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APPENDIX 9-2

DESIGN CALCULATIONS FOR SETTLEMENT PONDS

Slieveacurry WF - Settlement Pond Designs									
					Settlement Pond Dimensions*				
							Cross-	Pond	
			Catchment				Section Area	Volume	
Drainage Area	SP-Label	Description	Area (m ²)	L (m)	Depth (m)	Width (m)	(m²)	(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 partic	les up to 4/10	1 Dmicrons in size, at 10°C.							

Catchment A1:	Acces Track A1						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (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	m³/sec					
Q mean =	1.7	L/s					
Q mean =	144.2	m³/day					
Factored Q _{BAR} -Rural	0.0017	m°/sec					
Groth Factor - 10 yr return	1.3700						
10 yr return peak flow	0.002	m³/sec					
10 yr return peak flow	2.3	L/s					
10 yr return peak flow	197.5	m³/day					
Settlement Pond Design							
Using Stokes Law:	$V_{x} = \frac{g(sg)}{sg}$	$(r_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.		
U	p	18ν					
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
Water Temp	10	°C					
Kinematic viscosity	1.306E-06	(m²/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	m²	3.25	m width		
Q= V.A implies	V =	0.00070	m/sec				
		10.54		10.5			
Required length of Pond =	L =	10.54	m say:	10.5	mlength		
Law with the Add attle weather		2.00	.1	. 0.1			
Length to width ratio		3.23	:1	>=3:1	Acceptable		
		0410	m ²		Length to width ratio of ~3:1		
Plan Area	A =	34.13	207		Accontable		
	C% =	1.01%	>3%		Acceptable		
		(m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	10.5	3.25	1.00			
Operating Volume:	34.125	m ³		1			
					Good to remove medium silts to		
Rention Time, $R_T =$	4.1	hrs		OK	0.01mm		

Catchment A2:	Acces Track A2					
Mean Greenfield Runoff Rates						
$Q_{max} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} ×	(SOIL) ²	2.17	
		<u>, , , , , , , , , , , , , , , , , , , </u>		(00)=,		
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 _{nup} -Rural	0.0020	m ³ /sec				
Groth Eactor - 10 yr return	1 3700					
10 vr return peak flow	0.003	m ³ /sec				
10 yr return peak flow	0.003	1/s				
10 yr return poak flow	2.7	m^3/day				
To yr feforri pedk llow	200.0	in /ddy				
Settlement Pond Design						
<u>bememen rond besign</u>						
	<i>a</i> (so	$(-1) \times d^2$	2			from Metcalf & Eddy, 4th Ed, pg
Using Stokes Law:	$V_{n} = \frac{8(38)}{3}$	$\frac{p}{p}$ $1) \land a_p$	<u>}</u>			365.
-	P	<u>18v</u>				
<u>For 10 µm particles</u>	1.00E-05	m				10 micron particles
Particle Specific gravity	2.6					
Water Temp	10	°C				
Kinematic viscosity	1.306E-06	(m²/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	m²		3.50	m width
Q= V.A implies	V =	0.00078	m/seo	2		
Deswined length of Dond -	I _	11/7			10	an le a a th
Requirea lengin or Pona –	L =	11.07	m	suy.	12	mlength
Longth to Width ratio		3 /3	•1		>=3.1	Accontable
		0.40	.1		2=0.1	Acceptuble Length to width ratio of ~ 3.1
Plan Area	Δ =	42.00	m ²			
% of catchment area	∧ - ∩% =	1 83%	>3%		OK	Accentable
	C70 -	1.0070	- 070			
		l (m)		B (m)	D (m)	
Dimensions of Settlement Pond:	1 no.	12		3.50	1.00	
					•	
Operating Volume:	42	m ³				
						Good to remove medium silts to
Rention Time, $R_T =$	4.3	hrs			OK	0.01mm

Catchment B1:	Access Track B1						
Mean Greenfield Runoff Rates							
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17			
Area of site (km2)	0.002141	.,					
Area of (site) catchment (m2)	2141	mŕ					
SAAR	1602	mm					
SOIL	0.3	3,			Placed road material		
Q mean =	0.00187275	m [°] /sec					
Q mean =	1.9	L/s					
Q mean =	161.8	m³/day					
Factored Q _{BAR} -Rural	0.0019	m [*] /sec					
Groth Factor - 10 yr return	1.3700						
10 vr 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					
	221.7	, a.a.,					
Settlement Pond Design							
<u> </u>							
Using Stokes Law:	$V_{\rm c} = \frac{g(sg)}{sg}$	$(g_p-1)\times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.		
	[•] p	18ν					
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, (m/sec)	0.0007	m/s					
m/hr	0.240	m/br					
Time for D (m)	4 16	hrs					
		1110		1.00	D (m) - depth		
say pond cross section area =		3 50	m ²	3 50	m width		
		0.00		0.00			
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		314	•1	>=3.1	Acceptable		
		0.11			Length to width ratio of ~ 3.1		
Plan Aroa	A -	39.50	m ²				
af actobrant grag	Λ - C -	1 007	> 207	OK	Accontable		
	C%-	1.00%	~3%		Accepiable		
				D (m)			
Dimonsions of Sollion and Dar de	1 no	L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 10.		3.50	1.00			
		3					
Operating Volume:	38.5	m					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.2	hrs		OK	U.UIMM		

Catchment B2:	Access Track B2					
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17		
Area of site (km2)	0.001009	.,				
Area of (site) catchment (m2)	1009	m²				
SAAR	1602	mm				
SOIL	0.3	m ³ /200			Placea roda material	
Q mean =	0.00095873	m'/sec				
Q mean =	1.0	L/S				
Q mean =	82.8					
Factorea Q _{BAR} -Rurai	0.0010	111 / 360				
Groth Factor - 10 yr return	1.3700					
10 yr return peak flow	0.001	m³/sec				
10 yr return peak flow	1.3	L/s				
10 yr return peak flow	113.5	m²/day				
Settlement Pond Design						
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(r_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.	
	P P	18ν				
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	(m²/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 =	/.8/	m say:	8	mlength	
		0.00	,			
Length to Width ratio		3.20	:1	>=3:1	Acceptable	
			2		Length to width ratio of ~3:1	
Plan Area	A =	20.00	m			
% ot catchment area	C% =	1.98%	>3%	OK	Acceptable	
	1	L (m)	B (m)	D (m)		
Dimensions of Settlement Pond:	I no.	8	2.50	1.00		
Operating Volume:		m ³				
	20				Good to remove medium silts to	
Rention Time, R_{T} =	4.2	hrs		ОК	0.01mm	

