A
Project Report
On

‘READY MIX CONCRETE’

For the fulfillment of the syllabus of the subject
"Entrepreneurship Development & Project"
Of the final year of Diploma in Construction Technology as per M.S.B.T.E. Mumbai

Project report on:
"READY MIX CONCRETE"

Submitted by:

SUNNY.S.MAHAJAN (Group Leader)
ABHISHEK S. MITHARI
INDRAJIT.A.MANDEKAR
VISHWAJEET.A.BHOSALE
ABHIJEET.V.JAGDALE
ABHIJEET.A.KAMBLE
PRADEEP.E.KAMBLE
ABHIJEET.Z.PATIL
BHUSHAN. B. MALI
NITIN.V.KAMBLE

Of

Final year Diploma in
"CONSTRUCTION TECHNOLOGY"
(2007-2008)

PROJECT GUIDE:
PROF. V.V.DIWAN
(B.E.Civil, M.B.A. F.I.V, M.I.E, Chartered Engineer)

DEPT. of CONSTRUCTION TECHNOLOGY
NEW POLYTECHNIC, KOLHAPUR.

Certificate

This is to certify that this project work of:

"READY MIX CONCRETE"

Submitted by NITIN .V. KAMBLE
Roll no:-22

Student of final year of Diploma in Construction Technology in the academic year 2007-2008, NEW POLYTECHNIC KOLHAPUR.

This project work has been prepared under my guidance:

PROJECT GUIDE

Mr. V.V.DIWAN.

H.O.D. ***PRINCIPAL***

Mrs.S.V.SUTAR ***Mr.V.B.SHINDE***

Acknowledgement

We hereby express our intense sense of gratitude to our respected and beloved **MR. V.V.DIWAN** (Sr.Lec. in construction technology) Without whom we could not be able to present this project with such great confidence and determination. He has always been a great force of inspiration for all the team.

We are also thankful to all our lecturers in construction technology department who guided us in completion of this project.

We are also obliged to our principal **MR.V.B.SHINDE** and our head of department **MRS.S.V.SUTAR** and to all the staff members of construction technology department for their equal encouragement during the completion of this project.

We also thank respected **MR.SARVESH MALI** (Chief Plant Manager) ACC Ready Mix Plant Hingewadi, Pune. And all his associates who with such a gratitude explained us about all the details of the plant.

INDEX

PROJECT REPORT

AT A GLANCE

Name of Firm	:	11th Hour Associates.
Address	:	1182/4 ‘E’ Ward, ‘Sujay’ Takala, Kolhapur. PIN-416008.
Nature of Firm	:	Partnership
Nature of Work	:	Ready Mix Concrete
Self Investment	:	9 Nos X Rs. 13,00,000 = Rs. 1,17,00,000/-
Expected Term Loan	:	Rs. 1,85,00,000/-
Rate of Interest	:	13 % P.A.
Repayment of loan period	:	5 years
% Profit in 1st Year	:	13.49 %
B. E. P. in years	:	0.48 years

INTRODUCTION

Few things are more aggravating to produce on a worksite than concrete. Bags of cement, sand, aggregate (gravel) and possibly other additives must be delivered to the construction area. A supply of clean water is also necessary, along with a rented concrete mixing hopper. Even after all the dusty and heavy ingredients have been loaded into the hopper, one small error in the wet/dry ratio can render an entire batch of concrete unusable. One common solution to this messy and time-consuming problem is **"READY MIX CONCRETE"**

Ready-mix concrete (RMC) is a ready-to-use material, with predetermined mixture of cement, sand, aggregates and water. RMC is a type of concrete manufactured in a factory according to a set recipe or as per specifications of the customer, at a centrally located batching plant.

It is delivered to a worksite, often in truck mixers capable of mixing the ingredients of the concrete en route or just before delivery of the batch. This results in a precise mixture, allowing specialty concrete mixtures to be developed and implemented on construction sites. The second option available is to mix the concrete at the batching plant and deliver the mixed concrete to the site in an agitator truck, which keeps the mixed concrete in correct form.

In the case of the centrally mixed type, the drum carrying the concrete revolves slowly so as to prevent the mixed concrete from "segregation" and prevent its stiffening due to initial set.

However, in the case of the truck-mixed concrete, the batched materials (sand, gravel and cement) are carried and water is added just at the time of mixing. In this case the cement remains in contact with the wet or moist material and this phase cannot exceed the permissible period, which is normally 90 minutes.

The use of the RMC is facilitated through a truck-mounted 'boom placer' that can pump the product for ready use at multi-storied construction sites. A boom placer can pump the concrete up 80 meters.

RMC is preferred to on-site concrete mixing because of the precision of the mixture and reduced worksite confusion. It facilitates speedy construction through programmed delivery at site and mechanized operation with consequent economy. It also decreases labour, site supervising cost and project time, resulting in savings. Proper control and economy in use of raw material results in saving of natural resources. It assures consistent quality through accurate computerized control of aggregates and water as per mix designs. It minimizes cement wastage due to bulk handling and there is no dust problem and therefore, pollution-free.

Ready mix concrete is usually ordered in units of cubic yards or meters. It must remain in motion until it is ready to be poured, or the cement may begin to solidify. The ready mix concrete is generally released from the hopper in a relatively steady stream through a trough system. Workers use shovels and hoes to push the concrete into place. Some projects may require more than one production run of ready mix concrete, so more trucks may arrive as needed or additional batches may be produced offsite and delivered.

