Notes

Environment Agency defences are shown with a standard of protection which is against a 20% AEP event or more. Man-made and natural defences which may arise, for instance due to the presence of naturally high ground adjacent to a settlement, have been considered.

Many natural structures such as revetments and river banks may provide a limited flood defence function. This is includes features indicated as 'defences' downstream of East Farleigh.

Key Plan

Legend

- Maidstone Borough Council boundary
- Fluvial
- Fluvial and tidal
- Tidal

REF	Date	Comments
A	June 2020	-

0 1,125 2,250 4,500 m

MAIDSTONE BOROUGH COUNCIL

SFRA: APPENDIX I
FLOOD DEFENCES

JBA consulting

MAIDSTONE Borough Council

Notes

Flood Alerts are used to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and make early preparations. It is issued earlier than a flood warning, to give customers advance notice of the possibility of flooding, but before the Environment Agency are fully confident that flooding in Flood Warning Areas is expected.

Flood Warnings warn people of expected flooding to property and encourage them to take action to protect themselves and their property.

Some areas may be covered by more than one flood warning area as they may be at risk of flooding from more than one watercourse.

Key Plan

Legend

- Maidstone Borough Council boundary
- Flood Warning Areas
- Flood Alert Areas

REF	Date	Comments
A	June 2020	-

0 1,000 2,000 4,000 m

MAIDSTONE BOROUGH COUNCIL

SFRA: APPENDIX J
FLOOD WARNING AREAS

JBA consulting

MAIDSTONE Borough Council

Appendix 8 – SWMP Mapping Extracts

C.2 DA02 - Maidstone Rural Mid

Table C 2 Maidstone Rural Mid Receptors

Receptor	Location
A	Sandling
B	Detling
C	Eyhorne Street and Hollingbourne
D	Harrietsham
E	Lenham and Warren Street
F	Three Tees
F	Langley Heath
G	Chart Sutton, Sutton Valance and Warmlake
H	Other (isolated incidences across the drainage area)

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
A	28/02/2010	Boarley Lane	Fluvial	There are records of property being affected by flooding.	KCC Highways	KCC Highways P1 Dataset	There was a property at risk of flooding as water flowed near to the front door. Also, the gravel on the drive had disappeared.
A	09/02/2009	Boarley Lane	Surface Water with blocked drain/gully	There are records of property being affected by flooding.	KCC Highways	KCC Highways P1 Dataset	Records show that 5 or 6 drains were blocked with leaves which caused a garage to flood.
A	Regular	Boarley Lane	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, A drainage hotspot is defined as a flood prone section of the highway network Definition taken from Guidance on the HMEP 2012
A	13/02/2009	Boarley Lane	Surface Water	This historic record does not specify property	KCC Highways	KCC Highway P1 Dataset	Records show that two vehicles and a HGV were stuck in a flood area under the bridge here. Road closure was requested.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				flooding			
A	2012	Boarley Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to cleanse gullies and jet lines through to the next gully/centre line/outfall.
A	16/11/2009, 09/02/2009	Forstal Road	Fluvial	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The entire area was flooded. This was due to a blocked culvert. Water reached a high level and was flowing in from the woods which blocked the road. Water was reportedly halfway up the road and impassable.
A	Not Specified	Forstal Road, Aylesford	Fluvial	Records suggest that properties may have been affected by this incident	Environment Agency	An old historic record supplied by the Environment Agency *the Data Validation and Action Plan Workshop*	Several houses in the area flooded. *Forstal Road backs onto the River Medway, which this point is partly tidal. The EA explained that previous events may have been exacerbated by tide locking of outfalls discharging to the River Medway.*
A	Nov-60	Medway	Fluvial	There are approximately 7 properties that may be affected by flooding based on the GIS files provided by the EA historic outlines and NRD	Environment Agency	Environment Agency Flood History Maps	Outline from cabinet maps. Support info: Report on Flood Conditions in the Upper Medway Division Nov - Dec 1960. Photographs, newspaper cuttings, hand drawn flood outline of Maidstone Town Centre. Flood levels at Maidstone Bridge from SWA.
A	Oct-00	Medway Tidal	Fluvial	This historic record does not specify property flooding based	Environment Agency	Environment Agency Flood History Maps	Flood level at Allington Lock. Ground photos for Allington.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				on the GIS files provided by the EA historic outlines and NRD			
A	Sep-69	Medway	Fluvial	There are approximately 2 properties that may be affected by flooding based on the GIS files provided by the EA historic outlines and NRD	Environment Agency	Environment Agency Flood History Maps	Main source is cabinet maps. Some other sources of reference, newspaper articles in HFM folder.
A	Dec-27	Medway	Tidal	There are approximately 7 properties that may be affected by flooding based on the GIS files provided by the EA historic outlines and NRD	Environment Agency	Environment Agency Flood History Maps	Unknown source of outline. Tidal flooding on the River Medway in 1927 (sourced from Internet).
A	Oct-00	Medway	Fluvial	There are approximately 64 properties that may be affected by flooding based on the GIS files provided by the EA historic outlines and NRD	Environment Agency	Environment Agency Flood History Maps	Aerial and ground photography. Flood levels. Reports from Environment Agency staff. NOTE-some aerial photographs may not show peak of flooding.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
B	2000	Detling	Other/ Unknown	This historic record does not specific property flooding	Maidstone Borough Council	Maidstone Borough Council Meeting Minutes	This area was affected by flooding in 2000.
B	15/01/2009	Detling Hill	Other/ Unknown	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 dataset	Reports state that water was flowing down a bank and onto the road. It was unclear where the water was coming from.
B	2012	Hermitage Lane	Surface Water	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were asked to provide a tanker to remove flood water.
B	10/11/2008	Pilgrims Way	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	A drain was blocked opposite Jay's crossing.
B	Regular	Scragged Oak Road	Surface Water	There are records of property being affected by flooding in the past.	KCC Highways	KCC Highway Meeting Minutes	KCC suggests this road requires a CCTV survey to investigate the issues within the gullies.
B	2012	Scragged Oak Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were asked to provide a combo, to attend site and clear flood water and cleanse gullies. They were also requested to jet the lines through to the next gully/main line.
B	01/11/2008	Scragged Oak Road	Surface Water	There are records of property being affected by flooding in the past.	KCC Highways	KCC Highway P1 Dataset	Water was reportedly overflowing out of a drain and flooded the road. There has been property damage in this area in the past.
B	Regular	Scragged Oak Road	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, A drainage hotspot is defined as a flood prone section of the highway network Definition taken from Guidance on the HMEP 2012

