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Project Summary

Reference Manual for RASSMIT Version 2.1: A Sub-slab Depressurization System Design Performance Simulation Program

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A computer program has been developed to simulate and aid in the design of sub-slab depressurization systems used for indoor radon mitigation. The program has been designed to run on DOS-compatible personal computers to ensure broad applicability as a design tool for these mitigation systems. The program addresses both major techniques for employing sub-slab depressurization in slab-on-grade construction: discrete suction pits and extended suction systems. Discrete pit suction systems are applicable to both retrofit mitigation systems in existing houses and new house construction. Extended suction systems use some form of highly porous material, most typically drainage mat or large aggregate, to extend the suction over large distances below concrete slabs. These systems must be installed prior to pouring the slab and are therefore applicable only to new house construction. The RASSMIT computer program provides a menu-driven scheme to design and evaluate these indoor radon mitigation systems for houses utilizing slab-on-grade construction techniques over low permeability soil and fill materials.

This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Overview

The program utilizes finite difference techniques to provide numerical solutions to the differential equations that describe the airflow through the sub-slab volume. Following the user's specification of the parameters describing the building slab and mitigation system, three-dimensional solutions for the pressure and velocity fields in the sub-slab volume are obtained. The results have been well verified on full-size test slabs and for a number of houses where sub-slab depressurization systems have been installed.

Program operation is straightforward and menu-driven. The user steps through a series of screens where prompts for input solicit specification of the mitigation system. The program documentation provides a reference to the overall design and operation of the program. It also provides explicit descriptions and explanations for each input parameter. This provides the user with enough information to select a reasonable value for each input parameter for a particular application, or provides default values representative of conditions found in Florida houses. Help screens are also provided for each input parameter and provide an on-line description of each field that must be specified by the user. By studying the documentation, the user may also become acquainted with various philosophies for designing and successfully implementing sub-slab depressurization systems over low permeability soils.

The RASSMIT program provides users with a reasonable method to simulate any number of subslab depressurization sys-

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tem designs. It may therefore be utilized as a design tool, to provide for the prediction and optimization of a sub-slab depressurization system prior to actual installation. By being able to run on personal computers using the DOS operating system, the program can be applied to a wide range of problems, from mitigation system design by commercial mitigators, to the development of building code recommendations by government agencies.

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The complete report, entitled "Reference Manual for RASSMIT Version 2.1: A Sub-slab Depressurization System Design Performance Simulation Program," (Order No. PB93-155984; Cost: $17.50; subject to change) will be available only from
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