

Appendix B

B.1 Critical Storm Calculation

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 156985, Northing: 157075,

DURATION	Interval		Years										
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.8,	3.9,	4.6,	5.5,	6.2,	6.7,	8.4,	10.3,	11.6,	13.4,	15.0,	16.2,	17.0,
10 mins	3.9,	5.5,	6.4,	7.7,	8.6,	9.3,	11.7,	14.3,	16.1,	18.6,	20.8,	22.6,	23.8,
15 mins	4.5,	6.5,	7.5,	9.1,	10.2,	11.0,	13.7,	16.9,	19.0,	21.9,	24.5,	26.6,	27.9,
30 mins	5.9,	8.2,	9.4,	11.3,	12.5,	13.5,	16.7,	20.2,	22.6,	25.9,	28.8,	31.0,	32.5,
1 hours	7.6,	10.4,	11.9,	14.0,	15.5,	16.6,	20.2,	24.3,	26.9,	30.6,	33.8,	36.3,	37.9,
2 hours	9.8,	13.2,	14.9,	17.5,	19.1,	20.4,	24.6,	29.1,	32.0,	36.1,	39.6,	42.4,	44.2,
3 hours	11.4,	15.1,	17.1,	19.8,	21.7,	23.1,	27.5,	32.4,	35.5,	39.8,	43.5,	46.4,	48.3,
4 hours	12.7,	16.7,	18.8,	21.7,	23.6,	25.1,	29.8,	34.9,	38.2,	42.7,	46.5,	49.5,	51.4,
6 hours	14.8,	19.2,	21.4,	24.7,	26.8,	28.4,	33.4,	38.8,	42.3,	47.0,	51.1,	54.2,	56.2,
9 hours	17.2,	22.1,	24.5,	28.0,	30.3,	32.0,	37.4,	43.2,	46.9,	51.8,	56.1,	59.4,	61.5,
12 hours	19.2,	24.4,	26.9,	30.7,	33.0,	34.9,	40.5,	46.6,	50.4,	55.5,	60.0,	63.3,	65.5,
18 hours	22.3,	28.0,	30.8,	34.8,	37.4,	39.3,	45.4,	51.8,	55.8,	61.2,	65.9,	69.3,	71.6,
24 hours	24.8,	30.9,	33.9,	38.1,	40.8,	42.9,	49.2,	55.9,	60.0,	65.6,	70.4,	74.0,	76.3,
2 days	31.8,	38.8,	42.2,	47.0,	50.1,	52.3,	59.4,	66.7,	71.2,	77.2,	82.3,	86.1,	88.6,
3 days	37.9,	45.7,	49.5,	54.8,	58.2,	60.7,	68.3,	76.2,	81.1,	87.5,	93.0,	97.0,	99.7,
4 days	43.5,	52.1,	56.2,	61.9,	65.6,	68.3,	76.5,	84.9,	90.1,	97.0,	102.8,	107.1,	109.9,
6 days	53.8,	63.7,	68.5,	75.0,	79.1,	82.2,	91.5,	100.9,	106.7,	114.3,	120.7,	125.4,	128.5,
8 days	63.5,	74.6,	79.9,	87.1,	91.7,	95.0,	105.2,	115.6,	121.9,	130.2,	137.1,	142.2,	145.5,
10 days	72.7,	84.9,	90.7,	98.6,	103.6,	107.2,	118.3,	129.4,	136.2,	145.1,	152.5,	158.0,	161.5,
12 days	81.6,	94.9,	101.1,	109.7,	115.0,	118.9,	130.7,	142.7,	149.9,	159.4,	167.2,	173.0,	176.8,
16 days	99.0,	114.1,	121.2,	130.9,	136.9,	141.3,	154.6,	167.9,	176.0,	186.5,	195.2,	201.6,	205.7,
20 days	115.8,	132.7,	140.6,	151.3,	157.9,	162.8,	177.4,	192.0,	200.8,	212.3,	221.8,	228.7,	233.2,
25 days	136.4,	155.4,	164.2,	176.1,	183.5,	188.9,	205.0,	221.1,	230.8,	243.4,	253.7,	261.3,	266.2,

Add 30% CC = 70.46
Add 10% Urban Creep =
77.53mm - Critical Rainfall Depth

NOTES:

These values are derived from a Depth Duration Frequency (DDF) Model update 2023

For details refer to:

'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',

Available for download at:

<http://hdl.handle.net/2262/102417>

B.2 Zone 1 & 2 Delineated



ARUP

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Status	A2 - Issued for Planning		
Job Title	Cleaves Riverside Quarter Masterplan		
Drawing Title	Zone 1 and 2 Deliniation		
Scales	N/A	File Ref.	
Dwn	JL	Date	03/09/2025
		Chk'd	AS
Job No.	277975-00	Sketch No.	
		Rev.	4

Legend:

Zone 1 Catchments

Zone 2 Catchments

Red Line Boundary

B.3 Zone 1 SuDS Catchments



- Legend:**
- Hard Standing Concrete
 - Gravel
 - Porous Parking Trafficked
 - Hard Standing Roof
 - Green Space
 - Roads Hard Trafficked
 - Rain Garden
 - Permeable Paving
 - Temporary Green Space
 - Tree Pit
 - Grassed Area
 - Green Roof
 - Raised Planter
 - Safety Surface
 - Red Line Boundary
 - Site Catchment Boundary

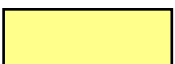
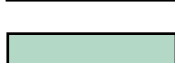
ARUP

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Status	A2 - Issued for Planning		
Job Title	Cleeves Riverside Quarter Masterplan		
Drawing Title	Catchments on Shipyard, The Flaxmill Plaza & O'Callaghan Strand		
Scales	N/A	File Ref.	
Drm	JL	Date	03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No.	Rev. 4



Legend:

- | | |
|---|---------------------------|
|  | Hard Standing Concrete |
|  | Gravel |
|  | Porous Parking Trafficked |
|  | Hard Standing Roof |
|  | Green Space |
|  | Roads Hard Trafficked |
|  | Rain Garden |
|  | Permeable Paving |
|  | Temporary Green Space |
|  | Tree Pit |
|  | Grassed Area |
|  | Green Roof |
|  | Raised Planter |
|  | Safety Surface |
|  | Red Line Boundary |
|  | Site Catchment Boundary |

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Status	A2 - Issued for Planning
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Job Title	Cleeves Riverside Quarter Masterplan
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Drawing Title	Catchments on Stonetown Terrace & PBSA
---------------	--

