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The Allied Arts: Three summer exhibitions; Stratford, "The Art Gallery in the Factory" and "New Sculpture"; Edinburgh, "Canada 101"

Features: Eight sports buildings in Canada, Mexico and the United States; Part Two of Anthony Collins "A Systems Approach to Urban Housing"; the Assembly panel on architectural criticism

Technical Section; Prof. C. Herbert Wheeler Jr's Assembly address on "Emerging Technologies and Techniques in Architectural Practice"


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Head Office
160 Eglinton Avenue East,
Toronto 12, Ontario

Telephone (416) 487-5591

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L'Institut Royal d'Architecture du Canada

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RAIC Committee Chairmen Meet Sept. 14 to Discuss Future Institute Programs

Chairmen of the Standing and Special Committees of the RAIC most concerned in the accelerated program of Institute activities are called to a special meeting Saturday, September 14 in Toronto to make recommendations on their committees' programs for consideration at the meeting of RAIC Council in St John's, Nfld., on Sept. 16 and 17.

York Faculty of Environmental Studies

A Faculty of Environmental Studies has been added to the academic program of York University in Metropolitan Toronto. Dean of the new Faculty is Dr Gerald A. P. Carrothers, who obtained his B. Arch and M. Arch degrees at the University of Manitoba, MCP at Harvard and Ph. D. (Economics) at U. of T. The Faculty of Environmental Studies will develop programs of study and research which will provide a setting for the investigation and understanding of the nature of man's living environment and will provide educational experience for a broad spectrum of

G. P. Carrothers

competences in dealing with the design and control of that environment. Graduate level programs will be designed to prepare students for practice in a variety of professions dealing with environment, and for scientific enquiry in a variety of disciplines focussing upon problems in this area. There is no exact counterpart for the new faculty anywhere in the world and the programs will be highly experimental and innovative. The first unit of the new faculty, a School of Urban And Regional Planning, will enrol students in September 1969. The nature of the programs to be offered by the school will be developed during the next twelve months. An institute or centre for urban research and eventually a school of architecture will also be introduced into the faculty.

Dean Carrothers comes to York University from Ottawa where he has been a member of the Advisory Group of Central Mortgage and Housing Corporation since January 1967. He will continue as an Advisor to CMHC.

1968 Peter Barott Awards Announced

The 1968 Peter Barott Awards for Excellence in building product literature are announced by the Canadian Joint Committee on Construction Materials of the RAIC, the ACEC, the CCA, and DBR. Closing date for entries is September 16 and judging will be September 27. The Awards presentation dinner will be held November 6 at the Chateau Laurier, Ottawa. The jury is J. Klassen, P.Eng., chairman, Ottawa and members are D'Arcy G. Helmer, FRAIC and Mark P. Gillen, P.Eng., Ottawa; H. P. Labelle, MIRAC and A. F. Wrenshall, Montreal, and I. F. B. McBride, P.Eng., Edmonton.

All enquiries about the award should be addressed to the secretary of the Joint Committee, E. L. Mahoney, Construction House, 151 O'Connor St., Ottawa 4.

Izumi Receives Killam Grant

Kiyoshi Izumi, MRAIC, recently appointed associate professor of social sciences at the University of Saskatchewan, Regina Campus, has received a $12,000 Killam Award from the Canada Council to do research on the human considerations in architecture and environmental design. The theme of his research is that environmental planning must be based on the biological, psychological, and social needs and preferences of people. In the course of a general study on urban design, he will include such situations as public housing and university campuses, where people live in something like an "institutional" fashion.
A well known Regina architect, Mr Izumi has

Artists' studio, 641 Queen St. E., Toronto is the scene of a happy gathering of 12 artists and Miss Lennox Grafton (Project Architect for the Regional Department of Ontario Public Works) helping solve the problem of finding art for 25 small post offices. This is an ever increasing activity of our Allied Arts Department in effecting real living liaison between artists and architects – can we help you?

already done extensive work on the problem of designing facilities for physically and psychologically handicapped people. From 1953 until recently he was with the Regina architectural firm of Izumi, Arnott and Sugiyama.

George F. Eber, Montreal architect, shares with two Rotterdam architects, W. Eijkelenboom and A. Middlehoek, the $25,000 Reynolds Aluminum 1968 International award for the year's most significant building involving the use of aluminum. The winning building was the Netherlands Pavilion at Expo '67, for which Mr Eber was Canadian associate architect.

H. Claire Mott Reminisces about Early Days of Architectural Practice in New Brunswick

Some interesting reminisces of early architectural practice in the Maritime Provinces have been given us by Mr H. Claire Mott (F), who was the recipient of an RAIC Honorary Membership at the Annual Assembly in Regina. Mr Mott joined his father's practice in Saint John 60 years ago, and the firm carries on today under the name of Mott, Myles and Chatwin.

At 77 years of age I cannot remember when I did not look forward to being an architect. My late father had established his own architectural office around 1880 and although I was not born until ten years later, I can remember general practice procedure for I frequented that office after school hours and on Saturdays.

Hours for construction workers were 7 am to noon; 1 to 5 pm. There was no portal to portal pay in any business. A man was to be in his place and ready for work at starting time and packed up his tools at quitting time, not before. In Saint John, where I grew up, the city maintained and operated bell towers in two locations which were rung to announce beginning and ending of labor periods, called the laborers' bells.

The architects' offices opened at 8 am, had an hour for lunch and normally closed at 6 pm, but in any busy periods evening work was the order for all staff. Because evening interruptions were fewer, specification writing was largely done at night, the architect-author writing by hand and usually copied by others in the same way until around 1900, when a few public stenographers competent in shorthand were available. Usually an original and two carbon copies were sufficient for the needs.

The architect then was personally responsible for both design and the specifications for the work of all trades, structural and mechanical, etc.

As to designing, after paper preliminaries were approved, all drawings were executed in pencil on heavy white drawing paper, inked and then colored. Tracings were in ink and nearly always on (Imperial) linen.

It was unheard of to issue drawings to owners and contractors until a contract was let, then usually one or two sets were issued, one to the owner and one to th contractor, who took far greater care of them than they do today.

Only after tenders closed and contracts awarded were any blue prints prepared from the linen tracings, which were signed by the contracting parties before prints were made on blueprint paper sheets coated in the architect's office. Printing was all done by the use of heavy sun-print frames loaded in a semi-darkened office and then invariably carried from the office up to and exposed on the roof for printing; a slow process and often interrupted by clouds and showers.

A cousin who started as a draftsman for my father conceived the idea around 1892 of establishing himself in the business of preparing blueprints for architects and engineers. He went to New York City and made a decided financial success.

About 1912 I personally built and used an electric printer into which I had incorporated a fair size sun-printing frame, but the outfit was very slow, so it was while on a visit to my cousin's office that I decided to purchase an electric printer. I bought at that time a Buck Eye vertical cylinder type machine with a single arc lamp dropping through the center. This was the first electric printer in Saint John. Years afterwards our office purchased more modern equipment providing for continuous printing and my old original machine was given to one of our schools and is still in operation.

In my earlier years building designs were largely traditional. Costs had to be kept to a minimum. Churches and many public buildings just had to be influenced by Gothic or Classic orders. One could not have a sense of proportion or fitness without a working knowledge of these forms.

I was almost always favored with a fair share of clients work and benefited from practice in association with my late father. However, I could not understand the prevailing personal attitude of our provincial architects towards each other, in spite of the fact that in other professions men met and profited by the exchange of ideas and experiences.

In 1933 the Architects' Association of New Brunswick was born, largely due to the efforts of the late Wallace W. Alward and myself.

As to the position taken by the professional engineers towards our incorporation, it was at first far from friendly but ended with the most co-operative feeling and interest between our professional groups for which we have both profited in many ways.

Book Review

An Outline of Architectural Practice in British Columbia and Some Notes on Architectural Associations

F. Murray Polson, FRAIC, ARIBA, Architectural Institute of British Columbia, Vancouver, 1967, 54 pages, $2.75

This is a handbook on architectural practice for the benefit of undergraduates and graduates, and particularly for those preparing for registration examinations. The author practiced in BC for many years before his recent appointment as Executive Director of the AIBC. Mr Polson took on the task of producing the book, when through the work of the Examining Board, it was realized that there was no source from which students could make themselves familiar with the routine work of architectural practice. The handbook is divided into 14 chapters, the first of which deal with architectural associations, ethics and professional conduct and professional organizations, the Architects Act and the AIBC; while the remainder explain the routine business of practice from building codes and tenders to the Mechanics Lien Act.

Coming Events

Symposium on Architecture and Town Planning in Sweden, Sept. 8 - 15. Information from Swedish Institute, Box 3306, Stockholm 3.

National Association of Corrosion Engineers Eastern Regional Conference, September 30 - October 2, King Edward Hotel, Toronto.

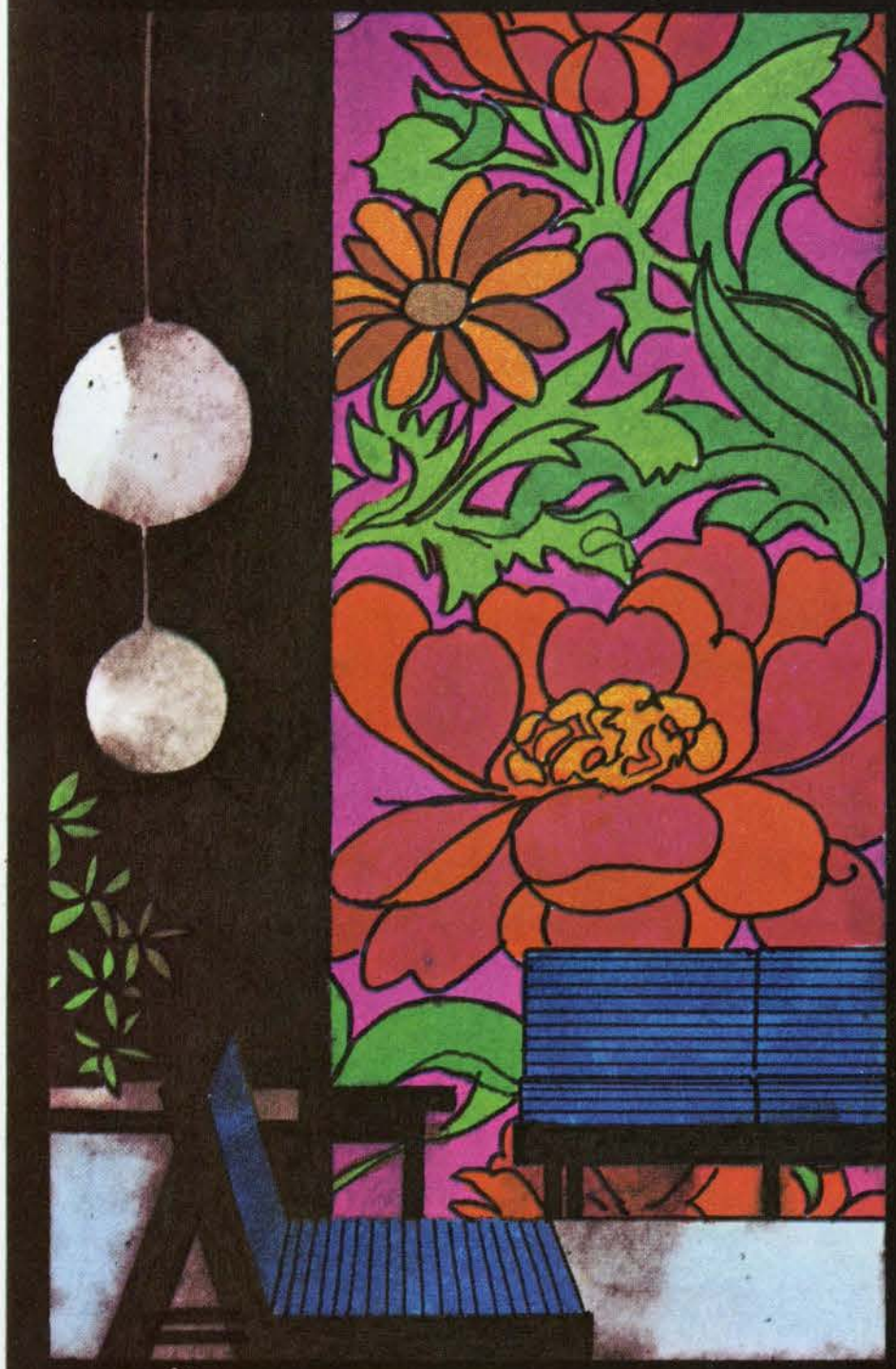
"World Building 1968 – Cost and Control" CIB, International Council for Building Research Studies and Documentation, Fourth Triennial Congress, Ottawa and Washington, DC, October 1968.

CPAC National Planning Conference, October 6 - 9th, Empress Hotel, Victoria.

19th Olympiad Program for Meeting of Young Architects, Mexico City, October 7 – 10. Details from RAIC Headquarters.

First Canada Conference on Housing, sponsored by the Canadian Welfare Council October 20 - 23, Royal York Hotel, Toronto.

National Interior Design Show, October 28, 29, 30th, Queen Elizabeth Building, Exhibition Park, Toronto.



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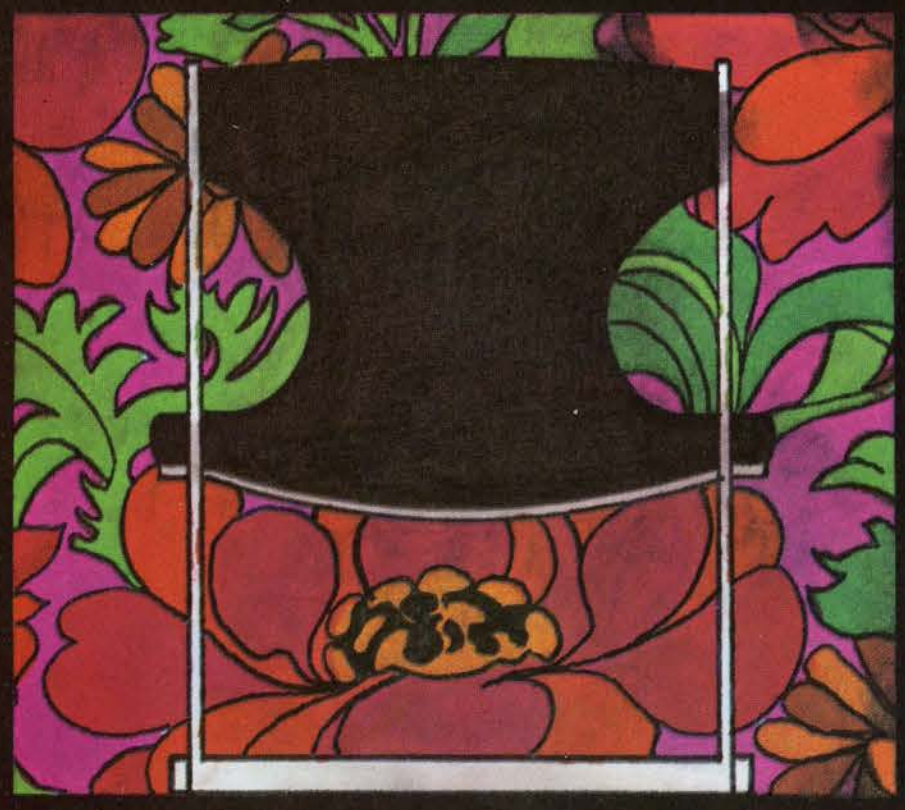

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Principles Underlying the Bestowal of Fellowships

The current procedure for the nomination and election of new Fellows was adopted at the Business Meeting of the College held in Hamilton, May 18, 1963. For the information of all Members of The Royal Architectural Institute of Canada, we herewith publish the two chief documents which implement this procedure. The first document sets forth the Principles Underlying the Bestowal of Fellowships, and the other document outlines the Procedure for Nomination and Election. Nomination forms may be obtained on application to Mr. Maurice G. Holdham, Executive Secretary of the Institute.

Peter M. Thornton, Chancellor, College of Fellows.

Fellowship is the highest honour the Royal Architectural Institute of Canada can bestow upon a member. To guard and further the prestige of the College, to observe the pledge of high professional conduct and service, and to assume full responsibility in maintaining the highest standard of the profession is the duty and obligation of every member of the College of Fellows.

The constant goal of improvement in the architectural profession in Canada is the principal objective of the RAIC College of Fellows. By recognizing the good works of our members who contribute most to the profession, we stimulate others to improve and so deserve equal awards. Recognition must be truly deserved or the objective of the College is destroyed.

A member of the RAIC who is over thirty-five years of age and has achieved professional eminence or rendered distinctive service to the profession is eligible for nomination to Fellowship. He must have proper qualifications under one, or more, of the following categories: design; science of construction; service to the Institute; public service; education or literature. The total membership of the College must never be over eight per cent of the total Institute membership and proper qualifications, regardless of locality or other influences, are the only criteria for election to the College.

To guard and improve the prestige of the College, the procedure for nominations has been enlarged and revised. The work of the Nominating Committees and the Screening Committee is to ensure that unworthy candidates are not elected and worthy candidates are not overlooked. Proposers should feel quite certain that nominees' achievements have sufficient distinction to make them notable contributors to the advancement of the profession and of architecture and should remember that the personality and popularity of a member does not of itself constitute a notable contribution; nor is Fellowship necessarily an award for the nominee's industry and success.

Letters attesting to intimate knowledge of the good works and character of nominees are required from each of the five proposers.

Procedure for the Nomination and Election of Fellows

"A member of the RAIC who is over thirty-five years of age and who has achieved professional eminence, or rendered distinctive service to the profession shall be eligible for nomination to Fellowship."

Any five Fellows may nominate, using the prescribed printed form which may be obtained on application to the RAIC Executive Secretary, and each nominator must write a letter addressed to the Chairman of the Screening Committee, attesting to the qualifications of the nominee. All letters by nominators must be sealed. The nominating form and sealed letters are to be submitted, through the RAIC Executive Secretary, to the Chairman of the local committee where nominee resides before October 15th of each year.

The Chancellor shall appoint a Chairman of a local committee for each provincial association who shall choose a committee of one to six members to initiate and/or receive nominations for Fellowship in that association. Nominators for any nominee may reside in any province in Canada. Members of the Screening Committee may not nominate or be members of a local committee.

Each Committee Chairman shall forward all documents, including the required sealed letters of nominators, to the RAIC Executive Secretary before November 1st and shall also forward a complete report of his Committee deliberations for submission to the Screening Committee. The report must include a list of all candidates initiated and considered by the Committee, with reasons why those considered but not nominated were omitted. Where nominations have been received and not initiated by a local committee the report is to recommend approval or give reasons for not recommending approval of received nominations.

Not later than February 1st, a list of all proposed nominees shall be sent to all Fellows with notice that if any Fellow objects to any name he must write a confidential letter, stating the reasons for his objections, to the Screening Committee before February 15th. The Screening Committee shall act on any such letters entirely at their discretion.

The Screening Committee will consist of the RAIC President, the Vice-President, the Chancellor, and the Dean of the College of Fellows. It shall consider all nominations submitted, and have the power to accept, reject, or postpone them; thus advising the Chancellor. The Screening Committee shall also recommend Honorary Fellowships and Corresponding Members. They shall meet for this purpose sometime between November 1st and February 1st and confer again between February 15th and March 1st to confirm final recommendations.

The Chancellor shall receive the final list of recommended nominees from the Screening Committee, not later than March 1st, for his presentation to the Council.

Only Council members who are Fellows shall meet with the Chancellor to consider the list of nominations and elect new Fellows, accepting or rejecting the Chancellor's recommendations but having no power to add new names or replace rejected nominees. Election will take place at the first meeting of the Council after March 1st.

The Registrar will send letters to Fellows-elect, advising them of their election, asking them to fill out a "form of consent", and inviting them to attend the convocation ceremony at the next RAIC Assembly.

Principes Régissant l'Admission des Fellows

Les règles régissant la mise en candidature et l'election des nouveaux Fellows remontent à la réunion d'affaires du Collège tenue à Hamilton le 18 mai 1963. Pour l'information de tous les membres de l'Institut royal d'architecture du Canada, nous publions les deux principaux documents dans lesquels sont contenues ces règles. Le premier expose les principes généraux d'après lesquels le titre de fellow est décerné et le second, les règles à suivre pour la mise en candidature et les élections. On peut obtenir des bulletins de mise en candidature en s'adressant à M. Maurice G. Holdham, secrétaire administratif de l'Institut.
Le chancelier du Collège des Fellows, Peter M. Thornton

Le titre de Fellow est le plus grand honneur que l'Institut royal d'architecture du Canada peut conférer à l'un de ses membres. Chaque membre du Collège des Fellows a pour devoir et obligation de sauvegarder le prestige du Collège et de travailler à augmenter son rayonnement, de respecter son engagement quant à la haute qualité professionnelle de sa conduite et de ses services et d'assumer pleine et entière responsabilité en ce qui a trait au maintien des plus hautes normes de la profession.

L'objectif du Collège des Fellows de l'IRAC est l'amélioration constante de la profession d'architecte au Canada. En reconnaissant le bon travail de nos membres qui contribuent le plus à la profession, nous encourageons les autres à s'améliorer et à mériter ainsi le même honneur. Toutefois, cet honneur doit être veritablement mérité, sans quoi le Collège manque son but. Tout membre de l'IRAC âgé de plus de 35 ans, qui s'est distingué dans l'exercice de sa profession ou a rendu à celle-ci des services signalés, peut être proposé comme membre du Collège des Fellows. Il doit posséder les qualités requises sous l'un ou plusieurs des chefs suivants: composition, science de la construction, services à l'Institut, civisme, enseignement et littérature. Le nombre des membres du Collège ne doit jamais dépasser 8% de l'effectif global de l'Institut et le mérite est, à l'exclusion de l'endroit de résidence et de toutes autres influences, le seul critère d'admission.

Afin de sauvegarder et de réhausser le prestige du Collège, on a revisé et élargi le processus de présentation des candidats. Les fonctions des Comités locaux et du Comité de sélection consistent à empêcher que des candidats non méritants soient acceptés et que des candidats méritants soient oubliés.

Les proposeurs doivent s'assurer que leurs candidats se sont suffisamment distingués pour constituer une contribution notoire à l'avancement de la profession et de l'architecture, et, se rappeler qu'en soi la personnalité et la popularité ne sont pas des contributions notoires; en outre, le titre de Fellows ne constitue pas nécessairement une récompense pour le travail ou les succès d'un membre.

Chaque candidature doit être appuyée par une lettre de chacun des cinq proposeurs, attestant qu'il connaît personnellement le bon travail et la bonne réputation du candidat en cause.

Règles Visant la Mise en Candidature et l'Admission de Membres

"Tout membre de l'IRAC âgé de plus de 35 ans, qui s'est distingué dans l'exercice de sa profession ou lui a rendu des services signalés, peut être proposé comme membre du Collège des Fellows."

Cinq membres du Collège peuvent proposer un candidat, au moyen de la formule imprimée réglementaire, qu'on peut obtenir en faisant la demande au secrétaire administratif de l'IRAC. Chacun des cinq proposeurs doit adresser une lettre au président du comité de sélection, attestant les qualités du candidat. Toutes les lettres des proposeurs doivent parvenir à destination, bien scellées. La formule de proposition et les lettres scellées doivent être soumises par l'entremise du secrétaire administratif de l'IRAC, au président du comité local où le candidat a son domicile, avant le 15 octobre de chaque année.
Le Chancelier nomme le président d'un comité local pour chaque Association provinciale. Ce président choisit de 1 à 6 membres pour former son comité dont les fonctions consistent à recevoir et (ou) proposer de son propre chef des candidatures au titre de Fellow parmi les membres de cette Association. Les proposeurs d'un candidat peuvent être résidents de n'importe qu'elle province du Canada. Les membres du comité de sélection ne peuvent agir comme proposeurs, ni être membres du comité local.
Chaque président de comité local doit faire parvenir tout les documents, y compris les enveloppes scellées des proposeurs, au secrétaire administratif de l'IRAC, avant le 1er novembre. Il devra, aussi faire parvenir un procès verbal complet des délibérations du comité. Le tout sera ensuite transmis au Comité de sélection. Le procès verbal devra comprendre une liste de tous les membres dont la candidature a été proposée et considérée par le comité, en y ajoutant les motifs qui ont incité le refus de ceux dont les noms ont été proposés mais non recommandés; Il devra inclure, de plus, les recommandations motivées, faites au Comité de sélection, favorables ou défavorables, à l'égard des candidatures qui n'auront pas été proposées par le comité local.
Le Comité de sélection se compose du président et du vice-président de l'IRAC ainsi que du chancelier et du doyen du Collège des Fellows. Il étudie toutes les candidatures soumises et il a le pouvoir de les accepter, de les rejeter ou de les différer et d'aviser en conséquence le chancelier. C'est lui aussi, qui recommande les candidats aux titres de Fellows Honoraires et de membres correspondants. Il se réunit à cette fin à une date quelconque entre le 1er novembre et le 1er février et, de nouveau, entre le 15 février et le 1er mars, cette fois pour confirmer les recommandations définitives.
Au plus tard le 1er février, la liste des candidats proposés est envoyée à tous les Fellows avec une note leur demandant de bien vouloir aviser le Comité de Sélection, avant le 15 février, au moyen d'une lettre confidentielle de leur opposition à tout candidat recommandé, en donnant les motifs qui justifient cette opposition. Le Comité de sélection a entière discrétion quant à la suite à donner à toute lettre de ce genre.
Au plus tard le 1er mars, le Comité de sélection fait parvenir la liste définitive des candidats recommandés au chancelier afin que celui-ci la présente au Conseil.
Seuls les membres du Conseil qui sont également membres du Collège des Fellows ont le droit de siéger avec le chancelier pour l'étude des candidatures et l'acceptation de nouveaux Fellows. Ils peuvent confirmer ou rejeter les recommandations du chancelier mais ils n'ont pas le pouvoir d'ajouter de nouveaux noms ni de rétablir des noms rayés. (Première réunion du Conseil après le 1er mars.)
Le secrétaire-archiviste envoie aux candidats choisis une lettre les avisant de leur candidature et leur demandant de bien vouloir remplir la "formule d'acceptation" et les invitant à assister à la cérémonie d'investiture à la prochaine assemblée.

J. E. Searle's Address to AIA Convention

Architecture is changing so rapidly that the profession is practicing in design areas that weren't even envisioned five years ago, James E. Searle, (*F*), Winnipeg, immediate Past President RAIC, told the annual convention of the American Institute of Architects in Portland, Oregon on June 25: Mr Searle, who was made an honorary Fellow of the AIA at the Convention, was guest speaker at the luncheon for AIA Honors Award Winners and Students. Mr Searle said that the root of most problems facing architects today centred around a lack of liaison between students, the academics in university and architects in practice. The real tragedy was that the teaching curriculum is out of step with the current needs of the profession. "The profession is concerned that most of those teaching architecture have never been involved or have any desire to practice", he said. Teachers were out of touch with society, payed little attention to the abilities of the individual student and had no concept of the demands of a profession that was becoming more highly specialized and diversified. Schools of Architecture were still teaching students in the old "master architect" style, where one man dealt with one client at one time in the construction of one building.

Concerns expressed by architectural students about architectural education were similar, in many respects, to the concerns of the forward looking practitioners in the profession, Mr Searle said, and added that architects in practice have shown a lack of concern for what is taught in schools and must accept part of the blame for the present situation.

Members of the profession had not contributed their time to become involved in the schools, because they have been concerned with the problems of day-to-day practice, such as increasing competition from outside the profession, diminishing profitability of operations and changing methods and scope of practice.

Illustrating the teaching crisis, Mr Searle noted that today 38 schools of architecture in the United States were unable to find capable people to head their teaching staffs. The problem of education was really a manifestation of a monumental challenge facing the profession, the challenge of doubling in the next 32 years an urban environment that took 400 years to create in North America and which already houses 70% of the population.

Mr Searle also strongly advocated that more architects seek public life. "Only with a strong voice in the governments of our cities, states, provinces and nations", can we be truly effective on behalf of the design profession at a level where basic decisions are made.

"Architects are moving so rapidly towards unknown technological and sociological horizons that change is the only certainty in our lives", Mr Searle said. The knowledge explosion demanded that all of us, students, academics and architects in practice, subject our minds to a two-way stretch. We must expand in breadth to learn more precisely how design decisions interact with the social, political and economic elements of people's lives. We must also expand in depth to keep abreast of new developments and improved methods that can be used in more efficiently solving the problems of modern society. If the architectural profession was prepared to shrug off its mantle of complacency, the future was unlimited.
If the profession was willing to listen to other members of the building and design team and would recognize the need for continuing education and re-education – then the whole field of environmental design could take full advantage of what he called "the greatest challenge and the greatest opportunity of all time". □

Discours de J. E. Searle à la Convention AIA

L'évolution de l'architecture est si rapide que la profession exécute actuellement des projets qui n'ont pu être envisagés, il y a cinq ans, a dit James E. Searle, (*F*), Winnipeg, président sortant de charge de l'IRAC, à la convention annuelle de l'AIA qui a eu lieu à Portland, Oregon, le 25 juin dernier. M. Searle, auquel le titre de Fellow honoraire de l'AIA a été conféré, a également assisté à un déjeuner donné en l'honneur des gagnants du prix de l'AIA et des étudiants dont il était l'orateur officiel. M. Searle a préconisé que le problème essentiel auquel la profession se heurte aujourd'hui, est le manque de communications entre étudiants, académiciens et architectes exerçant leur profession. Il est certainement déplorable que le programme d'études ne correspond plus aux besoins de l'heure. Les professeurs ne sont guère en contact avec la société et prêtent peu d'attention aux capacités individuelles de l'étudiant et n'ont surtout aucune idée des exigeances de la profession qui est en train de devenir une corporation hautement spécialisée et diversifiée.

Cette inquiétude en regard de l'enseignement de l'architecture est également partagée par les étudiants.
Les membres de la profession ne se sont pas préoccupés de l'enseignement parce qu'ils étaient trop absorbés par les problèmes quotidiens de leur métier, à savoir, la concurrence grandissante en dehors de la profession, la profitabilité réduite des operations et les méthodes changeantes.
En décrivant la crise de l'enseignement, M. Searle a remarqué que 38 écoles d'architecture aux Etats Unis sont dans l'impossibilité de trouver des cadres pour diriger le corps enseignant.
M. Searle invite les architectes à jouer un rôle plus important dans la vie publique. C'est seulement, lorsque notre influence se fera sentir dans les villes, états, provinces et nations que nous pourrons être vraiment utils à notre profession.
Les architectes se lancent de plus en plus vers des horizons technologiques et sociologiques inconnus et le changement continuel est la seule certitude dans notre vie. L'explosion technologique exige de nous tous, étudiants, académiciens et architectes de métier une vigilance croissante. Il faut apprendre à adapter les projets aux éléments politiques, sociaux et économiques dans la vie de tout le monde. Nous devrons également connaître les développements nouveaux et les méthodes améliorées pour pouvoir résoudre les problèmes de la société moderne. Si la profession se décidait à abandonner son attitude indifférente l'avenir serait plein de promesses. Si la profession voulait écouter les conseils des autres membres de la corporation et reconnaître la nécessité d'une éducation et rééducation continues, alors le champ serait libre pour participer à des actions plus grandes et pour profiter des plus grandes occasions de tous les temps. □


6382
6384

A "MASTERPLATE OR EQUAL" floor just 36 months after an "or equal" was used.

A "MASTERPLATE" floor after 30 months of gruelling tow conveyor use.

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The rest of the "or equal" floor also dusted and ravelled but at a slower rate since the traffic was less concentrated. However, in just three years the owner decided he could no longer tolerate the condition you see in the photo (upper left) and ordered it resurfaced. The resurfacing contract contained a flat MASTERPLATE spec.

