

Drainage Calculations

Proposed Residential Development
Land at Woodend, Netherley Road
Tarbock Green, Knowsley
L35 1QE

CLIENT

DOWLS CONSTRUCTION LTD

DOCUMENT NUMBER

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1. INTRODUCTION

1.1 OVERVIEW

The proposed works comprises the demolition of existing buildings and structures, and erection of 10 no. new dwellings with associated access, parking, landscaping and infrastructure at land on Woodend, Netherley Road, Tarbock Green, Knowsley, L35 1QE.

The following calculations are for the proposed drainage solution to discharge the foul and surface water for the new dwellings and surrounding pavements. The calculations below are for the proposed new surface and foul water drainage system to be installed on the site.

For the purposes of the drainage design calculations, the buildings design life is taken as 100 years. The climate change allowance for this site will be 1 in 100 years plus 40% climate change.

1.2 SURFACE WATER DRAINAGE DESIGN

A Flood Risk Assessment & Drainage Strategy was developed by DeltaSimons Consultants to support the planning application that was approved for the scheme. The RIBA Stage 4 detailed drainage follows the principles outlined in the Flood Risk Assessment & Drainage Strategy.

The drainage strategy has been designed for 1-in-100 year storm events, with the allowance of 40% for climate change. A new drainage system has been designed to pick-up surface water from the access roads, new roofs and pavements, and includes 1no. attenuation tanks, permeable paving and oversized pipes & manholes with a discharge restricted to 7.42 l/s as per the drainage strategy report submitted for planning. The new drainage will discharge via the existing private surface water drainage within the site. The new surface water connection will be made onto the existing 750mm surface water sewer within the site, this has an outfall into the nearby Greenbridge Lane Brook.

Attenuation strategy: All storage below ground – circa 435m³ (1 in 100yr + 40% cc) - provided within the new pipework & chambers, attenuation tank, and tanked permeable paving.

A full hydraulic drainage model has been created for the site and is included within the appendices

1.3 PROPOSED FOUL WATER DRAINAGE

A new separate foul drainage system will be provided within the site to pick up proposed internal and external connections and will discharge to the new private domestic package treatment plant within the site. This will ultimately discharge the treated effluent into the nearby brook / watercourse. The new foul drainage can also be connected into the existing culverted watercourse located in the existing 750mm sewer within the site that outfalls to the Greenbridge Lane Brook.

The below ground foul drainage system shall be designed & constructed to latest Design & Construction Guide, BS EN 752 Parts 3 and 4, and the Building Regulations Document H.

1.4 SIZING OF THE NEW DOMESTIC FOUL PACKAGE TREATMENT UNIT

The Flows and Loads Code of Practice is the main design guide for sizing of sewage treatment systems and provides a table of loadings which allows the total daily sewage load from properties to be calculated, and it is recommended that all designers should use this table when sizing and designing non-mains sewage treatment systems.

Sizing criteria is based on a loading of 150 litres per person per day with 60 grams BOD and 8 Ammonia. See Extract from Table of Loadings for Sewage Treatment Systems



Table of Loadings for Sewage Treatment Systems

Per person / activity / day (unless otherwise specified)	FLOW	BOD	Ammonia
(Grams)	(Litres)	(Grams)	as N
DOMESTIC DWELLINGS			
Standard residential	150	60	8
Mobile home type caravans with full services	150	60	8
INDUSTRIAL			
Office / Factory without canteen	50	25	5
Office / Factory with canteen	100	38	5
Open industrial site, e.g. construction, quarry, without canteen	60	25	5
*Full-time Day Staff	90	38	5
*Part-time Staff (4 hr shift)	45	25	3
SCHOOLS			
Non-residential with canteen cooking on site	90	38	5
Non-residential without a canteen	50	25	5
Boarding school (10 residents)	175	60	8

The proposed development will comprise of a mixture of 6no. 4-bedroom dwellings and 4no. 3-bedroom dwellings.

The size of a treatment system for a single house with more than 3 bedrooms shall be designed by adding 1 P for each additional bedroom to the minimum single house value of 5 P, eg:

- house with 3 bedrooms = minimum 5 P system
- house with 4 bedrooms = minimum 6 P system (5+1)
- house with 6 bedrooms = minimum 8 P system (5+3).

