

# Architecture Canada

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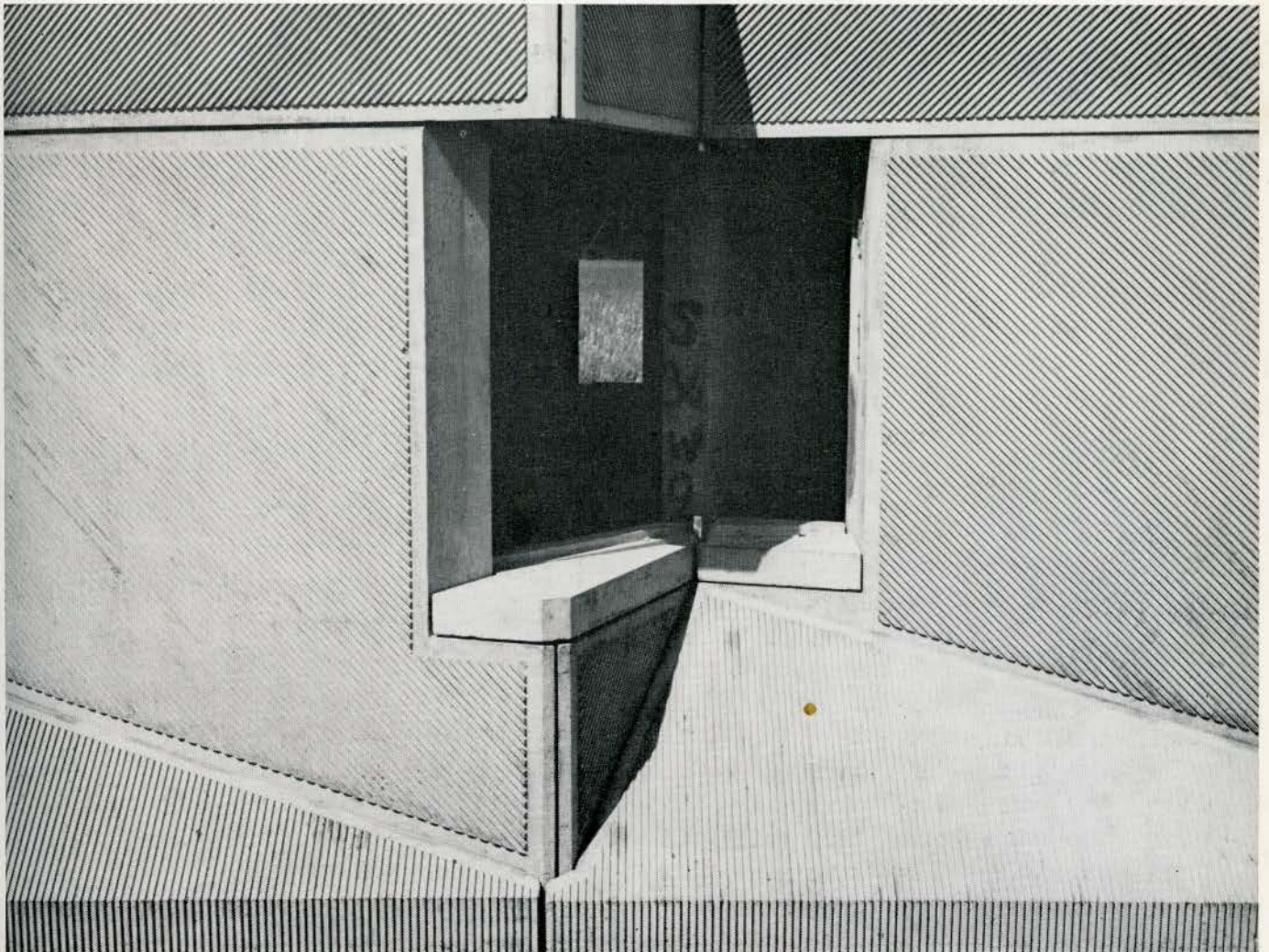
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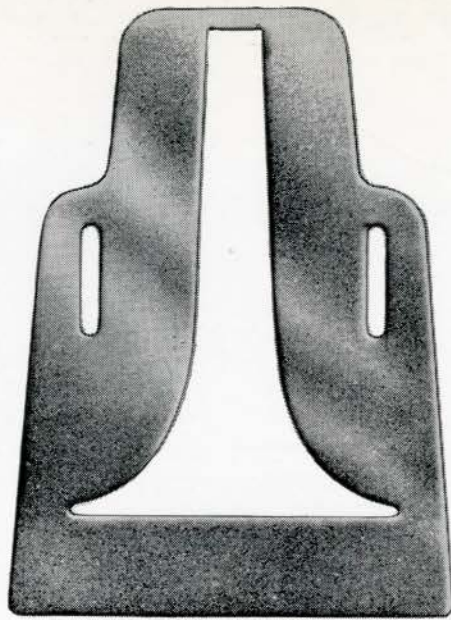
Features Section – six projects selected from the presentation to OAA Convention by James Stirling; conclusion of C. H. Davidson's two-part article "The Architect and Industrialized Building"

The Allied Arts – part three of Anita Aaron's article on use of plastics in art for architecture. Schools Section – "The Housing Crisis and Government Response"

Technical Section – tendering and contracts: "The Point of View of the Management Contractor", by T. M. Phelan; regional unit prices for masonry

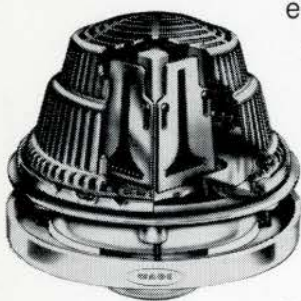






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Gerald McCue

**Professors McCue and Wheeler Join Keynote Speakers for RAIC Assembly's Profile /68**

Two more outstanding architects will be keynote speakers at *Profile /68*, the annual meeting of the Royal Architectural Institute of Canada in Regina, May 29th to June 1st. They are Professor Gerald M. McCue of Berkeley, California and C. Herbert Wheeler, Jr of Pennsylvania. Professor McCue is Chairman of the Department of Architecture at the University of California. He is presently directing the department in a complete revision of its curricula which is designed to provide a greater breadth of general education as well as increased opportunities for new areas of study in the graduate programs. He is also Chairman of the AIA Committee on the Future of the profession.

C. Herbert Wheeler, Jr is Associate Professor of Architectural Engineering at Pennsylvania State University. He will speak on "Architectural Practice and Its Many Variations". Professor Wheeler says he is gravely concerned about the great difference between architectural practice and architectural education. In the current war for survival of the architect as a professional man and a leader of the building industry. Professor Wheeler says he has only seen a few architectural schools that realize their

"bow and arrow" type of education will not meet the needs of architectural practice of the current age.

The chairman of the host committee for *Profile /68* is Gordon Arnott of Regina, RAIC Honorary Treasurer.

**New Fee Schedule Announced at Ontario Association of Architects Convention**

A new schedule of minimum professional fees and conditions of engagement, effective immediately, was announced at the annual meeting of the Ontario Association of Architects February 22-24 in Toronto. The meeting also criticized design-construction competitions; requested the Ontario government to require use of modular co-ordination by 1979 and to adopt the National Building Code as a provincial building code; and asked the federal government to require that architects it employs be registered. John Spence, Toronto, succeeded P. M. Keenleyside (F), as president.

The new fee schedule, result of an intensive research program by the OAA, is the first major revision of the schedule in 35 years. The former minimum of six per cent on most buildings has long been considered unrealistic in view of increased costs of office practice, payments to consultants and the more extensive services required of the architect. In the new schedule, projects are listed by category and the fee shown is based on a percentage of construction cost. Sales tax is not now included in the cost. Copies of the new schedule were sent to all members prior to the meeting and also to other provincial associations.

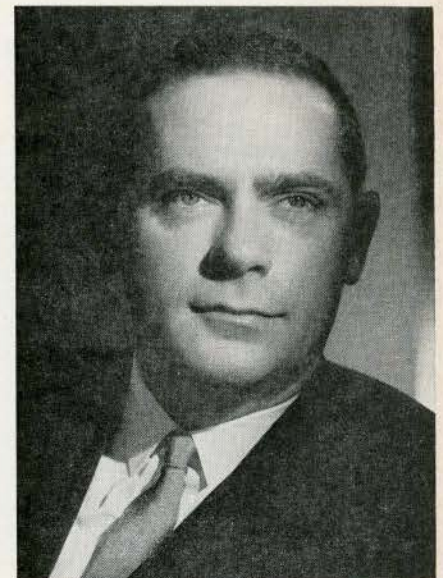
**Concern over Development Proposals**

A matter of serious concern to the profession, not confined to Ontario, is the growing incidence of development proposals involving speculative work by architects, builders and financial institutions in government buildings, or those benefiting from government grants. The Ontario Student Housing Corporation particularly came under fire.

The OAA was asked to establish conditions under which a member could participate in such ventures. (The Alberta Association recently amended its bylaws to prohibit members from knowingly engaging in projects being worked on by another architect.)

The resolution asking the Ontario Government to require no later than 1970 that all buildings benefiting from government grants utilize modular co-ordination follows a Federal Department of Public Works announcement that by 1969 use of modular co-ordination will be required of all architectural and engineering consultants working on federal projects.

Another resolution approved the establishment of an OAA advisory committee to the provincial archivist on the establishment and maintenance of an architectural archives for Ontario. This step now has been taken by most provincial associations and permits reconstitution of the RAIC National



John Spence





One of the electric unit ventilators at Redwood Public School. Architect: Jean-Paul St. Jacques, M.R.A.I.C. Consulting Engineer: Howard Boland, P.Eng.

## Why more than 210 Ontario schools keep their art collections (and their artists) in electrically heated rooms.

The public school Rembrandts who turned out the above work likely couldn't tell you the name of the architect who specified electric heating for their school. But the Fort William Board of Education could. And they could tell you a thing or two about how well electric heating has worked out in their Redwood Public School.

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Architectural Archives Advisory Committee on a provincial rather than a regional representational basis.

The Convention enjoyed three good speakers. Edmund Bacon, of the Philadelphia Planning Commission, accompanied four bus-loads of OAA members on a 50-mile tour of Toronto, (during which, as the tour passed City Hall Square on the south side, he is reported to have said "Good Lord" and hidden his face in his hands). In a luncheon address he told members that they should stop blaming local politicians for the unattractiveness of cities and give leadership in developing a public demand for good design and imaginative land use. James Stirling, British architect and visiting professor at Yale, enlivened things generally with his *joie de vivre* and held an overflow audience enthralled for several afternoon hours with an illustrated lecture on his work in Britain.

A highlight of the annual dinner was a presentation to John Miller, who retired as OAA Secretary at the end of 1967. Chief among the scholarships and prizes awarded was the Toronto Architectural Guild Medal to James H. Jorden of Chatham, the U of T School of Architecture graduating student who displayed the most outstanding ability in architectural design.

Other officers elected in addition to the President, John Spence, were vice president, Stanley H. Butcherd, Port Colborne; treasurer, Ronald E. Murphy, London; councillors, Robert C. Fairfield (F), Toronto; T. V. Murray and Michael D. Dixon, Ottawa; William C. Crosbie, Windsor and John Ranta, Fort William. Douglas C. Haldenby and Donald M. Blenkhorne were re-elected Registration Board president and vice president.

#### President RIBA Made Honorary FRAIC

A highlight of the visit to Toronto February 26-27 of the Board of Architectural Education of the Commonwealth Association of Architects was the conferring of an RAIC Honorary Fellowship upon Sir Hugh Wilson, President RIBA and Chairman of the visiting board. The presentation was made by the President RAIC, James E. Searle (F), Winnipeg, assisted by the Vice President, Norman H. McMurrich (F), Toronto, and took place at a reception given the visiting architect-educators by RAIC Council at OAA Headquarters in Toronto.

#### Newfoundland Annual Meeting

Premier J. Smallwood and RAIC Past President Charles A Fowler (F), Halifax, were guests of honor at the annual meeting of the Newfoundland Association of Architects February 2. Mr. Smallwood, who is an honorary life member of the NAA, addressed the annual banquet.



RIBA President Sir Hugh Wilson made Honorary Fellow. Left to right RAIC President J. E. Searle (F), Sir Hugh Wilson, RAIC Vice-President N. H. McMurrich (F). See news item



NAA officers and guests of honor at NAA Annual Meeting shown left to right, front row, are RAIC Pres., J. A. Fowler, Premier Smallwood and NAA President Dr. E. A. Steinbrink; back row, Councillors J. V. Oliver, Coleman Klein, B. E. Murphy; Honorary Secretary Treasurer T. P. Bolton, and Councillor Cyril Congdon



NSAA 1968 Council, left to right, front, R. J. Flinn, president; C. H. Cullum, hon. secretary; and E. M. Byrne, vice president; back, P. J. Mettan, hon. treasurer; C. E. Seamone, A. J. Donahue, councillors; M. H. F. Harrington, Past President and councillor G. W. Rogers

Crosby



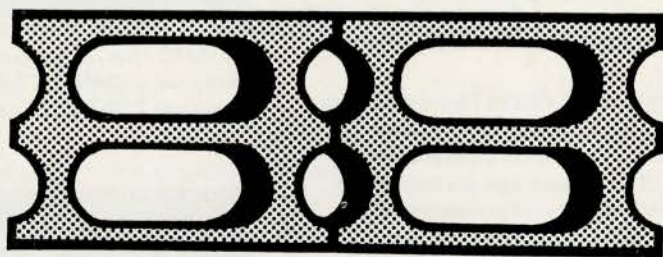
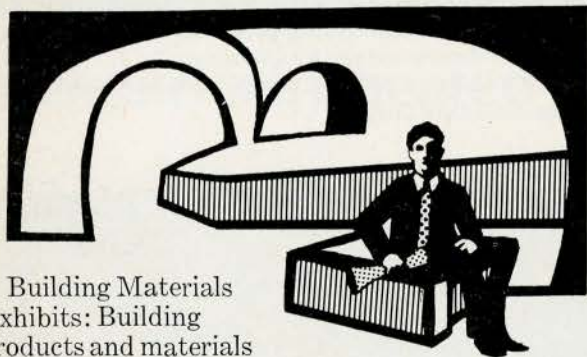
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## RAIC Statement on Competitions

On March 1st, 1967, the RAIC Council received a report from the RAIC competitions committee, chaired by G. Gibson, (F). This report expressed the concern of the competitions committee with the conduct of the Winnipeg Art Gallery competition, and to a lesser extent, the Osaka competition. The report acknowledged the concern expressed by a number of competitors with regard to several aspects of the Winnipeg Art Gallery competition, and most particularly the modification to site dimensions which was proposed and then withdrawn shortly before the submission date. The RAIC council shares the belief of the competitions committee that rigorous standards for the conduct of future competitions must be enforced in order to safeguard the interests of RAIC members. Fuller consultation between the professional advisor and the competitions committee prior to the publication of the conditions of the competition, should assist in achieving this objective.

The council of the RAIC supports the concept of competitions for major building projects conducted under RAIC rules. The council expressed concern at the growth of owner-sponsored competitions involving RAIC members which are not conducted under the auspices of the RAIC. The competitions committee will be examining these other types of competitions such as developer proposals, so that a recommendation can be made to the council.

## The Nova Scotia Annual Meeting

The Nova Scotia Association of Architects this year expanded their usual annual meeting program of events by sponsoring a public lecture given by Ray Affleck, Montreal. Another special guest, Dr. H. M. Nason Chief Director and Deputy Minister of Education addressed the members on "School Development in Nova Scotia". Officers elected were Robert J. Flinn, president; Michael Byrne, vice-president; Charles Cullum, honorary secretary; Peter J. Mettam, treasurer; Arthur J. Donahue, Charles E. Seamone, George W. Rogers, councillors. The NSAA Meeting was held Jan. 26th-27th in Halifax.

## U of T Master of Architecture Course

Applications for the two alternative Master of Architecture Programs offered by the University of Toronto Department of Architecture must be received this year by May 1. In future years the closing date will be February 15. The two programs offered are: Research, in which an approved subject is investigated in depth under the guidance of a supervisor; and Design, a structural program dealing with architecture in the urban context. Application forms are available from the Department of Graduate Studies, 65 St George St, Toronto 5, further information on application procedures from the Department of Architecture.

## Department of Public Works to require use of Modular Co-ordination by Consultants in 1969

The Federal Department of Public Works will adopt a system of modular co-ordination, and consulting architects and engineers will be required to use it when designing projects for the Department. Full implementation will come into effect after a year from now. The 12-month period is to permit designers, manufacturers and contractors to become familiar with the use and requirements of modular. The Department considers modular will encourage greater industrialization in all aspects of construction, and its adoption on a nationwide basis is one of the objectives of the Department of Industry's BEAM program.

## AIA Members' Dues Increase

A proposal to increase members annual dues from \$50 to \$75 in 1969 is reported to have received a favorable response from about 500 state and chapter officers representing the 19,000 members of the American Association of Architects. The increase will add about \$445,000 to the AIA's present \$2 million annual budget and permit a significant increase in the AIA's continuing programs and a start on new activities to enable the Institute to be an active, vigorous representative for the profession's role in modern society.

## Canadians to Plan Super Airport

A consortium of John B. Parkin Associates and Acres International Ltd., Toronto, has been chosen over seven other consortia from the United States, Europe and Canada, to plan South America's first jumbo and supersonic jet international airport in Brazil.

## DBR List of Publications Supplement

Supplement no 25, to the Division of Building Research, N.R.C. List of Publications, December 1965, is now available from DBR, Montreal, Ottawa.

## Coming Events

CIQS Convention, May 10, 11, 12, Skyline Hotel, Ottawa.

4th Technical Fortnite, Paris, France, May 16-June 3.

Fifth IUA Seminar on Industrial Architecture, May 19-26, Detroit, Michigan.

RAIC Assembly, May 27-June 1, Regina.

Madrid Symposium on Steel for Prestressing, June 6, 7.

International Federation of Landscape Architects Congress, June 15-20, Montreal.



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### RAIC Council Meeting, March 1, 2

Concern over lack of new work on architect's drawing boards in most parts of Canada which, in the months ahead, means fewer calls for tenders and therefore serious unemployment by next fall in the building construction industry, was expressed at the RAIC Council meeting held March 1 and 2 in Toronto. Quebec and the midwest seem to be the hardest hit, and the universally recognized cause is the postponement of new construction by all levels of government. The problem is one that will continue to plague all concerned in building construction – architects, the building trades and producers of building materials, until some way is found to cope with the "boom" and "bust" cycle. The RAIC approach to the problem, as outlined to Council by President, James E. Searle (F), Winnipeg, is to try to persuade government to heed the warning in the Economic Council of Canada report of last fall (*Architecture Canada*, November 1967, page 29). Mr. Searle had expressed the concern of the RAIC in a letter to the Prime Minister and had offered the expertise of the profession to assist in facing the wider concerns which confront urban Canada. Specially he had proposed the establishment of an interdepartmental committee with representatives also of the design and construction groups. A more concrete step was the establishment of a Presidents Committee of the heads of the RAIC, the Canadian Construction Association and the Association of Consulting Engineers of Canada to study this and other problems of mutual concern. (The Committee met again in Montreal March 11 and announced it will conduct a two-week survey of the construction slump and then take its case to the Federal Cabinet).

#### Study of RAIC By-Law Changes

Council heard a general discussion on the changes to RAIC By-Laws proposed by the PQAA. Each provincial association had been asked to consider the proposed changes and members from the various

associations brought the views of their provinces to the meeting. The views of the RAIC solicitor also were presented. The result was the appointment of Vice President N. H. McMurrich (F) as a one-man committee to work with the Institute solicitor to make a synthesis of the proposed changes in which the majority appear to be in agreement and to try to arrive at possible solutions to the more difficult ones so that a draft proposal representing majority opinion can be put before the Committee of Presidents at the RAIC Assembly at Regina at the end of May.

#### Guide to Bidding Procedure Endorsed

At the request of R. E. Briggs, chairman of the RAIC Committee on Legal Documents, Council endorsed a revised "Guide to Construction Tendering Procedures" and a revised Document 10, "Canadian Standard Form of Stipulated Sum Construction Tender", produced through the Canadian Joint Committee on Standard Documents and Procedures. □

#### Réunion du Conseil, le 1er et 2 mars

La réunion du Conseil de l'IRAC qui a eu lieu à Toronto le 1er et 2 mars se souciait du manque de projets sur la planche à travers le Canada puisque cela signifie moins d'appels pour soumissions à l'avenir suivis d'un problème de chômage grave dans l'industrie de la construction dès l'automne. Le Québec et la région centrale semblent avoir le plus de difficultés. La cause est la remise à plus tard des nouveaux projets de construction par tous les niveaux du gouvernement. Tous, dans la construction, seront ennuyés par ce problème tant que ne sera pas réglé le cycle de "boom" et "bust". ("expansion rapide" et "régression"). Le Président, James E. Searle (F), Winnipeg, a expliqué l'attitude de l'IRAC, dans l'espoir de persuader le gouvernement d'accepter l'avis du Rapport du Conseil Economique du Canada. (*Architecture Canada*, novembre 1967, page 29). Monsieur Searle a exprimé le souci de l'IRAC dans une lettre au Premier Ministre offrant l'expérience de

la Profession pour examiner de plus près les soucis plus généraux du Canada urbain. Spécifiquement, il a proposé la mise en oeuvre d'un comité de ministères conjoints avec représentants des groupes du dessin et de la construction. Allant plus loin, un Comité des Présidents a été établi, constitué des Présidents de l'IRAC, de l'Association Canadienne de la Construction et de l'Association des Ingénieurs Conseils du Canada, pour étudier ce problème et autres problèmes d'intérêt commun. (Ce Comité s'est réuni encore à Montréal le 11 mars et a décidé d'effectuer une enquête de deux semaines sur la régression en construction et puis de présenter son cas au Conseil des Ministres Fédéraux.)

#### Etude de Changements des Statuts de l'IRAC

Le Conseil a entendu une discussion générale sur l'amendement des statuts de l'IRAC proposé par l'AAPQ. Chaque association provinciale a été priée de considérer les changements proposés. Les divers points de vue des membres ont été entendus, ainsi que celui de l'avoué de l'IRAC. En conclusion, N. H. McMurrich, Vice-Président, a été nommé comme représentant qui, avec l'avoué de l'Institut, doit faire une synthèse des changements proposés où la majorité des membres semblent être d'accord, et ils essaieront de trouver des solutions possibles aux changements les plus difficiles afin de produire un brouillon exprimant l'opinion de la majorité pour l'usage du Comité des Présidents à l'Assemblée de l'IRAC à Regina en fin mai.

#### Guide aux Procédures de Soumission approuvé

A la demande de R. E. Briggs, Président du Comité de l'IRAC des Documents Légaux, le Conseil a approuvé un "Guide aux Procédures de Soumissions en Construction" révisé et le Document 10 révisé, "Formule canadienne standardisée pour Soumission en Construction à Prix Forfaitaire", produit par le Comité Conjoint Canadien sur Documents et Procédures Standards.

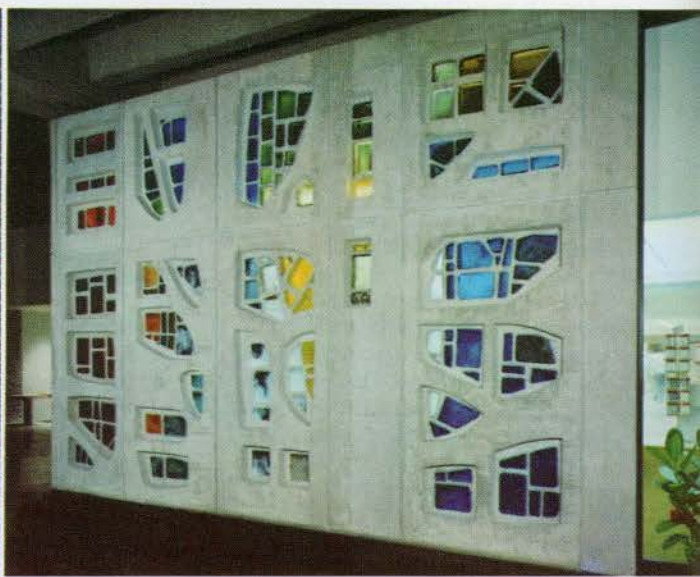




The exterior of this mammoth trade centre in downtown Montreal features exposed aggregate concrete walls having a vertically fluted pattern.



Many interior walls feature coloured and textured concrete masonry units.



Imaginative use of stained glass and concrete created this highly decorative wall.

