

ENGINEERING

Living in a Blueprint

Architects for a new office building first constructed a full-size model of one office, so a committee could try out all ideas for interior and exterior design. Saves time and money.

By HOWARD SIMONS

► HOW WOULD YOU like to live in a typical room of your dream house and try out every interior and exterior design idea you wanted before and while the house was being built?

It could save money by avoiding mistakes and by satisfying changes of mind, and it could save arguments among the tenants.

This is what an insurance company in Hartford, Conn., tried for a new office building. They found it saves time, money and waste, as well as insuring the best possible materials and working conditions. It also gives architects and builders an opportunity to learn new techniques.

Although a single room prototype for the average American homebuilder is still far in the future because of cost, it may soon be the standard operating procedure for large construction jobs, as it now is in the aviation, automotive and shipbuilding industries.

Prototype test models have been the mainstay for many engineering projects for some time now. Use of a prototype for building, however, is new.

Three-Dimensional Blueprint

This is not a small-scale model on a table in the architect's office, but a three-dimensional blueprint, where the people work and live while builders, engineers and architects rip out ceiling and floors and put in new ones so a committee can literally taste-test the new ideas.

When Connecticut General Life Insurance decided to build a country office five miles outside Hartford on a tract of 268 acres, its architects, Skidmore, Owings and Merrill, proposed a low horizontal glass wall building.

The plan called for several novel construction and design features, and both the company's executives and the architects agreed it might be wise to run a test program in advance of crucial construction stages.

This in itself was novel, and what has resulted is perhaps the world's most complete experimental structure.

The prototype measures 60 by 72 feet and represents about one percent of the total office space, 4,000 square feet compared to 500,000 square feet. The prototype constitutes a full scale replica of a typical clerical area in the main building, with the front of the mock-up simulating

the glass facade of the proposed building and the opposite glass wall representing the side overlooking a garden court. The main building will have four interior garden quadrangles.

The mock-up was constructed as a temporary building. Its steel frame consists of three heavy steel girders spanning three steel columns. The walls are plywood. The second floor, with a glass wall facade, characteristic of the exterior design theme for the whole building, is the experimental area. The ground floor serves as storage space for construction materials, fixtures and tools.

At one point, however, the builders used the storage space to test various types of concrete forms and glazed brick work that are being considered for use in the final structure.

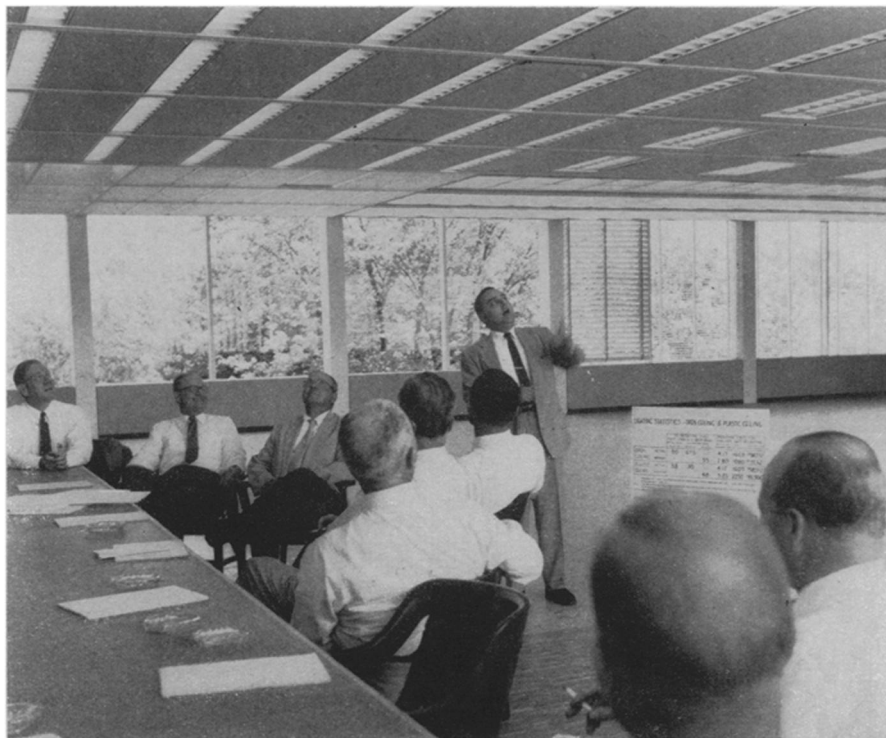
The mock-up has been tested since last spring. In it, the company and its architects

are able to examine, in full size, details of lighting, ceiling, partitioning and screening systems, and their relation to furniture, floor finish and color.