However there are some disadvantages of RMC to, like double handling, which results in additional cost and losses in weight, requirement of godowns for storage of cement and large area at site for storage of raw materials. Aggregates get mixed and impurities creep in because of wind, weather and mishandling at site. Improper mixing at site, as there is ineffective control and intangible cost associated with unorganized preparation at site are other drawbacks of RMC. There are always possibilities of manipulation; manual error and mischief as concreting are done at the mercy of gangs, who manipulate the concrete mixes and water cement ratio.

The first ready-mix factory, which was built in the 1930s, remained in a standstill position till 1960s, but continued to grow since then. The leading ready-mix concrete supplier worldwide is the Mexican concrete and cement company Cemex, and their main competitor is France-based Lafarge.

The Ready mix concrete business in India is in its infancy. Where as in developed countries, nearly 70 per cent of cement consumption is in the form of ready mix concrete and 25 per cent in the form of recast, in India, ready mix concrete accounts for less than 5 per cent and as much as 82 per cent of cement consumption is in the form of site-mixed concrete. While 70% of cement produced in a developed country like Japan is used by Ready Mix concrete business there, here in India, Ready Mix concrete business uses around 2% of total cement production.

There are several reasons for this. In early 70s both pricing and distribution of cement was controlled due to shortage of supply. Ready mix concrete technology could not be implemented as investors felt that Ready mix concrete plant will starve due to non-availability of cement. The levy of additional taxes & duties

on RMC, entry tax, excise duty also contributed to the slow development of the concept.

The growth of RMC is predominantly driven by demand from the metro cities. In cities like Mumbai, the mandatory use of RMC is in construction of flyovers provided the requisite impetus to growth, according to an ICRA analysis. RMC is particularly useful when the building activity is located in congested sites where little space is available for siting the mixer and for stock piling of aggregates. The use of RMC is also advantageous when only small quantities of concrete are required or when concrete is to be placed only at intervals.
Even as the concept of ready-mix concrete (RMC) is still catching up in the country, cement majors are keenly focusing on entering the new area in a big way. Anticipating huge potential for the product, cement majors, including Associated Cement Companies, Grasim, L&T, India Cements, Priyadarshini Cements, Chettinad Cement and Madras Cements, are foraying into the RMC business and the share of RMC is expected to go up from present levels of around 5 per cent of the total cement production to the global average of 70 per cent, according to industry players.

The teething troubles has been overcome by the RMC Industry and at present there are over 37 RMC plants delivering over one lakh cubic meters of mixed concrete every month. RMC plants are working in Delhi area also. Envisaging higher demand, the 16.4-million ton cement major, ACC is planning to beef up its existing RMC infrastructure of 11 units with two new RMC units - one at Noida and the other in Mumbai, during the current year. During the last fiscal, Madras Cements set up two RMC plants near Chennai, with a capacity of approximately 9 lakh cubic metres, while Chettinad Cements installed an RMC facility near Coimbatore. Grasim's RMC business accounted for a turnover of Rs 116 crore during 2003-04, against a turnover of Rs 59.8 crore during the previous year.

For growth of the industry, government bodies, private builders, architects/engineers, contractors, and individuals required to be made fully aware about the advantages of using ready mix concrete, government bodies/consultants needs to include ready mix concrete as mandatory in their specification for execution, government specifications for CPWD and PWD jobs should include Ready mix concrete as a mandatory item. Apart form this tax breaks are required for the growth of RMC and developers/contractors needs to be discouraged from piling up materials like metal, sand etc. on roads/foot paths.

HISTORY

Ready mix concrete was first patented in Germany in 1903, its commercial delivery was not possible due to lack of transportation needs. The first commercial delivery was made in Baltimore USA in 1913.The first revolving drum type transit mixer was developed in 1926.

In 1931, a RMC plant was set up for the construction of Heathrow airport, London. In the mid 90's there were about 1100 RMC plants in UK consuming about 45% of cement produced in that country. In Europe in 1997 there were 5850 companies producing a total of 305 million cusecs of RMC.

In USA by 1990, around 72% (more than 2/3rd) of cement produced was being used by various RMC plants. In Japan first RMC plant was set up in 1949. By 1992 Japan was the then largest producer of RMC, producing 18196 million tons of concrete. In many other countries of the world including some of the developing countries like Taiwan, Malaysia etc, RMC industry is well developed.

Development in India

In India RMC plant arrived in 1950's and use was restricted to only major construction projects such as, Bhakra dam was the first projects were RMC was used. Later on RMC was used for other large projects such as construction of long span bridges, industrial complexes etc. The first RMC plant was set up in Pune in 1993.

SCOPE OF
READY MIX CONCRETE

Long, Long years ago, their where simple houses but in 21st century we can see houses constructed in R.C.C. Therefore concrete got more importance then any other construction material. So the use of concrete is increasing day by day.

For construction most of the contractors and builders have to collect the raw materials required for the construction before starting actual works. These materials should be stored at the site properly. This technique can be possible when there will be more empty space at the construction site which is not possible in congested areas. At this time there is one solution to overcome all these problems that is nothing **"READY MIX CONCRETE".**

By using R.M.C we can save the time and money required for the labours. In following places ready mix concrete can be used:-

1. Major concerting projects like dams, roads, bridges, tunnels, canals etc.
2. For concreting in congested areas where storage of materials is not possible.
3. Sites where intensity of traffic makes problems.
4. When supervisor and labour staff is less.
5. To reduce the time required for construction etc.
6. Huge industrial and residential projects.

MATERIALS REQUIRED FOR R. M. C.

Admixture: A substance added to the basic concrete mixture to alter one or more properties of the concrete; ie fibrous materials for reinforcing, water repellent treatments, and coloring compounds.

