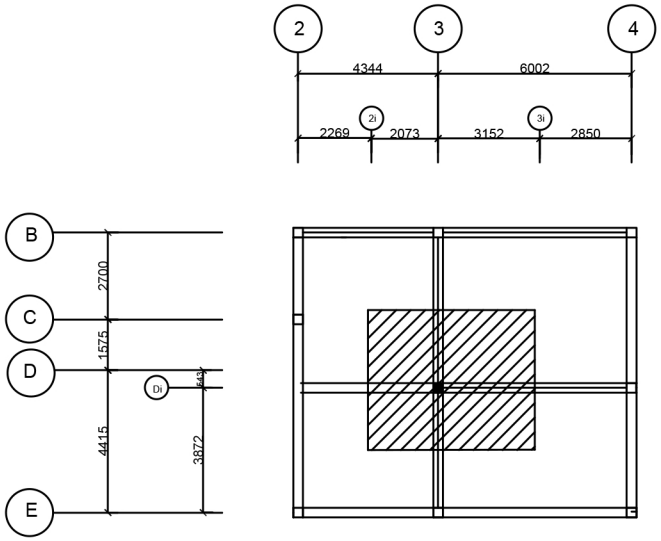
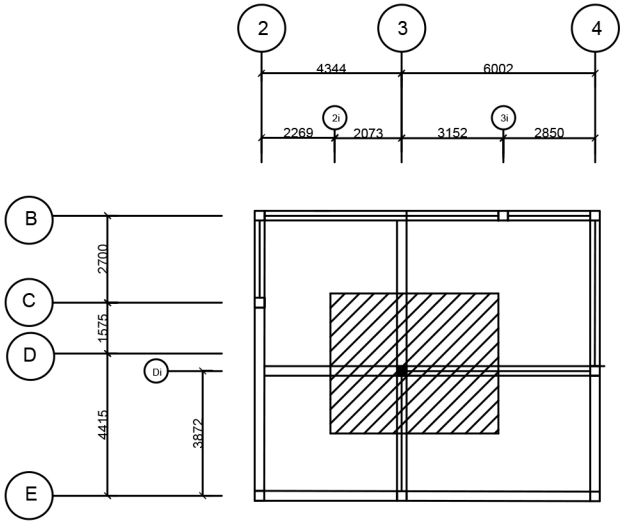
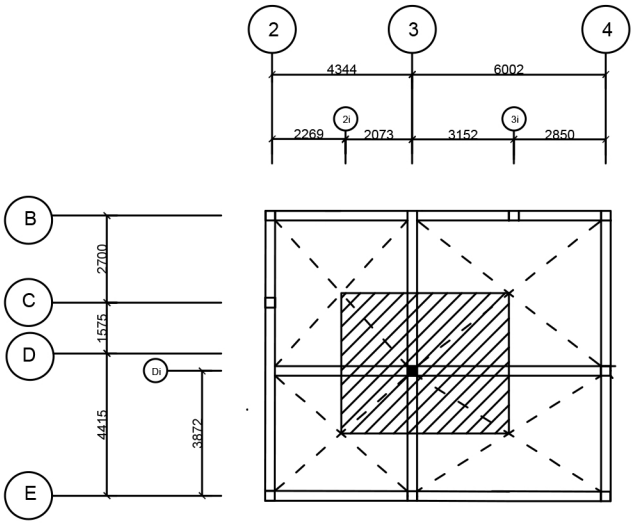
Column 1



GROUND FLOOR PLAN (STRUCTURAL)

