

Soakage Testing Letter Report

CLIENT	Welbeck Strategic Land II LLP
SITE ADDRESS	Land at Wandleys Lane, Fontwell, West Sussex BN18 0QR
REPORT REFERENCE	GWPR5116
ENGINEER	Roger Foord, Ground and Water Limited
INVESTIGATION LOCATIONS AND SCOPE OF WORKS	Site works were undertaken in on the 27 th February 2023. Three trial pits (TP1 – TP3) was machine excavated to a depth of between 1.00 – 2.00m bgl. Infiltration tests in accordance with the principles of BRE365 were undertaken in the trial pits. A trial hole location plan can be seen in Figure 1.

GROUND CONDITIONS ENCOUNTERED

Summary of Strata Encountered			
Strata	Depth Strata Encountered (m bgl)	Base of Strata (m bgl)	Thickness (m)
TOPSOIL: Dark brown fine to medium SAND.	GL	0.10m	0.10m
HEAD DEPOSITS: Brown clayey slightly sandy fine to coarse GRAVEL. The gravel was sub-angular to rounded flint.	0.10m	>1.00 – 1.90m	>0.90 – 1.80m
(LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED)): Structureless CHALK composed of off white to white slightly sandy medium and coarse GRAVEL with many sub-angular cobbles. Gravel and cobbles were medium dense. Matrix is uncompact and off white. (CIRIA C574: Grade Dc).	1.90m	>2.00m	>0.10m

GROUNDWATER	Groundwater was not encountered.
ROOTS	Roots encountered to a depth of 0.40m bgl in TP1, 0.20m bgl in TP2 and 0.25m bgl in TP3.
INFILTRATION TESTING	Soakaway tests, in accordance with the principles of BRE365 were undertaken in the base of each of the trial pits at depths of between 1.00 – 2.00m bgl within soils of the Head Deposits in TP2 and TP3 comprising a brown clayey slightly sandy fine to coarse gravel and within the soils of the Undifferentiated Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver chalk Formation and Portsdown Chalk Formation in TP1 comprising a structureless CHALK composed of off white to white slightly sandy medium and coarse GRAVEL with many sub-angular cobbles. The infiltration rates recorded within the trial pits can be seen tabulated overpage.

Soakage Tests in accordance with BRE365					
Test Details	Test No.	Starting Depth Level (m)	Final Water Level (m bgl)	Time Taken (mins)	Infiltration Rate (m/s)
TP1/2.00m bgl	1	1.00	1.90	30	2.32 x10 ⁻⁴
	2	1.00	1.86	32	2.68 x10 ⁻⁴
	3	1.00	1.90	40	2.42 x10 ⁻⁴
TP2/1.00m bgl	1	0.50	0.92	60	9.31 x10 ⁻⁵
	2	0.50	0.90	80	6.09 x10 ⁻⁵
	3	0.50	0.90	55	9.31 x10 ⁻⁵
TP3/1.50m bgl	1	0.90	1.35	27	9.64 x10 ⁻⁵
	2	1.00	1.40	40	1.37 x10 ⁻⁴
	3	1.00	1.44	50	5.77 x10 ⁻⁵

Based upon the results of the infiltration tests, it was considered that the soils of Head Deposits and/or the Undifferentiated Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation encountered would provide a suitable medium for soakaway installation.

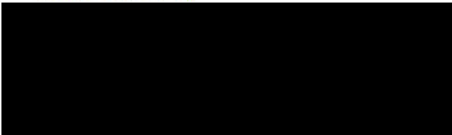
The submission of a Sustainable Urban Drainage Scheme (SUDS) is likely to be required for this site because the proposed development increase the amounts of hardstanding.

The relevant guidance should be followed with regards to discharging water into chalk related geology/sequence. A chalk dissolution risk assessment and the assessment of chalk solubility potential on site was not in the remit of this report.

Consultation with the Environment Agency must be sought regarding any drainage systems that may have an impact on groundwater resources.

Please feel free to contact us should you have any queries regarding the information enclosed within this letter report. The following figures and appendices complete this report.

Yours sincerely



Roger Foord BA (Hons), MSc, DIC, FGS, CGeol CIHM
Senior Engineer
For and on behalf of Ground and Water Limited

Figure 1 Trial Hole Location Plan
Appendix A Terms and Conditions
Appendix B Trial Hole Logs
Appendix C Infiltration Test Data



— APPROXIMATE SITE BOUNDARY

NOTE: NOT TO SCALE

Project:

Land at Wandleys Lane, Fontwell, West Sussex, BN18 0QR

Client:

Welbeck Strategic Land IV LLP

Date:

December 2022

Proposed Trial Hole Location Plan

Ref:

GWPR5116

Figure 1



APPENDIX A

Term and Conditions

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report (“you” or “the Recipient”) are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to land at Wandleys Lane, Fontwell, West Sussex BN18 0QR.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not

be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

APPENDIX B
Trial Hole Logs

Trial Pit Log

Project Name: Land at Wandleys Lane,		Client: Welbeck strategic Land II LLP		Date: 27/02/2023	
Location: Fontwell, West Sussex BN18 0QR		Contractor:			
Project No. : GWPR5116		Crew Name:		Equipment:	
Location Number TP1	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			TOPSOIL: Dark brown fine to medium SAND.	
		0.20	D					Brown clayey slightly sandy fine to coarse GRAVEL. The gravel was sub-angular to rounded of flint. (HEAD DEPOSITS)	
		0.50	D						
		1.00	D						
		1.50	D						
		2.00	D		1.90 2.00			Structureless CHALK composed of off white to white slightly sandy medium and coarse GRAVEL with many sub-angular cobbles. Gravel and cobbles were medium dense. Matrix is uncompact and off white. (CIRIA C574: Grade Dc). (LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED))	
								End of Borehole at 2.000m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks Roots noted to 0.40m bgl. Groundwater not encountered.							
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Trial Pit Log

