Evans & Langford LLP

- Structural & Civil Engineers
- Land & Building Surveyors
- Geo-Environmental Engineers
- Project Managers
- CDM Consultants
- Contract Administrators

British Gypsum
Robertsbridge

Truck Service Depot and Parking Area
Flood Risk Assessment and Drainage Strategy

	Name	Position	Signature	Date
Prepared by	Daniel McLeish BEng CEng MICE DMS PGCE	Associate		June 2020
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British Gypsum

15294
June 2020
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Cert No GB01604

ISO 45001
Cert No GB01604

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Contents

Flood Risk Assessment

1. Introduction

1.1 This Site Drainage Infrastructure Review and Flood Risk Assessment has been prepared on behalf of British Gypsum in accordance with general best practice for the drainage of large sites, CIRIA Document C624 Development and Flood Risk, CIRIA Document C753 The SUDS Manual, and in accordance with National Planning Policy Framework dated July 2018 with associated guidance.

Background and Aims

1.2 Terms of reference: This report has been prepared to consider the risk of flooding to the site from the development of a service depot and freight parking area to the south of the site, and to consider measures that may be required to manage this risk. In addition, the potential impacts of climate change have also been taken into account.

1.3 Reference is made to previous investigations and reports authored by Evans & Langford LLP covering drainage and ground conditions across the British Gypsum Robertsbridge site. In particular, the report on the Site Drainage Infrastructure Review (No 13304) is referenced and some of the contents incorporated where appropriate.

Study Limitations

1.4 The findings, recommendations and conclusions of this report are based on information obtained from a variety of external sources which are understood to be reputable. However, Evans & Langford LLP cannot guarantee the authenticity or reliability of any data from third parties and no liability can be accepted for any erroneous information or the conclusions drawn from it.

2. The Site and Proposals

Existing Site

2.1 The British Gypsum (BG) site lies 1.0 km to the south west of Mountfield, 4.2 km to the south west of Robertsbridge and 4.0 km to the north west of Battle as shown on Figure 1. The site is centred on approximate grid reference 572428, 119661.

2.2 Access to the site is gained from Eatenden Lane, Mountfield just to the south of the railway crossing. Vehicular access is gained from the A2100 London Road via a private access road, which crosses Eatenden Lane before proceeding to the British Gypsum site.

2.3 The British Gypsum site is situated within the High Weald National Character Area (NCA). The High Weald Area of Outstanding Natural Beauty (AONB) covers 78 percent of the NCA. The closest site is the River Line SSSI which is 1.5 miles to the west. The River Line (ditch) itself runs within the woodland close to the site area.

2.4 The proposed scheme is for the construction of a service depot building and vehicle parking area for approximately 50 HGVs and 10 cars. This is to be sited to the south east of the haulage road which traverses the British Gypsum complex on a part of the site which is currently used for stockpiles. Scheme proposal drawings are found in Appendix A.

2.5 Reference to the 1:50,000 scale map of the area published by the British Geological Survey indicates that the area is generally underlain by the Ashdown Formation and Purbeck Group successively with depth, with the Purbeck group outcropping within an anticlinal inlier at the western end of the site; the Ashdown formation is present beneath the eastern part of the site. The Ashdown Formation comprises siltstones and silty fine-grained sandstones with subordinate amounts of finely-bedded mudstone. The Purbeck group comprises interbedded mudstones, limestones and evaporites of marginal freshwater, brackish and marine origin; detrital quartz occurs in parts. Also mapped on this site is the Greys Limestone Member; this is a faulted inlier of the Purbeck group.

2.6 Borehole records for the area are available on the website of the British Geological Survey and may be found in Appendix C. There was no recent borehole information for the western end of the site but data for two boreholes drilled in 1930 and 1952 were found.

2.7 A soil investigation on the proposed site was undertaken by Evans & Langford LLP in June 2020. A Factual Report on Ground Investigation dated July 2014 was carried out by Evans & Langford LLP for repair works to the culvert / road works adjacent to the access road. Two of the boreholes were drilled to the south of the access road opposite the reception building. Boreholes 3 and 4 were outside our area of study. Boreholes 1 & 2 can be found

in Appendix C as well as the borehole records and locations from the June 2020 investigation.

The results of the boreholes were as follows.

Fill	Boreholes 1 and 2 were drilled in a grassed area, with Boreholes 3 and 4 being drilled through holes cored in the concrete access road. A significant thickness of Fill was encountered in all positions: At the culvert site 5.80m and 7.10m was encountered in BHs 1 and 2 respectively. At the road rebuild site, BHs 3 and 4 found 3.95m and 3.15m respectively. The Fill generally comprised clay, with varying proportions of gravel and cobbles of flint, brick, concrete, limestone, gypsum and mudstone. Layers of limestone gravel and cobbles were encountered in BHs 1 and 2, up to 1.45m thick. A significant proportion of organic matter was typically seen towards the base of the Fill. These findings were confirmed by the 2020 survey, with fill being found across the development site (boreholes 5-8) to depths of between 0.75m – 2.3m.
Ashdown Formation	Boreholes 3 and 4, at the road rebuild site, found the Ashdown Formation below the Fill, and remained within this sequence to their full depth. This comprised an upper layer of very stiff brown/orange brown silty CLAY, up to 1.65m thick, over stiff, becoming very stiff, brown silty CLAY/clayey SILT.
Purbeck Group	Boreholes 1 and 2, at the culvert site, encountered the Purbeck Group below the Fill. This was stiff to very stiff, grey-brown to grey-blue CLAY, locally with fine gravel of mudstone and cobbles/thin bands of limestone (only one such cobble was found, in BH1 at 7.15m depth). In the 2020 survey, the underlying soils across the development site were found to be firm to stiff CLAY in boreholes 5-7, and fine to medium GRAVEL in borehole 8.

Aerial photograph of the British Gypsum site (February 2020).

3. National Policy Context

Flood and Water Management Act 2010

3.1 This Act provides for better, more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges and protects water supplies to the consumer.

3.2 It makes provisions for the establishment of SUDS Approval Bodies (SABs), or Local Lead Flood Authorities (LLFA) and for the publication of National Standards in respect of the design, construction, maintenance and operation of sustainable drainage systems. The Act places a duty on all flood risk management authorities to co-operate with each other and provides LLFA and the EA with a power to request information required in connection with their flood risk management functions.

3.3 In April 2015 East Sussex County Council was made the LLFA for this area and in 2016 published the East Sussex Local Flood Risk Management Strategy setting out requirements for the management of flood risk in the county.

National Planning Policy Framework 2018

3.4 National Policy in relation to flood risk is set out in Section 14 of the National Planning Policy Framework (NPPF) and in the accompanying guidance, flood risk and coastal change. Flood Risk is discussed at Paragraphs 148 to 169.

3.5 The first paragraphs address Planning for Climate Change, whilst paragraphs 155 to 165 are headed Planning and Flood Risk, discussing among other topics the sequential approach, with the application of an exception test where necessary. Paragraph 166 onwards discusses coastal change.

3.6 Paragraph 157 states that:

All plans should apply a sequential, risk-based approach to the location of development taking into account the current and future impacts of climate change so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

a) applying the sequential test and then, if necessary, the exception test;
b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

3.7 Paragraph 163 states that:

When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
b) the development is appropriately flood resistant and resilient;
c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
d) any residual risk can be safely managed; and
e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan

with the accompanying note:

A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

4. Local Planning Policy

Strategic Flood Risk Assessment (SFRA)

4.1 Local Planning Authorities are required to produce Local Development Frameworks, which are a portfolio of Local Development Documents (LDD) that collectively deliver the spatial planning strategy for the Authority area. The LDDs undergo a Sustainability Appraisal which assists Planning Authorities in ensuring their policies fulfill the principles of sustainability. Strategic Flood Risk Assessments are one of the documents to be used as the evidence base for planning decisions and are a component of the Sustainability Appraisal process. Therefore, SFRAs should be used in the review or production of LDDs.

4.2 To assist Local Planning Authorities in their strategic land-use planning, SFRAs should present sufficient information to enable Local Authorities to apply the Sequential Test to their proposed development sites:

"Decision-makers should use the SFRA to inform their knowledge of flooding, refine the information on the Flood Map and determine the variations in flood risk from all sources of flooding across and from their area. These should form the basis for preparing appropriate policies for flood risk management for these areas."

4.3 In August 2008 Rother District Council issued a Level 1 Strategic Flood Risk Assessment, which covers the development area.

4.4 Within this report, the site is noted as being within the High Weald Character Area. Flooding is noted in the urban areas of Robertsbridge, but not in the vicinity of the site.

4.5 A copy of the SFRA is available from the Rother District Council website.

East Sussex Local Flood Risk Management Strategy (LFRMS)

4.6 The East Sussex Local Flood Risk Management Strategy report was published by East Sussex County Council in September 2016. The site is located within Drainage Risk Area 3. The action plan includes developing proposals to confirm drainage constraints and opportunities. Infiltration opportunities are likely to be limited by a high water table.

Catchment Flood Management Plan (CFMP)

4.7 The Cuckmere and Sussex Havens Catchment Flood Management Plan – Summary Report December 2009 – was prepared by the EA. This site falls within High & Low Weald and The Levels, Sub Area 5 where drainage and run-off from the Weald has an influence on flood risk in downstream parts of the Cuckmere River. In this area the preferred policy is Option 6, these are areas of low to moderate flood risk where the EA are already managing

the flood risk effectively but where they need to take further action to keep pace with climate change. Proposed actions to implement the preferred approach include to reduce flood risk locally or more widely in a catchment by storing water or managing run-off in locations that provide overall flood risk reduction or environmental benefits.

5. Other Consultees

5.1 During the preparation of this assessment the Gov.UK website was consulted to obtain details of any potential flooding or drainage impacts on the site.

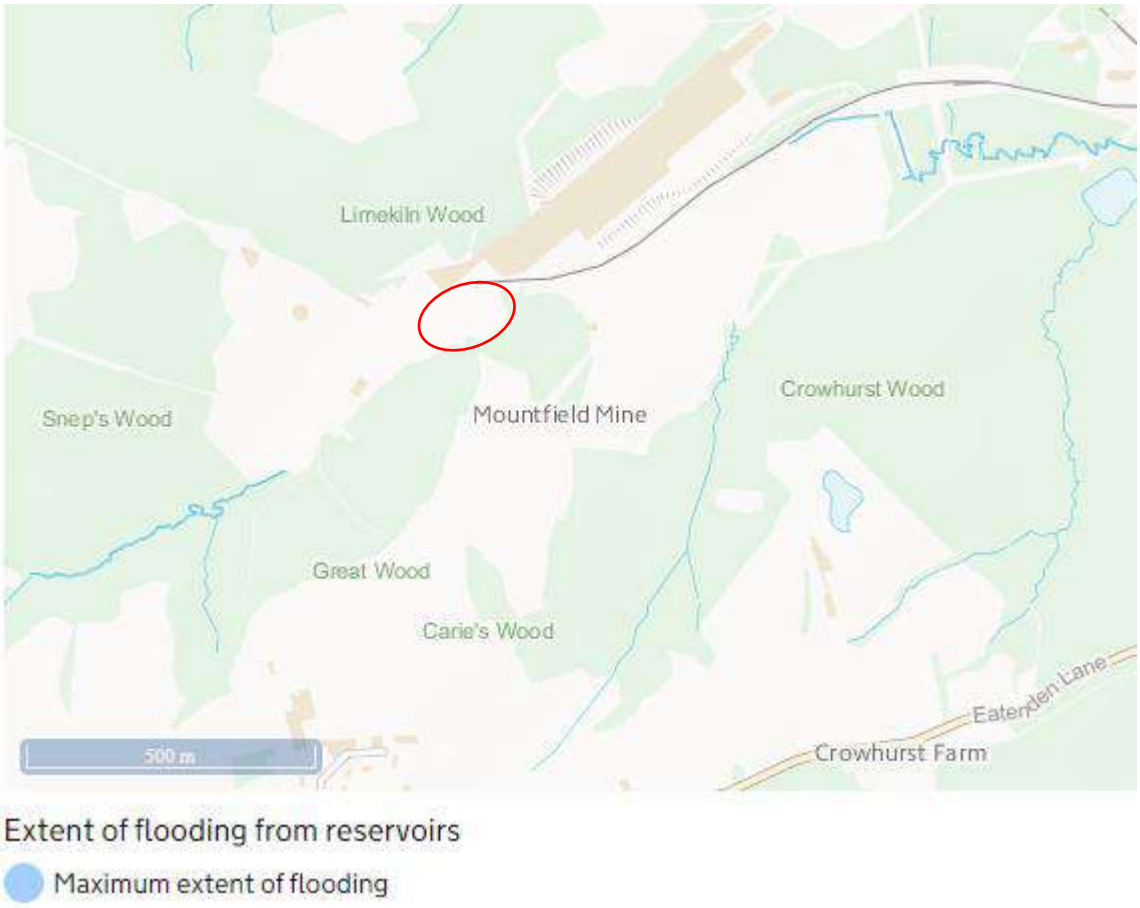
5.2 The extract of the interactive river or sea flooding map below shows that the site itself is considered to be at very low risk of river and sea flooding.

Extract of river or sea flooding map from Gov.uk website

5.3 The extract of the interactive surface water flooding map below shows that the site itself is considered to generally be at very low risk of surface water flooding, although the area directly along the river itself is at high risk of flooding. Typically, land around the site is considered to be at very low risk.

Extract of surface water flooding map from Gov.uk website

5.4 An interactive reservoir flood extents map is also available on the Gov.UK website. This shows the site to lie outside of the maximum extent of flooding.



Extract of reservoir flooding map from Gov.uk website

6 The Assessment of Flood Risk

Introduction

6.1 National Planning Policy Framework (NPPF) published in July 2018 and the associated guidance, provides assistance in assessing flood risk and seeks to guide development away from areas at risk of flooding. The guidance defines a number of 'Flood Zones' based on the probability of flooding and provides guidance on the most appropriate forms of development within each zone.

Flood Risk Zones

6.2 The flood zones can be summarised (from Table 1 of Planning Practice Guidance) as follows:

Zone	***Annual Probability in any year***	
	Fluvial Flooding	***Tidal Flooding***
Zone 1: Low Probability	Less than 1 in 1,000 (<0.1%)	Less than 1 in 1,000 (<0.1%)
Zone 2: Medium Probability	Between 1 in 1,000 & 1 in 100 (0.1% - 1%)	Between 1 in 1,000 & 1 in 200 (0.1% - 0.5%)
Zone 3a: High Probability	Greater than 1 in 100 (>1%)	Greater than 1 in 200 (>0.5%)
Zone 3b: Functional Floodplain	Greater than 1 in 20 (>5%)	

Note: The risk refers to flooding of land, not individual properties.

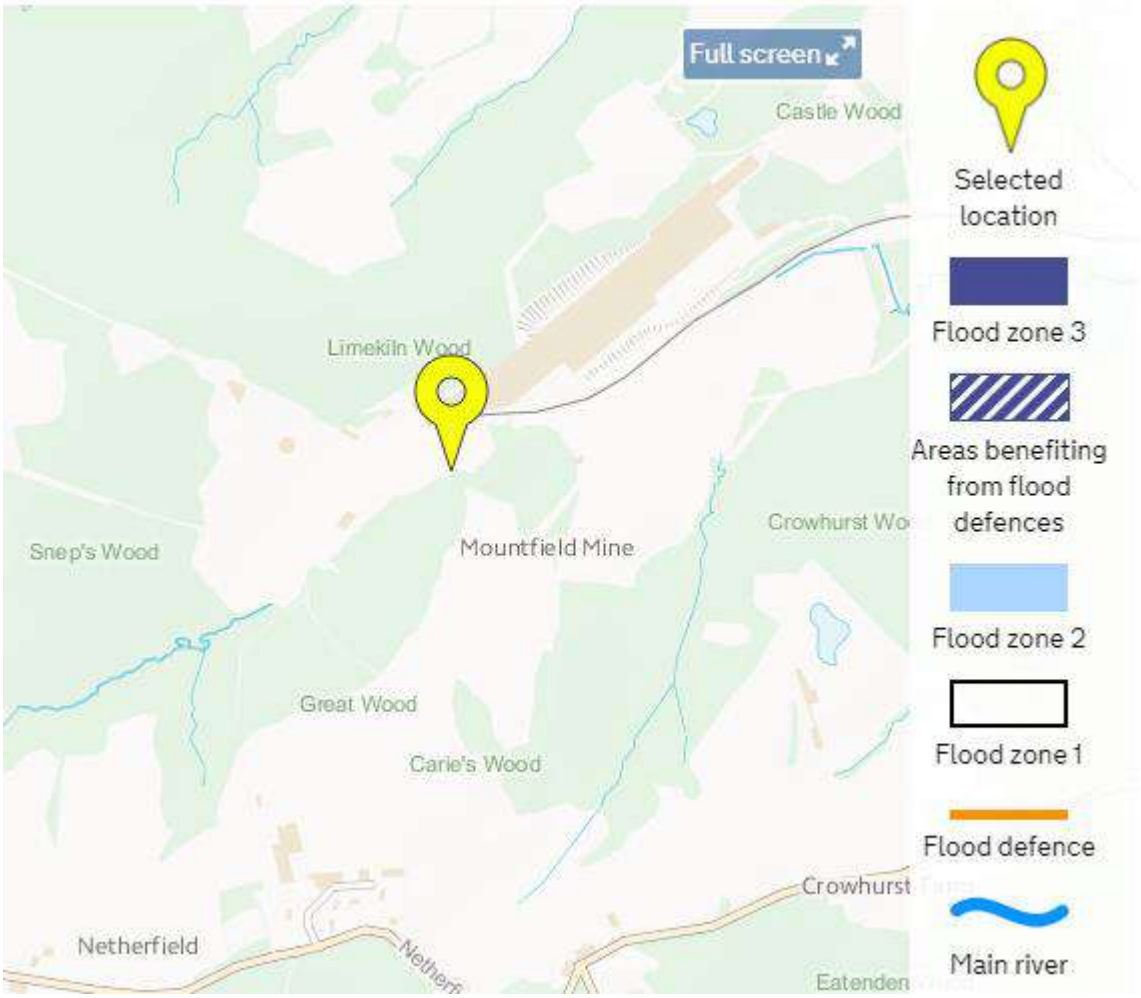
Sources of Flooding

6.3 NPPF identifies a number of potential sources of flooding which should be investigated in an FRA:

- Flooding from the sea or tidal flooding;
- Flooding from rivers or fluvial flooding;
- Flooding from rainfall falling directly on the ground (pluvial);
- Flooding from groundwater;
- Flooding from sewers;
- Flooding from reservoirs, canals, and other artificial sources.

Flood Risk to the Site

6.4 The extent of the natural floodplain shown on the EA map is the area that could flood if there were no flood defences or certain other manmade structures and channel improvements. The outlines show the areas with a 1% or 0.5% or greater chance of flooding from rivers and the sea respectively and the 0.1% (extreme) outline for both rivers and the sea. The flood map shows flooding to land only and does not necessarily indicate flooding to individual properties.



Extract of Flood Map for Planning from Gov.uk website

6.5 The extract of the interactive Flood Map for Planning shows that the site itself is within flood zone 1, low probability of flooding with an annual exceedance probability of less than 0.1%. Further down-stream to the east towards Mountfield by 1250m and outside the site, the River Line floods and the areas local to the river flood with an annual exceedance probability of greater than 1%.

Flood Defences

6.6 The Flood Map for Planning does not show any Environment Agency flood defences in the area.

Historic Flooding

6.7 There have been no reports of flooding in this area. It should also be noted that a programme of maintenance works to existing drainage which will further reduce the risk of flooding in this area.

Flood Risk to and from Other Sites and Sources

6.8 NPPF requires development proposals to consider the vulnerability to flooding from other sources as well as river and sea flooding. Such sources of flooding are from surface water run-off, groundwater, sewers, reservoirs, canals and other artificial sources or any combination of these. The potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development to surface water run-off should also be incorporated into the FRA.

6.9 If the River Line was to become flooded due to excessive run-off from the site then developments outside of the British Gypsum site to the east could be affected.

6.10 Foul sewer flooding is and will continue to be theoretically possible due to the presence of sewers in the vicinity of the site. The old works area to the west of the existing factory is at the foot of valley. Further up the valley is a sewage works which could presumably flood, or discharge foul water into the River Line that runs down the valley into a culvert to the west of the Old Works area.

6.11 It is considered that groundwater flooding is a risk on this site due to the bedrock geology beneath the site, with the Defra ‘Magic Map’ showing the site is vulnerable to surface water flooding.

6.12 The risk of reservoir flooding is considered to be low. Please refer to map extract and comments in Section 5.4 above.

The Sequential Test

6.13 NPPF requires that at all stages of planning a Sequential Test is completed with the aim of steering new development to areas at the lowest probability of flooding (Zone 1). The Sequential Test would normally be completed by the Local Planning Authority (LPA) to inform the preparation of the Local Development Framework (LDF) where one exists.

6.14 Only where the Sequential Test can demonstrate that *'there are no reasonably available sites in Flood Zone* 1 *or 2'* will development in Zone 3 be considered and in general only if an Exception Test can be passed.

6.15 The mapping shows the site to lie in a Flood Zone 1, so the proposed development passes the Sequential Test.

Vulnerability Classification

6.16 Table 2 of the planning guidance defines the Flood Risk Vulnerability Classification of a particular land use. This classification is based partly on Defra/EA research on flood risk to people and also the need of some uses to keep functioning during flooding.

6.17 Table 2 shows that sites used for general industry are classified as less vulnerable.

Suitability of Development

6.18 Table 3: Flood Risk Vulnerability and Flood Zone 'Compatibility' of the Planning Practice Guidance summarises suitable forms of development within each of the flood zones.

6.19 This table demonstrates less vulnerable land uses in a Flood Zone 1 are considered appropriate.

7 Drainage Systems

Existing Drainage Systems

7.1 The current Surface Water Drainage is shown on Figure 2, British Gypsum Drawing SS-SD-SWF-01, Site Drainage – Storm water and Foul Water.

7.2 The River Line flows over ground to a headwall, which is shown on the drawing and then flows through an underground culvert to re-emerge over-ground at outfall W4. This will be partially under the project area. An earlier site project has been completed in the last few years that has repaired and refurbished this culvert.

7.3 There is an existing French drain beside the south side of the access road behind the fence. The French drain was installed in 2007 and in 2015 the stone within the drain was taken out and has been replaced. The life of a French drain is usually around 20 years, so should operate adequately for another 15 years before further refurbishment is required.

7.4 There is a French drain behind the gabion wall on the south side of Old Works area, and the gabion position is shown on Figure 2.

7.5 There are currently two silt traps, one adjacent to outfall W4 collecting flow from the open concrete lined ditch and the other adjacent to the western side of the Train Unloading Pad (TUP) area collecting flow from the south side of the access road French drain. It is recommended that both of these remain in operation.

Proposed Drainage System

7.6 The borehole records from 2020 and 2014 indicate that there is a considerable thickness of made ground varying between 5.8 m and 7.1 m. It is likely that the majority of the old works area comprises made ground and therefore shallow soakaways cannot be utilised.

7.7 Deep bored soakaways were considered but unfortunately they will not be effective because the water table is too high. The borehole records indicate that the water table is directly over the Purbeck Bed Strata containing the very stiff grey brown clay or grey blue silty clay.

7.8 The premise behind the surface water drainage system for new service depot and parking area is that rain falling on to the paving and roof areas will be collected and channelled via gullies and downpipes to an underground attenuation tank, which will have a flow control device to allow water to enter the culvert at a reduced greenfield rate.

7.9 The drainage system has been designed in general accordance with Non Statutory Technical Standards for Sustainable Drainage Systems, The SuDS Manual C753 by CIRIA and Sustainable Drainage Systems C609 also published by CIRIA. The drainage has been designed in WinDes Microdrainage to ensure that there is no flooding to the site for all storms up to and including a 1 in 100 year storm, with a 40% allowance for climate change. In addition the half drain down time for the storage structure is 1211 minutes which is within the recommended limits.

7.10 Below ground pipework will run from the building, entering a sealed crate attenuation structure located just to the east of the building underneath the proposed hard standing area. The pipe outlet from the attenuation structure will then link via an outfall pipe to the culvert to the east in the vicinity of manhole W3. The outflow rate from the attenuation structure will be limited to the greenfield runoff rate by use of a Hydrobrake or similar flow control device. Water will then discharge into the ditch as per the existing situation.

7.11 As noted, the attenuation structure has been designed to fully accommodate the 100 year plus 40% climate change event. Any exceedance flows above this will follow the natural contours of the site and flow southwards towards the River Line, as per the existing situation.

7.12 In order to minimise the risk of sediment ingress into the crate attenuation, trapped gullies will be used and catchpits (sediment forebays) will be installed on the upstream manholes as recommended in the CIRIA SuDS Manual. For the hardstanding there will also be a bypass interceptor installed to collect oils, sediment and gross pollutants. The Hydrobrake manhole will have a sump which acts as a secondary capture point on the drainage system, thereby maintaining water quality prior to discharge to the culvert.

7.13 There are also a number of proposals that were recommended in the earlier Evans & Langford LLP Report 13304 which have since been completed. These are as follows:

a) Replace the stone and Terram surround in the French drain beside the access road.
b) Maintain the current silt traps.
c) Regular maintenance of drainage to the downstream TUP.

7.14 Some of these measures directly relate to the area covered by this scheme, and are proposed to be included within these works:

a) Provide attenuation in the form of underground storage baskets. It is important that these are located in an area where they will not be surcharged by stored material.
b) Install catchpits before the attenuation tank.

7.15 Collecting and discharging the surface water as detailed above is considered to be in accordance with the principals of sustainable urban drainage systems.

Design Calculations

7.16 Using WinDes the greenfield runoff rate for the project site has been calculated using IH124 method and gives a flow of 3.5l/s for a 1 in 100 year return period. It is also noted that the CIRIA Suds Manual (Chapter 24) states that 'the values derived from any analysis should be regarded as approximate, because prediction of runoff from small catchments will always be imprecise.'

7.17 We have designed the attenuation with a Hydrobrake flow control, with a discharge rate limited to the greenfield Qbar rate of 3.5l/s. WinDes was used for the design and the attached calculations show that a tank of 400m2 by 1.2m deep would provide sufficient storage for storms up to a 1 in 100 year with 40% climate change allowance, and has a half drain down time of 1211 minutes. This is based on a critical storm of 6 hours duration for the 100 year plus 40% climate change event as recommended.

8 Summary and Conclusions

8.1 This report has been produced to assess the flood risk to and from the proposed construction of a service depot and parking area, in accordance with the National Planning Policy Framework (NPPF).

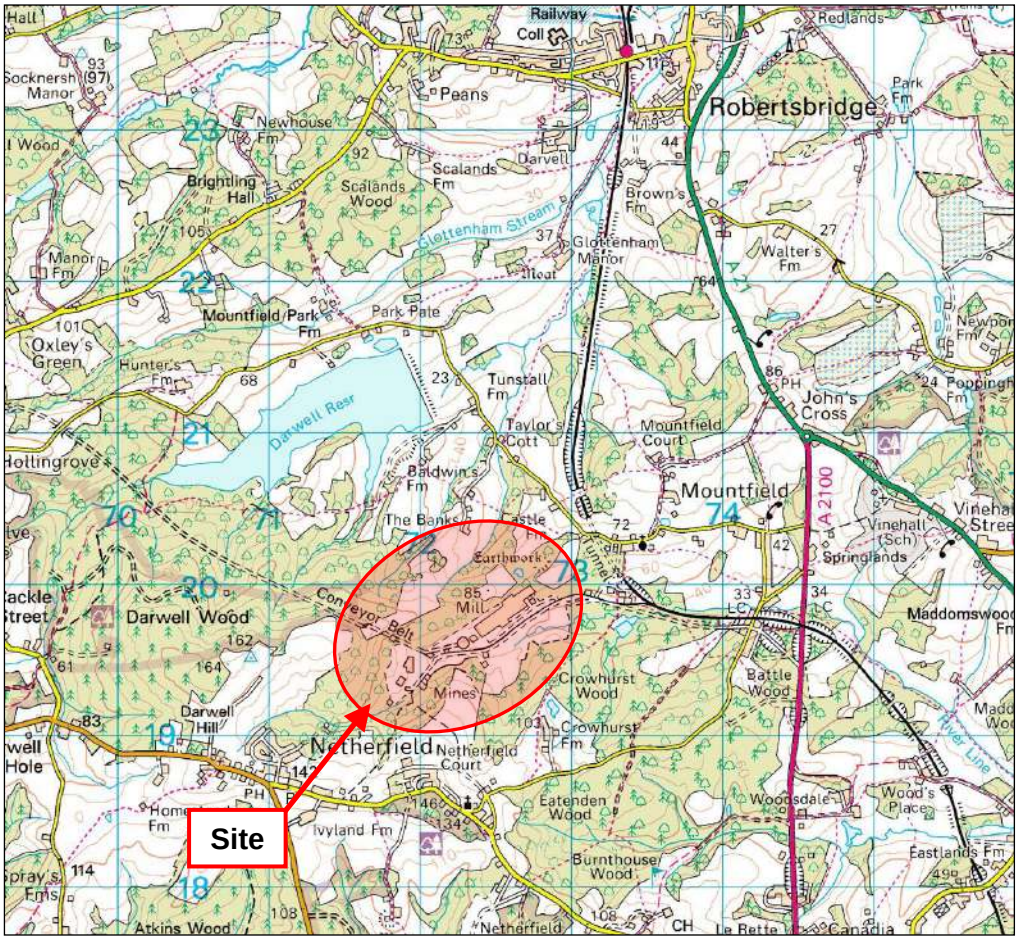
8.2 With reference to the maps on the Flood Map for Planning the site is shown to be within Flood Zone 1.

8.3 There are no recorded historic flood events that have impacted the site, and the site is not considered to be at risk of surface water or reservoir flooding.

8.4 The site is considered to fall into the less vulnerable classification. It should therefore be considered that the Exception test has been adequately satisfied.

8.5 The surface water drainage for new service depot and parking area will be channelled via gullies and downpipes to an underground attenuation tank, which will have a flow control device to allow water to enter the culvert at a reduced greenfield rate. In order to minimise the risk of pollution to downstream waterways, trapped gullies, catchpits, a bypass interceptor and Hydrobrake manhole sump will be constructed within the drainage system.

8.6 There are a number of proposals that were recommended in the earlier Evans & Langford LLP Report 13304 which have already been completed, and some further recommendations relating specifically to the development area which should be completed as part of this scheme.

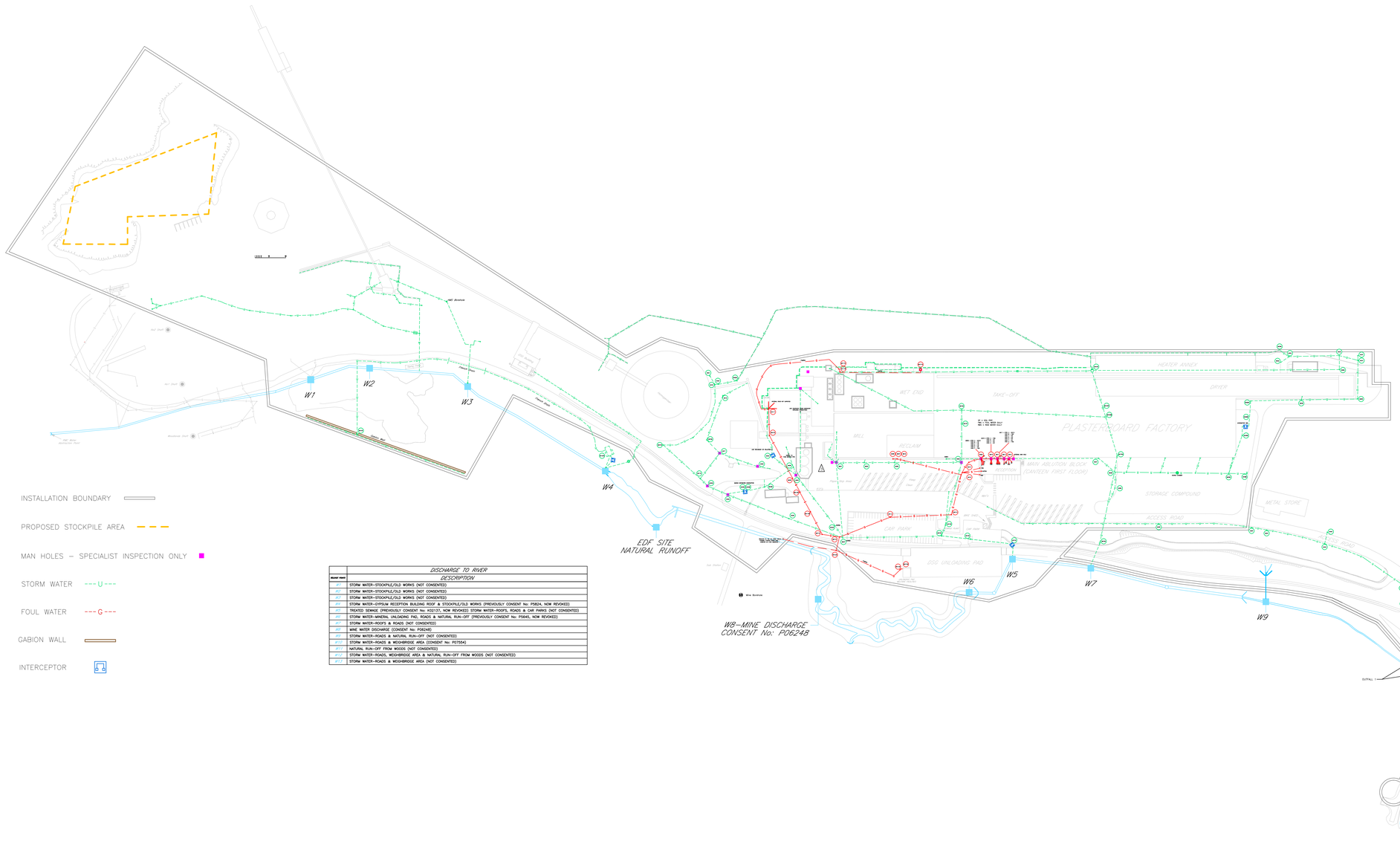


Site: British Gypsum, Robertsbridge

Job No.: 15294	**Date:** June 2020	**Scale:** 1:50,000

Figure 1: Site Location Plan

DWG NO SS-SW-SWF-01



INSTALLATION BOUNDARY

PROPOSED STOCKPILE AREA

MAN HOLES – SPECIALIST INSPECTION ONLY

STORM WATER ---U---

FOUL WATER ---G---

GABION WALL

INTERCEPTOR

	DISCHARGE TO RIVER
Master report	DESCRIPTION
W1	STORM WATER–STOCKPILE/OLD WORKS (NOT CONSENTED)
W2	STORM WATER–STOCKPILE/OLD WORKS (NOT CONSENTED)
W3	STORM WATER–STOCKPILE/OLD WORKS (NOT CONSENTED)
W4	STORM WATER–GYPSUM RECEPTION BUILDING ROOF & STOCKPILE/OLD WORKS (PREVIOUSLY CONSENT No: P5824, NOW REVOKED)
W5	TREATED SEWAGE (PREVIOUSLY CONSENT No: K02137, NOW REVOKED)) STORM WATER–ROOFS, ROADS & CAR PARKS (NOT CONSENTED)
W6	STORM WATER–MINERAL UNLOADING PAD, ROADS & NATURAL RUN–OFF (PREVIOUSLY CONSENT No: P5845, NOW REVOKED)
W7	STORM WATER–ROOFS & ROADS (NOT CONSENTED)
W8	MINE WATER DISCHARGE (CONSENT No: P06248)
W9	STORM WATER–ROADS & NATURAL RUN–OFF (NOT CONSENTED)
W10	STORM WATER–ROADS & WEIGHBRIDGE AREA (CONSENT No: P07554)
W11	NATURAL RUN–OFF FROM WOODS (NOT CONSENTED)
W12	STORM WATER–ROADS, WEIGHBRIDGE AREA & NATURAL RUN–OFF FROM WOODS (NOT CONSENTED)
W13	STORM WATER–ROADS & WEIGHBRIDGE AREA (NOT CONSENTED)

REV	ALTERATIONS	DATE	SIGNED
REV5	INTERCEPTOR DETAILS ADDED	22.01.12	
REV4	REVISED CONSTY – CLEAN CITY SURVEY	29.12.11	
REV3	REVISED	24.07.11	
REV2	REVISED	24.01.11	
REV1	RELEASED	18.05.10	

FOR EXPLANATION OF DIMS, TOL, NOTES ETC. – SEE BS 308

UNLESS OTHERWISE STATED DIMENSIONS IN MILLIMETRES (mm)
SURFACE TEXTURE VALUE IN (-m)
MACHINE WHERE MARKED
REMOVE SHARP EDGES
STRUCTURAL STEELWORK mm
MACHINED ITEMS mm

PROJECTION FIRST ANGLE

SCALE:	1:1
DRAWN:	TJS 10/05/10
CHECKED:	DAT(CHK)
APPROVED:	APP DAT(APP)
RISK ASSESSMENT:	R/A DATE(R/A)

CAD

British Gypsum
MOUNTFIELD, ROBERTSBRIDGE
EAST SUSSEX, TN32 5LA
PHONE: (01580) 880204
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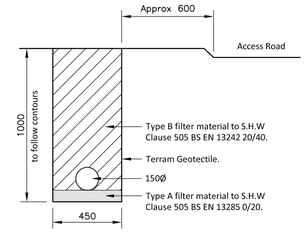
SECTION Site Services

TITLE SITE DRAINAGE – STORM WATER & FOUL

LOCATION ROBERTSBRIDGE DRG NO. SS-SD-SWF-01 A0



Detail A
French Drain
Scale 1:20

Legend

Storm Water

Borehole 1952 BH

Evans & Langford LLP
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Revisions	Checked	Date

Revisions	Checked	Date

Scale 1:1250 1:20

Drawn CAS
Date March 15
Checked
Date
Approved
Date

British Gypsum
Robertsbridge

Site Drainage Infrastructure Review
Drainage Proposals Western End of the Site

13304/02

Appendix A
Scheme Proposals

general notes:
do not scale from the drawing. all dimensions shall be checked on site prior to commencing works.
all works shall conform to the current edition of the building regulations and other relevant statutory requirements.
all materials and workmanship shall conform with the relevant british standard specification and code of practice.
this drawing is the copyright of gdm architects and shall not be copied or reproduced without permission.
this drawing shall be read in conjunction with gdm architect's health and safety risk assessments and all works shall be carried out in a safe manner, by competent persons.
drawing produced by gdm architects ltd trading as gdm architects.

