GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FORESTS & CLIMATE CHANGE
CIVIL CONSTRUCTION UNIT, CEDIII,
I Floor, 'D' Wing, KORAMANGALA,
KENDRIYA SADAN, BANGALORE -560 034.
☎: 080 25539464, 25539464 Email ID. eeced3ccu-mef@gov.in

No. 23 (6) (3) / CED III / 2025/ 618 **Date:** 20/ 06 /2025

MINUTES OF PRE-BID MEETINGS

Name of work: Construction of Green Building and Other Amenities for Eastern Ghats Regional Centre, Zoological Survey of India at Amaravati, Andhra Pradesh.

(NIT No. 1/2025-26/CE/CCU/CED-III/AMARAVATI)

The pre-bid meeting for the above-mentioned work was held in the office of Chief Engineer, CCU, 7th Floor, Pt. Deendayal Antyodaya Bhawan, CGO Complex, Lodhi Road, New Delhi- 110003 at 11:00 Hrs on 20.06.2025. Following officers and bidders attended the pre-bid meeting-

1) Shri Gunsagar Jain, Chief Engineer, CCU
2) Shri Mukesh Kumar, Superintending Engineer, CCU
3) Smt. Vibhuti Panjiyar, Under Secretary, MoEF&CC
4) Shri K. C. Pant, Executive Engineer (P), CCU
5) Shri Vineet Mishra, Executive Engineer (E)(P), CCU
6) Shri K. Jagadeesh, Executive Engineer, CED- III, CCU
7) Shri Rakesh Kumar, Assistant Engineer(P)-II, CCU
8) Shri Sadanand Ojha, Consultant, M/s Swati Structure Pvt. Ltd.
9) Shri Murali Krishna Vaddi, M/s Navya Construction.

The query from M/s Priya Engineering Projects Pvt Limited was received through email wherein some queries were raised by representative of M/s Navya Construction for clarifications. The clarifications are issued as under: -

S. No.	Reference to NIT page No.	Clause	Queries/ Observations	Clarification/reply
	M/s Priya Engineering Projects Pvt Limited			
1			1) Provide plot layout & structural drawing. 2) Pile layout drawing, pile depth and Soil investigation report.	Drawings (Pdf) are available on website.
	M/s Navya Construction			
2			Requested to upload Architectural and Structural Drawings	Drawings (Pdf) are available on website.

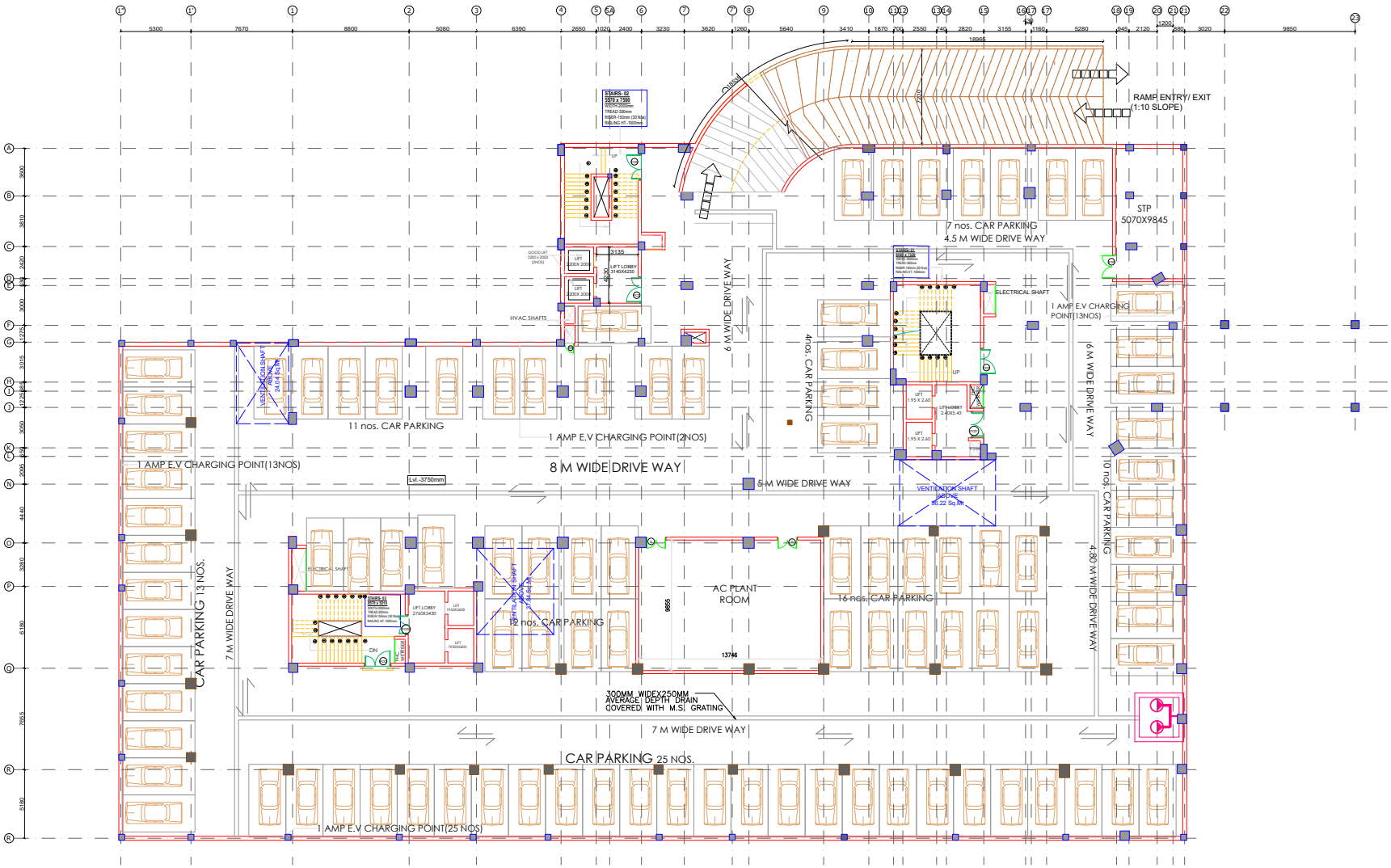
All other terms and condition of the NIT shall remain unchanged. The minutes of pre-bid meeting shall form part of bid documents.

20/06/25
Executive Engineer
CED-III, CCU, Bangalore

Copy to:

1. The Chief Engineer, CCU, MoEF&CC, New Delhi.
2. The Superintending Engineer, CCU, MoEF&CC, New Delhi.
3. For website: https:etender.cpwd.gov.in, https:moef.gov.in, https:zsi.gov.in
4. Original NIT

20/06/25
Executive Engineer
CED-III, CCU, Bangalore



BASEMENT PLAN

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DRAWINGS ARE NOT TO BE SCALED.
3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY

S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

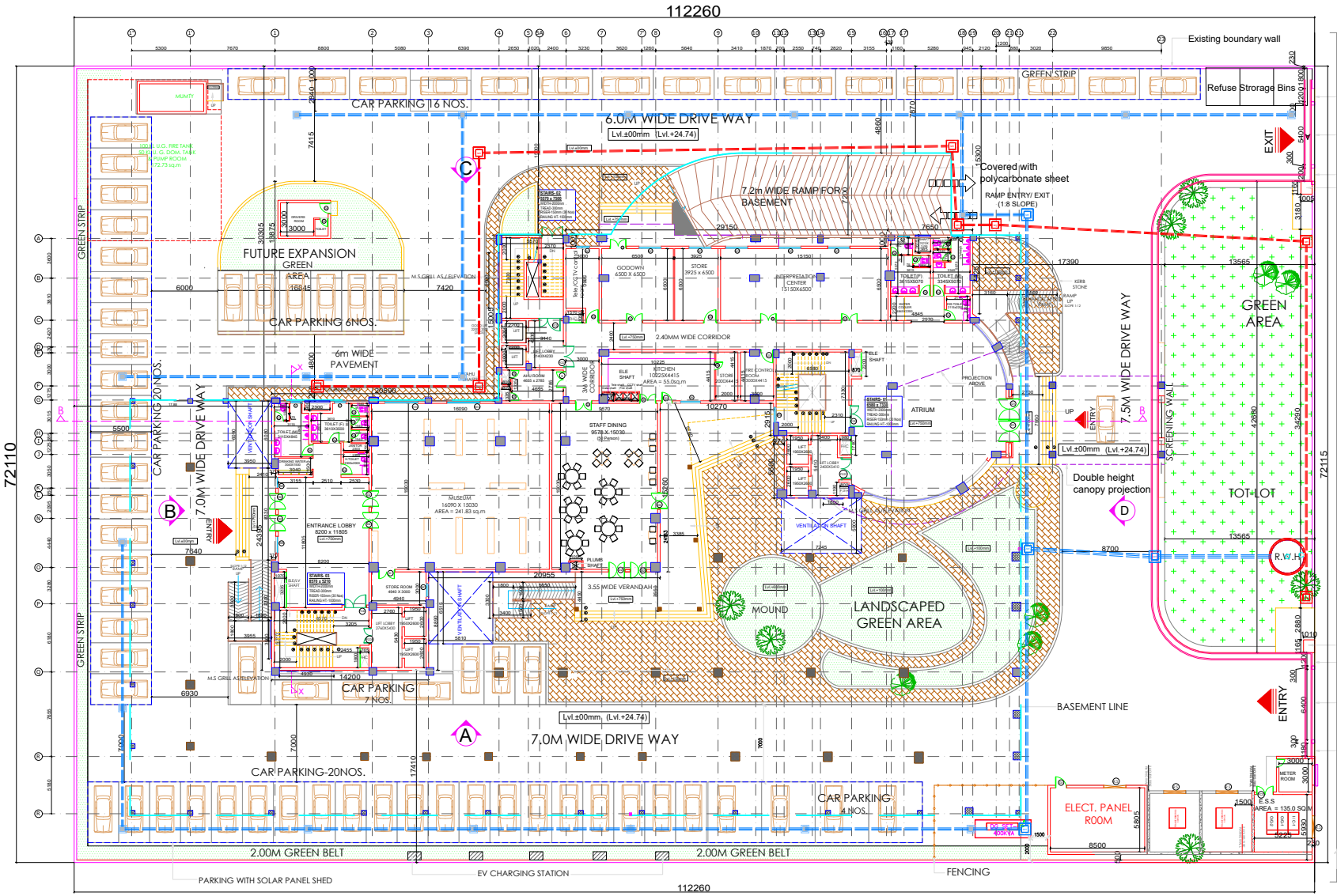
SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :

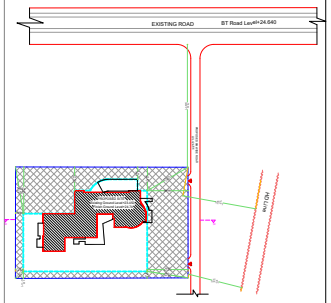
BASEMENT

NORTH :

DEALT BY :- VIKAS	DATE :-15.03.2025
CHECKED BY :- SWASTI	REV : 02
DRG. NO. : 0224/SSSPL/EGRC/AMRA/AR-01	SHEET NO. : 01



GROUND FLOOR PLAN



SCHEDULE OF DOORS & WINDOWS					
S.No.	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD'	2000X2400	–	2400	Fire Checked Door
3.	FCD1	1500X2400	–	2400	Fire Checked Door
4.	STP	1800X2400	–	2400	flush Door
5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

NOTE- NATURAL GROUND IS ABOUT 1.50 M BELOW ADJACENT ROAD LEVEL. HENCE PLINTH LEVEL IS 750 MM ABOVE ADJACENT ROAD LEVEL I.E., 2.25M ABOVE NATURAL GROUND LEVEL

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DRAWINGS ARE NOT TO BE SCALED.
3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY		
S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI 'CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :
SITE PLAN
with Ground Floor Plan

NORTH :