Based on the population of 6 people for a 4-bedroom house and 5 people for a 3-bedroom house, the treatment plant should have capacity for 56 persons. However, a 20 percent reduction can be applied where there are more than 26 people = $56 \times 0.8 = 45$ person.

For 56 persons, the total discharge would be = **8400 litres** Capacity required. These will produce 3360 grams BOD and 448 Ammonia prior to treatment.

For 45 persons, the total discharge would be = **6750 litres** Capacity required. These will produce 2700 grams BOD and 360 Ammonia prior to treatment.

Based on the above, a Klargester BioDisc or similar approved would be suitable for treating the discharge from the various dwellings. A specialist supplier is to be engaged to ensure the correct treatment plant is provided for the demand.

The Environment Agency will require a discharge permit for the site. This is to be obtained by the client / contractor prior to construction of the onsite drainage.

Appendix 1.

DETAILED DESIGN CALCULATIONS

SURFACE WATER DRAINAGE

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.014	5.00	5.0	13.692	450	346255.952	387710.868	1.702
2	0.016	5.00		13.400	450	346248.652	387690.474	1.555
3	0.085	5.00		13.385	450	346255.776	387675.404	1.665
70	0.000			13.386	450	346251.276	387663.128	1.886
4	0.095	5.00		13.386	600	346247.850	387653.790	1.906
5	0.037	5.00		13.190	600	346243.822	387642.800	1.750
6	0.022	5.00		13.100	600	346246.180	387637.711	1.675
7	0.027	5.00		12.900	600	346240.543	387622.339	1.515
8	0.052	5.00		12.900	600	346238.642	387617.154	1.530
9	0.000			12.662	1200	346232.434	387600.223	1.337
10	0.000			12.877	450	346219.988	387604.786	1.642
71				12.846	1200	346218.840	387602.565	1.626

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	21.661	0.600	11.990	11.845	0.145	149.4	150	5.44	50.0
1.001	2	3	16.669	0.600	11.845	11.720	0.125	133.4	150	5.76	50.0
1.002	3	70	13.075	0.600	11.720	11.645	0.075	174.3	150	6.05	50.0
1.003	70	4	6.425	0.600	11.500	11.480	0.020	321.3	300	6.17	50.0
1.004	4	5	15.226	0.600	11.480	11.440	0.040	380.7	450	6.42	50.0
1.005	5	6	5.609	0.600	11.440	11.425	0.015	373.9	450	6.51	50.0
1.006	6	7	16.373	0.600	11.425	11.385	0.040	409.3	450	6.78	50.0
1.007	7	8	5.523	0.600	11.385	11.370	0.015	368.2	450	6.87	50.0
1.008	8	9	18.033	0.600	11.370	11.325	0.045	400.7	450	7.16	50.0
1.009	9	10	13.256	0.600	11.325	11.235	0.090	147.3	150	7.43	50.0

	Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
?	1.000	1	2	0.820	14.5	7.5	1.552	1.405	1.394	1.552	0.014	5.0	76	0.826
?	1.001	2	3	0.868	15.3	10.4	1.405	1.515	1.405	1.515	0.030	5.0	91	0.932
?	1.002	3	70	0.758	13.4	25.8	1.515	1.591	1.515	1.591	0.115	5.0	150	0.772
?	1.003	70	4	0.872	61.6	25.8	1.586	1.606	1.586	1.606	0.115	5.0	135	0.833
✓	1.004	4	5	1.036	164.7	42.9	1.456	1.300	1.291	1.456	0.210	5.0	156	0.876
✓	1.005	5	6	1.045	166.2	49.6	1.300	1.225	1.218	1.300	0.247	5.0	168	0.918
?	1.006	6	7	0.998	158.8	53.6	1.225	1.065	1.062	1.225	0.269	5.0	180	0.904
?	1.007	7	8	1.053	167.5	58.5	1.065	1.080	1.065	1.080	0.296	5.0	183	0.963
?	1.008	8	9	1.009	160.5	67.9	1.080	0.887	0.887	1.080	0.348	5.0	204	0.969
?	1.009	9	10	0.826	14.6	67.9	1.187	1.492	1.168	1.492	0.348	5.0	150	0.841

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.010	10	71	2.500	0.600	11.235	11.220	0.015	166.7	150	7.49	50.0

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
? 1.010	10	71	0.775	13.7	67.9	1.492	1.476	1.476	1.492	0.348	5.0	150	0.790

