

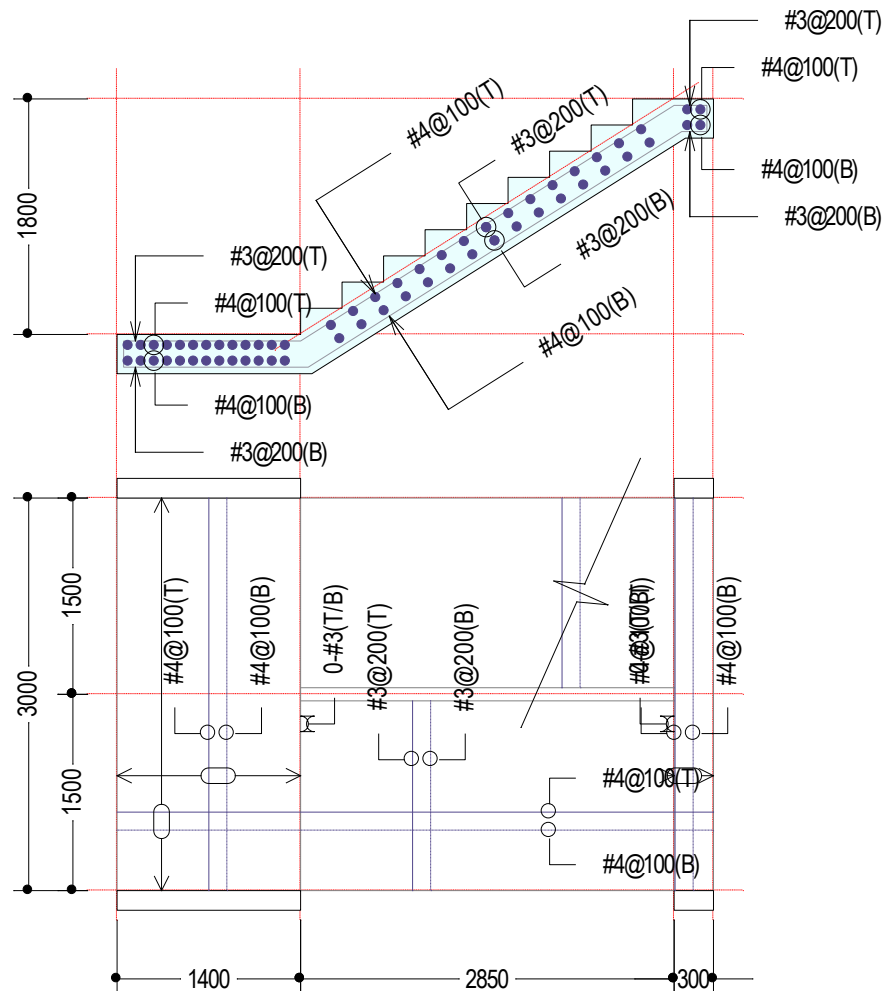
■ ESCALERAS EN CONCRETO

1. General Information

- (1) Design Code : ACI318M-14
(2) Unit System : N, mm

2. Design Data

- (1) Material
- F'_c : 28.00MPa
 - F_y : 400MPa
 - F_{ys} : 400MPa
- (2) Design Load
- DL (Stair) : 3.000kN/m²
 - DL (Landing) : 3.000kN/m²
 - Live Load : 5.000kN/m²

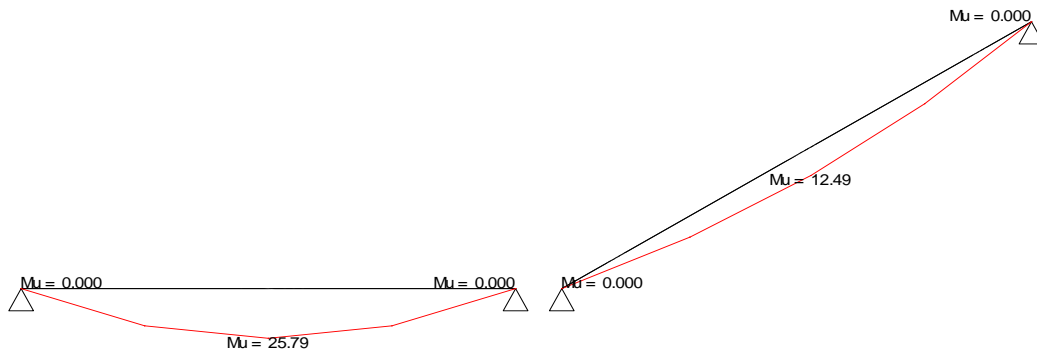


- (3) Support : By Landing
- (4) Thickness
- Stair : 200mm
 - Landing : 200mm
 - Cover : 25.00mm
- (5) Length
- Landing(Left) : 1.400m
 - Landing(Right) : 0.300m
 - Stair : 2.850m
- (6) Size
- Height : 1.800m
 - Width : 3.000m

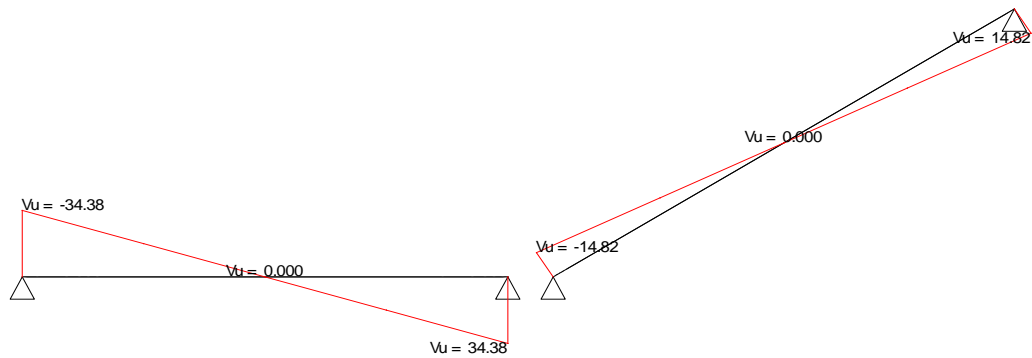
3. Calculate Design Load

- (1) Stair
- $\omega_u = 1.2\omega_D + 1.6\omega_L = 11.60\text{kN/m}^2$
- (2) Landing
- $\omega_u = 1.2\omega_D + 1.6\omega_L = 11.60\text{kN/m}^2$

4. Moment Diagram



5. Shear Force Diagram



6. Check Stair

(1) Moment Capacity

Rebar	Land(L)	Stair	Land(R)	Min. Land	Min. Stair
M_u (kN·m/mm)	25.79	12.49	25.79	$\rho = 0.00180$	$\rho = 0.00180$
#3	@114	@241	@114	@450(315)	@450(315)
#3+4	@158	@335	@158	@450(315)	@450(315)
#4	@204	@432	@204	@450(315)	@450(315)

(2) Shear Capacity

-	Land(L)	Stair	Land(R)
V_u (kN/mm)	-34.38	-14.82	34.38
ϕV_n (kN/mm)	75.77	75.77	75.77
$V_u / \phi V_n$	0.454	0.196	0.454