Mean Greenfield Runoft Rates Image: mail of the second seco	Catchment B3:	T1 Area						
$Q_{mean} = 0.00108 \times (AREA km^2)^{0.08} \times (SAAR mm)^{1.17} \times (SOIL)^{2.17}$ Area of site (km2) 0.004286 Area of site (km2) 0.004286 Area of site (km2) 0.004286 SAR 1602 mm Solt 0.00347343 m ² /sec Q mean = 0.00347343 m ² /sec Q mean = 335 l/3 Q mean = 300.1 m ² /sec Groth Factor - 10 yr return 1.3700 10 yr returp beak flow 0.0035 m ² /sec 10 yr returp beak flow 0.005 m ² /sec 10 yr returp beak flow 0.005 m ² /sec 10 yr returp beak flow 4.8 l/3 10 yr returp beak flow 4.8 l/3 10 yr returp beak flow 4.8 l/4 10 yr returp beak flow 1.000-05 m 10 yr returp beak flow 1.000-05 m 10 yr re	Mean Greenfield Runoff Rates							
Area of site [km2]0.004286Image: constraint of the second	$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	2.17			
Area of site (km2) 0.004286 m ² Area of site (cm2) 4286 m ² SAAR 1602 mm Placed road material Placed road material Q G mean = 0.00347343 m ² /sec Placed road material Q G mean = 0.00347343 m ² /sec Placed road material Q G mean = 0.00347343 m ² /sec Placed road material Q G mean = 0.00347343 m ² /sec Placed road material Q G mean = 0.00347343 m ² /sec Placed road material Q G mean = 0.0035 m ² /sec Placed road material Q Groth Factor - 10 yr return 1.3700 Placed road material Q Groth Factor - 10 yr return Q 10 yr return peak flow 4.8 L/s Placed road material Q Settlement Pond Design Placed road material Q Settlement Pond Design Placed road material Q Settlement Pond Design Placed road material Q V $_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$ from Metcalf & Eddy. 4th Ed, pg 365. For J0 yr manaficles 100 e ⁻¹ /s m 10 micron particles Placed road material Q Water Temp 10 ¹⁰ C Kinematic viscosity 1.3066-06 (m ² /s) Placed road material Q Mater Temp 10 ¹⁰ C V (m/sec) 0.00007 (m/s) Placed road material Q Mater Temp 10 ¹⁰ C Q = VA implies V = 0.00095 m/sec Place Placed								
Area of (site) catchment (m2) 4286 (m') Placed road material SAR 1602 mm Placed road material SOIL 0.3 Placed road material Q mean = 3.5 (L's Image: Constraint of the second material Q mean = 3.00.1 m'/day Tactored 2_{back} Rural 0.0035 (m') risk: Image: Constraint of the second material To yretum peak flow 0.0035 (m') risk: Image: Constraint of the second material To yretum peak flow 0.003 (m') risk: Image: Constraint of the second material To yretum peak flow 0.003 (m') risk: Image: Constraint of the second material To yretum peak flow 4.11.1 (m') risk: Image: Constraint of the second material To yretum peak flow 4.11.1 (m') risk: Image: Constraint of the second material Settlement Pond Design Image: Constraint of the second material Image: Constraint of the second material Using Stokes Law: $V_p = \frac{g(sg_p - 1) \times d_p^2}{1.8 V}$ Image: Constraint of the second material Ver 1.00E-05 m Image: Constraint of the second material Image: Constraint of the second material Vs (m/sec) 0.00000 m/s Image: Constraint of the second material Image: Cons	Area of site (km2)	0.004286	.,					
SAAR 1602 mm	Area of (site) catchment (m2)	4286	m²					
SOIL 0.3 Placed road material Q mean = 0.0034743 m ⁷ /sec Im ⁷ /day Q mean = 300.1 m ⁷ /sec Im ⁷ /day Groth Factor - 10 yr retum 1.3700 m ⁷ /sec Im ⁷ /day Groth Factor - 10 yr retum peak flow 0.0035 m ⁷ /sec Im ⁷ /day 10 yr retum peak flow 4.8 V/s Im ⁷ /day Im ⁷ /day 10 yr retum peak flow 411.1 m ⁷ /day Im ⁷ /day Im ⁷ /day SetHement Pond Design Im ⁷ /day Im ⁷ /day Im ⁷ /day Im ⁷ /day V _p $g(sg_p - 1) \times d_p^2$ Im ⁷ /day Im ⁷ /day Im ⁷ /day V _p $g(sg_p - 1) \times d_p^2$ Im ⁷ /day Im ⁷ /day Im ⁷ /day SetHement Pond Design Im ⁷ /day Im ⁷ /day Im ⁷ /day Im ⁷ /day V _p $g(sg_p - 1) \times d_p^2$ Im ⁷ /day Im ⁷ /day Im ⁷ /day Water Temp 10 Im ⁷ /day Im ⁷ /day Im ⁷ /day Im ⁷ /day Kinematic viscosity 1.306E-06 Im ⁷ /si Im ⁷ /si Im ⁷ /si Im ⁷ /si More for D (m) <td>SAAR</td> <td>1602</td> <td>mm</td> <td></td> <td></td> <td></td>	SAAR	1602	mm					
Q mean = 0.00347343 m//sec Q mean = 3.5 U/s Q mean = 300.1 m ³ /day Factored Q _{bAS} =Rural 0.0035 m ³ /sec 10 yr return peak flow 0.005 m ³ /sec 10 yr return peak flow 4.8 U/s 10 yr return peak flow 4.11.1 m ³ /day Settlement Pond Design image: set	SOIL	0.3	37			Placed road material		
Q mean =3.5. L/sQ mean =300.1 m³/dayFactored Q _{kAk} -Rural0.0035 m²/secGroth Factor - 10 yr return1.370010 yr return peak flow0.005 m²/sec10 yr return peak flow4.8 L/s10 yr return peak flow4.11.1 m²/daySettlement Pond Design5Ear 10. µm particles1.00E-05 mParticle Specific gravity2.6Vp $= \frac{g(sg_p - 1) × d_p^2}{18v}$ For 10. µm particles1.00E-05 mParticle Specific gravity2.6Water Temp10 °CKinematic viscosity1.306E-06 (m²/s)V, (m/sec)0.00007 m/sMarken1.00E-05 mV (m/sec)0.00007 m/sMarken1.00E-05 mV (m/sec)0.00007 m/sMarken1.00E-05 m/sV (m/sec)0.00007 m/sMarken1.00 ptmlMarken1.00 ptmlMarken1.00 ptmlMarken1.00 ptmlMarken1.00 ptmlMarken1.00 ptmlQ = V.A impliesV =V =0.00095 m/secRequired length of Pond =L =Length to Width ratio3.00 :1Length to Width ratio3.00 :1Pian AreaA =MarkenA =MarkenA =MarkenC% =MarkenA =MarkenA =MarkenA =MarkenA =MarkenA =MarkenA =Marken<	Q mean =	0.00347343	m°/sec					
Q mean = TockTored Qase-Rural300.1 m²/day 0.0005 m²/secGroth Factor - 10 yr return1.370010 yr return peak flow0.005 m²/sec10 yr return peak flow411.1 m²/daySettlement Pond Design	Q mean =	3.5	L/s					
Pactored degar.ktdl0.003 m²/secGroth Factor - 10 yr return1.370010 yr return peak flow4.8 U/s10 yr return peak flow4.8 U/sSettlement Pond Design	Q mean =	300.1	m°/day					
Groth Factor - 10 yr return1.3700 0.005m³/sec110 yr return peak flow0.005m³/sec110 yr return peak flow4.8L/s110 yr return peak flow411.1m³/day1Settlement Pond Design111Using Stokes Law: $V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$ 110 micron particlesEar 10 µm particles1.00E-05110 micron particlesParticle Specific gravity2.6110 micron particlesWater Temp10°C11Water Temp10°C11Winneratic viscosity1.30E-06(m²/s)11N/n0.240m/hr111Market for D (m)4.16hrs111Get V.A impliesV =0.00095m/sec11Required length of Pond =L =14.25m say:15m lengthLength to Width ratio3.00:1>=3:1Acceptable1Yen AreaA =75.00m²5.00AcceptableMarketaC% =1.75%3%OKAcceptableCoperating Volume:75m³000Operating Volume:75m³000.01mm	Factorea Q _{BAR} -Rurai	0.0035	111 / Sec					
10 yr return peak flow 0.005 m²/sec Image: second se	Groth Factor - 10 yr return	1.3700						
10 yr return peak flow4.8 /s10 yr return peak flow411.1 m³/daySettlement Pond Designimage: setting se	10 yr return peak flow	0.005	m³/sec					
10 yr return peak flow 411.1 m²/day Settlement Pond Design image: setting of the setting o	10 yr return peak flow	4.8	L/s					
Settlement Pond DesignImage: constraint of the set	10 yr return peak flow	411.1	m³/day					
Settlement Pond DesignImage: constraint of the set	<u> </u>							
Using Stokes Law: $V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$ from Metcalf & Eddy, 4th Ed, pg 365.Ear 10, µm particles1.00E-05 m10 micron particlesParticle Specific gravity2.610 micron particlesWater Temp10 °C10 micron particlesKinematic viscosity1.306E-06 (m²/s)10 micron particlesVs (m/sec)0.00007 m/s1.00m/hr0.240 m/hr1.00Time for D (m)4.16 hrs1.00Q = V.A impliesV =0.00095 m/secRequired length of Pond =L =14.25 m say:Length to Width ratio3.00 :1>=3:1AcceptableLength to width ratio of ~3:1Plan AreaA =75.00 m²% of catchment areaC% =1.75% >3%Operating Volume:75 m³Cood to remove medium silts to 0.01mmCoperating Volume:75 m³0KAcceptable0.01mm	Settlement Pond Design							
Using Stokes Law: $V_p = \frac{g(sg_p - 1) \times d_p^2}{18\nu}$ Item Metcall & Eddy, 4th Ed, pg 365.For 10 µm particles1.00E-05m10 micron particlesParticle Specific gravity2.61.00E-05m10 micron particlesWater Temp10 °C1.306E-06 (m²/s)1.306E-06 (m²/s)1.306E-06 (m²/s)1.306E-06 (m²/s)Vs (m/sec)0.00007 m/s1.306E-06 (m²/s)1.00D (m) - depthSay pond cross section area =5.00 m²5.00m widthQ= V.A impliesV =0.00095 m/secm lengthRequired length of Pond =L =14.25 msay:15 m lengthLength to Width ratio3.00 :1>=3:1AcceptablePlan AreaA =75.00 m²C% of catchment areaC% =1.75% s3%OKAcceptableOperating Volume:75 m³Good to remove medium silts to 0.01mm				 _				
Using Stokes Law: $V_p = \frac{1}{18\nu}$ 365. Eor 10, µm particles 1,00E-05 m 10 micron particles Particle Specific gravity 2.6 10 micron particles Water Temp 10 °C 2.6 2.6 Water Temp 10 °C 2.6 2.6 Water Temp 10 °C 2.6 2.6 Water Temp 10 °C 2.6 2.7 Winscold 0.00007 m/s 2.7 2.7 Winscold 0.00007 m/s 2.7 2.7 2.7 Mine for D (m) 4.16 hrs 1.00 D (m) - depth Say pond cross section area = 5.00 m² 5.00 m m width Q= V.A implies V = 0.00095 m/sec 2.7 2.7 Required length of Pond = L = 14.25 m say: 15 m length Length to Width ratio 3.00 :11 >=3:1 Acceptable Length to Width ratio C% = 1.75% >3% OK Acceptable Dimensions of Settlement Pond: 1 no. 15 5.00 1.00 Good to remove medium silfs to 0.01mm Operat		g(sg)	$(g_p - 1) \times d_p$	2		from Metcalt & Eddy, 4th Ed, pg		
InvestigationParticles1.00E-05 m10 micron particlesParticle Specific gravity2.6Water Temp10 °CKinematic viscosity1.306E-06 (m²/s)Vs (m/sec)0.00007 m/sMy (m/sec)0.00007 m/sm/hr0.240 m/hrTime for D (m)4.16 hrsasy pond cross section area =5.00 m²Solution of Constraints1.000 D (m) - depthge V.A impliesV =V =0.00095 m/secRequired length of Pond =L =Length to Width ratio3.00 :1Plan AreaA =AreaA =MarcaC =L (m)B (m)Dimensions of Settlement Pond:1 no.Time for Dimensions of Settlement Pond:1 no.Area75 m³Rention Time, R _T =4.4 hrsOperating Volume:75 m³	Using Stokes Law:	$V_p =$	181/	-		365.		
InductorInductorInductorParticle Specific gravity2.6Water Temp10Numeratic viscosity1.306E-06Vs (m/sec)0.00007M/hr0.240m/hr0.240Time for D (m)4.16hrs1.00D (m) - depthsay pond cross section area =5.00Q= V.A impliesV =0.00095m/secRequired length of Pond =L =1.425m say:11>=3:1AcceptableLength to Width ratio3.0011>=3:1Acceptable111.5111.00111.5111.00111.5111.00111.5111.00111.00111.00111.00121.00131.00141.00151.00151.00151.00150.01 mm150.01 mm160.01 mm170.01 mm180.01 mm190.	For 10 um particlas	1.005.05	107] 		10 mieron nartieles		
Particle specific gravity2.6Image: constraint of the specific gravityWater Temp10°CKinematic viscosity1.306E-06 (m²/s)Vs (m/sec)0.00007 m/sm/hr0.240 m/hrm/hr0.240 m/hrTime for D (m)4.16 hrsagy pond cross section area =5.00 m²get V.A impliesV =V =0.00095 m/secRequired length of Pond =L =Length to Width ratio3.00 ;1Plan AreaA =C% =1.75% >3%OKAcceptableImage: C% =1.75% S00Image: C% =1.75% S00Operating Volume:75 m³Rention Time, R _T =4.4 hrsOKOKOperating Volume:75 m²	<u>Poi to piti particles</u>	1.00E-05	rn			To micron panicles		
Water lemp10 $^{\circ}$ CImage: constraint of the second secon		2.6						
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Vs (m/sec) 0.00007 m/s m/s m/s m/hr 0.240 m/hr m/hr m/hr Time for D (m) 4.16 hrs 1.00 D (m) - depth say pond cross section area = 5.00 m² 5.00 m width Q= V.A implies V = 0.00095 m/sec m Required length of Pond = L = 14.25 m say: 15 m length Length to Width ratio 3.00 :1 >=3:1 Acceptable Plan Area A = 75.00 m² Length to width ratio of ~3:1 Dimensions of Settlement Pond: 1 no. 15 5.00 1.00 Operating Volume: 75 m³ M C Good to remove medium silts to 0.01mm	Kinematic viscosity	1.306E-06	(m²/s)					
m/hr0.240 m/hrImage: constraint of the matrix of th	V _s (m/sec)	0.00007	m/s					
Time for D (m)4.16 hrsImage: constraint of the section area is a point of the section are	m/hr	0.240	m/hr					
and the second cross section area = 5.00 m^2 $1.00 \text{ D} (\text{m}) - \text{depth}$ say pond cross section area = 5.00 m^2 5.00 m widthQ = V.A impliesV = 0.00095 m/sec $$	Time for D (m)	4.16	hrs					
say pond cross section area = 5.00 m^2 5.00 m widthQ= V.A impliesV = 0.00095 m/sec Required length of Pond =L = 14.25 m say:15Length to Width ratio $3.00 :1$ >=3:1AcceptableLength to width ratio of ~3:1Plan AreaA = 75.00 m^2 % of catchment areaC% = $1.75\% >3\%$ OKDimensions of Settlement Pond:1 no.15 5.00 m^2 Operating Volume:75 m³ $6000 \text{ for remove medium silts to of 0.01 mm}$					1.00	D (m) - depth		
Q= V.A impliesV = 0.00095 m/secRequired length of Pond =L = 14.25 msay:15Length to Width ratio 3.00 :1>=3:1AcceptableLength to Width ratio 3.00 :1>=3:1AcceptablePlan AreaA = 75.00 m²% of catchment areaC% = 1.75% >3%OKDimensions of Settlement Pond:1 no.155.001.00Operating Volume:75 m³Good to remove medium silts to 0.01mm	say pond cross section area =		5.00	m ²	5.00	m width		
Q= V.A impliesV = 0.00095 m/secImpliesImpliesV = 0.00095 m/secRequired length of Pond =L = 14.25 m say: 15 m lengthLength to Width ratio3.00:1>=3:1AcceptableLength to Width ratio3.00:1>=3:1AcceptablePlan AreaA = 75.00 m²Implies% of catchment areaC% = 1.75% >3%OKAcceptableImpliesImpliesImpliesImpliesImpliesImpliesDimensions of Settlement Pond:1 no.155.001.00ImpliesOperating Volume:75m³ImpliesGood to remove medium silts to 0.01mm								
Required length of Pond =L =14.25 msay:15 mm lengthLength to Width ratio3.00:1>=3:1AcceptableLength to Width ratio3.00:1>=3:1AcceptablePlan AreaA =75.00 m²Length to width ratio of ~3:1% of catchment areaC% =1.75%>3%OKAcceptableImage: Cm = 1MMMMMModel areaC% =1.75%>3%OKAcceptableImage: Cm = 1MMMMMModel areaC% =1.75%>3%OKAcceptableImage: Cm = 1MMMMMImage: Cm = 1MMMMMModel areaC% =1.75%>3%OKAcceptableImage: Cm = 1MMMMMImage: Cm = 1 <td>Q= V.A implies</td> <td>V =</td> <td>0.00095</td> <td>m/sec</td> <td></td> <td></td>	Q= V.A implies	V =	0.00095	m/sec				
Required length of Pond =L =14.25 msay:15 mm lengthLength to Width ratio3.00:1>=3:1AcceptableLength to Width ratio3.00:1>=3:1AcceptablePlan AreaA =75.00 m²Length to width ratio of ~3:1% of catchment areaC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationMathematicatio								
Length to Width ratio3.00:1>=3:1AcceptableLength to Width ratio3.00:1>=3:1Length to width ratio of ~3:1Plan AreaA =75.00m²% of catchment areaC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationC% =1.75%5.001.00Dimensions of Settlement Pond:1 no.155.001.00Operating Volume:75m³Rention Time, RT =4.4 hrsOKOK0.01mm	Required length of Pond =	L =	14.25	m say:	15	m length		
Length to Width ratio 3.00 :1>=3:1AcceptablePlan AreaA =75.00m²Length to width ratio of ~3:1% of catchment areaC% =1.75%>3%OKAcceptableMathematicationC% =1.75%>3%OKAcceptableMathematicationL (m)B (m)D (m)MathematicationDimensions of Settlement Pond:1 no.155.001.00Operating Volume:75 m³MathematicationGood to remove medium silts to 0.01mm								
Image: constraint of the second state of the seco	Length to Width ratio		3.00	:1	>=3:1	Acceptable		
Plan Area A = 75.00 m² % of catchment area C% = 1.75% >3% OK Acceptable % of catchment area C% = 1.75% >3% OK Acceptable						Length to width ratio of ~3:1		
% of catchment area C% = 1.75% >3% OK Acceptable Mathematical System L (m) B (m) D (m) D (m) Dimensions of Settlement Pond: 1 no. 15 5.00 1.00 Operating Volume: 75 m ³ Good to remove medium silts to 0.01mm	Plan Area	A =	75.00	m ²				
Dimensions of Settlement Pond:1 no.L (m) 15B (m) 5.00D (m) 1.00Operating Volume:75 m³ $\overline{}$ Rention Time, $R_T =$ 4.4 hrs OK	% of catchment area	C% =	1.75%	>3%	OK	Acceptable		
L (m) Dimensions of Settlement Pond:L (m) 1 no.B (m) 15D (m) 1.00Operating Volume:75 m³ \bigcirc Rention Time, $R_T =$ 4.4 hrs \bigcirc								
Dimensions of Settlement Pond: 1 no. 15 5.00 1.00 Operating Volume: 75 m ³ Good to remove medium silts to OK			L (m)	B (m)	D (m)			
Operating Volume: 75 m ³ Rention Time, R _T = 4.4 hrs Good to remove medium silts to OK	Dimensions of Settlement Pond:	1 no.	15	5.00	1.00			
Operating Volume:75 m³Rention Time, $R_T =$ 4.4 hrsGood to remove medium silts to OK								
Rention Time, R _T = 4.4 hrs Good to remove medium silts to OK	Operating Volume:	75	m ³					
Rention Time, R _T = 4.4 hrs OK 0.01mm						Good to remove medium silts to		
	Rention Time, $R_T =$	4.4	hrs		OK	0.01mm		

