



ST. THOMAS' SCHOOL

(Senior Secondary Recognised & Affiliated to CBSE, New Delhi)

S/S/2021/

04/10/2021

To

The Ex. Engineer (B) Najafgarh Zone, S D M C

Office of the Executive Engineer,

Building Department, Najafgarh Zone,

Main Zonal Building, Room No 121-122

1st floor, Dhansa Stand, Najafgarh, New Delhi-110043

806/SCMR
8/10/21

Sub :- SUBMISSION OF STRUCTURAL SAFETY AUDIT REPORT OF SCHOOL BUILDING

ST. THOMAS SCHOOL GOYALA VIHAR, NEAR SEC-19, DWARKA NEW DELHI-110071

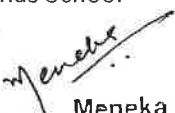
Sir,

Please refer to your office NOTICE No E E (B)/NGZ/21/DB-204 dated 27/07/2021.

In this connection we write to inform you that the Structural safety Audit of St. Thomas School, Goyala Vihar, Near Sec-19, Dwarka, New Delhi-110071 has been completed by Mr. Jitender Kumar (M C D License No SE//0455) of M/s. Buildtech Services Inc. D-38 Pal Piazza, Acharya Niketan, Mayur Vihar Phase -1, Delhi-110091. Their Audit report is enclosed for your perusal.

Kindly acknowledge receipt.

For St. Thomas School


Meneka I Singh
Meneka I. Singh
(H.O.S)
St. Thomas' School
Goyla Vihar, Near Sec-19
Dwarka, New Delhi-110071
H O S
Encl. AS Above


DIVYA GAUTAM
Manager
St. Thomas' School
Goyal Vihar, Near Sec.-19
Dwarka, New Delhi-110071

TO WHOMSOEVER IT MAY CONCERN

PROVISIONAL STRUCTURAL AUDIT CERTIFICATE

ST. THOMAS SCHOOL, GOYLA VIHAR, , DWARKA, NEW DELHI-110071

1. Proceedings

This is to inform that, I, Jitendra Kumar, MCD empaneled structural engineer, licence number SE/0455, has been awarded the structural audit works of the school building by the St. Thomas management committee. The buildings to be structurally audited is

1. Senior School Building (Five Storey)
2. Junior School Building (Single storey)

This is further to inform that we have been working on it and examining the building considering all the aspects and recommendations of various Indian Structural and civil engineering codes.

All the required Non-destructive tests have been carried out, by a highly reputed testing agency, at the site and the relevant reports are in the process of obtaining. All the required drawings for this work have been obtained. That structural designing of the complete building is under process.

We shall complete the Structural Audit works with all the recommendations and retrofitting scheme, if required, by the end of the month September 2021 and will submit the report to the management committee.

For Builtech Services Inc.



Jitendra Kumar
JITENDRA KUMAR
(Structural Engineer)
B.E. (Civil) M. Tech (Structure)
AM090575-8

Date: 24.09.21

Jitendra Kumar
(Structural Engineer)
MCD Licence no. SE/0455

Meneka Singh
Meneka Singh
(H.o.S)

St. Thomas' School
Goyla Vihar, Near Sec-19
Dwarka, New Delhi-110071

ADVANCE INSPECTION & TESTING LAB

B/110, Mayapuri Institutional Area, Phase 1, New Delhi-110064
 Web: www.advancetestinglab.com, Email: advancetestinglab@gmail.com
 Tel: 91-9810-85-8484, 91-9891-35-3939



TEST REPORT

FF:7.8.1.1

Issued To: M/s BUILTECH SERVICES INC.,
 05/02, Palm Road, Shipra Suncity,
 Indirapuram, Ghaziabad,
 Uttar Pradesh, India

W.O. No: AITL/1870/01
Report No: 21090501
Date of Issue: 06-09-2021
Date of Receipt: 05-09-2021
Party Ref. No: Letter Dated 27-08-2021
Order Confirmation Date: 27-08-2021

SITE PARTICULARS

Page 1 of 2

- Name of Work:** Site at St. Thomas' School, Near Sec-19, Block A, Goyla Vihar, Dwarka, Delhi-110071
- Date of Testing:** 05/09/2021
- Equipment Used:** Rebound Hammer, Brand AIMIL, AIM-388, S.N. 20456.
- Test/ Work Assignment:** Rebound Hammer Test on locations as specified by the party.