0m 4m 8m 12m 16m 20m

VISUAL SCALE 1:200 @ A0

North

Existing channel drain along haulage road is to be retained.

Haulage road

Entrance 1

Entrance 2

Line of culvert

Service Depot

Attenuation tank 400m2 x 1.2m deep, outfall connected to existing manhole with flow controlled by Hydrobrake to greenfield rate.

Outfall connection to gabion filter drain is to be retained.

Indicative Drainage Layout
E&L
June 2020

Rev	Description	Issued by	Date
C	Rev C		04.05.2020
B	Rev B		06.04.2020
A	Rev A		02.04.2020
	First Issue		Date 1

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client: British Gypsum
project: BG Robertsbridge
drawing: Tracking 1
date: 20/03/2020 drawn by: rn
scale: 1 : 200 @A0 checked: ge
draft

project number	drawing number	revision
4148	004	C

general notes:
do not scale from the drawing. all dimensions shall be checked on site prior to commencing works.
all works shall conform to the current edition of the building regulations and other relevant statutory requirements.
all materials and workmanship shall conform with the relevant british standard specification or code of practice.
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0m 10m 20m 30m 40m 50m

VISUAL SCALE 1:500 @ A0

North

Entrance 1

Haulage road

Entrance 2

Site Location Plan
1 : 500

Rev	Description	Issued by	Date
C	Rev C		04.05.2020
B	Rev B		06.04.2020
A	Rev A		02.04.2020
	First issue		Date 1

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client: British Gypsum

project: BG Robertsbridge

drawing: Site Location Plan

date: 20/03/2020 drawn by: rn

scale: 1 : 500 @A0 checked: ge

draft

project number	drawing number	revision
4148	001	C

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0m 4m 8m 12m 16m 20m

VISUAL SCALE 1:200 @ A0

North

Haulage road

Entrance 1

Entrance 2

Line of culvert

Line of culvert

Service Depot

walking route

External WC access

Refuse

Proposed Site Plan
1 : 200

Parking Schedule	
Type	Count
2500 x 5000 Car	8
3000x4800mm 1200mm	2
3500x13000 Trailer Only	50

Rev	Description	Issued by	Date
C	Rev C		04.05.2020
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A	Rev A		02.04.2020
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client: British Gypsum
project: BG Robertsbridge
drawing: Proposed Site Plan 1-200
date: 20/03/2020 drawn by: rn
scale: 1 : 200 @A0 checked: ge
draft

project number	drawing number	revision
4148	003	C

Appendix B
Design Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	0.630	Urban	0.000
SAAR (mm)	858	Region Number	Region 7

Results l/s

QBAR Rural	3.5
QBAR Urban	3.5
Q100 years	11.2
Q1 year	3.0
Q30 years	8.0
Q100 years	11.2

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

Half Drain Time : 1211 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	65.999	0.399	0.0	3.2	3.2	151.5	O K
30 min Summer	66.133	0.533	0.0	3.2	3.2	202.5	O K
60 min Summer	66.274	0.674	0.0	3.2	3.2	256.0	O K
120 min Summer	66.410	0.810	0.0	3.2	3.2	307.8	O K
180 min Summer	66.479	0.879	0.0	3.2	3.2	334.0	O K
240 min Summer	66.519	0.919	0.0	3.2	3.2	349.1	O K
360 min Summer	66.567	0.967	0.0	3.2	3.2	367.5	O K
480 min Summer	66.589	0.989	0.0	3.2	3.2	375.7	O K
600 min Summer	66.595	0.995	0.0	3.3	3.3	378.2	O K
720 min Summer	66.592	0.992	0.0	3.2	3.2	377.0	O K
960 min Summer	66.568	0.968	0.0	3.2	3.2	367.7	O K
1440 min Summer	66.519	0.919	0.0	3.2	3.2	349.2	O K
2160 min Summer	66.463	0.863	0.0	3.2	3.2	327.8	O K
2880 min Summer	66.411	0.811	0.0	3.2	3.2	308.3	O K
4320 min Summer	66.310	0.710	0.0	3.2	3.2	269.7	O K
5760 min Summer	66.208	0.608	0.0	3.2	3.2	231.0	O K
7200 min Summer	66.092	0.492	0.0	3.2	3.2	187.0	O K
8640 min Summer	65.987	0.387	0.0	3.2	3.2	147.2	O K
10080 min Summer	65.902	0.302	0.0	3.2	3.2	114.9	O K
15 min Winter	66.048	0.448	0.0	3.2	3.2	170.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	131.851	0.0	155.6	27
30 min Summer	88.566	0.0	208.9	41
60 min Summer	56.713	0.0	267.8	72
120 min Summer	35.004	0.0	330.7	130
180 min Summer	25.973	0.0	368.0	190
240 min Summer	20.877	0.0	394.4	250
360 min Summer	15.365	0.0	435.5	368
480 min Summer	12.341	0.0	466.4	486
600 min Summer	10.402	0.0	491.4	606
720 min Summer	9.042	0.0	512.3	726
960 min Summer	7.241	0.0	525.1	936
1440 min Summer	5.284	0.0	512.0	1160
2160 min Summer	3.848	0.0	654.3	1548
2880 min Summer	3.068	0.0	695.7	1968
4320 min Summer	2.226	0.0	757.4	2812
5760 min Summer	1.771	0.0	803.1	3632
7200 min Summer	1.483	0.0	840.7	4400
8640 min Summer	1.284	0.0	873.7	5104
10080 min Summer	1.137	0.0	902.1	5760
15 min Winter	131.851	0.0	174.2	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	66.200	0.600	0.0	3.2	3.2	227.8	O K
60 min Winter	66.359	0.759	0.0	3.2	3.2	288.2	O K
120 min Winter	66.515	0.915	0.0	3.2	3.2	347.7	O K
180 min Winter	66.596	0.996	0.0	3.3	3.3	378.5	O K
240 min Winter	66.645	1.045	0.0	3.3	3.3	396.9	O K
360 min Winter	66.706	1.106	0.0	3.4	3.4	420.4	O K
480 min Winter	66.738	1.138	0.0	3.4	3.4	432.6	O K
600 min Winter	66.754	1.154	0.0	3.4	3.4	438.3	O K
720 min Winter	66.758	1.158	0.0	3.4	3.4	440.0	O K
960 min Winter	66.747	1.147	0.0	3.4	3.4	435.9	O K
1440 min Winter	66.687	1.087	0.0	3.4	3.4	412.9	O K
2160 min Winter	66.609	1.009	0.0	3.3	3.3	383.3	O K
2880 min Winter	66.535	0.935	0.0	3.2	3.2	355.4	O K
4320 min Winter	66.383	0.783	0.0	3.2	3.2	297.5	O K
5760 min Winter	66.228	0.628	0.0	3.2	3.2	238.5	O K
7200 min Winter	66.041	0.441	0.0	3.2	3.2	167.5	O K
8640 min Winter	65.894	0.294	0.0	3.2	3.2	111.6	O K
10080 min Winter	65.783	0.183	0.0	3.2	3.2	69.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	88.566	0.0	234.2	41
60 min Winter	56.713	0.0	300.0	70
120 min Winter	35.004	0.0	370.3	128
180 min Winter	25.973	0.0	412.0	186
240 min Winter	20.877	0.0	441.9	244
360 min Winter	15.365	0.0	487.7	362
480 min Winter	12.341	0.0	522.5	476
600 min Winter	10.402	0.0	530.8	592
720 min Winter	9.042	0.0	530.5	704
960 min Winter	7.241	0.0	528.1	924
1440 min Winter	5.284	0.0	521.1	1318
2160 min Winter	3.848	0.0	732.7	1652
2880 min Winter	3.068	0.0	779.1	2116
4320 min Winter	2.226	0.0	847.8	3032
5760 min Winter	1.771	0.0	900.0	3928
7200 min Winter	1.483	0.0	942.0	4680
8640 min Winter	1.284	0.0	978.4	5288
10080 min Winter	1.137	0.0	1010.4	5952

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) 0.630

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.330	8	12	0.300

Model Details

Storage is Online Cover Level (m) 68.000

Cellular Storage Structure

Invert Level (m) 65.600 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	400.0	400.0	1.201	0.0	496.0
1.200	400.0	496.0			

Hydro-Brake® Optimum Outflow Control

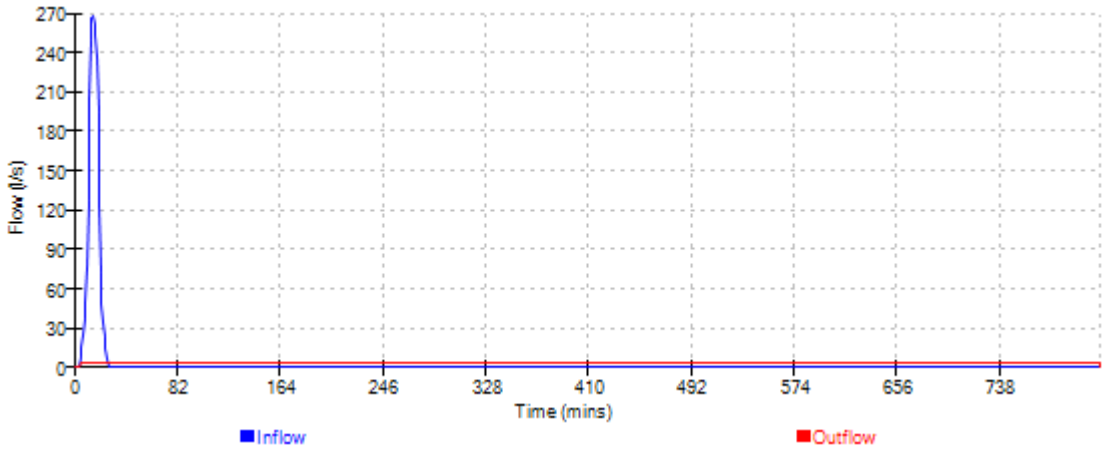
Unit Reference	MD-SHE-0083-3500-1400-3500
Design Head (m)	1.400
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	83
Invert Level (m)	65.400
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

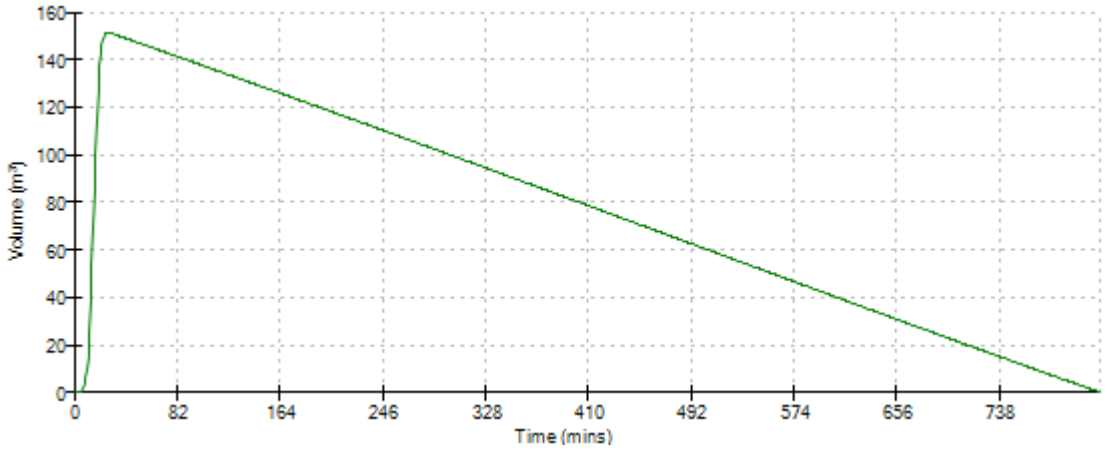
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	3.5
Flush-Flo™	0.363	3.2
Kick-Flo®	0.739	2.6
Mean Flow over Head Range	-	2.9

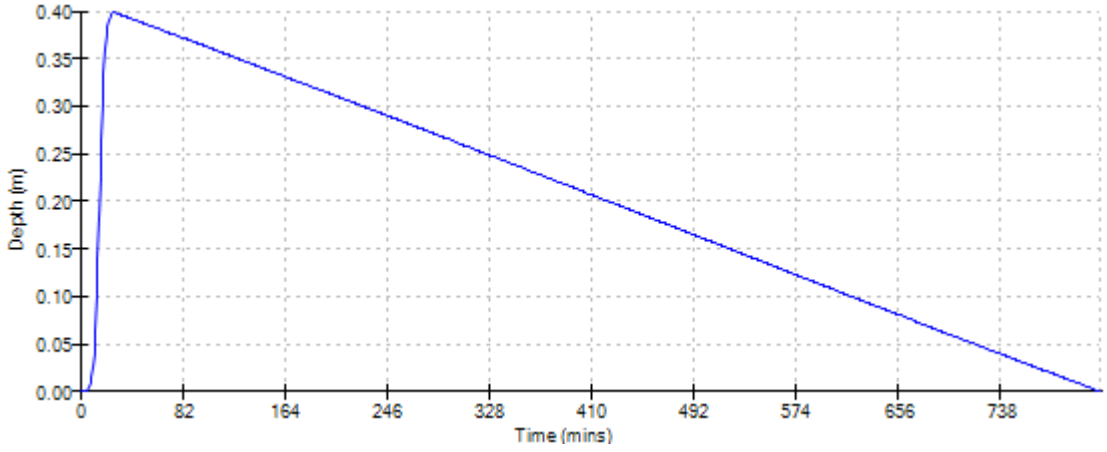
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.3	3.000	5.0	7.000	7.4
0.200	3.1	1.400	3.5	3.500	5.4	7.500	7.7
0.300	3.2	1.600	3.7	4.000	5.7	8.000	7.9
0.400	3.2	1.800	3.9	4.500	6.0	8.500	8.1
0.500	3.2	2.000	4.1	5.000	6.3	9.000	8.4
0.600	3.1	2.200	4.3	5.500	6.6	9.500	8.6
0.800	2.7	2.400	4.5	6.000	6.9		
1.000	3.0	2.600	4.7	6.500	7.2		