DEALT BY :- VIKAS

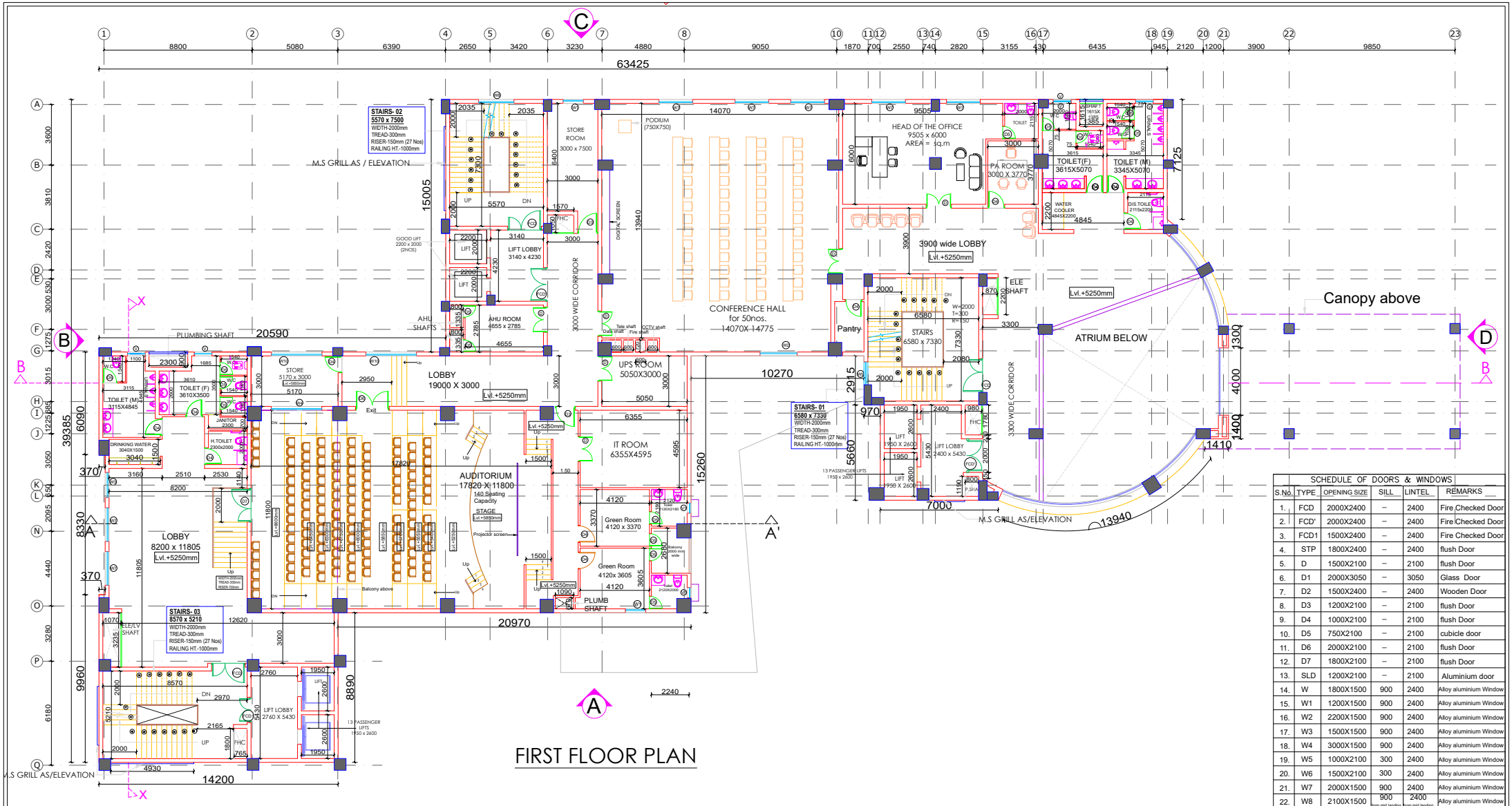
DATE :-15.03.2025

CHECKED BY :- SWASTI

REV : 02

DRG. NO. :
0224/SSSPL/EGRC/AMRA/AR-02

SHEET NO. : 02



SCHEDULE OF DOORS & WINDOWS

S.NO.	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD'	2000X2400	–	2400	Fire Checked Door
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5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DRAWINGS ARE NOT TO BE SCALED.
3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY

S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :

FIRST FLOOR PLAN

NORTH :

DEALT BY :- VIKAS

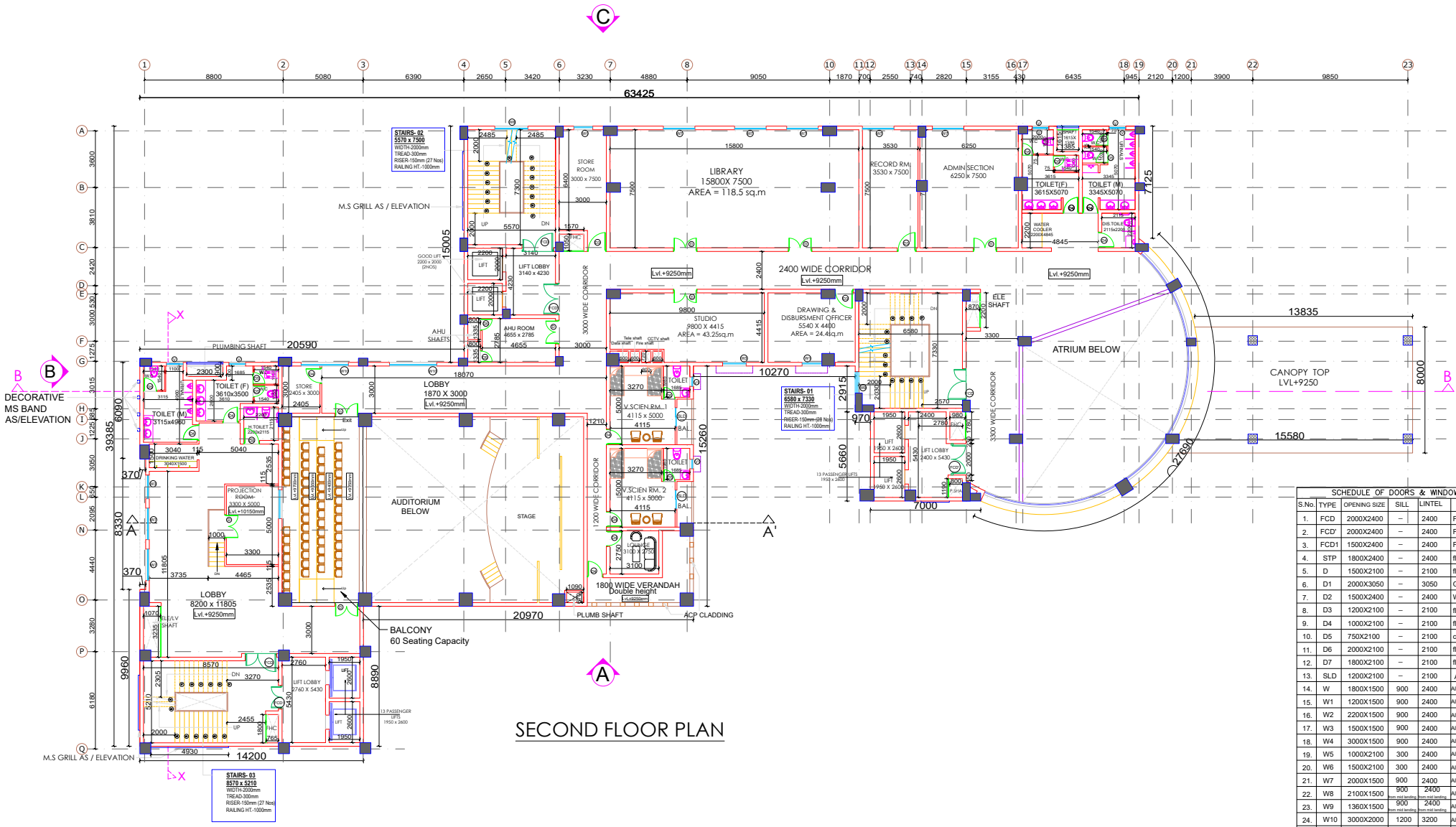
DATE :-15.03.2025

CHECKED BY :- SWASTI

REV :R2

DRG. NO. : 0224/SSSPL/EGRC/AMRA/AR-03

SHEET NO. : 03



SCHEDULE OF DOORS & WINDOWS					
S.No.	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD'	2000X2400	–	2400	Fire Checked Door
3.	FCD1	1500X2400	–	2400	Fire Checked Door
4.	STP	1800X2400	–	2400	flush Door
5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

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3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY		
S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :
SECOND FLOOR PLAN

NORTH :

DEALT BY :- VIKAS

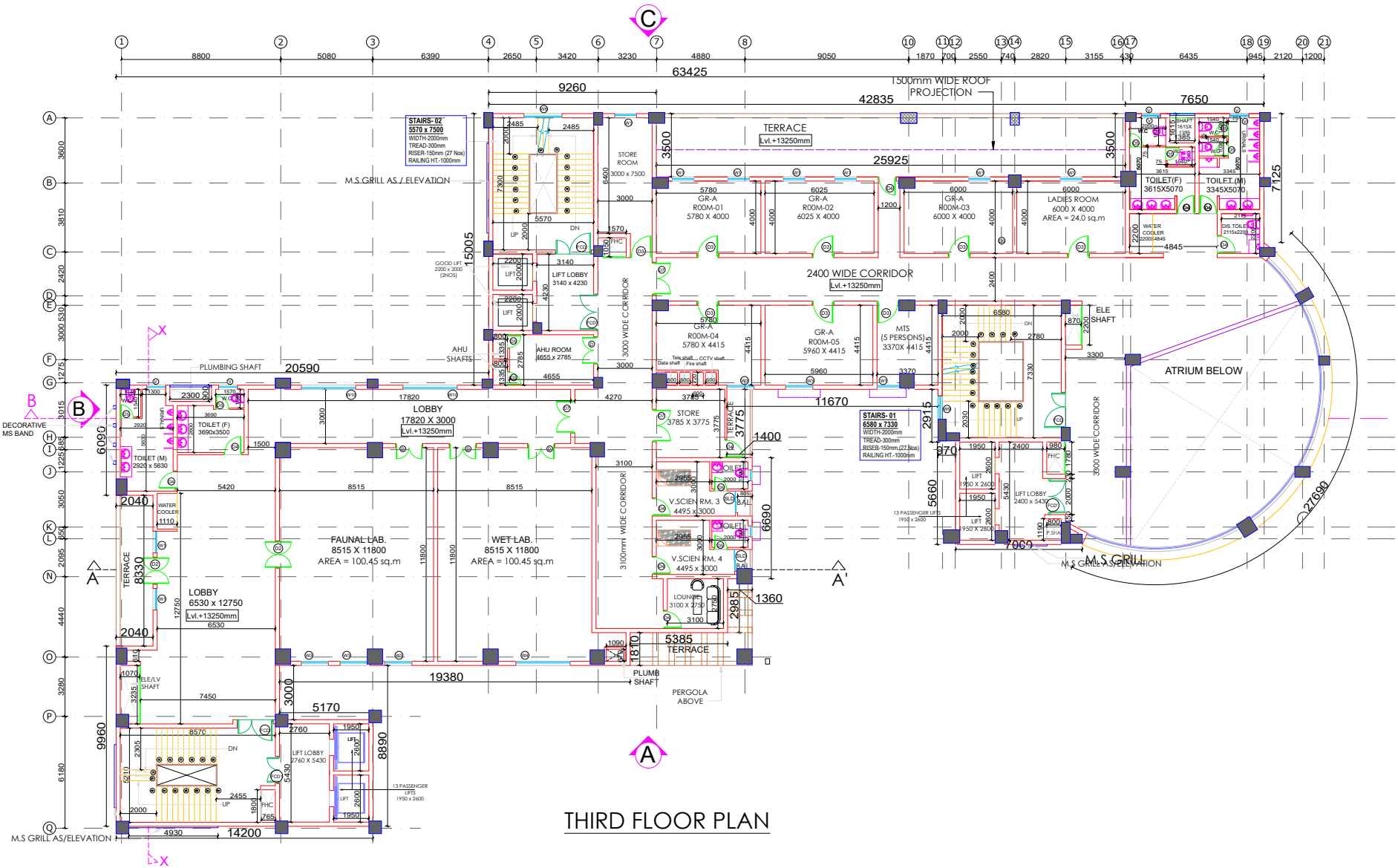
DATE :-15.03.2025

CHECKED BY :- SWASTI

REV :R2

DRG. NO. :
0224/SSSPL/EGRC/AMRA/AR-04

SHEET NO. : 04



SCHEDULE OF DOORS & WINDOWS					
S.No.	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD'	2000X2400	–	2400	Fire Checked Door
3.	FCD1	1500X2400	–	2400	Fire Checked Door
4.	STP	1800X2400	–	2400	flush Door
5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
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3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY		
S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :
THIRD FLOOR PLAN

NORTH :

DEALT BY :- VIKAS

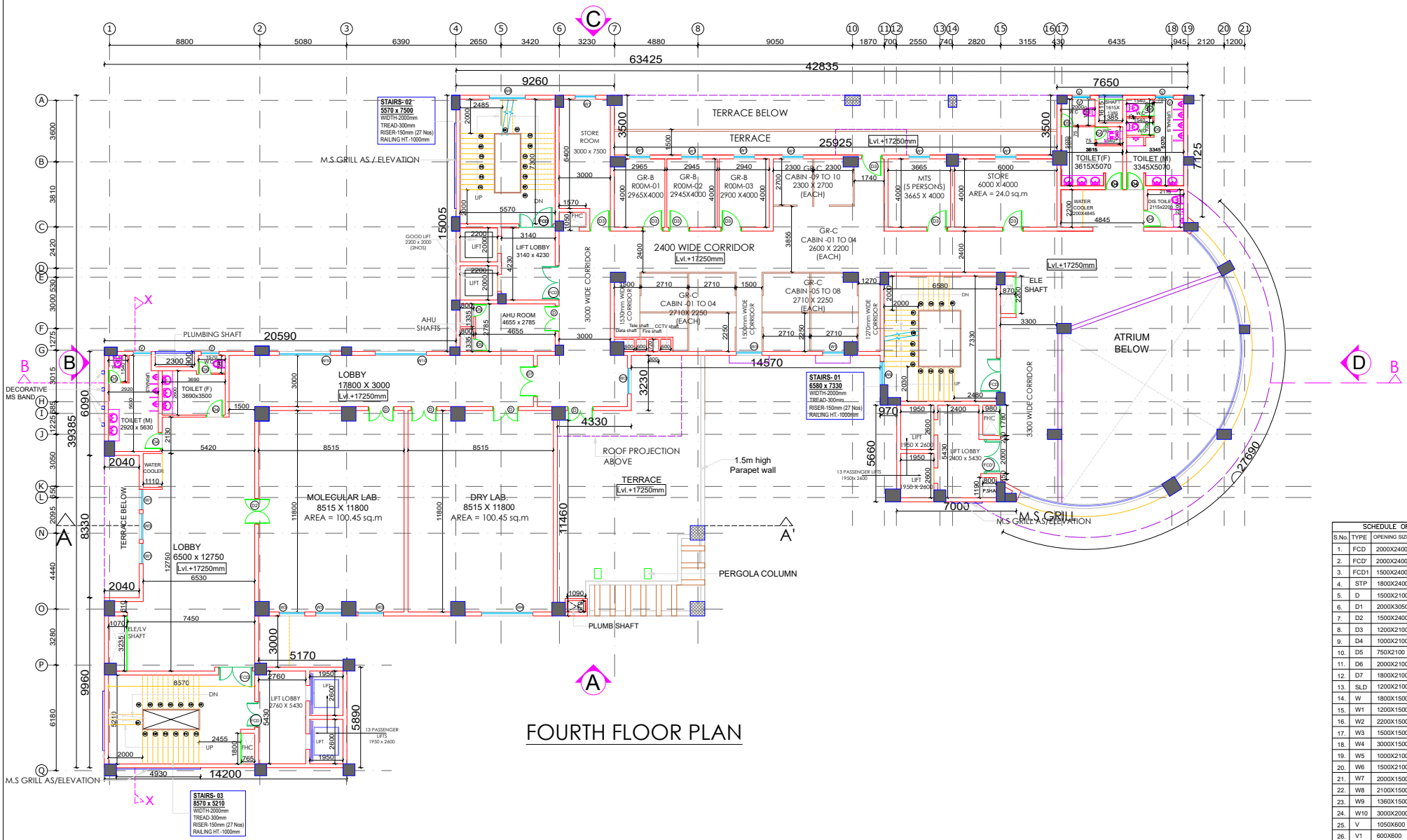
DATE :- 15.03.2025

CHECKED BY :- SWASTI

REV : 02

DRG. NO. :
0224/SSSPL/EGRC/AMRA/AR-05

SHEET NO. : 05



FOURTH FLOOR PLAN

SCHEDULE OF DOORS & WINDOWS					
S.No.	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD'	2000X2400	–	2400	Fire Checked Door
3.	FCD1	1500X2400	–	2400	Fire Checked Door
4.	STP	1800X2400	–	2400	flush Door
5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DRAWINGS ARE NOT TO BE SCALED.
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REVISION HISTORY		
S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :