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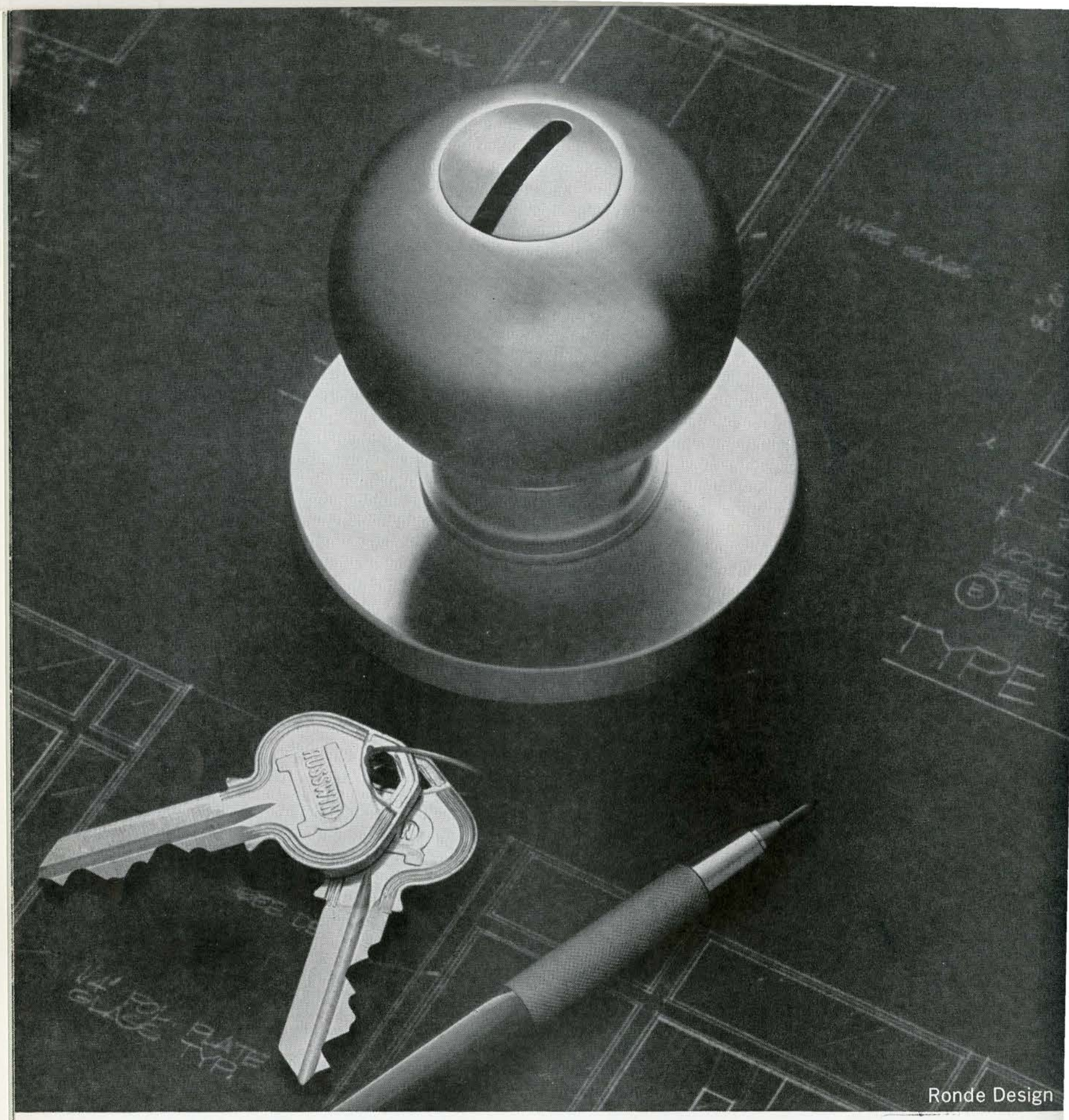

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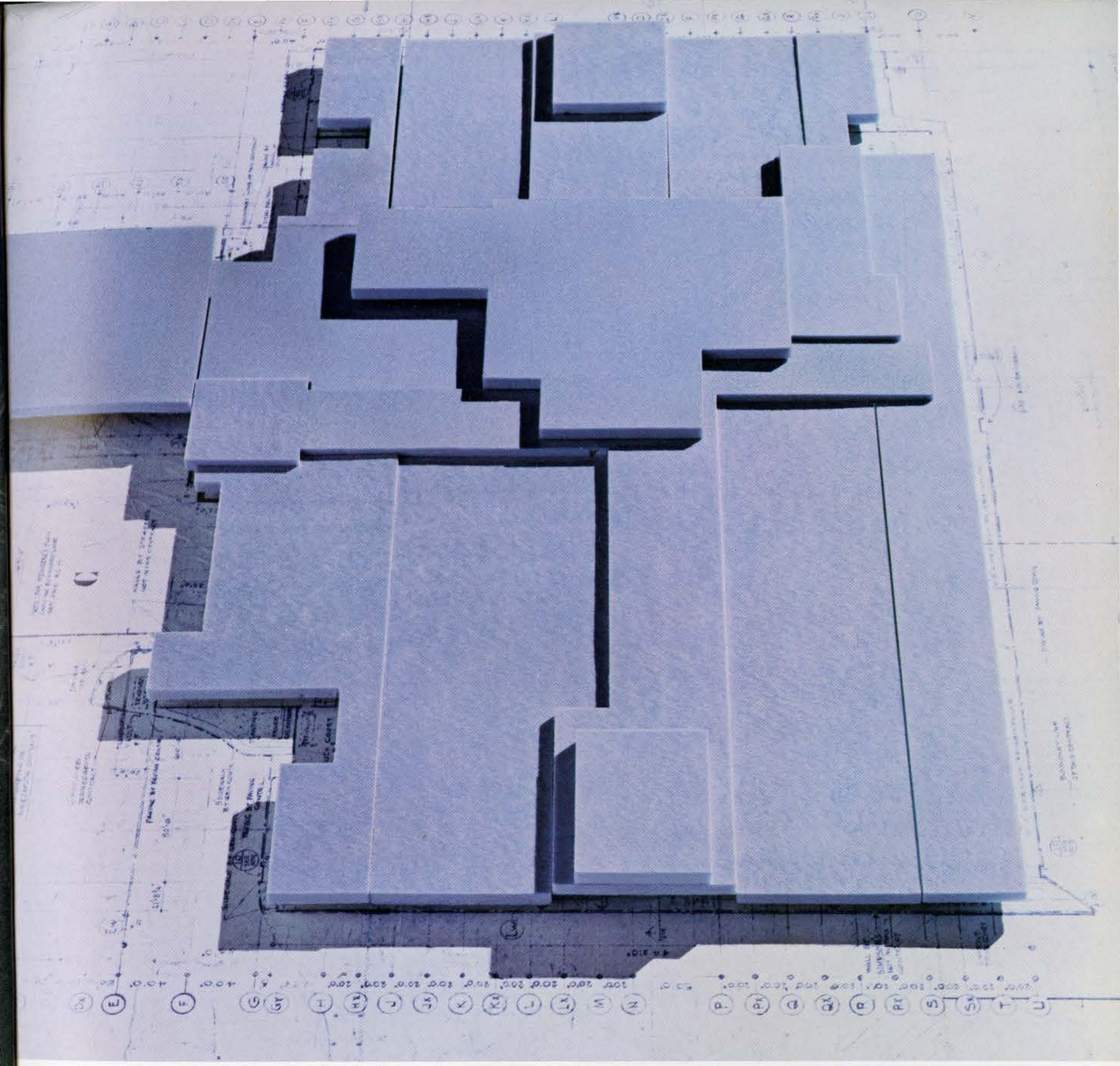


ROOFMATE FR brand plastic foam insulation, Construction Materials Sales, Dow Chemical of Canada, Limited.

This plan for a permanent roof called for outstanding insulation qualities—high thermal efficiency, light weight, ease of installation, and permanence. The project: a huge enclosed shopping complex in suburban Montreal. The architects specified ROOFMATE* FR brand plastic foam insulation. There is no equivalent to ROOFMATE.

DOW CHEMICALS

*Trademark

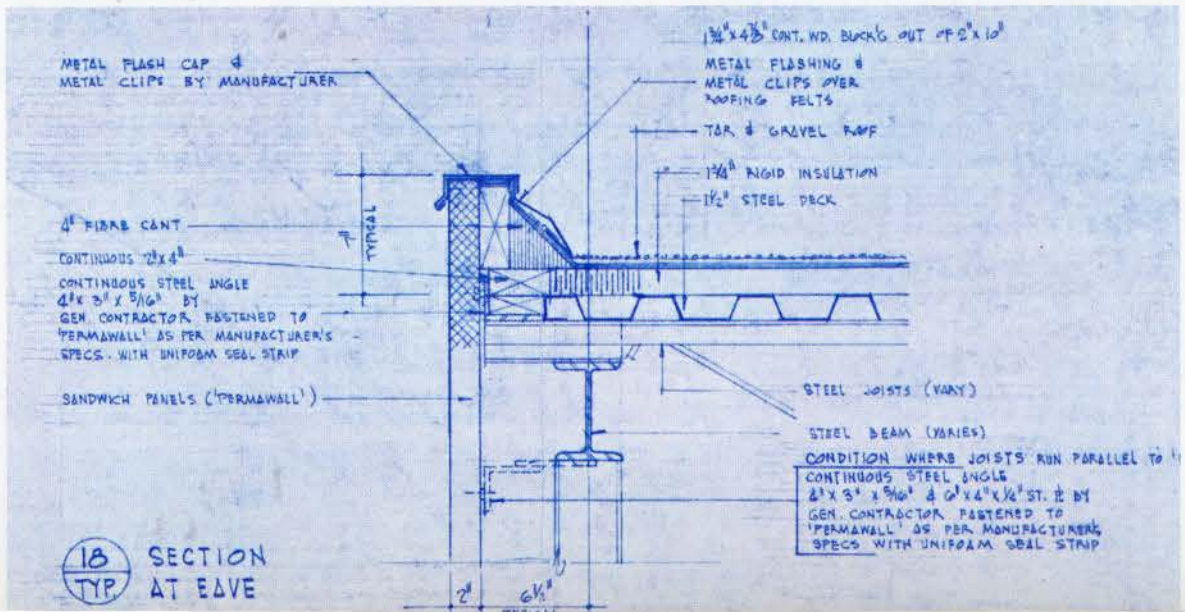
Architects: Greenspoon, Freedlander,Plachta & Kryton, Montreal.
General Contractors: Ain & Zakuta Ltd., Montreal.
Roofers: Kredl Inc., Montreal.

A complex roofing task calling for the unique properties of ROOFMATE FR brand plastic foam insulation.

Les Galeries d'Anjou on the north-eastern outskirts of Montreal is one of the largest self-contained shopping centres in the country, planned to provide first-class shopping facilities for the million-plus residents who live within a fifteen-minute zone. Managed by the Fairview Corporation, this vast retail complex reflects their experience of operating similar centres from Edmonton to Saint John. And vast is the operative word. With several hundred thousand square feet of roofing to consider, the problems of maintaining thermal efficiency were enormously important, especially in view of Montreal's severe climate.

Only an exceptional insulation would be fully equal to the task. It should always provide permanent insulation value regardless of water above and moisture vapour below. It should be lightweight enough to keep dead roof loads down, yet capable of resisting rot, fungus, settling and delamination. It should be durable and flame-retardant. And it should be easy to handle and cut, so reducing installation time and labour costs to a minimum.

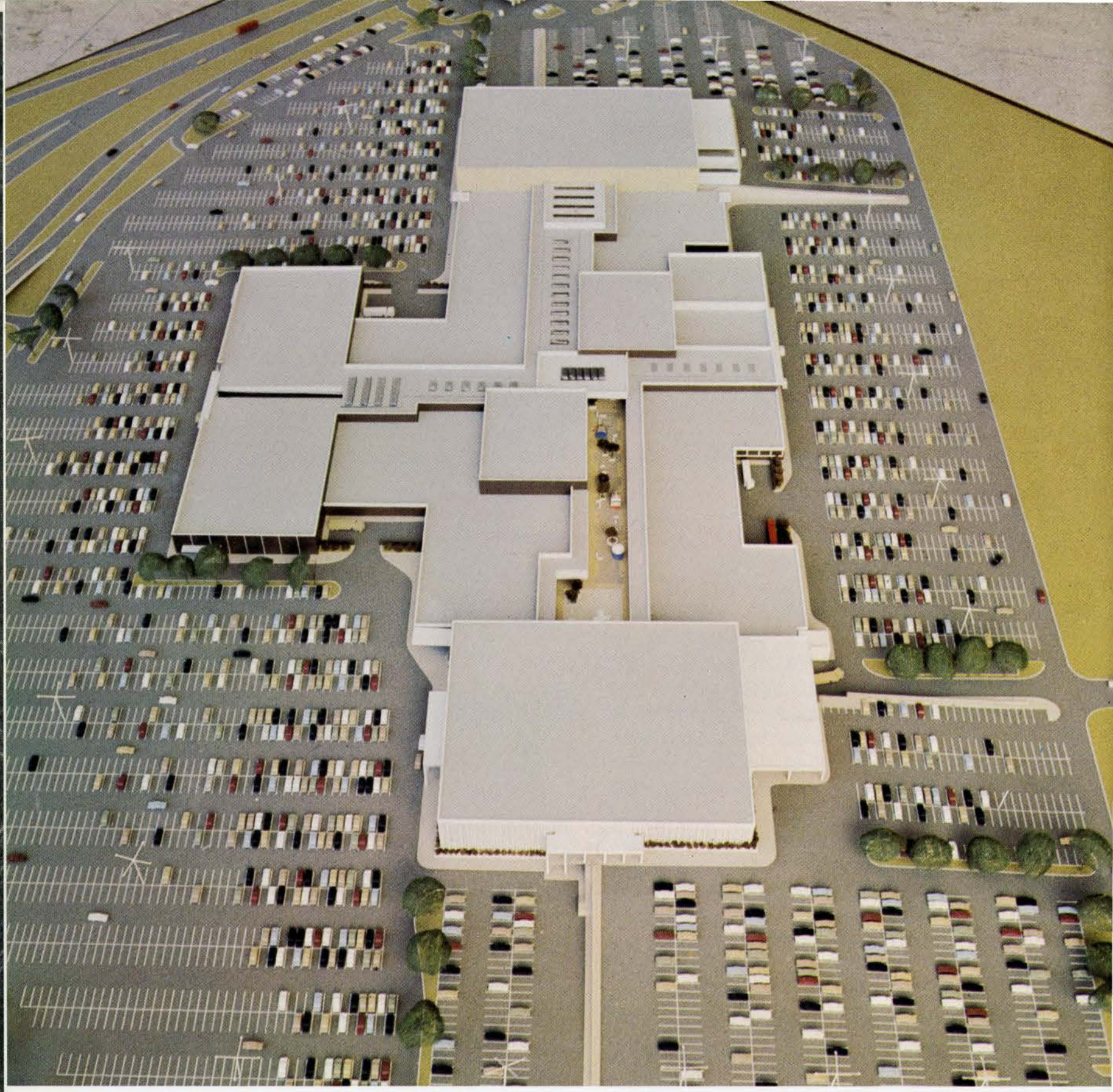
Everything pointed to a rigid polystyrene foam. And detailed research and discussions with various contractors convinced the Architects (Greenspoon, Freedlander, Plachta & Kryton) that ROOFMATE FR brand plastic foam offered the most advantages. For one thing, it needed no vapour barrier because its thermal efficiency is not affected by water vapour. And even without a vapour barrier only 1¾" of ROOFMATE FR brand plastic foam was required to provide the constantly low "k" factor (0.20 at 75°F.) that would ensure economical heating of the many stores it covered. Then there was its high compressive strength (30 p.s.i. at 5% deflection) and its ability to speedily provide a smooth firm base for the built-up roof using the coated base sheet system; a method which the Roofers (Kredl Inc.) applied semi-automatically



with further time- and labour-saving effect.

Immediately the fire-retardant adhesive had been applied to the steel deck, the ROOFMATE FR brand plastic foam boards were quickly laid in place. Light to carry (only 2.5 lb/cu. ft.) and easy to cut cleanly for flush fitting, this versatile material allowed the operation to be accomplished in a remarkably short time, so setting the pace for the roofing build-up to follow. This was maintained by using special equipment which manufactured a continuously coated felt base sheet on site, laying it so that the bonding asphalt was allowed to cool sufficiently not to damage the insulation on contact. The remaining plies, overlapped for maximum effectiveness, were laid with standard Garlock felt layers. Finally, a mechanical gravel spreader rapidly deposited a top layer of light-coloured gravel to reduce solar heat transmission. A novel method of speedily refilling the spreader with gravel and hot bitumen at the roof's edge from a mobile conveyor further accelerated the entire operation.

Any specifier looking for a roof insulation material that can go down quickly, cut down costs, eliminate the need for a separate vapour barrier, reduce repair and maintenance bills, and still provide lifetime thermal insulation values wherever it's installed, need look no further than ROOFMATE FR brand plastic foam. For built-up roofs, there is no equivalent to ROOFMATE.



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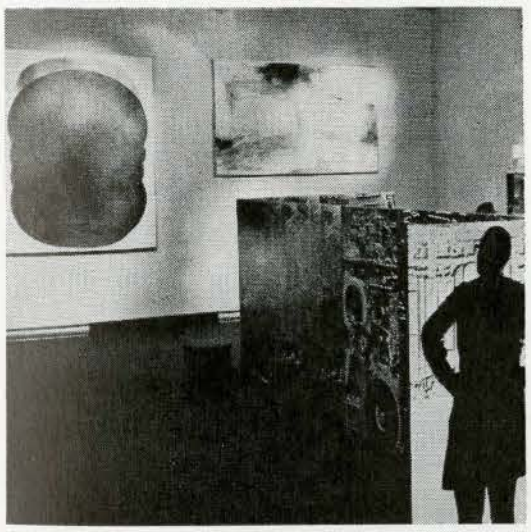
Summer Events 1968
Art for the Public Eye

Before commencing a fall series on public art, a brief glance at some early summer exhibitions of outstanding merit gives a salutory lesson to those who attempted and for the most part failed at collecting and placing art of distinction into the gallery of contemporary public buildings. Three events of note are: "The Art Gallery in the Factory", "New Sculpture" selected by Dorothy Cameron (both at Stratford at the Rothmans Art Gallery); and "Canada 101"; an exhibition of Canadian art at the third International Exhibition at Edinburgh.

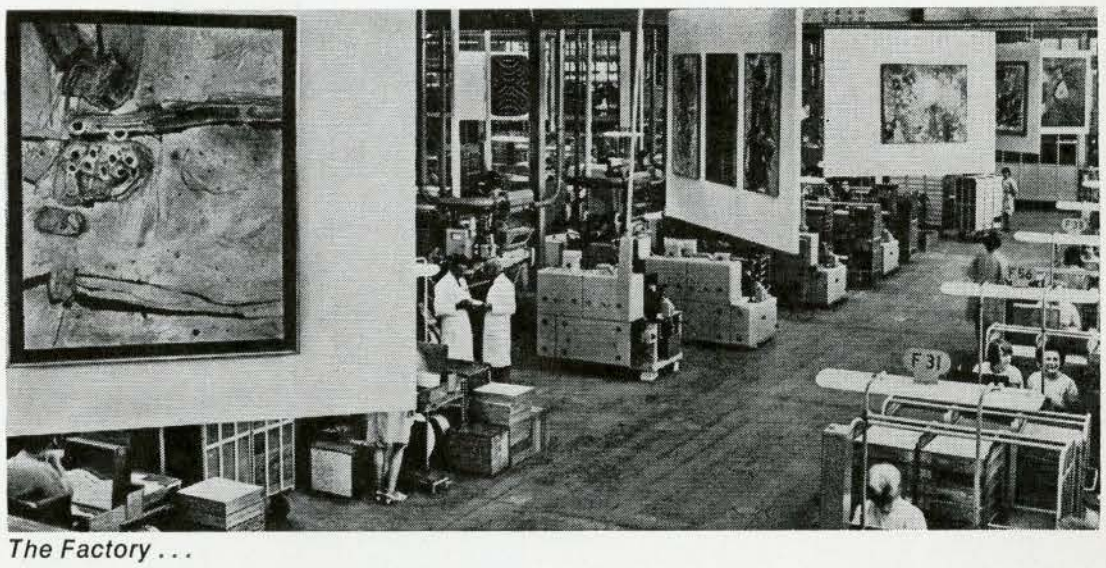
The Art Gallery in the Factory, June 11-Aug. 30

This exhibition has been brought to Canada by Rothmans with the co-operation of The Peter Stuyvesant Foundation. It is a collection of some of the world's most significant paintings which were purchased to form part of the collection to be displayed in the factories and offices of Turmac Tobacco Company in Holland and Switzerland.

This most attractively set up and cunningly contrived exhibition of paintings with a collage of exhibition photomurals recreates the factory environment. The paintings in their true setting are unequivocably placed directly out of gallery context into the factory atmosphere with no concessions made to display. By all canons of exhibiting



The Exhibition . . . "Art in the Factory" at Rothman's Gallery, Stratford
L'exposition "l'Art à l'usine", Galerie Rothman, Stratford



The Factory . . .

art, this should have been fatal, but it was not. Images quite unrelated to the factory atmosphere were placed at eye level and there was no relevant reference to industry in the painting, even in their content. The very irrelevance of the objects jolts the sensitivities. No attempts were made to "justify" the art but the simple statement is made that there is another world of reference; that of infinite imagination in a technological age. Cognizance is made without compromise. Impact alone is the direct method of appeal. It is gratifying to know that from interest the employees grew to love art as such. The most significant point is that the art chosen was of the highest contemporary standard – the world's leading painters, from a collector's point of view, taking the stage. No compromise was made to the employees' ignorance or taste. Choice was made with erudition as a challenge to aspirational understanding. Here, heads of industry prove that they are not the crude aestheticians opinion would have one believe. In spending money on art for their employees, contrary to some practice with public art, they selected the best possible people to make judgements in favor of the most distinguished artists available without compromise to lesser consideration. This can and should be done.

New Sculpture at Stratford, June 11-Aug. 30

Here again a distinguished entrepreneur has been asked to select sculpture for public exhibition. Miss Cameron rarely fails to find work of excitement plus contemporary professional competence. Her themes highlight aspects and trends. This exhibition highlights the monumental scale and the art of "confrontation" so lacking in most public art.

It is nothing short of infuriating, however, that this exhibition should be jammed into a small overcrowded area, a claustrophobic little garden already too heavy with lamps, planting etc. Not one of the quite important monumental structures can be seen to proper advantage. One or two works at the most could have been comfortably accommodated. The rest would have been happier in the open areas outside the enclosure. It is ironic that past exhibitions at Stratford, too domestic in scale, have suffered in the open area adjacent to the theatre. This exhibition was made for that site.

For the architect, here is a collection of sculpture of utmost importance which could complement and confront architecture in similar terms of scale. These artists must be seen and remembered. *Edward Zelenak* with "Stoattalos" has a monolithic form of compelling presence . . . architectural monumentality. Non-gestural (as is the art of Bob Murray) his contemplative giant justifies the term "architectural totem". *Robert Downing*'s "Red and White Box" (seen before) has better advantage in the open space upon the water. Unreally floated on pilons, narcissus-like it broods on its own juggernaut reflections in the mirror of the lake, while adjacent "Les Courtisanes du Roi James" (*Jacques*

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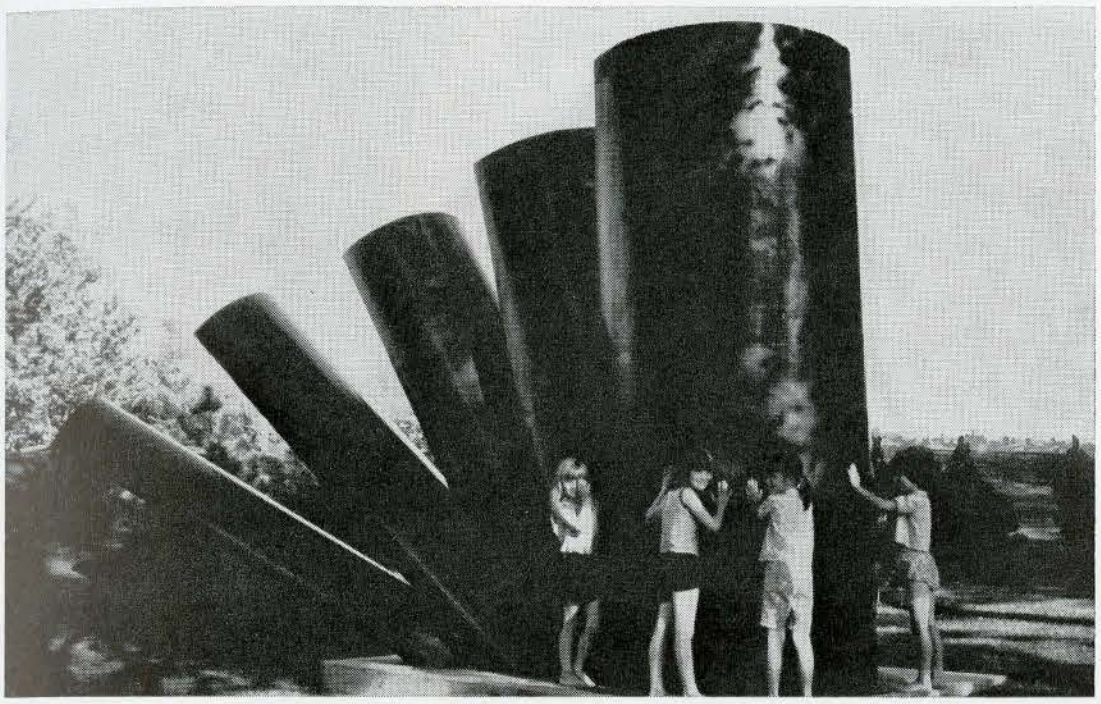
STEELCASE

3
A "peoples" sculpture invites intimacy and collusion, Stratford, Artist, Nobuo Kubota, address, 448 Spadina Avenue, Toronto 2B
Cette sculpture populaire invite à la fois à l'intimité et à la complicité, Stratford, artiste Nobuo Kubota
4
Downing's "Red and White Box" broods on its own juggernaut reflections, Stratford (Artists address, 227 Spadina Ave, Toronto)
"Le rouge et le blanc" par Robert Downing, Stratford
5
"Les courtisanes du roi James" floats with precious wistfulness, Stratford. Artist Jacques Cleary, 615 Champagneur # 76, Outremont, Montreal
"Les courtisanes du roi James" voguent sur l'eau plein de désir silencieux. Artiste, Jacques Cleary, 615 Champagneur #76, Outremont, Montreal



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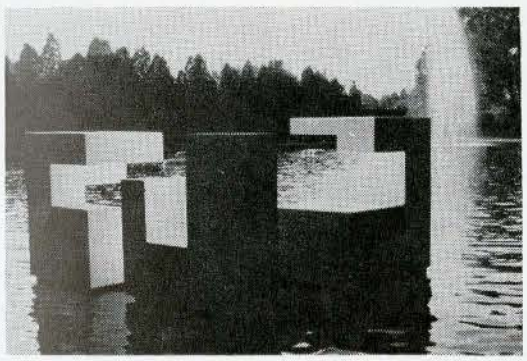

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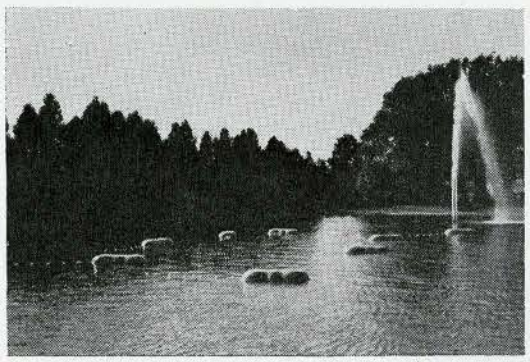

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Cleary) are more truly floating with precious wistfulness, and try more subtle competition with leaflike motion than the extraordinary drama of the intruding unnatural forms of Downing's. The prospect of placing sculpture on water is thoroughly neglected in Canada but not the USA.

The ubiquitous *Leroy* "Four Element Column" almost proves that it is a "sculpture for all occasions". It seems to accommodate itself to all the environments (where I have seen it exhibited) with visual equanimity. It is hard to believe some astute collector or gallery has not bought this quiet piece of contemporary classic form.

Other very good and subtle sculptures are overshadowed by unaccommodating exhibition space. *Guido Molinari*'s "Yellow Continuum" would be lively space modulators if they had the chance as would *Roger Paquin*'s "Canyons No. 3", truly a peripatetic grouping of "walls" inviting attention. *Arthur Handy* with a change from spheres with organic cracks to hard-edge geometry with taut slits, modestly takes a comfortable residence with formal growth. A ground sculpture such as "Guillotine" by *Serge Tousignant*, an ambiguous delight, is an idea for lobbies from which ascension and descension might give changing floor level the correct element for this kind of work. "Peronious" (*Walter Redinger*) is one of this artist's less successful works and the visceral form is most uncomfortably concluded by being pinned in awkward equilibrium on a platform of unrelated geometry. It is the sculpture of *Nobuo Kubota,* architect turned sculptor which commands attention and I long to see it incorporated in some permanent position such as a public park. This is without doubt an exciting "peoples" sculpture, inviting intimacy and collusion to move to and through its falling forms. Its vital sense of movements puts to scorn the artificial contrivance of motorized kinetics. The "spirit" of movement is at the fullest implication. Healthily this sculpture by an architect points up the very difference of sculptural architecture and architectural sculpture. The point of difference is in intention and referential matter. The aesthetic elements and means are common, the point of departure comes with intention.

The Edinburgh Festival, August 18 to Sept. 7

This exhibition, although it may not be seen by many Canadians is of the utmost importance to note. Law and Dunbar-Smith, architects for the exhibition, have been commissioned by the Canada Council to create the mood of the Canada 101 exhibition at this year's Festival – Canadian art in 1968.

The selection was made by Richard Demarco of the Richard Demarco Gallery, Edinburgh, from a group preselected by a three man committee in Canada . . . *Gilles Renault,* conservateur, Musée d'Art Contemporain, Montreal, *Doris Shadbolt*, curator, Vancouver Art Gallery and *William Withrow*, director, Art Gallery of Ontario, Toronto. These stewards have undertaken their task in a manner which makes one feel confident that Canada, from the artist's point of view, is being truly represented by contemporary creativity plus professional competence. This is enough to make this a team to be noted and remembered when government bodies or the like have need for guidance and advice. It is purely co-incidental that these people are gallery directors. Unfortunately hieratic position does not always ensure erudition, sensitivity and lack of bias. I can think of other equivalents which make me shudder. It is, in the long run, those individuals who have displayed this very necessary selective talent who must be remembered and sought out when the occasion for the ubiquitous "committee" arises. What is desirable is that any committee shall be as small as possible . . . erudite, adventurous and in empathy with each other. The risk then is minimal. There are no rules for success in these ventures only a history of successful entrepreneurs. Architects and government bodies please note.

Anita Aarons

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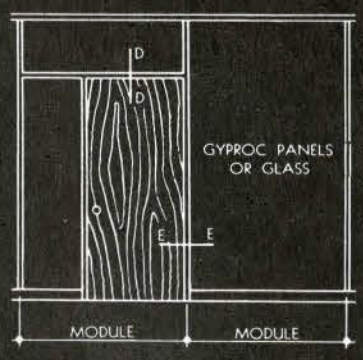

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DOMTAR

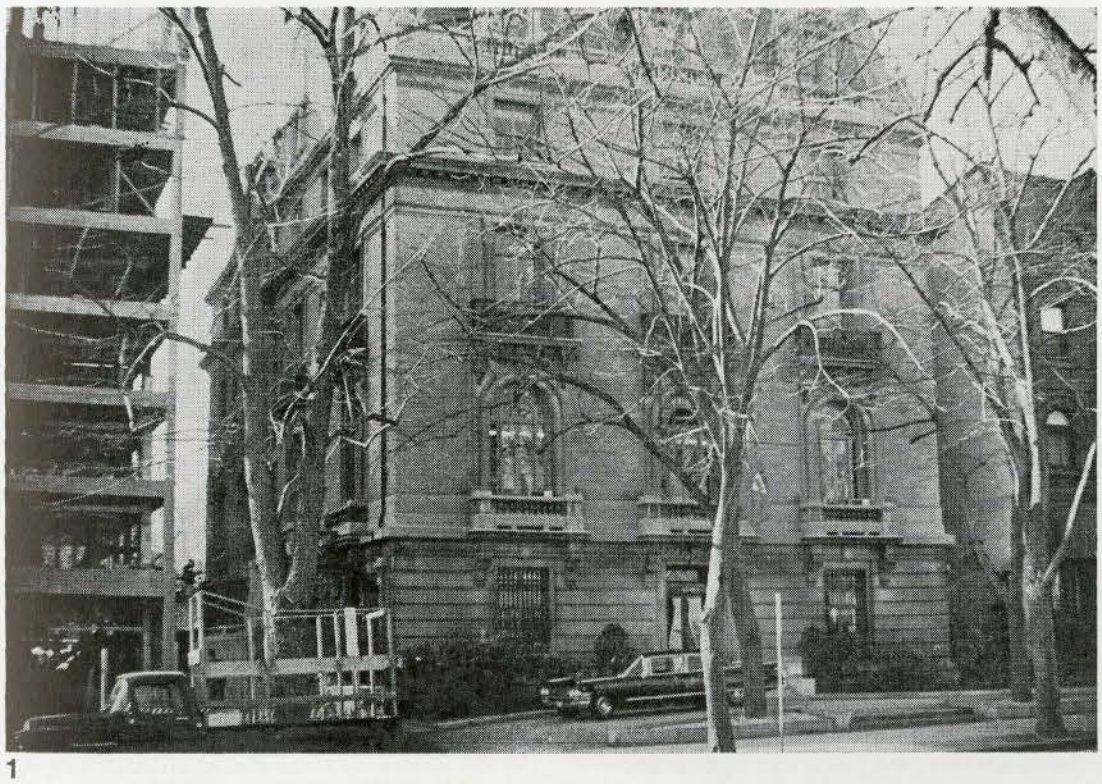
Whatever sensitivities Canada may have regarding other countries, it cannot be denied that the US is of great importance. Other countries which do not have such close ties recognize this. Evidence of this is in the time, effort, and talent put into the design and operation of their embassies in Washington. It was with great disappointment that we visited the Canadian embassy, **(1)**, shown with a 1962 Cadillac, the official limousine, in front. Surely we deserve better.

New High School complex at St. Albert, Alberta, **(2)** – the news release says . . . The architects have repeated a theme of arches throughout their design to "eliminate the monotony of forms." They have not eliminated the monotony of thought displayed by their irrelevant use.

