APPENDIX 9-2

DESIGN CALCULATIONS FOR SETTLEMENT PONDS

Slieveacurry WF - Settlement Pond Designs								
				Settlement Pond Dimensions*				
Drainage Area	SP-Label	Description	Catchment Area (m^2)	L (m)	Depth (m)	Width (m)	Cross-Section Area (m^2)	Pond Volume (m3)
Catchment A1	SP-A1	Acces Track A1	1881	10.5	1.00	3.25	3.25	34.13
Catchment A2	SP-A2	Acces Track A2	2293	12.0	1.00	3.50	3.50	42.00
Catchment B1	SP-B1	Access Track B1	2141	11.0	1.00	3.50	3.50	38.50
Catchment B2	SP-B2	Access Track B2	1009	8.0	1.00	2.50	2.50	20.00
Catchment B3-T1	SP-B3	T1 Area	4286	15.0	1.00	5.00	5.00	75.00
Catchment B4	SP-B4	Access Track B4	2016	10.5	1.00	3.50	3.50	36.75
Catchment B5	SP-B5	Access Track B5	1666	10.0	1.00	3.00	3.50	30.00
Catchment C1	SP-C1	Access Track C1	3811	16.0	1.00	4.00	4.00	64.00
Catchment C2	SP-C2	Access Track C2	2531	13.0	1.00	3.50	3.50	45.50
Catchment C3	SP-C3	Access Track C3	2531	13.0	1.00	3.50	3.50	45.50
Catchment C4	SP-C4	T3 Area	2519	12.5	1.00	3.50	3.50	43.75
Catchment D1	SP-D1	Access Track D1	3489	15.0	1.00	4.00	4.00	60.00
Catchment D2	SP-D2	T4 Area	2997	13.0	1.00	4.00	4.00	52.00
Catchment E1	SP-E1	Access Track E1	1053	8.0	1.00	2.50	2.50	20.00
Catchment E2	SP-E2	Access Track E2	1228	9.0	1.00	2.75	2.75	24.75
Catchment E3	SP-E3	Access Track E3	2062	10.5	1.00	3.50	3.50	36.75
Catchment E4-T2	SP-E4	T2 Area	2430	12.5	1.00	3.50	3.50	43.75
Catchment E5	SP-E5	Access Track E5	3485	13.5	1.00	4.50	4.50	60.75
Catchment F1	SP-F1	Access Track F1	1966	10.5	1.00	3.50	3.50	36.75
Catchment F2	SP-F2	Access Track F2	2138	11	1.00	3.50	3.50	38.5
Catchment F3	SP-F3	Access Track F3	2218	11	1.00	3.50	3.50	38.5
Catchment F4	SP-F4	T5 Area	2846	13	1.00	4.00	4.00	52
Catchment G1	SP-G1	Access Track G1	2784	12	1.00	4.00	4.00	48
Catchment G2-BP1	SP-G2	BP1	14807	45	1.00	15.00	20.00	1300
Catchment H1	SP-H1	Access Track H1	932	7.25	1.00	2.50	2.50	18.125
Catchment H2	SP-H2	Access Track H2	1964	22	1.00	7.25	7.25	159.5
Catchment J1-T6	SP-J1	T6 Area	3007	13	1.00	4.00	4.00	52
Catchment J2	SP-J2	Access Track J2	2843	13	1.00	4.00	4.00	52
Catchment K1	SP-K1	Access Track K1	3523	15	1.00	4.00	4.00	60
Catchment K2	SP-K2	T8 Area	4704	15.5	1.00	5.00	5.00	77.5
Catchment K3	SP-K3	Access Track K3	2523	12	1.00	3.75	3.75	45
Catchment K4	SP-K4	Access Track K4	1581	10	1.00	3.00	3.00	30
Catchment K5-T7	SP-K5	T7 Area	2842	12.25	1.00	4.00	4.00	49
Catchment L1	SP-L1	Access Track L1	1028	13	1.00	4.00	4.00	52
Catchment L2	SP-L2	Access Track L2	1028	10	1.00	3.50	3.50	35
Catchment L3	SP-L3	Access Track L3	693	7	1.00	2.00	2.00	14
Catchment L4_BP1	SP-L4_BP2	BP2	7014	45.00	1.00	15.00	15.00	675
Catchment M1	SP-M1	Substation	2421	12.00	1.00	3.50	3.50	42
* for removal of particles up to 4/10microns in size, at 10°C.								