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
B	Regular	The Street	Surface Water with blocked drain/gully	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Records show that the gullies and soakaways need regular maintenance.
B	2012	Water Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were asked to provide a combo to remove flood water and cleanse gullies. Anecdotal evidence suggests that recent resurfacing works covered and damaged the drainage system.
C	07/10/2009 15/02/2011 03/11/2011	Ashford Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	Standing water was reported on this road, which has caused cars to aquaplane in the past. In addition, A large puddle which nearly caused a road traffic collision.
C	Regular	Ashford Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Records show that the gullies require regular cleaning. Otherwise, the whole carriageway floods.
C	2012	Caring Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to cleanse all gullies along Caring Lane, jet the lines and cleanse the chamber.
C	14/02/2009 08/09/2010	Caring Lane	Surface Water	This historic record does not specify property flooding; there are records of external flooding (driveway).	KCC Highways	KCC Highways P1 dataset	A road was flooded and caused a driveway to flood. There was a lot of standing water reported and the water seemed to flow off the A20. Records show that there was a flash flood. This resulted in water entering a garage to a depth of approximately 2 inches. The driveway was reportedly less than 4 inches of water.
C	Regular	Caring Lane	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway Meeting Minutes	This location was highlighted as a drainage hotspot, KCC described that a new drainage system was installed in Sept 2012, including gullies and large crater soakaway with an additional 42m3 in capacity
C	21/09/2009	Chegworth Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	Three drains were blocked but there was still a permanent flow of water through the drains as water from a spring is piped through the same drainage system. A stream of water approximately 5-6ft wide and a few inches deep was reported.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
C	08/09/2010	Eyhorne Street in Eyhorne Street	Surface Water with blocked drain/gully	There are records of property being affected by flooding.	KCC Highways	KCC Highways P1 Dataset	Both storm drains were blocked with silt and were unable to drain the water away. This caused flooding and water entered a property via the front and back doors.
C	Not Specified	Eyhorne Street, Hollingbourne	Surface Water	This historic record does not specific property flooding	Maidstone Borough Council	Maidstone Borough Council Meeting Minutes and *the Data Validation and Action Plan Workshop*	There is a small ditch that flows through Eyhorne Street which has caused issues in the past. *The EA at the Data Validation and Action Plan Workshop described that the watercourses in this area are spring fed and arecharacterized by small channels* *The ditch is the responsibility of the landowner.*
C	11/11/2008	Eyhorne Street, Hollingbourne	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 dataset	Flooding was recorded at this location.
C	16/01/2010	Lower Street	Fluvial	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The B2163 (Lower Street) was flooded on both sides of the carriageway. The water was quite deep and one car broke down after going through it (near a small stream).
C	2012	Lower Street	Surface Water	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were asked to provide a tanker to clear flood water.
C	Regular	Lower Street	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, A drainage hotspot is defined as a flood prone section of the highway network Definition taken from Guidance on the HMEP(*Highways Maintenance Efficiency Programme)* 2012
C	28/02/2010	Old Mill Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	A privately owned fishing lake was overflowing near a commercial property on Old Mill Road.
C	2012	Old Mill Road	Surface Water	This historic record does not specify property	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to erect flood boards on either side of the flood by the lake (near Old Mill Farm), Old Mill Road, Leeds, Maidstone (Incident Make Safe)