# BOLD, BEAUTIFUL DESIGNS... SOLID

## PLACE BONAVENTURE, THE LARGEST ALL CONCRETE BUILDING

Countless uses of concrete are displayed to advantage in Montreal's newest landmark, the multi-million dollar Place Bonaventure complex. This mammoth structure, which covers an area of six acres, rises 17 storeys and has 3.1 million sq. ft of floor space, consumed 200,000 cu. yds. of concrete made with "Canada" cement. The exterior walls are cast-in-place reinforced concrete featuring a vertically fluted pattern; while the interior walls feature concrete masonry units, exposed concrete and precast concrete paneling. All the exposed concrete contains a special Shawville aggregate which reveals warm tones when the concrete has been sandblasted.

Concordia Hall alone boasts thirty-six 40 ft. high concrete "tree" columns spaced on

a grid of 50 ft. x 75 ft. which support the nine floors above. Each tree contains 425 cu. yds. of concrete. The "waffle" type ceiling adjacent to the trees accentuates the structural aspect of the reinforced concrete in the Hall. The wide spacing of the columns provides a relatively uncluttered floor space of 200,000 sq. ft.

This extraordinary study in concrete is topped by a 400-room hotel surrounding a concrete swimming pool and terrace.

Architect Raymond T. Affleck once referred to concrete as "the greatest contemporary building material". Certainly, Place Bonaventure has proved an amazing concrete achievement in concept, design and construction.

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# The Architect – His Role In Plastic Paradise “Lobbying”

The “message” this month, is straight out lobbying – in every sense of the word. Here is a direct appeal to the Canadian architect to accept a responsibility to pick up the ball (a symbol for the artist’s ideas and inventions in plastic), and place it, (as pure in conception as possible), between the “goalpost” . . . in this case the most frequently empty space available – public and private office complex lobbies.

If the Canadian architect were to concentrate for two years on making the entrances of major complexes vital and exciting he would perform a public act of infinite magnitude. The architect could replace or make an adjunct to our annual “twelve days of Xmas” pilgrimage to see the night light decorations of suburbia into a living nightly “downtown” tourist ritual. Toronto, a notorious dullsville, could profit by a livening up. Alternatives are needed to the gaudy corridors of Yonge St bars, fun parlors and pornographic bazaars.

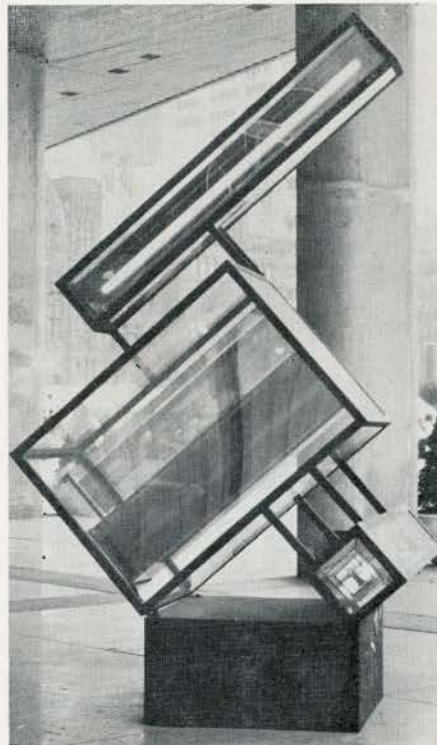
Since the architect is the only good salesman in contact with a client to whom he might sell the idea, it becomes as much a duty as a choice. Are there a few, just a few “fun-loving architects” who ought and could join hands to “start the ball rolling” with the bright young talented minds, competent and imaginative . . . Hayden, Blazje, Levine, Koblik, Chambers and the others who have been featured in these columns? Or is “fun-loving” unprofessional in architecture.

### Neon, neon, burning bright, In the forest of the night

Can you imagine the return to Toronto (or elsewhere) of those “D-Cameron” nights of Sculpture ’68, (Toronto City Hall Square), when the public could be found wandering wide-eyed at three and four a.m. to see the sculptural wonders? What excitement would be lent to any downtown morbid, warehouse jungle, if a thousand neon tiger-eyes pierced the dark caverns of the vaults and crypts – hollow, empty, vertical monoliths towering in gloomy rectitude in the draughty alleyways of metropolis sprawl! Every lobby, brightly lit and gay with movement and sound. A kinetic ballet, the

beautiful spawn of commercial incandescence, could be the city’s night-watchmen. Bright lights and an ever gazing public would be the most efficient burglar proofing yet devised. Warehouses please note. It could be fun and it should be fun. It should not offend even the most pure-minded architects. The neutral space is there and its “offensive” gaiety might be subdued to secondary purpose in daylight traffic.

This is public art, and relates to people. The velvet tombs for Blazje’s phosphorescent “spirits” and Hayden’s controlled beauty, within his “dime” machine (paying for its own maintenance) are healthy, real cultural alternatives to the vulgarities of the penny arcade. This new “art for the young” could really create a rival promenade to Yorkville or other local “broadways” of asinine vulgarity.



1  
“Neon Neon Burning Bright”  
Ziggy Blazje

### Talent Remembered? or Talent Forgotten?

Do you remember the “ride to the stars” in Quebec’s pavilion at Expo? Who will give us again, an elevator cell of wonder and delight. Oh, for a magic journey to a more mundane heaven of the business world above? Magic gloom and glowing choreography—geometric phosphorescent neon of Blazje’s contribution to the Canadian Pavilion’s Art Exhibition haunt nostalgic memory. Why are architects so quick to be excited by Expo and so slow to be inspired to use the talent of their native geni. We have the artists, we have the ideas, we have the need. The main streets of our metropolis are screaming for imaginative alternatives to the naturally spawned vulgarities which are now the common weeds of a city landscape.

All Canada needs is one percent of the approximate 3,000 registered architects to be catalysts. With their hands and minds *they* are fashioning our urban environment.

We want men who are vital, men who are not afraid and are ripe for ideas. Men who have not lost the feeling for experiment that a pioneering country needs to correct the inheritance of a dismal unexciting and vulgar commercial past.

### The Writer in a Vacuum?

What the writer never knows in writing is, however, if contact is made. Are you one of the elect one percent or are the readers of this column the other 99? I sometimes wonder. Action is vital; a kindness could be rendered by drawing attention to the one percent man if you think he is *the Man*. If we lack the talent within ourselves we usually ruefully know, with a little envy, where it does lie.

Aesthetic inertia is killing the North American continent. The artists, bright with ideas are ready with the ripe fruits of their creativity. Our files (slides, data, photographs and know-how) are ready for you too. We could, together, if the local architect would help, make a plastic paradise for 1970.





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# **STEELCASE**



2  
*Talent Remembered, Expo '67*  
*Elevator in Quebec Pavilion*  
*Papineau, Gérin, Lajoie, Leblanc & Durand*  
*Souvenirs de l'Expo '67*  
*Ascenseur au Pavillon du Québec*  
*Papineau, Gérin, Lajoie, Leblanc & Durand*

### Rider

Incidentally in reminding the architect of his responsibilities it is timely to remind artist readers, (there are a few who read these columns through their architectural liaisons) of their responsibility to architects.

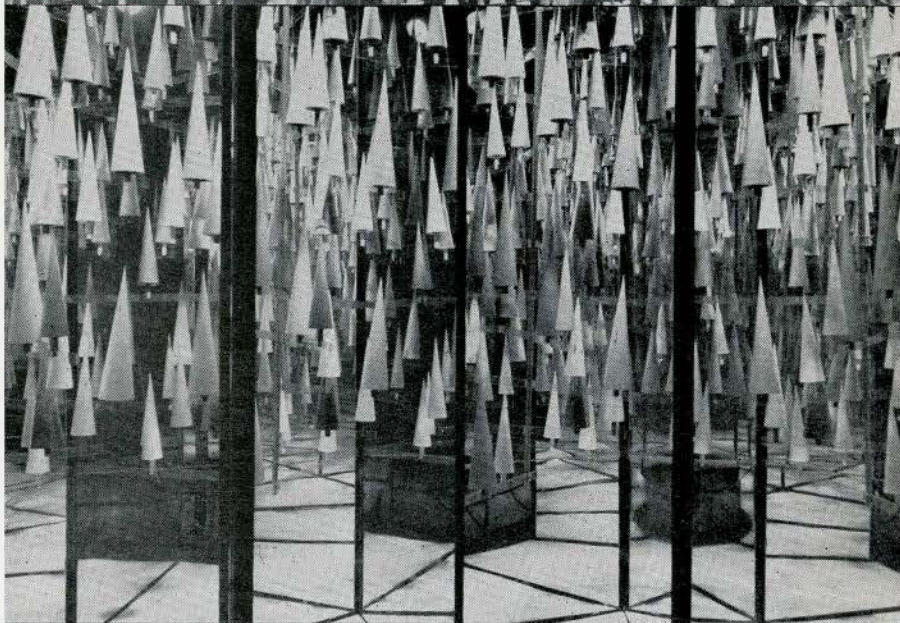
Recent gaudy public relations (and I suspect regarded as successful in the professional promoter's eyes) for a Toronto artist became somewhat of an embarrassment to his architect colleague in a current venture.

Whatever the artist chooses to do with his image and work is his own affair, even if he does choose a method of P.R. more suitable and advantageous in the selling of under-arm deodorant than art and artists. However, when he, without the knowledge and advice of his conjunctive colleague in architecture drags through his press releases, details to the detriment of the colleague, he shows insufferable immaturity and professional bad manners.

This column, well known for frankness of expression in principles and debate on open issues, would not carp at open two-sided debate. However, the publicizing of particular day to day wrangling in domestic working relationships presented from one side only, is something that the artist must regard as unprofessional and unseemly.

Future liaison with architecture will depend a great deal on the professional artist's ability to cope with the not always easy day to day tribulations of collaborative effort. The engineer or plumber does not parade his tears and tantrums through the daily journals, although at times he may well be justified. Professionalism breeds a stoicism and an ability to show dignity in adversity.

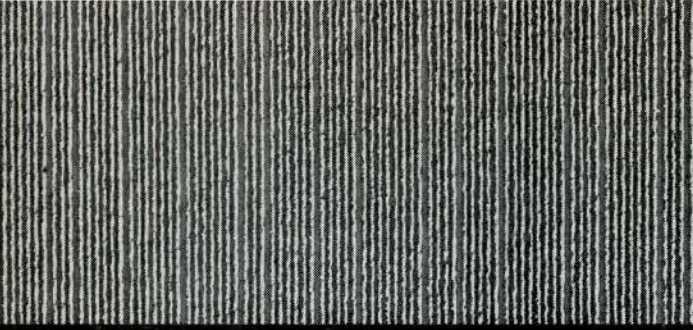
Anita Aarons



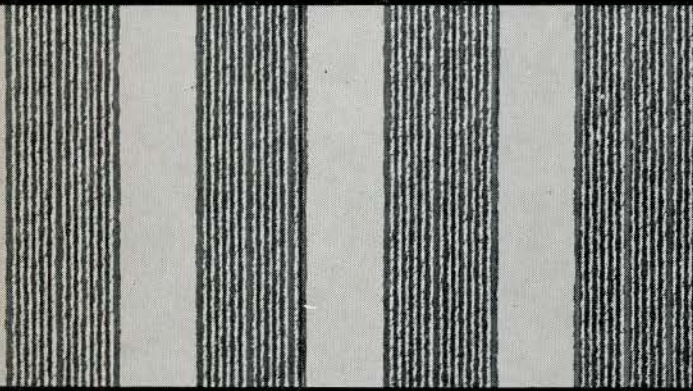
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Proulx

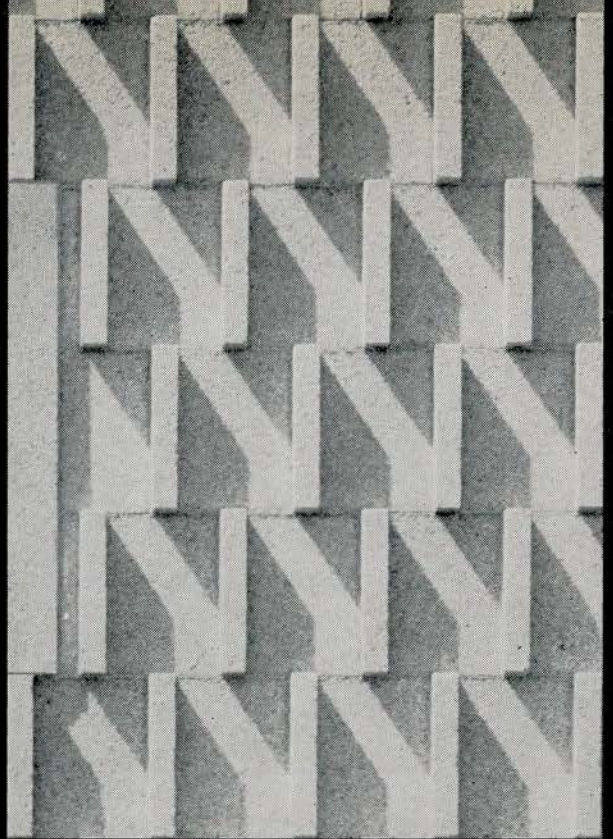




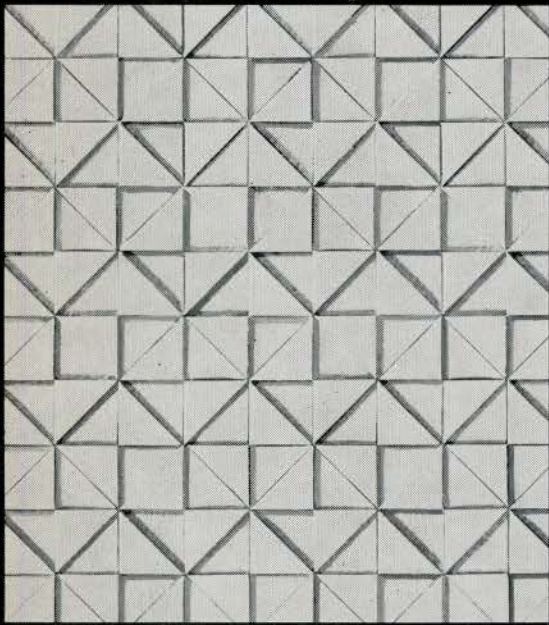
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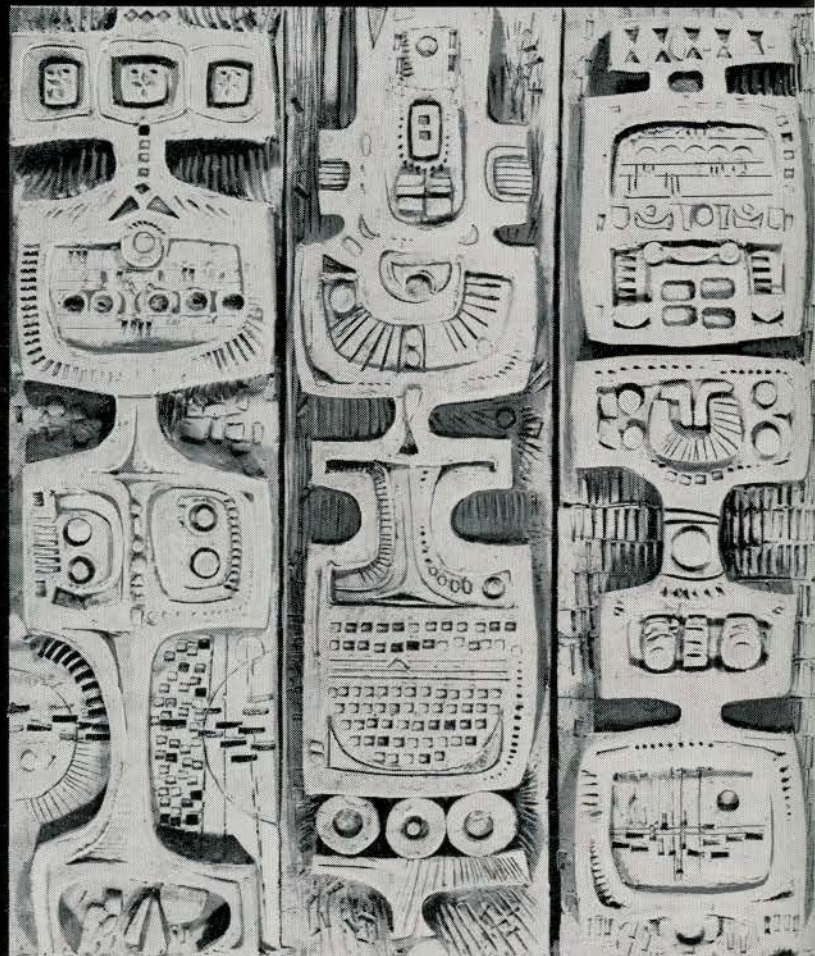
Geometrical Pattern



Geometrical Pattern



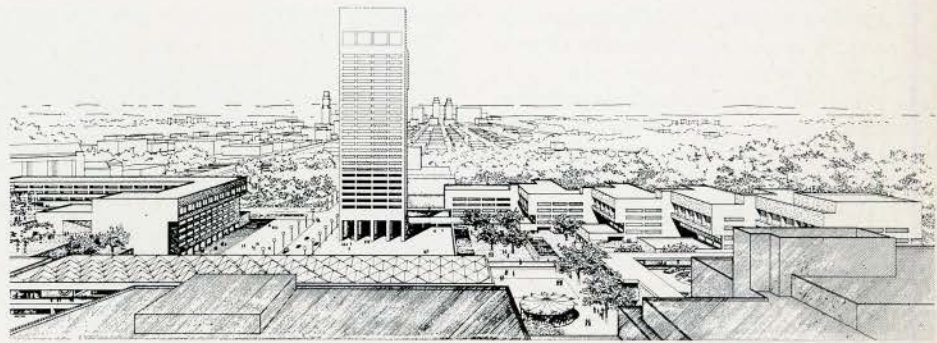
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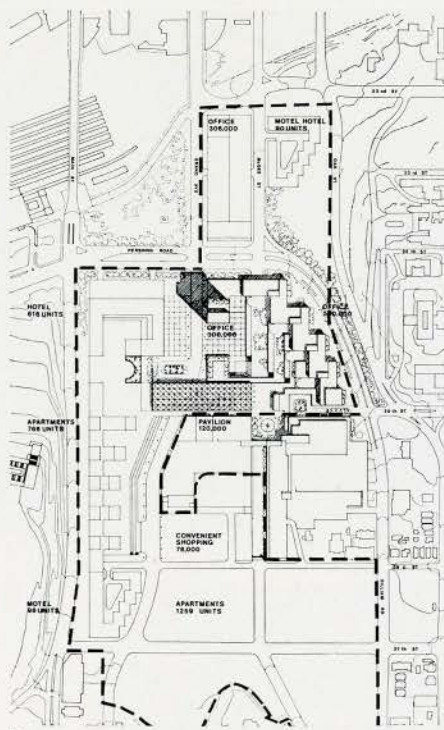
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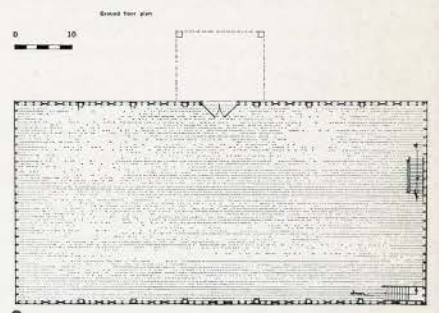
Concordia Estates Development Co., a Canadian real estate firm, has been retained as development and planning consultant and project manager for a major urban redevelopment in Kansas City, Mo. The project is the 115 million dollar urban community of Crown Center Redevelopment Corporation, a wholly-owned subsidiary of Hallmark Cards Incorporated. The project encompasses about 50 buildings, to be completed over a 15-year period or less. Groundbreaking is scheduled for mid-1968 with completion of the initial stage, to include office buildings containing approximately half a million square feet of space, a 500-room hotel, underground parking facilities, retail space and some 2,200 apartment units, slated for 1972. The job begins with an evaluation of the project to determine the future of the site based upon economic analysis and market projections in the context of the region, city, and immediate neighbourhood. Next come studies into programming and design in order to reflect present and future client and market needs. These findings will be evaluated in terms of economic, functional and technological requirements and other considerations. During actual construction, the firm will concern itself with construction economics and technology in terms of budget estimating, phasing, scheduling, cost control and execution of work. Finally, the firm will provide property management and leasing recommendations based on evaluations of the specialized requirements of maintenance programs, operating economics, building functions and leasing potential. Concordia was responsible with Affleck, Desbarats Dimakopoulos, Lebensold, Sise for Place Bonaventure which is the second largest commercial building in the world, with more than three million square feet of space. Only Chicago's Merchandise Mart is larger. Edward Larrabee Barnes is coordinating architect for the Kansas City venture, and has submitted architectural sketches for the first phase. (1, 2)



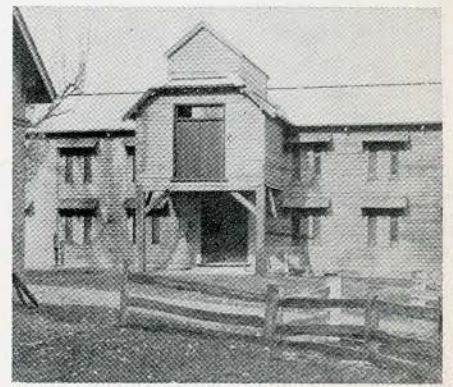
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"traditional building." (3, 4) The traditional building is frequently more innovative, forthright and "daring" (sic) than those buildings designed now. The drawings of the traditional buildings, presumably done after the building was erected, don't show stunning effects. The contemporary buildings have drawings which promise much, but result in little. It is that awful gap between the building as an end and drawing which have developed a language removed from reality.

Olympiad is well under way in Mexico City. A staff of young designers is creating everything from city plans and street signs to publications and posters for the event. "We cannot renew the city", said one of the designers, "that task is too big. But a design program has been started that will set precedents throughout the city long after the athletes have gone home." Let us hope this is true of Expo '67. To give its architects a chance to design these new facilities, the Mexicans held several architectural com-

On browsing through *Architecture in Australia* (Dec. '67) one is struck by a condition that is true for almost all contemporary architecture. The journal shows current projects and buildings as well as

Construction for next October's XIX

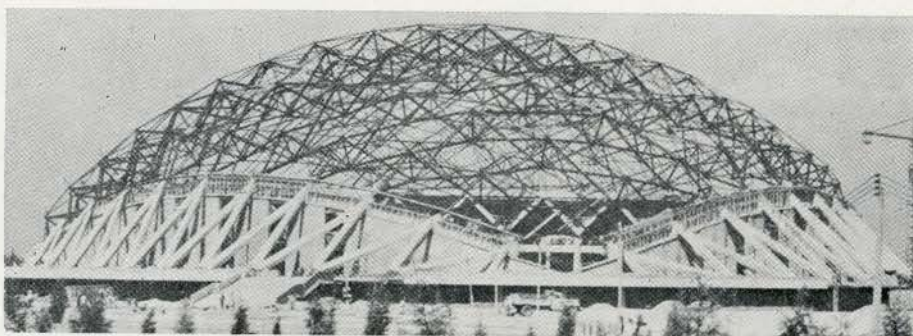


petitions. But the way they went about it would surprise Canadian architects. One Mexican competitor complains "I was telephoned one day and told I was part of a three-man team and that we had two weeks to get our presentation ready. I said, "look, you are telling me to get married to a girl I don't know - and then to produce a baby in fifteen days. It can't be done."

But it is being done, and the new buildings look neither hastily designed nor shoddy.

(5) shows the sports palace, by Felix Candela. The dome measures 524 feet across, and will seat 23,000. A steel space frame, with concrete buttresses will carry a plywood roof sheathed in copper.

