

REPORT OF LOW STRAIN INTEGRITY TEST ON PILE (PIT/PET) FOR
CONSTRUCTION OF
"Panache Green City"

72 Gouri Nath Shastri Sarani,
Ward no 27, JL No- 32/20, Mouza- Shamnagar,
PS.- Dum Dum, Kol-700055

Owner

Kalpataru Heights
S.N.G. Basak Road, Kolkata-700080

Contractor

Mr. Arun Halder

Consultant

S. D. Consultancy Services

Job No.

A2S-PET/26/V1/2019

Testing Agency



A2S CONSTRUCTIVE



ISO 9001:2015

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❖ Introduction:-

M/S A2S CONSTRUCTIVE has conducted low strain Integrity Test (PET/PIT/SIT) on pile for "PANACHE GREEN CITY "

The Scope of Work consists of conducting Pile Integrity Test on 24(Twenty Four) No Piles.

The test was conducted on 19th October 2019.

❖ Details of Pile:-

500mm and 450mm Diameter cast-in-place piles of about 20.50m from test Levels. Grade of Concrete used was M-25.

❖ Testing Instruments:-

An Accelerometer with amplifier and Microcontroller along with Simulation Software, a Small Nylon Hammer and a Laptop. The entire testing equipment meets or exceeds IS & ASTM Standards.

❖ Test Procedure.

In Low Strain Pile Integrity testing piles should be trimmed to sound concrete level or cut off level. For Cast-In-Situ Piles this test may be performed no sooner than 14 days after date of casting. *However, the quality of result entirely depends upon good preparation of pile head.* All the weak concrete/soil/foreign materials resulting from construction should be removed from pile head as it produces noisy signals.

This System utilizes the pulse-echo method. A small metal/hard rubber is used to produce light blow on top of the pile. The shock wave (having a wave length of 2.0m to 3.0m) traveling down the length of the pile is reflected back from the toe of the pile and recorded through suitable transducer/accelerometer in a computer for subsequent analysis. The receiver output is usually integrated through accelerometer attached to the top of pile with special putty (Temporary Bonding Material) and linearly and exponentially amplified with time to enhance weak reflection. Digital filtering (in built with system) is usually applied to eliminate high frequency noise. Thus PIT/PET generates a reflectogram on the time domain providing information on structural integrity of piles. The primary shockwave, which travels down the length of the shaft, is reflected from the toe by the change in density between the concrete and sub strata. However, if the pile has any imperfections and discontinuities within its length these will set up secondary reflections,

which will be added to the return signal. By analysis of the captured signal/reflectogram and knowledge of the conditions of the ground, age of concrete and any problem during installation of Pile (if any) etc, a picture of the locations of the pile shaft defects can be build up. The stress wave velocity and approximate pile lengths are provided as input for the integrity testing. The stress wave velocity is dependent on the Young's Modulus and mass density of pile concrete. This value generally lies between 3500-4500m/Sec depending on the grade of concrete used and age of concrete. Normally more than one recording of signals is done until repeatability of signals is achieved on same pile. Averaging of signals is also done to achieve more informative signals.

❖ Limitations of Test.

The Low Strain Sonic Test does not provide the following information:

- Load Carrying Capacity on piles.
- Progressive change in cross section.
- Debris at toes.
- Deviations from the straight line and from the vertical.

The toe reflection may not be detected when the L/D ratio roughly exceeds 20(In Hard Soil) to 60 (In very Soft Soil).

❖ Discussion.

The **Reflectograms** of the test are shown from Page No-3 to 5 . 'Remarks' column indicates comment against any test. The approximate depth indicated in 'Depth' column within the system's limitations. The accuracy of length of the pile estimated by this instrument may vary within (+/-) 10%.

