

Residential Building

(Notebook)



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Diploma in Civil Engineering (RCIT)
B.Sc in Civil Engineering (Study)

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(Pile Work)

SKETCH ARCHITECTURE

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PROJECT NAME:

4 Stories Residential Building

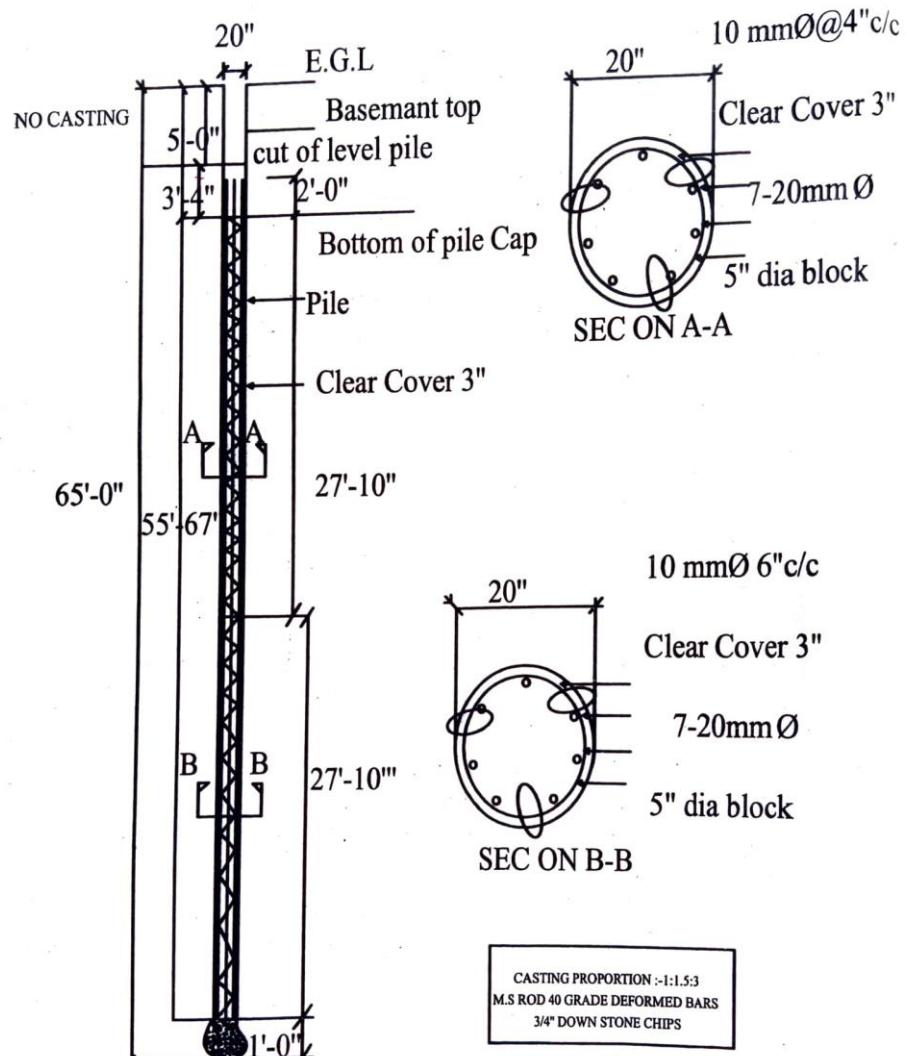
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Cast in Situ Pile - 20" DIA

(Pile Work)

$$\text{সূত্রঃ } \pi D^2 h / 4 = 3.1416 \times (20")^2 \times 60"/4 = 3.1416 \times (1.67)^2 \times 60"/4 = 131.42 \text{ Cft}$$

Dry volume = 131.42 x 1.50 = 197.13 Cft
 Sumation of Ratio = 1+1.5+3 = 5.5

$$\text{Cement} = \frac{197.13 \times 1}{5.5 \times 1.25} = 28.67 \text{ Bag}$$

$$\text{Sand} = \frac{197.13 \times 1.5}{5.5} = 54 \text{ Cft}$$

$$\text{Stone Chips} = \frac{197.13 \times 3}{5.5} = 107.52 \text{ Cft}$$

Pile Dia = 20" = 1.67'
 Pile L = 60'
 Dry volume = 1.50

Reinforcement:-

Long Reinforcement length: - 55.67' + 2' - 0" + 30" = 60.17'

20mm reinforcement weight = N x L x W = 7 x 60.17' x 0.75kg = 315.89kg

(A-A) Top Spiral = $\pi D + \text{Spacing} = 3.1416 \times 1.17' + 0.33' = 4'-0" \text{ Rft}$

Length = $27.83' \div 0.33' = 84.33 = 85+1 = 86 \text{ Nos}$

10mm reinforcement weight = N x L x W = 86 x 4' + (8 x 1.5) x 0.19 = 67.64kg

Laping Length = 30"
 Rein Nos = 7
 20mm 1' Rein Weight = 0.75kg

(B-B) Top Spiral = $\pi D + \text{Spacing} = 3.1416 \times 1.17' + 0.5' = 4'-17" \text{ Rft}$

Length = $27.83' \div 0.5' = 56.66 = 57 \text{ Nos}$

10mm reinforcement weight = N x L x W = 57 x 4.17' + (5 x 1.5) x 0.19 = 67.64kg

Pile dia = 20"-6"(clear covering)
 = 14" = 1.17'
 Spacing = 4" = 0.33'
 10mm 1' Rein Weight = 0.19kg
 Laping L = $86 \times 4 = 344 / 40 = 8.6 \text{ Nos}$

Total Reinforcement :-

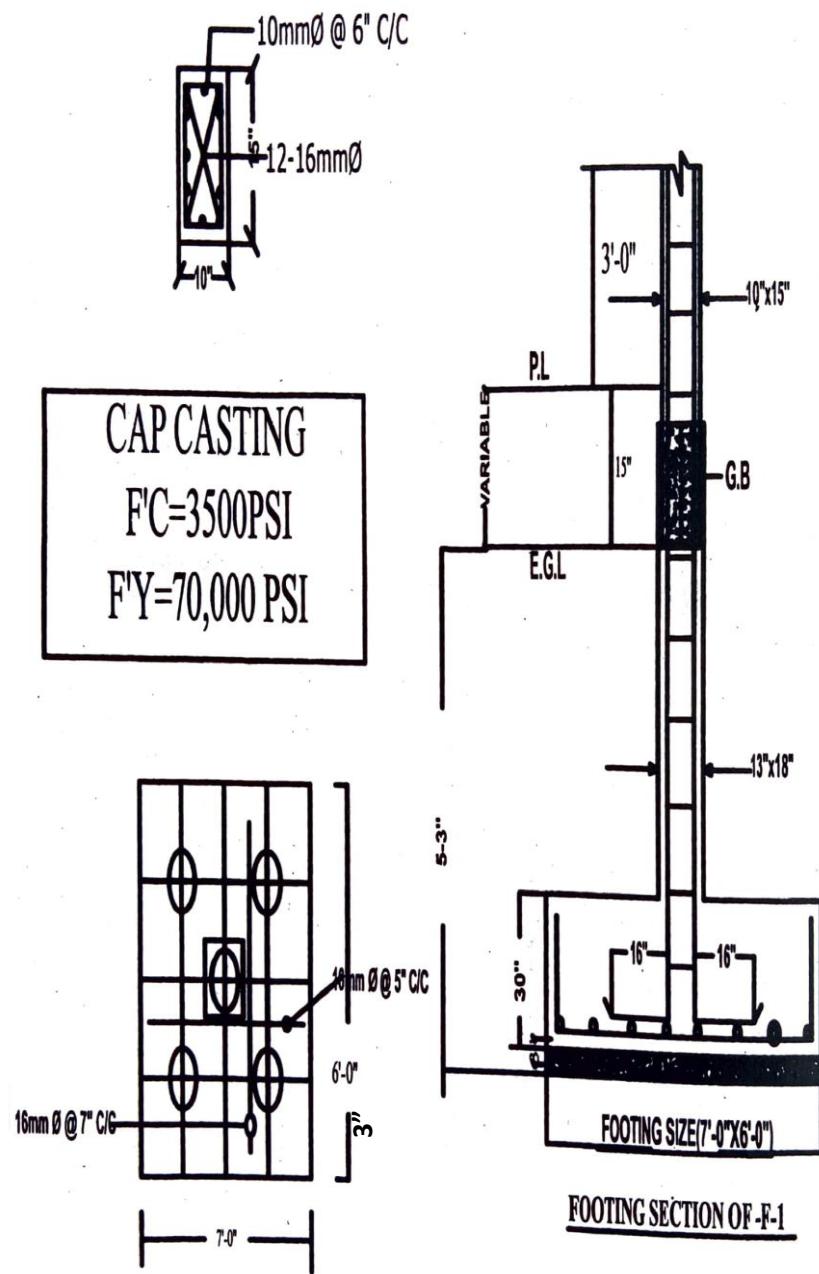
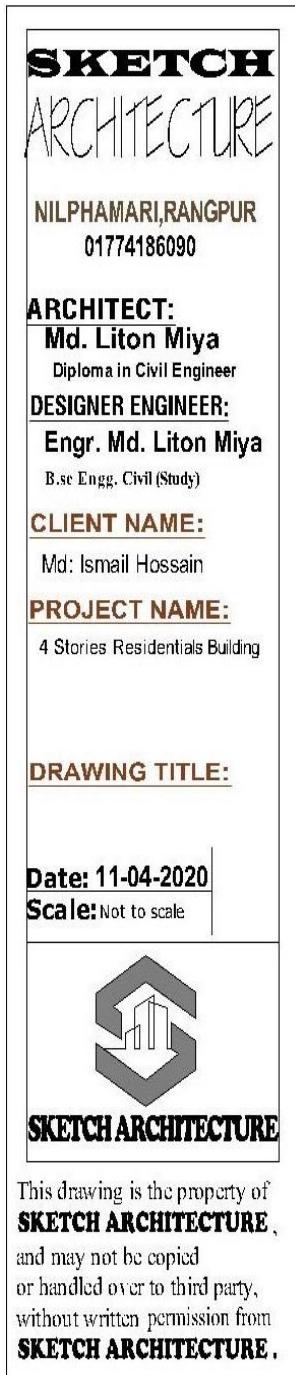
20mm reinforcement = 315.86 kg

10mm reinforcement = 67.64 + 46.59 = 114.23 kg

Total	= 430.12 kg
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Pile dia = 20"-6"(clear covering)
 = 14" = 1.17'
 Spacing = 6" = 0.5'
 10mm 1' Rein Weight = 0.19kg

(PILE CAP ESTIMATIN)



(PILE CAP ESTIMATIN)

C.C Casting = L x B x H = 7'-0" x 6'-0" x 0.25' = 10.5 Cft

Dry volume = 10.5 x 1.5 = 15.75 Cft

Sumation of Ratio = 1+3+6 = 10

$$\text{Cement} = \frac{15.75 \times 1}{10 \times 1.25} = 1.26 \text{ Bage}$$

$$\text{Sand} = \frac{15.75 \times 3}{10} = 4.72 \text{ Cft}$$

$$\text{Stone Chips} = \frac{15.75 \times 6}{10} = 9.45 \text{ Cft}$$

Column Casting : L x B x H = 13" x (30"+15")= 6.07 Cft

Footing Casting : L x B x H= 7'-0"x 6'-0"x 2'-6"= 105 Cft

Total Volumn = 6.07+105=111.07 Cft

Dry volume = 111.07 x 1.5 = 166.60 Cft

Sumation of Ratio = 1+1.5+3 = 5.5

$$\text{Cement} = \frac{166.60 \times 1}{5.5 \times 1.25} = 24.23 \text{ Bage}$$

$$\text{Sand} = \frac{166.60 \times 1.5}{5.5} = 45.43 \text{ Cft}$$

$$\text{Stone Chips} = \frac{166.60 \times 3}{5.5} = 90.87 \text{ Cft}$$

Pile Reinforcement:-

$$\text{Long Di:- } \frac{5.5'}{0.42'} = 13.09+1= 14 \text{ Nos}$$

Weight = N x L x W = 14 x 10.5' x 0.48 = 70.56kg

$$\text{Short Di:- } \frac{6.5'}{0.58'} = 11.21+1= 12 \text{ Nos}$$

Weight = N x L x W = 12 x 9.5' x 0.48 = 54.72kg

Short Column Reinforcement:-

Length = 1.33'+5.25'+1.25'-(0.25'+0.25'+0.105')= 7.22'

Main Rod = N x L x W= 12 x 7.22' x 0.48 = 41.58 kg

Stirap Length= (7"x2)+(12"x2)+4"=3.5'

Stirap = N x L x W = 11 x 3.5' x 0.19 = 7.32 kg

Total Reinforcement = 70.56+54.72+43.056+7.315=175.651 kg

Short CL Length:
5'-3"- (3"+30")=30"
C.C = 3"
Pile Cap H= 30"
G.B =15"

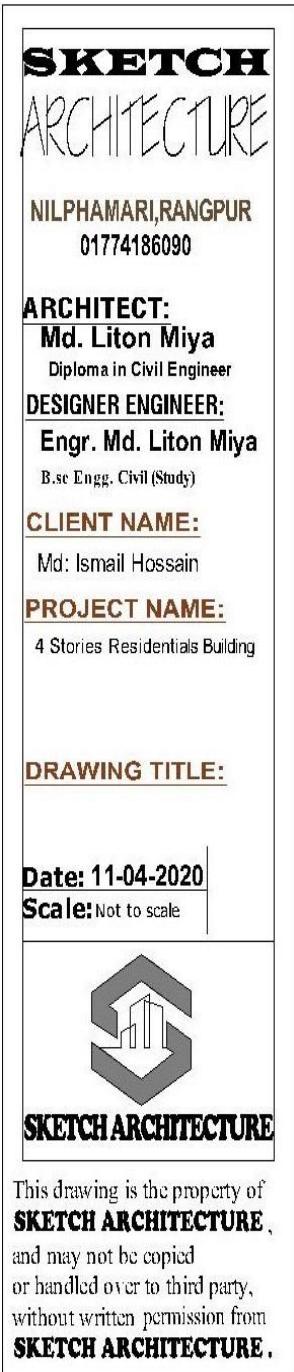
Short Dir:-
6'-0"- (3"x2 Side clear cover) = 5.5'
Long Di : Re:- 5" c/c= 0.42'
Long Di :L= 7'-0"- (3"x2 Side clear cover)= 6.5'+(2'x2 Nos L Bar)10.5'
W= 16mm 1' Rein Weight= 0.48 kg

