STAIRCASE – LOADS

Scheme of the structure – see the design of geometry

LOADS

Landing

Load	Char. value [kN/m²]	γ_f	Design value [kN/m²]
Slab	0,23 · 25	1,35	7,8
Floor	1	1,35	1,35
Live load	3,5	1,5	5,25

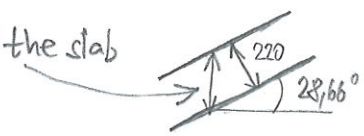
$f_{dl} = 14,4$ kN/m²

Flight

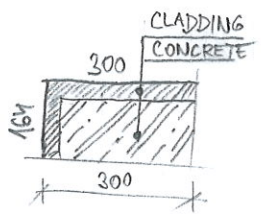
Load	Char. value [kN/m²]		γ_f	Design value [kN/m²]
Slab	$\frac{0,22}{\cos 28,66°} \cdot 25$	①	1,35	8,5
Cladding	$0,5 \cdot \frac{164+300}{300}$	②	1,35	1,04
Steps	$\frac{0,164}{2} \cdot 25$	③	1,35	2,78
Live load	3,5		1,5	5,25

$f_{df} = 17,6$ kN/m²

① We have to consider the vertical depth of the slab



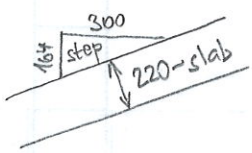
② One step:



Length of the cladding: 164 (riser) + 300 (tread)

Length of the projection: 300

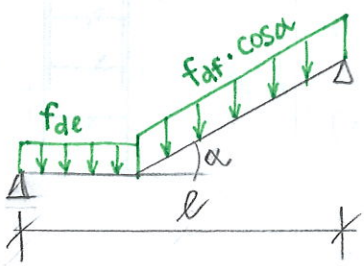
③



Average height of the step is $\frac{164+0}{2}$

(the rest of the self-weight is already included in the slab)

For detailed calculation of internal forces, following structural scheme should be considered (statically indeterminate structure → FEM program, or slope deflection method)



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