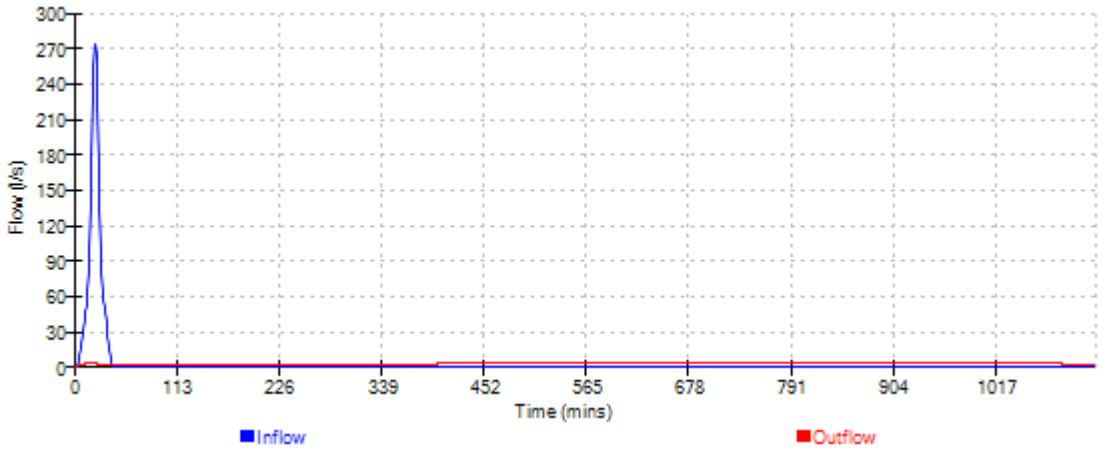
Event: 15 min Summer

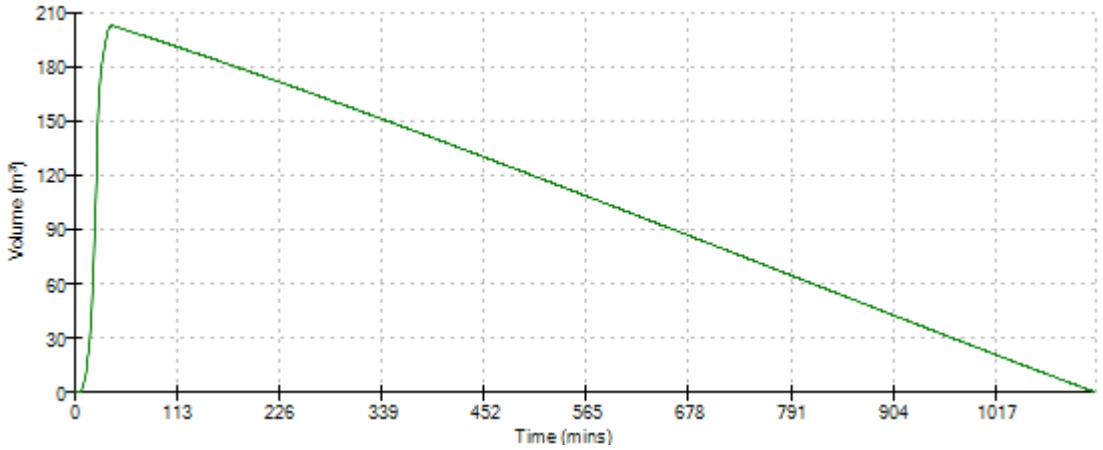


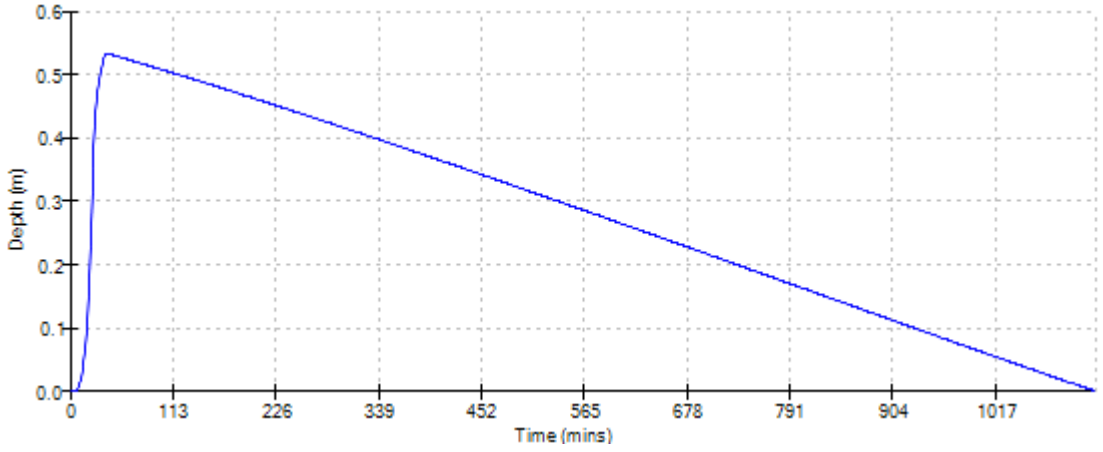




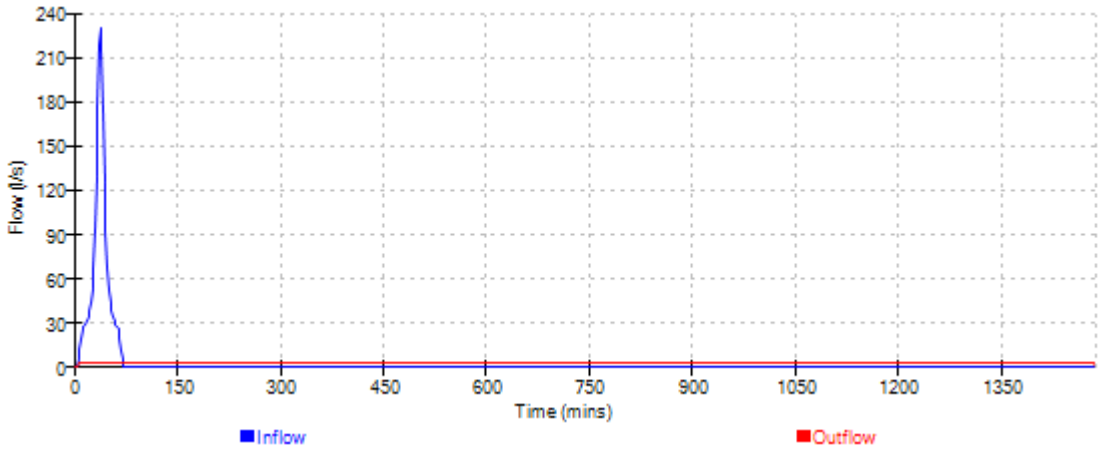
Event: 30 min Summer

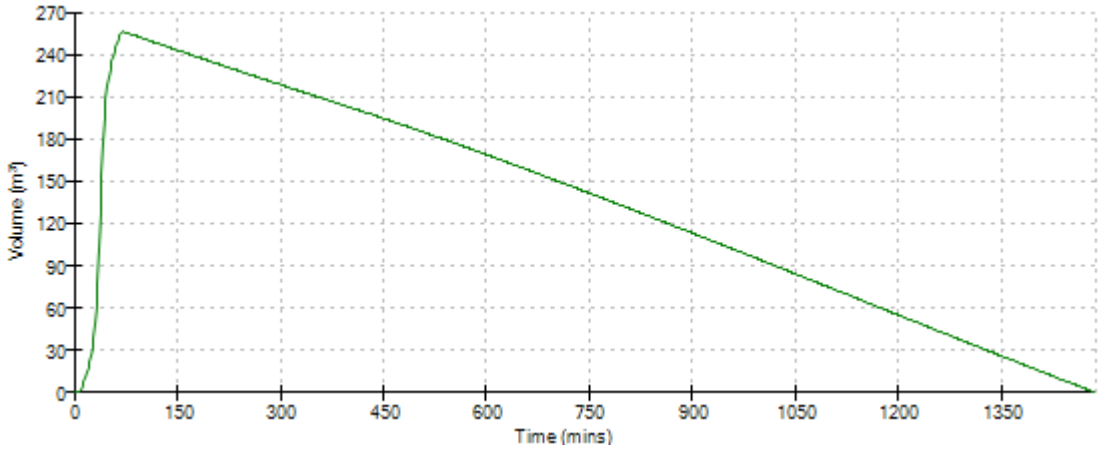


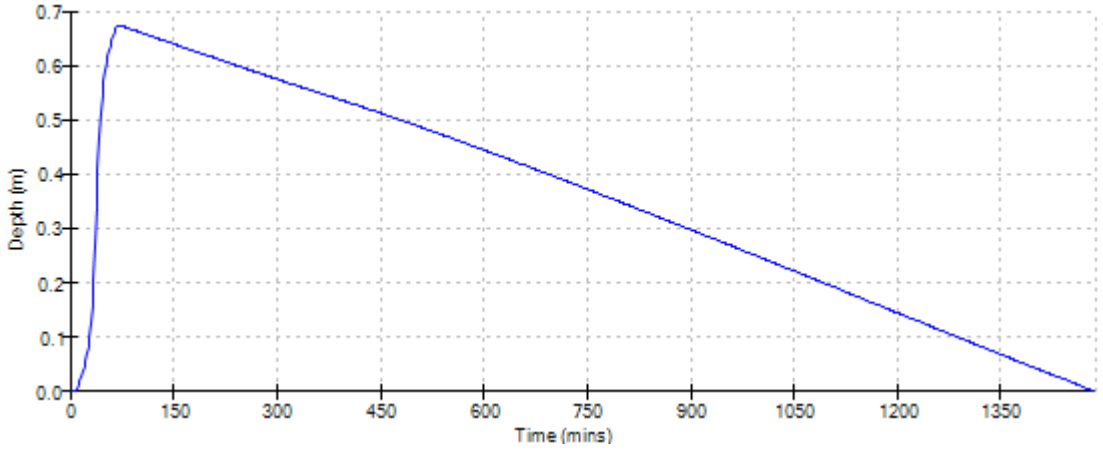




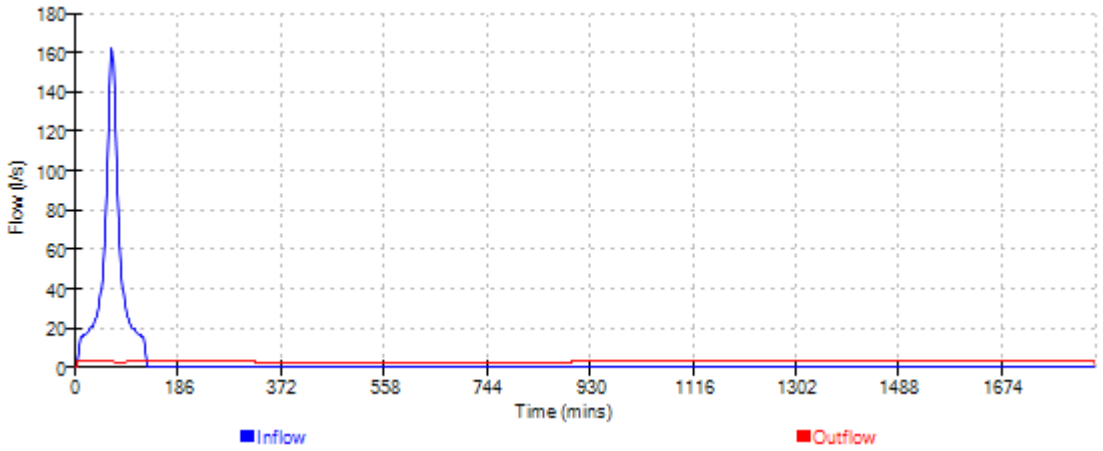
Event: 60 min Summer

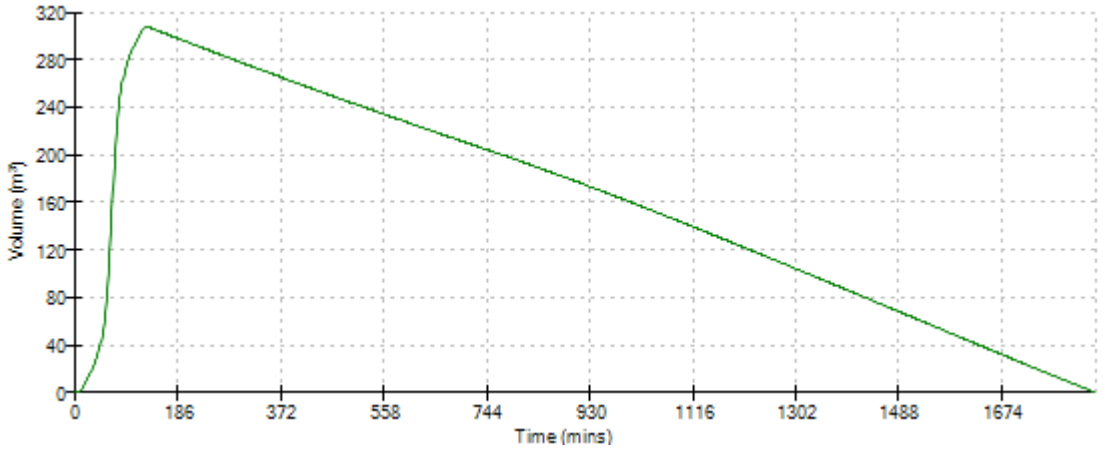


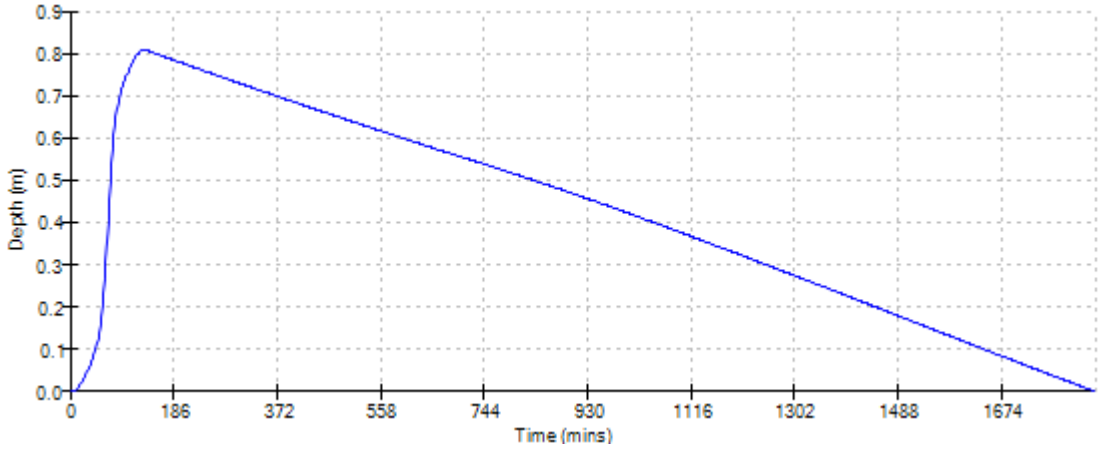




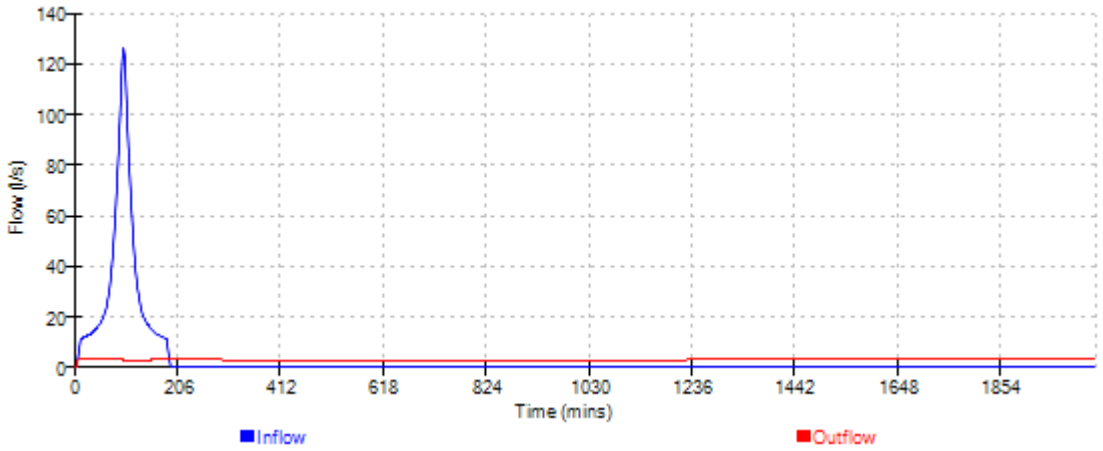
Event: 120 min Summer

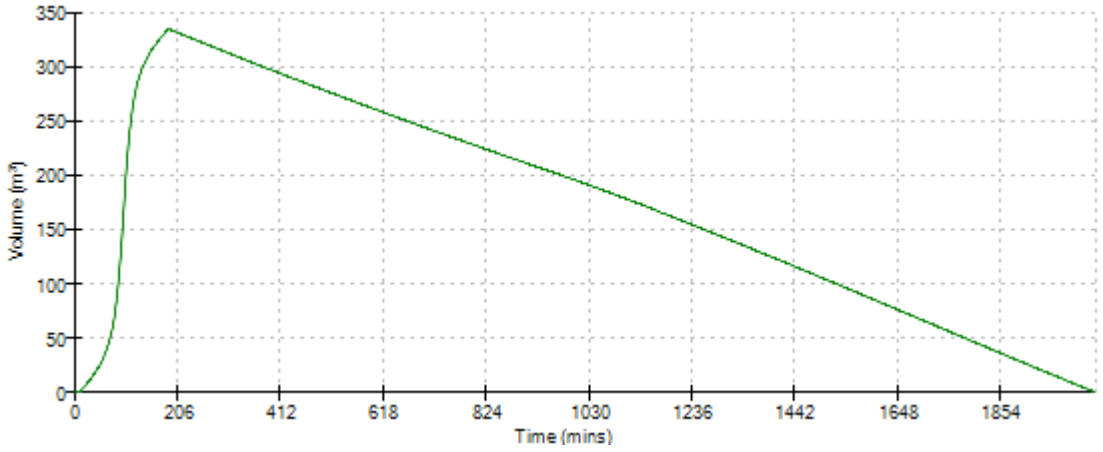


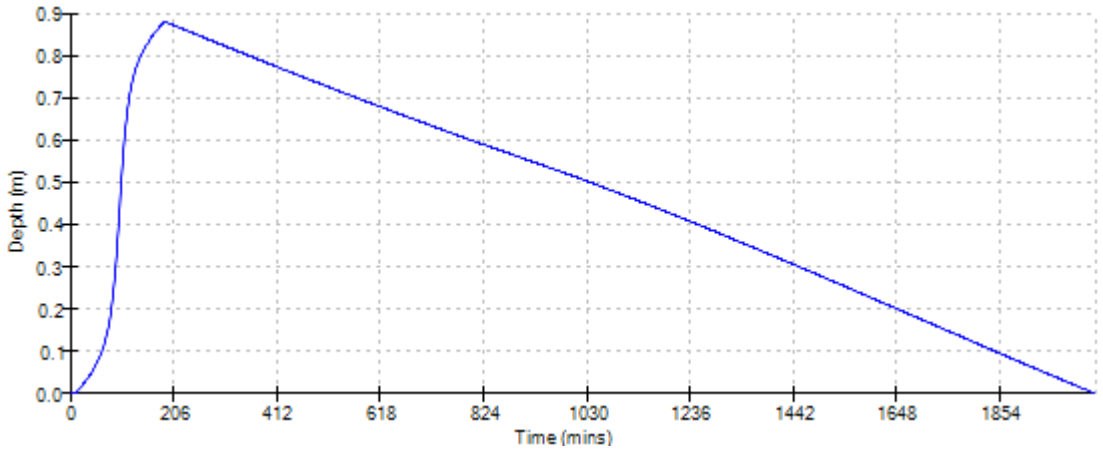




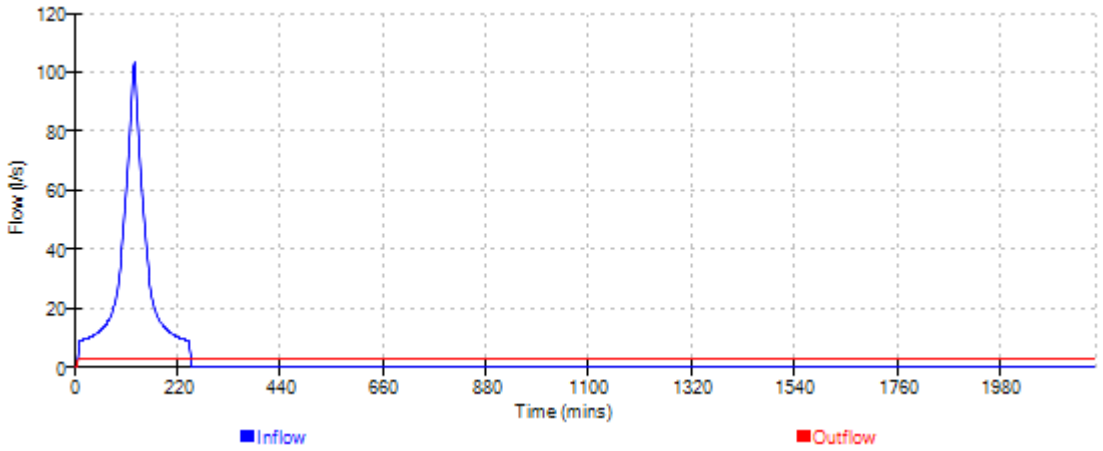
Event: 180 min Summer

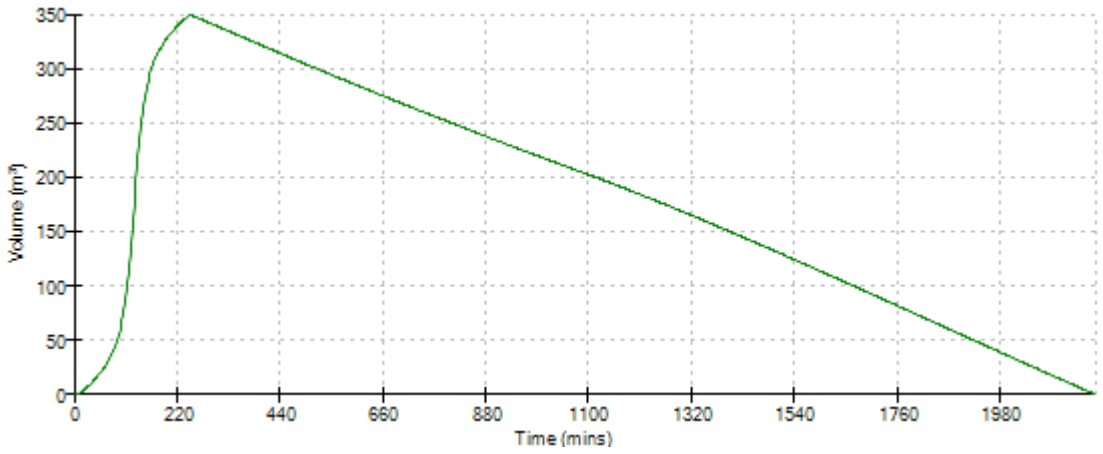


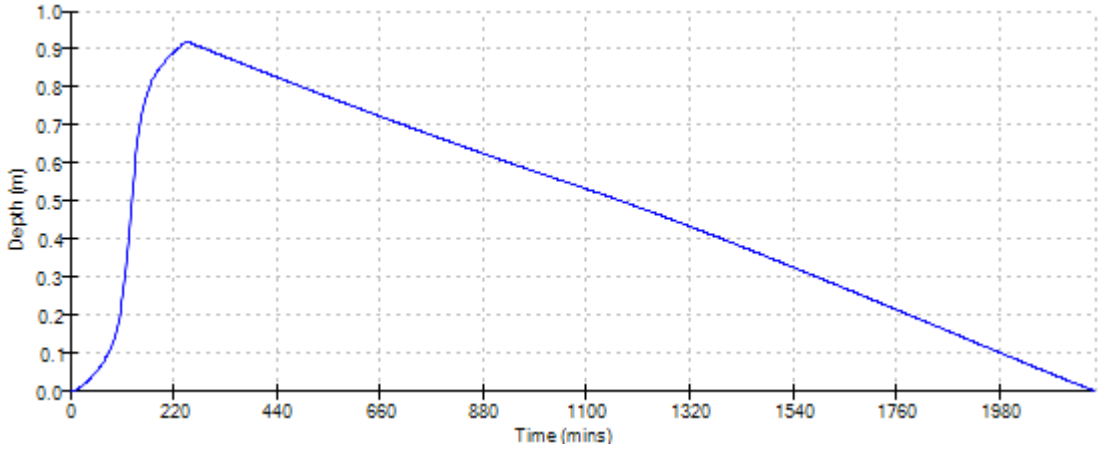




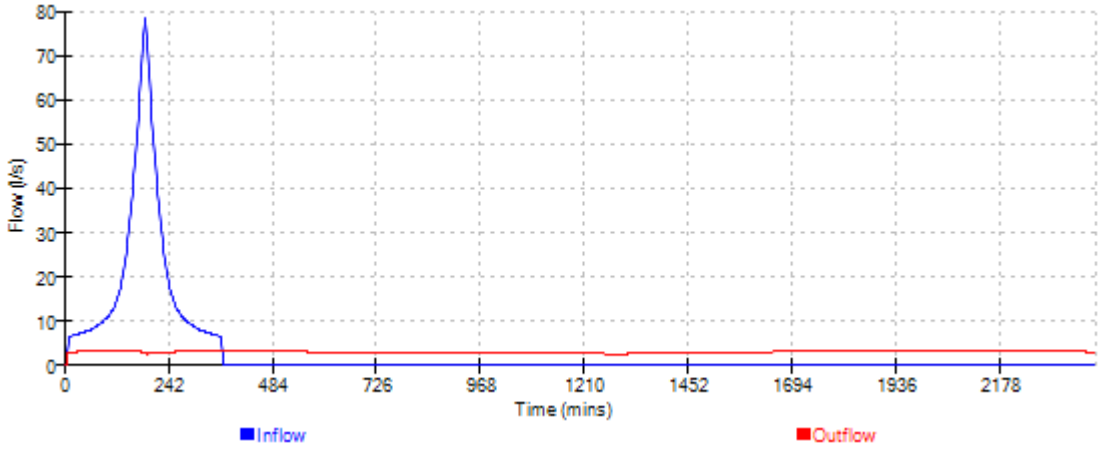
Event: 240 min Summer

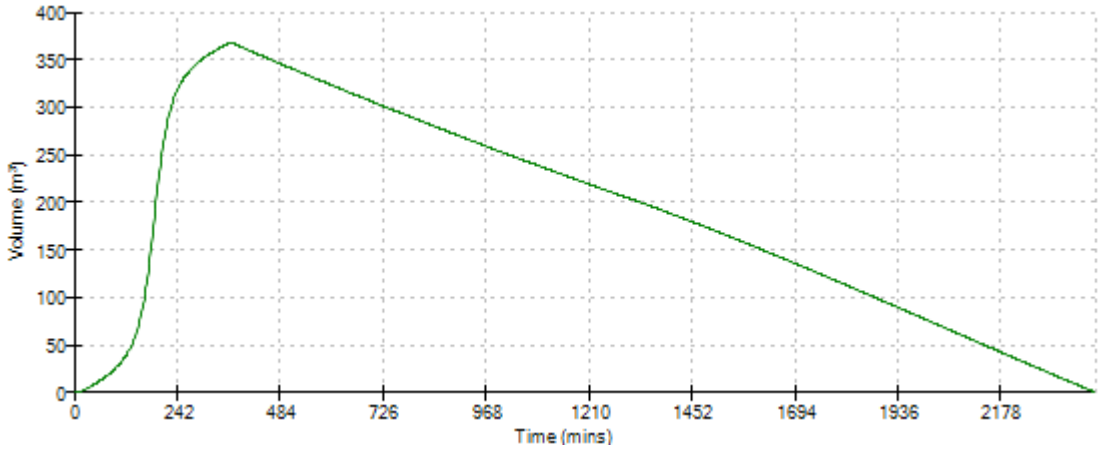


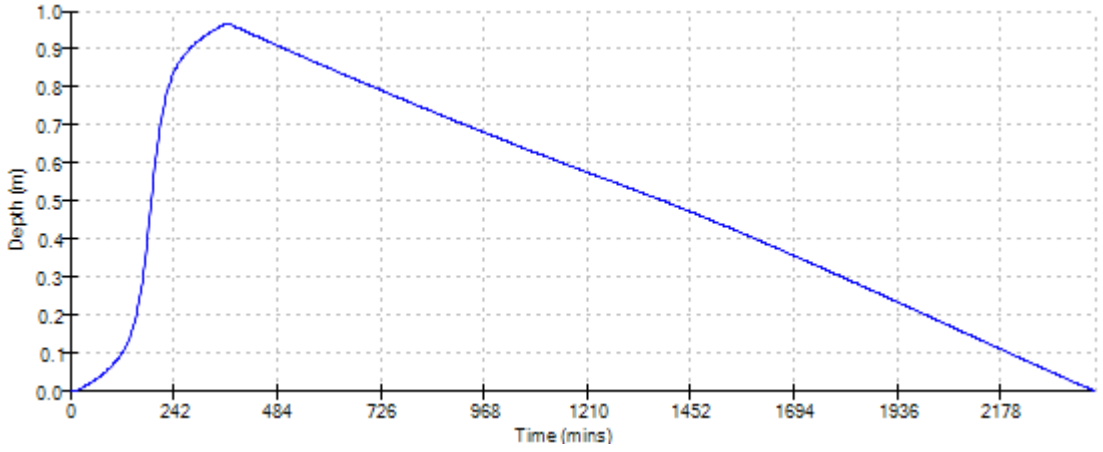




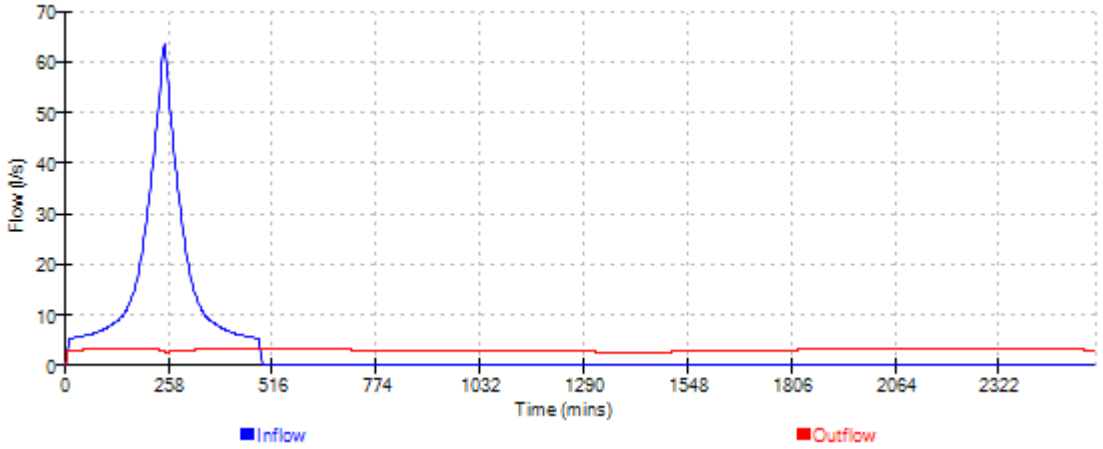
Event: 360 min Summer

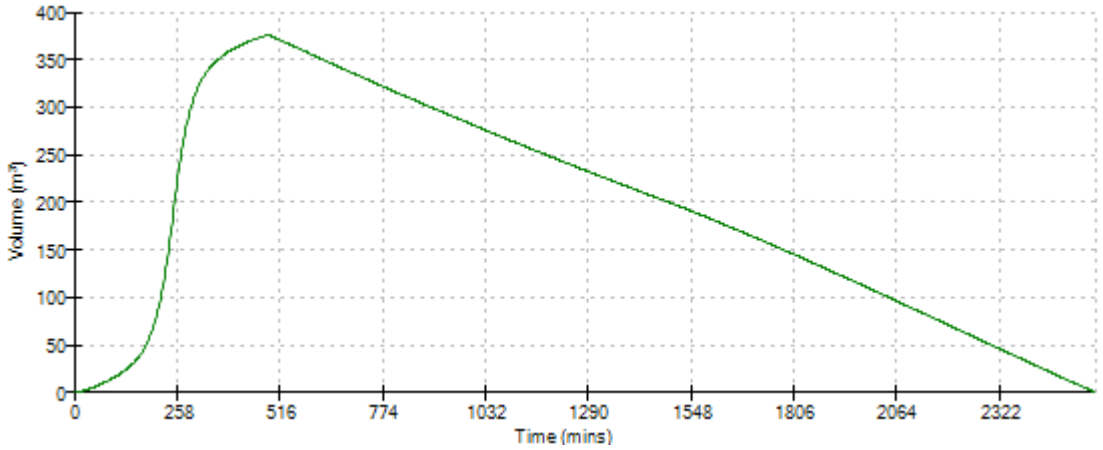


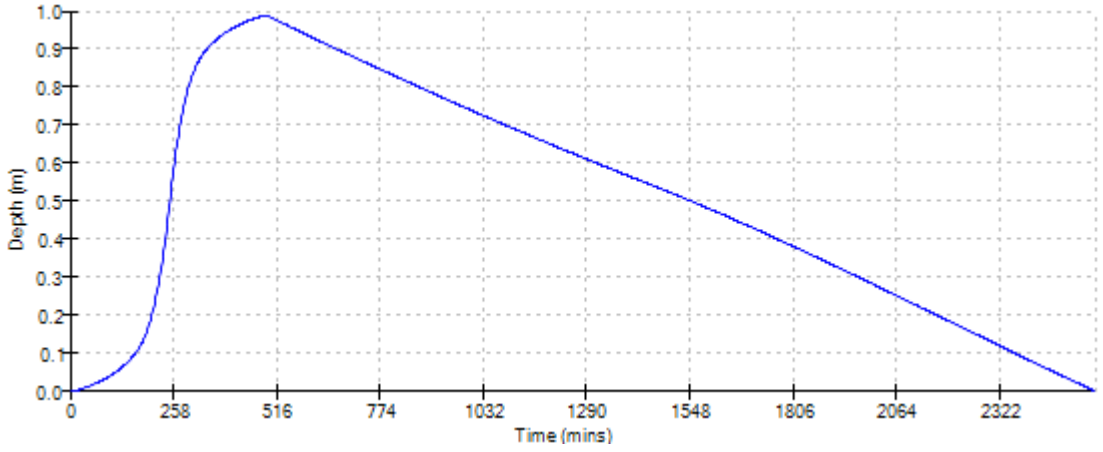




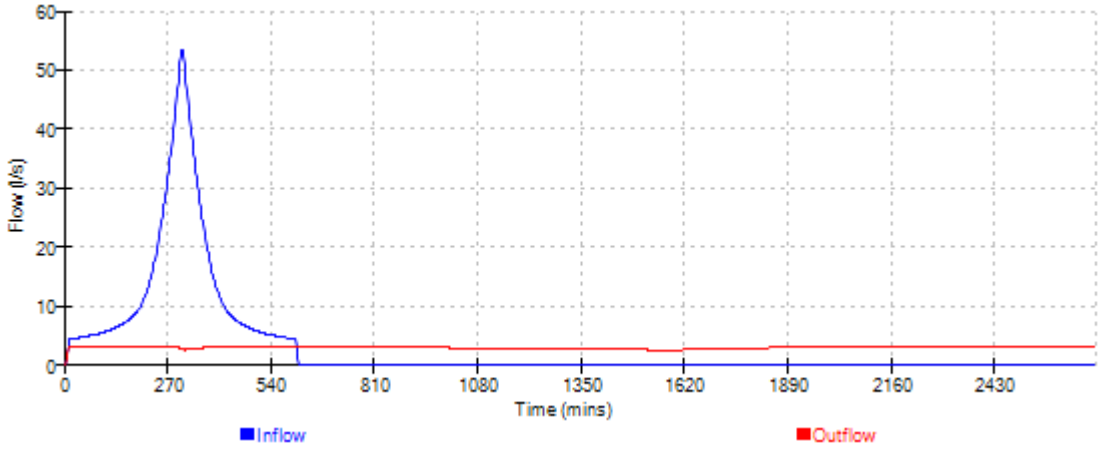
Event: 480 min Summer

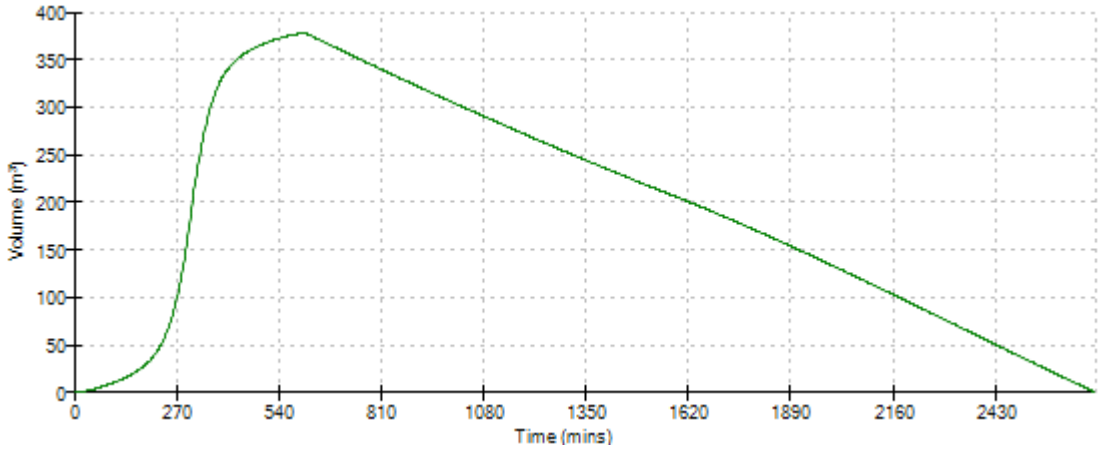


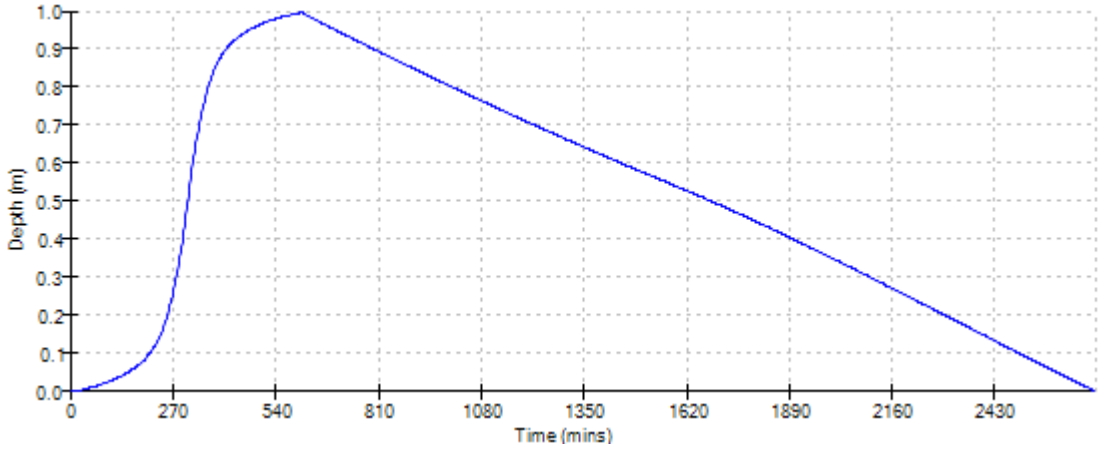




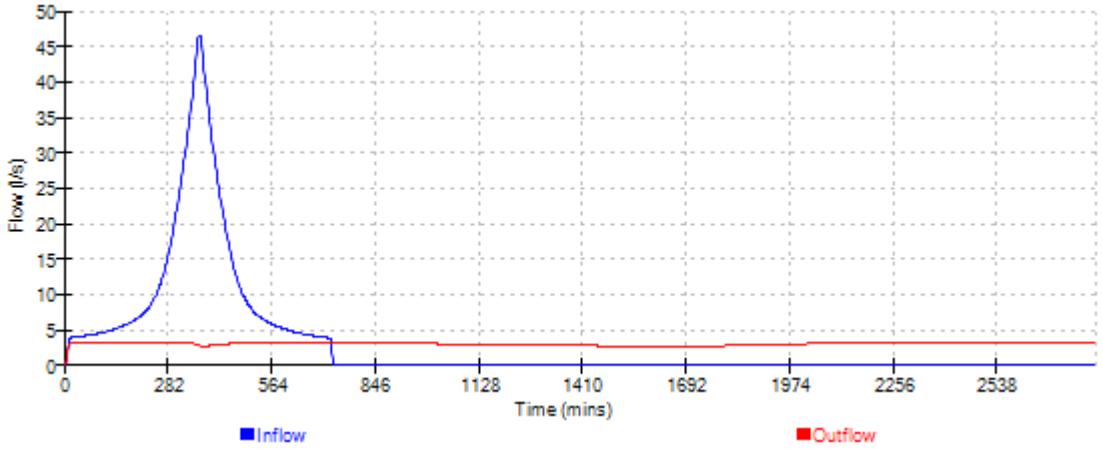
Event: 600 min Summer

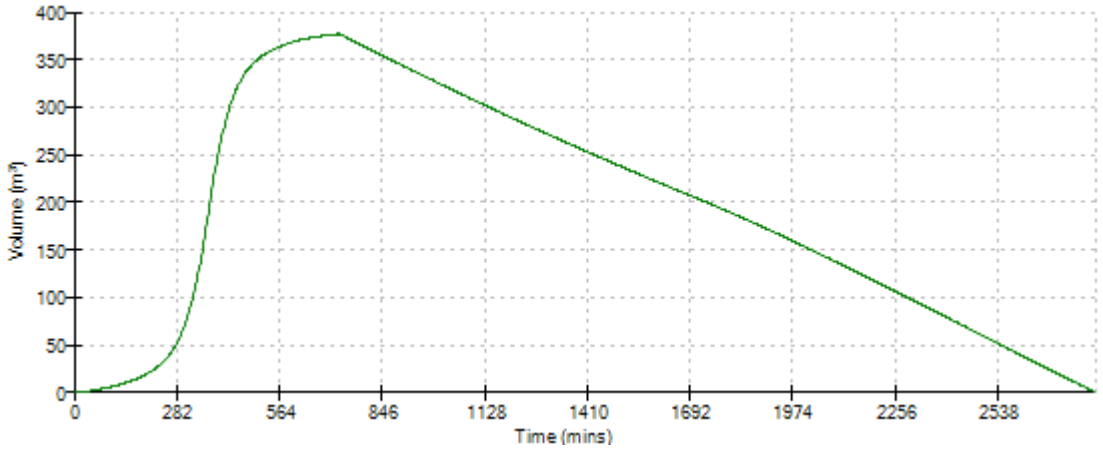


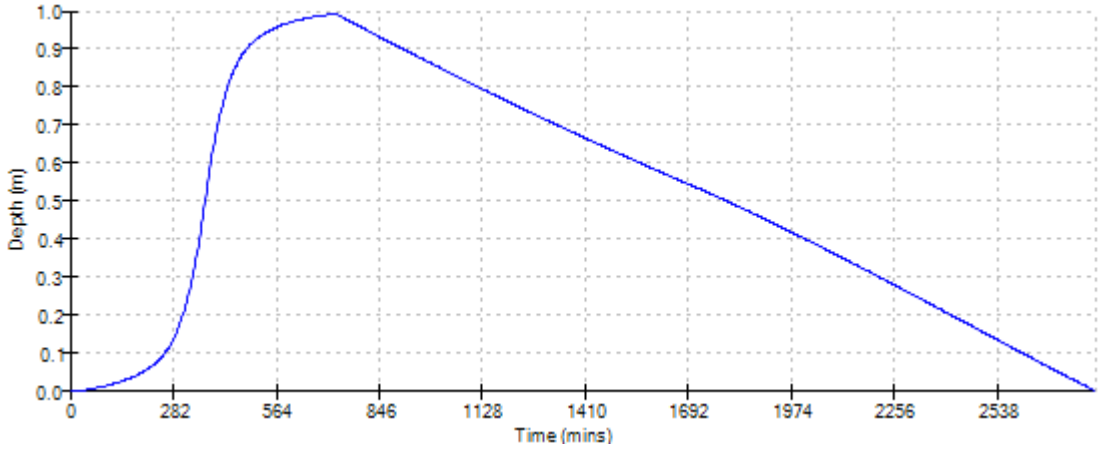




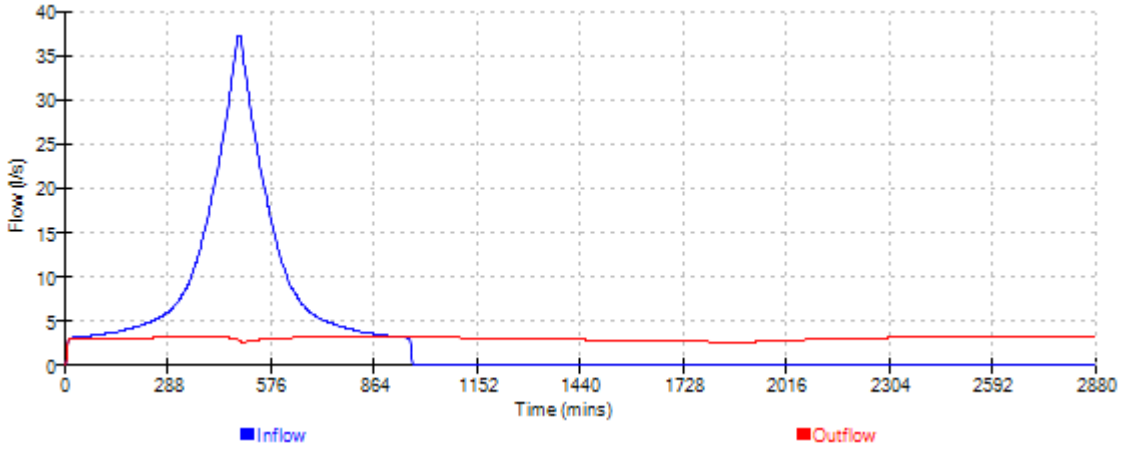
Event: 720 min Summer

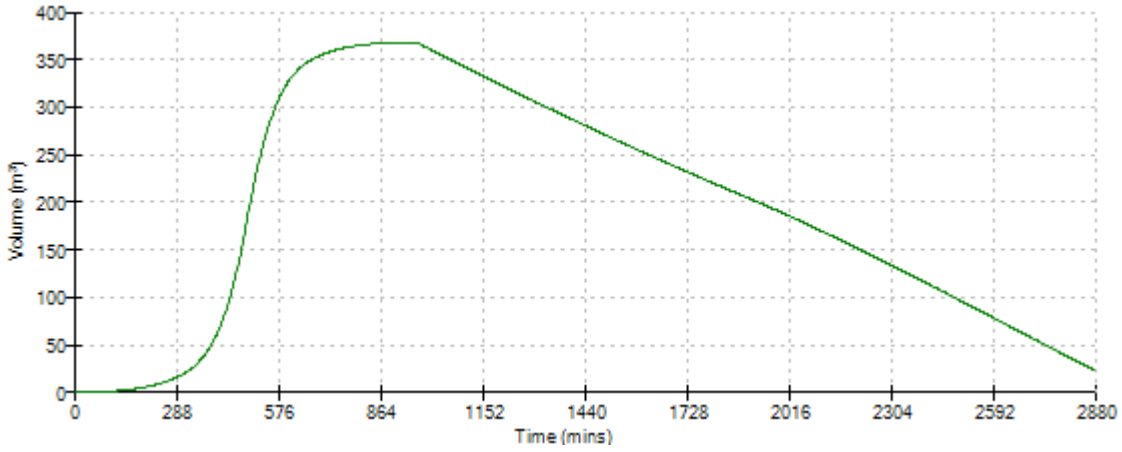


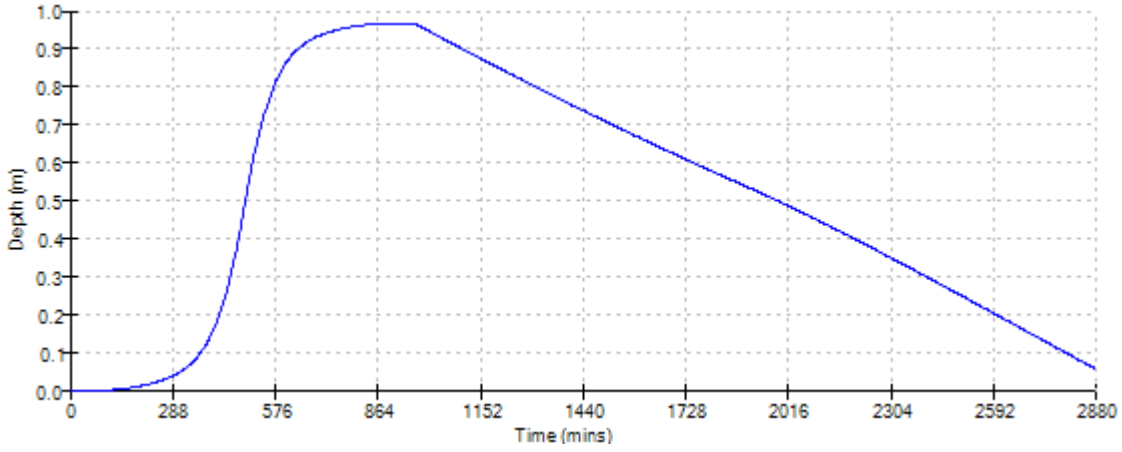




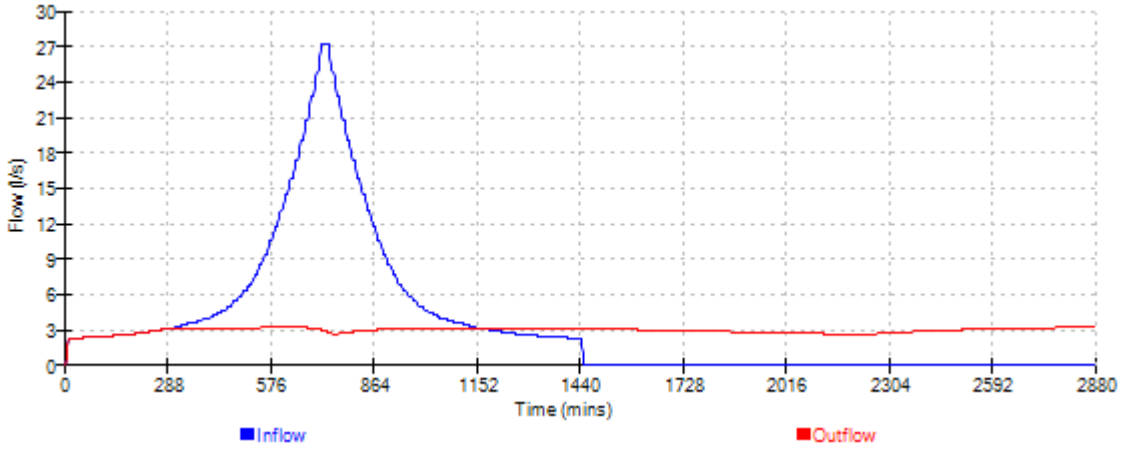
Event: 960 min Summer

