Session 2

Footings & Foundations

(Concrete & Formwork)

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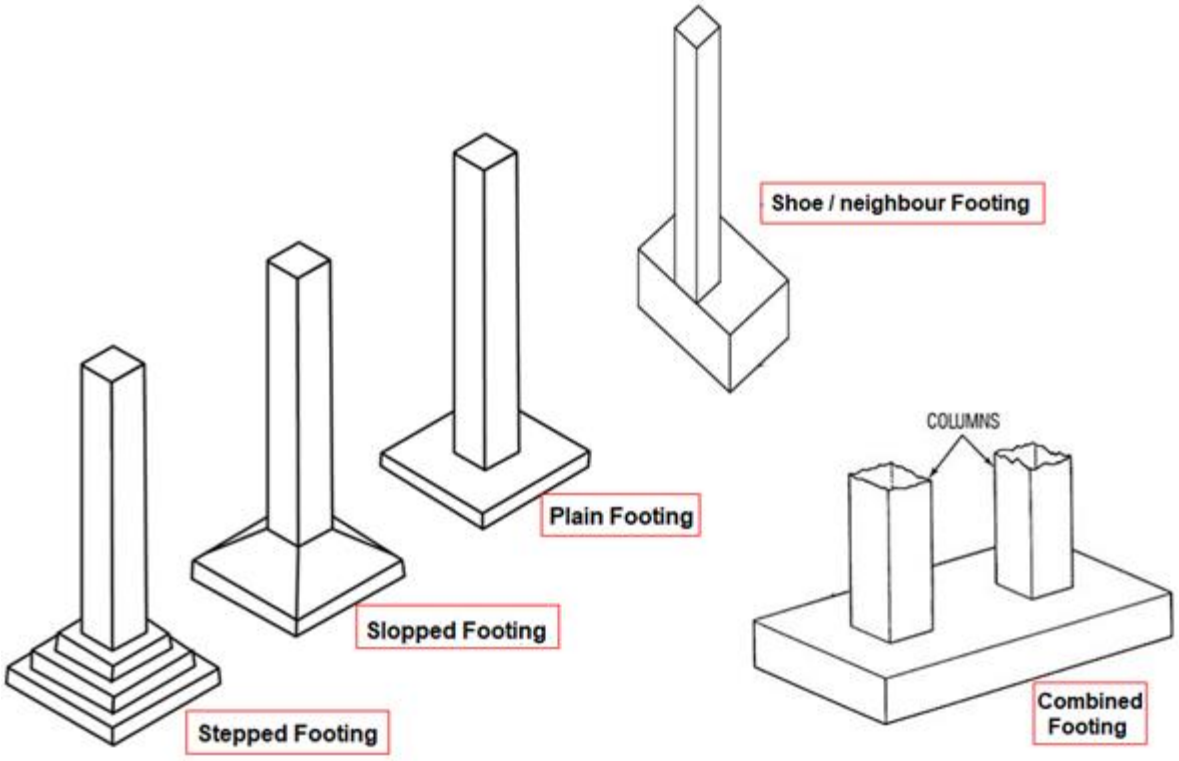
TRADIDA QS
Global Solutions LLP

Types of Footings & Foundation

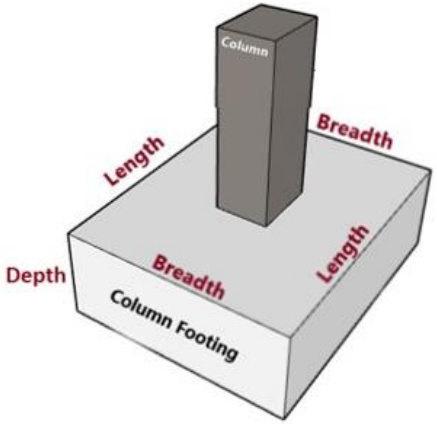
- Isolated Footing
- Strip Footing
- Raft Foundation
- Pile Foundation

ISOLATED FOOTINGS

Types of Isolated Footings



Isolated footings – Formwork arrangeement



Perimeter -

- (Length + Breadth) x 2
- (Length+ Length+ Breadth + Breadth)

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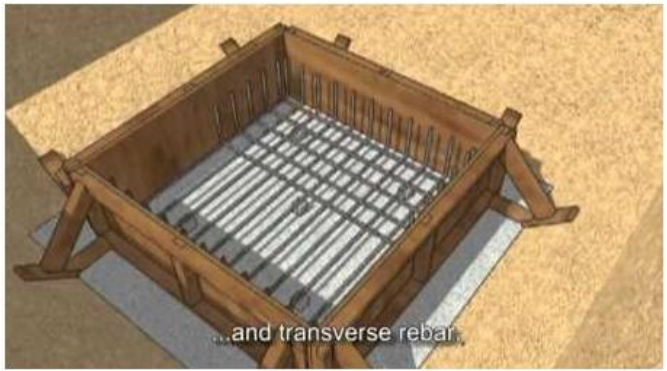
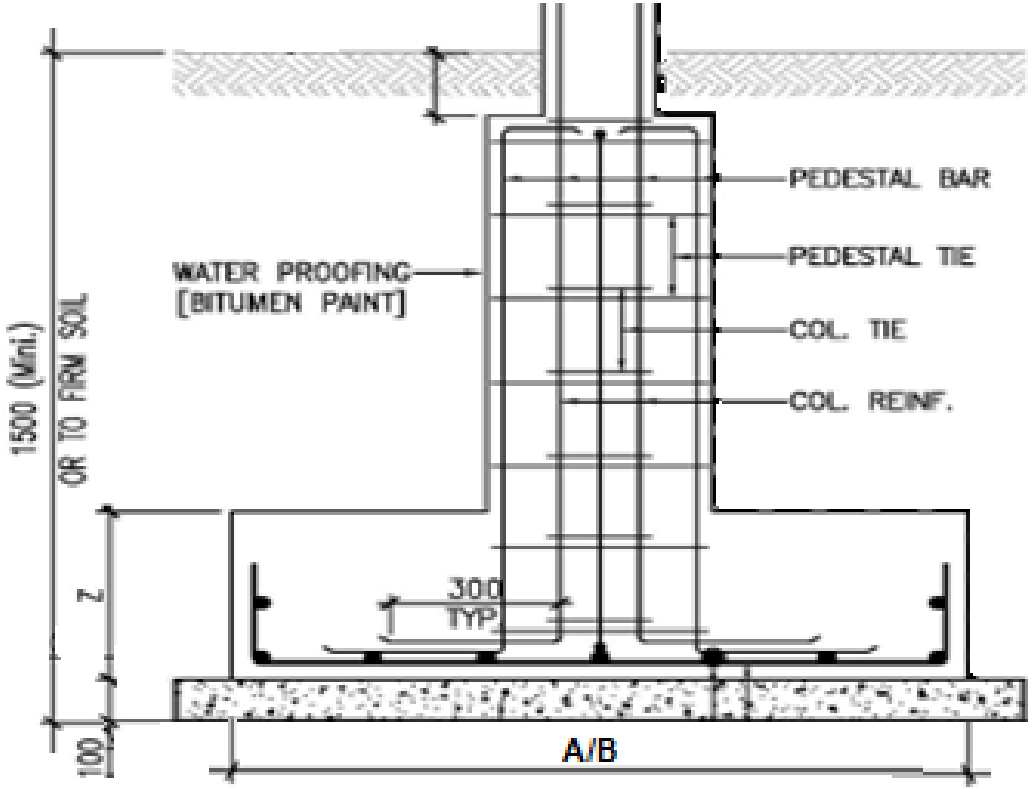