Project Name: Land at Wandleys Lane,		Client: Welbeck strategic Land II LLP		Date: 27/02/2023	
Location: Fontwell, West Sussex BN18 0QR		Contractor:			
Project No. : GWPR5116		Crew Name:		Equipment:	
Location Number TP2	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.10			TOPSOIL: Dark brown fine to medium SAND.	
		0.50	D					Brown clayey slightly sandy fine to coarse GRAVEL. The gravel was sub-angular to rounded of flint. (HEAD DEPOSITS).	
		1.00	D		1.00			End of Borehole at 1.000m	1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks Roots noted to 0.20m bgl. Groundwater not encountered.	
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Trial Pit Log

Project Name: Land at Wandleys Lane,		Client: Welbeck strategic Land II LLP		Date: 27/02/2023	
Location: Fontwell, West Sussex BN18 0QR		Contractor:			
Project No. : GWPR5116		Crew Name:		Equipment:	
Location Number TP3	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.10			TOPSOIL: Brown fine to medium SAND.	1
		0.50	D					Brown clayey slightly sandy fine to coarse GRAVEL. The gravel was sub-angular to rounded of flint.. (HEAD DEPOSITS).	
		1.00	D						
		1.50	D		1.50				
								End of Borehole at 1.500m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Roots noted to 0.25m bgl. Groundwater not encountered.



APPENDIX C
Infiltration Test Data

Only use if test reached 75%

Site	Wandleys Lane,Fontwell
Test number	TP1/1
Date	27/02/2023
Depth (m)	2.000
Length (m)	3.000
Width (m)	0.600

Calculation of Effective depth	
Top of test	1.000
Effective base	2.000
Effective depth	1.000
DON'T CHANGE FORMULAS (IN RED)	

Time (mins)	Water Depth (m)			
0	1.000	25%	1.250	
1.00	1.090			
2.00	1.200	75%	1.750	
4.00	1.280			
6.00	1.400			
8.00	1.470	$V_{75>25} (m^3)$	0.9	
10.00	1.550	$A_{90} (M^2)$	5.4	
15.00	1.750	T_{25}	3	From Graph
30.00	1.900	T_{75}	15	From Graph
		T	12	
		$f=$	0.01388889 m/min	
		$f=$	0.00023148 m/sec	

Site	Wandleys Lane,Fontwell
Test number	TP1/2
Date	27/02/2023
Depth (m)	2.000
Length (m)	3.000
Width (m)	0.600

Calculation of Effective depth	
Top of test	1.100
Effective base	2.000
Effective depth	0.900
DON'T CHANGE FORMULAS (IN RED)	

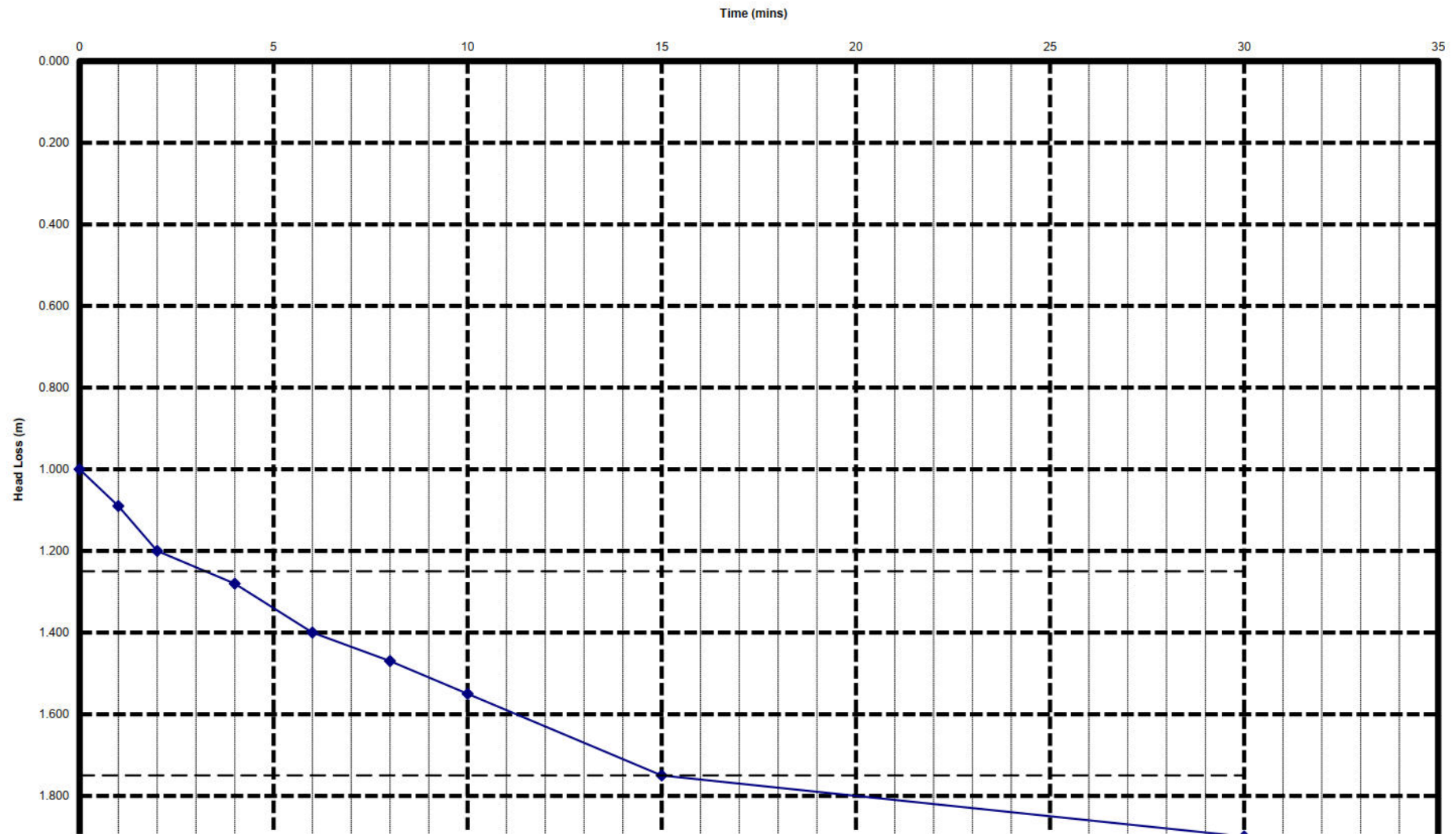
Time (mins)	Water Depth (m)			
0	1.100	25%	1.325	
1.00	1.100			
2.00	1.180	75%	1.775	
3.00	1.230			
4.00	1.270			
5.00	1.310	$V_{75>25} (m^3)$	0.81	
6.00	1.350	$A_{90} (M^2)$	5.04	
7.00	1.410	T_{25}	4.5	From Graph
8.00	1.460	T_{75}	14.5	From Graph
9.00	1.500	T	10	
10.00	1.560			
20.00	1.710			
32.00	1.860			
		$f=$	0.01607143 m/min	
		$f=$	0.00026786 m/sec	

