

Client:

Project: B234025_The Christie CT Redevelopment

Location: Manchester, M20 4BX

Roof Location: Level 4 Main Blue Roof (Opt.1)

Roof Details:

BlueRoof1325 m²x 100 %

Additional Catchment721 m²x 100 %

Effective Area2046 m²

Storage Details:

Area1325 m²

Depth100 mm

Porosity95 %

Slopenone

Rainfall Details - FEH Method:

Return Period100 years

Climate Change Factor45 %

Summer Storm Profile

Duration	Intensity	Required storage(m³)
	mmmm/h	
5 min	21.5258.1	43.1
10 min	31.4188.4	62.1
15 min	39.2156.7	76.6
30 min	52.0104.1	98.4
45 min	59.979.8	109.7
60 min	65.965.9	117.3
2 hours	78.139.0	123.1
6 hours	98.516.4	114.9
24 hours	129.25.4	69.2
48 hours	149.13.1	37.6

Outflow Details:

Attenuation ControlBlueRoof Outlet

ControlTwist Std. Position 4.5

Sump DepthNone

Discharge rate7.57 l/s

Outlet2 No

Flow Per Outlet3.78 l/s

Emergency overflows are required. See calculation in Red below

Result:

OutcomePass

Critical Storm Duration2 hrs

Hmax98 mm

Required Volume123.1 m³

Time to half empty2.3 hrs

Roof Loading*92.91 Kg/m²

The roof loading refers only to the weight of water on the roof.

Industry best practices recommend the provision of a minimum of two outlets per roof area. Where a single blue roof outlet is specified a second overflow only outlet should be installed.

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product. Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. Please NOTE: the overflows are designed to ensure the roof cannot be overloaded in an exceedance event. The overflows will require a head of water to achieve the required discharge rate (typically 35mm). This additional height of water and load should be allowed for.

Emergency Overflow requirement (in accordance with BSEN12056-3:2000, CAT 1 storm):

Total overflow discharge: 2046m2 x 0.018l/s/m2 = 36.8l/s.

(This would require 7no. additional DN70 outlets set at Hmax. Max capacity of overflows: 1.9l/s x 2no. (integrated) + 5.4l/s x 7no. (dedicated) = 41.6l/s).

Client:

Project: B234025_The Christie CT Redevelopment

Location: Manchester, M20 4BX

Roof Location: Level 4 Main Blue Roof (Opt.1)

Roof Details:

BlueRoof1325 m²x 100 %

Additional Catchment721 m²x 100 %

Effective Area2046 m²

Storage Details:

Area1325 m²

Depth100 mm

Porosity95 %

Slopenone

Rainfall Details - FEH Method:

Return Period1 years

Climate Change Factor0 %

Summer Storm Profile

Duration	Intensity		Required storage(m ³)
	mm	mm/h	
5 min	2.5	29.6	5.0
10 min	3.4	20.5	6.7
15 min	4.1	16.5	7.9
30 min	5.4	10.7	9.4
45 min	6.1	8.2	10.0
60 min	6.7	6.7	10.3
2 hours	9.2	4.6	12.1
6 hours	14.2	2.4	12.5
24 hours	23.0	1.0	9.4
48 hours	29.3	0.6	7.7

Outflow Details:

Attenuation ControlBlueRoof Outlet

ControlTwist Std. Position 4.5

Sump DepthNone

Discharge rate2.86 l/s

Outlet2 No

Flow Per Outlet1.43 l/s

Emergency overflows are required. See calculation in Red below

Result:

OutcomePass

Critical Storm Duration4 hrs

Hmax10 mm

Required Volume12.8 m³

Time to half empty37.3 min

Roof Loading*9.66 Kg/m²

The roof loading refers only to the weight of water on the roof.

Industry best practices recommend the provision of a minimum of two outlets per roof area. Where a single blue roof outlet is specified a second overflow only outlet should be installed.

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product. Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissionsor otherwise arising therefrom.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. Please NOTE: the overflows are designed to ensure the roof cannot be overloaded in an exceedance event. The overflows will require a head of water to achieve the required discharge rate (typically 35mm). This additional height of water and load should be allowed for.