The New Bell Canada Ottawa Building (**3**) will cover the entire block bounded by Elgin, Metcalfe, Gloucester and Nepean. It will rise 168 feet above street level, with ten floors above ground, four floors below, including seven typical office floors, one office floor, exterior promenade, one mezzanine (mechanical services) and (restaurants and cafeteria area). The floor area is about 830,000 square feet. Each of the seven typical office floors contains about 95,000 square feet and has an estimated cost of $28,000,000 (not including the cost of the land: $2,800,000). The elevators will be in two banks of four. The building is designed to accommodate about 5,900 people. Work is expected to begin late this year, for completion about mid-1970. *Architects, John B. Parkin Associates.*


3

A young Viennese graduate architect named Laurids, with his friends Zamp and Pinter (all use first names only), has formed the Haus-Rucker Company for the design and production of "devices that bring about and intensify contact between two people." The devices are, at the same time, part of the company's "mind-expanding program," which is concerned generally "with the broadening of physical and psychical capabilities." Current offerings, guaranteed to help you think better and love better, include "Balloon for Two" and "Connection-Skin." The former is a PVC shell with interior seating for two; the latter is described as the prototype of a very intimate, inflatable sphere-house. It is said to be especially useful for summer parties. Laurids, Zamp, and Pinter seem to favor an increasing obfuscation of distinctions between public and private life, for their love-protectors consist of no more than thin, transparent plastic, and, as can be seen in the accompanying photos, **(4, 5)** are intended for use in public places. By Laurid's own account, couples inside the synthetic environments are not at all disturbed by the attentions of the public eye, but those on the outside tend to feel left out, in the cold. The company's three principals take care to indicate the unprepossessing character of their inventions, noting that they can be set up at home, next to the flowers on the little end table, or over by the TV set. The Haus-Rucker (literal translation;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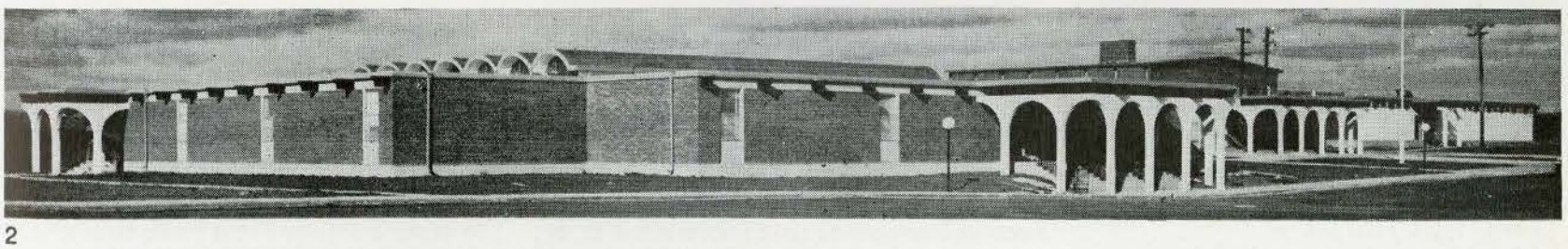
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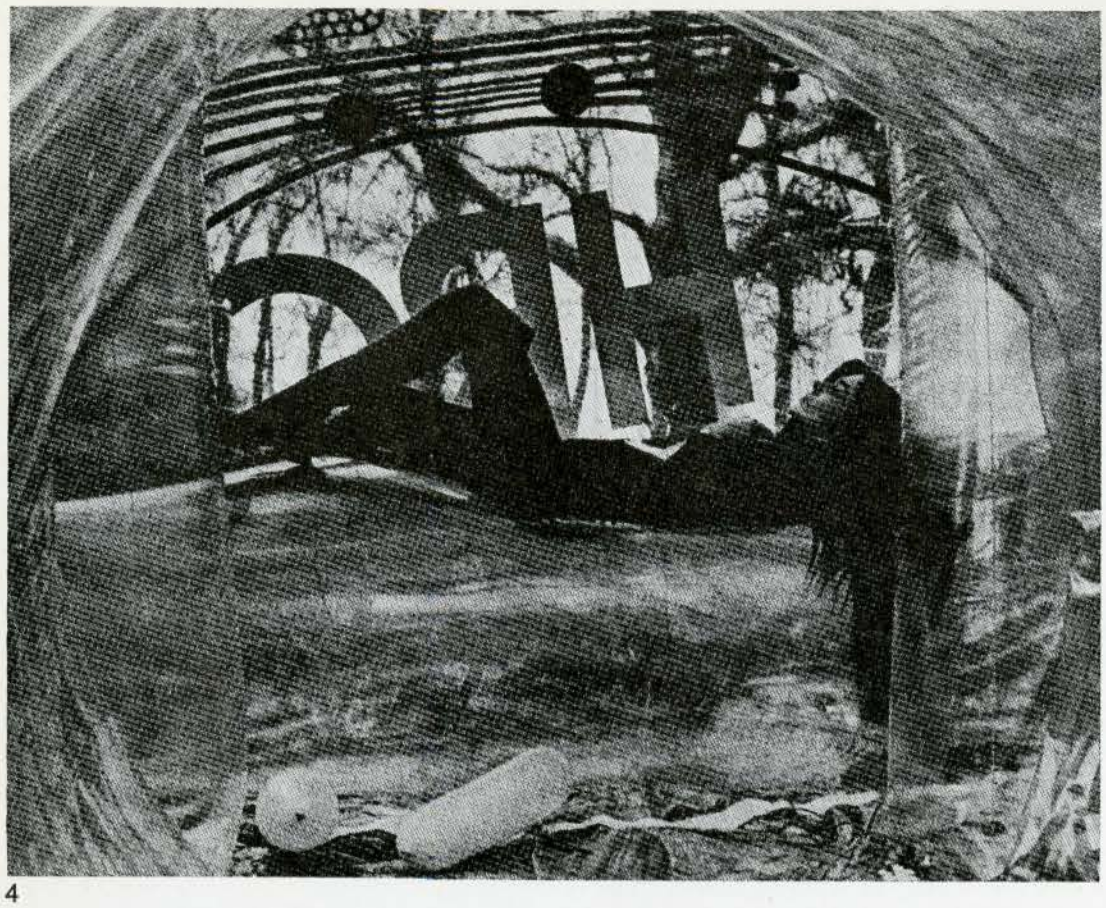
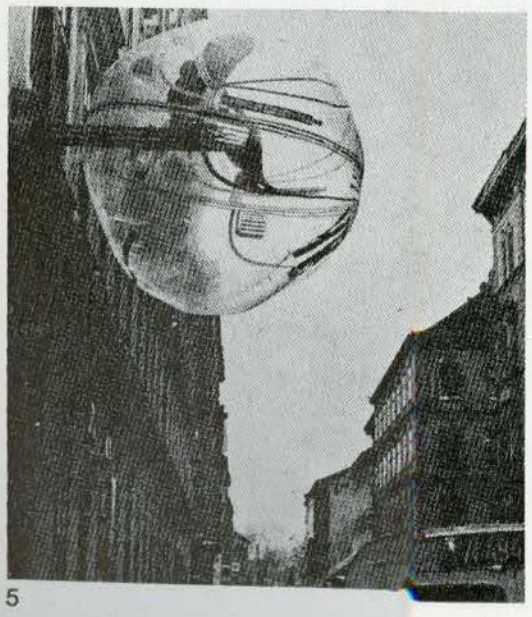


4

house-jolters) Company is not out to rock the world; it only wants to shake up a few houses. *P/A July 1968*

It's a pneu world.

Someone has said that if you want to change the system, you have to go out of the system for change. Hence our continued fascination with the relevance of the articles in the field of architecture and planning that we find in *Aviation Weekly*. The July 1 issue has an editorial that is a speech by General Bernard A. Schriever given to a conference on the urban crisis. The urban conference was significantly sponsored by North American Rockwell and System Development Corporation and George Washington University. Gen. Schriever, just as significantly, is an advisor to US Secretary Robert Weaver of the Housing and Urban Development Department.



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We publish Gen. Schriever's speech. We also publish a comment by the June *Architectural Record* on the competitive bidding proposals called by Secretary Weaver's HUD. Both these issues no longer *portend* change. They are change. King Canutes note: the implications for the AIA and the Consulting Engineers Council of bidding procedure to the ethical standards of both societies are equally relevant to the RAIC.

Aviation Week and Space Technology:

"Many people with whom I have discussed urban affairs in recent months have asked me, frankly, how a retired military officer can be so sure that he has answers to our critical and complicated urban problems. Such skepticism is justified. The average military man does not have the kinds of experiences during his career that would qualify him to deal with the difficulties that face the great cities. Certainly I don't claim to have them either. As most of you know, during my last ten years in the service, I was responsible for the management of a number of very large weapon system programs, the most important of which were intercontinental ballistic missiles. In the course of those years, I began to realize that many of the problems we faced in the Air Force in the research, development and production of our weapon systems and moving them into operational environments were similar from the management standpoint to the problems facing our cities. I also became convinced that the solutions we devised in the Air Force to our technical and management problems were applicable to the problems of our cities.

"Let me illustrate. Military weapon systems, such as intercontinental ballistic missiles, or aircraft, or ships, are large, costly, and complex. To manage a weapon system program of that type, one must use a systems approach. That is to say, the manager must deal with all the major parts of the weapon system in a unified plan. Engines, ordnance, maintenance facilities, personnel training, and so forth, must be studied by themselves. But each of these parts or subsystems must also be considered in its relationship to all others. There must be a time schedule, a management plan, a financial plan.

"A recent systems analysis of one American city revealed that it had 130 subsystems, including water, sewerage, transportation, education, law enforcement, housing, recreation, industry, and so on. If one is concerned with the rehabilitation of that city, he must consider how each of those subsystems interact with the other subsystems.

"There are many examples of cities which have tried a piecemeal approach to redevelopment, rather than a systems approach – that is, they have worked on one subsystem at a time. Some cities, for example, have built new transportation systems or new low-cost housing, without considering the effects of those projects on the other subsystems that make up the total city system. The result of these piecemeal efforts have often been the creation of more problems than have been solved.

"A systems approach to the rehabilitation of a city means planning not only on a broad scale, but over a long time period. It means multi-year programs in which all of the many individual projects and activities are scheduled. Not only must the projects and activities be scheduled over a number of years, but so must the funds or at least funds must be identified. In some cases, the availability of funds will be the controlling factor in a total city-program schedule. In the Armed Forces, we are never sure from year to year exactly what funds the Congress will approve. But at the Dept. of Defense level, we try to work out funding plans for major weapon system programs on the basis of a five year projection. In the case of a rehabilitation program for a city, the program may very well cover a 10-15 year span or even more.

"In dealing with our large weapon systems programs, I also learned that there must be more than just systems planning and systems programs. There must be a strong management authority as well to direct the long and complicated programs through to completion.

"In the case of United States cities, there is a need for a unified management and planning authority. At present our cities do not have a single political authority able to commit the cities and the adjacent areas to long-range programs of rehabilitation. To use my word of a moment ago, authority is fragmented.

"To make a change in the basic structure of our cities will require cooperation between the cities and the suburbs. And it will require a regional planning authority. It cannot be

done with fragmented authority.

"When someone mentions a regional planning authority, there is usually an immediate defensive reaction. It's that old fear of central planning. As I see it, a regional planning authority need not diminish the existing powers of either the city or suburban governments. It certainly would not require the formal incorporation of the suburbs into the cities. The planning authority would be a representative and cooperative body, created to deal only with those activities everyone agreed upon as necessary and beneficial to the entire area.

"Another of the problems we faced when we began to work on the ballistic missile system was an inability to get rapid decisions out of the Dept. of Defense. The difficulty was that there were many different offices in the Pentagon all concerned in some way with our ballistic missiles.
In the early days, I would send a paper over for a decision and it would go from office to office. All kinds of people would comment on it. But getting them all to say "yes" was very nearly impossible. This was another case of fragmented authority.

"The solution was a decision-making committee, composed of men from all the responsible offices. When a decision was needed, the committee was convened.
We didn't leave that room until a decision was made. All the indians fumed and stewed, but we worked out the details later.

"Today, at the federal level, there is also fragmentation of authority relative to urban problems. When major programs are created in the future to rehabilitate our cities, we will need a means for rapid and centralized decision-making. The arrangement may not be identical with the one worked out in the Dept. of Defense. But, I think it would have to be similar to it in principle." □

Architectural Record:

"Echoes of the still-rumbling confrontation between architectural and engineering professional groups and Federal A/E contracting procedures (which GAO and some agencies still say call for price bids on A/E design contracts) sounded a new note of alarm in April. The Department of Housing and Urban Development announced a basic change in its research and development procedures calling for competitive bidding on proposals prepared by the Department.

"AIA, CEC and others thereupon took another hard look at what this means to professions – not to question established ethical standards against price bidding for A/E commissions – but to assess the long-range implications of the 'R&D' label increasingly applied to government consulting work. Many A/E firms qualify to do the work; but the fee structures for this work and the emergence of other kinds of qualified organizations with different acquisition practices are outside the professional climate in which existing statements of ethical standards for design work evolved.

"First of the HUD proposals was to enlist a wide variety of talent in examination of problems attending the 'In-City' objective of providiing some 6,000,000 low-cost dwelling units in the next decade. A full spectrum of concerned organizations (including architects, engineers, consultants and some manufacturer-developer corporations) was asked to bid on investigating, reporting and prescribing (but not 'designing') modes of exploiting existing opportunities for, and obstacles to, rapid introduction of innovative low-cost housing into specific Model Cities – about 20 cities per contract in this first-phase inquiry.

"Out of 19 responding organizations, among whom were several architectural firms, HUD chose three to conduct the first phase of the project. They are: Abt Associates, Inc., in joint venture with Daniel, Mann, Johnson and Mendenhall; Building Systems Development, Inc.; and Westinghouse Electric Corp. Each was to submit proposals on about 20 cities by June 15. The three were chosen, according to HUD, to demonstrate effectiveness of three quite different approaches emphasizing 1) programming and design, 2) management and citizen participation, and 3) fabrication techniques, respectively, in order of contractors named.

"Both AIA and CEC took note of the implications of the bidding procedure in relation to the ethical stands of both societies against competitive bidding on professional design commissions. While AIA had taken no formal action at press-time, it was certain to be a subject for close examination at upcoming meetings.
The Consulting Engineers Council, at their New York meeting in May, issued a policy statement derived from discussions of the HUD incident but making no direct reference to the HUD program. The CEC statement said in part: 'Consulting Engineers Council/US reaffirms to any possible client be it governmental, civic, industrial, political or private, that any price competition solicitation of services of any nature to a derivative member-at-large, of Consulting Engineers Council/US or to any of its association members is against the best interests of its clients; and any class of member who responds to such a solicitation is in a position to be deprived of his membership in CEC/US.'

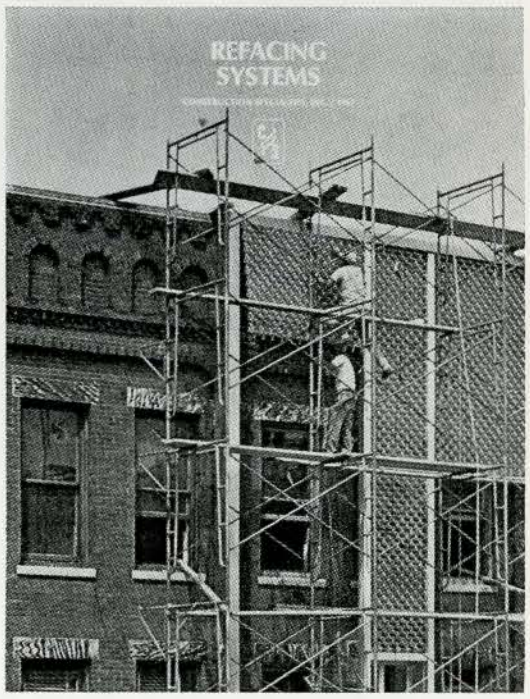
"Expulsion from CEC for competing on 'service of any nature' seems to close the door to the possibility of redefining some classifications of professional work to allow engineers and architects to engage in "research and development" under the somewhat different ethical regulations applying in that field.
For architects, whose opportunities in expanded services are likely to raise many such questions, the ethical posture is not so simply assumed. It is fairly common experience to mention costs of services in many preliminary discussions of work.
The nature of these first-phase HUD contracts is such that budgets to finance investigation can conceivably be defined without putting architects in direct competition on price. In any case, some would hold that research and development is not a design service and, therefore, can be performed in a different ethical climate.

"Competing on price is one thing. Competing for ideas is another. As one architect observes, architects are increasingly called upon for ideas and proposals preliminary to granting of commissions. The HUD program underscores the scale of work that is rapidly emerging in such proposals. Professional firms are finding out that the cost of preparing analyses and presentations on speculation at this new scale calls for reassessment of the whole procedure – whether on ethical grounds or any other.

"Another aspect of the proliferation of professional problems is the entrance of non-architectural firms into design fields by way of this federal proclivity for designating many of their current proposals as research and development. Westinghouse, for example, already deeply committed in urban development through various subsidiaries, has set up a new company to carry out all phases of urban renewal projects to provide low income housing. Under the name Urban Systems Development Corporation, the subsidiary will have headquarters in Washington with objectives to 'develop, build and sell low income housing in Federal supported programs and to build, rehabilitate, operate or manage urban projects.' Another development that seems to indicate one direction of Westinghouse's pursuit is their recent commissioning of American Plywood Association Research Laboratories as consultants in the In-City program." □

A.J.D. and B.M.

Outrage.



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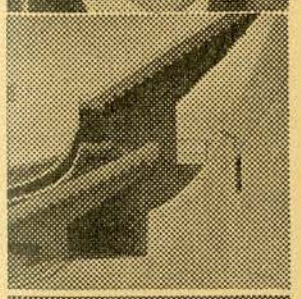

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Le Stade de l'Expo – Rétrospective
Victor Prus

Malgré le succès architectonique et physique du stade de l'Expo, M. Prus, son créateur, fait quelques réserves concernant son succès psychologique dû, il pense, au concept hors tout dictant les termes de référence. Il aurait préféré une ambiance de gaité comme on en trouve dans les petits stades européens au lieu d'un stade calculé à produire de gros revenus. L'insuccès financier sortait non du dessin du stade mais des coûts élevés, de la qualité des spectacles, du mauvais temps, de l'insistance sur les facilités pour le public et la presse au lieu d'accentuer une qualité d'amusement pur et simple. L'architecture devrait donner une forme appropriée à un contexte valide. Un spectacle populaire, simplement présenté à peu de frais et souvent spontanément, est considéré non-professionnel. Alors, les entrepreneurs ont demandé un stade "comme il faut" calculé à donner au spectateur l'impression qi'il obtient le plus possible pour son argent. Selon Prus, tous les spectacles ont été présentés sans imagination et n'ont pas profité des installations à leur disposition. Il n'y a pas eu au début ni à l'achèvement l'opportunité de consulter les metteurs en scène – fait qui aurait pu changer la présentation – ni même les concessionnaires. Autre ambiguite-l'avenir du stade n'était pas décidé – on lui a demandé de construire un stade "provisoire-permanent"! – Directive qui a frustré son premier concept d'un bol élliptique entouré d'une butte en terre. Le compromis était de préserver l'idée d'un cratère avec le bord du stade à mi-niveau – une vallée verte avec gradins en pseudo-rocher perchés sur le rebord, les "canons" entre les gradins servant d' accès et donnant une vue de la ville. Les pentes vertes sont devenues du béton pour des raisons technologiques et logistiques, mais l'idée a duré. Contre son gré, le plus grand accès a été créé par l'ommission du 20ème gradin (erreur architecturale) et une gigantesque structure laide construite pour empêcher la vue du dehors et pour fournir un arrière plan pour les spectacles, les entrées et sorties des participants. Officiellement, le stade a réussi. Les gradins, raccordés par une promenade élliptique ont présenté une solution simple et rationelle. Circulation, visibilité, éclairage et acoustique ont tous réussi. Mais le manque de dialogue entre client et architecte doit nous prévenir lorsqu'on dessinera les stades de l'avenir.

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Assemblée de l'IRAC
à Regina

Qui peut présenter au public un commentaire renseigné sur l'architecture et comment le diffuser? La discussion sur les moyens de faire parvenir au public les critiques valables sur l'architecture, l'urbanisme et la planification par la presse, la TV, les magazines et la radio, a été un des meilleurs moments de l'Assemblée annuelle de l'IRAC à Regina. Le jury, composé de trois journalistes, a survécu deux heures de questions au sujet de la critique de l'architecture; la question des crédits qui ne sont jamais publiés; et qui doit faire le premier reportage, le journaliste ou l'architecte. Le rôle désigné au journaliste est celui de présenter l'expert au public. Wolf von Eckhardt du Washington Post a ouvert la discussion en disant que le public se souciait de plus en plus de son environnement mais sans commentaires de la presse, il était difficile d'influencer l'opinion publique. Il incombait donc aux organes de publicité de fournir les commentaires et critiques intelligents puisque l'expert a perdu son pouvoir de communiquer sa politique et ses buts au public.

Peter McLintock du Winnipeg Free Press, fit remarquer le peu de commentaire architectural dans la presse canadienne – manque de tradition, manque d'éxpérience des reporteurs. Il donna l'opinion que la profession devait aider le journaliste à obtenir les connaissances nécessaires.

Kenneth B. Smith du "Report on Business" du *Globe and Mail,* a signalé qu'il s'est efforcé depuis des années d'encourager l'architecte à parler au public. L'attitude du "Public Relations" ne suffit pas et l'architecte local doit s'identifier avec les leaders qui essayent de résoudre les problèmes de la communauté. Ils devraient exprimer leurs buts dans le développement

de la communauté. Vancouver a fourni des conseils depuis 10 ans aux urbanistes civiques. (Aucune mention des efforts publics répétés des manitobains peut convaincre les gouvernements d'agir au sujet du centre Winnipeg avant qu'il ne soit trop tard.)
Un moyen pour l'architecte de contribuer à la meilleure compréhension des problèmes de l'environnement urbain est d'établir des contacts professionels avec les éditeurs sans que les architectes proéminents tiennent trop d'influence.

La profession a été critiquée pour son silence au sujet de projets mal cançus. Walter Bowker a proposé un programme organisé, déstiné à aider les reporteurs et journalistes à acquérir les connaissances nécessaires à la compréhension de l'architecture, du dessin civique et de la planification, subventionné peut-être par l'IRAC et le Conseil canadien – un voyage de travail à travers le Canada pour montrer la construction actuelle, par exemple. M. McLintock ainsi que M. Smith pensaient que leurs journaux et d'autres s'intéresseraient à un tel projet afin de provoquer une discussion publique sur l'environnement canadien.

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Nouvelle perspective sur le logement urbain au Canada. Deuxième partie
Anthony J. M. Collins, FRICS, AIArb.

Une solution partielle à la crise du logement a été proposée dans la première partie de cette étude. Nous allons examiner quelques uns des systèmes mentionnés et surtout les composants structuraux.

Une des solutions est de fabriquer en usine les composants verticaux seulement, les dalles de plancher et de plafond étant coulées sur place. Voir un exemple en Angleterre (Fig. 1) par le Cubitts Construction Systems Ltd. Les murs préfabriqués sont mis en place par grue sur les fondations coulées sur chantier. L'acier d'armature incorporant les serpentins de chauffage est préfabriqué dans les filets au sol et hissé par grue sur les coffrages suspendus des dalles (Fig. 2). Les avantages: l'uniformité des surcharges, la distribution des tolérances de montage à chaque niveau; économies en acier; omission des joints flexibles entre unités de service; adaptation facile aux variations en forme et l'élimination du transport des éléments du plancher (probablement les plus lourds).

Les systèmes employant les composants les plus connus entièrement fabriqués en usine sont les systèmes "Jespersen", "Skanska", "Ohlesson & Skarne", "Malmstrom" et "Larsen & Nielsen".

Tous ces systèmes exigent le plus grand degré de mécanisation, de coordination de livraison et montage sur chantier et sont basés sur un marché continu garanti qui fournit les fonds nécessaires à l'usine de fabrication d'éléments en béton. Figs. 3 & 4 montrent la fabrication des unités murales, leur livraison et montage sur chantier (Gladsaxe, Danemark – 1921 logements complétés en 1966). Afin de réussir au Canada un tel système doit avoir une demande garantie. Dans les grandes villes, les entreprises privées sont capables de garantir 6,000 appartements pendant trois ans sans aide gouvernementale. Une usine centrale entre Montréal et Toronto semble praticable si les besoins des deux centres peuvent être coordonnés; elle pourrait desservir d'autres villes au Québec et en Ontario (Voir Morris Walk, Angleterre, AC. juillet, 1968).

Un procédé entièrement différent et peut-être le meilleur pour le Canada est la construction sur chantier de l'usine employant des bâtiments temporaires portatifs. Wates Ltd., d'Angleterre, qui a développé ce système exclusif dit qu'une telle dépense sur chantier est justifiée (Fig. 6,7) pour un minimum de 250 logements ($3.5 à $4 millions) et que les conditions climatiques ne posent pas de problèmes. Plusieurs villes canadiennes d'environ 100,000 environ pourraient garantir un tel minimum.
Mais, on pourrait se demander, quel est le rôle de l'architecte dans la construction en série? Tout d'abord, ces systèmes ne veulent pas dire automatiquement une série de pâtés de maisons identiques telles qu'à Moscou. Au contraire, ces techniques d'éléments de construction fabriqués en usine se prêtent à une très grande variété de dessins, donc, le rôle de l'architecte doit être toujours très important de trois points de vue: le dessin du logement individuel dans le contexte du bâtiment basé sur le catalogue standard d'unités de base et son rapport aux autres; l'aménagement du site; le dessin des façades. Fig. 8 indique les aménagements à Gladsaxe employant des unités fabriquées pour Jespersen.
Les usines centrales tendent à fabriquer des modules plus petits à cause des problèmes de transport pendant que les usines sur chantier peuvent fabriquer des modules appropriés aux sites individuels. Entre ces limites, l'architecte dessine ses plans basés sur des modules de base mais en pratique il existe peu de limitations. Les plans d'emplacement sont les mêmes que pour les projets traditionnels ainsi que pour les facilités requises. Ces systèmes permettent les charges portées sur des cloisons intérieures laissant l'élévation extérieure libre à l'imagination de l'architecte (Fig. 10). L'architecte joue alors un rôle très important dans le dessin des façades appropriées aux matériaux et goûts locaux. Ces façades doivent être toujours conçues comme composants elles-mêmes puisqu'elles sont également prèfabriquées (Figs. 11 & 12).
La grue est un facteur primordial dans le succès de ces techniques et l'architecte devrait soigneusement considérer les exigences de l'emplacement afin de permettre l'accès des grues sur rails. Il est donc clair que la responsabilité de l'architecte est d'adapter ses techniques de dessin aux techniques de construction du système de production en série. L'architecte paysagiste y joue un rôle également important.

Quant aux intérieurs, leur adaptation aux méthodes de production en série est également éssentielle bien que quelques corps de métier travailleront sans préfabrication. Mais les systèmes de plâtrage et de cloisons sèches sont totalement élmininés. En Europe, les murs reçoivent une finition en papier peint directement sur le béton. Les plafonds sont finis au pistolet. La plomberie est préfabriquée et quelquefois même les salles de bains et le chauffage. Les travaux sur chantier consistent en raccordements flexibles et enfiletage.

La production en volume est la condition préalable de ces systèmes de construction, condition facile à réaliser avec la coopération entre gouvernements et particuliers. La clientèle ne manque pas! Nous avons vingt ans de retard sur l'Europe. L'architecte doit prendre les devants pour résoudre un des problèmes sociaux les plus critiques au Canada.

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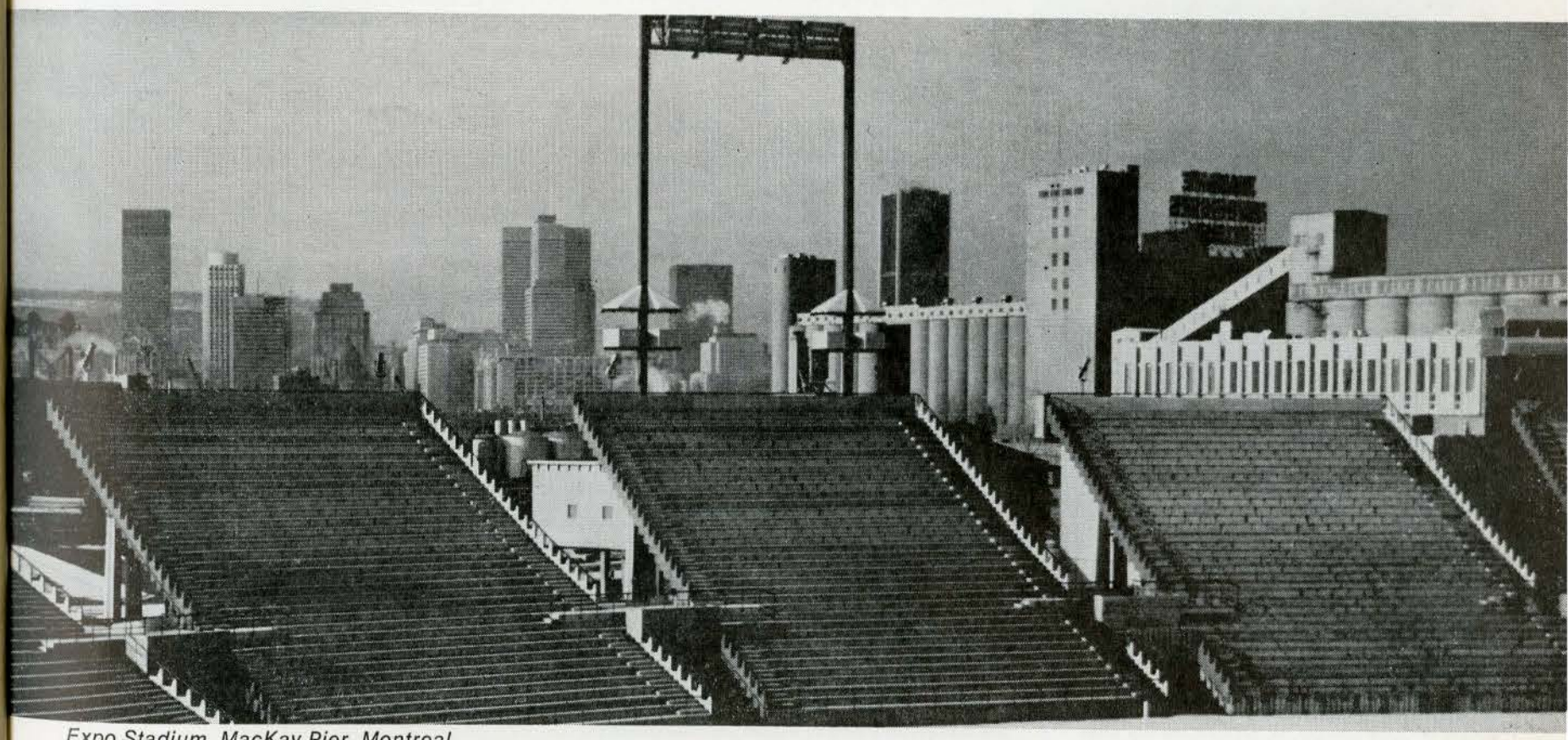
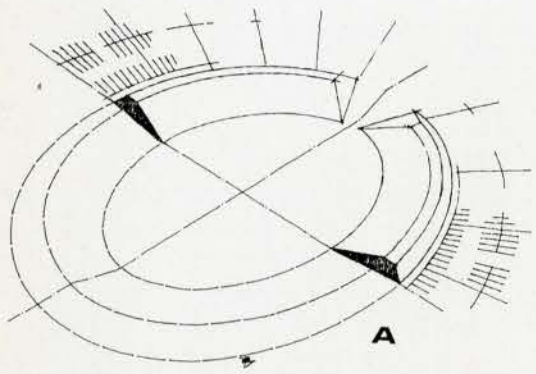
Nouvelles Technologies et Techniques dans la Pratique de l'Architecture
C. H. Wheeler, Jr.

A l'assemblée de l'IRAC à Regina en mai 1968, le Professeur C.H. Wheeler a décrit les technologies et techniques qui vraisemblablement changeront la profession.
Deux des trois études du Professeur à ce sujet ont déjà été publiées. Il dit que notre époque fournit à l'architecte des opportunés inouïes.
Ces technologies sont basées sur l'électronique, la photographie, l'imprimerie et la télévision. L'application de ces techniques n'est pas facile; il y en a cinq étapes: 1. Definition du problème; 2. procédures; 3. standardisation; 4. systématisation; 5. automatisation. L'usage combiné de ces techniques sera le vrai défi pour l'architecte. Le professeur croit que les firmes qui vont réussir, seront celles qui continuent à pratiquer l'art de construire avec compétence et sensibilité tout en employant les techniques scientifiques et les méthodes d'administration bien fondées. Comme résultat de ses recherches et de ses visites à plus de 75 architectes, voici quelques conclusions du professeur à propos de l'avenir de l'architecture: l'amalgamation de plusieurs firmes; l'amalgamation des ressources; la création d'un centre national pour la distribution de normes et de spécifications sur rubans magnétiques; l'amalgamation des firmes d'architectes et d'ingénieurs; la creation d'un département de "Programmation architecturale". Le professeur suggère la création (A) de Centres de Services Techniques fournissant les services d'ordinateurs, microfilms, renseignements et tous les services en dehors des moyens d'une firme moyenne et (B) d'un Centre de Services fournissant la compatabilité, le reportage de statistiques et tous les services d'administration. Il croit que chaque firme d'architectes sera obligée d'employer un spécialiste pour profiter des techniques nouvelles de la pratique professionnelle.

