

Former Cuban Firm Corners Design Market in Puerto Rico

An

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Politics caused the firm to shift from Havana but not from its approach to engineering. SACMAG continues to design daring structures that are envied by U. S. architects and engineers restricted by building codes far more conservative than those in Latin America.

Puerto Rico's codes are based on U.S. standards, which of course restrains SACMAG's style in that country, but its designers in the Mexico City and Costa Rica offices have a freer hand. U.S. codes are a thorn in the side of SACMAG's president, Luis P. Saenz, who complains that Washington's insistence on applying U.S. construction standards to Alliance for Progress projects could add 30% to the cost of urgently needed Latin American projects.

Mr. Saenz actively campaigns against this condition, and in his extensive Caribbean travels he vehemently protests Washington's attitude. He believes that resulting increased costs will cause refusal or cancellation of many projects. Recalling fondly his Cuban practice, Mr. Saenz says that in Cuba,

projects could be designed to the codes of any country, or even parts of the codes of several countries. Often, they followed U.S. standards, but SACMAG and other firms sometimes adopted their own design standards on certain projects.

To support this statement, Mr. Saenz points to a picture on the wall of his office. The photograph shows a 230-ft-span prestressed-concrete bridge over the Rio Canas in central Cuba, which says Mr. Saenz, could not have been built if Cuba followed U.S. design standards. Gleefully, the handwaving former professor recalls how he saved 15% on the cost of stressing tendons by raising their design stress to 120,000 psi. At the time the bridge was built the U.S. allowable design stress was 105,000 psi.



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Echoing Luis Saenz's frustration at Puerto Rico's building codes, Ignacio Martin, 34, the firm's vice-president, says that the island's economic and climatic conditions justify a more liberal interpretation of U. S. regulations. Mr. Martin backs up his views by patiently directing experiments on the behavior of concrete under local climatic conditions. This entails a weekly flight to Mayaguez, 90 miles distant at the western tip of Puerto Rico. He will also be travelling farther afield in his role of chairman of the ASCE-ACI joint committee on design criteria for reinforced concrete columns.

Mr. Martin, a studious engineer, maintains that the firm is "not wedded to any material." Nevertheless, SACMAG has espoused reinforced concrete for nearly all its jobs. This is not an unusual preference for offshore engineers, because of the high cost of importing structural steel.

• **Devoted to concrete**—A Miami architect, Howard Dutkin, who recently worked in SACMAG's office in San Juan, says that in Puerto Rico reinforced concrete is used beyond the usual practice in the U. S. (see also Puerto Rico Building Boom Spurs Unusual Design and Erection, ENR Nov. 15, 1962, p. 34). The difference between the two countries, says Mr. Dutkin, is that U. S. designers split their knowledge among several differ-

ent materials; but in Puerto Rico there is a concentrated devotion to reinforced concrete that produces truly expert knowledge of the material and its various applications.

This comparison may seem too partisan to U. S. designers, who have established first-class reputations in steel, timber and concrete. But SACMAG does endeavour to get the most out of concrete as a structural material. At present, its engineers are working on a project for a 20-story building supported on walls and slabs without any columns or beams. And two years ago, Mr. Saenz and Mr. Martin published a paper on their design of slabless tread-riser stairs, (JOURNAL OF THE AMERICAN CONCRETE INSTITUTE, Oct., 1961).

Technical success and financial stability have jockeyed SACMAG into first place among Puerto Rico's architectural and engineering firms. It employs 75 persons, now preparing projects worth over \$60 million. Because it is an exiled Cuban firm operating the largest office in Puerto Rico, there is plenty of criticism from local architects and engineers. "It's an assembly line," comments a prominent Puerto Rican architect.

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SACMAG quickly prospered. It soon had offices in Havana and Santiago employing over 100 persons. About 10% of its contracts were for Battista's government agencies. Mr. Martin emphasizes the distinction between working for the national government and working for government agencies. He implies that working directly for the government would have meant conforming to shabby business practices.

SACMAG welcomed Castro's revolution. Mr. Gutierrez became Director of Architecture, a division of the Public Works Ministry under the revolutionary government. Another senior member of SACMAG, Orlando Ray, headed the PRITCHET hydroelectric project near Cienfuegos, and his brother, Manuel, became Castro's first Minister of Public Works. But now all are in exile.

"Engineers remaining in Cuba," says Mr. Martin, "are so fearful of making errors that they consistently choose the proven solution to a problem rather than experiment. Standardized production, in quantity, is the dreary alternative of Castro engineers to the bold buildings that projected into the Havana skyline in the decade of the 1950's."

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Cuba's politics change, SACMAG intends keeping its San Juan office open.

This reassurance pleases satisfied clients but not the Puerto Rican architects and engineers aspiring to open their own offices. Actually, the firm is well integrated; about half the 75 persons on the staff are Puerto Rican and half Cuban. And the president of SACMAG of Puerto Rico, Inc., Jose Luis Capacete, was once president of

the Puerto Rican College of Engineers.

Integration is used in another sense by Ignacio Martin to defend his firm against a comparison with General Motors' size and assembly line. "We present the client with an integrated package of services ranging from preliminary land surveys all the way through supervision of the interiors of a new building." This package does not include construction, but does enable SAC-

MAG to schedule all drawings and specifications to the contractor so that work is not delayed for lack of information. "A SACMAG job does not stall because an outside consultant delivers his plans late, or in some way out of kilter with the project," says Mr. Martin.

It is the firm's adherence to punctuality, he adds, that accounts most for SACMAG's explosive success in Puerto Rico.



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