

CALCULATION:

TOTAL STAIR RISE (TSR) IS THE VERTICAL DISTANCE BETWEEN SURFACE FINISHES OF FLOORS:

/NOTE: MOSTLY IT IS EQUAL TO STRUCTURAL HEIGHT, NONETHELESS IT SHOULD BE DETERMINED PROPERLY./

$$TSR = \text{"CEILING HEIGHT"} + \text{"TOTAL FLOOR THICKNESS"} = 3000\text{mm}$$

WHERE: "TOTAL FLOOR THICKNESS" = "SUBFLOOR OR SLAB" + "FLOORING"

RECOMMENDED RISE OF A STEP H':

/NOTE: THE VALUE IS BASED ON THE FOLLOWING FORMULAE $2 \cdot H' + W' = <600,650>\text{mm./}$

$$H' = 160\text{mm}$$

NUMBER OF STEPS REQUIRED N:

$$N = TSR/H' = 3000/160 = 18.75 = 18 - \text{(AFTER ROUNDING TO NATURAL NUMBERS).}$$

DESIGNED RISE OF A STEP H:

$$H = TSR/N = 3000/18 = 166.66\text{mm}$$

DESIGNED RUN OF A STEP W:

$$2 \cdot H + W = 630 \text{ mm} \Rightarrow W = 630 - 2 \cdot H = 630 - 2 \cdot 166.67 = 296.66\text{mm}$$

$$W = 290\text{mm (AFTER ROUNDING)}$$

VERIFICATION:

PITCH OF STAIRCASE FLIGHT:

$$\text{tg}(\alpha) = H/W = 166.66/290 = 0.574 \Rightarrow \alpha = 29^\circ \in <25^\circ, 35^\circ> \rightarrow \text{CONDITION MET}$$

WIDTH OF FLIGHT B = BP:

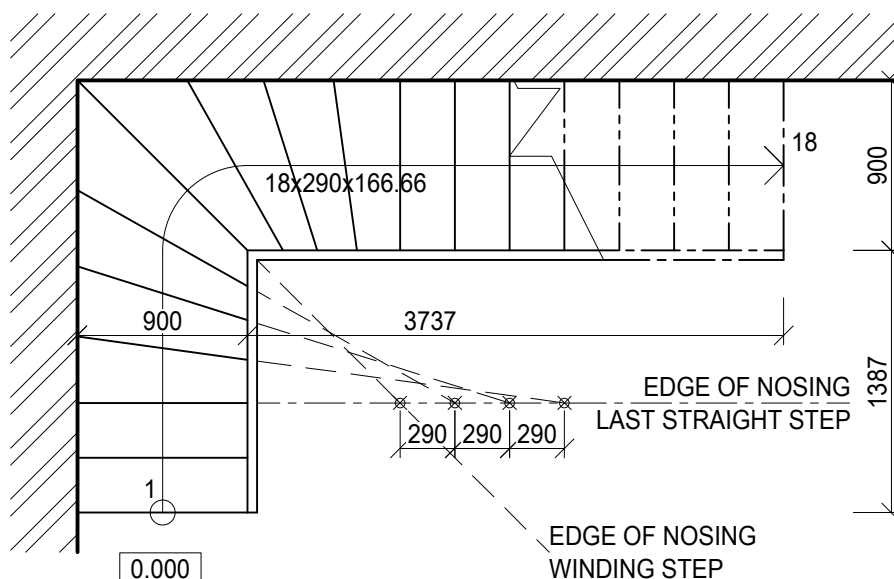
REQUIREMENT 900mm. OUR CHOICE B = 900mm

HEADROOM HR:

$$HR = 1500 + 750/\cos(\alpha) = 1500 + 750/\cos(29^\circ) = 2357\text{mm} \geq 2100\text{mm} \rightarrow \text{CONDITION MET}$$

CLEARANCE CL:

$$CL = 750 + 1500 \cdot \cos(\alpha) = 750 + 1500 \cdot \cos(29^\circ) = 2061\text{mm} \geq 1900\text{mm} \rightarrow \text{CONDITION MET}$$



COURSE BH052 BUILDING CONSTRUCTIONS 2

DRAWN BY JOHN DOE

STUDY TITLE S03 QUARTER TURN STAIR WITH WINDING STEPS

