



[QUALITY CHECKING BY NDT]

NON-DESTRUCTIVE TESTING REPORT

FOR
RCC SCHOOL BUILDING
BELONGS TO
SPRING DALE INTERNATIONAL SCHOOL

SITUATED AT:

**BYE LANE: 3, SONKUCHI PATH, BEHARBARI CHARALI,
NH-37, GUWAHATI - 781029, ASSAM**



Report Prepared by:

ENVIRONMENTAL RESEARCH & EVALUATION CENTRE

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MANAGER
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BYE LANE-3 SONKUCHI PATH
BEHARBARI CHARALI, GUWAHATI-28


Principal
Spring Dale International School
Sonkuchi Path, Beharbari
Guwahati - 29

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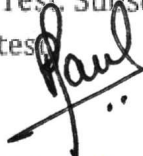
1 Assignment:

1. Name of Object
RCC School Building of Spring Dale International School , Byelane: 3, Sonkuchi Path, Beharbari Charali, NH-37, Guwahati, PIN - 781029, Dist - Kamrup, Assam
2. Appointment by
Work Order : Ref. No. Nil. Date : 23.06.2016
By: Admin Head,
Spring Dale International School , Byelane: 3, Sonkuchi Path, Beharbari Charali, NH-37, Guwahati, PIN - 781029, Dist- Kamrup, Assam.
3. Report Issued to
Spring Dale International School , Byelane: 3, Sonkuchi Path, Beharbari Charali, NH-37, Guwahati, PIN - 781029, Dist- Kamrup, Assam.
4. Scope of the works
 - Σ Visual Inspection of the building
 - Σ Rebound Hammer test on Ground floor and upper floors of the apartment for determination of compressive strength of the structure of the building.
 - Σ Identify the weakest and vulnerable parts /Points of the building.
 - Σ Suggestion for any remedial measures/ Retrofitting for Safety point of view.
5. Date of testing
12th , 14th & 17th Nov. 2016 (field works)
6. Date of Report
18th Nov. 2016
7. Technical staff member of EREC
Dr. Mahidhar Pathak,
Mr. Ujjal Dutta and Sri. Biman Bhuyan.
8. NDT Equipment used
1. Digi-Schmidt Hammer
2. Tico - Ultrasonic Pulse Velocity.
9. Person attending at sites
Mr. Jogen Rajbongshi
The representative of the school.
10. Proceeding of test: As per work order as mentioned above, the Erec Team have been to the concern school for the purposes of performing the Safety Audit by Non Destructive Testing (NDT) methods by applying HAMMER TEST AND ULTROSONIC PULSE VELOCITY (UPV) on concerned RCC multistoried school building. Accordingly, the Erec Team proceeds the test vide Visual Inspection, Hammer Test and Ultrasonic Pulse Velocity (UPV) Test. Subsequent the photographs of the testing are also taken as evidence of onsite test.



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For, Erec Technical Team

Er. M. Pathak

Chief Consultant / Ch. Engineer.

2. Methodology of Testing:

The quality checking of concrete is a process uses for determine the existing compressive strength and checking of uniformity and quality of concrete of the structure irrespective the category of RCC structure. The Non-Destructive Testing which is the modern and sophisticated testing method, is widely used for fulfillment of the quality checking of concrete.

In this type of testing, specially two kinds of NDT equipments are used like (a) Digi Schmidt Hammer and (b) Ultrasonic Pulse Velocity.

The Digi Schmidt Hammer is exclusively used for determination of Compressive strength of the concrete of structure. Compressive strength of the of application point on concrete surface is directly reflect on the monitor of the equipment and the collected data are shorted accordingly by the software application. The graph of the collected data is also developed by application of software.