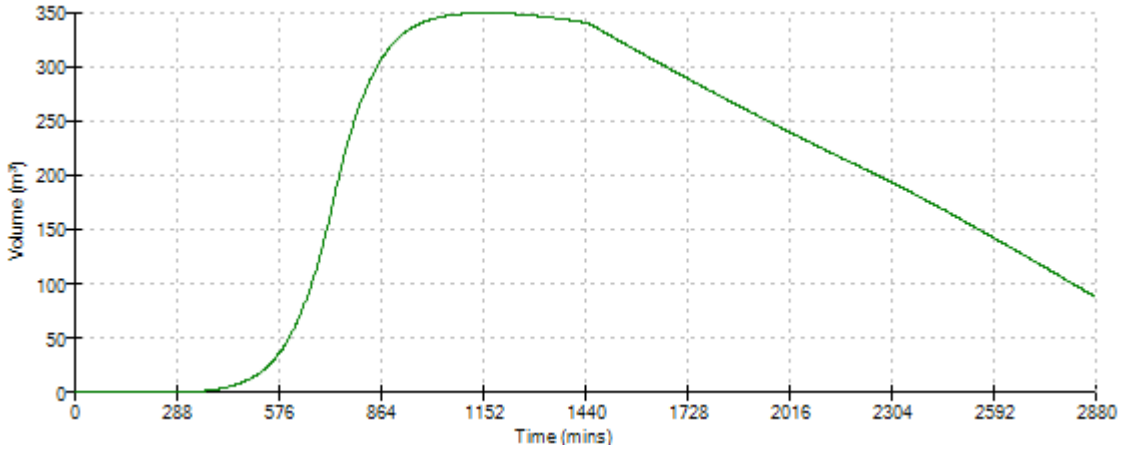


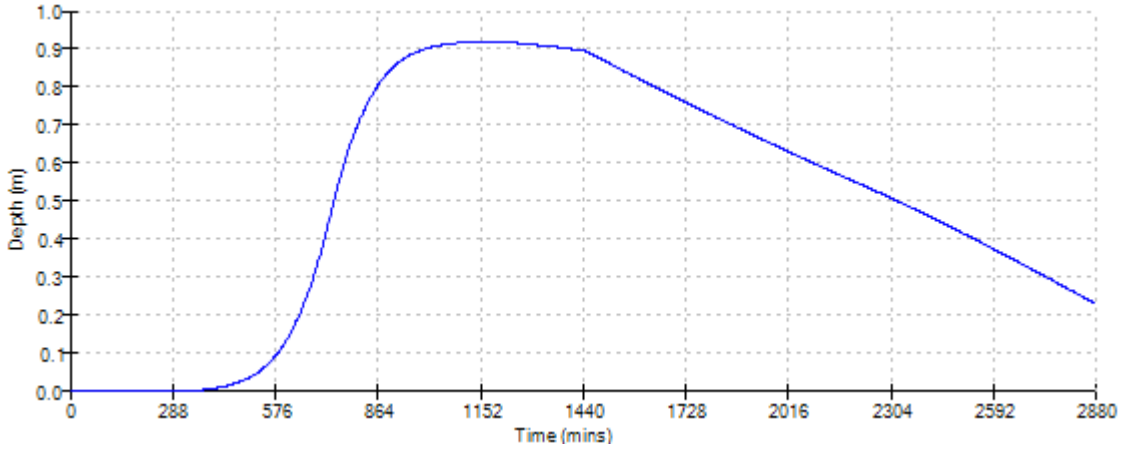




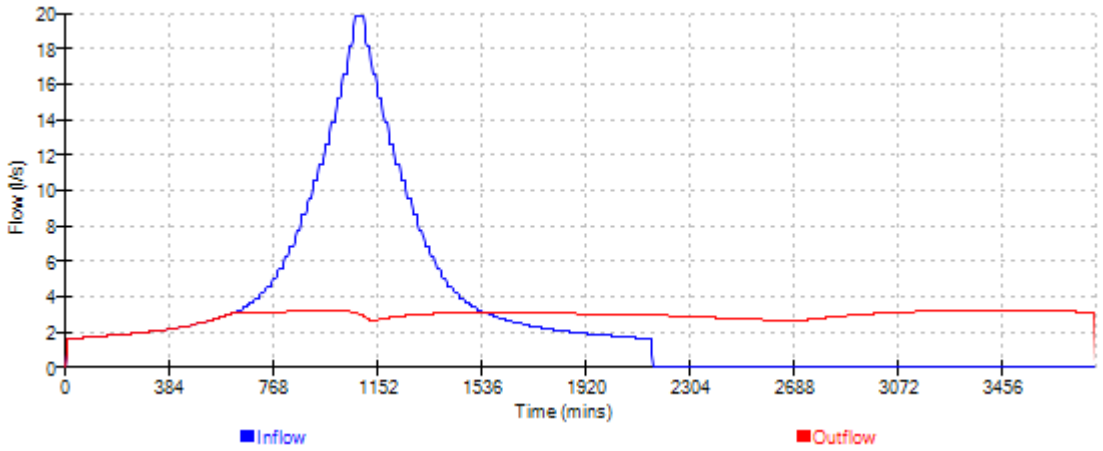
Event: 1440 min Summer

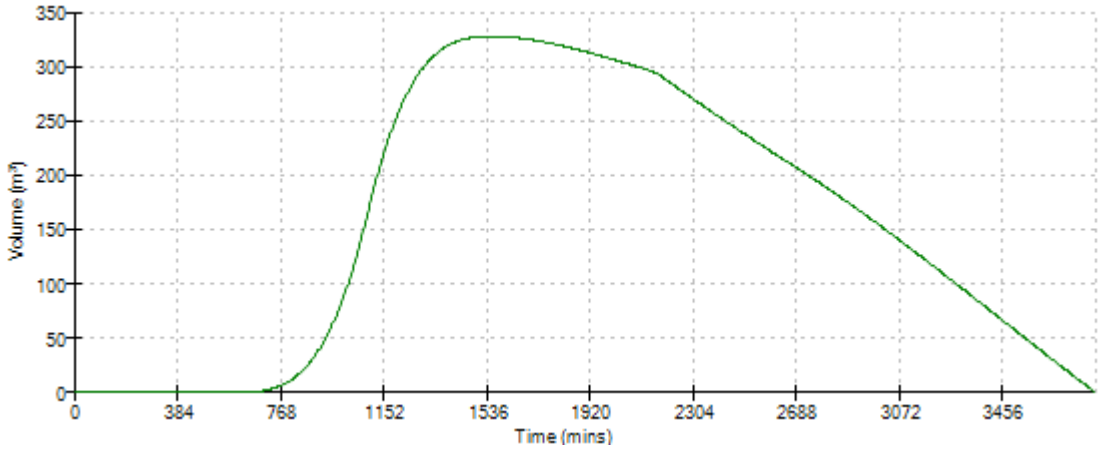


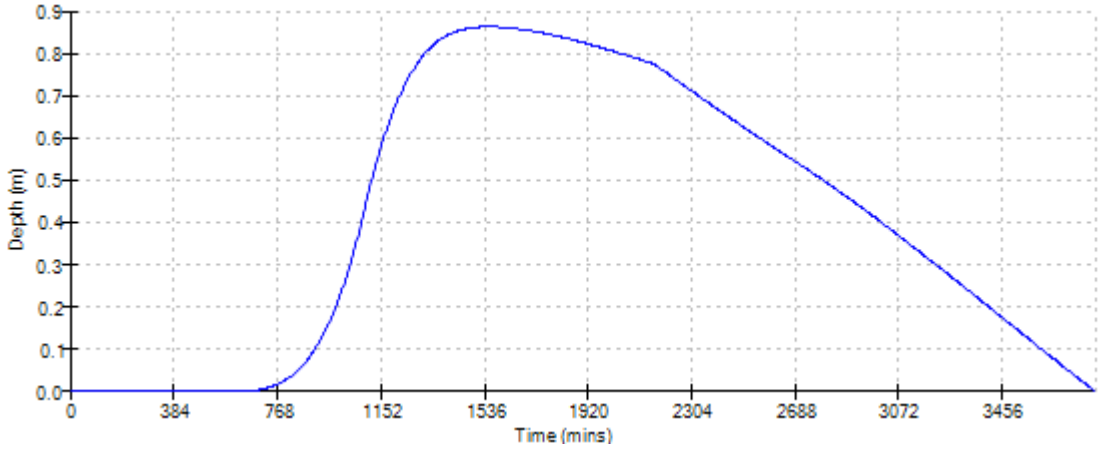




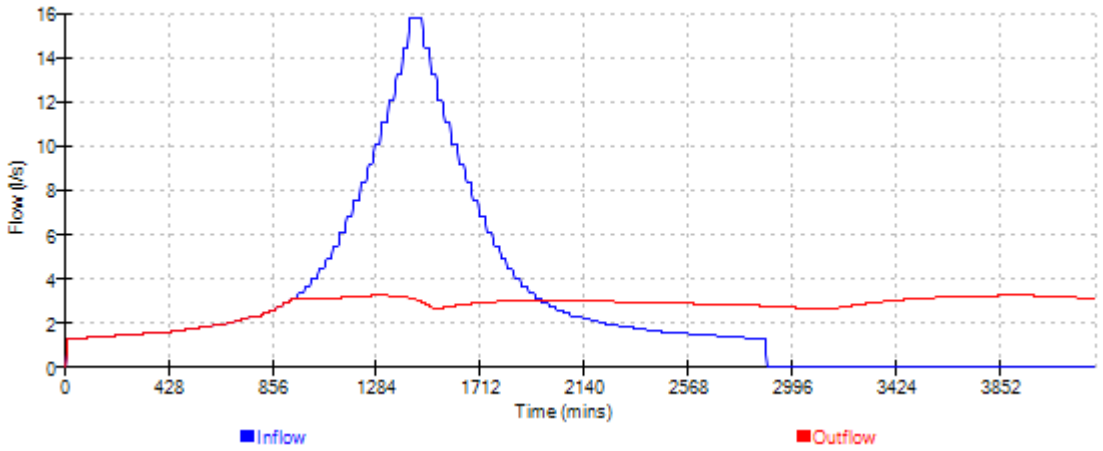
Event: 2160 min Summer

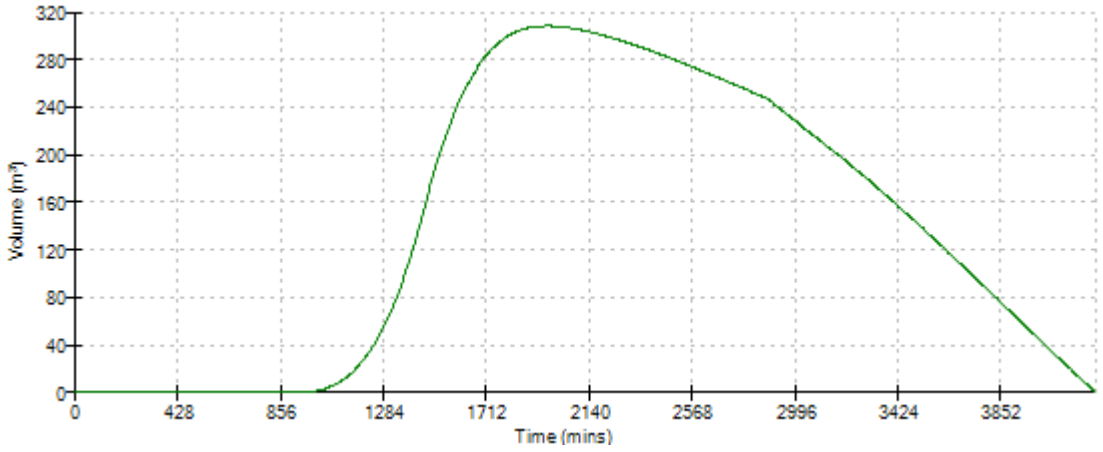


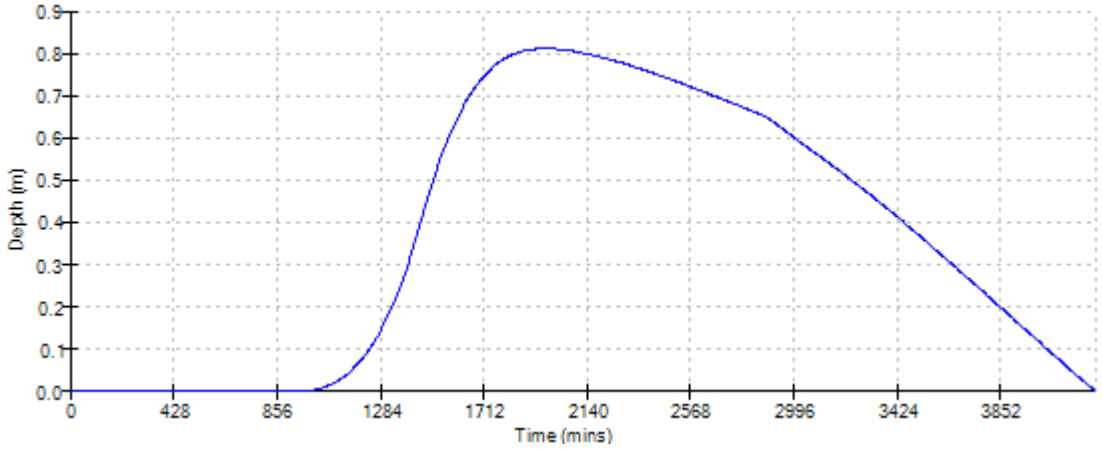




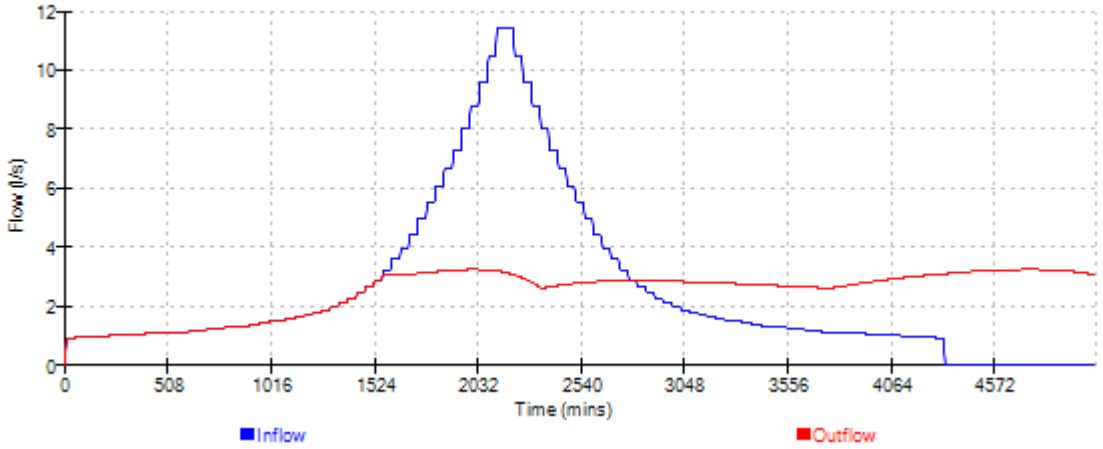
Event: 2880 min Summer

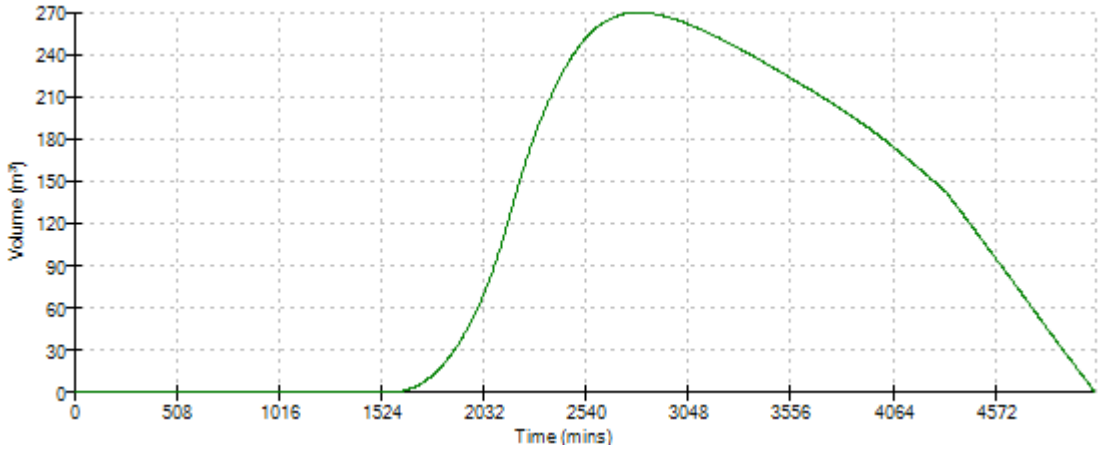


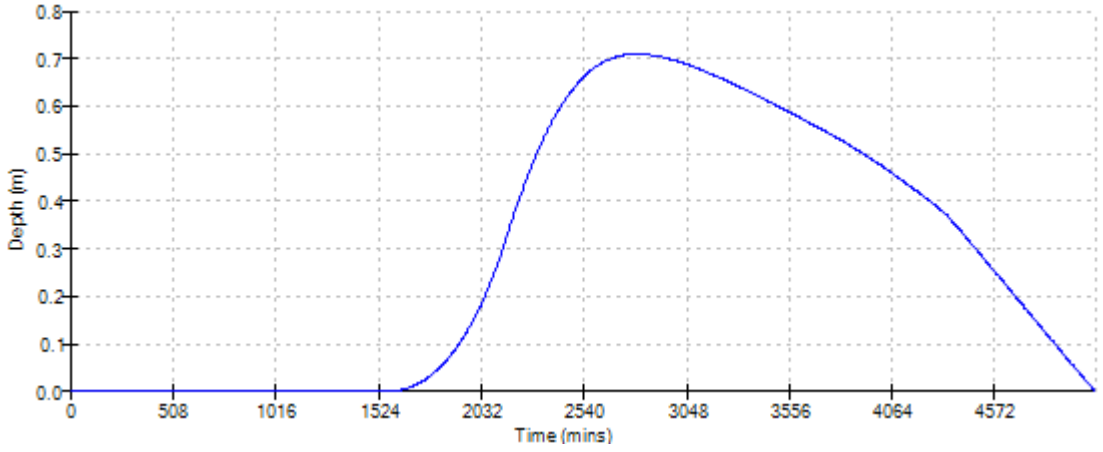




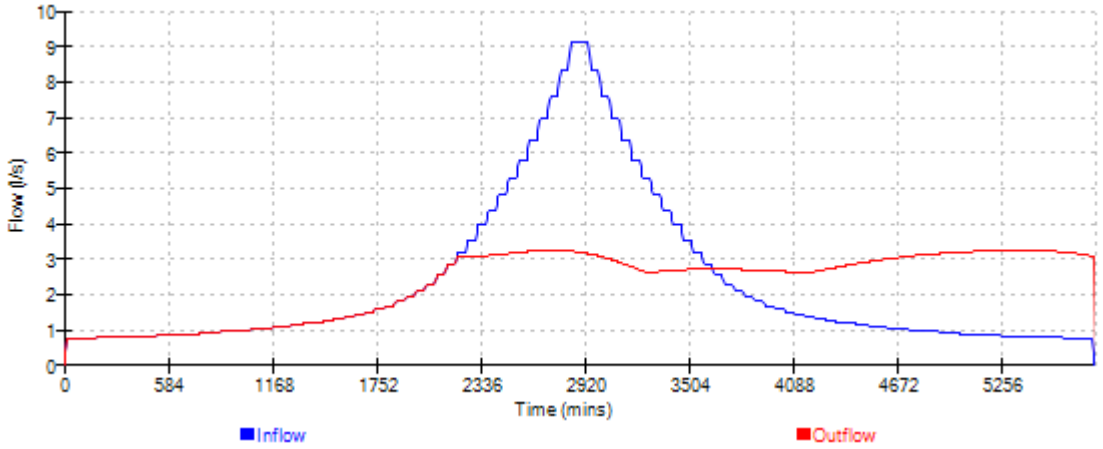
Event: 4320 min Summer

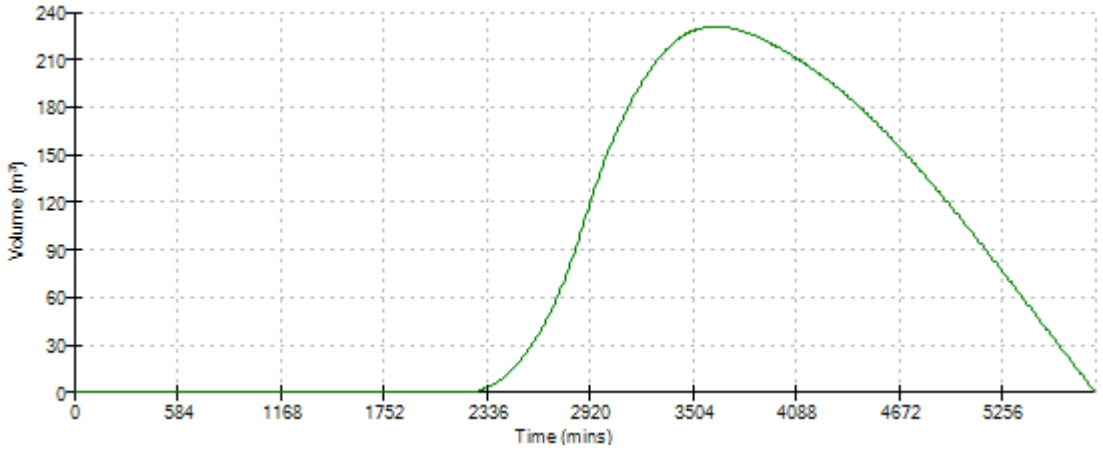


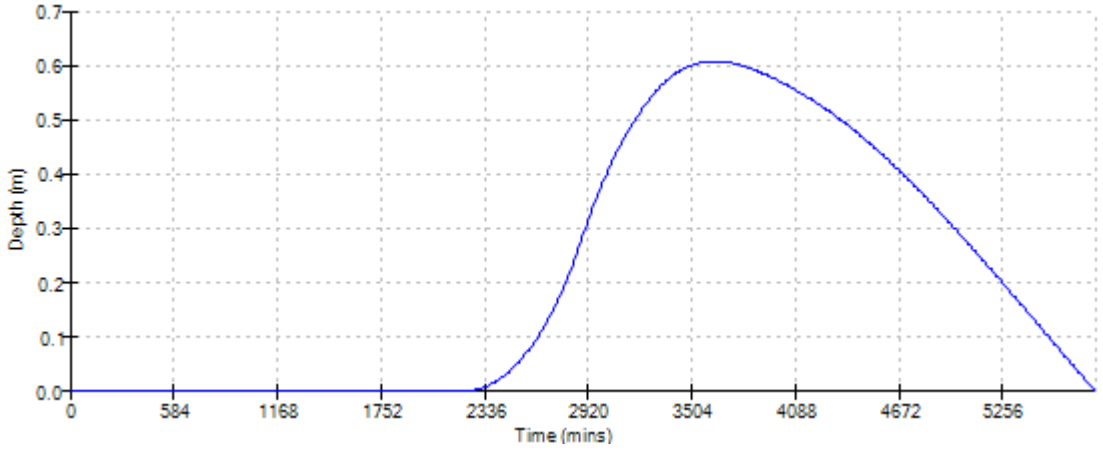




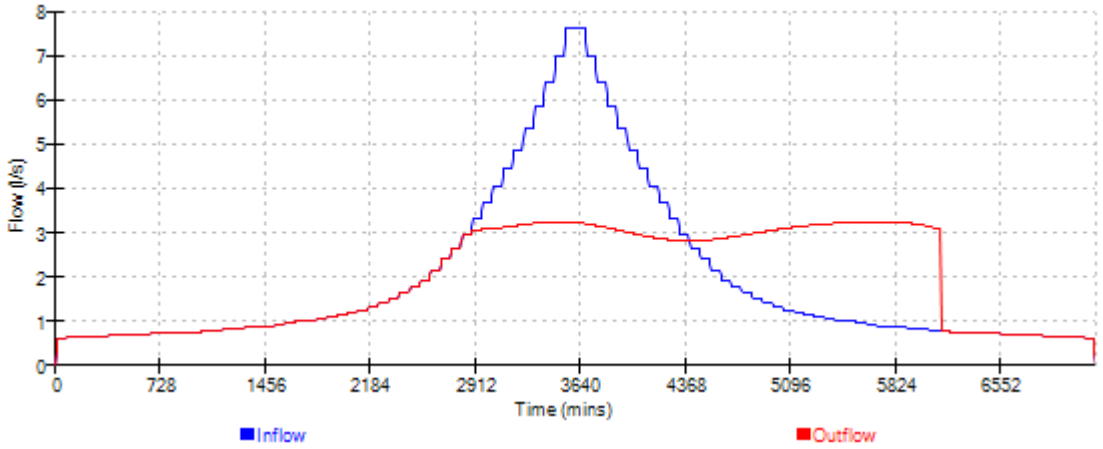
Event: 5760 min Summer

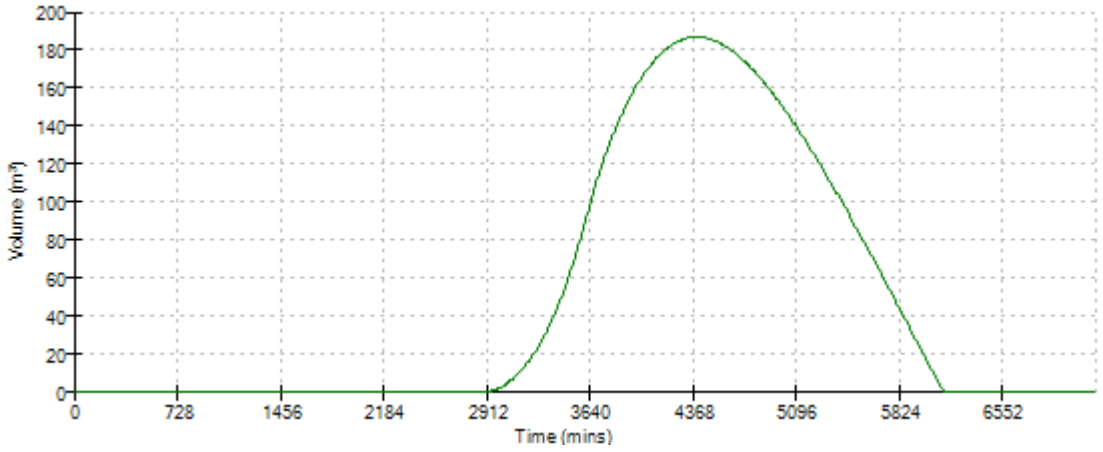


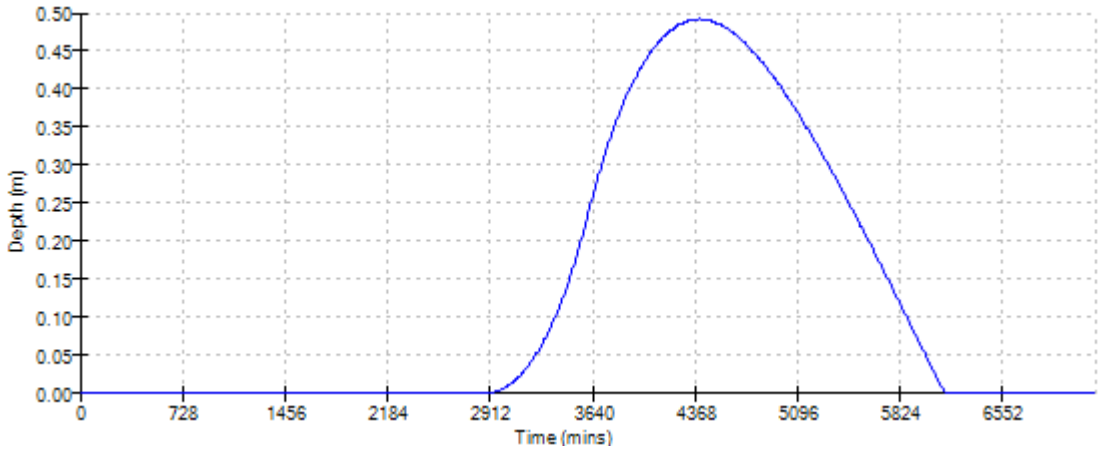




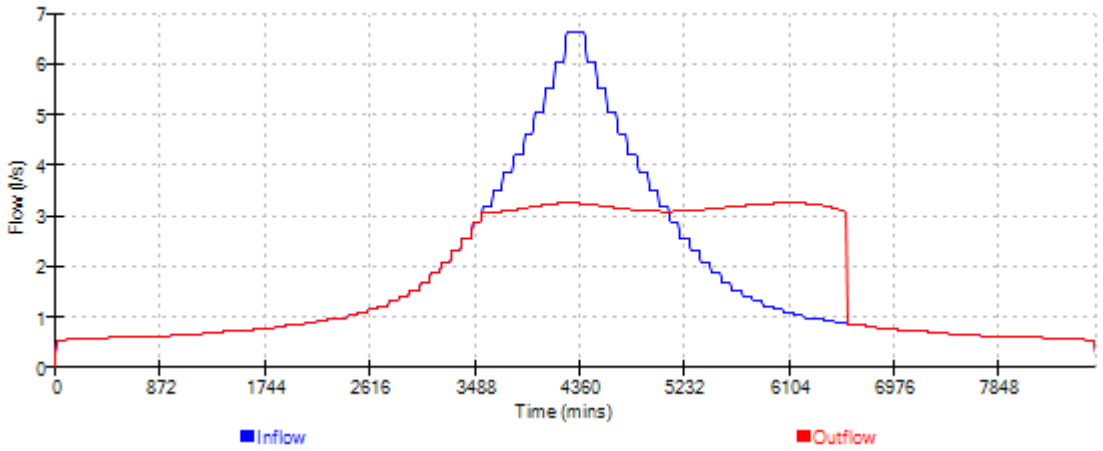
Event: 7200 min Summer

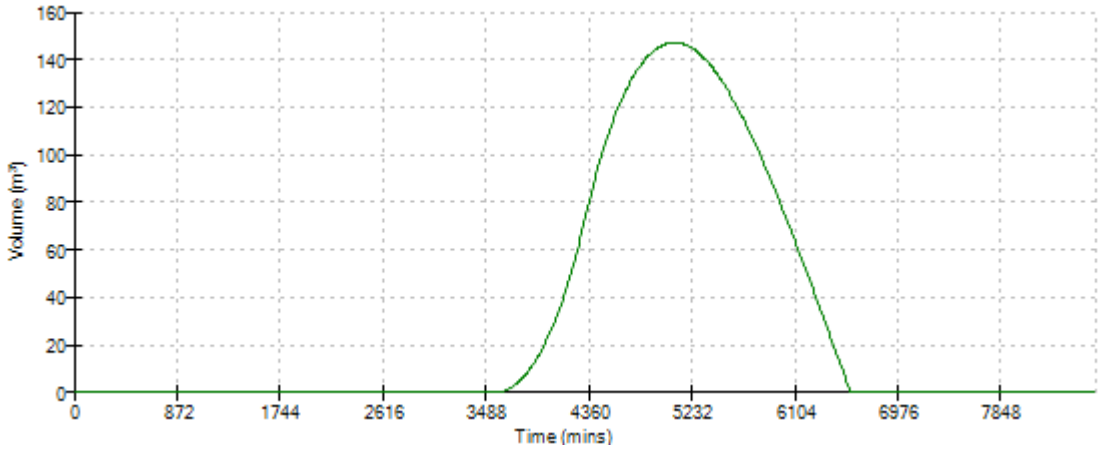


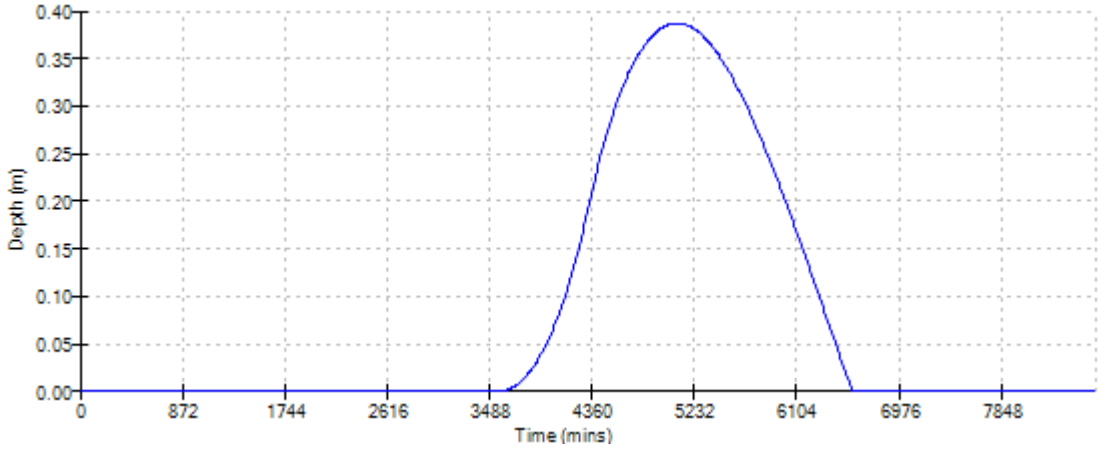




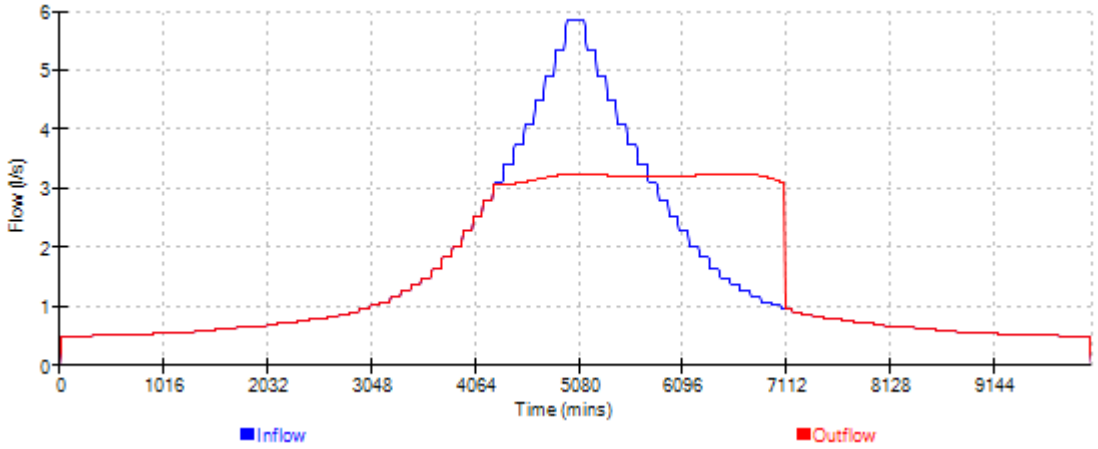
Event: 8640 min Summer

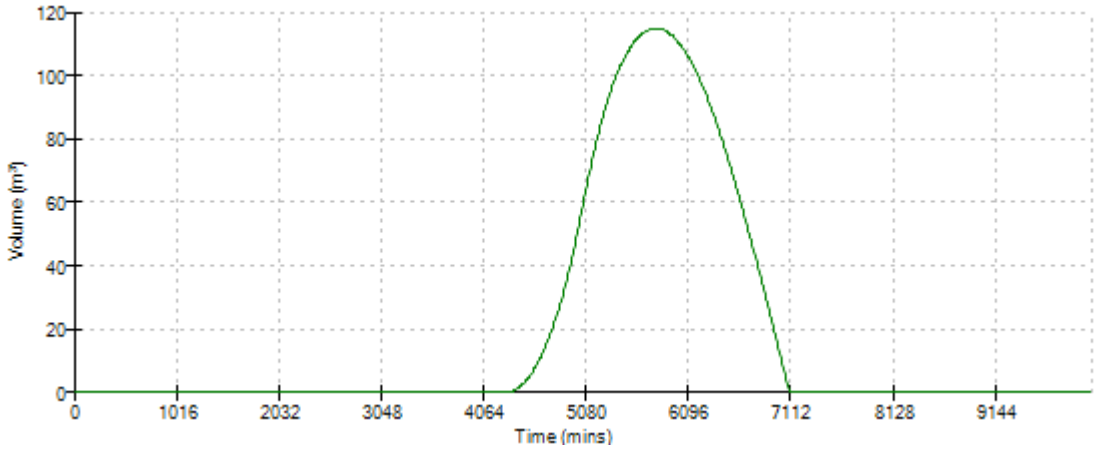


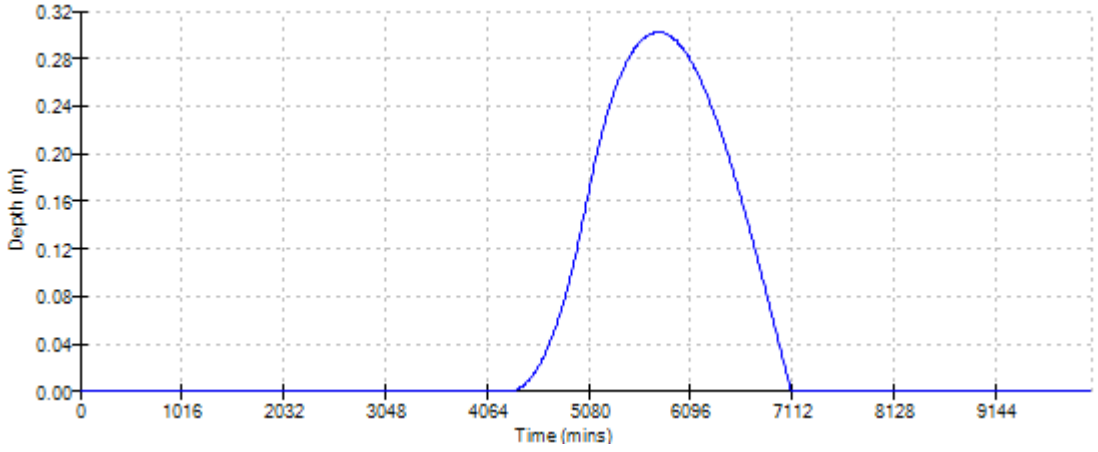




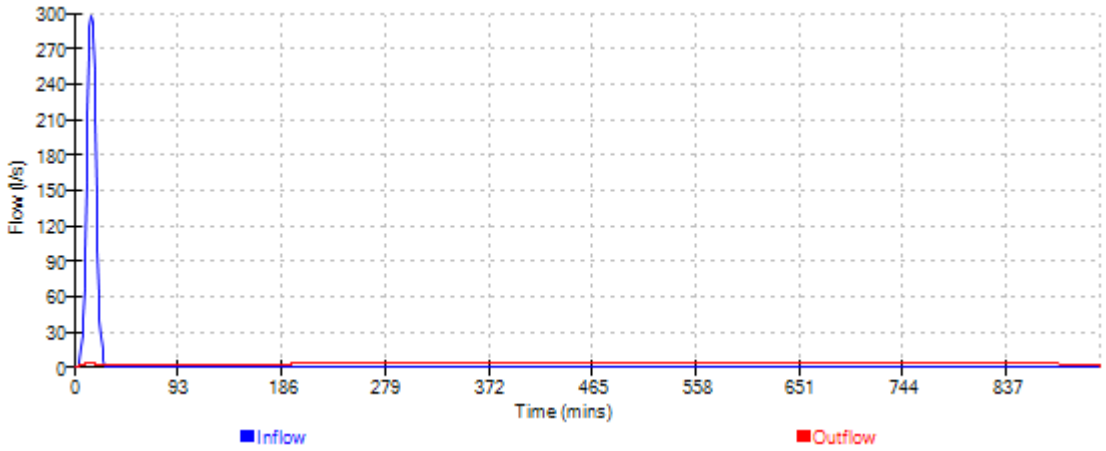
Event: 10080 min Summer

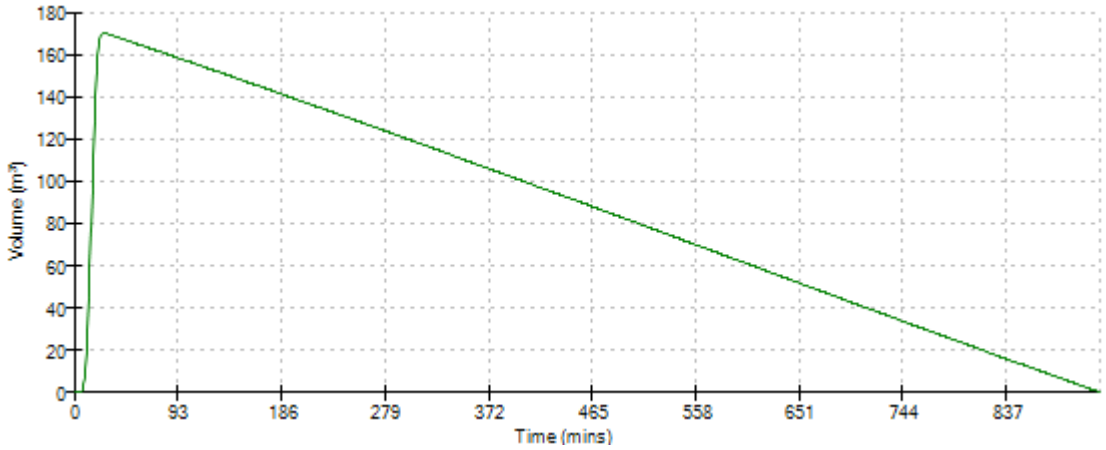


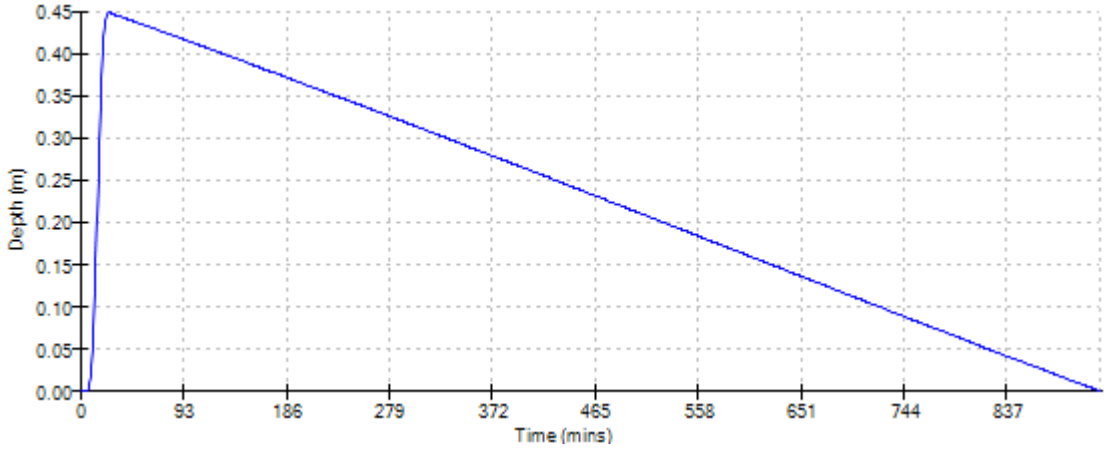




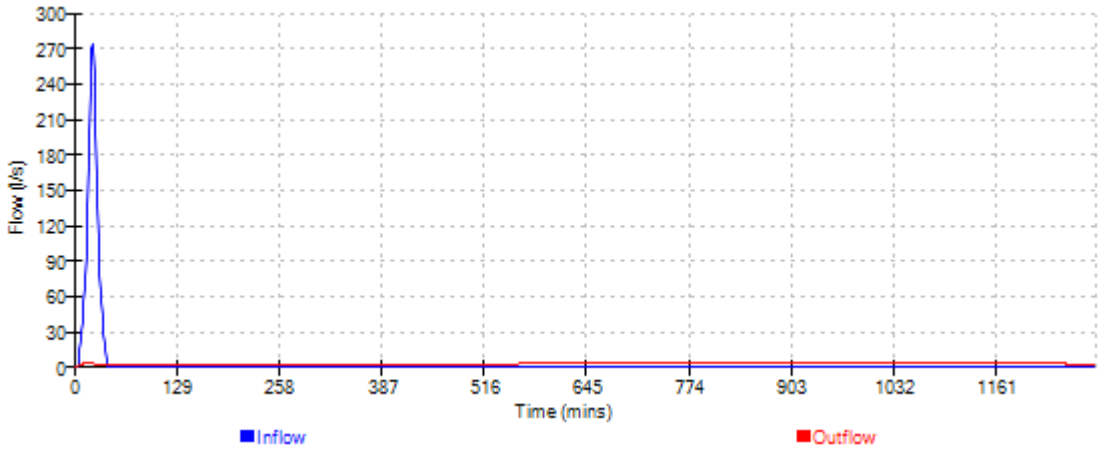
Event: 15 min Winter

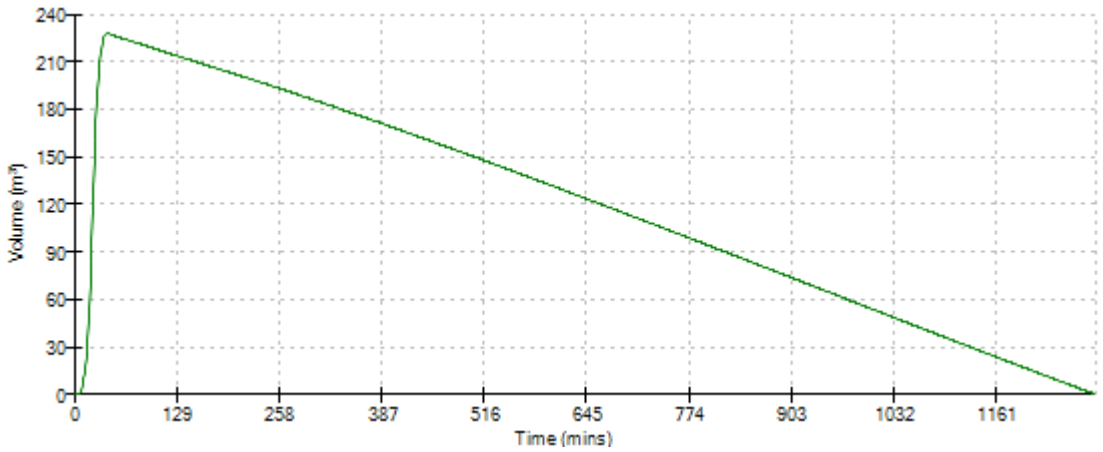


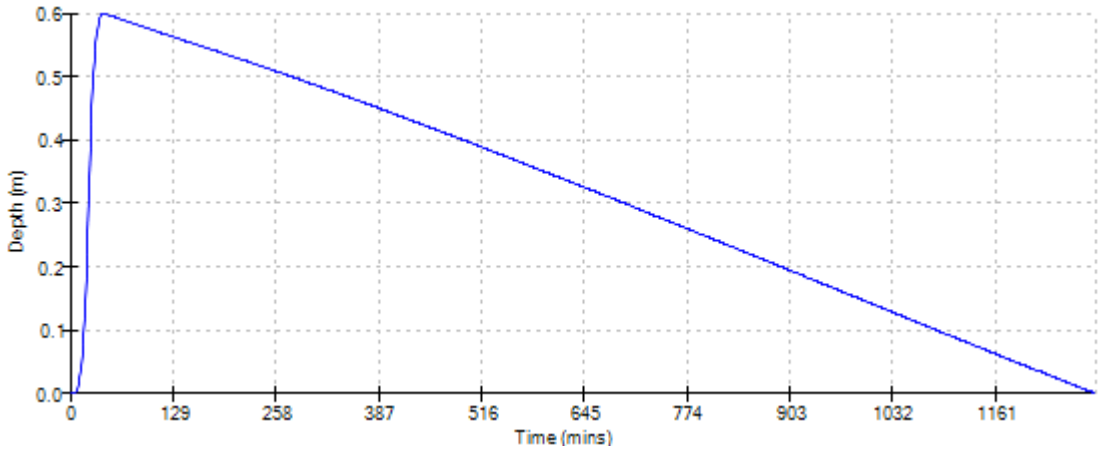




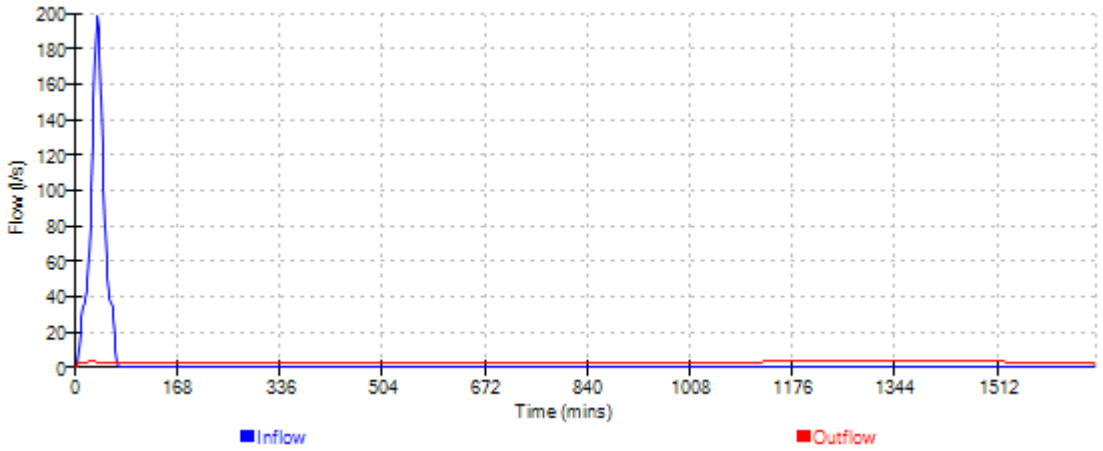
Event: 30 min Winter

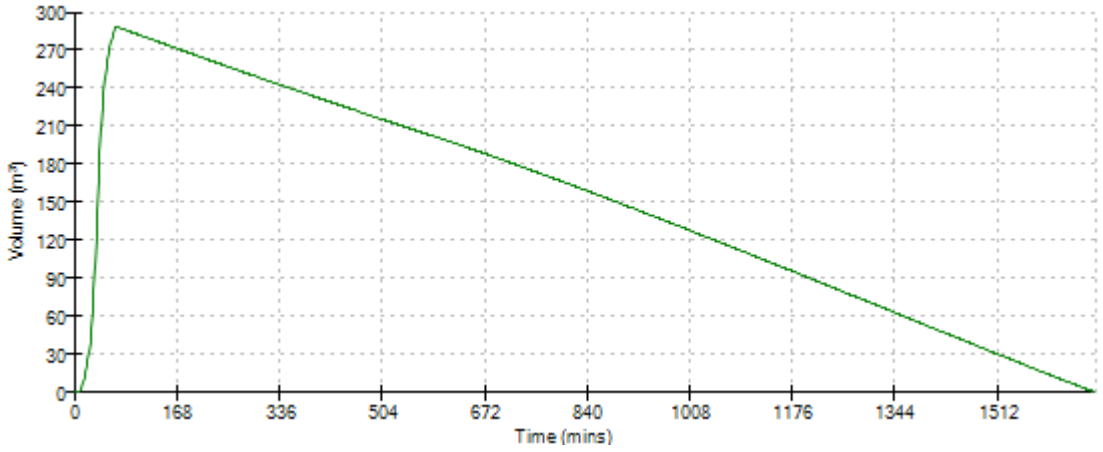


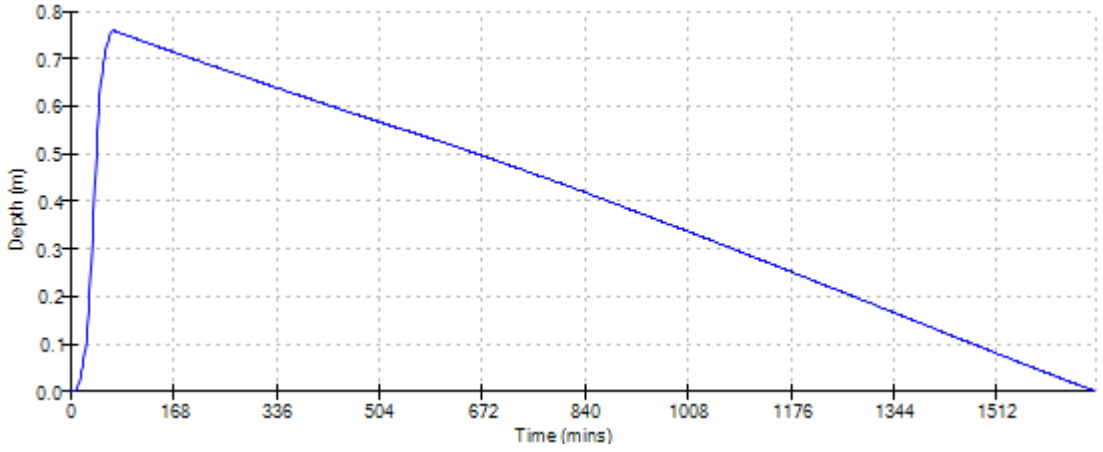




