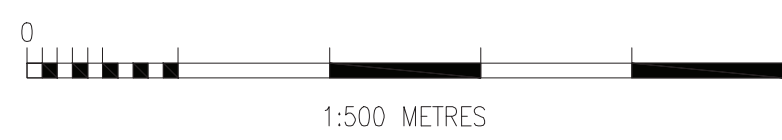
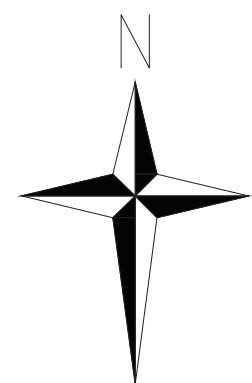


# Appendix A

## Development Masterplan (Indicative)





275 Balm Street GLASGOW G2 4JZ Tel: 0141 204 8800 Fax: 0141 204 8801		BARRATT HOMES Build your future	
Project Name: <b>ROBROYSTON/MILLERSTON          ROBROYSTON ROAD          GLASGOW</b>			
Drawing Title: <b>MASTERPLAN (INDICATIVE)</b>			
Scale of A3: 1:2000	Status:		
Drawn:	Checked:	Approved:	
Date:	Date:	Date:	
Drawing No.:	Revision:		

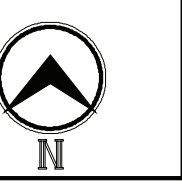



# Appendix B

## Scottish Water Record Plans





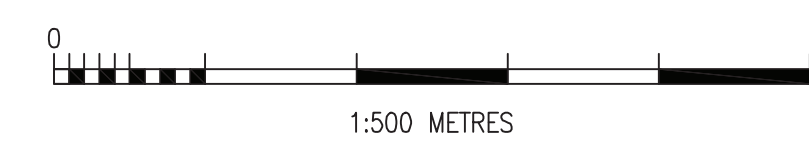
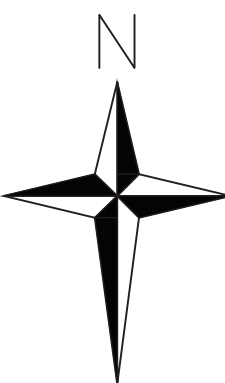
	NS639591		
	Scale: 1:1750	Date: 27/02/2014	
<small>The representation of physical assets and the boundaries of assets in this plan are for information only. It is not intended to be used as a legal document. For further details, please contact the appropriate District Office.</small>			<small>Scottish Water 2014 © Crown Copyright Ordnance Survey Licence number 100025460 Tel: 0845 801 8888</small>



# Appendix C

## Foul Drainage Foul Water Drainage Schematic





THIS IS THE PLAN/DRAWING/SPECIFICATION REFERRED TO IN THE APPLICATION  
SIGNED:  
DATED:



<b>FAIRHURST</b>		Description		Drawn	Checked	Appr.
275 Bona Street GLASGOW G2 4JZ Tel: 0141 204 8800 Fax: 0141 204 8801						
Project Name: <b>ROBROYSTON/MILLERSTON ROBROYSTON ROAD GLASGOW</b>						
Drawing Title: <b>INFRASTRUCTURE APPLICATION FOUL DRAINAGE LAYOUT</b>						
Scale of A3: 1:500	Status: For Approval	Drawn: RS	Checked:	Approved:	Date: 29/04/21	Date:
Drawing No: <b>1024972962-FOUL</b>						Revised:



# Appendix D

## Greenfield Catchment Area Run-off Assessment

# Institute of Hydrology Report No.124 - Flood Estimation for Small Catchments (IH124)

## Flow Calculation

User Defined  
Calculated



Project No.	165755
Project Title	Robroyston
Version No.	1

Calculation by:	FH	Date:	14/07/2014
Checked by:		Date:	

Return Period (years)	Flow (m <sup>3</sup> /s)	Flow (l/s)	Flow (MI/d)
2	0.01	6.4	0.56
5	0.01	7.8	0.68
10	0.01	10	0.87
25	0.01	13	1.11
50	0.02	15	1.33
100	0.02	19	1.61
200	0.02	21	1.83
200+cc	0.03	25	2.20

OS Grid Ref

AREA  Ha  
 km<sup>2</sup>

Catchment area.

