

Department of Electrical and Electronic Engineering

Electrical Wiring and Drafting
EEE 2200
Sec – A

Project Report

Submitted to:

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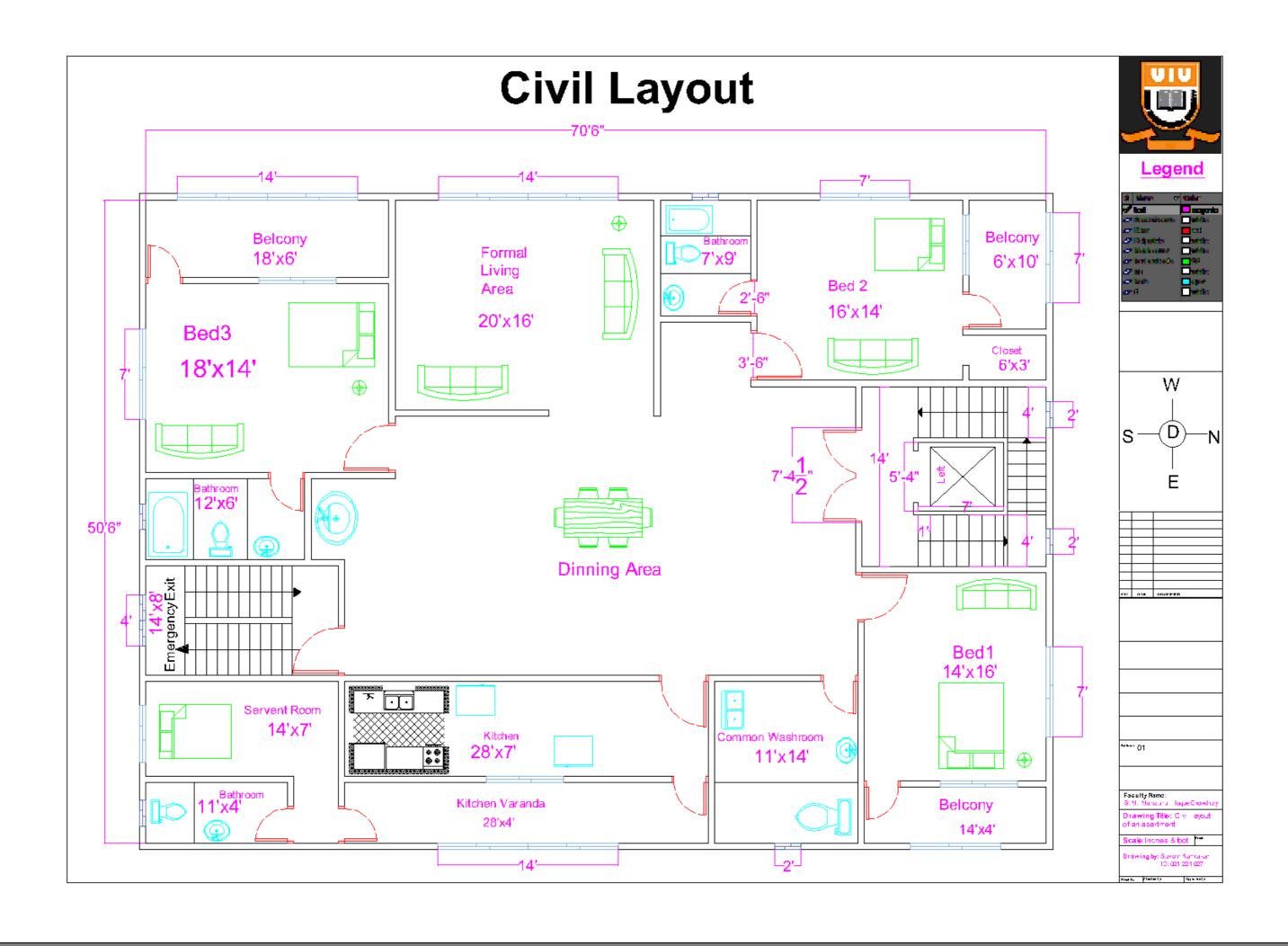
Date of submission: 30th December 2023