Scales	N/A
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File
Ref

Drn **JL** Date **03/09/2025** Chk'd **AS**

Job No. 277975-00

	Sketch No.
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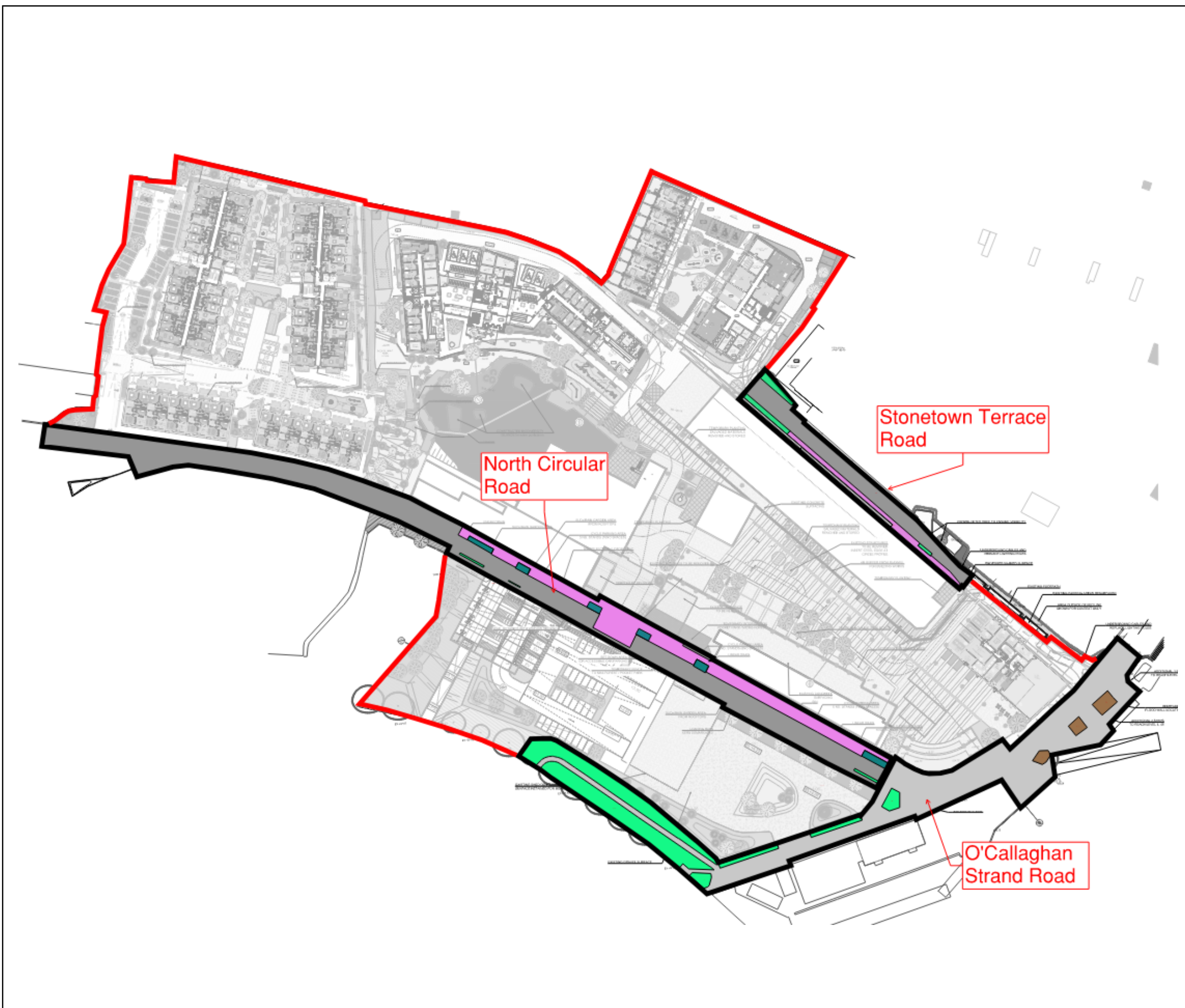
Rev. 4



- Legend:**
- Hard Standing Concrete
 - Gravel
 - Porous Parking Trafficked
 - Hard Standing Roof
 - Green Space
 - Roads Hard Trafficked
 - Rain Garden
 - Permeable Paving
 - Temporary Green Space
 - Tree Pit
 - Grassed Area
 - Green Roof
 - Raised Planter
 - Safety Surface
 - Red Line Boundary
 - Site Catchment Boundary

50 Ringsend Road, Dublin 4		
Tel: +353(0)1 233 4455		
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Status	A2 - Issued for Planning	
Job Title	Cleeves Riverside Quarter Masterplan	
Drawing Title	Catchments on Salesians	
Scales	N/A	File Ref.
Drn	JL	Date 03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No. Rev. 4

B.4 Zone 2 SuDS Catchments



- Legend:**
- Hard Standing Concrete
 - Hard Standing Roof
 - Roads Hard Trafficked
 - Gravel
 - Green Space
 - Temporary Green Space
 - Grassed Area
 - Safety Surface
 - Rain Garden
 - Permeable Paving
 - Tree Pit
 - Green Roof
 - Raised Planter
 - Porous Parking Trafficked
 - Swale
 - Red Line Boundary
 - Site Catchment Boundary

ARUP		50 Ringsend Road, Dublin 4	
		Tel: +353(0)1 233 4455	
		Fax: +353(0)1 668 3169	
Status	A2 - Issued for Planning		
Job Title	Cleeves Riverside Quarter Masterplan		
Drawing Title	Catchments on O'Callaghan Strand, Stonetown & North Circular Roads		
Scales	N/A	File Ref.	
Drm	JL	Date	03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No.	Rev. 4

B.5 Qbar Calculation

CALCULATION SHEET		Ref No.	1
Project	Cleeves Riverside Quarter	Sheet No.	1 of 1
Element	Greenfield runoff estimation and attenuation tank sizing	Designer.	AS
		Date	19/08/2025

Designed in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS)

Runoff Estimation

$Q_{bar} = 0.00108 * (AREA)^{0.89} * (SAAR)^{1.17} * (SOIL)^{2.17}$
 SAAR = 720 Taken from Met Eireann records
 SOIL = 0.3 Soil type 2 Taken from the winter rain acceptance potential map
 take 0.3

AREA $1km^2 = 100 \text{ ha}$
 $1 \text{ ha} = 10,000m^2$

*Note: Q_{bar} formula only suitable for sites greater than / equal to 50 hectares

Total Site Area	5.099	Hectares
Take	50	Hectares
	0.50	km ²
*Qbar	0.094	(m ³ /s)

** Note min allowable runoff per site is 2 l/s/ha

Area	Area	Calc. Allowable	Calc. Allowable	Calc. Allowable	**Actual	Actual
Reference		Runoff	Runoff	Runoff	Allowable runoff	Allowable runoff
	(ha)	(m ³ /s)	(l/s)	(l/s/ha)	(l/s/ha)	(l/s)
Site	5.10	0.00960	9.604	1.884	2.000	10.198

T	Multiplier	Flow
1	0.85	1.700
2	0.92	1.840
10	1.67	3.340
20	1.96	3.920
30	2.10	4.200
50	2.33	4.660
100	2.60	5.200

	Flow	Storage	Cumulative Storage
1 Yr Throttle	1.700	-1	-1
30 - 1Yr Throttle	2.220	532	531
100 - 30 Yr Throttle	1.280	3613	4144

****Note Multiplier taken from GSDSDS Appendix C

```

graph LR
    A([Development site]) --- B[ ]
    B --- C[1 Year throttle]
    B --- D[30 - 1Year Throttle]
    B --- E[100 - 30]
    style B width:0px,height:0px
    
```

CALCULATION SHEET		Ref No.	1
Project	Cleeves Riverside Quarter	Sheet No.	1 of 1
Element	Greenfield runoff estimation and attenuation tank sizing	Designer.	AS
		Date	19/08/2025

Designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS)

Runoff Estimation

$Q_{bar} = 0.00108 * (AREA)^{0.89} * (SAAR)^{1.17} * (SOIL)^{2.17}$

SAAR = 720 Taken from Met Eireann records

SOIL = 0.3 Soil type 2 Taken from the winter rain acceptance potential map
 take 0.3

AREA $1km^2 = 100 \text{ ha}$
 $1 \text{ ha} = 10,000m^2$

*Note: Q_{bar} formula only suitable for sites greater than / equal to 50 hectares

Total Site Area	4.438	Hectares
Take	50	Hectares
	0.50	km ²
*Qbar	0.094	(m ³ /s)