Development size	Method
0 - 50 ha	The Institute of Hydrology Report 124 Flood estimation for small catchments (Marshall & Bayliss, 1994) is to be used to determine peak greenfield runoff rates for QBAR.  Where developments are smaller than 50 ha, the analysis for determining greenfield discharge rate should use 50 ha in the formula but linearly interpolate the flow rate value based on the ratio of the size of the development to 50 ha.  FSSR 14 (IH, 1993) regional growth curve factors should be used to calculate greenfield peak flow rates for 1-, 30- and 100-year return periods.
50-200 ha	IH Report 124 should be used to calculate greenfield peak flow rates. Regional growth factors to be applied.
Above 200 ha	IH Report 124 can be used for catchments that are much larger than 200 ha. However, for schemes of this size it is recommended that the Flood Estimation Handbook (FEH) (IH, 1999) should be applied. Both the statistical approach and the unit hydrograph approach should be used to calculate peak flow rates. However, where FEH is not considered appropriate for the calculation of greenfield runoff for the development site, for whatever reasons, IH 124 should be used.

SAAR  mm

From FEH CD-ROM / literature.  
NB If catchment not defined in FEH, assume SAAR from neighbouring FEH-defined catchments

SOIL

SOIL = 0.15 x (WRAP1) + 0.30 x (WRAP2) + 0.40 x (WRAP3) + 0.45 x (WRAP4) + 0.50 x (WRAP5)  
(See Winter Rain Acceptance Potential Map)

WRAP Class	1	2	3	4	5
Factor	0.15	0.3	0.4	0.45	0.5
Fraction	0	0	0	1	0

### QBAR<sub>rural</sub>

QBAR<sub>rural</sub>  m<sup>3</sup>/s

$$QBAR = 0.00108 * AREA^{0.89} * SAAR^{1.17} * SOIL^{2.17} \quad (IH124 7.1)$$

if site is <50ha

QBAR<sub>rural</sub> (adjusted)  m<sup>3</sup>/s

Area Reduction  (ratio of size of site to 50ha)  
Applicable if area is < 50 ha

### QBAR<sub>urban</sub>

CWI

Catchment Wetness Index	SAAR <835	SAAR ≥835
CWI	=0.1745*SAAR-23.238	=0.0024*SAAR+120.5

CIND

$$CIND = 102.4 * SOIL + 0.28 * (CWI - 125) \quad (IH124 7.2)$$

NC

$$NC = 0.92 - 0.00024 * SAAR \quad (\text{for } 500 \leq SAAR \leq 1100 \text{mm})$$

$$NC = 0.74 - 0.000082 * SAAR \quad (\text{for } 1100 \leq SAAR \leq 3000 \text{mm}) \quad (IH124 7.3)$$

NC	0.66776
	0.653818

URBAN

Fraction of catchment under urban land use

QBAR<sub>urban</sub>/QBAR<sub>rural</sub>

$$QBAR_{urban}/QBAR_{rural} = [1 + URBAN]^2 * NC * [1 + URBAN * ((21/CIND) - 0.3)] \quad (IH124 7.4)$$

QBAR<sub>urban</sub>  m<sup>3</sup>/s

For conservative design, choose higher of QBAR<sub>urban</sub> and QBAR<sub>rural</sub>

QBAR  m<sup>3</sup>/s

Hydrometric Area

See map opposite for hydrometric areas within Scotland



### Growth Curve Factors

Region	Hydrometric Area	Return Period							
		2	5	10	25	50	100	200	500
N Scotland	1	0.9	1.2	1.45	1.81	2.12	2.48	2.8	3.25
S Scotland	2	0.91	1.11	1.42	1.81	2.17	2.63	3	3.45
	Q <sub>return period</sub> (m <sup>3</sup> /s)	0.0064	0.0078	0.010	0.013	0.015	0.019	0.021	0.024

(Growth factors and hydrometric areas taken from CIRIA SUDS Manual C697)