*Fortune, March 68.*

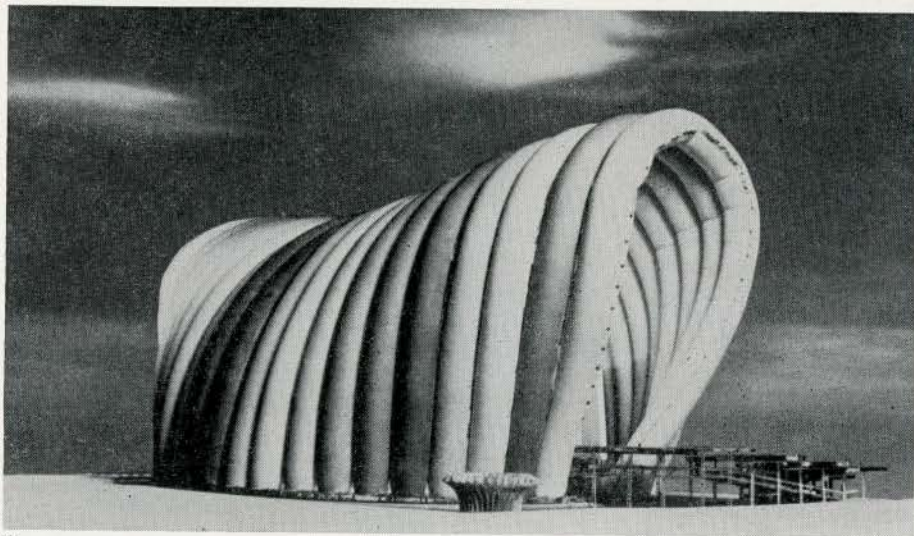


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Projects for Expo '70 are beginning to reach our office. Great disappointment was experienced after the dynamic planning at Montreal was followed by the essentially beaux arts plan for the Japanese Expo.

However, it seems that the architecture will redeem the situation, if the model in (6) is a representative example. This structure is sponsored by the Fuji group of companies. Huge air beams inflated with pressurized air, each 13 feet in diameter and 360 feet long will cover a floor area of some 13,000 square feet. The designer's claim that the pneumatic structure will be able to withstand wind velocities up to 130 mph.

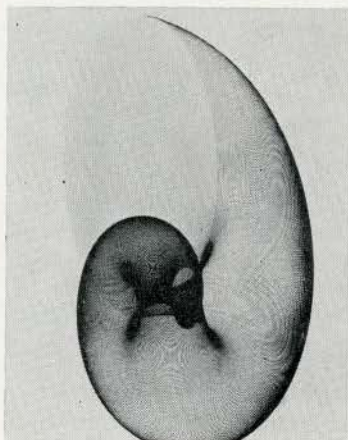
No doubt they are earthquake resistant too, and will have the advantage of easy demolition.



6

Calcomp (California Computer Products Inc) is sponsoring an international "computer/plotter art" competition, offering scholarships of \$5,000, \$3,000 and \$2,000 to accredited colleges or universities.

The products, (an example of what can be done is shown in (7)) are the results of a collaboration between computer/plotters, and, of course, human beings.



7

The cover (8) of *Arkitekten the Journal of the National Association of Swedish Architects* surely has a wry lesson for Canada too.

AJD



8



## Page 33-45

### Commentaires de James Stirling

En outre des statistiques sur un projet, dit M. Stirling, l'architecte doit prendre une décision au sujet des valeurs variables d'un projet à l'autre, par sa sensibilité, ce qu'il appelle le "super rationalisme".

Il cite comme exemple l'emploi généralisé de briques en Angleterre, "sûrement, ce n'est pas le matériau de nos jours?". Peut-être l'architecte doit s'efforcer d'utiliser des méthodes adaptées tant aux matériaux traditionnels qu'aux plus avancés.

Un moyen de construire à bon marché (Preston) est de substituer des matériaux moins chers aux matériaux traditionnels. Il a toujours essayé d'exprimer l'usage d'un bâtiment par le mouvement de sa surface. Selon Stirling, l'architecture moderne consiste surtout en clichés – souvent par manque d'apport par l'architecte. Les gratte-ciels où les habitants se sentent privés de contact avec l'ambiance naturelle et tous ces bâtiments en béton lisse, stéréotype courant, ne sont pas réalistes.

On devrait résoudre les problèmes fonctionnels d'un bâtiment avec un sens de chevauchement des activités et d'évolution des fonctions. Le dessin intérieur de chaque pièce doit changer suivant son usage; un esthétique dictant l'usage du même matériau à travers tout un bâtiment est vraiment déraisonnable. Même il faudrait changer la structure suivant l'usage de chaque espace. Concevoir un bâtiment est d'assembler des esthétiques et des solutions structurales distinctes et différentes, au lieu d'en faire une boîte en carton et de la remplir de petits carrés. Il essaie de faire un assemblage-collage de formes de chambres qui est alors entouré d'une peau de verre constituant ainsi un bâtiment complet. Le bâtiment est un assemblage ou la stabilisation de forces structurales, l'esthétique "dur et reflétant" de l'extérieur ne devant pas être forcément le même qu'employé à l'intérieur (Cambridge). Quant à la structure, il faut l'adapter au problème particulier sans nécessairement avoir le même système structural à travers tout un bâtiment. Il faut d'abord considérer l'usage et la circulation et puis la structure en troisième lieu – le bâtiment

Dorman-Long où il y avait plusieurs solutions structurales possibles en acier.

Il a opté pour une solution architecturale et esthétique, qui exprime le plan des étages.

## Page 46

### L'Architecte et l'Industrialisation,

#### 2ème partie

Colin Davidson

La clef de l'industrialisation de la construction est la répétition d'opérations et de procédés en volume suffisant pour défrayer la mécanisation industrielle. Avec le système propriétaire, l'entrepreneur s'est rendu compte le premier de la valeur de la continuité et de la répétition. Il a inventé de nouvelles techniques destinées à résoudre ses problèmes et à lui donner plus de contrôle de la programmation de construction. Donc, il a créé une organisation "maître" comprenant un service de fabrication et de dessin. Là où l'Etat est l'entrepreneur la tâche est plus facile; les aspects quantitatifs d'un programme de construction sont garantis et d'énormes usines peuvent être construites parce que la répétition à grande échelle est assurée. Certains clients, tels que les commissions scolaires, peuvent assurer un programme de construction continuant pendant plusieurs années, ce qui permet au client de mettre sur pied une organisation comprenant 2 fonctions architecturales distinctes; l'une, celle de dessinateur industriel (*fig. 8*) conçoit les éléments normalisés d'un système devant inclure une grande diversité de bâtiments. Les éléments sont forcément petits et les conséquences sur l'industrialisation, la fabrication et l'assemblage sont plutôt adverses. Ces "dessinateurs industriels" collaborent avec leurs collègues, les architectes-projeteurs (*fig. 8*) qui ont un travail simplifié – les ébauches deviennent schémas (*fig. 10*) leur laissant plus de liberté en dessin et en études. Les bâtiments démontrent la flexibilité inhérente dans ce système, au prix d'une complexité de fabrication et de montage (*Voir l'organigramme, fig. 8*).

Quant aux systèmes mixtes, le client établit une organisation-maître incluant un groupe dit "architecte" qui analyse les spécifications (exigences fonctionnelles) et les traduit en séries de spécifications de performance

qui sont données à l'industrie responsable (*fig. 15*).

D'autres chemins existent vers l'industrialisation. Ces systèmes doivent être partiels par nécessité étant donné la difficulté de réconciliation des intérêts de tous les participants et des facteurs ne faisant pas partie des systèmes. Un autre moyen serait l'établissement de lois et conventions stipulant le dessin des composants, qui ne seront pas faciles, même inutiles, à développer. L'architecte devra jouer son rôle dans la coordination des composants, qu'elle soit effectuée par le passage des lois ou par les fabricants individuels.

## Page 57

### Soumissions et Marchés – 3ème partie

T. M. Phelan, P.Eng.

Il est évident que pour un grand projet le client doit employer les services d'un administrateur de construction s'il veut s'assurer un projet esthétiquement et fonctionnellement satisfaisant achevé à temps dans les limites du budget. La préparation et la construction d'un grand projet pourrait durer 6 ans, mais avec les services d'un administrateur de construction ce temps peut être réduit à 3½ ou 4 ans. Un estimatif détaillé basé sur un simple programme est préparé. Durant le dessin et la préparation des plans les éléments de dessin sont continuellement vérifiés avec l'estimatif contrôlant ainsi les dépenses dès le début. La majoration de l'entrepreneur et des sous-traitants est le seul inconnu avant la réception des soumissions. Lorsqu'on considère tous les avantages d'un système d'administration de construction, les marchés à prix forfaitaire deviennent dénués de sens. Il faut à l'administrateur de construction une intégrité et une compétence irréprochables et il est essentiel qu'il soit admis au groupe à titre égal sur une base de confiance et de responsabilité. Des honoraires fixes doivent être négociés avec l'administrateur afin qu'il porte le même intérêt que le client à tout aspect du projet – un fait impossible avec tout autre système. L'architecte d'un projet aurait avantage aussi à négocier avec son client un marché à honoraires fixes plus salaires et déboursements. Dans



la demande, le client peut fixer les honoraires ou solliciter une demande d'honoraires prévus – il est recommandé que les honoraires soient fixes pour les projets publics afin d'éliminer l'influence politique. Le facteur décisif doit être toujours la compétence de l'organisation. Les principaux aspects d'un service d'administration de construction sont: des conférences de planning et de coordination assurant la participation à la programmation de tous les participants, l'administrateur servant à expédier des décisions. Quant aux estimatifs et au contrôle des dépenses, le premier estimatif préparé serait divisé en estimatifs séparés pour chaque élément majeur du projet et si approuvé, cet estimatif servirait de base au système de contrôle de dépenses et serait rajusté continuellement pour tenir compte des changements afin que le développement et les alternatives du dessin restent dans les limites du budget.

**Page 69**  
**La Crise du Logement et la Responsabilité du Gouvernement**  
**Wylie Freeman**

L'insuccès des gouvernements fédéraux et provinciaux de fournir des logements à prix modérés est dû à la difficulté d'obtenir des hypothèques à des prix intéressants (responsabilité fédérale) et au prix des terrains à bâtir (responsabilité provinciale). Le fait que les deux niveaux de gouvernements doivent agir est illustré par la baisse en construction résidentielle; Le CEC recommande la construction de 190,000 unités par an. 164,000 ont été construites en 1967. L'immigration et l'insuffisance de nouveaux logements ont fait augmenter rapidement les prix d'habitations et la famille à revenus modiques en souffre le plus. Puisqu'un des facteurs contribuant aux problèmes sociaux de la famille est un logement inadéquat, les frais entraînés sur le plan économique ou social dépassent de loin le coût probable de logements décents. Mais la participation gouvernementale n'existe pas pour ainsi dire dans la subvention de logements publics. La politique de la LNH doit être révisée étant donné le prix élevé d'habitations. Après la guerre, la mise sur pied de la

SCHL pour administrer la LNH et un taux d'intérêt standard applicable pendant 25 ans sur les hypothèques ont beaucoup stabilisé la situation. De là à 1967, le taux d'intérêt s'est élevé de 4½ % à 6% % . Une deuxième hypothèque est devenue nécessaire, les charges mensuelles subissant une hausse de 168.3%, le revenu familial moyen ne s'accroissant que de 46.6%. Au taux d'intérêt actuel, l'acheteur d'une maison doit gagner plus de \$12,000 par an, donc, 85% des salariés de Toronto n'ont pas le droit aux prêts de la LNH. La disparité des prix à travers le Canada est mise en évidence par les statistiques; il semblerait raisonnable que le plafond de la LNH devrait de même varier par région afin d'encourager les achats. Les subventions de l'état aux logements pour familles gagnant en dessous de \$6,000 sont également insuffisantes (la subvention fédérale du beurre est de \$2.00 par personne par an; celle du logement, \$0.18.) Le financement de vieilles maisons est possible mais compliqué par la résistance des prêteurs à offrir des hypothèques aux familles à revenus modiques. Des prêts directs de la SCHL pourraient se montrer plus effectifs et compléter l'argent actuellement consacré au renouvellement urbain. Un autre moyen de résoudre le problème serait la légalisation sur dividendes limités, Section 16 de la LNH. Pour un taux d'intérêt de 6½ % durant 50 ans, le constructeur limiterait ses bénéfices à 5% et la SCHL fixerait les loyers. Et si la SCHL prêtait davantage aux organisations charitables et aux coopératives, la crise du logement s'atténuerait peut-être. La hausse du taux de la LNH a encouragé les compagnies privées à prêter contre hypothèques de fait que les fonds limités de la LNH surveillés par le gouvernement en vue de l'inflation peuvent être voués aux logements publics et aux dividendes limités, limitant ainsi le rôle de la SCHL à pourvoir l'assurance sur les prêts, ce qui a produit un marché plus sain, libéré un peu des règlements gouvernementaux.

Quant aux prix des terrains-depuis 1950, le prix par unité d'appartement s'est élevé par 4 à 500%; pour une maison, par 4 à 12,000 dollars. Et au fur et à mesure que le prix des terrains s'accroît, moins de fonds

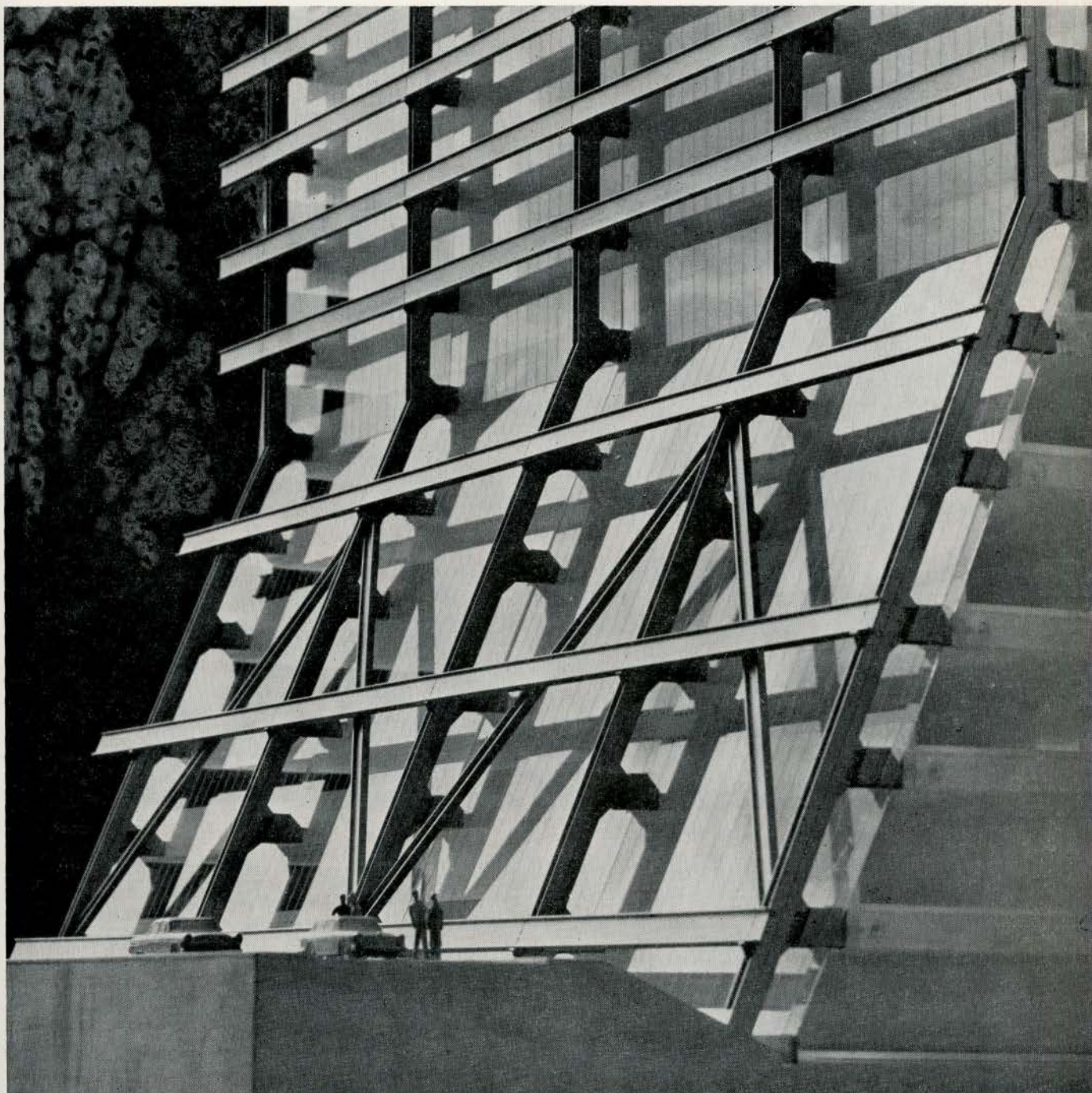
sont disponibles pour la construction. Les crédits fonciers ont influencé et contribué aux prix élevés des terrains par leurs idées conservatrices, comme à Flemingdon Park.

La division de l'agglomération métropolitaine de Toronto en municipalités quasi-indépendantes dont les revenus proviennent des taxes sur les terrains a encore haussé les prix et a compliqué les lois sur le zoning et les densités admissibles. Dans les plus anciens quartiers de Toronto, au lieu d'imposer des taxes plus élevées sur des maisons rénovées, on devrait les imposer sur les taudis, ce qui pourrait amener la taxation des terrains et non des biens, système tendant à décourager la spéculation sur terrains. Un des principaux problèmes de la taxation des propriétés est l'opposition des municipalités à l'approbation des projets d'exploitation à cause des frais d'installation des services. Il faudrait donc résoudre les problèmes financiers au niveau municipal avant que les projets fédéraux-provinciaux de redéveloppement puissent trouver une solution. Si la Province défrayait davantage les frais scolaires et les dépenses nécessaires aux services municipaux, les ressources de taxation seraient distribuées plus également. Il nous faudrait aussi une seule administration pour toutes les municipalités afin d'assembler les terrains et de créer un plan compréhensif de développement. Pour sa part, la Province devrait établir un seul code du bâtiment (de performance, espérons-le) – des nouvelles techniques et la préfabrication seraient alors encouragées. Mais avant que le prix des terrains soit réduit par l'action provinciale il faut trouver d'autres solutions à la crise du logement, par exemple, on peut prélever des taxes sur les profits amassés par les spéculateurs. On devrait même considérer un ministère du logement et des affaires urbaines pour remplacer les fonctions fédérales traditionnelles. La politique des hypothèques pourrait être coordonnée plus effectivement avec les prix des logements et les niveaux des salaires par un contrôle régional et une assistance aux familles à revenus modiques basée sur les besoins régionaux.



*Six projects by James Stirling, a leading British architect and 1966 winner of the Reynolds Aluminum Award.*

*The edited comments accompanying the pictures and diagrams which follow are excerpts from his keynote address to the OAA Convention, 1968*

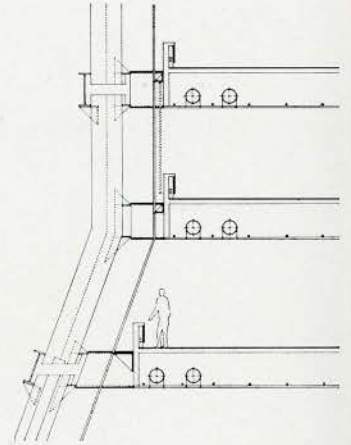
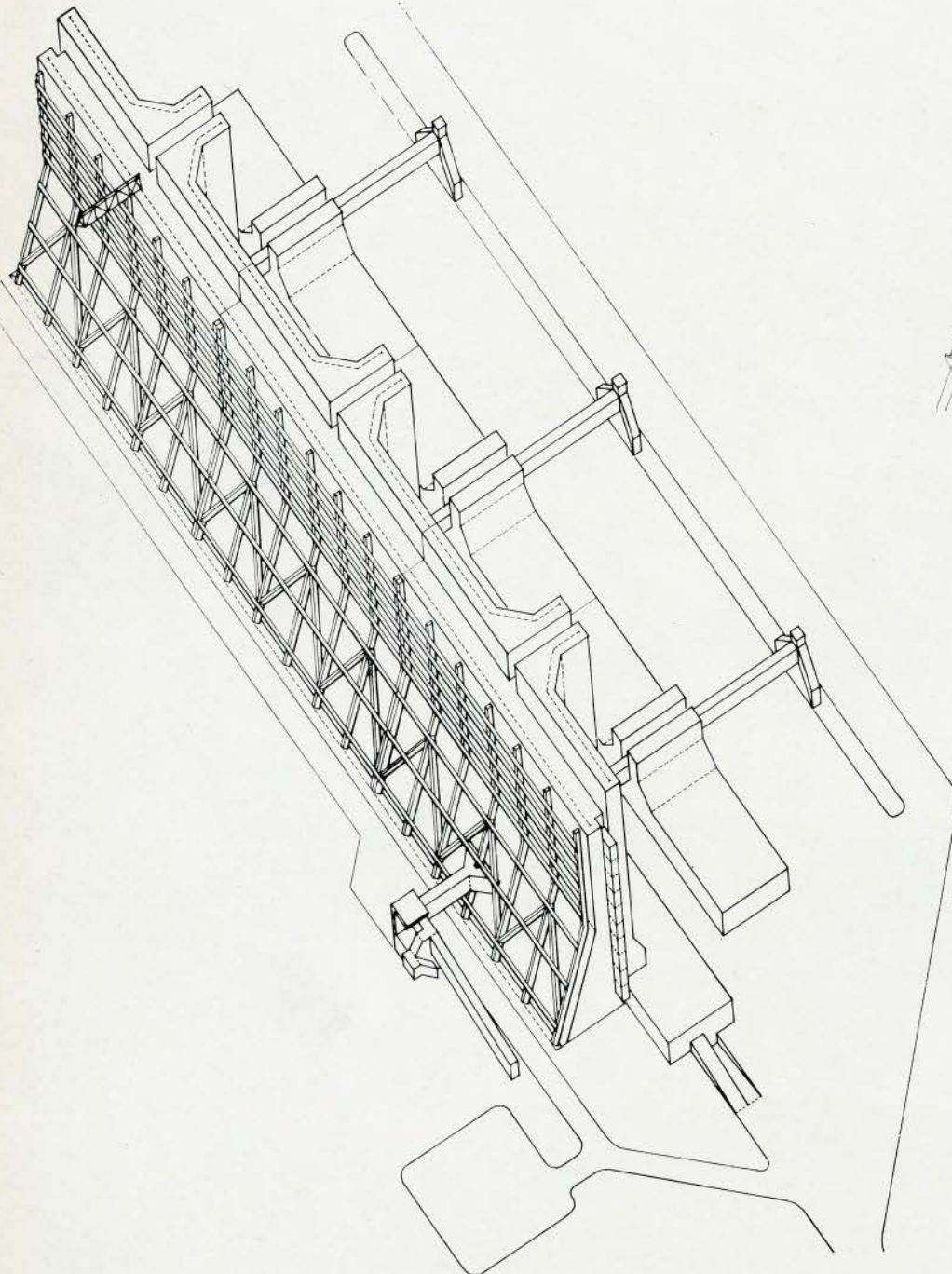


*Model, Dorman Long Steel Co., Middlesbury U.K., 1968 project, James Stirling Architect*



A strange thing occurred with the structural engineers when we were doing the design of the Dorman Long building. There were really about half a dozen quite different ways in which the structural steel grid could have existed outside the building. This confirms my idea that buildings which are entirely dependent on structural expression are somewhat arbitrary. We could have had the whole thing diagonally braced from top to bottom, or we could have had the whole thing horizontally and vertically meshed, . . . and there were other solutions, too, as long

as one has the same weight of steel and the same resistance against wind pressure . . . In the end we had to make a decision, which was an architectural one, in order to resolve this dilemma. We decided, that as the smaller spaces are at the top and the larger spaces are at the bottom, we would cut out every intermediate horizontal wind stiffening beam in the lower spaces, and put in a diagonal. On the upper levels we'd leave all the diagonals in, so that when you look at this mass you get an expression of two different scales.