Long Dir:-
7'-0"- (3"x2 Side clear cover) = 6.5'
Short Di: Re:- 7" c/c= 0.58'
Long Di :L= 6'-0"- (3"x2 Side clear cover)= 5.5'+(2'x2 Nos L Bar)9.5'
W= 16mm 1' Rein Weight= 0.48 kg

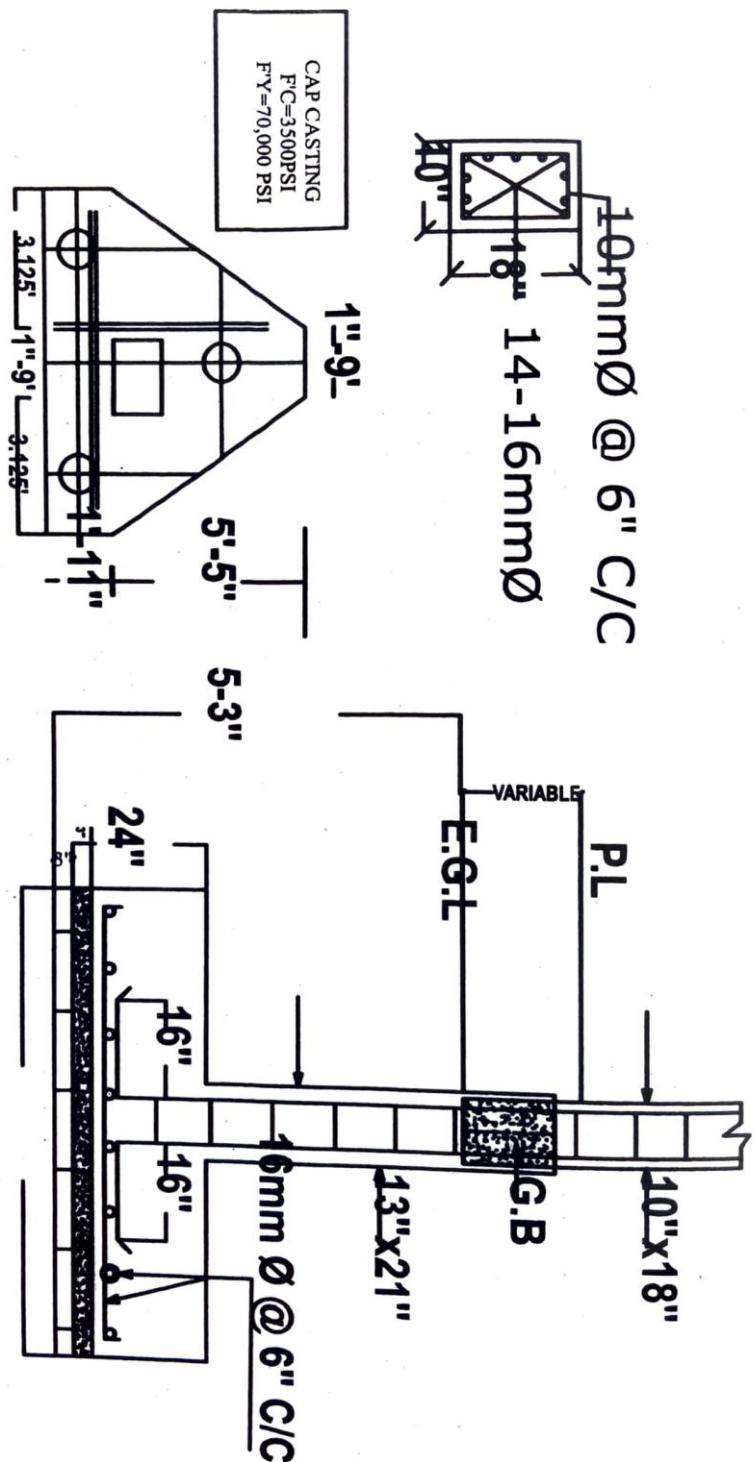
N=Total Re: 12 nos
CL.L.Bar=16"/12"=1.33'
Height=5'-3"=5.25'
G.B.Height=15"/12"=1.25'
C.C Casting=3"=0.25'
2 Nos Re: 16mm x 2=32mm/25.4(1"=25.4mm)=1.26" /12"=0.105'
W= 16mm 1' Rein Weight =0.48 kg

Nos= 5.25"-3"(C.C Casting 3"=0.25")-3"(Bottom Clear Cover 3"=0.25")-0.105'=4.645'/6"(5")=9.29+1=11 Nos Stirap L= CL Size(10"x15") CL B=10"- (1.5x2)=7" CL L=15"- (1.5x2)=12" Hooks= 2"x2=4" W= 10mm 1' Rein Weight =0.19 kg

(3-PILE CAP ESTIMATING)



PLAN OF PILE CAP



(3-PILE CAP ESTIMATING)

$$1^{\text{st}} = L \times B \times H = 8' \cdot 0'' \times 19' \times 2' = 30.72 \text{ Cft}$$

$$2^{\text{nd}} = L \times B \times H = 4.87' \times 5.42' \times 2' = 52.79 \text{ Cft}$$

$$\text{Total} = 30.72 + 52.79 = 83.51 \text{ Cft}$$

$$\text{Dry volume} = 83.51 \times 1.5 = 125.26 \text{ Cft}$$

$$\text{Sumation of Ratio} = 1+1.5+3 = 5.5$$

$$\text{Cement} = \frac{125.26 \times 1}{5.5 \times 1.25} = 18.21 = 19 \text{ Bags}$$

$$\text{Sand} = \frac{125.26 \times 1.5}{5.5} = 34.16 \text{ Cft}$$

$$\text{Stone Chips} = \frac{125.26 \times 3}{5.5} = 68.86 \text{ Cft}$$

$$\begin{aligned}L &= 8' \cdot 0'' \\B &= 1' \cdot 11'' = 1.92' \\H &= 24'' = 2'\end{aligned}$$

$$\begin{aligned}L &= 8' + 1.75'(1' \cdot 9'') = 9.75'/2 = 4.87' \\B &= 5' \cdot 5'' = 5.42' \\H &= 24'' = 2'\end{aligned}$$

Reinforcement:

$$1^{\text{st}} \text{ Long Direction} = 1.67'/0.50' = 3.34 \text{ Nos} = 4 \text{ Nos}$$

$$\text{Length} + L \text{ Bar} = 7.5' + 3' - 0'' = 10.5'$$

$$\text{Weight} = N \times L \times W = 4 \times 10.5' \times 0.48 \text{ kg} = 20.16 \text{ kg}$$

$$\begin{aligned}\text{Short Di:- } 1' \cdot 11'' &= 1.92' - 0.25' \\&(1 \text{ Side Clear Cover } 3'') \\&\text{Long Dir:- Spacing} = 6''/12'' = 0.50'\end{aligned}$$

$$\text{Length} = 8'0'' - 6'' (\text{Clear cover } 3'' \times 2 \text{ side})$$

$$\begin{aligned}\text{Casting Height} &= 2'0'' - 6'' \{ \text{Bottom Clear Cover } 3'' + \text{Top clear cover } 3'' \} = 18'' = 1.5' \times 2 \text{ Side (L Bar)} = 3'0''\end{aligned}$$

$$1^{\text{st}} \text{ Short Dir:- } 7.5'/6'' = 15+1 \text{ Nos} = 16 \text{ Nos}$$

$$\begin{aligned}\text{Long Di:- } 8'0'' - 6'' &= 7.5' \\(2 \text{ Side Clear Cover } 2 \times 3'') \\&\text{Short Dir:- Spacing} = 6''/12'' = 0.50'\end{aligned}$$

$$\text{Length} + L \text{ Bar} = 1.67' + 1.5' = 3.17'$$

$$\text{Weight} = N \times L \times W = 16 \times 13.17' \times 0.48 \text{ kg} = 24.34 \text{ kg}$$

$$\begin{aligned}\text{Short Di:- } 1'11'' &= 1.92' - 0.25' (\text{Clear cover } 3'') = 1.67' \\&\text{Casting Height} = 2'0'' - 6'' \{ \text{Bottom Clear Cover } 3'' + \text{Top clear cover } 3'' \} = 18'' = 1.5''\end{aligned}$$

$$2^{\text{st}} \text{ Long Dir:- } 5.17'/0.50'' = 10.34+1 \text{ Nos} = 12 \text{ Nos}$$

$$\begin{aligned}\text{Short Di:- } 5'5'' - 3'' &= 5.17' \\(1 \text{ Side Clear Cover } 3'') \\&\text{Long Dir:- Spacing} = 6''/12'' = 0.50'\end{aligned}$$

$$\text{Length} + L \text{ Bar} = 4.37' + (1.5' \times 2) = 7.37'$$

$$\text{Weight} = N \times L \times W = 12 \times 7.37' \times 0.48 \text{ kg} = 42.45 \text{ kg}$$

$$\begin{aligned}\text{Average} &= 8' + 1.75' = 9.75'/2 = 4.87' - 6'' (\text{Clear cover } 3'' \times 2 \text{ Side}) = 4.37' \\&\text{Casting Height} = 2'0'' - 6'' \{ \text{Bottom Clear Cover } 3'' + \text{Top clear cover } 3'' \} = 18'' = 1.5'' \times 2 \text{ L Bar} = 3'0''\end{aligned}$$

$$2^{\text{st}} \text{ Short Dir:- } 4.37'/0.50'' = 8.74+1 \text{ Nos} = 10 \text{ Nos}$$

$$\text{Length} + L \text{ Bar} = 5.17' + 1.5' = 6.67'$$

$$\text{Weight} = N \times L \times W = 10 \times 6.67' \times 0.48 \text{ kg} = 32.02 \text{ kg}$$

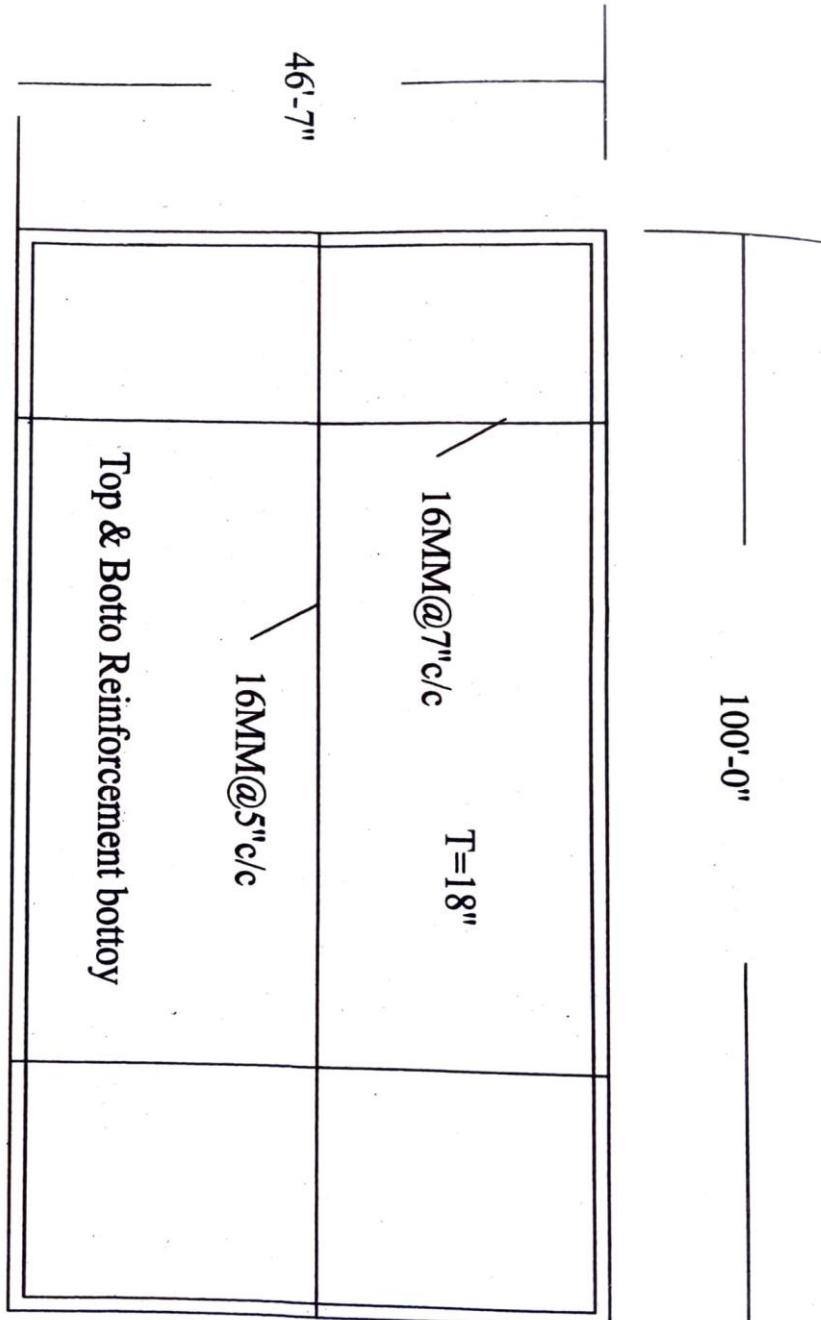
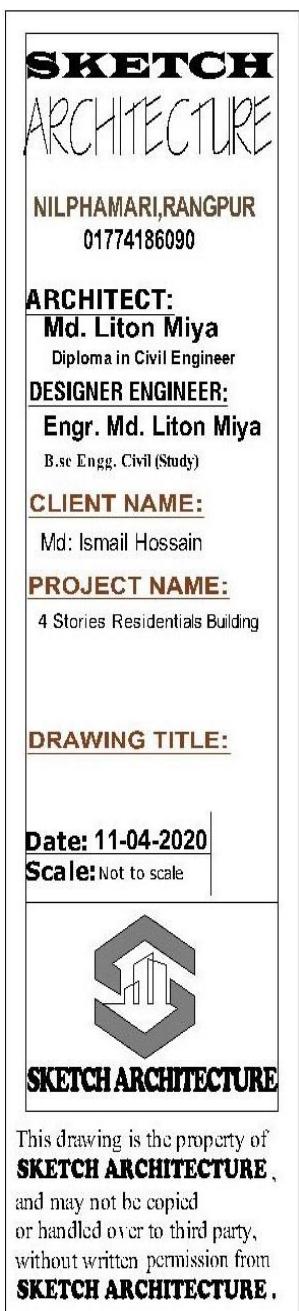
$$\text{Extra Bar 6 nos} = N \times L \times W = 6 \times 1.5' \times 0.48 \text{ kg} = 4.32 \text{ kg}$$

$$\begin{aligned}\text{Average} &= L = 4.87' \\&\text{Short Dir:- Spacing} = 6''/12'' = 0.50'\end{aligned}$$

$$\begin{aligned}1^{\text{st}} \text{ Short Di} &= 16 \text{ nos} \\2^{\text{nd}} \text{ Short Di} &= 10 \text{ nos} \\&\text{Extra Bar 6}\end{aligned}$$

$$\text{Total Reinforcement} = 20.16 + 24.34 + 42.45 + 32.02 + 4.32 \text{ kg} = 123.29 \text{ kg}$$

