
Five Chimney Wood
Clark's Wood
A272
Curtains Farm
Hadlow Oast Farm
Upper Wood
Sch
Hall Lane
Wheelers Lane
Mill View Farm
A272
Saxon Court
500 m


Flood risk from rivers or the sea
Extent of flooding
Flood risk from surface water
Extent of flooding
Flood risk from reservoirs
Extent of flooding
Exit full screen
Flood risk
High
Medium
Low
Very low
Location you selected
Howbourne Farm
Grove Farm
Three Corner Wood
Cypress Wood
Grey's Wood
Gate House Farm
Stockland Farm
Stockland Lane
Spring Farm
Brick Kiln Lane
Gillhope Bank Wood
Wheelers Lane
Howbourne Lane
Five Chimneys Lane
School Lane
Waghorns Lane
Tully's Farm
Nashes Farm
Five Chimney Wood
Clark's Wood
A272
Curtains Farm
Hadlow Oast Farm
Upper Wood
Hall Lane
Mill View Farm
Saxon Court
500 m

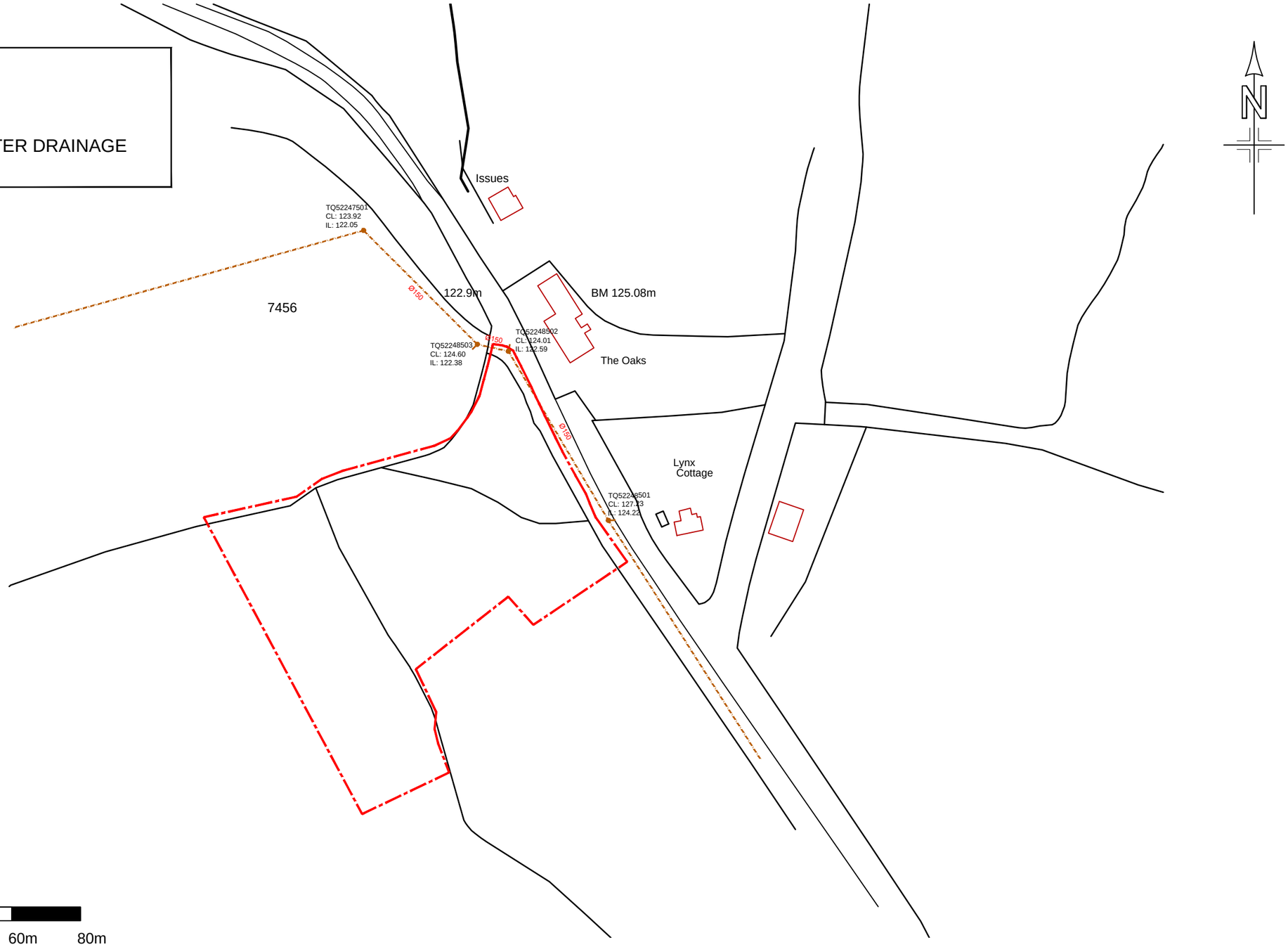

Flood risk from rivers or the sea
Extent of flooding
Flood risk from surface water
Extent of flooding
Flood risk from reservoirs
Extent of flooding
Exit full screen
Flood risk
Maximum extent of flooding
Location you selected
Howbourne Farm
Howbourne Farm
Grove Farm
Three Corner Wood
Cypress Wood
Grey's Wood
Gate House Farm
Stockland Farm