Formwork arrangement

Isolated footings – Quantification

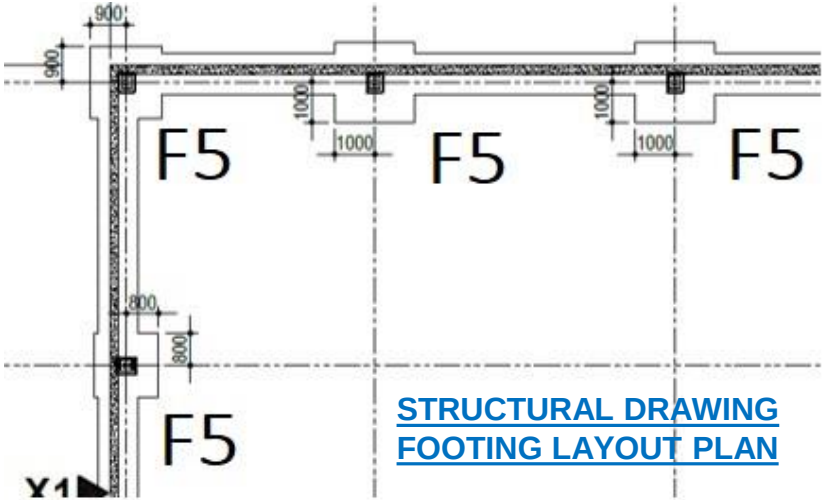


TYPICAL SECTION
(STRUCTURAL DRG)

Concrete – Volume – m3
Length X Breadth X Depth

Formwork – Area – m2
Perimeter of footing x depth

Isolated footings – Quantification



STRUCTURAL DRAWING
FOOTING LAYOUT PLAN

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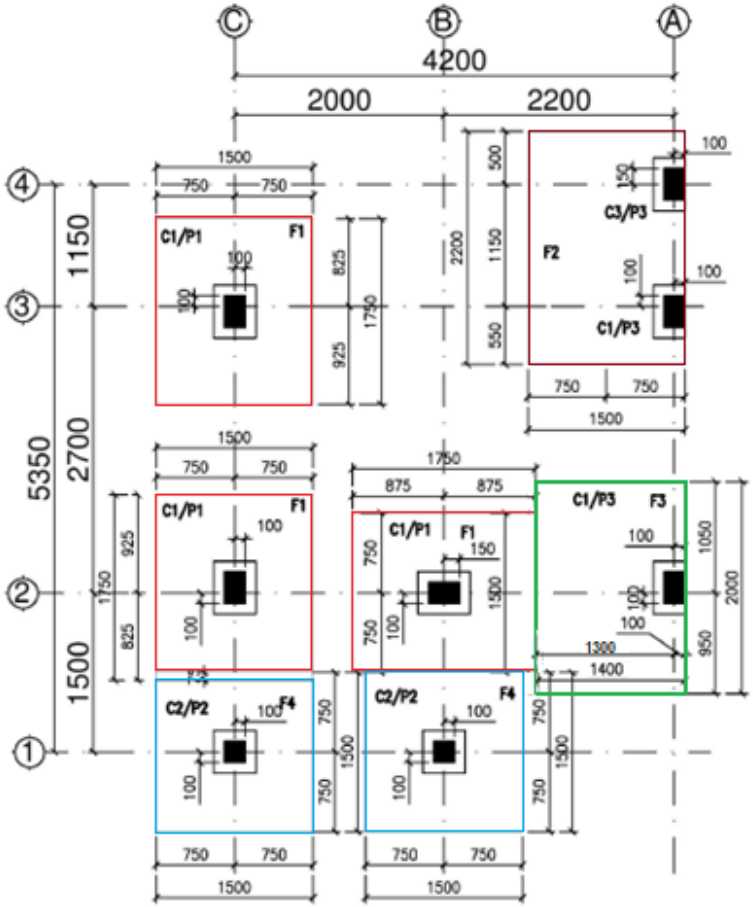
FOOTING SCHEDULE

FOOTING MKD.	FOOTING SIZE		
	A	B	Z
F1	2000	2000	500
F2	2000	2000	550
F3	1600	1600	450
F4	1800	1800	400
F5	2100	1800	400

Description	Nos	L	B	D	Quantity	Unit
Concrete – F5	4	2.1	1.8	0.40	6.048	M3
Form Work – F5	4	(2.1 + 1.8) *2		0.40	12.48	M2

Isolated footings – Quantification



FOOTING SCHEDULE

Type	A	B	Z	Nos
F1	1500	1750	350	3
F2	1500	2200	400	1
F3	1400	2000	400	1
F4	1500	1500	300	2

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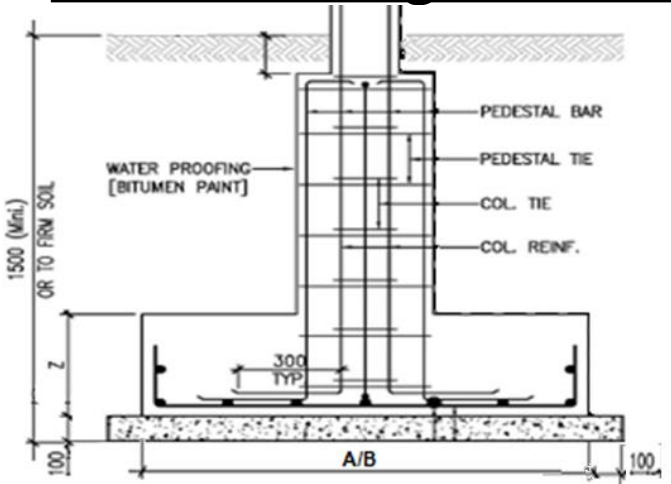
STRUCTURAL DRAWING
FOUNDATION PLAN

