STRUCTURE :			ADMIN BUILDING			
ITEM :			S5			
Longer clear span		=		5000 mm		
Sorter clear span		=		4000 mm		
Thickness of Slab		=		55 mm		
Total UDL.		=		1.4 Ton/m2		
Support Condition		=		**One Short Edge**		
A. DESIGN FORCES						
Longer clear span				5000	<mm; m>	5.00
Sorter clear span				4000	<mm; m>	4.00
Assumed thickness of sl	t	(By trial & error till OK for various		55 mm	<mm; m>	0.055
Clear cover to main reinf				30	mm	
Maximum diameter of bar				10	mm	
Facor of safety		Reinf		1.5	mm	
minimum slab thkness				110	mm	
Permissible Mu/bd2				2.76		
			Not OK, Lesser than min. as per tender.			
			Not OK, From max. Mu/bd2 considerations as detailed hereunder.			
			Not OK from deflection considerations as checked hereunder.			
The least effective depth in shorter / longer			= 55-30 -10/2 =	**20**	<mm; cm>	2.0
Total design UDL				1.40	t/m^2	
			Say	**1.40**	t/m^2	
Longer effective span	L_Y		= 5000+20 =	5020	<mm; m>	5.02
Sorter effective span	L_x		= 4000+20 =	4020	<mm; m>	4.02
		L_y/L_x	= 5020/4020 =	1.25		
Shorter of the two spans (for use in bending moment calculations)				4020	<mm; m>	4.02
Refering IS-456, Table-22, P91	CASE 2	One Short Edge				
-ve support moment at continuous edge across long span	$-M_y$	0.050	= 0.05*1.4*4.02^2 =	1.12	tm	
+ve moment at mid span across long span	$+M_y$	0.038	= 0.038*1.4*4.02^2 =	0.85	tm	
-ve support moment at continuous edge across short span	$-M_x$	0.037	= 0.037*1.4*4.02^2 =	0.84	tm	
+ve moment at mid span across short span	$+Mx$	0.028	= 0.028*1.4*4.02^2 =	0.63	tm	
B. REINFORCEMENTS						
-ve Mu/bd2 at support across long			= 1.5*1.12*10000/20^2 =	42.00	N/mm^2	
+ve Mu/bd2 at mid span across			= 1.5*0.85*10000/20^2 =	31.82	N/mm^2	
-ve Mu/bd2 at support across short			= 1.5*0.84*10000/20^2 =	31.39	N/mm^2	
+ve Mu/bd2 at mid span across			= 1.5*0.63*10000/20^2 =	23.76	N/mm^2	
Max. Mu/bd2			Max. of (42:23.76)	42.00	N/mm^2	
Min. reinf. in each direction - as per Cl. 26.5.2.1; Pg. 48; IS:456						
0.12 %			= 0.0012*2*100 =	0.24	cm^2/m	

		Reinf as per Table-2,Pg-48,SP-16				
Reqd. reinf	M_u/bd^2	$p_txd/10$				
For -ve moment i.e. top reinf. across long span	42.00	0.943	= 0.943*2/10 =	1.89	cm^2/m	
For +ve moment i.e. bottom reinf. across long span	31.82	0.943	= 0.943*2/10 =	1.89	cm^2/m	
For -ve moment i.e. top reinf. across short span	31.39	0.943	= 0.943*2/10 =	1.89	cm^2/m	
For +ve moment i.e. bottom reinf. across short span	23.76	0.943	= 0.943*2/10 =	1.89	cm^2/m	
Main Reinforcements	Φ	spacing				
At top across long span	8	250	= pi/4*(8/10)^2*1000/250 =	2.01	cm^2/m	1.006%
At bottom across long span	8	250	= pi/4*(8/10)^2*1000/250 =	2.01	cm^2/m	1.006%
At top across short span	8	250	= pi/4*(8/10)^2*1000/250 =	2.01	cm^2/m	1.006%
At bottom across short span	8	250	= pi/4*(8/10)^2*1000/250 =	2.01	cm^2/m	1.006%
				Max. % steel =		1.006%
Max. permissible spacing	3xd	60	(As per Cl. 26.3.3; Pg. 46; IS:456)			
	or	300				
Least of the two		60				
Max. provided spacing		250				
		Not OK				
Distribution Reinforcement						
Min. reinf. in each direction - as per Cl. 26.5.2.1; Pg. 48; IS:456						
0.12 %			= 0.0012*2*100 =	0.24	cm^2/m	
Provide	8	300	= pi/4*(8/10)^2*1000/300 =	1.68	cm^2/m	
Max. permissible spacing	5xd	100	(As per Cl. 26.3.3; Pg. 46; IS:456)			
	or	450				
Least of the two		100				
Max. provided spacing		300				
		Not OK				
C. DEFLECTION CHECK						
Permissible 'Span' to 'Depth' ratio		(As per Cl. 23.2.1; Pg. 37; IS:456)				
			Cantilever	7		
			Simply supported	20		
			Continuous	26		
fs = 0.58*Ast Reqd/Ast Pro				272.5		
Multiplication factor corresponding to steel service stress of 1.006% steel from				0.9		
Modified applicable ratio assuming 'Discontinuous'		= 0.91*26 =		23.55		
Actual 'Span' to 'Depth' ratio		= 4000/20 =		200.00		
			Not OK from deflection considerations.			

D. SKETCH

PLAN

All distribution rebars = 8dia @ 300 c/c

SECTION

Provided rebars on drawings may be the same or greater than the above design requirements.