



ICS

**INDUSTRIAL CONSULTANCY SERVICES
J.N.T.U.H. COLLEGE OF ENGINEERING HYDERABAD**

Kukatpally, Hyderabad - 500 085, Telangana State.

To
Senior Principal,
Vignana Jyothi Public School,
G-16A, Madhura Nagar,
Hyderabad-500004.

Lr.No.JNTUHCEH/CIVIL/ICS/VNR/
STR/4473/C-1956/2017

Date : 21.12.2017
Receipt.No.11995

Sir,

Sub:- JNTUHCEH-CIVIL-ICS-Non-Destructive Test and Structural Stability Tests for
Vignana Jyothi Public School- Report-Submitted-Reg.

Ref :- :Your Lr.No.-NIL-, dated 23.11.2017.

---***---

With reference to the letter cited above we are submitting herewith a structural stability
report for Vignana Jyothi Public School, Hyderabad.

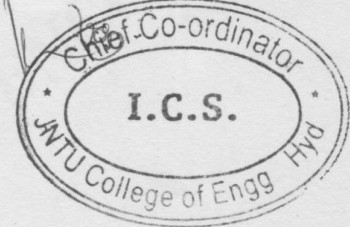
In case of any clarifications you may please contact us.

Thanking you,

Yours sincerely,

[Signature]
22/12/17
Chief Co-ordinator, ICS

Encl : as above



1. Introduction:

The Senior Principal Vignana Jyothi Public School requested JNTUH College of Engineering Hyderabad to carry out Non-Destructive test and Structural Stability tests for Vignana Jyothi Public School, Hyderabad. Accordingly two experts from JNTUH College of Engineering Hyderabad namely Mrs A.Krishna Niveditha, Associate Professor & Mrs.P.Srilakshmi, Associate Professor in Civil Engineering Department and their team visited the building on 11.12.2017 and conducted the tests on 19.12.2017. Also Mrs. J. Aruna Kumari, Senior Principal, and Mr. Srihari the site Engineer I/c were present during the inspection.


The JNTUHCEH team was provided with all the necessary help by Vignana Jyothi Public School, Hyderabad in arranging their visits to the testing site and logistics for conducting the tests.


2. Physical Observations:-

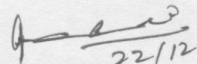
The building is a G+3 RC framed building and the school is being run in the G+2 floors only. The general maintenance of the building is good and there are no signs of distress, dampness or cracks in the building.

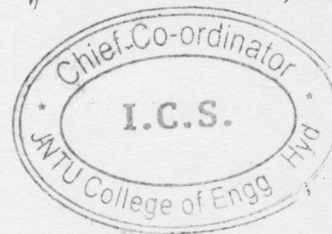
Details of Tests Conducted.

During site visit on 11.12.2017, JNTUHCEH team instructed the site engineers to make the necessary site preparations for the testing work to be performed at different locations. Before conducting the tests at the marked points, the cover plaster was to be removed for approximately 150 mm X 150 mm area to expose the concrete surface ,which needed to be cleaned further using carborundum stone as per the requirement of Rebound Hammer, and Ultrasonic Pulse Velocity (UPV) tests. The non-destructive tests were carried out on 19.12.2017 by JNTUHCEH team, and following are the details about the different tests which were carried out:


Faculty Incharge


Asst./Assoc./Professor


22/12/17
Chief Co-ordinator, ICS.



3. **Non-Destructive tests carried:**

The following Non-Destructive Tests were conducted to ascertain the present health of the structure.

- a. Rebound Hammer Tests
- b. Ultra-Sonic Pulse Velocity Tests


The results and observations of various test results are enclosed as under:

a. **Rebound hammer test:**

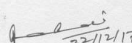
Rebound hammer test is done to find out the compressive strength of concrete by using rebound hammer as per IS: 13311 (Part 2) – 1992. The underlying principle of the rebound hammer test is as follows:

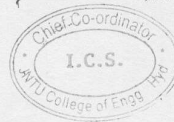
The rebound of an elastic mass depends on the hardness of the surface against which its mass strikes. When the plunger of the rebound hammer is pressed against the surface of the concrete, the spring-controlled mass rebounds and the extent of such a rebound depends upon the surface hardness of the concrete. The surface hardness and therefore the rebound is taken to be related to the compressive strength of the concrete.

The rebound value is read from a graduated scale and is designated as the rebound number or rebound index. The compressive strength can be read directly from the graph provided on the body of the hammer.

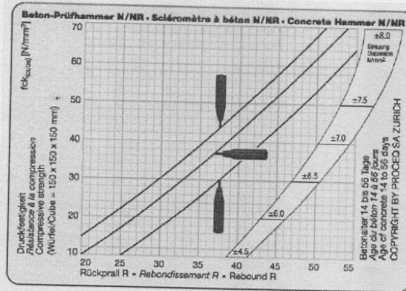

Faculty Incharge


Asst./Assoc./Professor


Chief Co-ordinator, ICS.



The typical graph for rebound hammer for the 3 directions of testing is given below:



The graph of the instrument is on the instrument itself.

Depending on the direction of testing the estimated compressive strength is calculated from the respective graph.

In case of columns and beams the testing is carried out by placing the Rebound hammer horizontally (perpendicular to the face of concrete) and in case of slabs (when tested from bottom) the Rebound Hammer is placed vertically upwards. Respective graph is used to ascertain the compressive strength of concrete.

Interpretation of results: Normally a minimum of 10 results are taken on a particular member at a specified location. The rebound hammer readings (called "R Value") are tabulated member wise.