** Note min allowable runoff per site is 2 l/s/ha

Area	Area	Calc. Allowable	Calc. Allowable	Calc. Allowable	**Actual	Actual
Reference		Runoff	Runoff	Runoff	Allowable runoff	Allowable runoff
	(ha)	(m ³ /s)	(l/s)	(l/s/ha)	(l/s/ha)	(l/s)
Site	4.44	0.00836	8.359	1.884	2.000	8.876

	Flow	Storage	Cumulative Storage
1 Yr Throttle	1.700	-1	-1
30 - 1Yr Throttle	2.220	466	465
100 - 30 Yr Throttle	1.280	3679	4144

T	Multiplier	Flow
1	0.85	1.700
2	0.92	1.840
10	1.67	3.340
20	1.96	3.920
30	2.10	4.200
50	2.33	4.660
100	2.60	5.200

****Note Multiplier taken from GDSDS Appendix C

```

graph LR
    A([Development site]) --- B[ ]
    B --- C[1 Year throttle]
    B --- D[30 - 1Year Throttle]
    B --- E[100 - 30]
    style B width:0px,height:0px
  
```

CALCULATION SHEET		Ref No.	1
Project	Cleeves Riverside Quarter	Sheet No.	1 of 1
Element	Greenfield runoff estimation and attenuation tank sizing	Designer.	AS
		Date	19/08/2025

Designed in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS)

Runoff Estimation

$Q_{bar} = 0.00108 * (AREA)^{0.89} * (SAAR)^{1.17} * (SOIL)^{2.17}$

SAAR = 720 Taken from Met Eireann records

SOIL = 0.3 Soil type 2 Taken from the winter rain acceptance potential map
take 0.3

AREA $1km^2 = 100 \text{ ha}$
 $1 \text{ ha} = 10,000m^2$

*Note: Q_{bar} formula only suitable for sites greater than / equal to 50 hectares

Total Site Area	0.732	Hectares
Take	50	Hectares
	0.50	km ²
*Qbar	0.094	(m ³ /s)

** Note min allowable runoff per site is 2 l/s/ha

Area	Area	Calc. Allowable	Calc. Allowable	Calc. Allowable	**Actual	Actual
Reference		Runoff	Runoff	Runoff	Allowable runoff	Allowable runoff
	(ha)	(m ³ /s)	(l/s)	(l/s/ha)	(l/s/ha)	(l/s)
Site	0.73	0.00138	1.379	1.884	2.000	1.464

T	Multiplier	Flow
1	0.85	1.700
2	0.92	1.840
10	1.67	3.340
20	1.96	3.920
30	2.10	4.200
50	2.33	4.660
100	2.60	5.200

	Flow	Storage	Cumulative Storage
1 Yr Throttle	1.700	2	2
30 - 1Yr Throttle	2.220	90	92
100 - 30 Yr Throttle	1.280	4052	4144

****Note Multiplier taken from GSDSDS Appendix C

```

graph LR
    A([Development site]) --- B[ ]
    B --- C[1 Year throttle]
    B --- D[30 - 1Year Throttle]
    B --- E[100 - 30]
    style B width:0px,height:0px
    
```


