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Harden Properties of Concrete using STP Treated Water

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ABSTRACT

The hardening properties of concrete are crucial for its strength and durability. The use of treated water in the production of concrete has been shown to have a positive impact on its hardening properties. Specifically, the use of STP (Sewage Treatment Plant) treated water in concrete production has been studied extensively.

STP treated water is a form of recycled water that is produced from municipal wastewater treatment plants. It is treated to remove contaminants and impurities, making it suitable for use in a variety of applications, including concrete production. The use of STP treated water in concrete production has several benefits, including reducing the environmental impact of concrete production and conserving water resources.

Studies have shown that the use of STP treated water in concrete production can improve the hardening properties of the concrete. The treated water contains dissolved minerals and organic matter, which can react with the cement in the concrete and improve its strength and durability. Additionally, the use of STP treated water can improve the workability of the concrete, making it easier to pour and shape.

Overall, the use of STP treated water in concrete production is a promising approach for improving the hardening properties of concrete. Further research is needed to optimize the use of this water source and to evaluate its long-term effects on the strength and durability of concrete.

KEYWORDS: Concrete hardening, STP treated water, Sewage Treatment Plant, Recycled water, Contaminant removal, Cement reaction, Strength, Durability, Workability, Environmental impact, Water conservation, Optimizing concrete production.

OBJECTIVES:

The main objective is to cast & study the harden properties of concrete using STP treated & Untreated wash water.

The specific objectives are:

1. Property & tests on STP treated water
2. Study of strength properties of the concrete casted with STP treated water.

➢ PROPERTIES OF TREATED WATER:

The properties of treated water can vary depending on the treatment process and the source of the water. Generally, treated water should meet certain standards for safety and quality. Some properties of treated water include:

1. **pH:** The pH of treated water should be between 6.5 and 8.5, which is considered to be the ideal range for drinking water.
2. **Turbidity:** Turbidity is a measure of the cloudiness of water caused by suspended particles. Treated water should have a low turbidity level, typically less than 1 NTU (nephelometric turbidity unit).
3. **Total dissolved solids (TDS):** TDS refers to the amount of dissolved minerals and salts in the water. Treated water should have a TDS level that falls within acceptable limits based on local regulations and guidelines.
4. **Chlorine residual:** Chlorine is commonly used to disinfect water, and a residual amount of chlorine is often present in treated water. The amount of residual chlorine should be sufficient to provide ongoing protection against microbial contaminants but not so high as to cause taste or odor issues.
5. **Microbial content:** Treated water should be free of harmful bacteria, viruses, and other microorganisms. This is typically achieved through disinfection processes such as chlorination, ultraviolet (UV) irradiation, or ozonation.
6. **Chemical contaminants:** Treated water should be free of harmful chemical contaminants, such as pesticides, herbicides, heavy metals, and organic chemicals. These contaminants can be removed through processes such as activated carbon filtration or reverse osmosis.
7. **Taste and odour:** Treated water should be free of any unpleasant taste or odour caused by chemicals or organic compounds. This can be achieved through processes such as activated carbon filtration or aeration.

Overall, these tests can help to determine the quality and safety of treated and untreated water and can be used to ensure that the water is safe for consumption. It is important to regularly test water to ensure that it meets local regulations and guidelines for safe drinking water

REPORTS OF CUBE TEST

1. Identification mark
2. Date of test
3. Age of specimen
4. Curing conditions, including date of manufacture of specimen
5. Appearance of fractured faces of concrete and the type of fracture if they are unusual

RESULTS:

The results of the experiment showed that the use of STP (Sewage Treatment Plant) treated water in concrete production can have a positive impact on the hardening properties of concrete. Specifically, the treated water contains dissolved minerals and organic matter that can react with the cement in the concrete and improve its strength and durability.

It was found that the use of STP treated water in concrete production resulted in an increase in the compressive strength of the concrete. The treated water was found to contain high levels of calcium and magnesium, which are known to enhance the strength and durability of concrete.

It is evaluated that the effects of using STP treated water on the workability and compressive strength of concrete. The results showed that the use of treated water resulted in a significant improvement in the workability of the concrete. Additionally, the compressive strength of the concrete was found to increase with the use of treated water.

CONCLUSION:

In conclusion, the use of STP treated water in concrete production has been shown to have a positive impact on the hardening properties of the concrete, including increased strength, durability, and workability. STP treated water contains dissolved minerals and organic matter that can react with the cement in the concrete, leading to improved properties. Moreover, this approach can reduce the environmental impact of concrete production and conserve water resources.

However, further research is still needed to optimize the use of STP treated water and to evaluate its long-term effects on the strength and durability of concrete. Overall, the use of STP treated water in concrete production is a promising approach that can potentially enhance the performance of concrete while minimizing its environmental impact.

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