Study on Various Types of Special Concrete For Different Types of Building Construction

M.S.Suresh
Dept of Civil Engineering
Sona College of Technology,Salem,Tamilnadu,India.

Abstract- *The Experimental study is based on the collection of datum using Questionnaires. The study about the various properties of concrete applied in different areas on site is being studied. This process involves the collection of various data from different companies and to perform the analysis. The setup requires a verified questionnaire form to be send to the companies and need to be perform the survey. In this project, the basic software needs are SPSS Software and MS Word. The process involves the collection of datum, manipulation, result and conclusion of the work.The process in the SPSS software involves the input of datum in both of the variable view and data view. Then to analyze and then finally we got a graph or chart as a result. Then by studying the chart we could give the results well as final conclusion. Thus by studying the result we can have the final conclusion to be done.*

Keywords- SPSS Software, Questionnaire Analysis, Management Method Of Project, Concrete.

I. INTRODUCTION

The main need for the present study includes the properties and behavior of concrete in various conditions. Hence, we have to study the previous literatures in order to know about the various works and challenges in practical work involving the installations of the concrete. The study includes the collection of various previous works as well as their results as a preview for this project. The scope of the project includes the collection of datum from the companies and to input in the SPSS to have to perform the analysis and to obtain the results.

In order to perform the works we need a survey questionnaire, which we have to send to lot of companies and to perform the data collection and the collected data is input fed into the software operations and thus the results are obtained. The reason for the study behind this project is to make a complete study about the difficulties in making, transporting, and placing of the concrete on-site.

The major objective of the project is to find out the practical challenges in on-site which the concrete is to be placed & henceforth to provide optimum suggestion find out the improved methods to find out the installation of modern methods in order of ease of installation of concrete on-site.

II. QUESTIONNAIRE

The previously prepared questionnaire helps us to study on the properties, difficulties and challenges of selecting as well as placing a right choice of concrete suitable to the varying site-condition.

At first, the questionnaire for **SELF-COMPACTING CONCRETE** is given below:

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Is Self-Compacting Concrete can be used as a Pumping Concrete?					
2	Does the addition of fly ash improve the flowing property of the Concrete?					
3	Can we improve the Density of this type of Concrete?					
4	Shall we use the artificial coarse aggregates in this type of concrete?					
5	Is there any replacement for the conventional sand used in this type of concrete?					

6	Is the washed off sea sand can be used as a partially substitute for The river sand?					
7	Does the partial replacement of washed off sea sand could affect the strength and durability properties of The Concrete?					
8	Do you have any type of special ingredients to improve the durability of this type of Concrete?					
9	Could this type of concrete mix be used to provide high dense Concrete?					
10	Are there any methods available to increase the flexural strength of this type of Concrete?					

Then, the questionnaire for **AUTOCLAVE AERATED CONCRETE** is given below:

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Is Self-Compacting Concrete can be used as a Pumping Concrete?					
2	Does the addition of fly ash improve the flowing property of the Concrete?					
3	Can we improve the Density of this type of Concrete?					
4	Shall we use the artificial coarse aggregates in this type of concrete?					
5	Is there any replacement for the conventional sand used in this type of concrete?					
6	Is the washed off sea sand can be used as a partially substitute for The river sand?					
7	Does the partial replacement of washed off sea sand could affect the strength and durability properties of The Concrete?					
8	Do you have any type of special ingredients to improve the durability of this type of Concrete?					
9	Could this type of concrete mix be used to provide high dense Concrete?					
10	Are there any methods available to increase the flexural strength of this type of Concrete?					

Then, the questionnaire for **BACTERIAL CONCRETE** is given below:

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Is this type of Concrete can be used a structural load bearing element?					
2	Does the addition of bacterial alter the density of this concrete?					
3	Is this type of concrete can be used for steam curing?					
4	Does the microbial sealing of the calcite precipitation reach various depths of concrete?					
5	Is the compressive strength of the concrete directly proportional to the concentration of the bacterial?					
6	Is it possible to Make this concrete economical?					
7	Could this type of bacterial, can be used to produce high strength concrete?					
8	Does this addition of these kinds of bacterial affects the health condition of the peoples who living inside?					
9	If the fly ash added to those kind of concrete, the bacterial properties affected adversely?					
10	Is these bacterial are useful in making high dense concrete?					