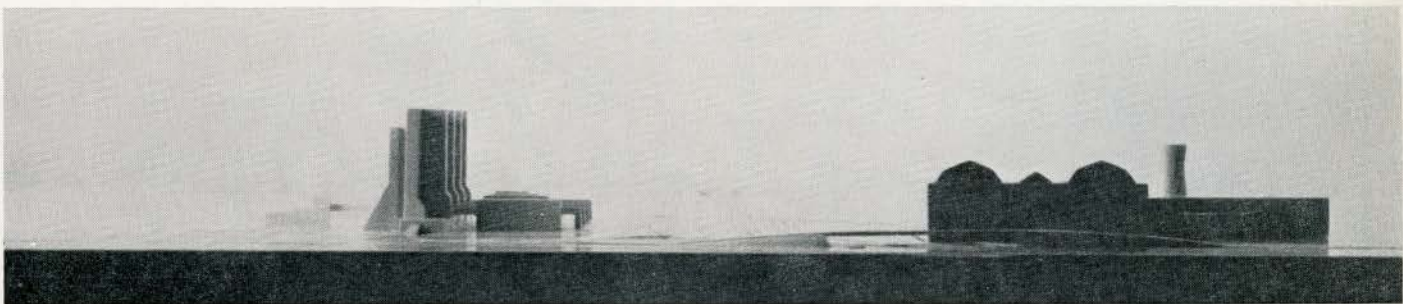
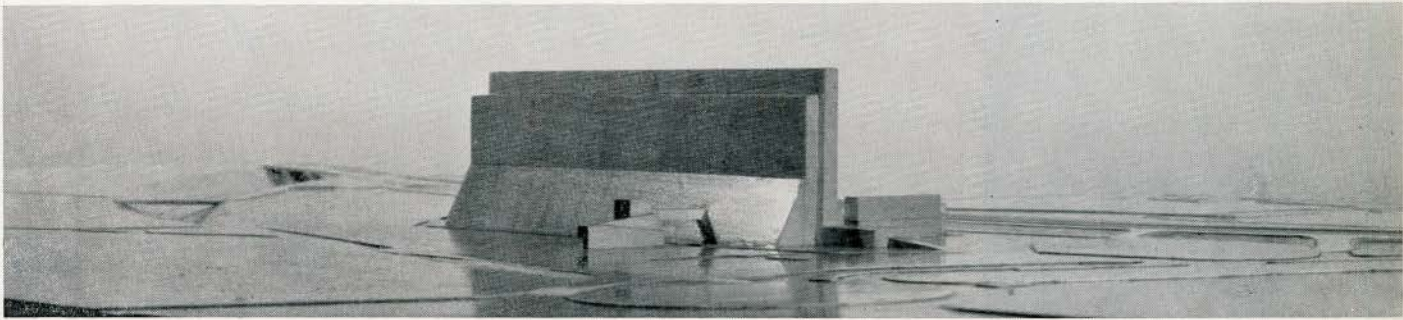
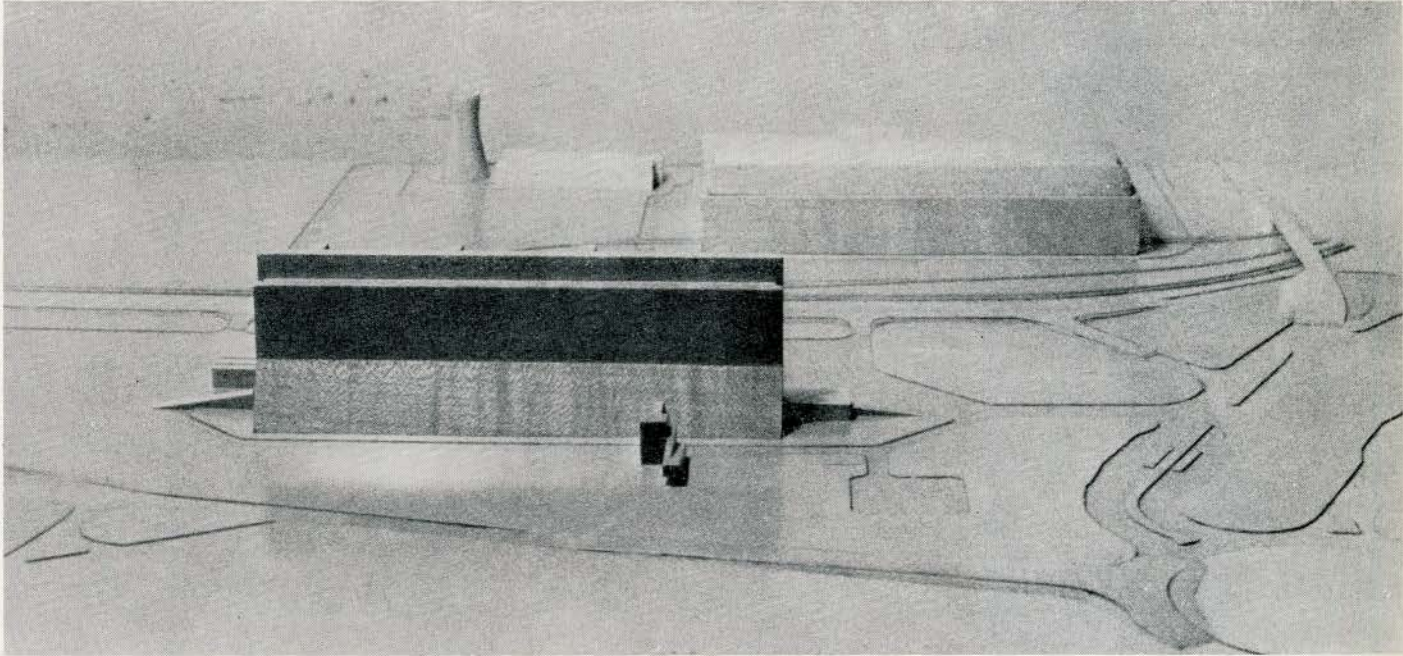


*Dorman Long*



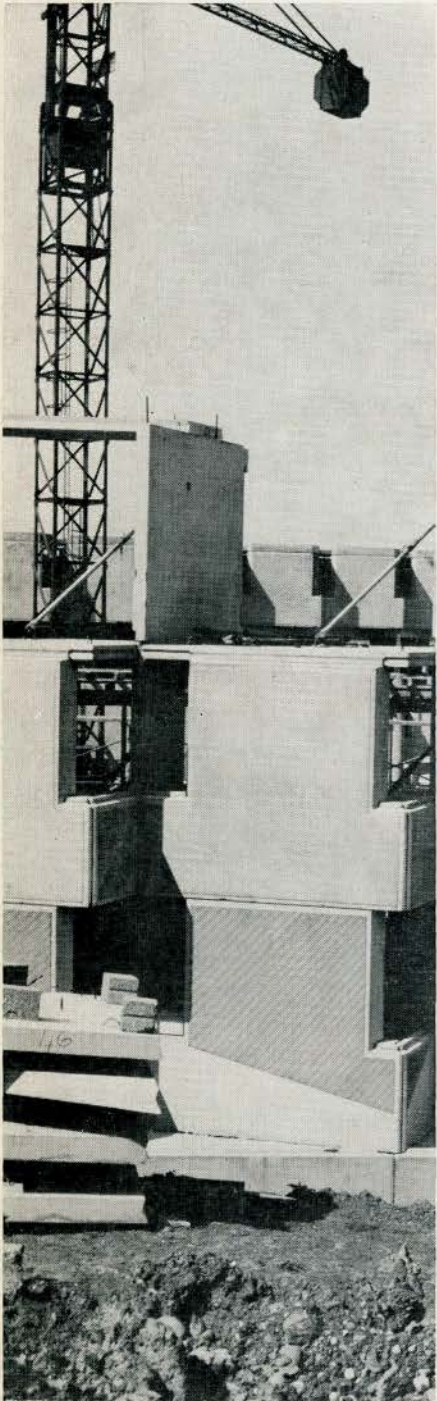
I believe there is a sort of realism or rationalization beyond that which is accommodated in any brief or statistics which we might call "superrationalism". This will no doubt horrify a few people.

Besides the rational statistics one gets with a building, I think the architect always has to, through his sensibility, make a decision about the values pertinent to the particular problem. I find these differ from building to building.

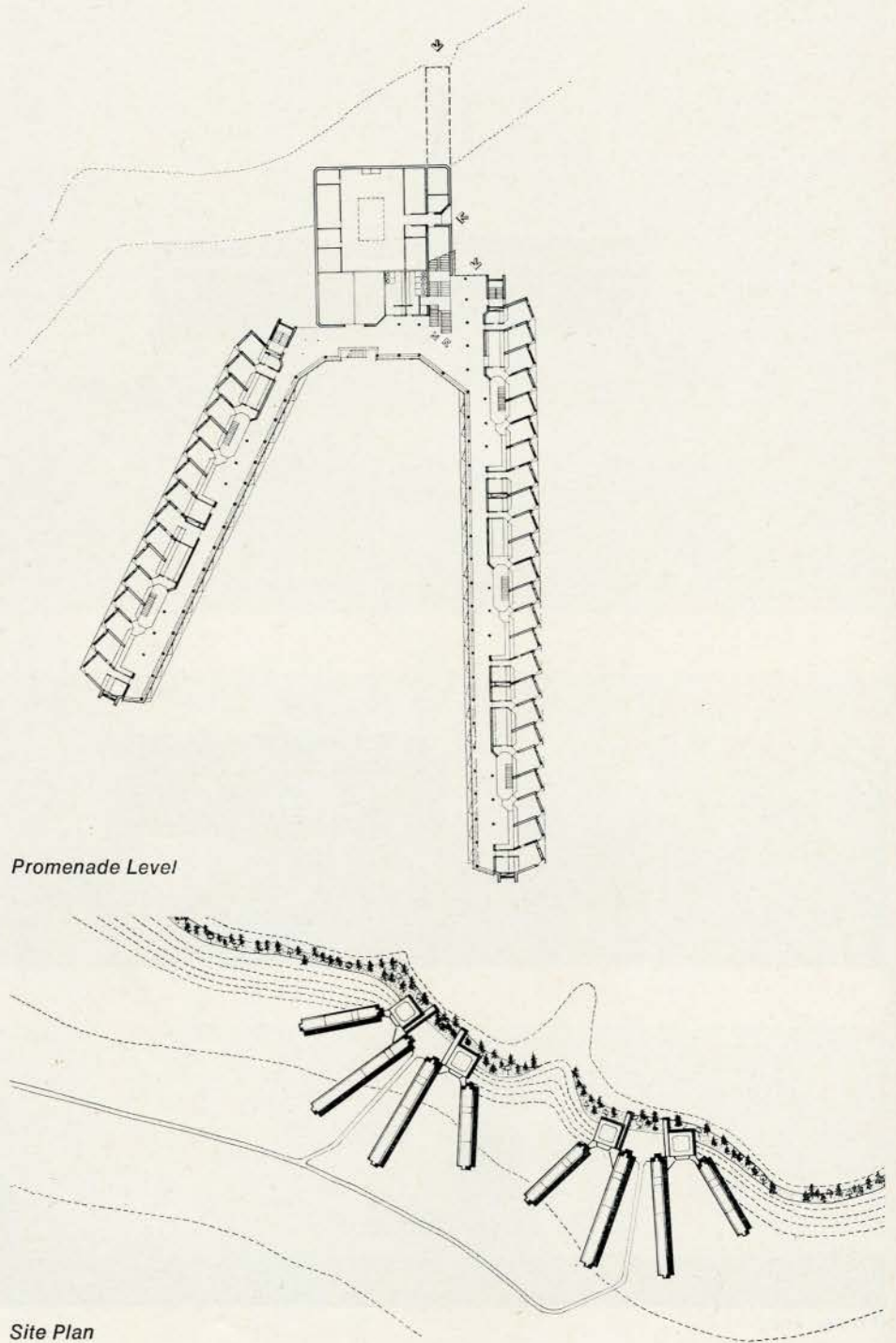


*Dorman Long*





St Andrews University Student Housing  
1964-68 (under construction)  
James Stirling Architect

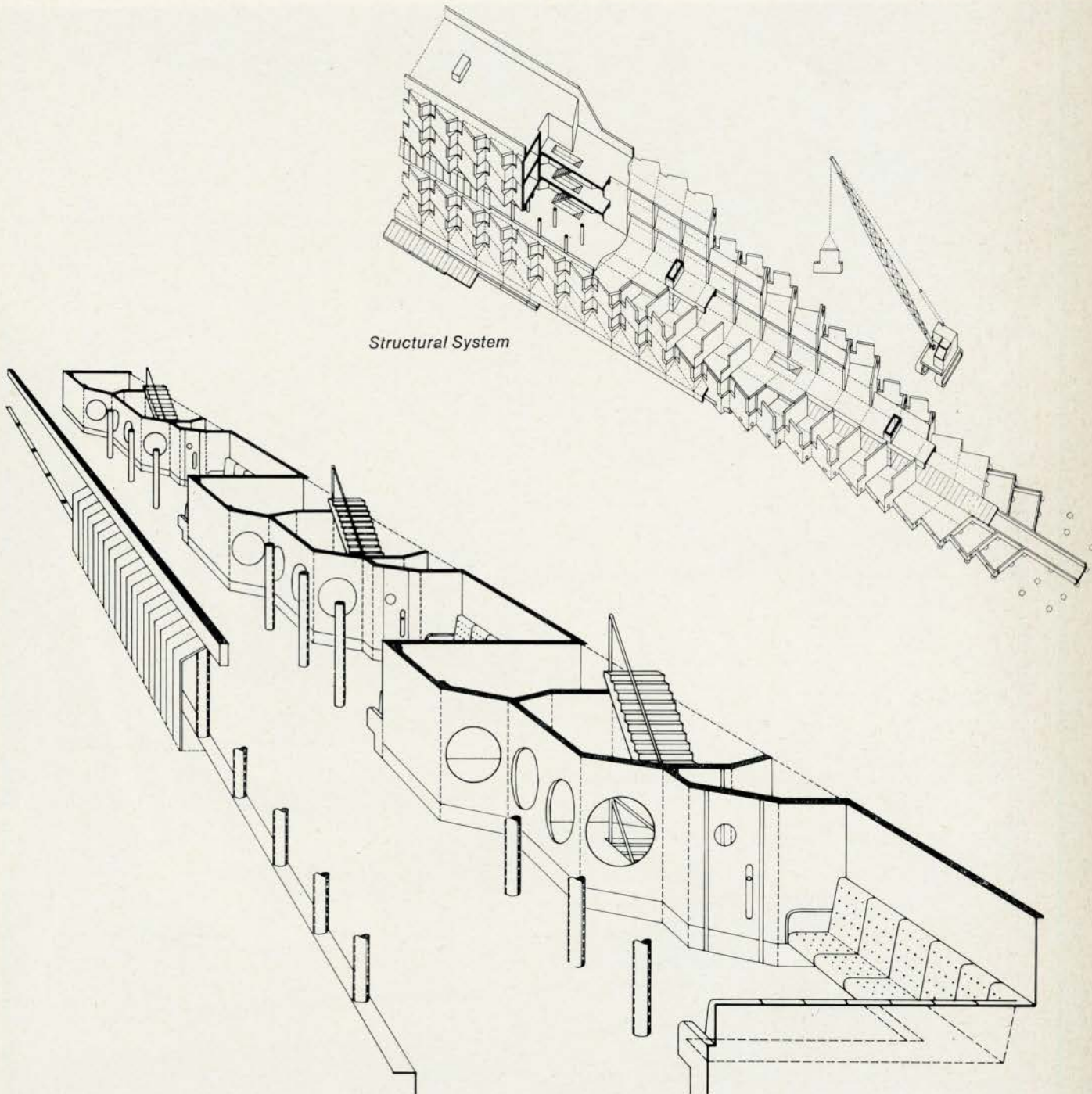


Promenade Level

Site Plan



What I was trying to do at St. Andrew's University was to give each student in his room an aspect of the fantastic panoramic view. To do that, one had to tilt the wall of the room outwards. This also returns the expression of the individual room to the facade of the building. As you look at the building you can see that it is made up of a collection of identical individual repetitive spaces so there is an expression of the most important rooms which here are the small ones.





The inside of The Faculty of History Building, Cambridge is quite different from the outside. The outside has larger areas of glass, ceramic tile, and a very hard, brittle, reflective surface. Inside it changes its aesthetics totally and becomes "soft". In other words, there is no attempt to bring the aesthetic of the exterior inside. Poor old Frank Lloyd Wright would turn in his grave.

My attitude to structure is in one sense very ad hoc and expedient. I take the structural system which is most appropriate to the particular problem, I even select different structures for the same building. No attempt is made to make a structural system run through-out the entire building. I think such a thing is arbitrary. It seems to me this is often used as a solution; architects set up a structural ordering and into that they fit all the accommodation. My attitude is quite the reverse. I think struc-

ture is something which you get around to about a third of the way down. Much more important is to consider the organization, the accommodation and circulation.

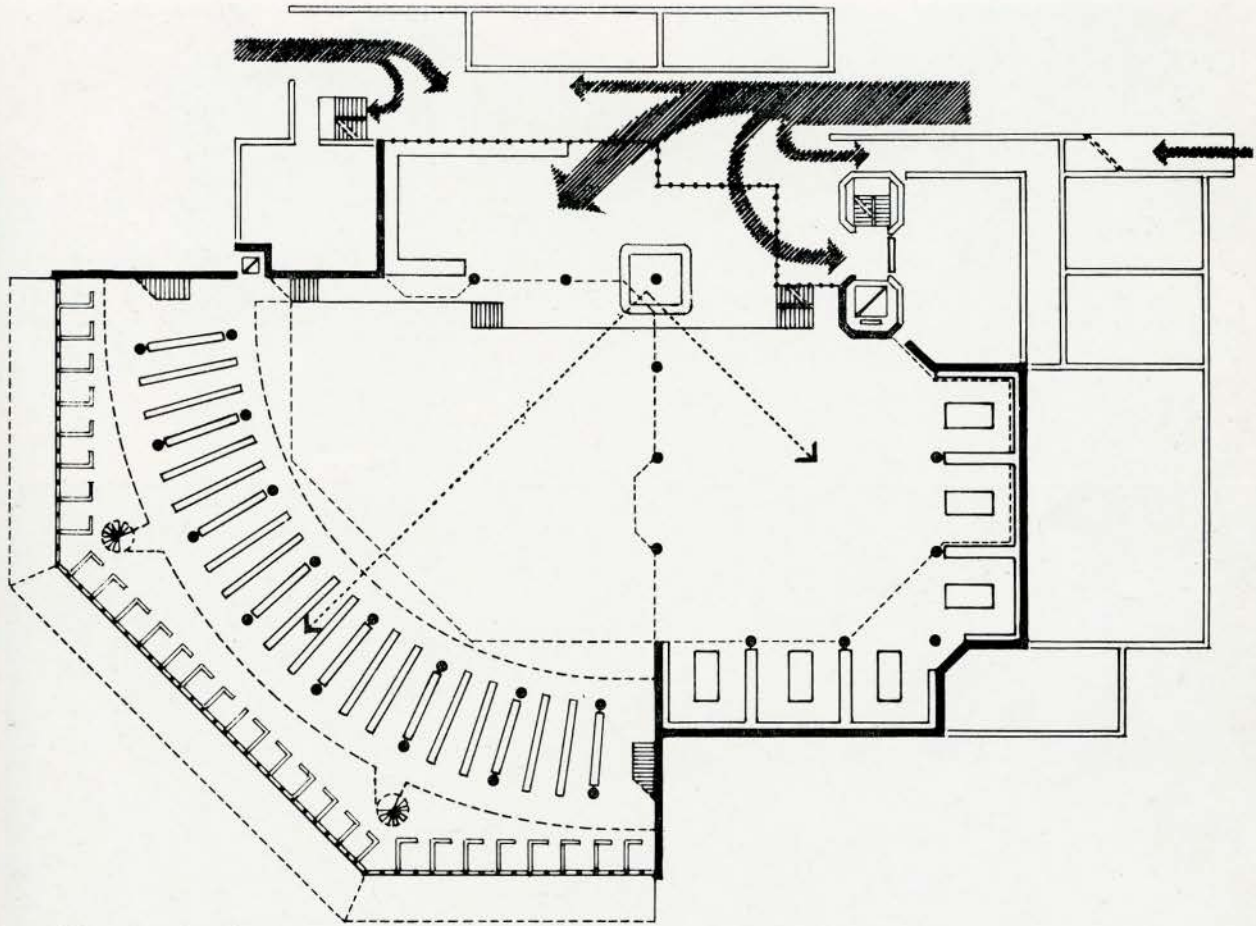


*Cambridge History Faculty, 1964-68  
(under construction), James Stirling  
Architect*

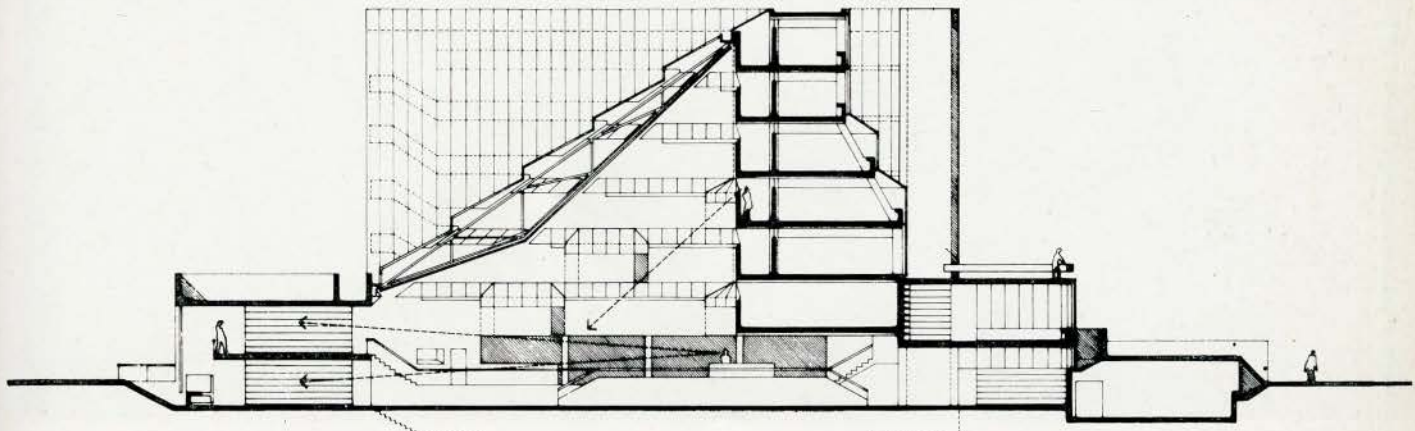


Instead of trying to put the whole of the thing in a package, as it were, drawing an oblong on paper and then fitting it in like a Maltese cross, which seems the way it is often done, what I try to do is think of the ideal shape for the particular rooms and maintain those shapes without distortion. Then these rooms are assembled so that the whole thing becomes an assemblage-collage of room shapes. Then a glass skin is draped over the whole lot, and that becomes the ultimate building.

The building is a putting together or stabilization of various structural thrusts and pieces. It is also a combination of steel structure where that is appropriate, and reinforced concrete where that is appropriate. (Cambridge).



