MEMBER NAME : S02

1. General Information

(1) Design Code : NSR-10
(2) Code Unit : N, mm

2. Material

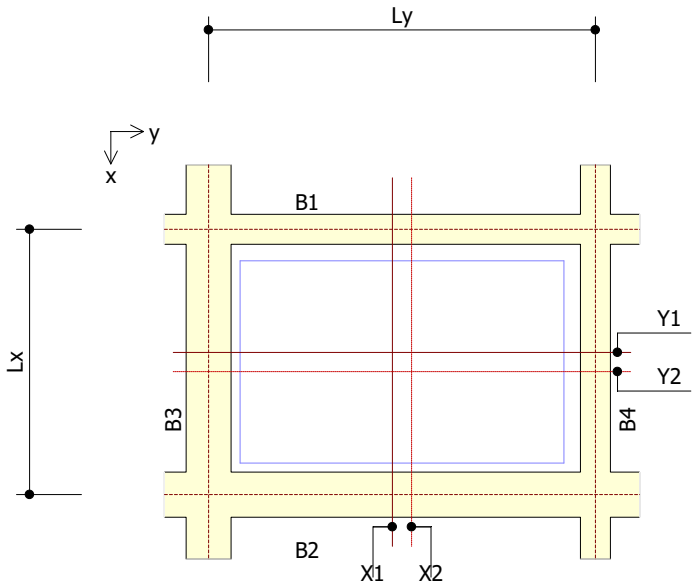
(1) F'_c : 28.00MPa
(2) F_y : 420MPa

3. Design Load

(1) Dead Load : 1.961KPa
(2) Live Load : 1.961KPa

4. Section Size

(1) Span(X) : 1.770m
(2) Span(Y) : 2.580m
(3) Thickness : 125mm
(4) Cover : 30.00mm
(5) Use clear span : Yes



5. Slab Type & Support

(1) Slab Type : 2-Way Slab
(2) Support Type : Case-2
(3) Boundary Beams : B1 : 200 x 600 / B2 : 300 x 600 / B3 : 300 x 600 / B4 : 200 x 600

6. Calculation Summary

(1) Check Thickness of Slab

Category	Value	Criteria	Ratio	Note
Minimum Thickness Required (mm)	125	90.00	0.720	

(2) Calculate Moment & Shear (X Direction)

Category	Value	Criteria	Ratio	Note
Moment Capacity (Top) (kN·m)	0.975	5.296	0.184	
Moment Capacity (Middle) (kN·m)	0.557	5.296	0.105	
Moment Capacity (Bottom) (kN·m)	0.975	5.296	0.184	
Rebar Ratio (Top)	0.00252	0.00180	0.713	
Rebar Ratio (Middle)	0.00252	0.00180	0.713	
Rebar Ratio (Bottom)	0.00252	0.00180	0.713	
Shear Capacity (Top) (kN)	3.541	60.88	0.0582	
Shear Capacity (Middle) (kN)	0.000	60.88	0.000	
Shear Capacity (Bottom) (kN)	3.541	60.88	0.0582	

(3) Calculate Moment & Shear (Y Direction)

Category	Value	Criteria	Ratio	Note
Moment Capacity (Left) (kN·m)	0.421	4.729	0.0890	
Moment Capacity (Center) (kN·m)	0.249	4.729	0.0526	
Moment Capacity (Right) (kN·m)	0.421	4.729	0.0890	
Rebar Ratio (Left)	0.00252	0.00180	0.713	
Rebar Ratio (Center)	0.00252	0.00180	0.713	
Rebar Ratio (Right)	0.00252	0.00180	0.713	
Shear Capacity (Left) (kN)	0.970	54.45	0.0178	
Shear Capacity (Center) (kN)	0.000	54.45	0.000	
Shear Capacity (Right) (kN)	0.970	54.45	0.0178	

7. Determine the design type of slab

(1) Calculate span ratio [Use clear span]