Stockland Lane
Stockland Lane
Brick Kiln Lane
Farm
Spring Farm
Gillhope Bank Wood
Wheelers Lane
Howbourne Lane
Five Chimneys Lane
Tully's Farm
School Lane
Waghorns Lane
Nashes Farm
Five Chimney Wood
Clark's Wood
A272
Curtains Farm
Hadlow Oast Farm
Upper Wood
Sch
Hall Lane
Wheelers Lane
A272
Mill View Farm
Saxon Court
500 m

Appendix C – MapInfo Records

KEY:

SITE BOUNDARY

EXISTING FOUL WATER DRAINAGE



SCALE 1:1250

0m 20m 40m 60m 80m

Notes:

1. This drawing to be read in conjunction with all other relevant Monson drawings and specifications, any discrepancies to be reported to Monson prior to any fabrication or work commencing on site.

2. Do not scale this drawing use figured dimensions only

3. All dimensions in millimetres, all levels in metres.

Issue	By	Date	Amendments
A	CM	08/10/18	Original issue

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Original Drawing:	Prepared	CM	Approved	GL	
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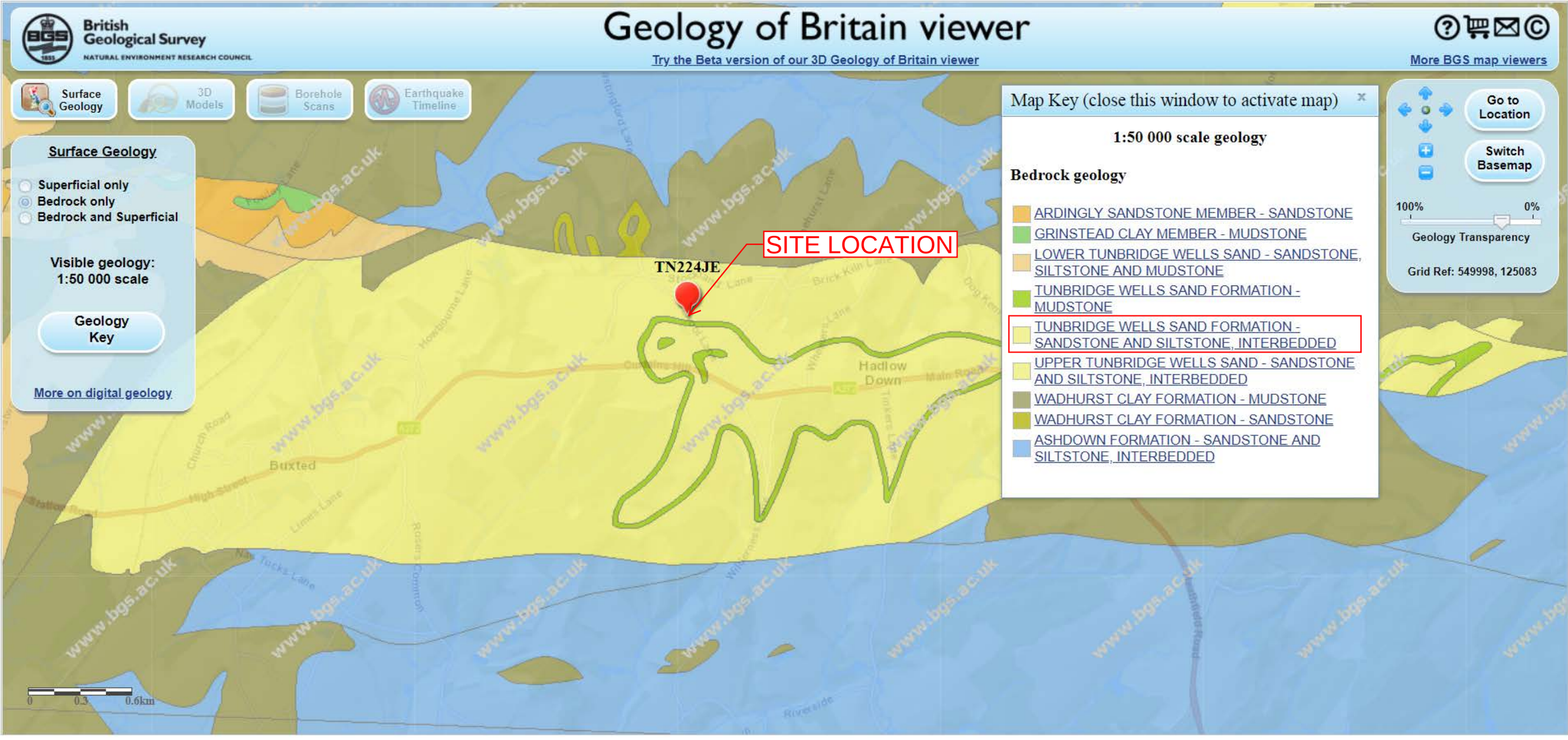
Current Issue:	Approved	GL	Date	08/10/18	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:1250	8600S/300	A