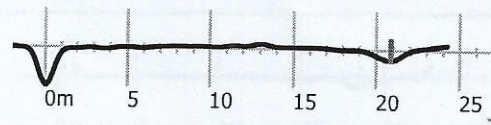
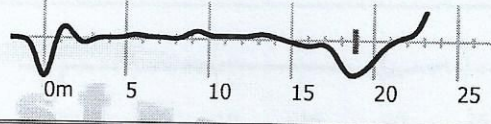
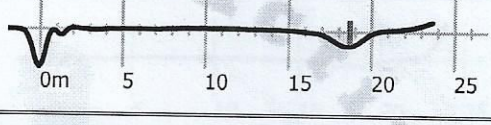
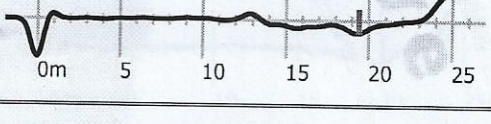
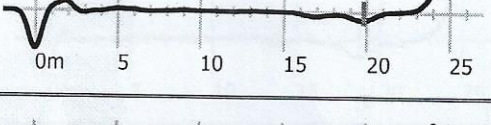
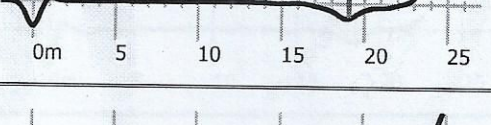
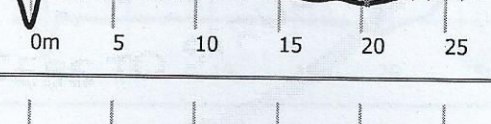
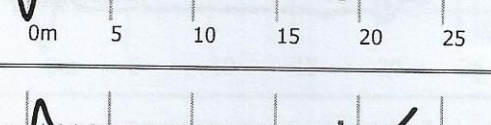
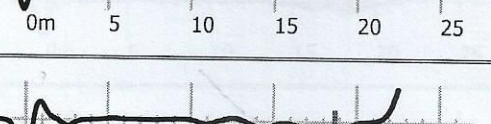
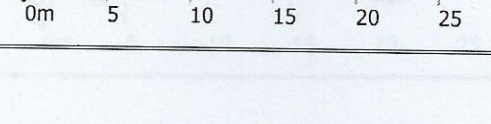
Tested piles are indicated by client's representative at site.

This report has been prepared with generally accepted low strain pile integrity testing practices and best of our knowledge. All judgment and decision was made based on data/information received from instrument and information provided by client/implementing Agency. No other warranty/guarantee/onus expressed or implied, is made. The findings provided in this report are based on individual judgment. The final decision regarding the acceptability will depend on the judgement of the EIC.

**LOW STRAIN INTEGRITY TEST ON PILE (PIT/PET) ON PILE FOR CONSTRUCTION OF PROPOSED
PROJECT "PANACHE GREEN CITY"**

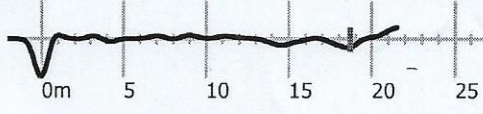
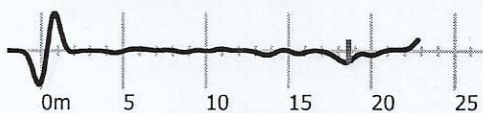
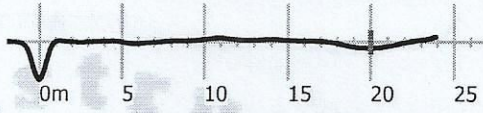
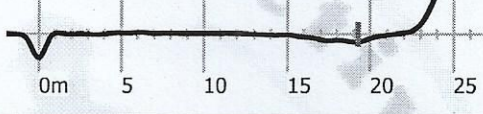
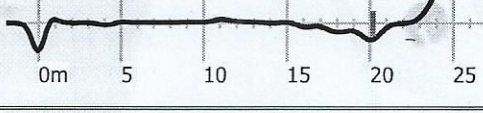
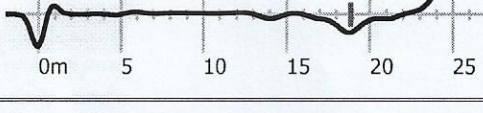
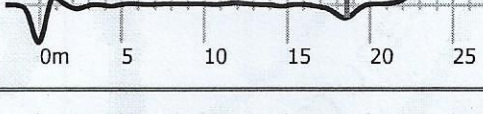
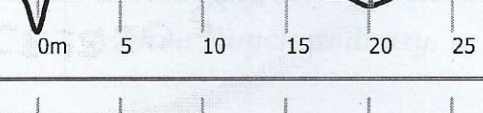
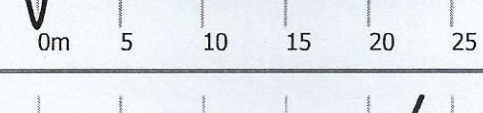
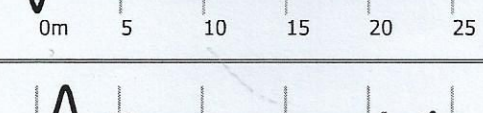
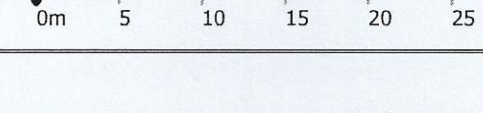
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❖ **Reflectograms**

