

Building with steel

A special A/C section on designing with steel appears this issue ; see pages 13-24.

Architecture Canada

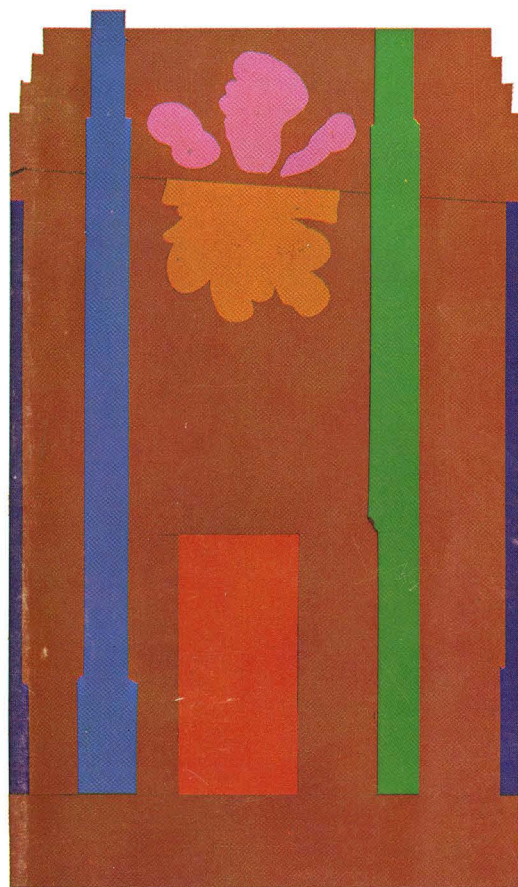
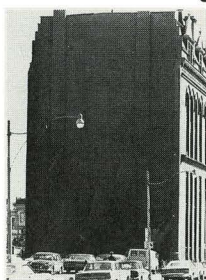
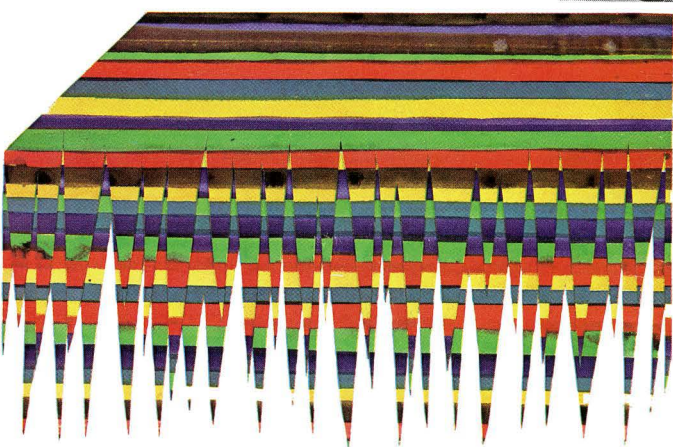
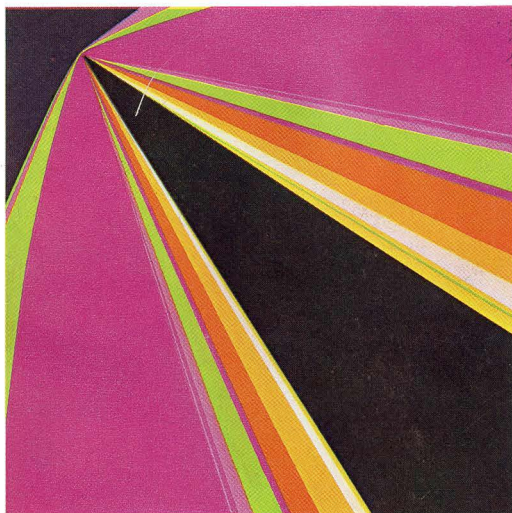
NEWSMAGAZINE

Published every two weeks by RAIC / IRAC October 12, 1971

Painting the town

Three of Toronto's large downtown building walls are now being transformed to "artwalls". In a project sponsored by Benson & Hedges Tobacco Co. in co-operation with the Art Gallery of Ontario, three works by local artists are being transferred to the blank faces of Neill-Wycik College, 96 Gerrard St. (1), the Edna Shoe Manufacturing Co. Ltd., 44 York St. (2), and the Flat Iron Building, 34 Wellington St. E. (3).

