

## **STANDARD OPERATING PRACTICES (SOP)**

### **1. STANDARD OPERATING PRACTICES (SOP) FOR MATERIAL**

All the material received at site will be tested at site laboratory as per the procedure laid down in the relevant BIS code or CPWD specification or the ASTM codes. Only the material which complies with the codal provisions will only be allowed to unload at the site. Following procedure must be followed once the material received at the gate of the site:

- I. Security persons at Gate will inform Authorized representatives of client about the arrival of the material.
- II. Authorized representatives of client will inform it to the quality engineers in lab.
- III. The quality engineers along with the authorized representatives of client will go for the collection of sample.
- IV. The sample will be tested at site lab in presence of authorized representatives of client and test report will be made by the QC Engineers and it will be jointly signed by the QC Engineers and the authorized representatives of client and they will make a slip of pass or fail. The slip will be in triplicate.
- V. The one copy of slip will be given to store, one copy to Security at Gate.
- VI. The security will allow the entry of vehicle which is having pass word on the slip and keep a record of it for future reference.

### **2. STANDARD OPERATING PRACTICES (SOP) FOR RMC PLANT**

- I. The QC will provide design mix for different grade of concrete if it is produced by the plant of Client or Contractor. If concrete is provided by the RMC plant from outside than it must be approved by QC before using it at site.
- II. All the correction for the design mix because of moisture in sand and change in gradation of material will be done by QC. The corrected design mix slip will be made by QC and will be given to the plant operator.
- III. The Plant operator will run the plant as per the provided corrected design mix slip.
- IV. The QC will check the batch report, check the slump and make cubes and maintain proper record of it as per the frequency.

### Time Limits for Testing

S.NO	Test	Time limit in minutes
A	Material	
1	Coarse Sand	90
2	20 mm	60
3	10 mm	60
4	Cement, Flyash, GGBS, Silica, Admixture	180
B	RMC	
5	Quality of RMC at Plant	20
6	Quality of RMC at site	15
7	RMC UTILIZATION TIME AFTER BATCHING START TIME FROM PLANT	120 to 150

**VISHWASVARYA CONSULTANCY, PROJECT :**  
**FORMAT OF INSPECTION AND TEST PLAN**

SL NO	MATERIAL	TYPE FOF TEST	FREQUENCY	TO BE TESTED AT	RESPONSIBILITY
<b>1</b>	<b>SAND</b>				
a)		PHYSICAL AND CHEMICAL TEST	AT THE START OF THE PLANT AND CHANGE OF THE SOURCE , SUSEQUENTLY EVERY THREE MONTHS	EXTERNAL LAB	STORE OF CLIENT
b)		GRADATION	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
c)		SILT BY VOL. OR WEIGHT,RANDOMLY BOTH	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
<b>2</b>	<b>COARSE AGGREGATE</b>				
a)	20MM & 10MM	PHYSICAL AND CHEMICAL TEST	AT THE START OF THE PLANT AND CHANGE OF THE SOURCE , SUSEQUENTLY EVERY THREE MONTHS	EXTERNAL LAB	STORE OF CLIENT
b)	20MM	GRADATION, IMPACT VALUE, VISUAL TEST	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
c)	10MM	GRADATION, IMPACT VALUE, VISUAL TEST	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
<b>3</b>	<b>WATER</b>				
		SUITABILITY FOR CONCRETE & CURING	AT THE START OF PLANT AND CHANGE OF SOURCE,	EXTERNAL LAB	

			SUSEQUENTLY EVERY THREE MONTHS		
		SUITABILITY FOR CONCRETE & CURING	EVERY DAY	INTERNAL LAB	QC ENGINEER SITE LAB
4	CEMENT, FLYASH, GGBS, MICROSILICA				
		PHYSICAL AND CHEMICAL TEST	AT THE START OF THE PLANT AND CHANGE OF THE SOURCE , SUSEQUENTLY EVERY THREE MONTHS	EXTERNAL LAB	STORE OF CLIENT
		FINENESS, VISUAL TEST, WEEK AND LOT AND CONCRETE TRAIL	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
5	ADMIXTURE				
		PHYSICAL AND CHEMICAL TEST	AT THE START OF THE PLANT AND CHANGE OF THE SOURCE , SUSEQUENTLY EVERY THREE MONTHS	EXTERNAL LAB	STORE OF CLIENT
		PH, DENSITY , VISUAL TEST, WEEK AND LOT AND CONCRETE TRAIL	EACH LOAD	INTERNAL LAB	QC ENGINEER SITE LAB
6	BATCHING PLANT				
		CALIBRATION	EVERY MONTH	EXTERNAL AGENCIES	STORE OF CLIENT
		CALIBRATION AND PHYSICAL	EVERY 15 DAYS AND WHENEVER REQUIRED	INTERNAL	QC ENGINEER SITE LAB
		PHYSICAL & CHEMICAL TESTS	PER 50 MT PER DIA.	EXTERNAL LAB	STORE OF CLIENT