TEST RESULTS

PROTOCOL: IS 13311(PART 2)-1992, RA 2018

S. No.	Location/Marked	Angle (Degree)	Rebound Number	Average Rebound Number	Estimated Compressive strength of concrete (N/mm ²) (UM±25%)
New Building-Ground Floor					
1	Column outside NurseryB -C1	0	40,42,40,40,40,40	40	42
2	Column Inside NurseryB -C2	0	42,40,42,42,42,42	42	46
3	Column outside NurseryD -C3	0	38,38,40,40,40,38	39	40
4	Column Inside NurseryC -C4	0	40,38,38,38,36,38	38	38
5	Column Inside KGA -C5	0	36,38,40,36,36,36	37	37
6	Column outside Opp KGC -C6	0	36,36,38,38,36,36	37	37
7	Column Inside KGE -C7	0	42,42,42,42,40,40	41	44
8	Column Inside KGF -C8	0	40,40,40,42,42,38	40	42
9	Column Opp KGF -C9(Left Side)	0	42,42,40,38,40,40	40	42
10	Column outside KGD-C10	0	38,38,38,40,40,40	39	40
Old Building-Ground Floor					
11	Column Outside Near exit- C1	0	34,32,34,34,34,32	33	30
12	Column Outside IA -C2	0	36,36,36,34,36,36	36	35
13	Column Gallery Opp IA-C3	0	30,32,28,30,30,30	30	26
14	Column outside Washroom Girls-C4	0	34,34,34,32,32,32	33	30
15	Column Opp IC -C5	0	24,24,24,22,24,26	24	16
16	Column outside ID -C6	0	28,28,26,30,26,26	27	20
17	Column Inside IE -C7	0	28,30,30,30,30,28	29	24
18	Column Inside IF -C8	0	24,26,28,26,24,26	26	19
19	Column Outside Surveillance Room-C9	0	26,28,26,26,26,26	26	19
20	Column Opp IIB-C10	0	28,28,30,28,28,28	28	22
21	Column Opp IIC-C11	0	32,32,32,32,30,30	31	27
22	Column Inside IIC-C12	0	28,28,28,30,32,34	30	26
23	Column Outside IIC-C13	0	30,28,32,28,28,30	29	24
24	Column Opp IIC(Right Side)-C14	0	40,40,38,40,40,40	40	42

Continued to Page 2

Er. Nitish
 NDT Engineer

DIVYA GAUTAM
 Manager

DR. VIRENDER TAANDON

Authorized Signatory

Civil / Mechanical / Chemical / NDT TESTING

Goyal Vihar, Near Sec-19
 Dwarka, New Delhi-110071

1. The results listed refer only to tested samples and applicable parameters. Endorsement of product is neither inferred nor implied. 2. Total liability of our lab is limited to the invoiced amount. 3. Samples will be destroyed after 15 days from the date of test certificate unless specified otherwise. 4. The Report shall not be reproduced except in full without written approval of Laboratory. 5. Report refers to the sample submitted to us and not drawn by Advance Inspection & Testing Lab unless mentioned otherwise. 6. In case of any dispute, the Jurisdiction shall be New Delhi Courts.

Issued To: M/s Bultech Services Inc.
 05/02, Palm Road, Shipra Suncity,
 Indirapuram, Ghaziabad,
 Uttar Pradesh, India

W.O. No: AITL/1870/01
Report No: 21090501
Date of Issue: 06-09-2021
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TEST RESULTS