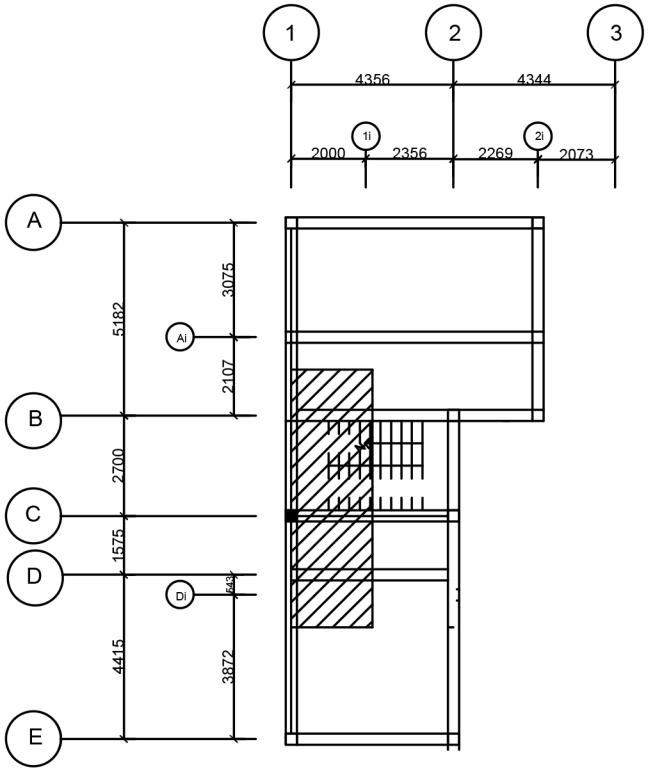


FIRST FLOOR PLAN (STRUCTURAL)

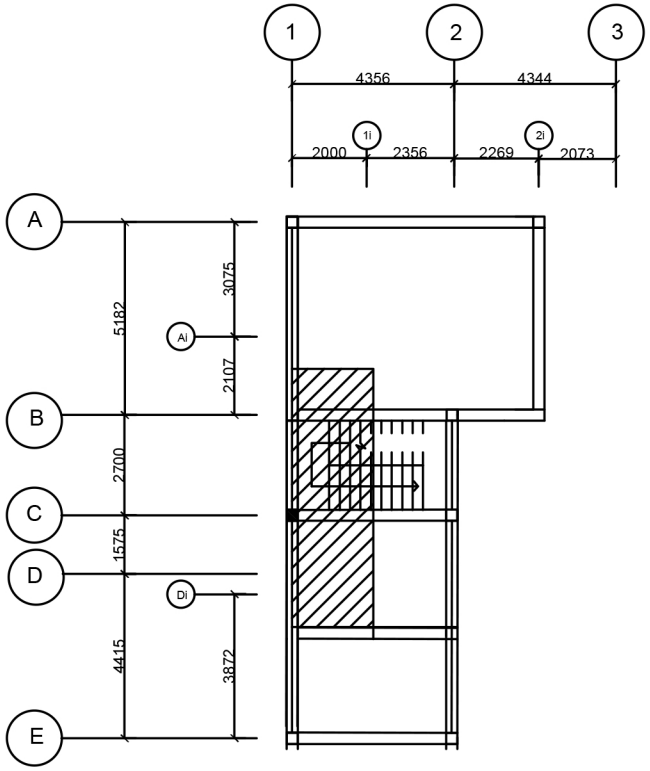


ROOF PLAN (STRUCTURAL)

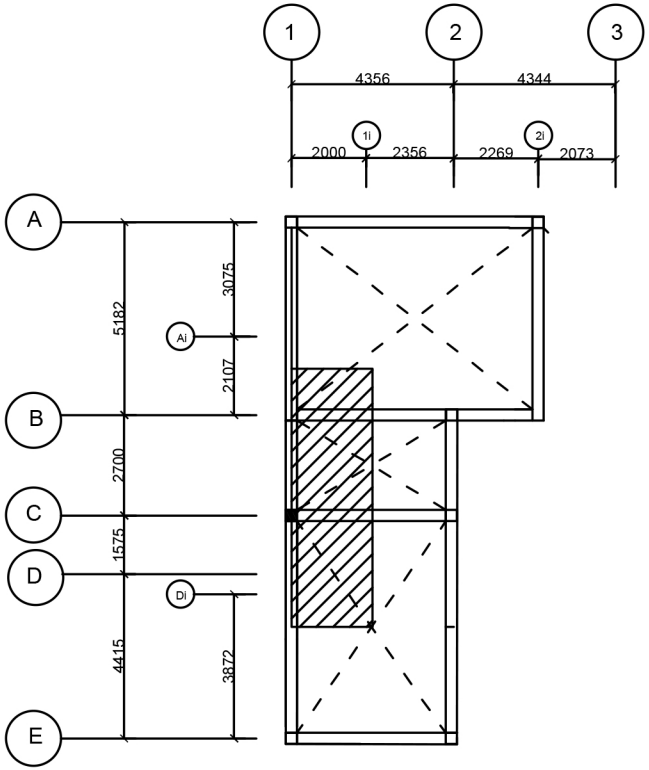
Column 2



GROUND FLOOR PLAN (STRUCTURAL)