Site	Wandleys Lane,Fontwell
Test number	TP1/3
Date	27/02/2023
Depth (m)	2.000
Length (m)	3.000
Width (m)	0.600

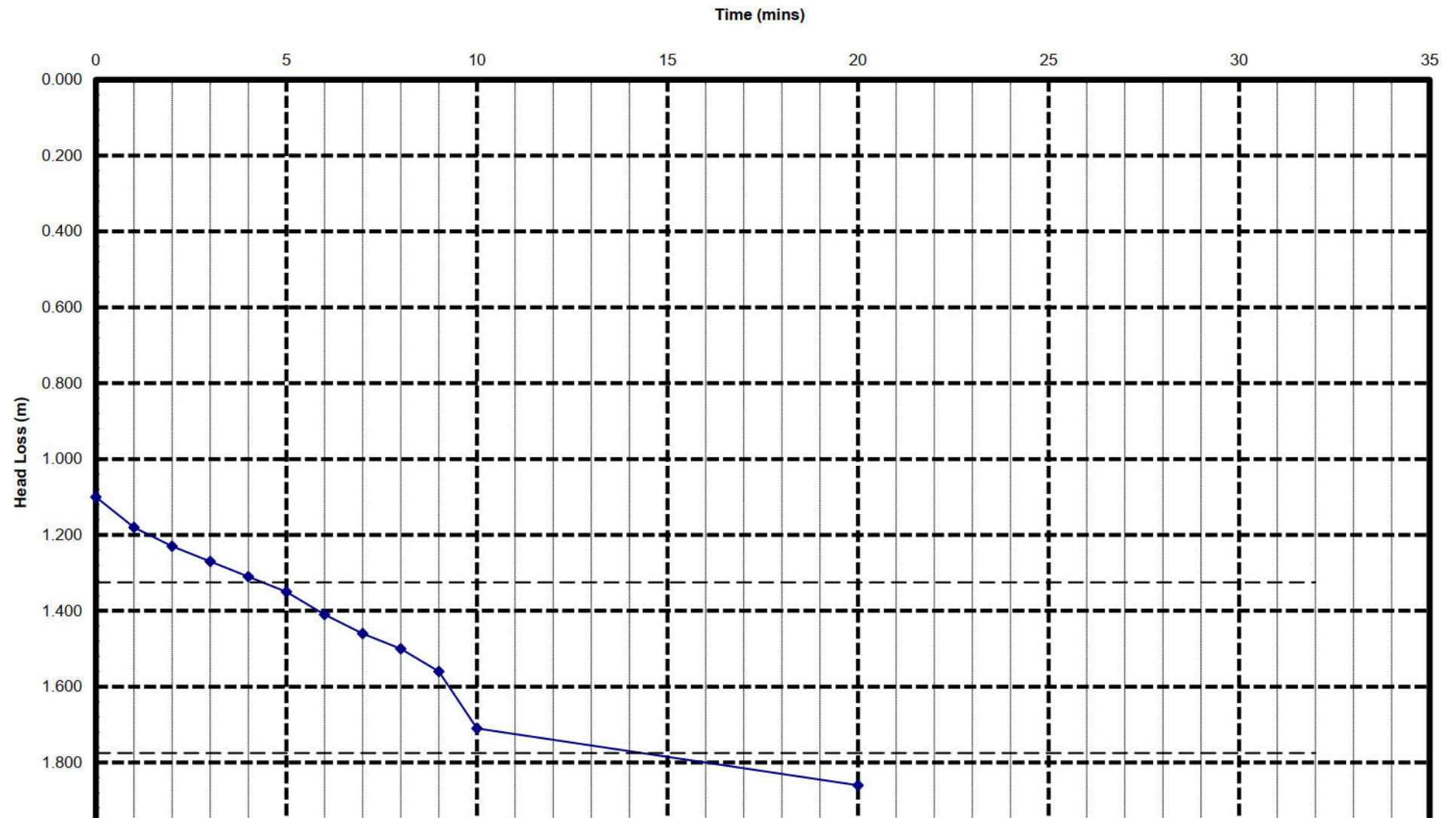
Calculation of Effective depth	
Top of test	1.000
Effective base	2.000
Effective depth	1.000
DON'T CHANGE FORMULAS (IN RED)	

Time (mins)	Water Depth (m)			
0	1.000	25%	1.250	
1.00	1.040			
2.00	1.110	75%	1.750	
4.00	1.200			
10.00	1.500			
30.00	1.810	$V_{75>25} (m^3)$	0.9	
40.00	1.900	$A_{90} (M^2)$	5.4	
		T_{25}	5	From Graph
		T_{75}	16.5	From Graph
		T	11.5	
		$f=$	0.0144928 m/min	
		$f=$	0.0002415 m/sec	