- Air-entraining admixtures (mainly used in concrete exposed to freezing and thawing cycles)
- Water-reducing admixtures, plasticizers (reduce the dosage of water while maintaining the workability)
- Retarding admixtures (mainly used in hot weather to retard the reaction of hydration)
- Accelerating admixtures (mainly used in cold weather to accelerate the reaction of hydration)
- Superplasticizer or high range water-reducer (significantly reduce the dosage of water while maintaining the workability)
- Miscellaneous admixtures such as corrosion inhibiting, shrinkage reducing, coloring, pumping etc.

Aggregate: Inert particles (i.e. gravel, sand, and stone) added to cement and water to form concrete.

Cement: Dry powder that reacts chemically with water to bind the particles of aggregate, forming concrete. Portland cement is typically used in concrete production.

Fly ash: Fly ash is a by-product from coal-fired electricity generating power plants. The coal used in these power plants is

mainly composed of combustible elements such as carbon, hydrogen and oxygen (nitrogen and sulfur being minor elements), and non-combustible impurities (10 to 40%) usually present in the form of clay, shale, quartz, feldspar and limestone. As the coal travels through the high-temperature zone in the furnace, the combustible elements of the coal are burnt off, whereas the mineral impurities of the coal fuse and chemically recombine to produce various crystalline phases of the molten ash. The molten ash is entrained in the flue gas and cools rapidly, when leaving the combustion zone (e.g. from 1500°C to 200°C in few seconds), into spherical, glassy particles. Most of these particles fly out with the flue gas stream and are therefore called fly ash. The fly ash is then collected in electrostatic precipitators or bag houses and the fineness of the fly ash can be controlled by how and where the particles are collected.

EQUIPMENT REQUIRED IN R. M. C.

Following are the equipments required in R.M.C

1. Batching plant
2. Transit mixer

BATCHING

Batching plants are classified as

1. Manual
2. Semiautomatic
3. Fully automatic

STORAGE

Storage of the raw materials is done by following methods: -

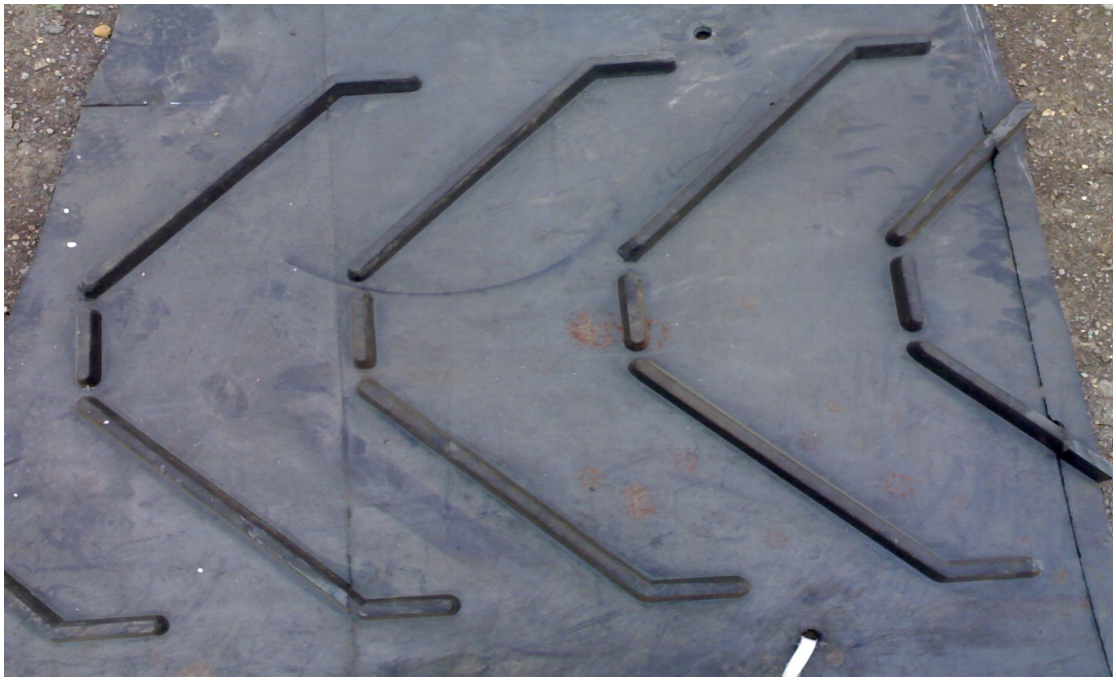
INLINE BINS

Inert raw materials like fine & coarse aggregates are stored in bins called as
"**Inline Bins**" where the trucks carrying fine & coarse aggregate can dump the material easily.

The aggregates required are fed by the means of aggregate belt conveyer. On the aggregate belt conveyer the aggregates are weighed automatically by means of computer form the computer room present on the plant.

Skip Bucket (Weighing belt)

Belt conveyer
(To feed Raw material to the holding hopper)



Belt

Weigh Bridge

Inline Bins

TRANSIT MIXER

SILOS

Cement & Flyash are stored in airtight container called as **“Silos”.** The required quantity of cement & flyash is extracted by the silos. There are two cement silos and one silo of flyash.

The capacity of cement silo is

2 x 130 tons = **<u>260 tons</u>**

Cement and Flyash are fed to holding hopper with the help of a screw conveyer.

A heavy duty cement screw conveyor is fixed in inclined position to convey the cement from Manual Feeding Hopper to Cement Hopper. A suitable drive unit is also provided to drive the screw

The screw conveyor body and the screw is manufactured from heavy duty ‘C’ class pipe and the flutes are fabricated from 5mm plate. Running clearances provided between body and flutes for smooth running. The screw is supported on both ends by bearing and at center by hanger bearing having renewable hard bush. These bearing can b adjusted with setting nuts so as to have proper alignment.

