TAYLOR'S UNIVERSITY

Wisdom • Integrity • Excellence

SCHOOL OF ARCHITECTURE, BUILDING & DESIGN

Research Unit for Modern Architecture Studies in Southeast Asia

Bachelor of Science (Honours) (Architecture)

Building Structures (ARC 2522)

Project 2: Extension of a R.C. bungalow

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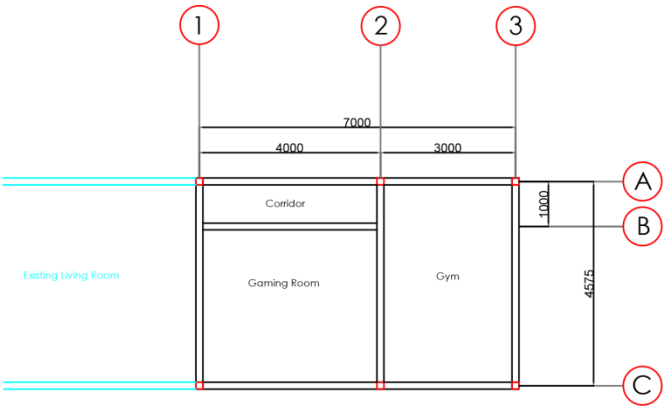
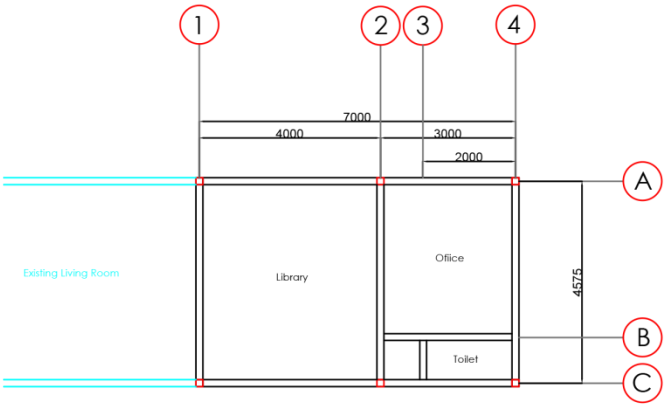
EXTENSION PROPOSAL