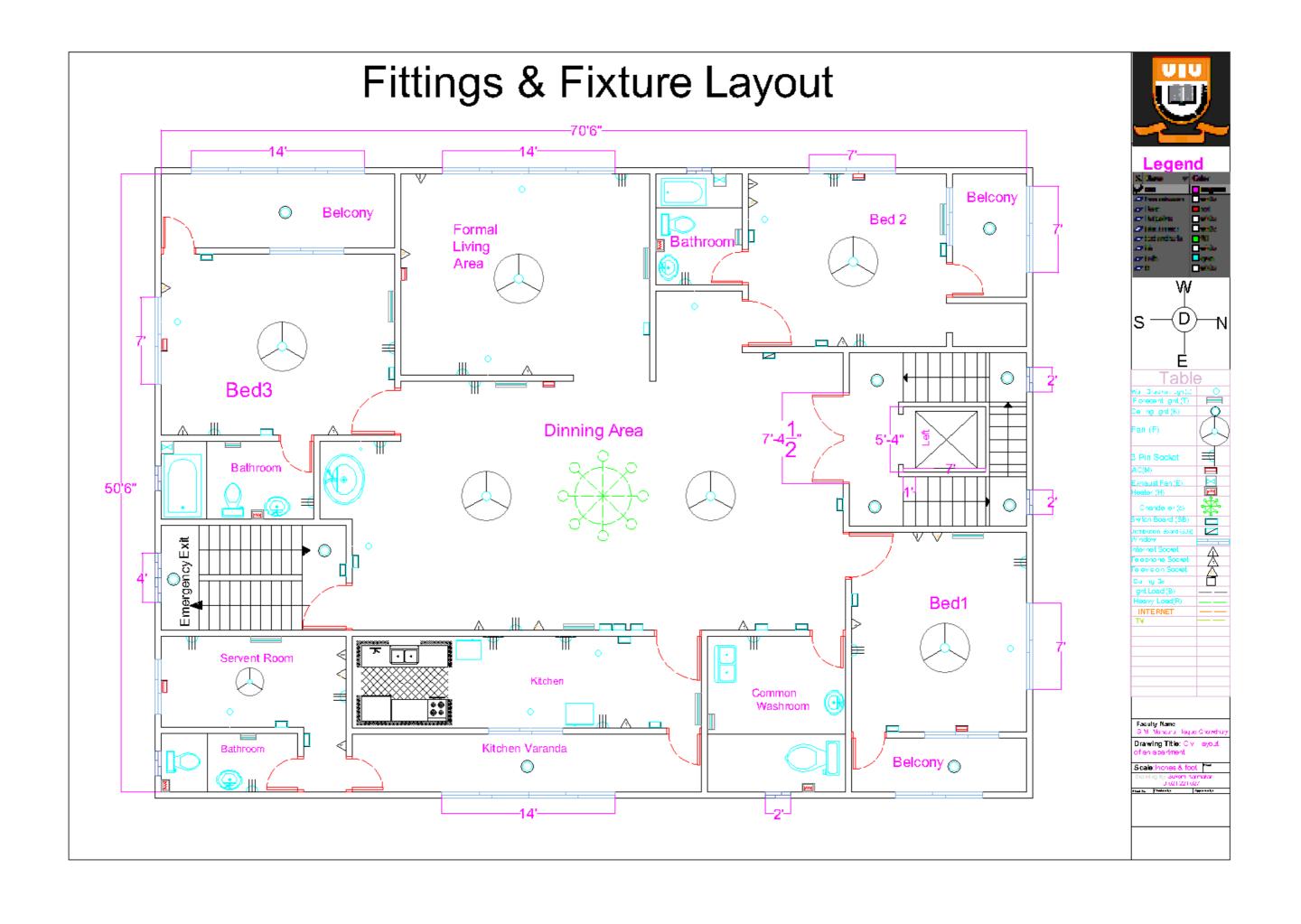
Project Specification

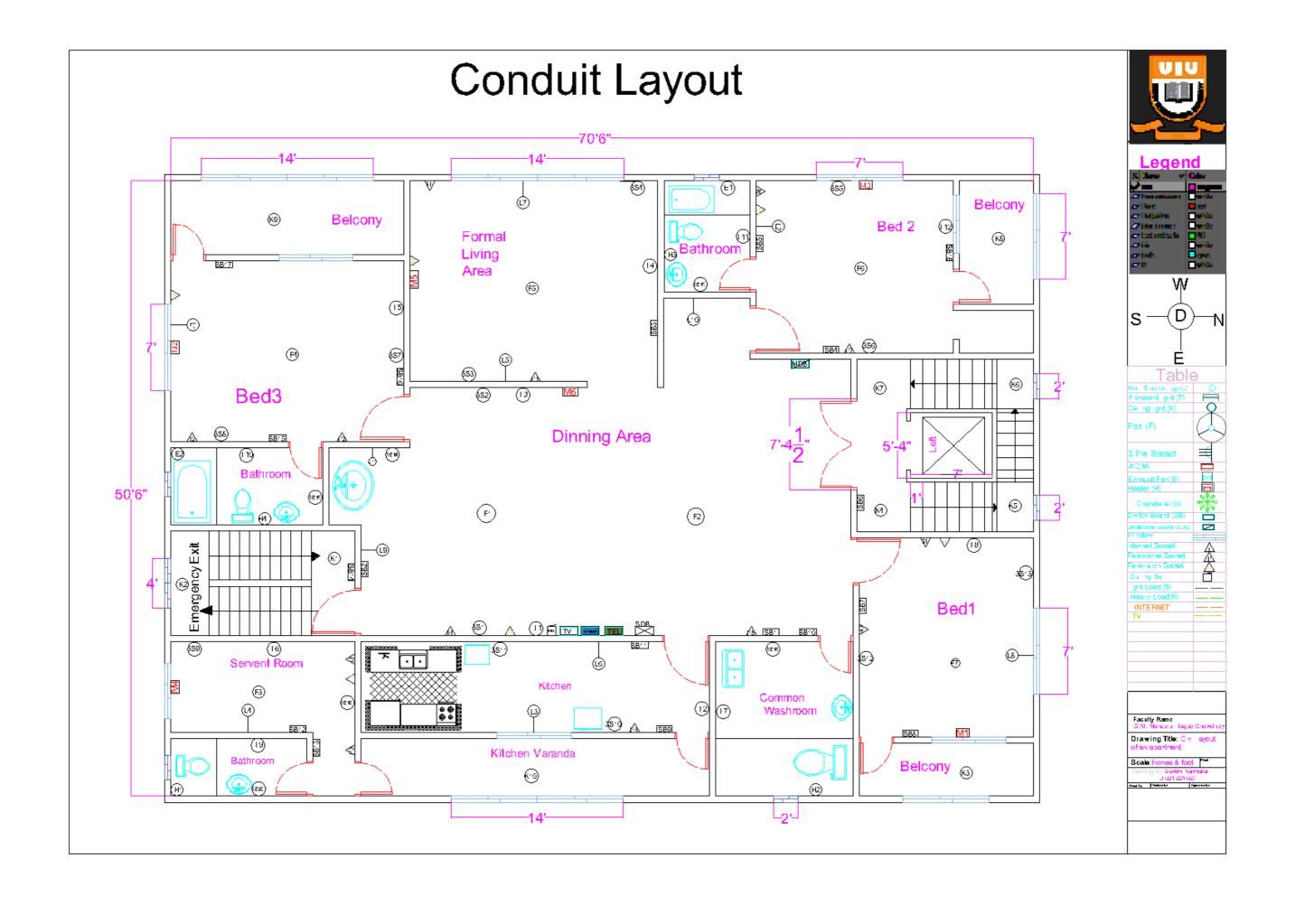
Design and layout of a 3500 square feet apartment unit of a 10 storied building. The report requires civil layout, fitting and fixture layout, conduit layout, SB group calculation, SB grouping, SDB calculation. The building was designed with MDB calculation, MDB connection diagram, single line diagram, lighting protection setup and earthing system.