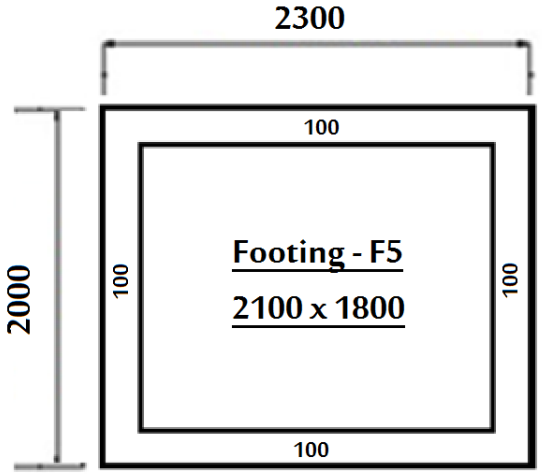
Isolated footings – Quantification

Description	Ref	Nos	L	B	D	Quantity	Unit
Concrete							
F1		3	1.50	1.75	0.35	2.76	
F2		1	1.50	2.2	0.4	1.32	
F3		1	1.40	2.0	0.4	1.12	
F4		2	1.50	1.5	0.3	1.35	
						6.55	**M3**
Formwork							
F1		3	6.50		0.35	6.825	
F2		1	7.40		0.4	2.960	
F3		1	6.80		0.4	2.720	
F4		2	6.00		0.3	3.600	
						16.105	**M2**

PCC / Blinding Concrete



TYPICAL FOOTING SECTION



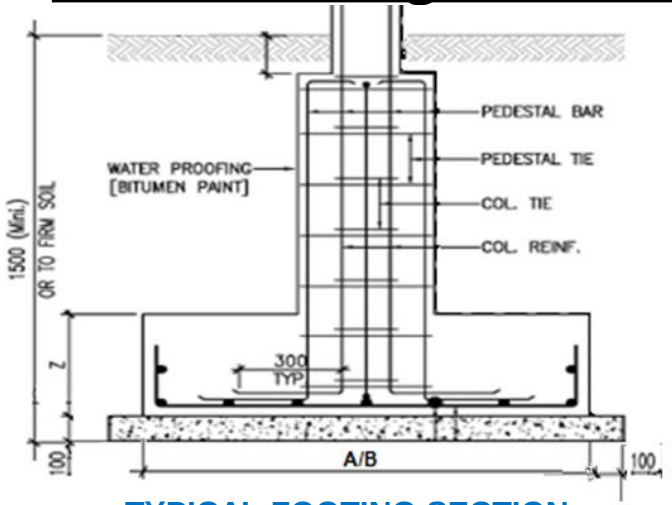
Concrete - Volume - m3
Formwork - Area - m2

Note - In GCC some clients doesn't pay formwork required for blinding concrete separately, In such cases formwork expenses should be added as part of blinding concrete cost.

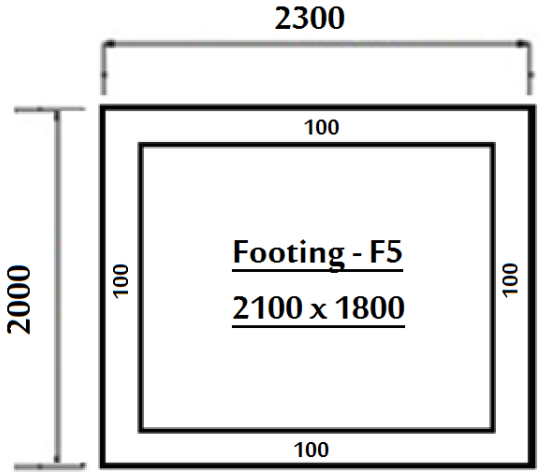
PRICING PREAMBLES

The rates for plain (unreinforced) concrete below formation level are to include for all necessary formwork to sides, edges and top surfaces to a slop exceeding 15 degrees from horizontal where required

PCC / Blinding Concrete



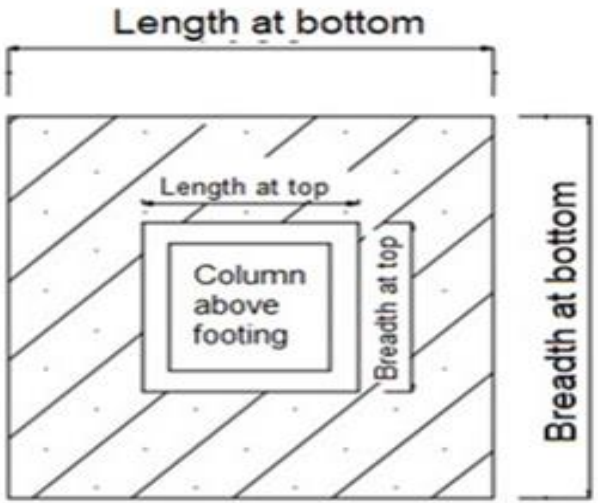
TYPICAL FOOTING SECTION

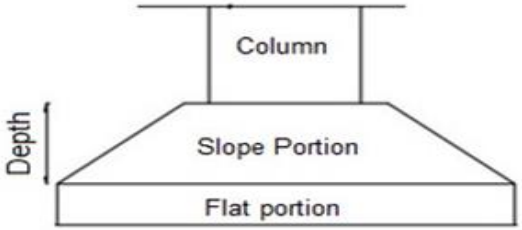


Concrete - Volume - m3
Formwork - Area - m2

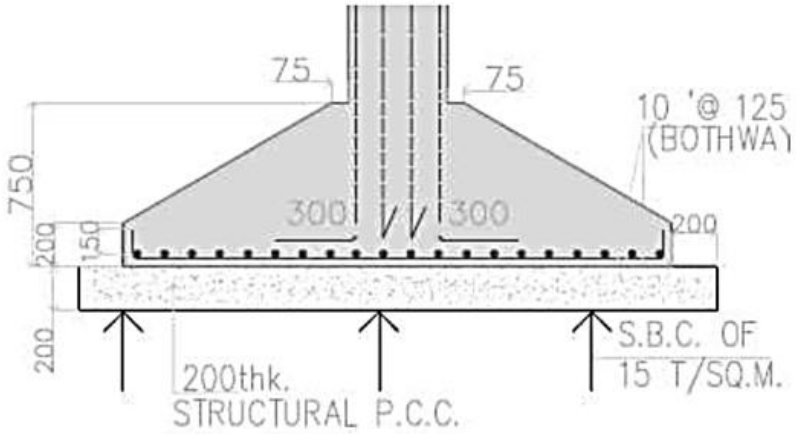
Description	Ref	Nos	L	B	D	Quantity	Unit
Concrete – F5		4	2.3	2.0	0.10	1.84	M3
Form work – F5		4	(2.3 + 2.0) * 2 = 8.6	-	0.10	3.44	M2

