

# STRUCTURAL DESIGN

UNITED NATIONS DEVELOPMENT PROGRAMME

SCHOOL TOILET IN NGARANAM

NOTES:

1. Design is to BS 8110
2. Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:

-Foundation	30(25)
-Columns	30(20)
-Beams & Slabs	30(20)
3. Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by "Y", having characteristic strength not less than 410N/mm<sup>2</sup>
4. Cover to reinforcement shall be the following:

Fondation:	50mm(bottom)/75mm(sides)
Columns:	25mm
Beams:	25mm
Slabs:	20mm
5. Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
6. Dimensions are in millimetre(mm) and must not be scaled at any time.
7. Foundation was designed for an assumed allowable soil bearing pressure of 150KNN/m<sup>2</sup>
8. This design engineer will not take responsibility for any job not supervised by him.

Project:

PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANMAM,MAFA LGA, BORNO STATE.

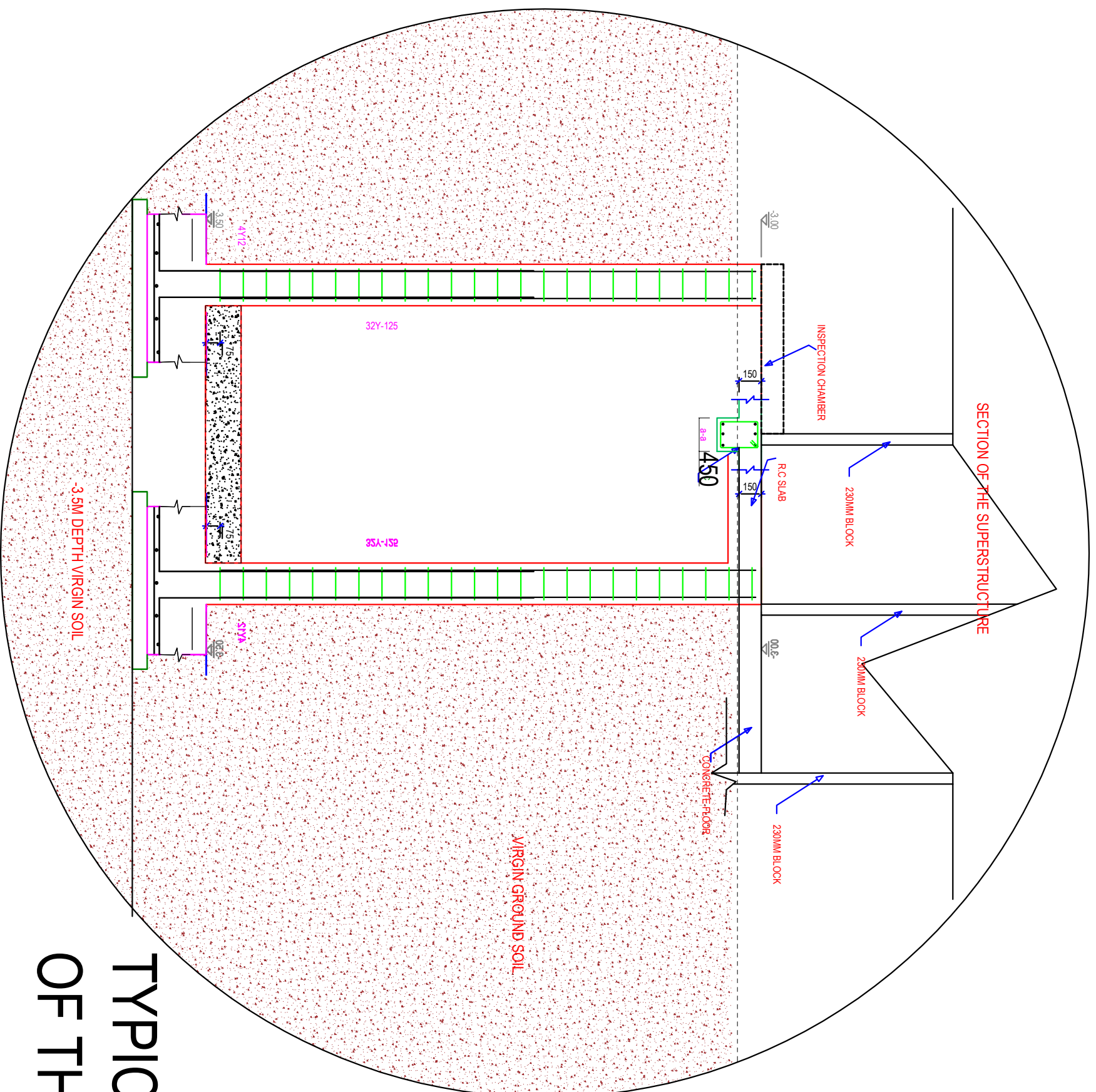
Client: UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

Drawing Title:

## COLUMN BASE DETAILS

Scale	1:50
Date	MARCH, 2021
Project Name.	SCHOOL V.I.P TOILET
Drawing No.	<b>SWD/03</b>

1000



# TYPICAL SECTION OF THE V.I.P TOILET

NOTES:

1. Design is to BS 8110
2. Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:

-Foundation	30(25)
-Columns	30(20)
-Beams & Slabs	30(20)
3. Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by "Y", having characteristic strength not less than 410N/mm<sup>2</sup>
4. Cover to reinforcement shall be the following:

Foundation:	50mm(bottom)/75mm(sides)
Columns:	25mm
Beams:	25mm
Slabs:	20mm
5. Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
6. Dimensions are in millimetres (mm) and must not be scaled at any time.
7. Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m<sup>2</sup>
8. This design engineer will not take responsibility for any job not supervised by him.