The screw conveyor is provided with suitable vertical supports. One inlet connection is provided at the bottom en where manual-feeding hopper is connection & one discharge connection at the top from where the cement is discharged to cement weighing hopper. Flexible joint is provided between discharge connection & cement weighing hopper. Two cleaning pockets, one in the middle

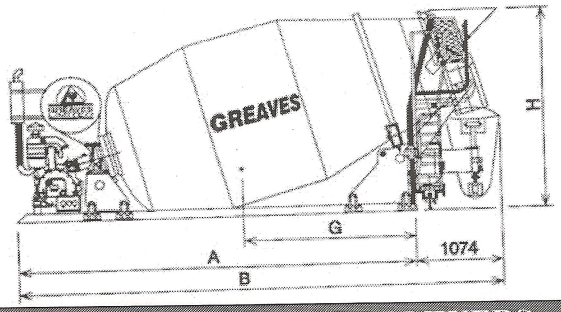
and another at the bottom side are also provided for emergency removal of cement from the conveyor.

TECHNICAL FEATURE

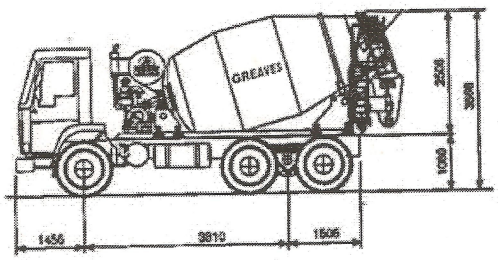
FOR TRANSIT MIXER

MODEL	CONMIX 4	CONMIX 5	CONMIX 6
NOMINAL CAPACITY	4.0m3	5.0m3	6.0m3
TOTAL GEOMETRIC VOLUME	7.6m3	8.7m3	10.2m3
FILLING RATIO	53%	57%	59%
ENGINE (KIRLOSKAR maker)	RB33	RB44	RB44
POWER REQUIREMENT	38 H.P/1500 R.P.M.	52H.P./1800 R.P.M.	56 H.P./2000 R.P.M.
DRUM SPEED	0-14 R.P.M.	0-14 R.P.M.	0-14 R.P.M.
WATER TANK	450 LITERS	450 LITERS	600 LITERS
WATER CONNECTION	25mm	25mm	25mm
WATER METER(OPTIONAL)	20m3/Hr.	20m3/Hr.	20m3/Hr.
LENGTH OF MIXER	5100mm	5700mm	5800mm
WIDTH OF MIXER	2200mm	2200mm	2200mm
HEIGHT OF MIXER	2350mm	2425mm	2500mm
WEIGTH OF MIXER ONLY	3000kgs.	3300kgs.	3500kgs.
DRUM ANGLE	13 degree	12 degree	12 degree
HYDRAULIC PUMP/MOTOR (SUNDSTRANI OR REXROTH)	70cc/Rev.	70cc/Rev.	70cc/Rev.
GEAR BOX (ZF,SUNDSTRAND OR EQUIVALENT)	1:141	1:141	1:141

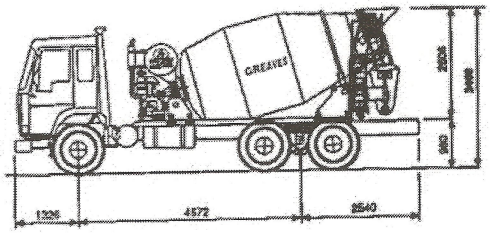
Specifications of transit mixer



Technical data		CONCRETE MIXERS
Models		RHS 65
Drum :		
Nominal capacity	m^3	6
Geometric volume	m^3	10,2
Filling ratio	%	59
Rotation speed	1/min	0+14
Diameter	mm	2200
Rollers	n°	2
Water pump output-press.	l/min – bar	400-3,5
Water meter scale	l	0+500
Water tank capacity	l	600
Driven by :		
Separate engine		HA494(KOEL)
Required power	kW	46
Dimensions :		
A - frame length	mm	4500
B - max. length	mm	5575
G - center of gravity	mm	1896
H - max. height	mm	2510
Max. width	mm	2300
Total weight (empty)	Kg	3400



MOUNTED ON HIPPO TRACTOR



MOUNTED ON TAURUS

CHETAN MOTORS

(Div. of Ghatge Patil Transports Ltd.)

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ACE & 207 DI -9225808727. LCV - 9225800909. HCV - 9225809898.

PROFORMA INVOICE / QUOTATION

Name : Sunny Mahajan

Address : 1182/4 E ward Takala Kolhapur.

Contact No. : 2524347

No. : 2585

Date : 23/2/2008.

We thank you very much for inquiring about the following vehicle and we are pleased to quote our best prices for the same, subject to the terms and conditions set forth over leaf.

	DESCRIPTION OF THE VEHICLE	AMOUNT in Rs.	
1	Being the cost of one unit Make : TATA COMMERCIAL VEHICLE MODEL : LPT 1613/42 Cwl BS-II (Wheel base as supplied by the manufacturers, with all tools, accessories and free service coupon book, but with out Jack and Tommy) Delivery : Ex-Showroom/Works - Uchgaon	8,73,760=00	
2	Insurance Charges (Comprehensive) Actual	30000=00	
3	Registration Charges Actual	20000=00	
4	Annual Maintainance Contract (Sampoorna Seva)		
	Note : This Proforma Invoice/Quotation is valid for 30 days from the date of issue. (Above price including VAT) Interest @ 6% p.a. is payable from 8th day of receipt of full Payment, subject to not cancelling the order in three months From the date of receipt. Advance payment for purchase of vehicles made by you to us is our own liability and our principals M/s. TATA Motors Limited are in no way explicitly responsible for any liability for the refund of any Advance or delivery of vehicles thereof as they deal with us on a Principal to Principal basis. Rs. : Nine Lakh twenty three thousand seven hundred & sixty only	9,23,760=00	

VAT TIN 27450016239 V
CST TIN 27450016239 C
w.e.f. 01-04-2006

Subject to Kolhapur Jurisdiction.