Catchment B4:	Access Track B4						
Mean Greenfield Runoff Rates							
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17			
Area of site (km2)	0.002016	0					
Area of (site) catchment (m2)	2016	m²					
SAAR	1602	mm					
SOIL	0.3	0			Placed road material		
Q mean =	0.00177512	m³/sec					
Q mean =	1.8	L/s					
Q mean =	153.4	m³/day					
Factored Q _{BAR} -Rural	0.0018	m³/sec					
Groth Factor - 10 yr return	1.3700						
10 vr return peak flow	0.002	m ³ /sec					
10 yr return peak flow	2.4	L/s					
10 vr return peak flow	210.1	m ³ /day					
Settlement Pond Design							
	g(se	$(-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = \frac{3}{2}$	10	2		365.		
	1	181					
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
Water Temp	10	°C					
Kinematic viscosity	1.306E-06	(m²/s)					
V _s (m/sec)	0.00007	m/s					
m/hr	0.240	m/hr					
Time for D (m)	4.16	hrs			- /		
			2	1.00	D (m) - depth		
say pond cross section area =		3.50	m ²	3.50	m width		
0)/ / / /							
Q= V.A Implies	V =	0.00069	m/sec				
Required length of Pond -	1 -	10 /1	m sav:	10.5	mlength		
	L -	10.41	ini suy.	10.5	Intengin		
Length to Width ratio		3.00	•1	>=3.1	Acceptable		
		0.00	• •	- 0.1	Length to width ratio of ~ 3.1		
Plan Area	Δ =	36.75	m ²				
% of catchment area	C% =	1.82%	>3%	OK	Acceptable		
		1.02/0					
		L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	10.5	3.50	1.00			
Operating Volume:	36.75	m ³					
					Good to remove medium silts to		
Rention Time, R_{T} =	4.2	hrs		OK	0.01mm		