(Mat Foundation)



(Mat Foundation)

Casting Volumm = L x B x H = 100' x 46'-7" x 18" = 6987 Cft
Dry Volumn = 6987 x 1.5 = 10480.5 Cft

Sumasion of Ratio :- 1+1.5+3= 5.5

$$\text{Cement} = \frac{10480.5 \times 1}{5.5 \times 1.25} = 1524.44 \text{ Bag}$$

$$\text{Sand} = \frac{10480.5 \times 1.5}{5.5} = 2858.32 \text{ Cft}$$

$$\text{Stone Chips} = \frac{10480.5 \times 3}{5.5} = 5716.64 \text{ Cft}$$

M.F Length = 100'-0"
M.F Brenght = 46'-7"
M.F Hight = 18"

Reinforcement :

Long Direction:- 46'-1"/5"= 109.71 Nos+1 Nos = 111 Nos

Short Di=46'7"-7"
(Clear Cover 3"x2 Side)= 46'-1"
Long Di=Spacing-5"

Weight= NxLxW= 111x(99'-6"+4'-0")x0.48 kg= 5514.48kg

Long Direction L=100'-6"=99.5'
(Clear Cover 3"x2 Side)
Lap length=2'-0"(99.5'/40'=2.49=3
Nos-1nos=2nosx2=4'-0"
1'-16mm Re. Weight=0.48kg

Short Direction=99'-6"/7"=171.55nos + 1nos=173 Nos

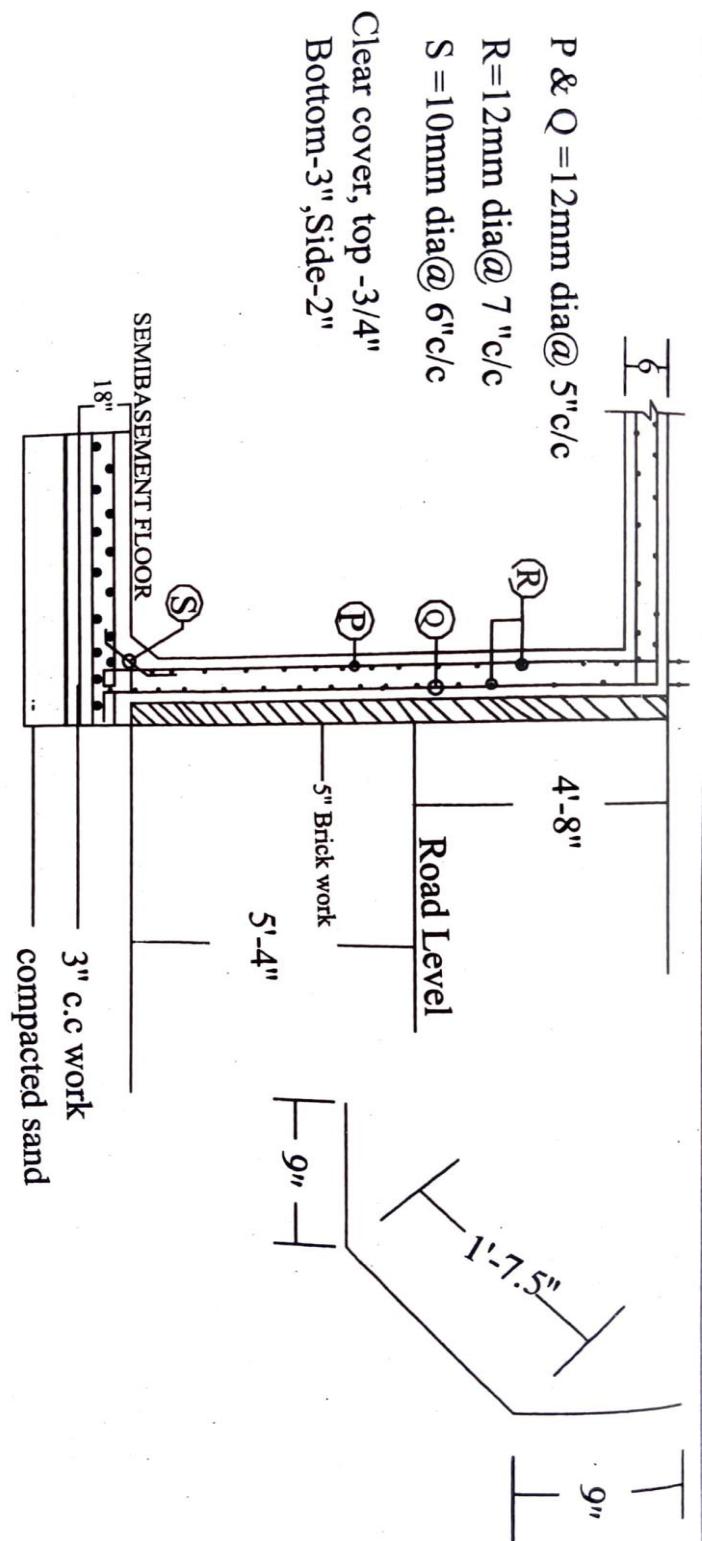
Long di= 100'-6" (Clear Cover 3"x2
Side)= 99'-6"
Long di:Spacing=7"
Lap length=2'-0"(46'-
1"/40'=1.15=2nos-1nos=1x2'=2'-
0"

Weight= NxLxW= 173x(46'-1"+2'-0")x0.48kg= 3992.56 kg

(Top & Bottom 2 net Re: Same)

Total Reinforcement=5514.48+3992.56=9507.04 kg x 2 = 19014.08 kg

(U.G.W.R)



(Retaining Wall)

Casting Volumn = NxBxH= 100'-0"x8"x9'-6"=636.5 Cft

Dry volume = 636.5 x 1.5 = 954.75 Cft

Sumation of Ratio = 1+1.5+3 = 5.5

Cement = $\frac{954.75 \times 1}{5.5 \times 1.25} = 138.87$ Bage

Sand = $\frac{954.75 \times 1.5}{5.5} = 260.39$ Cft

Stone Chips = $\frac{954.75 \times 3}{5.5} = 520.77$ Cft

Reinforcement:

Main Reinforcement = $99.67' / 0.42' = 237.31 + 1 = 239$ Nos

Weight = N x L x W = $239 \times 12.39' \times 0.27$ kg = 799.52kg x 2(2 Side Wall)
= 1599.05 kg

Disti: Bar = $9.5' / 0.58 = 16.38$ Nos + 1 nos = 18 Nos

Weight = NxLxW = $18 \times 103.67' \times 0.19$ kg x 2 = 709.10 kg

Extra Top = Weight = N x L x W = $200 \times 3.12' \times 0.19$ kg = 118.56kg

Total Reinforcement = 1599.05kg + 7.09.10kg + 118.56 kg = 2426.71 kg

R.W Length = 100'-0"
R.W Brenght = 8"
R.W Height = 10'-6"
slab T=9'-6"

Disti: Ba= 100'-0.33'(Clear cover
2"x2 Side)= 99.67'
Main Bar: Spacing=5"/12"=0.42'

Main Bar Length = $10' + 1.5' + 1.25' - (0.25' + 0.052' + 0.062') = 12.39'$ Rft
Height=10'-0"
M.F Height=18"=1.5'
C.L L bar=15"=1.25'
Bottom Clear cover =3"=0.25'
1 Nos Rein:
 $16\text{mm}/1000 = 0.16 \times 3.28' = 0.052'$
Top Clear cover $3/4" = 0.75" / 12" = 0.062$
1'-12mm Re: Weihgt = 0.27kg

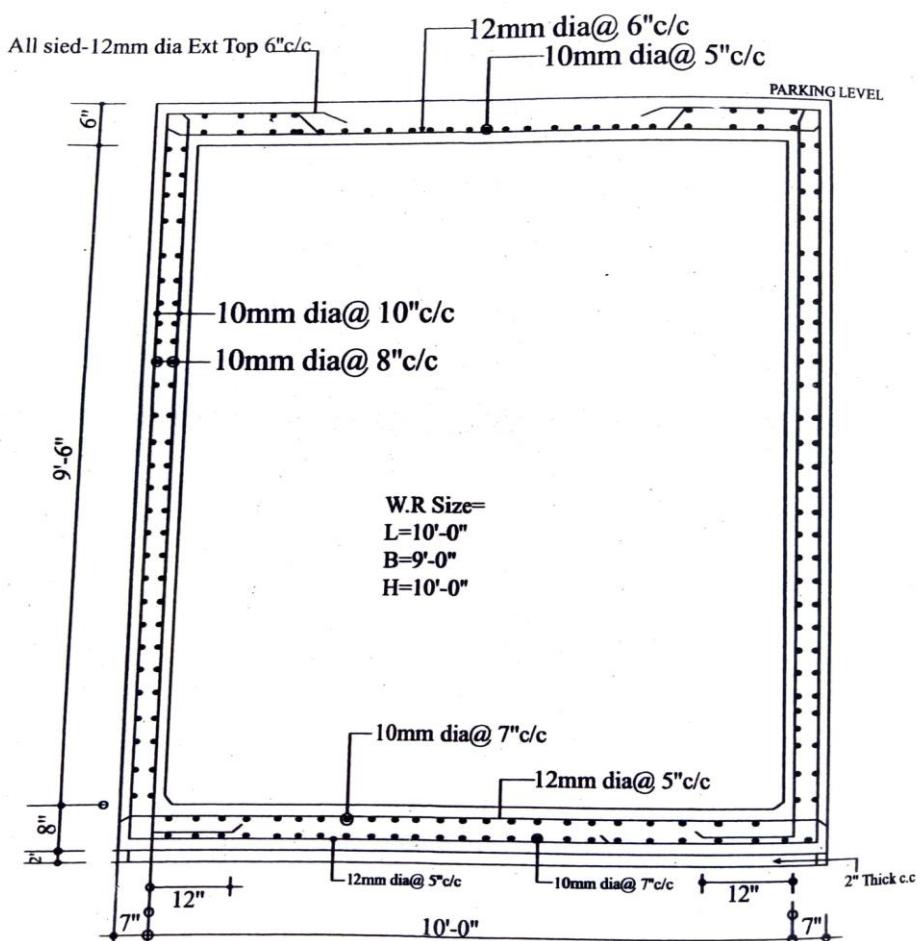
Height = 10'-6"(Slab T)= 9'-6"
Spacing= 7"=0.58'

Total Nos= $10' - 6" / 7" = 18$ nos
L = 100'-
0.33'=99.67'=99.67'+2'+2'(Lap
length=2')= 103.67'
1'-10mm Re: Weihgt = 0.19kg

N= $99.67' / 0.50' = 199.34 + 1 = 200$ nos
L = $9" + 9" + 1' - 7.5" = 3.125$ Rft

(U.G.W.R)

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4 Stories Residential Building	
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(U.G.W.R)

C.C Casting = (For Salt)

Bottom Slab Casting = LxBxH = 11.17'x10.17x0.67'=76.11 Cft

Top Slab Costing = LxBxH= 11.17x10.17x0.5'=56.80 Cft

W.R Wall Casting = LxBxH= 40.34'x9.5'x0.58'=222.27 Cft

Total Volumn= (76.11+56.80+222.27)=355.18 Cft

Dry volume = 355.18 x 1.5 =532.77 Cft

Sumation of Ratio = 1:1.5:3 = 1+1.5+3 = 5.5

Cement = $\frac{532.77 \times 1}{5.5 \times 1.25} = 77.49$ Bage

Sand = $\frac{532.77 \times 1.5}{5.5} = 145.30$ Cft

Stone Chips = $\frac{532.77 \times 3}{5.5} = 290.6$ Cft

L= 10'-0"+14"=11'-2"=11'-17"
(2 Side Wall =7"x2=14")
B = 9'-0"+14"=10'-2"=10.17'
(2 Side Wall =7"x2=14")
H = 8"/12"=0.67'