Pipeline Schedule

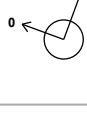
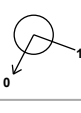
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	21.661	149.4	150	Circular_Default Sewer Type	13.692	11.990	1.552	13.400	11.845	1.405
1.001	16.669	133.4	150	Circular_Default Sewer Type	13.400	11.845	1.405	13.385	11.720	1.515
1.002	13.075	174.3	150	Circular_Default Sewer Type	13.385	11.720	1.515	13.386	11.645	1.591
1.003	6.425	321.3	300	Circular_Default Sewer Type	13.386	11.500	1.586	13.386	11.480	1.606
1.004	15.226	380.7	450	Circular_Default Sewer Type	13.386	11.480	1.456	13.190	11.440	1.300
1.005	5.609	373.9	450	Circular_Default Sewer Type	13.190	11.440	1.300	13.100	11.425	1.225
1.006	16.373	409.3	450	Circular_Default Sewer Type	13.100	11.425	1.225	12.900	11.385	1.065
1.007	5.523	368.2	450	Circular_Default Sewer Type	12.900	11.385	1.065	12.900	11.370	1.080
1.008	18.033	400.7	450	Circular_Default Sewer Type	12.900	11.370	1.080	12.662	11.325	0.887
1.009	13.256	147.3	150	Circular_Default Sewer Type	12.662	11.325	1.187	12.877	11.235	1.492
1.010	2.500	166.7	150	Circular_Default Sewer Type	12.877	11.235	1.492	12.846	11.220	1.476

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	450	Manhole	Adoptable	2	450	Manhole	Adoptable
1.001	2	450	Manhole	Adoptable	3	450	Manhole	Adoptable
1.002	3	450	Manhole	Adoptable	70	450	Manhole	Adoptable
1.003	70	450	Manhole	Adoptable	4	600	Manhole	Adoptable
1.004	4	600	Manhole	Adoptable	5	600	Manhole	Adoptable
1.005	5	600	Manhole	Adoptable	6	600	Manhole	Adoptable
1.006	6	600	Manhole	Adoptable	7	600	Manhole	Adoptable
1.007	7	600	Manhole	Adoptable	8	600	Manhole	Adoptable
1.008	8	600	Manhole	Adoptable	9	1200	Manhole	Adoptable
1.009	9	1200	Manhole	Adoptable	10	450	Manhole	Adoptable
1.010	10	450	Manhole	Adoptable	71	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	346255.952	387710.868	13.692	1.702	450		0	1.000	11.990	150
2	346248.652	387690.474	13.400	1.555	450		1	1.000	11.845	150
							0	1.001	11.845	150
3	346255.776	387675.404	13.385	1.665	450		1	1.001	11.720	150
							0	1.002	11.720	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
70	346251.276	387663.128	13.386	1.886	450		1	1.002	11.645	150
							0	1.003	11.500	300
4	346247.850	387653.790	13.386	1.906	600		1	1.003	11.480	300
							0	1.004	11.480	450
5	346243.822	387642.800	13.190	1.750	600		1	1.004	11.440	450
							0	1.005	11.440	450
6	346246.180	387637.711	13.100	1.675	600		1	1.005	11.425	450
							0	1.006	11.425	450
7	346240.543	387622.339	12.900	1.515	600		1	1.006	11.385	450
							0	1.007	11.385	450
8	346238.642	387617.154	12.900	1.530	600		1	1.007	11.370	450
							0	1.008	11.370	450
9	346232.434	387600.223	12.662	1.337	1200		1	1.008	11.325	450
							0	1.009	11.325	150
10	346219.988	387604.786	12.877	1.642	450		1	1.009	11.235	150
							0	1.010	11.235	150
71	346218.840	387602.565	12.846	1.626	1200		1	1.010	11.220	150

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	20.000	Starting Level (m)	
Ratio-R	0.400	Check Discharge Rate(s)	✓
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Node 9 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	11.325	Product Number	CTL-SHE-0119-7400-1500-7400
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	7.4	Min Node Diameter (mm)	1200

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	9

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	76.2	0.0	0.300	76.2	0.0	0.301	0.0	0.0

Node 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.685
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	1

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	216.6	0.0	0.300	216.6	0.0	0.301	0.0	0.0