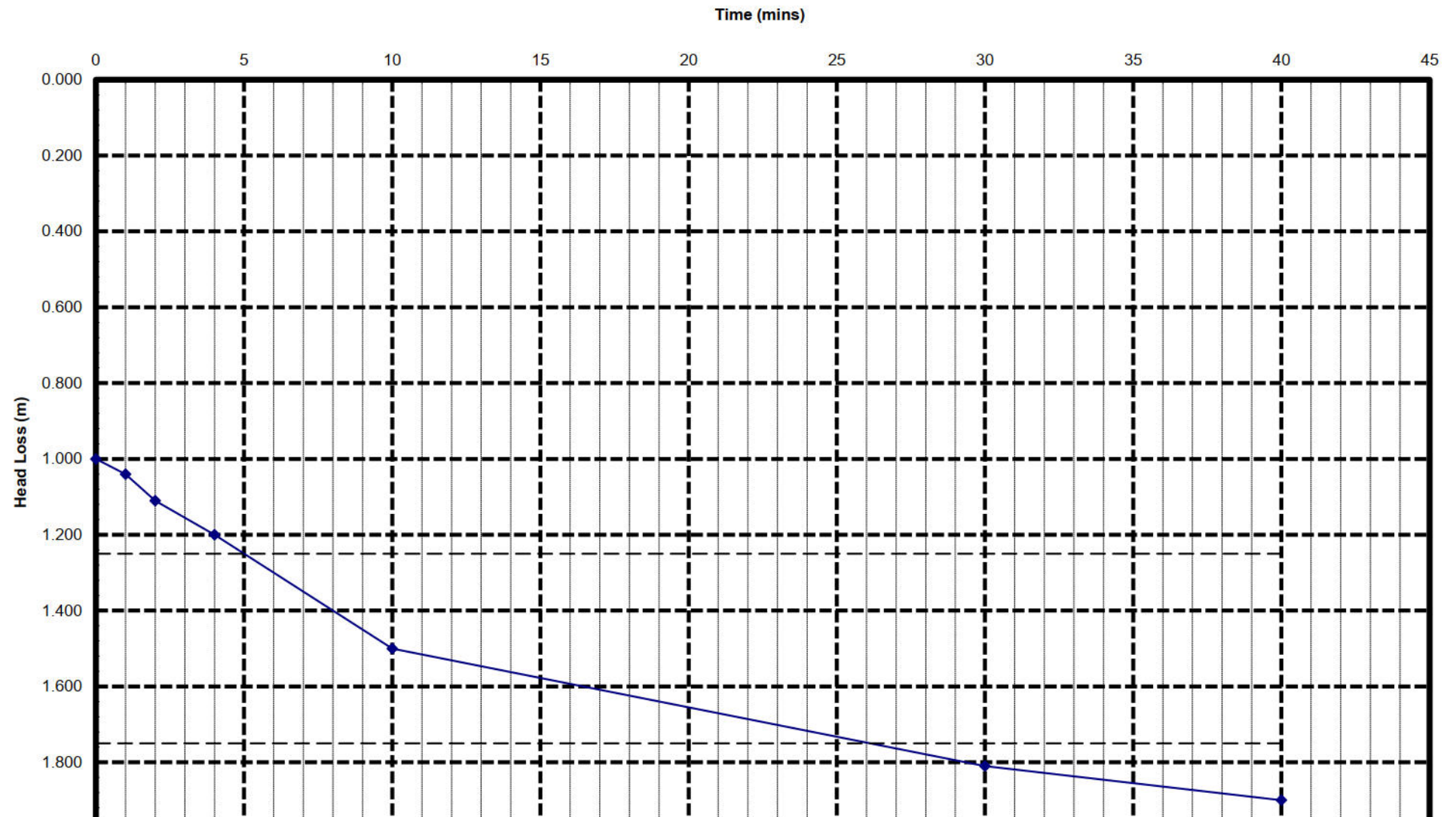
Headloss vs Time



Headloss vs Time



Headloss vs Time



Only use if test reached 75%

Site	Wandleys Lane,Fontwell
Test number	TP2/1
Date	27/02/2023
Depth (m)	1.000
Length (m)	2.500
Width (m)	0.600

Calculation of Effective depth	
Top of test	0.500
Effective base	1.000
Effective depth	0.500
DON'T CHANGE FORMULAS (IN RED)	

Time (mins)	Water Depth (m)			
0	0.500	25%	0.625	
1.00	0.500			
2.00	0.500	75%	0.875	
4.00	0.510			
6.00	0.530			
8.00	0.550	$V_{75>25} (m^3)$	0.375	
10.00	0.560	$A_{90} (M^2)$	3.05	
15.00	0.580	T_{25}	17	From Graph
20.00	0.690	T_{75}	39	From Graph
60.00	0.920	T	22	
		f=	0.00558867 m/min	
		f=	9.3145E-05 m/sec	

Site	Wandleys Lane,Fontwell
Test number	TP2/2
Date	27/02/2023
Depth (m)	1.000
Length (m)	2.500
Width (m)	0.600

Calculation of Effective depth	
Top of test	0.520
Effective base	1.000
Effective depth	0.480
DON'T CHANGE FORMULAS (IN RED)	

