

USE OF TREATED SEA WATER IN CONSTRUCTION INDUSTRY

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Abstract - According to the report of the World Meteorological Organization (WMO), more than half of the world's population will not have enough drinking water by 2025. To save drinking water, use of seawater in the concrete industry seems imperative. In the present study, the possibilities of seawater as a material of concrete are discussed as a result of the literature-based and experimental investigations. From the results of the literature-based study, more than half of the papers collected in this study had positive opinions about concrete mixed with sea water by adding the mineral admixture such as blast furnace slag (BFS). In addition, some results of long-term exposure tests indicated the high possibility of using seawater as a material of concrete. The experimental data obtained in this study indicated that the addition of BFS might contribute significantly to the corrosion resistance of steel bar, because of the low oxygen environment around steel bar and chloride immobilization.

Key Words: Sea Water, Ocean, Construction

1. INTRODUCTION

As the technologies and facilities is developed the population is increases rapidly which will further create a various problems in world. In the age of increasing population and dwindling resources coupled with the need of curb expenditure in the various sectors of the government's budget Attention has to be brought to reuse of resources whenever possible. Perhaps most valuable is water. Therefore efforts towards wastewater reuse made worldwide. If the next world war happens, it may well be triggered by water scarcity across the continents. It has been already found that the third of the world is suffering from water shortages. Increasing demand for water with rapidly growing rate of population, inadequate rainfall, uncontrolled use of water and climate change are some of the reasons behind it. Some of the major reasons behind water scarcity are:- same; water will turn out to be the world's most precious resource soon.

1.2 AIM

1) To do comparative study of the compressive strength of concrete using tap water and sea water.

- 2) To understand the effect of Biosanitizer on sea water.
- 3) To utilize Seawater in construction.
- 4) To understand the benefits of using Biosanitizer.

2. PROBLEM STATEMENT

From the various review of literature, the papers are giving the advantages of use of Bio sanitizer in wastewater recycling which increases the use of waste water and to make us capable to fight with water scarcity problems and also make able to avoid the problems occurs with conventional methods of water treatment. But still there is water scarcity problem in Construction work. To solve this problem I will did an experimental research of implementation of sea water in construction. In that I did study on comparison of compressive strength of concrete using treated seawater and compressive strength of pure water.

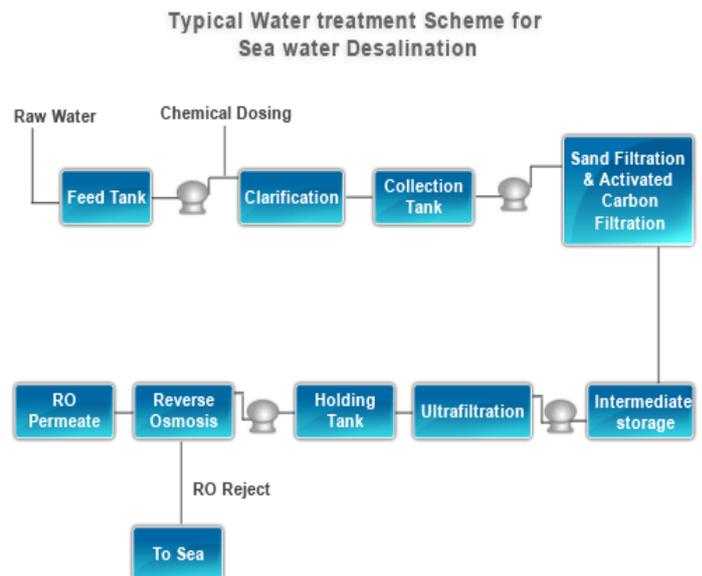


Chart -1 Typical water treatment scheme for sea water Desalination

Desalinations Projects

1. The Minjur Desalination Plant at Katupalli village, a northern suburb of Chennai, on the coast of the Bay of Bengal is the largest desalination plant in India. Built on a 60-acre site, it produces 36.5 million cubic meters of water per year. A reverse osmosis (RO) water desalination plant, it supplies water to the city of Chennai.

2. The Nemmeli Desalination Plant is also RO based water desalination plant

at Nemmeli, Chennai, that supplies water to the city of Chennai. The plant is the second

Desalination plant in the city after the 100-MLD plant at Minjur and has a capacity to treat 100 MLD of seawater.

3. The single largest desalination project is Ras Al-Khair in Saudi Arabia is capable of producing 728MLD water.

4. The largest percent of desalinated water used in any country is Israel, which produces 40% of its domestic water use from seawater desalination.



Fig -1: BIOSANITIZER ECOCHIPS

Biosanitizer is a natural biocatalyst that converts any polluted, dead water into living or bio-water. Its action is based on the ecological principle of utilisation of wastes as valuable raw materials, turning them into resources, rather than separation/ concentration and disposal. Bio-water resists scaling, corrosion, algal growth, biofouling, chemical contamination and growth of pathogens/ pests. The key reaction of this product involves production of active oxygen, which can drive several resource-producing reactions. Harmful salts, for instance, become useful minerals.

In nature, coconut water is produced from seawater using a similar reaction. This reaction is used to convert saline/ brackish water into rich mineral water.

3. CONCLUSIONS

The compressive strength of cube using tap water is 44.44 KN/m² after 28days .We made concrete blocks by also using sea water with treatment of biosanitizer. It also gives better results as compare to tap water. It gives strength 43.5KN/m².in this case problem of corrosion occurs at very small extent.

From the above result of concrete cube test and water quality parameter test, we analyzed that the Ph of sea water is decreased from 8.3 to 7.92. The hardness and sodium is reduced from 35000 mg/l to 2642.01mg/l,7210 mg/l and the sulphate is reduced from 27000 to 2642.Froms strength obtained with treated sea water is very good as compare to strength using pure water. Only corrosion problem is occurs in very small amount in case of treated sea water test .But, we can utilize the treated sea water in plain concreting work.

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