Catchment A1:	**Acces Track A1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001881				
Area of (site) catchment (m2)	1881	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00166893	m^3/sec			
Q mean =	1.7	L/s			
Q mean =	144.2	m^3/day			
Factored Q_{BAR}-Rural	0.0017	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.3	L/s			
10 yr return peak flow	197.5	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.25	m^2	3.25	m width
Q= V.A implies	V =	0.00070	m/sec		
Required length of Pond =	L =	10.54	m say:	10.5	m length
Length to Width ratio		3.23	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	34.13	m^2		
% of catchment area	C% =	1.81%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10.5**	**3.25**	**1.00**	
Operating Volume:	34.125	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment A2:	**Acces Track A2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002293				
Area of (site) catchment (m2)	2293	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00199063	m^3/sec			
Q mean =	2.0	L/s			
Q mean =	172.0	m^3/day			
Factored Q_{BAR}-Rural	0.0020	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.7	L/s			
10 yr return peak flow	235.6	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 μm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00078	m/sec		
Required length of Pond =	L =	11.67	m say:	12	m length
Length to Width ratio		3.43	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	42.00	m^2		
% of catchment area	C% =	1.83%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12**	**3.50**	**1.00**	
Operating Volume:	42	m^3			
Rention Time, R_T =	4.3	hrs		OK	Good to remove medium silts to 0.01mm

Catchment B1:	**Access Track B1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002141				
Area of (site) catchment (m2)	2141	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00187275	m^3/sec			
Q mean =	1.9	L/s			
Q mean =	161.8	m^3/day			
Factored Q_{BAR}-Rural	0.0019	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.6	L/s			
10 yr return peak flow	221.7	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00073	m/sec		
Required length of Pond =	L =	10.98	m say:	11	m length
Length to Width ratio		3.14	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	38.50	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**11**	**3.50**	**1.00**	
Operating Volume:	38.5	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment B2:	**Access Track B2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001009				
Area of (site) catchment (m2)	1009	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00095873	m^3/sec			
Q mean =	1.0	L/s			
Q mean =	82.8	m^3/day			
Factored Q_{BAR}-Rural	0.0010	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	1.3	L/s			
10 yr return peak flow	113.5	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2.50	m^2	2.50	m width
Q= V.A implies	V =	0.00053	m/sec		
Required length of Pond =	L =	7.87	m say:	8	m length
Length to Width ratio		3.20	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	20.00	m^2		
% of catchment area	C% =	1.98%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**8**	**2.50**	**1.00**	
Operating Volume:	20	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment B3:	**T1 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.004286				
Area of (site) catchment (m2)	4286	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00347343	m^3/sec			
Q mean =	3.5	L/s			
Q mean =	300.1	m^3/day			
Factored Q_{BAR}-Rural	0.0035	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.005	m^3/sec			
10 yr return peak flow	4.8	L/s			
10 yr return peak flow	411.1	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 μm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		5.00	m^2	5.00	m width
Q= V.A implies	V =	0.00095	m/sec		
Required length of Pond =	L =	14.25	m say:	15	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	75.00	m^2		
% of catchment area	C% =	1.75%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**15**	**5.00**	**1.00**	
Operating Volume:	75	m^3			
Rention Time, R_T =	4.4	hrs		OK	Good to remove medium silts to 0.01mm