FOURTH FLOOR PLAN

NORTH :

DEALT BY :- VIKAS

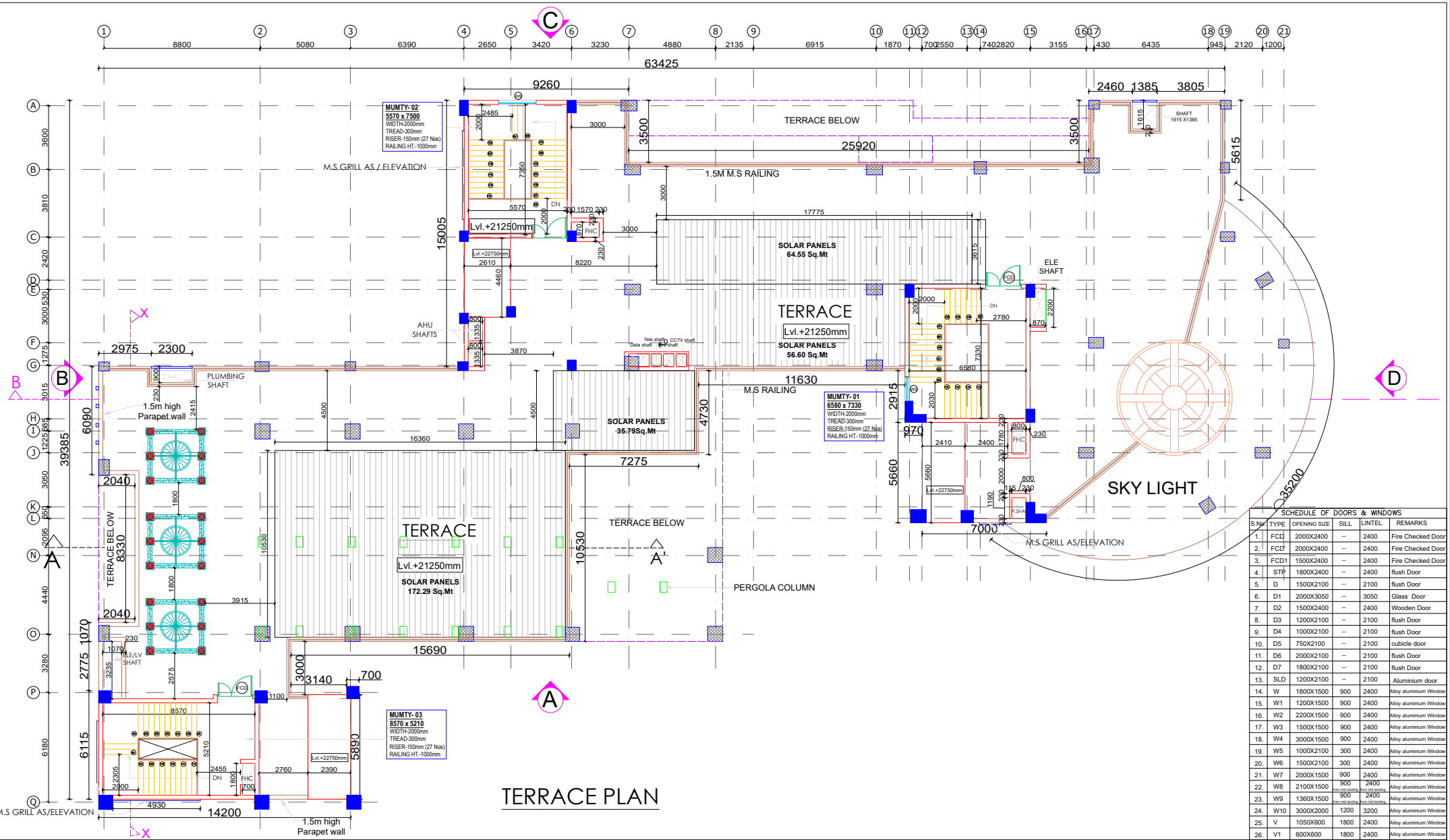
DATE :- 15.03.2025

CHECKED BY :- SWASTI

REV : 02

DRG. NO. :
0224/SSSPL/EGRC/AMRA/AR-06

SHEET NO. : 06



TERRACE PLAN

SCHEDULE OF DOORS & WINDOWS

S.No	TYPE	OPENING SIZE	SILL	LINTEL	REMARKS
1.	FCD	2000X2400	–	2400	Fire Checked Door
2.	FCD	2000X2400	–	2400	Fire Checked Door
3.	FCD1	1500X2400	–	2400	Fire Checked Door
4.	STP	1800X2400	–	2400	flush Door
5.	D	1500X2100	–	2100	flush Door
6.	D1	2000X3050	–	3050	Glass Door
7.	D2	1500X2400	–	2400	Wooden Door
8.	D3	1200X2100	–	2100	flush Door
9.	D4	1000X2100	–	2100	flush Door
10.	D5	750X2100	–	2100	cubicle door
11.	D6	2000X2100	–	2100	flush Door
12.	D7	1800X2100	–	2100	flush Door
13.	SLD	1200X2100	–	2100	Aluminium door
14.	W	1800X1500	900	2400	Alloy aluminium Window
15.	W1	1200X1500	900	2400	Alloy aluminium Window
16.	W2	2200X1500	900	2400	Alloy aluminium Window
17.	W3	1500X1500	900	2400	Alloy aluminium Window
18.	W4	3000X1500	900	2400	Alloy aluminium Window
19.	W5	1000X2100	300	2400	Alloy aluminium Window
20.	W6	1500X2100	300	2400	Alloy aluminium Window
21.	W7	2000X1500	900	2400	Alloy aluminium Window
22.	W8	2100X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
23.	W9	1360X1500	900 from mid landing	2400 from mid landing	Alloy aluminium Window
24.	W10	3000X2000	1200	3200	Alloy aluminium Window
25.	V	1050X600	1800	2400	Alloy aluminium Window
26.	V1	600X600	1800	2400	Alloy aluminium Window

NOTES:-

1. ALL DIMENSIONS & LEVELS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
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3. ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.

REVISION HISTORY

S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :
TERRACE FLOOR PLAN

NORTH :

DEALT BY :- VIKAS

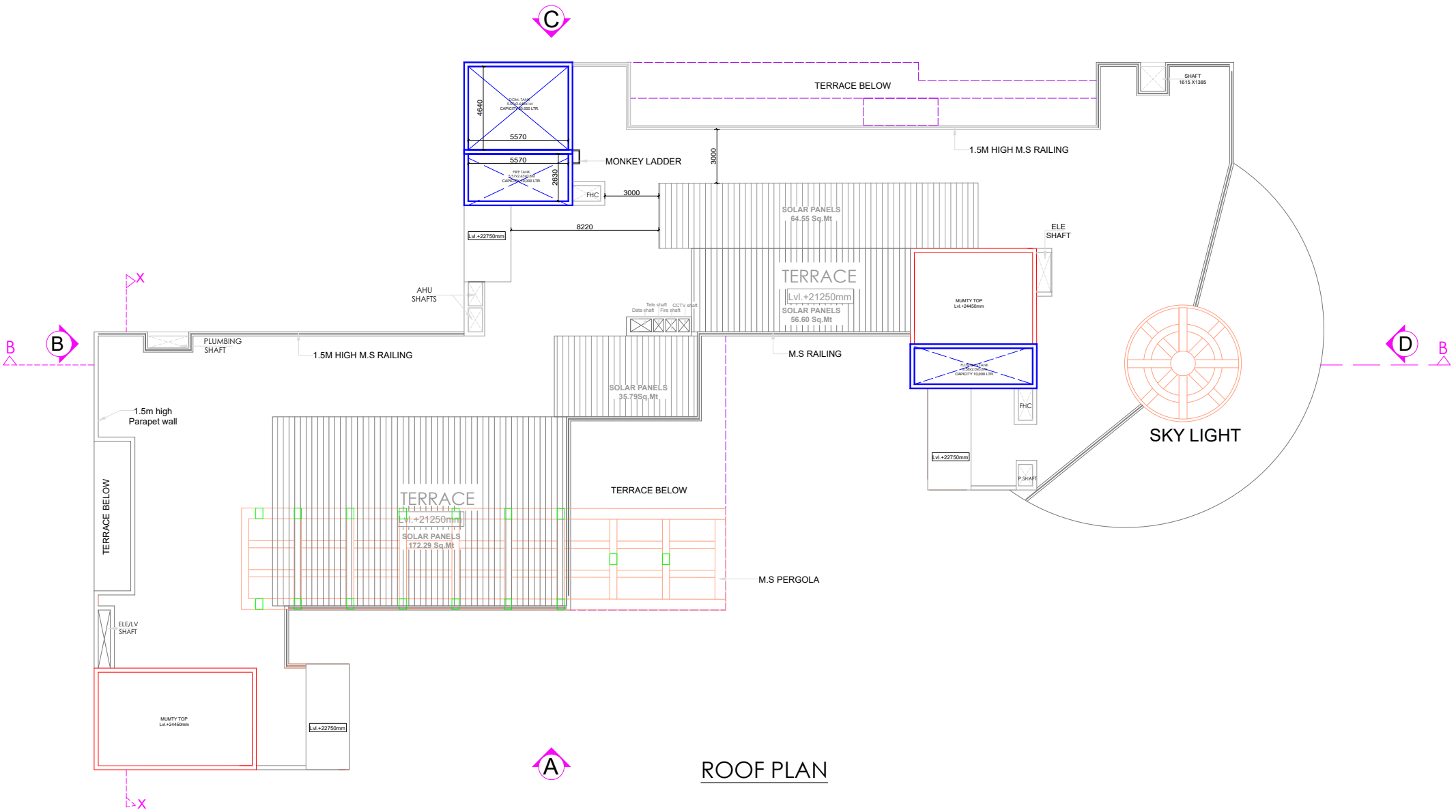
DATE :- 15.03.2025

CHECKED BY :- SWASTI

REV : 02

DRG. NO. :
0224/SSSPL/EGRC/AMRA/AR-07

SHEET NO. : 07



ROOF PLAN

NOTES:-

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REVISION HISTORY

S.NO.		DESCRIPTION

CLIENT:-

EXECUTIVE ENGINEER CED III, CCU, 1ST FLOOR, 'D' WING ,KENDRIYA SADAN, KORAMANGALA,BANGLORE - 560034.

PROJECT:-

'FOR ZSI' CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI, ANDHRA PRADESH.