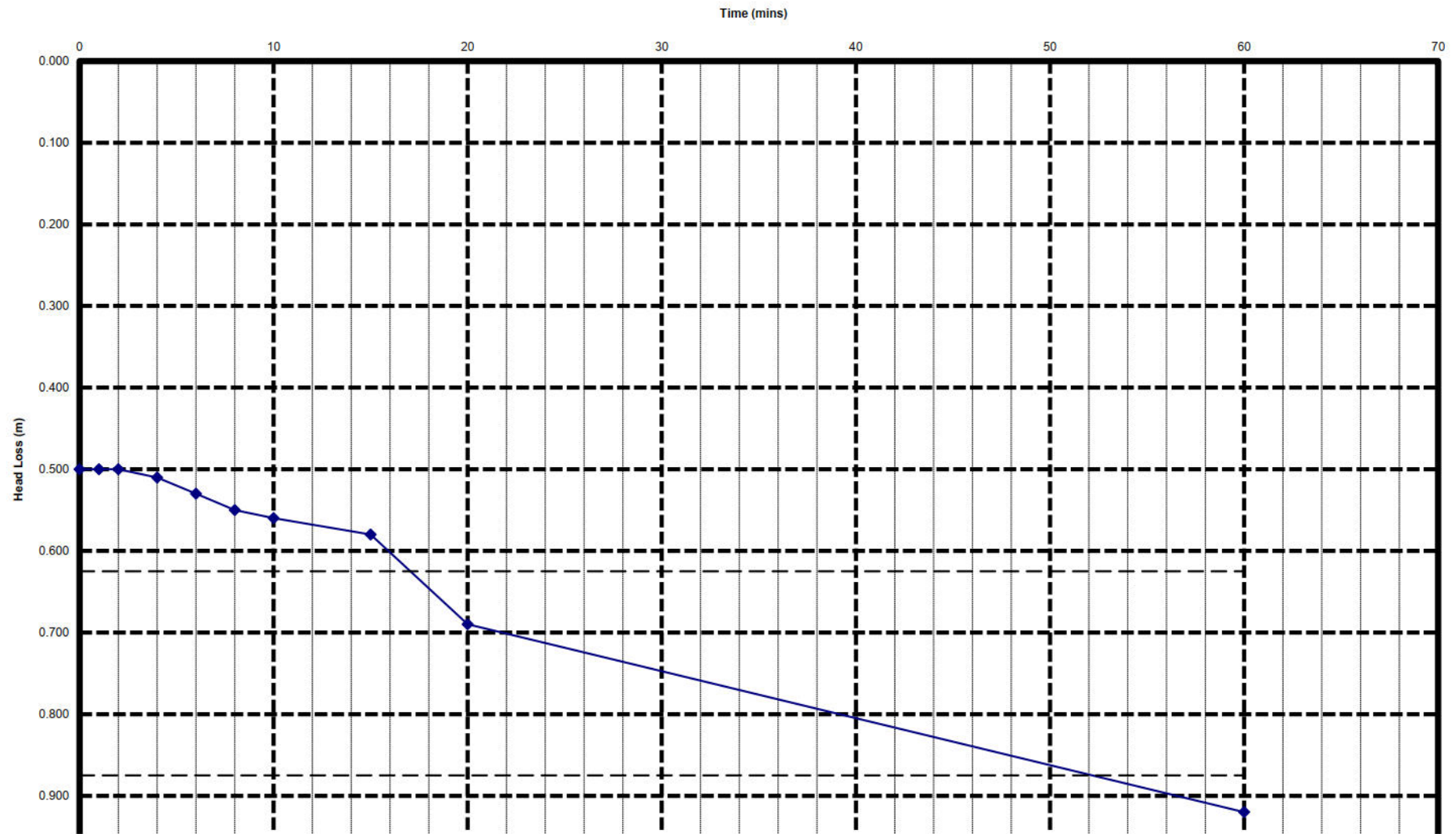
Time (mins)	Water Depth (m)			
0	0.500	25%	0.640	
2.00	0.520			
4.00	0.540	75%	0.880	
6.00	0.570			
8.00	0.590			
10.00	0.600	$V_{75>25} (m^3)$	0.36	
35.00	0.760	$A_{90} (M^2)$	2.988	
60.00	0.870	T_{25}	9	From Graph
80.00	0.900	T_{75}	42	From Graph
		T	33	
		f=	0.00365097 m/min	
		f=	6.0849E-05 m/sec	

Site	Wandleys Lane,Fontwell
Test number	TP2/3
Date	27/02/2023
Depth (m)	1.000
Length (m)	2.500
Width (m)	0.600