Then, the questionnaire for **READY MIX CONCRETE** is given below:

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Could we use extra/additional fly ash in this type of Concrete?					
2	Could we improve the workability time of the RMC through admixture?					
3	In RMC concrete, these compaction ratio (or) density parameters could be maintained to the optimum level?					
4	Does fly ash affects the workability of this concrete type?					
5	Is this type of concrete, is the best used as the pump able concrete, especially in the tall buildings?					
6	Is it compulsory to use any of the plasticizers to reduce the water consumption in this type of Concrete?					

7	Can we use SCC (Self Compacting Concrete) in the RMC trucks?					
8	Is shortage of Water in such concrete occurs due to heat through the rotation of the RMC drum?					
9	Does the water content to the optimal level, should we use any of the chemical additives?					
10	Could it be Economical for residential building projects?					

Then, the questionnaire for **STAMPED CONCRETE** is given below:

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Does this concrete need the long term maintenance?					
2	Is this concrete has tripping hazards / Slippery surface?					
3	Does it need to be resetting / replacing?					
4	Does this type of concrete needs more skilled laborers to get installed?					
5	Would it involve high intense Working conditions?					
6	Is the durability of this concrete makes the consumers Happy?					
7	Is this type of concrete economical for the residential Projects?					
8	Does this type of concrete could be used for all commercial Purposes?					
9	Can we make higher profit on selling this type of concrete?					
10	Are we able to make decorative touch on this type of concrete?					

Then, the questionnaire for **HIGH STRENGTH CONCRETE**is given below

S.NO	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Is it easy to install this Concrete on site?					
2	In this concrete can we substitute fly ash as a partial substitute to The cement?					
3	Does this concrete need any special curing Methods?					
4	Does this concrete need to be maintained Periodically?					
5	Does this could be economically affordable to be used in Commercial structures?					
6	Does it involve high cost of Repair works?					
7	Could it resist freeze thaw Attacks?					

8	Does the usage of any kind of special Plasticizers?					
9	Does it have higher durability properties?					
10	Are there any chances to use the demolition wastes in this type of concrete?					

III. DATA COLLECTION

The respective data was collected from various companies and had subjected to the process of analysis of questionnaire through IBM SPSS software. The datum was collected in order to perform the process of analysis. Thus the questionnaire analysis enables us to gives modern, optimistic and creative solutions to the ease of placing of concrete of various properties and different uses depends upon the properties among them. **In those following tables, the no. of Respondents represents the number of construction firm/building companies from which the datum is collected.**

Thus the collected responses from various companies are listed below here,

The datum shown below is for the **SELF COMPACTING CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7	8	9	10
1	4	1	2	4	4	5	2	3	4	2
2	5	1	2	5	4	4	1	3	4	1
3	5	1	2	4	5	4	2	3	4	2
4	4	1	2	5	5	5	2	4	4	1
5	4	1	2	4	5	4	2	3	4	1
6	5	1	2	4	5	5	1	4	3	1
7	4	1	1	5	5	4	2	3	3	2
8	4	1	2	5	5	5	2	3	4	2
9	5	1	2	4	5	5	2	3	3	1
10	5	1	1	5	4	5	1	4	3	1
11	5	2	2	5	5	4	2	4	4	2
12	4	1	2	4	4	5	1	3	4	2
13	5	1	1	5	5	4	1	4	4	2
14	4	2	2	5	4	5	2	4	4	2
15	5	2	1	5	5	5	1	4	3	2