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				flooding			
C	11/11/2008	Penfold Hill	Fluvial	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	There was flooding at this location.
C	2009	Queensway	Sewer	This historic record does not specify property flooding	Southern Water	initial_summary.csv	Hydraulic overload of foul sewer.
D	13/11/2009	Ashford Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	The water was reportedly 12 inches deep at this location.
D	Regular	Ashford Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Records show that the gullies needed cleaning. Otherwise, the whole carriageway would be flooded.
D	Not Specified	Ashford Road, Harrietsham	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of flooding at this location. Records suggest that the cause of flooding is surface water run off from an impermeable surface. The main receptor is highway.
D	Not Specified	Ashford Road, Harrietsham	Surface Water	This historic record does not specify property flooding	KCC and Environment Agency	*Data Validation and Action Plan Workshop*	*The EA explained that the watercourse is spring fed and is easily blocked.*
D	Not Specified	Chippendale Drive	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There were 2 incidents of blocked culverts due to increased runoff from a new development which caused flooding on the Highway and some gardens.
D	10/02/2009	Church Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 dataset	The road was flooded and the water depth was approximately 1.5ft.
D	Not Specified	Church Road	Surface Water	This historic record does not specific property	Maidstone Borough Council	Maidstone Borough Council	The attenuation pond off of Church Road is not maintained may exacerbate flooding during extreme events

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				flooding		Meeting Minutes	
D	Not Specified	Church Road / Court Lodge Lane	Surface Water	There are records of a property being affected by flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There have been 2 incidents of surface water flooding at this location due to blocked gullies and high intensity rainfall which has caused the highway and a garage to flood.
D	02/02/2010	East Street	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	There was standing water on the road and the footpath which did not drain away. Records show that the water was approximately 2-3 inches deep and about 8 houses in length. This has been an ongoing problem for the last few years.
D	Not Specified	East Street	Fluvial	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of a tributary overtopping due to blockages.
D	2012	Fairbourne Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to clear blocked gullies and jet connecting pipelines through. There was a burst water main but due to blocked gullies, the water had nowhere to go.
D	Not Specified	Fairbourne Lane	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	Runoff from fields which affected a highway.
D	10/11/2008	Forge Meadow	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 dataset	The road was flooded to the lip of the kerb. There are sloping driveways in the area and there were concerns that they could be flooded.
D	14/11/2008 30/11/2009	Goddington Lane	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	Records show that drains were overflowing onto the road. The lane was flooded. There was a constant stream of water flowing down the road and water was getting very close to the properties.
D	Not Specified	Goddington Lane	Surface Water with blocked drain/gully	This historic record does not specify property	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of blocked gullies at this location and insufficient culver capacity which resulted in the highway being flooded.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				flooding			
D	Not Specified	Goddington Lane	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of flow impeded by debris which resulted in agricultural land being affected by flooding.
D	12/01/2011	Holm Mill Lane	Surface Water with blocked drain/gully	There are records of property being affected by flooding.	KCC Highways	KCC Highways P1 Dataset	Drainage issues caused a property to flood.
D	Regular	Holm Mill Lane	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There have been 7 incidents of surface water flooding at this location due to tributary overtopping and blockages as well as runoff from the A20. The main receptors have been highways and some gardens.
D	Regular	Lakelands	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, A drainage hotspot is defined as a flood prone section of the highway network Definition taken from Guidance on the HMEP 2012
D	2012	Lakelands	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to remove flood water and cleanse and jet gullies.
D	10/02/2009 14/12/2009	Rectory Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 dataset	Records show that the drains were unable to cope with the rain and caused the road to flood. Reports state that a storm water gully was overflowing into properties.
D	Not Specified	Rectory Lane	Fluvial	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	An underground stream diverted which caused flooding of the sewer and affected residential areas and a highway.
D	Not Specified	Water Lane (Track)	Groundwater	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of flooding from springs which affected a highway.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
D	Not Specified	West Street	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	There was 1 incident of blocked culverts due to increased runoff from a new development which caused flooding on the Highway and some gardens.
D,E	01/11/2008	A20, Ashford Road, Harrietsham	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The road was flooded and the water depth was approximately 1ft.
E	2012	Ashford Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to remove floodwater, cleanse and jet any gullies as required to prevent further flooding.
E	Regular	Ashford Road	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Insufficient soakaways in a verge caused flooding on the A20.
E	17/01/2011 03/11/2011	Ashford Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	The road was flooded. No additional comments of the scale of flooding were provided. There was a large puddle with a depth of approximately 1ft which caused an obstruction on the road.
E	Not specified	Court Lodge	Sewer	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	No further comment was provided
E	02/11/2008	Ham Lane	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The whole road was flooded curb to curb. The water depth was approximately 4-5 inches.
E	28/02/2010	Headcorn Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	An overflowing gully caused the carriageway to flood. The water flowed onto the embankment then flowed onto the M20.
E	2012	Headcorn Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to clear floodwater and cleanse gullies and jet the lines through to the next gully/centre line.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
E	29/07/2008	Headcorn Road near Grafty Green	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The road was flooded to a depth of approximately 1.5ft.
E	Not specified	High Street, Lenham	Sewer	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	No further comment was provided
E	Not specified	High Street, Lenham	Sewer	A property was affected by flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	A damage sewer flooded a property, this record did not indicate whether the flooding was internal or external
E	30/11/2009	Honywood Road	Surface Water	This historic record does not specify property flooding; there are records of external flooding (pathway).	KCC Highways	KCC Highways P1 Dataset	The road was flooded and water overflowed onto the pathway.
E	Not specified	Robins Close	Sewer	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone Borough Council SFRA	No further comment was provided
E	23/02/2010	The Square	Other/ Unknown	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	No additional comments provided.
E	Not specified	Westwood	Surface Water	No property was affected by this incident	Maidstone Borough Council	Maidstone Borough Council SFRA	The cause of flooding was as a result of poor drainage and topography
F	28/02/2010	Honey Lane	Surface Water with blocked drain/gully	There are records of property being affected by flooding.	KCC Highways	KCC Highways P1 Dataset	A blocked drain surcharged and water entered a property.
F	14/11/2009 08/09/2010	Honey Lane	Surface Water	There are records of property being affected by	KCC Highways	KCC Highways P1 Dataset	The road was flooded and reports suggest that a front garden and garage were at risk and may have flooded. A garage was flooded again. This has been an