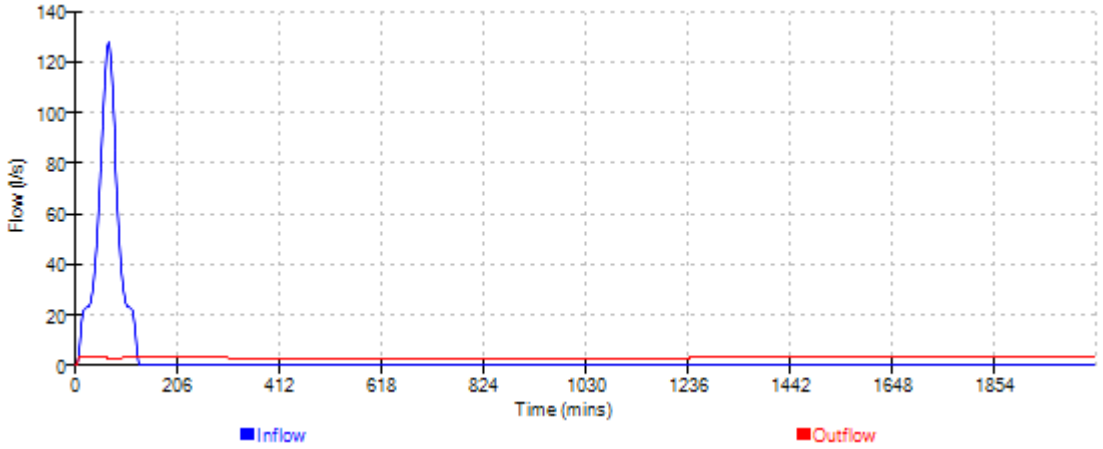
Event: 60 min Winter

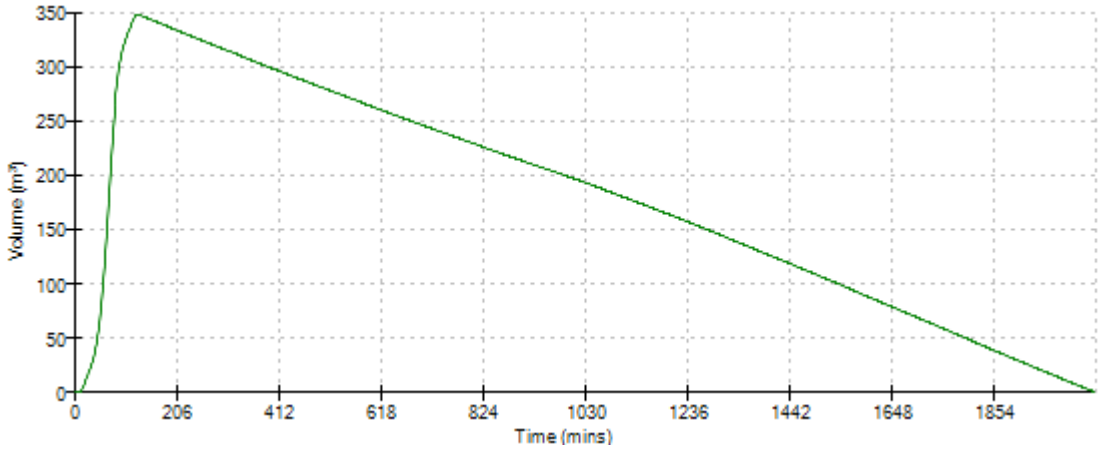


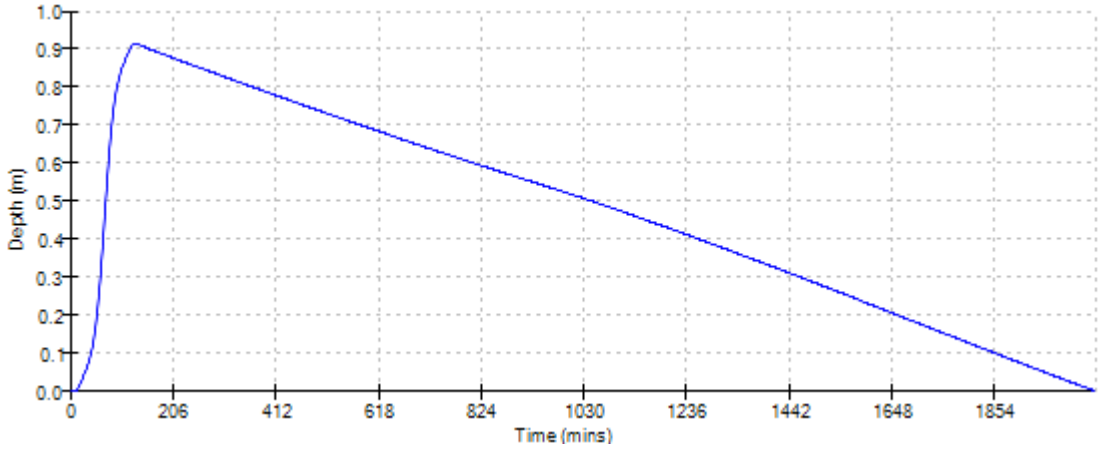




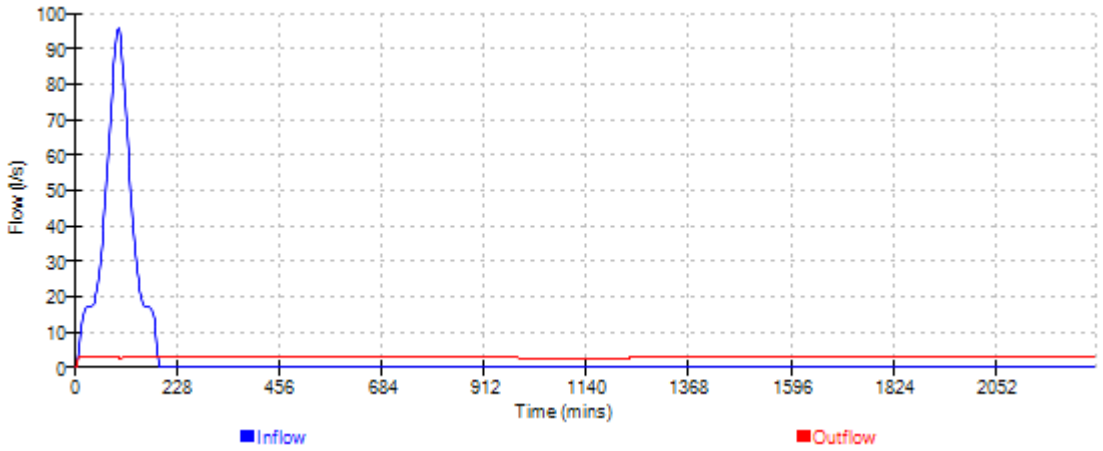
Event: 120 min Winter

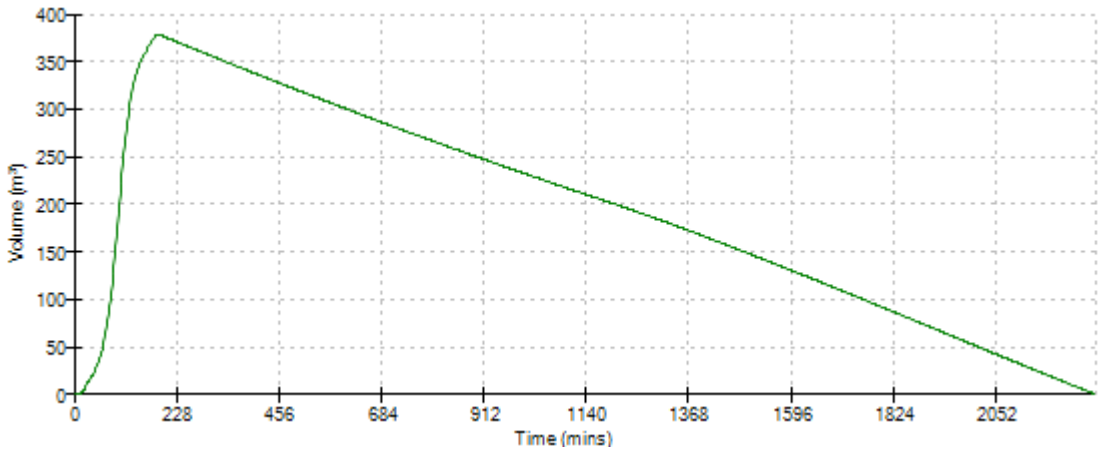


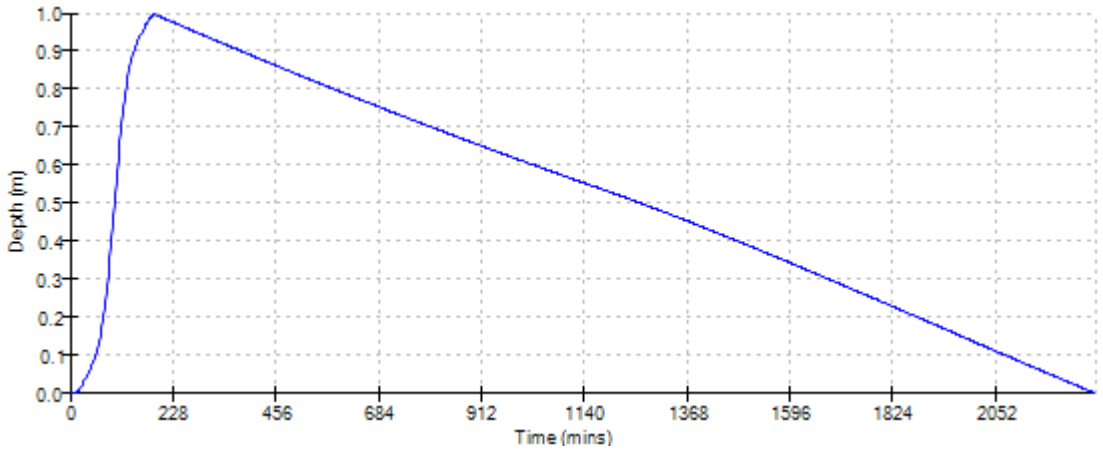




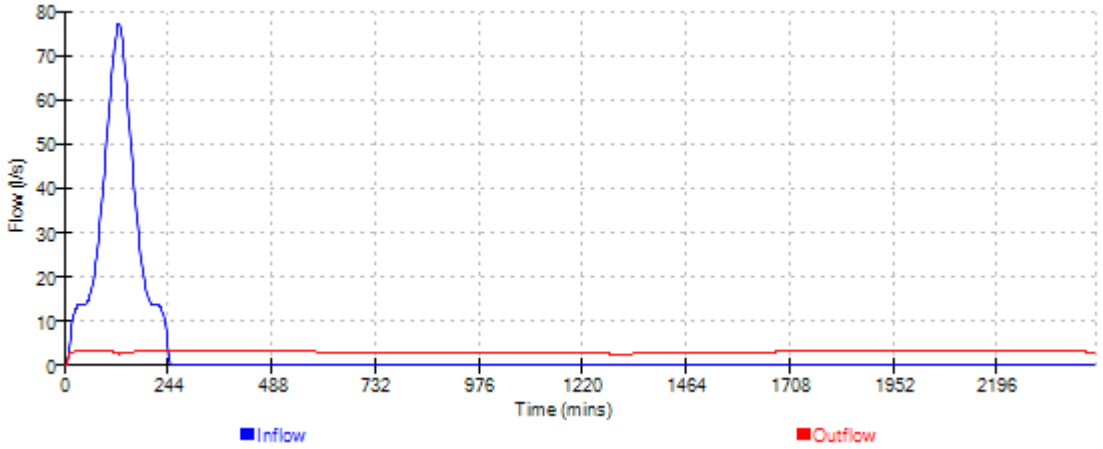
Event: 180 min Winter

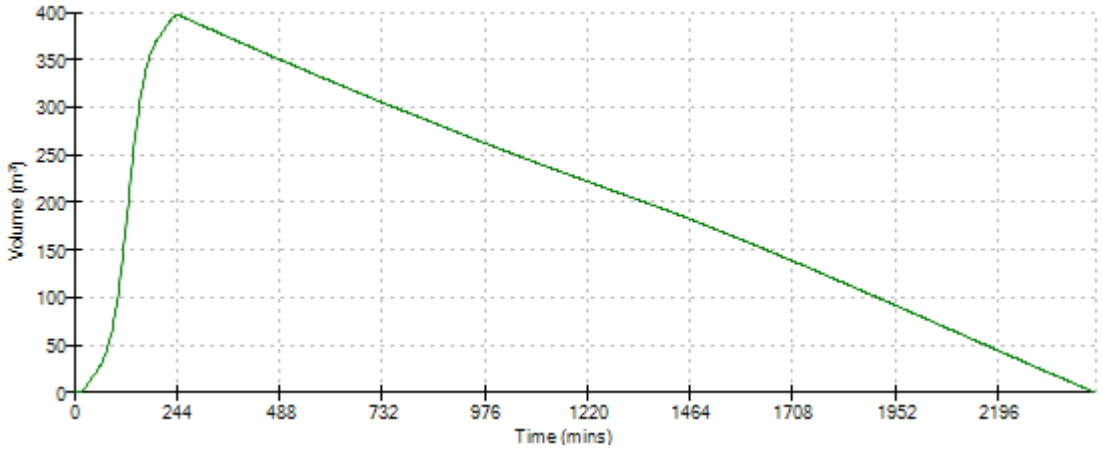


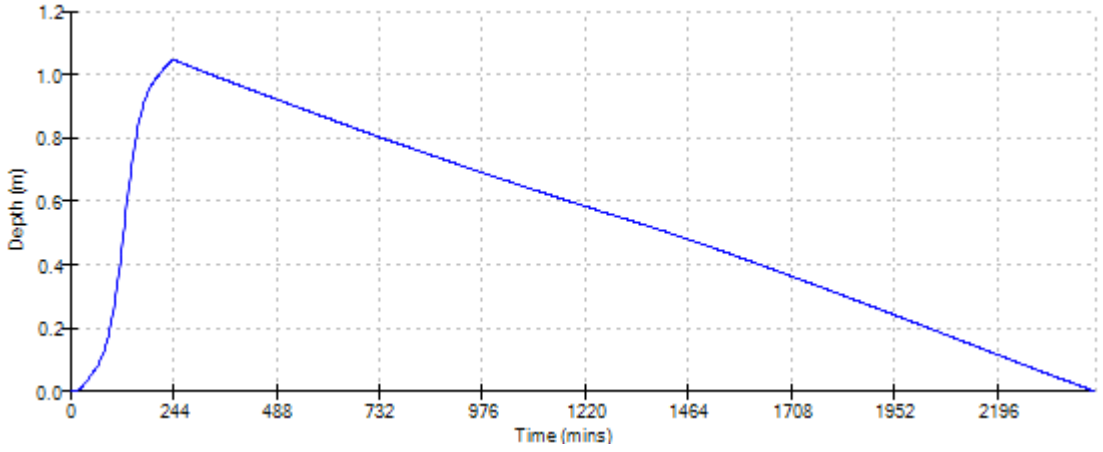




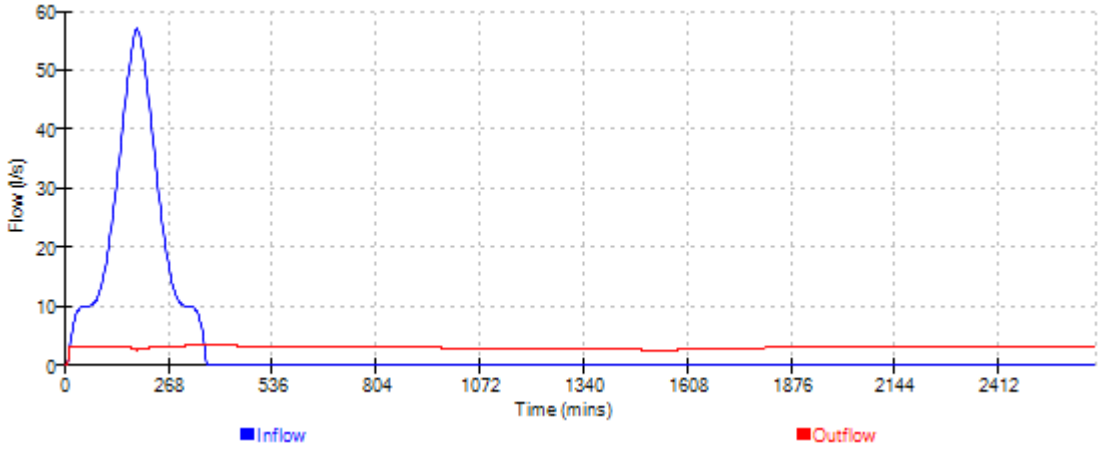
Event: 240 min Winter

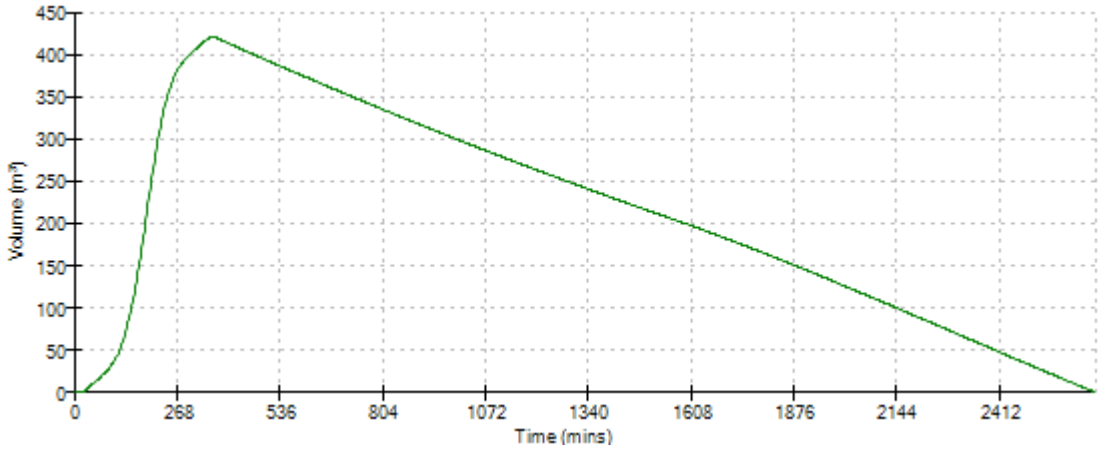


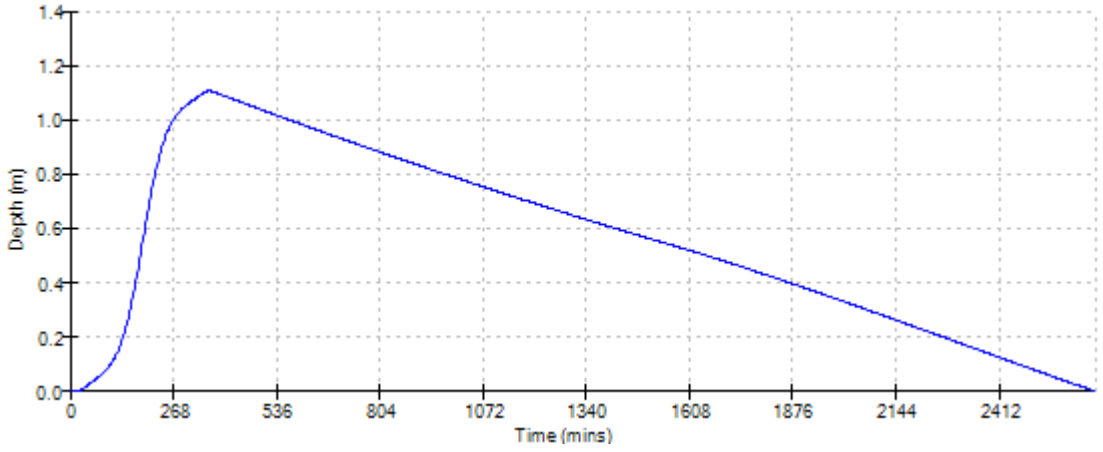




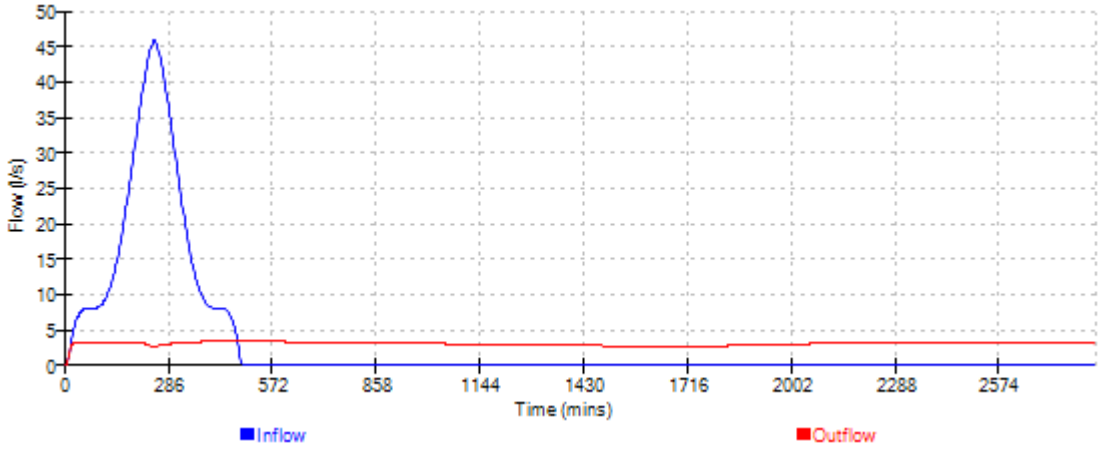
Event: 360 min Winter

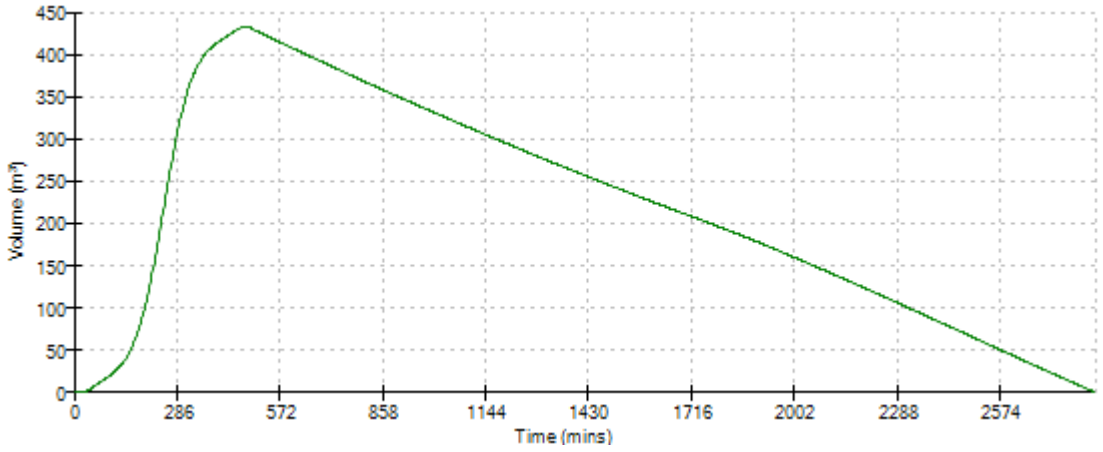


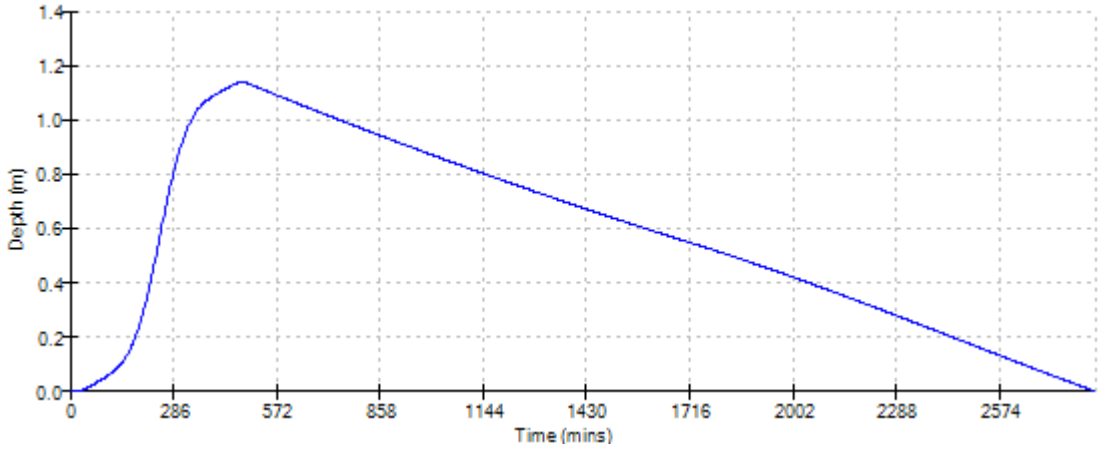




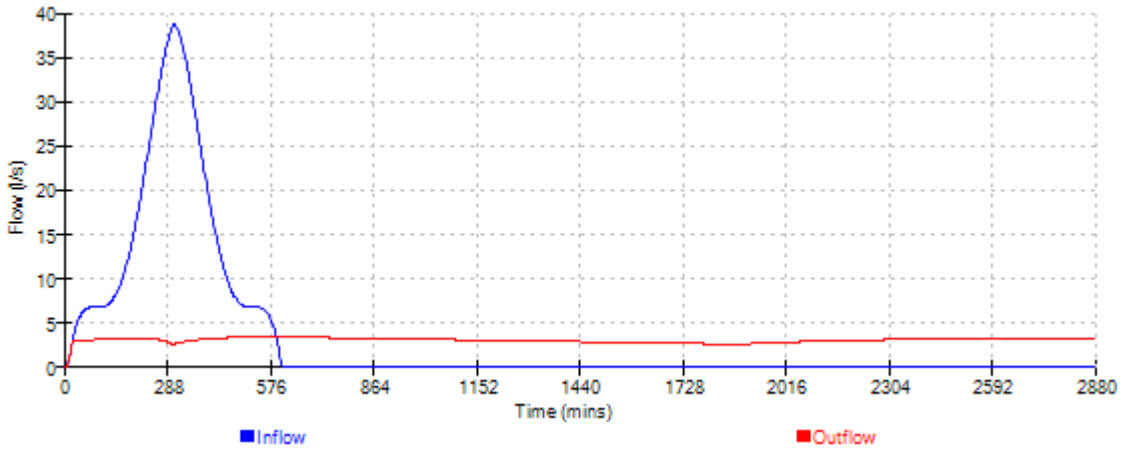
Event: 480 min Winter

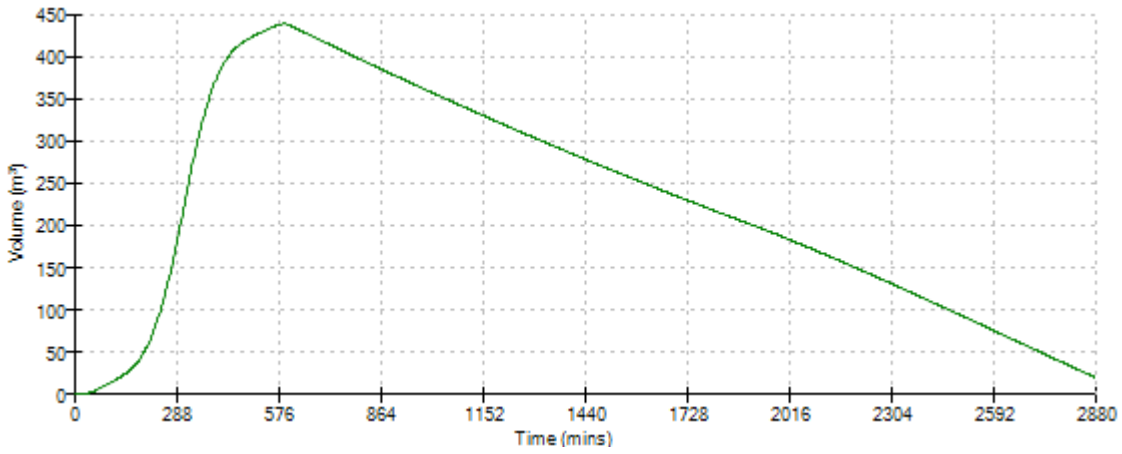


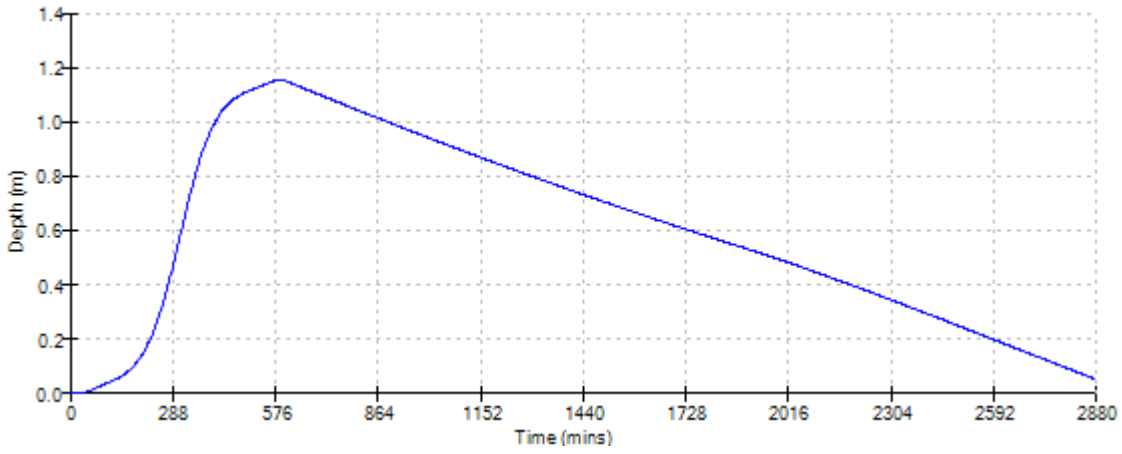




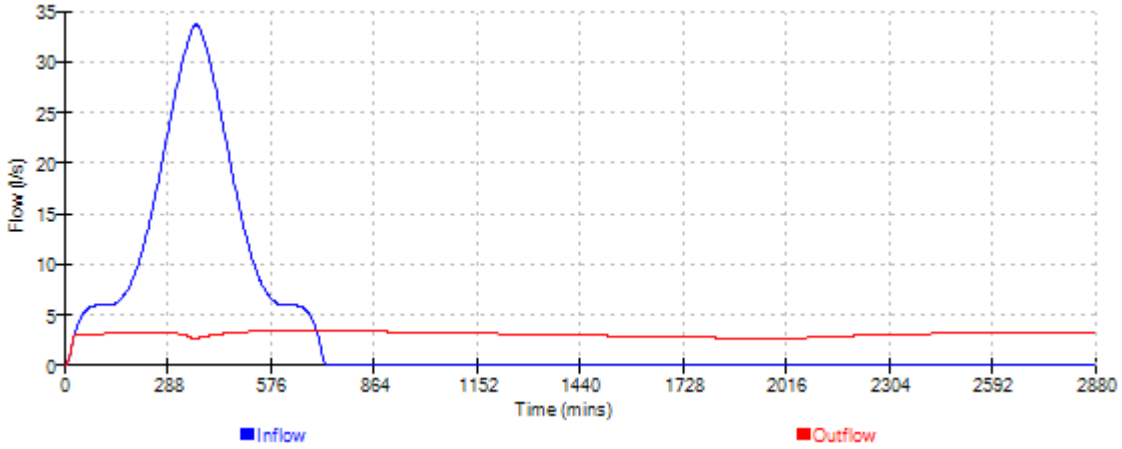
Event: 600 min Winter

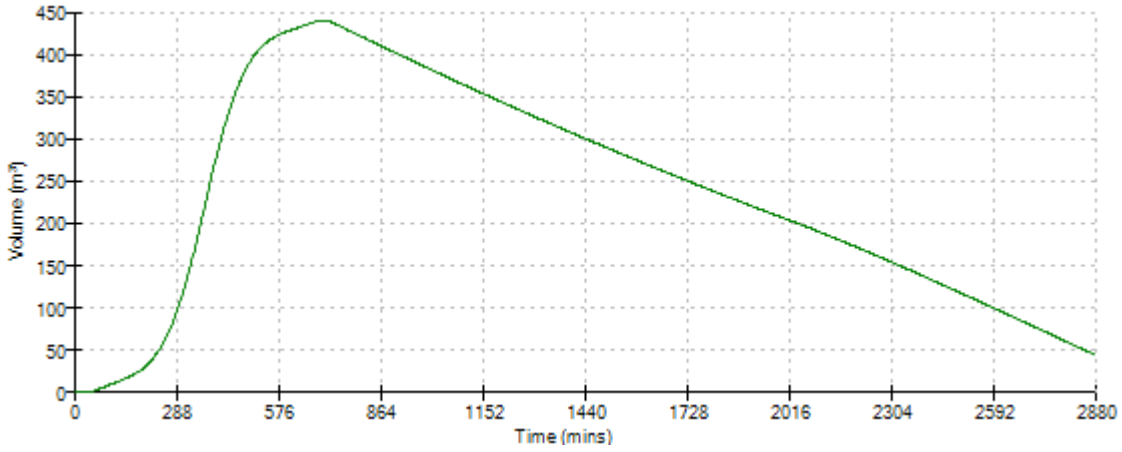


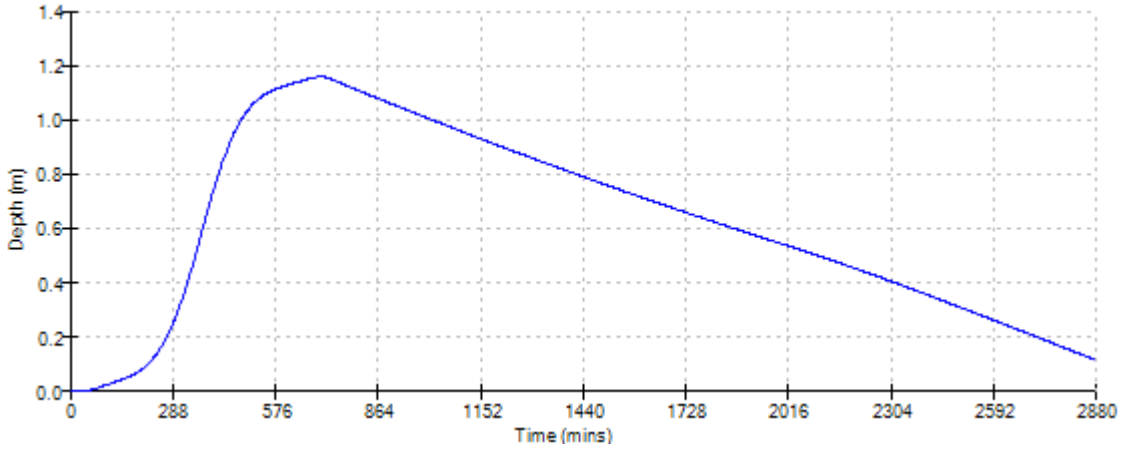




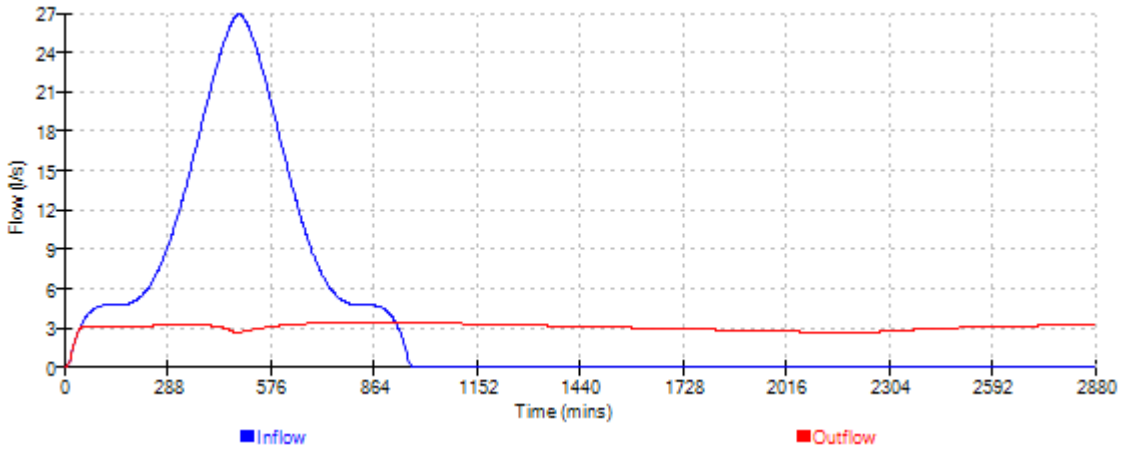
Event: 720 min Winter

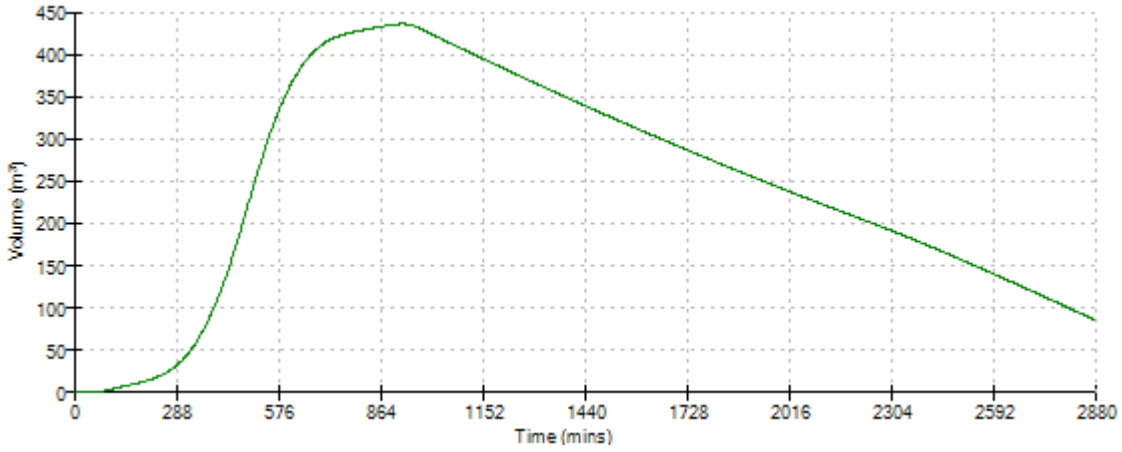


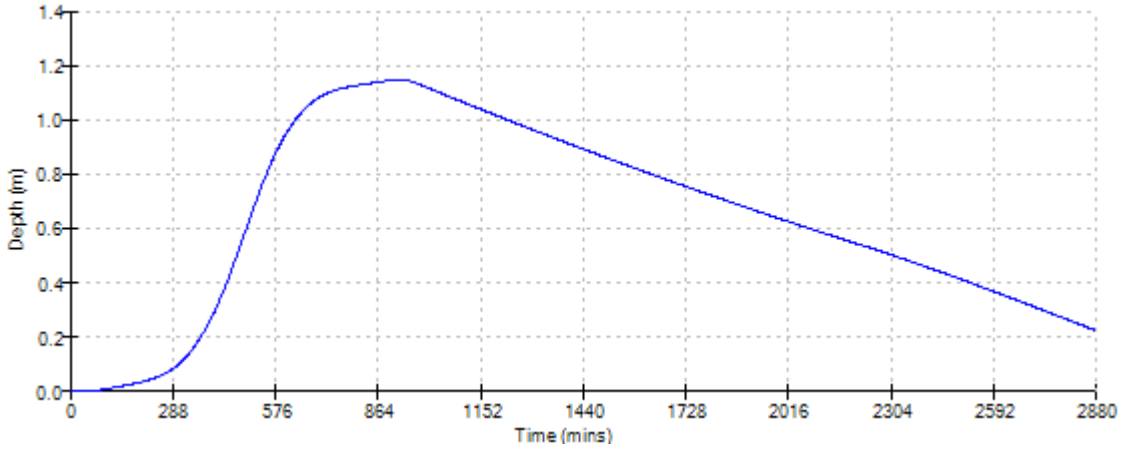




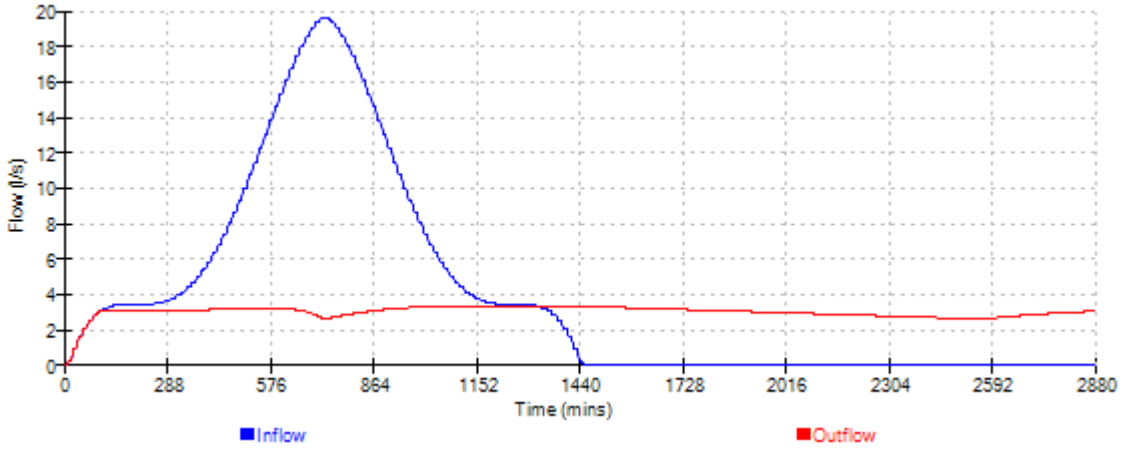
Event: 960 min Winter

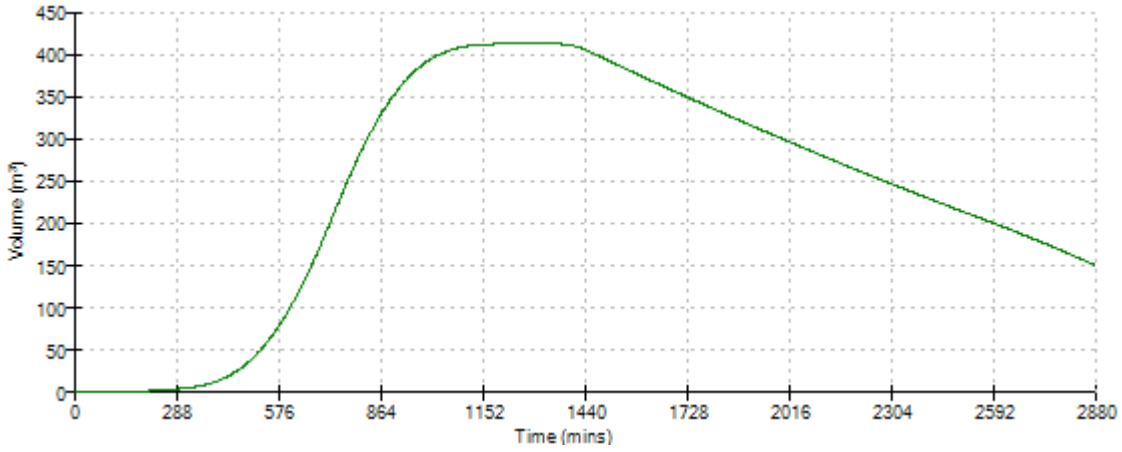


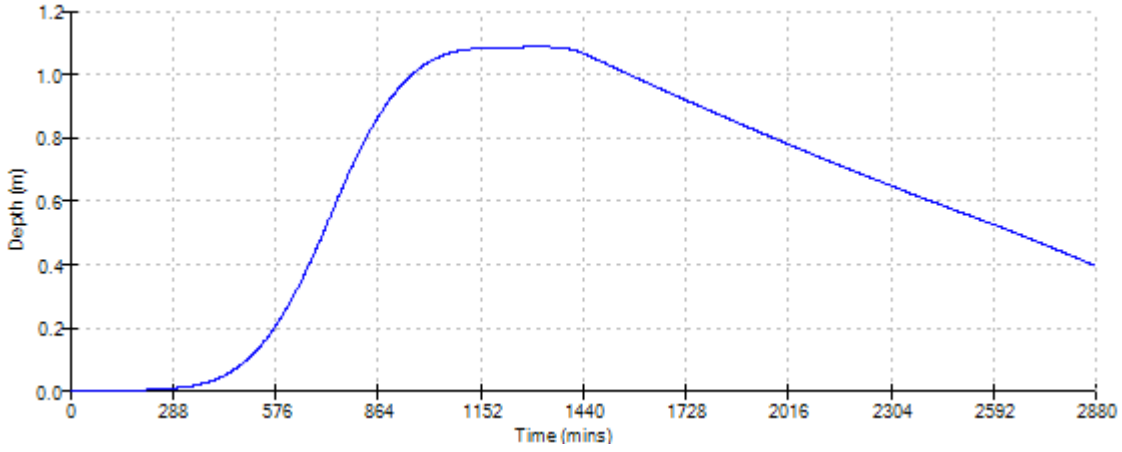




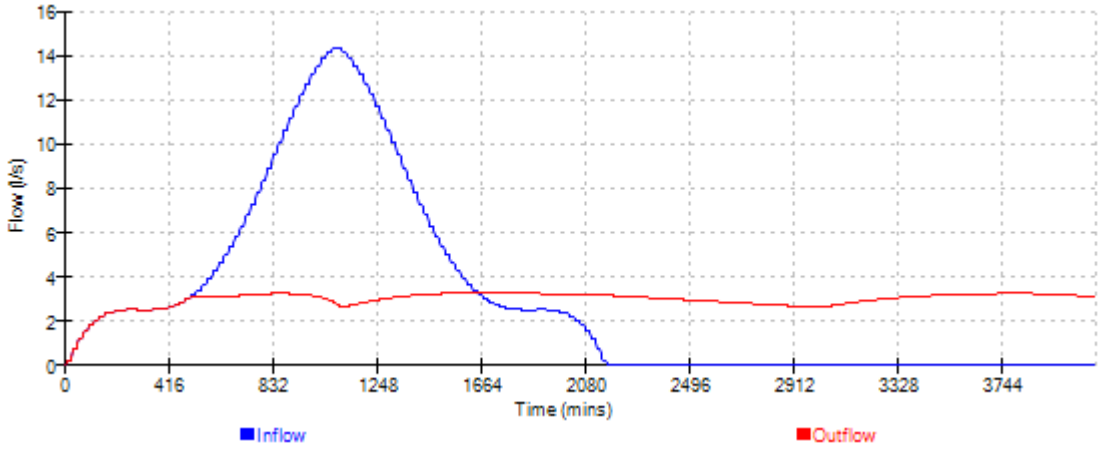
Event: 1440 min Winter

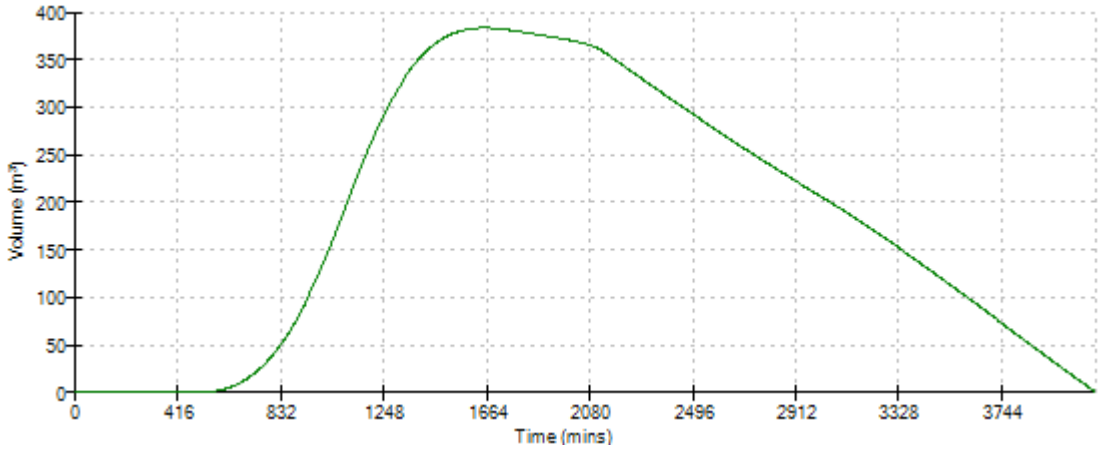


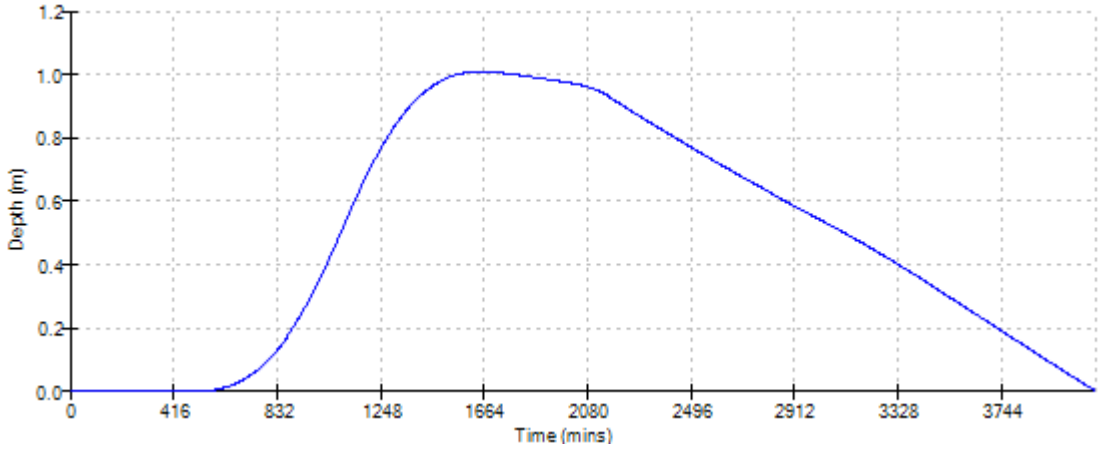




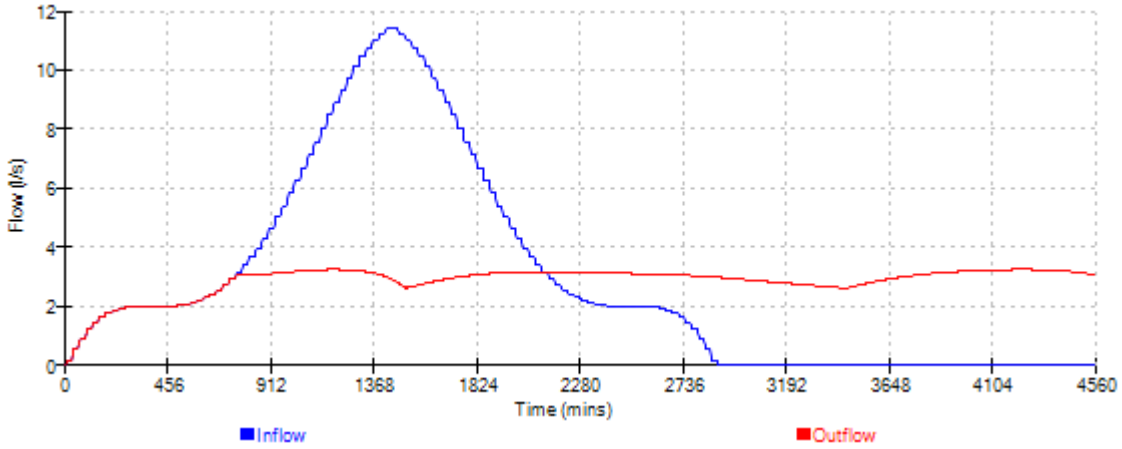
Event: 2160 min Winter