Project:

AT  
NGARANNAM,MAFA LGA, BORNO STATE.

Client: UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

Drawing Title:

## Foundation layout

Scale	1:50
-------	------

Date	MARCH, 2021
------	-------------

Project Name.	SCHOOL V.I.P TOILET
---------------	---------------------

Drawing No.	<b>SWD/01</b>
-------------	---------------

—



# FOUNDATION LAYOUT

Codes		
BS8110-1:1997,BS6399		
Soil Parameters		
Soil Bearing Capacity (kN/m <sup>2</sup> )	200.00	
Subgrade Reaction (kN/m <sup>3</sup> )	50000.000	
Material Properties (Default)		
Material	Rebar Grade	
Columns	C20/25	Grade 410 (Type 2)
Walls	C20/25	Grade 410 (Type 2)
	Long. Web Rebar	Grade 410 (Type 2)
	Lat. Web Rebar	Grade 410 (Type 2)
Beams	C20/25	Grade 410 (Type 2)
Slabs	C20/25	Grade 410 (Type 2)
Ribs	C20/25	Grade 410 (Type 2)
Footings	C20/25	Grade 410 (Type 2)
Links	C20/25	Grade 410 (Type 2)

NOTES:	
<div><div>1. Design is to BS 8110</div><div>2. Concrete grades are to be as follows with figures in brackets denoting maximum size aggregate: -Foundation 30(25) -Columns 30(20) -Beams &amp; Slabs 30(20)</div><div>3. Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by "Y", having characteristic strength not less than 410N/mm<sup>2</sup></div><div>4. Cover to reinforcement shall be the following: Foundation: 50mm(bottom)/75mm(sides) Columns: 25mm Beams: 25mm Slabs: 20mm</div><div>5. Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.</div><div>6. Dimensions are in millimetres (mm) and must not be scaled at any time.</div><div>7. Foundation was designed for an assumed allowable soil bearing pressure of 150KN/m<sup>2</sup></div><div>8. This design engineer will not take responsibility for any job not supervised by him.</div></div>	
Project:	PROPOSED RESIDENTIAL DEVELOPMENT, AT NGARANNAM, MAFA LGA, BORNO STATE.
Client:	UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.
Drawing Title:	
Foundation layout	
Scale	1:50
Date	MARCH, 2021
Project Name:	SCHOOL V.I.I.P TOILET
Drawing No.	<b>SWD/01</b>

NOTES:

- Design is to BS 8110
- Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:  
- Foundation: 30(25)  
- Columns: 30(25)  
- Beams & Slabs: 30(20)
- Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
- Cover to reinforcement shall be the following:  
- Foundation: 50mm(bottom) 75mm(sides)  
- Columns: 25mm  
- Beams: 25mm  
- Slabs: 20mm
- Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
- Dimensions are in millimetres (mm) and must not be scaled at any time.
- Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m<sup>2</sup>
- This design engineer will not take responsibility for any job not supervised by him.

Project:

PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

Client:  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

Drawing Title:

SLAB R.BAR DETAIL

Scale

1:50

Date

MARCH, 2021

Project Name.

SCHOOL V.I.P TOILET

Drawing No.

SWD/02

FORM PLANS QUANTITY TAKE OFF - STOREYS: [0] [1]

BM	SIZE	QTY	Length (mm)	FORM	TOTAL LENGTH (m)
					Y12
1	12	9	1550	<div><div></div><div>1550</div></div>	13.95
2	12	24	1050	<div><div></div><div>300</div><div>740</div></div>	25.20
3	12	9	1600	<div><div></div><div>1590</div></div>	14.40
4	12	18	1350	<div><div></div><div>1310</div></div>	24.30
5	12	9	1450	<div><div></div><div>1450</div></div>	13.05
6	12	15	2700	<div><div></div><div>2680</div></div>	40.50

TOTAL LENGTH (m)

131.40

UNIT WEIGHT (kg/m)