The datum shown below is for the **AUTOCLAVE AERATED CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7	8	9	10
1	4	1	3	5	5	5	5	3	3	3
2	4	1	4	5	5	5	5	4	3	3
3	5	1	3	5	5	5	5	4	3	3
4	5	1	3	5	5	5	5	4	3	3
5	5	2	3	5	5	5	5	3	3	3
6	4	1	3	5	5	5	5	4	3	4
7	5	1	4	5	5	5	5	4	3	3
8	5	1	3	5	5	5	5	4	3	3
9	5	1	4	4	5	5	5	3	3	4
10	5	1	4	5	5	5	5	4	3	3
11	4	2	4	5	5	5	5	4	3	4
12	5	1	3	5	4	5	5	4	3	4
13	4	1	3	5	4	4	5	4	3	3
14	5	2	4	4	5	4	4	4	3	3
15	5	1	4	5	5	5	5	3	3	3

The datum shown below is for the **BACTERIAL CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7	8	9	10
1	5	3	4	5	2	5	4	1	4	4
2	5	2	4	5	2	5	4	1	4	5
3	4	3	4	5	2	5	5	2	4	5
4	5	3	4	5	2	5	4	1	3	5
5	4	2	3	5	2	5	5	1	3	4
6	5	3	4	5	2	5	4	2	4	4
7	5	2	3	5	3	4	5	1	3	5
8	5	3	4	4	2	5	4	2	3	5
9	5	3	4	5	3	4	5	1	3	5
10	5	3	4	5	2	4	5	1	3	5
11	5	2	4	4	3	5	4	1	4	4
12	5	3	4	5	2	4	5	1	3	4
13	5	3	4	5	3	5	5	1	4	5
14	5	3	4	4	3	5	5	2	3	5
15	5	3	4	5	2	5	5	1	3	4

The datum shown below is for the **READY MIX CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7	8	9	10
1	2	4	4	4	5	4	4	5	3	2
2	2	3	4	3	5	4	5	5	4	3
3	2	4	3	4	5	4	4	5	3	3
4	2	4	4	3	5	4	4	4	3	2
5	2	4	4	4	5	3	5	4	4	3
6	2	3	4	4	5	4	4	4	3	3
7	2	4	4	3	5	4	5	5	3	2
8	2	3	4	4	5	4	5	4	4	3
9	2	3	3	3	5	4	5	4	3	2
10	2	4	4	4	5	4	5	4	3	2
11	1	4	4	4	4	3	5	4	3	3
12	1	3	4	4	5	4	4	5	2	2
13	2	3	4	4	5	4	5	4	3	2
14	2	4	3	4	4	3	4	4	3	3
15	2	4	4	3	5	4	5	4	3	3

The datum shown below is for the **STAMPED CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7	8	9	10
1	3	2	3	2	1	4	3	5	5	4
2	3	2	4	1	2	5	4	5	4	4
3	4	1	3	1	2	4	3	5	5	5
4	3	1	4	1	1	4	4	5	4	5
5	4	1	4	1	1	4	4	4	4	5
6	3	1	4	2	1	4	4	5	5	4
7	4	1	3	1	1	4	3	5	4	4
8	4	1	3	1	2	4	4	4	5	5
9	4	2	4	2	1	5	4	5	4	4
10	3	1	4	1	1	4	4	5	5	5
11	3	2	4	1	1	5	4	4	4	4
12	3	2	4	1	1	4	3	5	4	5
13	3	2	4	1	2	4	4	5	4	4
14	4	1	4	1	1	4	3	5	4	4
15	4	2	3	1	1	4	4	4	4	5

The datum shown below is for the **HIGH STRENGTH CONCRETE** questionnaire:

No. of Questions / No. of Respondents	1	2	3	4	5	6	7		8	9	10
1	4	3	1	2	5	2	1		4	5	5
2	4	3	1	1	5	2	2		4	5	5
3	4	2	1	1	5	1	2		5	4	5
4	4	3	1	2	5	1	2		4	5	5
5	4	3	1	1	5	2	1		4	5	5
6	4	2	1	1	4	2	1		5	4	5
7	4	2	1	2	5	1	2		4	5	5
8	4	3	1	1	5	1	2		5	4	5
9	4	3	1	1	4	1	2		4	5	4
10	4	3	1	2	5	1	2		5	4	5
11	4	3	3	1	5	2	1		4	5	4
12	4	3	3	2	4	1	1		5	5	4
13	4	3	1	1	4	1	1		4	4	5
14	4	3	1	1	4	1	2		4	4	5
15	4	3	3	2	4	1	2		5	5	4

IV. RESULT

The following table explains about the **SCC (SELF\COMPATING CONCRETE)** analysis result.