Sloped Footing

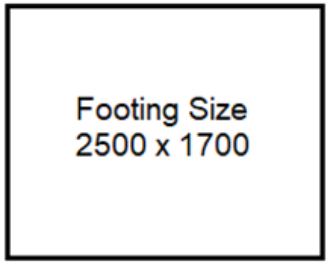




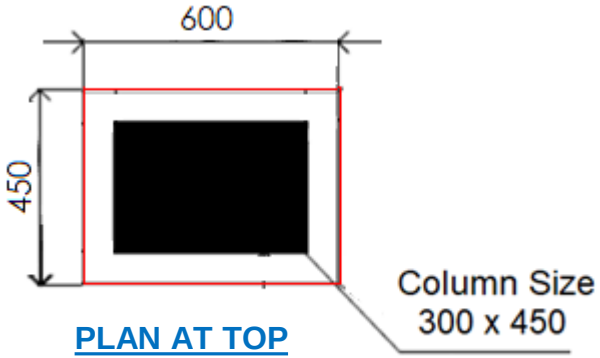
Sloped Footing



TYPICAL FOOTING SECTION

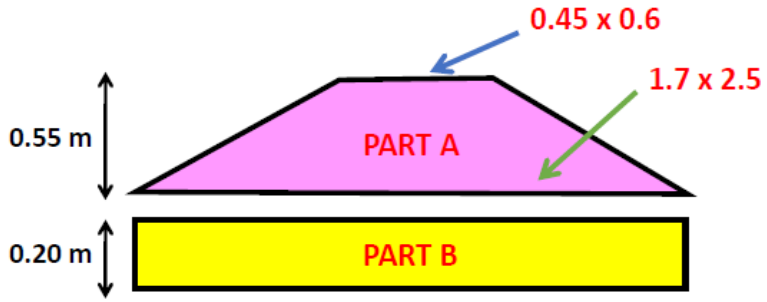


PLAN AT BOTTOM



PLAN AT TOP

Sloped Footing



Volume of Part A
h/3 x [A1 + A2 + Sqrt (A1 x A2)]

H – Height of trapezoidal portion
A1 – Area at Bottom of trapezoidal portion
A2 – Area at Top of trapezoidal portion

Volume of part B

1.7m x 2.5m x 0.2m = 0.85 m3

Volume of part A

A1 = 1.7 x 2.5 = 4.25m2 and A2 = 0.45 x 0.6 = 0.27m2

0.55/3 x [4.25 + 0.27 + sqrt (4.25x0.27)] = 1.03 m3

VOLUME OF FOOTING

0.85m3 + 1.03m3 = 1.88 m3

Sloped Footing

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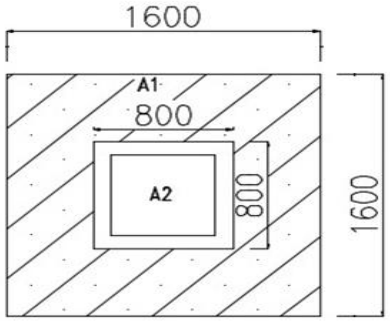
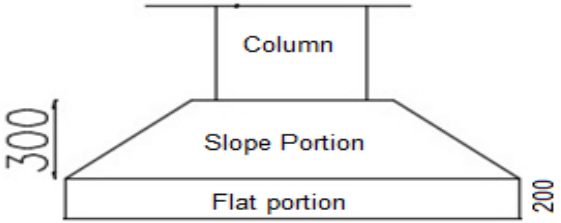


PLAN



SECTION

Sl No.	Description	Nos.	L	B	D	Unit	Quantity
1	**Concrete**						
1.1	Flat portion	1	1.6	1.6	0.2	M3	0.512
1.2	Slope Portion	1	**A1 + A2 + SQRT (A1*A2)** (1.6x1.6)+ (0.8x0.8) + SQRT((1.6x1.6)*(0.8x0.8))		0.3/3	M3	0.448
2	**Formwork**						
2.1	Side formwork for flat portion	1	2 x (1.6+1.6)		0.2	M2	1.28

RAFT FOUNDATION

Raft Foundation

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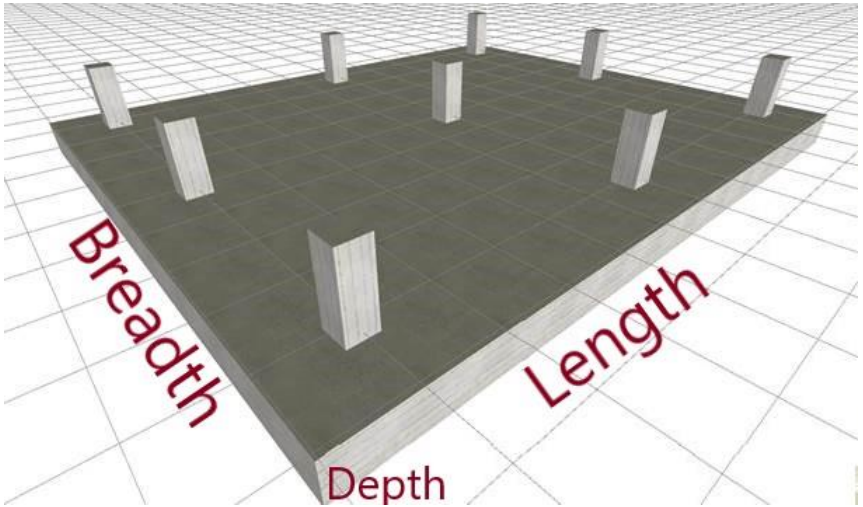
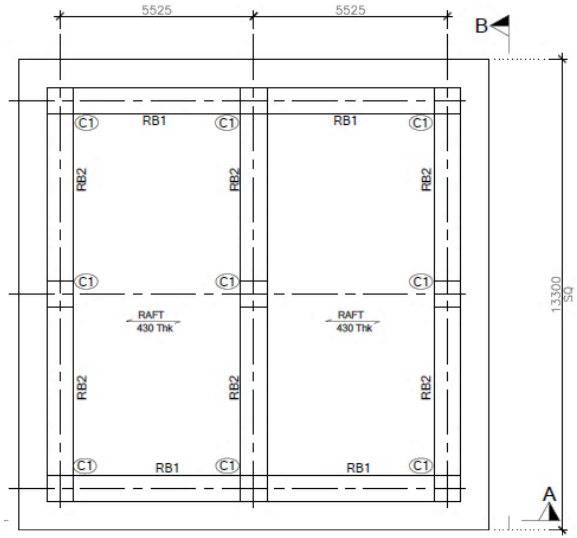