Before any decision on the interior and exterior design ideas were incorporated into the main and permanent structure, a committee passed on all experimental tests in the "mock-up." Two committees were used, a senior, seven-man committee of the company's top officers and a four-man subcommittee of junior officers. These groups worked with both the architects and the builders on every phase of construction.

A floor pattern, for example, would be checked to determine whether it was cheapest, best and fitted well with the rest of the office interior. If it was rejected, another floor pattern was tried by the testers.

For example, the two long walls of the sample building have different windows; one side has eight-by-11-foot panes and the other, six-by-eight-foot panes. The larger size was chosen for the finished building by the committee and will be of three-eighths-inch, heat-absorbent glass. They will be the largest panes of this type to be used in building construction to date.



LIVING BLUEPRINT—When Connecticut General Life Insurance Company decided to build a new office building near Hartford, Conn., the executives agreed a full-size model section of the main building should be built first. Here in the "mock-up" conference room, a test ceiling is being evaluated by a committee that passed on experimental interior and exterior design ideas before the main structure was built.

GENERAL SCIENCE

Suggest Labor Source

One of the most important tests with the mock-up was for lighting. Three basic ceilings with a dozen variations were installed in the model. As a result of the tests, the committee chose a new open baffle design developed by the architects. The bare fluorescent tubes and exposed steel beams, overhead subfloor, sprinkler pipes, air-conditioning ducts and electrical conduits were all tried out in the ceiling, rather than on paper.

Money Saved by Experiments

Illustrating how the mock-up can be a money-saver in building today, one modification of the basic ceiling system looked on paper to be the simplest and cheapest. When actually tried, however, the estimated saving of 50 cents a foot turned into a cost of ten cents a foot more. The total saving can be figured when one realizes that the completed building will have 350,000 square feet of ceiling.

The finished building is designed to accommodate 3,000 office workers, none of whom will be more than 35 feet from a window wall.

Experiments have been conducted with a newly designed, movable partitioning that can be placed almost anywhere. Aluminum, hollow-square posts will fit into the corner of floor squares and into recessed runners on the ceiling. Colored plastic laminates will separate clerical areas. Fabric-surfaced panels will be used in areas where tack boards are required or where there is a sound problem. Office enclosures will be of translucent glass.

Cost of the mock-up and the experiments might appear big until they are related to the cost of the project. The cost of constructing and demolishing the model building, and the cost of all the experimental work carried out in the prototype is estimated to be one percent of the total cost for the entire project.

To the insurance company, one percent seems like a very small premium to insure against the possibility of expensive errors in building construction.

Science News Letter, September 29, 1956

► THE "EX-EMPLOYEE" may be a new and hitherto overlooked source of workers for hard-pressed business and industrial employers.

This was suggested in a study at the University of California at Los Angeles by Dr. Wayne L. McNaughton of the Graduate School of Business Administration.

The investigation was conducted with the cooperation of a large western aircraft company whose rate of employee turnover was 5,600 separations a year from a work force of 10,000. It covered all former workers who had been gone from two to 11 months.

For statistical reasons, Dr. McNaughton's analysis was limited to employees who had resigned during the second, seventh and eleventh months previous to the study.

Each of the ex-employees received a questionnaire with a covering letter assuring them their answers would have no effect on their record.

The ex-employees were asked:

1. Why did you quit your job with the company?
2. Would you like to return to the company?
3. What did you like best about the company?
4. What did you dislike most about the company?

One of the first things Dr. McNaughton noted was that the reasons given in the confidential questionnaire for leaving the company were quite different from those given at the time of separation.

Most of the ex-employees had told interviewers on their departure that they were leaving for "other employment." Other common reasons included "leaving the state," "returning to the farm," "military service," "poor health" and "maternity."

The general impression was that the employees were being forced out of the company by forces beyond the employer's control.

However, the questionnaires filled out by

employees after they had left the job revealed a very different picture.

On these the ex-employees emphasized such reasons as "poor pay," "bad supervision," "slow advancement." About 40% of the workers gave a "polite" excuse at the time of leaving, then gave a more truthful answer later.

Most disliked by the ex-employees was the poor quality of supervision, 23% of the two-month group so stating. Wages as a disliked factor was reported by eight percent, five percent and ten percent of the three groups.

Another five percent, eight percent and three percent had been dissatisfied with the nature of the job.

The remarkable finding of the survey was the number of ex-employees who said they would consider rejoining the company. Three out of four ex-employees who had quit after two months on the job indicated they were still interested in rejoining the company, as were 57% of the group which had quit after 11 months.

Science News Letter, September 29, 1956

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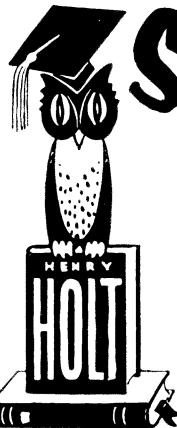
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