Structural Design Services

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3.6.24

Design calculations
for
The proposed internal opening
at
393 Bradford Road
Huddresfield HD2 2QY

Note

The following calculations are based on the plans & verbal instructions

from the client. No structural or any other report is provided.

The contractor is to verify all the dimensions, the method of construction and any other

queries with the designer before the start of the works and prior to

ordering any building material .

Health & safety to be observed through out during the construction works.

No work to commence on site before the prior approval of the Building Regulation

Designed By

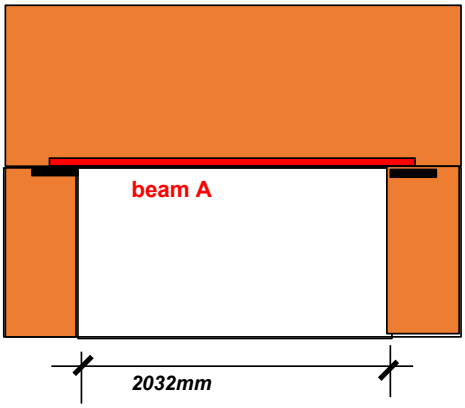
Nasir Hussain
B Sc (Civil Eng.)
PE, MIE

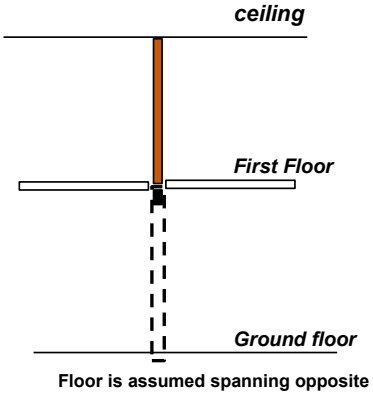
Designed For

Syed Komail Zaidi

Brief History

Beam A is designed to carry the loadings above for the proposed works





Floor is assumed spanning opposite

All information is provided by the client

Beam A

Use 1 no.s 178 x 102 x19 UKB S355

use 100x 300 x 150mm deep concrete pad stone under the beam

minimum bearing is 150mm

Note

Please note that I have been instructed to design beam A

so no comments on any other issue if there is any.

All dimensions are to be verified on site

Loadings

		service kn/m^2	*gema m*	*ultimate kn/m^2*
Roof				
	Dead load = tiles,battens,rafters etc.	***1***	***1.4***	***1.40***
	Imposed load = roof + ceiling	***0.75***	***1.6***	***1.2***
	Total	***1.75***		***2.60***
First floor				
	Dead loads = boards,joists& ceilings	***0.5***	***1.4***	***0.7***
	Imposed loads =	***1.5***	***1.6***	***2.4***
	Total	***2***		***3.1***
Gr. floor				
	Dead load = 150mm conc. Slab	***3.6***	***1.4***	***2.4*2***
	Imposed loads =	***1.5***	***1.6***	***2.4***
	Total	***5.1***		***2.4***
Ext.walls				
	Dead load = 102mm Brickwork	**2.1**	**1.4**	**2.94**
	= 100mm Blockwork	**1.8**	**1.4**	**2.52**
	Total	**3.9**		**5.46**
Intr.walls				
	Dead load 100mm blockwall plaster both sides	**2.1**	**1.4**	**2.94**

Steel Beam A

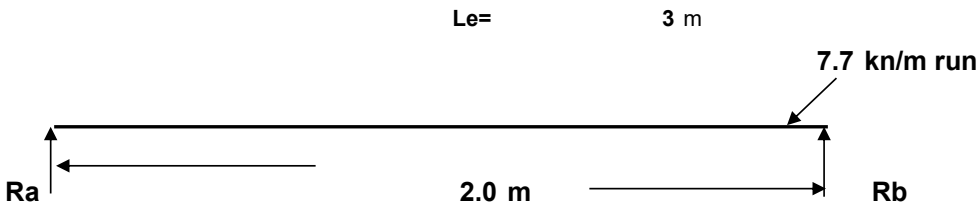
this proposed steel beam is supporting the following

1. Load from the Floors
2. Load from the wall
3. Load from the Roof
4. Self weight

Loads

1. Load from the Floors=assumed spanning opposite	0 kn/m run
2. Load from the wall=2.94*2.5=	7 kn/m run
3. Load from the Roof=assumed no roof load shared by this beam	0 kn/m run
4. Self weight	0.3 kn/m run
	7.7 kn/m run

Span of steel beam = **2.0** **m**



Ra = Rb 7.8 kn

Moment = 4 knm

Use 1 no.s 178 x 102 x19 UKB S355

Mbs=41.9 Knm **Mb= 28.3 knm for Le=3m and n = 1**

plastic

Deflection Check of Beam A

Type of beam = simply supported

Type of loading = uniformly distributed load

Max.deflection is at mid span = 5 FL^3/384EI

where

F = total load on the beam / 1.5 =	***10.36***	***kn***
L = span of the beam =	***2032***	***mm***
E = elastic modulus of steel =	***205***	***kn/mm^2***
I = moment of inertia of the beam =	***1360***	***cm^4***

Actual deflec. = 0.4 mm

Allowable deflection = 6 mm (L /360)
> the actual

Therefore beam is ok in deflection

Design Of Padstone Beam A

Ultimate Point load = 7.8 kn

Mortar class (iii) 1 : 1 : 6

Blockwork Strength = 7 N/mm^2

Compressive Strength = fk = 6.4 N/mm^2

from table 2a of BS 5628 part 1 1992

Partial safety factor = gema m = 3.5

from table 4 of BS 5628 part 1 1992

Local design strength = 1.5 x fk/ &m = 2.74 N/mm^2

Actual strength = ultimate load / area

Assuming size of padstone =

100 mm wide
300 mm long
150 mm deep concrete pad stone

Area = 30000 mm^2

Actual stress = 0.26 N/mm^2

As Actual stress is < design strength
therefore size of padstone assumed is ok
therefore use 100x 300 x 150mm deep concrete pad stone under the beam
minimum bearing is 150mm