Client:

Project: B234025_The Christie CT Redevelopment

Location: Manchester, M20 4BX

Roof Location: Level 4 Main Blue Roof (Opt.2)

Roof Details:

BlueRoof1325 m²x 100 %

Additional Catchment721 m²x 100 %

Effective Area2046 m²

Storage Details:

Area1325 m²

Depth130 mm

Porosity95 %

Slopenone

Rainfall Details - FEH Method:

Return Period100 years

Climate Change Factor45 %

Summer Storm Profile

Duration	Intensity	Required storage(m ³)
	mmmm/h	
5 min	21.5258.1	43.7
10 min	31.4188.4	63.5
15 min	39.2156.7	79.0
30 min	52.0104.1	103.8
45 min	59.979.8	118.2
60 min	65.965.9	129.0
2 hours	78.139.0	147.1
6 hours	98.516.4	161.4
24 hours	129.25.4	143.1
48 hours	149.13.1	119.0

Outflow Details:

Attenuation ControlBlueRoof Outlet

ControlTwist Std. Position 1.5

Sump DepthNone

Discharge rate2.71 l/s

Outlet2 No

Flow Per Outlet1.36 l/s

Emergency overflows are required. See calculation in Red below

Result:

OutcomePass

Critical Storm Duration5.87 hrs

Hmax128 mm

Required Volume161.4 m³

Time to half empty8.3 hrs

Roof Loading*121.81 Kg/m²

The roof loading refers only to the weight of water on the roof.

Industry best practices recommend the provision of a minimum of two outlets per roof area. Where a single blue roof outlet is specified a second overflow only outlet should be installed.

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product. Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. Please NOTE: the overflows are designed to ensure the roof cannot be overloaded in an exceedance event. The overflows will require a head of water to achieve the required discharge rate (typically 35mm). This additional height of water and load should be allowed for.

Emergency Overflow requirement (in accordance with BSEN12056-3:2000, CAT 1 storm):

Total overflow discharge: 2046m² x 0.018l/s/m² = 36.8l/s.

(This would require 7no. additional DN70 outlets set at Hmax. Max capacity of overflows: 1.9l/s x 2no. (integrated) + 5.4l/s x 7no. (dedicated) = 41.6l/s).

Client:

Project: B234025_The Christie CT Redevelopment

Location: Manchester, M20 4BX

Roof Location: Level 4 Main Blue Roof (Opt.2)

Roof Details:

BlueRoof1325 m²x 100 %

Additional Catchment721 m²x 100 %

Effective Area2046 m²

Storage Details:

Area1325 m²

Depth130 mm

Porosity95 %

Slopenone

Rainfall Details - FEH Method:

Return Period1 years

Climate Change Factor0 %

Summer Storm Profile

Duration	Intensity		Required storage(m ³)
	mm	mm/h	
5 min	2.5	29.6	5.0
10 min	3.4	20.5	6.8
15 min	4.1	16.5	8.2
30 min	5.4	10.7	10.2
45 min	6.1	8.2	11.3
60 min	6.7	6.7	11.8
2 hours	9.2	4.6	14.5
6 hours	14.2	2.4	17.5
24 hours	23.0	1.0	15.4
48 hours	29.3	0.6	12.3

Outflow Details:

Attenuation ControlBlueRoof Outlet

ControlTwist Std. Position 1.5

Sump DepthNone

Discharge rate1.35 l/s

Outlet2 No

Flow Per Outlet0.67 l/s

Emergency overflows are required. See calculation in Red below

Result:

OutcomePass

Critical Storm Duration8.17 hrs

Hmax14 mm

Required Volume17.7 m³

Time to half empty1.8 hrs

Roof Loading*13.36 Kg/m²

The roof loading refers only to the weight of water on the roof.

Industry best practices recommend the provision of a minimum of two outlets per roof area. Where a single blue roof outlet is specified a second overflow only outlet should be installed.

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product. Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissionsor otherwise arising therefrom.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. Please NOTE: the overflows are designed to ensure the roof cannot be overloaded in an exceedance event. The overflows will require a head of water to achieve the required discharge rate (typically 35mm). This additional height of water and load should be allowed for.