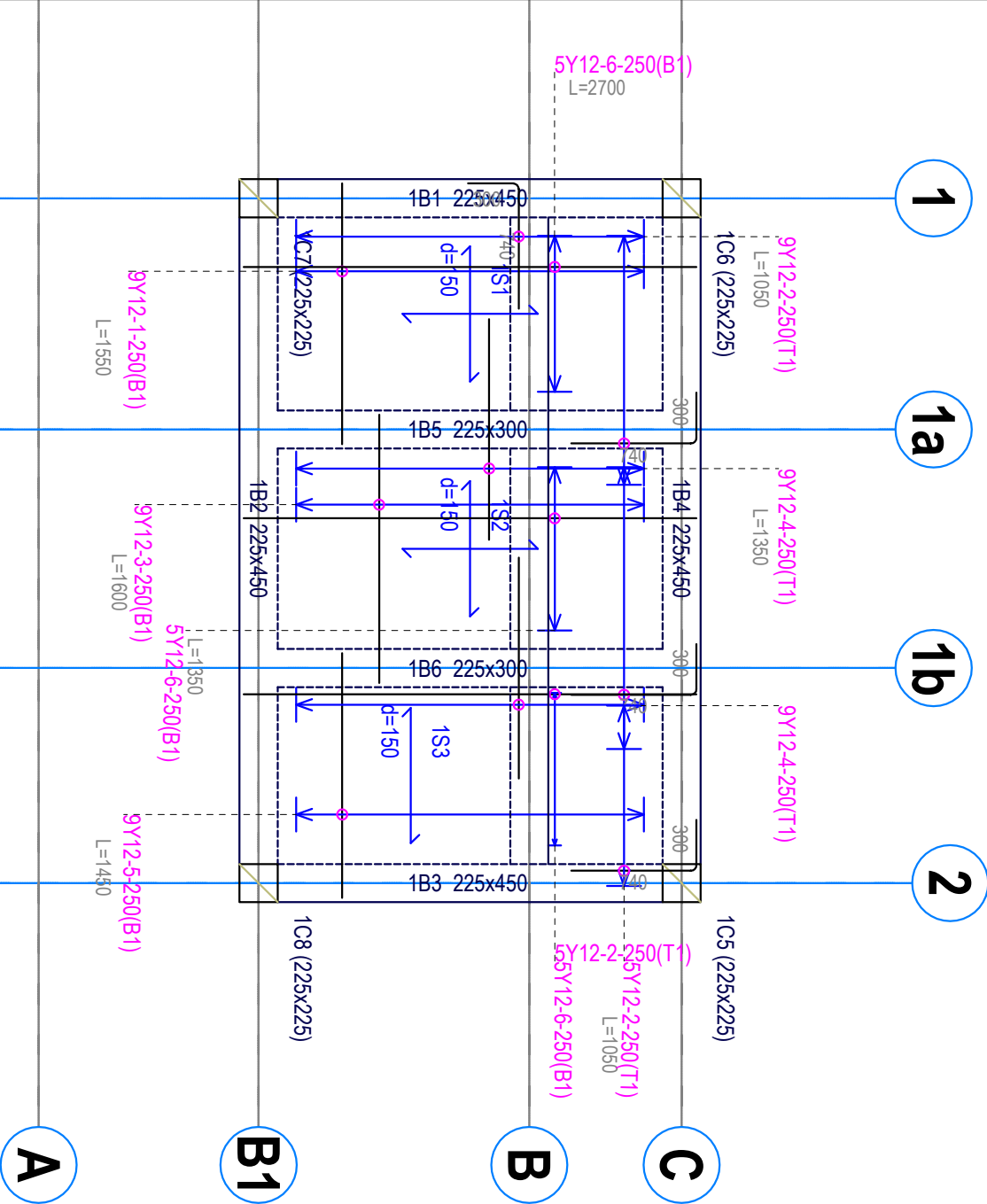
0.889

WEIGHT (Kg)

116.8

T. WEIGHT (kg)

116.8



St: 1 (+3.00m) Scale: 1/50

# SLAB REINFORCEMENT DETAILS

NOTES:

1. Design is to BS 8110
2. Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:  
-Foundation 30(25)  
-Columns 30(20)  
-Beams & Slabs 30(20)
3. Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
4. Cover to reinforcement shall be the following:  
Foundation: 50mm(bottom) 75mm(sides)  
Columns: 25mm  
Beams: 25mm  
Slabs: 20mm
5. Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
6. Dimensions are in millimetre(mm) and must not be scaled at any time
7. Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m<sup>2</sup>
8. This design engineer will not take responsibility for any job not supervised by him.

