

Leagram Mill Farm

Surface Water Calculations

Client: Zara Moon Architects
Author: Rizwan Shafiq
Date: 10/10/2025
Reference: 25039-PWA-00-XX-CA-3000

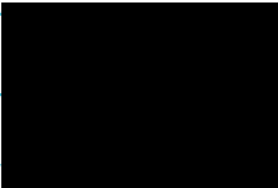
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Client: Zara Moon Architects
Project: Leagram Mill Farm
Report: Surface Water Calculations
Status: Preliminary
Reference: 25039-PWA-00-XX-CA-3000

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Prepared By	Rizwan Shafiq	
Approved By	Liam Steadman	

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25039-PWA-00-XX-CA-3000: Surface Water calculations Leagram Mill farm, Preston	Date: 08/10/2025		
	Designed by: RS	Checked by: LS	Approved By: LS
Report Details: Type: Stormwater Controls Storm Phase: Phase Flow Path: Flow Path	Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	116.000
Depth (m)	1.200
Base Level (m)	113.490
Number of Crates Long	6
Number of Crates Wide	10
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	35.510

25039-PWA-00-XX-CA-3000: Surface Water calculations Leagram Mill farm, Preston		Date: 08/10/2025		
		Designed by: RS	Checked by: LS	
		Approved By: LS		
Report Details: Type: Manhole Schedule Storm Phase: Phase Flow Path: Flow Path		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWMH03	115.300 114.700	Diameter / Length: 0.450					Manhole
E:363867.362 N:444118.840	0.600						
			{a} Pipe (3)	Pipe	114.700	Diam/Width:150	Not Applicable
SWMH04	115.500 114.649	Diameter / Length: 0.450	{1} Pipe (3)	Pipe	114.649	Diam/Width:150	Manhole
E:363866.066 N:444123.739	0.851						
			{a} Pipe (4)	Pipe	114.649	Diam/Width:150	Not Applicable
SWMH05	115.900 114.510	Diameter / Length: 0.450	{1} Pipe (1)	Pipe	114.510	Diam/Width:150	Manhole
E:363875.110 N:444133.917	1.390		{2} Pipe (4)	Pipe	114.510	Diam/Width:150	
			{a} Pipe (2)	Pipe	114.510	Diam/Width:150	Not Applicable
SWMH06	115.970 114.370	Diameter / Length: 0.450	{1} Pipe (2)	Pipe	114.370	Diam/Width:150	Manhole
E:363878.756 N:444141.895	1.600						
			{a} Pipe (5)	Pipe	114.370	Diam/Width:150	Not Applicable
SWMH07	116.000 113.470	Diameter / Length: 1.200	{1} Pipe (6)	Pipe	113.470	Diam/Width:150	Manhole
E:363893.102 N:444135.286	2.530						
			{a} Pipe (7)	Pipe	113.470	Diam/Width:150	Not Applicable

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Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
Manhole	116.000 113.384	Diameter / Length: 0.450	{1} Pipe (7)	Pipe	113.384	Diam/Width:150	Manhole
E:363898.209	2.616						
N:444142.146							

25039-PWA-00-XX-CA-3000: Surface Water calculations Leagram Mill farm, Preston		Date: 08/10/2025			
Report Details: Type: Inflow Summary Storm Phase: Phase Flow Path: Flow Path		Designed by: RS	Checked by: LS		
		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area (3)	SWMH03		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (2)	SWMH04		Time of Concentration	0.031	100	0	100	0.031
Branch: Pipe								
Catchment Area (6)	SWMH05		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (5)	SWMH06		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (4)	SWMH06		Time of Concentration	0.009	100	0	100	0.009
TOTAL		0.0		0.083				0.083

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Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	116.000
Depth (m)	1.200
Base Level (m)	113.490
Number of Crates Long	6
Number of Crates Wide	10
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	35.510