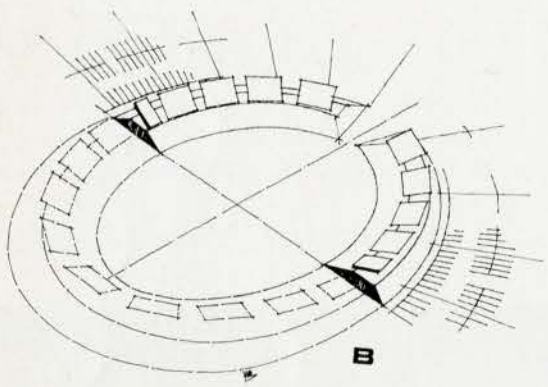


Expo Stadium, MacKay Pier, Montreal
Architects Victor Prus and M. Desnoyers

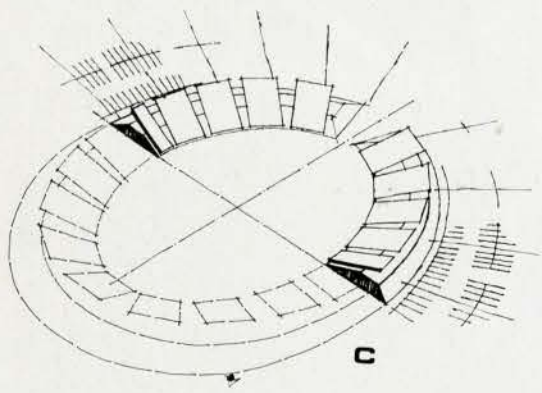
The Expo Stadium in Retrospect



First phase – excavation and sloping bank used as bleachers. Not taking into account the water table. Access from the top only.



Second phase – excavation reduced to the minimum with partial use of prefabricated bleachers. Water table level taken into account and access to bleachers via elevated vomitorium



Third phase – excavation reduced to minimum with full use of prefabricated bleachers. Water table level taken into account and access to bleachers via elevated vomitorium

I remember watching, in a provincial European town, many years ago, a historic pageant staged in a natural valley surrounded by grass-covered hills on which townspeople deployed themselves in family groups in a spontaneous if somewhat chaotic manner. A child of ten, credulous and unsceptical, I was thrilled to the bone by the great spectacle unfolding before me. Sitting on the grass and popping up and down and running here and there, the better to see, I felt intensely involved in the action performed with more bravura than skill by the local cavalry regiment.

It was a great occasion and its memory haunts me even now as I look back, with mixed feelings, at the Expo Stadium, a product of my own work and effort. For, even if, as a physical fact, the stadium has received some praise for its architectonic face I have a feeling of uneasiness about its performance as a psychological fact.
This is not entirely due to the architectural concept which, after all, was an attempt to interpret the given terms of reference.
More significantiy, it is due, I think, to the overall concept which dictated those terms of reference.

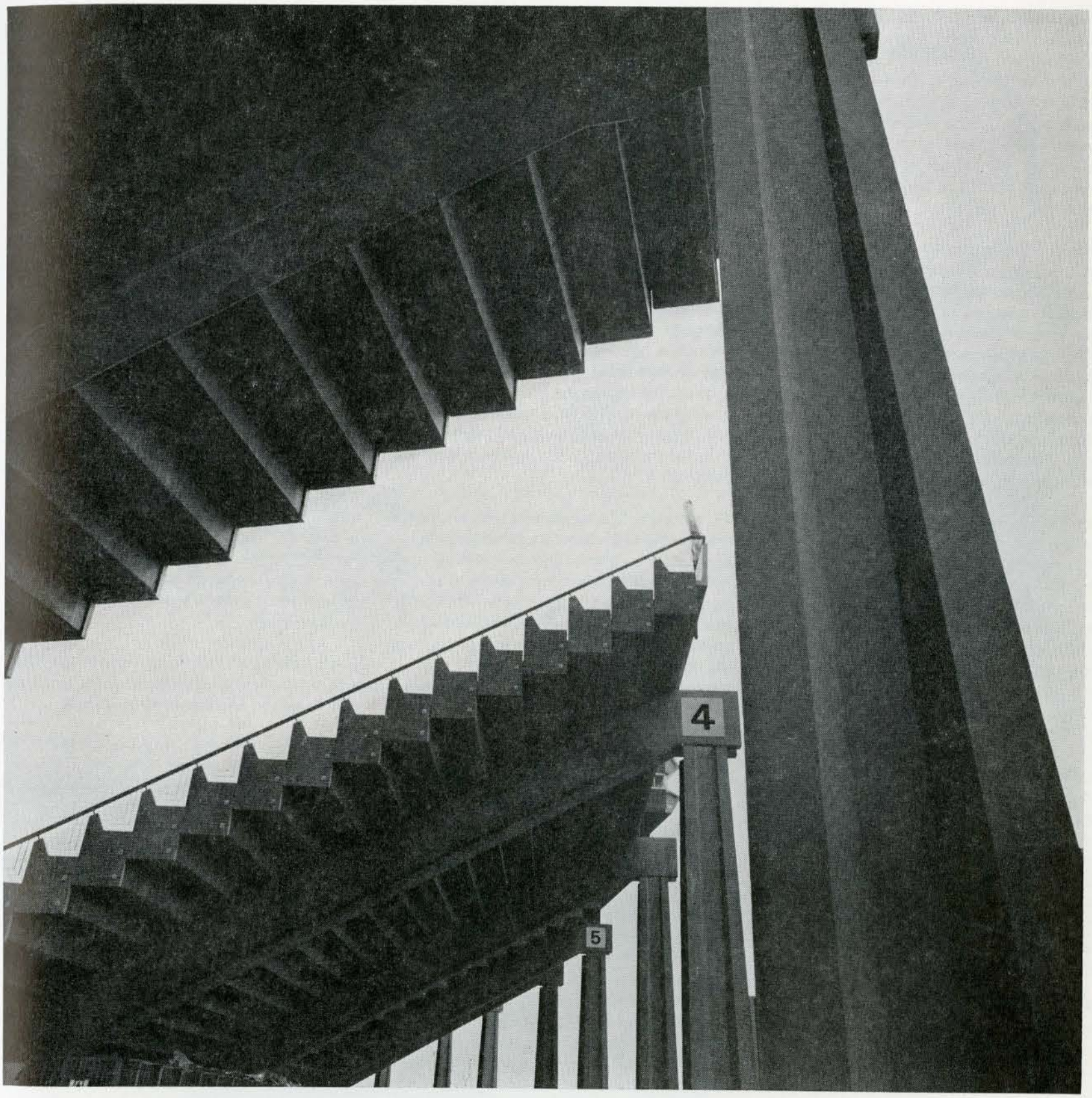
A legacy of previous fairs, a traditional exhibition fixture, the stadium was hopefully, if vaguely thought to be a good source of revenue; a hope largely frustrated, as it happened, by high costs, inclement weather, plain surfeit and, I suspect, quality and choice of spectacles. It was perhaps this emphasis on profitability, with its climate of commercial ethics of giving the customer full value for his money that proved its own undoing by insistence on an elaborate program of crowd control and spectators' comfort visibility and acoustics, light and sound control, mechanical and electrical systems, special press, radio and television facilities and the like. What was really wanted was a lot of noisy, rumbustious, infectious fun that could be had in a little valley surrounded by little hills, all artificially bulldozed for a fraction of the cost.

This may sound like a case against architecture but it is made out of concern for validity of context to which architecture must be given appropriate form.
Somehow the art of holding a rousing popular spectacle simply and cheaply and often spontaneously is considered on this continent as being beneath the professional concern of show business. And so, I suppose, the showman demanded a "proper" stadium with all trimmings calculated to give the impression that the customer is indeed given value for his money. But in my view, all spectacles, to a varying degree but without exception, were indifferently if pretentiously produced. The staging was largely unimaginative in the use of the elaborate facilities and the peculiarities of the setting.

A dialogue with the showman might have helped matters but, at the planning stage it was impossible. The shows had not been booked. There existed only a vague plan of staging some spectaculars and some sports events. Later programs developed without our participation and we had no say in the preparation of the shows even though we had plenty of things to say. Particularly as the early completion of the stadium, nine months before the opening of the Expo, afforded valuable feedbacks for the mise-en-scène of the shows.

Much the same was the story of the food concessions. These, as well as the restrooms were to be deployed along the broad promenade surrounding the stadium.
It is a rowdy, frantic industry probably best left alone to its highly individualistic devices. But there is a difference between the Italian gelateria on wheels, much loved and cared for by its proud owner, and the hastily improvised, shacky fly-by-night North American hot dog stand. So I thought that a few old disused railway cars lifted off their wheels, painted gaily and planted along the promenade would settle the dilemma between order and laissez-faire. But by the time the concessionaires were contracted, it was too late for that idea. Harassed by all concerned, Expo finally had to construct concession shacks in a most unsatisfactory and half-hearted way.

Expo Stadium, an assembly of 18 loosely connected segments each consisting of three precast concrete elements: columns, prestressed beams and prestressed seat rows
Le Stade Expo est un assemblage de 19 segments vaguement reliés. Chaque segment se compose de trois éléments préfabriqués, de poteaux, poutres et rangées de sièges en béton précontraint



To the doubts and ambiguities of "what it was to do" and "how it was to be used" was added another uncertainty. For a reason that is as mysterious as it is frequent in our public life the post-exhibition future of the stadium could not be determined. Our instructions were to design a "temporary-permanent" (sic) structure that could be dismantled after Expo and re-erected elsewhere.

This directive frustrated our very first concept: that of a crater, an elliptic bowl surrounded by an earth mound. Spectators would circulate on its rim and descent to their seats on the inner slope. Though I mourn this concept, my elegy is not altogether frank for the very high water table and shortage of earth fill (depleted in the course of making new islands in the river) would have made it impossible. But I still think that this topologic, landscape approach to the problem of multi-purpose stadia is a correct one.

The "permanent" concept so disposed of and the "temporary" one, of scaffold tubing and wood planks, rejected on the grounds of doubtful economics and public safety, I tried hard to salvage what I could of the "crater" idea with the rim at mid height of the seating incline. It was to be a green valley, a green crater with rock-like bleachers perched on its rim. The canyons between them were for access and to enable the spectators, many new to Montreal, to see glimpses of the City and the Expo islands. Although the green slopes became hard concrete for technical and logistic reasons, the idea still stands. The seating segments, the nineteen identical bleachers, sized for 40 eighteen inch seats between aisles, could be grouped in any plan configuration. Their few structural components: columns, beams and seat rows of precast and prestressed concrete were designed in strict interpretation of optimum structural behavior.

My canyons, the gaps between bleachers met with much opposition. True, they were the traditional vomitoria but, it was argued, they were oversize and so a waste of valuable seating. They restricted the sense of togetherness and detracted attention from the show, it was pointed out. This last argument distressed me for I had thought that they offered an unusual opportunity for imaginative mise-en-scène and a challenge to the wits of the show director. They were never so used and now that the stadium is to be enlarged they will disappear.

The largest of these gaps was made by omitting the 20th bleacher at the end nearest Place d'Acceuil. This was an architectonic error to which I admit with a mixed feeling of guilt and resentment. For if the missing tooth spoiled the classic unity of the ensemble it opened the field – stage towards the entrance in a gesture of welcome. The gesture was futile, however, for a gigantic structure, ugly beyond belief, was built there by the showmen to screen the show from free-loading peepers and to provide a suitable backdrop to the spectacle and thank goodness the darned architect had provided space for it.

This was also the location of the performers entry to the field stage: a vomitorium high enough for elephants and their mahout and wide enough for mass movements to and from the acting area. Sean Kenny thought it was a mistake: the movement should be unidirectional: in at one end and out through the other. This may be true but I did enjoy the extraordinary richness and complexity of the kinetic pattern made by incoming and outgoing massed bands during the great tattoo. There were simply twice as many performers in the field at any given time. This tumultuous magic deepened at night when it was further enriched by the City and Expo lights visible through the gaps between the bleachers.

Within the official terms of reference the stadium worked well. The simple arrangement of bleachers linked by an eliptical promenade at the rim of the mound was legible and made easy the problems of orientation and circulation of crowds. The spectators, seated in rows spaced a few inches wider than in other stadia were reasonably comfortable. The bleachers, angled for single row vision aimed at the near edge of the field, afforded good visibility. The xenon field lighting coherently grouped on four supports was well distributed and gave good color rendition. The numerous loud speakers mounted at the rear of the bleachers emitted intelligible sound without interference.

Some critics felt that it was not enough to see and hear well if it came to rain, that the stadium should have been enclosed. This proves my point for, clearly, there are two ways to choose from: either a permanent, year-round stadium, large and profit oriented for sports and elaborate spectacles or a simple landscape arrangement for general fun. Any palliative is open to question.

I cannot help feeling that there is a note of warning if not of general alarm in the story of the Expo Stadium for it is typical of the processes conditioning our environment. In the present methodology either openly authoritarian, when directives are handed down to be followed without question, or bureaucratic, whose hierarchic structure, ambition and suspicion ridden, makes work in committee unrealistic, there is no room for true "threshing-out" of problems in synergistic manner among generalists – specialists at a round table, or preferably, no table at all.

Such a dialogue, I feel sure, would have had a salutary effect on both the way the stadium was designed and the way it was used.

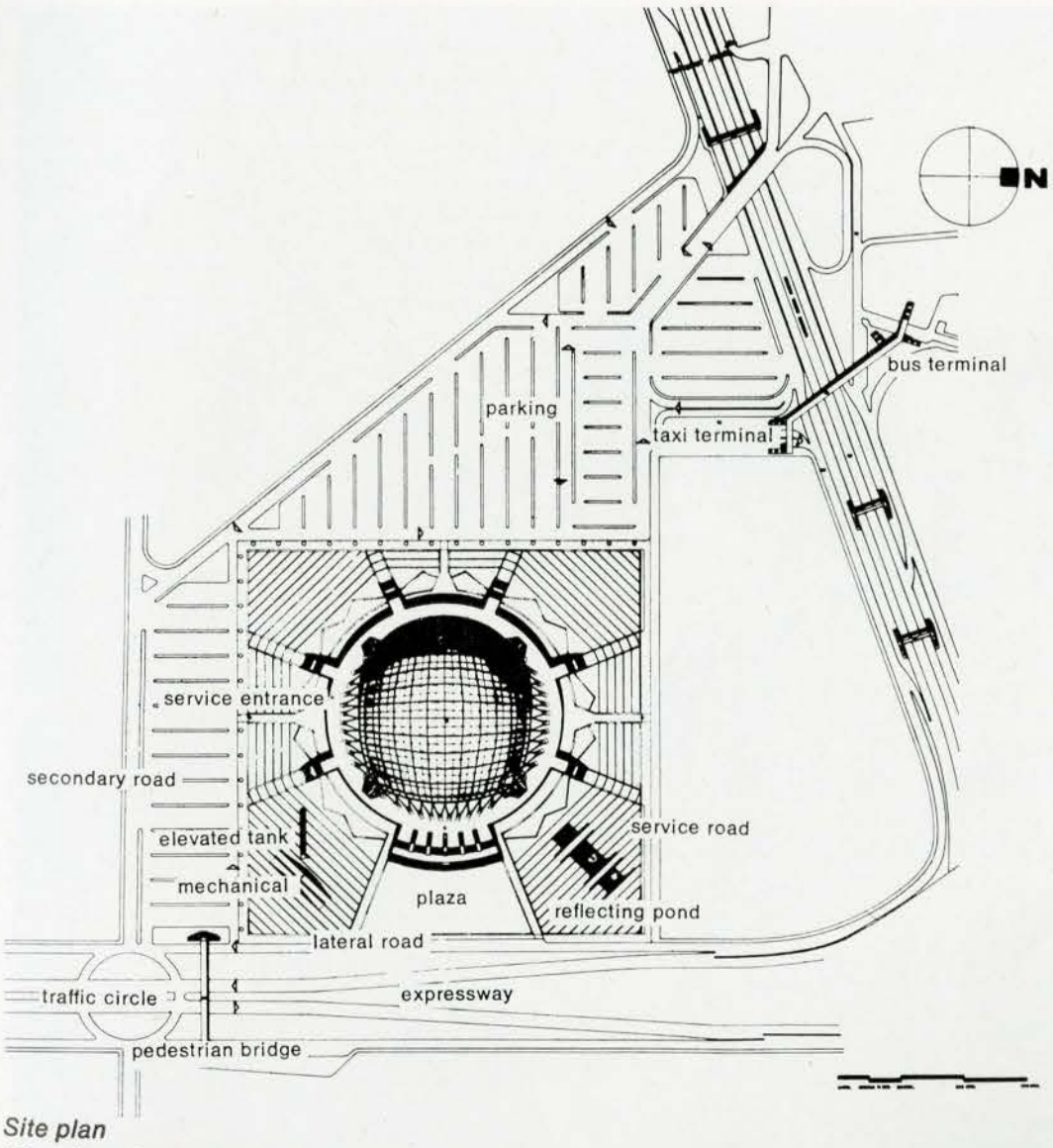
If the form is to fit the context surely the context must support the form; and it is the working of this intricate symbiotic relationship that the validity of architecture is revealed. □

Victor Prus

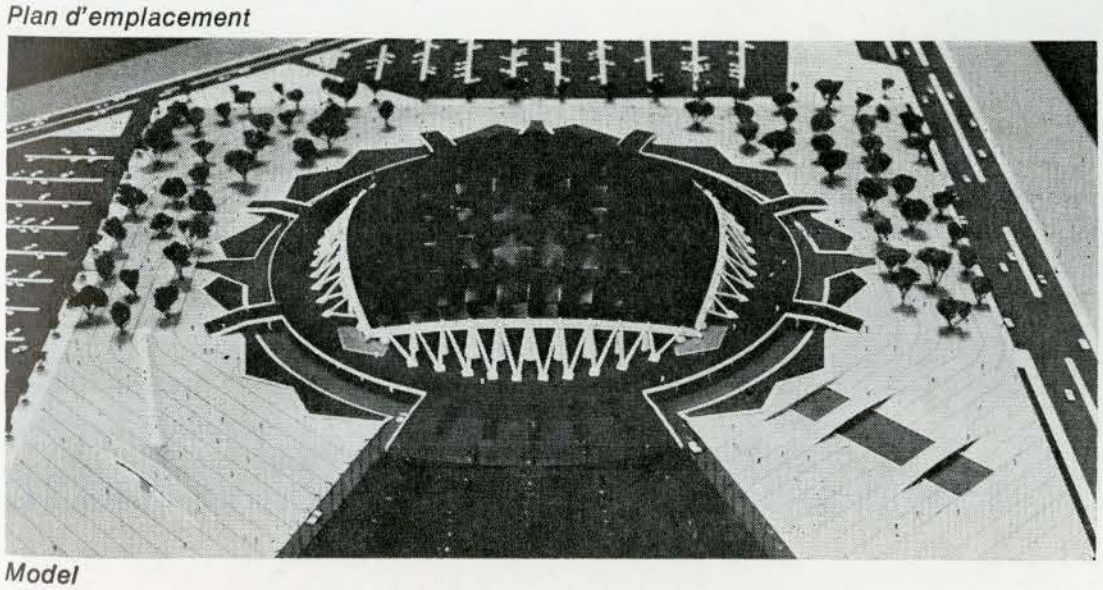
Palacio de los Deportes
19th Olympic Games, Mexico

Architects, Félix Candela, Antonio Peyri, and Enrique Castañenda Tamborrel

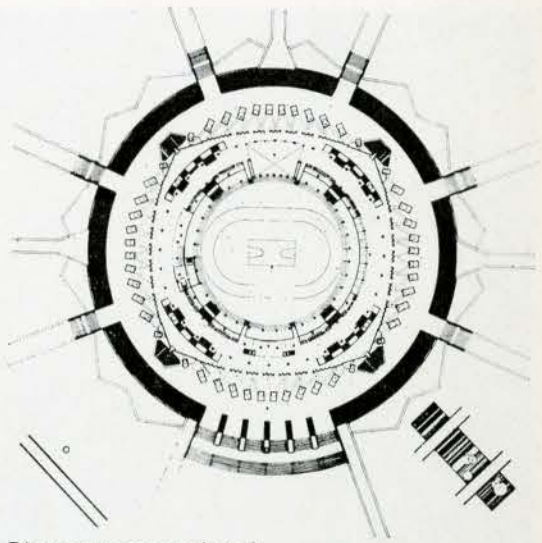
A giant dome enclosed by 22 sweeping steel arches, the Sports Palace in Mexico City will seat 25,000 spectators for Olympic basketball games and other sporting events.
The structure comprises four basic levels: the competition area, below street level, surrounded by service facilities; the spectator access level; the mezzanine and the grandstand. The roof arches will be joined to the apexes of reinforced concrete supports resembling a series of giant V's ringing the building. The roofing material, wood with a metal sheathing, will follow the zig-zag pattern of the steel leaving much of the structure exposed.



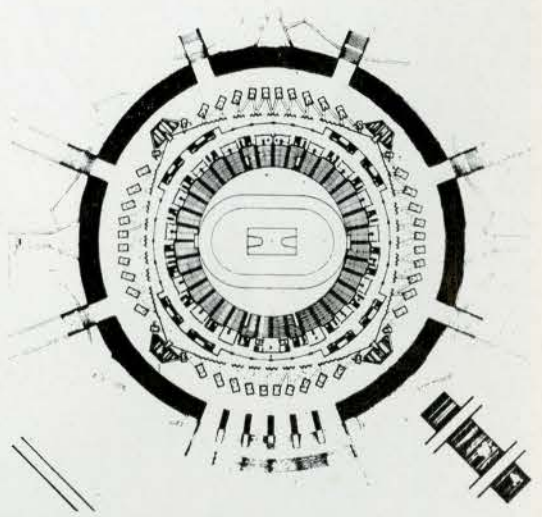
Site plan
Plan d'emplacement



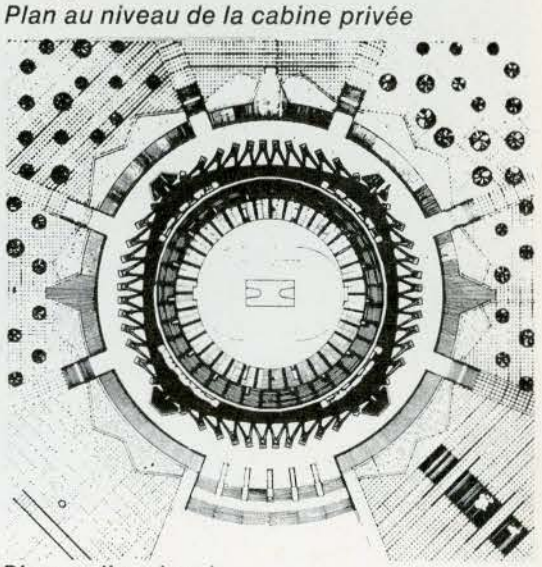
Model
Maquette



Plan concourse level
Plan au niveau de l'allée



Plan, private box level
Plan au niveau de la cabine privée

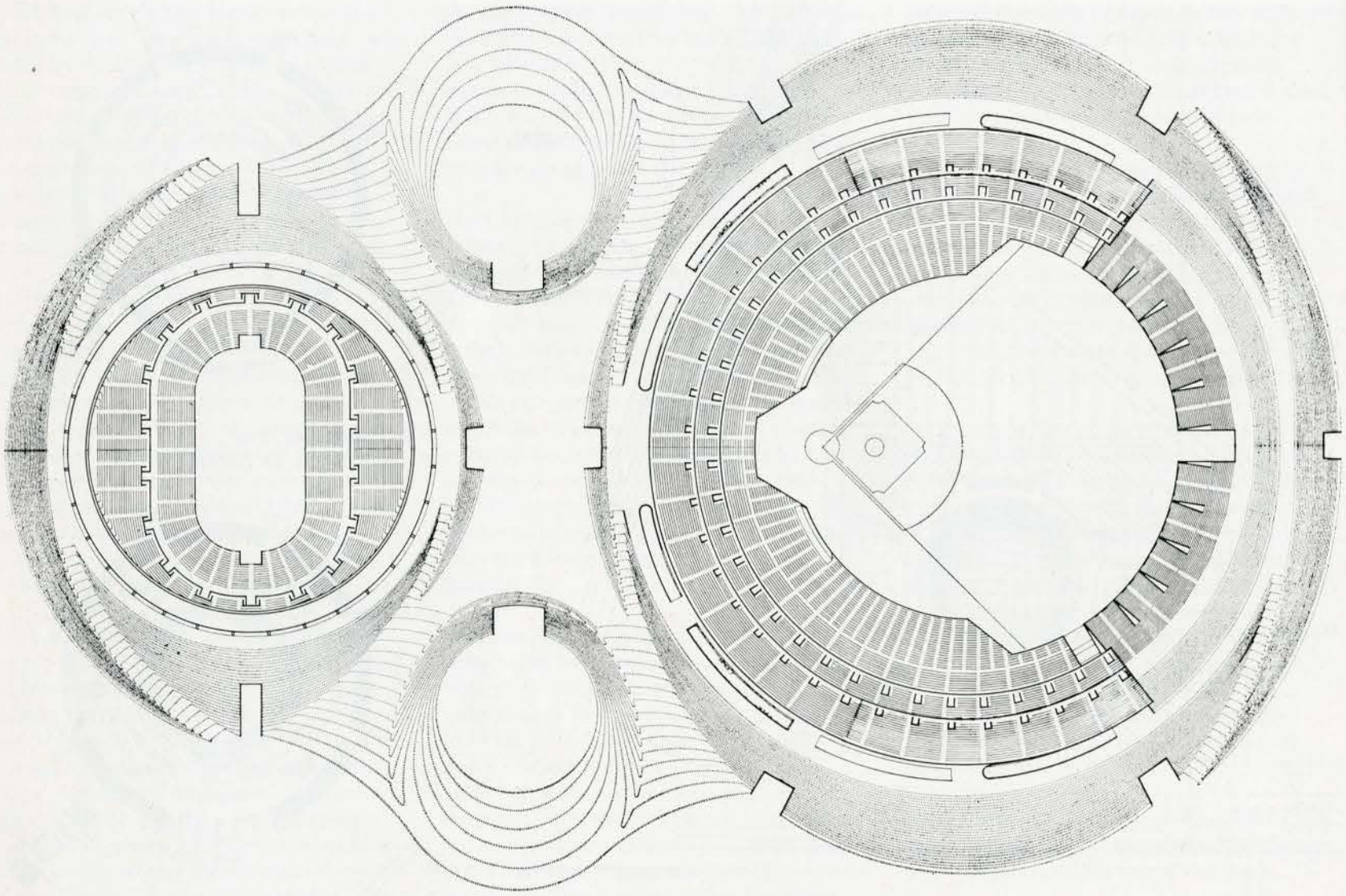


Plan, gallery level
Plan au niveau de la galerie

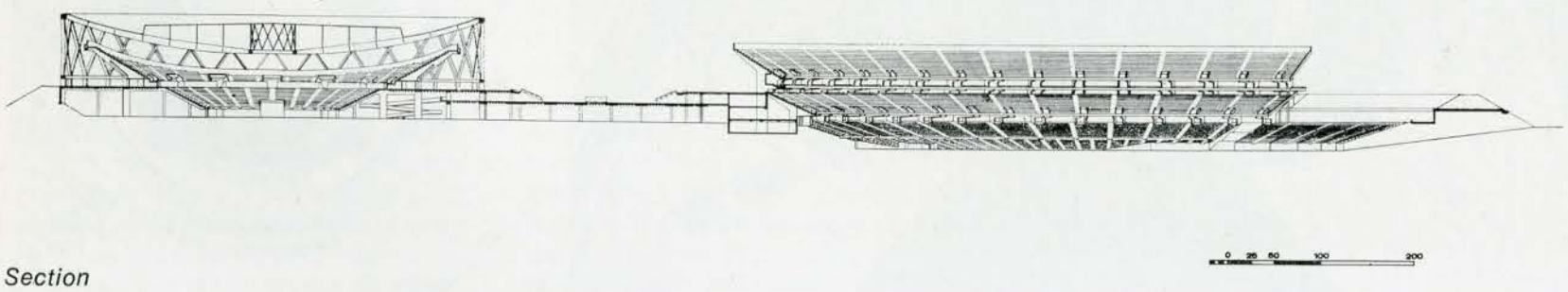
Oakland-Alameda County Coliseum Complex

The Oakland-Alameda County Coliseum Complex is designed to accommodate both indoor and outdoor athletic events, exhibitions, theatrical presentations and public meetings, with the possibility of two functions being staged simultaneously. The complex consists of three basic elements: an outdoor stadium, an enclosed arena, and a connecting exhibit hall, the roof of which forms the central pedestrian plaza.

Architects, Skidmore, Owings and Merrill



Arena and Baseball Stadium Plan
Plan de l'arène et du stade de base-ball



Section
Coupe

The stadium, designed for baseball, football and soccer, has an outside diameter of 770 ft with a playing field diameter of 490 ft. Seating capacity is 50,000 for baseball and 53,000 for football. The arena building, designed for basketball, ice hockey, circuses and other large gatherings, has a diameter of 420 ft and seating capacities ranging from 11,000 to 15,000. The connecting exhibit hall has 50,000 sq ft of floor space and is directly adjacent to the area floor. The exhibit floor and arena floor can be used in combination to provide 110,000 sq ft of contiguous exhibit space.

The stadium of relatively conventional construction consists of a lower grandstand sunken into the earth and an upper grandstand extending around two-thirds of the playing field. Depressing the playing field 29 feet below the parking lot level made it possible to enter the stadium at the mid-point of the seating bowl without ramps and stairs. The football field is laid out perpendicular to the baseball field; thus the center seats are also prime sideline seats. This arrangement also permits dual use of the press box facilities.

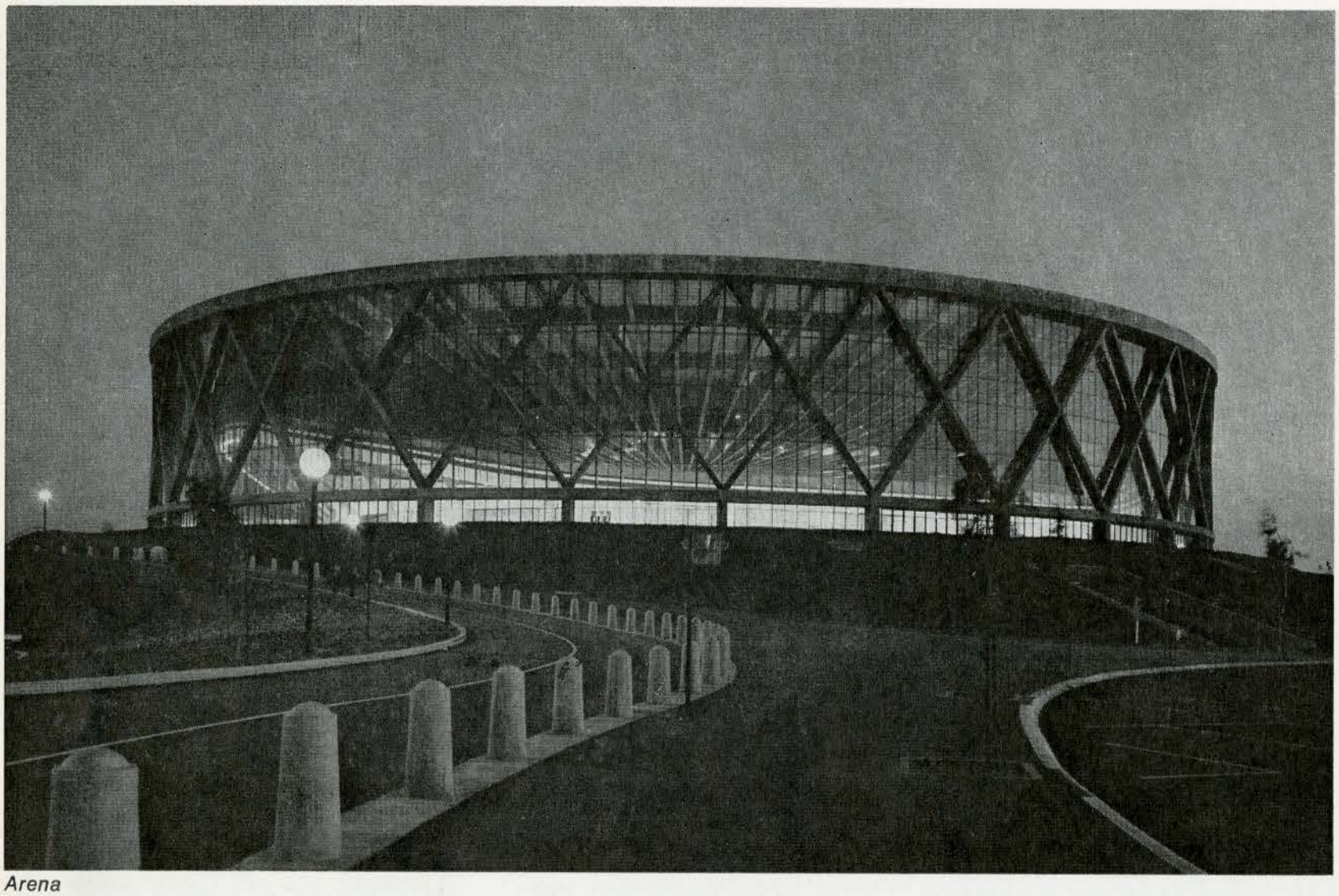
The arena, a more unique structure, has one of the world's largest cable-supported roofs which rests on a ring of X-columns. A glass wall inside the X-columns is independently supported by open-web joists hanging down from the compression ring. The draped cables support not only the roof but also a 260 ft diameter penthouse containing mechanical equipment. The X-columns rise up from the promenade level to carry the 420 ft diameter concrete suspension ring from which the roof cables are suspended. The cables span from this compression ring to a 45 ft diameter steel tension ring at the

Sunderland

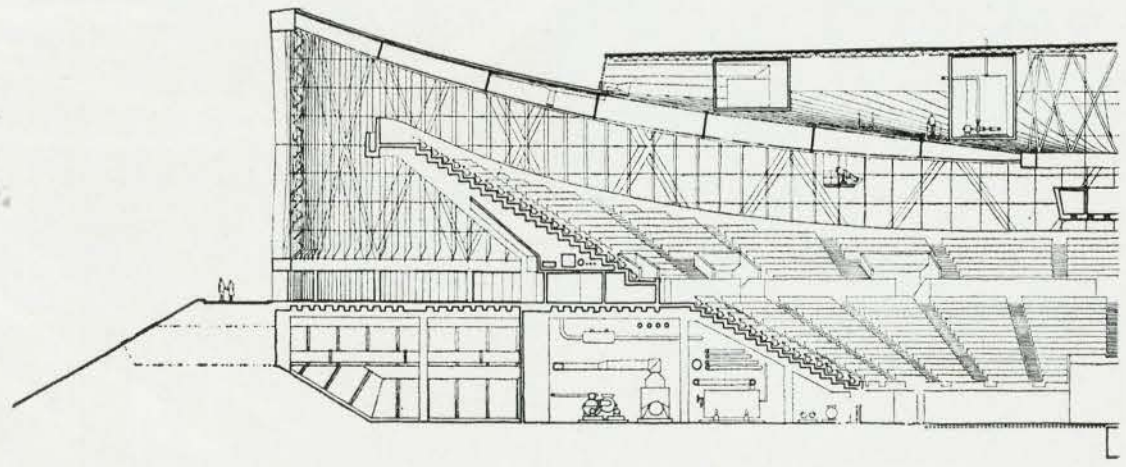
Aerial view
Vue aérienne

center. There are 96 of the 2-3/16 inch galvanized bridge strands supporting the roof. Precast concrete radial ribs rest on top of the cables. These ribs are interconnected by diaphragms that form six annular rings which tie the roof structure together. The penthouse is steel framed with columns resting on top of the radial ribs. A cast-in place gypsum roof rests directly on top of the radial ribs and the penthouse steel framing. The 32 pairs of X-columns were cast in place using prefabricated steel forms. The columns act as compression members for both gravity loads and for lateral seismic forces.