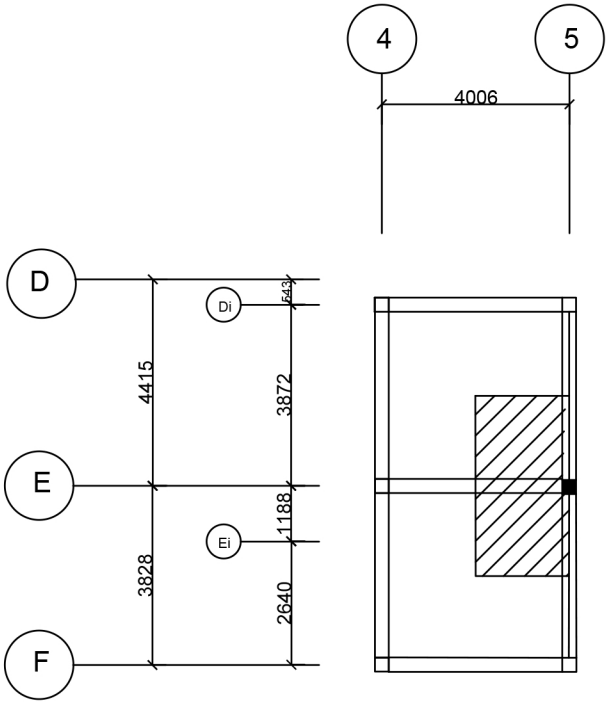


FIRST FLOOR PLAN (STRUCTURAL)

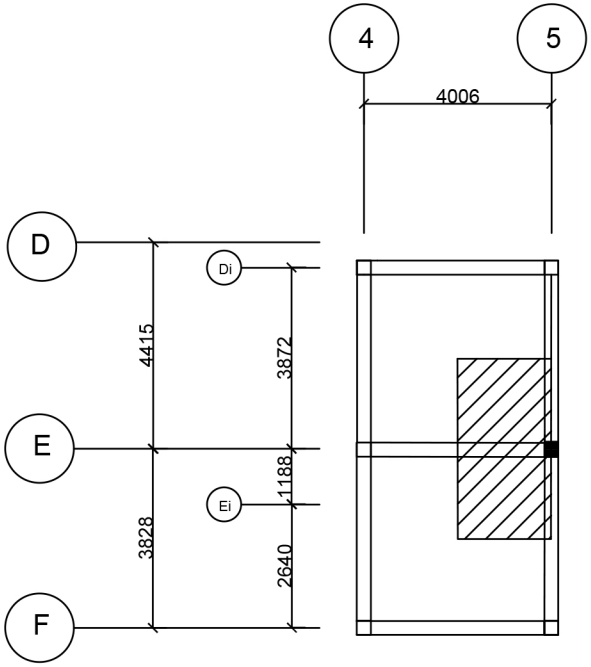


ROOF PLAN (STRUCTURAL)

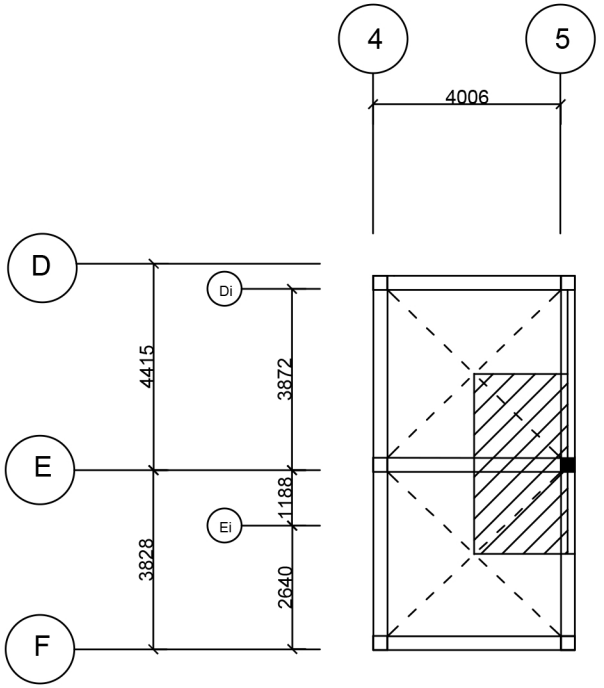
Column 3



GROUND FLOOR PLAN (STRUCTURAL)



