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Investigative Study Car Wash and Kitchen Water in Concrete

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ABSTRACT

In construction industry, the cement concrete is most important and widely used material. The concrete is the conventional mixture of cement, sand, coarse aggregates and water in a mix proportion. The strength of concrete is more in the hardened state. Concrete is preferred and also easy in manufacturing process. For manufacture and curing of concrete, water is the most essential constituent. The main sources of water are river, lake, pond and well water etc. Due to rapid growth of industrialization and construction activity water is depleting day by day. Hence, we must take one step forward towards conservation or reuse of water in the construction industry. By reusing or recycling the water or wastewater in construction industry we can minimize water scarcity problem and wastewater disposal problems. The major source of wastewater is for domestic, industrial and commercial area. In the construction industry water is required in a large quantity as a curing waters for cement concrete structures. So an attempt has been made to study the effect of untreated kitchen wastewater on the strength characteristics of cement concrete as curing water's. For the present study the dissertation work is carried out on m30 grade of concrete, the curing of these specimens was carried out by using kitchen wastewaters for a period of 7, 14, and 28 days. An attempt is made to study the strength characteristics of m25 grade of concrete. This study will motivate and help for utilization of kitchen wastewater n the construction industry as curing water's effectively. Hence, we can reduce the water scarcity problems and also reduce the usage of potable water in the construction industry.

Keywords: Concrete, Kitchen Waste and Car Wash Water, Potable Water, etc,

I. INTRODUCTION

Water is an important component of concrete and plays an important role in its strength and durability. The quality of water used in mixing can affect the performance of the final product. This study provides an in-depth look at the relationship between water quality and concrete, as well as an understanding of how different water conditions affect the integrity of concrete in construction. Water is water that contains high mineral content, salt, chloride, sulphate and other impurities. These changes affect the chemical reaction during the hydration of the cement, ultimately affecting the strength, durability and life of the concrete. The presence of bacteria will affect the performance of the stone. For example, high levels of chloride or sulphate in water can accelerate the corrosion of steel bars in concrete, causing structural deterioration over time. On the other hand, water with

optimum pH and low TDS levels contributes to better cement hydration and increased strength. How does water quality affect performance? Our research will involve using different fluids to prepare concrete structures, simulating real-world construction situations. We will measure the compressive strength, tensile strength, durability and other relevant properties of concrete in different waters. to understand how to optimize water for mixing. This information will help improve composite design and improve the overall quality, durability and stability of concrete in construction.

II. EXPERIMENTAL PROGRAM

A. Water quality selection

Firstly, I have selected the kitchen water And Car wash water and After Treatment on it And After use in concrete. Identify and collect water samples representative of various water qualities in construction, including:

B. Clean water

- Water with different pH levels (acidic, neutral, alkaline)
- Different pH levels water with total dissolved solids (TDS) content
- Water containing chlorides, sulphates and organic compounds
- Water containing minerals at different points

C. Combination

According to the mixed model, use all water samples. Preparation Mixing creates a consistency consisting of cement, aggregates and additives. Use appropriate cement commonly used in construction. Prepare beams or prisms for bending strength and durability tests. Perform strength tests on cured concrete samples (e.g. 7 days, 28 days) using a universal testing device. Durability testing: Concrete samples will be subjected to rapid weathering tests (e.g., freeze-thaw cycles, chloride exposure) to evaluate durability. Density, porosity and water absorption. Check water quality (pH, TDS, contaminants) and concrete properties (strength, durability). > In order to evaluate the corrosion potential, corrosion tests for water quality were carried out on steel bars in concrete samples exposed to different environments.

D. Environmental considerations

Analysis of the environmental footprint of the use of different products Water quality together, taking into account factors such as water use, waste management and safety. Promote sustainable water management in construction. Recommendations for water quality in composite concrete design; Strategies to improve concrete strength, durability and environmental sustainability.

Figure1:Kitchen Water Before treatment

Figure2:Kitchen Water After treatment

Figure3:Car Wash Before treatment

Figure4:Car Wash After treatment

E. Objectives

- Property and tests on Treated and Untreated Water.
- Study of Strength property of the concrete casted with Treated and Untreated Wash Water.

F. Scope

- To check the compressive strength and durability in concrete.
- To improve the Strength of Concrete with Treated Water.
- To reduce cracks from the concrete.
- Can enhanced resistance to corrosion, fatigue, wear, and abrasion

III.METHODOLOGY

In this study, it was decided to Water sample selection: Identify the various types of water used in buildings, including Car wash and kitchen water, well water, and recycled water. Dissolved solids (TDS), chlorides, sulfates and organic pollutants. Design of composite materials (e.g. fly ash, slag). They poured concrete using molds of various sizes to create structures such as cubes (for strength testing) and beams (for flexural strength testing). Improving the structure in management to provide the same hydration and strength increase. Compressive strength of fixed stone cubes. degree test), density, porosity and water absorption. > Chloride Penetration Test: Concrete samples are exposed to chloride or salt spray to measure chloride penetration and corrosion. Resistance to sulphate attack.