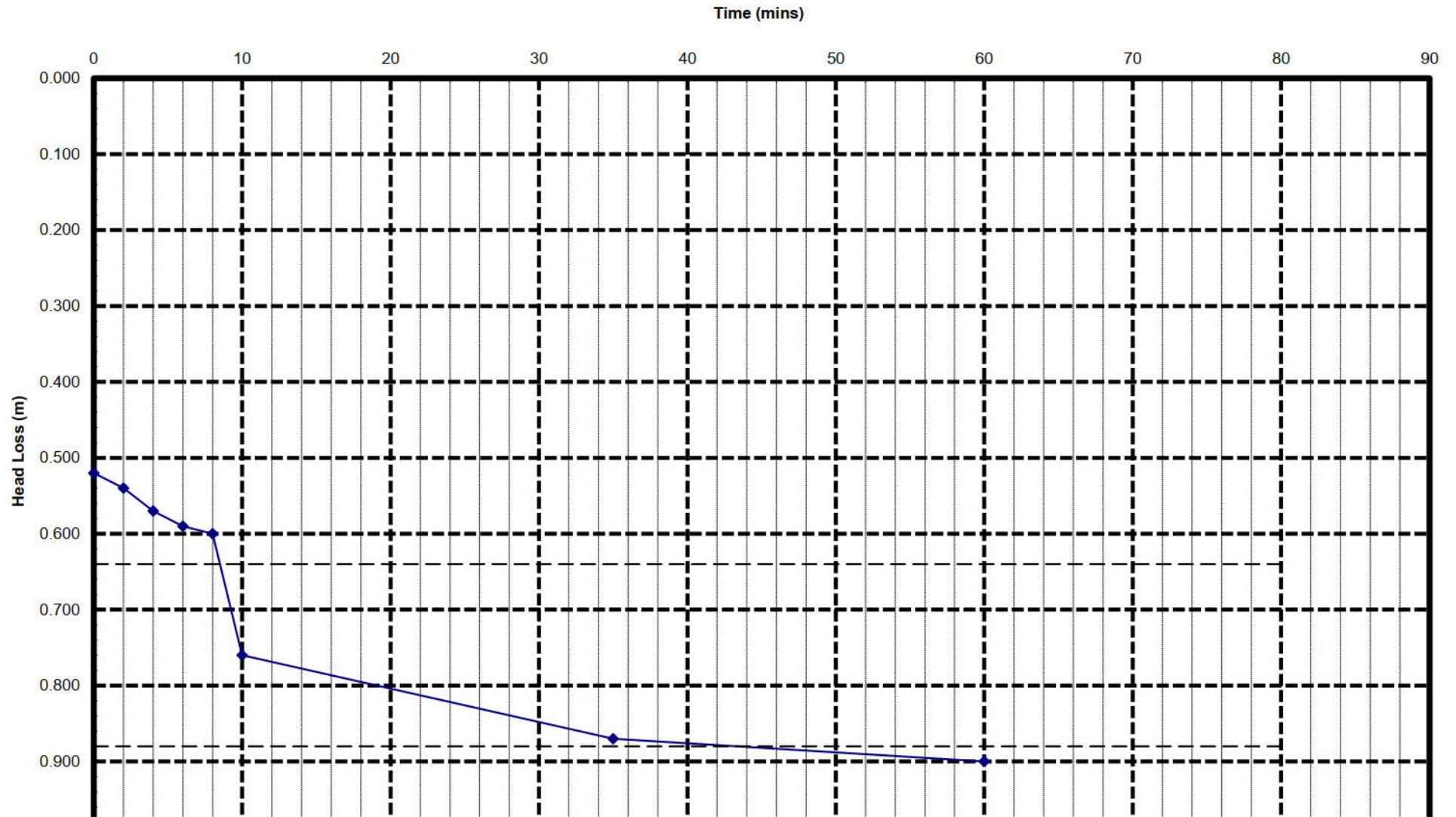
Calculation of Effective depth	
Top of test	0.500
Effective base	1.000
Effective depth	0.500
DON'T CHANGE FORMULAS (IN RED)	

Time (mins)	Water Depth (m)			
0	0.500	25%	0.625	
1.00	0.530			
2.00	0.540	75%	0.875	
3.00	0.540			
4.00	0.550			
5.00	0.560	$V_{75>25} (m^3)$	0.375	
7.00	0.570	$A_{90} (M^2)$	3.05	
10.00	0.570	T_{25}	30	From Graph
15.00	0.580	T_{75}	52	From Graph
25.00	0.600	T	22	
30.00	0.620			
55.00	0.920			
		f=	0.0055887 m/min	
		f=	9.314E-05 m/sec	

