PERFORMACE REPORT OF AJAX SELF LOADING CONCRETE MIXER – "ARGO 2500" Cement : Ultratech, 43 Grade, OPC

TEST ORDER NO. BL/2084/9/2020/1
Dated :26.09.2020

Project/Site :
"Dalavai Constructions, Rajanakunte"

OCTOBER 2020

REPORT FOR

M/s. Ajax Engineering Pvt. Ltd.,
#253/1, 11th Main, Phase III, Peenya Industrial Area,
Bengaluru - 560 058, Karnataka, India

BUREAU VERITAS (INDIA) PRIVATE LIMITED
Construction Services Laboratory
 # 43, 45, 46 & 47, Ground & 1st Floor, 1st Main, Pete Chennappa Inds. Estate, Magadi Road,
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NABL Accredited Laboratory as per ISO 17025

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To : M/s Ajax Engineering Pvt. Ltd.,

CONTENTS

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A. INTRODUCTION:

On reference from M/s. Ajax Engineering Pvt. Ltd., #253/1, 11th Main, Phase III, Peenya Industrial Area, Bengaluru - 560 058, Karnataka, India, vide their Letter No. AJAX/BVQI/001 Dated 22.09.2020, PO NO. 3500001933 dated 28.09.2020, analysis of fresh Concrete mix for homogeneity of mix in Self Loading Concrete Mixer "ARGO 2500" were taken up for the Site "Dalavai Constructions, Rajanakunte", in our laboratory vide our Test Order No. BL/2084/9/2020/1 Dated: 26.09.2020.

For analysis of fresh concrete mix in self-loading concrete mixer for homogeneity of the mix, trials were conducted by adopting a theoretically proportioned concrete mix based on IS-10262-2009 and IS-456-2000 recommendations.

B. MATERIALS:

Cement	:	Ultratech, OPC 43 Grade
Fine Aggregate	:	Crushed Stone Sand (Manufactured sand)
Coarse Aggregate	:	Angular crushed coarse aggregate of size 20 mm and 12.5 mm down size
Water	:	Potable

Above materials adopted during trials are conforming to relevant Indian Standards.

C. DETAILS OF AJAX SELF LOADING CONCRETE MIXER: - "ARGO 2500"

Specification: (As furnished by the customer)

Engine

- 4 Cylinder turbo charged intercooled – 56.67 kW @ 2200 rpm.
- Bharat III Emission Certified

Chassis

- High tensile steel welded "Box" type construction

Hydrostatic Drum Drive

- Hydrostatic Drum Drive with high rotation for homogenous mix and drum lift for fast and complete discharge even on inclines.
- Drum Volume : 3.84 m^3
- Concrete Output : 2.5 m^3
- Maximum Drum Rotation : 0 – 22 rpm
- Infinitely variable for mixing & discharge.

Wheels

- Tyre : 12.5/80-18 -14 PR

Transmission

- 4 wheel drive, 4 Speed Automotive hydrostatic transmission.
- Electro-hydraulic control for "slow" & "fast" speeds.
- Vehicle speed - 0 to 22 Kmph (forward and reverse)

Brake

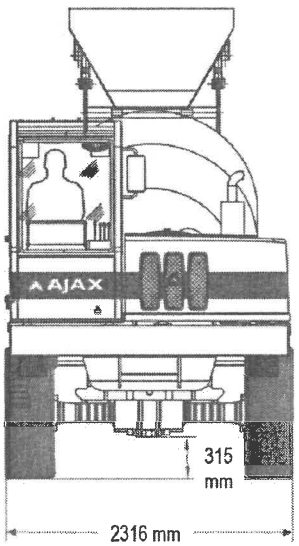
- Wet discs available in front & rear axles.
- Hand operated parking brake acting on transmission shaft.