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Report Details: Type: Manhole Schedule Storm Phase: Phase Flow Path: Flow Path (1)		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWMH01	116.300 115.500	Diameter / Length: 0.450					Manhole
E:363852.267 N:444137.913	0.800						
			{a} Pipe	Pipe	115.500	Diam/Width:150	Not Applicable
SWMH02	116.000 115.252	Diameter / Length: 0.450	{1} Pipe	Pipe	115.252	Diam/Width:150	Manhole
E:363861.352 N:444133.900	0.748						
			{a} Pipe (1)	Pipe	115.252	Diam/Width:150	Not Applicable
SWMH05	115.900 114.510	Diameter / Length: 0.450	{1} Pipe (1)	Pipe	114.510	Diam/Width:150	Manhole
E:363875.110 N:444133.917	1.390		{2} Pipe (4)	Pipe	114.510	Diam/Width:150	
			{a} Pipe (2)	Pipe	114.510	Diam/Width:150	Not Applicable
SWMH06	115.970 114.370	Diameter / Length: 0.450	{1} Pipe (2)	Pipe	114.370	Diam/Width:150	Manhole
E:363878.756 N:444141.895	1.600						
			{a} Pipe (5)	Pipe	114.370	Diam/Width:150	Not Applicable

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Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Branch: Pipe (3)								
Catchment Area (3)	SWMH03		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (2)	SWMH04		Time of Concentration	0.031	100	0	100	0.031
Catchment Area (6)	SWMH05		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (5)	SWMH06		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (4)	SWMH06		Time of Concentration	0.009	100	0	100	0.009
TOTAL		0.0		0.083				0.083

25039-PWA-00-XX-CA-3000: Surface Water calculations Leagram Mill farm, Preston	Date: 08/10/2025		
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Report Details: Type: Network Design Criteria Storm Phase: Phase	Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Flow Path	Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH03	FSR: 1 years: +0 %: 15 mins: Winter	115.300	114.700	114.726	0.026	1.2	0.004	0.000	1.2	0.550	OK
SWMH04	FSR: 1 years: +0 %: 15 mins: Winter	115.500	114.649	114.704	0.055	4.9	0.009	0.000	4.8	2.276	OK
SWMH05	FSR: 1 years: +0 %: 15 mins: Winter	115.900	114.510	114.566	0.056	5.9	0.009	0.000	5.7	2.814	OK
SWMH06	FSR: 1 years: +0 %: 15 mins: Winter	115.970	114.370	114.411	0.041	9.7	0.006	0.000	9.7	4.664	OK
SWMH07	FSR: 1 years: +0 %: 60 mins: Winter	116.000	113.470	113.647	0.177	2.0	0.200	0.000	1.9	7.505	Surcharged
Manhole	FSR: 1 years: +0 %: 60 mins: Winter	116.000	113.384	113.417	0.033	1.9	0.000	0.000	1.9	7.488	OK

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FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH03	FSR: 30 years: +40 %: 15 mins: Winter	115.300	114.700	114.779	0.079	4.1	0.013	0.000	3.8	1.897	OK
SWMH04	FSR: 30 years: +40 %: 15 mins: Winter	115.500	114.649	114.774	0.125	16.6	0.020	0.000	16.1	7.835	OK
SWMH05	FSR: 30 years: +40 %: 15 mins: Winter	115.900	114.510	114.630	0.120	20.1	0.019	0.000	19.5	9.685	OK
SWMH06	FSR: 30 years: +40 %: 15 mins: Winter	115.970	114.370	114.450	0.080	33.2	0.013	0.000	33.1	16.021	OK
SWMH07	FSR: 30 years: +40 %: 120 mins: Winter	116.000	113.470	114.294	0.824	2.5	0.932	0.000	2.1	24.633	Surcharged
Manhole	FSR: 30 years: +40 %: 120 mins: Summer	116.000	113.384	113.419	0.035	2.1	0.000	0.000	2.1	24.389	OK