Artists Rita L'Etendre (Neill-Wycik), Gordon Rayner (Edna Shoe) and Dan Solomon (Flat Iron) were selected from a group of ten suggested by AGO Curator of Contemporary Art, Dennis Young. Judges were William Withrow, AGO Director, Nina Wright, special art consultant to Benson & Hedges, and Elizabeth Scott, an environmental art expert.



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RAIC

Council meeting report

Preceding the latest RAIC Council meeting, RAIC officers met with the PQAA Council at its headquarters in Montreal. The idea of joint meetings was initiated by RAIC President Jean-Louis Lalonde to promote a better liaison and interchange of opinions between provincial associations and the national institute. The next meeting of RAIC officers, November 4 in Halifax, will also be preceded by a joint meeting, this time with the councils of Nova Scotia, New Brunswick and Newfoundland Associations.

The Council meeting itself was held September 28, also at PQAA Headquarters. Discussion centered around "Communication". Below, a summary of proceedings as reported by RAIC Executive Assistant Lorraine Rioux:

- Council feels that A/C should be the medium of communication between the Institute and individual members, and between the members themselves. Provincial representatives have been asked to invite their respective associations to communicate news of meetings, reports, studies, surveys and other undertakings through the magazine. They have also been invited to encourage individual members to contribute opinions on controversial subjects to initiate a dialogue between members.

- At the President's request, provincial representatives reported on activities and projects of their own councils. This worthwhile exchange of information set a pattern for the future meetings which might be improved, however, if representatives would present reports in a written form. A number of interesting studies are underway by provincial associa-

tions, and summaries, opinions and comments will be published in A/C as soon as RAIC Headquarters receives copies of the documents.

- Council gave first approval to a complete revision of the RAIC By-law concerning the College of Fellows, to give effect to the new procedures for nomination and election of Fellows recommended by the College at their 1971 Annual Business Meeting. This revision was referred to Component Associations for interchange of views in accordance with the By-law on "Amendments".

- A report on the UIA (Union internationale des Architectes) first meeting of Commission No. 3 (A/C 9/27/71) was received by Council. Appreciation to Chairman Douglas Shadbolt was expressed.

- RAIC President announced that the Director of Professional Services, Wilson Salter, is representing the RAIC at the Amsterdam World Conference on Reciprocity for Architects in Amsterdam, October 1st and 2nd. He is also visiting the CIB (Conseil international du bâtiment) Headquarters in Rotterdam, the UIA Headquarters in Paris and the CAA (Commonwealth Association of Architects) Headquarters in London and will report his findings on return.

- Council asked if the Ontario Association would undertake, on behalf of the RAIC, production of a Handbook of Professional Practice. If agreeable, the OAA was requested to present a proposal at the next council meeting.

- Further to the preliminary brief submitted to the federal Treasury Board last June, a detailed report in English and in French on Government Contract Policy was submitted September 15. These two submissions, prepared mainly by C. F. T. Rounthwaite as Chairman of a Contract Policy Committee, endeavoured to reflect the opinions and recommendations of the architectural profession in Canada, to assist the current Treasury Board Study (see right).

- The RAIC Certification Board will meet in Toronto, in the OAA Board Room, on November 5, 1971.

- Further representations on the proposed Tax Reform will be made by the RAIC to the Senate Committee in November, with particular reference to accruals and partnerships.

- The PQAA is completing a study on the Competition Act - Bill C-256 and will make copies available to RAIC for distribution to component associations.

- Council approved the appointment of the Chairmen of Standing Committees.

- A Report was received on a program for the 1972 RAIC Assembly in Victoria, May 31-June 3.