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				flooding.			ongoing issue for the previous 18 months and the last time it happened, prior to this event, the house was flooded.
G	Regular	Amber Lane	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	This area has been highlighted as a drainage hotspot.
G	2012	Chart Hill Road	Surface Water	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to provide a tanker to clear flood water and pump out trench line.
G	Not Specified	Chart Sutton	Surface Water	This historic record does not specific property flooding	Maidstone Borough Council	Maidstone Borough Council Meeting Minutes	The highway floods as a result of poor roadside drainage.
G	2012	Heath Road	Sewer	Records describe the curtilage of one property being affected	Southern Water	initial_summary.xlsx	Hydraulic overload of foul sewer
G	22/02/2010	Leeds Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	This area has ongoing flooding problems. The road was flooded and there was an accident at this location. Reports state that the water was very deep.
G	Regular	Maidstone Road	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, KCC described that drains located on the A274 require an investigation.
G	Not Specified	Marshall's corner, Chart Sutton	Surface Water	This historic record does not specify property flooding	Environment Agency	An old historic record supplied by the Environment Agency	An unclassified road at Marshall's corner flooded at Chart Sutton.
G	10/02/2009	Norton Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	Records show that a large stretch of road was flooded as a result of water flowing off the fields.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
G	2012	Pleasure House Lane	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	Maidstone 2012 P1.xls	KCC were requested to clear flood water and cleanse and jet drainage system to prevent further flooding.
G	10/02/2009	Plough Wents Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	Flooding was reportedly worse than usual.
G	10/11/2008 2012	Plough Wents Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	Records show that a ditch was blocked and water threatened to flood a property as the water levels were rising quickly. Flooding in rural areas. KCC were asked to provide a combo to clear floodwater, empty gullies and jet lines through to the next gully/main line.
G	Regular	Plough Wents Road	Surface Water	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Reports state that flooding was observed and further investigation was needed.
G	Regular	Plough Wents Road	Surface Water	This historic record does not specify property flooding	KCC Highways	Drainage Hotspots.xlsx	This location was highlighted as a drainage hotspot, A drainage hotspot is defined as a flood prone section of the highway network Definition taken from Guidance on the HMEP 2012
G	Not Specified	Sutton Valance	Surface Water	This historic record does not specific property flooding	Maidstone Borough Council	Maidstone Borough Council Meeting Minutes	The drains at this location would benefit from more frequent maintenance.
G	Not Specified	Warmlake Crossroads, Sutton Valence	Surface Water	This historic record does not specify property flooding	Environment Agency	An old historic record supplied by the Environment Agency	Flooding was recorded on A274. The existing soakaways did not function due to lack of permeable strata.
G	Regular	Warmlake Road	Surface Water with blocked drain/gully	This historic record does not specify property flooding	Maidstone Borough Council	Maidstone_SWMP_KCC_Highway_Drainage_Hotspots.shp	Gullies and soakaways in a verge needed cleaning as they pose a flood risk to properties.