DATASET ACTIVATE DataSet1.

FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10/ORDER=ANALYSIS.

Notes

Output Created		04-JUL-2020 02:00:18
Comments		
Input	Data	C:\Users\Gladiator\Documents\Scc 1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.03

[DataSet1] C:\Users\Gladiator\Documents\Scc 1.sav

Statistics

		Q1	Q2.	Q3	Q4.	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Frequencies

Q1- Is Self- Compacting Concrete can be used as a pumping Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	7	46.7	46.7	46.7
	Strongly Agree	8	53.3	53.3	100.0
	Total	15	100.0	100.0	

Q2- Does the addition of fly ash improve the flowing property of the Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	80.0	80.0	80.0
	Disagree	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Q3- Can we improve the Density of this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	26.7	26.7	26.7
	Disagree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Q4- Shall we use the artificial coarse aggregates in this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q5- Is there any replacement for the conventional sand used in this type of concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	5	33.3	33.3	33.3
	Strongly Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

Q6- Is the washed off sea sand can be used as a partially substitute for the river sand?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q7- Does the partial replacement of washed off sea sand could affect the strength and durability properties of the concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	40.0	40.0	40.0
	Disagree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q-8 Do you have any type of special ingredients to improve the durability of this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	8	53.3	53.3	53.3
	Agree	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Q-9 Could this type of concrete mix be used to provide high dense Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	33.3	33.3	33.3
	Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

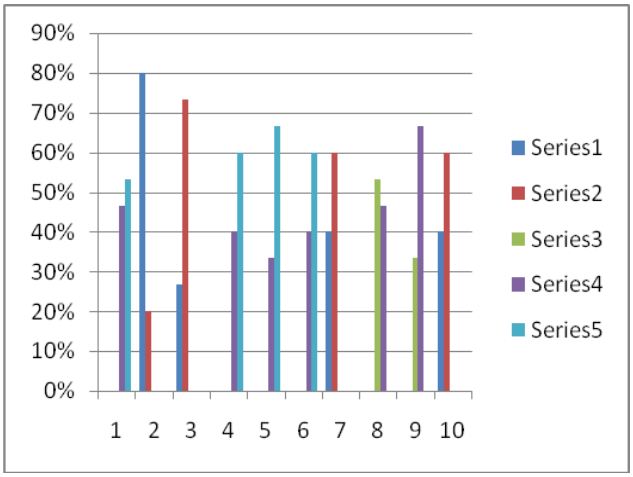
Q10- Are there any methods available to increase the flexural strength of this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	40.0	40.0	40.0
	Disagree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Here, the series explained as:

Series1 – Strongly Disagree, Series2 – Disagree, Series3- Neutral, Series4-Agree, Series5-Strongly Agree.

Picture explains the graphical representation of the SCC survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