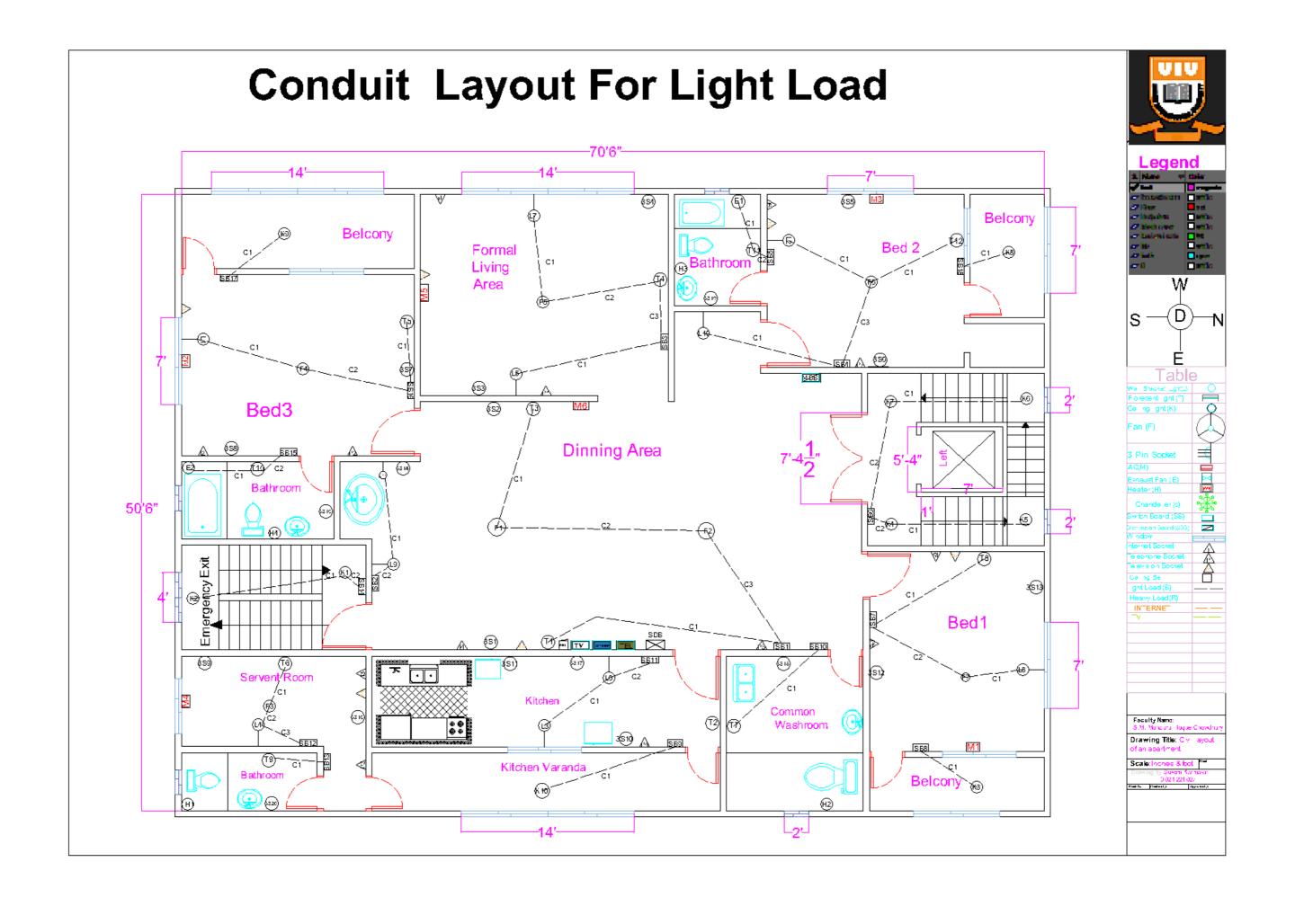
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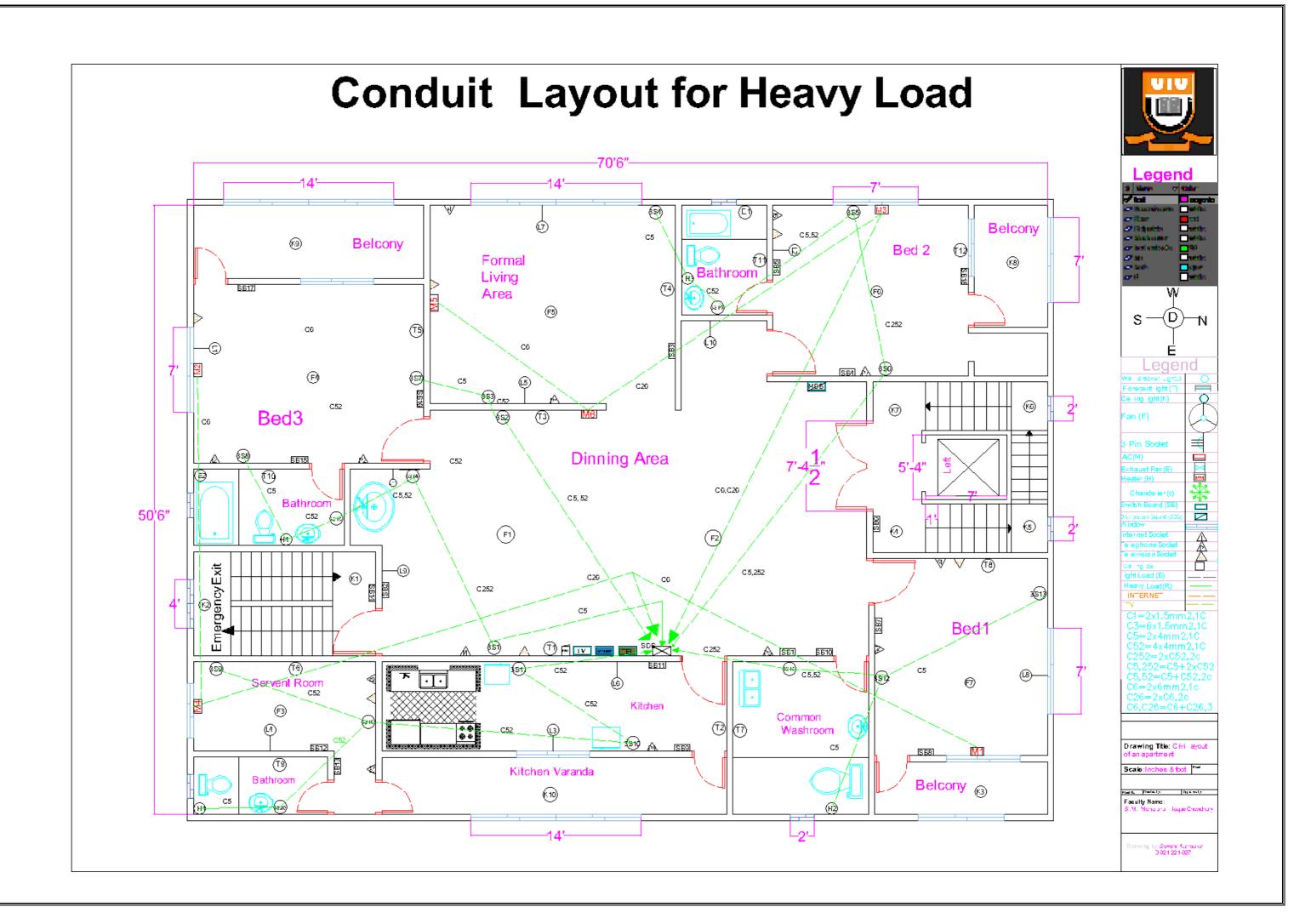
- 1. Civil Layout
- 2. Fittings and Fixture Layout
- 3. Conduit Layout
- 4. Conduit Layout (Light Load)
- 5. Conduit Layout (Heavy Load)
- **6.** Conduit Layout (Switchboard Grouping)
- 7. TV & Internet Connection
- 8. Switch Board Calculation & Group Diagram
- 9. SDB Connection Diagram
- 10. MDB Connection Diagram
- 11. SDB & MDB Calculation
- 12. Breaker Selection & Load Division
- 13. Sub-Station (SLD Diagram)