For CHETAN MOTORS

Authorised Signatory

BRANCHES : ● **GPT Complex, Old P.B. Road, Kolhapur. Phone : 6452434.**
● **Gadhinglaj : Sankeshwar Road, Gadhinglaj. Phone : (02327) 225513, 222213.**

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SPECIFICATIONS

TATA LPT 1613 Turbo EX BS II

Confirms to Bharat Stage II Emission Norms

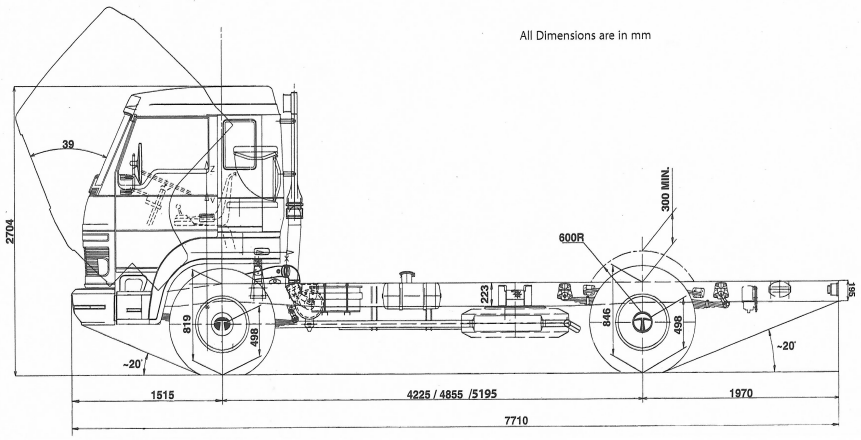
ENGINE	:	Tata 697 TC IC engine
Type	:	Turbo Charged Intercooled Diesel Engine
No. of Cylinders	:	6 Inline
Capacity	:	5675cc
Air Filter	:	Dry type, remote Mounted
Max.Engine Output	:	129 HP (96 kw)at 2400 rpm
Max.Torque	:	41 kgm (410 Nm) at1400-1700 rpm
Fuel Injection Pump	:	Rotary type, Mico
CLUTCH	:	330 mm dia. single plate dry friction type
GEAR BOX	:	Tata GBS 40
Type	:	Synchromesh on all forward gears & constantmesh on reverse gear
No.of gears	:	5 Forward,1 Reverse
FRONT AXLE	:	Heavy duty,Forged I beam,Reverse Elliot Type
REAR AXLE	:	Tata RA 108 RR
Type	:	Single reduction, fully floating axle shafts.
Ratio	:	5.857 (41 / 7)
STEERING	:	Power Steering 20.2 : 1
FRAME	:	Ladder type heavy duty frame with rivetted/bolted cross members. Depth-223mm, Width-60mm, Thick-7mm
SUSPENSION	:	Semi-elliptical leaf spring at front & rear
Shock Absorbers	:	Hydraulic double acting telescopic type at front only.
BRAKES		
Service Brakes	:	Dual circuit full air S-Cam brakes
Parking Brake	:	Spring actuated parking brake acting on rear wheels with graduated hand brake valve.
Engine exhaust brake	:	Coupled with service brake
WHEELS & TYRES	:	10.00x20-16 PR/ 10 R x 20-16 PR Radial (optional)
Wheel rims	:	7.00 x 20
No.of wheels	:	Front: 2, Rear: 4, Spare: 1
FUEL TANK	:	350 litres
CAB/COWL	:	Resiliently mounted New tilt sleeper cabin / cowl options
ELECTRICAL SYSTEM	:	12 Volts, 120 Ah capacity battery, 65 Amps alternator capacity
PERFORMANCE		
Max.climbing ability	:	18.2% (in 1st gear with standard gear box & rear axle)
Max. geared speed in top gear	:	78 kmph

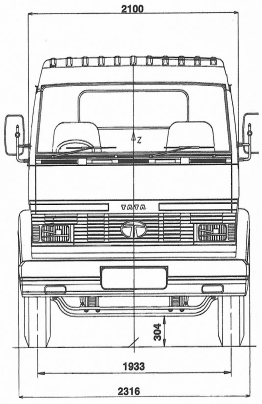
WEIGHTS :

	Wheel Base Options		
WEIGHT	4225mm	4855 mm	5195mm
Kerb weight with cowl	3935 kg	3985 kg	4040 kg (50% R.O.H.) 4055 kg (60% R.O.H.)
Kerb weight with cabin	4440 kg	4490 kg	4545 kg (50% R.O.H.) 4560 kg (60% R.O.H.)
Max. Permissible FAW	6000 kg	6000 kg	6000 kg
Max. Permissible RAW	10200 kg	10200 kg	10200 kg
Max. Permissible GVW	16200 kg	16200 kg	16200 kg

CAUTION: Do not weld or drill on chassis frame. **Accessories shown in the picture or elsewhere do not constitute standard fitment.**
The Specifications are subject to change without notice. These are indicative specifications for Reference only.

All Dimensions are in mm





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MIXING PROCESS

Following in are types of mixing of concrete.