Catchment B4:	Access Track B5						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ^{2.}	.17			
Area of site (km2)	0.001444						
Area of (site) catchmont (m2)	0.001000	m ²					
	1600	mm					
SOIL	0.3				Placed road material		
0 mean =	0.00149804	m ³ /sec					
Q mean =	1.5	L/s					
Q mean =	129.4	m ³ /day					
Eactored Que-Rural	0.0015	m ³ /sec					
Groth Eactor - 10 yr return	1.3700						
10 vr return peak flow	0.002	m ³ /sec					
10 yr return peak flow	2.1	1/s					
10 yr return peak flow	177.3	m ³ /dav					
		, ,					
Settlement Pond Design							
	g(sg	$(n-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = \frac{c + c}{c}$	<u>p</u> <u>r</u> 1817			365.		
For 10 um particlas	1.005.05	10/					
Particle Specific gravity	1.00E-05	m			TU micron particles		
Water Temp	2.0	°C					
Kinomatic viscosity	1 3045 04	(m^2/s)					
	0.00007	m/s					
v _s (III/sec)	0.00007	m/br					
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		
		2.22	.1	> 0.1			
Lengin to width ratio		3.33	:1	>=3:1	Acceptable		
	A _	20.00	m ²				
rian Area	A =	30.00	>3%	OK	Acceptable		
	C /0 -	1.00%	- 070				
		L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	10	3.00	1.00			
Operating Volume:	30	m ³					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.1	hrs		OK	U.UIMM		

Catchment C1:	Access Track C1						
Mean Greenfield Runoff Rates							
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	·		
Area of site ((m2))	0.002011						
Area of (site) optobroot (m2)	0.003611	m ²					
Area of (sife) catchment (m2)	3811	mm					
SOIL	0.3				Placed road material		
0 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 ⁻ /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	1/5					
10 yr return peak flow	370.3	m^{3}/day					
	570.5						
Settlement Pond Desian							
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.		
	, p	18ν					
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. (m/sec)	0,00007	m/s					
	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	mwidth		
		4.00		4.00			
Q= V A implies	V =	0.00107	m/sec				
	•	0.0010/	111/300				
Required length of Pond =	L =	16.05	m sav:	16	m lenath		
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					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.1	hrs		OK	0.01mm		

Catchment C2:	Access Track C2						
Mean Greenfield Runoff Rates							
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17			
Area of site (km2)	0.002531						
Area of (site) catchment (m2)	2531	m²					
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	m³/day					
Factored Q _{BAR} -Rural	0.0022	m³/sec					
Groth Factor - 10 yr return	1.3700						
10 vr return peak flow	0.003	m ³ /sec					
10 yr return peak flow	3.0	L/s					
10 vr return peak flow	257.3	m ³ /day					
	207.0	, ,					
Settlement Pond Design							
	g(se	$(-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = \frac{3}{2}$	10	2		365.		
	1	181					
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
Water Temp	10	°C					
Kinematic viscosity	1.306E-06	(m²/s)					
V _s (m/sec)	0.00007	m/s					
m/hr	0.240	m/hr					
Time for D (m)	4.16	hrs		1.00			
			2	1.00	D (m) - depth		
say pond cross section area =		3.50	m²	3.50	m width		
		0 00005					
Q= V.A Implies	V =	0.00085	m/sec				
Required length of Pond -	1 -	12.74	m sav:	13	mlength		
	L -	12.74	ini say.	10	intergin		
Lenath to Width ratio		3.71	•1	>=3.1	Acceptable		
		0171			Length to width ratio of $\sim 3:1$		
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					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm		

Catchment C3:	Access Track C3						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	1		
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 Qnee-Rural	0.0022	m ³ /sec					
Groth Factor - 10 vr return	1.3700						
10 vr return peak flow	0.003	m ³ /sec					
10 yr return peak flow	3.0	L/s					
10 vr return peak flow	257.3	m ³ /day					
	20/10	. ,					
Settlement Pond Design							
	g(sg	$(n-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = \frac{c + c}{c}$	<u>p</u> <u>r</u> 181	<u>_</u>		365.		
For 10 um particlas	1.005.05	101					
<u>Por 10 μm panicles</u>	1.00E-05	m			10 micron particles		
Water Temp	2.6	°C					
Kinomatia visoosity	1 20/5 0/	(m^2/s)					
	1.306E-06	(111 / 3)					
v _s (m/sec)	0.00007	m/br					
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		
Level alle the AAP alle weather		0.71	.1	1 0 1			
Length to width ratio		3./1	:1	>=3:1	Acceptable		
			m ²		Length to width ratio of ~3:1		
Plan Area	A =	45.50	207	OK	Accoptable		
	C /0 -	1.00%	- 576		Accepiuble		
		L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	13	3.50	1.00	-		
Operating Volume:	45.5	m ³					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm		

Catchment C4:	T3 Area						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17			
		<i>_</i>	(
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	m³/day					
Factored Q _{BAR} -Rural	0.0022	m³/sec					
Groth Factor - 10 yr return	1.3700						
10 vr 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							
	g(sg)	$(q_p - 1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p =$	$\frac{1}{18\nu}$	-		365.		
For 10 um particles	1.005.05	m			10 micron particles		
Particle Specific gravity	1.002-03						
Water Temp	10	°C					
Kinematic viscosity	1 304F-04	(m^2/s)					
	0.00007	m/s					
m/hr	0.00007	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		
		0.57	,				
Length to Width ratio		3.5/	:1	>=3:1			
		10.75	m ²		Length to width ratio of ~3:1		
Plan Area	A =	43./5	111				
	C% =	1./4%	>3%	<u> </u>	Acceptable		
		(m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	12.5	3.50	1.00			
Operating Volume:	43.75	m ³					
					Good to remove medium silts to		
Rention Time, R_{T} =	4.1	hrs		OK	0.01mm		

Catchment D1:			Acces	s Track I	01					
Mean Greenfield Runoff Rates										
$Q_{mean} = 0.00108 \times (AREA km^2)^{0.89} \times (SAAR mm)^{1.17} \times (SOIL)^{2.17}$										
Area of site (km2)	0.003489									
Area of (site) actobrant (m2)	2490	m ²								
	1407	mm								
SOIL	0.3				Placed road material					
Q mean =	0.00289225	m³/sec								
Q mean =	2.9	L/s								
Q mean =	249.9	m ³ /day								
Factored Q _{BAR} -Rural	0.0029	m ⁻ /sec								
Groth Factor - 10 yr return	1 3700									
10 vr return peak flow	0.004	m ³ /sec								
10 yr return peak flow	4.0	1/5								
10 yr return peak flow	342.3	m^{3}/day								
	042.0									
Settlement Pond Design										
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.					
	, p	18ν								
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 (m/sec)	0,00007	m/s								
	0.00007	m/br								
Time for D (m)	4 16	hrs								
				1.00	D (m) - depth					
say pond cross section greg -		4.00	m ²	4.00	m width					
		4.00		4.00						
$\Omega = V A$ implies	V =	0 00099	m/sec							
	v –	0.00077	11/300							
Required length of Pond =	L =	14.84	m say:	15	m length					
			,		5					
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								
					Good to remove medium silts to					
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm					

Catchment D2:			T4	Area	
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	-
Area of site (km2)	0.002997	.,.			
Area of (site) catchment (m2)	2997	m²			
SAAR	1602	mm			
SOIL	0.3	37			Placed road material
Q mean =	0.00252629	m°/sec			
Q mean =	2.5	L/s			
Q mean =	218.3	m°/day			
Factored Q _{BAR} -Rural	0.0025	m /sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m³/sec			
10 yr return peak flow	3.5	L/s			
10 yr return peak flow	299.0	m³/day			
Settlement Pond Design					
Using Stokes Law:	$V_n = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2 2		from Metcalf & Eddy, 4th Ed, pg 365.
U	P	<u>18v</u>			
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)			
	0.00007	m/s			
v _s (iii/see)	0.00007	m/br			
Time for D (m)	4 16	hrs			
	4.10	1113		1.00	D (m) - depth
ray pand crass saction grag -		4.00	m ²	1.00	m width
		4.00		4.00	
	V -	0 00097	m/200		
	v –	0.00087	11/360		
Required length of Pond =		12.96	m sav:	13	mlength
		12.70	ini suy.	10	inteligin
Longth to Width ratio		3.05	•1	>-2.1	Accontable
		5.25	.1	~-0.1	Longth to width ratio of ~3:1
		F0.00	m ²		
Pian Area	A =	52.00	111		
% of catchment area	C% =	1./4%	>3%	OK	Acceptable
	ļ,				
	1	L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	ı no.	13	4.00	1.00	
		3			
Operating Volume:	52	m.			
				C 11	Good to remove mealum silfs to
κ ention time, $K_T =$	4.2	nrs		OK	0.0111111

Catchment E1:			Acces	s Track	E1				
Mean Greenfield Runoff Rates									
$Q_{mean} = 0.00108 \times (AREA km^2)^{0.89} \times (SAAR mm)^{1.17} \times (SOIL)^{2.17}$									
Area of site (km2)	0.001053								
Area of (site) actobrant (m2)	1053	m ²							
	1603	mm							
SOIL	0.3				Placed road material				
Q mean =	0.00099585	m³/sec							
Q mean =	1.0	L/s							
Q mean =	86.0	m ³ /day							
Factored Q _{BAR} -Rural	0.0010	m ⁻ /sec							
Groth Eactor - 10 yr return	1.3700								
10 vr return peak flow	0.001	m ³ /sec							
10 vr return peak flow	1.4	L/s							
10 vr return peak flow	117.9	m ³ /day							
		/							
Settlement Pond Design									
Usina Stokes Law:	$V_{z} = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.				
	. P	18ν							
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	(m²/s)							
V. (m/sec)	0.0007	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				
		2.00		2.00					
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							
					Good to remove medium silts to				
Rention Time, R_{T} =	4.1	hrs		OK	0.01mm				