B.6 Zone 1 runoff volumes and destinations

Cleeves Catchment SuDS volumes

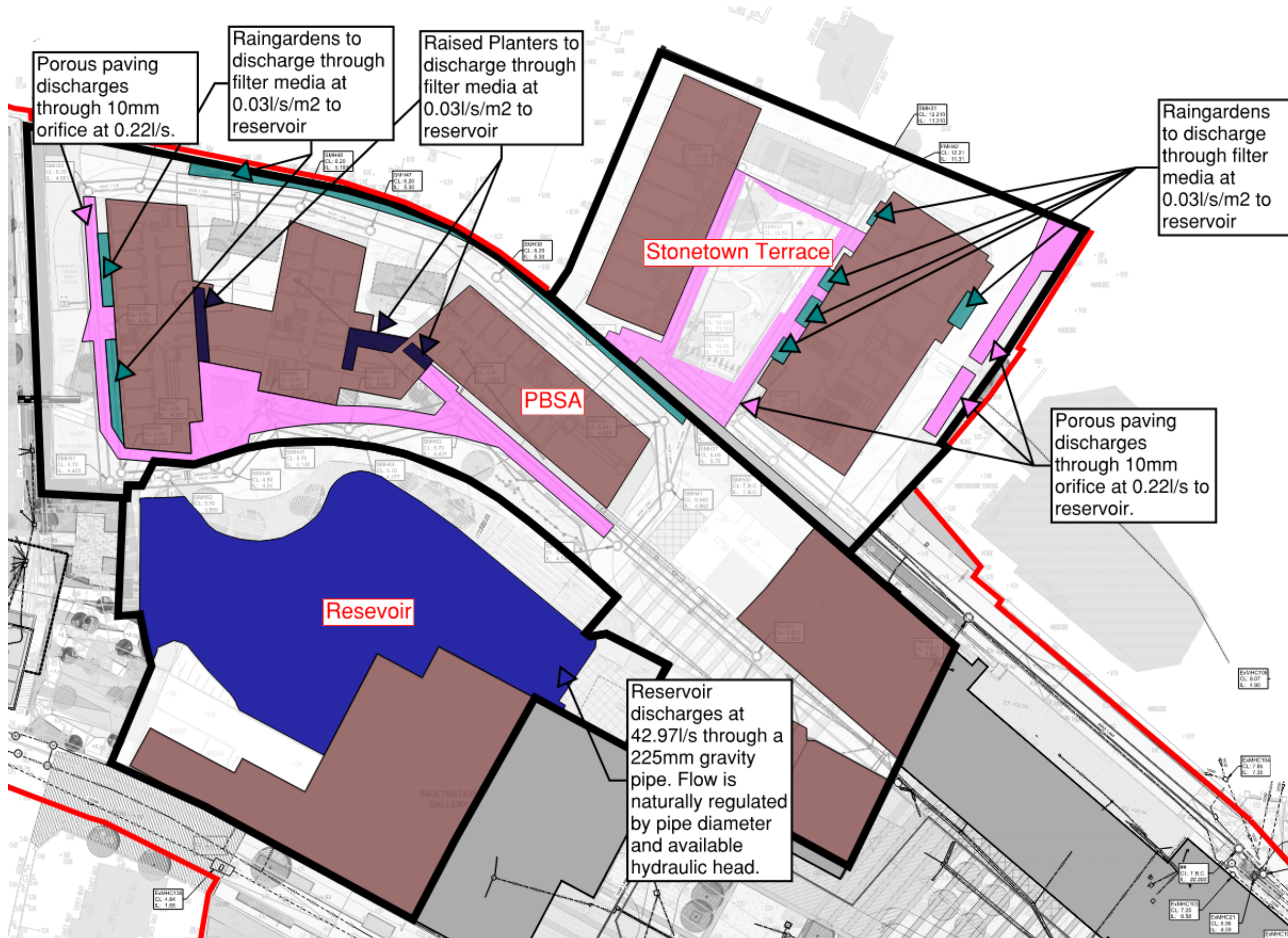
Site	Catchment	Zone	Details	Rainfall depth	Area	Destination	Rainfall volume	Runoff factor	Runoff volume	Discharge Rate	Controlled Discharge Rate after SuDS	Runoff destination (m3)								
				mm	m2	Zone Name	m3	C Coeff	m3	l/s	l/s	Attenuated on-site	Raingarden/Planters /Raised Garden /Tree Pits	Swale	Porous Paving	Reservoir	Existing Network			
Salesians	Catchment 1: Surface Network	GS43	Green space	77.53	103.5	Reservoir	8.0	0.2	1.6	0.4	0.4	6.4					1.6	0.0		
		GS44	Green space	77.53	3.5	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2					0.1	0.0		
		GS46	Green space	77.53	147.9	Reservoir	11.5	0.2	2.3	0.6	0.6	9.2					2.3	0.0		
		GS47	Green space	77.53	46.2	Reservoir	3.6	0.2	0.7	0.2	0.2	2.9					0.7	0.0		
		GS48	Green space	77.53	7.5	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5					0.1	0.0		
		GS49	Green space	77.53	23.7	Reservoir	1.8	0.2	0.4	0.1	0.1	1.5					0.4	0.0		
		GS50	Green space	77.53	9.6	Reservoir	0.7	0.2	0.1	0.0	0.0	0.6					0.1	0.0		
		GS51	Green space	77.53	7.3	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5					0.1	0.0		
		GS52	Green space	77.53	7.3	Reservoir	0.6	0.2	0.1	0.0	0.0	0.4					0.1	0.0		
		GS53	Green space	77.53	7.3	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5					0.1	0.0		
		GS54	Green space	77.53	7.4	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5					0.1	0.0		
		GS90	Green space	77.53	14.9	Reservoir	1.2	0.2	0.2	0.1	0.1	0.9					0.2	0.0		
		GS91	Green space	77.53	10.5	Reservoir	0.8	0.2	0.2	0.0	0.0	0.7					0.2	0.0		
		GS92	Green space	77.53	14.9	Reservoir	1.2	0.2	0.2	0.1	0.1	0.9					0.2	0.0		
		RG26	Rain garden	77.53	10.6	RG26	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0	
		RG27	Rain garden	77.53	10.8	RG27	0.8	0.7	0.6	0.2	0.3	0.3	0.6						0.0	
		RG28	Rain garden	77.53	10.6	RG28	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0	
		RG34	Rain garden	77.53	10.4	RG27	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0	
		RG35	Rain garden	77.53	9.5	RG28	0.7	0.7	0.5	0.1	0.3	0.2	0.5						0.0	
		RG29	Rain garden	77.53	53.6	RG29	4.2	0.7	2.9	0.8	1.6	1.2	2.9						0.0	
		G3	Gravel	77.53	63.3	Reservoir	4.9	0.8	3.9	1.1	1.1	1.0						3.9	0.0	
		G4	Gravel	77.53	140.9	Reservoir	10.9	0.8	8.7	2.4	2.4	2.2						8.7	0.0	
		G6	Gravel	77.53	97.3	Reservoir	7.5	0.8	6.0	1.7	1.7	1.5						6.0	0.0	
		G7	Gravel	77.53	10.2	Reservoir	0.8	0.8	0.6	0.2	0.2	0.2						0.6	0.0	
		H8.1	Hard	77.53	619.6	RG29	48.0	1	48.0	13.4	N/A	0.0	48.0						0.0	
		H8.2	Hard	77.53	170.9	Reservoir	13.3	1	13.3	3.7	3.7	0.0						13.3	0.0	
		GR5	Green Roof	77.53	339.5	Reservoir	26.3	0.6	15.8	4.4	4.4	10.5							15.8	0.0
		SS4	Safety Surfacing	77.53	83.9	Reservoir	6.5	0.7	4.6	1.3	1.3	2.0							4.6	0.0
		CHS7	Concrete Hard Standing	77.53	607.9	Reservoir	47.1	1	47.1	13.1	13.1	0.0							47.1	0.0
		Total for Catchment 1 Salesians					2650.0		205.5		160.2	44.5	32.8	45.3	53.8	0.0	0.0		106.4	0.0
		Catchment 2: Underground Network - N	H9	Hard	77.53	1032.5	RG29/RG30	80.1	1	80.1	22.3	N/A	0.0	80.1						0.0
			GR6	Green Roof	77.53	90.6	Reservoir	7.0	0.6	4.2	1.2	1.2	2.8						4.2	0.0
			RG29	Rain garden	77.53	69.0	RG29	5.3	0.7	3.7	1.0	2.1	1.6	3.7						0.0
			RG30	Rain garden	77.53	59.5	RG30	4.6	0.7	3.2	0.9	1.8	1.4	3.2						0.0
			RG31	Rain garden	77.53	10.6	RG31	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0
			RG32	Rain garden	77.53	10.5	RG32	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0
			RG33	Rain garden	77.53	10.0	RG33	0.8	0.7	0.5	0.2	0.3	0.2	0.5						0.0
			RG36	Rain garden	77.53	10.7	RG34	0.8	0.7	0.6	0.2	0.3	0.2	0.6						0.0
			RG37	Rain garden	77.53	9.4	RG35	0.7	0.7	0.5	0.1	0.3	0.2	0.5						0.0
			GS55	Green space	77.53	68.0	Reservoir	5.3	0.2	1.1	0.3	0.3	4.2						1.1	0.0
	GS57		Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS58		Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS59		Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS60		Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS61		Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS62		Green space	77.53	17.8	Reservoir	1.4	0.2	0.3	0.1	0.1	1.1						0.3	0.0	
	GS63		Green space	77.53	52.4	Reservoir	4.1	0.2	0.8	0.2	0.2	3.2						0.8	0.0	
	GS64		Green space	77.53	8.9	Reservoir	0.7	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS65		Green space	77.53	153.1	Reservoir	11.9	0.2	2.4	0.7	0.7	9.5						2.4	0.0	
	GS66		Green space	77.53	12.3	Reservoir	1.0	0.2	0.2	0.1	0.1	0.8						0.2	0.0	
	GS67		Green space	77.53	72.7	Reservoir	5.6	0.2	1.1	0.3	0.3	4.5						1.1	0.0	
	GS68		Green space	77.53	12.4	Reservoir	1.0	0.2	0.2	0.1	0.1	0.8						0.2	0.0	
	GS69		Green space	77.53	5.0	Reservoir	0.4	0.2	0.1	0.0	0.0	0.3						0.1	0.0	
	GS71		Green space	77.53	5.3	Reservoir	0.4	0.2	0.1	0.0	0.0	0.3						0.1	0.0	
	GS72		Green space	77.53	3.3	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2						0.1	0.0	
	GS73		Green space	77.53	12.1	Reservoir	0.9	0.2	0.2	0.1	0.1	0.8						0.2	0.0	
	GS74		Green space	77.53	23.8	Reservoir	1.8	0.2	0.4	0.1	0.1	1.5						0.4	0.0	
	GS75		Green space	77.53	75.9	Reservoir	5.9	0.2	1.2	0.3	0.3	4.7						1.2	0.0	
	GS76		Green space	77.53	14.6	Reservoir	1.1	0.2	0.2	0.1	0.1	0.9						0.2	0.0	
	GS93		Green space	77.53	30.0	Reservoir	2.3	0.2	0.5	0.1	0.1	1.9						0.5	0.0	
	GS94		Green space	77.53	38.7	Reservoir	3.0	0.2	0.6	0.2	0.2	2.4						0.6	0.0	
	GS95		Green space	77.53	8.6	Reservoir	0.7	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS96		Green space	77.53	38.3	Reservoir	3.0	0.2	0.6	0.2	0.2	2.4						0.6	0.0	
	GS97		Green space	77.53	79.9	Reservoir	6.2	0.2	1.2	0.3	0.3	5.0						1.2	0.0	
	GS98		Green space	77.53	14.4	Reservoir	1.1	0.2	0.2	0.1	0.1	0.9						0.2	0.0	
	GS99		Green space	77.53	12.7	Reservoir	1.0	0.2	0.2	0.1	0.1	0.8						0.2	0.0	
	GS100		Green space	77.53	7.4	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5						0.1	0.0	
	GS101		Green space	77.53	3.2	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2						0.1	0.0	
	GS102		Green space	77.53	15.1	Reservoir	1.2	0.2	0.2	0.1	0.1	0.9						0.2	0.0	
	GS103		Green space	77.53	4.1	Reservoir	0.3	0.2	0.1	0.0	0.0	0.3						0.1	0.0	
	GS104		Green space	77.53	3.6	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2						0.1	0.0	
	GS105		Green space	77.53	52.4	Reservoir	4.1	0.2	0.8	0.2	0.2	3.2						0.8		