7	<b>CUBE TESTING MACHINE</b>				
		CALIBRATION	EVERY THREE MONTHS	EXTERNAL AGENCIES	STORE OF CLIENT
9	<b>ALL TESTING MACHINE IN LAB</b>	CALIBRATION	EVERY THREE MONTHS	EXTERNAL AGENCIES	STORE OF CLIENT
10	READY MIX CONCRETE				
	<b>FRESH CONCRETE</b>	SLUMP/FLOW TSET/VFLOW/L BOX	50 CUM OR PART THERE OF	INTERNAL LAB	QC ENGINEER SITE LAB
		TRAIL DESIGN MIX	FOR EVERY LOT OF CEMENT, FLYASH, SILICA AND ADMIXTURE	INTERNAL LAB	QC ENGINEER SITE LAB
	<b>HARDENED CONCRETE</b>	CUBE TEST, 7 DAYS, 28 DAYS AND 90 DAYS INCLUDING DEFORMATION MEASUREMENTS	ONE SET 50 CUM OR PART THERE OF OR ATLEAST ONE SET FOR EACH GRADE OF CONCRETE PER DAY	INTERNAL LAB	QC ENGINEER SITE LAB
		RAPID CHLORINE PENETRATION TEST AFTER EVERY 28 DAYS RAND	ONE SET PER 1000 CUM OR ATLEAST ONE SET FOR EACH GRADE (ABOVE M30) OF CONCRETE USED IN THE PROJECT	EXTERNAL LAB	STORE OF CLIENT
		CORE TEST	ONE FROM EVERY GRADE AFTER 90 DAYS OF CASTING	EXTERNAL LAB	STORE OF CLIENT
		CUBE TEST ON 28 DAYS	RANDOMLY ONE SET AT EVERY MONTHS SO THAT EACH GRADE IS TESTED IN PROJECT CONSTRUCTION PERIOD	EXTERNAL LAB	STORE OF CLIENT

## Material Testing Sequence

### Arrival of Vehicle

- First Vehicle Report at Security Gate.
- Vehicle Report Time at Store within 5 Min of arrival.
- Vehicle Report Time at Quality Lab within 10 Min of arrival.

### Testing

- Vehicle's Royalty Paper checked by QC Lab within 15 Min of arrival.
- Vehicle's Sample Collect by QC Lab within 20 Min of arrival.
- Testing of Sample Start within 5 min on sample taken.

### Result

- Testing completed of Sample within
- 60 Min (10mm, 20mm)
- 90 Min (Sand)
- 180 Min (Cement, Flyash, GGBS, Silica, Admixture)
- Testing Result Report will send to store within 5 Min of Testing complete.

## RMC Testing & Pouring Sequence

### Moisture

- Gradation and Moisture report of Material available in Bin Like like- 10 & 20 mm and C/Sand by QC Engineer.
- Cement & Admixture Make & raw material Gradation Report to be provide by Quality Engineer for Corrected Design Mix.
- Above information must be updated in whatsapp group 30 min before concrete start time by QC Engineer
- Corrected Design mix to be provided by Expert within 30min of receiving of information on Whatsapp group

### Design Mix

- Corrected Design Mix to plant & start Loading by QC Engineer
- After getting feeded the design mix in plant send pic of Display of plant showing design mix feeding
- Give a signed copy of corrected design mix to plant
- After loading of check the Batch report with in 20 min QC Engineer
- If all ok Allowed for further Loading work QC Engineer

### Checking

- Check the Slump, Flow, Vflow etc by QC Engineer.
- check concrete after 10 min also.
- If all ok Allowed for further Casting work
- Casting, curing and Testing of cube for 7, 28 & 90 days QC Engineer
- Display the equipment name, calibration report in Lab
- Daily Cube testing time must be fixed at 4pm and it must be displayed at site.

## Site Testing Sequence

### Pouring

- Check the Slump, Flow at Site by Site QC Engineer.
- If ok Concrete must be poured within 120 to 150 minutes from loading time.
- If flow or slump is less than the desired discuss the quality engineer at plant and quality engineer at plant will take decision after consulting the expert.
- If concrete is bleeding hold the TM till bleeding goes, for duration consult the expert

### Post

- Next day Post concreting checked by Site QC Engineer (fill the post concreting format).
- Consult if any deficiencies are observed to Quality/Structural Consultant - site incharge
- go for curing for 7 days - site engineer (Enter it in curing register)

## **Register/ Report/ File to be maintained at the plant:**

1. Day to day test report of 10mm, 20mm, coarse sand each separate file/ printed book
2. Day to day test report and MTC of cement, flyash, silica, admixture each separate file
3. Daily water test report
4. Cube test register (showing slump/flow)
5. Curing tank cleaning register
6. Calibration file separately for CTM, Plant and all other equipment available at plant
7. Daily silica reconciliation register at plant (if added manually)
8. Separate file for third party test report for 10mm, 20mm, coarse sand, cement, flyash, silica, admixture, water and core test.
9. Rebound Hammer test report register (if conducted at site)
10. Ultrasonic pulse velocity test report register (if conducted at site)

## **Register/ Report/ File to be maintained at the site**

1. Slump/ flow register (Remarks about concrete quality)
2. Register showing redosing , bleeding, addition of VMA, returning of TM to plant without poring etc
3. Curing register
4. Repair register