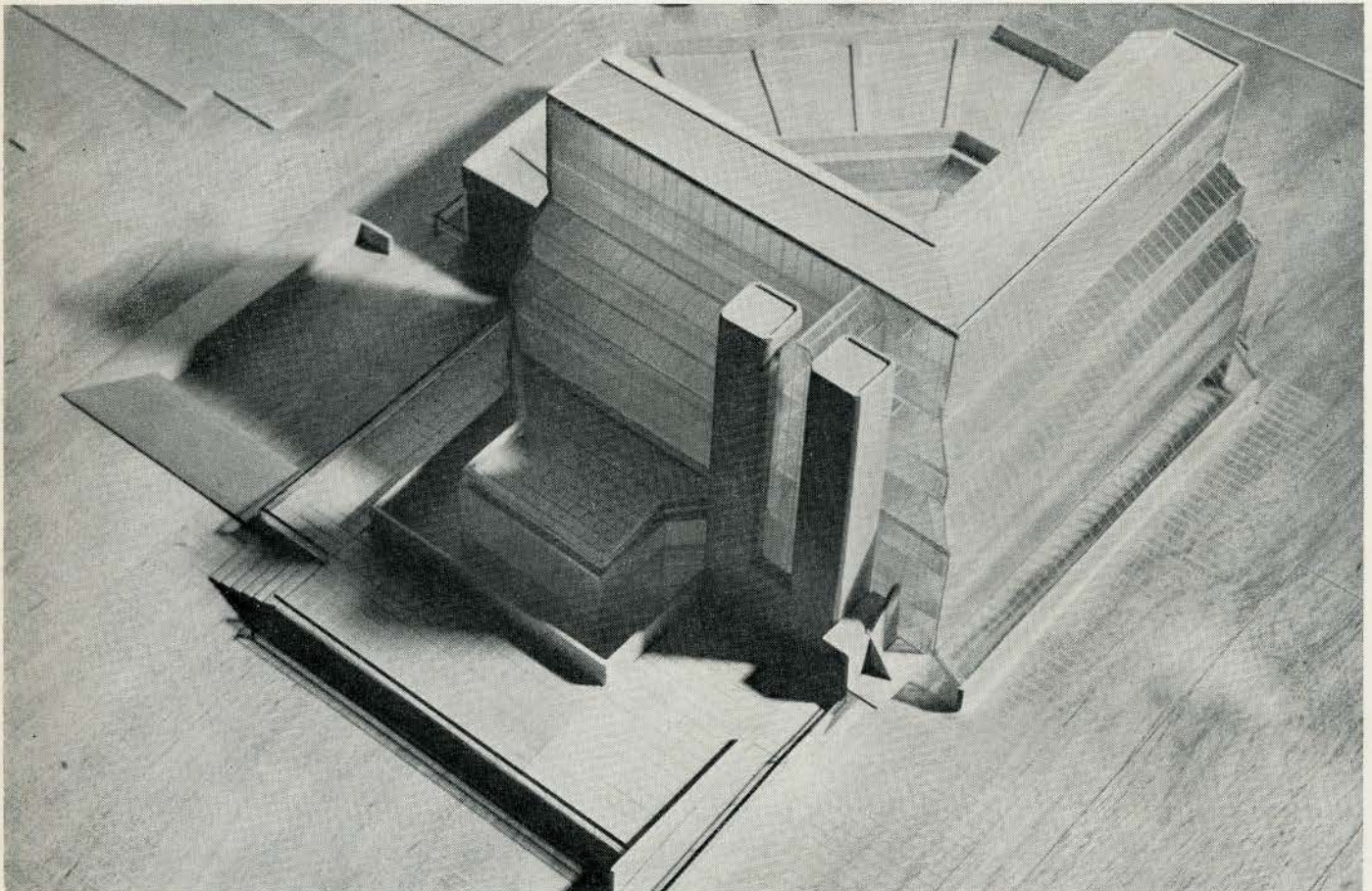
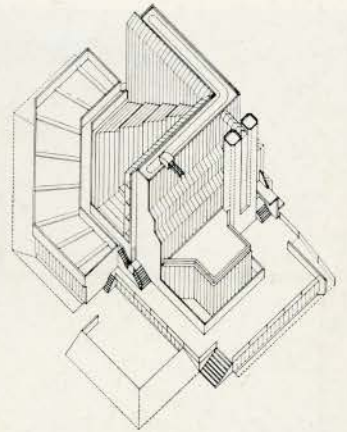
Ground Floor Plan Reading Room





The interior design of each room changes with its usage. . . . I maintain this is logical because, what happens in these different places is different and there should not be any attempt to carry an aesthetic through. A building which I am quite familiar with is the Arts and Architecture Building at Yale where you have a corrugated concrete surface on the exterior which ruthlessly goes right through the interior, flowing through the library, then the studio, then the ladies'

lavatory and then the guest suite and even goes into the shower in the guest suite. I would maintain that this is really unreasonable. I would go further and say you have to change the structure. As the problems of each space change, you have to produce the most appropriate structural solution for that space. The making up of the whole building is the putting together of quite distinctly different aesthetics and structural solutions.



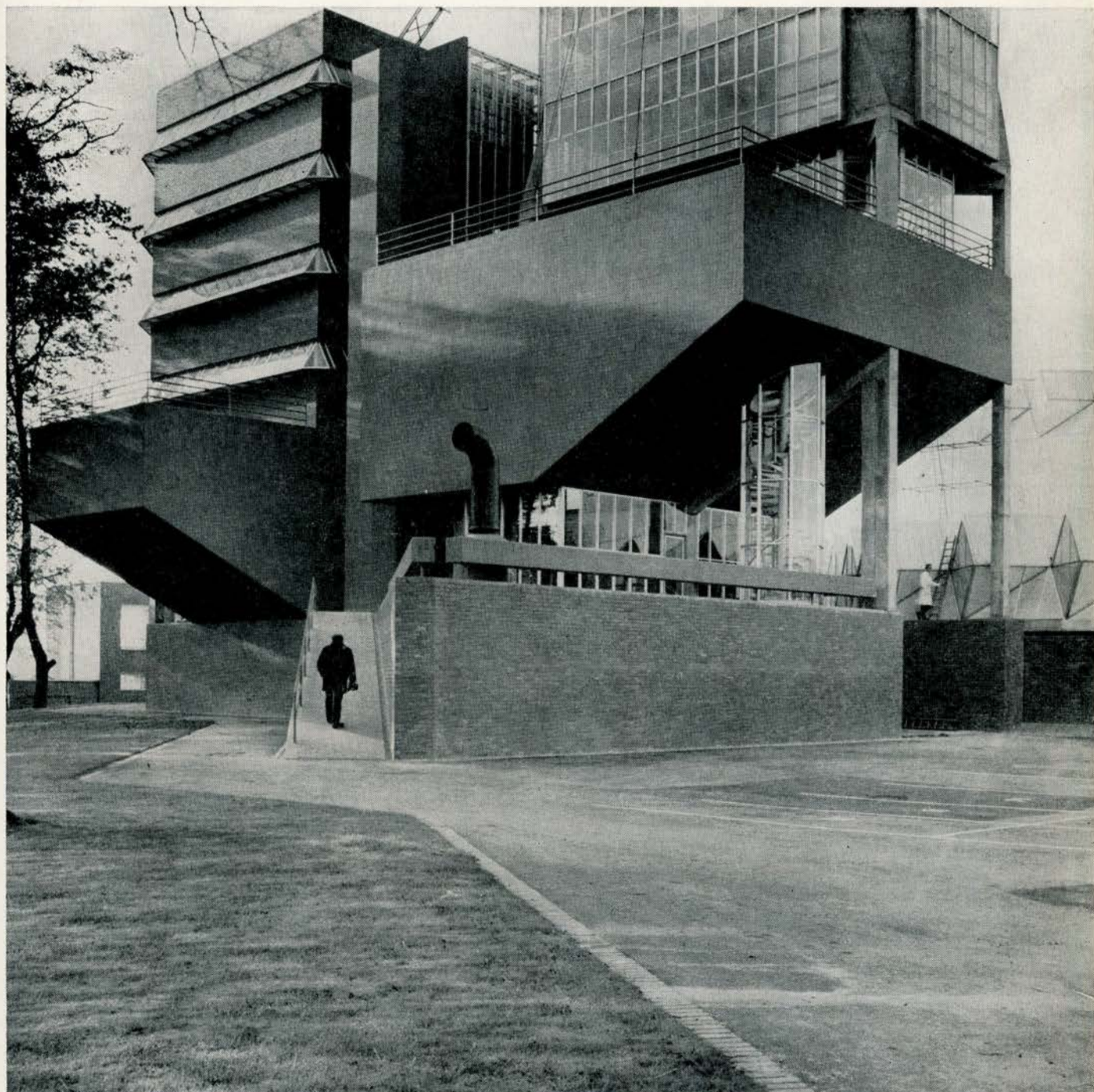
Cambridge, Faculty of History



It is really very unrealistic to think of making fair-faced concrete buildings, which you know is the current cliché. What happens to us is that the damp gets into concrete and it starts going green within six months, a fine variation of mold. It also has uncontrolled pattern staining. All in all it is a pretty unsuccessful material.

I believe you can not really put buildings together in simplistic relationship by resolving functional problems in a one-to-one system. You have to resolve the functional problems of a building in an overlapping sense. You could say that somehow the building design should be in its part a multi-functional resolution. To give an example: The beams inside the tower, Engineering Building at Leicester, instead of being down-stand beams which is the normal solution,

up-stand around the edge of the floor. They contain the horizontal services and are also a seat upon which students can wait. In other words, each is three things: a service duct, a beam, and a seat.



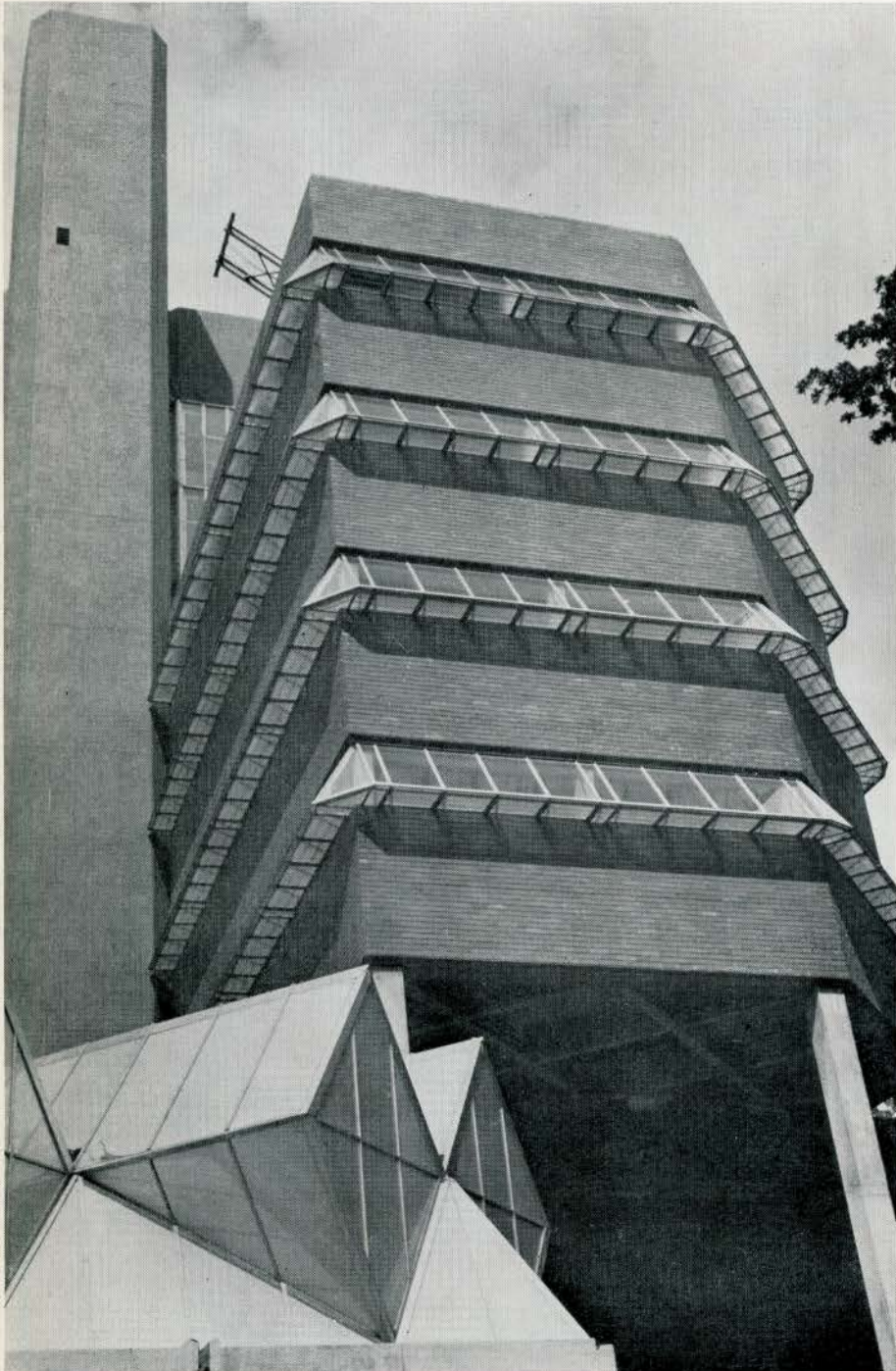
*Engineering Building, Leicester University  
1959-63, Stirling and Gowan Architects*

Donat

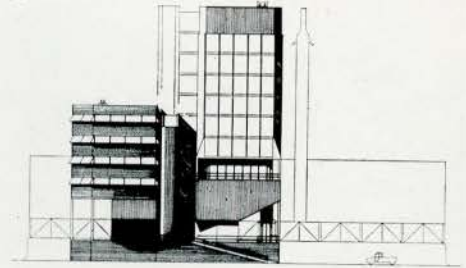


A building should somehow express what its basic activities are.

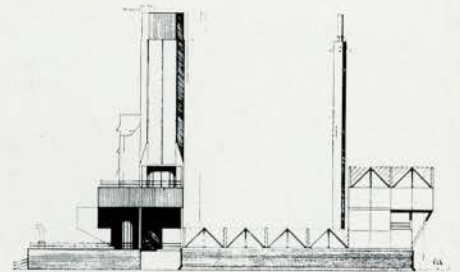
In England, if you mention beauty, they take you for Oscar Wilde.



*Leicester Engineering Building*



*Front Elevation*

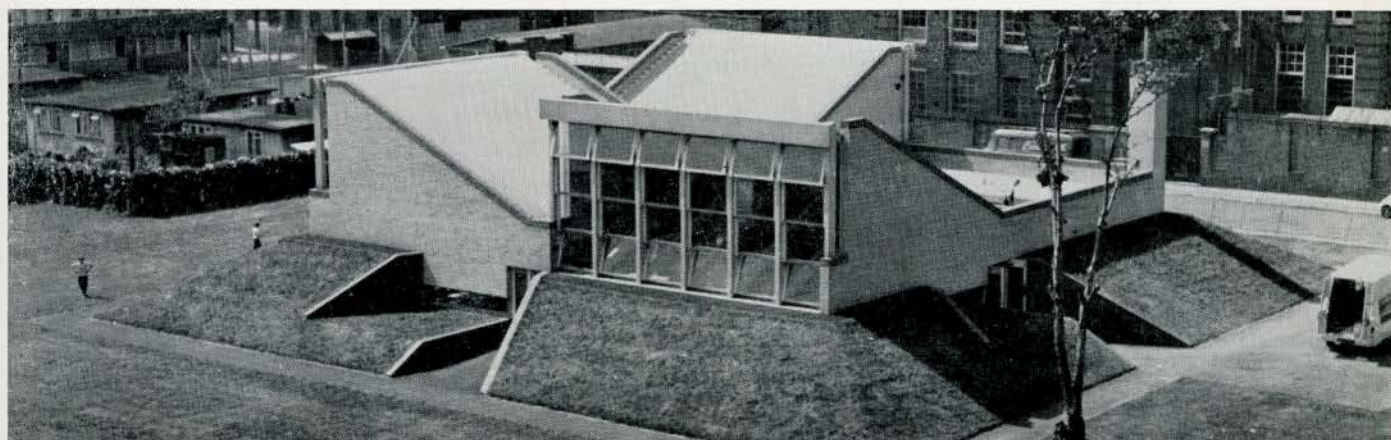
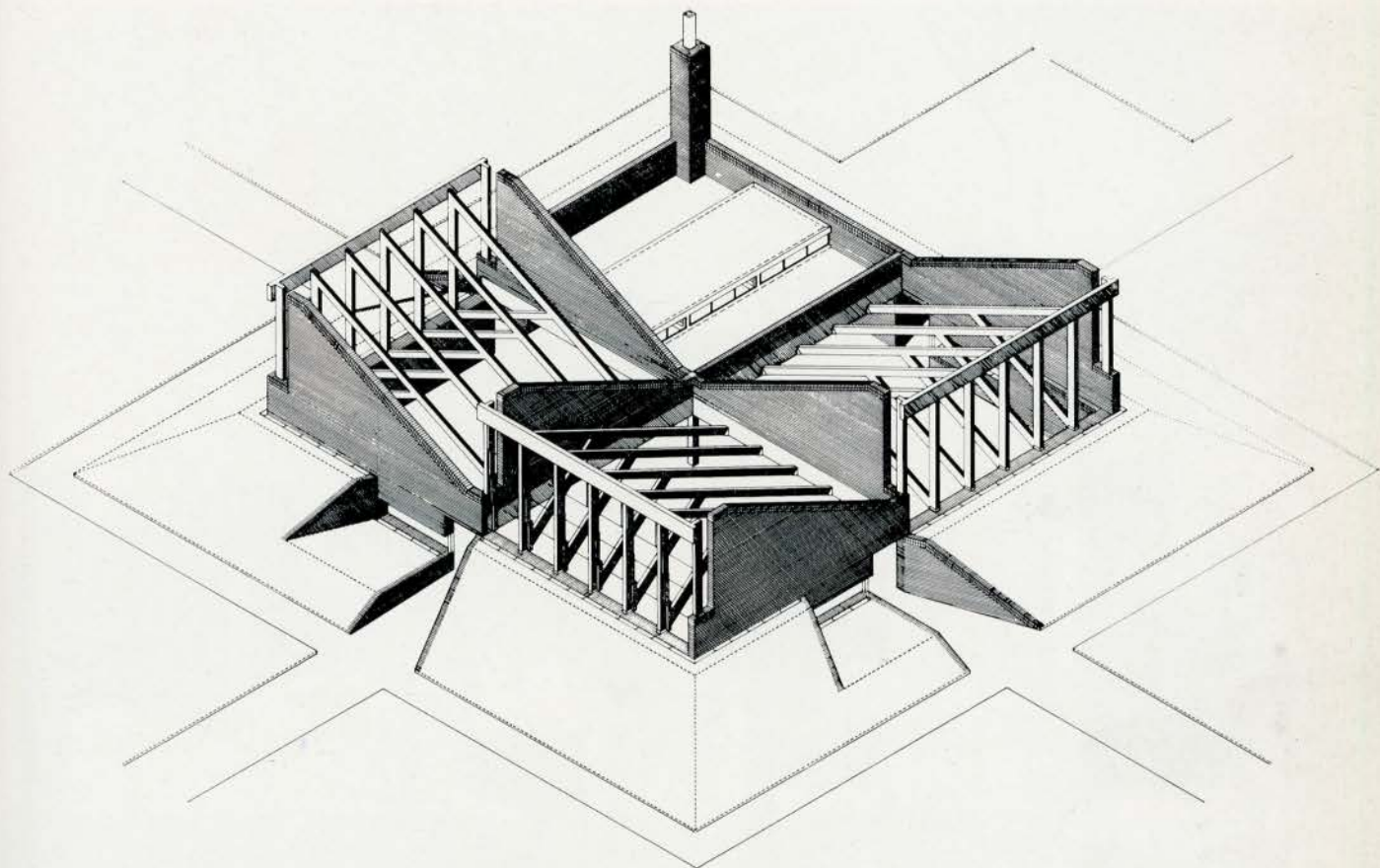


*Side Elevation*



When confronted with building cheaply you often have to fall back on the traditional method of construction, which is brick. For some reason which I don't understand, we can still maintain a very high standard of brickwork in England. Nevertheless, it also poses difficult problems for an architect operating in the middle of the 20th Century. Surely this method of handling a 9 x 4½ module can not really be the media of our time? Aalto does not seem to have this

philosophical problem. Maybe architects have to work within a range which can encompass the most traditional methods of construction and also the most advanced.

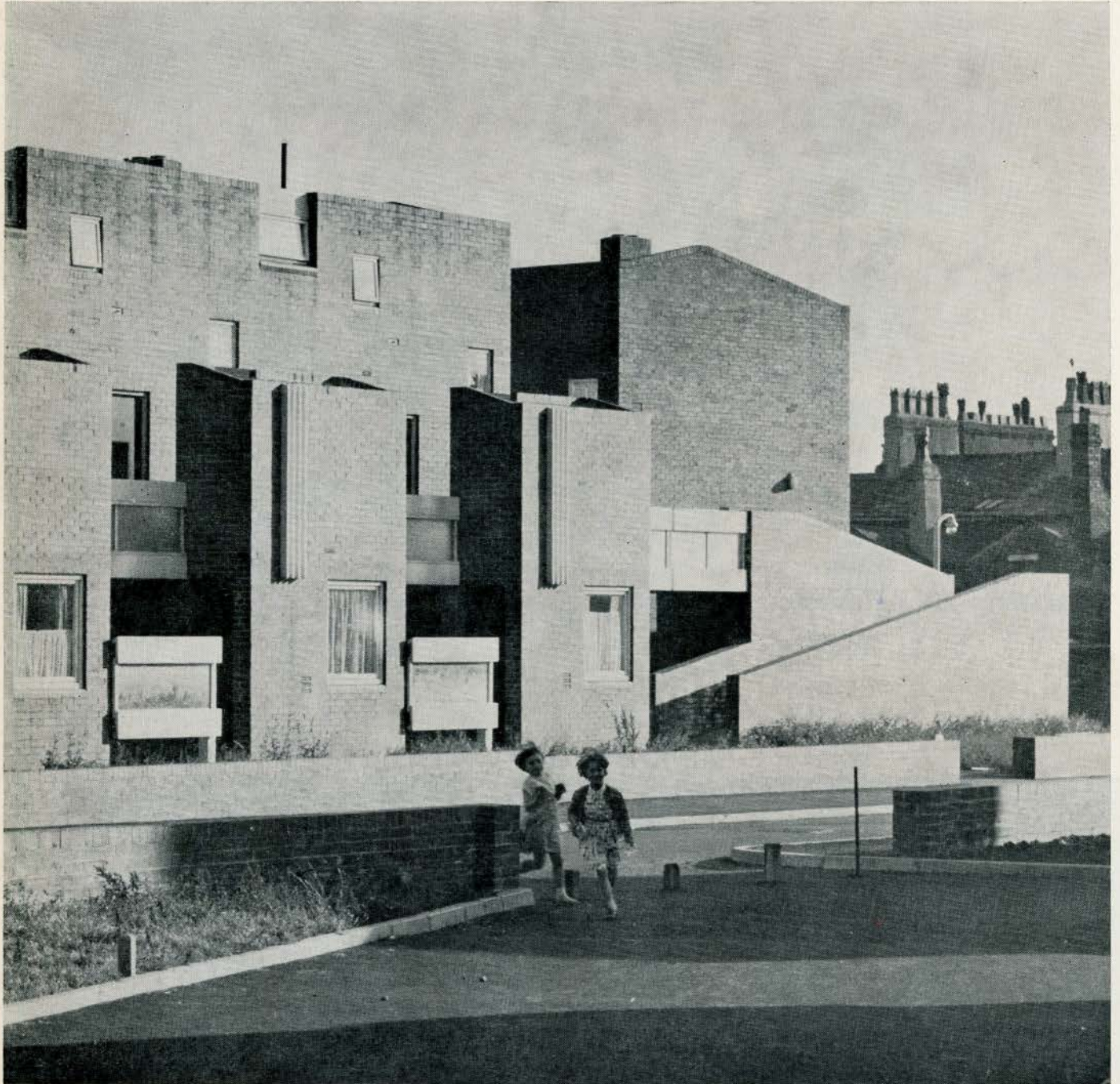


*School Assembly Hall, Camberwell, London, 1958-61, Stirling and Gowan Architects*



One of the devices of making very low cost buildings is to use materials that are out of context. In this case (Preston), we built with semi-engineering bricks, which are normally used in building sewers. They are much cheaper than facing bricks and they do in fact give that hard reflective surface that I personally prefer to fair-faced traditional bricks. I suppose this will be call "Brutalism".

We have always been interested in the articulation and identification of the scale of accommodation of which a building is made up. . . . We have always tried, by moving the actual surface of the building, to introduce this expression of what the accommodation in fact is.