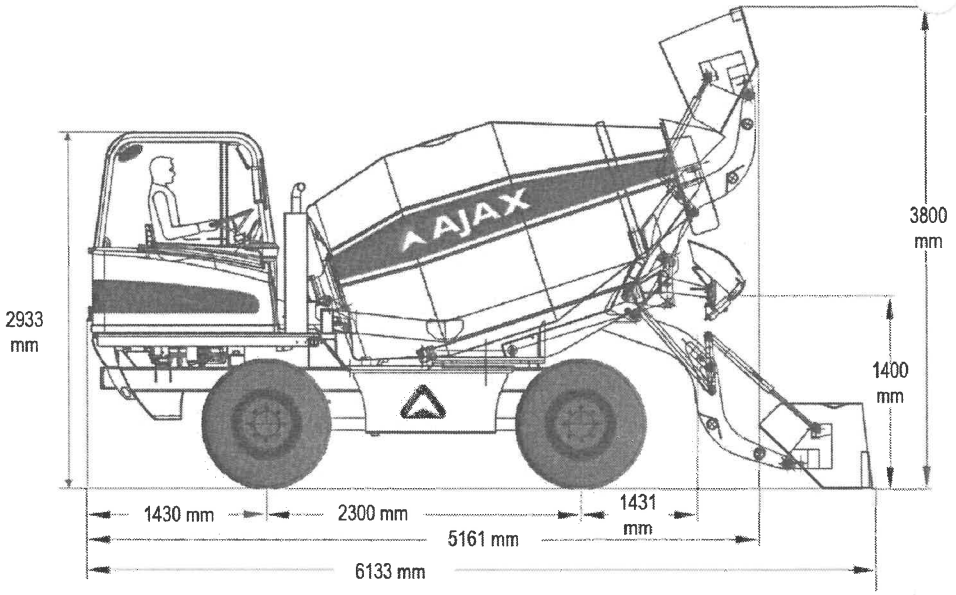
Electrical System

- Battery: 12V, 135 Amp-hr.
- Complete lighting & signaling system as per CMVR standards.

Weight

- Net vehicle weight : 6910 kgs
- Gross vehicle weight :12910 kgs





D. PROCEDURE FOR BATCHING OF MATERIALS IN ARGO 2500:

Operator of the self-loader is trained to batch the materials as per mix design recipe to be adopted for a particular job. Concrete Batch Controller (CBC) device fitted inside the operator cabin, aids the operator to know the weight of the mentioned batched. Loading is continued until the required quantity is batched as per the mix design recipe.

Aggregate is scooped by the loading bucket and loaded on to the mixer. Similarly required quantity of cement is batched using loading bucket. Water is added to the mixer from the water tank fitted with a water meter. After batching all the constituents of concrete, the mixer is kept rotating. The entire process of loading and unloading is completed in 20 minutes.

Print out of the batched materials can be obtained using a batch printer fitted in the cabin.

E. MIX PROPORTION:

Properties of the materials brought from site were determined. Concrete Mix of grade M25 was proportioned as per Mix Design.

Trials were conducted for M25 grade of concrete in the self-loading Ajax mixer- "ARGO-2500" machine.

I. MIX PROPORTION ADOPTED (Quantities for 1 cum of Concrete)

Cement	:	350 kg
Free W/C	:	0.49
Free water	:	171.5 kg
Manufactured Sand	:	793.9 kg
20 mm	:	636.2 kg
12.5 mm	:	424.2 kg

Note: Aggregate in saturated surface dry condition.

II. CONTROL MIX:

Trial was done with Control Concrete (without Chemical Admixture), Concrete samples were collected while unloading, one sample collected in the beginning and 2nd sample was collected in the middle and 3rd Sample collected at the end, to check the consistency of concrete mix in the same batch. Cubes were cast for determining the compressive strength at 7 days and 28 days.

TABLE

Fresh & Hardened Concrete Properties

Sample No.	(Workability) Slump (mm)	Compressive Strength of Concrete in N/mm²	
		7 days	28 Days
Sample-1	80	23.4	32.9
Sample-2	70	24.2	34.3
Sample-3	60	25.3	35.2

E. INFERENCES :

1. Calibration of batching systems was done, as informed by customer.
2. Mixing of concrete is achieved by rotation of mixer at a predetermined speed.
3. The concrete mix was found to be satisfactory in terms of workability. The increase in slump can be obtained by adding admixture.
4. Concrete mix was found to be satisfactory at different points in the mixer during unloading.
5. Cube Compressive strength of concrete was found to be satisfactory meeting the requirement of 28-day strength in all trials.