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
G, H	01/11/2008	Leeds Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	The carriageway was completely flooded.
H	Not Specified	B2163, Langley Heath	Surface Water	This historic record does not specify property flooding	Environment Agency	An old historic record supplied by the Environment Agency	A road floods outside a property, B2163, Langley Heath as a result of soakaways not functioning due to lack of permeable strata.
H	08/09/2010	Dickens Close	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	The road was flooded to a depth of approximately 1ft, close to some properties. The water level was only a few inches from entering a property.
H	2010	Dickens Close	Sewer	Records describe the curtilage if one property being affected.	Southern Water	initial_summary.xlsx	Hydraulic overload of foul sewer
H	31/10/2008	Gravelly Bottom house through to Slow Hill	Surface Water with blocked drain/gully	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	Reports state that there was flooding all along the road and drain covers were lifting up along the road. It was reported that six gullies were blocked and required cleaning.
H	27/11/2009	Gravelly Bottom Road	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highways P1 Dataset	The whole road was flooded for about 100 yards in length.
H	Not Specified	Gravely Bottom Road, Kingswood	Surface Water	This historic record does not specify property flooding	Environment Agency	An old historic record supplied by the Environment Agency	The road was flooded.
I	28/07/2008	Charlesford Avenue	Surface Water	This historic record does not specify property flooding	KCC Highways	KCC Highway P1 Dataset	Works were being carried out on a gully sucker by KCC at Coldharbour. Water was reportedly tearing up through the road surface causing flooding.
I	Nov-60	Len, Bearsted	Fluvial	This historic record does not	Environment Agency	Environment Agency Flood	Outline from cabinet maps. Support info: Report on Flood Conditions in the Upper Medway Division Nov -

DA02 - Maidstone Rural Mid							
Receptor, see Table C 2	Date (Month/ Year)	Location (Area/Road/ Street etc)	Source	No. of properties affected	Source supplied data (organisation)	Source supplied data (report)	Comments
				specify property flooding based on the GIS files provided by the EA historic outlines and NRD		History Maps	Dec 1960. Photographs, newspaper cuttings, hand drawn flood outline of Maidstone Town Centre. Flood levels at Maidstone Bridge from SWA.
I	Sep-68	Len, Bearsted	Fluvial	There is 1 property that may be affected by flooding based on the GIS files provided by the EA historic outlines and NRD	Environment Agency	Environment Agency Flood History Maps	Main source is cabinet maps. Some other sources of reference, newspaper articles in HFM folder.
I	Not Specified	Spot Lane, Bearsted	Fluvial	Records suggest that properties may have been affected by this incident	Environment Agency	An old historic record supplied by the Environment Agency	Flooding of residential area.

Appendix 9 – HR Wallingford Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Elizabeth Austin
Site name:	Old Ashford Road
Site location:	Lenham

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:	51.23465° N
Longitude:	0.73096° E
Reference:	3657120097
Date:	Aug 03 2021 18:46

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	3.85

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.693
Q_{MED} (l/s):	
Q_{BAR} / Q_{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	743	743
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

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):		7.38
1 in 1 year (l/s):		6.27
1 in 30 years (l/s):		16.97
1 in 100 year (l/s):		23.53
1 in 200 years (l/s):		27.59

Appendix 10 – Microdrainage Calculations

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	104.217	0.517	1.8	118.5	O K
30 min Summer	104.334	0.634	1.8	158.2	O K
60 min Summer	104.445	0.745	1.8	200.9	O K
120 min Summer	104.535	0.835	1.8	239.7	O K
180 min Summer	104.593	0.893	1.8	266.1	O K
240 min Summer	104.636	0.936	1.8	287.2	O K
360 min Summer	104.704	1.004	1.8	321.6	O K
480 min Summer	104.752	1.052	1.9	347.7	O K
600 min Summer	104.787	1.087	1.9	367.0	O K
720 min Summer	104.811	1.111	1.9	381.2	O K
960 min Summer	104.839	1.139	2.0	397.6	O K
1440 min Summer	104.852	1.152	2.0	405.1	O K
2160 min Summer	104.835	1.135	1.9	394.7	O K
2880 min Summer	104.811	1.111	1.9	381.0	O K
4320 min Summer	104.762	1.062	1.9	353.3	O K
5760 min Summer	104.718	1.018	1.9	329.4	O K
7200 min Summer	104.680	0.980	1.8	309.1	O K
8640 min Summer	104.644	0.944	1.8	290.9	O K
10080 min Summer	104.609	0.909	1.8	274.1	O K
15 min Winter	104.261	0.561	1.8	132.9	O K
30 min Winter	104.385	0.685	1.8	177.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	142.114	0.0	117.5	19
30 min Summer	95.276	0.0	140.7	34
60 min Summer	61.107	0.0	205.2	64
120 min Summer	37.120	0.0	248.4	124
180 min Summer	27.925	0.0	276.0	184
240 min Summer	22.938	0.0	282.5	242
360 min Summer	17.583	0.0	283.4	362
480 min Summer	14.609	0.0	285.7	482
600 min Summer	12.625	0.0	290.4	602
720 min Summer	11.179	0.0	295.7	722
960 min Summer	9.147	0.0	301.6	962
1440 min Summer	6.792	0.0	304.0	1440
2160 min Summer	4.977	0.0	582.6	1816
2880 min Summer	3.972	0.0	570.8	2188
4320 min Summer	2.868	0.0	541.3	2984
5760 min Summer	2.278	0.0	737.8	3808
7200 min Summer	1.913	0.0	774.4	4616
8640 min Summer	1.663	0.0	807.7	5448
10080 min Summer	1.481	0.0	838.5	6256
15 min Winter	142.114	0.0	130.4	19
30 min Winter	95.276	0.0	138.8	34