Project:  
PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

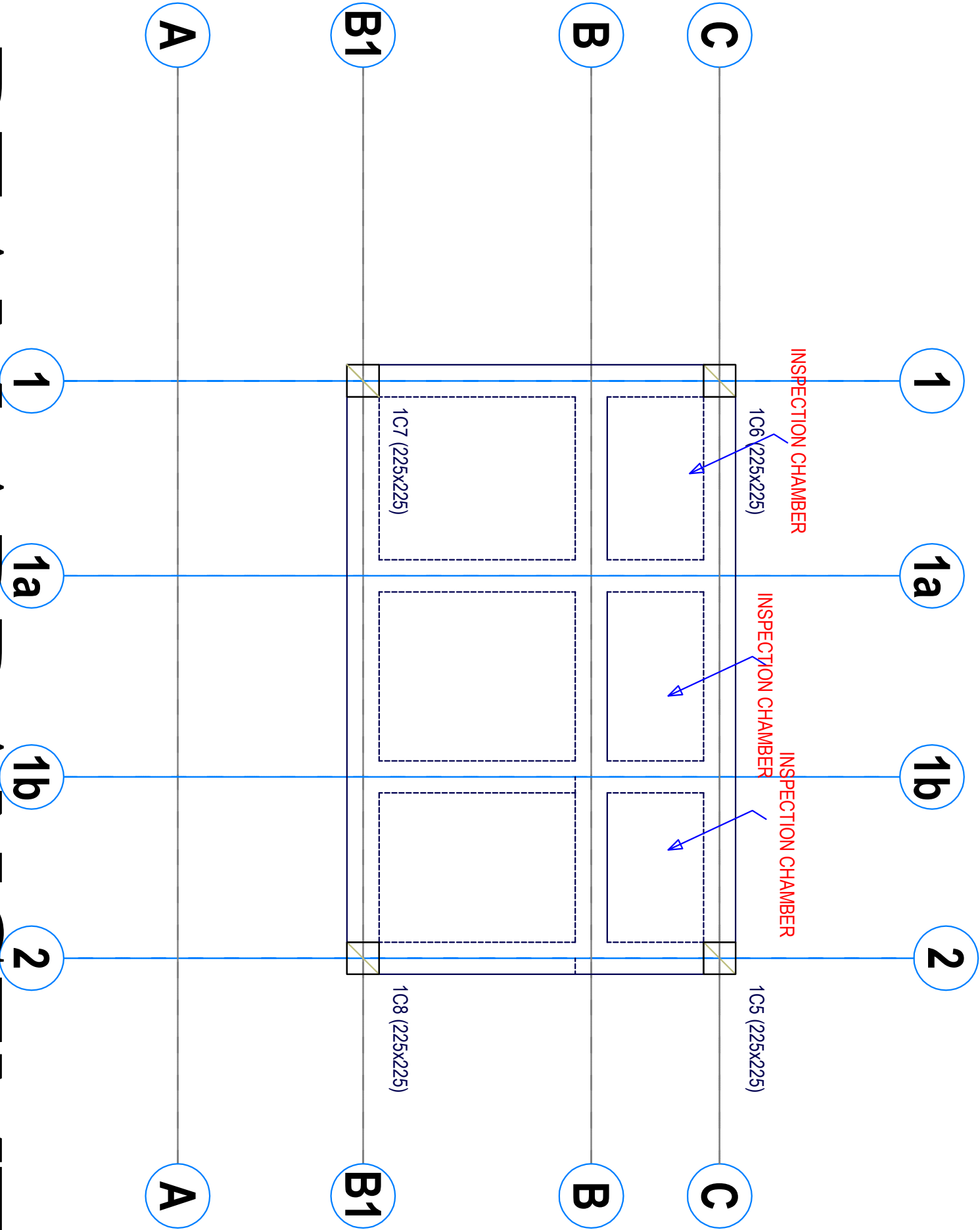
Client:  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

Drawing Title:

Beams layout

Scale	1:50
Date	MARCH, 2021
Project Name.	SCHOOL V.I.P TOILET
Drawing No.	SWD/02

BEAM ARRANGEMENT



NOTES:

- Design is to BS 8110
- Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:  
-Foundation 30(25)  
-Columns 30(20)  
-Beams & Slabs 30(20)
- Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