The drainage system for the roof is unusual in that, because of the inverted shape, no natural run off is possible. Therefore, rainwater is collected at the outer wall of the penthouse and fed by gravity to pumps located inside the penthouse on top of the tension ring. From here it is pumped back up the sloping roof to the drainline at the compression ring. In case of pump failure, the roof is designed to store up to 160,000 gallons of water. Any more rain than that will be dumped in overflow onto the Arena floor below.



Arena
L'arène

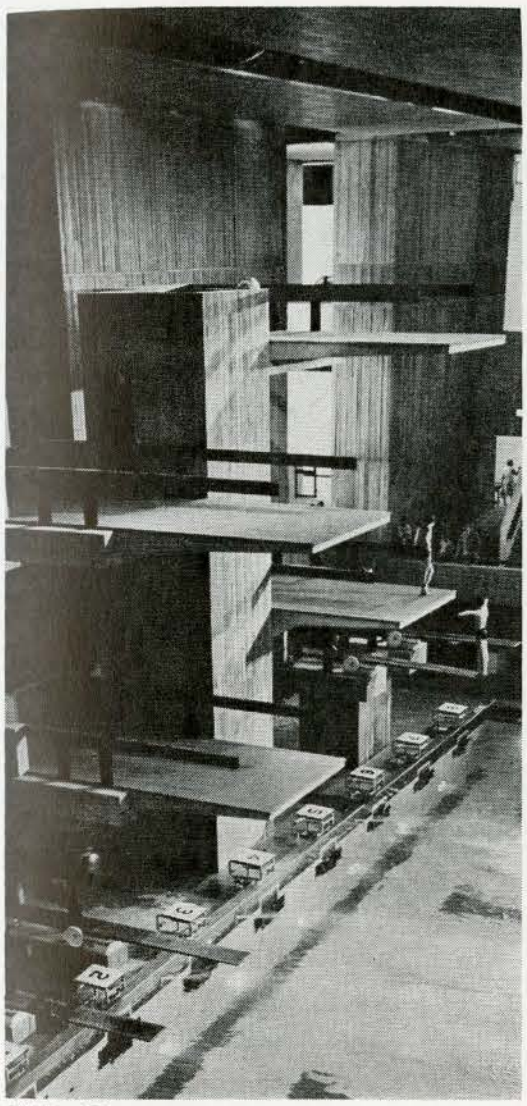


Arena section
Coupe de l'arène

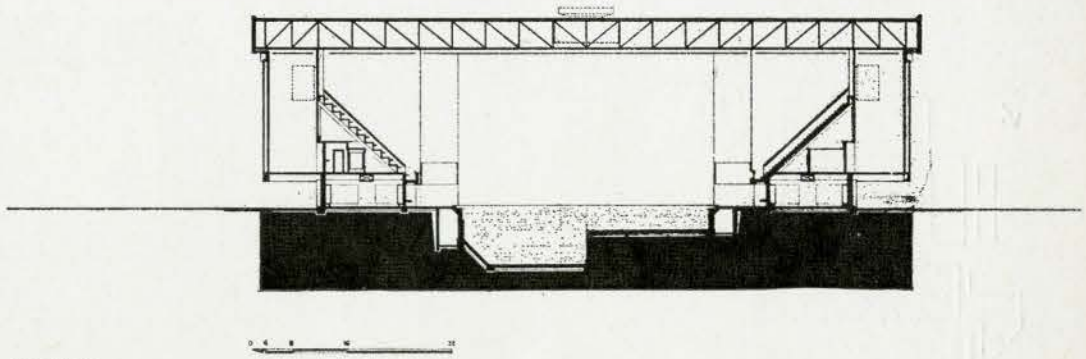
Pan-Am Pool
Winnipeg, Manitoba

The only Canadian pool wide enough to be used for top-flight international competitions, the Pan-Am Pool features a 190 by 225 ft column free area, two levels separating spectators from contestants, and glazed end walls which provide a view outdoors.
The long span roof structure consists of triangular steel space trusses cantilevered out 15 ft beyond their supporting columns. These carry the full weight of the exterior pre-cast wall panels. The double glazed walls are set into black anodized aluminum frames and supported by hollow steel columns which direct warm air onto the glass to prevent fogging.

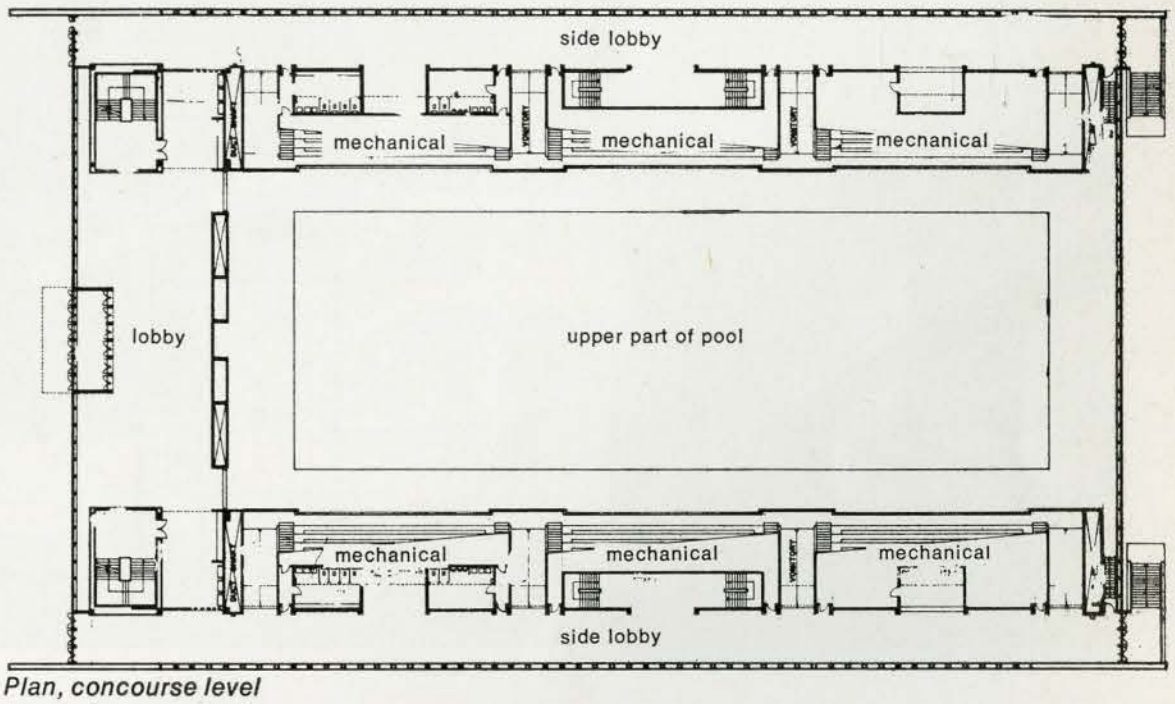
Smith Carter Searle Architects and Engineers



Diving Tower
Plongeoir (girafe)



Section
Coupe



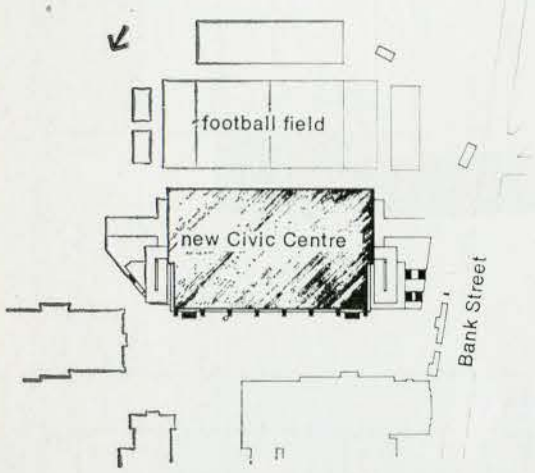
Plan, concourse level
Plan, niveau de l'allée

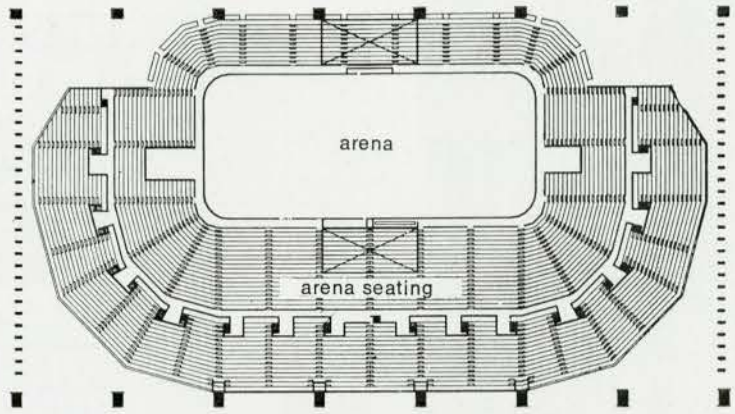
Pool, built for Pan-Am Games, July '67 seats 3,000
La pisoine est conçue pour recevoir 3,000 personnes

Ottawa Civic Centre
Lansdowne Park, Ottawa

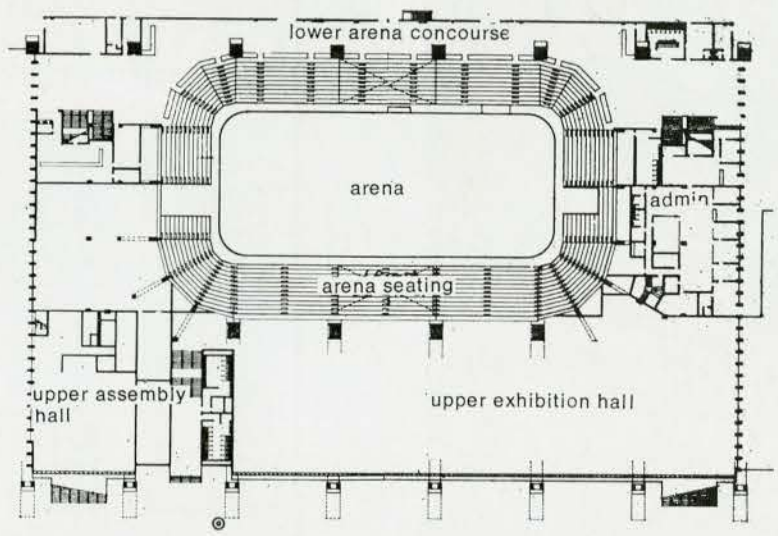
Architects, Gerald Hamilton & Associates, Vancouver, and Craig and Kohler, Ottawa

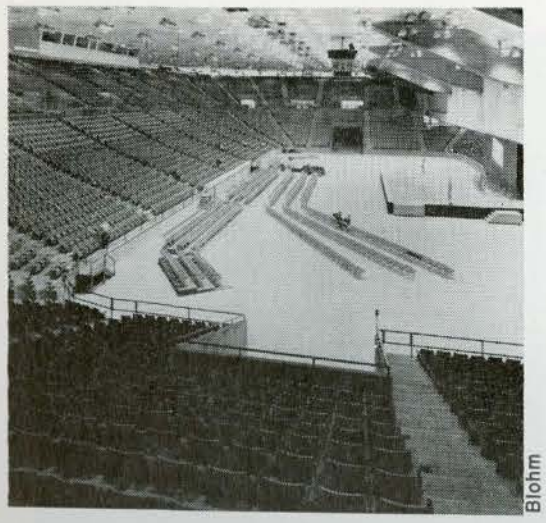
The Ottawa Civic Arena combines a grandstand with seating capacity of 15,000, an arena seating 10,000, an assembly hall for 400, an exhibition hall of 36,000 sq. ft. To combine stadium and arena, the stadium seating has been placed on the roof of the arena and the ice surface depressed below grade. The exhibition hall, so that it can be used with the arena for large shows, is placed under the main arena concourse on the same level as the ice surface. The section of seats separating the two can be flown to the roof of the arena leaving a 55' clear opening. The section of seating opposite, lifts hydraulically to permit the erection of a demountable stage.

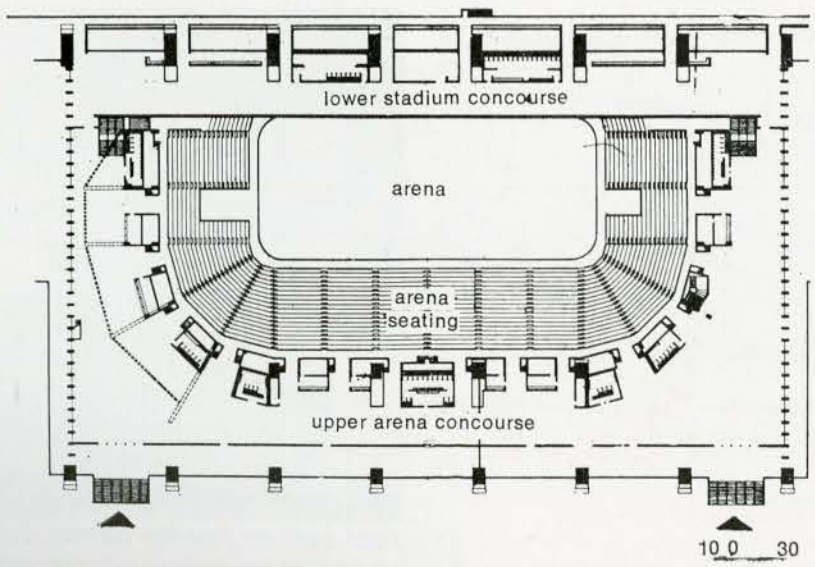





Blohm



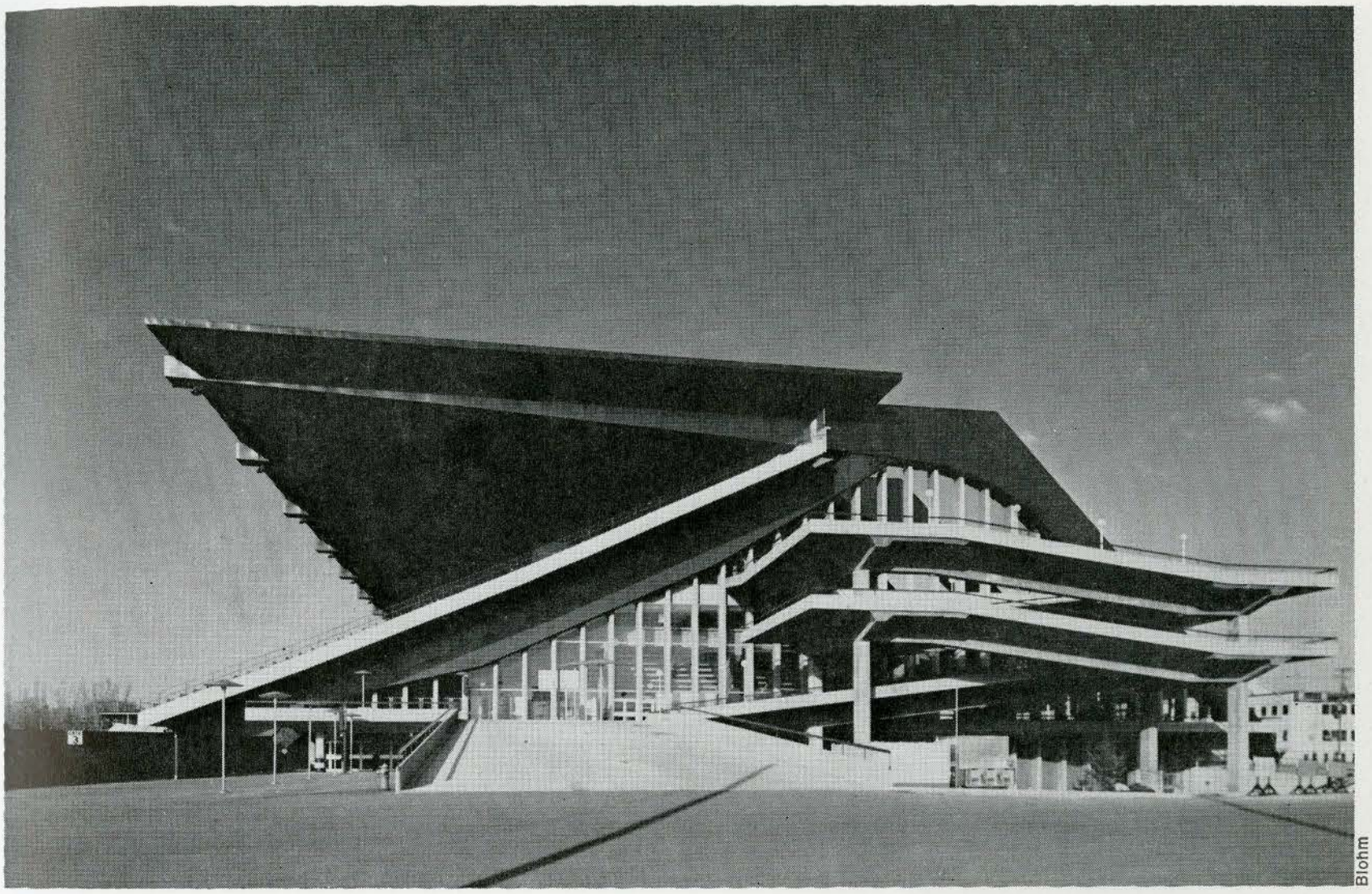

Blohm



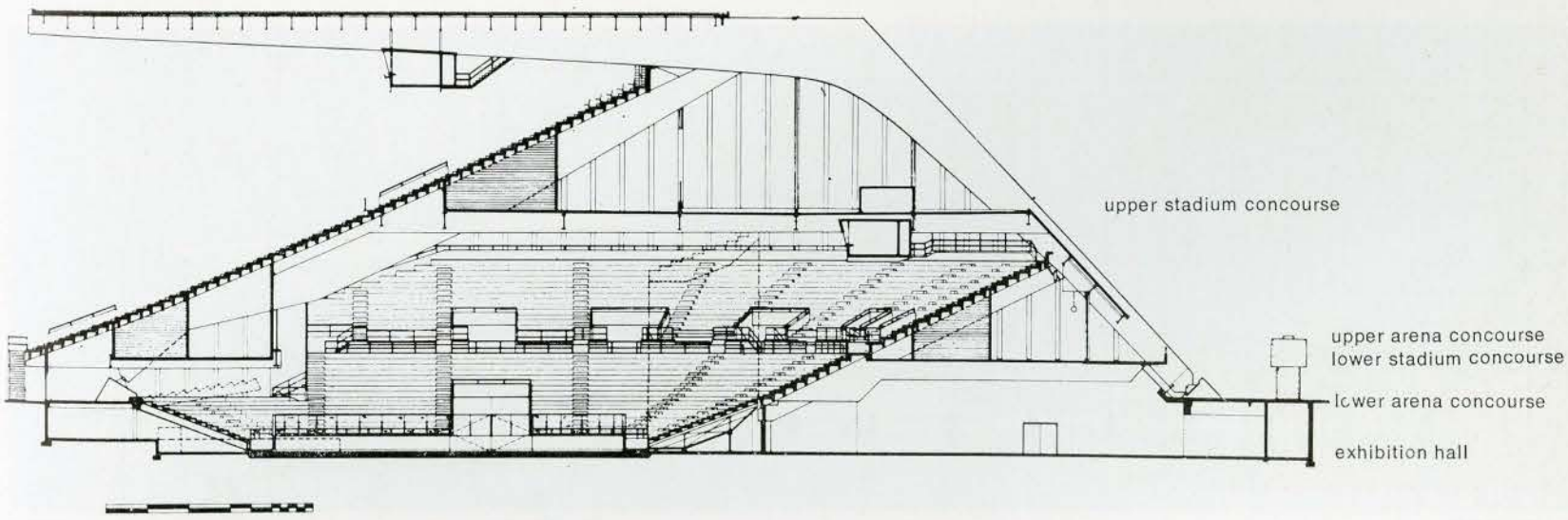
The assembly hall, which operates as a separate facility, is enclosed in a space below the arena concourse at the east end.
The lower stadium concourse is above the south arena seats. A portion of the flat part of the arena roof serves as the upper stadium concourse. Access to both concourses is by concrete ramps at either end of the building. Stadium facilities, including access, washrooms, press, radio, TV, police, first aid, and concessions, are separate from those of the arena so that both facilities may be used at the same time under separate control.

The structure is basically a three-hinged arch with a 165' cantilever from the apex. The main supports at 60'-8" o.c. are constructed of steel welded plate sections to form hollow box and lattice work girders. Spanning between the steel frames forming the stadium deck are precast prestressed modified concrete T's. Polystyrene insulation suspended below in a shingle fashion sheds any water which penetrates the deck.
The north sloping roof of the arena is composed of precast light weight slabs on steel purlins and is roofed with neoprene hypalon. Remaining roof areas are built-up cold process roofing on insulation laid over steel-decking on long span steel joists.

The largest installation in Canada of infra-red gas fired heaters suspended from the ceiling, heat the arena. Electrically operated infra-red heaters are used over the south arena seats and in the upper arena concourse. Elsewhere, heating is by hot water from a gas fired boiler plant. The assembly and exhibition halls and offices are air conditioned. Both stadium and arena are illuminated for colored TV. Consideration of movements induced in the structure by the enormous cantilever roof affected the design of anchorage of window frames, concrete mullions, masonry partitions and the suspension of plumbing and gas lines.



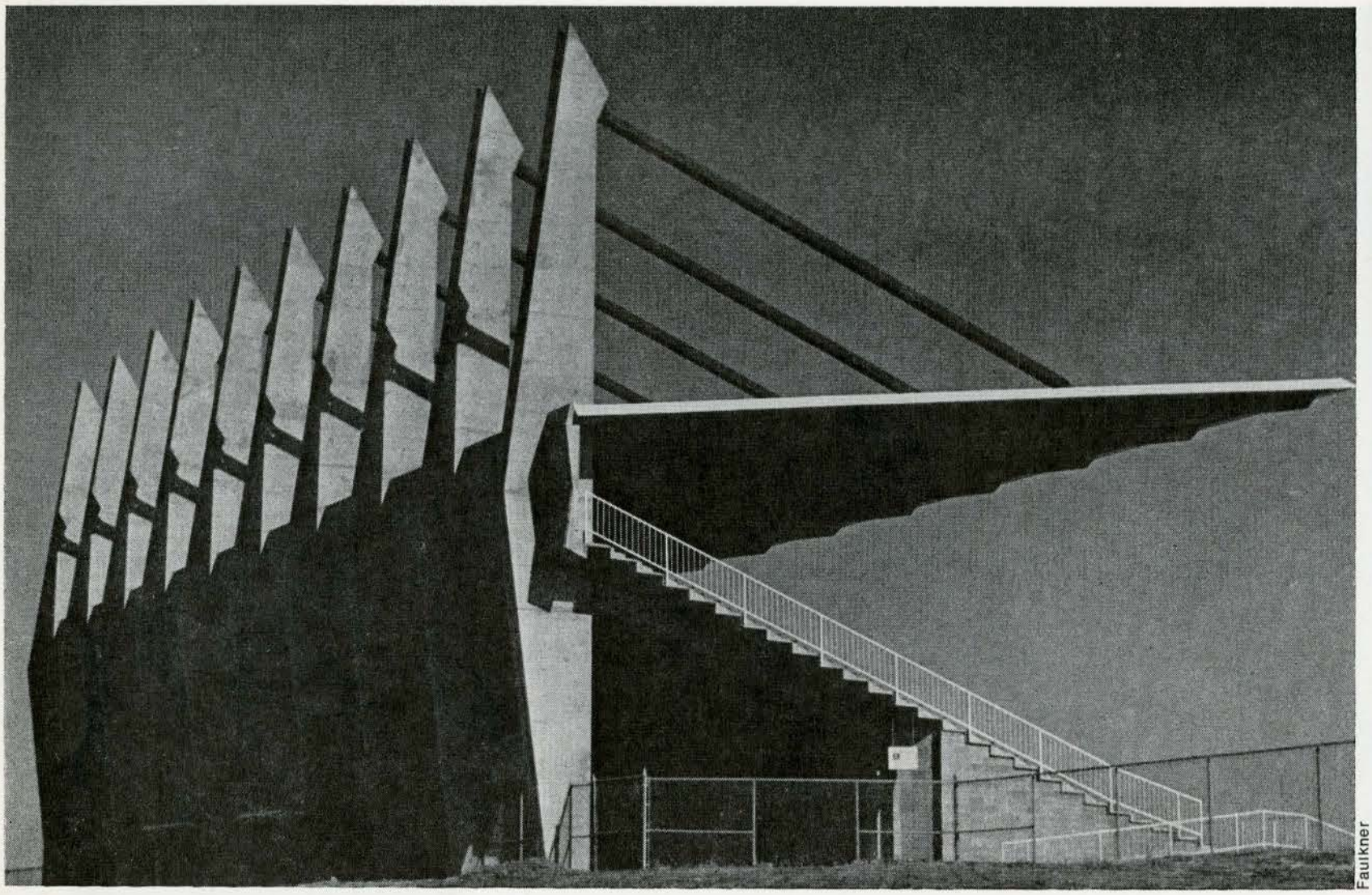
Biohm



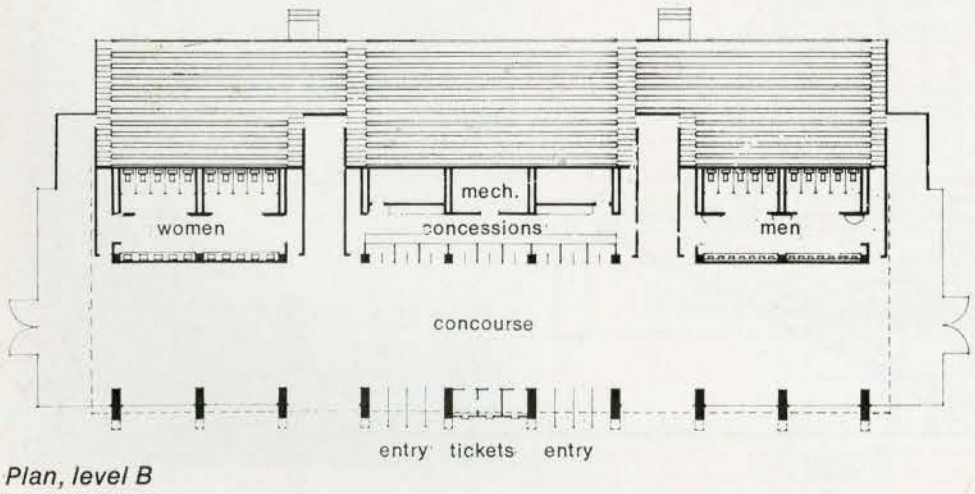
Centennial Stadium
University of Victoria
Campus, Victoria, BC

Architects Siddall, Dennis & Associates

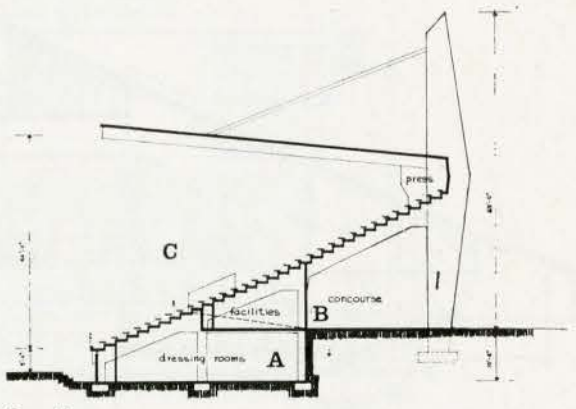
The Centennial Stadium at present accommodates 3,000 in three major seating sections. One or two sections can be added at either end and original planning envisages possible expansion in convenient stages by any figure, up to 25,000 (complete bowl). The low berms surrounding the field, created out of excess material from grading, are at slopes compatible with contemporary bleacher seating which can be added at low cost.