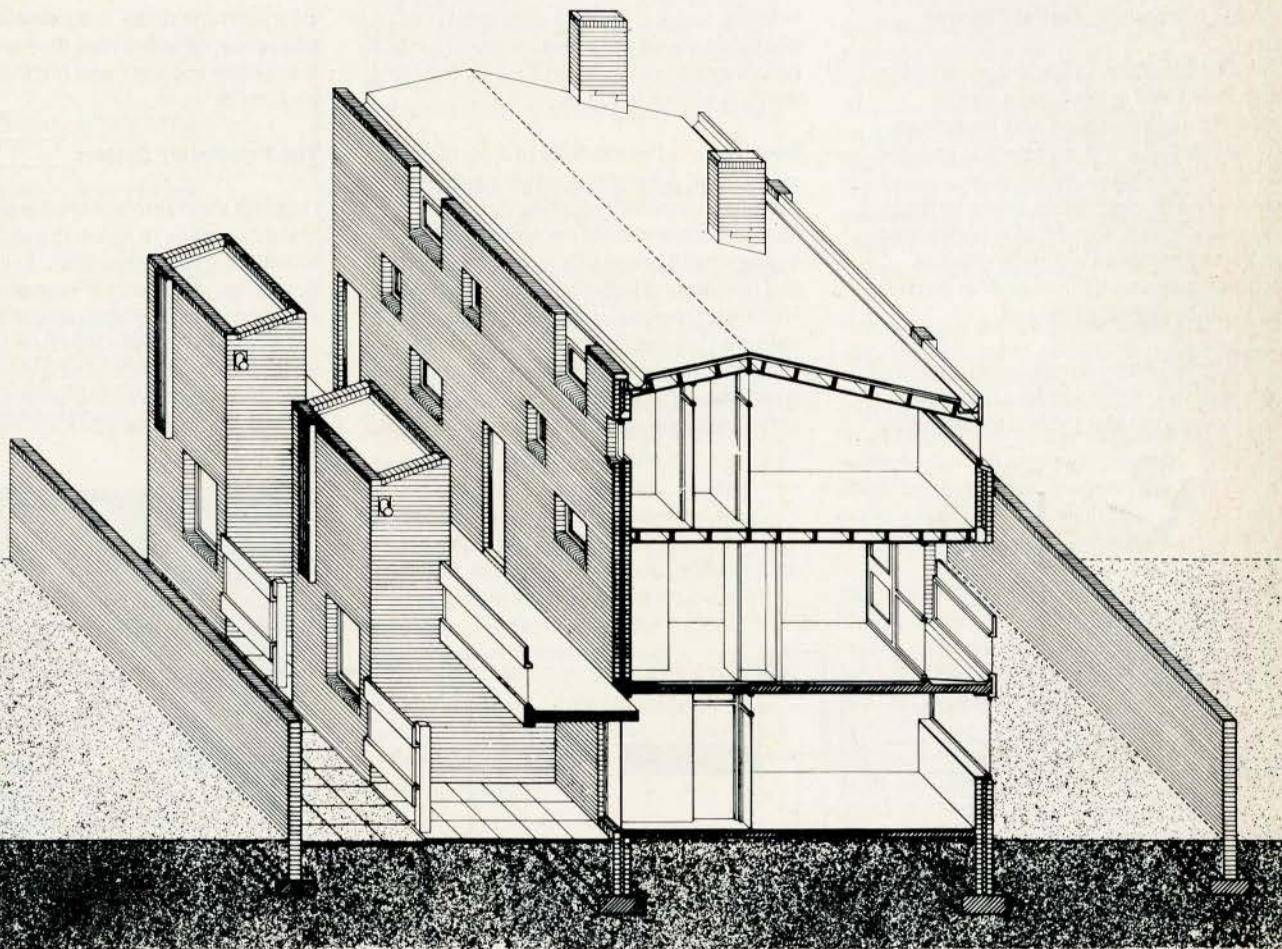


*Rehousing at Preston, U.K., 1957-59  
Stirling and Gowan Architects*

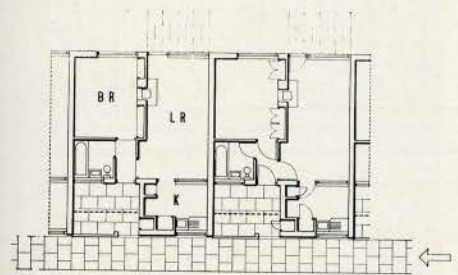


It seems to me that so much of modern architecture is very benign, anonymous, shoe box cliché. This often results from just taking the brief and not putting anything into it. If you take the brief without any input and make a solution, you probably arrive at this benign, stereotype architecture. The stock solution to housing nowadays is to build highrise buildings where you stack all the accommodations vertically — which has been recently described as every borough engineer's monument. A lot of sociological studies have been done which

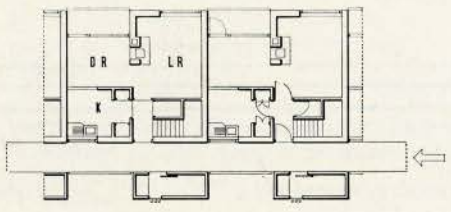
show that people really don't like living in apartments up in the sky. There is a lack of contact, which once was part of the neighborhood from which they were taken . . .



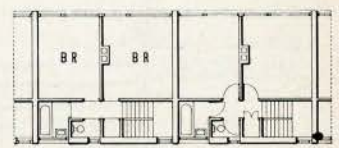
*Preston, Section through three storey terraces*



*Flats Ground Floor*



*Maisonettes, First Floor*



*Maisonettes, Second Floor*



# The Architect and the Industrialization of Buildings, Part 2

Colin H Davidson, M Arch (MIT) Dip Arch.

Part I of this article appeared in the March issue of Architecture Canada, page 62.

## Partial Integration, Partial Systems

The key therefore, to the industrialization of building lies in devising a way of carrying out operations and processes repetitiously from one project to another. What is repeated could be large or small components, assemblies, room-boxes or even processes, so long as it is repeated sufficiently often to carry the costs of industrial mechanization and/or organization without being penalized.

One way to obtain repetition is by an arrangement which allows activities to carry over from one project to another; a

building system. With a building system all decisions about ways and means are made before any project design begins. How this works is shown in Fig. 4.

Here again is the example of a partition and a door. A system sponsor decides to establish a system including partition components and door components; he designs each range (*decisions C1 and C2*) and the jointing between them (*decision J*). These are now manufactured. When an individual project using this system is designed, no design decisions remain to be taken about the components or the jointing, only selections of a quantitative sort. Again

decisions are taken in a compatible sequence, only this time they are taken by the system sponsor, and not the project architect!

## The Proprietary System

Building contractors were the earliest in many countries to sense the value to them of continuity and repetition. In France and Scandinavia this was in response to a dual situation: an acute shortage of building craftsmen on the one hand, on the other, clear signs that the building market was well organized. In countries such as the UK and the USA the situation was not so

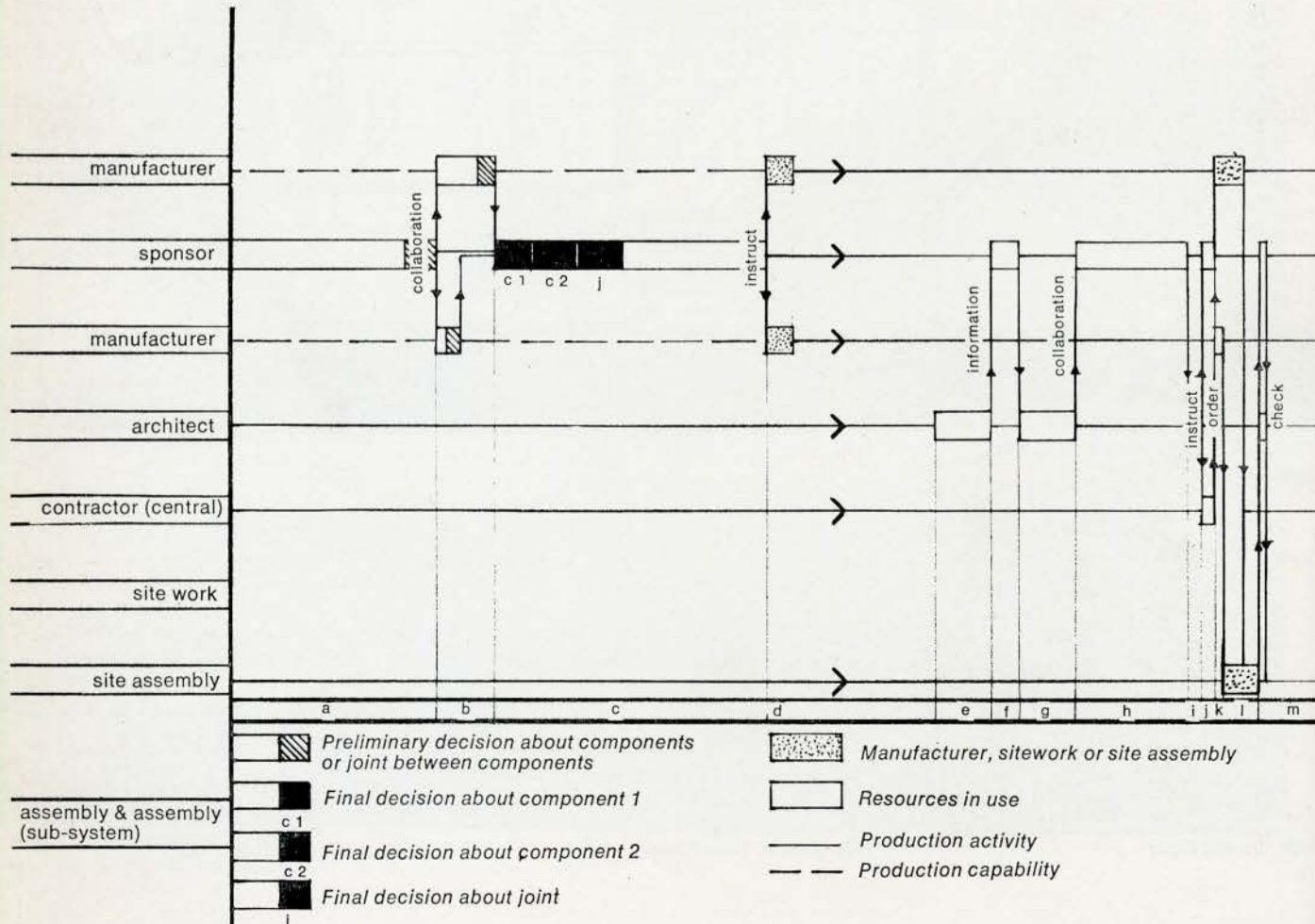
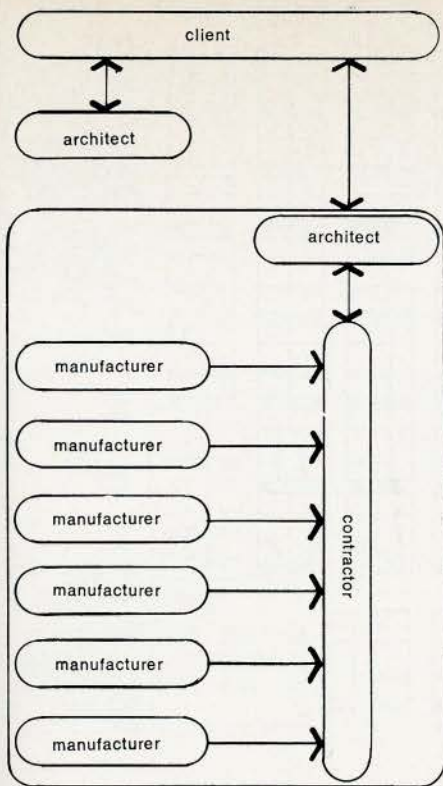


Fig. 4





The architect as consultant to contractor. Here the contractor takes on an organizing role involving design and manufacture; the market is still outside  
Fig. 5



Fig. 6

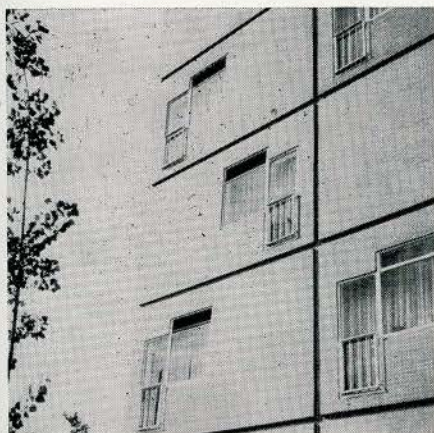


Fig. 7

clear. In the UK it was dominated by a politically motivated call to "industrialize", and it looks as though something similar is now happening in the USA.

These building contractors devised new techniques, predominantly to overcome their problems – shortages of craftsmen – but incidentally to get a bigger share of control over the programming of building. In terms of organization, therefore, they created around themselves a "master" organization, including a manufacturing capability and a design service (called politely "architect" in Fig. 5). This master organization has a two-way link to the client, since these firms go out to sell their product (as a means of ensuring repetitious use of their process). It should be noted that the client probably appoints another architect as advisor to him to help appraise the technical worth of the propositions he is receiving.

We are familiar with the techniques that these contractors evolved.

The development programs were based on arguments something like this: "We, (the contractor sponsor) would find it convenient if we could provide ourselves on our building sites with large components, the size of the walls of rooms, for example Fig. 6, it would be nice if these were complete in every respect, except perhaps the internal paint, so that they could be assembled easily without requiring traditional craftsmen. We are prepared to set up a factory, even though the amount of repetition is not very great in any one project, so we devise complex but versatile moulds and an efficient factory organization. As for design of buildings, we know that certain types of buildings are easier to construct than others using these techniques, we will press for them whenever we can".

In some of the countries where these systems grew up, architects had already abdicated from housing, and so there were few conflicts. In other countries, however, this had not happened, and soon we find that there were collisions between architects practicing for clients and architects operating within the system sponsor's organizations. These became collisions because there was no commonly accepted value scale against which to assess the requirements of buildings (in the sense of something finite created for a definite purpose) and of building (regarded as a process).

When an architect has accepted that there is common ground, some remarkable buildings have resulted.

For example, Architect Emile Aillaud of France was working for a client who had already accepted the need to build with a large concrete panel system. Point blocks

of apartments were appropriate, but Aillaud saw particular requirements in the window functions: a low-level portion that would allow a view of the ground without taking up all the wall area, and a high level portion that would allow ventilation without funnelling draughts. We can see the windows he designed (Fig. 7). These would be extremely costly in any coursed masonry construction, but in this case, of course, the walls are made from panels cast flat in which openings are formed by "dummies" which can be any shape as far as the casting operations are concerned.

In countries which do not have a market economy, the system sponsor (probably the State) has a much easier task. The quantitative aspects of the housing or building program are guaranteed, so he can safely set up vast factories and invest in complex production equipment. In Russia, there are examples of a high degree of mechanization and organization in the manufacture and assembly of buildings, because the repetition over which to spread the amortization is assured.

It is stressed that concrete is not the only material that has been or can be used for this kind of system. Nor is the building contractor the only such sponsor. But in all such cases, the rules of the game are somewhat similar, and the master organization is likely to have the same configuration.

#### The Client Sponsored Systems

Some building owners (such as groups of school boards in the UK) have on-going needs, and therefore can be sure of a program of building requirements over a period of many years.

A program of this sort allows an organization to be set up by the client; within this organization are included two distinct architectural functions. One of these (the lower in fig. 8) acts as "industrial designers", devising once and for all (and then improving) the components out of which all subsequent schools in the program will be built.

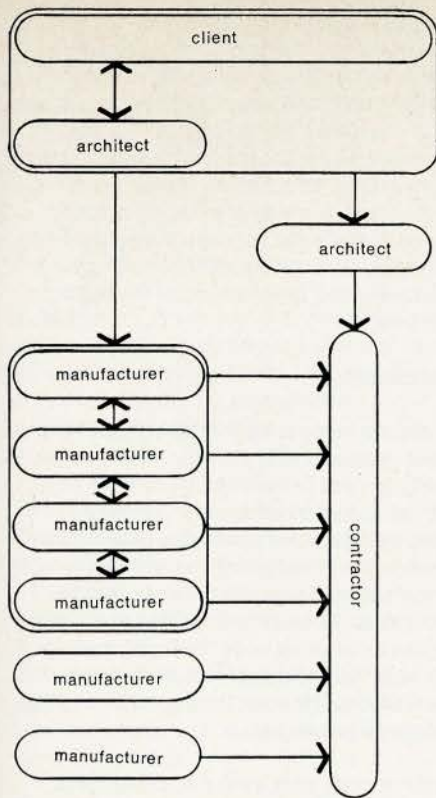
Somewhat naturally, these "industrial designers-architects" are overtly conscious of the range of types of building that will be required, and consequently of the diversity with which the system must cope. As a result, the ranges of components are extensive (fig. 9) and the components tend to be rather small; this has adverse consequences in terms of industrialization of manufacture and of assembly.

Returning, however, to the organization set up by the client. His "industrial designers" collaborate to a certain extent with the manufacturers selected to carry out the manufacture of the ranges of









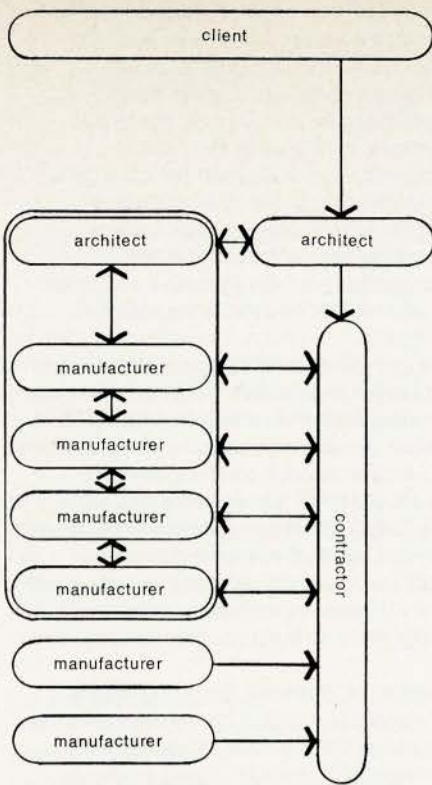
Architect as consultant to a client, for system development only – for example, SCSD manufacturers are now fully involved but links with project architect and contractor are weak.

Fig. 11

SCSD school building program. The client established a master organization including a group (called "architect") who analyzed their educational specification (functional requirements) and translated it into a series of *related* performance specifications. These were put out to industry whose responsibility it then was to devise the hardware – the carrot being a building program worth about \$27 million gross.

Industry, it was argued, alone knows the details of its own productive potential; it alone can draw upon this knowledge to design sub-systems and components which can be manufactured and assembled in practical industrial terms. Industry, on the other hand (and manufacturers supplying the building industry were being addressed) is highly individualized, so the performance specifications included procedural requirements devised to force the industrial respondents to form a coordinating master organization around themselves. In the event, four (and a fifth later) sub-systems were developed: structure, h.v.c., ceiling-lighting, and partitions (with, later, joinery added). The electrical and plumbing services were excluded (though space was allowed for them) because no agreement could be reached with the unions in time; the outside wall was excluded because it would have raised problems with the project architects!

When the systems had been developed and



Architect as consultant to a consortium of manufacturers another method of involving the manufacturer, but exposed to uncertainties of the market

Fig. 12

were available for use, the client selected the project architects in their traditional way, and subsequently the general contractors were selected, also in the traditional way. This is reflected in Fig. 11 where the architects and the contractor are outside the two master organizations. A number of the practical problems which arose during the individual projects can be traced directly to this fact that some participants were outside the main organizations and thus not involved in the systems decisions and the system disciplines.

In Fig. 12 a variant on this arrangement is shown, where an architect (acting in a quasi industrial designer-quasi manager capacity) formed a team with a number of manufacturers. Components are designed, and each manufacturer is responsible for the production of one range.

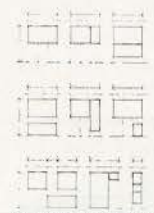
Because this system was devised against factual data about the intricacies of the UK housing market, particularly on the question of variety and the vested interests of project architects therein, its development was dominated by the need to devise components that could, at one and the same time, allow great variety of architectural design and simplicity and repetition at manufacture. Modular disciplines governed the design of the components, and great attention was paid to getting compatible dry jointing techniques that would meet all possible combinations of components within the system.

The master organization, it will be noted, groups together the manufacturers and their architect-designer-manager, but does not include the client-project architect-contractor linkage. The system had, therefore, to be sold into this other linkage. In this case, the system was promoted to other architects (on the argument that if they use the system, they are free to design to meet their client's requirements, but get the advantage of the repetitious industrial component manufacture). As a result, particular attention was paid to the documentation and communications aspect of systems management. Sophisticated computer codes (based on standard specification heads and modular-numerical descriptions of the components) have been prepared. (Fig. 13).

### Other Ways to Industrialization

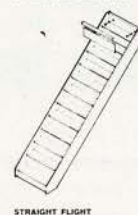
I would not wish to give blanket approval to building systems as if they were the only route to increasing the industrialization of building. Nor would I wish to imply that the architect has roles to play in systems and nowhere else.

It seems that building systems must necessarily be partial, because of the difficulties in reconciling the interests of all the participants in building, at least for some time to come. But when problems arise in system building today, they arise from factors kept outside the system and for which the traditional procedures and



SOME POSSIBLE ARRANGEMENTS OF WINDOWS AND DOORS

Fig. 13



STRAIGHT FLIGHT

10. Specification and performance of partitions and separating walls

ASTM Sound transmission classes are derived according to ASTM Test Method Recommended Practice F90-87 as follows and sound reduction, spec. 10

Spec. 10	Construction	Sound reduction	STC	STC
1	3 in (76.2 mm) concrete block at 13 lb (5.9 kg) per sq ft (100 mm) concrete block at 13 lb (5.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	45	45
2	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	50	50
3	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	55	55
4	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	60	60
5	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	65	65
6	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	70	70
7	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	75	75
8	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	80	80
9	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	85	85
10	4 in (101.6 mm) concrete block at 24 lb (10.9 kg) per sq ft with Adhesive or caulking seal over other wall surface	120 to 4000 Hz, control Cape Building Products Limited	90	90

Fig. 14



practices are still being applied. An alternative approach that is often mooted is the establishment of rules and conventions governing the design of components so that they can be selected and used in buildings generally, yet with the simplest of site assembly operations needed.

On the face of it, this seems plausible enough. Consider the partition-door example again, but this time assuming the use of *standard* components (Fig. 15). Assume three manufacturers: 1 and 3 make partitions, and 2 makes door components. Manufacturers 1 and 2 develop their products independently, taking decisions C1 and C2a independently. Manufacturer 3 decides to check out compatibility with the products of manufacturer 2, with decisions C2b and C3 related to each other so that decision J about the common joint is a possible one. When the project architect comes to make his selection, he checks out products 1 and 2 only to discover their incompatibility, so he turns to 2 and 3 which are compatible. Manufacturers 2 and 3 get the business, and 1 does not.

But could conventions be devised so that manufacturer 1, by referring to them, could be sure that his products are also generally compatible? It is not easy to develop these conventions, and many

people, myself included, have doubts as to whether it is possible or even desirable. After all, we do not want the risk of freezing technology at some state resembling its present one. These conventions, incidentally, start with dimensional coordination (which should be taken for granted by now anyhow) and then have to cover such matters as tolerances, joints and jointing, compatibility for site assembly and so on — in other words all of building practice.

The coordination of components, whether it is brought in on a wide front through these conventions or whether it is a matter of ad-hoc decisions by specific manufacturers, is a field wide open for the architect. He should know more than most people in building about components-in-buildings; he must add to this knowledge some additional commercial and production skills that will make his collaboration really useful to the manufacturer.

Meanwhile, however, there is one field in which it is possible to progress towards agreement: the field of information-systematic information about products, their properties and their uses.

In Fig. 14 is an example from a catalog prepared by a firm of consultant architects

from a brief given to them by a manufacturer of asbestos cement products. It illustrates how it is possible to show products in context, and for the manufacturer to advise on the resultant performances in a way that is meaningful to the project architect and many others. Information, it must be recognized, is a way of bridging across the gaps that exist between the participants to traditional building without calling for the formalized organization of the building systems.

### Conclusion

There are many roles for the architect now; these correspond to the new relationships being devised in the industry to keep pace with industrial innovation. The roles all presuppose an understanding of processes; processes of production and processes of organization. To qualify for a place in the new industrial undertakings that are beginning to grow up in the building industry, the architect must know more than hitherto. He must be a specialist on top of being a generalist.