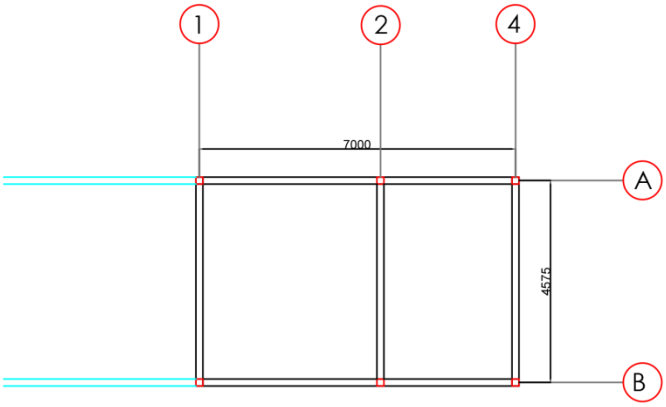
Ground Floor



First Floor

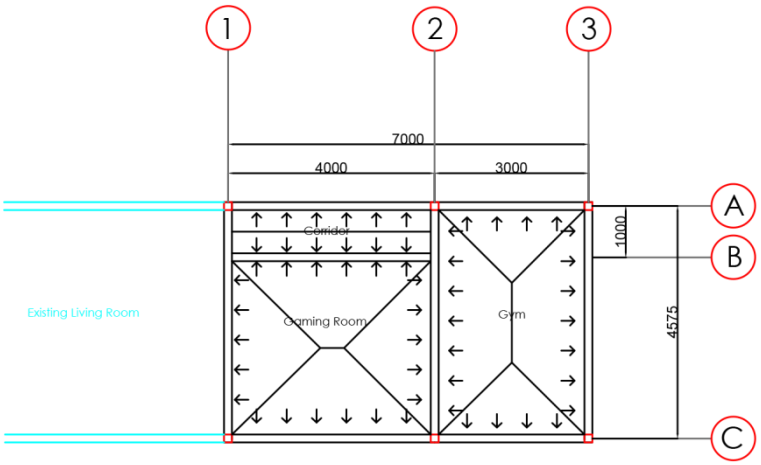


Roof Plan

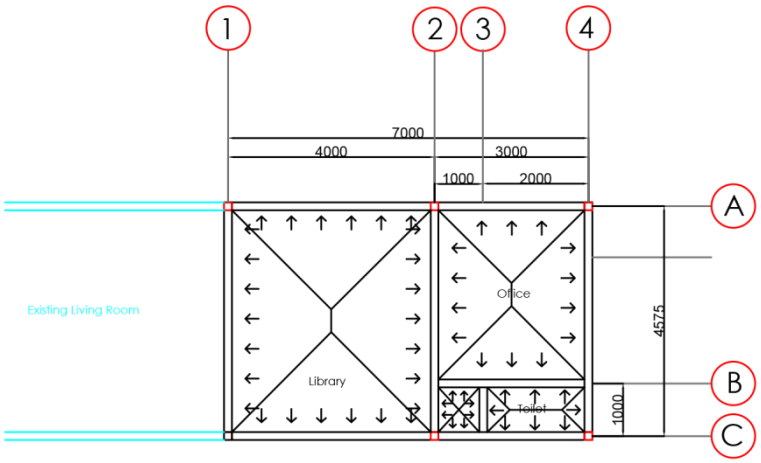


LOAD DISTRIBUTION DIAGRAM

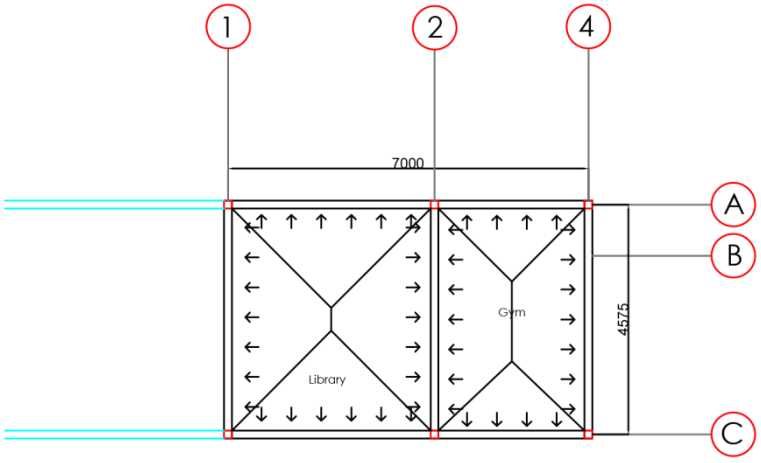
Ground Floor



First Floor



Roof Plan



QUANTIFY DEAD LOADS ACTING ON STRUCTURE

GROUND FLOOR

Gaming Room :

Slab thickness = 150*mm*

Slab self weight = 0.15m x 24kN/m^3

= 3.6kN/ m^3

Gym:

Slab thickness = 150*mm*

Slab self weight = 0.15m x 24kN/m^3

= 3.6kN/ m^3

Corridor:

Slab thickness = 150*mm*

Slab self weight = 0.15m x 24kN/m^3

= 3.6kN/ m^3

Brick Wall:

= Wall Height x Thickness x Density

= 3.6m x 0.15m x 19kN/m^3

= 10.26kN/*m*

Beam Self Weight:

(Assume all beams are 150mm x 300mm)

= Beam Size x Concrete Density

= 0.15m x 0.3m x 24kN/ m^3

= 1.08kN/ m^3

1ST FLOOR

Library :