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	104.503	0.803	1.8	225.6	O K
120 min Winter	104.600	0.900	1.8	269.8	O K
180 min Winter	104.662	0.962	1.8	300.1	O K
240 min Winter	104.709	1.009	1.8	324.4	O K
360 min Winter	104.782	1.082	1.9	364.4	O K
480 min Winter	104.835	1.135	1.9	395.2	O K
600 min Winter	104.874	1.174	2.0	418.4	O K
720 min Winter	104.902	1.202	2.0	435.9	Flood Risk
960 min Winter	104.936	1.236	2.0	457.6	Flood Risk
1440 min Winter	104.959	1.259	2.0	472.4	Flood Risk
2160 min Winter	104.947	1.247	2.0	464.3	Flood Risk
2880 min Winter	104.918	1.218	2.0	446.2	Flood Risk
4320 min Winter	104.859	1.159	2.0	409.3	O K
5760 min Winter	104.801	1.101	1.9	374.9	O K
7200 min Winter	104.746	1.046	1.9	344.1	O K
8640 min Winter	104.693	0.993	1.8	315.9	O K
10080 min Winter	104.642	0.942	1.8	289.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	61.107	0.0	229.5	64
120 min Winter	37.120	0.0	274.8	122
180 min Winter	27.925	0.0	283.7	180
240 min Winter	22.938	0.0	284.3	240
360 min Winter	17.583	0.0	287.7	358
480 min Winter	14.609	0.0	295.7	474
600 min Winter	12.625	0.0	302.7	590
720 min Winter	11.179	0.0	307.5	708
960 min Winter	9.147	0.0	312.6	936
1440 min Winter	6.792	0.0	313.6	1386
2160 min Winter	4.977	0.0	595.5	2028
2880 min Winter	3.972	0.0	589.9	2304
4320 min Winter	2.868	0.0	570.9	3204
5760 min Winter	2.278	0.0	826.3	4144
7200 min Winter	1.913	0.0	867.3	5040
8640 min Winter	1.663	0.0	904.4	5880
10080 min Winter	1.481	0.0	937.7	6760

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 590701 151899 TQ 90701 51899
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.450

Time (mins) From:	To:	Area (ha)
0	4	0.450

Model Details

Storage is Online Cover Level (m) 105.200

Tank or Pond Structure

Invert Level (m) 103.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	152.0	1.200	625.9	1.500	800.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0064-2000-1200-2000
Design Head (m)	1.200
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	64
Invert Level (m)	103.700
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.0
Flush-Flo™	0.282	1.8
Kick-Flo®	0.573	1.4
Mean Flow over Head Range	-	1.6

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	1.5	1.200	2.0	3.000	3.0	7.000	4.5
0.200	1.7	1.400	2.1	3.500	3.3	7.500	4.7
0.300	1.8	1.600	2.3	4.000	3.5	8.000	4.8
0.400	1.7	1.800	2.4	4.500	3.7	8.500	5.0
0.500	1.6	2.000	2.5	5.000	3.9	9.000	5.1
0.600	1.5	2.200	2.6	5.500	4.0	9.500	5.2
0.800	1.7	2.400	2.7	6.000	4.2		
1.000	1.8	2.600	2.8	6.500	4.4		

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	108.867	0.667	2.9	129.2	O K
30 min Summer	109.021	0.821	2.9	172.5	O K
60 min Summer	109.166	0.966	2.9	218.4	O K
120 min Summer	109.279	1.079	2.9	258.2	O K
180 min Summer	109.349	1.149	2.9	284.3	O K
240 min Summer	109.400	1.200	3.0	304.4	O K
360 min Summer	109.477	1.277	3.1	336.0	O K
480 min Summer	109.529	1.329	3.1	358.4	O K
600 min Summer	109.563	1.363	3.2	373.3	O K
720 min Summer	109.584	1.384	3.2	382.7	O K
960 min Summer	109.597	1.397	3.2	388.8	O K
1440 min Summer	109.586	1.386	3.2	383.9	O K
2160 min Summer	109.547	1.347	3.1	366.4	O K
2880 min Summer	109.505	1.305	3.1	347.9	O K
4320 min Summer	109.414	1.214	3.0	310.0	O K
5760 min Summer	109.327	1.127	2.9	276.0	O K
7200 min Summer	109.247	1.047	2.9	246.7	O K
8640 min Summer	109.172	0.972	2.9	220.5	O K
10080 min Summer	109.099	0.899	2.9	196.5	O K
15 min Winter	108.926	0.726	2.9	145.1	O K
30 min Winter	109.090	0.890	2.9	193.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	142.114	0.0	131.6	26
30 min Summer	95.276	0.0	176.1	41
60 min Summer	61.107	0.0	227.4	70
120 min Summer	37.120	0.0	276.2	130
180 min Summer	27.925	0.0	311.7	188
240 min Summer	22.938	0.0	341.3	248
360 min Summer	17.583	0.0	392.1	366
480 min Summer	14.609	0.0	433.6	484
600 min Summer	12.625	0.0	465.2	604
720 min Summer	11.179	0.0	476.1	722
960 min Summer	9.147	0.0	475.3	936
1440 min Summer	6.792	0.0	471.5	1162
2160 min Summer	4.977	0.0	667.6	1556
2880 min Summer	3.972	0.0	710.1	1964
4320 min Summer	2.868	0.0	767.9	2776
5760 min Summer	2.278	0.0	815.0	3624
7200 min Summer	1.913	0.0	855.5	4400
8640 min Summer	1.663	0.0	892.4	5192
10080 min Summer	1.481	0.0	926.8	6048
15 min Winter	142.114	0.0	147.3	26
30 min Winter	95.276	0.0	196.6	41