Page 2 of 2

PROTOCOL: IS 13311(PART 2)-1992, RA 2018

S. No.	Location/Marked	Angle (Degree)	Rebound Number	Average Rebound Number	Estimated Compressive strength of concrete (N/mm ²) (UM±25%)
25	Column Inside IIA-C15	0	32,34,34,36,32,32	33	30
26	Column Inside IID-C16	0	32,34,32,32,32,32	32	28
27	Column Inside IIF-C17	0	30,30,30,32,30,28	30	26
28	Column Opp IIIA-C18	0	40,38,36,36,36,36	37	37
29	Column Outside IIIA-C19	0	30,32,30,30,30,30	30	26
30	Column Opp IIIB, Near Stairs-C20	0	36,36,36,34,34,36	35	34
31	Column Outside IIIB-C21	0	40,40,40,36,38,40	39	40
32	Column Inside IIIC-C22	0	36,36,36,40,36,36	37	37
33	Column opp IIID Left Side-C23	0	32,34,36,32,32,32	33	30
34	Column Lift-C24	0	38,38,38,36,36,36	37	37
35	Column Opp Lift-C25	0	34,34,36,36,34,36	35	34
36	Column Opp IIID(Right Side)-C26	0	34,34,32,32,34,34	33	34
Old Building First Floor					
37	Column Outside, opp Staff Room-C27	0	36,36,38,34,36,38	36	35
38	Column Outside opp Computer Lab-C28	0	38,40,40,38,40,40	39	40
39	Column Outside Computer Lab-C29	0	38,38,38,36,38,40	38	38
40	Column Opp Boys Washroom-C30	0	38,40,38,38,36,38	38	38
41	Column Inside IIIE-C31	0	36,34,36,34,34,36	35	34
42	Column Inside IVA-C32	0	34,36,38,38,36,38	37	37
43	Column Between GF & 1st Floor Stairs, Opp IIIB, Left Side-C33	0	30,34,34,34,32,34	33	30
44	Column Between GF & 1st Floor Stairs, Opp IIIB, Right Side-C34	0	34,34,32,34,36,34	34	32
45	Column Opp IIIE-C35	0	34,34,36,36,34,36	35	34

Er. Nitish
 (NDT Engineer)

DIVYA GAUTAM
 Manager
 St. Thomas' School
 Goyal Vihar, Near Sec.-19
 Dwarka, New Delhi-110071

DR. VIRENDER TAANDON
 ADVANCE INSPECTION & TESTING LAB

Authorised Signatory

Civil / Mechanical / Chemical / NDT / TESTING

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ADVANCE INSPECTION & TESTING LAB

R-119, Anand Market, Phase 1, New Delhi-110064
 Web: www.advanceinspectionandtestinglab.com, Email: advanceinspectionandtestinglab@gmail.com
 Tel: 91-9810-35 2464, 91 9801-35 3939



TEST REPORT

FF:7.8.1.1

Issued To: M/s Bultech Services Inc.
 05/02, Palm Road, Shipra Suncity
 Indirapuram, Ghaziabad,
 Uttar Pradesh, India

W.O. No: AITL/1880/08
Report No: 21091508
Date of Issue: 16-09-2021
Date of Receipt: 15-09-2021
Party Ref. No: Letter Dated 27-08-2021
Order Confirmation Date: 27-08-2021

SITE PARTICULARS

Page 1 of 1

- Name of Work:** Site at St. Thomas' School, Near Sec-19, Block A, Goyla Vihar, Dwarka, Delhi-110071
- Date of Testing:** 15-09-2021
- Equipment Used:** Half Cell Potention eter, Brand Avantech
- Test/ Work Assignment:** Half Cell Potential on locations as specified by the party.

TEST RESULTS

PROTOCOL: ASTM C-876-15

S. No	Location/Marked	Half Cell Potential Test Reading relative to Cu-CuSO ₄ Reference Electrode, mV (Average)	Average temperature of reference electrode, Deg C
Old Building- Ground Floor			
1	Column opp IIID Left Side-C23	-309	
2	Column Gallery Opp IA-C3	-310	31
3	Column Inside IE -C7	-330	29
4	Column Outside Surveillance Room-C9	-203	31
5	Column Inside IIF-C17	-309	30
			30

REQUIREMENTS

S.No	Half Cell Potential Reading Range mV relative to Cu-CuSO ₄ reference Electrode	Possibility of Corrosion being Active
1	More Negative Than -350 mV	>90% probability that reinforcing steel corrosion is occurring in that area at time of measurement.
2	-200 to -350 mV	Corrosion activity of reinforcing steel in that area is uncertain
3	More Positive than -200mV	>90% probability that no reinforcing steel corrosion is occurring in that area at time of measurement.