Catchment B4:	**Access Track B4**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002016				
Area of (site) catchment (m2)	2016	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00177512	m^3/sec			
Q mean =	1.8	L/s			
Q mean =	153.4	m^3/day			
Factored Q_{BAR}-Rural	0.0018	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.4	L/s			
10 yr return peak flow	210.1	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00069	m/sec		
Required length of Pond =	L =	10.41	m say:	10.5	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	36.75	m^2		
% of catchment area	C% =	1.82%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10.5**	**3.50**	**1.00**	
Operating Volume:	36.75	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment B4:	**Access Track B5**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001666				
Area of (site) catchment (m2)	1666	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00149804	m^3/sec			
Q mean =	1.5	L/s			
Q mean =	129.4	m^3/day			
Factored Q_{BAR}-Rural	0.0015	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.1	L/s			
10 yr return peak flow	177.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.00	m^2	3.00	m width
Q= V.A implies	V =	0.00068	m/sec		
Required length of Pond =	L =	10.25	m say:	10	m length
Length to Width ratio		3.33	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	30.00	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10**	**3.00**	**1.00**	
Operating Volume:	30	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment C1:	**Access Track C1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.003811				
Area of (site) catchment (m2)	3811	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00312865	m^3/sec			
Q mean =	3.1	L/s			
Q mean =	270.3	m^3/day			
Factored Q_{BAR}-Rural	0.0031	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.004	m^3/sec			
10 yr return peak flow	4.3	L/s			
10 yr return peak flow	370.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	m width
Q= V.A implies	V =	0.00107	m/sec		
Required length of Pond =	L =	16.05	m say:	16	m length
Length to Width ratio		4.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	64.00	m^2		
% of catchment area	C% =	1.68%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**16**	**4.00**	**1.00**	
Operating Volume:	64	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment C2:	Access Track C2				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002531				
Area of (site) catchment (m2)	2531	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00217351	m^3/sec			
Q mean =	2.2	L/s			
Q mean =	187.8	m^3/day			
Factored Q_{BAR}-Rural	0.0022	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.0	L/s			
10 yr return peak flow	257.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00085	m/sec		
Required length of Pond =	L =	12.74	m say:	13	m length
Length to Width ratio		3.71	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	45.50	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**3.50**	**1.00**	
Operating Volume:	45.5	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment C3:	Access Track C3				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002531				
Area of (site) catchment (m2)	2531	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00217351	m^3/sec			
Q mean =	2.2	L/s			
Q mean =	187.8	m^3/day			
Factored Q_{BAR}-Rural	0.0022	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.0	L/s			
10 yr return peak flow	257.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00085	m/sec		
Required length of Pond =	L =	12.74	m say:	13	m length
Length to Width ratio		3.71	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	45.50	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**3.50**	**1.00**	
Operating Volume:	45.5	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment C4:	**T3 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002519				
Area of (site) catchment (m2)	2519	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00216434	m^3/sec			
Q mean =	2.2	L/s			
Q mean =	187.0	m^3/day			
Factored Q_{BAR}-Rural	0.0022	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.0	L/s			
10 yr return peak flow	256.2	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00085	m/sec		
Required length of Pond =	L =	12.69	m say:	12.5	m length
Length to Width ratio		3.57	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	43.75	m^2		
% of catchment area	C% =	1.74%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12.5**	**3.50**	**1.00**	
Operating Volume:	43.75	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment D1:	**Access Track D1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.003489				
Area of (site) catchment (m2)	3489	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00289225	m^3/sec			
Q mean =	2.9	L/s			
Q mean =	249.9	m^3/day			
Factored Q_{BAR}-Rural	0.0029	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.004	m^3/sec			
10 yr return peak flow	4.0	L/s			
10 yr return peak flow	342.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	m width
Q= V.A implies	V =	0.00099	m/sec		
Required length of Pond =	L =	14.84	m say:	15	m length
Length to Width ratio		3.75	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	60.00	m^2		
% of catchment area	C% =	1.72%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**15**	**4.00**	**1.00**	
Operating Volume:	60	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment D2:	**T4 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002997				
Area of (site) catchment (m2)	2997	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00252629	m^3/sec			
Q mean =	2.5	L/s			
Q mean =	218.3	m^3/day			
Factored Q_{BAR}-Rural	0.0025	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.5	L/s			
10 yr return peak flow	299.0	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 μm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	m width
Q= V.A implies	V =	0.00087	m/sec		
Required length of Pond =	L =	12.96	m say:	13	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	52.00	m^2		
% of catchment area	C% =	1.74%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**4.00**	**1.00**	
Operating Volume:	52	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment E1:	**Access Track E1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001053				
Area of (site) catchment (m2)	1053	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00099585	m^3/sec			
Q mean =	1.0	L/s			
Q mean =	86.0	m^3/day			
Factored Q_{BAR}-Rural	0.0010	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	1.4	L/s			
10 yr return peak flow	117.9	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2.50	m^2	2.50	m width
Q= V.A implies	V =	0.00055	m/sec		
Required length of Pond =	L =	8.17	m say:	8	m length
Length to Width ratio		3.20	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	20.00	m^2		
% of catchment area	C% =	1.90%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**8**	**2.50**	**1.00**	
Operating Volume:	20	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment E2:	**Access Track E2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001228				
Area of (site) catchment (m2)	1228	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00114187	m^3/sec			
Q mean =	1.1	L/s			
Q mean =	98.7	m^3/day			
Factored Q_{BAR}-Rural	0.0011	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	1.6	L/s			
10 yr return peak flow	135.2	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2.75	m^2	2.75	m width
Q= V.A implies	V =	0.00057	m/sec		
Required length of Pond =	L =	8.52	m say:	9	m length
Length to Width ratio		3.27	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	24.75	m^2		
% of catchment area	C% =	2.02%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**9**	**2.75**	**1.00**	
Operating Volume:	24.75	m^3			
Rention Time, R_T =	4.4	hrs		OK	Good to remove medium silts to 0.01mm