Catchment E2:			Acces	s Track	E2
Mean Greenfield Runoff Rates					
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	2.17	·
Area of site ((m2))	0.001000				
Area of (site) established (m2)	0.001228	m ²			
Ared of (site) catchment (m2)	1228	mm			
SOIL	0.3				Placed road material
Ω 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 ⁻ /sec			
Groth Factor - 10 yr return	1 3700				
10 vr return peak flow	0.002	m ³ /sec			
10 yr return peak flow	0.002	1/5			
10 yr return peak flow	135.2	m^{3}/day			
	100.2				
Settlement Pond Desian					
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg
	' p	18ν			
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. (m/sec)	0.00007	m/s			
	0.240	m/hr			
Time for D (m)	4.16	hrs			
				1.00	D (m) - depth
say pond cross section area =		2 7 5	m ²	2.75	m width
		2.70		2.70	
Q= V A implies	V =	0.000.57	m/sec		
	•	0.00007	111,500		
Required length of Pond =	L =	8.52	m sav:	9	m lenath
			,		
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			
					Good to remove medium silts to
Rention Time, $R_T =$	4.4	hrs		OK	0.01mm

Catchment E3:			Acces	Access Track E3				
Mean Greenfield Runoff Rates								
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17				
Area of site (km2)	0.002062							
Area of (site) catchment (m2)	2062	m²						
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	m³/day						
Factored Q _{BAR} -Rural	0.0018	m³/sec						
Groth Factor - 10 yr return	1.3700							
10 vr return peak flow	0.002	m ³ /sec						
10 yr return peak flow	2.5	L/s						
10 vr return peak flow	214.4	m ³ /dav						
	2.1.1	, ,						
Settlement Pond Design								
	<i>e(se</i>	$(-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg			
Using Stokes Law:	$V_n = \frac{\delta \sqrt{\delta} \delta}{\delta}$		<u>></u>		365.			
	Ĩ	181						
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles			
Particle Specific gravity	2.6							
Water Temp	10	°C						
Kinematic viscosity	1.306E-06	(m²/s)						
V _s (m/sec)	0.00007	m/s						
m/hr	0.240	m/hr						
Time for D (m)	4.16	hrs						
			0	1.00	D (m) - depth			
say pond cross section area =		3.50	m²	3.50	m width			
Q= V.A implies	V =	0.00071	m/sec					
		10.70		10.5				
Required length of Pond =	L =	10.62	m say:	10.5	miengin			
Length to Width ratio		3 00	•1	>=3.1	Accentable			
		0.00	• 1	2-0.1	Length to width ratio of ~ 3.1			
Plan Area	A -	34 75	m ²					
% of catchment area	C% =	1 78%	>3%	OK	Acceptable			
	~/0	1.7 070						
		L (m)	B (m)	D (m)				
Dimensions of Settlement Pond:	1 no.	10.5	3.50	1.00				
Operating Volume:	36.75	m ³						
-					Good to remove medium silts to			
Rention Time, R_{T} =	4.1	hrs		OK	0.01mm			

Catchment E4-T2:		T2 Area				
Mean Greenfield Runoff Rates						
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	- -	
Area of site (km2)	0.00243					
Area of (site) catchment (m2)	2430	m²				
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	m³/day				
Factored Q _{BAR} -Rural	0.0021	m³/sec				
Groth Factor - 10 yr return	1.3700					
10 vr return peak flow	0.003	m ³ /sec				
10 yr return peak flow	2.9	L/s				
10 vr return peak flow	248.1	m ³ /day				
	210.1	, ,				
Settlement Pond Design						
	<i>e(se</i>	$r = -1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg	
Using Stokes Law:	$V_n = \frac{\delta \sqrt{\delta} \delta}{\delta}$		<u>-</u>		365.	
	Ĩ	181				
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles	
Particle Specific gravity	2.6					
Water Temp	10	°C				
Kinematic viscosity	1.306E-06	(m²/s)				
V _s (m/sec)	0.00007	m/s				
m/hr	0.240	m/hr				
Time for D (m)	4.16	hrs				
			0	1.00	D (m) - depth	
say pond cross section area =		3.50	m²	3.50	m width	
Q= V.A implies	V =	0.00082	m/sec			
		10.00		10.5		
Required length of Pond =	L =	12.29	m say:	12.5	miengin	
Length to Width ratio		3 57	•1	>=2.1	Accentable	
		0.07	• 1	2-0.1	Length to width ratio of ~3.1	
Plan Area	A -	13 75	m ²			
% of catchment area	C% =	1.80%	>3%	OK	Acceptable	
	~/0	1.0070				
		L (m)	B (m)	D (m)		
Dimensions of Settlement Pond:	1 no.	12.5	3.50	1.00		
Operating Volume:	43.75	m ³				
-					Good to remove medium silts to	
Rention Time, R_{T} =	4.2	hrs		OK	0.01mm	

Catchment E5:			Access Track E5				
Mean Greenfield Runoff Rates							
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (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	m³/day					
Factored Q _{BAR} -Rural	0.0029	m³/sec					
Groth Factor - 10 yr return	1.3700						
10 vr return peak flow	0.004	m ³ /sec					
10 yr return peak flow	4.0	L/s					
10 vr return peak flow	342.0	m ³ /day					
	0 12.0	, ,					
Settlement Pond Design							
	g(se	$(-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = \frac{3}{2}$	10	2		365.		
	1	181					
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
Water Temp	10	°C					
Kinematic viscosity	1.306E-06	(m²/s)					
V _s (m/sec)	0.00007	m/s					
m/hr	0.240	m/hr					
Time for D (m)	4.16	hrs		1.00			
			2	1.00	D (m) - depth		
say pond cross section area =		4.50	m²	4.50	m width		
		0.00000					
Q= V.A Implies	V =	0.00088	m/sec				
Required length of Pond -	1 -	13 17	m sav:	13.5	mlength		
	L -	10.17	ini say.	10.0	intergin		
Lenath to Width ratio		3.00	•1	>=3.1	Acceptable		
		0.00			Length to width ratio of $\sim 3:1$		
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					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.3	hrs		OK	0.01mm		

Catchment F1:			Acces	s Track	F1
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (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	m³/sec			
Q mean =	1.7	L/s			
Q mean =	150.0	m³/day			
Factored Q _{BAR} -Rural	0.0017	m³/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.002	m³/sec			
10 yr return peak flow	2.4	L/s			
10 yr return peak flow	205.5	m³/day			
Settlement Pond Design					
Using Stokes Law:	$V_{p} = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.
	P	18v			
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m²/s)			
V _s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
lime for D (m)	4.16	nrs		1.00	D(m) dooth
		2 50	m ²	1.00	D (m) - depin
say pond cross section area =		3.50		3.50	
	V =	0.00048	m/sec		
	•	0.00000	11/300		
Required length of Pond =	L =	10.18	m say:	10.5	m length
Length to Width ratio		3.00	•1	>=3.1	Accentable
		5.00	• 1	2-0.1	Length to width ratio of ~3.1
Plan Area	A -	36 75	m ²		
% of catchment area	<u>∧</u> =	1 87%	>3%	OK	Acceptable
	~/0	1.07 /0	. 070		
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	1 no.	10.5	3.50	1.00	
		0			
Operating Volume:	36.75	m ³			
Rention Time, $R_T =$	4.3	hrs		ОК	Good to remove medium silts to 0.01mm

Catchment F2:		Access Track F2				
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17		
Area of site (km2)	0.002138					
Area of (site) catchment (m2)	2138	m²				
SAAR	1602	mm				
SOIL	0.3				Placed road material	
Q mean =	0.00187042	m³/sec				
Q mean =	1.9	L/s				
Q mean =	161.6	m³/day				
Factored Q _{BAR} -Rural	0.0019	m°/sec				
Groth Factor - 10 yr return	1.3700					
10 yr return peak flow	0.003	m³/sec				
10 yr return peak flow	2.6	L/s				
10 yr return peak flow	221.4	m³/day				
Settlement Pond Design						
Using Stokes Law:	g(sg	$(q_p - 1) \times d_p^2$	2		trom Metcalt & Eddy, 4th Ed, pg	
Using Stokes Edw.	$V_p =$	$\frac{18\nu}{18\nu}$	-			
For 10 µm particles	1.00E-05	m			10 micron particles	
Particle Specific gravity	2.6					
Water Temp	10	°C				
Kinematic viscosity	1.306F-06	(m^2/s)				
V _a (m/sec)	0.00007	m/s				
	0.0000/	m/br				
Time for D (m)	4 16	hrs				
				1.00	D (m) - depth	
say pond cross section area =		3.50	m ²	3.50	() 1-	
		0.00		0.00		
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				
					Good to remove medium silts to	
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm	

Catchment F3:			Access Track F3				
Mean Greenfield Runoff Rates							
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	·		
Area of site (km2)	0.002218	0					
Area of (site) catchment (m2)	2218	m²					
SAAR	1602	mm					
SOIL	0.3				Placed road material		
Q mean =	0.00193258	m³/sec					
Q mean =	1.9	L/s					
Q mean =	167.0	m³/day					
Factored Q _{BAR} -Rural	0.0019	m³/sec					
Groth Factor - 10 yr return	1.3700						
10 vr return peak flow	0.003	m ³ /sec					
10 yr return peak flow	2.6	1/s					
10 vr return peak flow	228.8	m ³ /day					
	220.0	,,					
Settlement Pond Desian							
	g(sg	$(n-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p =$	<u>r</u> <u>r</u> 1817			365.		
For 10 um particlas	1.005.05	10/					
<u>For to µm panicles</u>	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
	10	$\frac{1}{2}$					
Kinematic viscosity	1.306E-06	(m /s)					
V _s (m/sec)	0.00007	m/s					
m/nr Time for D (m)	0.240	m/nr					
	4.10	1115		1.00	D(m) dooth		
		0.50	m ²	1.00	D (m) - depin		
say pond cross section area =		3.50		3.50			
	V -	0.00076	m/sec				
	v –	0.00070	11/360				
Required length of Pond =	=	11.33	m sav:	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	m³					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.0	hrs		OK	U.UIMM		