L= 10'-0"+14"=11'-2"=11'-17"
(2 Side Wall =7"x2=14")
B = 9'-0"+14"=10'-2"=10.17'
(2 Side Wall =7"x2=14")
H = 6"/12"=0.50'

Total L=(11.17'+11.17'+9'+9')=40.34
B = 10'-0"-6"=9'-6"=9.5'(Slab T=6")
H = 7"/12"=0.58'

Bottom Slab Reinforcement

Long Direction = 9.67'/0.42 = 23.02+1=24 Nos

Weight= NxLxW = 24x10.67'x0.27= 69.14 kg x2 = 138.28 kg

Short direction=10.67'/0.58'=18.40+1=19Nos

Weight= NxLxW = 19x9.67'x0.19= 634.91 kg x2 = 69.82 kg

Bottom Slab Reinforcement

Short Di= 10'-2"-6"=9'-8"=9.67'
Long Di: Spacing= 5" c/c /12"=0.42'
1'-12mm Rein: Weight=0.27kg
Long di=11'-2"-6"=10'-8"=10.67
2 Net Same

Long Di= 11'-2"-6"=10'-8"=10.67'
Short Di: Spacing= 7" c/c /12"=0.58'
1'-10mm Rein: Weight=0.19kg
Short di=10'-2"-6"=9'-8"=9.67
2 Net Same

W.R. Side Wall Reinforcement

Main Reinforcement Out = 41.35'/0.83'=49.82+1=51 Nos

Main Reinforcement Out = 39.33'/0.83'=47.38+1=48 Nos

Total (Out+In)=51+48=99 Nos

Length=9.5'+0.67'+1'+0.5'=11.67'-(0.25'+0.072'+0.062')=11.29'

Weight=NxLxW=99x11.29x0.19=212.36kg

Binder Reinforcement Out = 9.5'/0.67'=14.18nos+1=15nos

Weight = NxLxW=15x(41.35+2')x0.19kg=123.54 kg

Binder Reinforcement Out = 9.5'/0.67'=14.18nos+1=15nos

Weight = NxLxW=15x39.33'x0.19kg=112.09 kg

W.R. Side Wall Reinforcement

Total In L=L(10'+10')+B(9'+9')
 $=38'+1.33=39.33'$ {(clear cover 2"x2 Side)=4"(1 Conner)x4 Conner=16"/12"=1.33' in +

Total Out L=L(10'+10')+B(9'+9')
 $=38'+(\text{Wall T: } 7"\text{x2 Side})\times 4=42.68'$ - 1.33=41.35' {(clear cover 2"x2 Side)=4"(1 Conner)x4 Conner=16"/12"=1.33' in -

Out Hori=41.35'
Veri: Spacing= 10 c/c / 12"=0.83'

In Hori=41.35'
Veri: Spacing= 10 c/c / 12"=0.83'

Height=9'-6"=9.5'
Bottom Slab T: = 8"/12"=0.67'
L Bar=12"=1'
Top Slab T:=6"/12"=0.5'

Bottom Slab Rein: 2nos
 $=10\text{mm}+12\text{mm}=22\text{mm}/25.4\text{mm}=0.87"/12"$
 $=0.072'$
Top clear cover=3/4"=0.75"/12"=0.062'

H=10'-0"-6"=9.5'(Slab T=6")
Binder Spacing=8" c/c /12"=0.67'
Total binder L=41.35'
Laping=2'

H=10'-0"-6"=9.5'(Slab T=6")
Binder Spacing=8" c/c /12"=0.67'
Total binder L=39.33'
1'-10mm Rein:=0.19 kg



Total Slab Reinforcement :

Long Direction= $9.67' / 0.5' = 19.34$ +1nos=21 Nos

Short Di= $10.17' - 5' = 9.67'$ (clear cover 3"x2Side)

Long Di: Spacing = $6"$ c/c / $12" = 0.5'$

Weight = $N \times L \times W = 21 \times 10.67' \times 0.27 = 60.50$ kg

Long Di: $11' - 2" - 6" = 10' - 8"$ (Clear Cover 3"x2 Side) = $6" / 12" = 0.5'$

Short Direction= $10.67' / 0.42' = 25.40$ +1nos=27 Nos

Short Di= $11.17' - 5' = 10.67'$ (clear cover 3"x2Side)

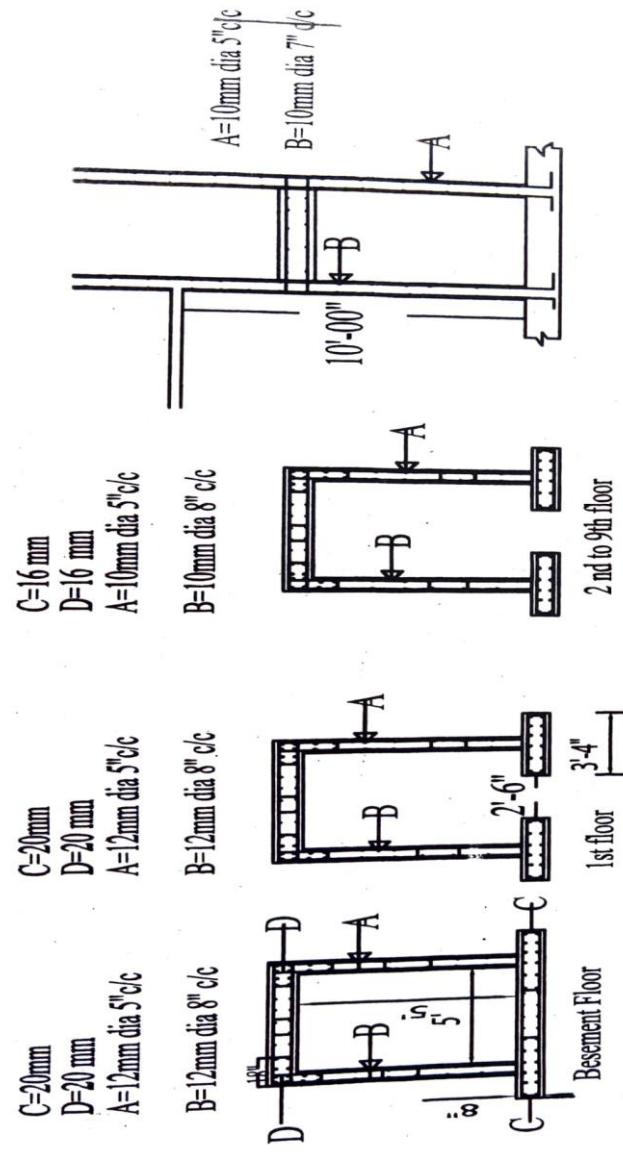
Long Di: Spacing = $5"$ c/c / $12" = 0.42'$

Weight = $N \times L \times W = 27 \times 9.67' \times 0.19 = 49.61$ kg

Long Di: $10' - 2" - 6" = 9' - 8"$ (Clear Cover 3"x2 Side) = $6" / 12" = 0.5'$

1'-10mm Rein: =0.19kg

(Lift Core)



SKETCH
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Md. Ismail Hossain
PROJECT NAME:
4 Stories Residential Building

DRAWING TITLE:

Date: 11-04-2020
Scale: Not to scale



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(Lift Core)

G.D to 9th floor Wall Casting =Total Volumn= $(6.33' + 6.67' + 5' + 5') \times 9.5' \times 0.67' = 146.40 \text{ Cft}$

$$L=\{(8''+5'+8'')=6'-4''\}\{(3'-4'' \times 2)=6'-8''\}\{5'-0''\}\{5'-0''\}$$

$$\{H=10'-0''-6''(\text{Slab T:})=9'-6''\}\{B=8''=0.67'\}$$

Dry volume = $146.40 \times 1.5 = 219.6 \text{ Cft}$

Sumation of Ratio = $1:1.5:3 = 1+1.5+3 = 5.5$

$$\text{Cement} = \frac{219.6 \times 1}{5.5 \times 1.25} = 32 \text{ Bage}$$

$$\text{Sand} = \frac{219.6 \times 1.5}{5.5} = 59.89 \text{ Cft}$$

$$\text{Stone Chips} = \frac{219.6 \times 3}{5.5} = 119.78 \text{ Cft}$$

Lift Core Side Wall Reinforcement

Main Reinforcement = $11.67'/5'' = 2.78 \text{ Nos} + 1 = 29 \text{ Nos}$

$$\{5'-0''-10''=4'-2''=4.17' \times 2 \text{ Side } = 8.34'\}, \{5'-0''-10''-10''=3'-4''=3.33'\}, \text{Total}=8.34+3.33=11.67'$$

$$\{\text{C.L Side}=18''-(8''\text{Wall T: less})=10''\}$$

Weight= $N \times H \times W = 29 \times 12' \times 0.27 \text{ kg} = 93.96 \text{ kg} \times 2 = 187.92 \text{ kg}$

$$H=10'-0''+2'-0''(\text{lap length } 2'')=12'$$

$$1' \text{ Rein: Weight-12mm} = 0.27 \text{ kg}$$

Binder Reinforcement In = $9.5'/0.67' = 14.18 \text{ nos} + 1 = 15 \text{ Nos}$

$$H=10'-0''-6''(\text{Slab T:})=9'-6''$$

$$12 \text{ mm Dia } 8'' \text{ c/c / } 12''=0.67'$$

$$5'+5'+5'=15'+0.67'=15.67'\{\text{2'' Clear cover x 2 Side}\}=4'' \times 2 \text{ Conner}=8''=0.67'$$

Weight= $N \times H \times W = 15 \times 15.67' \times 0.27 \text{ kg} = 63.46 \text{ kg}$

Binder Reinforcement Out = $9.5'/0.67' = 14.18 \text{ nos} + 1 = 15 \text{ Nos}$

$$H=10'-0''-6''(\text{Slab T:})=9'-6''$$

$$12 \text{ mm Dia } 8'' \text{ c/c / } 12''=0.67'$$

$$(5'+8'')+(8''+5'+8'')+(8''+5')=17'-8''-8''=17' \{\text{2'' Clear cover x 2 Side}\}=4'' \times 2 \text{ Conner}=8''=0.67'$$

Weight= $N \times H \times W = 15 \times 17' \times 0.27 \text{ kg} = 68.85 \text{ kg}$

Total Reinforcement Weight = $187.92+63.46+68.85=320.23 \text{ kg}$

SKETCH ARCHITECTURE

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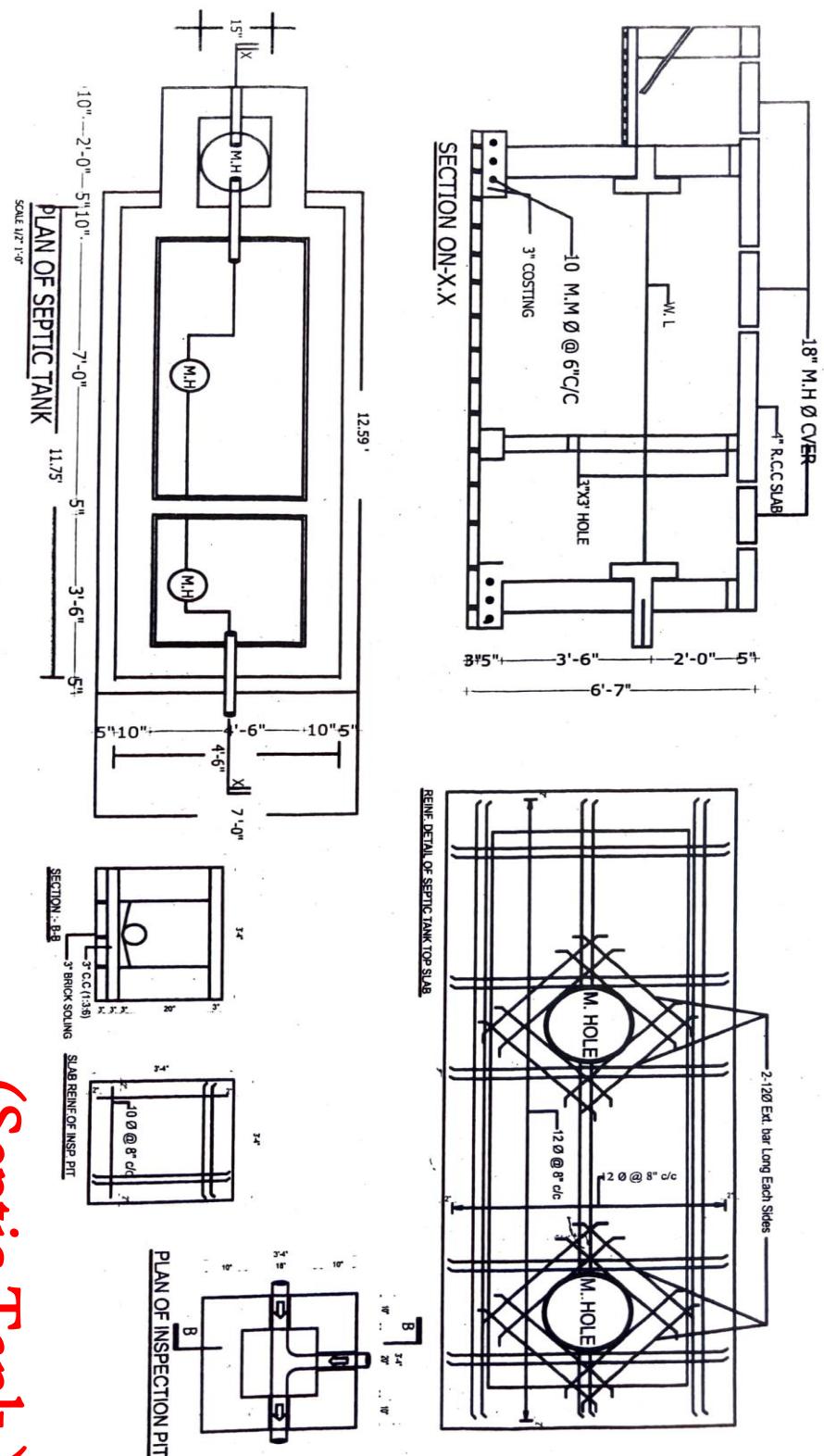
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(Septic Tank)