- RAIC President outlined a proposal for Annual Honor Awards for Architectural Achievements to be conducted during RAIC Assemblies, possibly commencing in 1972.

OPINION

Store front architects?

I have read with interest many letters and articles concerning public relations problems of architects. It is true that the man on the street has about as much idea of what an architect does as he knows about quantum mechanics. Every architect has stories about people asking "how they make so many drawings, all the same", or "can you sell me some blueprints?"

The spectacular inability of the public to understand what our profession is all about calls for drastic action.

The medical profession in the United States pulled off the P.R. triumph of the decade when their association agreed to give advice and monitor the tapes of TV medical shows as to accuracy of detail. The TV doctors come through as heroes and everyone knows what a pediatrician is.

Marshall McLuhan was right!

Architects, too, need an image maker in the mass media to clearly illustrate the full depth of the problems which plague our profession and threaten social and environmental collapse.

The possibilities for scripting and backgrounds for a TV series must be enormous and have to be more exciting than doctors' offices or hospital corridors.

I have neither the resources nor the literary talent to write television plays, but perhaps with the support of the RAIC and the CBC our profession could come up with a few pilot episodes, especially now when some architects are less than busy and many are talented writers.

I can already visualize our handsome TV hero, not unlike Wojcek, dodging a client's wife as he tries to design their home; or balancing on an 8" steel beam thirty storeys above the street as he deals with a disgruntled sub-trade; or fighting for one cause or another to preserve the environment.

The medical shows are dying, the lawyers are old hat. Let's try the "Store Front Architects".

H. L. King,
Vancouver

BUILDING INDUSTRY

SWAC to set up registration board

Members of the Specification Writers Association of Canada have voted overwhelmingly in favor of setting up a registration board to maintain a "high standard of professionalism among specification writers".

Successful applicants before the Board will have the right to use an as-yet-undetermined title. The assessing procedure will take into account the applicant's knowledge of his profession and his years of experience.

"The new title at the end of a man's name," says SWAC president George Lord, a Winnipeg architect,

"will show the construction industry that this man has met the high standards set by his colleagues—and his training and experience indicate that he is capable of handling the specialized function he must perform."

A provisional Board has already been set up with SWAC past president A. W. Cluff, a Toronto architect, as acting chairman. Other members include: Ivan Lavender, Federal Department of Public Works, Ottawa; architect Mervyn Jones, Toronto; engineer Lyn Shecter, Montreal; B. H. Rondot of Eastern Const. Co., Windsor; and architect F. E. Davis, Ottawa.

The preliminary rules and regulations are being drawn up by this board, including the means by which the first formal registration board will be established, before the next annual meeting of SWAC in Halifax next April.

RAIC suggests changes to federal contracting procedures

Changes in federal contract policies that could free public construction contracts from a web of restrictive regulations and more effectively mobilize the country's professional architectural skills have been recommended to the Treasury Board by the RAIC.

In a report submitted September 15 at the request of the Board, the RAIC summarizes shortcomings and inequities in the existing methods of contracting for architectural services. It suggests policy changes that could be of benefit to the Government, professional architects, engineers, management consultants and the Canadian taxpayers. These changes include:

- Establishment of a Government-private industry review board to review methods and procedures annually;

- Retention of consulting architects for major projects at the earliest planning stages, before objectives, timing and cost estimates are fixed;

- A new approach to project management that would put an architect, engineer or builder in charge, depending upon the nature and scope of each project;

- A reassessment of criteria applied in judging and commissioning developer proposals, including cost and quality factors;

- A study by Government and architects of management consultant functions and redefinition of such management functions as an adjunct, in most cases, to project management;

- Provision for more time and money to be spent in pre-design work to more clearly define projects and estimate details before calling tenders;

- Introduction of cost plus fixed fee management contracts for high-risk work, such as projects in the Arctic;

- A reappraisal of insurance, bonding and security requirements and study of three possible alternatives to present policies: (a) insurance



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5th Company editorial committee: Annabel Slaight, Patrick Hailstone, Ron Butler, Janeva Van Buren, Michael de Pencier.