Faulkner



Plan, level B
Plan, niveau B

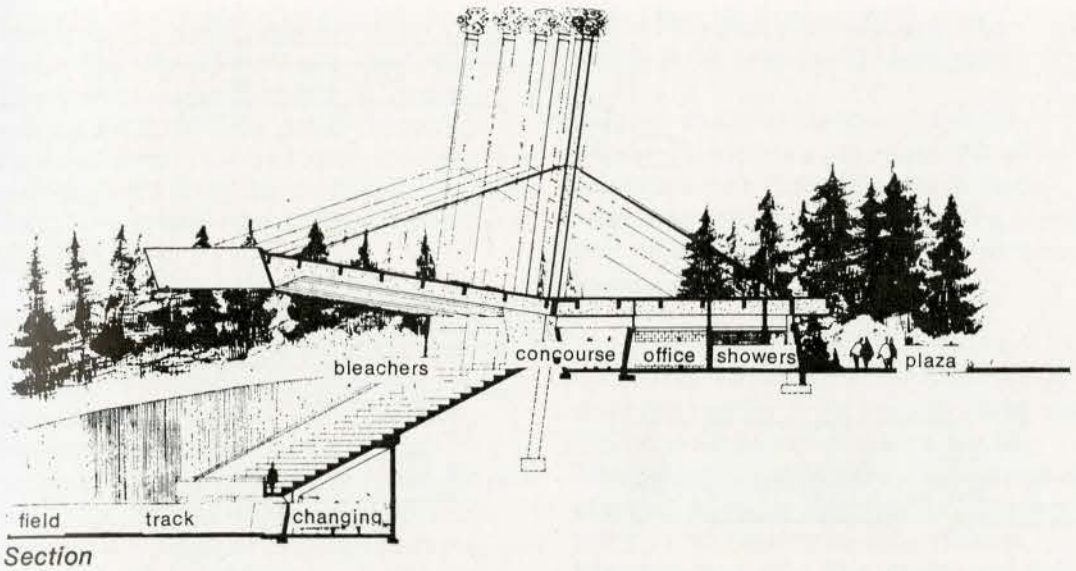


Section
Coupe

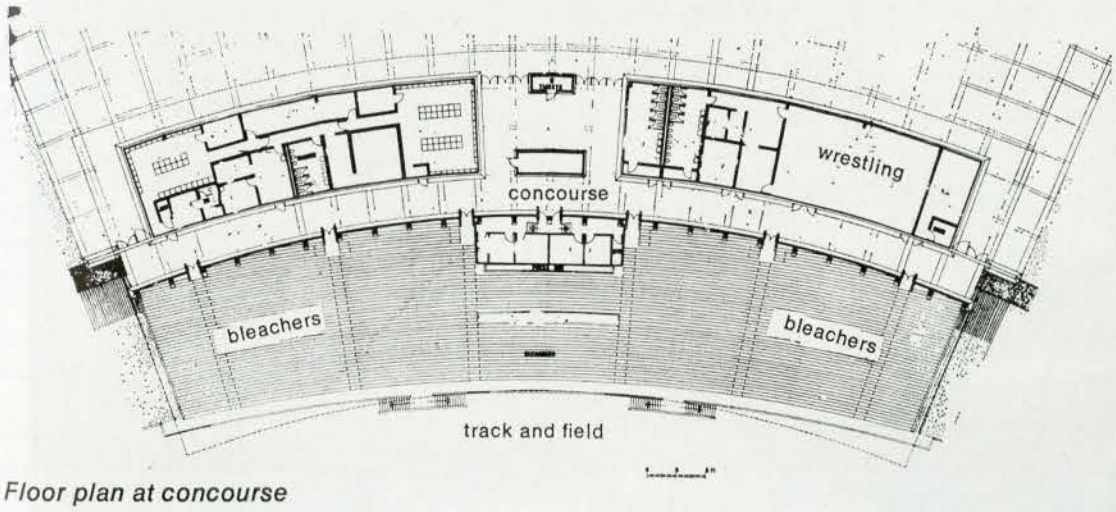
Thunderbird Stadium
UBC, Vancouver

Vladimir Plasvic & Associates, Architects

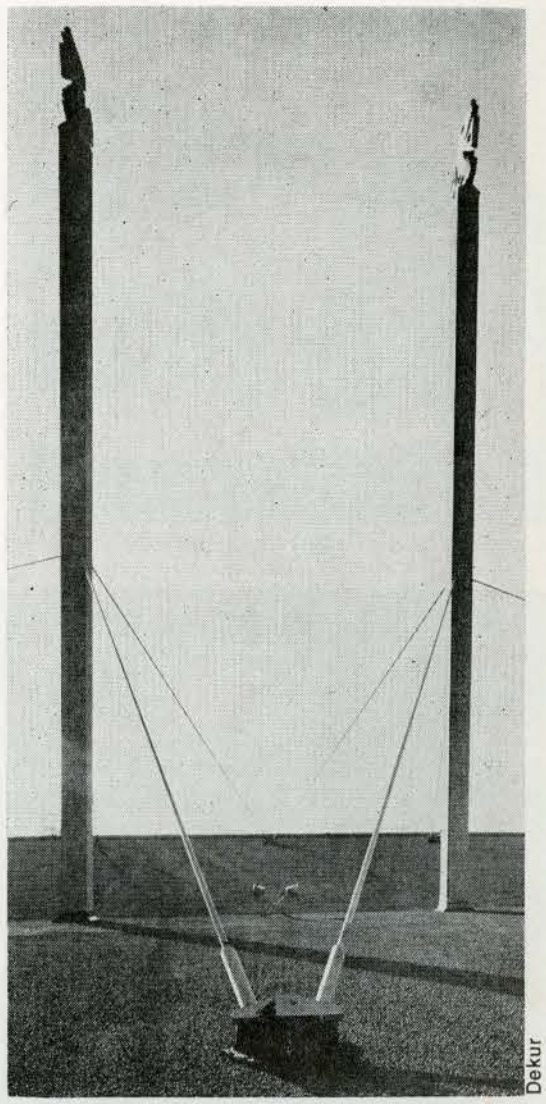
Two basic requirements for the Thunderbird Stadium were that the area of the concourse and facilities be equal to that of the grandstand and, that there be no columns in the seating area. Cable suspension design proved to be more economical than cantilevering. The roof is hung by 1½" cables from twelve 70' prestressed concrete poles topped by lightweight precast concrete thunderbirds designed by artist Zeljko Kujundzic. A timber and concrete combination was used for the roof structure for economy and easy maintenance.



Section
Coupe

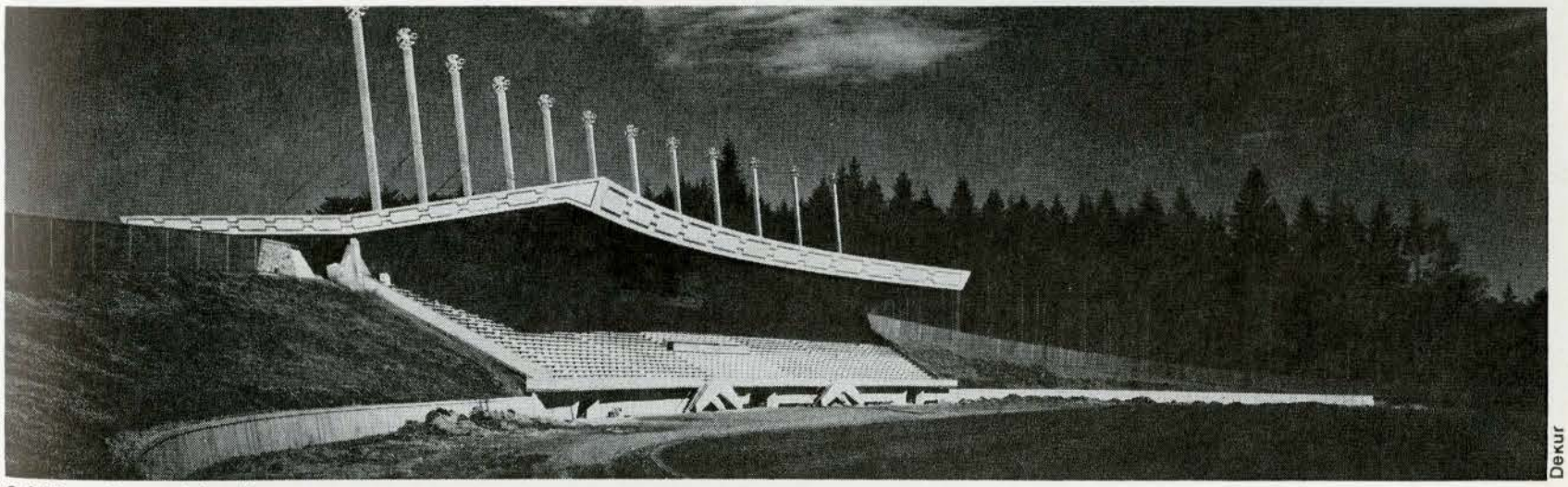


Floor plan at concourse
Plan d'étage au passage



Dekur

Prestressed concrete poles and roof cables
Montants en béton précontraint et cables



Dekur

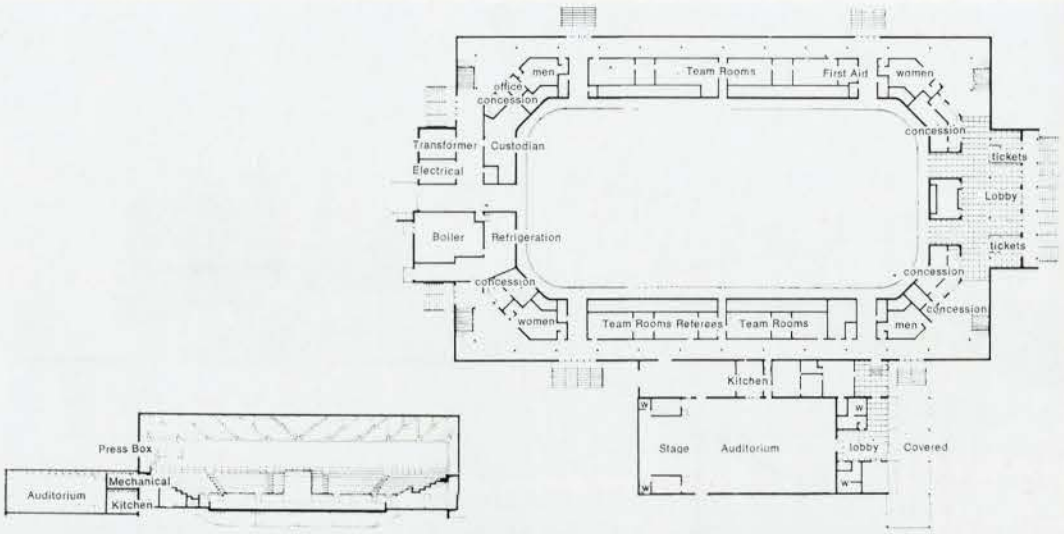
3,000 seat grandstand
Tribune de 3,000 places

Brantford and District Civic Centre Brantford, Ontario

Brooks and Van Poorten, Architects
Charles H. Brooks, Partner in charge

Almost entirely financed by public contributions the cost of this building had to be kept within a rigid budget. In addition the building had to accommodate as many types of activities as possible. Therefore, the 3,000 seat arena primarily for professional hockey can be easily adapted to other activities. The auditorium is also multipurpose and can be combined with the arena when required. Foundations are deep due to soil conditions, floors are structural concrete, superstructure is structural steel, and walls are prepainted roll formed aluminum insulated panels.

The Centre, a centennial project



Architecture, Comment and the Mass Media

Assembly seminar hears proposals for "Take an Editor to Lunch" week and RAIC sponsored architecture, civic design and planning study tours for writers.

How to get informed comment on architecture, urban development and planning into newspapers, magazines and on TV and radio in order to fill the genuine social need for an informed public opinion, provided the liveliest of the panel discussions at the 1968 RAIC Annual Assembly at Regina at the end of May.

The panelists – three professional journalists – survived a two hour question and answer period on the subject of architectural criticism, during which they were asked why newspapers deleted the names of the architects when publishing architectural projects, and debated whether architectural criticism should be written only by those professionally qualified or by professional writers. To meet the needs of the mass media, it had to be the latter. The writer's job was to interpret the expert to the public.

Wolf von Eckhardt, author and architecture critic of the *Washington Post,* (one of two* professional writers in North America engaged full-time in architectural comment and criticism) and an Assembly theme speaker, opened the discussion by saying that people were becoming quite disturbed about what is happening to the environment, but without informed press comment, it was hard to form public opinion. Press releases were not enough. The expert had lost the power to communicate his policies and aims to the public. To media therefore fell the responsibility of providing intelligent comment and criticism of what was happening.

Peter McLintock, Executive Editor of the *Winnipeg Free Press,* said that there was very little comment about architecture in Canadian newspapers. There was no tradition of it, and the average newspaper reporter was not experienced in the subject. (His newspaper was, however, aware of the problem and had just made arrangements for a member of the faculty of the University of Manitoba School of Architecture to write for the *Free Press.*) He did feel that the architectural profession should help writers to obtain necessary background knowledge. "Doctors and lawyers take editors to lunch to give their points of view on events concerning their professions, but no architect has ever invited me to lunch."

Seminar chairman Gordon Arnott *(F)* Regina, immediately proposed that architects institute a "take an editor to lunch" week, a suggestion which brought a prompt and cheerful response from the Manitoba architects present.

The third panelist, Kenneth B. Smith, Toronto, a staff writer for the *Report on Business* section of the Toronto *Globe and Mail,* who for years has been a familiar figure around architectural, civic design and planning meetings, said that he had been trying for a long time to get architects talking to the public. The trouble was that architectural organizations took the public relations approach in dealing with the press, but a community's sense of responsibility towards architecture and planning could not be fostered by press releases. Architects at the local chapter level should become identified as the leaders in tackling the problems of the community.

From the floor came the comment that Vancouver architects met their civic responsibility in their field in a successful and practical way. For over ten years the Vancouver Chapter has provided an advisory design panel for the city planner, which reviews every local project at the design stage, and, in practice, sets minimum standards for architectural projects. The system works, and is being looked into by other North American cities.

(No mention seems to have been made at the Seminar of the Manitoba Association of Architects' repeated strong, public appeal to the provincial and municipal governments to do something about planning downtown Winnipeg before it is too late.)

On ways and means of enabling the architectural profession to contribute to a better public understanding of the problems of the urban development, Mr von Eckhardt said that one of the most useful things the RAIC could do was to establish professional contact with editors. In this, the prominent architects should not wield too much influence. A point of view was needed to get discussions started on urban design or development problems, and here writers on the subject, even part-time writers, were very important.

The profession itself should be criticized on one score, however – that it did not speak up when a bad development or project was proposed. For example, two years ago he had written a strong criticism of the huge trade center project for New York in the Atlantic Monthly magazine. What had been the result? Nothing. He did not hear a peep out of the New York Chapter of the AIA.

Speaking as one who for most of his life had been directly involved in the communications aspect of planning and architecture, first as a newspaper reporter and next as a public information director, Walter Bowker said that from the beginning he had been greatly helped by a sympathetic interest on the part of the professionals who, for their part, realized the need for public understanding of their ideas. He wondered if the RAIC, possibly with the assistance of the Canada Council, would be interested in fostering an organized program to help today's writers and commentators to acquire a good background knowledge of architecture, civic design and planning. One way to do this would be to conduct a group of writers each year on a working tour across Canada, and perhaps to certain cities in the USA. They would thus acquire a substantial fund of knowledge and experience, and establish valuable contacts, of great assistance to them later in commenting upon their own local problems. Editors and publishers, he hoped, would support such a plan to increase the competence of their staffs. Mr McLintock, as an executive editor, thought his and other leading papers would be interested in sending staff on tours of this kind. Mr Smith also supported the suggestion. He thought such a travelling seminar arriving in a Canadian city and putting local officials or tastemasters on the hot seat could engender invaluable public discussion and awareness. "Let it focus" he said "on the magnificent prospects of the Toronto waterfront; explore the validity of putting pedestrians underground in Montreal, and try to discover why most of the good in Vancouver has been done by God".

*Ada Louise Huxlable of the New York Times

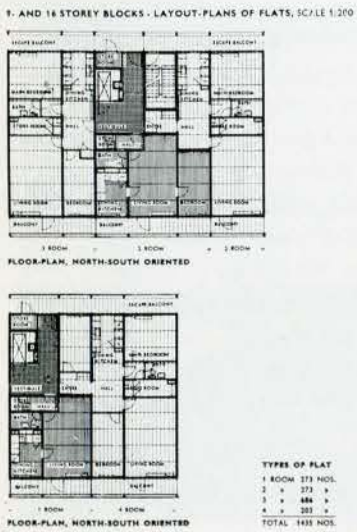
8
Various planning layouts used for dwellings in the Hoje Gladsaxe scheme. In Denmark each dwelling must pass through the structure to permit cross-ventilation. All these designs are feasible using standard "Jespersen" units from the manufacturer's catalogue. P. E. Malmstrom
Divers plans d'aménagement des projets de logements pour Hoje, Gladsaxe. Au Danemark chaque logement doit longer le bâtiment de façon à permettre une ventilation transversale. Ces projets sont réalisables si on utilise les éléments modulaires "Jespersen" indiqués au catalogue

9
An entirely different design uses combined floor and wall units. AB Skanska Cemengjuteriet, Kalmar, Sweden
Un autre projet utilise des éléments combinés de parquet-mur

10
The complete freedom of choice for exterior cladding is obtained by loading the interior cross-walls. AB Skanska Cementgjuteriet
Une liberté d'action pour parement extérieur peut étre obtenue en chargeant les murs de refend

11
Placing a façade element consisting of a typical concrete insulated sandwich, with an exposed aggregate external face. Department of Architecture and Civic Design of the Greater London Council
Mise en place d'un élément de façade revêtu de panneaux isolants

12
The scheme shown in Figure 10 after precast concrete façades (non-load bearing) have been installed
Même projet que figure 10 après l'installation des façades préfabriquées en béton



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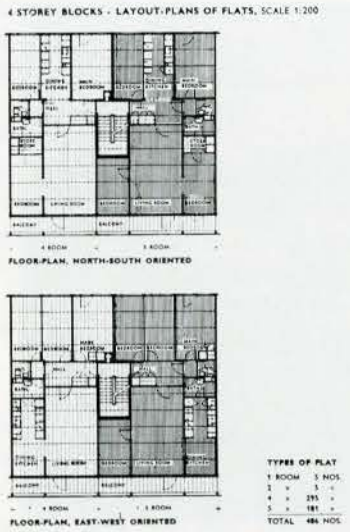


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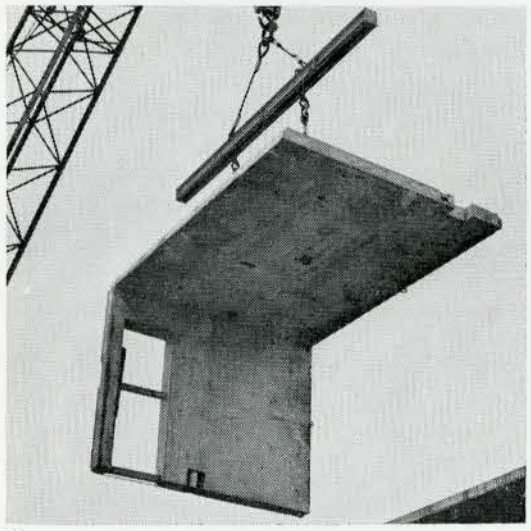
Typical planning layouts (Fig. 8) show the arrangements devised at Gladsaxe in Denmark, for 1 room, 2 room, 3 room and 4 room accommodation built into 16 storey blocks, and 4 room and 5 room layouts built into 4 storey blocks. All these designs used units manufactured at Modulbeton's factory near Copenhagen, for Jespersen.

As has been described earlier, different systems provide different design modules for the architect. Central factory units *tend* towards smaller modules to ease the transportation problems, while site factories can make modules to suit the actual individual planning arrangements. We can see in (Fig. 9), that in Sweden, combined "L" shaped wall and floor units are often used. Within these limitations, the architect therefore designs his layouts around basic modules, yet as we see, little practical limitation *in fact* seems to occur. The site layouts are more or less completely the same in pre-fabricated schemes as for traditional schemes and the same facilities are required, – all built on the site itself, such as: building foundations and basement, garages and parking areas, play areas and recreation facilities, services (all *underground* of course!), district heating schemes, roads and communications.

Many if not all of the structural systems described, permit the live and dead loads to be carried on *internal* partitions, leaving the outside elevation completely clear (Fig. 10) for an architectural free hand. The architect therefore, has a most important role to play in devising the best elevational variety in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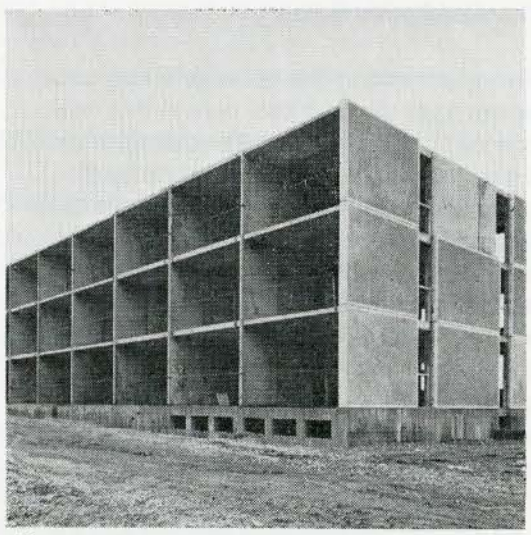
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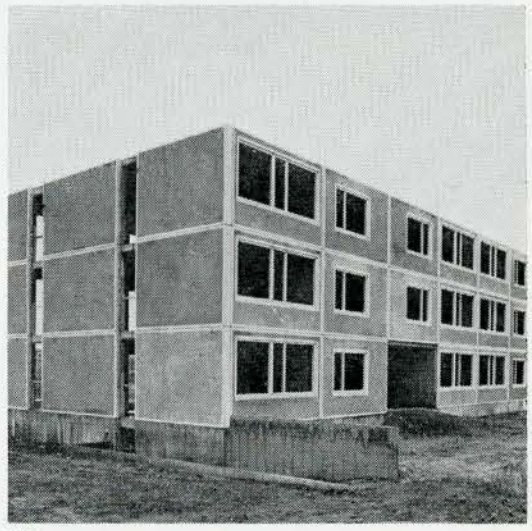
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accord with local materials or local tastes. Such façades *must always* of course, be designed as components themselves, being pre-fabricated to cover the elevation of each individual dwelling in one or more sections and to be complete with insulation, colored finishes (if applicable) and glazed windows. These façade elements which will be crane hoisted into place, can be of concrete sandwiches (Figs. 11 & 12), wood (the Gladsaxe scheme is one such example), asbestos cement, steel or aluminum, panel-assembled facing bricks, and so on.

Since the crane will play a vital part in the success and economy of the technique, the architect will have to consider very carefully the layout requirements which permit the rail travelling cranes to reach all the buildings.

13
An impression of landscaping when well co-ordinated with large housing schemes, Denmark. Larsen & Nielsen Consultor A/S Copenhagen, Denmark
Exemple d'un equilibre maintenu entre immeubles et paysage

13

Such cranes each make 120-130 lifts in an eight-hour shift and a well organized site can use this equipment to top capacity. One crane can usually erect at least two dwellings a day.

Clearly therefore, the architect's role remains *a vital one* and the responsibility will be his to adapt his design techniques to suit the construction techniques of the mass production system. It must be stressed that the landscaping of such large housing schemes is a very important part of the whole – one perhaps given insufficient care in many Canadian schemes to date. The illustrations with this article generally show reasonably new schemes, but the designers state that great attention has been given to "planting", to provide in some 15 years, a very well balanced environment of buildings and mature trees. Where schemes have been built in already mature landscaped areas, some impression of the expected and result can be seen, (Fig. 13).

Interiors

We have given considerable attention so far to the structure and façade of these "systems" buildings, as this is a fundamental change in the whole new concept of building housing. Nevertheless, the similar adaption of interior work to mass production methods is equally essential. Admittedly, some trades must still work within the building without prefabrication and we can include floor finishes and decoration as the principal of these, (as well as of course, elevator installation or boiler room plant).

If we look at other trades, we notice first of all the total elimination of plastering and/or drywall systems. The precast concrete elements when factory produced, have almost blemish-free finished surfaces. A small amount of "spackling" at joints, or over the odd small defect is all that has to be done before the decorator takes over. In Europe, the walls are always wall-papered (Fig. 14) directly onto the concrete. Ceilings are spray finished and of course the spandrel and windows arrive pre-painted from the factory, before erection. Kitchen cabinets can all be pre-fabricated and pre-finished for crane delivery to each apartment and small closing strips are all that is needed to take up minor construction tolerances. Plumbing is pre-fabricated in one or two storey assemblies, merely requiring the hook up of the fixtures to the outlets already prepared in the walls. In some schemes, bathrooms have been wholly or partially pre-fabricated incorporating sound transmission deadening systems. Radiant floor heating through coils has been one accepted European way of heating the apartments, therefore the site work largely consists of making the flexible connections between the factory cast coils into the pre-cast floor units. Electrical boxes and conduit are also pre-cast into the slabs, and while individual wiring is necessary at the site, the development of ring main systems would speed up this installation procedure.

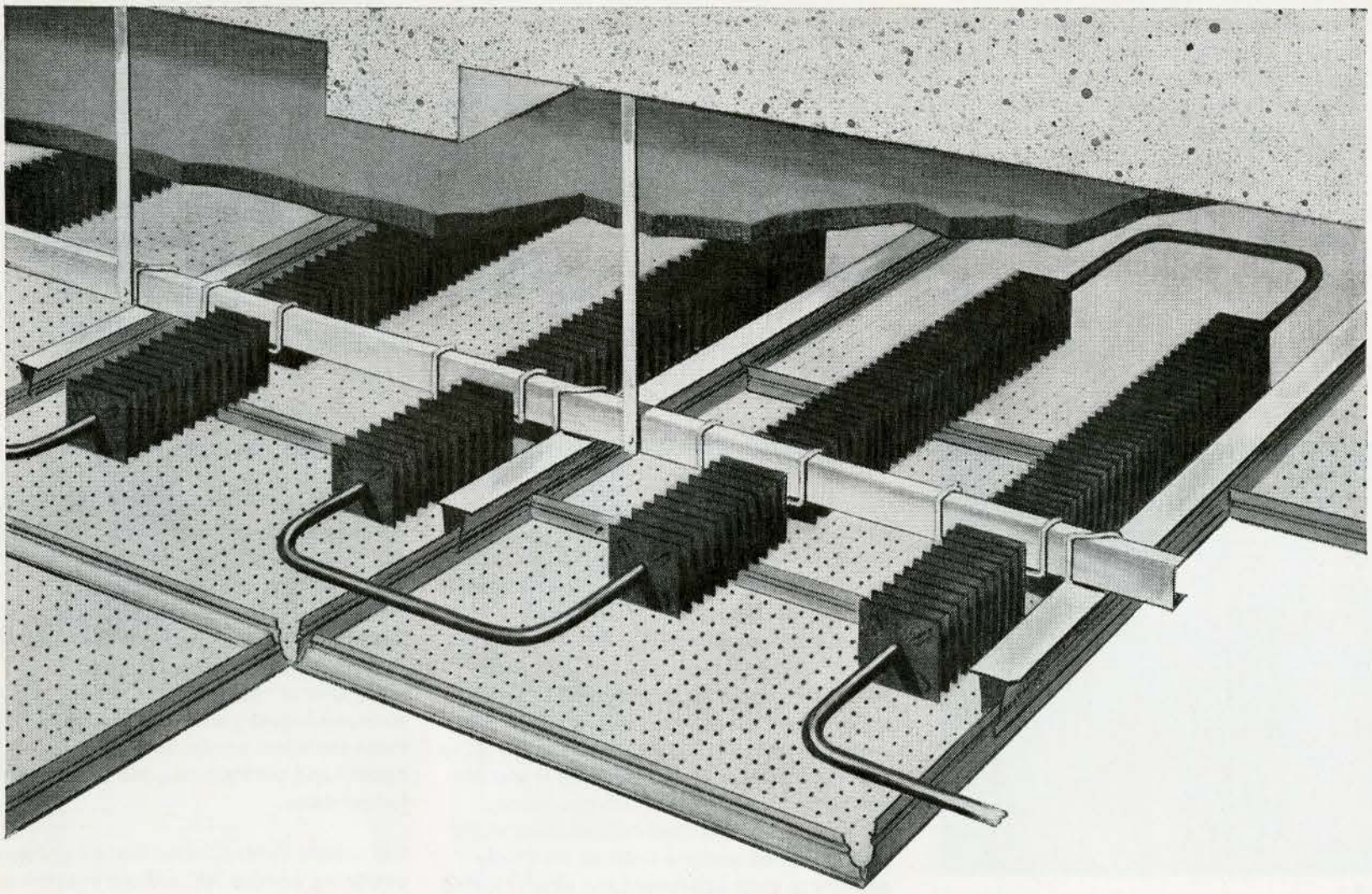
Summary

A pre-requisite to "systems building", must obviously be *volume production.* Everything rests on a secured program of minimum quantities over a set period of time. It surely cannot be insuperable, whether under governmental or private enterprise "umbrellas", to organize capital, land, and planning approvals for a pre-determined time of let us say three years? *The consumers are certainly waiting!* Whether the adopted system would be the central factory in each major city, or factories set midway between major centers, will entirely depend on the guaranteed volume that each city can generate. The answer may well be, to commence with the site factory and develop "systems building" for housing into a larger market from smaller schemes.

It cannot be over emphasized, that just as the climbing tower crane was engineered and proven in Europe some 20 or more years *before* the first one was purchased in Canada (in 1959), so too are the "systems building" methods already engineered and proven. Instead of regarding Europe as some kind of "mediaeval museum", our construction industry would do well to accept these technical advances "lock, stock and barrel" and put them to good use without further delay.

It is clearly demonstrated that all European designing companies, without exception, are looking for North American markets provided that our industry is flexible enough and willing enough to make some of the drastic changes which will be required.

The fears of aesthetic monotony are absolutely unfounded as the evidence proves. One can say that the appearance of the buildings will of course be only as good as the competence of their designers, but this is no different for the technical innovations outlined in this article than it has been with traditional building techniques. The architect should and indeed must be at the forefront of new developments in his own industry. As a professional he must be *a leader.* Therefore surely the architectural profession which is trained to visualize the possibilities and economics of building schemes, has the responsibility to implement the new approaches of "systems building" in Canada. Architects are in a special position, both to encourage their clients – the building owners, and to challenge the construction industry which has to realize their designs. The possibilities and economics of "systems building" has long since been tried and proven on the other side of the Atlantic, particularly for high-rise housing in urban areas. If architects could meet this challenge, they would bring their profession to the forefront of the industry by providing some solutions to one of the most critical social problems facing Canadians in the next 30 years. □



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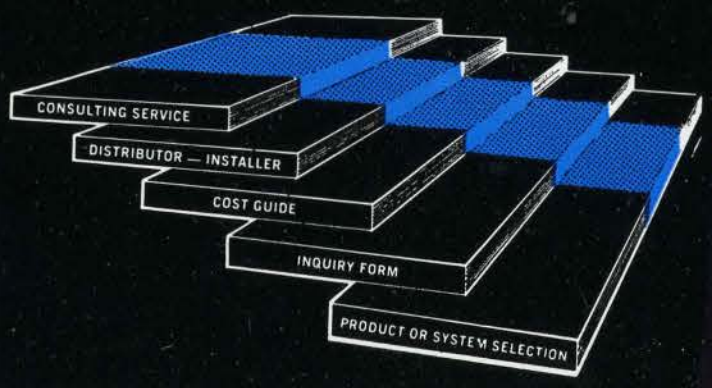

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Emerging Technologies and Techniques in Architectural Practice

Technical Technique 6

The address to the 1968 RAIC Assembly in Regina by C. Herbert Wheeler, Jr.

Technologies and techniques which, he believes, will change the profession of architecture, were described at the 1968 RAIC Assembly at Regina on May 29 by C. Herbert Wheeler Jr, AIA, associate professor of Architectural Engineering at Pennsylvania State University.

"Two important situations stand out," said Professor Wheeler – "first, many of the progressive architectural firms have accepted the fact that 'updating' is a fundamental need of professional practice and, second, the leading architectural firms are making great strides in actually using electronic and other technologies and new techniques to improve their system of services."

Professor Wheeler has carried out three different studies of practice under five research grants from the American Institute of Architects. "Emerging Techniques of Architectural Practice" has already been published; "Emerging Techniques of Architectural Programming" is nearly ready for publication, and a third "The Role and Responsibilities of the Technician in Architectural Practice" was published in part by the AIA in its report on technician training.

The knowledge gained by Professor Wheeler through his visits to large and small offices in the USA and Canada in conducting the research programs is communicated to the profession in his writings and in addresses. History may show, he says, that the present era is providing the architectural profession with unusual opportunities to reach a new plateau of service. Science, business and industry has given today's architect a series of fabulous new technologies, in which some of the keywords are: magnetic tapes, computers, data processing, xeroxgraphy, digitizers, data platters, cathode ray tubes, light pens, microfilming, microfiche, offset printing, multi-color printing. Other key words in new scientific processes are: systems analysis, network planning, reliability engineering, value analysis, information retrieval and so on.

Innovation in the profession would not result from the new techniques or the new equipment themselves but the innovation would be "the effect" which they are having upon practice. "Those of you who have already tried some of these techniques know the effect they have had on you. You know that these techniques force the designer to think – logically and completely – they give him time to think and the capability to make value judgements. They give the architect the opportunity to offer reliability with his designs.

"We are expected by our clients to use the newest equipment and the most modern techniques of design methodology, and following the line of reasoning I have acquired two hypotheses pertaining to the use of new techniques. The first, – 'an architectural firm should use computers and scientific techniques whenever they will improve its service.' Architectural firms need not be afraid of talk of computers nor need they fear the computer – but I suggst that we all respect the architectural firm which is using the computer. I suggest that we watch out for the entreprenurial and industrial groups who are hovering over our field because they are probably gearing up to use computers and the other scientific and business-like techniques.

"The second hypothesis is 'architects should depend upon automation.' In this respect, I believe automation may have a deteriorating effect on the conceptual designer and the creative architect – if – they forget how to derive formulas, use basic data, make their own analytical comparisons and 'think for themselves.' I hope the architect never finds himself dependent on the machine which in turn is dependent upon a power failure, a union strike or some other catastrophe of modern society.

"Changes are the essence of today's architectural practice, just as changes are the theme of life in the world today. Let me remind you of the changes going on in the construction world.

• Today's clients are more sophisticated. Oftentimes, they know more about their type of buildings than the design profession. Corporate clients and government clients are experienced in negotiations, in problem solving, in automation and in the modern techniques for managing and operating businesses.

• Our building technology is more advanced and our technical products are more complicated; our products are factory-made and our systems are highly-engineered, our components are larger; our environmental and structural systems are integrated prior to field installation. Our new technology gives us complex systems requiring comprehensive design procedures.

• The automation of construction bidding, planning, ordering and scheduling coupled with the mechanization of building erection and material handling complicates design procedures.

• The financial planning of projects causes more tax complications and long range funding. All of these require greater understanding of cash flow problems and financial justifications.

• Government involvement becomes deeply rooted in our practices. The government is (a) a major buyer of design services (b) a regulator for the construction market and total economy, (c) a regulator of codes and restrictions and (d) a primary instigator of building research.

• The business-oriented world of commerce and industry envelops the construction industry and architectural profession. Business machines, computers, photographic techniques, communications systems and other modern systems are being used by the governmental agencies, building industry groups, the allied professionals and the clients who surround us.