Applications

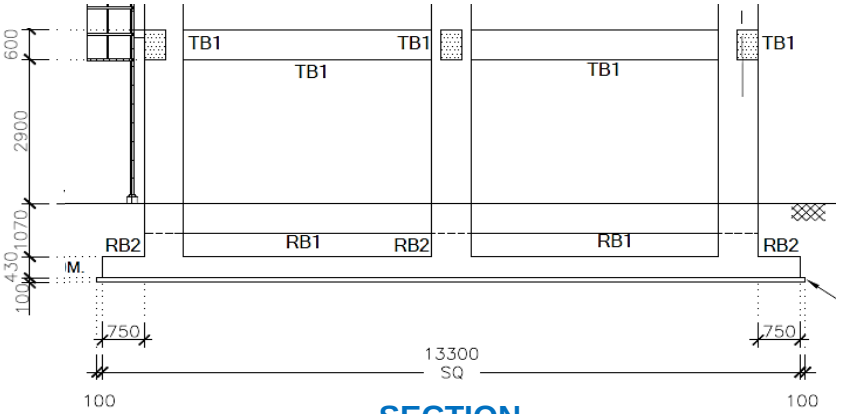
Building Basement floor
Water Tank floor

Concrete =	Length	X Breadth	X Depth	Volume of concrete	M3
Shuttering / formwork =	(Length + Breadth) x 2	-	X Depth	Area of formwork	M2

Raft Foundation



STRUCTURAL LAYOUT



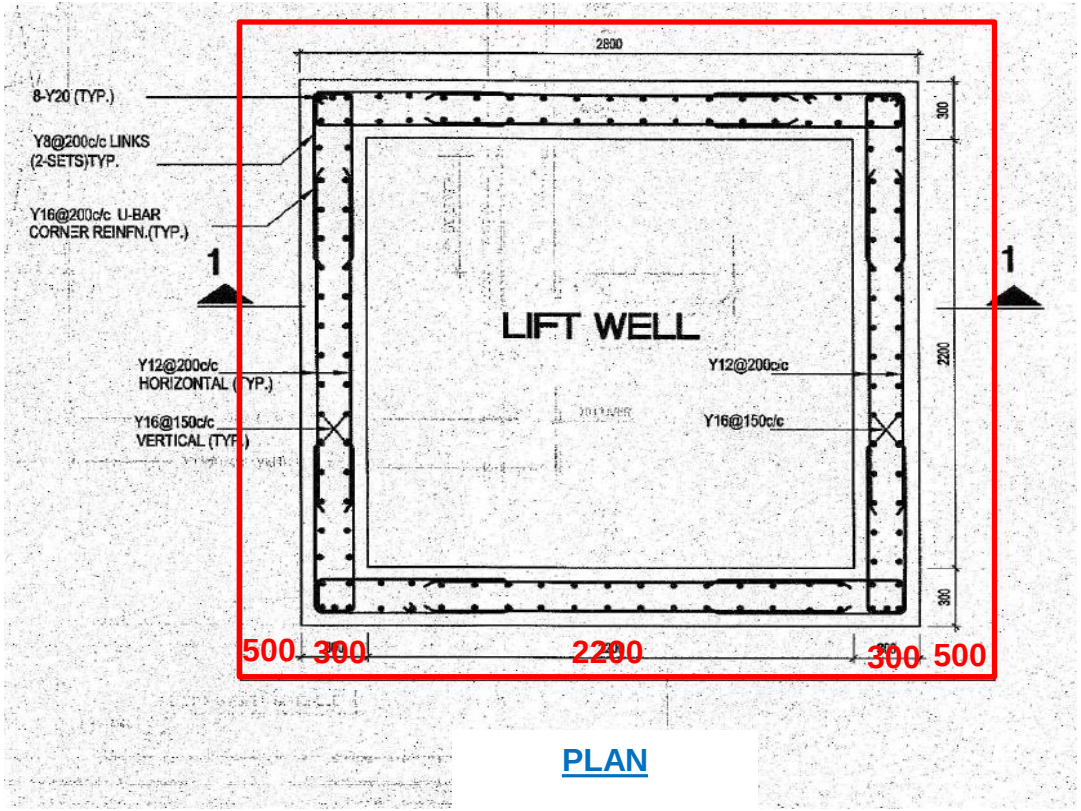
SECTION

TB – TIE BEAM
RB – RAFT BEAM

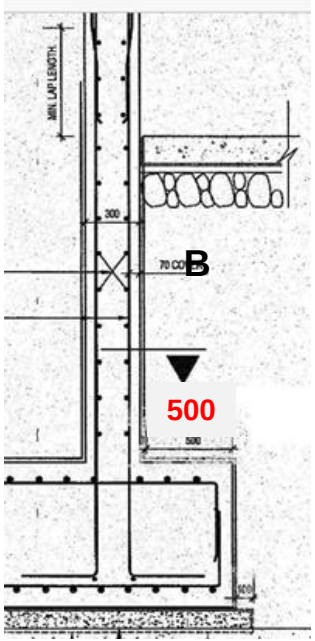
C - COLUMN

Description	Ref	Nos.	L	B	D	Quantity	Unit
Concrete		1	13.3	13.3	0.43	76.06	M3
Formwork		1	(13.3+13.3) x 2		0.43	22.88	M2