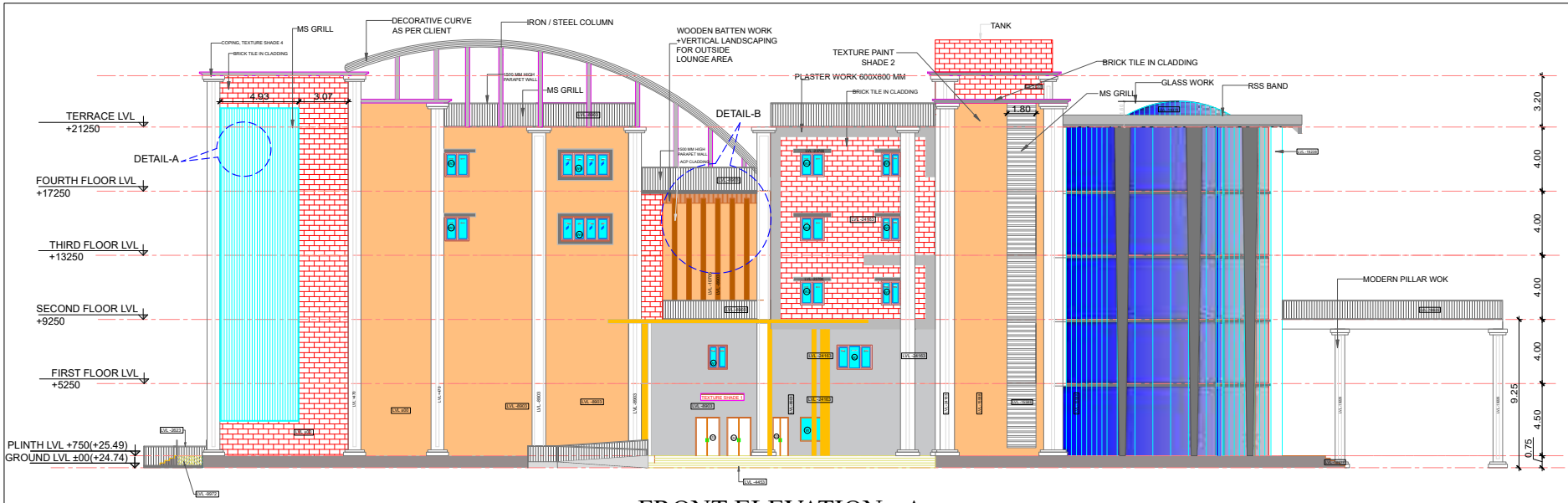
PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

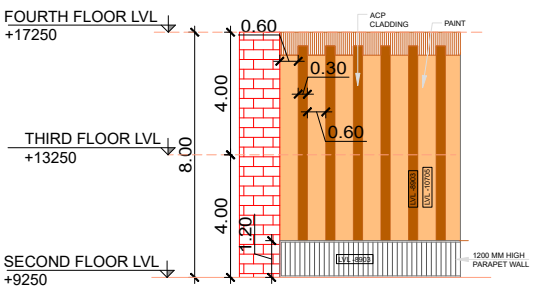
DRAWING TITLE : ROOF PLAN

NORTH :

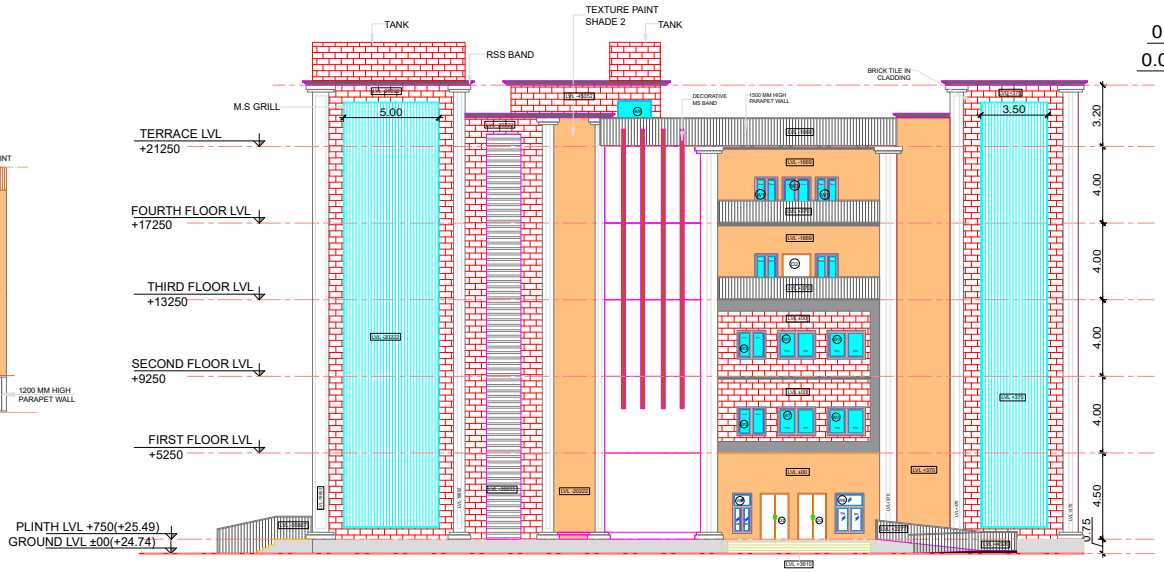
DEALT BY :- VIKAS	DATE :-15.03.2025
CHECKED BY :- SWASTI	REV : 02
DRG. NO. : 0224/SSSPL/EGRC/AMRA/AR-08	SHEET NO. : 08



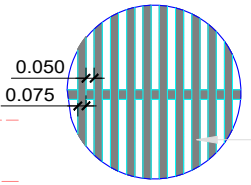
FRONT ELEVATION - A



DETAIL -B



SIDE ELEVATION - B



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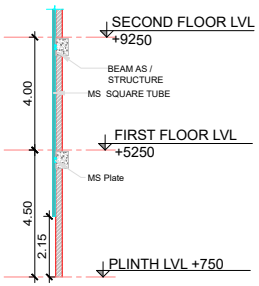

MS GRILL FIXING DETAIL

NOTES:-

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REVISION HISTORY

S.NO.	DATE	DESCRIPTION

CLIENT:-

THE CHIEF ENGINEER,
CCU, MINISTRY OF ENVIRONMENT,
CGO COMPLEX,
LODHI ROAD,
NEW DELHI

PROJECT:-

'FOR ZSI'CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES
FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI,
ANDHRA PRADESH.

PROJECT CONSULTANT:-

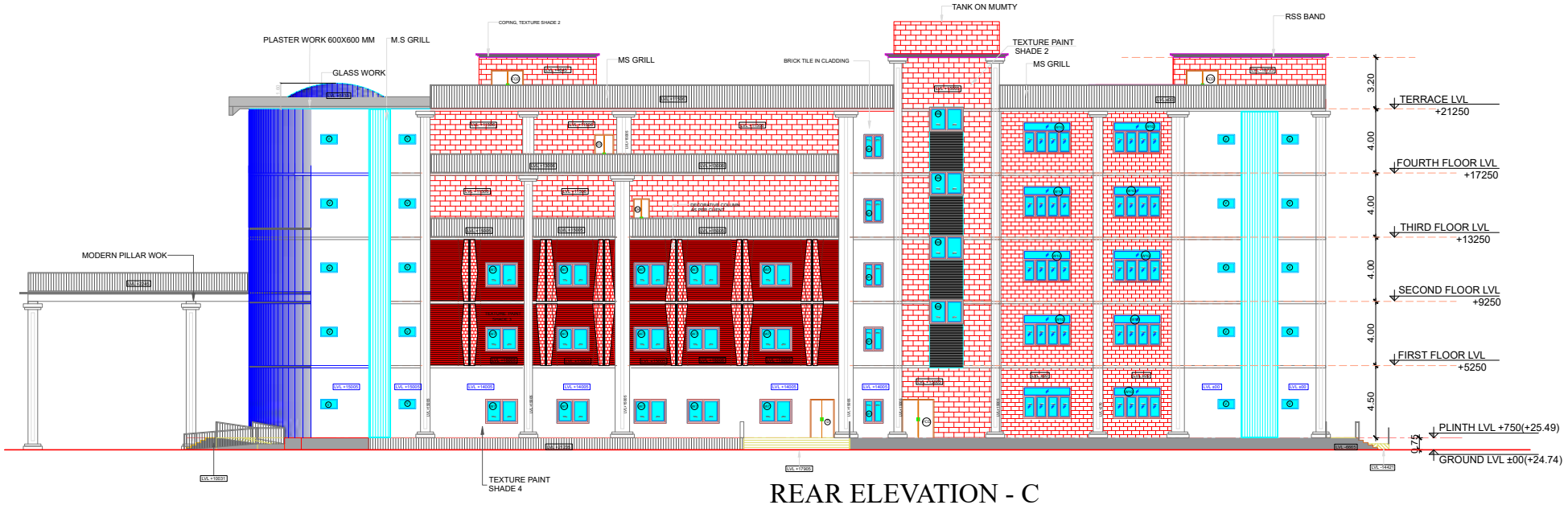
SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :

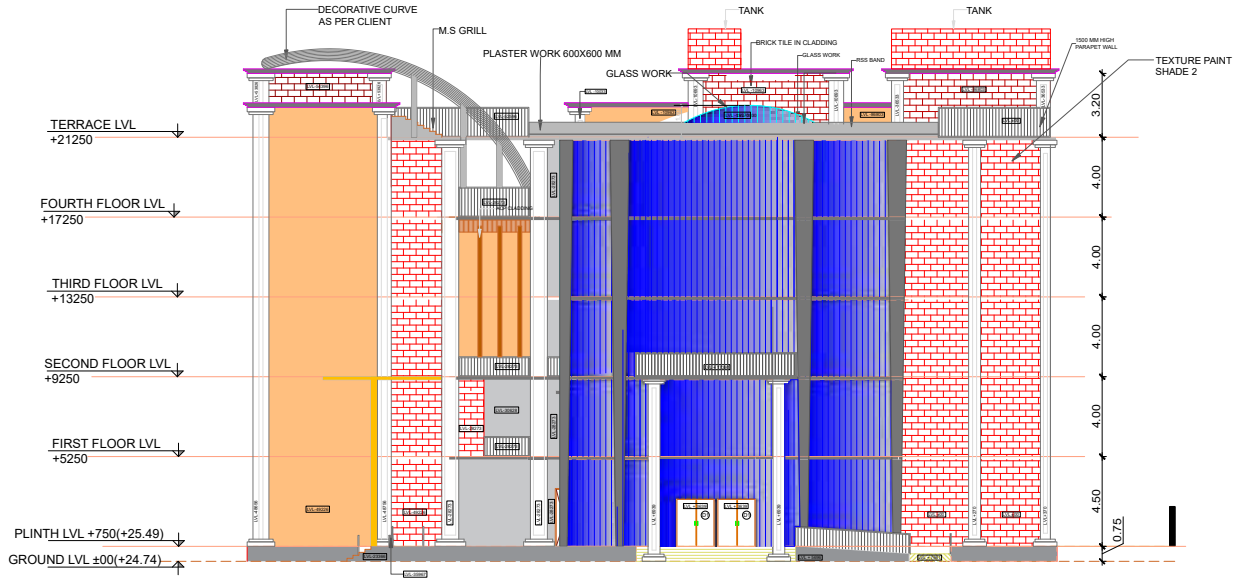
ELEVATION-A & B

NORTH :

DEALT BY :- VIKAS	DATE :-15.03.2025
CHECKED BY :- SWASTI	REV : R2
DRG. NO. : 0224/SSSPL/EGRC/AMRA/AR-10	SHEET NO. : 10



REAR ELEVATION - C



RIGHT SIDE ELEVATION - D

NOTES:-

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REVISION HISTORY

S.NO.	DATE	DESCRIPTION

CLIENT:-

THE CHIEF ENGINEER,
CCU, MINISTRY OF ENVIRONMENT,
CGO COMPLEX,
LODHI ROAD,
NEW DELHI

PROJECT:-

'FOR ZSI'CONSTRUCTION OF GREEN BUILDING AND OTHER AMENITIES
FOR EASTERN GHATS REGIONAL CENTRE AT AMARAVATI,
ANDHRA PRADESH.

PROJECT CONSULTANT:-

SWATI STRUCTURE SOLUTIONS PVT. LTD.
503, SACHDEVA CORPORATE TOWER,
PLOT NO-8, SECTOR-8 ROHINI, DELHI-85
Ph. 47528888
E-mail:-swaticonsultant@gmail.com

DRAWING TITLE :

ELEVATION-C & D

NORTH :

DEALT BY :- VIKAS

DATE :- 15.03.2025

CHECKED BY :- SWASTI

REV : R2

DRG. NO. : 0224/SSSPL/EGRC/AMRA/AR-11

SHEET NO. : 11

NAME OF WORK: GEOTECHNICAL SOIL INVESTIGATION FOR FOUNDATION OF MULTI STORIED BUILDING WITH B+G+4 FLOORS FOR EGRC, ZOOLOGICAL SURVEY OF INDIA AT SURVEY NO: 205, 61 & 62, RAYAPUDI VILLAGE, GUNTUR DISTRICT OF ANDHRA PRADESH.

GEOTECHNICAL REPORT

CLIENT: -

EXECUTIVE ENGINEER
CED III, CCU, 1ST FLOOR, 'D' WING,
KENDRIYA SADAN, KORAMANGALA,
BANGLORE - 560034.

SOIL CONSULTANT:-

M/S SWATI STRUCTURE SOLUTIONS PVT. LTD.
KH NO.7/9, GROUND FLOOR, NANGLOI,
JAT HARSUKH BLK, PREM NAGAR,
DELHI- 110041

TABLE OF CONTENTS

ABBREVIATION

BH	Borehole
IS	Indian standard
N Values	No of blows/30cm from standard penetration test
γ_d	Dry Density of Soil
N_m	Uncorrected SPT blow count
Q_{ab}	Allowable Net Bearing capacity
C	Cohesion in N/mm^2
B	Width of footing in m
D	Depth of Foundation in m
G	Specific Gravity
e	Void ratio
d_q, dr, d_c	Depth factors
S_q, S_c, $S\gamma$	Shape factors
I_q, Ir, I_c	Inclination factors
N'c, N'q, N'r,	Bearing capacity factor
q	Total surcharge at the base level of foundation
W'	Water table correction factor
Φ	Angle of shearing resistance of soil
N_R	Recorded standard penetration value
N_C	Corrected standard penetration value
k	Modulus of sub-grade reaction
EGL	Existing Ground Level
Qu	Ultimate bearing capacity
qs	Safe Bearing Capacity

1.0 INTRODUCTION

The work of Geotechnical Soil Investigation for Foundation of multi storied Building with B+G+4 Floors for EGRC, Zoological survey of India at Survey No: 205, 61 & 62, Rayapudi Village, Guntur District of Andhra Pradesh has been assigned to M/S Swati Structure Solutions Pvt. Ltd., having its address at KH No.7/9, Ground floor, Nangloi, Jat Harsukh BLK, Prem nagar, Delhi- 110041. The report presents the details of field investigation carried out and the results obtained from various fields and laboratory tests based on computation. Foundation analysis has been done and recommendation has been made as regards to suitable type of foundations to be provided for the proposed structure.