Catchment E3:	**Access Track E3**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002062				
Area of (site) catchment (m2)	2062	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00181113	m^3/sec			
Q mean =	1.8	L/s			
Q mean =	156.5	m^3/day			
Factored Q_{BAR}-Rural	0.0018	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.5	L/s			
10 yr return peak flow	214.4	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00071	m/sec		
Required length of Pond =	L =	10.62	m say:	10.5	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	36.75	m^2		
% of catchment area	C% =	1.78%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10.5**	**3.50**	**1.00**	
Operating Volume:	36.75	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment E4-T2:	**T2 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.00243				
Area of (site) catchment (m2)	2430	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00209615	m^3/sec			
Q mean =	2.1	L/s			
Q mean =	181.1	m^3/day			
Factored Q_{BAR}-Rural	0.0021	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.9	L/s			
10 yr return peak flow	248.1	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	m width
Q= V.A implies	V =	0.00082	m/sec		
Required length of Pond =	L =	12.29	m say:	12.5	m length
Length to Width ratio		3.57	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	43.75	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12.5**	**3.50**	**1.00**	
Operating Volume:	43.75	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment E5:	**Access Track E5**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.003485				
Area of (site) catchment (m2)	3485	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.0028893	m^3/sec			
Q mean =	2.9	L/s			
Q mean =	249.6	m^3/day			
Factored Q_{BAR}-Rural	0.0029	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.004	m^3/sec			
10 yr return peak flow	4.0	L/s			
10 yr return peak flow	342.0	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.50	m^2	4.50	m width
Q= V.A implies	V =	0.00088	m/sec		
Required length of Pond =	L =	13.17	m say:	13.5	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	60.75	m^2		
% of catchment area	C% =	1.74%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13.5**	**4.50**	**1.00**	
Operating Volume:	60.75	m^3			
Rention Time, R_T =	4.3	hrs		OK	Good to remove medium silts to 0.01mm

Catchment F1:	**Access Track F1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001966				
Area of (site) catchment (m2)	1966	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00173589	m^3/sec			
Q mean =	1.7	L/s			
Q mean =	150.0	m^3/day			
Factored Q_{BAR}-Rural	0.0017	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.4	L/s			
10 yr return peak flow	205.5	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	
Q= V.A implies	V =	0.00068	m/sec		
Required length of Pond =	L =	10.18	m say:	10.5	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	36.75	m^2		
% of catchment area	C% =	1.87%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10.5**	**3.50**	**1.00**	
Operating Volume:	36.75	m^3			
Rention Time, R_T =	4.3	hrs		OK	Good to remove medium silts to 0.01mm

Catchment F2:	**Access Track F2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002138				
Area of (site) catchment (m2)	2138	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00187042	m^3/sec			
Q mean =	1.9	L/s			
Q mean =	161.6	m^3/day			
Factored Q_{BAR}-Rural	0.0019	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.6	L/s			
10 yr return peak flow	221.4	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	
Q= V.A implies	V =	0.00073	m/sec		
Required length of Pond =	L =	10.97	m say:	11	m length
Length to Width ratio		3.14	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	38.50	m^2		
% of catchment area	C% =	1.80%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**11**	**3.50**	**1.00**	
Operating Volume:	38.5	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment F3:	**Access Track F3**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002218				
Area of (site) catchment (m2)	2218	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00193258	m^3/sec			
Q mean =	1.9	L/s			
Q mean =	167.0	m^3/day			
Factored Q_{BAR}-Rural	0.0019	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.6	L/s			
10 yr return peak flow	228.8	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	
Q= V.A implies	V =	0.00076	m/sec		
Required length of Pond =	L =	11.33	m say:	11	m length
Length to Width ratio		3.14	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	38.50	m^2		
% of catchment area	C% =	1.74%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**11**	**3.50**	**1.00**	
Operating Volume:	38.5	m^3			
Rention Time, R_T =	4.0	hrs		OK	Good to remove medium silts to 0.01mm