Raft Foundation – Lift Core

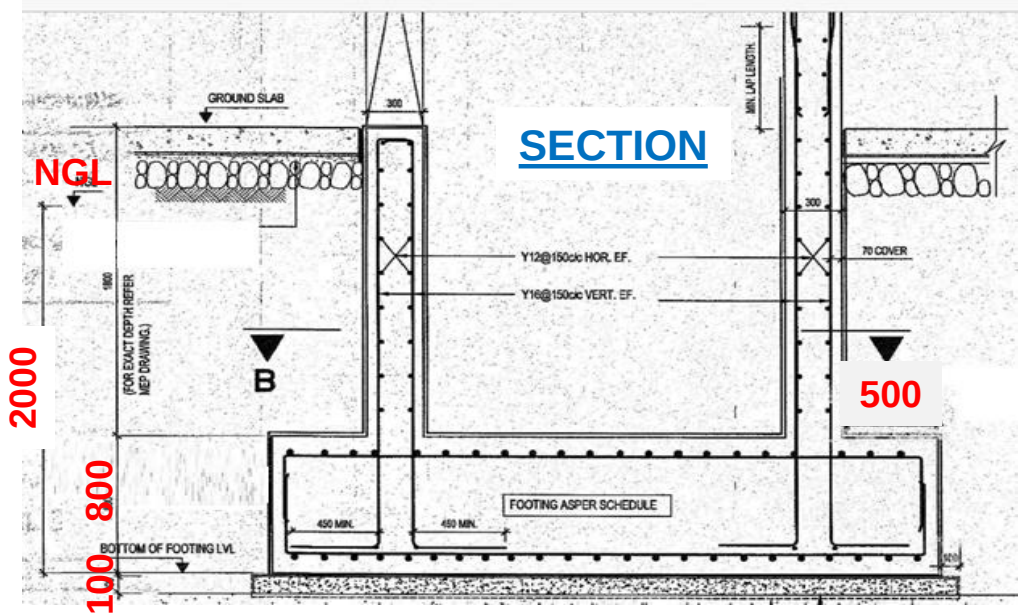


PLAN



SECTION

Raft Foundation – Lift Core



Description	Ref	Nos.	L	B	D	Quantity	Unit
Concrete		1	3.8	3.8	0.8	11.55	M3
Formwork		1	(3.8 +3.8) x 2		0.8	12.16	M2

STRIP FOOTING

Strip Footing

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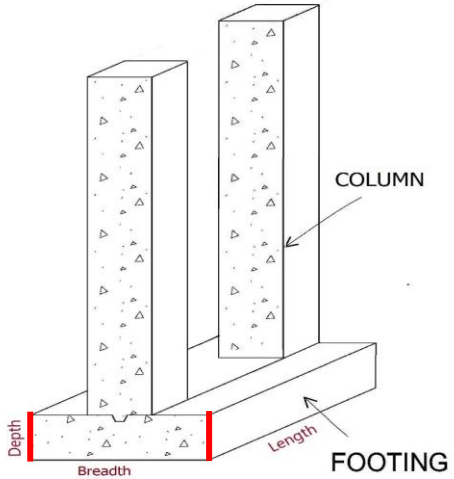

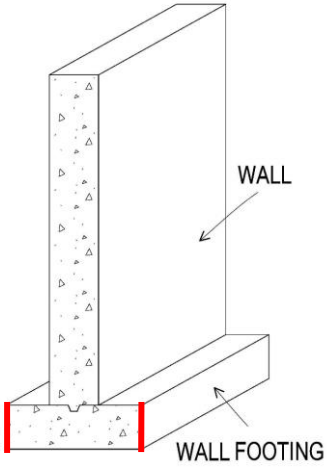

Concrete =	No.	Length	x Breadth	x Depth	Volume of concrete	M3
Shuttering / formwork =	No. x 2 sides	Length	-	x Depth	Area of formwork	M2

Strip Footing – Boundary Wall

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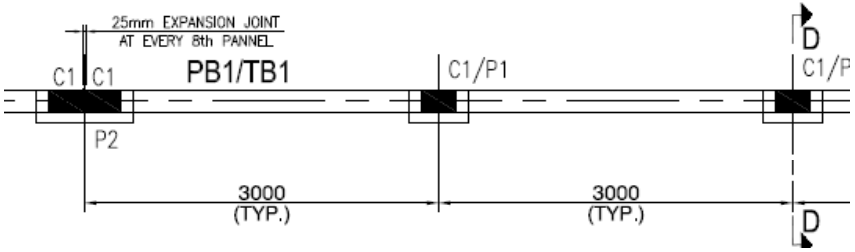
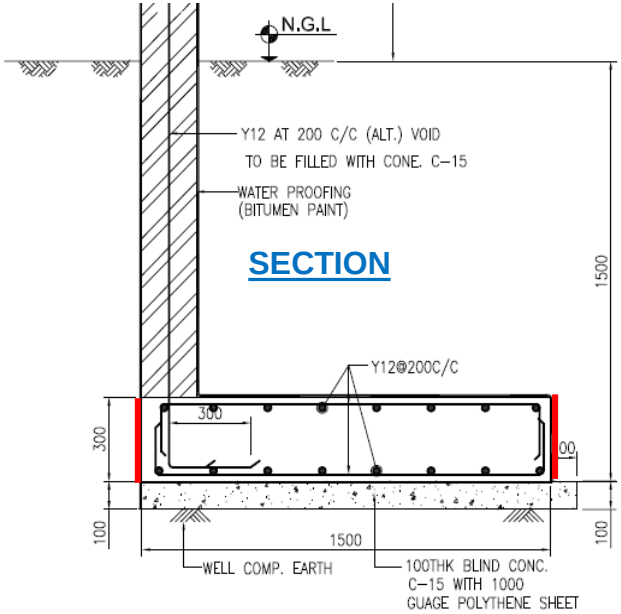
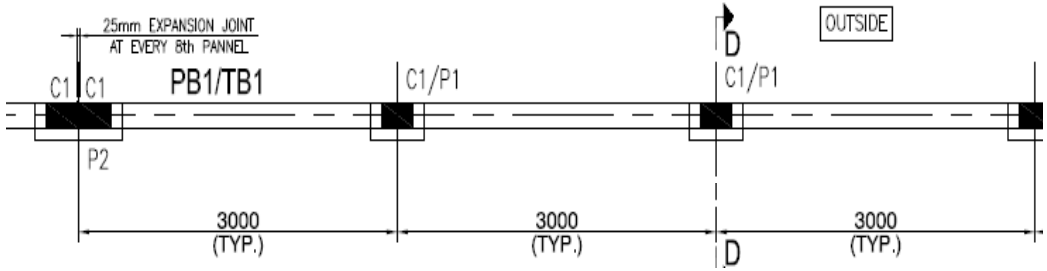