• Competition from outside of architecture increases for architectural firms. Construction entrepreneurs, package builders, building manufacturers, diversified industries and other business opportunists are aggressively striving for a larger part of the building design market.

• Developing and expanding quickly is the field of building programming which uses the new techniques of systems analysis,

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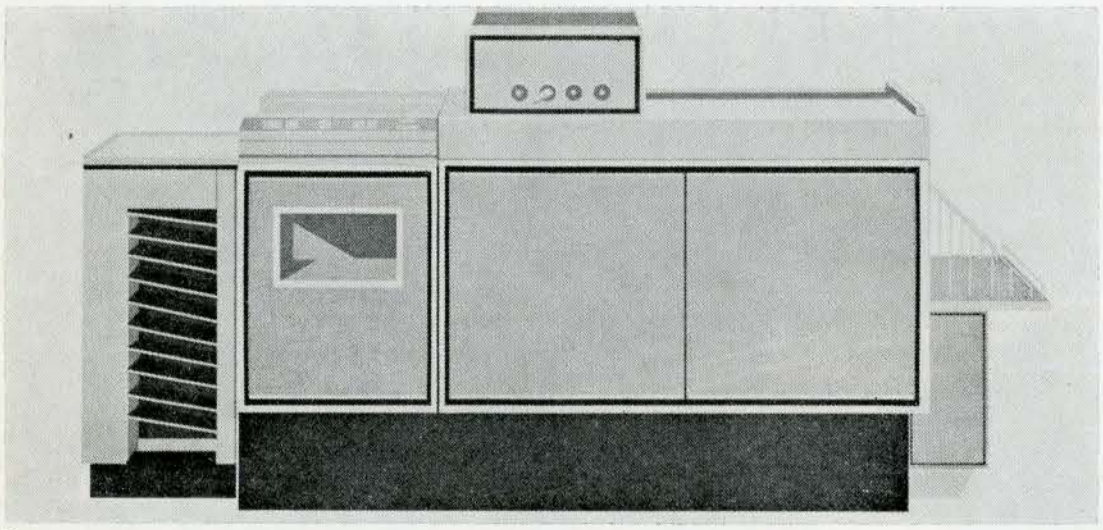

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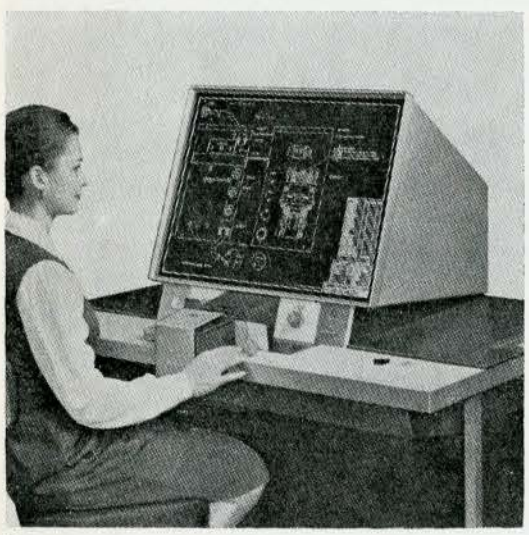

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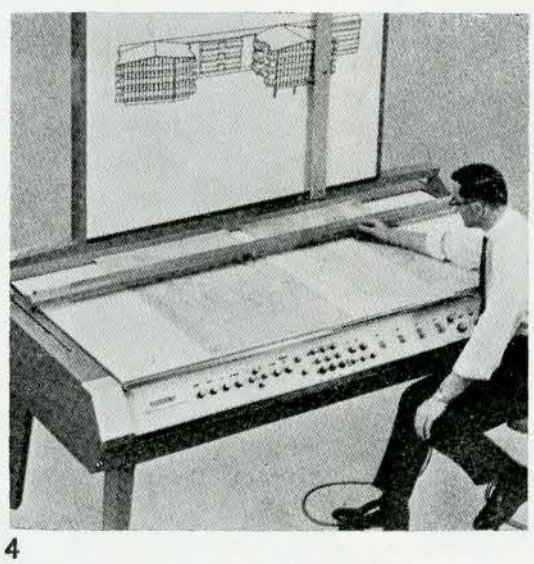

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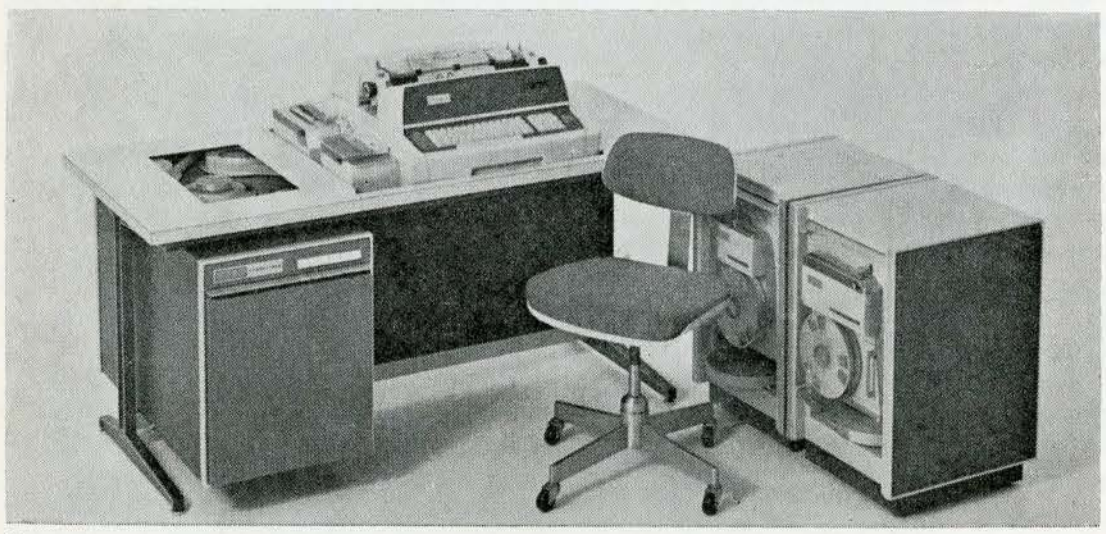

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value analysis, computer technology, investigative techniques and electronic devices. Improved building programming by clients is causing the influx of economists, sociologists, psychologists, behavioral scientists, land specialists, transportation engineers and other disciplines which now profess an interest in man's total environment.

• But the change which excites me most stems from the younger generation of new architects and allied professionals who are coming out of colleges with an exposure to computers, systems analysis and the other new techniques. They have a broad outlook about our building design procedures and research – and our profession as a means to serve society.
"The technologies illustrated are based on electronics, photography, printing and television.

"Now for the emerging techniques of the modern architectural practice: (a) those techniques which are made possible by the new technologies and/or (b) those techniques which are evolving from the systematic development of the architect's system of services.

"Let me caution – applying the techniques does not come easily. It does not mean a sudden jump into automation. Automation comes as the last of five steps in the development of a system. The steps are:

1. Problemization or Problem Definition
2. Procedurization
3. Standardization
4. Systematization
5. Automation

"We don't re-invent the wheel on every architectural project. We, you, your client – no one can afford to re-invent and custom design everything we do, nowadays.

"To apply the new techniques and technologies to architectural practice requires a systems development effort. It requires a period of 'Technique Involvement.' In fact, it seems to me that the next plateau for architecture will depend upon the willingness of architects to become involved with

5
Eastman's Miracode System
Système Miracode Eastman

new technologies and techniques. The combined use of many of these techniques will be the real challenge to the architect of the seventies.

"This however is only the beginning of a generous flow of new techniques which are available to the architect of the future. It is said in research circles that 75% of all 10 year old products are out-of-date; in business circles that almost all procedures which have been used for over 5 years can be improved. That is how fast we are developing or changing.

"Until recently, the architectural firm was the victim of an ever-widening gap between a static methodology of design services and a dynamic industrialized society. Now, individual architectural firms, or groups of firms are beginning to use the new techniques, new technologies, and new equipment to update their system of services and to close the gap.

"Admittedly, this would not have been possible ten years ago. But, as I see it, the leading architectural firms in the next ten years will be those firms who continue to practice the art of building with competency and sensitivity, as always, – but, in addition, use scientific techniques and business-like methods.

"As a university professor who has had the rare opportunity of visiting over 75 architects in their offices, and who has directed many conferences and seminars for over 200 more architectural firms and who is in a position to examine the profession of architecture objectively, – I would like to tell you about a few thought provoking developments in our profession.

• The combining of industrial firms and architectural firms, as joint ventures or as permanent corporations, to tackle large industry-wide projects.

• The trend toward mergers or permanent associations by architectural firms.

• The trend toward cross-country architects-in association agreements for single projects.

• The pooling of resources to set up a professional services center for purchase and use of new equipment.

• The developing of a cooperative of architectural and consulting engineering firms to share in the use of computers in their practices.

• The development of printing company subsidiaries to obtain and use the best in offset and multicolor printing.

• An experimental project between a large architectural firm and an information industry firm to develop a new type of information system.

• The nation-wide marketing of standards specifications on magnetic tapes.

• The experimentation by architectural firms in the offering of additional services in professional construction management.

• The accelerated growth of consulting firms in the field of building economics, sociological consulting, site engineering, building programming, building costs control and so on.

• The search for and impending purchase of a 100 man architectural firm by a leading supplier of educational equipment.

• The mergering of architectural and engineering firms.

• The initiation of a department of "architectural programming" in another large firm.

"The search for new approaches and new arrangements for the practice of architecture is wide spread.

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Mosler Selectriever System
Système Selectriever Mosler
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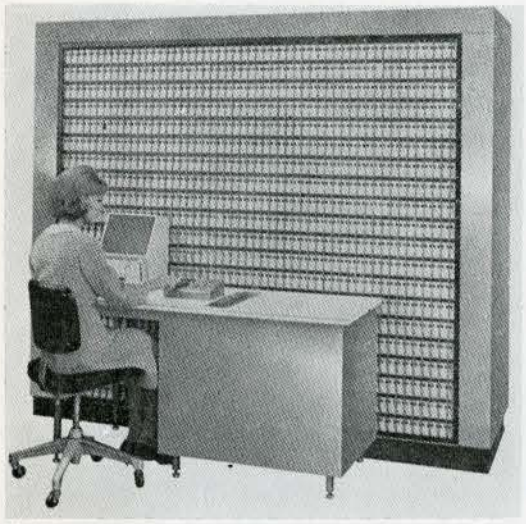

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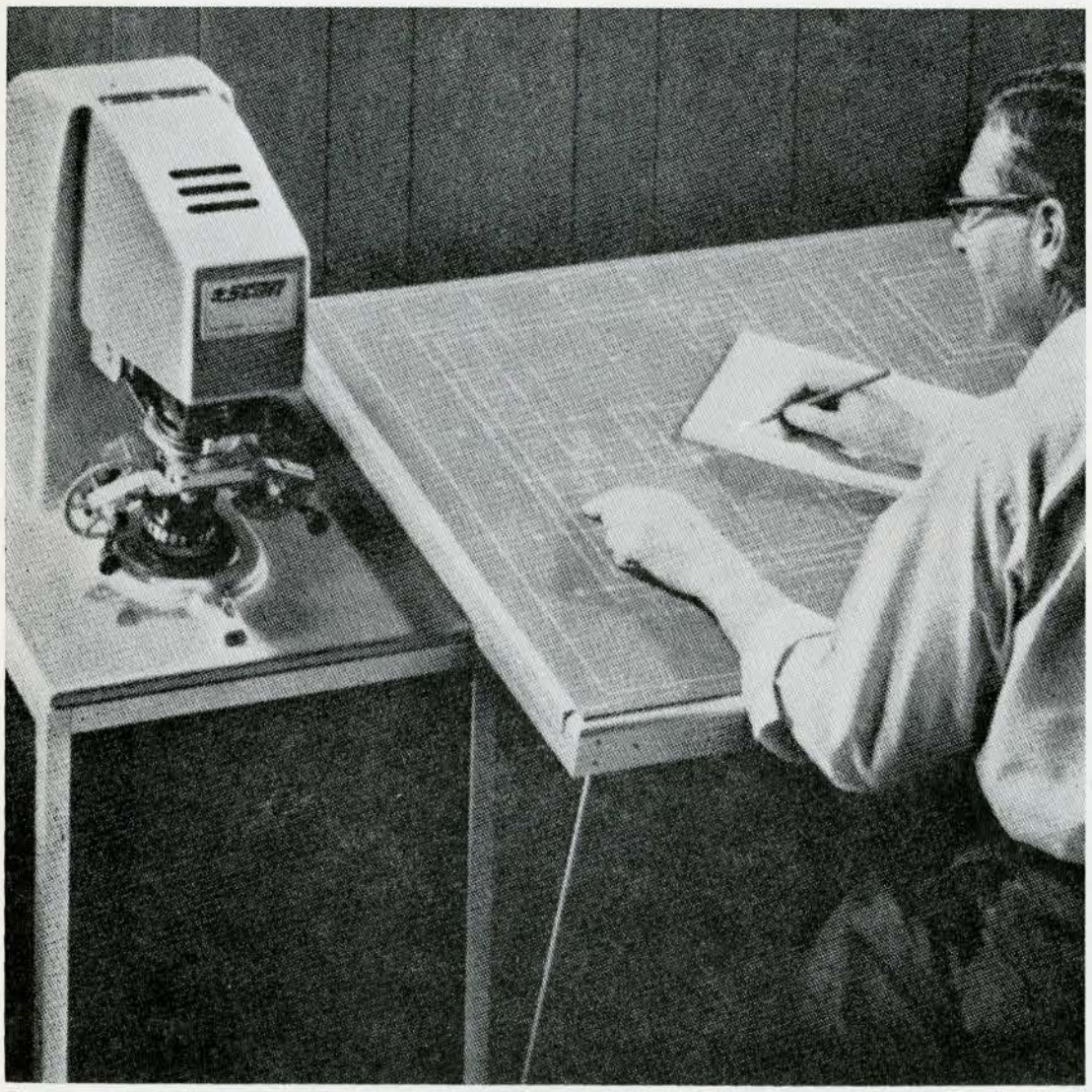

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"Two suggestions which I have been promoting since I first introduced them at the American Institute of Architects National Convention in New York, last summer, pertain to the development of centers for new techniques, new equipment and new types of specialists. These suggestions are:
A *'Technical Services Center'* – the pooling of resources by a group of architectural firms to create a Center, which would be staffed with technical experts and equipped with up-to-date computers and photographic equipment. It would provide computer services, microfilming services, printing services, information services and all of the other technological services which are usually too costly for single average-size practices to support.
A *'Business Services Center'*, cooperatively-owned, to render expert bookkeeping, record-keeping, time keeping, statistical reporting and other business administration types of services which now consume too much of the architect's time and too great a percentage of the fee.

"In closing, I would like to make one observation pertaining to the future use of the emerging technologies and techniques in architectural practice. I believe that the new techniques of practice will become so fundamental to the system of architectural services that every architectural firm – small, medium & larger – will be required to have – on its staff or available from a service center – the technician/specialists necessary to use the new techniques of practice. In this respect, I visualize the architectural profession in 1988 having many types of specialized practices, not only many large comprehensive services practices." □

Monthly Report of Unit Prices

Our Technical Section Advisory Committee has agreed that our monthly report on unit prices should be withdrawn until such time as we can perfect a method of minimizing the spread between prices on the same units provided us by reporters in different parts of the country. We will report again after we have investigated further.

CANADIAN

BUILDING DIGEST

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CANADA

STACK EFFECT IN BUILDINGS

by A. G. Wilson and G. T. Tamura

UDC 697.952

Stack effect in buildings is the same as stack effect in a chimney. The draft produced in a chimney depends on the difference between the temperatures of the flue gas and the outside air as well as on the chimney height. During cold weather similar action occurs in buildings, although the inside-to-outside air temperature difference is much less. Even for one- or two-storey houses the stack effect in winter is sufficient to affect certain aspects of air leakage significantly; and in very tall buildings it can lead to pressure differences as great as 1 in. of water across exterior walls.

This Digest discusses the nature of stack action, the distribution of air pressures across a building enclosure and its interior separations that stack action causes, and some of the implications of the resulting air flow patterns. Air pressure differences across building components are also caused by wind action and the operation of mechanical air supply and exhaust systems (CBD 23). Problems caused by air leakage in buildings have been discussed in other Digests (CBD 25, 42, and 72).

Stack Effect

Stack effect can be explained with the aid of Figure 1(a), which represents a building with no internal separations, a single opening at the bottom, and an air temperature inside greater than that outside. The graph shows the variations with height of the absolute air pressures; under steady temperature conditions pressures inside and outside are equal at the level of the opening. The absolute pressures decrease with height because of the reduction of the total weight (per unit area) of the air above. This phenomenon of decreasing air pressures with height is widely experienced and is noticeable in the ear discomfort it causes during rapid changes in elevation, as when travelling on non-pressurized aircraft.

Figure 1(a) indicates that the outside air is denser than that inside, so that reduction in pressure with height is more rapid outside; and the absolute pressure inside is greater than that outside at all levels above the opening. This difference in pressure is the stack effect. It acts across the walls of the building and is equal to the horizontal distance between the lines representing the inside and outside pressures; the maximum value occurs at the top and is the stack effect for the total height of the building. Stack effect can be calculated from the following relation:

$$p_s = 0.52\ PH \left(\frac{1}{T_o} - \frac{1}{T_i} \right) \quad (1)$$

where p_s = total pressure difference caused by stack effect, in. of water

P = ambient pressure, psia

H = building height, ft

T_o = absolute temperature, outside, °F

T_i = absolute temperature, inside, °F

As an example, the total stack effect for a building 50 storeys high and with an outside air temperature of −25°F is approximately 2 in. of water (see CBD 23, Table III).

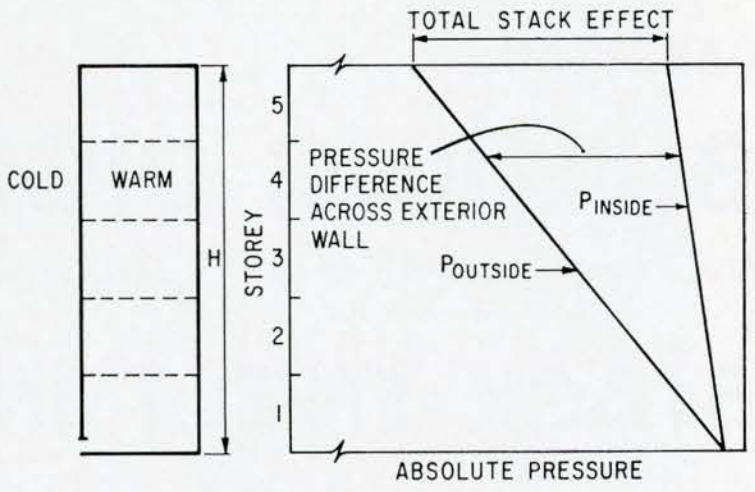
NRC DBR OTTAWA AUGUST 1968 | CBD 104

If the opening in Figure 1(a) had been at the top of the building, absolute pressures inside and outside would have been equal at the top; the pressure inside would have been less than that outside at all lower levels; and the maximum pressure difference across the walls of the enclosure at the bottom would have been equal in magnitude but opposite in direction to that at the top.

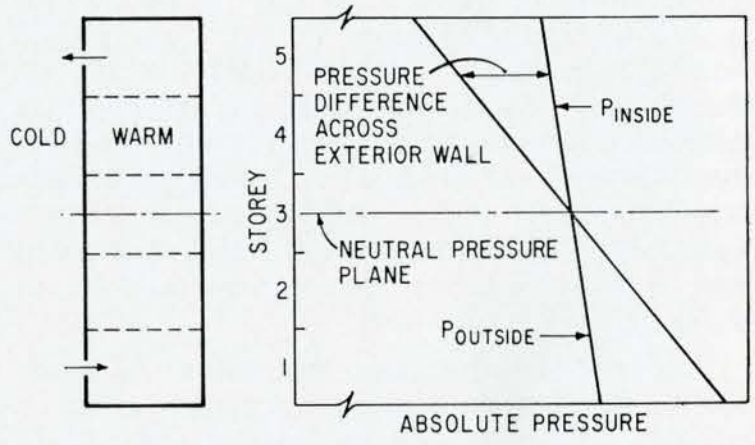
Openings through which air can leak occur in the walls of buildings at various levels. Figure 1(b) represents a heated building with no internal separations and openings of equal size in the exterior wall, top and bottom. The air in the building is warmer and therefore lighter than that outside, so that it tends to rise and escape through the upper opening while colder outside air comes in through the lower opening to replace it. The pressure difference required to cause flow through the openings is the stack effect. As air flow takes place from high to low pressure, the pressure outside must be higher than that inside at the bottom and lower than that inside at the top. Because the openings at the top and bottom are of equal size they impose an equal resistance to flow. The pressure differences across them are therefore of equal magnitude.

The inside and outside pressures required to fulfil these conditions are as illustrated in Figure 1(b). Lines representing the absolute pressures cross at mid-height, indicating that there is no pressure difference across the exterior wall; this level, where the inside and outside pressures are equal, is called the neutral zone or neutral pressure plane. In Figure 1(a) the neutral pressure plane is at the level of the bottom opening. The pressure difference across the exterior wall increases in proportion to the distance from it. As the temperature difference between inside and outside increases, the difference in the slopes of the lines representing inside and outside pressures increases, and the pressure difference across the exterior wall increases. The total pressure difference caused by stack effect, which can be calculated from equation (1), is the sum of the pressure differences across the exterior walls at top and bottom.

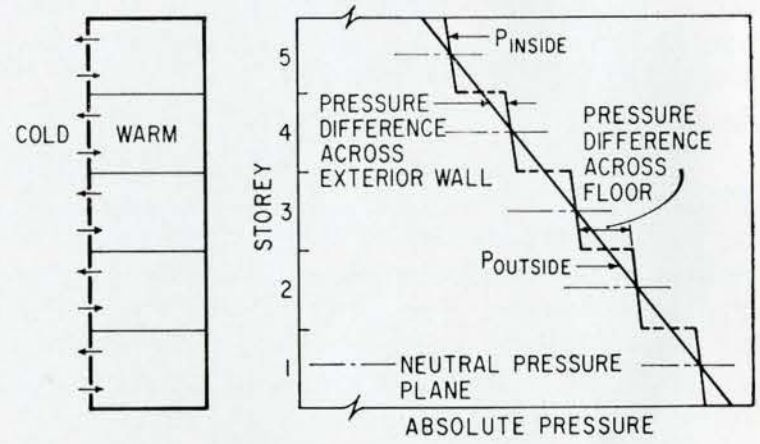
Leakage openings in the exterior walls of a building are not always distributed uniformly from bottom to top, but the in-flow always equals the out-flow. If the openings at the bottom were larger than those at the top, and therefore imposed a smaller resistance to flow,



(1a) NO INTERNAL PARTITION
SINGLE OPENING AT THE BOTTOM



(1b) NO INTERNAL PARTITION
EQUAL OPENINGS AT TOP AND BOTTOM



(1c) COMPLETE ISOLATION OF EACH STOREY WITH
EQUAL OPENINGS TOP AND BOTTOM

Figure 1 Stack effect for simple enclosures.

the pressure difference across the bottom would be less than that across the top. This would be equivalent to a shift of the inside pressure line to the right and a lowering of the neutral plane. The extreme situation, with the bottom openings very large in relation to those at the top, is represented by the pressure pattern shown in Figure 1(a).

Figure 1(c) represents a building with perfectly air-tight separations at each floor level, so that there can be no flow of air between stories; and with openings of equal size in the exterior wall of each storey, top and bottom. Each storey thus acts independently, its own stack effect unaffected by that of another level. There is a tendency for air to flow in at the bottom and out at the top of each storey, with a neutral pressure plane between. The sum of the pressure differences across the exterior walls at the top and bottom of any storey, therefore, is equal to the stack effect for that storey. This is equivalent to the pressure difference acting across each floor, and is represented by the horizontal line at each floor level. The total stack effect for the total building height is the same as that in Figure 1(b) and is equal to the sum of the pressure differences across the floors, plus the pressure difference across the exterior walls at top and bottom of the building.

In reality, multi-storey buildings are not completely open inside, as represented in Figure 1(b), nor are the separations between stories completely air tight (Figure 1(c)). There are passages for air to flow directly through the floors, and there are stairwells, elevators and other service shafts that penetrate the floors and provide passages for air to flow between stories. This is illustrated in Figure 2, which represents a heated building with a uniform distribution of openings in the exterior

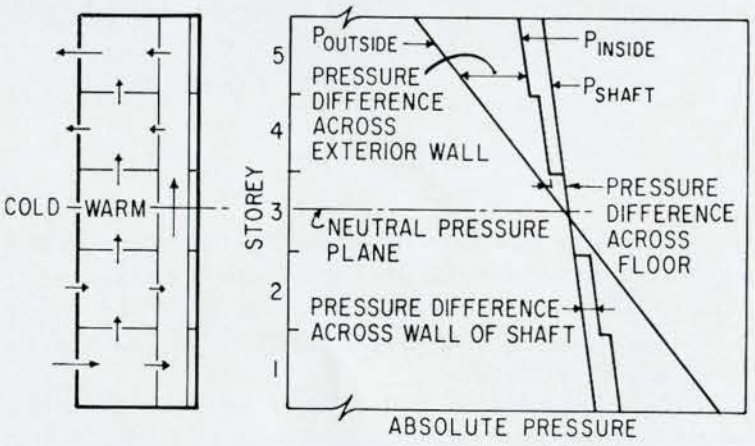


Figure 2 Stack effect for idealized building.

wall, through each floor, and into the vertical shaft at each storey.

The general pattern of air flow is the same as that in Figure 1(b). Air comes into the building at the bottom, flows upwards through vertical shafts and openings in the floors, and passes out through openings in the upper exterior wall. Between floors the slope of the line representing the inside pressure is the same as that in Figure 1(b), but there is a discontinuity at each floor, as in Figure 1(c), that represents the pressure difference across it. The total stack effect for the building remains the same as before, but some of the total pressure difference is required to maintain the air flow through the openings in the floors and vertical shafts. The pressure difference across the exterior wall at any level is therefore less than if there were no resistance to flow within the building.

Figure 2 also indicates the pattern of pressure difference and air flow for the vertical shaft. It is assumed that there is no significant resistance to flow within the shaft, so that the line representing pressure has a uniform slope determined by the density of inside air for the building as a whole (as in Figure 1(b)). The horizontal distance between this line and that for the pressure within the building proper represents the pressure difference across the wall of the shaft and any openings it contains. With a uniform resistance to air flow across the floors and a uniform resistance to flow into the shaft at each floor level, air enters the shaft at lower levels and leaves it at higher levels in a symmetrical pattern. The neutral pressure plane for the shaft with respect to adjacent spaces in the building occurs near mid-height. The pressure difference across the wall of the shaft is maximum at the top and bottom and the change in this pressure difference from floor to floor corresponds to the pressure difference across the intervening floor. Thus the sum of pressure differences across the shaft wall at the bottom and top is equal to the sum of the pressure differences across all the floors in the building.

The total stack effect for the building is equal to the sum of the pressure differences across the exterior wall at bottom and top plus the pressure differences across all the floors. As the resistance to flow imposed by separations within the building increases, the pressure differences across floors and walls of vertical shafts increase and the pressure differences across the exterior walls decrease.

Air flow induced by stack effect within a real building occurs through each path illustrated in Figure 2. As the height and number of floors increase, however, the total resistance of the flow path through openings in the floors increases more rapidly than that through the vertical shafts; thus with high buildings, upward air flow occurs mainly through the vertical shafts.

Air Flow Effects

Some of the effects of the general pattern of flow and pressure differences resulting from stack effect in a heated building, as illustrated in Figure 2, can be usefully reviewed. It may be seen that infiltration occurs below the neutral pressure plane and exfiltration above it. There is a general upward movement of air inside the building, with air flowing into vertical shafts from the lower floors and out to the upper ones.

This general pattern causes a variation in the heating and humidification load from floor to floor, and therefore has implications for the maintenance of uniform temperatures and humidities throughout the building. It is also a factor in the spread of odours and other contaminants. If fire occurs in lower floors there is a tendency for smoke to move to upper floors via the vertical shaft, and for stairwells and corridors to become smokefilled. This pattern of smoke movement induced by stack effect must be regarded as one of the major problems in providing for fire safety in high buildings.

Air entering through exterior walls at the lower levels is a source of cold drafts as well as dust and other contaminants. It is particularly troublesome near entrances. Air exfiltrating through the roof of exterior wall construction at the upper levels can give rise to damage from condensation when the water vapour it contains is cooled below its dew-point temperature inside the structure. The extent of condensation depends on the quantity of air flow, its initial moisture content, and the reduction in temperature it undergoes in passing through the building components. In general, moisture problems due to exfiltration will increase with increasing building height, decreasing average winter temperature, and increasing building humidity.

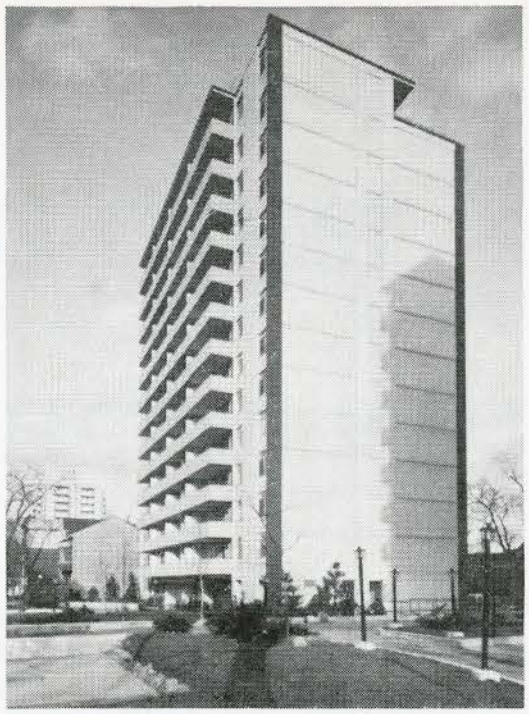
During the summer, when the outside air temperature is higher than that inside, the pattern of pressure differences and air flow is the reverse of that shown in Figure 2. Infiltration occurs through the exterior walls at the upper levels and exfiltration at lower levels, with air flowing downward within the building. The stack effect is, however, much less than under winter conditions because of the smaller inside-to-outside air temperature difference, and its importance is reduced correspondingly.

Summary

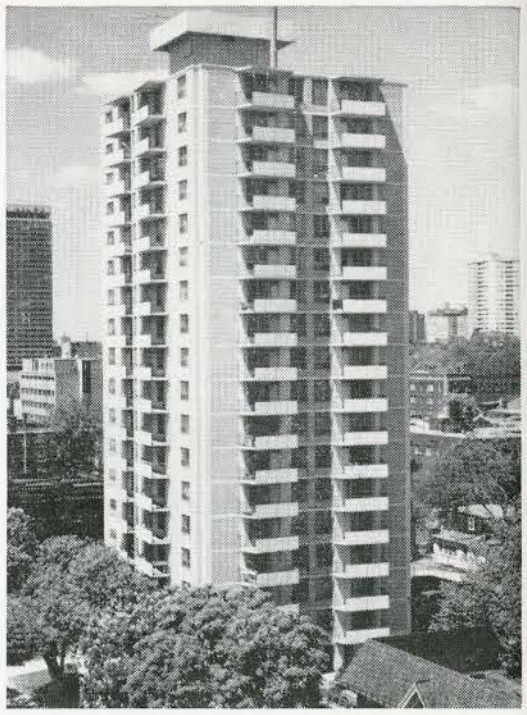
The total pressure difference acting on a building as a result of stack action depends upon building height and the difference between temperatures inside and outside. It cannot be avoided, but the way in which it is distributed across the building enclosure and interior separations can be modified through design because it depends upon the relative resistances to flow presented by the building components and the way in which they are distributed in the flow path.

Air movement caused by stack action has many important implications related to the functional adequacy of buildings that should be recognized in both their design and operation. This Digest provides a basis for understanding the nature of stack action and some of the problems it may present. Some of the choices available to the designer in providing for its control will be the subject of a future Digest.

High Park Gardens, Toronto, Ont. *Owners & Builders:* Oak Pacific Holdings Ltd. *Architects & Consulting Structural Engineers:* Grozbord, King & Assocs. Ltd. *Masonry Contractor:* O. M. Construction Co. *Concrete Masonry Units:* Richvale Block Supply Co. Ltd. *Ready-Mixed Concrete:* Richvale Ready Mix Ltd.