Standard Result of Hammer test : The result of Compressive Strength (f_{ck}) depends upon the age of concrete. Generally the test is carried after 28 days from casting and the strength is increasing with increase of age upto a certain limit. However the very old structure can also be tested. The standard value of Hammer test after 28 days are categorized as under:

S.N	Compressive Strength (f_{ck})	Concrete quality Grading
1	40 N/mm ² and above	Excellent
2	30 N/mm ² and above	Standard
3	20 N/mm ² and above	Normal
4	Below 20 N/mm ²	Poor

Ultrasonic pulse Velocity a special technique for testing of uniformity of concrete body so that quality of concrete can be easily determined. There are three methods of testing - Direct Transmission, Semi direct Transmission, and Indirect Transmission. Depending on the type and quality of the concrete, the measuring range (distance between transducers) is applied. The Coupling paste to contact surfaces of the transducers and to the points on the object to be measured. The aim of the application is to measured time required for pulse to cover the distance of points both of transducers so that the pulse velocity can be determine. The results of Pulse velocity reflect the quality of concrete.

The standard value of pulse velocity (in meter/second) and quality of concrete are tabulated as under: (Refer : Concrete Technology- S Chand)

S.N	Pulse Velocity (m/s)	Concrete quality Grading
1	Above 3500	Excellent
2	3000 - 3500	Good
3	3000 - 2500	Medium
4	Below 2500	Poor

The obtained results of testing is verified with the tabulated value and graded accordingly to get the test result of the concrete of structure.

The Ultrasonic Pulse Velocity equipment which is commercially known as TICO is used in the testing.

For, Erec Technical Team

Er. M. Pathak
Chief Consultant / C.E. Engineer.

(3)



3A. Visual Inspection: (Part - I)

The following observations are made during the Visual Inspection of the concerned Building are enlisted as under:

SN	Head	Particulars
1	Name of the Building/Appt.	Spring Dale International School. - A School Building.
2	GMDA/GMC Approval No.	GMDA/BP/07012012/114 Date : March 03, 2014
3	Year of Construction	2014-2015
4	Year of Completion	2015-16
5	Design Checked by & Date	Not done
6	Approach Road & Width	Byelane: 3, Sonkuchi Path, Beharbari Charali, NH-37, Guwahati, PIN - 781029, Dist - Kamrup, Assam
7	Total Built up area & ht.	G.F= 2207.0 Sqm First floor = 2250.0 sqm
8	Ground floor branching/wall	Ground floor - covered with brick wall.
9	Side margins as actual	Compliance as per NOC of GMDA
10	Nos. of Stairs and Lifts	3 Nos. Staircases.
11	Water storage & capacity	PVC water tank on top floor - Capacity 20000 Ltrs.
12	Availability of fire fighting	Available in all floors.
13	External visible damage	No any visible cracks are found.
14	Internal visible damage	No any visible cracks are found.
15	Any expansion joint of blocks	No expansion joint.
16	Any additional load on top	No other load except water tank.
17	Condition of Lift/s	NA
18	Any deviation of const ⁿ ?	Not found.
19	Any crack on structure?	No any crack on RCC structure.
20	Any other information regarding the safety of Building	NA

4. NDT -Testing and Analysis :

I. Test Data :

The test data are divided into two divisions:

- A. Hammer Test Data
- B. UPV Test Data

A. The result of Hammer Test is revealed in two folds such as :

- (1) Summary Data Table (Table - I),
- (2) Summary data of UVP. (Table - II) and

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Er. M. Pathiak
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(1) Summary of Test Data (Results):

Table – I. Summary of Compressive Strength Test Result:

Position	Average Quality of Concrete (N/mm ²)	Category of the Concrete. (On the basis of Compressive Strength)
Ground floor Column	48.6	> 40 N/mm ² - Excellent > 30 N/mm ² – Standard > 20 N/mm ² – Normal < 20 N/mm ² - Poor
Ground floor Beam	42.1	
Ground Floor Slab	40.4	
1 st Floor Column	44.7	
1 st Floor Beams	42.2	
1 st Floor Slab	41.7	

Table – II, Summary of UPV Test Result:

S.N	Location	Velocity Result (m/s)	Minimum Velocity (m/s)	Concrete Quality Grading (Average)
1	Ground floor (Column)	3790, 3684	3510 > 3000	Excellent
2	Ground Floor (Beams)	3860, 4580,		
3	First Floor (Column)	3665, 3564		
4	First Floor (Beams)	3510, 3870		