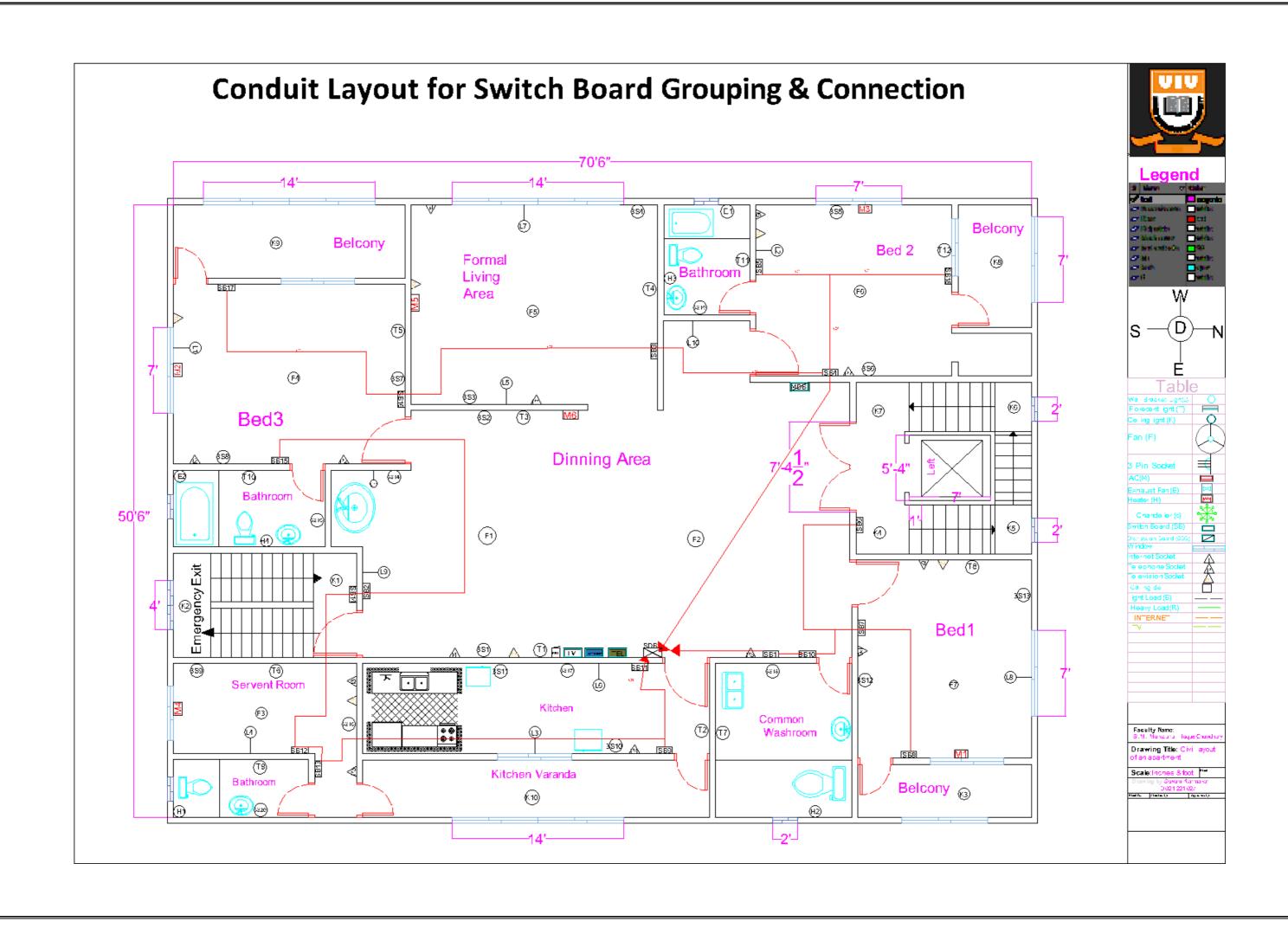


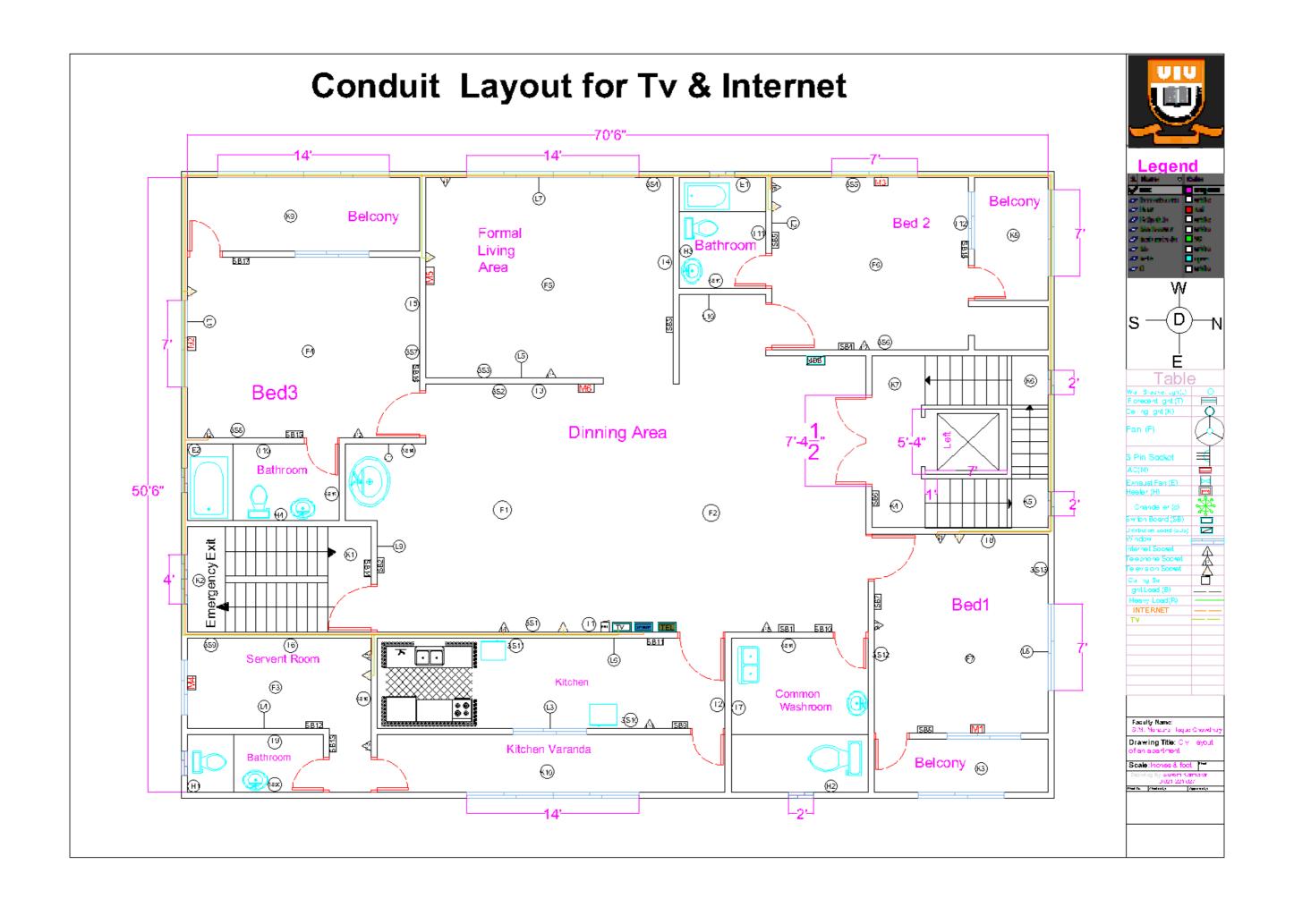












Calculation For Switchboard

Switchboard-1

Switchboard-2

Switchboard-4

1. Light 2*100w 2.Fan 2*80w

1.Light 2*100w

1.Light 3*100w 2.Fan 80w

Switchboard-3

1.Light 3*100w

Total 360w

Total 200w P=VI*0.8

Total 380w P=VI*0.8 Total 380w P=V1*0.8

2.Fan 80w

P=VI*0.8 Here,I= 360/(230*.8) =1.95 A

Here,I= 200/(230*.8) =1.08 A

P=V1*0.8 Here,I= 380/(230*.8) =2.06 A Here,I= 380/(230*.8) =2.06 A

Switchboard-5

Switchboard-6

Switchboard-7

Switchboard-8

1.Light 1*100w 2.Exhaust Fan 60w 1.Light 4*100w

1.Light 2*100w 2.Fan 80w 1.Light 1*100w

Total 160w P=VI*0.8 Here,I= 160/(230*.8) =0.86 A Total 400w P=VI*0.8 Here,I= 400/(230*.8) =2.17 A

Total 280w P=VI*0.8 Here,I= 280/(230*.8) =1.52 A Total 100w P=VI*0.8 Here,I= 100/(230*.8) =0.54 A