- Cover to reinforcement shall be the following:  
Foundation: 50mm(bottom) 75mm(sides)  
Columns: 25mm  
Beams: 25mm  
Slabs: 20mm
- Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
- Dimensions are in millimetre(mm) and must not be scaled at any time
- Foundation was designed for an assumed allowable soil bearing pressure of 150KN/m<sup>2</sup>
- This design engineer will not take responsibility for any job not supervised by him.

Project:

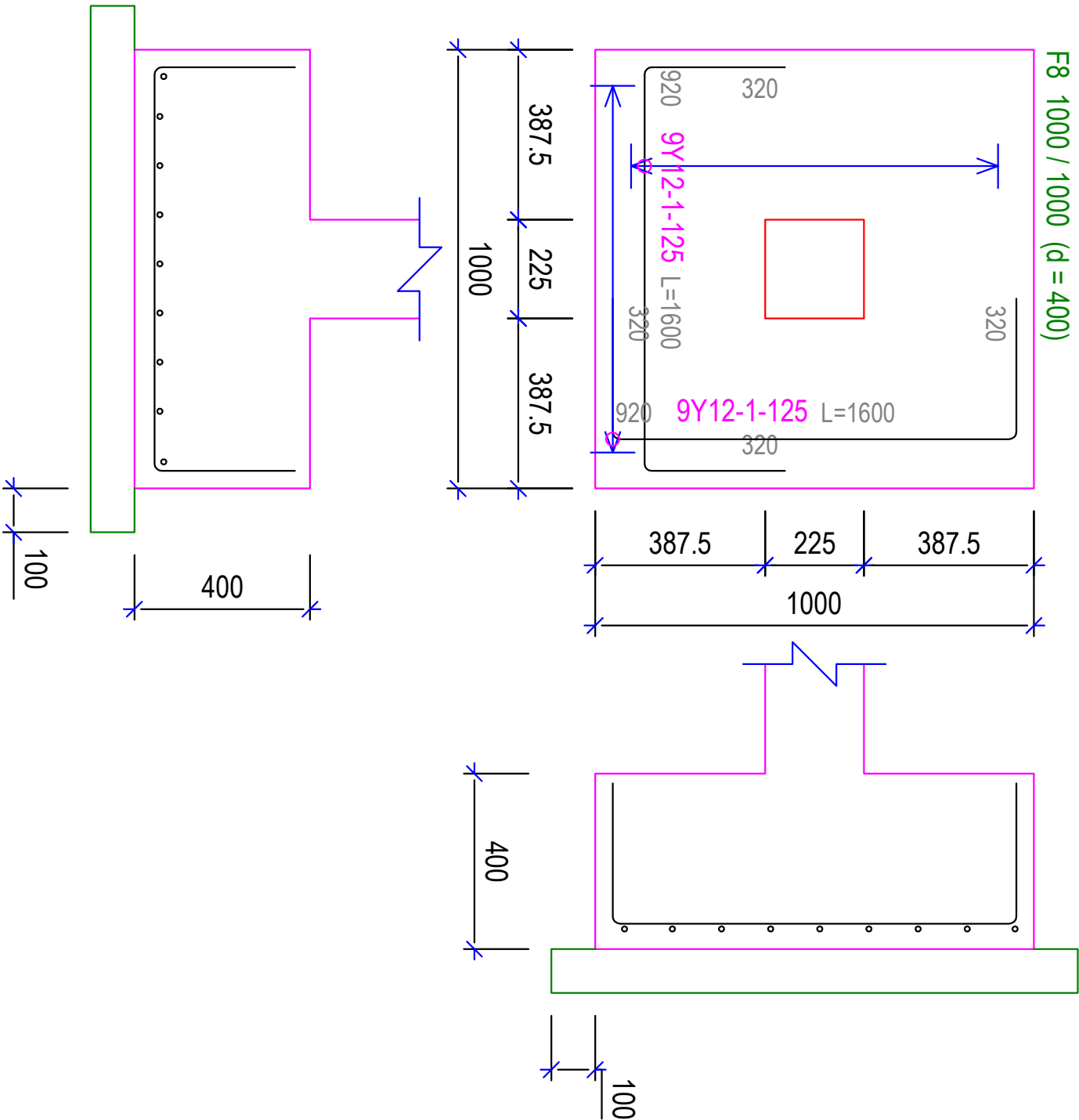
PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