FIRST FLOOR PLAN (STRUCTURAL)



ROOF PLAN (STRUCTURAL)

Column 1 (Ground floor D/3)

Dead load

ROOF LEVEL

(Assume as flat roof)

Roof slab = 0.15m x 24kN/m^3 x (5.173 x 4.345)m^2

= 80.92kN

Roof beam self weight

1 = (0.15 x 0.3)m^2 x 24kN/m^3 x (2.172 + 2.409)m

= 4.95kN

2 = (0.3 x 0.3)m^2 x 24kN/m^3 x (3.001 +1.936)m

= 10.66kN

Total dead load = 80.92 + 4.95 + 10.66

= 96.53kN

1st FLOOR

Dead load

Brick wall self weight = 0.15m x 3.2m x 19kN/m^2 x 0.291m

= 2.65kN

Slab self weight = 0.15m x 24kN/m^3 x (5.173 x 4.345)m^2

= 80.92kN

Beam self weight

1 = (0.15 x 0.3)m^2 x 24kN/m^3 x (2.172 + 2.409)m

= 4.95kN

2 = (0.3 x0.3) x 24kN/m^3 x (3.001 + 1.936)m

= 10.66kN

Column self weight = 0.3 x 0.3 x 3.2 x 24kN/m^3

= 6.91kN

Total dead load = 2.65 + 80.92 + 4.95 + 10.66 + 6.91

= 106.09kN

Live load

Corridor = 1.5kN/m^2 x [(2.172 x 2.409) + (2.172 x 1.936) + (3.001 x 1.936)]m^2

= 22.88kN

Living area = 1.5kN/m^2x (2.409 x 3.001)m^2

= 10.84kN

Total live load = 22.88 + 10.84

= 33.72kN

GROUND FLOOR

Dead load

Brick wall self weight = 0.15m x 3.2m x 19kN/m^3 x (2.409 + 3.001)m

= 49.34kN

Slab self weight = 0.15m x 24kN/m^3 x (5.173 x 4.345)m^2

= 80.92kN

Beam self weight

1 = (0.15 x 0.3)m^2 x 24kN/m^3 x 2.172

= 2.346kN/m

2 = (0.3 x 0.3)m^2 x 24kN/m^3 x (3.001 + 1.936 + 2.409)m

= 15.87kN/m

Column self weight = (0.3 x 0.3 x 3.2)m^3 x 24kN/m^3

= 6.91kN

Total dead load = 49.34 + 80.92 + 2.346 + 15.87 + 6.91

= 155.39kN

Live load

Corridor = 1.5kN/m^2 x [2.172 x (2.409 + 1.936)]

= 14.16

Car porch = 2.0kN/m^2 x (3.001 x 2.409)

= 14.46

Dining area = 1.5kN.m^2 x (3.001 x 1.936)

= 8.71

Total live load = 14.16 + 14.46 + 8.71

= 37.33kN

TOTAL DEAD LOAD

96.53 + 106.09 + 155.39 = 358.01kN

TOTAL LIVE LOAD

33.72 + 37.33 = 71.05kN

TOTAL ULTIMATE LOAD

(358.01 x 1.4) + (71.05 x 1.6) = 501.214 + 113.68

= 614.89kN

Column 2 (Ground floor C/1)

Dead load

ROOF LEVEL

(Assume as flat roof)

Roof slab = 0.15m x 24kN/m^3 x [2.178 x (3.941 + 2.995)]m^2

= 54.38kN

Roof beam self weight = (0.15 x 0.3)m^2 x 24kN/m^3 x (2.178 + 3.941 + 2.995)m

= 9.84kN

Total dead load = 54.38 + 9.84

= 64.22kN

1st FLOOR

Dead load

Brick wall self weight = 0.15m x 3.2m x 19kN/m^2 (2.178 + 3.941 + 2.995)m

= 83.21kN

Slab self weight = 0.15m x 24kN/m^3 x [(2.178 x 1.241) + (2.995 x 2.178)]