Calculation For Switchboard

Switchboard-9

Switchboard-10

Switchboard-12

1.Light 1*100w

1.Light 1*100w

1.Light 2*100w

1.Light 2*100w 2.Fan 80w

Total 100w P=VI*0.8

Total 100w P=VI*0.8

Total 200w

Total 280w P=VI*0.8

Here,I= 100/(230*.8)=0.54 A Here,I= 100/(230*.8) =0.54 A

P=VI*0.8 Here,I= 200/(230*.8) =1.08 A

Switchboard-11

Here,I= 280/(230*.8) =1.52 A

Switchboard-13

Switchboard-14

Switchboard-15

Switchboard-16

1.Light 1*100w

1.Light 2*100w

1. Light 1*100w 2.Exhaust fan 1*60w 1. Light 2*100w 2.Fan 1*80w

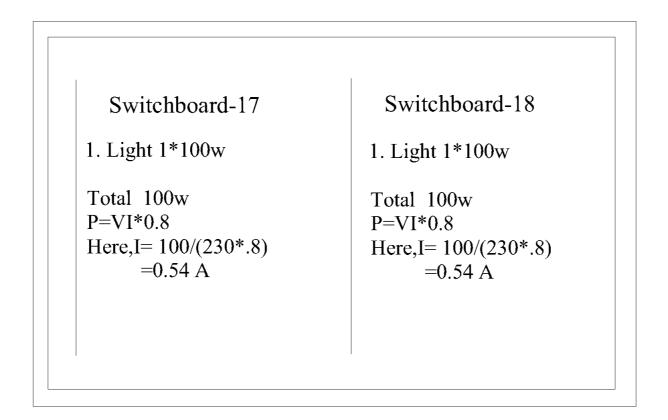
Total 280w

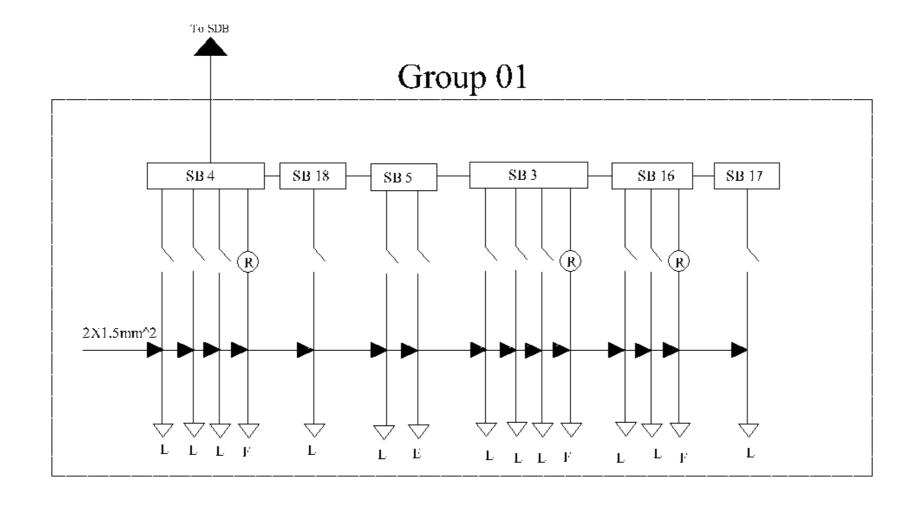
Total 100w P=VI*0.8 Here,I= 100/(230*.8) =0.54 A

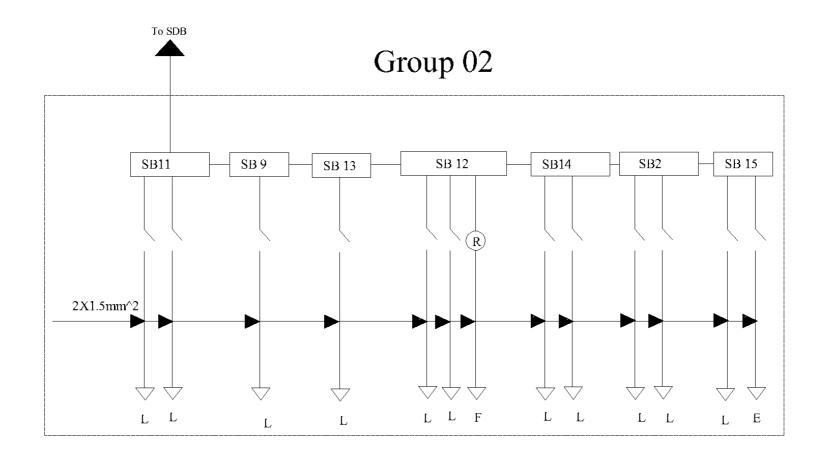
Total 200w P=VI*0.8 Here,I= 200/(230*.8) =1.08 A