Report collected data using statistical methods to determine the relationship between water quality (pH, TDS, bacteria) and concrete properties (strength, durability). and its impact on property.

A. Problem Statement

The quality of water used in concrete mixing is an important but often overlooked factor that can affect the strength and durability of concrete. However, there is a lack of understanding of how different water quality factors affect performance, especially in real construction environments. This knowledge gap creates many challenges and raises important questions.

IV. RESULTS

TABLE I RESULTS FOR COMPRESSIVE STRENGTH: - FOR TREATED KITCHEN WATER AND CAR WASH WATERX`

Sr. No.	Designation (Water sample)	Days	Compressive strengthIn N/mm²	Average In N/mm²
1	Normal Water (Tap Water)	7	24.16	24.63
			24.16	
			25.58	
		14	24.90	25.25
			25.41	
			25.46	
		28	28.30	29.60
			29.30	
			30.90	
2	Treated Kitchen Water	7	16.80	17.72
			17.32	
			19.06	
		14	20.89	20.65
			20.94	
			20.14	
		28	30.39	31.40
			31.56	
			32.26	
3	Treated Car Wash Water	7	16.12	17.34
			17.00	
			18.90	
		14	19.15	19.34
			19.33	
			19.54	
		28	28.10	28.64
			29.50	
			28.32	

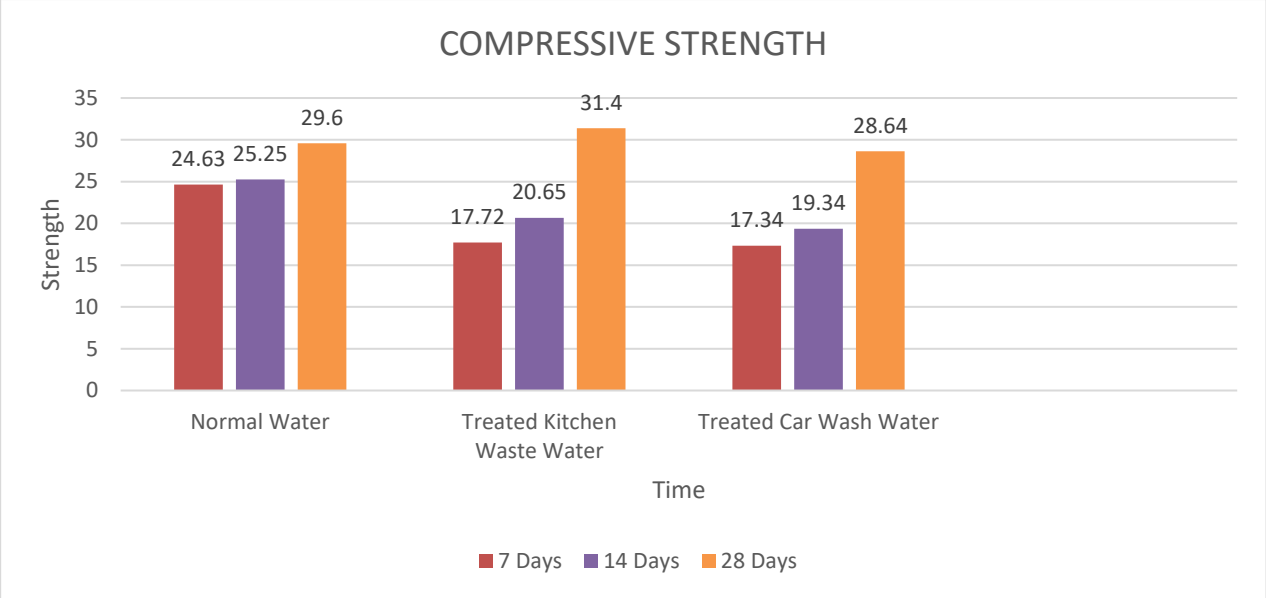

Figure5:Compressive strength

Figure6:Compressive Test

TABLE III RESULTS FOR SPLIT TENSILE STRENGTH: -FOR TREATED KITCHEN WATER AND CAR WASH WATER

Sr. No.	Designation (Water sample)	Days	Compressive strengthIn N/mm²	Average In N/mm²
1	Normal Water (Tap Water)	7	1.68	1.81
			1.83	
			1.94	
		14	2.18	2.3
			2.33	
			2.38	
		28	2.5	2.63
			2.6	
			2.8	
		7	1.83	1.92
			1.96	