Appendix D – Site Geology


British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL
Geology of Britain viewer
Try the Beta version of our 3D Geology of Britain viewer
More BGS map viewers
Surface Geology
3D Models
Borehole Scans
Earthquake Timeline
Surface Geology
Superficial only
Bedrock only
Bedrock and Superficial
Visible geology: 1:50 000 scale
Geology Key
More on digital geology
SITE LOCATION
TN224JE
Map Key (close this window to activate map)
1:50 000 scale geology
Bedrock geology
ARDINGLY SANDSTONE MEMBER - SANDSTONE
GRINSTEAD CLAY MEMBER - MUDSTONE
LOWER TUNBRIDGE WELLS SAND - SANDSTONE, SILTSTONE AND MUDSTONE
TUNBRIDGE WELLS SAND FORMATION - MUDSTONE
TUNBRIDGE WELLS SAND FORMATION - SANDSTONE AND SILTSTONE, INTERBEDDED
UPPER TUNBRIDGE WELLS SAND - SANDSTONE AND SILTSTONE, INTERBEDDED
WADHURST CLAY FORMATION - MUDSTONE
WADHURST CLAY FORMATION - SANDSTONE
ASHDOWN FORMATION - SANDSTONE AND SILTSTONE, INTERBEDDED
Go to Location
Switch Basemap
100%
0%
Geology Transparency
Grid Ref: 549998, 125083
Buxted
Hadlow Down
0
0.3
0.6km

Appendix E – Greenfield Runoff Rate

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	0.710	Urban	0.007
SAAR (mm)	844	Region Number	Region 7

Results l/s

QBAR Rural	3.9
QBAR Urban	3.9
Q100 years	12.5
Q1 year	3.3
Q30 years	8.9
Q100 years	12.5