2.0 SCOPE OF WORK

a) Mobilization and demobilization of all relevant men and machinery including all T&P required for carrying out soil investigation work as per direction of Engineer-in-charge.
b) Drilling 2 Nos. Bore holes up to the depth of 30m or refusal whichever is earlier below the ground surface by shell and auger method.
c) Conducting Standard Penetration Test at 1.50m regular interval as per Indian Standard Specification.
d) Collection of disturbed and undisturbed soil samples from the bore holes at regular interval of 1.50m or change of strata.
e) Carrying out lab test to find physical properties of sub soil strata.
f) Recording of water table level in the bore hole after completion of bore hole.
g) Preparation and submission of report incorporating all the data obtained from the field and laboratory tests.
h) Evaluation of SBC based on shear & settlement Criteria.

3.0 LOCATION OF BORE HOLES

Two nos. of bore holes are drilled at the proposed site. All the test locations are given by the client.

4.0 FIELD INVESTIGATION

4.1 Grain size distribution of soil at various depths has been carried out and grain size distribution curve is drawn. The soil type and shear parameters as obtained in the various bore-hole are given in the table below:

Bore Hole (BH) No.	Subsoil Layers	Soil Type	Shear Parameters	
			Cohesion c in KN/m^3	Action of friction (in Degree)
BH-1	Layer-1 (0.0m to 6.0m)	Brownish Plastic Clay	43	-
	Layer-2 (6.0m to 10.0m)	Dark Brown Plastic Clay	100	-
	Layer-3 (10.0m to 14.0m)	Yellowish Brown Sand	15	30^0
	Layer-4 (14.0m to 26.0m)	Yellowish With Sandy Silty Clay	15	38^0
	Layer-5 (26.0m to 30.0m)	Yellowish SDR	10	42^0
BH-2	Layer-1 (0.0m to 7.0m)	Dark Brown Plastic Clay	38	-
	Layer-2 (7.0m to 15.0m)	Yellowish Red Sandy Silty Clay	15	30^0
	Layer-3 (15.0m to 20.0m)	Yellowish With Sandy Silty Clay	15	38^0
	Layer-4 (20.0m to 30.0m)	Yellowish Red Sandy Silty Clay	15	42^0

4.2 Subsurface Exploration

Subsurface Exploration was carried out in 2 no. of bore hole at site using rotary drilling. The depth of bore- hole was taken from the existing ground surface.

4.3 Boring

The bore holes of 150 mm dia. were drilled by using rotary drilling method to collect soil sample up to the specified depth.

4.5 Standard Penetration Test (SPT)

Standard penetration tests as per IS: 2131-1981 was conducted at the bore hole, each at 1.5m interval or change of strata. The tests were performed by using a standard split spoon sampler attached to 'A' rod placed at the test level in the bore hole. The sampler was driven to a depth of 45cm by means of a standard hammer weighing 63.5 Kg. falling freely through a vertical height of 75 cm. Blows required for each 15 cm

penetration (Total penetration 45cm) were recorded and the number of blows for last 30cm penetration of the sampler was taken as N values. Blows for first 15 cm penetration of the sampler in each test, were discarded owing to the possible disturbance of the strata during auguring operations. The observed and the corrected N SPT values (IS: 2131-1981) are given with graphical representation on and soil profile.

5.0 GROUND WATER TABLE

Water table was not encountered in the bore hole up to the depth of exploration.

6.0 LABORATORY TESTS

A visual and discrete examination of all the soil samples collected was carried out for deciding the number and type of tests as well as the number of samples to be tested from each bore hole. Based on the strata met at site the following tests were conducted on samples to classify them and to evaluate their index and Engineering properties

a) Grain size distribution
b) Bulk density and Moisture content
c) Direct Shear Test
d) Liquid limits and plastic limits
e) Specific Gravity

a) Grain Size Distribution

Grain size distribution of the soil is determined by sieving the soil sample in a set of IS sieves: 4.75mm, 2.36mm, 0.825mm, 0.6mm, 0.425mm, 0.30mm, 0.150mm, 0.075mm size. Grain Size Analysis curve has been plotted and attached in the appendices of this report for the soil samples collected from various depths of bore-holes.

b) Bulk Density And Natural Moisture Content

Undisturbed samples were collected from the boreholes in thin wall steel sample tubes by taking the dimensions and weight of these sample tubes, the bulk density of the soil is determined. Moisture content of the soil has been calculated by Oven Drying Method.

c) Direct Shear Test

A direct shear test is a laboratory or field test used by geotechnical engineers to measure the shear strength properties of soil or rock material, or of discontinuities in soil or rock masses. The test is performed on specimens from undisturbed soil sample. A specimen is placed in a shear box which has two stacked rings to hold the sample; the contact between the two rings is at approximately the mid-height of the sample. A confining stress is applied vertically to the specimen, and the upper ring is pulled laterally until the sample fails, or through a specified strain. The load applied and the strain induced is recorded at frequent intervals to determine a stress-strain curve for each confining stress. Several specimens are tested at varying confining stresses to determine the shear strength parameters, the soil cohesion (c) and the angle of internal friction (commonly friction angle) (ϕ). The results of the tests on each specimen are plotted on a graph with the peak (or residual) stress on the x-axis and the confining stress on the y-axis. The y-intercept of the curve which fits the test results is the cohesion, and the slope of the line or curve is the friction angle.

d) Atterberg Limits

Atterberg Limits in the form of liquid limit, plastic limit and shrinkage limit are determined for the soil to establish its consistency. In the case of cohesion less soil, plastic limit is first determined and if it cannot be determined the soil sample is reported to be non-plastic.

e) Specific Gravity

Specific Gravity of the soil has been determined by Specific Gravity Bottle.

7.0 STRENGTH CHARACTERISTICS OF SOIL

The strength of a material is defined as the greatest stress it can sustain. If the stress exceeds strength, failure occurs. Strength analysis can be performed for tensile, compressive and shear stresses. Since soil mass has very little or negligible tensile strength, hence tensile strength analysis is rarely performed. Normally the geometry of most geotechnical problems is such that the soil mass is in compression, but do not fail in compression. Although the introduction of large compressive stresses may result in

soil failure, the soil is actually failing in shear, not in compression. Therefore, nearly all geotechnical strength analysis is performed for shear stresses. The shear strength of a soil in any direction is the maximum shear stress that can be applied to the soil in that direction. It can also be defined as the resistance to deformation by continuous shear displacement of soil particles.

The shear strength of soil is basically made up of the following components:

(i) Frictional component:

It is mainly due to interlocking of soil particles and the friction between them.

(ii) Cohesion component:

It is due to mutual attraction that exists between the fine particles of some soils. The shear strength of cohesive soil results both from friction as well as cohesion whereas for cohesion-less soil it results from friction alone.

The shear strength equation was first proposed by French engineer Coulomb. He expressed the shear strength's' as a linear function of total normal stress 'σ' on the potential surface of sliding

$s = c + \sigma \tan(\phi)$

Where s = shear strength

To assess the strength characteristics of soil at the proposed site 2 nos. of bore hole were drilled up to the depth mentioned in the bore log data. This Bore hole was advanced by Shell and Auger method up to the depth specified below the ground surface. While advancing the bore holes SPT tests were conducted at regular intervals of 1.5m depth and representative samples were collected and analyzed for soil classification. Water table was not encountered in the bore hole. The SPT values obtained have been corrected for overburden pressure. These corrected values have been plotted against depth and are shown in the respective bore log. It has been seen from the plots that the SPT values varying from 7 to >100 has been achieved for various bore holes and at various depth as shown in bore log plot between SPT value and depth. Direct Shear Tests were conducted on undisturbed soil samples collected at regular intervals of 1.5m for evaluating the shear parameters. The results are shown in the bore log.

8.0 DESIGN CRITERIA

Any foundation (shallow footing) is to be safe against possible failure against

a) Excessive shear Failure (the bearing pressure should be within the permissible limits)

b) Excessive settlement

The settlement depends not only on the type of soil below the foundation but also on the type of foundation, material used for construction and functionality of the structure.

9.0 DESIGN METHODOLOGY FOR SOIL

9.1 ISOLATED FOUNDATION

Since the structure to be constructed on this site is RCC framed structure is Multi Storied Building with B+G+4 Floors isolated foundation has been analyzed, at a depth of 2.5m below EGL. An allowable settlement of 50mm for isolated footing has been considered as per IS: 1904 – 1986. The evaluation of SBC of foundation has been done using following two criteria.

Shear Failure Criteria

The safe bearing pressure from interpolation of General & Local Shear failure criteria can be obtained, using the Equation given below

Q_{ab} =0.67C NcSc dc ic + q (Nq-1) sq dq iq + 0.5 B γ Nr Sr dr ir Rw1

Where

C = cohesion in KN/m^2

B = Width of the footing in m

dq, dγ, dc = Depth factors

Sq, Sγ, Sc = Shape factors

Iq, Iγ, Ic = Inclination factors

N'q, N'γ, N'c = Bearing capacity factor

q = Total surcharge at the base level of foundation

W' = Water table correction factor (Considered for flooding and heavy rain)

γ = Bulk unit wt. of foundation soil, in KN/m^3

a) Settlements:

i) Soil profile is given for each bore hole. The Soil profile which is likely to cause greater settlements is to be considered for calculations.

ii) The imposed load at the foundation level is likely to compress the soil up to the depth of approximately equal to 1.5B below the foundations.

iii) The settlements can be calculated using IS-8009 part-I & II.

SAMPLE CALCULATION FOR ISOLATED FOUNDATION
2.5M DEPTH FOR SHEAR CRITERIA

SAFE BEARING CAPACITY		
Symbol	**Description**	**Value**
C	Cohesion	**55 KN/m2**
ϕ	Angle of shearing resistance of soil in degrees	**0**
ϕ_m	Angle of shearing resistance of soil in degrees [$\tan^{-1}(0.67(\tan\phi))$]	0.00
G	Specific Gravity	2.65
γ_d	Dry Density of Soil	14.40
e	Void ratio [$(G\gamma_w/\gamma_d)-1$]	0.84
N'c	Bearing Capacity Factor (Local Shear)	5.14
N'q	Bearing Capacity Factor (Local Shear)	1.00
N'γ	Bearing Capacity Factor (Local Shear)	0.00
	Shape of Base	square
Sc	Shape Factor (Square)	1.30
Sq	Shape Factor (Square)	1.20
Sr	Shape Factor (Square)	0.80
D	Depth of Foundation	2.5
B	Width of Foundation	2
Nϕ	$\tan^2(\pi/4 + \phi/2)$	0.000
dc	Depth Factors $(1 + 0.2\ Dt/B\sqrt{N\phi})$	1.00
ic	Inclination Factors	1
iq	Inclination Factors	1
ir	Inclination Factors	1
γ	Density at Foundation Level	18.50 KN/m3
q	Total surcharge at the base level of foundation (γ X D)	46.25 KN/m3
dq = dr	Depth Factors (1 for $\phi < 10^\circ$)	-
dq = dr	Depth Factors (1+0.1 $Dt/B\sqrt{N\phi}$ for $\phi < 10^\circ$)	1.002
Rw_1	Reduction Factor	1
Qu	Ultimat bearing capacity of Foundation	Qu = 0.5 C Nc Sc dc ic + q (Nq-1) sq dq iq + 0.5 B γ Nr Sr dr ir Rw1
Qu	**Ultimat bearing capacity of Foundation**	**184 KN/m2**
FS	Factor of Safety	2.5
qs	**Qu/FS**	**74 KN/m2**
	Allowable Bearing Capacity of Foundation	**7.38 t/m2**

SAMPLE CALCULATION FOR ISOLATED FOUNDATION 2.5M DEPTH FOR SETTLEMENTS CRITERIA

SETTLEMENT CONSIDERATION AS PER IS: 8009 Part I (Fig. 9) (AT THE DEPTH OF 2.5M FROM E.G.L.)		
N_R	N Value Recorded at a depth of 2.5m	10.0
N_C	N Value Corrected at a depth of 2.5m	10.0
B	Width of Footing	2.0 m
	Permissible Settlement As Per IS: 8009 Part I(Fig. 9)	50 mm
	Settlement by applying 1kg/sqcm pressure as per IS:8009-I - 1976	33.0 mm
	Corrected settlement by applying W' (RW) for 1 kg/cm^2	33.0 mm
	Pressure allowed for 50mm settlement (50/corr. Settlement)	1.515
	Bearing Capacity of Foundation	**15.15 t/m2**
	Allowable Bearing Capacity of Foundation	**15.2 t/m2**

9.2 Suitability of Deep Pile Foundations

Piles transmit foundation loads through soil strata of low bearing capacity to deeper soil having a higher bearing capacity value. Piles carry loads as a combination of side friction and point bearing resistance.

Piles are suitable due to the following specific advantages over spread footings / isolated foundation:

- Completely non-displacement.
- Carry the heavy superstructure loads into or through a soil stratum. Both vertical and lateral loads may be involved.
- Controls settlements when spread footing / raft foundation is on a marginal soil.
- Can resist uplift, or overturning.
- Applicable for a wide variety of soil conditions.
- Safe against liquefaction in case of earthquake.

9.3 Vertical Load Carrying Capacity of Piles

The ultimate pile capacity can be determined as follows:

(As per IS: 2911 Part – I / Sec. 2)

Ultimate Pile Capacity (Q_u) = $\Sigma K P_{Di} \tan\delta X A_{si}$

(for Granular Soils, C = 0)

with factor of safety taken 2.5

Where,

Σ = summation for n layers in which pile is installed;

P_{Di} = effective overburden pressure in Kg/cm^{2}for the ith layer where I varies from 1 to n;

δ = angle of wall friction between pile and soil, in degrees. (may be taken equal to Φ);

and

A_{si} = Surface area of pile stem in cm^2 in the ith layer, where i varies from 1 to n.