Slab thickness = 150*mm*

Slab self weight = 0.15m x 24kN/m^3

= 3.6kN/ m^3

Toilet:

Slab thickness = 100*mm*

Slab self weight = 0.1m x 24kN/m^3

= 2.4kN/ m^3

Office:

Slab thickness = 150*mm*

Slab self weight = 0.15m x 24kN/$m^{3\backslash}$

= 3.6kN/ m^3

Brick Wall:

= Wall Height x Thickness x Density

= 3.3m x 0.15m x 19kN/m^3

= 9.41kN/*m*

Roof Slab:

Slab Thickness = 150mm

Self Weight = 0.15m x 24kN/m^3

= 3.6kN/ m^3

QUANTIFY LIVE LOADS ACTING ON STRUCTURE

GROUND FLOOR

Gaming Room :

= 2kN/m^3

Gym:

= 4kN/m^3

Corridor:

= 4kN/m^3

1^{ST} FLOOR

Library :

= 2.5kN/m^3

Toilet:

= 2kN/m^3

Office:

= 2kN/m^3

Roof Slab:

= 0.5kN/ m^3

IDENTIFY ONE WAY OR TWO WAY SLAB
Indicating the Distribution of Load from Slab to Beam

L_y = Longer side of slab
L_x = Shorter side of slab
When $L_y / L_x > 2$, it is a one way slab
When $L_y / L_x <$ or = 2, it is a two way slab

GROUND FLOOR

Gaming Room:
= 4 m ÷ 3.58 m
= 1.1 < 2 (Two way slab)

Gym:
= 4.58 m ÷ 3 m
= 1.53 < 2 (Two way slab)

Corridor:
= 4 m ÷ 1 m
= 4 > 2 (One way slab)

FIRST FLOOR

Library:
= 4.58 m ÷ 4 m
= 1.14 < 2 (Two way slab)

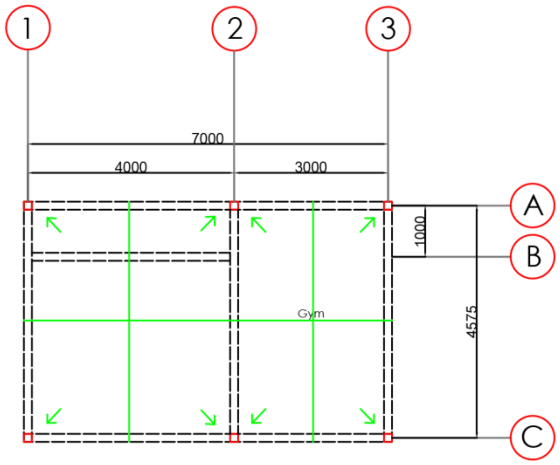
Office:
= 4.58 ÷ 3 m
= 1.53 < 2 (Two way slab)

Toilet:
= 2 m ÷ 2 m
= 2 = 2 (Two way slab)

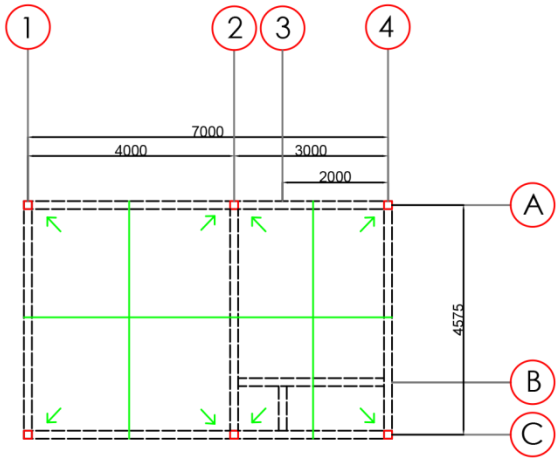
LOAD DISTRIBUTION DIAGRAM

Indicating the distribution of load from slab by using the tributary area method

Ground Floor



First Floor



Roof Plan