

Application of Value Engineering Approach for Improving the Quality and Productivity of Ready-Mixed Concrete Used in Construction and Hydraulic Projects

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Abstract : This paper studies the effectiveness of applying value engineering to actual concrete mixtures. The study was conducted in the State of Qatar on a number of strategic construction projects with international engineering specifications for the 2022 World Cup projects. The study examined the concrete mixtures of Doha Metro project and the development of KAHRAMAA's (Qatar Electricity and Water Company) Abu Funtas Strategic Desalination Plant, in order to generally improve the quality and productivity of ready-mixed concrete used in construction and hydraulic projects. The application of value engineering to such concrete mixtures resulted in the following: i) improving the quality of concrete mixtures and increasing the durability of buildings in which they are used; ii) reducing the waste of excess materials of concrete mixture, optimizing the use of resources, and enhancing sustainability; iii) reducing the use of cement, thus reducing CO₂ emissions which ensures the protection of environment and public health; iv) reducing actual costs of concrete mixtures and, in turn, reducing the costs of construction projects; and v) increasing the market share and competitiveness of concrete producers. This research shows that applying the methodology of value engineering to ready-mixed concrete is an effective way to save around 5% of the total cost of concrete mixtures supplied to construction and hydraulic projects, improve the quality according to the technical requirements and as per the standards and specifications for ready-mixed concrete, improve the environmental impact, and promote sustainability.

Keywords : value management, cost of concrete, performance, optimization, sustainability, environmental impact

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