F. CONCLUSION :

The performance of self-loading concrete mixer "ARGO 2500" was found to be satisfactory in terms of homogeneity, cohesiveness, workability and compressive strength of concrete produced

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26/10/2020

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SENIOR ENGINEER

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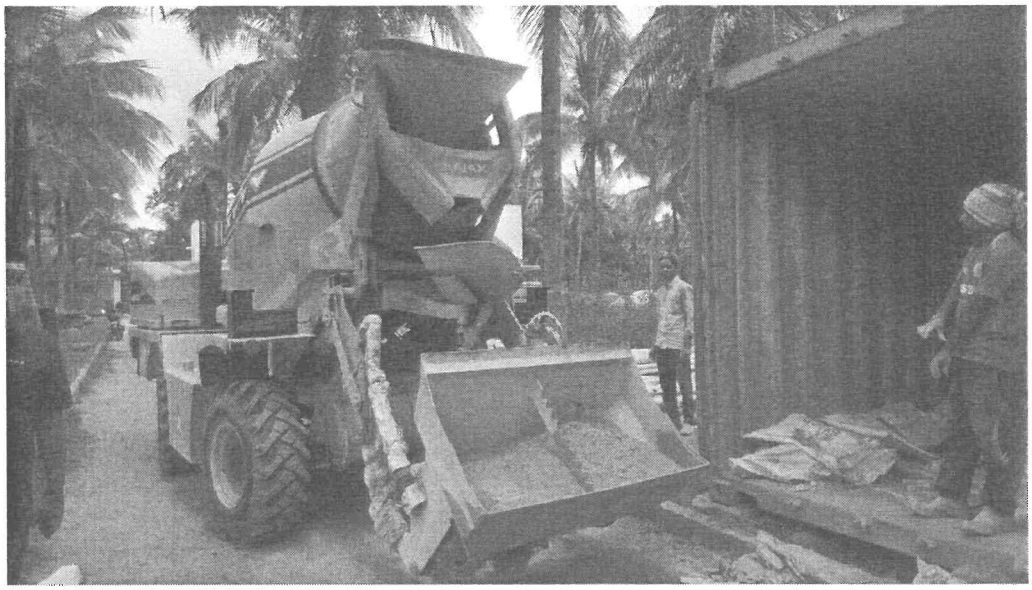
PHOTOGRAPHS