The following table explains about the **AAC (AUTOCLAVE AERATED CONCRETE)** analysis result.

```
GET
FILE='C:\Users\Gladiator\Documents\AAC-2.sav'.
DATASET NAME DataSet5 WINDOW=FRONT.
DATASET ACTIVATE DataSet5.

SAVE OUTFILE='C:\Users\Gladiator\Documents\AAC-2.sav'
/COMPRESSED.
FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10
/ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		03-JUL-2020 15:07:47
Comments		
Input	Data	C:\Users\Gladiator\Documents\AAC-2.sav
	Active Dataset	DataSet5
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.02

[DataSet5] C:\Users\Gladiator\Documents\AAC-2.sav

Statistics

		Q1	Q2	Q3	Q4	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Q1- Is this type of concrete has high porosity when compared with conventional concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	5	33.3	33.3	33.3
	Strongly Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

Q2- Can we use the demolition wastes as ingredients in such concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	80.0	80.0	80.0
	Disagree	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Q3- Could we use copper slag as a partial replacement in this type of concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	8	53.3	53.3	53.3
	Agree	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Q4- Does this type of concrete, will be able to absorb the water?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	13.3	13.3	13.3
	Strongly Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q5- Does this type of concrete have the property of thermal insulation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	13.3	13.3	13.3
	Strongly Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q6- Can we use this concrete to provide thermal insulation/cover to the structures?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	13.3	13.3	13.3
	Strongly Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q7- Shall we use this mix, to cast a readymade concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	1	6.7	6.7	6.7
	Strongly Agree	14	93.3	93.3	100.0
	Total	15	100.0	100.0	

Q8- Is it possible to improve the compressive strength of this type of concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	4	26.7	26.7	26.7
	Agree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Q9- Here, can we replace the conventional cement with sodium silicate hydrate gel paste?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	15	100.0	100.0	100.0

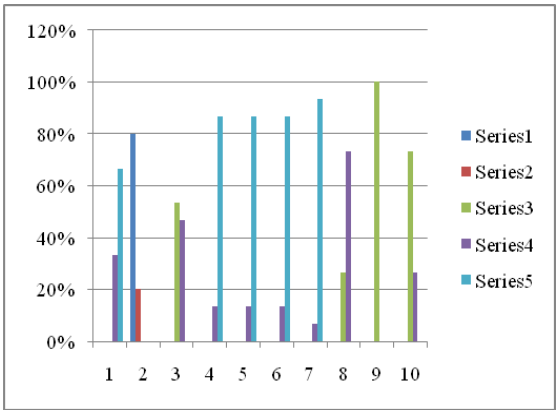
Q10- Is it durable in all types of exposure conditions?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	11	73.3	73.3	73.3
	Agree	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Here, the series explained as:

Series1 – Strongly Disagree, Series2 – Disagree, Series3- Neutral, Series4-Agree, Series5-Strongly Agree.

Picture explains the graphical representation of the AAC survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

The following table explains about the **BACTERIAL CONCRETE** analysis result.

```
DATASET ACTIVATE DataSet3.
FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10
/ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		04-JUL-2020 02:22:03
Comments		
Input	Data	C:\Users\Gladiator\Documents\BACTERIAL CONC.sav
	Active Dataset	DataSet3
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.04

[DataSet3] C:\Users\Gladiator\Documents\BACTERIAL CONC. Sav

Statistics

		Q1	Q2	Q3	Q4	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Frequency Table

Q1- Is this type of concrete can be used a structural load bearing element?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	13.3	13.3	13.3
	Strongly Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q2- Does the addition of bacterial alter the density of this concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	26.7	26.7	26.7
	Neutral	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Q3- Is this type of concrete can be used for steam curing?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	13.3	13.3	13.3
	Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q4- Does the microbial sealing of the calcite precipitation reach various depths of concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	3	20.0	20.0	20.0
	Strongly Agree	12	80.0	80.0	100.0
	Total	15	100.0	100.0	

Q5- Is the compressive strength of the concrete directly proportional to the concentration of the bacterial?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	66.7	66.7	66.7
	Neutral	5	33.3	33.3	100.0
	Total	15	100.0	100.0	

Q6- Is it possible to make this concrete economical?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	4	26.7	26.7	26.7
	Strongly Agree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Q7- Could this type of bacterial, can be used to produce high strength concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q8- Does this addition of these kinds of bacterial affects the health condition of the peoples who living inside?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	73.3	73.3	73.3
	Disagree	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Q9- If the fly ash added to those kind of concrete, the bacterial properties affected adversely?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	9	60.0	60.0	60.0
	Agree	6	40.0	40.0	100.0
	Total	15	100.0	100.0	