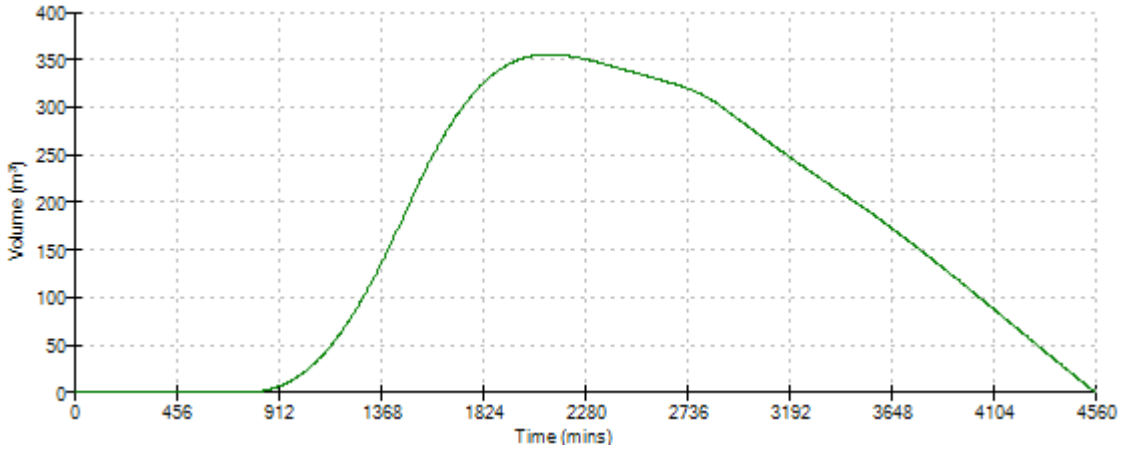


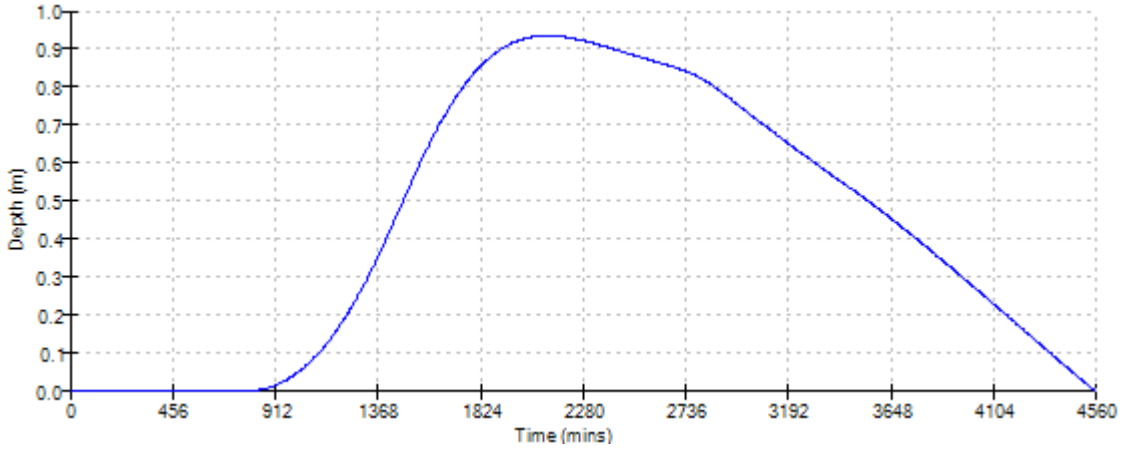




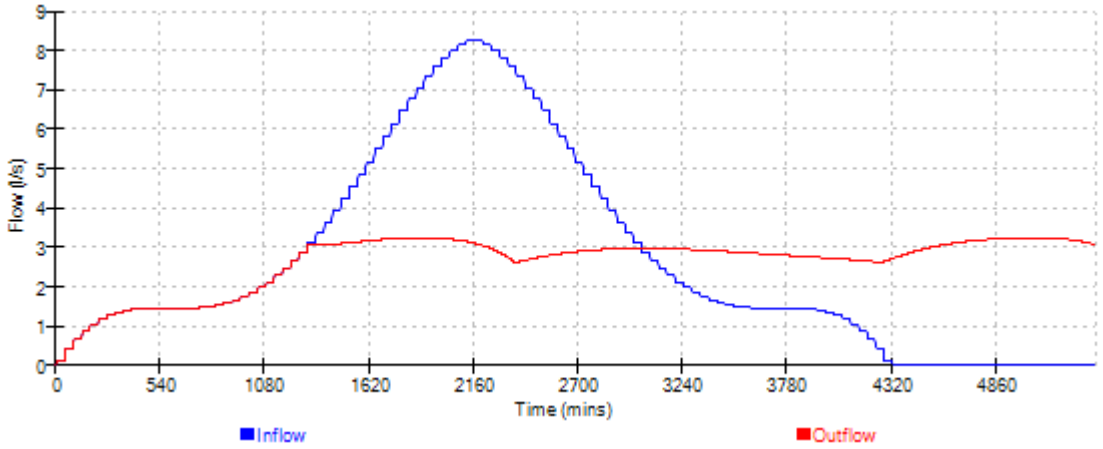
Event: 2880 min Winter

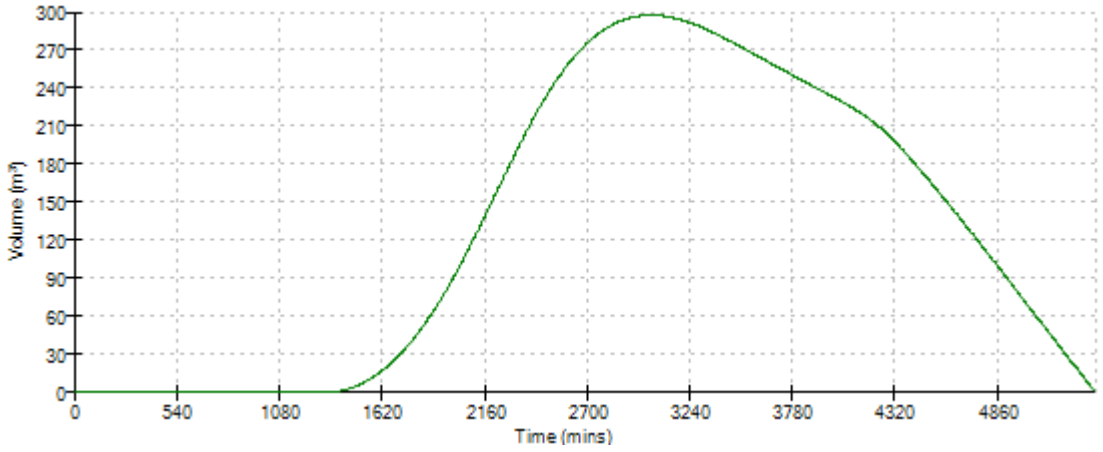


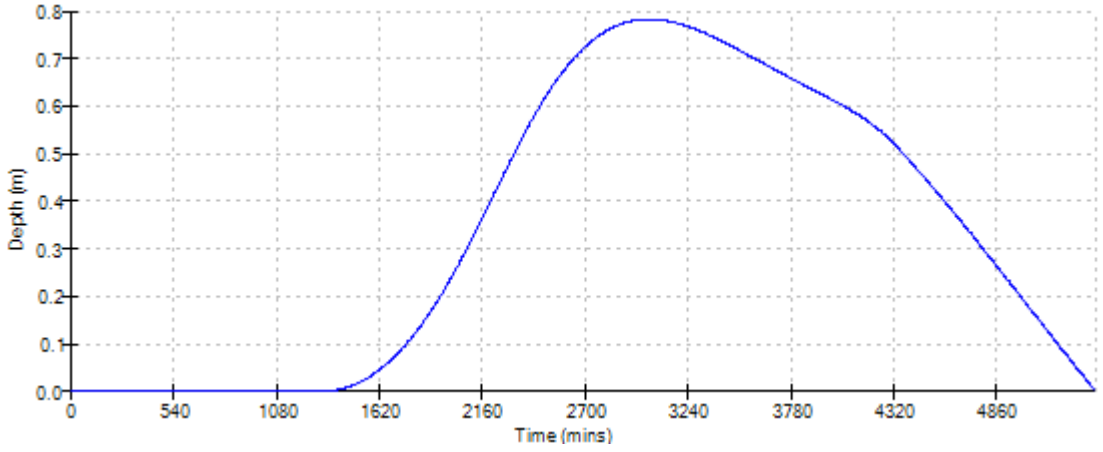




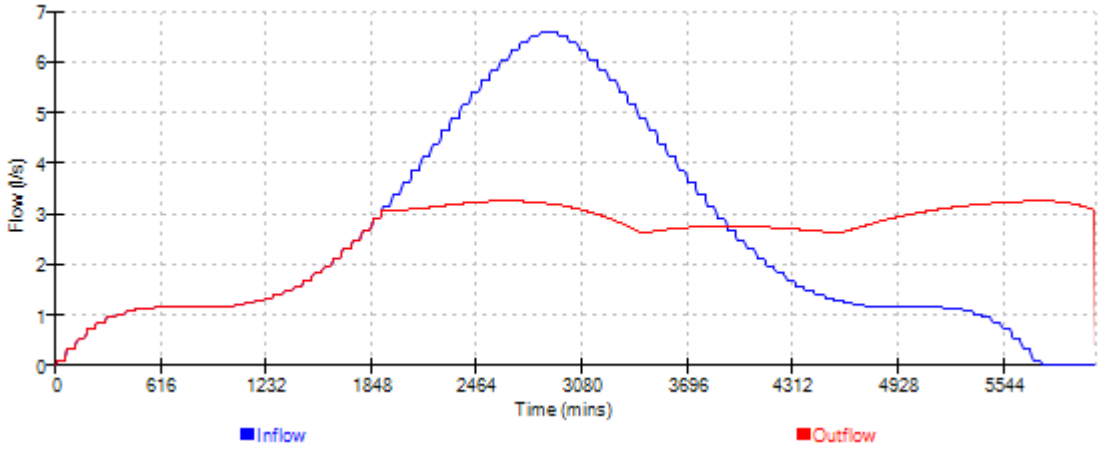
Event: 4320 min Winter

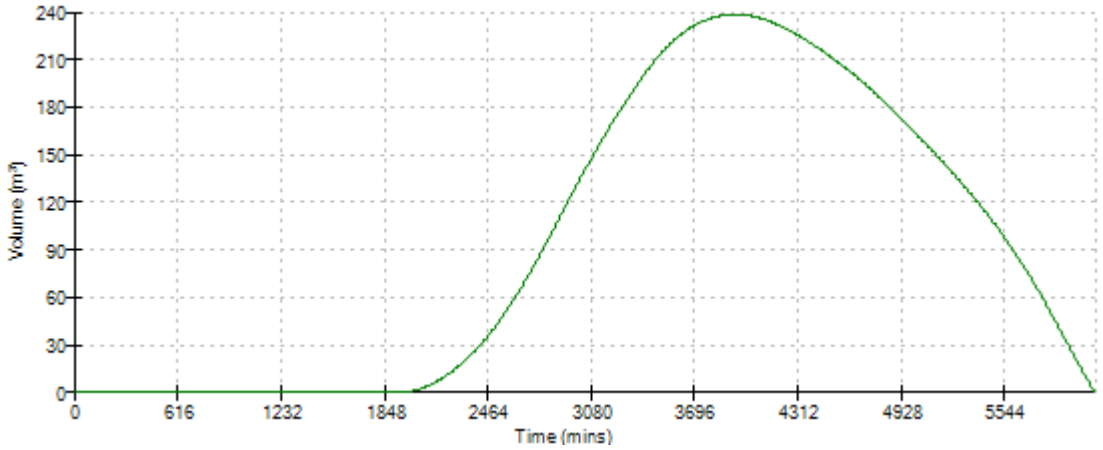


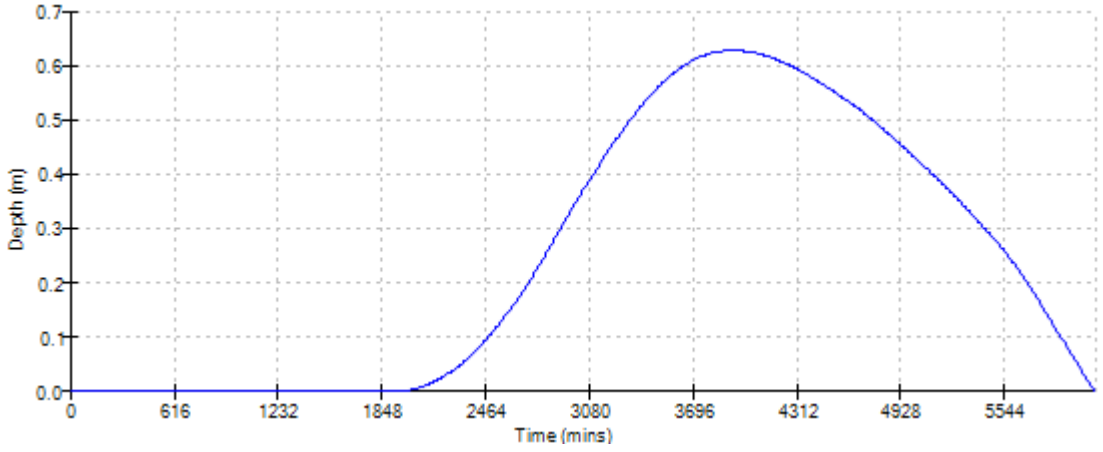




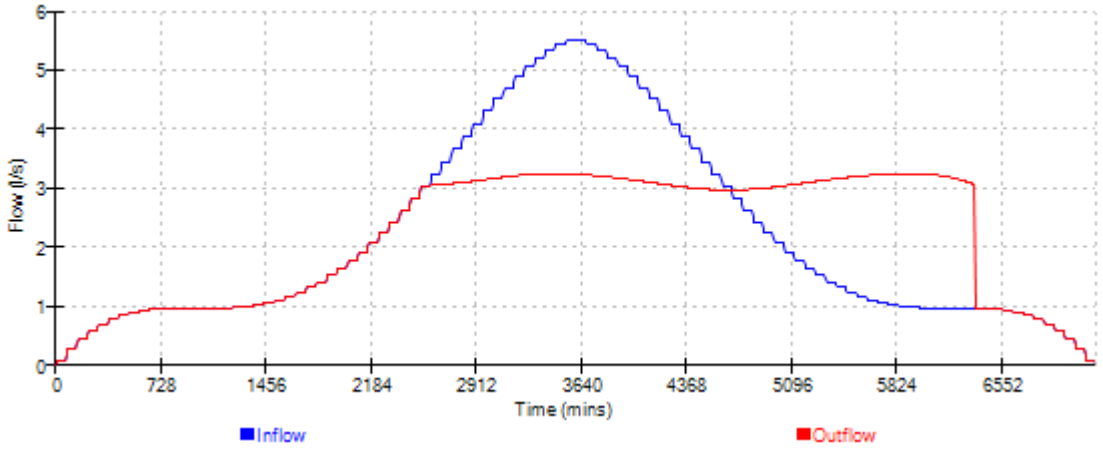
Event: 5760 min Winter

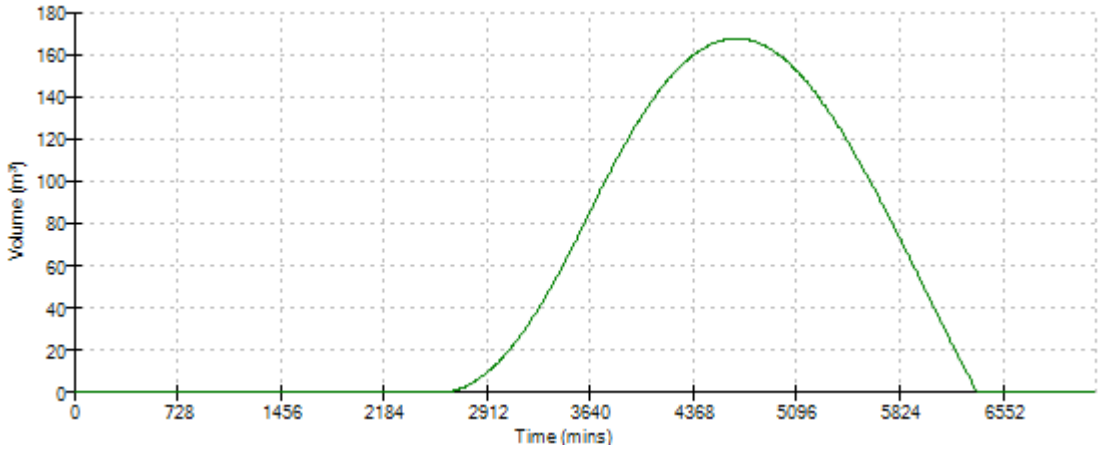


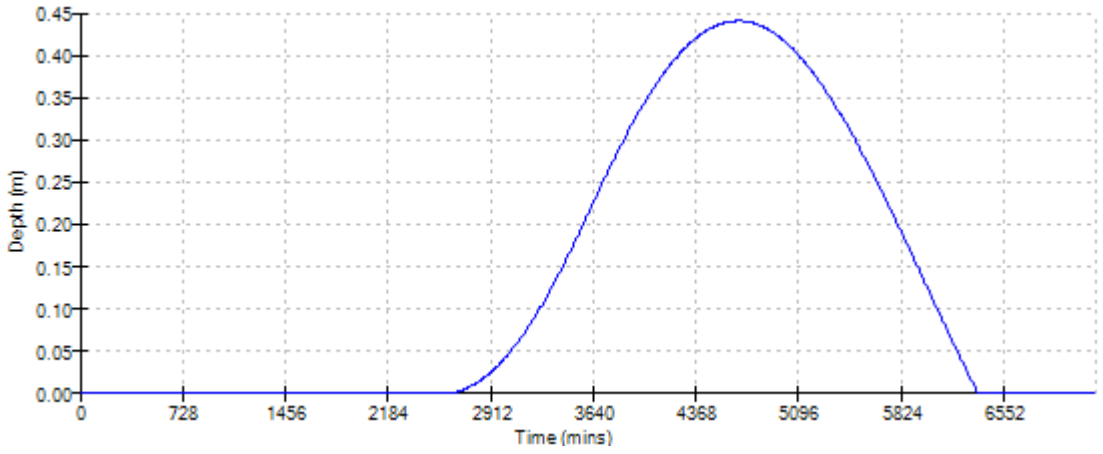




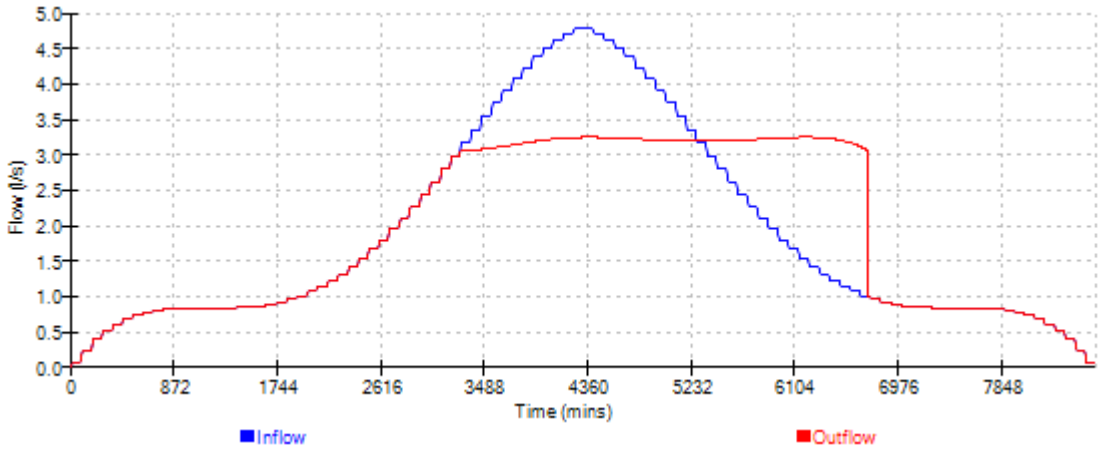
Event: 7200 min Winter

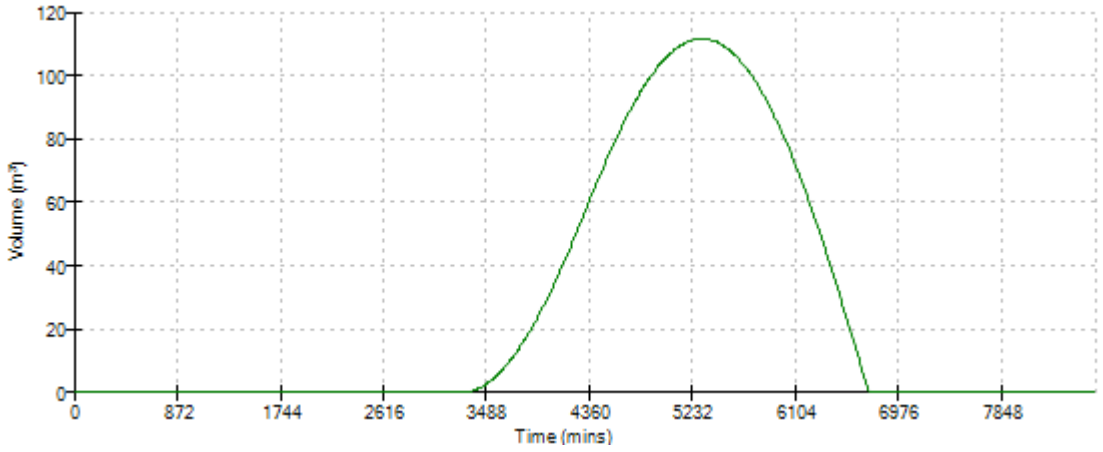


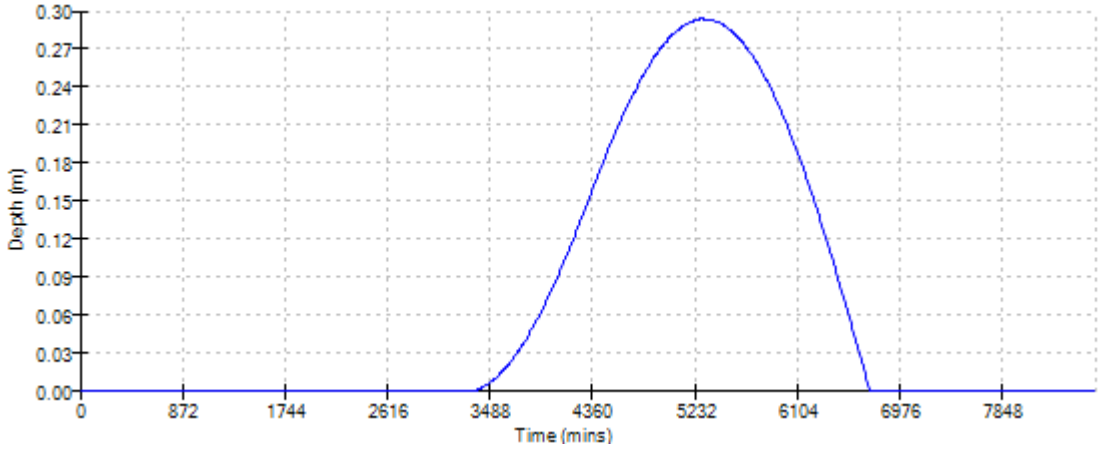




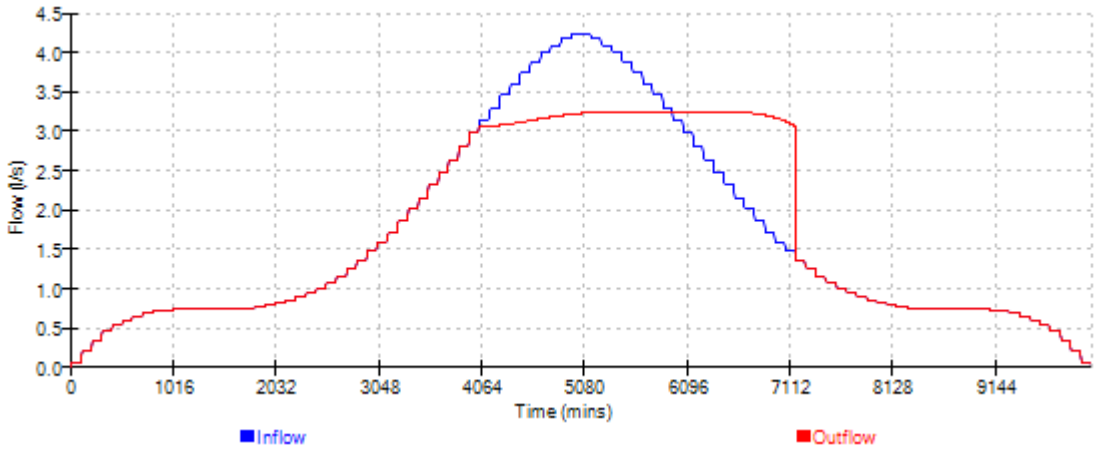
Event: 8640 min Winter

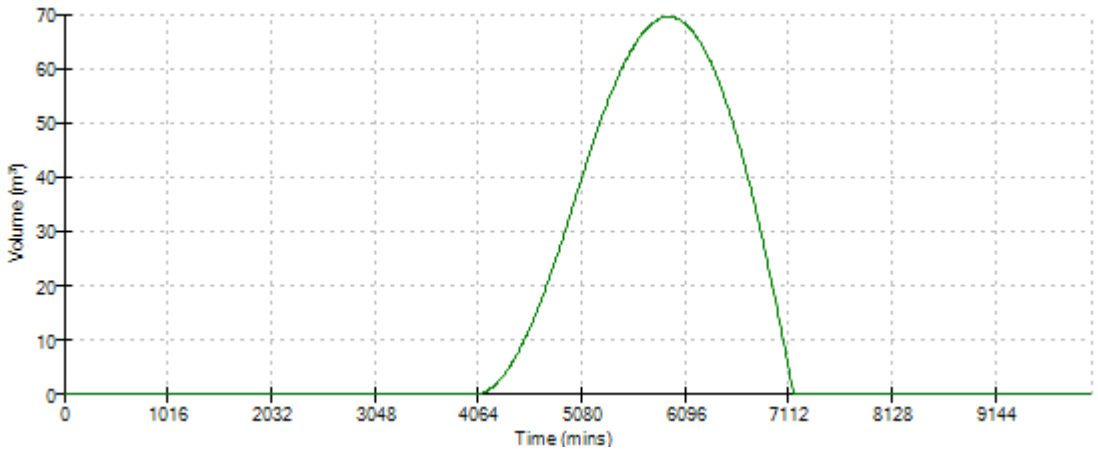


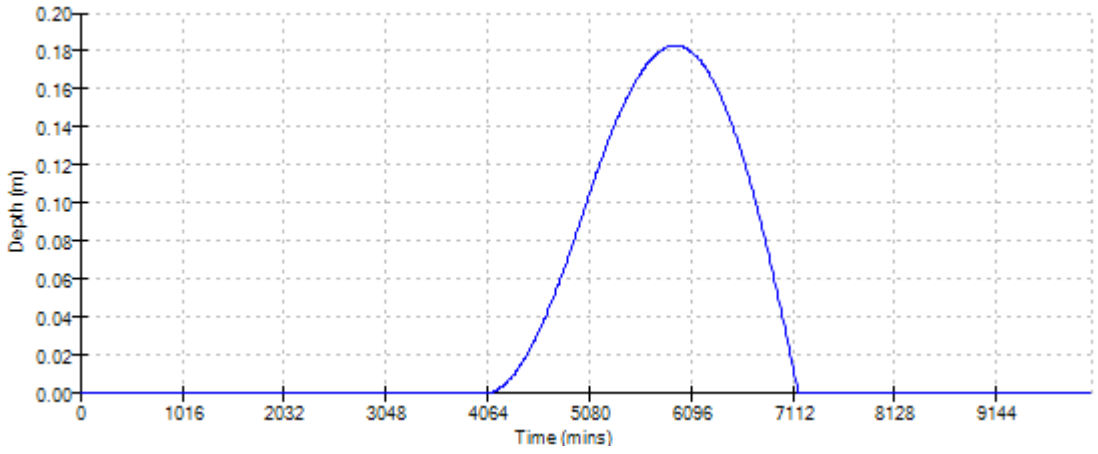




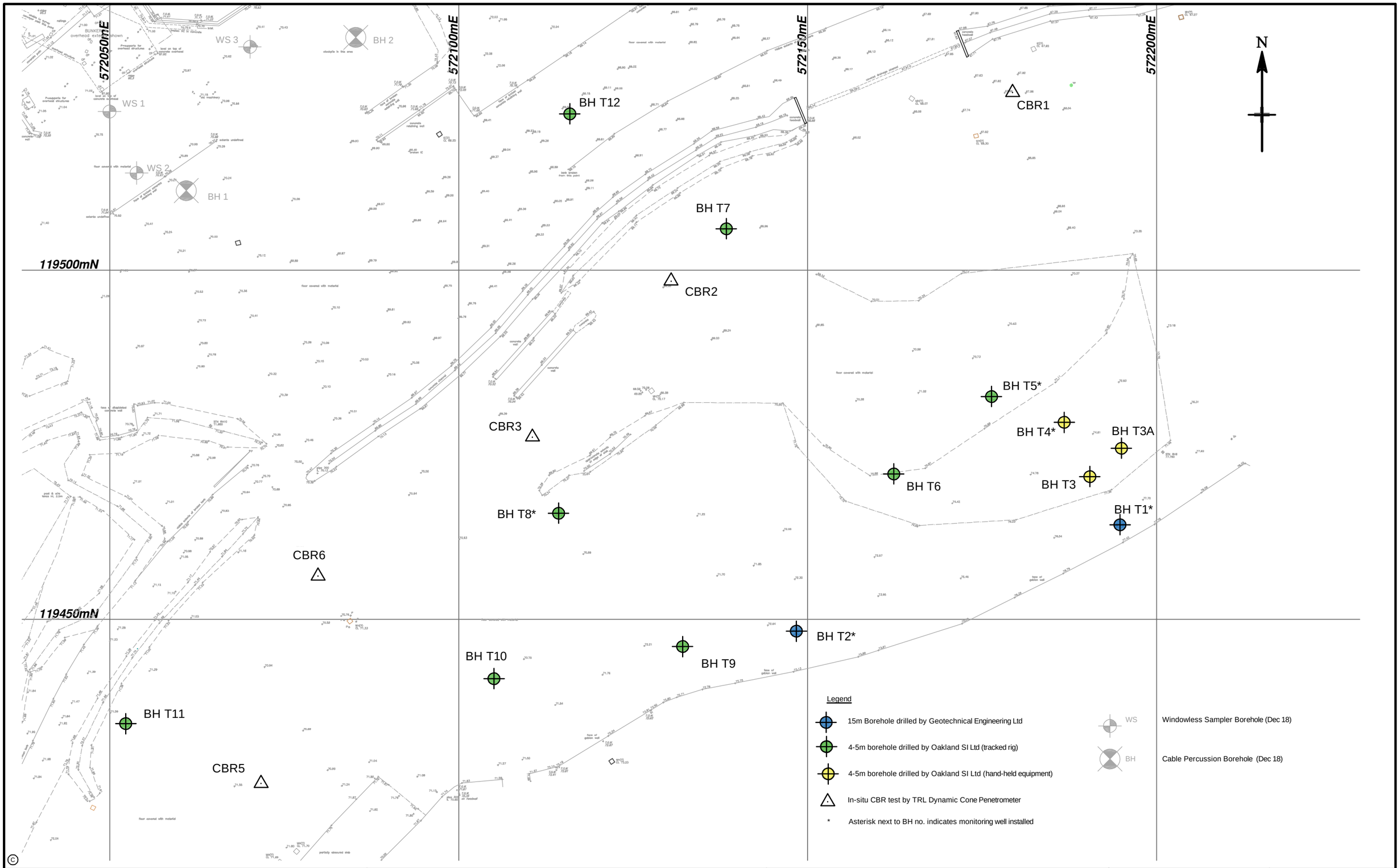
Event: 10080 min Winter







Appendix C
Borehole Logs



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Revisions	Checked	Date

Southern Rock Handling Area
British Gypsum
Robertsbridge

Site Investigation Layout

Scale	1:500 A3
Drawn	HW
Date	June 20
Checked	
Date	
Approved	
Date	
Drg No.	15154X / Figure 2
Rev.	-

Evans & Langford LLP

Borehole Log

WS No.: T3

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 2.4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	-	75.48	10/06/2020	10/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
						(1.40)	Grey silty, very sandy gravel with rare cobbles. Gravel and cobbles are of limestone, with some mudstone and gypsum. Rare fine gravel size lenses of firm grey brown clay. ***(Made Ground)***	