Appendix F – Calculations for the Attenuation Tank for the Critical Storm

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 423 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	125.805	0.315	0.0	3.9	3.9	76.7	O K
30 min Summer	125.910	0.420	0.0	3.9	3.9	102.2	O K
60 min Summer	126.017	0.527	0.0	3.9	3.9	128.2	O K
120 min Summer	126.111	0.621	0.0	3.9	3.9	151.0	O K
180 min Summer	126.148	0.658	0.0	3.9	3.9	160.1	O K
240 min Summer	126.162	0.672	0.0	3.9	3.9	163.5	O K
360 min Summer	126.166	0.676	0.0	3.9	3.9	164.4	O K
480 min Summer	126.158	0.668	0.0	3.9	3.9	162.5	O K
600 min Summer	126.147	0.657	0.0	3.9	3.9	159.9	O K
720 min Summer	126.135	0.645	0.0	3.9	3.9	156.8	O K
960 min Summer	126.107	0.617	0.0	3.9	3.9	150.1	O K
1440 min Summer	126.046	0.556	0.0	3.9	3.9	135.2	O K
2160 min Summer	125.942	0.452	0.0	3.9	3.9	109.8	O K
2880 min Summer	125.854	0.364	0.0	3.9	3.9	88.5	O K
4320 min Summer	125.725	0.235	0.0	3.9	3.9	57.1	O K
5760 min Summer	125.650	0.160	0.0	3.8	3.8	38.9	O K
7200 min Summer	125.610	0.120	0.0	3.6	3.6	29.3	O K
8640 min Summer	125.595	0.105	0.0	3.3	3.3	25.5	O K
10080 min Summer	125.584	0.094	0.0	3.0	3.0	22.9	O K
15 min Winter	125.845	0.355	0.0	3.9	3.9	86.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	131.851	0.0	79.1	26
30 min Summer	88.566	0.0	106.6	40
60 min Summer	56.713	0.0	137.9	68
120 min Summer	35.004	0.0	170.4	126
180 min Summer	25.973	0.0	189.7	184
240 min Summer	20.877	0.0	203.3	242
360 min Summer	15.365	0.0	224.5	348
480 min Summer	12.341	0.0	240.4	404
600 min Summer	10.402	0.0	253.3	466
720 min Summer	9.042	0.0	264.2	530
960 min Summer	7.241	0.0	282.1	668
1440 min Summer	5.284	0.0	308.6	946
2160 min Summer	3.848	0.0	338.2	1328
2880 min Summer	3.068	0.0	359.5	1704
4320 min Summer	2.226	0.0	390.8	2384
5760 min Summer	1.771	0.0	415.3	3056
7200 min Summer	1.483	0.0	434.9	3744
8640 min Summer	1.284	0.0	451.6	4416
10080 min Summer	1.137	0.0	466.0	5144
15 min Winter	131.851	0.0	88.7	26

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	125.964	0.474	0.0	3.9	3.9	115.2	O K
60 min Winter	126.085	0.595	0.0	3.9	3.9	144.7	O K
120 min Winter	126.193	0.703	0.0	3.9	3.9	170.9	O K
180 min Winter	126.238	0.748	0.0	3.9	3.9	182.0	O K
240 min Winter	126.258	0.768	0.0	3.9	3.9	186.7	O K
360 min Winter	126.269	0.779	0.0	3.9	3.9	189.4	O K
480 min Winter	126.259	0.769	0.0	3.9	3.9	186.9	O K
600 min Winter	126.243	0.753	0.0	3.9	3.9	183.1	O K
720 min Winter	126.227	0.737	0.0	3.9	3.9	179.2	O K
960 min Winter	126.188	0.698	0.0	3.9	3.9	169.8	O K
1440 min Winter	126.100	0.610	0.0	3.9	3.9	148.3	O K
2160 min Winter	125.940	0.450	0.0	3.9	3.9	109.6	O K
2880 min Winter	125.807	0.317	0.0	3.9	3.9	77.2	O K
4320 min Winter	125.648	0.158	0.0	3.8	3.8	38.4	O K
5760 min Winter	125.597	0.107	0.0	3.3	3.3	26.0	O K
7200 min Winter	125.580	0.090	0.0	2.8	2.8	22.0	O K
8640 min Winter	125.570	0.080	0.0	2.5	2.5	19.5	O K
10080 min Winter	125.564	0.074	0.0	2.2	2.2	17.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	88.566	0.0	119.5	40
60 min Winter	56.713	0.0	154.5	68
120 min Winter	35.004	0.0	190.9	124
180 min Winter	25.973	0.0	212.5	182
240 min Winter	20.877	0.0	227.8	238
360 min Winter	15.365	0.0	251.5	348
480 min Winter	12.341	0.0	269.3	452
600 min Winter	10.402	0.0	283.8	486
720 min Winter	9.042	0.0	296.0	562
960 min Winter	7.241	0.0	315.9	718
1440 min Winter	5.284	0.0	345.6	1028
2160 min Winter	3.848	0.0	378.8	1432
2880 min Winter	3.068	0.0	402.7	1788
4320 min Winter	2.226	0.0	437.9	2420
5760 min Winter	1.771	0.0	465.2	3000
7200 min Winter	1.483	0.0	487.1	3688
8640 min Winter	1.284	0.0	505.9	4416
10080 min Winter	1.137	0.0	522.1	5120