2	Treated Kitchen Waste Water		1.99	
		14	2.13	2.17
			2.19	
			2.20	
		28	2.8	3.42
			3.48	
			3.98	
3	Treated Car Wash Water	7	1.77	1.85
			1.92	
			1.87	
		14	2.18	2.16
			2.06	
			2.24	
		28	3.15	2.93
			2.67	
			2.97	

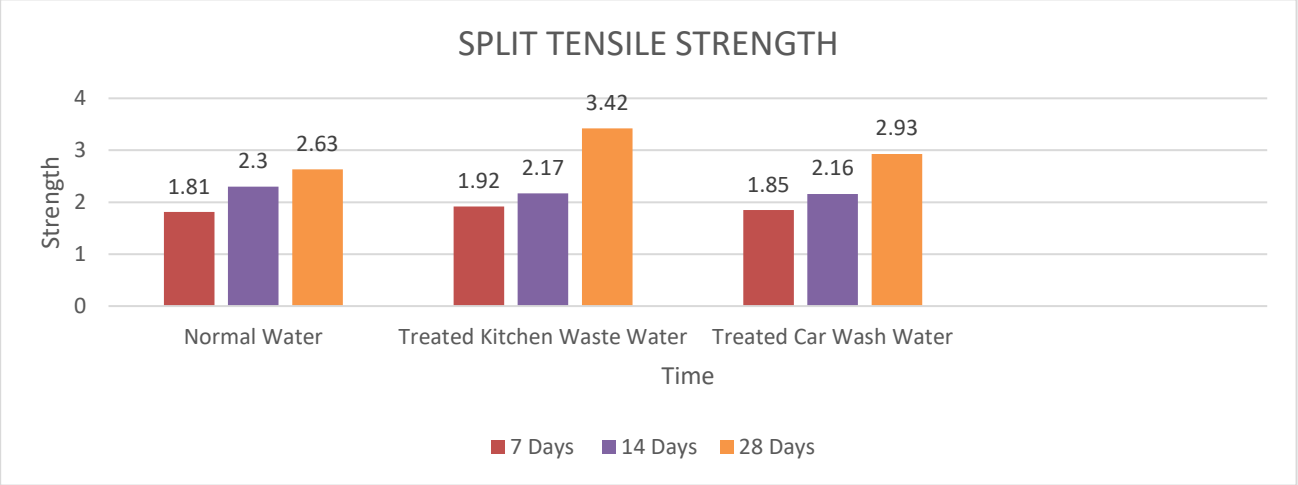

Figure7:Split Tensile Strength

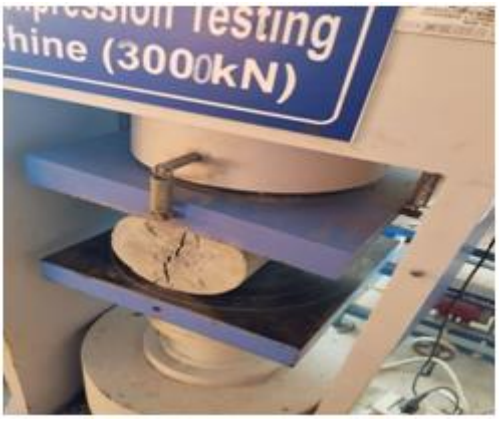

Figure8:Split Tensile Test

V. CONCLUSION

Fromtheexperimentalinvestigationfollowingconclusionscanbedrawn

- The experiment is giving empathies on using waste water to make the concrete in this experiment car wash water and kitchen waste water is used for casting the cubes to increase the strength of water. It is firstly treated and then used. The results obtained from both the waste waters are very similar to the normal water thus it is economical to use the waste water instead the normal water for casting the concrete cubes.
- From this experimental work we can conclude that kitchen waste water used for mixing of concrete structure shown considerable increase in a compressive strength for period of 28 days average is 31.40 N/mm^2
- From this experimental work we can conclude that Car wash water used for mixing of concrete structure shown considerable increase in a compressive strength for a period of 28 days average is 28.64 N/mm^2
- From this experimental work we can conclude that kitchen waste water used for mixing of concrete structure shown considerable increase in a split tensile strength for period of 28 days average is 3.42 N/mm^2
- From this experimental work we can conclude that car wash water used for mixing of concrete structure shown considerable increase in a split tensile strength for period of 28 days average is 2.93 N/mm^2
- From the present study we can conclude that the wastewater can be used in the construction industry with more efficiency, and also it can be used when there is scarcity of potable water.

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