= 33.21kN

Beam self weight = (0.3 x 0.3)m^2 x 24kN/m^3 x (2.178 + 3.941 + 2.995)m

= 19.69kN

Column self weight = 0.3 x 0.3 x 3.2 x 24kN/m^3

= 6.91kN

Total dead load = 83.12 + 33.21 + 19.69 + 6.91

= 142.93kN

Live load

Master bedroom = 1.5kN/m^2x (1.241 x 2.178)m^2

= 4.05kN

Staircase = 1.5kN/m^2 x (2.7 x 2.178)m^2

= 8.82kN

Study room = 1.5kN/m^2 x (2.7 x 2.995)m^2

= 12.13kN

Total live load = 4.05 + 8.82 + 12.13

= 25.0kN

GROUND FLOOR

Dead load

Brick wall self weight = 0.15m x 3.2m x 19kN

= 83.12kN

Slab self weight = 0.15m x 24kN/m^3 x [2.178 x (3.941 + 2.995)]m^2

= 54.38kN

Beam self weight = (0.3 x 0.3)m^2 x 24kN/m^3 x (2.178 + 3.941 + 2.995)m

= 19.69kN

Column self weight = 0.3 x 0.3 x 3.2 x 24kN/m^3

= 6.91kN

Total dead load = 83.12 + 54.38 + 19.69 + 6.91

= 164.1kN

Live load

Living area = 1.5kN/m^2 x (1.241 x 2.178)m^2

= 4.05kN

Staircase = 1.5kN/m^2 x (2.7 x 2.178)m^2

= 8.82kN

Storeroom = 1.5kN/m^2 x (1.575 x 2.178)m^2

= 5.15kN

Guest room = 1.5 kN/m^2 x (1.42 x 2.178)m^2

= 4.64kN

Total live load = 4.05 + 8.82 + 5.15 + 4.64

= 22.66kN

TOTAL DEAD LOAD

64.22 + 142.93 + 164.1 = 371.25kN

TOTAL LIVE LOAD

25.0 + 22.66 = 47.66Kn

TOTAL ULTIMATE LOAD

(371.25 X 1.4) + (47.66 X 1.6) = 596.01Kn

Column 3 (Ground floor E/5)

Dead load

ROOF LEVEL

(Assume as flat roof)

Roof slab = 0.15m x 24kN/m^3 x [(1.936 + 1.914) x 2.003]m^2

= 27.76kN

Roof beam self weight = (0.15 x 0.3)m^2 x 24kN/m^3 x (1.936 + 1.914 + 2.003)m

= 6.32kN

Total dead load = 27.76 + 6.32

=34.08kN

1st FLOOR

Dead load

Brick wall self weight = 0.15m x 3.2m x 19kN/m^2 x (1.936 + 1.914 + 2.003)m

= 53.38kN

Slab self weight = 0.15m x 24kN/m^3 x (3.85 x 2.003)m^2

= 27.76kN

Beam self weight = (0.3 x 0.3)m^2 x 24kN/m^3 x (1.936 + 1.914 + 2.003)m

= 12.64kN

Column self weight = 0.3 x 0.3 x 3.2 x 24kN/m^3

= 6.91kN

Total dead load = 53.38 + 27.76 + 12.64 + 6.91

= 100.69kN

Live load

Gym room = 1.5kN/m^2 x (1.936 x 2.003)m^2

= 5.82kN

Bedroom = 1.5kN/m^2 x (1.914 x 2.003)m^2

= 5.75kN

Total live load = 5.82 + 5.75

= 11.57kN

GROUND FLOOR

Dead load

Beam self weight = $(0.3 \times 0.3)m^2 \times 24kN/m^3 \times (1.936 + 1.914 + 2.003)m$

$= 12.64kN$

Slab self weight = $0.15m \times 24kN/m^3 \times (3.85 \times 2.003)m^2$

$= 27.76kN$

Column self weight = $(0.3 \times 0.3 \times 3.2)m^3 \times 24kN/m^3$

$= 6.91kN$

Total dead load = 12/64kN + 27.76 + 6.91

$= 47.31kN$

Live load

Outdoor chilling area = $1.5kN/m^2 \times (3.85 \times 2.003)m^2$

$= 11.57kN$

Total live load = 11.57kN

TOTAL DEAD LOAD

34.08 + 100.69 + 47.31 = 182.08kN

TOTAL LIVE LOAD

11.57 + 11.57 = 23.14Kn

TOTAL ULTIMATE LOAD

(182.08 X 1.4) + (23.14 X 1.6)

= 291.94kN