Catchment F4:	T5 Area				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002846				
Area of (site) catchment (m2)	2846	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00241269	m^3/sec			
Q mean =	2.4	L/s			
Q mean =	208.5	m^3/day			
Factored Q_{BAR}-Rural	0.0024	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.3	L/s			
10 yr return peak flow	285.6	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00083	m/sec		
Required length of Pond =	L =	12.38	m say:	13	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	52.00	m^2		
% of catchment area	C% =	1.83%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**4.00**	**1.00**	
Operating Volume:	52	m^3			
Rention Time, R_T =	4.4	hrs		OK	Good to remove medium silts to 0.01mm

Catchment G1:	**Access Track G1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002784				
Area of (site) catchment (m2)	2784	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00236585	m^3/sec			
Q mean =	2.4	L/s			
Q mean =	204.4	m^3/day			
Factored Q_{BAR}-Rural	0.0024	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.2	L/s			
10 yr return peak flow	280.0	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00081	m/sec		
Required length of Pond =	L =	12.14	m say:	12	m length
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	48.00	m^2		
% of catchment area	C% =	1.72%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12**	**4.00**	**1.00**	
Operating Volume:	48	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment G2:	**BP1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.014807				
Area of (site) catchment (m2)	14807	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.01047002	m^3/sec			
Q mean =	10.5	L/s			
Q mean =	904.6	m^3/day			
Factored Q_{BAR}-Rural	0.0105	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.014	m^3/sec			
10 yr return peak flow	14.3	L/s			
10 yr return peak flow	1239.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 4 μm particles	4.00E-06	m			4 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00001	m/s			
m/hr	0.038	m/hr			
Time for D (m)	26.00	hrs			
				1.00	D (m) - depth
say pond cross section area =		20.00	m^2	20.00	
Q= V.A implies	V =	0.00072	m/sec		
Required length of Pond =	L =	67.13	m say:	65	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	1300.00	m^2		
% of catchment area	C% =	8.78%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**2 no.**	**45**	**15.00**	**1.00**	Pond G2A
		45	**15.00**	**1.00**	Pond G2B
Operating Volume:	1300	m^3			
Rention Time, R_T =	25.2	hrs		OK	Good to remove medium silts to 0.004mm

Catchment H1:	**Access Track H1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.000932				
Area of (site) catchment (m2)	932	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00089333	m^3/sec			
Q mean =	0.9	L/s			
Q mean =	77.2	m^3/day			
Factored Q_{BAR}-Rural	0.0009	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	1.2	L/s			
10 yr return peak flow	105.7	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2.50	m^2	2.50	
Q= V.A implies	V =	0.00049	m/sec		
Required length of Pond =	L =	7.33	m say:	7.25	m length
Length to Width ratio		2.90	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	18.13	m^2		
% of catchment area	C% =	1.94%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**7.25**	**2.50**	**1.00**	
Operating Volume:	18.125	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment H2:	**Access Track H2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001964				
Area of (site) catchment (m2)	1964	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00173431	m^3/sec			
Q mean =	1.7	L/s			
Q mean =	149.8	m^3/day			
Factored Q_{BAR}-Rural	0.0017	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.4	L/s			
10 yr return peak flow	205.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		7.25	m^2	7.25	
Q= V.A implies	V =	0.00033	m/sec		
Required length of Pond =	L =	4.91	m say:	22	m length
Length to Width ratio		3.03	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	159.50	m^2		
% of catchment area	C% =	8.12%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**22**	**7.25**	**1.00**	
Operating Volume:	159.5	m^3			
Rention Time, R_T =	18.6	hrs		OK	Good to remove medium silts to 0.01mm

Catchment J1:	**T6 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.003007				
Area of (site) catchment (m2)	3007	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00253379	m^3/sec			
Q mean =	2.5	L/s			
Q mean =	218.9	m^3/day			
Factored Q_{BAR}-Rural	0.0025	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.5	L/s			
10 yr return peak flow	299.9	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	m width
Q= V.A implies	V =	0.00087	m/sec		
Required length of Pond =	L =	13.00	m say:	13	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	52.00	m^2		
% of catchment area	C% =	1.73%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**4.00**	**1.00**	
Operating Volume:	52	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment J2:	**Access Track J2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002843				
Area of (site) catchment (m2)	2843	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00241042	m^3/sec			
Q mean =	2.4	L/s			
Q mean =	208.3	m^3/day			
Factored Q_{BAR}-Rural	0.0024	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.3	L/s			
10 yr return peak flow	285.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00083	m/sec		
Required length of Pond =	L =	12.36	m say:	13	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	52.00	m^2		
% of catchment area	C% =	1.83%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**4.00**	**1.00**	
Operating Volume:	52	m^3			
Rention Time, R_T =	4.4	hrs		OK	Good to remove medium silts to 0.01mm

