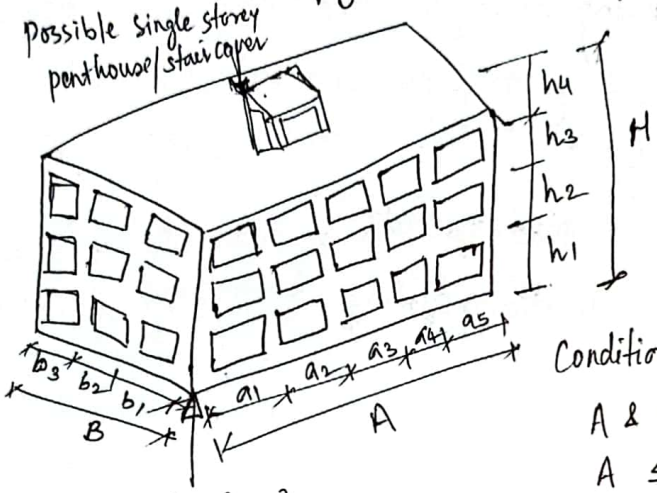
Mandatory rule of thumb in building design

→ The main objective of these Ready to use Detailing Guideline (RUD) is to provide ready-to-use dimensions & details for various structural and non-structural elements for up to three-storey reinforced concrete (RC) framed, ordinary residential building commonly being built by owner-builders in Nepal.

for a structure to be built using this RUD Guideline / Mandatory rule of thumb, it shall comply with the restrictions set out below:



NBC 205:2012

Conditions for detailed dimensions.

$A \& B \leq 25.0\ m$

$A \leq 3 * B$

$a \times b \leq 13.5\ sq.m$

$a, b \leq 4.5\ m$

$a, b \geq 2.1\ m$

A or $B \leq 6$ bays.

1. A is longer side of building & B is shorter side of building.
2. Openings can be provided as per functional/architectural requirements.
3. Foundations is not shown.

fig: Restrictions in Reinforced Concrete frame.

The restrictions are:

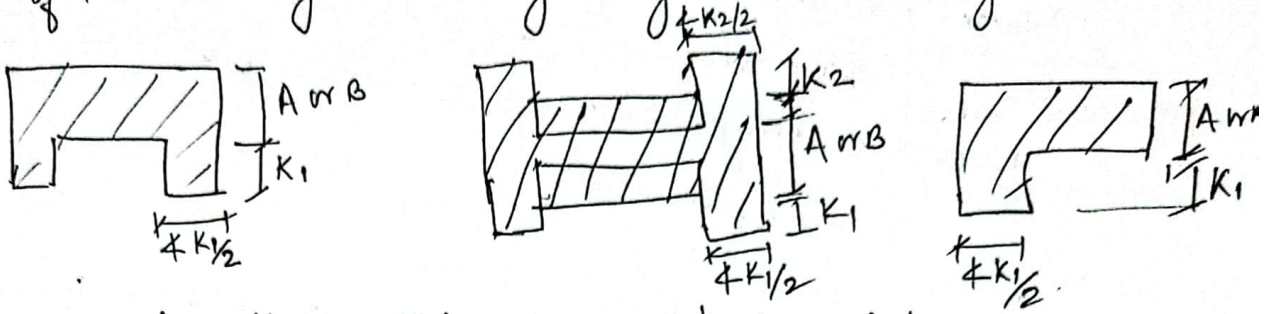
(a) Neither A nor B shall exceed 6 bays in length nor 25 meters. Each bay shall not exceed 4.5m, max^m panel area $a \times b < 13.5 m^2$.

(b) A shall not be greater than 3B.

(c) H/B shall not exceed 3.

(d) The max^m ht. of the structure is 11m or 3 storeys, whichever is less, from the level of lateral restraint. Within an 11m height, there may be an additional storey of smaller plan area whose area shall not exceed 25% of the area of a typical floor.

(e) The lengths of the wings on the structure shall be restricted such that K_1 & K_2 shall be less than the lesser of 0.15A or 0.15B, The width of the wings shall be restricted as shown in fig. The plan shape of the building excluding wings shall be rectangular.



K_1, K_2 < 0.15A or 0.15B, whichever is less.

(f) All columns resisting lateral load shall be vertical & shall continue on the same centerline down to foundation level. The top storey may however be smaller or have a different geometry subject to the provision of (e) above.

(g) No wall except a parapet wall shall be built on a cantilevered slab. Such wall shall be constructed only if the cantilevered slab is framed with beams.

(h) The foundation shall be at uniform level.

(i) Buildings shall not have a soft storey.

(j) The size of cantilever projection should not exceed 1 metre.

Building occupancy : Ordinary Building

Column Plan Bay Dimension : 3m * 3m to 4.5m * 3.0m

Bay Nos : 2 x 2 to 6 * 6

Number of storeys : up to three plus stair cover.

Storey height

terai = 3.35m

other = 2.75m

Wall thickness = 115 mm and 230 mm (external)
(internal)

Cantilever floor projection = 1.0m (from centerline of beam)

Concrete mix = M20

Reinforcement = fe 415 or fe500

Mortar = Min^m 1:4 cement sand mortar for half brick thick wall & 1:6 for one-brick

Bricks = Min^m crushing strength 3.5 N/mm^2

Slab (Roof & floors)

Thickness = 125 mm

Steel = 8 ϕ (fe 415 or fe 500)

Beams

Width = 230 or 250 mm

Depth = 355 mm overall depth including slab

Plinth tie beam (both directions)

Width = 230mm

Depth = 230mm overall depth

Column

300mm * 300mm

Staircase

inclined slab depth = 125mm

(25° angle min^m) Width of the staircase flight : 1050mm

~~Trade~~ Tread & rise size : as per building plan (300mm - 150mm min^m)

Load Bearing Masonry.

→ This MRT is valid (with certain limitations as to span, floor height etc, as prescribed in table below) for:

i) up to three-storeyed load-bearing brick (& other rectangular building units) masonry buildings constructed in cement mortars.

ii) up to two-storeyed load-bearing stone masonry buildings constructed in cement mortar.

iii) up to two-storeyed load-bearing brick masonry buildings constructed in mud mortar.

Building Size Limitations.

	floor	Min. Wall thickness (mm)	Max. Height (m)	Max. Short span of floor (m)	Cantilever (m)
Load bearing brick masonry in cement mortar	2nd	230	2.8	3.5	1.0
	1st	230	3.0	3.5	1.0
	Ground	350	3.2	3.5	No
Load-bearing stone masonry in cement Mortar	1st	350	3.0	3.2	No
	Ground	400	3.2	3.2	No
or Load bearing brick masonry in Mud Mortar	1st	350	3.0	3.2	No
	Ground	350	3.2	3.2	No,

→ Lintel