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.326

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.109	4	8	0.109	8	12	0.109

Model Details

Storage is Online Cover Level (m) 127.000

Cellular Storage Structure

Invert Level (m) 125.490 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	256.0	256.0	0.801	0.0	307.2
0.800	256.0	307.2			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0097-3900-0800-3900
Design Head (m)	0.800
Design Flow (l/s)	3.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	125.490
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	3.9
Flush-Flo™	0.239	3.9
Kick-Flo®	0.526	3.2
Mean Flow over Head Range	-	3.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.7	3.000	7.2	7.000	10.8
0.200	3.9	1.400	5.0	3.500	7.8	7.500	11.1
0.300	3.9	1.600	5.4	4.000	8.3	8.000	11.5
0.400	3.7	1.800	5.7	4.500	8.7	8.500	11.8
0.500	3.4	2.000	6.0	5.000	9.2	9.000	12.2
0.600	3.4	2.200	6.2	5.500	9.6	9.500	12.5
0.800	3.9	2.400	6.5	6.000	10.0		
1.000	4.3	2.600	6.7	6.500	10.4		

Appendix G – Surface Water Drainage Proposal

SCALE 1:500

0m 10m 20m 30m 40m

KEY:

- SITE BOUNDARY
- TREE PROTECTION ZONE
- HYDROBRAKE CHAMBER TO RESTRICT THE FLOW TO 3.9l/s
- PROPOSED SURFACE WATER DRAINAGE
- SEALED ATTENUATION TANK - GEOCELLULAR STORAGE UNITS

Surface water discharge into existing ditch

HydroBrake to restrict flow to 3.9 l/s (Greenfield Runoff Rate)

Indicative location of underground geo-cellular storage tank to accommodate surface water from impermeable roofs and car park.

Geocellular Storage 16m x 16m x 0.8m

GFL = 130.200

CYCLE STORE

BIN STORE

SCHOOL LANE

NEW PLAY AREA

Notes:

1. Size of the tank has been calculated assuming that infiltration cannot be achieved therefore both roof areas and car park are considered as impermeable.

Notes:

1. This drawing to be read in conjunction with all other relevant Monson drawings and specifications, any discrepancies to be reported to Monson prior to any fabrication or work commencing on site.

2. Do not scale this drawing use figured dimensions only

3. All dimensions in millimetres, all levels in metres.

Issue	By	Date	Amendments
A	CM	05/10/18	Original issue

MONSON

Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project:
Hadlow Down Community Centre
School Lane
Hadlow Down
TN22 4JE

Description:
Indicative Surface Water Drainage Layout

Original Drawing:	Prepared	CM	Approved	GL	
Origin:	Crowborough		Size	A3	
Current Issue:	Approved	GL	Date	05/10/18	

Drawing Status: PRELIMINARY

Scale:	Dwg No:	Issue:
1:500	8600S/301	A

Appendix H – Groundwater Source Protection Zones Map

Hadlow Down Community Centre, School Lane, Hadlow, TN22 4JE

SITE LOCATION

Legend

Source Protection Zones merged (England)

- Zone I - Inner Protection Zone
- Zone I - Subsurface Activity
- Zone II - Outer Protection Zone
- Zone II - Subsurface Activity
- Zone III - Total Catchment
- Zone III - Subsurface Activity
- Zone of Special Interest

Projection = OSGB36
xmin = 544700
ymin = 121100
xmax = 560800
ymax = 128700

0 0.75 1.5
km

Map produced by MAGIC on 3 October, 2018.