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Er. M. Pathiak
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STRUCTURAL SAFETY AUDIT CERTIFICATE

This is certified that the School Building under name and style "SPRING DALE INTERNATIONAL SCHOOL" located at Byelane -3, Sonkuchi Path, Beharbari Charali, NH-37, Guwahati, PIN - 781029, Dist- Kamrup, Assam., is duly carried out the Non Destructive Testing(NDT) along with Visual Inspection of the Building for the purpose of QUALITY SAFETY AUDIT as per request of authority of object, the EREC Expert team has performed the tests, collected the data and information by Visual Inspection and NDT testing, analysis the test data and prepared the report. The final results of test and existing condition of building we are in the opinion that in view of safety the building may classified under the Category of "Excellent" (average fck >40N/mm²).

Date: 18/11/2016

For, Erec Technical Team
Er. M. Pathak
Chief Consultant / Ch. Engineer.


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Testing Photographs Spring Dale International School



Field work (field testing) is done by the EREC Staff with the help of NDT Equipments. For detection of strength Schmidt Hammer (ND Type) & UPV are used for quality checking of the building.

For, Erec Technical Team
Er. M. Pathak
Chief Consultant/Ch. Engineer

10. **OPINION:** Scrutinizing the visual inspection and NDT data, it is observed that the RCC multistoried School building has complied the structural safety as per test result.. The both the floors have the sufficient strength and no any crack found in any structural part. The slabs which covered from tiles/ marble cannot be tested however the columns and beam acquired sufficient strength. There is no extra or addition unnecessary death load on the top roof slab.

11. **SUGGESTION:** Scrutinizing the all above data and information we are in the opinion that the main structure is complied the standard quality. No any repair/retrofitting is required from structural point of view.

For, Erec Technical Team

Er. M. Pathak
Chief Consultant / Ch. Engineer.

Dr. M. Pathak
Chief Consultant - EREC



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Environmental Research & Evaluation Centre

পৰিৱেশ গবেষণা আৰু মূল্যায়ন কেন্দ্ৰ

[An ISO 9001 : 2008 Certified Organisation]



To,

Date: 17/08/2019

The Principal.

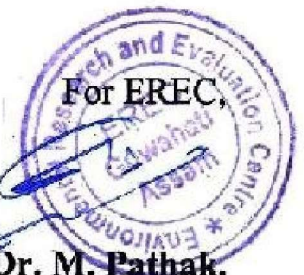
Spring Dale International School.
Bye lane: 3, Sonkuchi Path,
Beharbari Charali, NH-37,
Guwahati – 781029, Assam.

Sub.: Submission of certificate.

Dear Sir,

Reference to our Non Destructive Testing report
NDT/2016/O-137 Date.: 18.11.2016, we enclosed our approved
certificate form Govt. of Assam herewith for your ready reference.

Thanking You.



Dr. M. Pathak.

CEO cum Technical Manager

Enclosed:

1. Certificate from Public Works Department. Govt. of Assam.

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GOVERNMENT OF ASSAM
PUBLIC WORKS ROADS DEPARTMENT
DISPUR, ASSAM.

To whom it may concern

Based on test reports submitted by the CEO, EREC LAB, MPG Complex, R-2 Rupnagar, Guwahati – 781032, Assam, this is to certify that the Erec India Research Laboratory, Guwahati is a competent and reliable organization for carrying out Non Destructive Testing such as Hammer test, Rebar Detection, UPV test, Resistivity test, Pile Integrity test, Laboratory testing such as Rebar/steel testing, Cement testing, Cube/brick testing, Mix design, Aggregate testing, Core cutting, Bitumen Testing such as Penetration test, Ductility test, Softening point test, Specific gravity test, viscosity, etc. for roads and bridge works under Assam PWRD.



D. Bhuyan
29/05/17

Under Secretary to the Govt of Assam (Works)
Public Works Roads Department, Dispur.

Under Secretary
to the Govt. of Assam (P)
Public Works Roads Deptt., Dispur

[Signature]

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