Site	Catchment	Zone	Details	Rainfall depth	Area	Destination	Rainfall volume	Runoff factor	Runoff volume	Discharge Rate	Controlled Discharge Rate after SuDS	Runoff destination (m3)							
				mm	m2	Zone Name	m3	C Coeff	m3	l/s	l/s	Attenuated on-site	Raingarden/Planters /Raised Garden /Tree Pits	Swale	Porous Paving	Reservo ir	Existing Network		
		GS14	Green space	77.53	25.5	Reservoir	2.0	0.2	0.4	0.1	0.1	1.6				0.4	0.0		
		CHS1	Concrete Hard Standing	77.53	616.5	Reservoir	47.8	1.0	47.8	13.3	13.3	0.0				47.8	0.0		
		Total for Catchment 2				1983.3		153.8		141.8	39.4	39.4	12.0	0.0	0.0	141.8	0.0		
	Total		Total for PBSA - Post Development *Total for PBSA - Pre Development				6895.5		532.0		441.0 460.7	123.1 128.1	101.6	91.0	106.8	0.0	0.0	334.2	0.0
Stonetown Terrace		GA1	Grassed Area	77.53	255.6	Reservoir	19.8	0.2	4.0	1.1	1.1	15.9					4.0	0.0	
		GA2	Grassed Area	77.53	146.8	Reservoir	11.4	0.2	0.4	0.6	0.6	1.6					0.4	0.0	
		GA3	Grassed Area	77.53	46.0	Reservoir	3.6	0.2	0.1	0.2	0.2	0.5					0.1	0.0	
		GA4	Grassed Area	77.53	96.7	Reservoir	7.5	0.2	0.1	0.4	0.4	0.3					0.1	0.0	
		RG18	Rain garden	77.53	10.6	RG18	0.8	0.7	0.6	0.2	0.3	0.2	0.6					0.0	
		RG19	Rain garden	77.53	6.7	RG19	0.5	0.7	0.4	0.1	0.2	0.2	0.4		0.6			0.0	
		RG20	Rain garden	77.53	14.8	RG20	1.1	0.7	0.8	0.2	0.4	0.3	0.8		0.4			0.0	
		RG21	Rain garden	77.53	2.3	RG21	0.2	0.7	0.1	0.0	0.1	0.1	0.1		0.1			0.0	
		GS18	Green space	77.53	17.6	Reservoir	1.4	0.2	0.3	0.1	0.1	1.1					0.3	0.0	
		GS19	Green space	77.53	38.6	Reservoir	3.0	0.2	0.6	0.2	0.2	2.4					0.6	0.0	
		GS20	Green space	77.53	26.3	Reservoir	2.0	0.2	0.4	0.1	0.1	1.6					0.4	0.0	
		GS21	Green space	77.53	7.8	Reservoir	0.6	0.2	0.1	0.0	0.0	0.5					0.1	0.0	
		GS22	Green space	77.53	4.4	Reservoir	0.3	0.2	0.1	0.0	0.0	0.3					0.1	0.0	
		GS23	Green space	77.53	45.4	Reservoir	3.5	0.2	0.7	0.2	0.2	2.8					0.7	0.0	
		GS24	Green space	77.53	9.4	Reservoir	0.7	0.2	0.1	0.0	0.0	0.6					0.1	0.0	
		GS25	Green space	77.53	4.0	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2					0.1	0.0	
		GS26	Green space	77.53	17.9	Reservoir	1.4	0.2	0.3	0.1	0.1	1.1					0.3	0.0	
		GS27	Green space	77.53	107.4	Reservoir	8.3	0.2	1.7	0.5	0.5	6.7					1.7	0.0	
		GS28.1	Green space	77.53	41.7	Reservoir	3.2	0.2	0.6	0.2	0.2	2.6					0.6	0.0	
		GS29.1	Green space	77.53	21.9	Reservoir	1.7	0.2	0.3	0.1	0.1	1.4					0.3	0.0	
		GS32	Green space	77.53	3.9	Reservoir	0.3	0.2	0.1	0.0	0.0	0.2					0.1	0.0	
		GS70	Green space	77.53	94.3	Reservoir	7.3	0.2	1.5	0.4	0.4	5.9					1.5	0.0	
		G2	Gravel	77.53	64.2	Reservoir	5.0	0.8	4.0	1.1	1.1	1.0					4.0	0.0	
		GR1	Green Roof	77.53	151.9	Reservoir	11.8	0.6	7.1	2.0	2.0	4.7					7.1	0.0	
	GR2	Green Roof	77.53	173.7	Reservoir	13.5	0.6	8.1	2.2	2.2	5.4					8.1	0.0		
	H6	Hard	77.53	549.0	Reservoir	42.6	1	42.6	11.8	11.8	0.0					42.6	0.0		
	H7.1	Hard	77.53	258.0	RG17/RG18/RG19	20.0	1	20.0	5.6	N/A	0.0	20.0					0.0		
	H7.2	Hard	77.53	25.3	RG17/RG18/RG19	2.0	1	2.0	0.5	N/A	0.0	2.0		20.0			0.0		
	H7.3	Hard	77.53	200.4	RG20	15.5	1	15.5	4.3	N/A	0.0	0.0		15.5			0.0		
	PP4	Porous Paving	77.53	291.5	PP4	22.6	0.6	13.6	3.8	0.2	9.0					13.6	0.0		
	PP6	Porous Paving	77.53	30.3	PP6	2.3	0.6	1.4	0.4	0.2	0.9					1.4	0.0		
	PP7	Porous Paving	77.53	78.4	PP7	6.1	0.6	3.6	1.0	0.2	2.4					3.6	0.0		
	RHT2.1	Roads - Hard Trafficked	77.53	865.8	Reservoir	67.1	1	67.1	18.7	18.7	0.0					67.1	0.0		
	CHS4	Concrete Hard Standing	77.53	82.6	Reservoir	6.4	1	6.4	1.8	1.8	0.0					6.4	0.0		
	Total		Total for Stonetown Terrace - Post Development *Total for Stonetown Terrace - Pre Development				3791.0		293.9		204.6 212.3	58.0 33.7	43.5	69.9	39.4	0.0	18.6	146.6	0.0
	Reservoir		GS90	Green space	77.53	10.5	Reservoir	0.8	0.2	0.2	0.0	0.0	0.6					0.2	0.0
			GS91	Green Space	77.53	41.4	Reservoir	3.2	0.2	0.6	0.2	0.2	2.6					0.6	0.0
			GS92	Green Space	77.53	12.9	Reservoir	1.0	0.2	0.2	0.1	0.1	0.8					0.2	0.0
			GS93	Green Space	77.53	32.3	Reservoir	2.5	0.2	0.5	0.1	0.1	2.0					0.5	0.0
			GS94	Green Space	77.53	257.9	Reservoir	20.0	0.2	4.0	1.1	1.1	16.0					4.0	0.0
			TGS21	Temporary Green Space	77.53	132.6	Reservoir	10.3	0.2	2.1	0.6	0.6	8.2					2.1	0.0
			RES1	Reservoir Water Body	77.53	2763.1	Reservoir	214.2	1	214.2	59.6	64.1	0.0					214.2	0.0
			H13.2	Hard	77.53	1197.7	Reservoir	92.9	1	92.9	25.8	25.8	0.0					92.9	0.0
			CHS10	Concrete Hard Standing	77.53	344.4	Reservoir	26.7	1	26.7	7.4	7.4	0.0					26.7	0.0
			CHS11	Concrete Hard Standing	77.53	76.3	Reservoir	5.9	1	5.9	1.6	1.6	0.0					5.9	0.0
CHS12			Concrete Hard Standing	77.53	485.2	Reservoir	37.6	1	37.6	10.5	10.5	0.0					37.6	0.0	
Total				Total for Reservoir - Post Development *Total for Reservoir - Pre Development				5354.2		344.9		314.6 297.8	87.5 82.8	92.0	30.2	0.0	0.0	0.0	314.6
The Flaxmill Plaza		Catchment 1 - to plaza channel, then att tank	H3.2	Hard Roof	77.53	1693.9	RG1/RG2	131.3	1	131.3	36.5	N/A	0.0	131.3					0.0
			H4.2	Hard Roof	77.53	435.5	RG1/RG2	33.8	1	33.8	9.4	N/A	0.0	33.8					0.0
			H13.1	Hard	77.53	954.4	Existing Network	74.0	1	74.0	20.6	20.6	0.0						74.0
			TGS5	Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0
	TGS6		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS7		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS8		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS9		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS10		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS11		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	TGS12		Temporary Green space	77.53	5.6	RG1/RG2	0.4	0.2	0.1	0.0	N/A	0.3	0.1					0.0	
	RG1		Rain garden	77.53	59.0	RG1	4.6	1	4.6	1.3	1.8	0.0	4.6					0.0	
	RG2		Rain garden	77.53	61.5	RG2	4.8	1	4.8	1.3	1.8	0.0	4.8					0.0	
	CHS2.1		Concrete Hard Standing	77.53	313.2	RG1/RG2	24.3	1.0	24.3	6.8	N/A	0.0	24.3					0.0	
	CHS2.2		Concrete Hard Standing	77.53	1189.5	Existing Network	92.2	1.0											