The average of each group is first calculated. In case any particular R value in the group varies by more than 5 units, the said values are discarded and then the Average R Value is calculated.

Faculty Incharge

Asst./Assoc./Professor

Chief Co-ordinator, ICS
 I.C.S.
 JNTU College of Engg. Hyd

With the average R value and Ultrasonic Pulse Velocities the strength and quality of concrete is estimated.

The tests were conducted by Schmidt Rebound test Hammer manufactured by M/s Schmidt, Switzerland (year of manufacture: Sept 2009). All results are interpreted from the graphs provided by the Manufacturer.

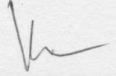
b. Ultra sonic pulse velocity test:


Ultra-Sonic pulse velocity tests are conducted on Concrete structures to qualitatively access the concrete and to determine presence of any voids, cracks and other imperfections in concrete. In Ultra-sonic testing low frequency ultra sonic waves are transmitted through the concrete by the

Classification as per IS 13311 part 1		
	Pulse Velocity (km/sec)	Concrete Quality grading
1	Above 4.50	Excellent
2	3.5 - 4.5	Good
3	3.0 - 3.50	Medium
4	Below 3.0	Doubtful

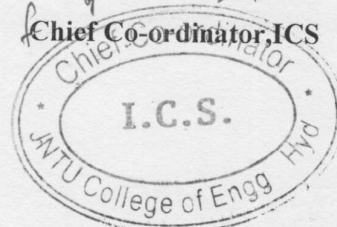
transmitter and are received at the other end by the receiver. The time taken by the pulse is measured and with the information of the thickness of concrete the instrument provides the velocity of the sound wave in km/sec or m/sec. Based on the Pulse Velocity the quality of concrete is classified as per IS Code : 13311 (Part 1) – 1992. The classification as per IS code is as under

UPV results provide the information on quality of the core concrete. The results of the Rebound hammer test and Ultrasonic Pulse Velocity test conducted on various structural elements of the buildings are enumerated below:


Faculty Incharge


Asst./Assoc./Professor


Chief Co-ordinator, ICS



These test results indicate "Medium to Good" quality of concrete with estimated strengths of concrete coming to more than 20 N/mm².

Ultrasonic Pulse velocity measurements:

The concrete can only be qualitatively assessed using this method, and the method should not be used directly to estimate the strength of concrete. As per the guidelines provided in the IS code 13311 (Part I) : 1992, it can be stated that the quality of concrete varied between medium, good and excellent. It may be stated that the ultrasonic pulse velocity data obtained from the site clearly reinforce the conclusion suggested under hammer tests that the concrete quality used in the construction was in general, acceptable for building construction.

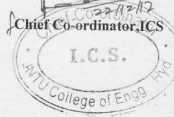
TEST RESULTS OF THE SCHOOL BUILDING

Sl.No	Identification	Ultrasonic Pulse-velocity (km/sec)	Average Rebound Hammer Number	Equivalent Compressive Strength (N/mm ²)	Quality of Concrete
Ground Floor					
Room No 5 VI A					
1	C1	3.510	30	27	GOOD
2	Roof Beam	3.480	34	34	MEDIUM
Room No 1					
1	C2	3.400	28	25	MEDIUM
2	Roof Beam	3.640	30	28	GOOD
First Floor					
Room No 7 VI B					
1	C3	3.640	32	32	GOOD
2	Roof Beam	3.310	26	23	MEDIUM
Second Floor					
Room No 14					
1	Column (Right Side)	3.100	32	30	MEDIUM
2	Column (Corridor)	3.810	38	43	GOOD
3	Roof Beam	3.990	38	44	GOOD
4	Roof Slab	3.300	40	43	MEDIUM
5	Corridor Cantilever Slab	3.410	42	46	MEDIUM

Faculty Incharge

Asst./Assoc./Professor


Chief Co-ordinator, I.C.S.



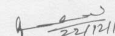
Conclusions: The results of the above NDTs performed on the members (beam/columns) identified by the Engineer-in-charge are enclosed. The tests have been performed by causing minimum damage to the structure as some tests involve chipping of plaster. It may kindly be noted that these results are subject to the limitations inherent in any non-destructive method of testing concrete.

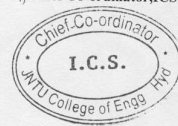
The results are within the limits as suggested by IS 13311. This is indicated by the ultrasonic tests performed on the beams and columns, the results of which indicate the quality of concrete is varying from medium to good.

The building is safe and stable for the intended use.


Faculty Incharge


Asst./Assoc./Professor


22/12/12
Chief Co-ordinator, ICS



STRUCTURAL INTEGRITY
Consulting Structural Engineers

K. VIJAYAKUMAR
Consulting Engineer



Date: 02-03-2020

STRUCTURAL STABILITY CERTIFICATE

The Building consisting of Existing G+3 floors , which are used as School purpose to

The organization of VIGNANA JYOTHI PUBLIC SCHOOL

Situated At G-16A, MADHURA NAGAR, HYDERABAD, Telangana State - 500004.

The Building consisting of Existing G+3 floors and the school is being run in the G+2 floors and are investigated by me as a Structural Consultant . The general maintenance of the building is good and there are no signs of distress, dampness or cracks in the building. The building is structurally sound and is safe and can be used for the intended purpose.


KALAKOTI VIJAYA KUMAR
550/A/ENGINEER/TP10/GHMC 2016-21

Signature of the Structural Engineer