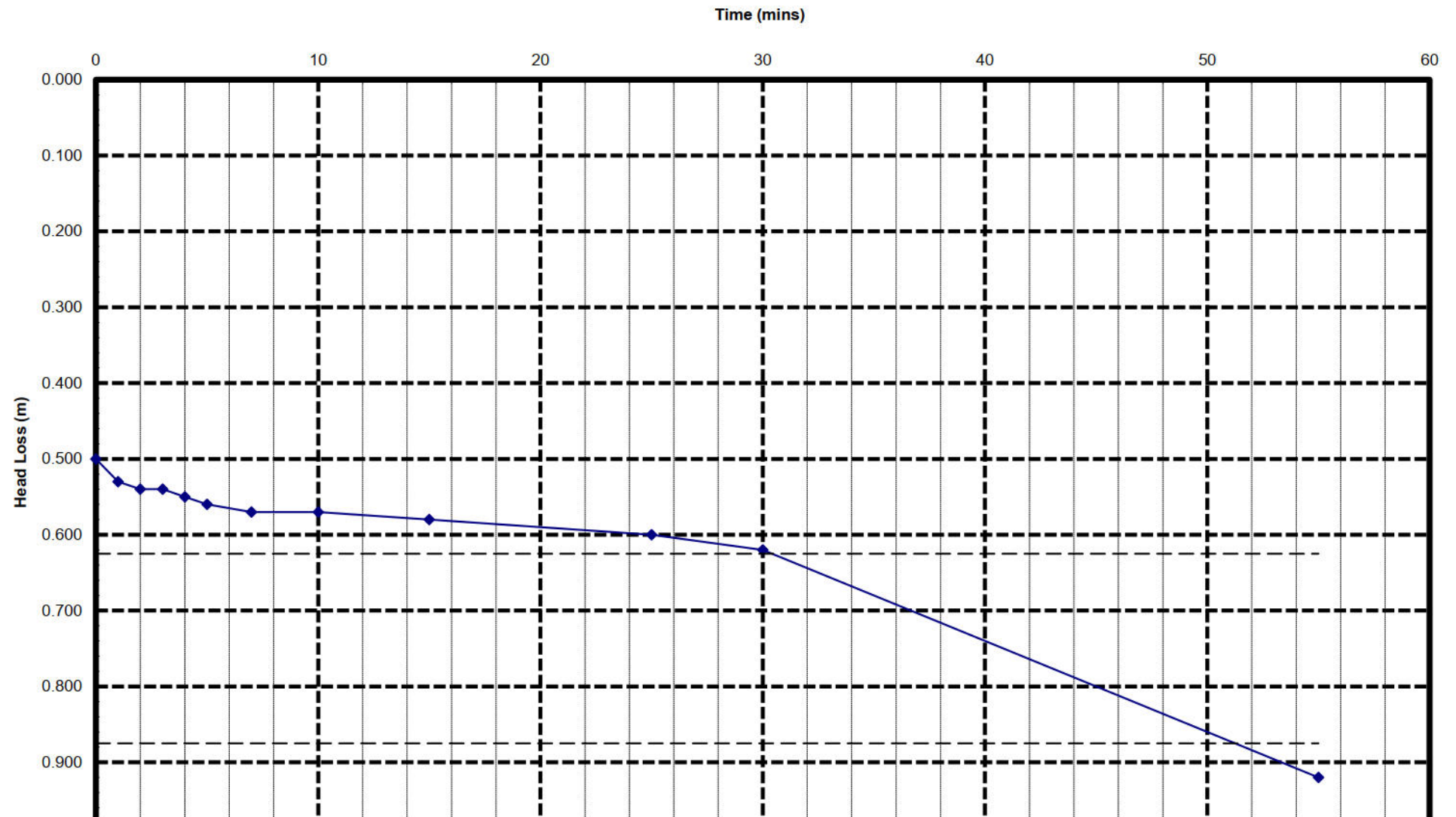
Headloss vs Time



Headloss vs Time



Headloss vs Time



Only use if test reached 75%

Site	Wandleys Lane,Fontwell
Test number	TP2/1
Date	27/02/2023
Depth (m)	1.500
Length (m)	2.900
Width (m)	0.600

Calculation of Effective depth	
Top of test	0.900
Effective base	1.500
Effective depth	0.600

DON'T CHANGE FORMULAS (IN RED)

Time (mins)	Water Depth (m)			
0	0.900	25%	1.050	
1.00	1.000			
2.00	1.030	75%	1.350	
3.00	1.040			
4.00	1.080			
5.00	1.100	$V_{75>25}$ (m ³)	0.522	
8.00	1.130	A_{90} (M ²)	3.84	
10.00	1.150	T_{25}	3.5	From Graph
20.00	1.300	T_{75}	27	From Graph
25.00	1.340	T	23.5	
27.00	1.350			
		f=	0.00578457 m/min	
		f=	9.641E-05 m/sec	

Site	Wandleys Lane,Fontwell
Test number	TP2/2
Date	27/02/2023
Depth (m)	1.500
Length (m)	2.900
Width (m)	0.600

Calculation of Effective depth	
Top of test	1.010
Effective base	1.500
Effective depth	0.490

DON'T CHANGE FORMULAS (IN RED)

Time (mins)	Water Depth (m)			
0	1.010	25%	1.133	
1.00	1.010			
2.00	1.030	75%	1.378	
3.00	1.040			
4.00	1.040			
5.00	1.050	$V_{75>25}$ (m ³)	0.4263	
8.00	1.090	A_{90} (M ²)	3.455	
10.00	1.110	T_{25}	8.5	From Graph
15.00	1.180	T_{75}	23.5	From Graph
20.00	1.210	T	15	
24.00	1.270			
40.00	1.400			
		f=	0.00822576 m/min	
		f=	0.0001371 m/sec	

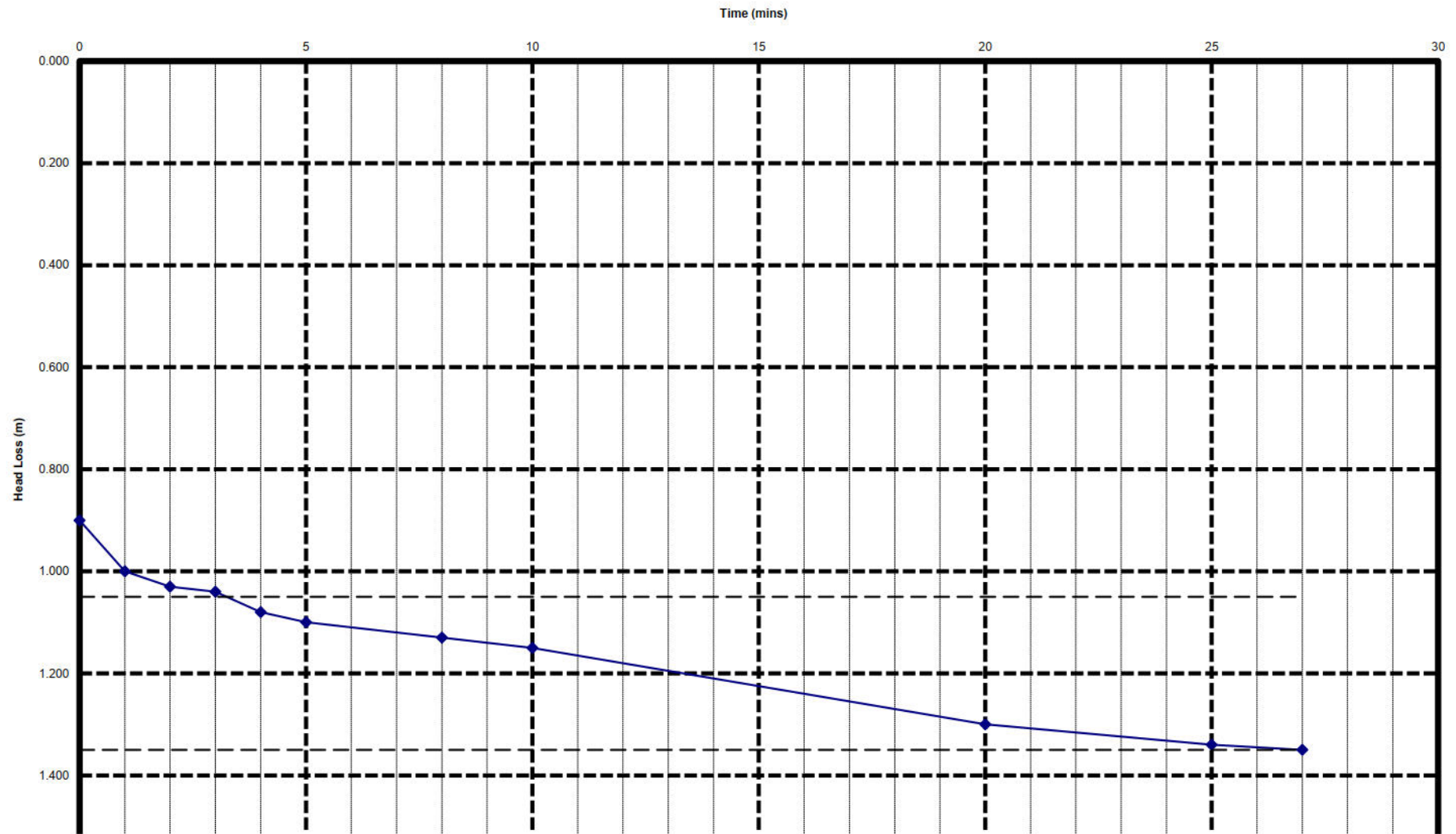
Site	Wandleys Lane,Fontwell
Test number	TP2/3
Date	27/02/2023
Depth (m)	1.500
Length (m)	2.900
Width (m)	0.600