10.0 PILE LOAD CAPACITY

As per the requirement of the structure, the load carrying capacity of various lengths of cast in situ bored piles of 750mm diameter has been worked out. Determination of safe axial load carrying capacity in compression and lateral load carrying capacity of cast in situ bored pile has been made and the recommendation is given below.

11.0 DISCUSSION ON SOIL PROFILE

Results of field and laboratory tests indicate that soil strata in BH-1 Brownish Plastic Clay up to a depth of 6m. Below 6m soil strata is Dark Brown Plastic Clay found up to a depth of 10m. After 10m soil strata is Yellowish Brown Sand up to the depth of 14m. Below 14m soil strata is Yellowish with Sandy Silty Clay up to the depth of 26m and after 26m soil strata is Yellowish SDR up the depth of exploration (30m). In BH-2 soil strata is Dark Brown Plastic Clay up to the depth of 7m. Below 7m soil strata is Yellowish Red Sandy Silty Clay up to the depth of 15.0m. Below 15m soil strata is Yellowish with Sandy Silty Clay up to the depth of 20m. After 20m depth soil strata is Yellowish Red Sandy Silty Clay up to the depth of exploration (30m). Bore log data of various bore holes are shown in Fig. A. Soil strata is same for both the bore holes.

SAMPLE CALCULATION FOR PILE

Pile																			
Ap	D	GAMMA	Nq	Ng	Pd	K1	Pd'	TAN X1	Pile Length L1	K2	Angle of friction (ϕ)	Qp	Qf	Qu	Qsafe	QfxRed Fact/FOS	PILE SELF WEIGHT	final Qsafe vertical	FINAL QF	FINAL Quplift	total pile length
0.282735	0.6	0.78	18.4	22.4	12.24	1	5.85	0.58	15	1.25	30	66.146	98.33	164.477	54.8	27.533	3.05	51.77	51.77	30.59	15
0.282735	0.6	0.79	36.39	54.168	16.935	1	7.90	0.71	20	1.25	35.5	180.289	213.90	394.186	131.4	59.891	4.01	127.38	127.38	63.91	20
0.282735	0.6	0.81	36.39	54.168	20.175	1	10.13	0.71	25	1.25	35.5	213.778	341.42	555.200	185.1	95.598	4.88	180.19	180.19	100.48	25
0.441773	0.75	0.78	18.4	22.4	12.24	1	5.85	0.58	15	1.25	30	103.354	122.91	226.267	75.4	34.416	4.77	70.65	70.65	39.19	15
0.441773	0.75	0.79	36.39	54.168	16.935	1	7.90	0.71	20	1.25	35.5	281.702	267.37	549.072	183.0	74.864	6.27	176.75	176.75	81.14	20
0.441773	0.75	0.81	36.39	54.168	20.175	1	10.13	0.71	25	1.25	35.5	334.028	426.78	760.806	253.6	119.498	7.62	245.98	245.98	127.12	25

LATERAL LOAD CAPACITY									
Dia., D (cms)	Mix (N/mm^2)	Young's Modulus of Pile Material, E (Kg/Sq.cm)	Moment of Inertia, I (cm4)	Stiffness Factor, T	L1 / T	Depth of Fixity, Lf (cms)	L1 (cms.)	DEFLECTION AT CUT OFF	Lateral Load Capacity, $Q_{L\,T}$
60	35	295804.0	636172.512	222	2.1	465.9	45	1.316	22
60	35	295804.0	636172.512	215	2.1	450.8	45	1.320	24
60	35	295804.0	636172.512	207	2.1	435.5	45	1.324	27
75	35	295804.0	1553155.55	275	2.1	577.5	45	1.294	30
75	35	295804.0	1553155.55	263	2.1	553.2	45	1.298	33
75	35	295804.0	1553155.55	253	2.1	530.9	45	1.302	38

12.0 BEARING CAPACITY

12.1 FROM SHEAR CRITERIA

ISOLATED FOUNDATION

Depth of foundation	Footing	Footing Size (m)	Net Allowable Bearing Capacity (T/Sq. M)
2.5	ISOLATED	2.0 X 2.0	7.38
		2.5 X 2.5	7.37

12.2 FROM SETTLEMENT CRITERIA

FOR ISOLATED FOUNDATION

Depth of foundation	Footing	Footing Size (m)	Net Allowable Bearing Capacity (T/Sq. M)
2.5	ISOLATED	2.0 X 2.0	15.2
		2.5 X 2.5	14.3

13.0 RECOMMENDATIONS

(A) ISOLATED FOUNDATION FOR BOUNDARY WALL

Depth of foundation	Footing	Footing Size (m)	Net Allowable Bearing Capacity (T/Sq. M)
2.5	ISOLATED	2.0 X 2.0	7.38
		2.5 X 2.5	7.37

(B) BORED CAST IN SITU PILE FOUNDATION

Bored Pile Dia (mm)	Cut off Level (m)	Termination Depth (m)	Suggested Safe load capacity (ton)			
			Vertical Load capacity	Lateral Load capacity	L_f (m)	Uplift capacity (ton)
600	1.2	15	51	22	4.7	30.5
		20	127	24	4.5	63.9
		25	180	27	4.4	100.4
750	1.2	15	70	30	5.8	39.1
		20	176	33	5.5	81.1
		25	245	38	5.3	127.1

The Centre to Centre spacing of the piles may be taken as 3.0 x diameter of pile. Piles should be installed as per the provision of IS: 2911 (Part-I/Sec-II) and relevant BIS code of practices. The safe load capacities should be verified by pile load test.

NOTE:-

1. If any loose pockets are observed during excavation for foundation, the same shall be filled with PCC 1:5:10. Foundation can subsequently be placed over this prepared surface.
2. If the profile of soil at any location defers from what is shown, the same shall be brought in notice of soil consultant before laying any foundation.

14.0 CLOSURE

We appreciate the opportunity to perform this investigation for you and have pleasure in submitting this report. Please contact us when we can be of further service to you.

For Swati Structure Solutions Pvt. Ltd

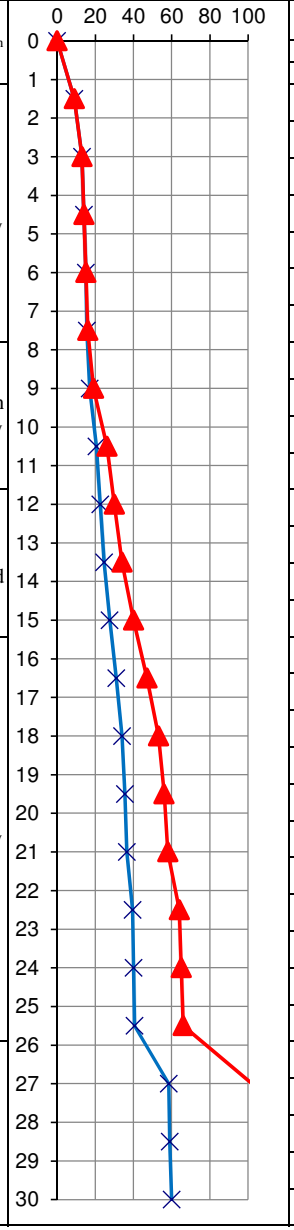
Er. Shubham Ojha

SWATI STRUCTURE SOLUTIONS PVT. LTD.

S.P.T. PLOT

Observed

Corrected



PROJECT: GEOTECHNICAL SOIL INVESTIGATION FOR FOUNDATION OF MULTI STORIED BUILDING WITH B+G+4 FLOORS FOR EGRC, ZOOLOGICAL SURVEY OF INDIA AT SURVEY NO: 205, 61 & 62, RAYAPUDI VILLAGE, GUNTUR DISTRICT OF ANDHRA PRADESH

SHEET NO 15

BOREHOLE NO	TERMINAL DEPTH (m)	Water Table
BH-1	30.0 meter	Nill

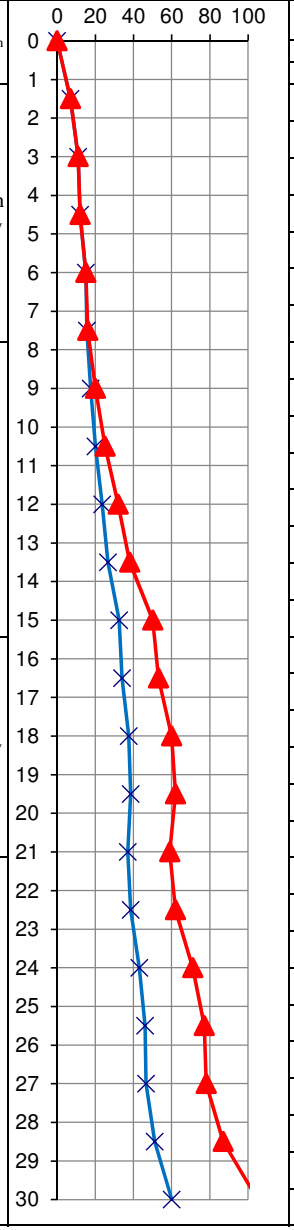
N Values	N Values Corrected	DEPTH (m)	Type of Sample	Soil Classification	GRAIN SIZE ANALYSIS				LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY	BULK DENSITY	MOIST. CONT.	SHEAR PARAMETER			Sp. Gr.
					GRAVEL	SAND	SILT	CLAY						TEST TYPE	C	f	
					%	%	%	%	%	%	gm/cc	gm/cc	%		Kn/m3	deg.	
		0.50	DS-1	Brownish Plastic Clay													
9	9	1.95	SPT-1		0.0	3.8	4.8	91.4	66	27							
		2.80	UDS-1								1.39	1.84	32	UU	66		2.65
13	13	3.45	SPT-2		0.0	4.6	7.4	91.4	68	30							
14	14	4.95	SPT-3														
		5.80	UDS-2								1.42	1.85	30	UU	80		2.65
15	15	6.45	SPT-4		0.0	5.8	6.7	87.5	69	30							
16	16	7.95	SPT-5	Dark Brown Plastic Clay													
		8.80	UDS-3								1.40	1.84	31	UU	100		2.65
19	17	9.45	SPT-6		0.0	3.8	7.0	88.9	70	29							
26	21	10.95	SPT-7														
		11.80	UDS-4	Yellowish Brown Sand							1.50	1.78	19	UU	15	30	2.66
30	23	12.45	SPT-8		0.0	78.7	19.4	1.8	NL	NP							
34	25	13.95	SPT-9														
		14.80	UDS-5								1.50	1.78	19	UU	15	34	2.67
40	28	15.45	SPT-9	Yellowish With Sandy Silty Clay	0.0	17.1	65.3	17.6	NL	NP							
47	31	16.95	SPT-10														
		17.80	UDS-6								1.50	1.79	19	UU	15	38	2.64
53	34	18.45	SPT-11		0.0	12.5	70.1	17.5	NL	NP							
56	36	19.95	SPT-12														
		20.80	UDS-7								1.48	1.80	22	UU	15	38	2.67
58	37	21.45	SPT-13		0.0	13.9	64.4	21.7	NL	NP							
64	40	22.95	SPT-14														
		23.80	UDS-8								1.65	1.81	10	UU	10	40	2.66
65	40	24.45	SPT-14		0.0	9.3	70.2	20.5	NL	NP							
66	41	25.95	SPT-15														
Refusal		26.80	UDS-9	Yellowish SDR													
		27.45	SPT-16														
		28.95	SPT-17														
		29.80	UDS-10														
		30.00	SPT-18														

SWATI STRUCTURE SOLUTIONS PVT. LTD.

S.P.T. PLOT

Observed

Corrected



PROJECT: GEOTECHNICAL SOIL INVESTIGATION FOR FOUNDATION OF MULTI STORIED BUILDING WITH B+G+4 FLOORS FOR EGRC, ZOOLOGICAL SURVEY OF INDIA AT SURVEY NO: 205, 61 & 62, RAYAPUDI VILLAGE, GUNTUR DISTRICT OF ANDHRA PRADESH

SHEET NO 16

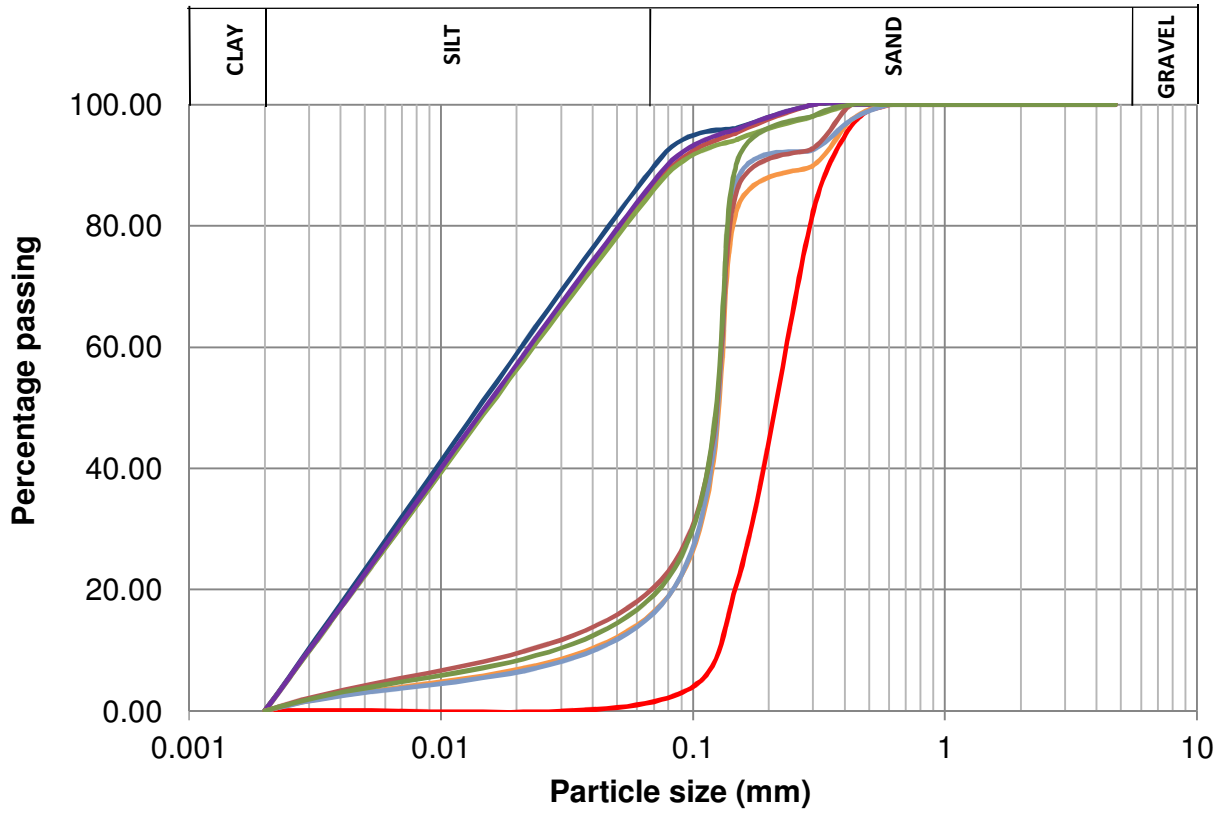
BOREHOLE NO	**TERMINAL DEPTH (m)**	**Water Table**
BH-2	30.0 meter	Nill