Catchment F4:		T5 Area				
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	$(SA^{2})^{0.89} \times (SA^{2})^{0.89}$	AR mm)	^{1.17} × (SOIL) ²	.17	1	
,	(
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 QRAR-Rural	0.0024	m ³ /sec				
Groth Factor - 10 yr return	1.3700					
10 vr return peak flow	0.003	m ³ /sec				
10 yr return peak flow	3.3	1/s				
10 yr return peak flow	285.6	m ³ /day				
	200.0	,,				
Settlement Pond Desian						
	<i>e(se</i>	$r = -1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg	
Using Stokes Law:	$V_p = \frac{3}{2}$	10			365.	
	1	181				
For 10 µm particles	1.00E-05	m			10 micron particles	
Particle Specific gravity	2.6					
Water lemp	10	°C				
Kinematic viscosity	1.306E-06	(m²/s)				
V _s (m/sec)	0.00007	m/s				
m/hr	0.240	m/hr				
lime for D (m)	4.16	hrs		1.00		
			2	1.00	D (m) - depth	
say pond cross section area =		4.00	m	4.00		
		0.00000				
	V =	0.00083	m/sec			
Required length of Pond =	1 =	12.38	m sav.	13	m length	
	L	12.00	in say.			
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		
		3				
Operating Volume:	52	m				
					Good to remove medium silts to	
Kention lime, $K_T =$	4.4	Inrs		OK	0.0111111	

Catchment G1:		Access Track G1				
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	$(SA^{2})^{0.89} \times (SA^{2})^{0.89}$	AR mm)	^{1.17} × (SOIL) ²	.17		
Area of site (km2)	0.002784					
Area of (site) catchment (m2)	2784	m²				
SAAR	1602	mm				
SOIL	0.3				Placed road material	
Q mean =	0.00236585	m³/sec				
Q mean =	2.4	L/s				
Q mean =	204.4	m³/day				
Factored Q _{BAR} -Rural	0.0024	m°/sec				
Groth Factor - 10 yr return	1.3700					
10 yr return peak flow	0.003	m³/sec				
10 yr return peak flow	3.2	L/s				
10 yr return peak flow	280.0	m³/day				
Settlement Pond Design						
	g(sg)	$(g_p - 1) \times d_p^2$	2		from Metcalt & Eddy, 4th Ed, pg	
Using Stokes Law:	$V_p =$	181	-		365.	
For 10 um particles	1 005 05	m			10 micron particles	
Particle Specific gravity	1.00E-03	111				
Water Temp	2.0	°C				
Kinomatia viagosity		(m^2/s)				
	1.306E-06	(111 / 5)				
	0.00007	m/s				
m/hr	0.240	m/hr				
	4.16	1115		1.00	D(m) donth	
		4.00	m ²	1.00	D (m) - depin	
say pond cross section dred =		4.00		4.00		
	V -	0.00081	m/sec			
	v -	0.00001	11/360			
Required length of Pond =	1 =	12.14	m sav:	12	m lenath	
	-					
Length to Width ratio		3.00	:1	>=3:1	Acceptable	
		0.000			Length to width ratio of $\sim3:1$	
Plan Area	Δ =	48.00	m ²			
% of catchment area	C% =	1 72%	>3%	OK	Accentable	
	~/~	1.7 2/0				
		1 (m)	B (m)	D(m)		
Dimensions of Settlement Pond [.]	1 no.	12	4,00	1.00		
Operating Volume:	10	m ³				
	40				Good to remove medium silts to	
Reption Time $R_{r} =$	A 1	brs		OK	0.01mm	
Kormon mno, K ₁ -	4.1	1113		UN		

Catchment G2:				BP1	
Mean Greenfield Runoff Rates					
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	
	0.01.007				
Area of sife (km2)	0.014807	m ²			
Area of (sife) catchment (m2)	1480/				
SAAR	1602	mm			Placed road material
0 magn =	0.3	m ³ /sec			
	10.0104/002	11/5			
	904.4	m^{3}/day			
Factored Q _{RAD} -Rural	704.6	m ⁻ /sec			
$C_{\text{roth}} = \frac{10}{2} \text{ m}^2 \text{ roth}$	1.2700				
Groth Factor - 10 yr refurn	1.3/00	m^3/soc			
10 yr refurn peak flow	0.014				
	14.3	L/S			
TU yr refurn peak flow	1239.3	in /uuy			
Settlement Pond Design					
	<i>a</i> (so	$r = 1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg
Using Stokes Law:	$V_n = \frac{g(3g)}{2}$	$\frac{1}{p}$ $1) \land u_p$	2		365.
	P	18ν			
<u>For 4 µm particles</u>	4.00E-06	m			4 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m²/s)			
V _s (m/sec)	0.00001	m/s			
m/hr	0.038	m/hr			
Time for D (m)	26.00	hrs			
			0	1.00	D (m) - depth
say pond cross section area =		20.00	m²	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	m²		
% 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
		3			
Operating Volume:	1300	m°			
					Good to remove medium silts to
Rention Time, $R_T =$	25.2	hrs		OK	U.UU4mm

Catchment H1:	Access Track H1						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	$1.17 \times (SOIL)^2$.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	m³/sec					
Q mean =	0.9	L/s					
Q mean =	77.2	m³/day					
Factored Q _{BAR} -Rural	0.0009	m [°] /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	m³/day					
Settlement Pond Design							
	g(sg)	$(n-1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p = -$	181			365.		
For 10 um particles	1.005.05	10V	 		10 mieron partieles		
Particle Specific gravity	1.00E-03						
Water Temp	2.0	°C					
Kinementie viegesity		(m^2/s)					
	1.306E-06	(111 / 5)					
v _s (11/sec)	0.00007	m/s					
m/hr Time for D. (m)	0.240	m/hr					
	4.10	1115		1.00	D(m) donth		
			2	1.00	D (m) - depin		
say pond cross section area =		2.50	m-	2.50			
		0.000.40					
Q= V.A implies	V =	0.00049	m/sec				
		7.00		7.05			
Required length of Pond =	L =	/.33	m say:	7.25	miength		
		0.00	,				
Length to width ratio		2.90	:1	>=3:1	Acceptable		
			2		Length to width ratio of ~3:1		
Plan Area	A =	18.13	m				
% 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			
		3					
Operating Volume:	18.125	m					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.1	hrs		OK	0.01mm		

Catchment H2:	Access Track H2						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	$(SA^{2})^{0.89} \times (SA^{2})^{0.89}$	AR mm)	$^{1.17}$ × (SOIL) ²	.17			
, , , , , , , , , , , , , , , , , , ,	, ,	,					
Area of site (km2)	0.001964						
Area of (site) catchment (m2)	1964	m²					
SAAR	1602	mm					
SOIL	0.3				Placed road material		
Q mean =	0.00173431	m³/sec					
Q mean =	1.7	L/s					
Q mean =	149.8	m³/day					
Factored Q _{BAR} -Rural	0.0017	m ⁻ /sec					
Groth Eactor - 10 yr return	1 3700						
10 vr return peak flow	0.002	m ³ /sec					
10 yr return peak flow	0.002	1/5					
	2.4	m^{3}/day					
	205.5	iii /uuy					
Settlement Pond Design							
Semement ond Design							
Illsing Stokes Law:	$V = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg		
	$\mathbf{v}_p =$	18ν					
For 10 µm particles	1.00E-05	m			10 micron particles		
Particle Specific gravity	2.6						
Water Temp	10	°C					
Kinematic viscosity	1.306F-06	(m^2/s)					
V. (m/sec)	0.00007	m/s					
	0.0000/	m/br					
Time for D (m)	4 16	hrs					
				1.00	D (m) - depth		
any nand areas so ation area -		7.05	m ²	7.05			
say pond cross section dred =		7.25	111	/.23			
		0.00022					
Q= v.A implies	V =	0.00033	m/sec				
Deguized length of Dand -		4.01		00	na lon ath		
Required length of Pond =	L =	4.71	m say:		miengin		
		0.00	. 1	. 0.1			
Length to width ratio		3.03	:1	>=3:1			
			2		Length to width ratio of ~3:1		
Plan Area	A =	159.50	mf				
% 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					
					Good to remove medium silts to		
Rention Time, R_T =	18.6	hrs		OK	0.01mm		

Catchment J1:			T6	Area	
Mean Greenfield Runoff Rates					
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	
Area of site (km2)	0.003007				
Area of (site) catchment (m2)	3007	mŕ			
SAAR	1602	mm			
SOIL	0.3	34			Placed road material
Q mean =	0.00253379	m ⁻ /sec			
Q mean =	2.5	L/s			
Q mean =	218.9	m°/day			
Factorea Q _{BAR} -Rurai	0.0025	111 / Sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m³/sec			
10 yr return peak flow	3.5	L/s			
10 yr return peak flow	299.9	m³/day			
Settlement Pond Design					
	g(sg)	$\frac{1}{2(n-1)\times d^2}$	2		from Metcalf & Eddy, 4th Ed, pg
Using Stokes Law:	$V_p = \frac{\sigma + \sigma}{\sigma}$	$\frac{18\nu}{1}$			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	(m²/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	m²	4.00	m width
Q= V.A implies	V =	0.00087	m/sec		
Required length of Pond =	L =	13.00	m say:	13	mlength
			-		
Length to Width ratio		3.25	:1	>=3:1	Acceptable
			2		Length to width ratio of ~3:1
Plan Area	A =	52.00	mŕ		
% of catchment area	C% =	1.73%	>3%	OK	Acceptable
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	i no.	13	4.00	1.00	
		3			
Operating Volume:	52	l m_			
					Good to remove medium silts to
Rention Time, $R_T =$	4.2	hrs		OK	u.uimm