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FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH03	FSR: 100 years: +50 %: 15 mins: Winter	115.300	114.700	114.881	0.181	5.7	0.029	0.000	3.8	2.621	Surcharged
SWMH04	FSR: 100 years: +50 %: 15 mins: Winter	115.500	114.649	114.878	0.229	21.5	0.036	0.000	19.7	10.836	Surcharged
SWMH05	FSR: 100 years: +50 %: 120 mins: Winter	115.900	114.510	114.703	0.193	10.1	0.031	0.000	10.1	29.632	Surcharged
SWMH06	FSR: 100 years: +50 %: 120 mins: Winter	115.970	114.370	114.703	0.333	16.8	0.053	0.000	16.8	49.091	Surcharged
SWMH07	FSR: 100 years: +50 %: 120 mins: Winter	116.000	113.470	114.700	1.230	2.6	1.391	0.000	2.3	27.366	Surcharged
Manhole	FSR: 100 years: +50 %: 120 mins: Winter	116.000	113.384	113.421	0.036	2.3	0.000	0.000	2.3	27.326	OK

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FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 1 years: +0 %: 60 mins: Winter	113.648	113.648	0.158	0.158	5.3	4.491	0.000	0.000	2.0	7.555	87.354	OK

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FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 30 years: +40 %: 120 mins: Winter	114.295	114.295	0.805	0.805	11.9	22.938	0.000	0.000	2.5	25.069	35.403	OK

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**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By:
Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +50 %: 120 mins: Winter	114.701	114.701	1.211	1.211	16.8	34.221	0.000	0.000	2.6	28.255	3.631	OK

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Report Details: Type: Junctions Summary Storm Phase: Phase Flow Path: Flow Path (1)		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 1 years: +0 %: 15 mins: Summer	116.300	115.500	115.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH02	FSR: 1 years: +0 %: 15 mins: Summer	116.000	115.252	115.252	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH05	FSR: 1 years: +0 %: 15 mins: Winter	115.900	114.510	114.566	0.056	5.9	0.009	0.000	5.7	2.814	OK
SWMH06	FSR: 1 years: +0 %: 15 mins: Winter	115.970	114.370	114.411	0.041	9.7	0.006	0.000	9.7	4.664	OK

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FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 30 years: +40 %: 15 mins: Summer	116.300	115.500	115.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH02	FSR: 30 years: +40 %: 15 mins: Summer	116.000	115.252	115.252	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH05	FSR: 30 years: +40 %: 15 mins: Winter	115.900	114.510	114.630	0.120	20.1	0.019	0.000	19.5	9.685	OK
SWMH06	FSR: 30 years: +40 %: 15 mins: Winter	115.970	114.370	114.450	0.080	33.2	0.013	0.000	33.1	16.021	OK

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FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 100 years: +50 %: 15 mins: Summer	116.300	115.500	115.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH02	FSR: 100 years: +50 %: 15 mins: Summer	116.000	115.252	115.252	0.000	0.0	0.000	0.000	0.0	0.000	OK
SWMH05	FSR: 100 years: +50 %: 120 mins: Winter	115.900	114.510	114.703	0.193	10.1	0.031	0.000	10.1	29.632	Surcharged
SWMH06	FSR: 100 years: +50 %: 120 mins: Winter	115.970	114.370	114.703	0.333	16.8	0.053	0.000	16.8	49.091	Surcharged

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Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 1 years: +0 %: 60 mins: Winter	113.648	113.648	0.158	0.158	5.3	4.491	0.000	0.000	2.0	7.555	87.354	OK

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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase Flow Path: Flow Path (1)		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW			



FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 30 years: +40 %: 120 mins: Winter	114.295	114.295	0.805	0.805	11.9	22.938	0.000	0.000	2.5	25.069	35.403	OK

25039-PWA-00-XX-CA-3000: Surface Water calculations Leagram Mill farm, Preston		Date: 08/10/2025		
		Designed by: RS	Checked by: LS	
		Approved By: LS		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase Flow Path: Flow Path (1)		Company details: PWA Consulting engineers Summit House, Riparian Way BD20 7BW		



**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By:
Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +50 %: 120 mins: Winter	114.701	114.701	1.211	1.211	16.8	34.221	0.000	0.000	2.6	28.255	3.631	OK

End of Report