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	109.244	1.044	2.9	245.7	O K
120 min Winter	109.367	1.167	2.9	291.4	O K
180 min Winter	109.443	1.243	3.0	321.9	O K
240 min Winter	109.500	1.300	3.1	345.7	O K
360 min Winter	109.586	1.386	3.2	383.6	O K
480 min Winter	109.645	1.445	3.2	411.2	O K
600 min Winter	109.686	1.486	3.3	430.4	O K
720 min Winter	109.712	1.512	3.3	443.5	Flood Risk
960 min Winter	109.736	1.536	3.3	455.4	Flood Risk
1440 min Winter	109.726	1.526	3.3	450.4	Flood Risk
2160 min Winter	109.679	1.479	3.3	427.4	O K
2880 min Winter	109.624	1.424	3.2	401.0	O K
4320 min Winter	109.499	1.299	3.1	345.6	O K
5760 min Winter	109.375	1.175	2.9	294.7	O K
7200 min Winter	109.258	1.058	2.9	250.4	O K
8640 min Winter	109.141	0.941	2.9	210.4	O K
10080 min Winter	109.020	0.820	2.9	172.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	61.107	0.0	254.7	70
120 min Winter	37.120	0.0	309.4	128
180 min Winter	27.925	0.0	349.0	184
240 min Winter	22.938	0.0	382.1	242
360 min Winter	17.583	0.0	438.4	360
480 min Winter	14.609	0.0	477.6	474
600 min Winter	12.625	0.0	483.3	590
720 min Winter	11.179	0.0	484.6	702
960 min Winter	9.147	0.0	487.5	924
1440 min Winter	6.792	0.0	493.6	1332
2160 min Winter	4.977	0.0	747.6	1660
2880 min Winter	3.972	0.0	795.2	2116
4320 min Winter	2.868	0.0	852.2	3028
5760 min Winter	2.278	0.0	912.8	3880
7200 min Winter	1.913	0.0	958.2	4752
8640 min Winter	1.663	0.0	999.5	5616
10080 min Winter	1.481	0.0	1038.0	6456

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 590701 151899 TQ 90701 51899
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.497

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.166	4	8	0.166	8	12	0.166

Model Details

Storage is Online Cover Level (m) 110.000

Tank or Pond Structure

Invert Level (m) 108.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	132.1	1.500	488.7	1.800	600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0079-3300-1500-3300
Design Head (m)	1.500
Design Flow (l/s)	3.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	79
Invert Level (m)	108.200
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	3.3
Flush-Flo™	0.344	2.9
Kick-Flo®	0.704	2.3
Mean Flow over Head Range	-	2.7

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	2.3	1.200	3.0	3.000	4.5	7.000	6.8
0.200	2.8	1.400	3.2	3.500	4.9	7.500	7.0
0.300	2.9	1.600	3.4	4.000	5.2	8.000	7.2
0.400	2.9	1.800	3.6	4.500	5.5	8.500	7.4
0.500	2.8	2.000	3.8	5.000	5.8	9.000	7.6
0.600	2.7	2.200	3.9	5.500	6.0	9.500	7.8
0.800	2.5	2.400	4.1	6.000	6.3		
1.000	2.7	2.600	4.2	6.500	6.5		