Calculation of Effective depth	
Top of test	1.000
Effective base	1.500
Effective depth	0.500

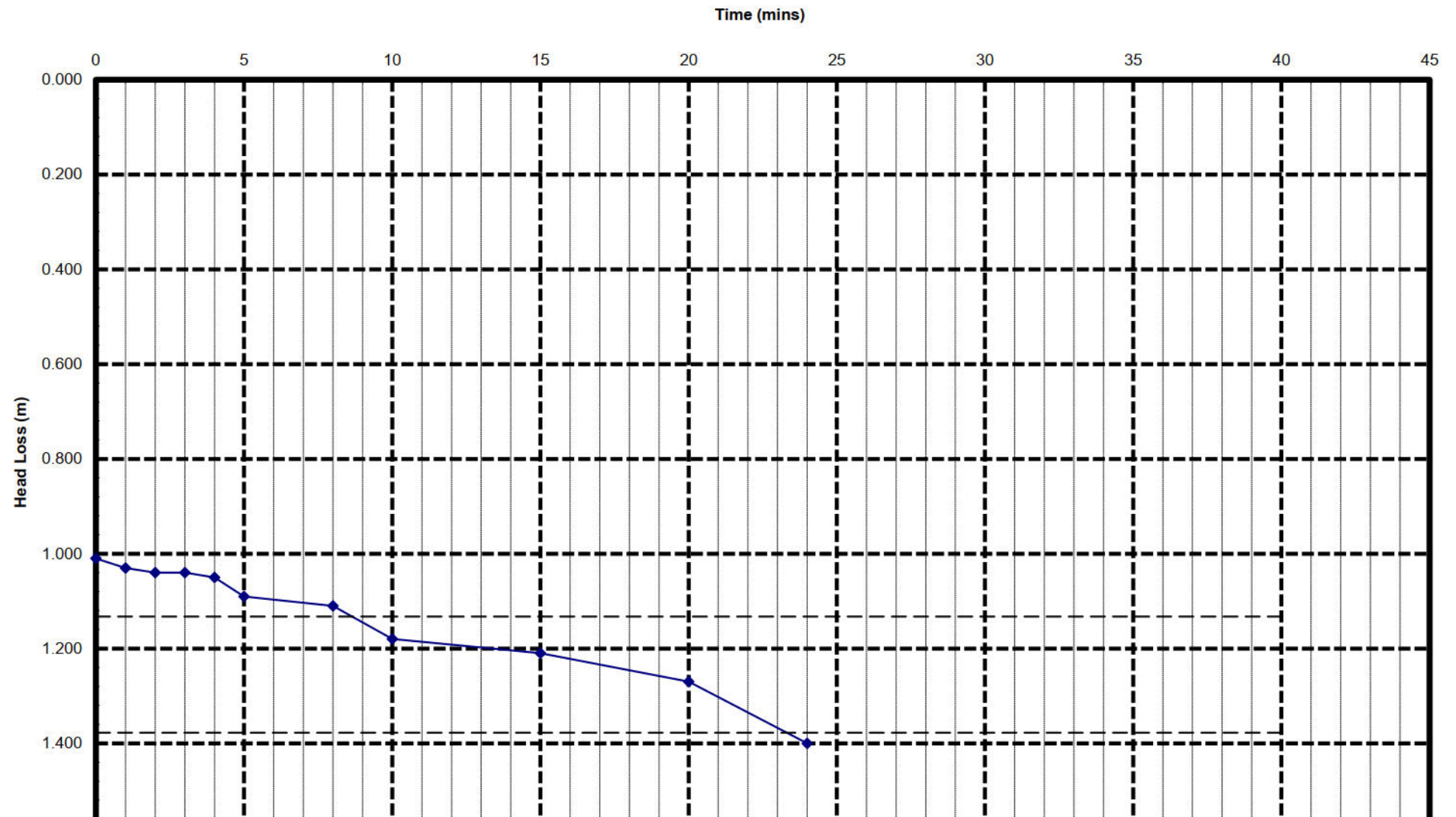
DON'T CHANGE FORMULAS (IN RED)

Time (mins)	Water Depth (m)			
0	1.000	25%	1.125	
2.00	1.030			
4.00	1.080	75%	1.375	
8.00	1.100			
10.00	1.200			
30.00	1.270	$V_{75>25}$ (m ³)	0.435	
50.00	1.440	A_{90} (M ²)	3.49	
		T_{25}	9	From Graph
		T_{75}	45	From Graph
		T	36	
		f=	0.0034623 m/min	
		f=	5.77E-05 m/sec	

Headloss vs Time



Headloss vs Time



Headloss vs Time