Catchment K1:	**Access Track K1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.003523				
Area of (site) catchment (m2)	3523	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00291732	m^3/sec			
Q mean =	2.9	L/s			
Q mean =	252.1	m^3/day			
Factored Q_{BAR}-Rural	0.0029	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.004	m^3/sec			
10 yr return peak flow	4.0	L/s			
10 yr return peak flow	345.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00100	m/sec		
Required length of Pond =	L =	14.96	m say:	15	m length
Length to Width ratio		3.75	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	60.00	m^2		
% of catchment area	C% =	1.70%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**15**	**4.00**	**1.00**	
Operating Volume:	60	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment K2:	**T8 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.004704				
Area of (site) catchment (m2)	4704	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00377336	m^3/sec			
Q mean =	3.8	L/s			
Q mean =	326.0	m^3/day			
Factored Q_{BAR}-Rural	0.0038	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.005	m^3/sec			
10 yr return peak flow	5.2	L/s			
10 yr return peak flow	446.6	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 μm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		5.00	m^2	5.00	
Q= V.A implies	V =	0.00103	m/sec		
Required length of Pond =	L =	15.48	m say:	15.5	m length
Length to Width ratio		3.10	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	77.50	m^2		
% of catchment area	C% =	1.65%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**15.5**	**5.00**	**1.00**	
Operating Volume:	77.5	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment K3:	**Access Track K3**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002523				
Area of (site) catchment (m2)	2523	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.0021674	m^3/sec			
Q mean =	2.2	L/s			
Q mean =	187.3	m^3/day			
Factored Q_{BAR}-Rural	0.0022	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.0	L/s			
10 yr return peak flow	256.6	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.75	m^2	3.75	
Q= V.A implies	V =	0.00079	m/sec		
Required length of Pond =	L =	11.86	m say:	12	m length
Length to Width ratio		3.20	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	45.00	m^2		
% of catchment area	C% =	1.78%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12**	**3.75**	**1.00**	
Operating Volume:	45	m^3			
Rention Time, R_T =	4.2	hrs		OK	Good to remove medium silts to 0.01mm

Catchment K4:	Access Track K4				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001581				
Area of (site) catchment (m2)	1581	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00142982	m^3/sec			
Q mean =	1.4	L/s			
Q mean =	123.5	m^3/day			
Factored Q_{BAR}-Rural	0.0014	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m^3/sec			
10 yr return peak flow	2.0	L/s			
10 yr return peak flow	169.2	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.00	m^2	3.00	
Q= V.A implies	V =	0.00065	m/sec		
Required length of Pond =	L =	9.78	m say:	10	m length
Length to Width ratio		3.33	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	30.00	m^2		
% of catchment area	C% =	1.90%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10**	**3.00**	**1.00**	
Operating Volume:	30	m^3			
Rention Time, R_T =	4.3	hrs		OK	Good to remove medium silts to 0.01mm

Catchment K5:	**T7 Area**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002842				
Area of (site) catchment (m2)	2842	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00240967	m^3/sec			
Q mean =	2.4	L/s			
Q mean =	208.2	m^3/day			
Factored Q_{BAR}-Rural	0.0024	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	3.3	L/s			
10 yr return peak flow	285.2	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00083	m/sec		
Required length of Pond =	L =	12.36	m say:	12.25	m length
Length to Width ratio		3.06	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	49.00	m^2		
% of catchment area	C% =	1.72%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12.25**	**4.00**	**1.00**	
Operating Volume:	49	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment L1:	**Access Track L1**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001028				
Area of (site) catchment (m2)	1028	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00097478	m^3/sec			
Q mean =	1.0	L/s			
Q mean =	84.2	m^3/day			
Factored Q_{BAR}-Rural	0.0010	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	1.3	L/s			
10 yr return peak flow	115.4	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		4.00	m^2	4.00	
Q= V.A implies	V =	0.00033	m/sec		
Required length of Pond =	L =	5.00	m say:	13	m length
Length to Width ratio		3.25	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	52.00	m^2		
% of catchment area	C% =	5.06%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**13**	**4.00**	**1.00**	
Operating Volume:	52	m^3			
Rention Time, R_T =	10.8	hrs		OK	Good to remove medium silts to 0.01mm