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	106.118	0.418	3.8	428.4	O K
30 min Summer	106.244	0.544	3.8	573.4	O K
60 min Summer	106.376	0.676	3.8	732.4	O K
120 min Summer	106.495	0.795	3.8	882.6	O K
180 min Summer	106.576	0.876	3.8	988.6	O K
240 min Summer	106.640	0.940	3.8	1075.1	O K
360 min Summer	106.743	1.043	3.8	1219.8	O K
480 min Summer	106.823	1.123	3.8	1334.7	O K
600 min Summer	106.884	1.184	3.8	1424.9	O K
720 min Summer	106.932	1.232	3.8	1496.8	O K
960 min Summer	106.997	1.297	3.8	1596.5	O K
1440 min Summer	107.064	1.364	3.9	1701.4	O K
2160 min Summer	107.096	1.396	4.0	1752.7	O K
2880 min Summer	107.094	1.394	4.0	1749.0	O K
4320 min Summer	107.052	1.352	3.9	1683.3	O K
5760 min Summer	107.013	1.313	3.9	1621.9	O K
7200 min Summer	106.982	1.282	3.8	1573.0	O K
8640 min Summer	106.955	1.255	3.8	1531.8	O K
10080 min Summer	106.932	1.232	3.8	1496.1	O K
15 min Winter	106.164	0.464	3.8	480.2	O K
30 min Winter	106.303	0.603	3.8	643.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	142.114	0.0	312.7	27
30 min Summer	95.276	0.0	323.4	42
60 min Summer	61.107	0.0	628.5	72
120 min Summer	37.120	0.0	615.5	132
180 min Summer	27.925	0.0	589.3	190
240 min Summer	22.938	0.0	572.4	250
360 min Summer	17.583	0.0	557.5	370
480 min Summer	14.609	0.0	563.3	490
600 min Summer	12.625	0.0	578.1	608
720 min Summer	11.179	0.0	588.8	728
960 min Summer	9.147	0.0	601.2	968
1440 min Summer	6.792	0.0	607.2	1446
2160 min Summer	4.977	0.0	1202.2	2164
2880 min Summer	3.972	0.0	1203.7	2880
4320 min Summer	2.868	0.0	1169.3	3680
5760 min Summer	2.278	0.0	2315.9	4440
7200 min Summer	1.913	0.0	2234.6	5192
8640 min Summer	1.663	0.0	2153.0	6048
10080 min Summer	1.481	0.0	2086.5	6864
15 min Winter	142.114	0.0	319.8	27
30 min Winter	95.276	0.0	322.3	41

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	106.447	0.747	3.8	821.7	O K
120 min Winter	106.577	0.877	3.8	991.1	O K
180 min Winter	106.665	0.965	3.8	1110.5	O K
240 min Winter	106.735	1.035	3.8	1208.3	O K
360 min Winter	106.849	1.149	3.8	1372.8	O K
480 min Winter	106.937	1.237	3.8	1504.1	O K
600 min Winter	107.004	1.304	3.8	1607.9	O K
720 min Winter	107.057	1.357	3.9	1691.1	O K
960 min Winter	107.131	1.431	4.0	1808.4	O K
1440 min Winter	107.209	1.509	4.1	1937.1	Flood Risk
2160 min Winter	107.253	1.553	4.2	2011.4	Flood Risk
2880 min Winter	107.260	1.560	4.2	2024.1	Flood Risk
4320 min Winter	107.226	1.526	4.1	1965.7	Flood Risk
5760 min Winter	107.177	1.477	4.1	1884.6	O K
7200 min Winter	107.140	1.440	4.0	1823.8	O K
8640 min Winter	107.105	1.405	4.0	1766.4	O K
10080 min Winter	107.071	1.371	3.9	1712.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	61.107	0.0	629.1	70
120 min Winter	37.120	0.0	592.7	130
180 min Winter	27.925	0.0	571.6	188
240 min Winter	22.938	0.0	562.1	246
360 min Winter	17.583	0.0	569.2	364
480 min Winter	14.609	0.0	590.4	482
600 min Winter	12.625	0.0	605.2	600
720 min Winter	11.179	0.0	615.5	718
960 min Winter	9.147	0.0	626.8	952
1440 min Winter	6.792	0.0	630.2	1418
2160 min Winter	4.977	0.0	1259.4	2104
2880 min Winter	3.972	0.0	1257.4	2776
4320 min Winter	2.868	0.0	1218.1	4064
5760 min Winter	2.278	0.0	2372.8	4664
7200 min Winter	1.913	0.0	2320.8	5552
8640 min Winter	1.663	0.0	2280.5	6488
10080 min Winter	1.481	0.0	2223.6	7376

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 590701 151899 TQ 90701 51899
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 1.623

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.541	4	8	0.541	8	12	0.541

Model Details

Storage is Online Cover Level (m) 107.500

Tank or Pond Structure

Invert Level (m) 105.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	935.5	1.500	1662.5	1.800	2000.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0089-4100-1500-4100
Design Head (m)	1.500
Design Flow (l/s)	4.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	89
Invert Level (m)	105.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	4.1
Flush-Flo™	0.387	3.8
Kick-Flo®	0.790	3.1
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	2.7	1.200	3.7	3.000	5.7	7.000	8.4
0.200	3.5	1.400	4.0	3.500	6.1	7.500	8.7
0.300	3.8	1.600	4.2	4.000	6.5	8.000	9.0
0.400	3.8	1.800	4.5	4.500	6.8	8.500	9.3
0.500	3.8	2.000	4.7	5.000	7.2	9.000	9.5
0.600	3.7	2.200	4.9	5.500	7.5	9.500	9.8
0.800	3.1	2.400	5.1	6.000	7.8		
1.000	3.4	2.600	5.3	6.500	8.1		

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