Catchment J2:	Access Track J2							
Mean Greenfield Runoff Rates								
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL)	2.17	-			
Area of site (km2)	0.002843							
Area of (site) patchmont (m2)	0.002043	m ²						
	2043	mm						
SOIL	0.3				Placed road material			
Q mean =	0.00241042	m³/sec						
Q mean =	2.4	L/s						
Q mean =	208.3	m ³ /day						
Factored Q _{BAR} -Rural	0.0024	m ⁻ /sec						
Groth Eactor - 10 yr return	1 3700							
10 vr return peak flow	0.003	m ³ /sec						
10 yr return peak flow	3.3	1/5						
10 yr return peak flow	285.3	m^{3}/day						
	200.0							
Settlement Pond Design								
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(q_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg			
	, p	18ν						
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 (m/sec)	0.00007	m/s						
m/hr	0.240	m/br						
Time for D (m)	4 16	hrs						
				1.00	D (m) - depth			
say pond cross section greg -		4.00	m ²	4.00				
		4.00		4.00				
$\Omega = V A implies$	V =	0.00083	m/sec					
	•	0.00000	11,300					
Required length of Pond =	L =	12.36	m sav:	13	m lenath			
	-	. 2.000						
Length to Width ratio		3.25	:1	>=3:1	Acceptable			
		0.20			Length to width ratio of $\sim3:1$			
Plan Area	A =	52.00	m ²					
% of catchment area	C% =	1.83%	>3%	ОК	Acceptable			
	0/0	1.00/0						
		(m)	B (m)	D (m)	1			
Dimensions of Settlement Pond:	1 no.	13	4.00	1.00				
Operating Volume:	.52	m ³						
	52				Good to remove medium silts to			
Rention Time, $R_T =$	4.4	hrs		OK	0.01mm			

Catchment K1:	Access Track K1						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	$1.17 \times (SOIL)^2$.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	m³/sec					
Q mean =	2.9	L/s					
Q mean =	252.1	m³/day					
Factored Q _{BAR} -Rural	0.0029	m [°] /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	m³/day					
Settlement Pond Design							
	g(sg)	$(n-1) \times d_{n}^{2}$	2		from Metcalf & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p =$	1812	-		365.		
For 10 µm particles	1.00E-05	m			10 micron particles		
Particle Specific aravity	1.002-05						
Water Temp	10	°C					
Kinematic viscosity	1 3045 04	(m^2/s)					
	0.00007	(iii / 5) m /c					
	0.00007	III/S					
Time for D (m)	0.240	hrs					
	4.10	1113		1.00	D (m) - denth		
		4.00	m ²	1.00			
say pona cross section area =		4.00		4.00			
		0.00100					
Q= v.A implies	V =	0.00100	m/sec				
Deguized length of Dand -		14.07		1 <i>E</i>	na lon ath		
	L -	14.70	ni suy.	10	mengin		
Longth to Width ratio		2 75	•1	>=2.1	Accontable		
		5.75	.1	<u> </u>	Acceptuble		
		(0.00			Length to width ratio of ~3.1		
Plan Area	A =	60.00	(1) 				
% of catchment area	C% =	1./0%	>3%	OK	Acceptable		
	r						
	1	L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	ı no.	15	4.00	1.00			
		3					
Operating Volume:	60	l m ~					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.2	hrs		OK	u.uimm		

Catchment K2:			Т8	Area	
Mean Greenfield Runoff Rates					
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	1
	0.00.170.1				
Area of sife (km2)	0.004/04				
Area of (site) catchment (m2)	4704	m-			
SAAR	1602	mm			Discord road material
	0.3	m^3/coo			Placea load malenal
Q medn =	0.00377336				
Q mean =	3.8	L/S			
Q mean =	326.0	m /uuy			
	0.0038	111 / 300			
Groth Factor - 10 yr return	1.3700	3.			
10 yr return peak flow	0.005	m [°] /sec			
10 yr return peak flow	5.2	L/s			
10 yr return peak flow	446.6	m²/day			
Settlement Pond Design					
			2		from Metcalf & Eddy, 4th Ed. pa
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(r_p-1) \times d_p^2$	2		365
Using Stokes Edw.	$\mathbf{v}_p =$	18ν			
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	(m²/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			
					Good to remove medium silts to
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm

Catchment K3:	Access Track K3						
Mean Greenfield Runoff Rates							
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	- -		
Area of site (km2)	0.002523	,					
Area of (site) catchment (m2)	2523	m					
SAAR	1602	mm					
SOIL	0.3	m ³ /200			Placea road material		
Q mean =	0.00216/4	m /sec					
Q mean =	2.2	L/S					
Q mean =	187.3						
Factored Q _{BAR} -Rotat	0.0022	111 / 300					
Groth Factor - 10 yr return	1.3700	3.					
10 yr return peak flow	0.003	m³/sec					
10 yr return peak flow	3.0	L/s					
10 yr return peak flow	256.6	m²/day					
Settlement Pond Design							
Ilsing Stokes Law:	$V = \frac{g(sg)}{sg}$	$(r_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg		
	$\mathbf{v}_p =$	18v					
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	(m²/s)					
V _s (m/sec)	0.0007	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			
		0.70		0.70			
Q= V A implies	V =	0.00079	m/sec				
			,				
Required length of Pond =	L =	11.86	m sav:	12	m lenath		
	_						
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%	ОК	Acceptable		
		1.7 070					
		L (m)	B (m)	D (m)			
Dimensions of Settlement Pond:	1 no.	12	3,75	1.00			
Operating Volume:	45	m ³					
					Good to remove medium silts to		
Rention Time, $R_T =$	4.2	hrs		OK	0.01mm		

Catchment K4:	Access Track K4							
Mean Greenfield Runoff Rates								
$Q_{mean} = 0.00108 \times (AREA km^2)$	$(SA^{2})^{0.89} \times (SA^{2})^{0.89}$	AR mm)	1.17	× (SOIL) ²	.17			
	/	/		<u> </u>				
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	m³/sec						
Q mean =	1.4	L/s						
Q mean =	123.5	m ³ /day						
Factored Q _{BAR} -Rural	0.0014	m ⁻ /sec						
Groth Eactor - 10 yr return	1 3700							
	0.002	m ³ /sec						
10 yr return peak flow	0.002	1/2						
	2.0	L/3						
10 yr refurn peak flow	169.2	m /ddy						
Settlement Pond Design								
			Ļ					
	g(sg)	$(d_p - 1) \times d_p$	2			from Metcalt & Eddy, 4th Ed, pg		
Using Stokes Law:	$V_p =$	181/	-			365.		
Englo and states		10/						
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	(m²/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			
		0.00			0.00			
Q= V A implies	V =	0.00065	m/se	26				
	•	0.00000	111, 50					
Required length of Pond =	1 =	9 78	m	sav.	10	m length		
	-	/// 0		00.71				
Length to Width ratio		3.33	•1		>=3.1	Acceptable		
		0.00	• •		2 0.1	Length to width ratio of ~ 3.1		
Plan Area	A -	20.00	m^2					
	A -	30.00	> 207		OK	Accontable		
	C% =	1.70%	>3%			Accepiable		
						I		
Dimonsions of Colling and Danst	1 no	L (m)		B (m)	D (m)			
Dimensions of Settlement Pond:	1 NO.	10		3.00	1.00			
-								
Operating Volume:	30	m	-					
						Good to remove medium silts to		
Rention Time, $R_T =$	4.3	hrs			OK	u.uimm		

Catchment K5:			17	Area	
Mean Greenfield Runoff Rates					
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (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	m³/sec			
Q mean =	2.4	L/s			
Q mean =	208.2	m³/day			
Factored Q _{BAR} -Rural	0.0024	m³/sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.003	m³/sec			
10 yr return peak flow	3.3	L/s			
10 yr return peak flow	285.2	m³/day			
Settlement Pond Design					
Using Stokes Law:	$V_{p} = \frac{g(sg)}{sg}$	$(p_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.
	P	18v			
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m²/s)			
V _s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
lime for D (m)	4.16	nrs		1.00	D(m) dooth
		4.00	m ²	1.00	D (III) - depin
say pond cross section area =		4.00		4.00	
	V =	0.00083	m/sec		
	•	0.00000			
Required length of Pond =	L =	12.36	m say:	12.25	m length
Level a Mr. de Mr. alle and the		2.07	. 1	. 0.1	
Length to width ratio		3.06	:1	>=3:1	Acceptable
		10.00	m ²		Length to width ratio of ~3:1
Plan Area	A =	49.00	111	OK	Accontable
		1./2%	~3/0	UN	
		(m)	B (m)	D (m)	
Dimensions of Settlement Pond:	1 no.	12.25	4.00	1.00	
Operating Volume:	49	m ³			
Pontion Time R -	4.1	bra			Good to remove medium silts to
$K_{\rm T}$ =	4.1	1115		UK	0.0111111