- L_x = 1.520m
- L_y = 2.330m
- Span Ratio(L_x / L_y) = 0.652 >= 0.5 -> 2-Way Slab

8. Check Load

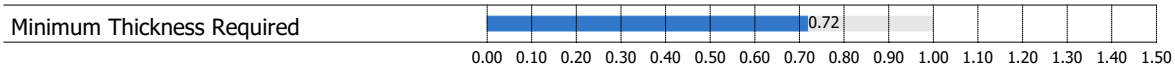
(1) Calculate factored load

- LCB01 = 2.746KPa (1.4D)
- LCB02 = 5.492KPa (1.2D+1.6L)
- ω_u = 5.492KPa

9. Check Thickness of Slab

Calculation Summary (Check Thickness of Slab)

Category	Value	Criteria	Ratio	Note
Minimum Thickness Required (mm)	125	90.00	0.720	



(1) Calculate factors

- $\beta = I_{ny} / I_{nx}$ = 1.533
- α_m = 24.45 (α_1 = 24.72, α_2 = 33.29, α_3 = 22.84, α_4 = 16.96)

(2) Calculate minimum thickness required

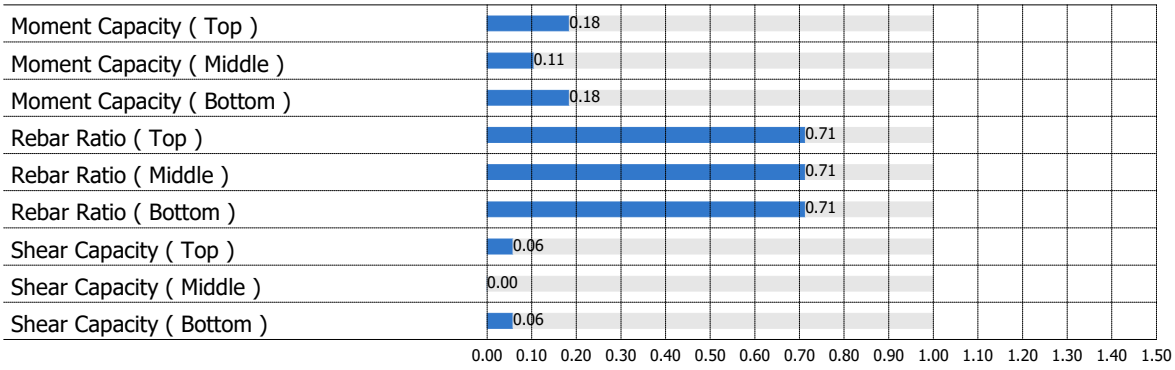
- $h_{req} = \frac{l_n (0.8 + (f_y / 1400))}{36 + 9\beta}$ = 90.00mm
- **h = 125mm > h_{req} = 90.00mm → O.K**

10. Check Capacity of Slab

(1) Calculate Moment & Shear [Direction X]

Calculation Summary (Calculate Moment & Shear (X Direction))

Category	Value	Criteria	Ratio	Note
Moment Capacity (Top) (kN·m)	0.975	5.296	0.184	
Moment Capacity (Middle) (kN·m)	0.557	5.296	0.105	
Moment Capacity (Bottom) (kN·m)	0.975	5.296	0.184	
Rebar Ratio (Top)	0.00252	0.00180	0.713	
Rebar Ratio (Middle)	0.00252	0.00180	0.713	
Rebar Ratio (Bottom)	0.00252	0.00180	0.713	
Shear Capacity (Top) (kN)	3.541	60.88	0.0582	
Shear Capacity (Middle) (kN)	0.000	60.88	0.000	
Shear Capacity (Bottom) (kN)	3.541	60.88	0.0582	