Client:  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

Drawing Title:

COLUMN BASE DETAILS

Scale	1:50
Date	MARCH, 2021
Project Name.	SCHOOL V.I.P TOILET
Drawing No.	<b>SWD/03</b>



NOTES:

- 1. Design is to BS 8110
- 2. Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:
  - Foundation 30(25)
  - Columns 30(25)
  - Beams & Slabs 30(20)
- 3. Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
- 4. Cover to reinforcement shall be the following:
  - Foundation: 50mm(bottom) 75mm(sides)
  - Columns: 25mm
  - Beams: 25mm
  - Slabs: 20mm
- 5. Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
- 6. Dimensions are in millimetres (mm) and must not be scaled at any time.
- 7. Foundation was designed for an assumed allowable soil bearing pressure of 150KN/m<sup>2</sup>
- 8. This design engineer will not take responsibility for any job not supervised by him.

Project:  
PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

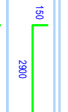
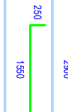
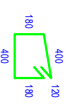
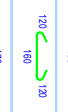
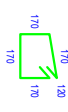
Client:  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

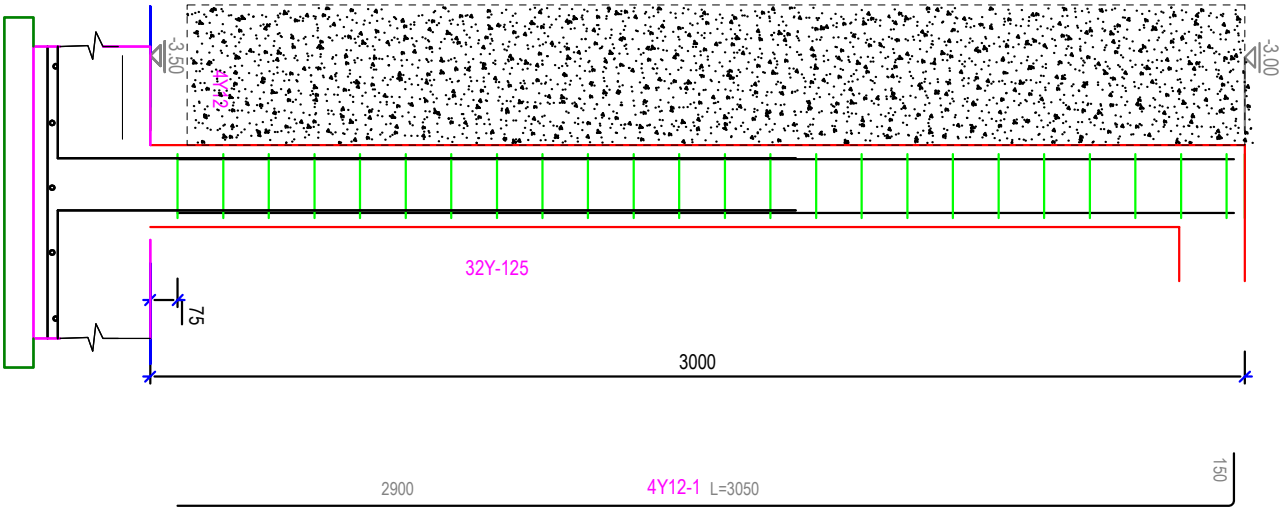
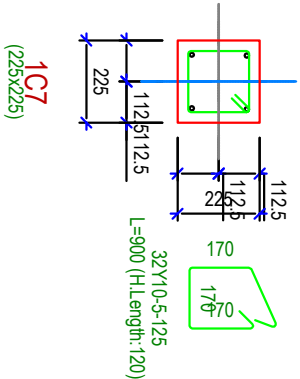
Drawing Title:

COLUMN & BASE DETAILS

Scale	1:50
Date	MARCH, 2021
Project Name.	SCHOOL V.I.P TOILET
Drawing No.	SWD/04

COLUMN ELEVATIONS QUANTITY TAKE OFF - STOREYS: [0] [1]