1. Transit Mixed (or "truck-mixed") Concrete
2. Shrink Mixed Concrete
3. Central Mixed Concrete

1.Transit Mixed (or "truck-mixed") Concrete

While ready mixed concrete can be delivered to the point of placement in a variety of ways, the overwhelming majority of it is brought to the construction site in truck-mounted, rotating drum mixers. Truck mixers have a revolving drum with the axis inclined to the horizontal. Inside the shell of the mixer drum are a pair of blades or fins that wrap in a helical (spiral) configuration from the head to the opening of the drum. This configuration enables the concrete to mix when the drum spins in one direction and causes it to discharge when the direction is reversed.

To load, or charge, raw materials from a transit mix plant or centrally mixed concrete into the truck, the drum must be turned very fast in the charging direction. After the concrete is loaded and mixed, it is normally hauled to the job site with the drum turning at a speed of less than 2 rpm.

Since its inception in the mid-1920's, the traditional truck-mixer has discharged concrete at the rear of the truck. Front discharge units, however, are rapidly becoming more popular with contractors. The driver of the front discharge truck can drive directly onto the site and can mechanically control the positioning of the discharge chute without the help of contractor personnel.

Currently, because of weight laws, the typical truck mixer is a 7 to 8.5 m3. The drums are designed with a rated maximum

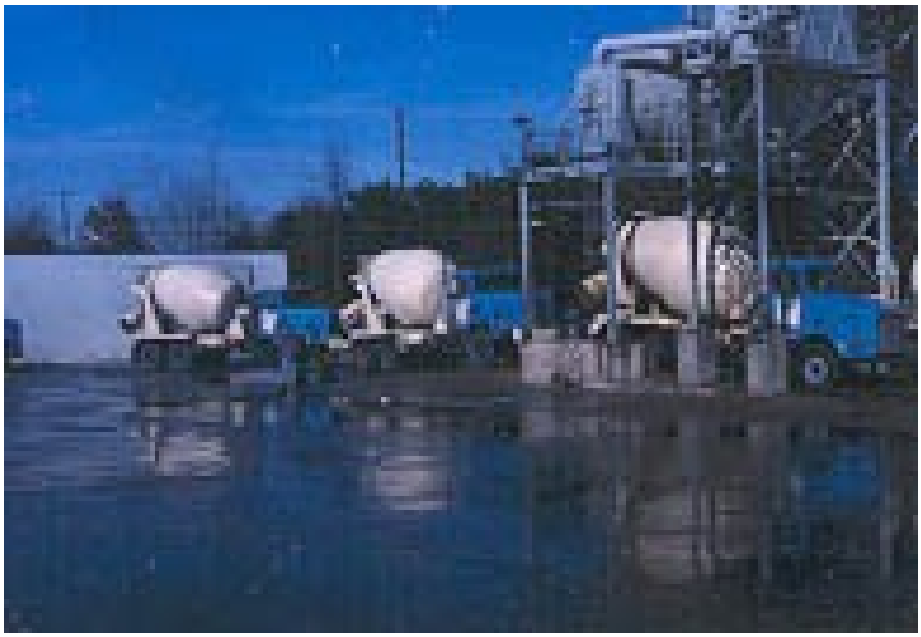
capacity of 63% of the gross drum volume as a mixer and 80% of the drum volume as an agitator. Generally, ready mixed concrete producers, load their trucks with a quantity at or near the rated mixer capacity. Fresh concrete is a perishable product that may undergo slump loss depending on temperature, time to the delivery point on the job site, and other factors.

Water should not to be added to the mix unless the slump is less than that which is specified. If water is added, it should be added all at once and the drum of the truck mixer should be turned minimum of 30 revolutions, or about two minutes, at mixing speed.
The ASTM C 94, Specification for Ready Mixed Concrete, indicates that the concrete shall be discharged on the job site within 90 minutes and before 300 revolutions after water was added to the cement. The purchaser may waive this requirement, when conditions permit.

In certain situations, air-entraining, water reducing, set-retarding or high-range water reducing admixtures may need to be added to concrete prior to discharge to compensate for loss of air, high temperatures or long delivery times. The ready mixed concrete producer will assist the purchaser in such circumstances.

2.Shrink Mixed Concrete

Concrete that is partially mixed in a **plant mixer** and then discharged into the drum of the truck mixer for completion of the mixing is called shrink mixed concrete. Central mixing plants that include a stationary, plant-mounted mixer are often actually used to shrink mix, or partially mix the concrete. The amount of mixing that is needed in the truck mixer varies in these applications and should be determined via mixer uniformity tests. Generally, about thirty turns in the truck drum, or about two minutes at mixing speed, is sufficient to completely mix shrink-mixed concrete.



3.Central Mixed Concrete

Central-mixing concrete **batch plants** include a stationary, **plant-mounted mixer** that mixes the concrete before it is discharged into a truck mixer. Central-mix plants are sometimes referred to as wet batch or pre-mix plants. The truck mixer is used primarily as an agitating haul unit at a central mix operation. Dump trucks or other non-agitating units are sometimes be used for low slump and mass concrete pours supplied by central mix plants. About 20% of the concrete plants in the US use a central mixer. Principal advantages include:

- Faster production capability than a transit-mix plant
- Improved concrete quality control and consistency and
- Reduced wear on the truck mixer drums.

There are several types of plant mixers, including:

- Tilt drum mixer
- Horizontal shaft paddle mixer
- Dual shaft paddle mixer
- Pan mixer
- Slurry mixer

The tilting drum mixer is the most common American central mixing unit. Many central-mix drums can accommodate up to 12 yd3 and can mix in excess of 200 yd3 per hour. They are fast and efficient, but can be maintenance-intensive since they include several moving parts that are subjected to a heavy load.