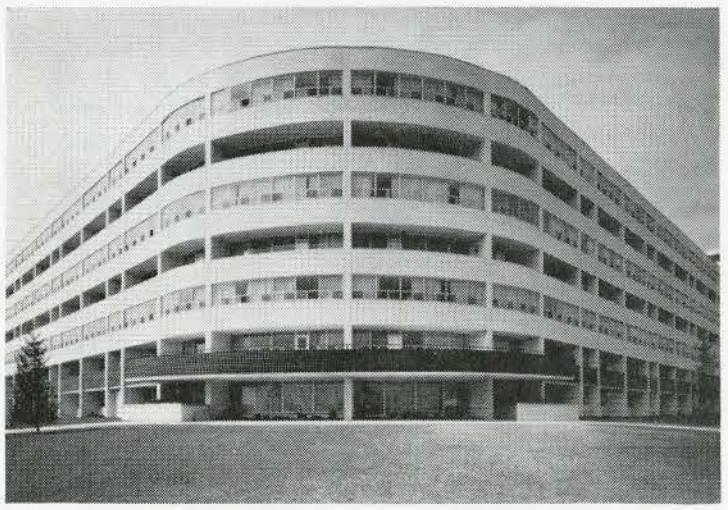


Gramercy House, Toronto, Ont. *Owners & Builders:* Greenwin Construction Company Ltd. *Architects:* Harry B. Kohl. *Consulting Structural Engineers:* Kazmar Consultants Ltd. *Masonry Contractor:* New Hillmount Construction Company. *Concrete Masonry Units:* Richvale Block Supply Co. Ltd. *Ready-Mixed Concrete:* Richvale Ready Mix Ltd.

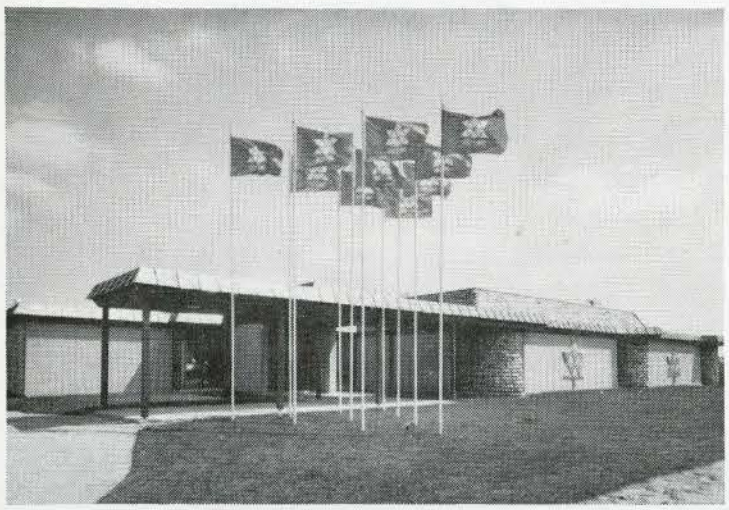


Apartment Complex at 100 Maitland Street, Toronto, Ont. *Owners, Architects & Builders:* Grozbord, King & Associates Ltd. *Consulting Structural Engineers:* Kazmar Consultants Ltd. *Masonry Contractor:* J. Russo Masonry Contractors. *Concrete Masonry Units & Ready-Mixed:* Richvale Ready Mix Ltd.

The Attache, on Shaughnessy Blvd., Toronto, Ont. *Owners & Builders:* North Valley Const. Ltd. *Architects:* E. I. Richmond. *Consulting Structural Engineers:* Alex Tobias & Associates Ltd. *Masonry Contractor:* Omar Masonry Contractors Ltd. *Ready-Mixed Concrete:* Mel-Mix Concrete & Asphalt.



Markham-Eglinton Square, Toronto, Ont. *Architects:* Martin L. Mendelow. *Consulting Structural Engineers:* Farkas, Barron, Jablonsky. *General Contractor:* F.T. Developments Ltd. *Masonry Contractor:* M. Rodaro Co. Ltd. *Concrete Masonry Units:* Meteor Building Supplies Ltd. *Ready-Mixed Concrete:* Mel-Mix Concrete & Asphalt.

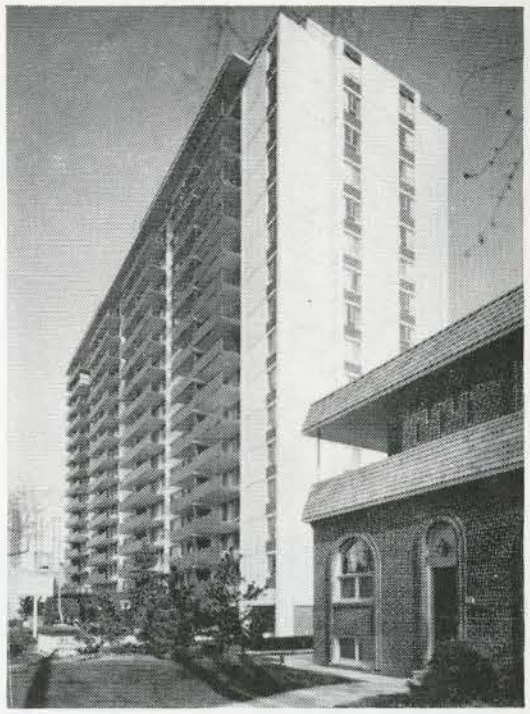


Columbus Centre, Kitchener, Ont. *Owners:* Corporation of the Knights of Columbus. *Architects:* Horton & Ball. *Consulting Structural Engineers:* McCargar & Hachborn Ltd. *General Contractor:* Brandon General Contractors Ltd. *Masonry Contractor:* Seibel Masonry Ltd. *Concrete Masonry Units:* Forwell Ltd. *Ready-Mixed Concrete:* Albert Raith Cement Contractor Ltd.

Prague Towers, 737 Birchmount Road, Toronto, Ont. *Architects:* Keywan & Kassian. *Consulting Structural Engineers:* Farkas, Barron, Jablonsky. *General Contractor:* Prague Towers Investment Ltd. (*Owner & Builder*). *Masonry Contractor:* Gottardo Contracting Co. Ltd. *Concrete Masonry Units:* Richvale Block Supply Co. Ltd. *Ready-Mixed Concrete:* Richvale Ready Mix Ltd.

Rockhill Apartments, Apartment Building on Cote des Neiges, Montreal, Que. *Owners:* Manucape Holdings Ltd. *Architects:* Menkes & Webb. *Consulting Structural Engineers:* M. S. Yolles & Assocs. *General Contractor:* E. G. M. Cape & Co. (1956) Ltd. *Masonry Contractor:* Di Biase Construction Ltd.

"Top of the Valley" Apartment Complex, Toronto, Ont. *Owners:* The Rubin Corporation & Mr. Jos. Godfrey. *Architects:* Henry Fliess. *Consulting Structural Engineers:* Reicher Bradstock & Associates Ltd. *General Contractor:* The Top of the Valley Limited. *Masonry Contractor:* Zachary De Vuono. *Concrete Masonry Blocks:* Richvale Block Supply Co. Ltd. *Ready-Mixed Concrete:* S. McCord & Co. Ltd.



Greenwin Place (East) Toronto, Ont. *Owners:* New Age Development Company. *Architects:* Harry B. Kohl. *Consulting Structural Engineers:* Kazmar Consultants Ltd. *General Contractor:* Greenwin Construction Company Ltd. *Masonry Contractor:* Village Contractors. *Concrete Masonry Units:* Richvale Block Supply Co. Ltd. *Ready-Mixed Concrete:* Richvale Ready Mix Ltd.

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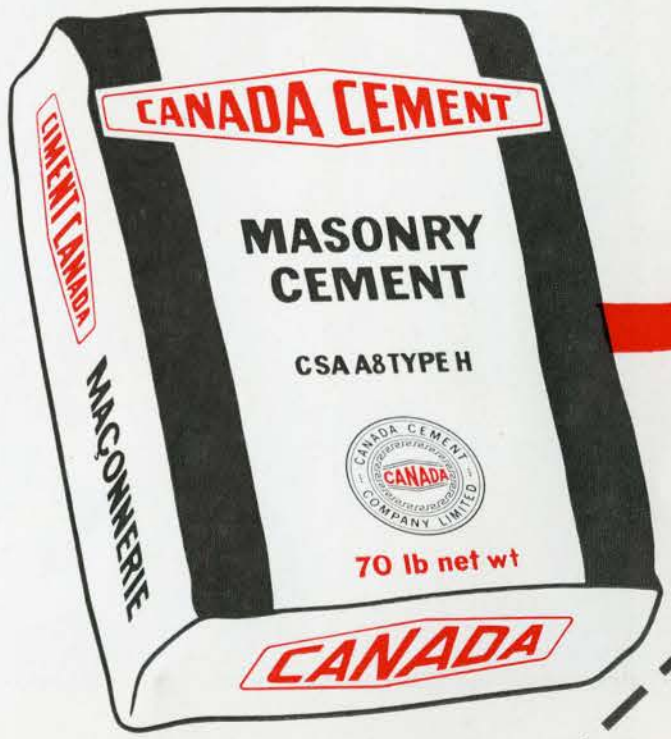

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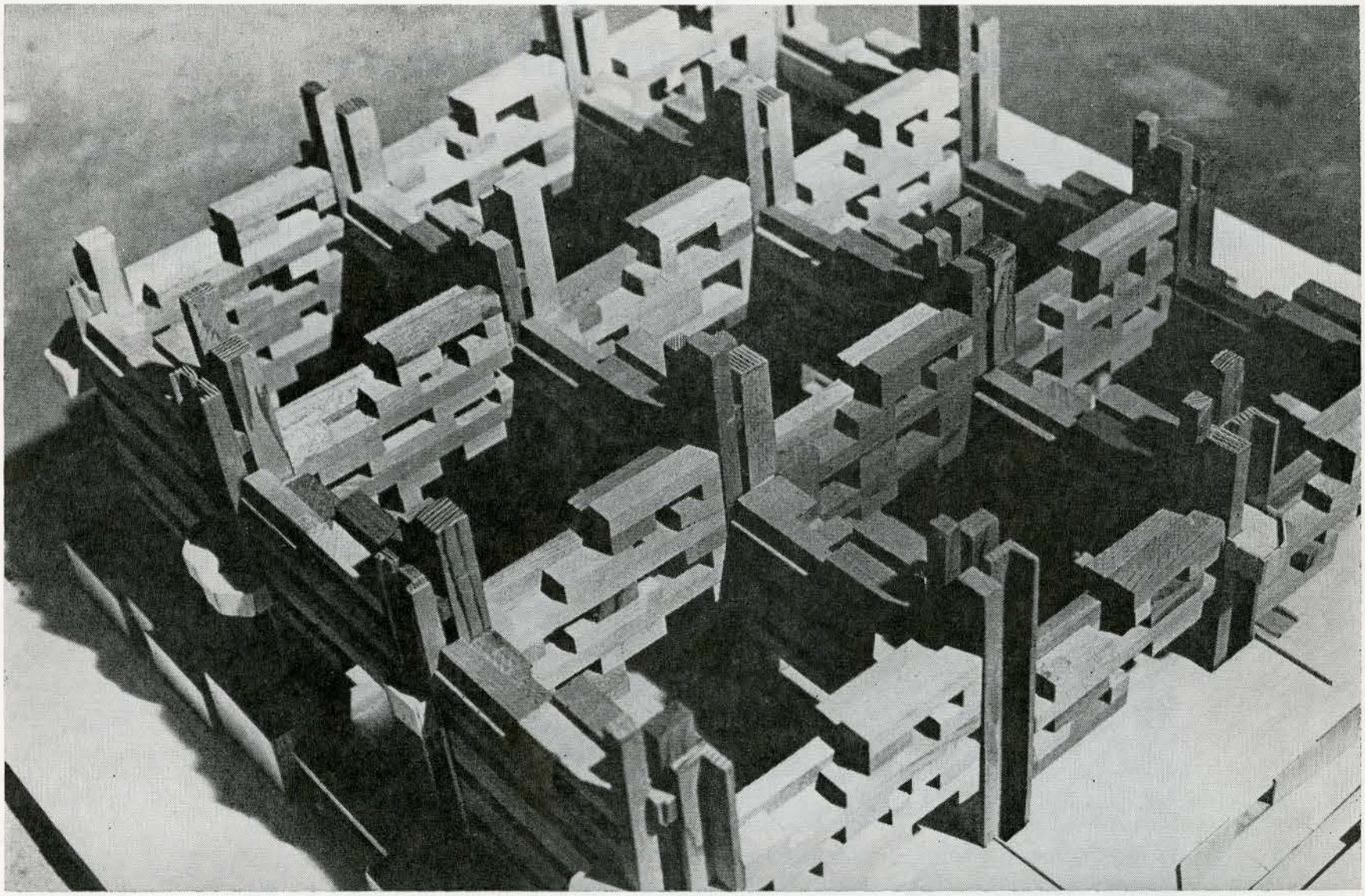
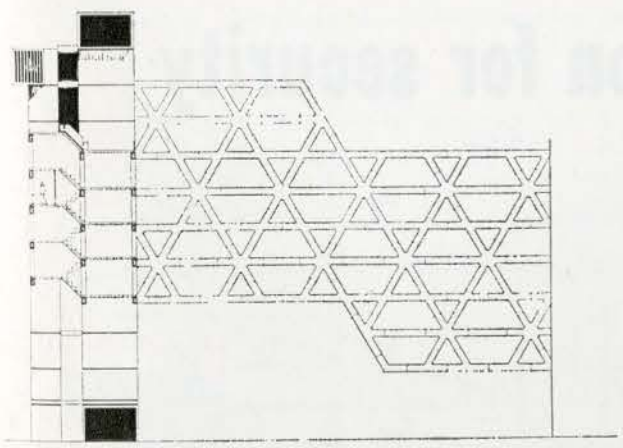
Winning scheme in the 1968 Portland Cement Association's Scholarship Awards Competition



1
Maquette
Model



2
Structure

The winner of this year's Portland Cement Association Scholarship was Michel-Ange Panzini, a fourth year student at the Université de Montreal. Runner-up was fourth year student at Manitoba, Patrick Lan for his design for a neighbourhood religious center. Both Mr Panzini and Mr Lan received scholarships to attend the summer session at Fontainebleau School of Fine Arts, Paris.

Jurors were Derek Buck, FRAIC, Toronto, and American architects Charles M. Nes Jr., Baltimore, Macdonald Becket, Los Angeles, Don Hisaka, Cleveland and Mark Hampton, Tampa.

The jury commented that the scheme was "an imaginative and simple solution to a complex problem – well excuted".
Mr Panzini's comments follow:

Student Statement

We abandoned the traditional compositional system of building juxtaposition which no longer corresponds to contemporary urban needs, and instead, elected to investigate the possibilities of mega-structural organizational systems which offer the advantages of more homogeneous and flexible infrastructures. Another basic consideration was the elimination of heavy and expensive room unit prefabrication systems in favor of lightweight and semi-heavy standardized prefabricated concrete components and panels which are both easier to manufacture and to erect. We wanted, also to avoid complex and futuristic solutions in favor of a simple solution well adapted to providing for determinate, as well as interdeterminate, urban user requirements.

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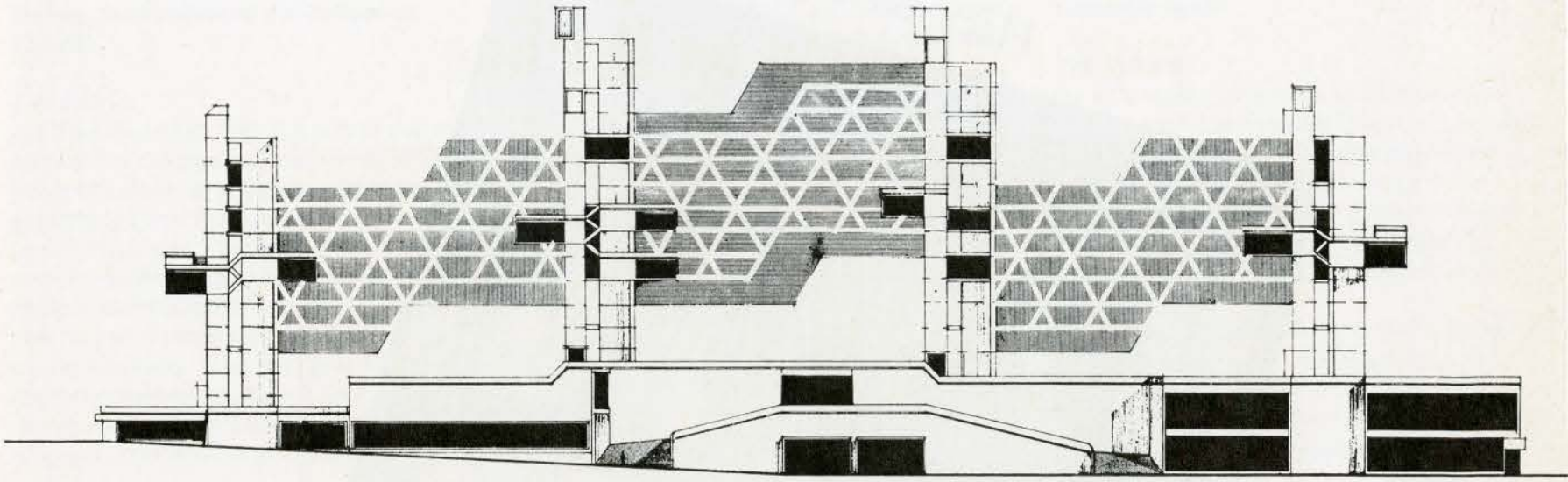

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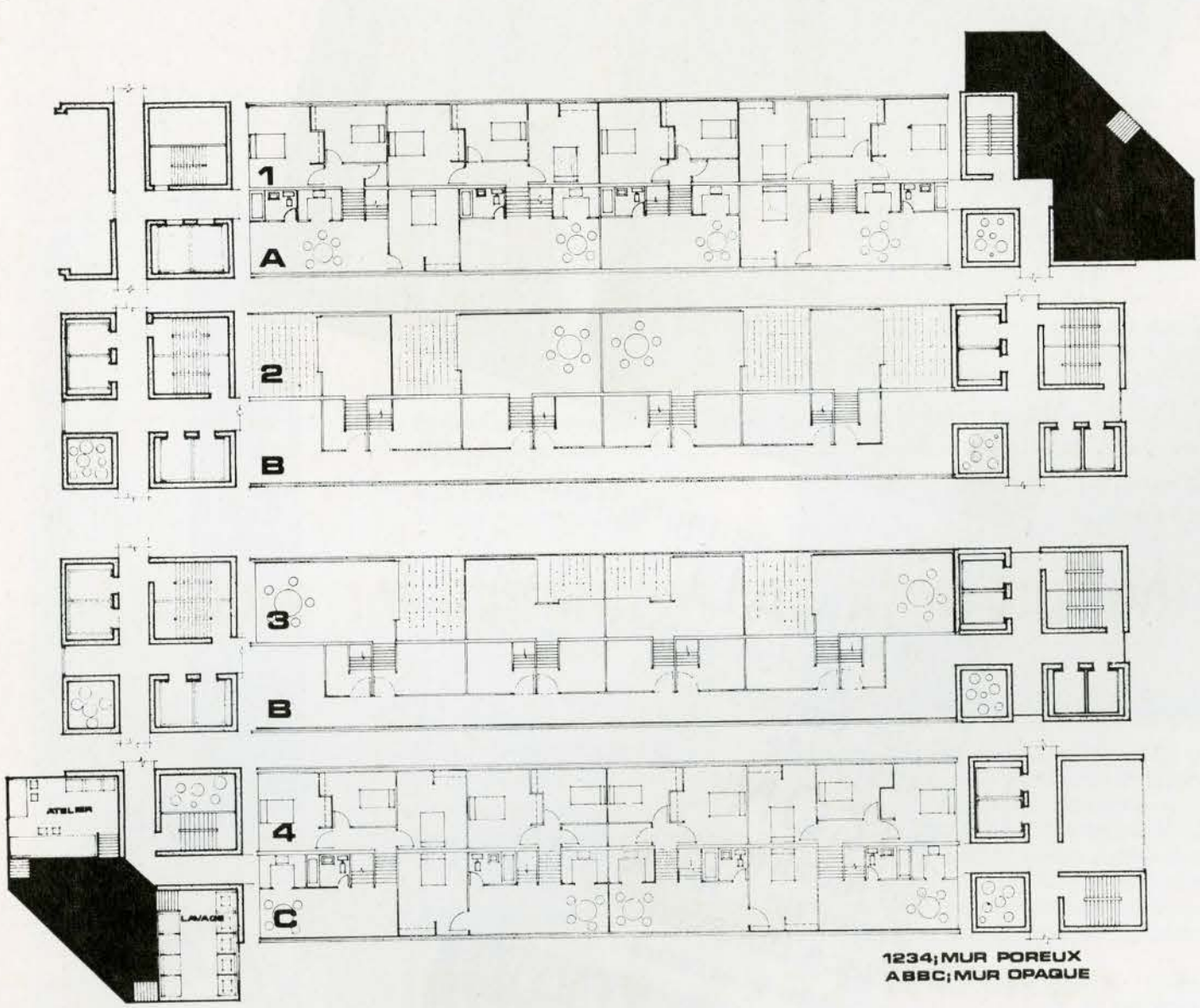

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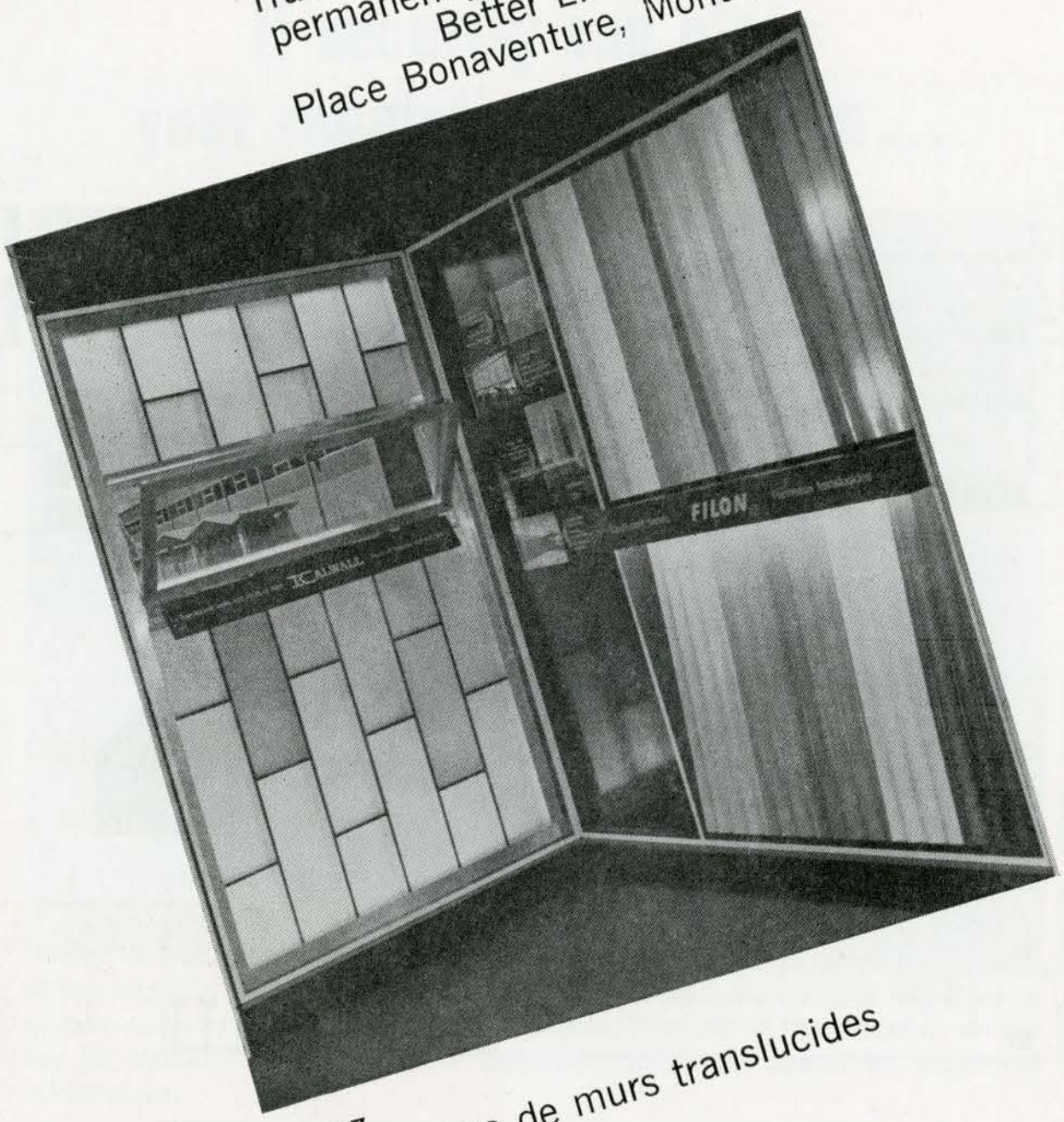


Letters
Lettres

8

On the Convocation of the College of Fellows

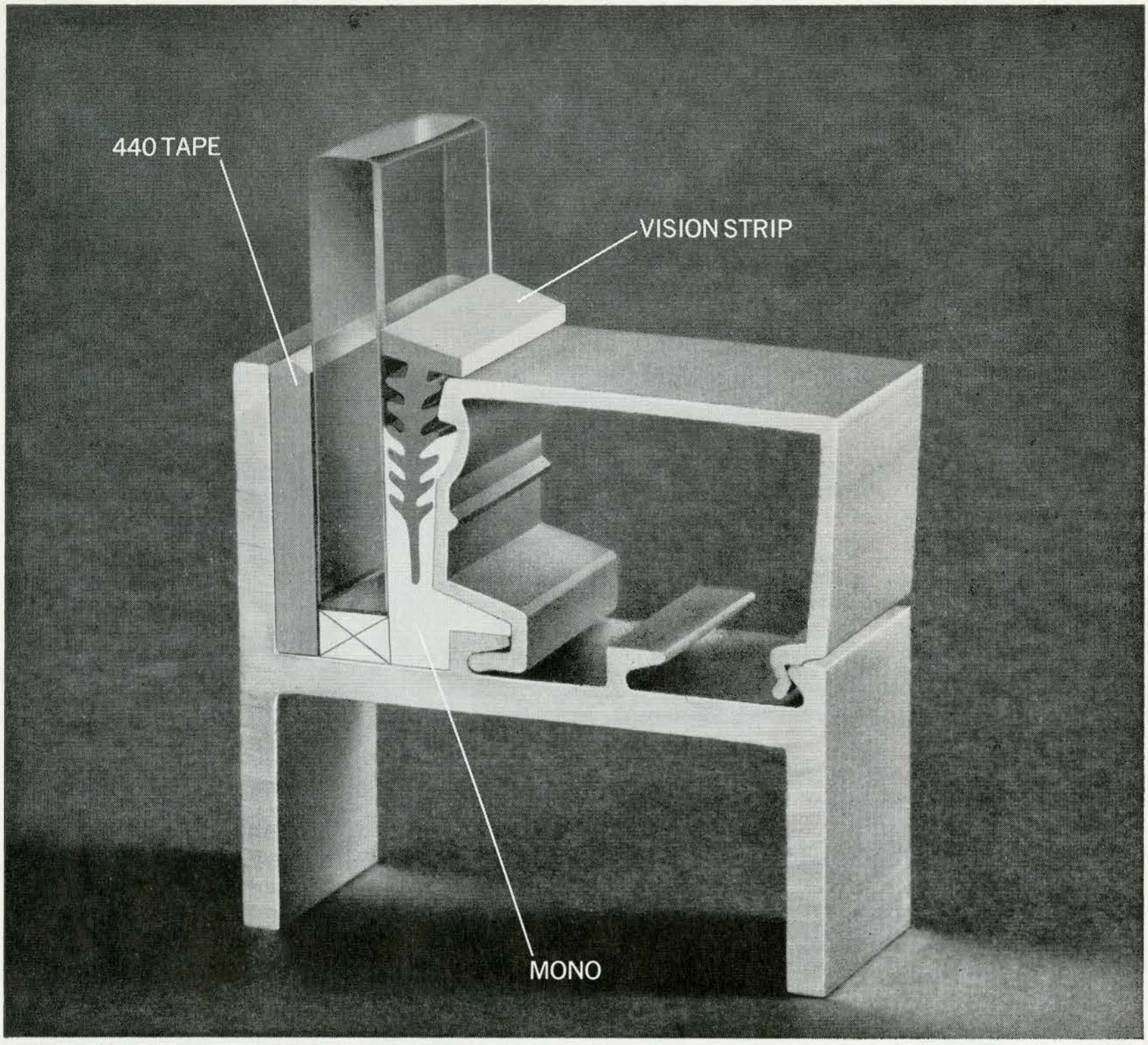
The Editors:
Let it be recorded from the outset that the aims of the College are most worthwhile and not in dispute and furthermore that the selection of new Fellows is not a point at issue in this letter. But why is the form of ceremony designed or selected with such obvious bad taste and repeated year after year in the company of seasoned and newly elected Fellows. The ritual fails to impress a serious observer because it appears to be ambiguous. It is a ritual reminiscent of religious, academic and military ceremonies, but lacks the integrity of any of these, being a mixture of all three. It lacks the mystical qualities of a religious, the strict limits for achievement in an academic and the precision and discipline of a military ceremony. The first task of the Fellows ought to be to revise their ceremony to one which reflects in present day forms of speech and imaginative modes of action, the truly worthwhile purpose of recognition of excellence.

Ir. E. H. Grolle, MRAIC, Regina

Concrete Issue

The Editors:
As a Company (Sternson Ltd) having an experienced background of some forty years in the manufacture and marketing of concrete admixture materials we find the Features Section 5 of your June issue most interesting and helpful in developing a better understanding of the entire subject of concrete.
The article "Admixtures in Portland Cement Concrete" by Mr E. G. Swenson is a particularly good piece of writing and does not in my opinion warrant the editorial comment concerning it as appearing on page 44.

A. F. Penny, Vice-President, Sternson Limited



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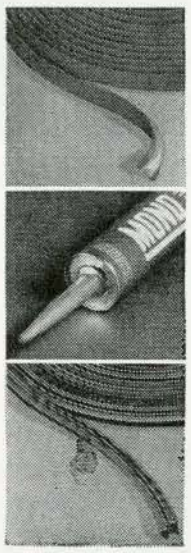

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Registrations

Alberta Association: Eugene Yuzda

Ontario Association: Paul G. Harasti, B, Arch; Michael F. Thom, B. Arch, M. Arch; Keith Helme Wagland, B. Arch, M. Arch, ARIBA; Julius Bartha, D.A. (Budapest); Clemens Robert Briskie, B. Arch; Glen Gibson; B. Arch., Dowrie Milne, B.. Arch, M. Arch; Paul Skinner, B. Arch, Arnold Schrier, B. Arch.

Nova Scotia Association: Frank W. Portman

Change of Address

A. J. Diamond and Barton Myers' new office address is 49 Avenue Rd, Toronto 5. Telephone number 920-3911.

Practice Notes

Peter J. Haensli has been made an associate in the Toronto firm of Shore and Moffat and Partners Architects and Engineers.

Positions Wanted

Canadian architect, MRAIC, 46, familiar with all phases of architectural practice, including management control of large projects, 20 years experience, including six years own practice, available for interesting and permanent position. Reply *Architecture Canada, Box No 152.*

Swiss Architectural Technician, 29, presently working in Ireland, seeks employment with Canadian Architect. Experience in design, specifications and site supervision for factories, schools and housing schemes. Resume and samples available, Walter Zbinden, Apt. 21 Mitchel House, Appian Way, Dublin 6, Ireland.

25 year old Dutch architect, graduate of the Technological University of Delft, Holland, seeks employment from November '68 with architectural or planning firm, preferably in Vancouver area. One year field and office experience, partly in Chicago. Trained in related fields: planning and engineering. Fluency in English, working knowledge of French. Particularly interested in urban design and interdisciplinary teamwork. Write: S. J. Schouten, Ruys de Beerenbrouckstraat 47, Delft, The Netherlands.

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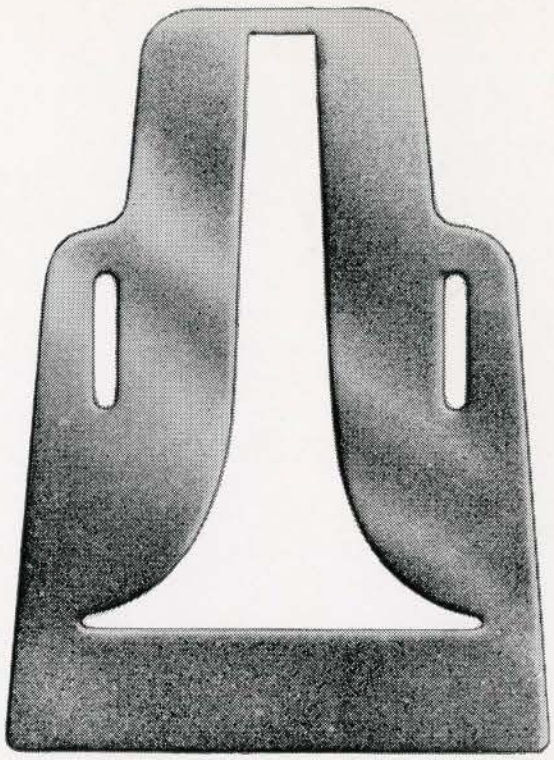

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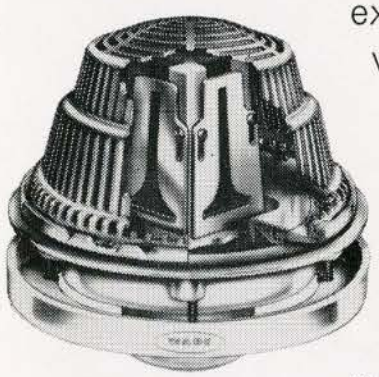

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