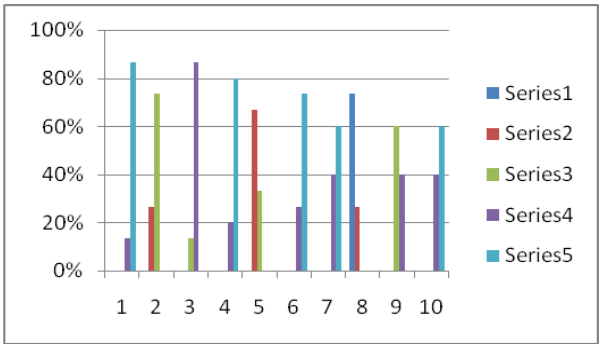
Q10- Is these bacterial are useful in making high dense concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Here, the series explained as:

Series1 – Strongly Disagree, Series2 – Disagree, Series3- Neutral, Series4-Agree, Series5-Strongly Agree.

Picture represents the graphical explanation of the BACTERIAL CONCRETE survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

The following table explains about the **RMC (READY MIX CONCRETE)** analysis result.

```
DATASET ACTIVATE DataSet4.
FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10
/ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		04-JUL-2020 02:23:29
Comments		
Input	Data	C:\Users\Gladiator\Documents\RMC.sav
	Active Dataset	DataSet4
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

[DataSet4] C:\Users\Gladiator\Documents\RMC.sav

Statistics

		Q1	Q2	Q3	Q4	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Frequency Table

Q1- Could we use extra/additional fly ash in this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	13.3	13.3	13.3
	Disagree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q2- Could we improve the workability time of the RMC through admixture?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	6	40.0	40.0	40.0
	Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q3- Could we improve the workability time of the RMC through admixture?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	20.0	20.0	20.0
	Agree	12	80.0	80.0	100.0
	Total	15	100.0	100.0	

Q4- Does fly ash affects the workability of this concrete type?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	33.3	33.3	33.3

	Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

Q5- Is this type of concrete, is the best used as the pump able concrete, especially in the tall buildings?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	13.3	13.3	13.3
	Strongly Agree	13	86.7	86.7	100.0
	Total	15	100.0	100.0	

Q6- Is it compulsory to use any of the plasticizers to reduce the water consumption in this type of Concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	20.0	20.0	20.0
	Agree	12	80.0	80.0	100.0
	Total	15	100.0	100.0	

Q7- Can we use SCC (Self Compacting Concrete) in the RMC trucks?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q8- Is shortage of water in such concrete occurs due to heat through the rotation of the RMC drum?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	10	66.7	66.7	66.7
	Strongly Agree	5	33.3	33.3	100.0
	Total	15	100.0	100.0	

Q9- Does the water content to the optimal level, should we use any of the chemical additives?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	6.7	6.7	6.7
	Neutral	11	73.3	73.3	80.0
	Agree	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

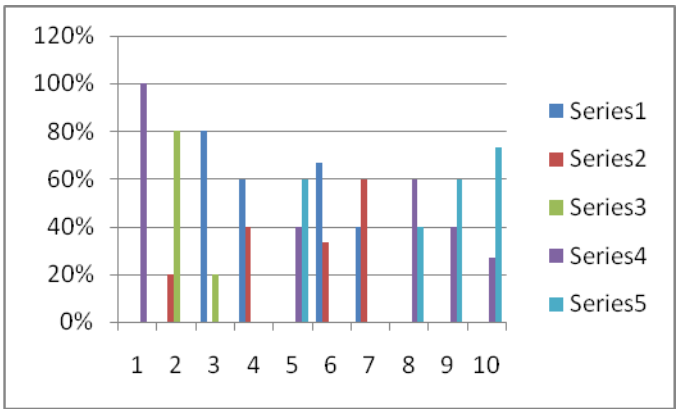
Q10- Could it be economical for residential building projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	46.7	46.7	46.7
	Neutral	8	53.3	53.3	100.0
	Total	15	100.0	100.0	

Here, the series explained as:

Series1 – Strongly Disagree, Series2 – Disagree, Series3-Neutral, Series4-Agree, Series5-Strongly Agree.

Picture represents the graphical explanation of the READY MIX CONCRETE survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

The following table explains about the **STAMPED CONCRETE** analysis result.