Horizontal shaft mixers have a stationary shell and rotating central shaft with blades or paddles. They have either one or two mixing shafts that impart significantly higher horsepower in mixing than the typical drum mixer. The intensity of the mixing action is somewhat greater than that of the tilt drum mixer. This high energy is reported to produce higher strength concrete via to thoroughly blending the ingredients and more uniformly coating the aggregate particles with cement paste. Because of

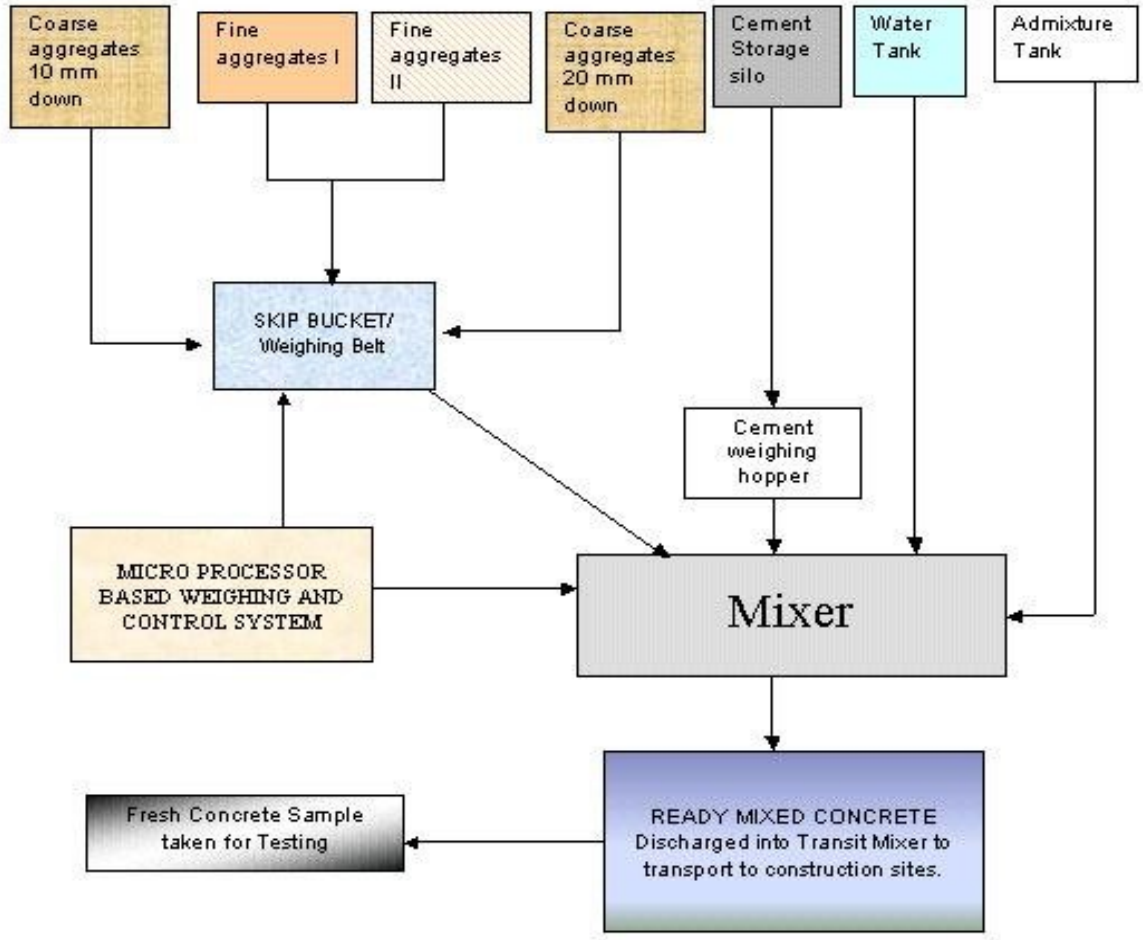
the horsepower required to mix and the short mixing cycle required to complete mixing, many of these mixers are 4 or 5 yd3 units and two batches may be needed to load a standard truck or agitator.

Pan mixers are generally lower capacity mixers at about 4 to 5 yd3 and are used at precast concrete plants.

Slurry Mixing

The slurry mixer is a relative newcomer to concrete mixing technology. It can be added onto a dry-batch plant and works by mixing cement and water that is then loaded as slurry into a truck mixer along with the aggregates. It is reported to benefit from high-energy mixing. Another advantage is that the slurry mixer reduces the amount of cement dust that escapes into the air.

FLOW CHART OF RMC



Inert raw materials namely fine aggregates and coarse aggregates are stored in bins, whereas cement is stored in air-tight silos. Water and admixtures are stored in tanks. The inert raw materials are fed to the batching plant mixer by means of an aggregate belt conveyor. The required quantity of cement is extracted from the silo by a screw conveyor and fed into the mixer. Water and admixtures are pumped into the mixer through a flow meter. After the mixing in the mixer is complete, the ready mixed concrete is discharged into the transit mixer which can then transport the concrete to the construction site. All these above operations are controlled by a computer housed in the control room of the batching plant.

TESTS CARRIED ON R.M.C

All the ingredients used for preparation of the concrete, are thoroughly tested for their quality and physical properties in a well equipped laboratory attached to the plant for conformity to relevant Indian Standard Codes.
The moisture probe determines the water content in the sand and aggregates. This accordingly helps in fixing the proportion of water to be added for the preparation of the mix.
The sand being used is passed through the mechanized sieving system, before feeding for mixing.
Trial mixes are carried out and tested to ensure that each and every batch of concrete coming out of the plant meets the parameters of client's requirements
The sand being used is passed through the mechanized sieving system, before feeding for mixing.