N Values	N Values Corrected	DEPTH (m)	Type of Sample	Soil Classification	GRAIN SIZE ANALYSIS				LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY	BULK DENSITY	MOIST. CONT.	SHEAR PARAMETER			Sp. Gr.
					GRAVEL	SAND	SILT	CLAY						TEST TYPE	C	f	
					%	%	%	%	%	%	gm/cc	gm/cc	%		N/mm^2	deg.	
		0.50	DS-1	Dark Brown Plastic Clay													
7	7	1.95	SPT-1		0.0	9.1	4.5	86.4	68	27							
		2.80	UDS-1								1.44	1.84	28	UU	55	-	2.65
11	11	3.45	SPT-2		0.0	7.3	6.4	86.4	70	28							
12	12	4.95	SPT-3														
		5.80	UDS-2								1.41	1.85	31	UU	77	-	2.65
15	15	6.45	SPT-4		0.0	5.7	7.2	87.1	72	32							
16	16	7.95	SPT-5	Yellowish Red Sandy Silty Clay													
		8.80	UDS-3								1.55	1.78	15	UU	15	25	2.67
20	18	9.45	SPT-6		0.0	9.1	66.2	18.4	NL	NP							
25	20	10.95	SPT-7														
		11.80	UDS-4								1.48	1.78	20	UU	15	30	2.65
32	24	12.45	SPT-8		0.0	11.2	70.5	18.3	NL	NP							
38	27	13.95	SPT-9														
		14.80	UDS-5								1.52	1.79	18	UU	15	35	2.64
50	33	15.45	SPT-9	Yellowish With Sandy Silty Clay	0.0	7.6	75.4	17.0	NL	NP							
53	34	16.95	SPT-10														
		17.80	UDS-6								1.49	1.80	21	UU	15	38	2.66
60	38	18.45	SPT-11		0.0	9.0	74.6	16.5	NL	NP							
62	39	19.95	SPT-12														
		20.80	UDS-7								1.54	1.80	17	UU	15	38	2.67
59	37	21.45	SPT-13	Yellowish Red Sandy Silty Clay	0.0	10.0	70.8	19.2	NL	NP							
62	39	22.95	SPT-14														
		23.80	UDS-8								1.63	1.81	11	UU	15	40	2.65
71	43	24.45	SPT-14		0.0	8.4	72.8	18.8	NL	NP							
77	46	25.95	SPT-15														
		26.80	UDS-9								1.63	1.82	12	UU	15	42	2.66
78	47	27.45	SPT-16		0.0	6.3	77.4	16.3	NL	NP							
87	51	28.95	SPT-17														
		29.80	UDS-10														
Refusal		30.00	SPT-18														

SWATI STRUCTURE SOLUTIONS PVT. LTD. **SHEET NO. 17**

GRAIN SIZE ANALYSIS

BORE HOLE NO. BH - 1

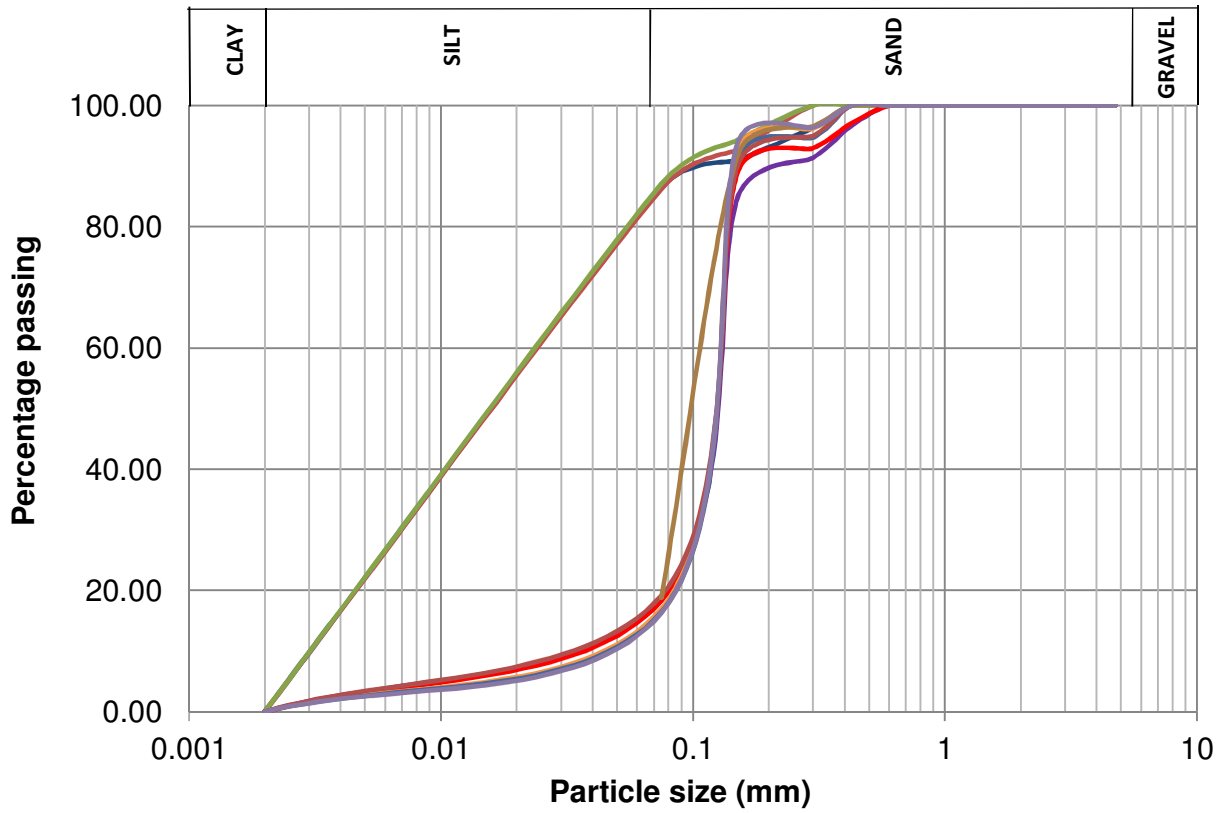


Symbol	Description	Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
	Brownish Plastic Clay	1.50	0.0	3.8	4.8	91.4
	Brownish Plastic Clay	3.00	0.0	4.6	7.4	88.0
	Brownish Plastic Clay	6.00	0.0	5.8	6.7	87.5
	Dark Brown Plastic Clay	9.00	0.0	4.0	7.0	88.9
	Yellowish Brown Sand	12.00	0.0	78.7	19.4	1.8
	Yellowish With Sandy Silty Clay	15.00	0.0	17.1	65.3	17.6
	Yellowish With Sandy Silty Clay	18.00	0.0	12.5	70.1	17.5
	Yellowish With Sandy Silty Clay	21.00	0.0	13.9	64.4	21.7
	Yellowish With Sandy Silty Clay	24.00	0.0	9.3	70.2	20.5

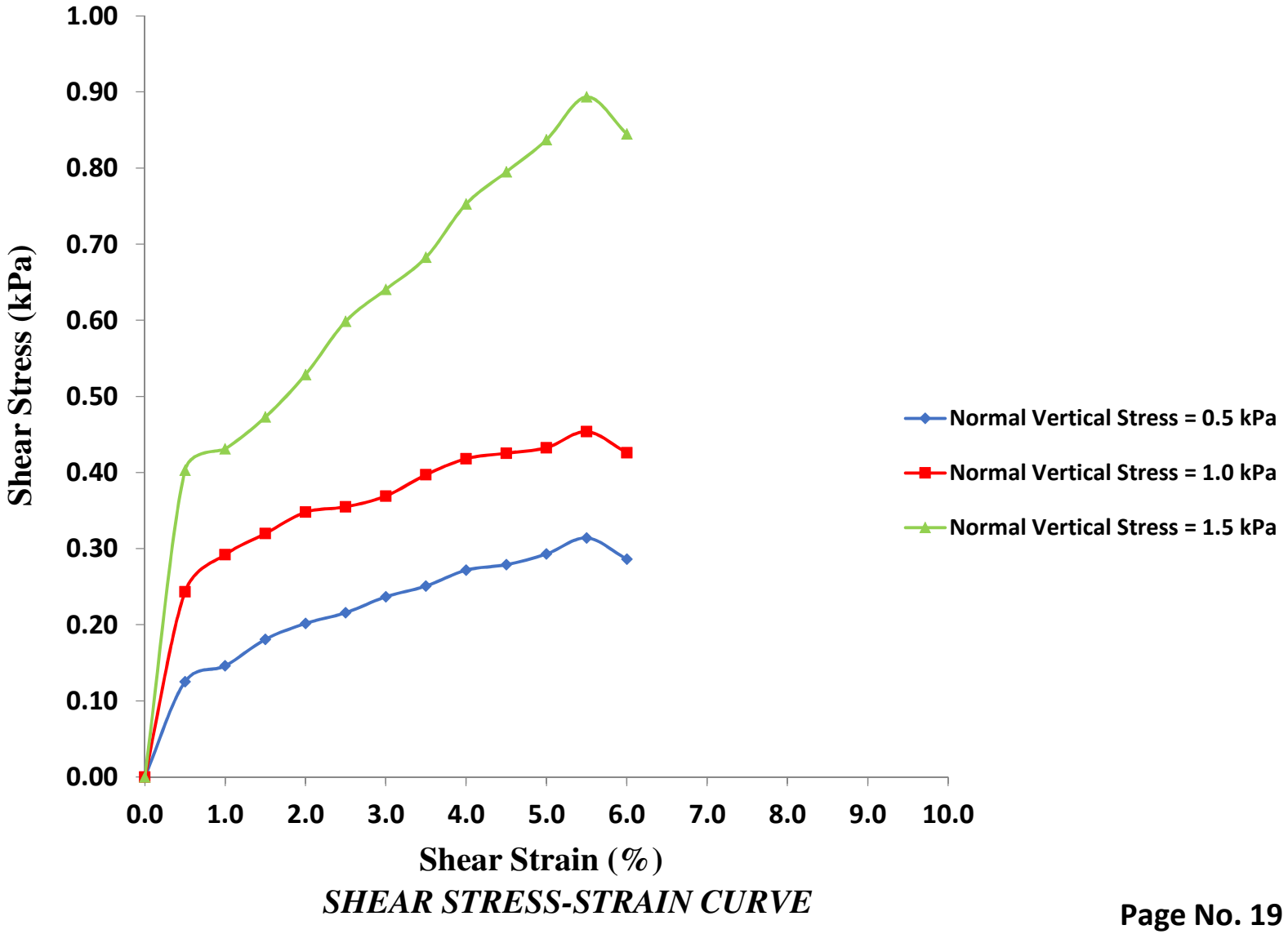
SWATI STRUCTURE SOLUTIONS PVT. LTD. **SHEET NO. 18**