BM	SIZE	QTY	Length (mm)	FORM	TOTAL LENGTH (m)	
					Y10	Y12
1	12	22	3050			67.10
2	12	22	1800			39.60
3	10	32	1400		44.80	
4	10	32	400		12.80	
5	10	128	900		115.20	
TOTAL LENGTH (m)					172.80	106.70
UNIT WEIGHT (Kg/m)					0.617	0.889
WEIGHT (Kg)					106.7	94.8
T. WEIGHT (kg)					201.5	



COLUMN TYPES AND DETAILS



NOTES:

- Design is to BS 8110
- Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:
  - Foundation 30(25)
  - Columns 30(20)
  - Beams & Slabs 30(20)
- Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
- Cover to reinforcement shall be the following: 50mm(bottom) 75mm(sides) Foundation: 25mm Columns: 25mm Beams: 25mm Slabs: 20mm
- Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
- Dimensions are in millimetres (mm) and must not be scaled at any time.
- Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m<sup>2</sup>
- This design engineer will not take responsibility for any job not supervised by him.

**Project:**  
PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

**Client:**  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

**Drawing Title:**

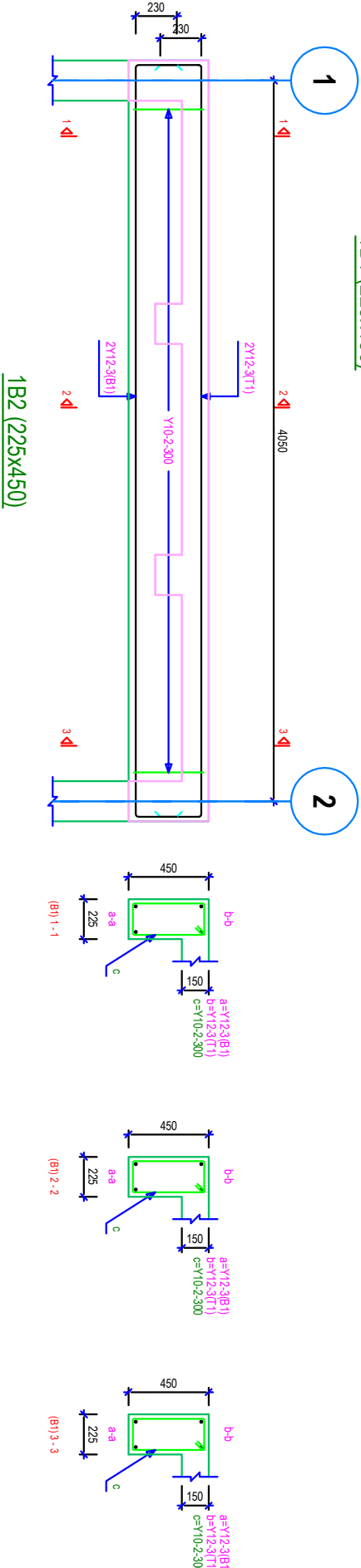
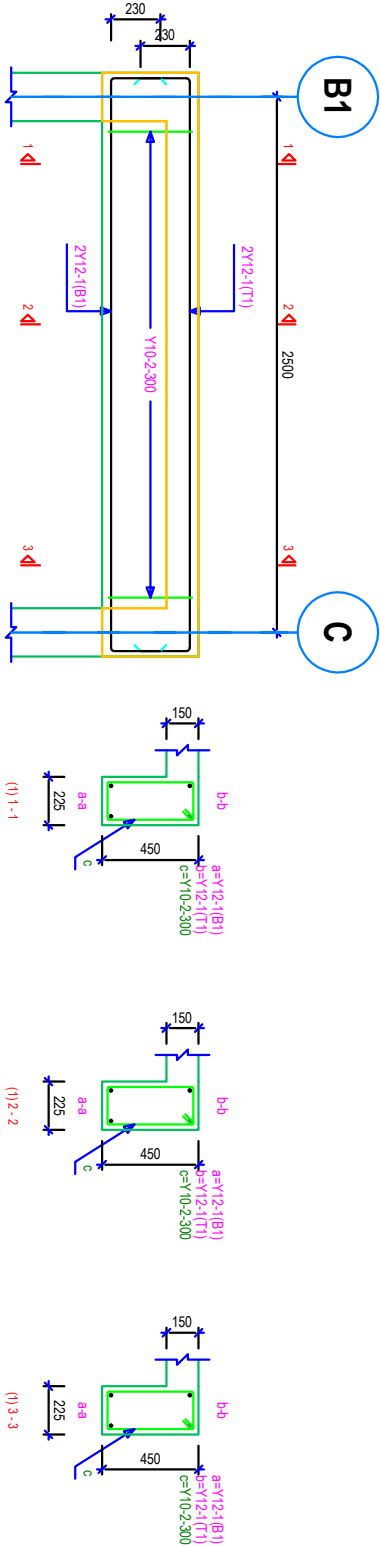
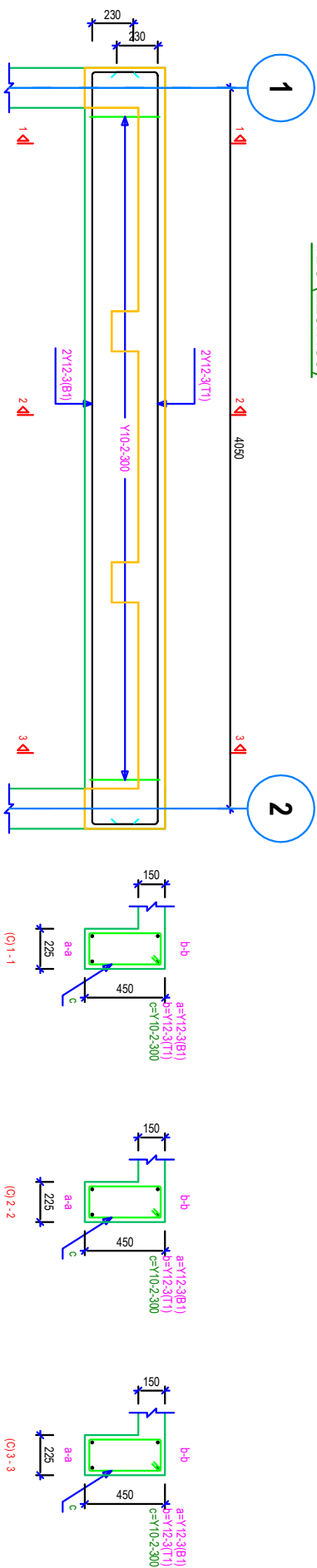
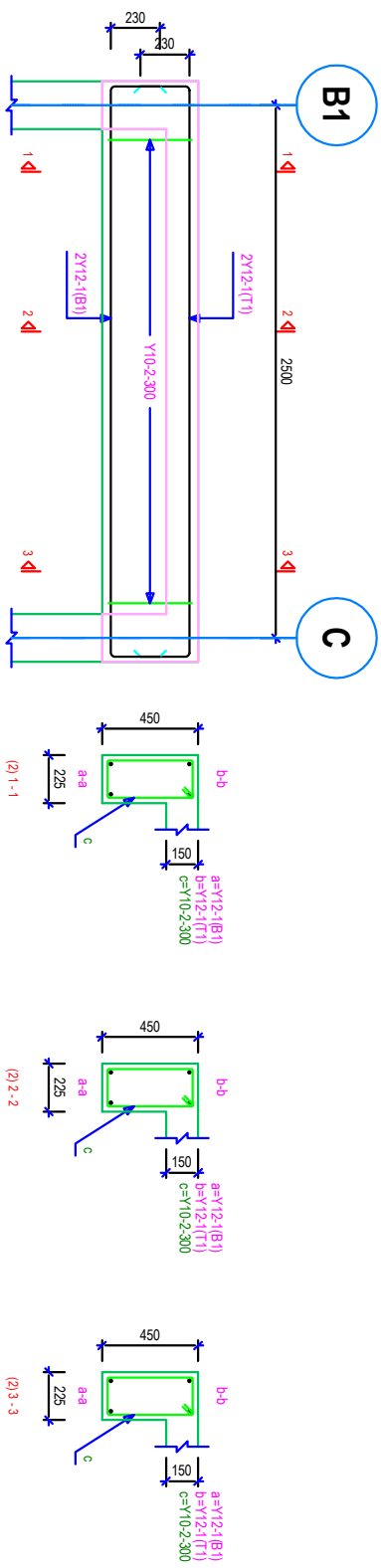
ROOF BEAM DETAILS

