

Concrete Mix Design Based on IS 10262:2019 using MS Excel

Report on Mini Project

Submitted

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CERTIFICATE

It is certified that the Mini project report entitled "Concrete Mix Design Based on IS 10262:2019 using MS Excel" submitted by Ayushi Sharaff, Prakash Tiwari and Chirag Shinde of B. Tech 4th Semester, in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering and Technology Guru Ghasidas Vishwavidyalaya, Bilaspur is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2023-24 under my supervision and guidance.

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ABSTRACT

Concrete mix design may be defined as the art of selecting suitable ingredients of concrete and determining their relative proportions with the object of producing concrete of certain minimum strength & durability as economically as possible. Considering objectives of mix design desired workability in the plastic stage, desired minimum strength in the hardened stage, desired durability in the given environment conditions & basic considerations like cost, specification, workability is to be studied while designing mix design. Grade of concrete & its Characteristics compressive strength of 150 mm cube at 28 days, N/mm^2 is very important criteria to be considered. Factors affecting choice of mix design is being studied for better mix design.

The integration of IS 10262:2019 principles into an Excel spreadsheet offers a systematic approach to concrete mix design. Excel allows for the creation of a dynamic model where input parameters—such as the target strength, cement type, aggregate properties, and workability requirements—are entered into designated cells. The spreadsheet then applies the equations and procedures specified in the IS code to compute the appropriate proportions of cement, fine aggregates, coarse aggregates, and water.

The use of Excel in this context not only facilitates quick and accurate calculations but also enables easy modifications and updates to the mix design as needed. By leveraging Excel's computational and data management capabilities, users can efficiently handle various design scenarios and optimize the mix for specific project requirements. This approach enhances precision, reduces manual errors, and supports better decision-making in the concrete mix design process.

In summary, the application of IS 10262:2019 in an Excel-based concrete mix design model represents a practical and efficient method for engineers and designers to achieve high-quality concrete mixtures tailored to their specific needs, ultimately contributing to the success and longevity of construction projects.

Keywords: Grade of Concrete, Cost, Specification, Workability, Compressive Strength , W/C Ratio, Target average compressive strength, IS Method of Mix Design.