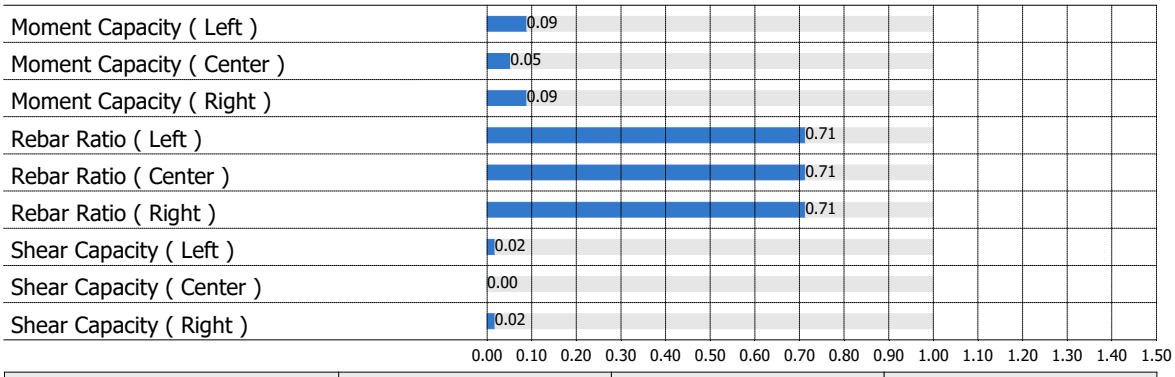
Check Items	TOP	MIDDLE	BOTTOM
Bar-1	#3@450	#3@450	#3@450

Bar-2	#3@450	#3@450	#3@450
Bar-3	-	-	-
Moment Coefficient (DL)	0.000	0.0319	0.000
Moment Coefficient (LL)	0.000	0.0528	0.000
Moment Coefficient (FL)	0.0769	0.000	0.0769
Shear Coefficient	0.848	0.000	0.848
M_u (kN·m/m)	0.975	0.557	0.975
V_u (kN/m)	3.541	0.000	3.541
$øM_n$ (kN·m/m)	5.296	5.296	5.296
$øV_n$ (kN/m)	60.88	60.88	60.88
M_u / $øM_n$	0.184	0.105	0.184
V_u / $øV_n$	0.0582	0.000	0.0582
$ρ_{min}$ / ρ	0.713	0.713	0.713

(2) Calculate Moment & Shear [Direction Y]

Calculation Summary (Calculate Moment & Shear (Y Direction))

Category	Value	Criteria	Ratio	Note
Moment Capacity (Left) (kN·m)	0.421	4.729	0.0890	
Moment Capacity (Center) (kN·m)	0.249	4.729	0.0526	
Moment Capacity (Right) (kN·m)	0.421	4.729	0.0890	
Rebar Ratio (Left)	0.00252	0.00180	0.713	
Rebar Ratio (Center)	0.00252	0.00180	0.713	
Rebar Ratio (Right)	0.00252	0.00180	0.713	
Shear Capacity (Left) (kN)	0.970	54.45	0.0178	
Shear Capacity (Center) (kN)	0.000	54.45	0.000	
Shear Capacity (Right) (kN)	0.970	54.45	0.0178	



Check Items	LEFT	CENTER	RIGHT
Bar-1	#3@450	#3@450	#3@450
Bar-2	#3@450	#3@450	#3@450
Bar-3	-	-	-
Moment Coefficient (DL)	0.000	0.00604	0.000
Moment Coefficient (LL)	0.000	0.0101	0.000
Moment Coefficient (FL)	0.0141	0.000	0.0141
Shear Coefficient	0.152	0.000	0.152
M_u (kN·m/m)	0.421	0.249	0.421
V_u (kN/m)	0.970	0.000	0.970
$øM_n$ (kN·m/m)	4.729	4.729	4.729
$øV_n$ (kN/m)	54.45	54.45	54.45
M_u / $øM_n$	0.0890	0.0526	0.0890

MEMBER NAME : S02

V_u / $øV_n$	0.0178	0.000	0.0178
$ρ_{min}$ / ρ	0.713	0.713	0.713