0.80	●							
				74.08		1.40		
1.50	●					(0.40)	Firm brown and grey, slightly gravelly clay. Gravel is fine to medium of limestone, with some mudstone and gypsum. ***(Made Ground)***	
		pp=0.8		73.68		1.80		
1.90	●						Stiff becoming very stiff, orange brown slightly gravelly CLAY. Gravel is of mudstone.	
		pp=2.6				(0.55)	***(Purbeck Group)***	
2.20	●	pp=6+						
				73.13		2.35		
2.40	●			73.08		2.40	Brown MUDSTONE recovered as tabular, fine to medium gravel. ***(Purbeck Group)***	

Remarks

Borehole refused on mudstone at 2.40m.
Borehole remained dry whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 5

Method: Hand Held Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: T3A

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 2.2 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	-	75.22	10/06/2020	10/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
							Grey silty very sandy gravel with rare fine to medium gravel size lenses of clay. Gravel is of limestone, with some mudstone and gypsum.	
0.50	●					(0.80)	***(Made Ground)***	
				74.42		0.80		
0.90	●	pp=0.9		74.22		(0.20) 1.00	Firm orange brown gravelly clay. Gravel is of limestone, mudstone and gypsum.	
							(Made Ground)	
1.20	●	pp=1.6					Stiff orange brown, slightly gravelly CLAY. Gravel is fine of mudstone.	
		pp=1.5					Below 1.80m, clay is very stiff.	
1.50	●	pp=1.8				(1.20)	***(Purbeck Group)***	
1.90	●	pp=4.0						
		pp=4.7						
2.20	●	pp=3.9		73.02		2.20		

Remarks

Borehole refused at 2.20m.
Borehole remained dry whilst open.