(Septic Tank)

Brick Soling :

$$L \times H = 12.59' \times 7'-0'' = 88.13 \text{ Sft} \times 3 \text{ Nos} = 264.39 \text{ Nos}$$

L = 12.59', B = 7'-0'', 1 Sft Brick Soling = 2.86 = 3 Nos

$$\text{Brick wall} = 11.75' + 11.75' + 4.5' + 4.5' = 32.5' \text{ Rft} \times 5.5' = 178.75 \text{ Sft} \times 10 \text{ Nos} = 1787.5 \text{ Nos}$$

Total L:= 32.5'

Height = 3'-6"+2'-0"=5'-6"=5.5'

1 Sft Brick Wall 10" = 10 Nos

$$\text{Shear Wall} = 4.5' \times 5.5' = 24.75 \text{ Sft} \times 5 \text{ Nos} = 123.75 \text{ nos}$$

L=4'-6"

Height=3'-6"+2'-0"=5'-6"=5.5'

1 Sft Brick Wall 5" = 5 Nos

$$\text{Shear Wall Casting Volumn} = 24.75 \times 0.37' = 9.16 \text{ Cft}$$

L x H=24.75 Sft

B=4.5"/12"=0.37'

$$10" \text{ Wall Casting Volumn} = 178.75' \times 0.83' = 148.36 \text{ Cft}$$

L x H=178.75 Sft

B=10"/12"=0.83'

$$\text{Total} = 9.16 + 148.36 = 157.52 \text{ Cft}$$

$$\text{Dry volume} = 157.52 \times 0.35 = 55.13 \text{ Cft}$$

$$\text{Sumation of Ratio} = 1:5 = 1+5 = 6$$

$$\text{Cement} = \frac{157.52 \times 1}{6 \times 1.25} = 7.35 \text{ Bage}$$

$$\text{Sand} = \frac{157.52 \times 5}{6} = 45.94 \text{ Cft}$$

$$\text{Plaster in} = 1^{\text{st}} \text{ Step} (7'-0"+7'-0"+4'-6"+4'-6") + 2^{\text{nd}} \text{ Step} (4'-6"+4'-6"+3'-6"+3'-6") = 39 \text{ Rft} \times 5.5' \times 0.083' = 17.80 \text{ Cft}$$

Total L=39'

Height= 3'-6"+2'-0"=5'-6"=5.5'

Plaster T:- 1"/12"=0.083'

$$\text{Dry volume} = 17.80 \times 1.5 = 26.7 \text{ Cft}$$

$$\text{Sumation of Ratio} = 1:4 = 1+4 = 5$$

$$\text{Cement} = \frac{26.7 \times 1}{5 \times 1.25} = 4.27 \text{ Bage}$$

$$\text{Sand} = \frac{26.7 \times 4}{5} = 21.36 \text{ Cft}$$

Top Slab

Reinforcement:

$$\text{Long Direction} = 6'-2"-0.25" = 5.92' / 0.67' = 8.83 + 1 = 10 \text{ Nos}$$

Short Di=7'-0"-(Bottom Slab Extra 5"x2 Side) =6'-2"-0.25'=5.92'(clear cover = 1.5"x2 Side = 3"/12"=0.25') Long Di: Spacing =8" c/c /12"=0.67'

$$\text{Weight} = \text{NxLxW} = 10 \times 11.50' \times 0.19 = 21.85 \text{ kg}$$

Long Di=11.75'-0.25'=11.50'(clear cover = 1.5"x2 Side = 3"/12"=0.25')

$$\text{Short Direction}=11.50'/0.67'=17.16+1=19 \text{ Nos}$$

Long Di=11.75'-0.25'=11.50'(clear cover = 1.5"x2 Side = 3"/12"=0.25')

Short Di: Spacing =8" c/c /12"=0.67'

$$\text{Weight} = \text{NxLxW}=19 \times 5.92' \times 0.19 = 25.65 \text{ kg}$$

Short Di=7'-0"-0.83'=6'-2"-0.25'=5.92'(Bottom Slab Extra 5"x2 Side= 10"/12"=0.83'(clear cover = 1.5"x2 Side = 3"/12"=0.25')

$$\text{Total Reinforcement Weight} = 21.85 + 25.65 = 47.5 \text{ kg}$$

Exta Top

Long Direction= $10.67'/0.5'=21.34'+1=23$ nos x 2 Side = 46 Nos

Long Di=11.17'-0.5'=10.67'(clear cover = 3"x2 Side = 6"/12"=0.50')

Long Di: Spacing =6" c/c /12"=0.50'

Weight = NxLxW= $23 \times 2.24' \times 0.27 = 15.03$ kg x 2 = 30.04 kg

Short Di=10'-2"-6""=9'-8"=9.67"(clear cover = 3"x2 Side = 6"/12"=0.5')

L/4=9.67'/4=2.42'

Exta top 2 Side

Short Direction= $9.67'/0.42'=23.02'+1=24$ nos x 2 Side = 48 Nos

Short Di=10'-2"-6'=9.67'(clear cover = 3"x2 Side = 6"/12"=0.50')

Long Di: Spacing =5" c/c /12"=0.42'

Weight = NxLxW= $24 \times 2.67' \times 0.27 = 17.30$ kg x 2 = 34.6 kg

Short Di=11-2"-6""=9'-8"=10.67"(clear cover = 3"x2 Side = 6"/12"=0.5')

L/4=10.67'/4=2.67'

Exta top 2 Side

Total Reinforcement=138.28+69.82+212.36+123.54+112.09+60.50+49.61+30.04+34.6 = 830.48 kg

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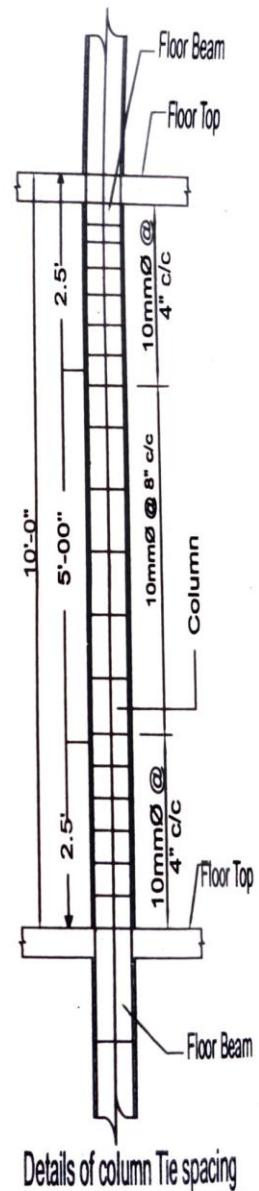


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COLUMN SCHEDULE:

Column no.	Up to Plinth Level	Plinth Level to 2nd Level	2nd Level to 5th Level	Above 6th Level
C1	14" x 12" 10"	12" 10"	12" 10"	12"
C2	17" x 14" As = 6-20mm Ø+4-16mm Ø	15" x 12" As = 6-20mm Ø+4-16mm Ø	15" x 12" As = 6-20mm Ø+4-16mm Ø	15" x 12" As = 10-16mm Ø
C3	17" x 14" As = 10-20mm Ø	15" x 12" As = 10-20mm Ø	15" x 12" As = 6-20mm Ø+4-16mm Ø	15" x 12" As = 4-20mm Ø+6-16mm Ø
C4	20" x 14" As = 12-20mm Ø	18" x 12" As = 12-20mm Ø	18" x 12" As = 8-20mm Ø+4-16mm Ø	18" x 12" As = 6-20mm Ø+6-16mm Ø



Details of column Tie spacing

(Column Work)

C2 Column Costing = LxBxH=12"x15"x10'-0"=12.5 Cft

Column Size=12"x15" Height=10'-0"

Dry volume = 12.5 x 1.50 = 18.75 Cft

Sumation of Ratio = 1:1.5:3 = 1+1.5+3 = 5.5

Cement = $\frac{18.75 \times 1}{5.5 \times 1.25} = 3$ Bag

Sand = $\frac{18.75 \times 1.5}{5.5} = 5.11$ Cft

Stone Chips = $\frac{18.75 \times 3}{5.5} = 10.23$ Cft

Main Reinforcement:

Weight = NxLxW=6x(10'x2.5')x0.75=56.25 kg

Main Re:- 6 Nos Height=10'-0" Lap Length=30" 1' 20mm Re: Weight = 0.75 kg

Weight= NxLxW= 4x(10'x2.5')x0.48=24 kg

Main Re:- 4 Nos Height=10'-0" Lap Length=30" 1' 20mm Re: Weight = 0.48 kg

1st Stirap

Top & Bottom Stirap = 9'-6"/4(L/4)=2.37'x2=4.75 Rft/0.33'=14.39=15 Nos

Height=9'-6" 4" c/c Spacing=0.33' 2=Top & Bottom

Middle Stirap=4.75'/0.67'=0.09+1=8 Nos

Height=9'-6" 8" c/c Spacing=0.33' Middle=4.75'

Total = 15+8=23 Nos

Weight= NxLxW=23x3.83"x0.19=16.73 kg

L=9"+9"+12"+12"+4"=46"/12"=3.83'

L=CL Size{12"x15"}, {CL B=12"-{(1.5"x2 Side)=9"} } {CL B=12"-{(1.5"x2 Side)=9"} }
{CL L=15" - (1.5"x2 Side)=12"} {CL L=15" - (1.5"x2 Side)=12"} {2"x2=4"(Hooks 2"x2 Nos)}

1'-10mm Re:Weight=0.19kg

2nd Stirap

Weight = NxLxW= 23x2.5"x0.19= 10.92 kg

L=9"+4"+4"+4"=30"/12"=2.50'

1'-10mm Re:Weight=0.19kg

3rd Stirap

$$O^2 = L^2 + V^2$$

- $\sqrt{4.5^2 + 4^2}$
- $\sqrt{20.5 + 16}$
- $\sqrt{36.5}$
- 6.04"

$$L=6.04"\times 4 \text{ Nos} + 4" + 4" + 4" (\text{Hooks}) = 36.16"/12 = 3.01$$

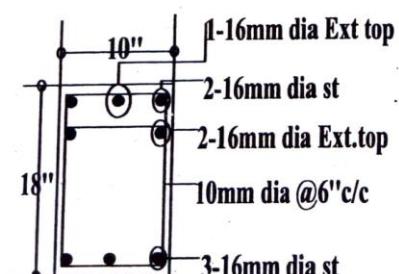
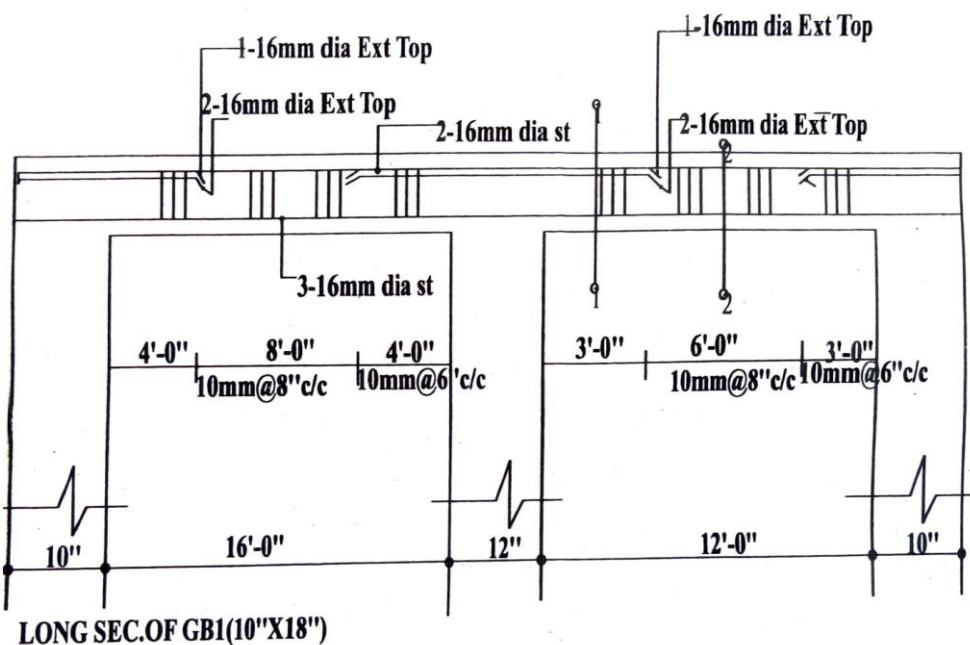
$$NxLxW=23x3.01"x0.19=13.15\text{kg}$$

$$\begin{aligned} 15"-3" &= 12"/3=4" \\ 12"-3" &= 9"/2=4.5" \end{aligned}$$

Total Reinforcement = 56.25+24+16.73+10.92+13.15=121.05 kg

(Beam Work)

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(Beam Work)

Casting = LxBxH=28'-0"x10"x18"=34.86' Cft

Beam Size=10"x18"

Length=16"x12"=28'-0"

Dry volume = 34.86' x 1.50 = 52.29 Cft

Sumation of Ratio = 1:2:4 = 1+2+4 = 7

Cement = $\frac{34.86 \times 1}{7 \times 1.25} = 5.98$ Bags

Sand = $\frac{34.86 \times 2}{7} = 14.94$ Cft

Stone Chips = $\frac{52.29 \times 4}{7} = 29.88$ Cft

Reinforcement

Main Reinforcement

Main Reinforcement:-5x30.42'x0.48=72.98 kg

Main Re:-5 Nos

L=28'x10"x12"x10"=30.66'-0.25'(1.5" Clear cover x 2 Side) = 30.41'