I am not quite sure what the future holds for the generalist. □

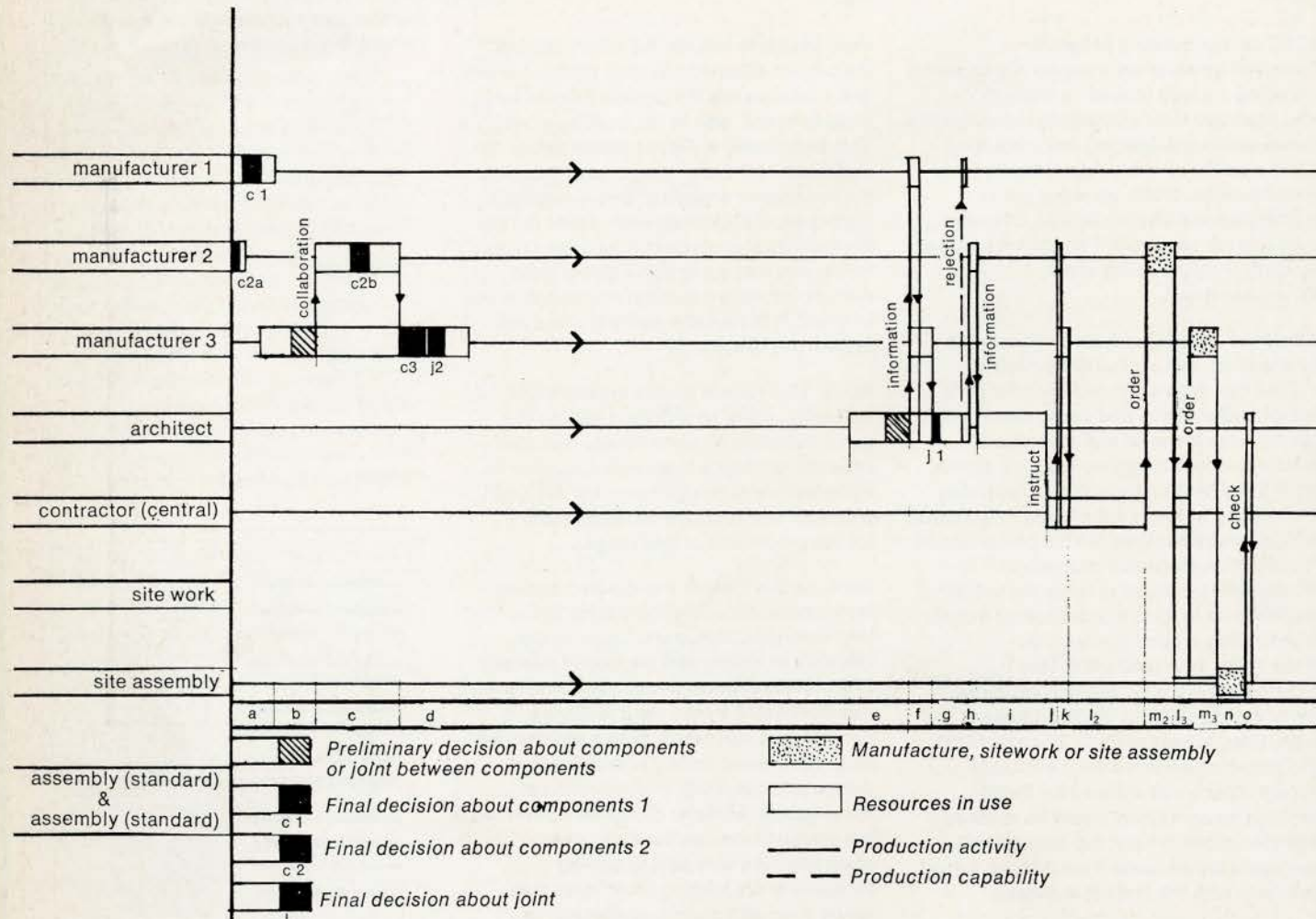


Fig. 15



T. M. Phelan, P. Eng.

*T. M. Phelan, President of Concordia Construction Limited, Montreal, continues the discussion of management contracts from the point of view of a management contractor. Concordia Construction were*

*responsible for the Place Bonaventure in Montreal, working as construction managers with Affleck, Desbarats, Dimakopoulos, Lebensold and Sise. This very large project was completed on time and within budget.*

To state the obvious, owners generally, whether they be private individuals, corporations or public bodies, when contemplating a building project desire that it be well designed in aesthetic and functional terms, that it be completed on schedule and within the budget. To fulfill these wishes, if the project is a large and/or complex one, some type of construction management arrangement is essential.

### Why Construction Management?

With construction management the architect gains more time to work out his designs and drawings because it permits overlap of design and construction. He is able to give full rein to his creative abilities and ideas because he has at hand an available sounding board to react from the point of view of time, money and practicality, and therefore need not hesitate in exposing creative ideas because reliable testing is at hand. Excellence in design satisfies the criteria of aesthetics, function and cost. With constructive critique regarding practicality and cost continuously available from competent construction management throughout the design process, the resultant design inevitably will be superior.

The preparation of a completed set of working drawings and specifications for a very large complex building project can take, say, three years to produce, and construction can take, say, three years to complete. Without a construction management arrangement the total time would therefore be six years. With construction management skillfully applied this time could be reduced to from three and one-half to four years. The advantage of this two to two and a half years' time saving to the owner is obvious.

The permissible cost of a project is determined by a preset budget or by the required return on investment which is a function of the rental rates which the market will accept. With construction management a detailed estimate, based on little more than the basic program, is prepared. Throughout the design process right through the production of working drawings, items are being checked against the estimate so that cost control is

initiated at the outset. Great flexibility in allowing overruns and underruns on certain items can be utilized to produce the required designs and still maintain the desired figure in the bottom right hand corner of the cost sheet.

It is not fully appreciated by many owners that, in fact, when the working drawings and specifications are completed just about all items of cost are fixed. At this stage the major portion of the architectural and engineering costs are expended, and embodied in the rolls of drawings and specifications are all the materials and labor required to carry out the work. The only item of cost still outstanding is the markup that the general contractor and subcontractors add to their costs when submitting their bids. In other words, at least 90% of the construction and design costs are already established in those drawings and specifications. When one considers that with construction management it is still possible to obtain competitive bids on all subcontracted work, that on an average building project the general contractor carries out about 15% of the construction costs with his own personnel, and that half of this percent is material and therefore relatively fixed, it then becomes possible to realize that the actual competition in a lump sum tender call is on the efficiency factor of the 7½% labor content, and the fee quoted on the job. The variance in labor efficiency between competent general contractors could range up to 10% which represents 3/4% of the total construction costs, and the variance in fee between seriously competing general contractors would not vary more than about 1%. The obvious conclusion is that by waiting to call for lump sum general contract bids, the owner is obtaining competition on approximately 2% more of the total construction cost than by the construction management method. Note that obtaining competition on 2% does not mean saving 2%. When the other advantages of construction management and its ability to influence, check, and control 100% of the construction cost from the beginning of the design process to completion of construction are considered, the reasons for calling lump sum general contract bids, if com-

petent construction management is available, become rather meaningless.

About now one usually hears someone say – "This is ridiculous. We have seen tender list after tender list where the general contract bids vary up to 10% and sometimes even more." This is true, but a close scrutiny of these bid lists would indicate a tight group of prices that varied by less than 2% and in many cases less than 1%. These are the right prices for the job. Any price significantly below this group is headed for trouble and is probably the result of a miscalculation or an error. It is not necessary here to describe the unhappy results for all concerned when this tender is accepted and the contractor is in financial trouble from the beginning of the work. The prices significantly above the group are those of contractors who are not seriously competing for the job but who would be more than delighted to obtain it at their price, or, the high price could also be the result of an error.

### What Type of Contractual Arrangement?

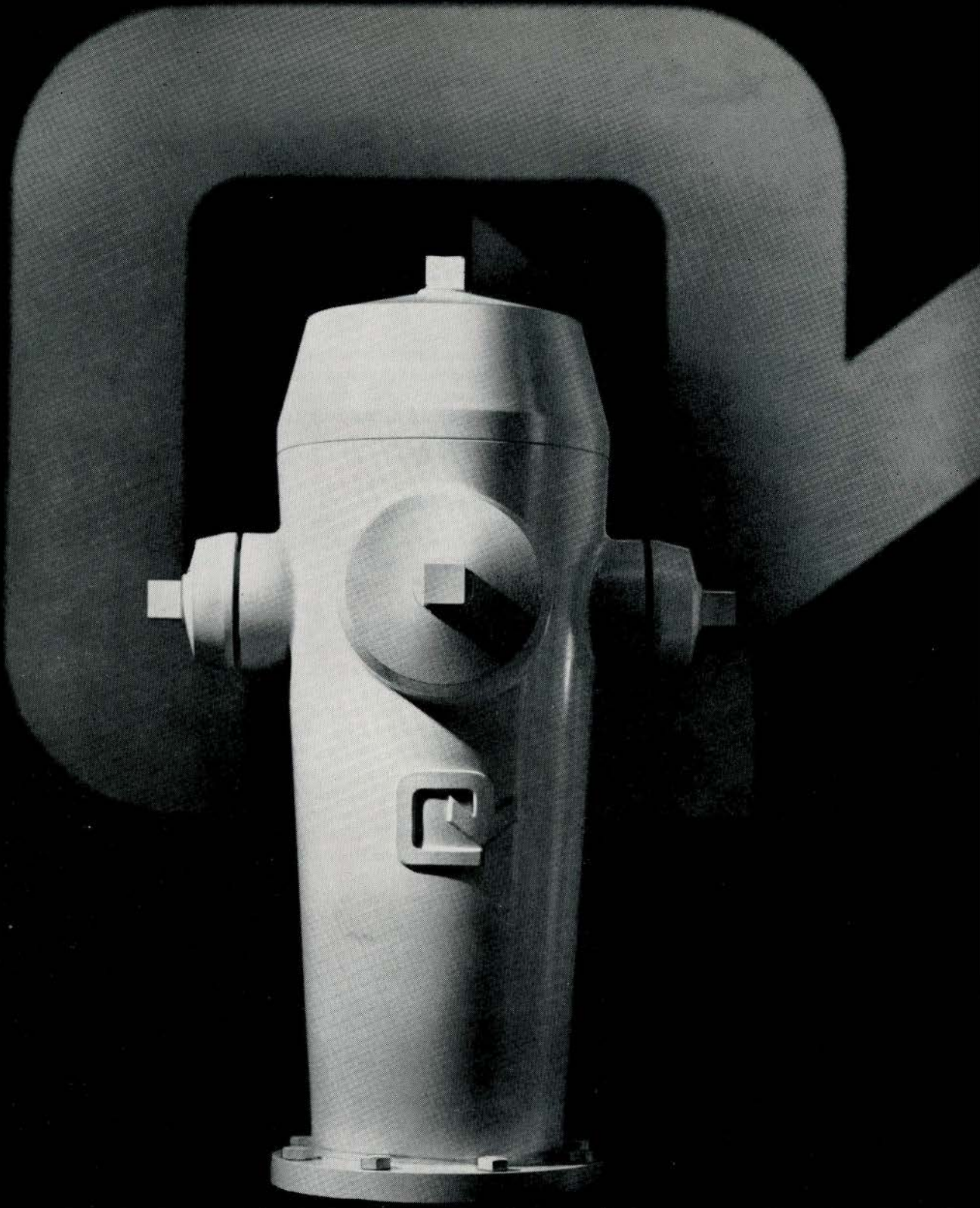
Having stated that the ideal way to organize the execution of a large project is to retain a construction management organization at the beginning of the design process, the question is to find the ideal arrangement for the retention of this service.

Perhaps before suggesting the type of arrangement a few words would be in order to describe the essentials and the essence of the service.

The essentials required of the construction management organization are complete integrity and competence. Without this combination the project is headed on a collision course. The essence of the service is that the construction manager is brought into the project group in a position of great trust and responsibility to assist in the realization of all the aims of the program.

The project group consists of the owner, developer or user as the case may be; the architect and his consultants; and the construction management organization.





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The construction management organization is an equal partner with the architect in the group.

Having determined that the construction management organization meets the essentials of integrity and competence mentioned above, the ideal arrangement to be entered into is as follows: A fixed fee should be negotiated with the construction management organization. This fee should be based on the size, complexity and duration of the project. The head office overhead and head office supervision costs of the project management organization together with its profit are the *only* items to be included in this fee. All other costs, including salaries of the personnel assigned to the project and all travelling expenses, form part of the cost of the project. Upon the agreement of a fixed fee the construction management organization has an identical interest with the owner concerning every aspect of the project which is not achievable by any other arrangement.

With this arrangement the construction manager is brought in as a full partner to the project group and not as a part partner and part lump sum bidder, with the corresponding possible conflict of purpose or interest. In other words, having decided on construction management and retained an able organization, the potential benefits that should accrue with this arrangement should not be diluted by stepping backwards into an arrangement which is neither one thing nor another.

To digress from the topic of management contracts a moment, it is felt also that the architect and his design group should be retained on large complex projects on a similar basis, either on a time card multiple basis or preferably on a cost plus fixed fee. It has been observed first hand on some projects that when a design group makes five or six alternative studies of some complicated feature of a project, the effectiveness of the solution in terms of good design and economy is a direct function of the time and effort involved in working out possible solutions. *It is certainly a paradox that the more time, effort, and therefore money the*

*design group expends to lower the cost of a project for the owner, the more out of pocket expenses the design group has incurred.* Conversely the more hastily arrived at, expensive, solutions that are reached, the greater the cost to the owner and the more recompense to the design group. It is suggested that the architectural associations should investigate a fixed fee structure over and above out of pocket costs, related to the scope, complexity and duration of large projects, rather than a fee calculated as a direct function of the construction cost.

### Selection of Construction Management

In selecting which construction management organization to retain, the integrity, competence and experience of the organization in construction management are the key factors. Information should be received on the key personnel to be assigned to the project and the head office executive in charge of the particular project. The nominated personnel should be interviewed and their experience reviewed. Selection should not be made on the basis of bigness or name only, as large firms without specific experience in this type of construction management may have no real comprehension or experience of the subtleties and requirements of a total construction management service.

The request for proposals should give some basic information on the project, its hoped for duration and a provisional budget. The request should ask for details of the construction management service proposed by the various organizations submitting proposals.

It can readily be ascertained what is a fair fee on a particular project for this service. In requesting proposals for a project, the fee can be stated as a fixed sum, or a request for a quoted fee can be obtained. In asking for proposals for public projects it is strongly recommended that the fee be fixed in the requests for proposals so that the decision on the selection of the construction management organization can be made on the basis of the abilities of the organi-

zation and its personnel to carry out the service, rather than have the "red herring" of a low fee politically complicate making the correct decision in favor of the most competent group. In retaining this service, having obtained proposals from acceptable construction management organizations, the deciding factor in the selection should *always* be the capabilities of the organization and its personnel to carry out the service.

A brief summary of the main aspects of a Construction Management Service is outlined below:

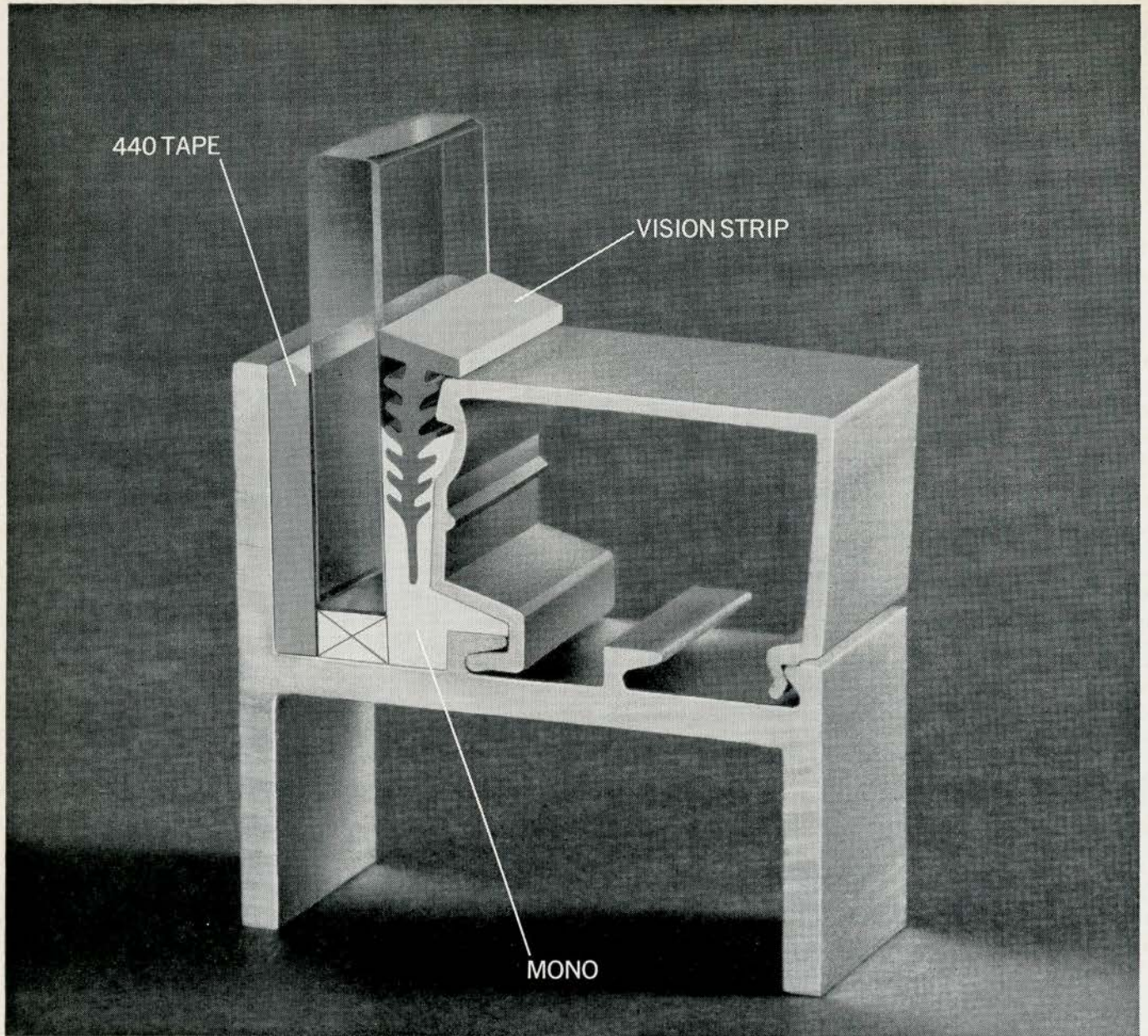
### Planning & Coordination

Regular planning and coordination meetings should be set up with the appropriate representation from the owner, design group and the construction management organization. The attendance of the construction management organization at such meetings would be to ensure that all the disciplines of the schedule, and costs of construction particularly, are involved in the decision making process. Construction management would also act as an expediting influence in obtaining decisions from all groups in time to meet schedule requirements. It should be pointed out at this stage that, dependent on the dictates of the detailed schedules, and especially the lead times required for shop drawings, fabrication and delivery of critical components, the preparation of working drawings and specifications may be required, in some instances, out of their normal sequence. By this means "bid packages" can be prepared for such critical items to enable tender calls and early procurement.

### Estimates & Cost Control

An estimate would be prepared on the information immediately available. The estimate would be broken down into as much detail as possible and be divided into separate estimates for each of the major elements of the project. If this estimate gives an acceptable total cost to the owner it could then be used as the basis for the cost control system. If not, then by means of further





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discussion, suggestions and changes, a revised agreed estimated amount would be established as a working budget amount. On a continuing basis this estimate would be updated to reflect all the refinements or changes to the preliminary design drawings so that the design development is being monitored from a cost point of view to maintain total cost within the agreed budget amount.

All the main alternatives that occur to the architect and the design group as they proceed with the design of the project would also be estimated.

In close cooperation with the architects and engineers the drawings and specifications would be reviewed on a continuing basis as they are being produced. This would be done with a view towards suggested cost reductions without disturbing the desired aesthetics, functions, and associated cost of the work within the limits of the agreed budget estimate.

Regular reports would be issued giving current details of the actual and projected costs to complete as compared to the agreed budget estimate.

With this system changes, refinements or events which may affect cost are spotted immediately and analyzed throughout all stages of the project so that decisions and action can always be made early with actual knowledge of the resulting effects on the overall project.

#### Execution

A construction management organization carries out all the functions normally associated with the general contractor in the execution of the work. The architect retains his normal function of field inspection of the work. With construction management, work in the field can start much earlier and there is a considerable overlap of the construction operation and the preparation of construction drawings and specifications,

with a corresponding compression of the overall time for completion.

The total process is not unlike a manufacturing concern with the architect working out the functions of design and quality control and the construction management organization carrying out the function of cost and time control and production.

Throughout the process, understanding and mutual respect for the talents and aims of all members of the project group is essential. When the service is carried out to its full potential it is a most satisfying experience for all concerned. The planning meetings can be stimulating sessions where the various disciplines represented are brought to bear on a problem, often producing extraordinary results. In this interdisciplinary exchange when an effective rapport is achieved, sparks figuratively fly, and the roles of the participants sometimes overlap as all use their talents and training in working towards a common objective. □

### Architecture Canada Monthly Report of Unit Prices

*The unit prices given below are average rates for reasonable quantities of work carried out in the locations shown. They are net rates including waste where applicable but without any allowance for a general contractor's overhead and profit. Users are cautioned that unit prices are affected*

*cautioned that unit prices are affected by the location of the project, market conditions including the availability of materials and the availability and productivity of labor, the size of the project and the quantities of materials required, the circumstances under which*

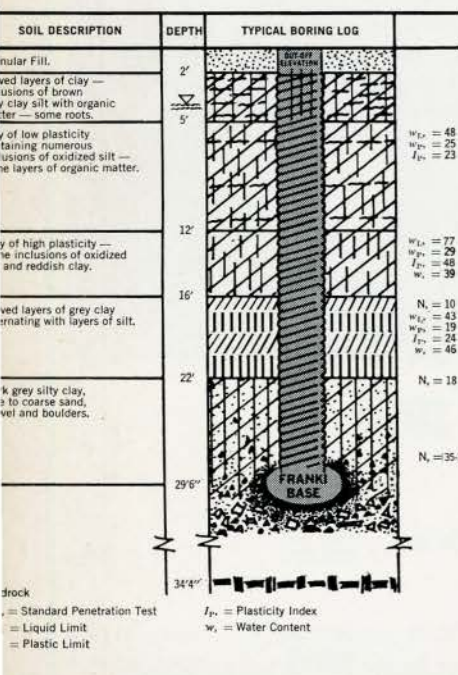
*the work is being performed, the type of construction etc. and these factors must be taken into account when using them. In particular they should not be used for alteration work or for changes in the work during construction.*

5.4 Masonry			Unit	Edmonton	Regina	Toronto	Ottawa	Montreal	Vancouver
<i>Stone</i>									
1	4" Limestone facing, planer finish	Low \$	5.50	—	3.75	5.50	4.50	4.75	7.00
		High \$							
2	2" Canadian black granite, honed finish	Low \$	8.25	—	6.00	5.25	7.75	8.00	9.00
		High \$							
<i>Brickwork</i>									
3	Face brick (material cost \$90.00 per M) in common bond with tooled joints	Low \$	290.00	210.00	225.00	225.00	200.00	300.00	350.00
		High \$							
4	Common brick back-up (material cost \$50.00 per M)	Low \$	160.00	130.00	155.00	160.00	150.00	220.00	240.00
		High \$							
<i>Blockwork (not reinforced)</i>									
5	8" Concrete header block back-up	Low \$	0.80	0.66	0.79	0.78	0.72	0.70	0.85
		High \$							
6	8" Slag header block back-up	Low \$	0.80	—	0.84	0.87	0.78	—	—
		High \$							
7	4" Concrete block in partitions	Low \$	0.70	0.53	0.66	0.64	0.45	0.65	0.70
		High \$							
8	6" Concrete block in partitions	Low \$	0.74	0.56	0.72	0.69	0.55	0.80	0.80
		High \$							
9	8" Concrete block in partitions	Low \$	0.80	0.66	0.76	0.75	0.68	0.90	0.90
		High \$							
10	10" Concrete block in partitions	Low \$	0.88	0.71	0.89	0.83	0.75	1.10	1.10
		High \$							
11	12" Concrete block in partitions	Low \$	0.98	0.81	0.94	0.90	.85	1.15	1.30
		High \$							



# FRANKI FACTS

R.A.I.C. File No. 6-A-2



## Franki Gets impressive Results

**Problem:** Canadian Electrolytic Zinc Limited at Valleyfield, Quebec, is located on the north shore of Beauharnois Canal.

The site on which this complex stands was originally a marsh which was filled hydraulically when the Beauharnois waterway was being built.

The soil investigations, carried out to determine the best foundation design, revealed a high water table and a low bearing capacity of all upper layers overlying the bearing stratum found at a depth of about 22 feet. These layers consisted of clays of high plasticity and high water content. (See soil profile).

It thus became evident that serious consideration would have to be given to ensuring the security and stability of the buildings against shear failure and differential settlement. The problem consisted, therefore, of a choice between end bearing piles and excavated caissons, founded on or in the bearing stratum.

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### STRUCTURE:

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### LOCATION:

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### CONSULTING ENGINEERS:

Surveyer Nenniger & Chênevert, Montreal, Que.

### NUMBER OF FOUNDATION UNITS:

3084 steel cased Franki caisson-piles  
156 Franki caisson-piles

### DESIGN LOAD:

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### CONCRETED LENGTH:

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Literature - This series of job highlights, as well as other descriptive literature, will be sent to you upon request to Franki of Canada Ltd., 187 Graham Blvd., Montreal 16, P.Q.





Wylie Freeman, B. Arch

*Mr Freeman obtained his B. Arch with honors and was awarded a CMHC Fellowship to study in the Graduate Design Studio at the University of Toronto where he is*

*currently a Master of Architecture candidate. This paper was one among a number analysing various determinants of form.*

## Introduction

At a time when public welfare in many fields is an increasing concern of government, the two senior governments, federal and provincial, have failed to provide adequate shelter for citizens. Two major cost elements have priced housing out of reach of both low-income families (defined in Toronto as those earning under \$6000 per annum) and the middle income group (\$6000 to \$8500). The first is the cost and availability of mortgage funds. These are determined by federal government policy and leading institutions. The second is the cost of land, the responsibility for which lies ultimately with the provincial government, since municipalities by constitution are their "creatures". With particular reference to Toronto, some of these specific problem areas will be identified, and solutions suggested for revision of policy.