STRUCTURAL / ARCHITECTURAL PLAN

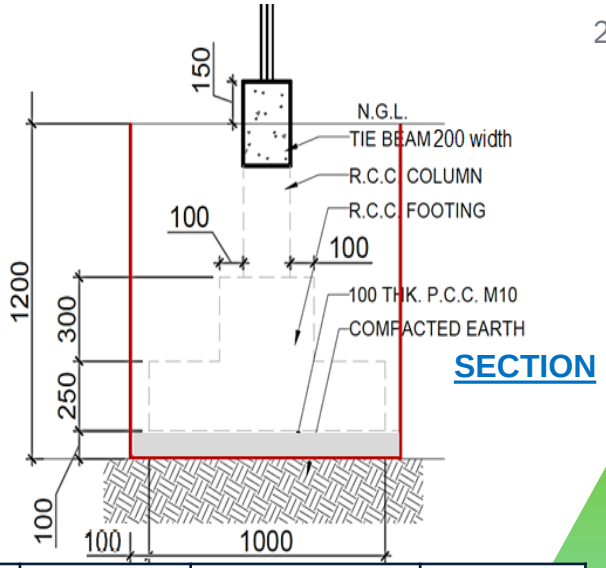


Description	Ref	Nos.	L	B	D	Quantity	Unit
RC Concrete		1	8 x 3	1.5	0.3	10.80	M3
Formwork		1 x 2	8 x 3	-	0.3	14.40	M2
PC Concrete		1	8 x 3	1.5 + 0.1	0.1	3.84	M3
Formwork		1 x 2	8 x 3		0.1	4.80	M2

Strip Footing – Boundary Wall



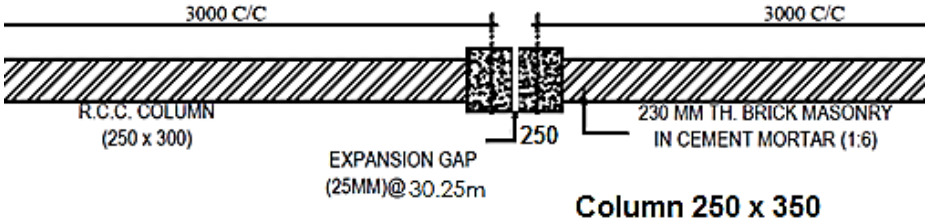
PLAN



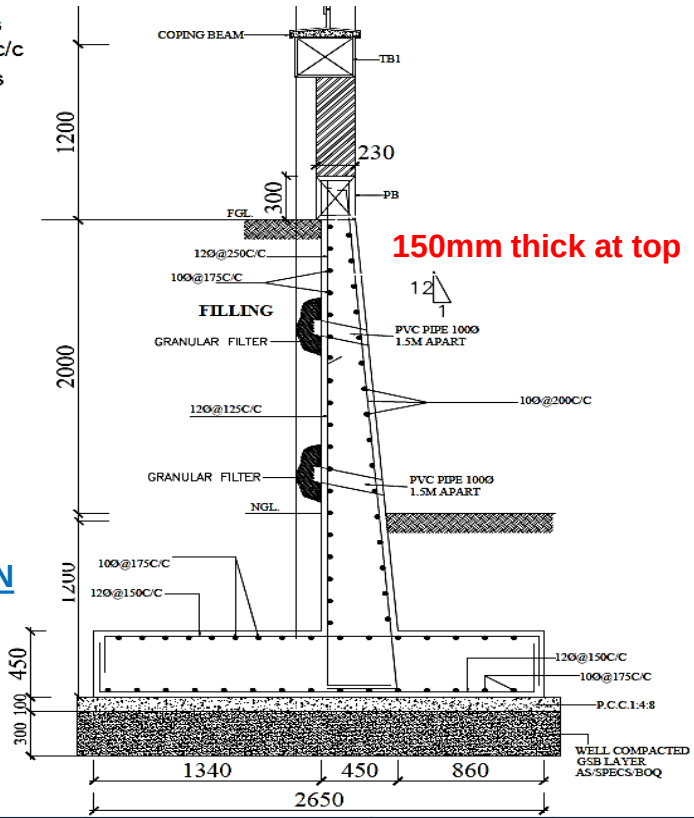
SECTION

Description	Ref	No	L	B	D	Quantity	Unit
PCC Concrete		1	24	1.2	0.1	2.88	M3
PCC Formwork		2	24		0.1	4.8	M2
Concrete							
Footing - Step 1		1	24	1	0.25	6.0	M3
Footing - Step 2		1	24	0.4	0.3	2.88	M3
Formwork							
Footing - Step 1		2	24		0.25	12.0	M2
Footing - Step 2		2	24		0.30	14.4	M2

Strip Footing – Boundary Wall



PLAN AT GROUND LVL



150mm thick at top

SECTION

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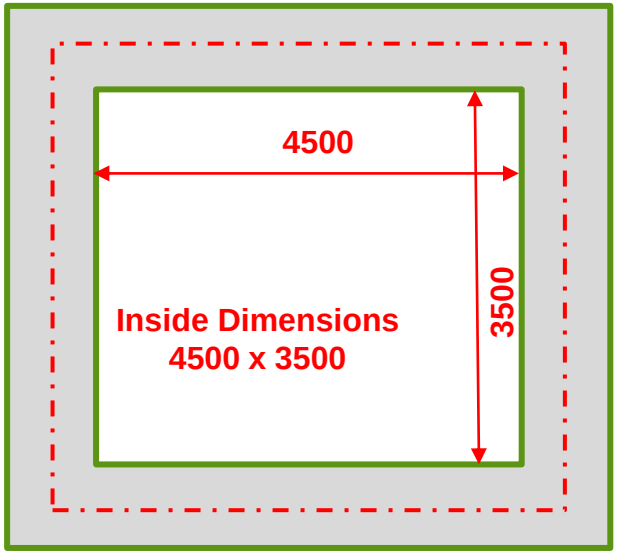
Description	Ref	Nos.	L	B	D	Qty	Unit
Concrete		1	30.25	2.65	0.45	36.07	M3
Formwork		2 Sides	30.25		0.45	27.23	M2