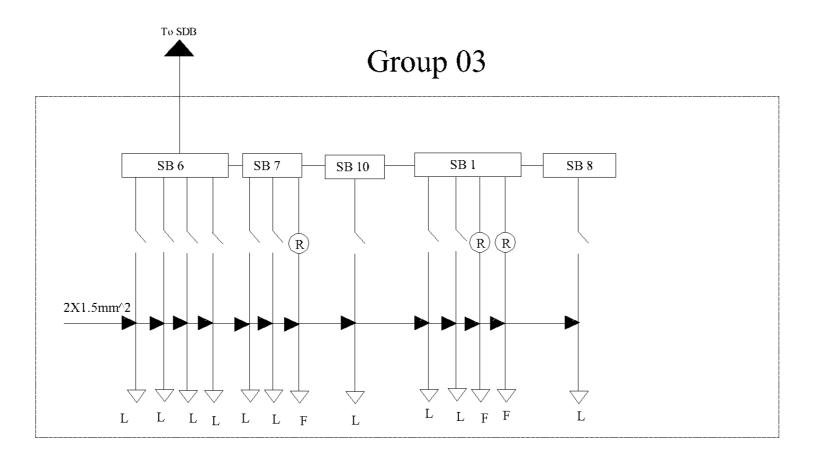
Total 160w P=VI*0.8 Here,I=160/(230*.8) =0.86 A