1'Re: Weight-0.48 kg

Extra Top

Extra Top= 16'-0"/4(L/4)=4'-0"x 2 Side = 8'-0"

= 12'-0"/4(L/4)= 3'-0" x 2 Side = 6'-0"

Total L = 14'-0"+0.83'+1'-0"+0.83'-0.25'(1.5" Clear cover x 2 Side=3"=0.25')=16.41 Rft

Weight=NxLxW=3x16.41x0.48=23.63 kg

Extra Re:-3 Nos

Total Length=16.41'

CL.L=(10"+12"+10")=(0.83'+1'-0"+0.83'

1'Re: Weight-0.48 kg

Stirap

Stirap = 6" c/c =8'-0"+6'-0"=14'-0"/0.50' = 28 Nos

Total L=14'-0"

6" c/c Spacing=0.50'

Stirap 1 Nos (+) Not

= 8" c/c =8'-0"+6'-0"=14'-0"/0.67' = 21 Nos

Total L=14'-0"

8" c/c Spacing=0.67'

Stirap 1 Nos (+) Not

Total = 28+21 = 49 Nos

L=CL Size(10"x18"),{CL B=10"-{(1.5"x2Side)=7"}{CL B=10"-{(1.5"x2Side)=7"}{CL L=18"-{(1.5"x2Side)=15"}{CL L=18"-{(1.5"x2Side)=15"}{2"x2=4"(Hooks 2"x2 Side)}

L=7"+7"+15"+15"+4"=48"/12"=4' Rft

Weight=NxLxW=49x4"x0.19=37.24 kg

Total Reinforcement = 72.98kg+23.63kg+37.2kg=133.85 kg

(Stair Work)

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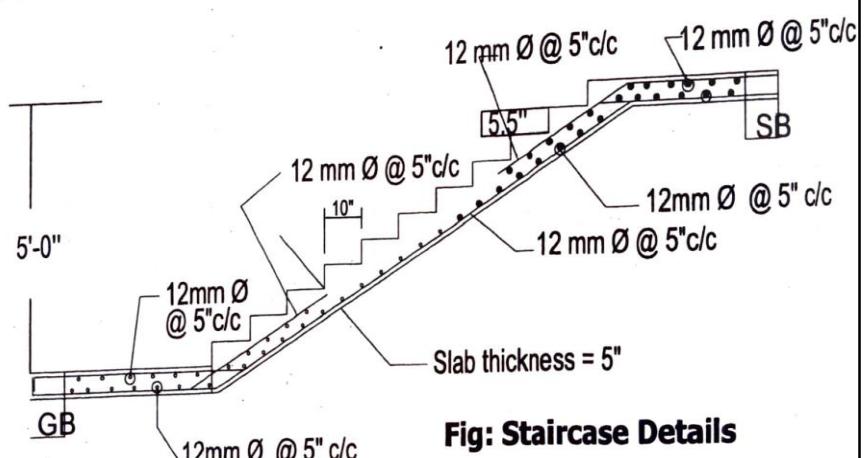
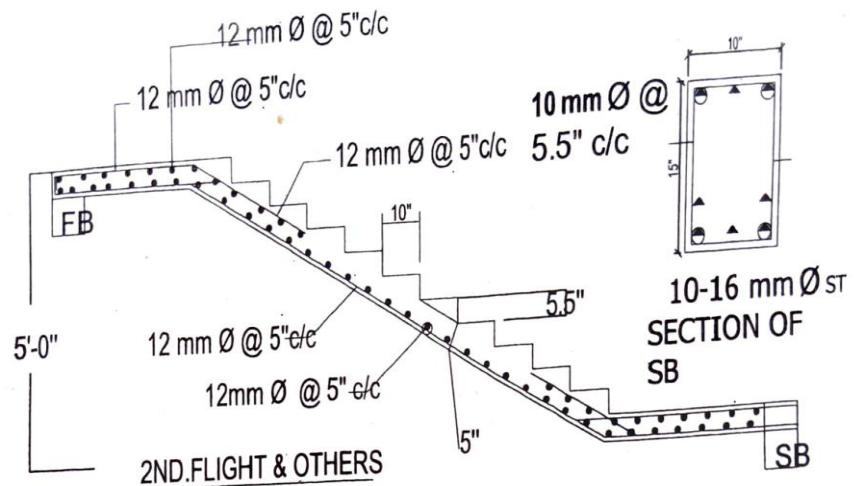
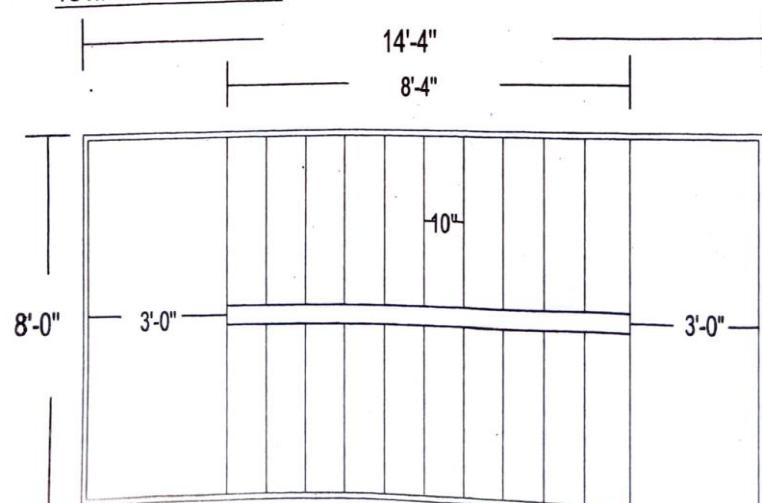


Fig: Staircase Details



(Stair Work)

Volume 1 = $1/2 \times 10'' \times 5.5'' \times (4'' \times 2) \times 10$ Nos = 15.27 Cft

$$\text{Formula} = 1/2 \times \text{Land} \times \text{Hight} = (1/2 \times 10'' \times 5.5'') (\text{Trade}=10'') (\text{Riser}=5.5'')$$

(1st Flight B=4'+2nd Flight B=4')(Total Trede = 10 Nos)

Volume 2 = $L \times B \times H = 15.71' \times 8' \times 0.42 = 52.78$ Cft

$$L=\sqrt{L^2 + V^2} = \sqrt{5^2 + 8.33^2} = \sqrt{25 + 69.39} = 9.71' + 3' + 3' = 15.71'$$

(H=5')(Flight L=8.33')(1st Landing=3'-0'')(2nd Landing=3'-0'')

(Total Breadth = 8'-0'')(Slab = 5''=0.42')

Volume = $15.27' + 52.78' = 68.05'$ Cft

Dry volume = $68.05' \times 1.50 = 102.07$ Cft

Sumation of Ratio = 1:1.5:3 = 1+1.5+3 = 5.5

$$\text{Cement} = \frac{102.07 \times 1}{5.5 \times 1.25} = 14.85 \text{ Bag}$$

$$\text{Sand} = \frac{102.07 \times 1.5}{5.5} = 27.84 \text{ Cft}$$

$$\text{Stone Chips} = \frac{102.07 \times 3}{5.5} = 55.67 \text{ Cft}$$

Bottom Reinforcement

Short Direction:-

$15.46'/0.42'=36.81$ nos+1 nos=38 nos

Long Di:- 15.71'-0.25'=15.46' (Clear cover 1.5" x 2Side)

Short Di: Spacing 12mm =5" c/c

Weight = NxLxW = $38 \times 7.5' \times 0.27 = 76.95$ kg

Short Di:- 8'-0"-0.5'=7.5'(Clear cover 1.5" x 2 Side)

1'-12mm Rein: Weight = 0.27 kg

Long Direction:-

$7.5'/0.42'=17.86$ nos+1 nos=19 nos

Short Di:- 8'-0"-0.5'=7.5' (Clear cover 1.5" x 4 Side)

Long Di: Spacing 12mm =5" c/c

Weight = NxLxW = $19 \times 15.46' \times 0.27 = 79.31$ kg

Short Di:- 8'-0"-0.5'=7.5'(Clear cover 1.5" x 2 Side)

1'-12mm Rein: Weight = 0.27 kg

Ext Top:

Long Direction:-

$7.5'/0.42'=17.86$ nos+1 nos=19 nos

Short Di:- 8'-0"-0.5'=7.5' (Clear cover 1.5" x 4 Side)

Long Di: Spacing 12mm =5" c/c

Weight = NxLxW = $19 \times 5.31' \times 2 \times 0.27 = 54.48$ kg

Long Di:- $9.71'/4=2.43'+3'-0"-1.5"=5.31'$ (Flight=9.71')(L/4)(Landing = 3'-0"-1.5"Clear cover)

Short Direction:-

$5.31'/0.42'=12.64$ nos+1 nos=14 nos

Long Di:- 5.31'

Short Di: Spacing 12mm =5" c/c

Weight = NxLxW = $14 \times 7.5' \times 27 \times 0.27 \times 2 = 56.7$ kg

Short Di:- 8'-0"-0.5'=7.5'(Clear cover 1.5" x 4 Side)

1'-12mm Rein: Weight = 0.27 kg

Extra Top 2 Side

Total Reinforcement = $76.95+79.31+64.48+56.7=267.44$ kg

(Slab Work)

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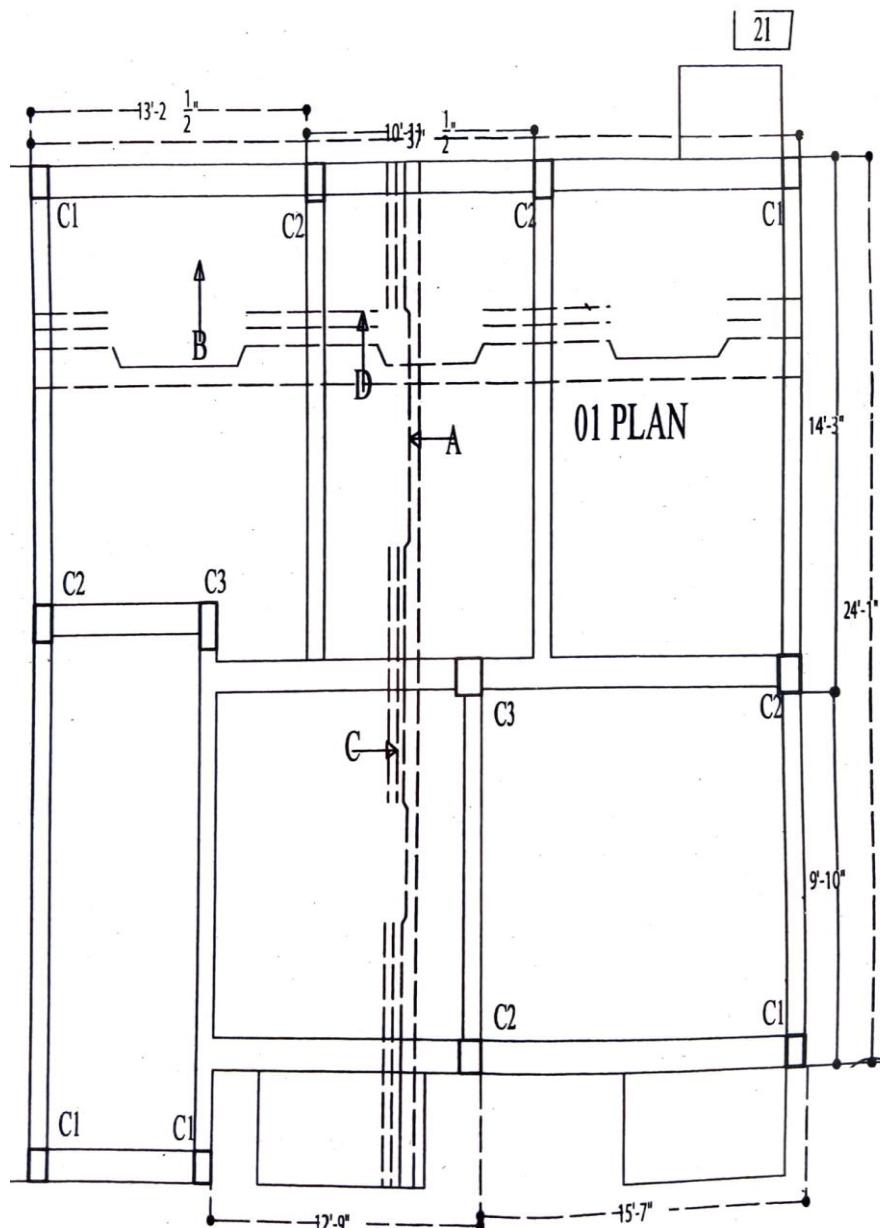
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C1=10"x10" All beam=10"

C2=10"x12" A=12mm dia 5" c/c C=12mm dia 5" c/c ext.top

C3=12"x15" B=10mm dia 7" c/c D=12mm dia 6" c/c ext top



(Slab Work)

Slab Casting Volume = LxBxH = 37'x25.54'x0.42' = 396.89 Cft

L = 37'-0"

Average B = 27'-0"+24'-1"=51'-1"/2 = 25.54'

Slab T:- 5"/12" = 0.42'

Ver + G.D Casting = 35.84+10.42 = 46.26x0.42 = 19.43 Cft

Ver= 7'-2"x2'-6" = 17392 Sft x 2=35.84 Sft

G.D Ver = 4'-2"x2'-6" = 10.42 Sft

Total Volume = 396.89+19.43 = 416.32 Cft

Dry volume = 416.32' x 1.50 = 624.48 Cft

Sumation of Ratio = 1:2:4 = 1+2+4 = 7

Cement = $\frac{624.48 \times 1}{7 \times 1.25}$ = 71.37 Bag

Sand = $\frac{624.48 \times 2}{7}$ = 178.42 Cft

Brick Chips = $\frac{624.48 \times 4}{7}$ = 356.84 Cft

Reinforcement

Long Direction :- (1)