Fr. Nitish
 (NDT Engineer)

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 Manager
 St. Thomas' School
 Goyal Vihar, Near Sec.-19
 Dwarka, New Delhi-110071

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ADVANCE INSPECTION & TESTING LAB

New Delhi, India
 www.advanceinspectionlab.com
 011-26191353



TEST REPORT

FF:7,8,1,1

Issued To: M/s Bultech Services Inc.
 05/02, Palm Road, Shipra Suncity,
 Indirapuram, Ghaziabad,
 Uttar Pradesh, India

W.O. No: AITL/1863/02-03-04-05-06
Report No: 21082802-03-04-05-06
Date of Issue: 04-09-2021
Date of Receipt: 28-08-2021
Party Ref. No: Letter Dated 27-08-2021
Order Confirmation Date: 27-08-2021

SAMPLE PARTICULARS

Page 1 of 2

1. **Name of Work:** Site at St. Thomas' School, Near Sec-19, Block A, Goyla Vihar, Dwarka, Delhi-110071
2. **Date of Core Cutting:** 28-08-2021
3. **Sample Description/ Work Assignment:** 5 Core samples were drawn from specified location as described by the party for following tests only.

TESTS RESULTS

PROTOCOL:IS 516 Part 4 -2018

S.No	TESTS	RESULTS		
		Column opp IIF Left Side-C23	Column Inside IIF-C17	Column Outside Surveillance Room-C9
SAMPLE MARKED & SAMPLE IDENTIFICATION				
1.	Weight of core, g	565	563	1045
2.	Diameter of core, mm	67.2	67.3	67.2
3.	Height of core, mm	69.4	69.1	128.24
4.	Area of core, mm ²	3544.93	3555.49	3544.93
5.	Volume of core, cm ³	246.02	245.68	454.60
6.	Density, g/cm ³	2.296	2.292	2.299
7.	L/D Ratio	1.033	1.027	1.908
8.	Compressive Load, KN	71	52	72
9.	Measured compressive strength, N/mm ²	20.03	14.62	20.31
10.	Corrected compressive strength after core diameter correction applicable for core diameter ≤80mm, N/mm ²	21.23	15.50	21.53
11.	Correction N for L/D Ratio, F	0.894	0.893	0.990
12.	Corrected Cylinder strength, N/mm ²	18.98	13.84	21.31
13.	Equivalent cube strength, N/mm ²	23.7	17.3	26.6

Continued to Page 2



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 Goyal Vihar, Near Sec.-19
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	STRUCTURAL AUDIT REPORT	Building No. 19, Sec. 19, Dwarka, New Delhi-110071
	ST. THOMAS SCHOOL, GOYLA VIHAR, DWARKA, NEW DELHI-110071	Building type: Masonry and RCC Structure
	C-22, 1st Floor, Acharya Niketan, Mayapuri-1, New Delhi-110031	Date: 30/04/2021


REPAIRS / RETROFIT SUGGESTED

A-BLOCK 5 STOREY

1. Foundations are checked on the basis of the support reactions obtained and have been found satisfactory in as per the structural design procedure. Mat foundation has been provided with 700 mm thickness which is adequate and safe. Reinforcement steel is also sufficient. Additional support was provided with the RCC peripheral walls all around the basement coming directly from the raft foundation which makes the structure more stable against the natural hazards.
2. All the buildings are properly provided with the Tie/ Roof Beams as required in the design.
3. All the columns provided are of the sizes that are 230mm x 450mm, and 300mm x 600mm except a few columns next to the stairs block and others, are provided with 300mm x 750mm. All of these columns are found adequate in sections and steel in the basement as well as on upper floors, as per the recommendations of IS: 1893. The structural drawings provided show that the ductile details as per the code IS: 13920, has been followed in the design and construction. Further in some of the columns, the minimum dimension criteria is not fulfilled, and subsequently the suitable retrofitting arrangement shall be taken by the retrofitting agency to make the minimum dimension of the columns 300mm.
4. Beam sizes are adequate, considering the walls support, as done by the structural engineer and the reinforcement detailing and the percentage of steel in the required zones are properly maintained. Beams need not be strengthened.
5. Fire escape and the main Staircase placement design and sections are sufficient so no strengthening needed.
6. Overhead and underground water tank are found satisfactory in design and the maintenance.
7. As per the Damageability Grade chart, the building falls in Grade II category, therefore structural retrofitting is not recommended and suggested to be performed.
8. Single lift had been provided in the whole school building which is on one side, but integrated part of the structure.