Chiselling Details						
From	m	To	m	Time		
Water added		From	m	To	m	

Scale: 1:25

Figure No.: 6

Method: Hand Held Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: T4
Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	72.61	10/06/2020	10/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
				72.51		0.10	Grey silty, very sandy gravel. Gravel is of limestone, with some mudstone and gypsum.	
		pp=2.6					***(Made Ground)***	
							Stiff, locally very stiff, orange brown, locally grey or orange CLAY.	
0.50	●						At 0.75m, clay is firm.	
							At 1.20m-2.00m, clay is grey, locally orange.	
		pp=1.4					At 1.50m-1.55m, 2.00m-2.10m and 2.60m-2.65m, much gravel of mudstone, with dark red brown staining.	
1.00	●							
		pp=1.5					At 2.10m-2.60m, clay is grey.	
		pp=2.5					Below 2.65m, clay is orange.	
1.40	●						***(Purbeck Group)***	
1.50	●					(2.90)		
		pp=3.2						
		pp=3.6						
		pp=2.2						
1.90	●							
		pp=2.3						
		pp=1.7						
2.20	●							
		pp=2.8						
		pp=2.3						
		pp=2.2						
		pp=2.9						
2.60	●							
		pp=2.8						
		pp=2.7						
		pp=2.4						
3.00	●			69.61		3.00		
		pp=1.6					Stiff orange gravelly, becoming slightly gravelly CLAY. Gravel is fine to medium of mudstone.	
3.35	●						***(Purbeck Group)***	
						(1.10)		
		pp=2.0						
		pp=1.7						
4.00	●			68.51		4.10		
		pp=2.0					Stiff grey brown CLAY.	
4.30	●					(0.30)	***(Purbeck Group)***	
				68.21		4.40		
		pp=2.7	1				Stiff, dark grey brown gravelly CLAY. Gravel is tabular, fine to medium of mudstone.	
							(Purbeck Group)	
4.80	●					(0.60)		
		pp=1.6		67.61		5.00		

Remarks

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 7

Method: Tracked Window Sampler | Logged: HW | Checked: CPS | Approved: CPS

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Borehole Log

WS No.: T5

Sheet 1 of 2

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	70.90	08/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
							Grey, silty very sandy gravel with rare cobbles. Gravel and cobbles are of limestone, with some mudstone and gypsum. Cobbles decrease with depth. ***(Made Ground)***	
0.80	●							
1.10-1.60	↕					(2.30)		
2.00	●							
2.30	●			68.60		2.30		
2.50	●	pp=1.2					Very stiff grey locally orange brown CLAY. At top of stratum and at 4.50m, clay is firm . At 2.50m-3.10m and 4.20-4.60 and below 4.80m, clay is grey, locally orange.	
		pp=3.3					To 2.60m, rare fine roots.	
3.00	●	pp=3.6					At 3.10m-4.20m, clay is dark grey, locally red brown becoming orange.	
		pp=3.2					Below 3.50m, clay is locally extremely closely fissured.	
3.50	●	pp=3.5				(2.60)	At 4.60m- 4.80m, rare fine dark grey/black gravel of mudstone.	
		pp=3.5					***(Purbeck Group)***	
4.00	●	pp=4.5						
4.50	●	pp=1.3	▼1					
4.70	●							
				66.00		4.90		
				65.90		5.00	Grey MUDSTONE recovered as fine to medium gravel.	

Remarks
Drilled through backfilled machine excavated pit to 1.70m.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 8

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: T5

Sheet 2 of 2

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	70.90	08/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
							(Purbeck Group)	

Remarks
Drilled through backfilled machine excavated pit to 1.70m.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 8

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: T6

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	70.64	09/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
						(1.20)	Grey silty gravel and sand. Gravel is of limestone, with some mudstone and gypsum. ***(Made Ground)***	
0.70	●			69.44		1.20		
1.30	●	pp=2.9					Stiff, locally firm or very stiff orange brown, locally grey CLAY.	
1.50	●	pp=1.5					Rare fine roots to 1.70m.	
		pp=1.3					At 1.90m, becomes brown, locally grey.	
2.00	●	pp=1.4					At 2.10m, becomes grey brown.	
		pp=1.3					At 2.70m - 2.80m, frequent fine gravel size fragments of off-white shell.	
2.50	●	pp=2.7					At 3.80m, becomes dark grey.	
		pp=1.8					At 4.25m, clay is soft.	
3.00	●	pp=2.1				(3.80)	Below 4.50m, rare medium gravel of mudstone.	
		pp=1.7					***(Purbeck Group)***	
3.50	●	pp=2.3						
		pp=2.6						
4.00	●	pp=3.1	1					
		pp=0.5						
4.50	●	pp=2.7						
		pp=3.5						
5.00	●	pp=6+		65.64		5.00		

Remarks

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 9

Method: Tracked Window Sampler | Logged: HW | Checked: CPS | Approved: CPS

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Borehole Log

WS No.: T7
Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	-	68.79	08/06/2020	08/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
						(0.75)	Grey silt, very sandy gravel. Gravel is of limestone, with some mudstone and gypsum. ***(Made Ground)***	
0.50	●			68.04		0.75		
0.85	●	pp=2.1					Firm, locally stiff orange brown, locally grey CLAY.	
0.90	●							
		pp=1.2					At 1.25m, clay is very stiff.	
		pp=5.2					At 1.10m-3.00m, dark grey becoming grey, locally yellow, orange or grey brown.	
1.50	●	pp=2.2					At 3.40m, black decaying root of 8mm diameter.	
		pp=1.6					At 3.70m-3.90m and 4.70m-4.80m, rare gravel of mudstone.	
2.00	●	pp=1.3					At 4.00m, rare medium gravel of gypsum.	
		pp=1.6					At 4.40m and 4.50m, black decaying root of 2mm diameter.	
2.50	●	pp=1.4					At 4.50m, clay is soft.	
		pp=0.9				(4.25)	***(Purbeck Group)***	
3.00	●	pp=1.3						
		pp=1.0						
3.50	●	pp=1.1						
		pp=1.2						
4.00	●	pp=1.5						
		pp=1.4						
4.50	●	pp=0.5						
		pp=1.1						
5.00	●	pp=1.2		63.79		5.00		

Remarks
Borehole remained dry whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 10

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: T8

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	70.34	09/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.10-0.60							Grey, silty very sandy gravel with rare cobbles. Gravel and cobbles are of limestone, with some mudstone and gypsum. ***(Made Ground)***	
0.70				69.24		(1.10) 1.10		
1.20				69.04		(0.20) 1.30	Dark brown gravel of mudstone with a little firm to stiff clay. ***(Made Ground)***	
1.50				68.54		(0.50) 1.80	Grey silty sandy gravel. Gravel is of limestone, with some mudstone and gypsum. ***(Made Ground)***	
1.90				68.34		(0.20) 2.00	Grey and grey brown gravel of mudstone and siltstone. At 2.00m, piece of black decaying cut timber approx. 50 x 60 x 90mm. ***(Made Ground)***	
2.00							Grey, locally grey brown fine to medium GRAVEL of mudstone, locally with orange staining on faces. At 4.50m, becomes dark grey. ***(Purbeck Group)***	
2.50								
3.00								
3.50						(3.00)		
4.00								
4.50								
5.00				65.34		5.00		

Remarks
Drilled through backfilled machine excavated pit to 1.60m.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 11

Method: Tracked Window Sampler | Logged: HW | Checked: CPS | Approved: CPS

Evans & Langford LLP

Borehole Log

WS No.: T9

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	72.24	09/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.80	●					(2.10)	Light grey becoming grey, silty very sandy gravel. Gravel is of limestone, with some mudstone and gypsum. ***(Made Ground)***	
1.80	●							
2.10	●			70.14		2.10		
		pp=1.2				(0.40)	Firm, dark grey, locally red brown clay. Locally stained black. ***(Made Ground?)***	
		pp=1.6		69.74		2.50		
2.60	●						Firm orange brown, becoming brown CLAY. At 2.30m, fine root. At 4.00m, clay is stiff, very stiff at 4.50m and soft at 4.75m ***(Purbeck Group)***	
		pp=1.7						
3.00	●							
		pp=1.2						
		pp=1.2						
3.50	●							
		pp=1.3						
		pp=1.4				(2.50)		
4.00	●							
		pp=1.9						
		pp=1.2						
4.50	●							
		pp=3.3	1					
		pp=0.7						
5.00	●	pp=1.2		67.24		5.00		

Remarks
Drilled through backfilled machine excavated pit to 1.60m.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 12

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

Evans & Langford LLP

Borehole Log

WS No.: T10

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 2.00m	70.85	09/06/2020	09/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
				69.25		(1.60) 1.60	Grey silty gravel and sand with rare cobbles. Gravel and cobbles are of limestone, with some mudstone and gypsum. ***(Made Ground)***	
0.60	●							
1.80	●	pp=1.8		68.85		(0.40) 2.00	Stiff brown, locally orange or grey, slightly gravelly clay. Gravel is medium to coarse of limestone, mustone and gypsum. ***(Made Ground)***	
2.00	●							
		pp=1.3		68.25		(0.60) 2.60	Firm to stiff, grey brown, locally dark grey and orange CLAY. At 2.40m, decaying root of 2mm diameter. ***(Purbeck Group)***	
2.50	●	pp=1.5						
		pp=1.4		67.65		(0.60) 3.20	Firm to stiff, dark green CLAY with frequent black speckling. At 2.70m, decaying root of 2mm diameter. ***(Purbeck Group)***	
3.00	●	pp=1.5						
		pp=1.9		65.85		(1.80) 5.00	Stiff, locally firm, orange, locally grey CLAY. At 4.70m, medium gravel of gypsum. ***(Purbeck Group)***	
3.50	●	pp=1.6						
		pp=1.5						
4.00	●	pp=1.2						
		pp=1.6						
4.50	●	pp=1.6						
		pp=1.6						
5.00	●	pp=2.0						

Remarks

Drilled through backfilled machine excavated pit to 1.40m.
Borehole re-drilled as no/poor recovery between 2.00m and 4.00m. Assumed large piece of gyprock being pushed down hole.
Borehole remained dry whilst open.

Chiselling Details					
From	m	To	m	Time	
Water added		From	m	To	m

Scale: 1:25

Figure No.: 13

Method: Tracked Window Sampler | Logged: HW | Checked: CPS | Approved: CPS

Evans & Langford LLP

Borehole Log

WS No.: T11

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	GL to 1.00m	71.43	10/06/2020	10/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20-0.70							Grey silty very sandy gravel with and little clay and rare cobbles. Gravel and cobbles are of limestone, with some mudstone and gypsum.	
0.50	●					(0.80)	***(Made Ground)***	
				70.63		0.80		
1.00	●	pp=1.6				(0.35)	Stiff orange brown, locally grey or brown CLAY.	
				70.28		1.15	At 1.10m, decaying root of 12mm diameter, surrounding clay is stained black.	
1.35	●	pp=2.1					***(Purbeck Group)***	
		pp=1.7				(0.85)	Stiff grey, locally yellow, orange brown or green, slightly gravelly CLAY with rare fine roots. Gravel is fine to medium of mudstone.	
1.70	●	pp=1.7					At 1.30m-1.35m, frequent decaying fine roots, surrounding clay is stained black.	
				69.43		2.00	***(Purbeck Group)***	
2.10	●	pp=1.6					Firm, grey brown, locally orange brown or green brown CLAY.	
		pp=0.8					Rare fine roots with surrounding clay stained black to 3.70m.	
2.50	●	pp=0.8					At 2.65m, decaying root of 12mm diameter, and at 3.20m decaying root of 5mm diameter, both surrounded by stained black clay.	
2.65	●	pp=0.9					At 3.50 and 3.80m, rare fine to medium gravel of lignite.	
3.00	●	pp=1.0					At 4.30m and 4.70m, medium gravel of gypsum.	
		pp=1.0					At 5.00m, clay is stiff.	
3.50	●	pp=1.0				(3.00)	***(Purbeck Group)***	
		pp=1.2						
4.00	●	pp=0.9						
		pp=0.9						
4.50	●	pp=1.2						
		pp=1.1						
5.00	●	pp=1.7		66.43		5.00		

Remarks

Drilled through backfilled machine excavated pit to 0.80m.
Borehole remained dry whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 14

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

Evans & Langford LLP

Borehole Log

WS No.: T12

Sheet 1 of 1

Location: Southern Rock Handling Area, British Gypsum

Job No.: 15154X | **Final Depth:** 5 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm	-	69.07	08/06/2020	08/06/2020

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.30	●					(0.45)	Grey silty gravel and sand with rare fine to medium brick. Gravel is of limestone, with some mudstone and gypsum. ***(Made Ground)***	
				68.62		0.45		
0.50	●			68.47		0.60	Dark grey/black, locally dark grey green very gravelly clay with a little sand and ash. Gravel is of tarmac with occasional fine to medium clinker and rare brick. ***(Made Ground)***	
0.70	●						Stiff, orange brown, locally grey or yellow CLAY.	
1.00	●	pp=1.6					At 3.00m, becomes grey brown.	
		pp=1.6					At 3.40m, becomes dark grey.	
1.50	●	pp=1.9					At 3.70m, becomes grey, locally orange.	
		pp=1.5					***(Purbeck Group)***	
2.00	●	pp=1.8						
		pp=2.1				(3.50)		
2.50	●	pp=2.2						
		pp=1.8						
3.00	●	pp=2.8						
		pp=2.3						
3.50	●	pp=2.0						
		pp=2.3						
4.00	●	pp=2.1		64.97		4.10		
4.50	●					(0.90)	Very stiff, locally extremely closely fissured, grey locally orange, CLAY. Below 4.50m, rare medium gravel of mudstone. ***(Purbeck Group)***	
5.00	●			64.07		5.00		

Remarks

Drilled through backfilled machine excavated pit to 0.60m.
Borehole remained dry whilst open.
Borehole collapsed to 2.80m on completion of drilling.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 15

Method: Tracked Window Sampler	Logged	HW	Checked	CPS	Approved	CPS

Borehole Log

BH No.: 1
Sheet 1 of 2

Construction Consultants

Location: British Gypsum, Robertsbridge

Job No.: 12998X | **Final Depth:** 12 metres

Borehole Diameter	Casing	Ground Level (mAOD)	Date Started	Date Finished
150mm	GL to 7.70m	68.19	08/06/2014	08/06/2014

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.10				67.99		0.20	Low vegetation over brown clayey topsoil with rare fine to medium gravel of flint and chalk. Occasional roots up to a few mm in diameter.	
0.50						(0.75)	***(Fill)***	
1.00				67.24		0.95	Very stiff orange brown clay with rare fine gravel of brick and mudstone. Rare fine roots.	
1.20-1.65		N=34		66.84		(0.40) 1.35	***(Fill)***	
1.85							Stiff orange brown and grey clay with rare fine to medium gravel of brick, flint and gypsum. Rare coarse gravel and cobbles of grey limestone. A little chalk silt. Rare fine roots.	
2.20-2.65		N=22				(1.45)	***(Fill)***	
2.80-3.80				65.39		2.80	Gravel and cobble size pieces of grey limestone. Rare fine to medium gravel size fragments of gypsum and flint. Some grey clay and some grey sandy silt.	
3.20-3.65		N=32					***(Fill)***	
4.20-4.65		N=24				(3.00)	Stiff grey clay with occasional to frequent gravel and rare cobbles of grey limestone. Rare fine to medium gravel size fragments of gypsum.	
4.95							***(Fill)***	
5.20-5.65		N=27	1					
5.80		W	1	62.39		5.80		
6.20							Very stiff grey brown CLAY with rare fine to medium gravel of mudstone. Cobble of limestone in sample at 7.15m.	
6.70-7.15		U(50)				(1.80)	***(Purbeck Group)***	
7.15								
7.70				60.59		7.60	Very stiff pale grey blue CLAY.	
8.20-8.65		N=50					***(Purbeck Group)***	
9.15						(2.70)		
9.70-10.15		N=60						

Remarks
Hand augered to 1.20m.

Chiselling Details						
From	m	*To*	m	*Time*		
Water added		*From*	m	*To*	m	

Scale: 1:50

Figure No.: 3

Method: Cable Percussion Boring	Logged	HW	Checked	CPS	Approved	CPS

Construction Consultants

Borehole Log

BH No.: 1
Sheet 2 of 2

Location: British Gypsum, Robertsbridge

Job No.: 12998X | **Final Depth:** 12 metres

Borehole Diameter	Casing	Ground Level (mAOD)	Date Started	Date Finished
150mm	GL to 7.70m	68.19	08/06/2014	08/06/2014

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
				57.89		10.30		
10.70	●						Very stiff brown, locally grey blue silty CLAY (driller noted seams of grey blue CLAY).	
11.20-11.65		N=62				(1.70)	***(Purbeck Group)***	
12.00	●			56.19		12.00		

Remarks
Hand augered to 1.20m.

Chiselling Details						
From	m	*To*	m	*Time*		
Water added	*From*	m	*To*	m		

Scale: 1:50

Figure No.: 3

Method: Cable Percussion Boring	Logged	HW	Checked	CPS	Approved	CPS

Borehole Log

BH No.: 2
Sheet 1 of 2

Construction Consultants

Location: British Gypsum, Robertsbridge

Job No.: 12998X **Final Depth:** 12 metres

Borehole Diameter	Casing	Ground Level (mAOD)	Date Started	Date Finished
150mm	GL to 7.20m	66.75	07/06/2014	07/06/2014

Samples & insitu tests | **STRATA DETAILS**

Depth	Type	Test Result	Water	Reduced Level	Legend	Depth/ Thickness	Description	Installation/ Backfill
0.10				66.65		0.10	Low vegetation over brown clayey topsoil with rare fine to medium gravel of brick, flint, chalk and limestone. Rare roots up to 5mm in diameter.	
0.50						(0.50)		
				66.15		0.60	***(Fill)***	
1.00							Grey clayey silt with rare fine gravel size fragments of gypsum. Rare gravel size pockets of firm grey silty clay.	
1.20-1.65		N=14				(1.20)	***(Fill)***	
							Stiff orange brown, locally orange clay with rare gravel of mudstone. Rare fine and medium gravel size fragments of gypsum.	
1.85				64.95		1.80	***(Fill)***	
2.20-2.45		N=62 (150mm)				(0.60)	Gravel and cobbles of grey limestone with a little stiff grey clay.	
				64.35		2.40	***(Fill)***	
				64.05		2.70	Gravel and cobbles of grey limestone.	
2.80-3.80							***(Fill)***	
3.20-3.65		N=27				(1.60)	Firm grey, locally orange brown silty clay with rare fine and medium size fragments of gypsum. Rare fine roots/decaying organic matter.	
3.85							***(Fill)***	
4.20-4.65		N=15		62.45		4.30		
							Stiff grey, locally grey brown, locally orange brown clay with a little organic matter. Rare gravel of limestone and sandstone at base of layer.	
5.10							Much decaying wood/organic matter up to 25mm in diameter in samples from 4.2-4.65 and 5.7 to 6.15m.	
5.70-6.15		U(40)	1			(2.80)	***(Fill)***	
6.15-6.20	W		1					
6.20								
6.70								
				59.65		7.10		
7.20-7.65		N=32					Stiff to very stiff grey blue silty CLAY.	
							(Purbeck Group)	
8.20								
8.70-9.15		N=43						
						(4.90)		
9.70								

Remarks
Hand augered to 1.20m.

Chiselling Details					
From	m	To	m	Time	
Water added		From	m	To	m

Scale: 1:50

Figure No.: 4

Method: Cable Percussion Boring	Logged	HW	Checked	CPS	Approved	CPS

Construction Consultants

Borehole Log

BH No.: 2
Sheet 2 of 2

Location: British Gypsum, Robertsbridge

Job No.: 12998X | **Final Depth:** 12 metres

Borehole Diameter	Casing	Ground Level (mAOD)	Date Started	Date Finished
150mm	GL to 7.20m	66.75	07/06/2014	07/06/2014

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
10.20-10.65		N=48					Stiff to very stiff grey blue silty CLAY.	
11.05							***(Purbeck Group)***	
11.55-12.00		N=49		54.75		12.00		

Remarks
Hand augered to 1.20m.

Chiselling Details						
From	m	To	m	Time		
Water added		From	m	To	m	

Scale: 1:50

Figure No.: 4

Method: Cable Percussion Boring	Logged	HW	Checked	CPS	Approved	CPS

Mountfield—Map N.S.G. 320.

322. *First Sub-Wealden Boring, ½ mile S.W. of Mountfield church. Ht. above O.D. about ~~250~~ 240 ft. Maps 43 N.E., S.E.

		Thickness Ft.	Depth Ft.
Purbeck Beds	Shales	16½	16½
	Blue limestone, with spring	2½	19
	Shale	5	24
	Blue limestone	2	26
	Shale	4	30
	Limestone	1½	31½
	Shale	4	35½
	Limestone	3	38½
	Shale, with spring. Water stood permanently at 42 ft. down, inside the tubes	4	42½
	Limestone	4	46½
	Hard blue shale	15½	62
	Hard grey shale	3	65
	Hard shale	14½	79½
	Shales, with crystals of carbonate of lime	9	88½
	Grey shale	13	101½
	Greenish shales, with gypseous veins	20	121½
	Impure gypsum	8½	130
	Pure white gypsum (alabaster)	4	134
	Impure gypsum	5½	139½
	Pure white gypsum (alabaster)	3	142½
	More or less pure, hard and dark gypsum	14½	157
	Black shale, very sulphureous	3½	160½
	Gypsum in nodules and veins	12	172½
	Gypseous marl	6½	179
	Sandy marl. Water-level lowered here	½	179½
	Black sulphureous shale	½	180
? Portland Beds, 110 ft.	Greenish sand, with nodules of black chert	21	201
	Sandy shale	30	231
	Calcareous matter, with chert-nodules	8	239
	(Not described)	2	241
	Hard black sandy shale, very sulphureous	12	253
	Blacker and softer shale	7	260
	Harder shale, with much chert	12	272
	Black shale, very sulphureous	14	286
	Paler shale, with veins of gypsum	4	290
Kimmeridge Clay, 727 ft.	Darker and more sandy shale	2	292
	Shale	2	294
	Dark clay	18	312
	Clay, generally rather sandy, some calcareous (toward the lower part)	288	600
	Hard light-coloured bed, very rich in petroleum	2	602
	Clay, with bands of cement-stone	232	834
	Cement-stone	50	884
	Clay	2½	886½
	Cement-stone	2½	889
	Clay	67	956
	Dark clay, with cement-stone	55	1,011
	Sandy bed	2	1,013
	Dark clay	4	1,017

The lowest 61 ft. were originally classed as Oxford Clay; but the second boring showed that the Kimmeridge Clay goes much deeper and is succeeded by Corallian Beds.

A core of some 17 ft., or to the depth of about 1,030 ft. was left in the borehole. The work was stopped by an accident to the rods.

A list of the fossils found, from 300 to 1,013 ft. down, is given in 'Geology of the Weald' (*Mem. Geol. Surv.*), 1875, p.44.

No complete section of this boring is given in the "Quarterly Reports of the Exploration," but in the second of these, some details from 131 ft. downward, differ from the above account.

White gypsum (alabaster) reached at 131, 4 ft. thick, or to depth of 135 ft.
Gypseous marl " " 10 " " 145 ft.
Alabaster " " 3 " " 148 ft.

Published in

Cited by △ on 6" 'Wells & Springs

TQ 71 NW/5
7203 1965

TQ 71/24

(11498) WL30370/6370 10,000 9/30 A.& E.W.Ltd. Gp.485

RECORD OF SHAFT OR BORE FOR MINERALS IN CORE HOLES

County Essex
6" Quarter Sheet 43 NW/E
1" N.S. Geol. Map 320
1" O.S. Geol. Map
Whether Confidential
320

Number of Shaft or Bore given by Geological Survey: Gypsum Mines Bore No. 44
Name and Number given by owner (if different from above):

Town or Village Mountfield Date of sinking 13th-24th June 1952
Exact site see site plan attached to notification

A sketch-map or tracing from a large-scale map is desirable.

Purpose for which made Gypsum exploration
Level at which bore commenced relative to O.D. 303.08 ft. T.D. If not down bore, state if horizontal or up
Made by for Messrs. Gypsum Mines Ltd
Information from Company and from inspection of cores by L.J.Wells Date received 1-2/7/52
Specimens Bi 4284-4319 Dip of strata

Geological Classification	Description	Thickness ft.	Thickness in.	Depth ft.	Depth in.
	Drifting samples 0–220 ft.				
	Grey clay with a little scattered lst. & calcite	20	–	20	–
	" Brown clay with some silty lst. & yellow sst.	20	–	40	–
	Dark grey clay; some limestone with pyrites	10	–	50	–
	Grey calcareous sst. with many lignite fragments	10	–	60	–
	Dark grey shale & grey shelly shale	20	–	80	–
	Light grey, hard shale with pyrites; grey limestone with small black speckles	20	–	100	–
	Samples missing	20	–	120	–
	Grey shales, blue-white silty lst & dark blue lst.	20	–	140	–
	" " & dark blue limestone	20	–	160	–
	Oolitic limestone with small black specks	20	–	180	–
	ditto & brown-grey compact limestone	10	–	190	–
	Grey white limestone	10	–	200	–
	Lt. grey, silty limestone	10	–	210	–
	" " Grey shale	10	–	220	–
	CORES, 220–311 ft.				
	Pale grey, bedded, fine grained mudstone	1	6	221	6
	Soft dark grey, broken & flake sided mudstone		6	222	–
	Pale greenish-grey, fine grained mudstone	1	6	223	6
	Hard, banded shelly limestone & hard shale		9	224	3
	" dark grey silty mudstone		3	224	6
	Grey, fine grained mudstone becoming silty in lower 6 in. Shell @ 226 ft.	2	6	227	–
	Hard, light grey compact mudstone	1	–	228	–
	Soft, pale greenish-grey fine grained mudstone	4	6	232	6
	Darker, greenish broken mudstone		3	232	9
	Hard, light grey, silty mudstone	2	9	235	6
	Hard, light grey, banded limestone	1	6	237	–
	Compact grey mudstone	1	6	238	6
	Darker fine grained mudstone	2	6	241	–
	Dark grey, fine grained mudstone with limestone bands	4	–	245	–

Geological Survey and Museum,
South Kensington,
London, S.W.7.

G.S.M. Office File No.	Site marked on 6" Map by	Site marked on 1" Map by

Appendix D
Site Photographs

Photograph 1 – Existing channel drain beside access road

Photograph 2 – view north east across the site

Photograph 3 – Gabion wall and French drain, south side of Old Works area

Photograph 4 – Drainage outfall from filter drain behind south side gabion wall

Photograph 5 – Access Road – Old Works area looking South West

Appendix E
Maintenance Plan

SUDs Maintenance Schedule

British Gypsum, Robertsbridge

CONTENTS PAGE No.

APPENDICES

REFERENCES

Ref.	Title
A	Non Statutory Technical Standards for Sustainable Drainage Systems, LASOO
B	The SUDS Manual (C753), CIRIA publication
C	Sustainable Drainage System (C609), CIRIA publication
	HR Wallingford, UK Sustainable Drainage Guidance & Tools [Online] Available at: www.uksuds.com

STRATEGY

The site comprises one catchment, being that from the roof of the new servicing building and hardstanding of the adjacent parking area.

This catchment is provided with attenuation storage, and has been designed to accommodate the 100yr + 40% climate change storm.

DESIGN CRITERIA

1. The approved design has been based upon the following publications and computer software.

    a) Non Statutory Technical Standards for Sustainable Drainage Systems (Ref A)
    b) The SUDS Manual C753 by CIRIA (Ref B)
    c) Sustainable Drainage Systems C609 by CIRIA (Ref C)
    d) MicroDrainage WinDes software

MAINTENANCE

2. Maintenance needs will be dependent on the frequency of inspections. Regular inspections will identify problems at an early stage and enable minor defects to be rectified before any major deterioration occurs. Maintenance can fall into two categories:

    Routine Maintenance
    Periodic Maintenance

Catchpit Chambers

3. The cleaning out/removal of silt and debris from the catchpit chambers on a monthly basis during the construction phase, and annually, after large storms or as required thereafter.
4. Inspection and monitoring of inlets, outlets and overflows for blockages on a monthly basis during the construction phase, and annually, after large storms or as required thereafter.

Bypass Interceptors

5. Regular checking of the bypass separator is particularly important, as a lack of routine maintenance is highly likely to cause poor outflow quality due to the re-suspension of solids and anaerobic conditions developing within the device.
6. The unit should be inspected after large rainfall events, and floating debris and floating oils should be removed. Regular maintenance should be performed in accordance with manufacturer's recommendations.
7. As a minimum the units should be cleaned at least annually, but more regularly if silt buildup is found to be above 75% capacity of the sump.

Attenuation Tanks/Crates

8. The cleaning out/removal of silt and debris from the catchpit and/or silt chambers on a monthly basis during the construction phase, and annually, after large storms or as required thereafter.
9. Inspection and monitoring of inlets, outlets, flow controls and overflows for blockages on a monthly basis during the construction phase, and annually, after large storms or as required thereafter.

Swales, French Drains & Attenuation Basins

10. The cleaning out/removal of litter & debris on a monthly basis or as required. Wild flower cutting is required annually and the removal of cuttings is essential as if the soil becomes too rich all that will grow is grass.
11. Re-seeding & planting of areas of poor vegetation growth on an annual basis. Remedial action to be taken of erosion or build-up of sediment as required.
12. Inspection/monitoring of inlets, outlets, overflows for blockages on a monthly basis.

Maintenance Schedule

13. A suggested Maintenance Schedule has been prepared for the future Stakeholders and it will be their responsibility to implement a suitable maintenance regime. A copy of this Maintenance Schedule is provided at Appendix 1.

CONCLUSION

11. The array of on-site storage facilities have been designed to accommodate the run-off from the proposed development for all storms up to and including the 1 in 100 year + 40% climate change event.

    By using a combination of the 'Best Management Practices' for this development it is believed that the design approach meets the objective of the SUDS concept and the requirements of the EA. The benefits can be listed as:-

    - Reduction in the quantity of run-off to, and the protection of groundwater.
    - Protection of existing and proposed properties from flooding.
    - Improved ecological environment.

British Gypsum, Robertsbridge

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APPENDIX 1

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MAINTENANCE SCHEDULE

APPENDIX 1

SUSTAINABLE URBAN DRAINAGE SYSTEMS MAINTENANCE SCHEDULE

AIM

1. The aim of the Maintenance Schedule is to set out the minimum requirements to maintain the Sustainable Urban Drainage System (SUDS) provided on this development for the treatment / retention of surface water run-off.

OBJECTIVE

2. The objective is to ensure that through planned maintenance and regular inspections the SUDS management train will continue to function for the purpose it was intended.

INSPECTIONS

3. Maintenance needs will be dependent on the frequency of inspections. Regular inspections will identify problems at an early stage and enable minor defects to be rectified before any major deterioration occurs.

MAINTENANCE

4. Initial Maintenance Schedules have been prepared and should be developed during the design phase and adjustments made thereafter to suit specific site requirements.
    - Table 1 – Catchpit & Flow Control Chambers
    - Table 2 - Attenuation Tanks/Crates
    - Table 3 – Separators
    - Table 4 - Ditches/Swales/French Drains Management Schedule

Table 1 – Catchpit & Flow Control Chambers Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Silt, litter and debris removal from catchpit chambers.	Three monthly initially and then as required.
	Silt and debris removal from gullies.	Three monthly initially and then as required.
	Oils removed from catchpits and gullies.	Immediately following spillages or as required.
Monitoring	Open and inspect catchpit chambers.	Monthly/after large storms.

Table 2 – Attenuation Tanks/Crate Storage Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Three monthly initially, then as required.
	Debris removal from catchment surface (where this may cause risk to performance).	Monthly.
	Remove sediment from pre-treatment structures (catchpit/silt traps)	Quarterly or as required.
Remedial Action	Repair of inlets, outlet, overflows and vents.	As required.
Monitoring	Inspect and check all inlets, outlet, overflows and vents to ensure they are in good condition and operating as designed.	Annually.
	Survey inside of tank for sediment build-up, and remove if necessary.	Annually, after large storms or as required.

Table 3 – Separators Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation.	Six monthly.
	Change the filter media.	As recommended by manufacturer.
	Remove sediment, oil, grease and floatables.	As necessary – indicated by system inspections or immediately following significant spill.
Remedial Action	Replace malfunctioning parts or structures.	As required.
Monitoring	Inspect for evidence of poor operation.	6 monthly.
	Inspect sediment accumulation rates and establish appropriate removal frequencies.	Monthly during first half of operation, then every six months.

Table 4 – Ditches/Swales/French Drains Management Schedule

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter and debris removal. Free movement of flap valves.	Monthly (or as required)
	Meadow grass mixture in basins and swales	Twice a year
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required)
Occasional maintenance	Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where possible.	Annually
	Re-seed areas of poor vegetation growth.	Annually
Remedial Action	Repair erosion or other damage by re-turfing or reseeding.	As required
	Re-level uneven surfaces and reinstate design levels.	As required
	Remove build up of silt/sediment.	As required
	Remove and dispose of oils or petrol residues using safe standard practices.	As required
Monitoring	Inspect inlets, outlets, control chambers and overflows for blockages, and clear if required.	Monthly
	Inspect surfaces for ponding, silt accumulation. Record areas where water is ponding for >48 hrs.	Monthly minimum, or as required