12.58'/0.58'=21.69 nos+1 nos=23 nos

Short Di:- 14'-3"-20"=12.58' (2 nos Beam 2 x 10" =20"=1.67')

Long Di: Spacing 12mm =5" c/c

Weight = NxLxW = 19x15.46'x0.27 = 79.31 kg

L:- 15.71'-0.25'=15.46' (Clear cover 1.5" x 2Side)

1'-12mm Rein: Weight = 0.27 kg

Short Direction:- (1)

33.67'/0.42'=80.17 nos+1 nos=81 nos

Long Di:-37'-0"-3.33'=33.67'(4 nos Beam -10"x4=40"/12=3.33')

Short Di: Spacing 12mm =5" c/c

Weight = NxLxW = 81x14.125'x0.27 = 305.91 kg

L= 14'-3"-1.5"=7.5'(Clear cover 1.5" x 1 Side)

1'-12mm Rein: Weight = 0.27 kg

Long Direction :- (2)

9'-0"/0.58'=15.52 nos+1 nos=17 nos

Short Di:- 9.83"-0.83'=9'-0" (1 nos Beam = 1x10"=10"=0.83')

Long Di: Spacing =7" c/c/12"=0.58'

Weight = NxLxW = 17x28.91'x0.19 kg = 93.38 kg

L= (0.83'+12.75'+15.58')=29.16-0.25'=28.91' (Clear cover 1.5" x 2Side)

1'-10mm Rein: Weight = 0.19 kg

Short Direction:- (2)

26.66'/0.42'=63.48 nos+1 nos=65 nos

Long Di:- (0.83'+12.75'+15.58')=29.16-2.5'=26.66' (9 nos Beam=3 x 10"=30"=2.5')

Long Di:- 5" c/c/12" =0.42'

Weight = NxLxW = 65x9.70'x0.27 = 170.32 kg

L= 9'-10"-1.5"=9.70' (Clear cover 1.5" x 1 Side)

1'-12mm Rein: Weight = 0.27 kg

Ver

Long Dir G (1):- 2.375'/0.58'=4.09 nos + 1 = 5 nos

Short Di= 2.5'-1.5'=2.375' (Clear cover 1.5" x 1 Side)

Long Di: Spacing =7" c/c/12"=0.58'



$$\text{Weight} = \text{NxLxW} = 5 \times 6.92' \times 0.19 \text{ kg} = 6.57 \text{ kg} \times 2 = 13.14 \text{ kg}$$

L= 7'-2"-3"=6.92' (Clear cover 1.5" x 2Side)

1'-10mm Rein: Weight = 0.19 kg

$$\text{Short Dir G (2):- } 6.92'/0.50'=16.48 \text{ nos} + 1 = 18 \text{ nos}$$

L= 7'-2"-3"=6.92' (Clear cover 1.5" x 2Side)

Long Di: Spacing =5" c/c/12"=0.42'

$$\text{Weight} = \text{NxLxW} = 5 \times 6.92' \times 0.19 \text{ kg} = 6.57 \text{ kg} \times 2 = 13.14 \text{ kg}$$

Short Di= 2.5'-1.5'=2.375' (Clear cover 1.5" x 1 Side)

1'-10mm Rein: Weight = 0.19 kg

$$\text{G D: Long Di:- } 2.375'/0.58'=4.09 \text{ nos} + 1 = 5 \text{ nos}$$

Short Di= 2.5'-1.5'=2.375' (Clear cover 1.5" x 1 Side)

Long Di: Spacing =7" c/c/12"=0.58'

$$\text{Weight} = \text{NxLxW} = 5 \times 3.92' \times 0.19 \text{ kg} = 3.72 \text{ kg}$$

L= 4'-2"-3"=3.92' (Clear cover 1.5" x 2 Side)

1'-10mm Rein: Weight = 0.19 kg

$$\text{G D: Short Di:- } 3.92'/0.42'=9.33 \text{ nos} + 1 = 10 \text{ nos}$$

L= 4'-2"-3"=3.92' (Clear cover 1.5" x 2 Side)

Long Di: Spacing =5" c/c/12"=0.42'

$$\text{Weight} = \text{NxLxW} = 5 \times 3.92' \times 0.19 \text{ kg} = 3.72 \text{ kg}$$

Short Di= 2.5'-1.5'=2.375' (Clear cover 1.5" x 1 Side)

1'-12mm Rein: Weight = 0.27 kg

Extra Top: or Part

$$\text{Long Dir :- } 12.58'/0.50'=25.16+1 \text{ Nos} = 27 \text{ Nos}$$

Short Di:- 14'-3"-20"=12.58' (2 nos Beam=2 x 10"=20"=1.67')

Long Di: Extra top- 6" c/c/12" =0.50'

$$\text{Weight} = \text{NxLxW} = 27 \times 3.495' \times 0.27 = 94.36 \text{ kg (1 Side)}$$

Short Di:-12'-10"-20"=11'-16"(2 nos Beam 10"x2=20")

1'-12mm Rein: Weight = 0.27 kg

L/4=11.16/4=2.79'+10"(Beam)=3.62'-1.5'=3.495'(Clear cover 1.5"/12"=0.125')

Other Side Weight

$$\text{NxLxW} = 27 \times 5.94' \times 0.27 = 43.30 \text{ kg}$$

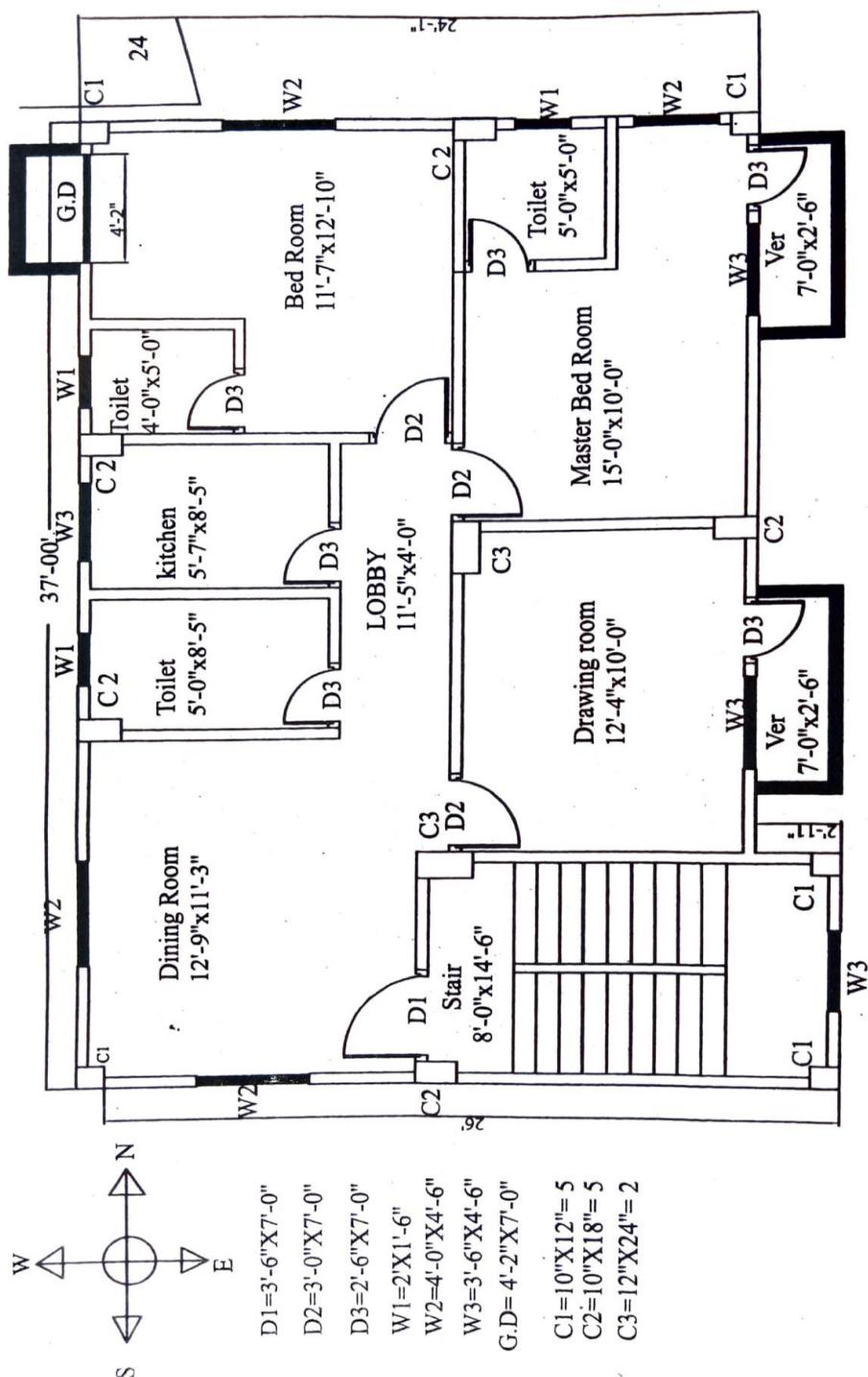
Short Di:- 10.95"-20"=9.28' (2 nos Beam = 2x10"=20")

L/4=9.28'/4=2.32'+10"(Beam)+(Out side) 2.79'=5.94'

$$\begin{aligned} \text{Total Reinforcement} = \\ 160.597 + 308.91 + 93.38 + 170.32 + 13.14 + 21.8 + 3.72 + 6.41 + 94.36 + 43.30 = 915.937 \text{ kg} \end{aligned}$$

(Brick Work)

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4 Stories Residential Building	
DRAWING TITLE:	
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Scale: Not to scale	
	
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South wall=5'-0"+5"=5'-5"x9'-6"

=51.49 sft

W1 Ded = 2'x1'-6"=3 sft

Total= 78.49 Sft

Drawing room:

C-3 = 24"-5"=19"

West wall =12'-4"-19"=10'-9"x9'-6"

=102.125 sft

D2 Ded = 3'-0"x7'-0" = 21 sft

C-3 = 10"-5"=5"

East wall=12'-4"-5"=11'-11"x9'-6"

=113.24 sft

D3 Ded =2'-6"x7'-0"=17.5 sft

W3 Ded = 3'-6"x4'-6" = 15.75 Sft

Total = 161.115 Sft

Stair :

C-2 = 10"-5"=5", C-2=12"-5"=7"

West wall = 8'-0"-(7"+5")=7'-0"x9'-6"

=66.50 sft

D1 Ded = 3'-6"x7'-0"=24 sft

C-1 = 10"-5"=5", C-2=10"-5"=5"

East wall =8'-0"-(5"+5")=7'-2"x9'-6"

=68.115 sft

W3 Ded = 3'-6"x4'-6"=15.75 sft

North wall =14'-6"-(19"+7")=12'-4"x9'-6"

=117.135 sft

C-3 = 24"-5"=19", C-1=12"-5"=7"

South wall = 14'-6"-(7"+13")=12'-10"x9'-6"

=121.885 sft

C-1 = 12"-5"=7", C-2=18"-5"=13"

Total = 333.385 sft

Total Brick wall = 1758.31 sft

Total Brick = 1758.31 sft x 4.76 = 8369.55 Nos

5" Brick wall Casting:

Volume = 1758.31 sft x 0.375 = 659.37 Cft

Dry volume = 659.37 x 0.35 = 230.78 Cft

Sumation of Ratio = 1:5 = 1+5 = 6

Cement = $\frac{230.78 \times 1}{6 \times 1.25} = 30.77$ Bag

Sand = $\frac{230.78 \times 5}{6} = 193.32$ Cft

(OVER HEAD WATER TANK)

SKETCH ARCHITECTURE

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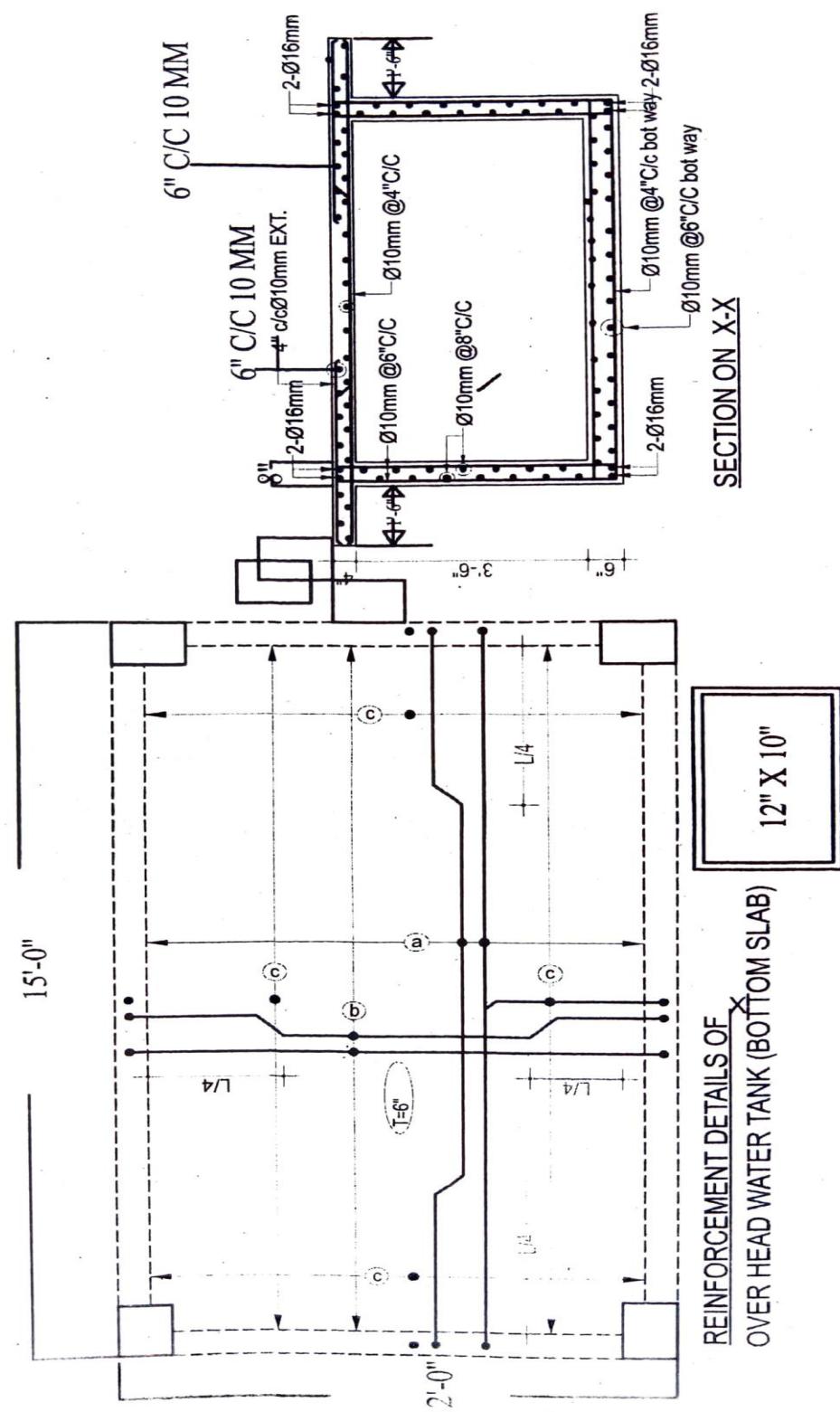
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(OVER HEAD WATER TANK)