**Scale** 1:50

**Date** MARCH, 2021

**Project Name.** SCHOOL V.I.P TOILET

**Drawing No.** SWD/05

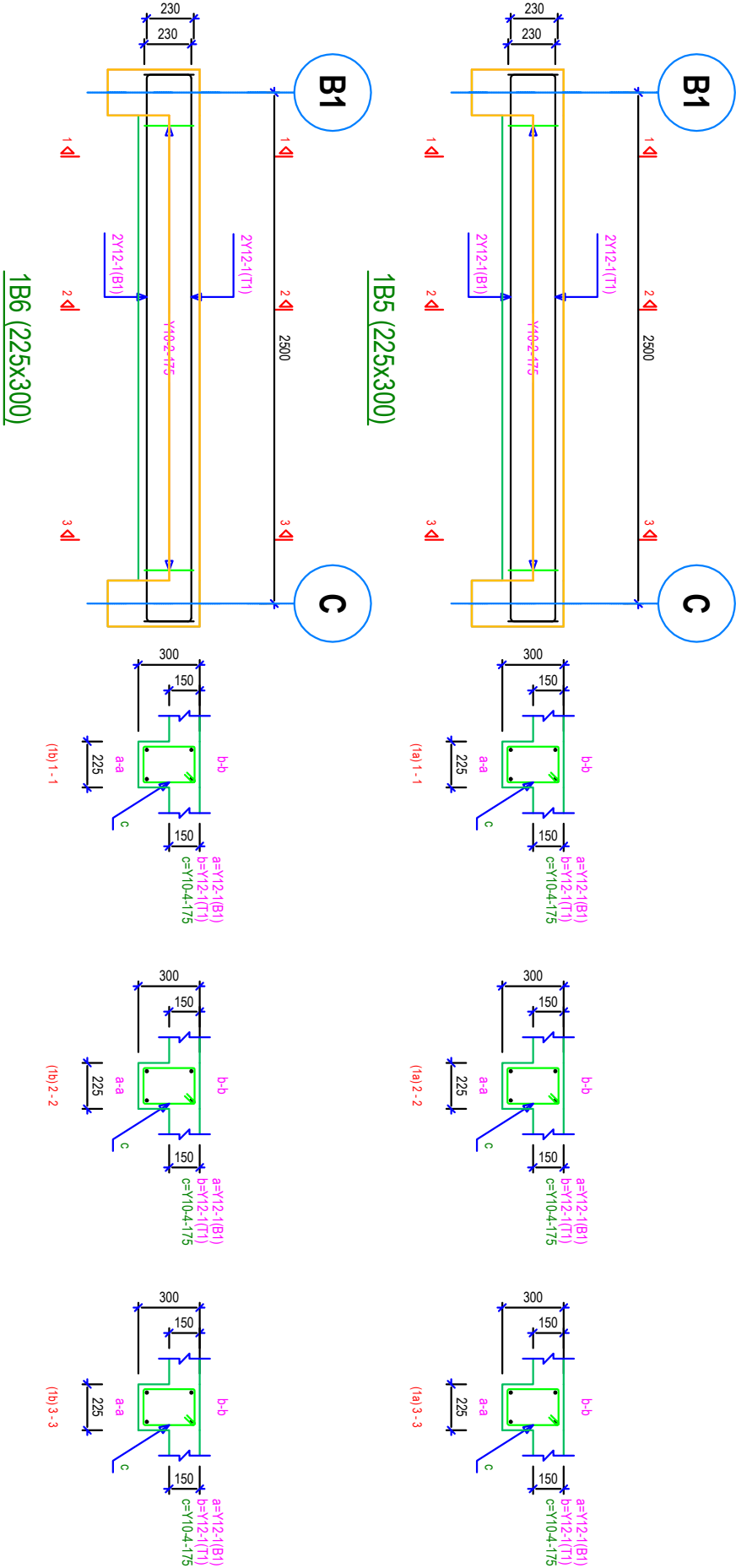
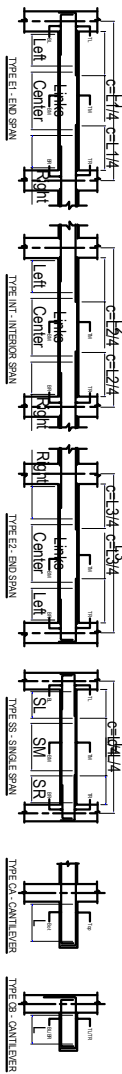


# ROOF BEAMS DETAIL



BEAM ELEVATIONS QUANTITY TAKE OFF - STOREYS: [0] [1]				
BM	SIZE	QTY	Length (mm)	TOTAL LENGTH (m)
1	12	16	3150	Y10 50.40
2	10	46	1400	64.40
3	12	8	4700	37.60
4	10	28	1100	30.80
TOTAL LENGTH (m)			96.20	88.00
UNIT WEIGHT (kg/m)			0.617	0.889
WEIGHT (kg)			58.8	78.2
T. WEIGHT (kg)				137.0

Concrete Beam Rebar Schedule [0] [1]									
Beam		Top Reinforcements			Bottom Reinforcements			Links	Side Bars
Mark	Width (mm)	Depth (mm)	Span (mm)	Type	Left	Center	Right	Left	Center
1B1	225	450	2510	SS	2Y12			2Y12	Y10-300
1B2	225	450	4050	SS	2Y12			2Y12	Y10-300
1B3	225	450	2510	SS	2Y12			2Y12	Y10-300
1B4	225	450	4050	SS	2Y12			2Y12	Y10-300
1B5	225	300	2510	SS	2Y12			2Y12	Y10-175
1B6	225	300	2510	SS	2Y12			2Y12	Y10-175
Remarks									
Similar									



Codes	
BS8110:1987 BS6399	
Soil Parameters	
Soil Bearing Capacity (kN/m <sup>2</sup> )	200.00
Subgrade Reaction (kN/m <sup>3</sup> )	50000.000
Material Properties (Default)	
Material	Rebar Grade
Columns	C20/25
Walls	C20/25
Beams	C20/25
Slabs	C20/25
Footings	C20/25
Links	C20/25

#### NOTES:

- Design is to BS 8110
- Concrete grades are to be as follows with figures in bracket denoting maximum size aggregate:
  - Foundation 30(25)
  - Columns 30(20)
  - Beams & Slabs 30(20)
- Unless otherwise indicated, reinforcement shall be high yield steel (type 2), denoted by 'Y' having characteristic strength not less than 410N/mm<sup>2</sup>
- Cover to reinforcement shall be the following:
  - Foundation: 50mm(bottom) 75mm(sides)
  - Columns: 25mm
  - Beams: 25mm
  - Slabs: 20mm
- Drawings must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
- Dimensions are in millimetre(mm) and must not be scaled at any time
- Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m<sup>2</sup>
- This design engineer will not take responsibility for any job not supervised by him.

#### Project:

PROPOSED RESIDENTIAL DEVELOPMENT,  
AT  
NGARANNAM,MAFA LGA, BORNO STATE.

Client:  
UNITED NATIONS DEVELOPMENT PROGRAMME, UNDP.

#### Drawing Title:

#### ROOF BEAM DETAILS

Scale	1:50
Date	MARCH, 2021
Project Name.	SCHOOL V.I.P TOILET
Drawing No.	<b>SWD/05</b>

# ROOF BEAMS DETAIL CONT.