GRAIN SIZE ANALYSIS

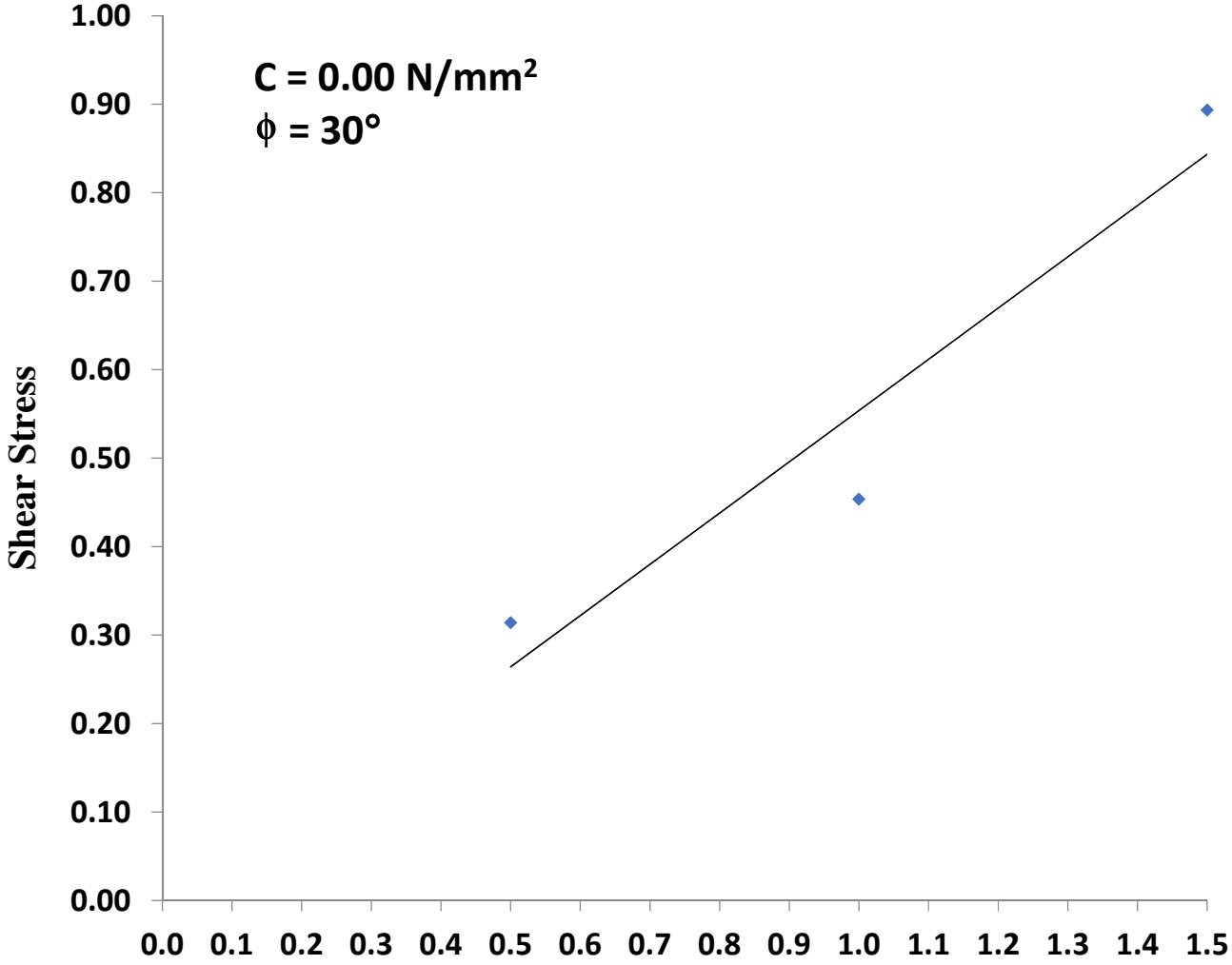
BORE HOLE NO. BH - 2



Symbol	Description	Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
	Dark Brown Plastic Clay	1.50	0.0	9.1	4.5	86.4
	Dark Brown Plastic Clay	3.00	0.0	7.3	6.4	86.3
	Dark Brown Plastic Clay	6.00	0.0	5.7	7.2	87.1
	Yellowish Red Sandy Silty Clay	9.00	0.0	15.3	66.2	18.4
	Yellowish Red Sandy Silty Clay	12.00	0.0	11.2	70.5	18.3
	Yellowish With Sandy Silty Caly	15.00	0.0	7.6	75.4	17.0
	Yellowish With Sandy Silty Caly	18.00	0.0	9.0	74.6	16.5
	Yellowish Red Sandy Silty Clay	21.00	0.0	10.0	70.8	19.2
	Yellowish Red Sandy Silty Clay	24.00	0.0	8.4	72.8	18.8
	Yellowish Red Sandy Silty Clay	27.00	0.0	6.3	77.4	16.3

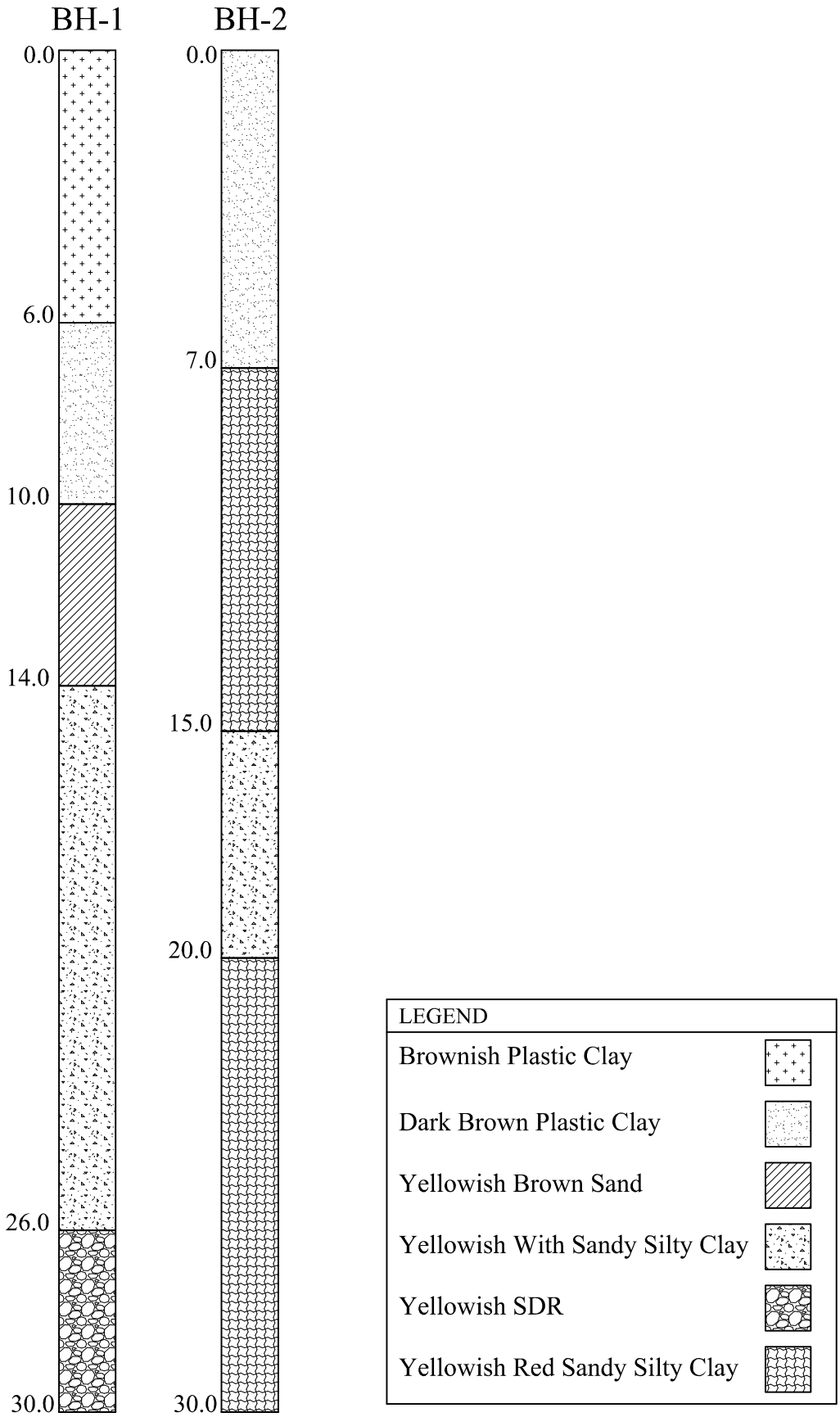


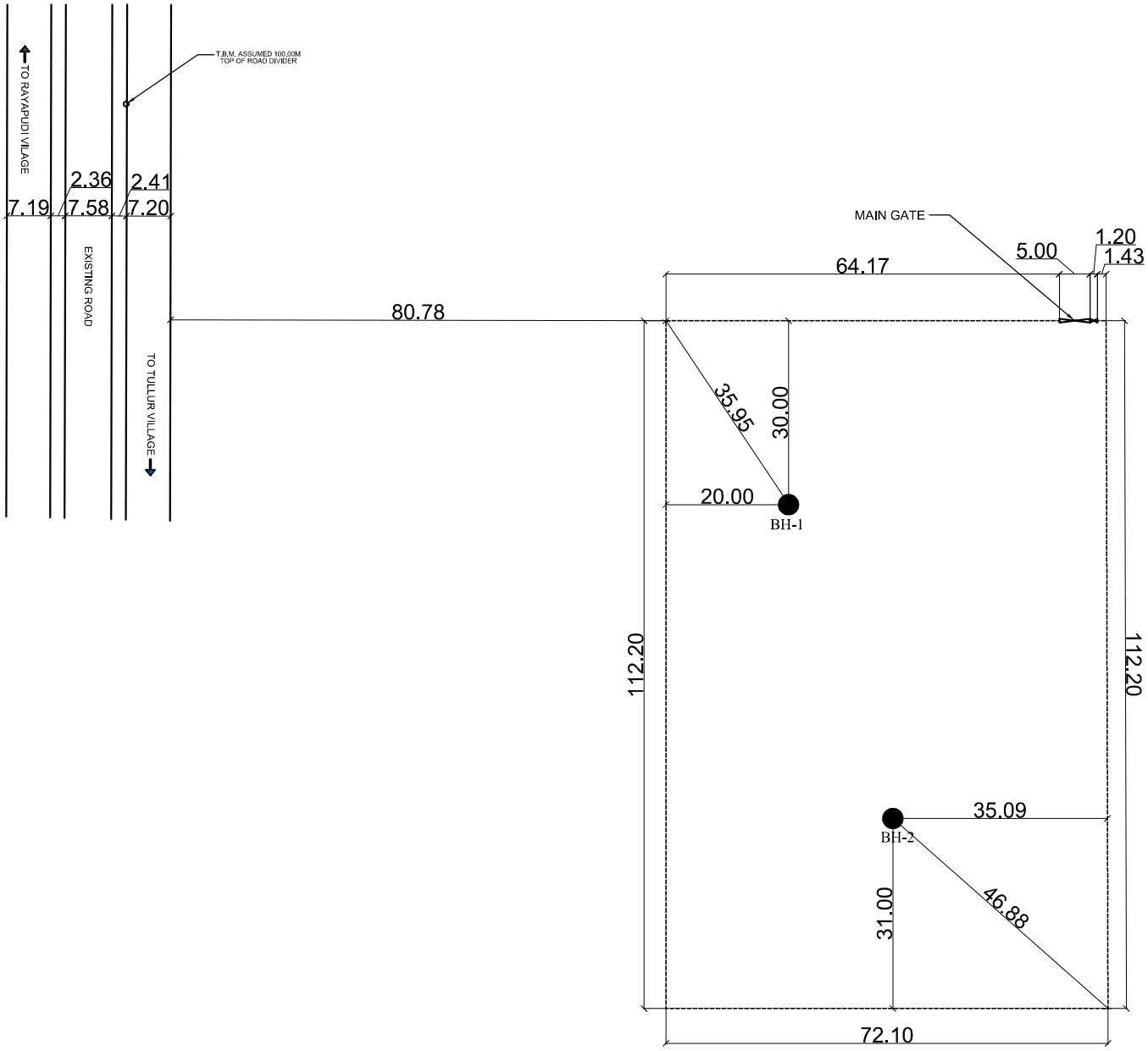
SHEAR STRESS-STRAIN CURVE



FAILURE ENVELOP

Fig. A


BH-1
BH-2
0.0
6.0
10.0
14.0
26.0
30.0
0.0
7.0
15.0
20.0
30.0
LEGEND
Brownish Plastic Clay
Dark Brown Plastic Clay
Yellowish Brown Sand
Yellowish With Sandy Silty Clay
Yellowish SDR
Yellowish Red Sandy Silty Clay



BORE HOLE LOCATION PLAN

● BORE HOLES 30M (2 NOS)

APPENDIX – 'A'

LIST OF REFERRED IS CODES

Field Investigation

1. IS: 1948-1970 Classification and identification of soils for general engineering purposes (first revision) Amendment 2
2. IS: 1892-1979 Code of practice for sub surface investigations for foundations
3. IS: 2131-1981 Method of standard penetration tests for soils
4. IS: 2132-1986 Code of practice for thin walled tube sampling of soils
5. IS: 6935: 1973 Method for determination of water level

Laboratory tests

1. IS: 2720-1983 (Part 1) Methods of tests for soils: Preparation of dry soil samples for various tests (second revision)
2. IS: 2720-1980 (Part-2) Methods of test for soils: Determination of water content (second revision) Amendment 1
3. IS: 2720-1980 (Part-3/Sec 1) Method of test for soil: Determination of specificgravity: Fine grained soils
4. IS: 2720-1980 (Part-3/Sec 2) Method of test for soil: Determination of specificgravity:Fine, medium & coarse grained soils. (First revision)
5. IS: 2720-1985 (Part-4) Methods of test for soils: Grain size analysis (Second revision)
6. IS: 2720-1985 (Part-5) Methods of test for soils: Determination of liquid and plastic limit (Second revision)
7. IS: 2720 (Part-8) Determination of water contant – dry density relation using heavy compaction. (First revision)
8. IS: 2720 (Part-10) Methods of test for soils: Determination of Shear strength Parameter using triaxial apparatus.
9. IS: 1498 - 1970 Classification and identification of soils for general engineering purposes.
10. IS: 3015-1987 Methods of Sampling and Test (Physical and Chemical) For Water and Wastewater

Foundation Construction

1. IS: 1080-1986Code of Practice for design and construction of shallow foundation on soils (other than raft, ring and shall) (Second revision)
2. IS: 1904-1986Code of Practice for design and construction offoundation in soils: First Revision (Amendment 1)
3. IS: 6403-1981 Code of Practice for determination of bearing capacity of shallow foundation: First revision (Amendment 1)
4. IS: 2911 (part-III) Code of Practice for Design and Construction of Pile Foundations.
5. IS: 2720(part 16)-1987 Laboratory Determination of CBR
6. IS: 8009 (part 2)-1980 Settlement for shallow &deep foundations
7. IS: 1893 (Part-1) Criteria for Earthquake Resistant Design of Structures
8. IS: 2950-1 (Part-1) Practice for design and construction of raft foundations, Design