The need for action by both levels of government is revealed by a summation of the housing situation in Canada and particularly Metropolitan Toronto. Firstly the volume of Canadian residential construction has dropped significantly below the recommended levels of 190,000 new units per annum, as calculated by the Economic Council of Canada. In 1967, 164,000 units were produced and in 1966 only 135,000. Canada as one of the richest and fastest growing countries stands twelfth among Western nations in the ratio of housing starts to population growth behind Britain, West Germany, Italy and France. Approximately 100 immigrants per week enter Toronto alone, many of whom are forced to double up with relatives and friends before entering the housing market.

## Rising Costs

As a result of the rapid population influx and the failure of new residential building to keep pace, costs of both new and older housing have risen rapidly in the last two to three years. The Social Planning Council of Metropolitan Toronto has completed a study of budget expenditure for a typical family of four. In the 50's housing accounted for 25% of the household budget, by 1964 this had risen to 28.6% and by 1967 reached 37.3%. This figure was derived from current rentals

for 3-bedroom apartments and in this sense the study was somewhat academic since very few of these exist. The average vacancy rate for some 330,000 apartment units in Metro last year was 1% compared to rates for example of 10% in Chicago.

The housing problem is particularly acute for the low income family. At the present time there are 10,400 families on the waiting list for public housing in Metro. Toronto is one of the very few cities in North America forced to provide family hostels for the homeless. Robert B. Bradley, Executive Director of the Toronto Housing Authority reports that an average of 15 people enter these each day. In most American cities, with higher vacancy rates it is possible to place homeless families in apartments under rent supplement schemes. Of the number of families that left the Toronto Housing Authority's public housing in 1967 to re-rent, 55% are now forced to double up. When one reflects that perhaps the greatest factor contributing to the social problems of the family is directly attributable to inadequate housing, the total costs to society, both economic and social, far exceed initial dollar and cent costs. Yet government participation in the field of subsidized housing is almost non-existent. The Canadian Welfare Council estimates that 50% of Canadians need some public assistance to obtain decent shelter and yet in Canada there are only 50,000 publicly owned low rental units - less than 1% of Canadian dwellings.

The essential problem in the housing market becomes evident in a study of the 10,000 properties offered on the market at the present time in Metro. As regards new housing, 17% of the units cost under \$16,000, 22.9% between \$16,000 and \$22,500, 31.9% between \$22,500 and \$30,000 and 43.5% over \$30,000. The average cost of a new home as of January 31, 1968 stands at \$32,000. The high price of new homes has maintained and even increased the value of older homes, as a consequence the market price in resales is not much lower. For example, only 7.4% for sale are in the \$10,000 to \$15,000 price range as compared to the 34% in the \$20,000 to \$25,000 range and 15% above \$30,000. The average cost of resales in Toronto is now \$25,000. It is in

order then that the N.H.A. policy can now be assessed in light of current house prices.

## N.H.A. Policy

Out of the urgent need for housing immediately following the war, the National Housing Act was enacted and the Central Mortgage and Housing Corporation established to administer the Act. The introduction of a standard Canadian interest rate on mortgages and the extension of the term to 25 years did much to enhance the housing situation at a time when rates varied greatly, (generally higher in rural areas) and terms were an average length of ten years.

By 1957, the N.H.A. interest rate had risen by 1% to 5½%, and ceilings on loans were set at \$13,000. Since the average cost of a new home in Toronto at that time was approximately \$15,000 with a small down payment the borrower had no need of a second mortgage and could carry the new home for \$104.36 per month, including an estimated \$300 annual property tax. By 1967, because the flow of mortgage money was decreasing, the N.H.A. rate had risen 3½% to 6½% and ceilings on loans to \$18,000. However, the average cost of a new home was \$30,000. Assuming a \$5,000 down payment, \$600 annual property tax, a second mortgage of \$7000 at 15% and an \$18,000 N.H.A. mortgage, the monthly carrying charge was \$279.50 per month, an increase of 168.3%. In contrast, average family income rose 46.6% in the same period of time.

Although the prospective owner's situation was much better in 1957 than now, the lower income levels were still deprived of any government assistance as regards home ownership. Compared to the average family income of \$4,025, the average income level of N.H.A. borrowers was \$5,798, in Toronto. Only 2% of N.H.A. home owner borrowers came from the lower third of family income groups. Moreover, N.H.A. mortgaging for older homes was not available until 1966.

The dictum, "socialism for the rich, free enterprise for the poor" certainly applied to the 50's and in no small way was responsible for many of our current housing problems. The dictum is still applicable. For example,



CMHC presently allows a maximum 27% gross debt service based on the borrower's salary. At this rate, the buyer of the average new home in Toronto paying \$279.50 per month in carrying charges, would have to earn over \$12,000 per annum. Of course, this example assumes that this is the buyer's first home and that he has no other source of money such as an inheritance. If the buyer was able to get a full N.H.A. loan and has enough money to cover the difference in the cost of the new home he would still need an income of \$8,500 for carrying charges of about \$200 per month. On this basis 85% of the salary earners in Toronto are ineligible to get an N.H.A. loan. An irony in regard to loan ceilings is that as the price of the home increases, and presumably the salary of the buyer, the more chance he will have of getting the full loan amount.

### Loan Limit Too Low

Until December 1966, N.H.A. loans were granted for new residential construction only, including single family, high rise and horizontal multiple units. Legislation was finally introduced in 1966 for N.H.A. loans to a maximum of \$10,000 to permit the refinancing of existing dwellings. Because of stringent requirements, including an expenditure on the part of the applicant of \$1,000 before becoming eligible for a loan, the provision has been little used in the Metro area. As is the case with new homes, the loan limit is unrealistically low.

A table from the latest Toronto Real Estate Board report "Estimated Costs of New Bungalows - 1964-66" indicates the great disparity in home costs throughout Canada. For example prices range from a low in Chicoutimi of \$13,853 in 1966 to Toronto's high of \$23,056. It would seem reasonable that the N.H.A. ceiling should likewise reflect the \$10,000 price differential, in order to be a more effective instrument in promoting home ownership.

### Butter Subsidies Better

Federal government participation in housing for the low-income family earning under \$6,000 has similarly been insufficient. Evidence of this is indicated by the present waiting lists for public housing. At a recent Community Planning Association Conference it was pointed out that the federal government spends two dollars per person per annum in Canada to subsidize butter, while it spends 18¢ per person per annum to subsidize housing.

A discussion of N.H.A. urban renewal legislation and the sociological implications of public housing is outside the scope of this paper, but suffice it to say that the majority of families plan and save for the day when home ownership will be possible. In fact, eventual home ownership is encouraged by rent scales: families earning over \$6,500 in O.H.C. housing pay 30% of their income for

rent. Mr. Bradley of the Toronto Housing Authority cites several cases of families with combined incomes of over \$6,000 who have saved for a home, however, modest, and are now frustrated in their attempt by the increased N.H.A. rate. Tenants in some O.H.C. projects paying \$220 per month are remaining because it is difficult to find anything cheaper on the open market. As pointed out earlier there are some properties on the market in older areas of the city available to this income group which would be much cheaper to carry on a monthly basis than their present rent, but financing is difficult to obtain since institutional lenders will not grant mortgages to low income groups because of the high risk involved. Active participation in this area by C.M.H.C. in the form of direct lending might prove more effective and could complement moneys presently devoted to urban renewal.

### Limited Dividend Legislation

Another method introduced recently to bridge the gap has been the reenactment of the limited dividend legislation, Section 16 of the National Housing Act. In return for a low interest rate, 6½%, and a 50 year term, the builder agrees to limit his return to 5% and C.M.H.C. have the authority to set the rent scale. C.M.H.C. reports that response has been high since December 1967, possibly because of the high cost of mortgage money. More active involvement by C.M.H.C. in granting loans to non-profit building organizations such as churches, and cooperative building societies could also increase the amount of housing available to the middle income bracket.

The foregoing was an attempt to study some of the implications of N.H.A. policy in the light of increased costs and a higher interest rate necessitated by a shortage of capital in the mortgage market. It is understandable, however, that C.M.H.C. were unwilling to become a vast lending empire. By raising the N.H.A. rate, enough private capital was encouraged into the mortgage field so that their own limited funds, closely regulated by the government in view of inflationary trends, could be entirely devoted to public housing and limited dividend housing. This then limited the C.M.H.C. role in other areas to the insuring of loans made by approved lenders. This produced a healthier market, freed to a greater extent from the governmental regulation of housing as an "economic tap".

Until the present "inflation psychology" and the average 4½% annual increase in cost of living subsidies high interest rates will prevail. Changing the N.H.A. term from a fixed 25 year term to a policy of allowing for renewal of mortgages every 5 years will not solve the problem: Most institutional lenders charge 8½% to 9% even on 5 year mortgages at the present time. Extending the term to 40 years may force interest rates up again and add to the inflationary trends. A revamping of the present legislation with the

introduction of more realistic loan limits and ensuring that mortgages are available to the lower income groups, even if done by direct lending, may help the problem on a short term basis. However, it is only by recognizing the major cause of the rise in residential prices that the situation in the long term view will be eased.

### Land Cost

A. E. Diamond of Cadillac Construction points out that in 1950 the cost of land for an apartment building was \$500 per unit. In 1967 the same land cost \$2,000 to \$2,500 per unit, a net increase of 400 to 500%. A single family lot costing \$4,000 in 1956 has risen in price to between \$12,000 and \$16,000 for a similar lot today. According to the latest report of the Toronto Real Estate Board, the average price of a bungalow lot in Metro now is \$8,306, the highest price in Canada. The cost of land, a direct factor in the type of building erected, has been one of the causes of the shift to high rise building. It is obviously poor economics to put a \$15,000 house on a \$12,000 lot. Another problem is that as the price of land increases, less capital is available for the building.

The institutional lenders have influenced land use policy and contributed to the cost of land by their conservative approach to new ideas. For example, it was proposed to have a series of high-rise apartments surrounding the Don Mills Shopping Center. At the time this was a radical departure from the norm with the result that the institutional lenders would not forward funds, which ultimately led to the building of a conservative series of 3 storey walk-ups at a prime location for high density development. One of the first integrated communities of row houses, maisonettes and apartments, Flemingdon Park, likewise was not able to obtain funds from the institutional lenders. Mortgage companies encourage the building of more expensive homes by imposing certain regulations, since big houses on ample lots are considered a better risk than small homes on small lots.

Some solutions to the land cost problem may suggest themselves by a brief analysis of land consumption trends in the last 10 to 15 years. One of the major sources of the problem was, and still is, the division of the Metro area into a series of partially self-governing municipalities, supporting themselves on a property tax base. CMHC policy, requiring 4,000 square foot minimum lot sizes and giving loans for new housing only, abetted each municipality's emphasis of residential development aimed only at middle and upper income families. Minimum lot sizes are often set at 6,000 square feet by the municipality, as lot size become a financial device to increase assessment. Moreover, the magic 60-40 ratio of residential to commercial and industrial assessment leads to the practice of "fiscal zoning", whereby unimproved land is zoned to serve essentially



fiscal objectives, thus preventing coordinated and comprehensive land development. The implication of property tax as a source of revenue hinders the development of the row house and maisonette as a response to high land prices while still providing on the ground accommodation for families. For example, the municipality of Scarborough Planning Board calculated that while it gained \$38.54 in total tax contributions over costs for public school education for each apartment unit, it loses \$193.30 for each maisonette or row house. Another municipality found that a group of town houses assessed at \$3,500 a unit produced \$200 per unit in tax revenue. However, each unit has an average of 1½ children and it costs an average of \$750 a year to educate each child. As a result of higher education and servicing costs, land zoned for this type of development is often at a premium, and in many municipalities maximum permissible densities are set at 15 to 17 units to the acre. However, architects have produced successful row housing schemes with as high as 35 units the acre.

### **Tax Discourages Improvement**

In the older areas of Metropolitan Toronto tax tends to discourage rehabilitation and improvement of private property. It rewards those who permit their property to depreciate into slums with decreased tax liabilities and penalizes those who improve their property with higher tax assessments. It would make more sense to increase taxes on properties causing more cost to the city; the decaying firetrap not the new fireproof building should pay more public service tax. This might involve taxing the land and not buildings, a system that would tend to discourage land speculation by forcing redevelopment or sale.

The lure of the tax revenue yielded by apartment buildings encourages this form of development to have priority over a comprehensive plan based on demographic considerations. The Toronto Real Estate Board reports that the growing number of apartment houses is eroding the supply of lower priced single houses. In 1967, the number of single houses was decreased by 800. This is producing a situation in which the family, particularly the lower income family, is prevented from living near the central area. Both apartments and other forms of lower density housing are needed in central areas. A report recently issued by the Toronto Housing Authority indicates that 96% of the wage earners in the Authority's public housing works in the city proper and wishes to live near their source of employment.

In relation to cost of land, one of the major problems of property assessment has been a reluctance on the part of the municipality to approve development plans and hence add to the supply of land, because of a lack of assessment to cover the cost of services.

Large tracts of land may go undeveloped until sufficient industrial and commercial assessment has been achieved to cover the extra servicing cost of new residential areas. A prime example of this particular problem occurred when 1600 acres of land were purchased under a federal-provincial agreement in 1953 in Scarborough. No development has occurred to date in spite of frequent promises, because, it is stated, the servicing costs are too expensive. Until financial problems at the municipal level are solved, federal-provincial land assembly schemes for redevelopment hold no promise of a solution to the land-cost-problem.

On the average, 30% to 40% of municipal revenues are devoted to school costs. Comparing 1946 provincial grants to 1937 grants, the provincial contribution to education has actually dropped by 15%. Since the provincial source of revenue is elastic it increases more than proportionately to private economic growth. As salaries rise likewise the corresponding expectations on standards of services rise. But so do the revenues of government. However, property tax, the major source of municipal revenue (an average of 80% in metro), increases less than proportionately with increased private production. Hence the only answer to increased services is to raise property taxes or discourage development. A possible solution to this problem is for the province to assume responsibility for education costs, and if necessary, for the provision of services via grants or long-term low-interest loans to municipalities. The resultant increase in provincial income tax rates would tend to distribute costs more evenly, since at the present time, through the medium of property tax, the low-income property owner is required to contribute a much higher proportion of his income to municipal expenditures than upper income levels do.

### **One Administrative Unit for Municipalities**

The size of the municipal unit is a direct factor in the efficiency of its economy as small political subdivisions are too small to benefit from the internal and external economies of scale. As the political subdivisions became smaller and more numerous, the land-planning problem becomes more difficult, if fiscal balance is to be achieved. To attain a comprehensive development within Metro and an orderly extension of its boundaries, it would seem that the province should unite the six existing municipalities, and fringe townships as required to form one administrative unit. In this way municipal land assembly on a large scale could be undertaken in outlying areas where land is still available at \$500 to \$1000 per acre. It would then not be difficult to create a comprehensive development plan that would include the opening of transportation corridors to existing centers. Further, land could be held in municipal ownership with the granting of long term leases so that any appreciation in value accrues to the public purse rather than the speculator's.

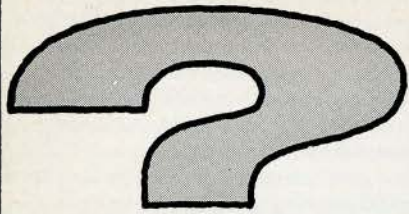
To complement this scheme the province should take the lead in abolishing the myriad of outdated building codes and zoning by-laws used by each separate municipality. This would reduce the onerous multiplicity-of-authorities problem presently slowing development. Goldenberg in his 1964 report found that because of the many authorities at the provincial and municipal level no less than 80 planning and engineering steps were necessary to get approval of development plans. This process can take up to five years to complete, and during that time the land usually increases in value. Further, by the establishment of one code, which hopefully would be a performance code, new building techniques and prefabrication could be encouraged.

### **Conclusions:**

In spite of possible steps to decrease land costs by increasing the supply of serviced land, the urban dweller must expect to encounter higher priced land and hence high housing costs, as the price for living close to the amenities and employment opportunities that large cities offer. By passage of the Condominium Act in Ontario in 1967, ownership of less expensive family accommodation such as row housing and maisonettes will be possible close to urban cores and this form of development would be encouraged as a response to high land costs. However, the full development potential of this legislation is hindered by the municipal by-laws limiting densities because of property tax consideration. To be effective, therefore, the Condominium legislation should be complemented by readjusting property tax as a source of municipal revenue.

In view of the prediction of the Deutsch report, that by 1980, 86% of the population of Ontario will be urban, questions are being asked about the future of provincial governments with their rurally dominated legislatures. Now is the time for initiative, before future elections, to recognize the problems of the urban dweller and his inability at the present time to provide shelter for himself commensurate with otherwise high standards of living. Until land costs can be sufficiently reduced by provincial action in abolishing municipal and township boundaries to form regional urban governments able to effect comprehensive planning policies, short term solutions to the housing problem must be found. Among these are the institution of a tax on profits from land speculation. In view of the great disparity of housing costs in different parts of Canada, it may prove expedient to consider a provincial ministry of housing and urban affairs to perform functions traditionally handled at the Federal level. In this manner, mortgaging policies can be more effectively co-ordinated with house costs and salary levels through regional control. Money devoted to assisting the low-income groups can likewise be apportioned to the areas demonstrating greatest need. □





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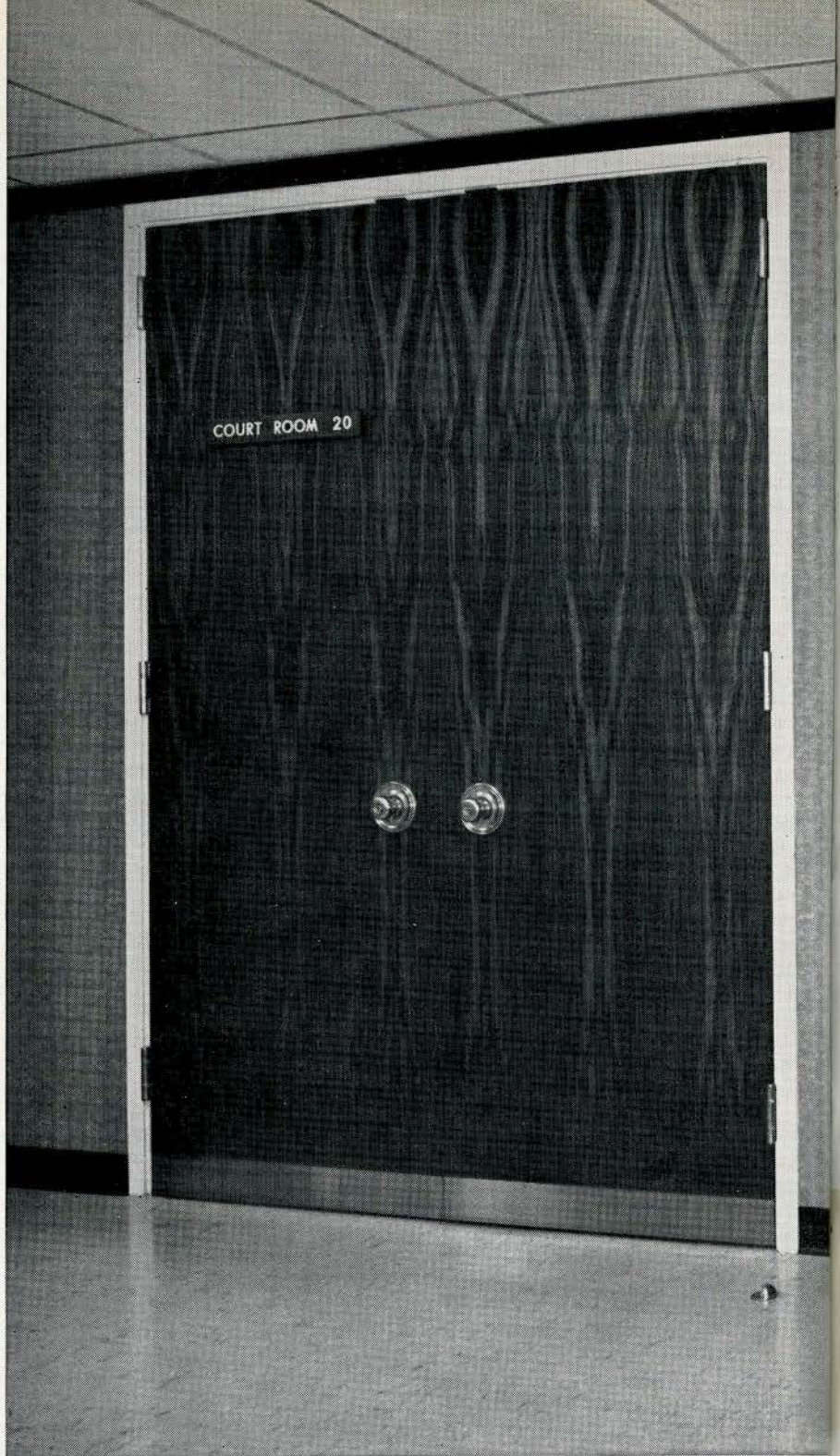
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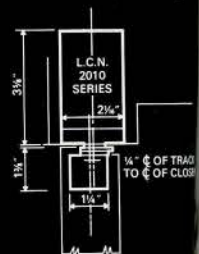
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*Victor Chanasyk, Professor and Director, School of Landscape Architecture, University of Guelph.*

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*J. R. Griffin, Thompson, Berwick, Pratt & Partners, Vancouver*

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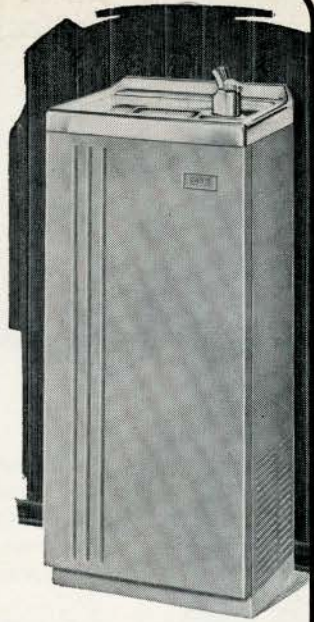
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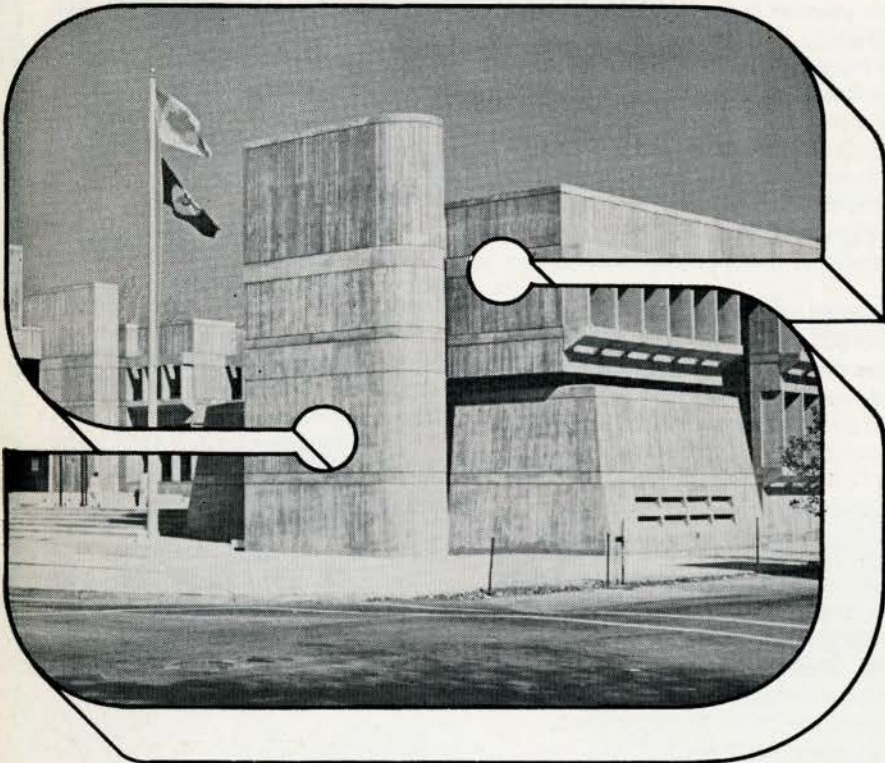
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