Catchment L2:	**Access Track L2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.001028				
Area of (site) catchment (m2)	1028	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00097478	m^3/sec			
Q mean =	1.0	L/s			
Q mean =	84.2	m^3/day			
Factored Q_{BAR}-Rural	0.0010	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	1.3	L/s			
10 yr return peak flow	115.4	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	
Q= V.A implies	V =	0.00038	m/sec		
Required length of Pond =	L =	5.71	m say:	10	m length
Length to Width ratio		2.86	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	35.00	m^2		
% of catchment area	C% =	3.40%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**10**	**3.50**	**1.00**	
Operating Volume:	35	m^3			
Rention Time, R_T =	7.3	hrs		OK	Good to remove medium silts to 0.01mm

Catchment L3:	**Access Track L3**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.000693				
Area of (site) catchment (m2)	693	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00068625	m^3/sec			
Q mean =	0.7	L/s			
Q mean =	59.3	m^3/day			
Factored Q_{BAR}-Rural	0.0007	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.001	m^3/sec			
10 yr return peak flow	0.9	L/s			
10 yr return peak flow	81.2	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2.00	m^2	2.00	
Q= V.A implies	V =	0.00047	m/sec		
Required length of Pond =	L =	7.04	m say:	7	m length
Length to Width ratio		3.50	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	14.00	m^2		
% of catchment area	C% =	2.02%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**7**	**2.00**	**1.00**	
Operating Volume:	14	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm

Catchment L4:	**BP2**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.007014				
Area of (site) catchment (m2)	7014	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00538445	m^3/sec			
Q mean =	5.4	L/s			
Q mean =	465.2	m^3/day			
Factored Q_{BAR}-Rural	0.0054	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.007	m^3/sec			
10 yr return peak flow	7.4	L/s			
10 yr return peak flow	637.3	m^3/day			
GW Inflow	10.0	m^3/day			Based on know permeability and aquifer type
Total Flow (SW+GW)	0.007	m^3/sec			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 4 µm particles	4.00E-06	m			4 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00001	m/s			
m/hr	0.038	m/hr			
Time for D (m)	26.00	hrs			
				1.00	D (m) - depth
say pond cross section area =		15.00	m^2	15.00	m width
Q= V.A implies	V =	0.00049	m/sec		
Required length of Pond =	L =	46.03	m say:	45	m length
				rec	
Length to Width ratio		3.00	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	675.00	m^2		
% of catchment area	C% =	9.62%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**45**	**15.00**	**1.00**	Single pond design
	2 no.	**34**	**10.00**	**1.00**	**Apply 2 no. ponds (L3A & L3B)**
Operating Volume:	675	m^3		OK	Good to remove medium silts to 0.004mm

Catchment M1:	**Substation**				
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (\text{AREA km}^2)^{0.89} \times (\text{SAAR mm})^{1.17} \times (\text{SOIL})^{2.17}$					
Area of site (km2)	0.002421				
Area of (site) catchment (m2)	2421	m^2			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00208924	m^3/sec			
Q mean =	2.1	L/s			
Q mean =	180.5	m^3/day			
Factored Q_{BAR}-Rural	0.0021	m^3/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m^3/sec			
10 yr return peak flow	2.9	L/s			
10 yr return peak flow	247.3	m^3/day			
Settlement Pond Design					
Using Stokes Law:	$V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$				from Metcalf & Eddy, 4th Ed, pg 365.
For 10 µm particles	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V_s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		3.50	m^2	3.50	
Q= V.A implies	V =	0.00082	m/sec		
Required length of Pond =	L =	12.25	m say:	12	m length
Length to Width ratio		3.43	:1	>=3:1	Acceptable
					Length to width ratio of ~3:1
Plan Area	A =	42.00	m^2		
% of catchment area	C% =	1.73%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	**1 no.**	**12**	**3.50**	**1.00**	
Operating Volume:	42	m^3			
Rention Time, R_T =	4.1	hrs		OK	Good to remove medium silts to 0.01mm