Length (m)	Details	File	Reflectogram	Remarks
20.9m	10/19/2019 C:4000m/s Amp:110 F:20 Planned:20.5m	C4/P1		Well formed.
18.9m	10/19/2019 C:4000m/s Amp:120 F:20 Planned:20.5m	C4/P2		Mild bulging around 9.3m
18.7m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	C4/P4		Well formed.
19.4m	10/19/2019 C:4000m/s Amp:100 F:20 Planned:20.5m	C12/P1		Bulging around 12.8m
19.8m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	C12/P2		Well formed.
19.1m	10/19/2019 C:4000m/s Amp:160 F:20 Planned:20.5m	C12/P3		Well formed.
20.3m	10/19/2019 C:4000m/s Amp:160 F:20 Planned:20.5m	C12/P4		Well formed.
19.0m	10/19/2019 C:4000m/s Amp:160 F:20 Planned:20.5m	C13/P1		Well formed.
19.0m	10/19/2019 C:4000m/s Amp:150 F:20 Planned:20.5m	C13/P2		Well formed.
18.7m	10/19/2019 C:4000m/s Amp:160 F:20 Planned:20.5m	C13/P3		Bulging around 12.6m

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<u>Length (m)</u>	<u>Details</u>	<u>Pile</u>	<u>Reflectogram</u>	<u>Remarks</u>
18.7m	10/19/2019 C:4000m/s Amp:100 F:20 Planned:20.5m	C16/P1		Impedance change around 14.5m
18.6m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	C16/P2		Mild undulations throughout the length up to founding level.
20.0m	10/19/2019 C:4000m/s Amp:165 F:20 Planned:20.5m	C17/P1		Well formed.
19.3m	10/19/2019 C:4000m/s Amp:110 F:20 Planned:20.5m	C17/P2		Well formed.
20.2m	10/19/2019 C:4000m/s Amp:110 F:20 Planned:20.5m	C17/P3		Well formed.
18.8m	10/19/2019 C:4000m/s Amp:140 F:20 Planned:20.5m	C18/P1		Well formed.
18.6m	10/19/2019 C:4000m/s Amp:100 F:20 Planned:20.5m	C18/P2		Well formed.
20.1m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	C18/P3		Well formed.
20.7m	10/19/2019 C:4000m/s Amp:160 F:20 Planned:20.5m	C24/P1		Mild impedance change around 16.9m
18.5m	10/19/2019 C:4000m/s Amp:150 F:20 Planned:20.5m	C25/P2		Well formed.
20.9m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	C30/P2		Well formed.



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<u>Length (m)</u>	<u>Details</u>	<u>Pile</u>	<u>Reflectogram</u>	<u>Remarks</u>
19.7m	10/19/2019 C:4000m/s Amp:150 F:20 Planned:20.5m	SW1/P1		Bulging around 13.0m
18.6m	10/19/2019 C:4000m/s Amp:110 F:20 Planned:20.5m	SW1/P3		Bulging around 12.8m
19.8m	10/19/2019 C:4000m/s Amp:130 F:20 Planned:20.5m	SW1/P4		Well formed.

Tested piles are indicated by client's representative at site.

<i>Abhijit Das, B.E.</i>	<i>Agniva Roychowdhury, B.E.</i>