B.7 Zone 2 runoff volumes and destinations

Cleaves Peripheral Catchment Volumes																			
Site	Catchment	Zone	Details	Rainfall depth	Area	Destination	Rainfall volume	Runoff factor	Runoff volume	Discharge Rate	Controlled Discharge Rate SuDS	Runoff destination (m3)							
				mm	m2	Zone Name	m3	C' Coeff	m3	l/s	l/s	Attenuated on-site	Raingarden/Planters/Raised Garden /Tree Pits	Porous Paving	Existing Network				
ROAD NCR		GS3	Green space	77.53	10.1	RG5/6/9/10/11/13/14	0.8	0.2	0.2	0.0	N/A	0.6	0.2		36.5				
		GS4	Green space	77.53	10.5	RG5/6/9/10/11/13/14	0.8	0.2	0.2	0.0	N/A	0.6	0.2						
		GS5	Green space	77.53	40.2	RG5/6/9/10/11/13/15	3.1	0.2	0.6	0.2	N/A	2.5	0.6						
		GS6	Green space	77.53	3.8	RG5/6/9/10/11/13/16	0.3	0.2	0.1	0.0	N/A	0.2	0.1						
		GS7	Green space	77.53	11.6	RG5/6/9/10/11/13/17	0.9	0.2	0.2	0.0	N/A	0.7	0.2						
		PP1	Porous Paving	77.53	784.2	PP1	60.8	0.6	36.5	10.1	0.2	24.3							
		RG5	Rain Garden	77.53	19.7	RG5	1.5	0.7	1.1	0.3	0.6	0.5	1.1						
		RG6	Rain Garden	77.53	11.6	RG6	0.9	0.7	0.6	0.2	0.3	0.3	0.6						
		RG7	Rain Garden	77.53	17.3	RG7	1.3	0.7	0.9	0.3	0.5	0.4	0.9						
		RG8	Rain Garden	77.53	14.1	RG8	1.1	0.7	0.8	0.2	0.4	0.3	0.8						
		RG9	Rain Garden	77.53	13.0	RG9	1.0	0.7	0.7	0.2	0.4	0.3	0.7						
		RG10	Rain Garden	77.53	11.4	RG10	0.9	0.7	0.6	0.2	0.3	0.3	0.6						
		RG11	Rain Garden	77.53	11.6	RG11	0.9	0.7	0.6	0.2	0.3	0.3	0.6						
		RG12	Rain Garden	77.53	24.6	RG12	1.9	0.7	1.3	0.4	0.7	0.6	1.3						
		RG13	Rain Garden	77.53	13.7	RG13	1.1	0.7	0.7	0.2	0.4	0.3	0.7						
		RG14	Rain Garden	77.53	25.0	RG14	1.9	0.7	1.4	0.4	0.8	0.6	1.4						
		RHT1	Roads - Hard trafficked	77.53	1212	RG5/6/9/10/11/13/17	93.9	1	93.9	26.1	N/A	0.0	93.9						
		RHT3	Roads - Hard trafficked	77.53	1082	Existing Network	83.9	1	83.9	23.3	23.3	0.0							
		Total		Total for NCR - Post Development *Total for NCR - Pre Development		3315.9		257.1	10.6	224.3 257.1	62.3 71.5	28.4	32.8				103.9	36.5	83.9
		ROAD OCS		GS84	Green Space	77.53	373.5	Existing Network	29.0	0.2	5.8	1.6	1.6				23.2		
	GS85			Green Space	77.53	403.9	Existing Network	31.3	0.2	6.3	1.7	1.7	25.1			6.3			
	GS86			Green Space	77.53	30.1	Existing Network	2.3	0.2	0.5	0.1	0.1	1.9			0.5			
	GS87			Green Space	77.53	33.1	Existing Network	2.6	0.2	0.5	0.1	0.1	2.1			0.5			
	GS88			Green Space	77.53	28.4	Existing Network	2.2	0.2	0.4	0.1	0.1	1.8			0.4			
	GS89			Green Space	77.53	34.4	Existing Network	2.7	0.2	0.5	0.1	0.1	2.1			0.5			
	TP7			Tree Pit	77.53	21.5	TP7	1.7	0.7	1.2	0.3	0.6	0.5	1.2					
	TP8			Tree Pit	77.53	23.4	TP8	1.8	0.7	1.3	0.4	0.7	0.5	1.3					
TP9	Tree Pit			77.53	38.4	TP9	3.0	0.7	2.1	0.6	1.2	0.9	2.1						
CHS14	Concrete Hard Standing		77.53	1941.0	Existing Network	150.5	1	150.5	41.8	41.8	0.0			150.5					
Total			Total for Road OCS - Post Development *Total for Road OCS - Pre Development		2927.5		227.0		169.0 197.3	47.0 54.8	48.2	58.0	4.5	0.0	164.5				
ROAD Stonetown Terrace			PP3	Porous Paving	77.53	163.6	PP3	12.7	0.6	7.6	2.1	0.2	5.1		7.6				
			GS31	Green Space	77.53	8.3	Existing Network	0.6	0.2	0.1	0.0	0.0	0.5			0.1			
			GS32	Green Space	77.53	3.9	Existing Network	0.3	0.2	0.1	0.0	0.0	0.2			0.1			
			GS30	Green Space	77.53	27.7	Existing Network	2.2	0.2	0.4	0.1	0.1	1.7			0.4			
			GS29.2	Green Space	77.53	37.0	Existing Network	2.9	0.2	0.6	0.2	0.2	2.3			0.6			
			GS28.2	Green Space	77.53	41.0	Existing Network	3.2	0.2	0.6	0.2	0.2	2.5			0.6			
		CHS5	Concrete Hard Standing	77.53	77.2	Existing Network	6.0	1	6.0	1.7	1.7	0.0			6.0				
		CHS4.2	Concrete Hard Standing	77.53	60.0	Existing Network	4.7	1	4.7	1.3	1.3	0.0			4.7				
		RHT2.2	Roads - Hard trafficked	77.53	540	Existing Network	41.9	1	41.9	11.6	11.6	0.0			41.9				
	Total		Total for Road Stonetown Terrace - Post Development *Total for Road Stonetown Terrace - Pre Development		958.8		74.3	4.6	61.9 76.8	17.2 21.4	15.3	12.4	0.0	7.6	54.3				
	* Note that Pre Development Volumes and Discharge Rate calculations are not shown here, totals are shown for comparison purposes																		
	Summary																		
Details				Area	Rainfall Depth	Runoff volume	Unattenuated Discharge Rate	Controlled Discharge Rate SuDS	Runoff Destination (m3)										
				m2	mm	m3	l/s	l/s	Raingarden/Planters/Raised Garden /Tree Pits	Porous Paving		Existing Network							
Road NCR				3315.9	77.5	224.3	62.3	28.4	103.9		36.5		83.9						
Road OCS				2927.5	77.5	169.0	47.0	48.2	4.5		0.0		164.5						
Road Stonetown Terrace				958.8	77.5	61.9	17.2	15.3	0.0		7.6		54.3						