Node 70 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	11.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	221.0	0.0	1.200	221.0	0.0	1.201	0.0	0.0

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.685
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1015.0	0.0	0.300	1015.0	0.0	0.301	0.0	0.0

Node 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.490
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	75

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	254.9	0.0	0.300	254.9	0.0	0.301	0.0	0.0

Node 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	103.0	0.0	0.300	103.0	0.0	0.301	0.0	0.0

Node 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	161.5	0.0	0.300	161.5	0.0	0.301	0.0	0.0

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	214.0	0.0	0.300	214.0	0.0	0.301	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC +10% A 15 minute summer	488.233	138.153
100 year +40% CC +10% A 15 minute winter	342.620	138.153
100 year +40% CC +10% A 30 minute summer	320.551	90.705
100 year +40% CC +10% A 30 minute winter	224.948	90.705
100 year +40% CC +10% A 60 minute summer	214.603	56.713
100 year +40% CC +10% A 60 minute winter	142.577	56.713
100 year +40% CC +10% A 120 minute summer	129.587	34.246
100 year +40% CC +10% A 120 minute winter	86.094	34.246
100 year +40% CC +10% A 180 minute summer	97.729	25.149
100 year +40% CC +10% A 180 minute winter	63.526	25.149
100 year +40% CC +10% A 240 minute summer	75.977	20.078
100 year +40% CC +10% A 240 minute winter	50.477	20.078
100 year +40% CC +10% A 360 minute summer	56.677	14.585
100 year +40% CC +10% A 360 minute winter	36.841	14.585
100 year +40% CC +10% A 480 minute summer	43.979	11.622
100 year +40% CC +10% A 480 minute winter	29.219	11.622
100 year +40% CC +10% A 600 minute summer	35.604	9.738
100 year +40% CC +10% A 600 minute winter	24.327	9.738
100 year +40% CC +10% A 720 minute summer	31.433	8.424
100 year +40% CC +10% A 720 minute winter	21.125	8.424
100 year +40% CC +10% A 960 minute summer	25.432	6.697
100 year +40% CC +10% A 960 minute winter	16.847	6.697
100 year +40% CC +10% A 1440 minute summer	18.055	4.839
100 year +40% CC +10% A 1440 minute winter	12.134	4.839

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 98.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	13.083	1.093	17.3	0.3715	0.0000	SURCHARGED
30 minute summer	2	23	12.947	1.102	27.9	6.0872	0.0000	SURCHARGED
30 minute summer	3	22	12.835	1.115	78.1	11.2279	0.0000	SURCHARGED
720 minute winter	70	705	12.660	1.160	19.9	243.7235	0.0000	SURCHARGED
720 minute winter	4	705	12.660	1.180	7.9	1.6267	0.0000	SURCHARGED
720 minute winter	5	705	12.660	1.220	8.6	13.9167	0.0000	SURCHARGED
720 minute winter	6	705	12.660	1.234	12.1	8.7400	0.0000	SURCHARGED
720 minute winter	7	705	12.659	1.274	9.8	15.4437	0.0000	FLOOD RISK
720 minute winter	8	705	12.659	1.289	10.0	20.6522	0.0000	FLOOD RISK
720 minute winter	9	705	12.659	1.334	8.0	1.5090	0.0000	FLOOD RISK
120 minute winter	10	50	11.324	0.089	7.4	0.0141	0.0000	OK
120 minute winter	71	50	11.298	0.078	7.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	16.1	0.917	1.114	0.3813	
30 minute summer	2	1.001	3	20.9	1.188	1.363	0.2935	
30 minute summer	3	1.002	70	43.2	2.452	3.222	0.2302	
720 minute winter	70	1.003	4	-7.8	0.511	-0.127	0.4524	
720 minute winter	4	1.004	5	7.2	0.446	0.044	2.4125	
720 minute winter	5	1.005	6	11.4	0.449	0.069	0.8887	
720 minute winter	6	1.006	7	8.2	0.404	0.052	2.5942	
720 minute winter	7	1.007	8	7.0	0.365	0.042	0.8751	
720 minute winter	8	1.008	9	8.0	0.244	0.050	2.8572	
720 minute winter	9	Hydro-Brake®	10	7.4				
120 minute winter	10	1.010	71	7.4	0.736	0.539	0.0251	137.2