TESTS ON FINE AGGREGATES

1. Sieve Analysis
2. Specific Gravity
3. Bulk Density (Loose / Rodded)
4. Silt Test by Volume / Weight
5. Water Absorption
6. Sulphite / Chloride / Alkali Reactivity
7. Organic Impurities

TEST ON COARSE AGGREGATES

1. Sieve Analysis
2. Specific Gravity
3. Aggregate Impact Value
4. Bulk Density (Loose / Rodded)
5. Water Absorption
6. Flakiness Index
7. Elongation Index
8. Alkali Reactivity
9. Abrassion Test
10. Crushing Test

TEST ON WATER

1. pH Value
2. Chloride
3. Sulphite
4. Nitrite

TEST ON FRESH CONCRETE

1. Workability
2. Temperature

TEST ON HARDENED CONCRETE

1. Compressive Strength
2. Flexure Strength

TEST ON ADMIXTURES

1. Air entrained
2. Specific gravity

MERITS OF R. M. C.

1. Better quality concrete is produced.
2. Elimination of storage space for basic materials at site.
3. Elimination of Procurement / Hiring of plant and machinery
4. Wastage of basic materials is avoided.
5. Labour associated with production of concrete is eliminated
6. Time required is greatly reduced
7. Noise and dust pollution at site is reduced.
8. Organization at site is more streamlined.
9. Durable & Affordable
10. No storage space required either for raw materials or for the mix
11. Lower labour and supervisory cost
12. No wastage at site
13. Environment friendly
14. Availability of concrete of any grade

DEMERITS OF R. M. C.

1. Need huge initial investment.
2. Not affordable for small projects (small quantity of concrete)
3. Needs effective transportation system from R.M.C to site.
4. Traffic jam or failure of vehicle creates problem if proper dose of retarder is not given.
5. Labours should be ready on site to cast the concrete in position to vibrate it and compact it.

CONCLUSION

Ready Mix Concrete plant is a modern technique of production of concrete in large quantities away from the actual site of placing. It is very useful in cities where demand of concrete is very high and construction sites are in congested areas where mixing on site is not possible. It is suitable for projects like Dam, Roads, Bridges, commercial complex, Malls and all types of mass construction where time limit plays a vital role and where demand is huge.

11TH HOUR
A S S O C I A T E S
1182, “SUJAY”, E WARD, TAKALA, MALI COLONY,
KOLHAPUR – 416 008. Mob. : 9890186121, 9764931717

Ref. No. : **Date :**

19/03/2008

To,
The Regional Manager,
State Bank Of India, Regional Office,

Kolhapur-416002

Subject: For Loan
Reference: DIC/PROP/I

Respected Sir,

My proposal for “Ready Mix Concrete” is submitted to D.I.C. by letter DIC/PROP/I. It is my pleasure to submit the detailed project report for your scrutiny about financial assistance. The sanction from D.I.C. is in Progress. I request you for Loan of Rs.1,85,00,000/- for above mentioned project in your budget.

Date: 19/03/2008

Your Sincerely,

Place: Kolhapur

11TH HOUR
ASSOCIATES
1182, “SUJAY”, E WARD, TAKALA, MALI COLONY,
KOLHAPUR – 416 008. Mob. : 9890186121, 9764931717

Ref. No. : **Date :**

19/03/2008

To,
The General Manager,
District Industrial center,
Udyog Bhavan Opposite Mahavir Garden,
Kolhapur-416002

Subject: Project for Ready Mix Concrete Plant

Respected Sir,

I the undersigned hereby request you to go through the proposal of my project report for Ready Mix Concrete. I request you to go through the details and forward the same with your remark to the bank manager for financial assistance.

Thanking you and assuring my best co-operation for all time.

Date: 19/03/2008

Your Sincerely,

Place: KOLHAPUR

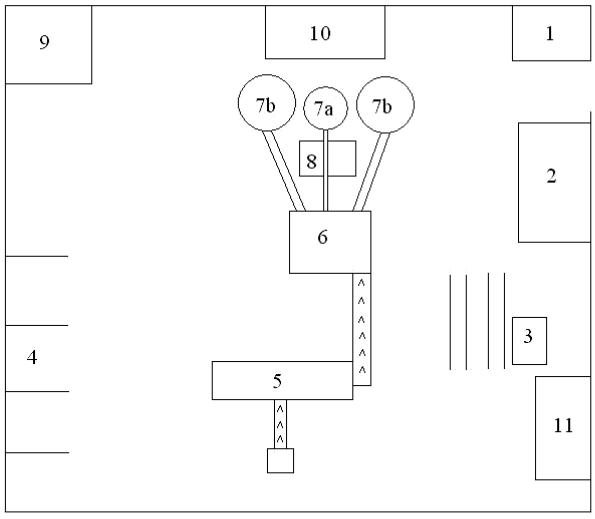
PROJECT REPORT

Location of project : ACC Limited
RMX Batching & Mixing Plant
Survey No. 124/125,
Hinjewadi Industrial Area,
Hinjewadi, District Pune.
Maharashtra. India.

Plant Manager : Mr. Sarvesh Mali

Depu

RMX PROJECT PLAN.



1.CHECK POST.
2.TESTING ROOM.
3.WEIGHING BRIDGE.
4.STOCKPILES.
COMPARTMENT.
5.WEIGHING BELT.
6.CENTRAL MIXER.
7a.FLYASH SILO.
7b.CEMENTSILO.
8.COMPUTER ROOM.
9.POWER HOUSE.
10.PLANT MANAGER ROOM.
11.PLANT STAFF ROOM.

PROJECT TEAM MEMBERS WITH PLANT MANAGER

MR. SARVESH MALI AND DEPUTY MANAGER (QC)

MR. AJIT DHONGADE AT ACC RMX PLANT

HINJEWADI, PUNE.

11TH HOUR

ASSOCIATES