B.8 Zone 1 proposed SuDS controls



Legend:

- Building Footprint
- Rain Garden
- Permeable Paving
- Reservoir
- Raised Planter
- Red Line Boundary
- Site Catchment Boundary

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Status **A2 - Issued for Planning**

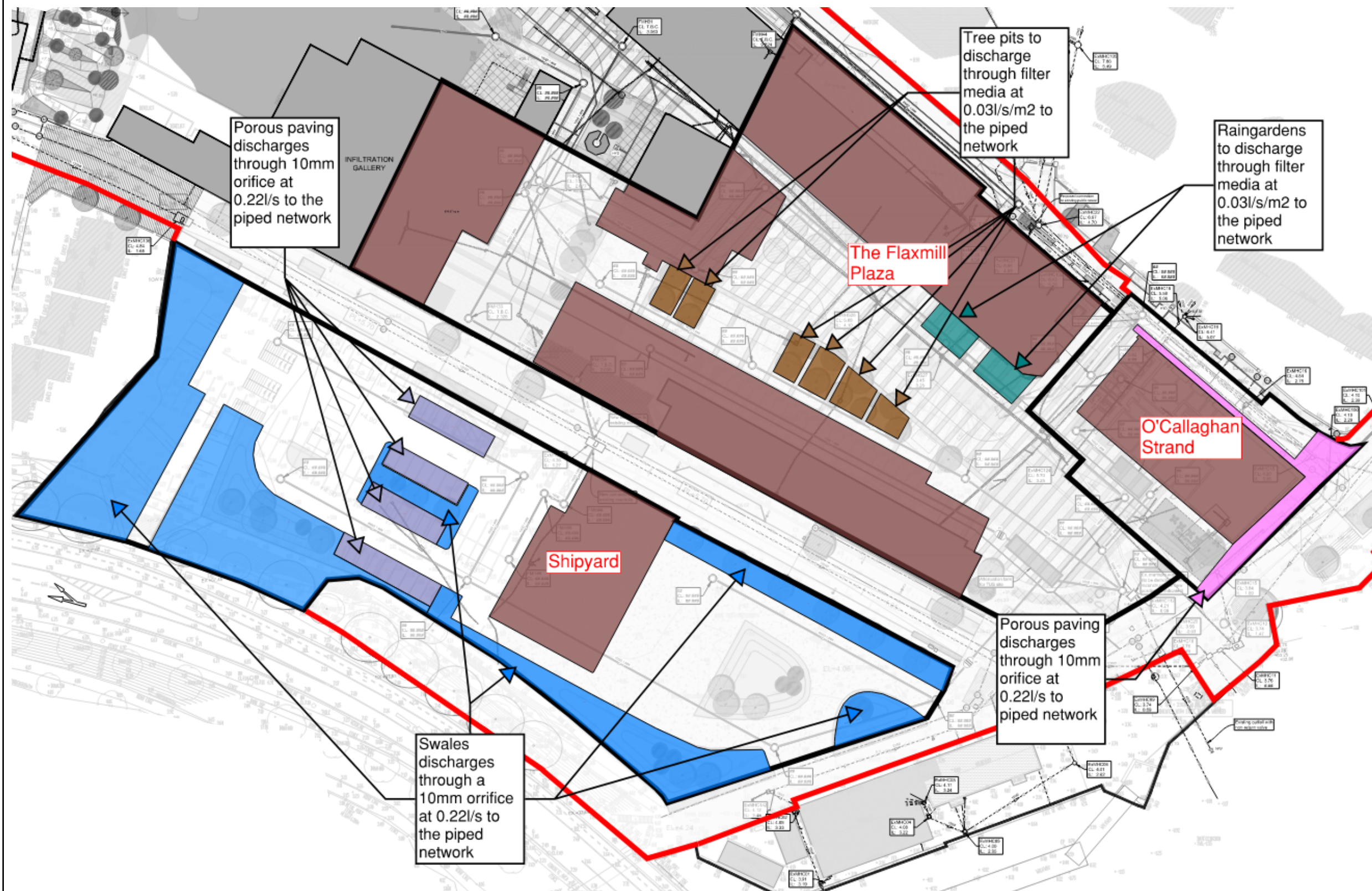
Job Title **Cleeves Riverside Quarter Masterplan**

Drawing Title **Proposed SuDs Controls on Stonetown Terrace, PBSA and Reservoir**

Scales **N/A** File Ref.

Drm **JL** Date **03/09/2025** Chk'd **AS**

Job No. **277975-00** Sketch No. Rev. **4**



Legend:

- Building Footprint
- Rain Garden
- Permeable Paving
- Permeable Paving Trafficked
- Tree Pit
- Swale
- Red Line Boundary
- Site Catchment Boundary

