FINAL REPORT

EXPERT SYSTEM FOR CONCRETE QUALITY ASSURANCE

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Executive Summary

Quality assurance is an important component of concrete construction. In most cases the quality of concrete is assessed using 28 day companion cylinder strengths Because corrections cannot be done economically after 28 days, the quality of concrete is always monitored at earlier stages. The most widely used quality control measure of plastic concrete is slump. The other measures are air content and wet density.

In this project, we developed a knowledge-based expert system and related FORTRAN programs on a microcomputer to provide an aid for quality assurance of concrete. The primary focus of the expert system is to provide information on the variables which effect concrete quality. Potentially, use of an expert system of this type can lead to quicker identificaton in deficiences in concrete quality.

The expert system accepts as input the properties of plastic concrete, slump and air content. The expert system checks that these values are within the specified limits. If there is a variation in these parameters, the program provides advice and suggests corrective measures which can be implemented to restore the concrete quality.

Integrated with the expert system are a number of FORTRAN programs. These programs include calculation of the required compressive strength of concrete for a specified concrete strength; mix design for the calculated required compressive strength. and a program to find the properties of the concrete mix based upon known quantities of the constituent materials.