B- block, Single Storey


1. Strip/ Mat/ Combined/ isolated footing type foundations have been provided and are checked on the basis of the support reactions obtained. and have been found satisfactory in as per the structural design procedure. Foundations has been provided with 600 ~ 700 mm thickness

	STRUCTURAL AUDIT REPORT	
	ST. THOMAS SCHOOL, GOYLA VIHAR, DWARKA, NEW DELHI-110071	
		Date: 31/09/2021

which is adequate and safe. Reinforcement steel is also sufficient.

2. All the columns provided are of different size that is 300mm x 600mm and 500mm x 500mm. All of these columns are found adequate in sections and steel in the stilt and parking area, as per the recommendations of IS: 1893. The structural drawings provided show that the ductile detail as per the code IS: 13920, has been properly followed in the design and construction. The minimum dimensions are provided 300mm which is safe adequate in design and reinforcement percentage.
3. Beam sizes are adequate and the reinforcement detailing and the percentage of steel in the required zones are properly maintained. Beams need not to be strengthened.
4. Fire escape and the main Staircase placement design and sections are sufficient so no strengthening needed.
5. Overhead and underground water tank are found satisfactory in design and the maintenance.
6. In the non-stilted and stilted both areas Plinth beams are found provided which makes the structure safe and adequate against the Earthquake forces. Plinth beam design found sufficient.
7. As per the Damageability Grade chart, the building falls in Grade II category; therefore structural retrofitting is not recommended and suggested to be performed.
8. Lift is provided in the multi-storey building area which is safe, however annual maintenance charges are properly paid as clarified by the client.


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 St. Thomas' School
 Goyal Vihar, Near Sec.-19
 Dwarka, New Delhi-110071

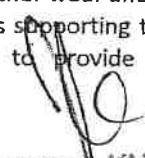
	STRUCTURAL AUDIT REPORT	
	ST. THOMAS SCHOOL, GOYLA VIHAR, DWARKA, NEW DELHI-110071	Building type: <i>Education</i> Condition:
	D-33, Pal Plaza, Ashoka Vihar, New Delhi Delhi-110091	Date: 30-09-2021

CONCLUSIONS:


IN THE ABOVE SCENARIO AND THE CURRENT SITUATION, CONSIDERING ALL THE TECHNICAL FACTS, BOTH THE BLOCKS ARE SAFE AND ADEQUATE TO TAKE THE GRAVITY LOADINGS AND THE MILD EARTHQUAKE FORCES AS EXPLAINED IN THE DESIGN CONSIDERATION PART. The structural drawings provided show that the ductile detail as per the code IS: 13920, has been followed in the design and construction and it makes the structure adequate and safe.

The NDTs and destructive test reports are mostly ok. Bur the Ultra-sonic pulse velocity results in the poor side so injection grouting, as explained in the procedure pages, shall be done with Epoxy grouts as per the company specifications. Detail investigation suggested

Minor repairs are required to be done for non-structural cracks and the weather wear and tear effects. In both the structure, on the terrace major cracks observed in the columns supporting the overhead water tank. Urgent Retrofitting suggested for them. It is advisable to provide as per the recommendations of structural engineers / architects.


JITENDRA KUMAR
 (Structural Engineer)
 B.E. (Civil) M.Tech (Structure)
 AM090575-8
 M.C.D. Licence No. SE-0455
 Structural Engineer

License No. _____


DIVYA GAUTAM
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 St. Thomas' School
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