AJAX Argo 2500 machine

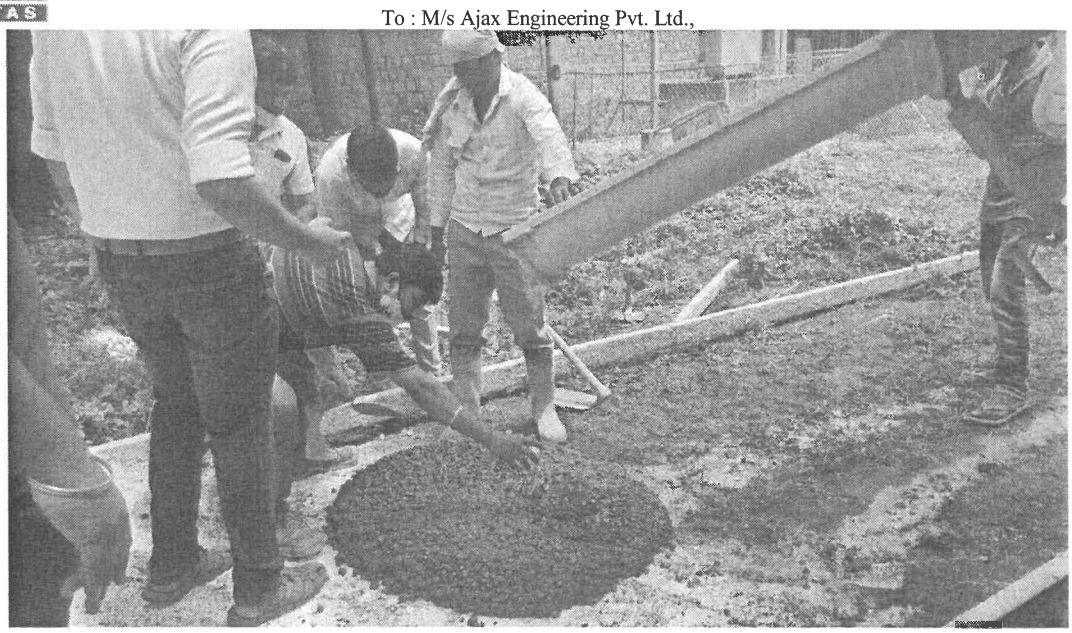


Loading of Cement through AJAX ARGO 2500

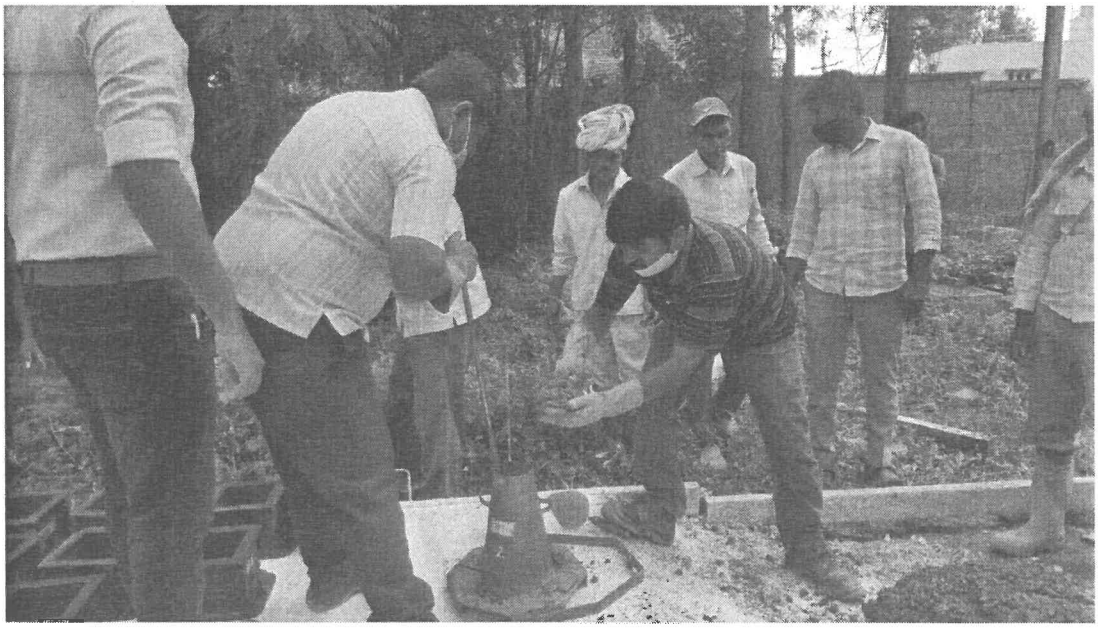
To : M/s Ajax Engineering Pvt. Ltd.,

Loading of Manufactured Sand & aggregates through AJAX ARGO 2500

Unloading of fresh concrete from ARGO 2500



Concrete poured for testing from ARGO 2500



Slump test carried out on fresh concrete

G.	REFERENCES:	
1.	IS:10262-2019	Concrete Mix Proportioning - Guidelines (Second Revision)
2.	SP:23(S&T)-1982	Handbook on concrete mixes.
3.	IS:456-2000 (Reaffirmed 2016)	Code of Practice for plain & reinforced concrete. (Fourth Revision)
4.	IS:516-1959 (Reaffirmed 2013)	Method of test for strength of concrete.
5.	IS:383-2016	Indian Standard specifications for coarse and fine aggregates for concrete. (Third Revision)
6.	IS:1199-1959 (Reaffirmed 2013)	Indian Standard specifications for methods of sampling and analysis of concrete.
7.	IS:1199-2018 (Part 1)	Indian Standard specifications for methods of sampling and analysis of fresh concrete.
8.	IS:4926-2003 (Reaffirmed 2017)	Ready-Mixed Concrete - Code of Practice
9.	IS : 269 – 2015 Clause 7 for OPC 53	Indian Standard Specifications for 53 grade ordinary portland cement.
10.	Neville, A. M.	"Properties of Concrete" 4th Edition, – 1995- Publicity Pearson Education (Singapore) Pte. Ltd., Indian Branch, 482, FIE, Prathapganj Delhi 110092