Strip Footing – All Round Building



Centreline Method

Thickness of Strip footing
250mm

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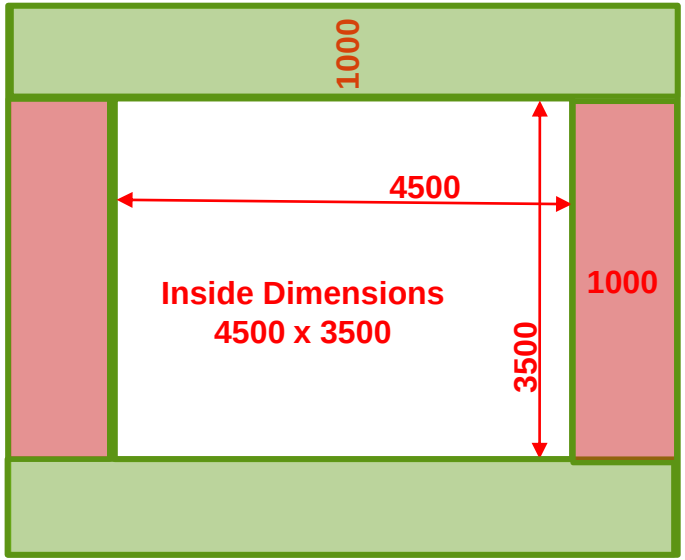
Description	Nos.	L	B	D	Qty	Unit
Concrete	1	((½ +4.5+ ½) + (½ +3.5 + ½)) x 2 = 20	1.00	0.25	5.00	M3
Formwork	2 Sides	20		0.25	10.00	M2

Strip Footing – All Round Building



Longwall / Short wall Method

Thickness of Strip footing
250mm

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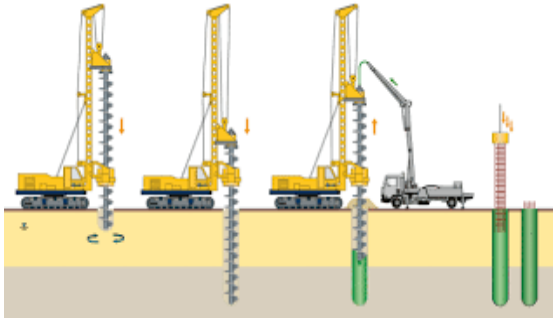
Description	Ref	Nos.	L	B	D	Qty	Unit
Concrete – Long wall	Out to Out	2	1+4.5+ 1	1.00	0.25	3.25	M3
Concrete – Short Wall	In to In	2	3.5	1.00	0.25	1.75	M3
Formwork		2 x 2	6.5		0.25	6.5	M2
Formwork		2 x 2	3.5		0.25	3.5	M2

PILE FOUNDATION

Pile Foundation



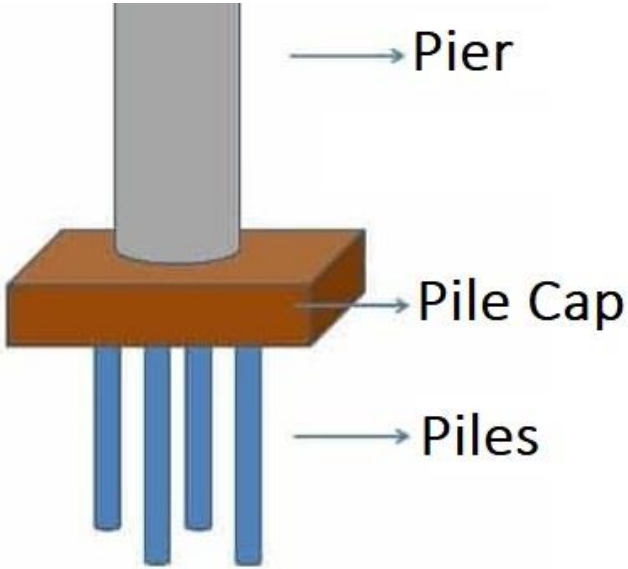
Pile Boring

Pile Concreting

Piling work completed site

Breaking of Pile Head

Pile Foundation



Applications

Week Soil conditions
Buildings / Bridges / Fly overs

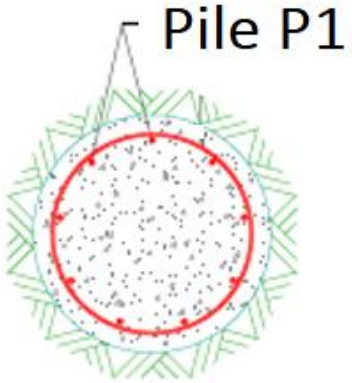
$$Volume - Depth\ x\ \pi r^2$$

Concrete	Nos.	Pile radious^2	π	x Depth of pile	Volume of concrete	m3
Boring Length	Nos.	-	-	x Depth of pile	Total boring length	m
Breaking pile head	Nos.	Pile radious^2	π	x 1 m or as indicated in drawing	Volume of demolition	m3

Pile Foundation

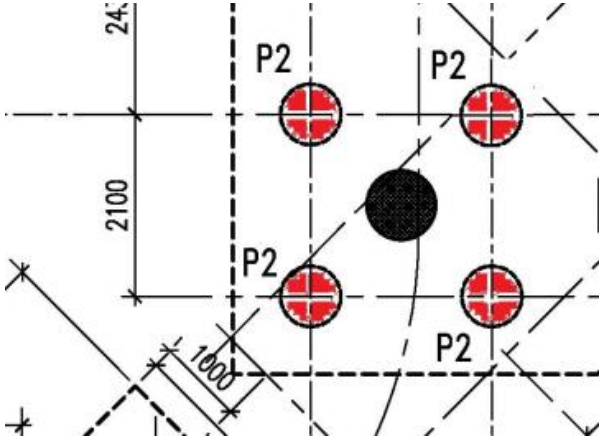
PL – PILE LENGTH
SL – SOCKETING LENGTH

BORED PILE DIAMETER (mm)	MAIN REINFTS	SPIRAL LINKS	REINFTS LENGTH	TOTAL No. OF PILE	PILE COMPRESSION CAPACITY (kN)	ESTIMATED PENETRATION PL = PILE LENGTH FR	
						ZONE 1	
						BH1, BH2, BH3 BH2A, BH4, BH5	
						PL (M)	SL (M)
600	9T16	T10–175	VARIES	REFER TO LAYOUT DRG.	1600	13	5



Description	Ref	Nos.	L	B	D	Quantity	Unit
Concrete	Pile – P1	1	0.30 ^ 2	π	13	3.68	M3
Boring of Pile	Pile – P1	1	-	-	13	13.00	M
Breaking of Pile Head	Pile – P1	1	0.30 ^ 2	π	1	0.28	M3

Pile Foundation



PILE FOUNDATION LAYOUT PLAN

P1 **- 600Ø Pile (12m. Depth)**

P2 **- 700Ø Pile (12m. Depth**

Note – breaking of pile head, depth may vary according to different projects.

Description	Ref	Nos.	L	B	D	Quantity	Unit
Concrete	Pile – P2	4	0.35 ^ 2	π	12	18.47	M3
Boring of Pile	Pile – P2	4	-	-	12	48.00	M
Breaking of Pile Head	Pile – P2	4	0.35 ^ 2	π	1	1.54	M3

Thanks!

Any questions?

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