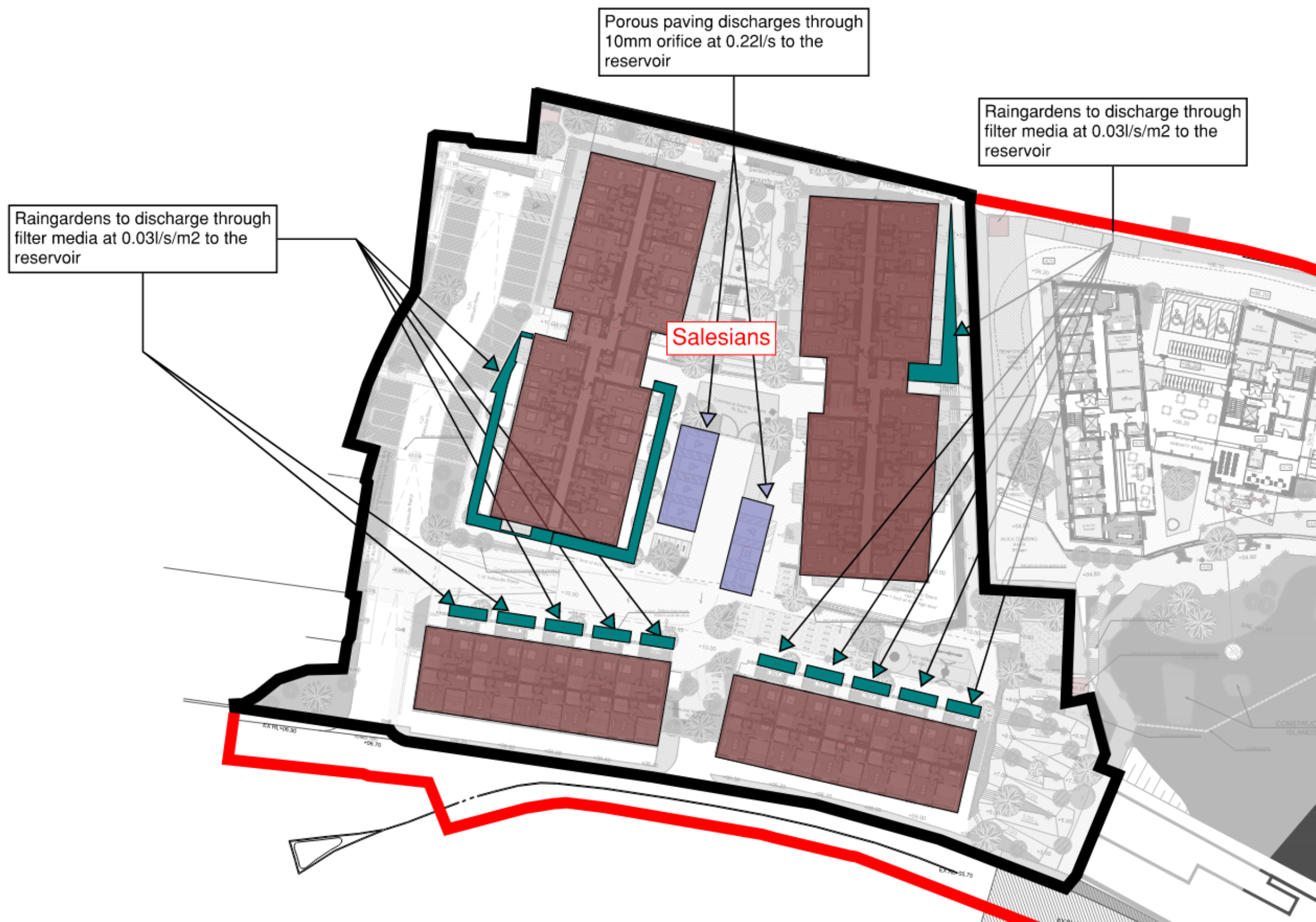
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 Tel: +353(0)1 233 4455
 Fax: +353(0)1 668 3169

ARUP

Status	A2 - Issued for Planning		
Job Title	Cleeves Riverside Quarter Masterplan		
Drawing Title	Proposed SuDs Controls on Shipyard, The Flaxmill Plaza & O'Callaghan Strand		
Scales	N/A	File Ref.	
Drm	JL	Date	03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No.	Rev. 4

Legend:

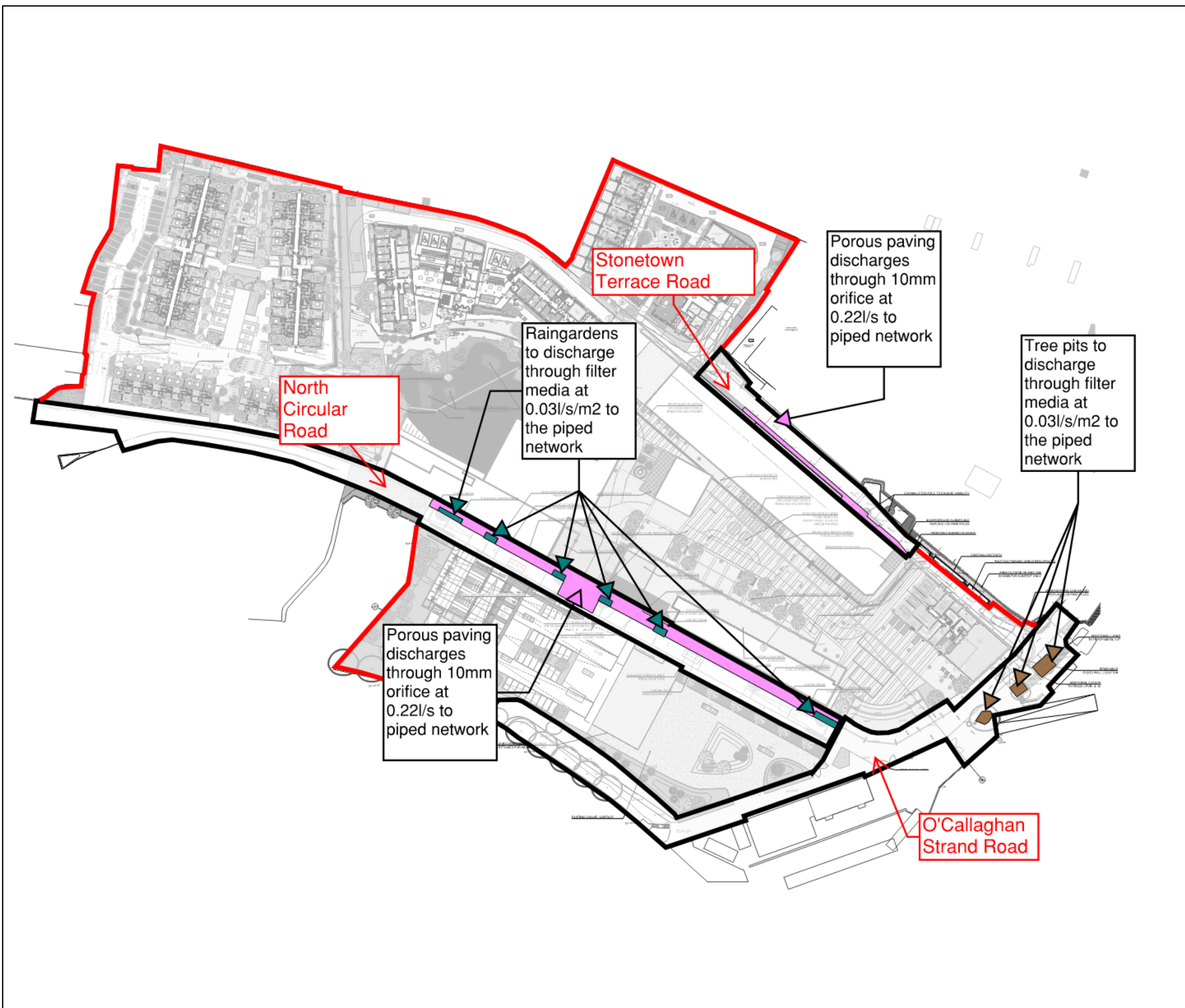
- Building Footprint
- Rain Garden
- Permeable Paving Trafficked
- Red Line Boundary
- Site Catchment Boundary



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 Fax: +353(0)1 668 3169

Status	A2 - Issued for Planning		
Job Title	Cleeves Riverside Quarter Masterplan		
Drawing Title	Proposed SuDs Controls on Salesians		
Scales	N/A	File Ref.	
Drm	JL	Date	03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No.	Rev. 4

B.9 Zone 2 proposed SuDS controls



Legend:

-  Rain Garden
-  Permeable Paving
-  Raised Planter
-  Red Line Boundary
-  Site Catchment Boundary

ARUP 50 Ringsend Road, Dublin 4 Tel: +353(0)1 233 4455 Fax: +353(0)1 668 3169		
Status	A2 - Issued for Planning	
Job Title	Cleeves Riverside Quarter Masterplan	
Drawing Title	Proposed SuDs Controls on OCS Road, Stonetown Terrace Road and NCR Road	
Scales	N/A	File Ref.
Drm	JL	Date 03/09/2025 Chk'd AS
Job No.	277975-00	Sketch No. Rev. 4