```
DATASET ACTIVATE DataSet5.
FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10
  /ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		04-JUL-2020 02:24:19
Comments		
Input	Data	C:\Users\Gladiator\Documents\STAMPED CONC..sav
	Active Dataset	DataSet5
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.13

[DataSet5] C:\Users\Gladiator\Documents\STAMPED CONCRETE .sav

Statistics

		Q1	Q2	Q3	Q4	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Frequency Table

Q1- Does this concrete need the long term maintenance?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	8	53.3	53.3	53.3
	Agree	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Q2- Is this concrete has tripping hazards / slippery surface?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	53.3	53.3	53.3
	Disagree	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Q3-Does it need to be resetting / replacing?.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	33.3	33.3	33.3
	Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

Q4- Does this type of concrete needs more skilled laborers to get Installed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	80.0	80.0	80.0
	Disagree	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Q5- Would it involve high intense working conditions?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	73.3	73.3	73.3
	Disagree	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Q6- Is the durability of this concrete makes the consumers happy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	12	80.0	80.0	80.0
	Strongly Agree	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Q7- Is this type of concrete economical for the residential projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	33.3	33.3	33.3
	Agree	10	66.7	66.7	100.0
	Total	15	100.0	100.0	

Q8- Does this type of concrete could be used for all commercial purposes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	4	26.7	26.7	26.7
	Strongly Agree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Q9- Can we make higher profit on selling this type of concrete?

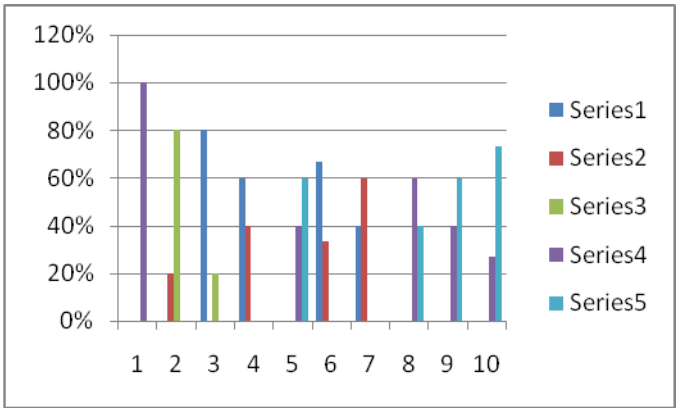
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	10	66.7	66.7	66.7
	Strongly Agree	5	33.3	33.3	100.0
	Total	15	100.0	100.0	

Q10- Are we able to make decorative touch on this type of concrete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	8	53.3	53.3	53.3
	Strongly Agree	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Here, the series explained as:
Series1 – Strongly Disagree, Series2 – Disagree, Series3- Neutral, Series4-Agree, Series5-Strongly Agree.

Picture represents the graphical explanation of the STAMPED CONCRETE survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

The following table explains about the **HSC (HIGH STRENGTH CONCRETE)** analysis result.

```
DATASET ACTIVATE DataSet6.
FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7
Q8 Q9 Q10
```

/ORDER=ANALYSIS.

Frequencies

Notes

Output Created		04-JUL-2020 02:25:12
Comments		
Input	Data	C:\Users\Gladiator\Documents\HSC.sav
	Active Dataset	DataSet6
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.06

[DataSet6] C:\Users\Gladiator\Documents\HSC.sav

Statistics

		Q1	Q2	Q3	Q4	Q5
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Statistics

		Q6	Q7	Q8	Q9	Q10
N	Valid	15	15	15	15	15
	Missing	0	0	0	0	0

Q1- Is it easy to install this concrete on site?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	15	100.0	100.0	100.0

Q2- In this concrete can we substitute fly ash as a partial substitute to the cement?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	20.0	20.0	20.0
	Neutral	12	80.0	80.0	100.0
	Total	15	100.0	100.0	