Catchment L1:				Acces	s Track	L1
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} ×	(SOIL) ²	.17	
	ĺ .	í í				
Area of site (km2)	0.001028					
Area of (site) catchment (m2)	1028	m²				
SAAR	1602	mm				
SOIL	0.3					Placed road material
Q mean =	0.00097478	m³/sec				
Q mean =	1.0	L/s				
Q mean =	84.2	m ³ /day				
Factored Q _{BAR} -Rural	0.0010	m ⁻ /sec				
Groth Eactor - 10 yr return	1 3700					
	0.001	m ³ /sec				
10 yr return peak flow	0.001	1/2				
	1.5	L/3				
10 yr refurn peak flow	115.4	m /ddy				
Settlement Pond Design						
			Ļ			
	g(sg)	$(p_p - 1) \times d_p^2$	2			from Metcalf & Eddy, 4th Ed, pg
Using Stokes Law:	$V_p =$	191				365.
5 10		101	┙			
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	(m²/s)				
V. (m/sec)	0.00007	m/s				
m/hr	0.240	m/hr				
Time for D (m)	4.16	hrs				
					1.00	D (m) - depth
any pand grass spatian grass -		4.00	m ²		1.00	
say pond cross section died =		4.00			4.00	
	<u> </u>	0.00022				
Q= v.A implies	V =	0.00033	m/sec			
Deguized length of Dand -		E 00			10	m longth
	L -	5.00		suy.	13	mengin
		2.05	.1		> 0.1	
Length to width ratio		3.25	:1		>=3:1	
			2			Length to width ratio of ~3:1
Plan Area	A =	52.00	m-			
% ot catchment area	C% =	5.06%	>3%		OK	Acceptable
		L (m)	E	8 (m)	D (m)	
Dimensions of Settlement Pond:	1 no.	13		4.00	1.00	
Operating Volume:	52	m ³				
						Good to remove medium silts to
Rention Time, R_{T} =	10.8	hrs			OK	0.01mm

Catchment L2:		Access Track L2						
Mean Greenfield Runoff Rates								
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17				
Area of site (km2)	0.001028							
Area of (site) catchment (m2)	1028	m²						
SAAR	1602	mm						
SOIL	0.3	3.			Placed road material			
Q mean =	0.00097478	m³/sec						
Q mean =	1.0	L/s						
Q mean =	84.2	m²/day						
Factored Q _{BAR} -Rural	0.0010	m ⁻ /sec						
Groth Factor - 10 yr return	1.3700							
10 yr return peak flow	0.001	m³/sec						
10 yr return peak flow	1.3	L/s						
10 yr return peak flow	115.4	m³/day						
Settlement Pond Design								
		L						
Heiner Stelkes Lenvi	g(sg)	$(q_p - 1) \times d_p^2$	2		from Mercali & Eddy, 4in Ed, pg			
Using slokes Ldw:	$V_p =$	18ν	-		363.			
For 10 µm particles	1.00E-05	m			10 micron particles			
Particle Specific aravity	2.6							
Water Temp	10	°C						
Kinematic viscosity	1 304F-04	(m^2/s)						
V. (m/sec)	0.00007	m/s						
	0.00007	m/br						
Time for D (m)	4 16	hrs						
				1.00	D (m) - depth			
any nand areas to ation area -		2.50	m ²	2.50				
say pond cross section died =		3.50	111	3.50				
	V -	0 00020	m/200					
Q- V.A Implies	v –	0.00036	III/Sec					
Required length of Pond -	1 -	5 71	m sav:	10	mlength			
	L -	5.71	ini suy.	10	inteligin			
Length to Width ratio		2.84	•1	>-2.1	Accentable			
		2.00	• 1	2-0.1	Length to width ratio of ~ 3.1			
Plan Aroa	A -	25.00	m ²					
ridii Aled	A -	33.00	> 207	OK	Accontable			
	C /o -	5.40%	-3%		Accepiuble			
		(m)	P(m)	D(m)				
Dimensions of Settlement Rond:	1 no	10	B (III) 3 50	1 00				
Sinchaona or semement i ond.	1 110.	10	0.00	1.00				
Operating Volume:	25	m ³						
	35				Good to remove medium silts to			
Pontion Time R -		hra						
$\kappa_{\rm emion}$ inne, $\kappa_{\rm T}$ =	7.3	nrs		OK	0.0111111			

Catchment L3:	Access Track L3				
Mean Greenfield Runoff Rates					
$Q_{\text{mean}} = 0.00108 \times (\text{AREA km}^2)$	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	.17	·
Area of site (km2)	0.000693				
Area of (site) catchment (m2)	693	m⁴			
SAAR	1602	mm			
SOIL	0.3				Placed road material
Q mean =	0.00068625	m³/sec			
Q mean =	0.7	L/s			
Q mean =	59.3	m³/day			
Factored Q _{BAR} -Rural	0.0007	m³/sec			
Groth Factor - 10 yr return	1.3700				
10 vr return peak flow	0.001	m ³ /sec			
10 yr return peak flow	0.9	L/s			
10 vr return peak flow	81.2	m ³ /day			
	01.2	, ,			
Settlement Pond Design					
	2 (SE	$r = -1) \times d^2$	2		from Metcalf & Eddy, 4th Ed, pg
Using Stokes Law:	$V_{p} = \frac{808}{100}$	<u>10</u>	<u>></u>		365.
	r	181			
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles
Particle Specific gravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m²/s)			
V _s (m/sec)	0.00007	m/s			
m/hr	0.240	m/hr			
Time for D (m)	4.16	hrs			
			0	1.00	D (m) - depth
say pond cross section area =		2.00	m²	2.00	
Q= V.A implies	V =	0.00047	m/sec		
		7.04		7	
Required length of Pond =	L =	7.04	m say:	/	miengin
Longth to Width ratio		3 50	•1	>-2.1	Accoptable
		5.50	• 1	2-0.1	Length to width ratio of ~3:1
Plan Area	A -	14.00	m ²		
	A - C% -	2 02%	<u>\3%</u>	OK	Acceptable
	C /0 -	2.02/0	- 070		
		L (m)	B (m)	D (m)	
Dimensions of Settlement Pond:	1 no.	7	2.00	1.00	
Operating Volume:	14	m ³			
					Good to remove medium silts to
Rention Time, $R_T =$	4.1	hrs		OK	0.01mm

Catchment L4:	BP2				
Mean Greenfield Runoff Rates					
Q _{mean} = 0.00108 × (AREA km ²	²) ^{0.89} × (SA	AR mm)	^{1.17} × (SOIL) ²	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	m³/sec			
Q mean =	5.4	L/s			
Q mean =	465.2	m³/day			
Factored Q _{BAR} -Rural	0.0054	m [°] /sec			
Groth Factor - 10 yr return	1.3700				
10 yr return peak flow	0.007	m³/sec			
10 yr return peak flow	7.4	L/s			
10 vr return peak flow	637.3	m ³ /day			
	10.0	m ³ /day			Based on know permeability
	10.0	m^3/coo			
Iotal How (SW+GW)	0.007	III /sec			
Cottlement Rend Design					
Settlement Pond Design					
		1) v J	2		from Metcalf & Eddy, 4th Ed. pa
Using Stokes Law:	$V = \frac{g(sg)}{sg}$	$(p-1) \times a_p$	<u>,</u>		365.
	' p	18ν			
For 4 µm particles	4.00E-06	m			4 micron particles
Particle Specific aravity	2.6				
Water Temp	10	°C			
Kinematic viscosity	1.306E-06	(m^2/s)			
V _c (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
			2		Length to width ratio of ~3:1
Plan Area	A =	675.00	m		
% ot catchment area	C% =	9.62%	>3%	OK	Acceptable
				D ()	
	1	L (m)	B (m)	D (m)	Single pand designs
Dimensions of Semiement Pond:	1 NO.	45	15.00	1.00	
	z 110.	34	10.00	1.00	Apply 2 no. ponas (L3A & L3B)
					Good to remove medium silts to
Operating Volume:	675	m ³		OK	0.004mm

Catchment M1:	Substation					
Mean Greenfield Runoff Rates						
$Q_{mean} = 0.00108 \times (AREA km^2)$	²) ^{0.89} × (SA	AR mm)	$^{1.17}$ × (SOIL) ²	.17	-	
Area of site (km2)	0.002421	-				
Area of (site) catchment (m2)	2421	m²				
SAAR	1602	mm				
SOIL	0.3				Placed road material	
Q mean =	0.00208924	m³/sec				
Q mean =	2.1	L/s				
Q mean =	180.5	m³/day				
Factored Q _{BAR} -Rural	0.0021	m³/sec				
Groth Factor - 10 yr return	1.3700					
10 yr return peak flow	0.003	m³/sec				
10 yr return peak flow	2.9	L/s				
10 yr return peak flow	247.3	m³/day				
Settlement Pond Design						
Using Stokes Law:	$V_p = \frac{g(sg)}{sg}$	$(p_p-1) \times d_p^2$	2		from Metcalf & Eddy, 4th Ed, pg 365.	
	Ĩ	181				
<u>For 10 µm particles</u>	1.00E-05	m			10 micron particles	
Particle Specific gravity	2.6					
Water lemp	10	°C				
Kinematic viscosity	1.306E-06	(m²/s)				
V _s (m/sec)	0.00007	m/s				
m/hr	0.240	m/hr				
	4.16	nis		1.00	D(m) dopth	
any pand arose spatian aros -		2 50	m ²	1.00		
say pond cross section died =		3.50		3.30		
Q= V A implies	V =	0 00082	m/sec			
		0100002	,			
Required length of Pond =	L =	12.25	m say:	12	m length	
		0.10	1			
Length to Width ratio		3.43	:1	>=3:1		
		(0.00	m ²		Length to width ratio of ~3:1	
Plan Area	A =	42.00	111		Acceptable	
	C% =	1./3%	>3%			
		(m)	B (m)	D (m)		
Dimensions of Settlement Pond:	1 no.	12	3.50	1.00		
Operating Volume:	42	m ³				
					Good to remove medium silts to	
Rention Time, R_{T} =	4.1	hrs		OK	0.01mm	