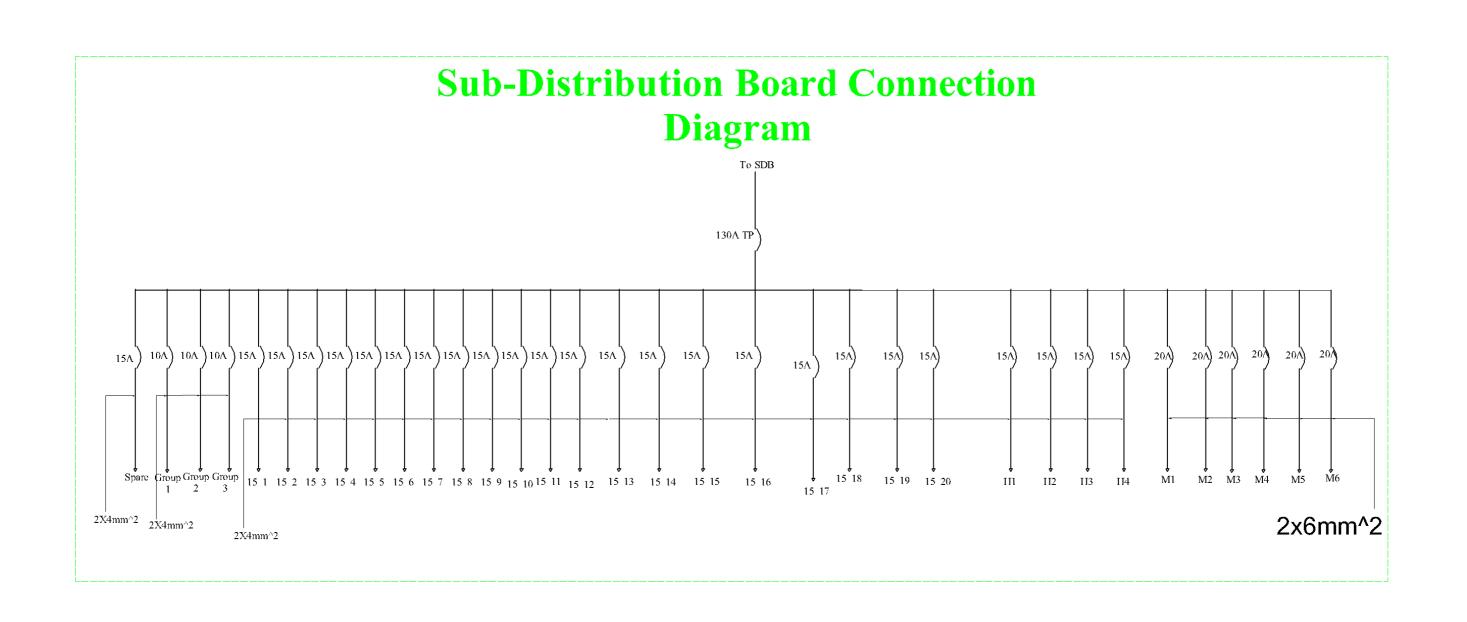
P=VI*0.8 Here,I= 280/(230*.8) =1.52 A

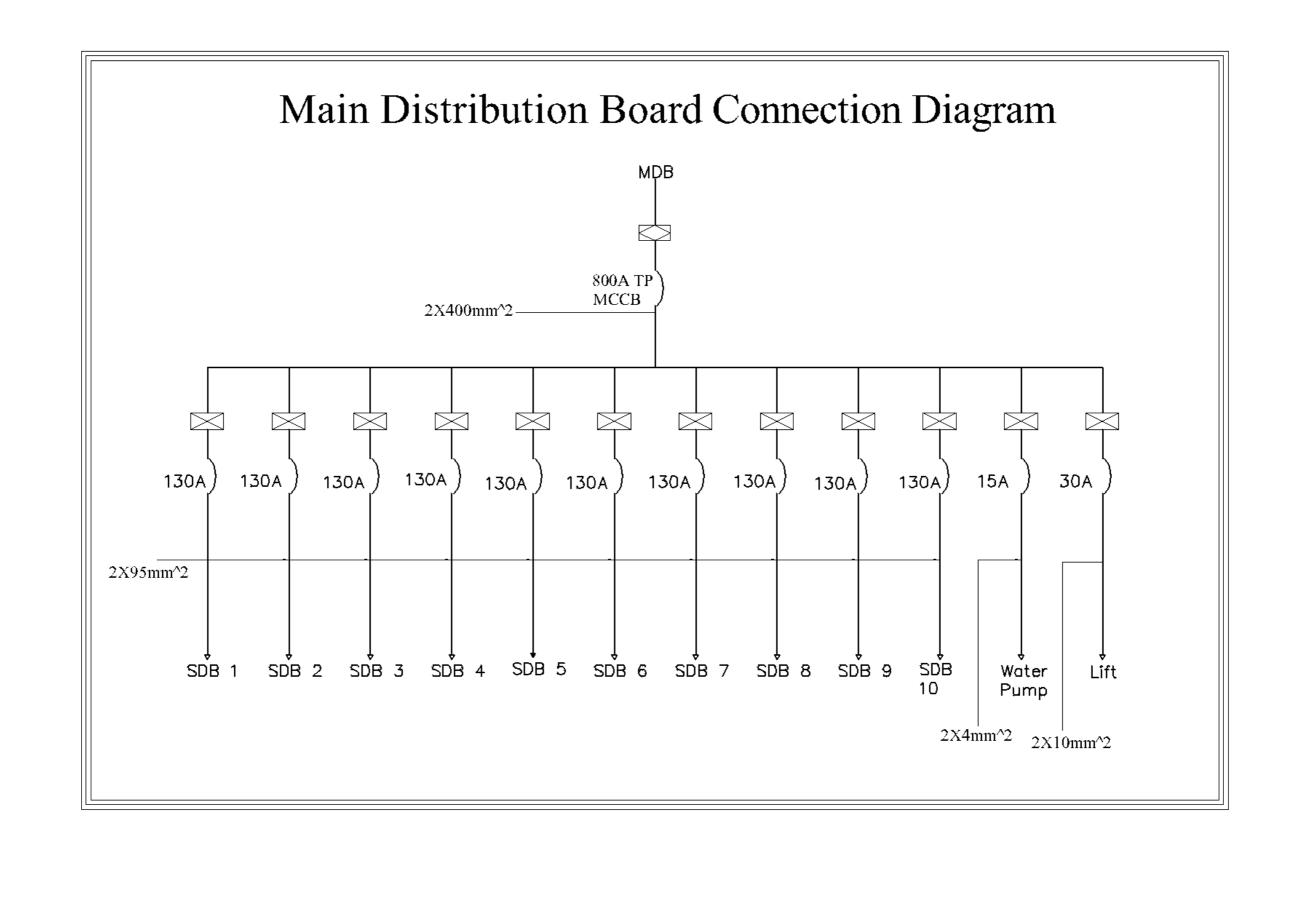












Calculation For SDB

```
Light load TP= 3880w
Havy load:
3 pin Socket [20*1500]= 30000w
Ac 20A [6*2200]= 13200w
Geyser [4*1500]=6000
```

```
Total power=(L-Load x 65%) + (H-Load(15A) x 65%)
+(H-Load(15A) x 70%) +(H-Load(20A) x 100%)
=(3880x.6)+(30000x.7)+(6000x.7)+(13200x1)
=40728w
```

```
If 9KW<Load then supply must be 415 L-L.

Apartment requires 3 phase line of 415V L-L voltage.

P=1.73*V_load*I_load*.8

I_load= 40728/(1.73*.8*415)

=70.91 A

With Safety Factor I=I_load*sf+I_spare

=70.91*1.5+15
```

=121.36 A

So, I choose 130 A TP Circuit Breaker.

Calculation For MDB

```
Every unit=40728 W

10 Unit=10*40728=407.28 kW

I choose 1 water pump 10HP

s0,1 water pump=10*746 W