Q3- Does this concrete need any special curing methods?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	80.0	80.0	80.0
	Neutral	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Q4- Does this concrete need to be maintained periodically?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q5- Does this could be economically affordable to be used in commercial structures?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	66.7	66.7	66.7
	Disagree	5	33.3	33.3	100.0
	Total	15	100.0	100.0	

Q6- Does it involve high cost of repair works?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	40.0	40.0	40.0
	Disagree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q7- Could it resist freeze thaw attacks?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	9	60.0	60.0	60.0
	Strongly Agree	6	40.0	40.0	100.0
	Total	15	100.0	100.0	

Q8- Does the usage of any kind of special plasticizers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	6	40.0	40.0	40.0
	Strongly Agree	9	60.0	60.0	100.0
	Total	15	100.0	100.0	

Q9- Does it have higher durability properties?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	4	26.7	26.7	26.7
	Strongly Agree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

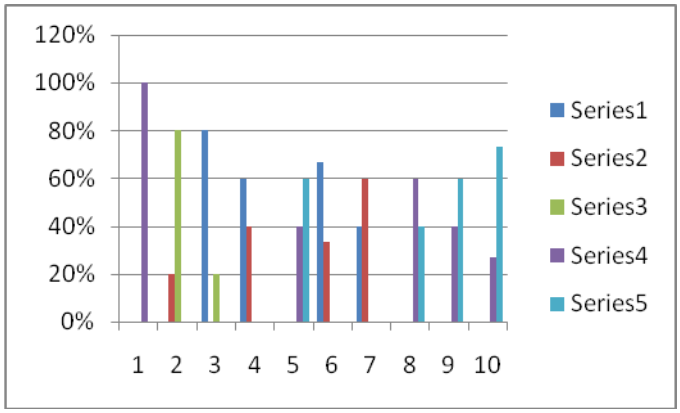
Q10- Does it have higher durability properties?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	4	26.7	26.7	26.7
	Strongly Agree	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Here, the series explained as:

Series1 – Strongly Disagree, Series2 – Disagree, Series3-Neutral, Series4-Agree, Series5-Strongly Agree.

Picture represents the graphical explanation of the HIGH STRENGTH CONCRETE survey Questionnaire analysis result.



Here, the vertical axis denotes the possibility percentages for the five scale responses given above and the horizontal axis denotes the number of questions answered.

V. CONCLUSION

Thus the results from various companies are brought down and are tabulated in a graphical manner. Here, we are having results tabulated from fifteen different companies. Thus by analyzing these results we can provide modern and necessary modification in the concrete technology/solutions to improve the quality of the concrete.

Further modifications / improvements can be made by studying these results and can helps us to improve the occupational difficulties in placing of the concrete.

REFERENCES

[1] ManikGoyal& Harish Kumar, 2018. *Green Concrete: A Literature Review*, ISSN: 2278-0181.

[2] Mohammad Abdur Rashid & Mohammad Abul Mansur, 2009.*Considerations in producing high strength concrete*, Journal of Civil Engineering (IEB), 37(1) (2009) 53-63.

[3] S. P. Mukherjee And Dr. GaurangVesmawala, 2013.*Literature Review on Technical Aspect of Sustainable Concrete*
ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726
www.ijesi.org Volume 2 Issue 8‖ August. 2013 ‖ PP.01-09

[4] P.Kannan, C.F.Jerin, Dr.K.Murali,2015. *A Review on Self Compacting Concrete.*Volume 01 Issue 07 October 2015.
[5] Yan Niu, 2006. *Research Progress of Building Materials Used in Construction Land*. MSEE2017 IOP Publishing IOP Conf. Series: Materials Science and Engineering 301 (2018) 012006 doi:10.1088/1757-899X/301/1/012006.
[6] Jayesh S. Gosavi1, U. R. Awari2, 2018. *A Review on High-Performance Concrete.* Volume: 05 Issue: 05,May-2018.IRJET.