Bottom Slab Casting = 15'x12'x0.50' = 90 Cft

$$L= 15'-0'', B=12'-0'', H= 6''/12''=0.50'$$

Top Slab Casting = 18'x15'x0.33' = 89.1 cft

$$L= 15'+3'=18', B=12'+3'=15', H= 4''/12''=0.33'$$

W.R wall Casting = 46.68'x3.5'x0.67'=109.46 cft

$$L=2x13.17[15'-\{(C1\ Size)12''+10''\}]+10.34'[12'-\{(C1\ Size)10''+10''\}]+10'[12'\{[C1\ Size]1'-1'\}]=46.68'$$

$$B=3'-6'', H= 8''/12''=0.67'$$

Volume = 89.1+109.46 = 288.56 Cft

Dry volume = 288.56 x 1.5 = 432.84 Cft

Sumation of Ratio = 1:1.5:3 = 1+1.5+3 = 5.5

$$\text{Cement} = \frac{432.84 \times 1}{5.5 \times 1.25} = 62.96 \text{ Bag}$$

$$\text{Sand} = \frac{432.84 \times 1.5}{5.5} = 118.05 \text{ Cft}$$

$$\text{Brick Chips} = \frac{432.84 \times 3}{5.5} = 236.09 \text{ Cft}$$

Bottom Slab Reinforcement

Long Direction = 12'-3"=11.75'/0.33'=35.61+1=37 Nos

$$\text{Short Di:-} 12'-0''-0.25'=11.75'(1.5'' \text{ Clear cover 2 Side})$$

$$\text{Long Di:- } 10\text{mm Dia } 4'' \text{ c/c / } 12'' = 0.33'$$

Weight = NxLxW = 37x14.75'x0.19 = 103.69 kg x 2=207.38 kg

$$L=15'-0''-0.25'=14.75'(1.5'' \text{ Clear cover 2 Side})$$

2 Net Same

Short Direction =14.75'/0.50'=29.5+1=31 Nos

$$\text{Long Di:-} 15'-0''-0.25'=14.75'(1.5'' \text{ Clear cover 2 Side})$$

$$\text{Long Di:- } 10\text{mm Dia } 6'' \text{ c/c / } 12'' = 0.50'$$

Weight = NxLxW = 31x11.75'x0.19 = 69.21 kg x 2=138.41 kg

$$L=12'-0''-0.25'=11.75'(1.5'' \text{ Clear cover 2 Side})$$

2 Net Same

W.R. Side Wall Reinforcement

Main Reinforcement In+ Out = 46.68'/0.50'=93.36+1=95 Nos

$$(\text{In+Out}) L = 2x13.17[15'-0''-\{(C1\ Side)12''+10''\}]+10.34'[12'-0''-\{(C1\ Side)10''+10''\}]+10'-0''[12'-0''-\{(C1\ Side)1'-0''-1'-0''\}]=46.68'$$

Weight =NxLxW = 95x5.16'x0.19 = 93.14 kg x 2 = 186.28 kg

Length = 3.5'+6"+4"+1"-{0.75"}+1"(Top & Bottom Covering)=5.16'

Binder Reinforcement In+Out=3.5'/0.67'=5.22 nos +1 = 6 Nos

$$H=4.33'-(6"+4")=3.5' [Top Slab 4" & Bottom Slab 6"]$$

Weight =NxLxW=6x46.68'x0.19'=53.21 kg x 2 = 106.42 kg

Top Slab Reinforcement:

Long Di:- 11.75'/0.33'=35.61+1=37 Nos

$$B:-12'-0''-0.25'=11.75'(1.5'' \text{ Clear cover 2 Side})$$

$$\text{Long Di:- } 10\text{mm Dia } 4'' \text{ c/c / } 12'' = 0.33'$$



Weight = $N \times L \times W = 37 \times 14.75 \times 0.19 = 103.69$ kg

L=15'-0"-0.25'=14.75'(1.5" Clear cover 2 Side)

Short Direction = $15'-3" = 14.75' / 0.33" = 44.69 + 1 = 46$ Nos

L=15'-3"-0.25'=14.75'(1.5" Clear cover 2 Side)

Weight = $N \times L \times W = 46 \times 11.75 \times 0.19 = 102.69$ kg

B=12'-0"-0.25'=11.75'(1.5" Clear cover 2 Side)

Exta Top

Long Di: L = $11.75' / 4(L/4) = 2.94 \times 2$ Side = $5.88' + 1' + 2.75' = 9.63'$

B=12'-0"-0.25'=11.75'(1.5" Clear cover 2 Side)

Exta Top Slab = (1.5 x 2 Side)=3'-0.25'=2.75' (Covering 1.5"x 2 Side)

Exta Top ar Exta Bar=6"x2(Side)=12"/12"=1'

Weight = $N \times L \times W = 46 \times 9.63 \times 0.19 = 84.17$ kg

L = $11.75' / 4(L/4) = 2.94 \times 2$ Side= $5.88' + 1' + 2.75' = 9.63'$

Short Di: L = $14.75' / 4(L/4) = 3.69 \times 2$ Side = $7.38' + 1' + 2.75' = 11.13'$

L=15'-0"-0.25'=14.75'(1.5" Clear cover 2 Side)

Exta Top Slab = (1.5 x 2 Side)=3'-0.25'=2.75' (Covering 1.5"x 2 Side)

Exta Top ar Exta Bar=6"x2(Side)=12"/12"=1'

Weight = $N \times L \times W = 46 \times 9.63 \times 0.19 = 84.17$ kg

L = $14.75' / 4(L/4) = 2.94 \times 2$ Side= $7.38' + 1' + 2.75' = 11.13'$

Total Reinforcement = $207.38 + 138.41 + 186.28 + 106.42 + 103.69 + 102.69 + 84.17 + 78.24 = 1007.28$ kg

(PLASTER WERK)

SKETCH ARCHITECTURE

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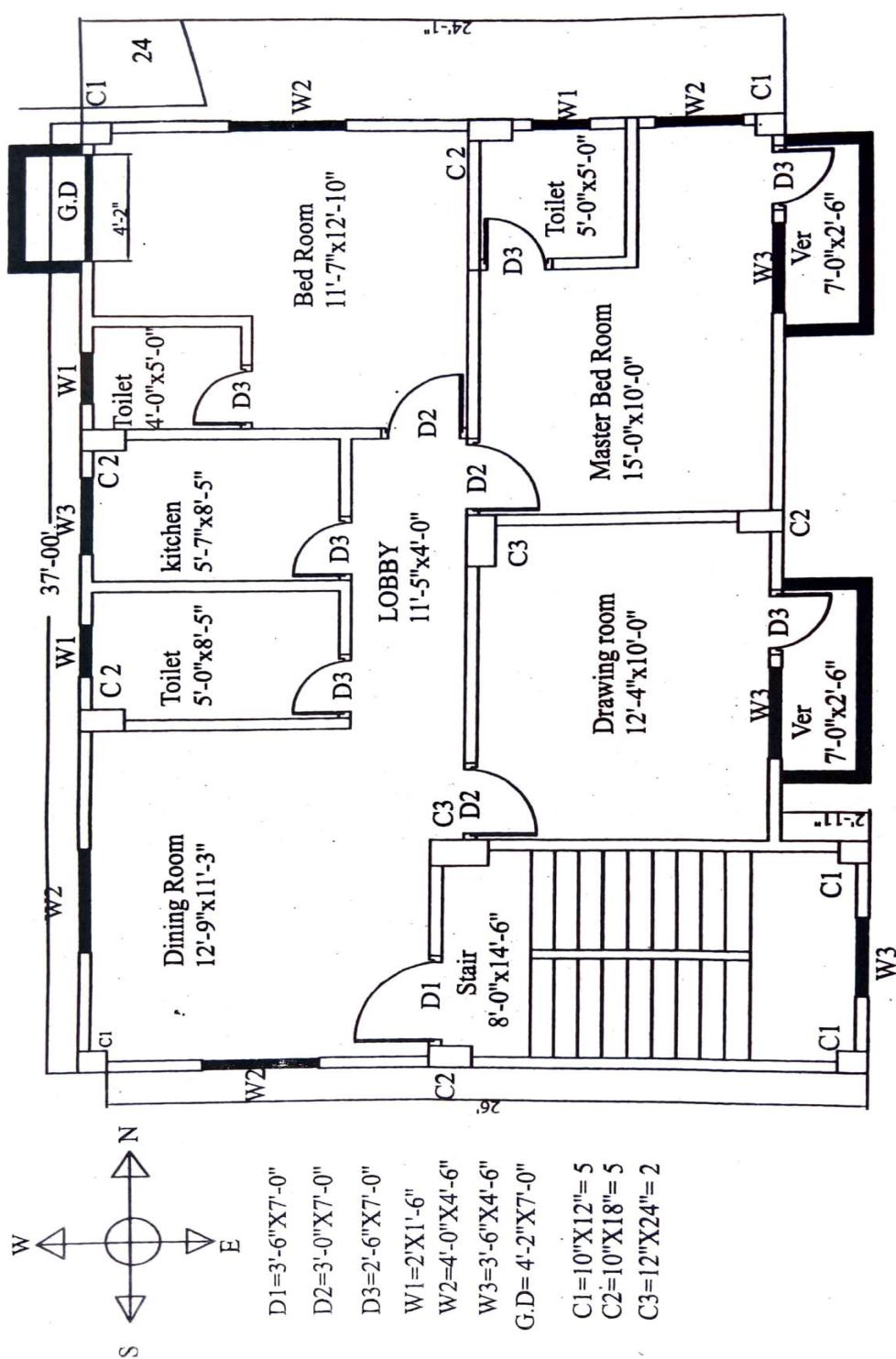
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(Plaster work)

Out side Plaster:

Plaster = (3/4") (18mm) (Ratio= 1:6)

$$18\text{mm}/1000=0.018 \text{ m} \times 3.28' = 0.059'$$

Volume = 1071.81 sft x 0.059' = 63.24 cft

Dry volume = 63.24 x 1.5 = 94.86 Cft

Sumation of Ratio = 1:6 = 1+6 = 7

$$\text{Cement} = \frac{94.86 \times 1}{7 \times 1.25} = 10.84 \text{ Bag}$$

$$\text{Sand} = \frac{94.86 \times 6}{7} = 81.31 \text{ Cft}$$

Ceiling:

Plaster = (6mm)(1/4") (Ratio 1:4)

=38.46'x25.54'=982.27 sft + 87.1 sft = 1069.37 sft

$$\text{Average L}=37'+(37'+2'-11")=76.92'/2=38.46'$$

$$\text{Average B}=27'+24.08'=51.08'/2=25.54'$$

Toilet Top Slab =87.1 sft {M-toilet 5'x5'=25 sft}{B-toilet 5'x4'=20 sft}{C-toilet 5'x8'-5"=42.1 sft}

=1069.37 sft x 0.2' = 21.38 cft

$$6\text{mm}/1000=0.006 \text{ mm} \times 3.28' = 0.02'$$

Dry volume = 21.38 x 1.5 = 32.07 Cft

Sumation of Ratio = 1:4 = 1+4 = 5

$$\text{Cement} = \frac{32.07 \times 1}{5 \times 1.25} = 5.13 \text{ Bag}$$

$$\text{Sand} = \frac{32.07 \times 4}{5} = 25.65 \text{ Cft}$$

In side Plaster:

Plaster = (1/2") (12mm) (Ratio= 1:6)

$$T=12\text{mm}/1000=0.012 \text{ m} \times 3.28' = 0.039'$$

Total plaster = 2144.23 sft

Volume = 2144.23 sft x 0.039' = 83.62 cft

Dry volume = 83.62 x 1.5 = 125.43 Cft

Sumation of Ratio = 1:6 = 1+6 = 7

$$\text{Cement} = \frac{125.43 \times 1}{7 \times 1.25} = 14.33 \text{ Bag}$$

$$\text{Sand} = \frac{125.43 \times 6}{7} = 107.51 \text{ Cft}$$

Out side wall=37'+39.92'+27'+24.08'=128.00 Rft x 10'-0"=1280.00 sft – Ded:- windows & door=208.19
sft=1071.81 sft

{West wall=37'-0"}{East wall=39.92'}{South wall=27'-0"}{North wall=24.08'}