=7460 W
```

For 1 Lift: I choose 1600 kg Lift(around 16 person). Speed=1.8m/s

Motor capacity:
Power= (1600kg×9.8×1.8)W
Power=28,224Watts
Total Power=407.28*1000+28,224+7460
=442.96 kW
I_load=442.96*1000/(1.73*.8*415)
=771.22 A
So I choose 800 A TP Circuit Breaker.

Breaker Selection for Grouping

Group 01

Group 02

Group 03

SB 4,18,5,3,16,17

SB 11,9,13,12,14,2, 15

SB 6,7,10,1,8

=2.06+0.54+0.86+

=1.08+0.54+0.54+1.52+

=2.17+1.52+0.54+1.95+

2.06+ 1.52+0.54

1.08+1.08+0.86

0.54

= 7.58 A

= 6.7 ASo, I choose 10A = 6.72 A

So, I choose 10A

breaker.

So, I choose 10A breaker.

breaker.

Load Division

Phase A (45A)

G1,15 1,15 2,15 3,15 4,15 5,15 6 H1,H2,M1, M2

Phase B (45A)

G2,15 7,15 8,15 9,15 10,15 11,15 12, 15 13,H3,M3, M4

Phase C (45A)

G3,15 14,15 15,15 16,15 17,15 18, 15 19,15 20,H4,M5, M6