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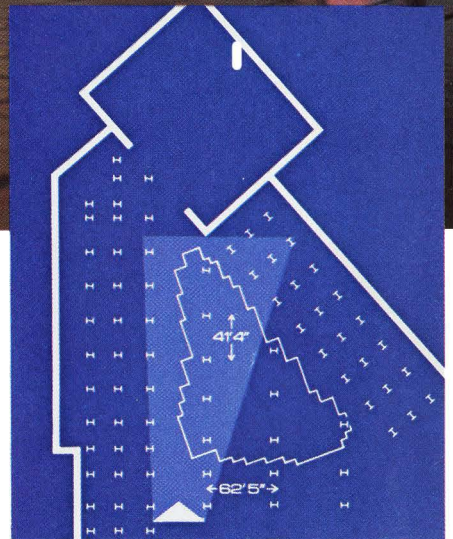
Steel & space

Owner: J.D.S. Investments Limited, Toronto, Architect: Martin Mendelow, Toronto
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Structural steel makes this shopping mall a wide open world of its own.

One of the most outstanding features of structural steel framing is its ability to provide long clear spans more economically than other building materials. The Sheridan Mall in Mississauga, Ont., pictured above, took full advantage of this feature and the inherent economies. The Mall is basically triangular in plan with spans in its centre section ranging from 32' to 65'. The reduced number of columns and the free pattern of boutiques give a remarkable impression of a completely open area. This is an excellent example of how steel gives freedom to the architect while allowing for maximum flexibility as rental requirements change in the future.

In addition to the economy and flexibility associated with structural steel, the speed of erection allows for early occupancy of tenants and hence a much earlier return on the total investment. If you are planning a building with a future, consider steel. And when it comes to quality structural steel, the name to remember is Algoma.



This partial floor plan of the Sheridan Mall shows the location of columns in the area covered by the photograph above. The jagged outline in the centre of the plan illustrates the free-form arrangement of boutiques.



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required only after the start of construction and for a specified time after completion and occupancy; (b) an all-risks Government insurance plan; (c) removal of insurance requirements.

The report is one of several requested by the Treasury Board from professional bodies associated with Government building, including the Canadian Construction Association.

"We have restricted our report to questions that concern architects, and we hope enough has been said to engender further discussion with the Treasury Board," says C. F. T. Rounthwaite, chairman of the RAIC contract policy committee. "We are not a pressure group. The report is a detailed consideration, factual and businesslike, of procedures that should be reviewed in the interests of efficiency and value.

"Buying a professional service is not like buying potatoes. A review of approaches to serious, unresolved issues is necessary and we hope the Treasury Board will continue to listen to our point of view in future discussions. Some of the expedencies developed in the past have not been appropriate for the past quarter-century."

In its suggestions and recommendations, the RAIC's report notes differences between working with government and working with private clients. Most of these differences are rooted in the inflexible, non-functional structure of big government, which tends to establish fixed requirements that restrict the normal give and take of private construction and even interfere with the accepted workings of the profit system.

Typical of such requirements brought into question by the RAIC is the practice of delegating responsibility but not authority. This occurs when a department such as Public Works retains a consulting architect after preliminary planning and design work for a building are completed within the department. The responsibility for carrying out a project conceived and estimated in part by others is delegated to the consulting architect but authority is retained by the department.

For these, and other reasons, the RAIC suggests that architects be retained in the earliest planning stages. They would then be involved in establishing three essential preliminary factors, described in the report as objectives, time and money. They would bring, fresh from the marketplace, an expert knowledge of current costs to improve estimates. They would help departments keep estimates current and accurate by assisting with reviews in the event of a lengthy delay in calling tenders. They would have a voice in decision-making at every stage of the project, in keeping with the responsibility delegated.

The report recommends that consultants be retained on a per diem basis for the pre-design program and budget planning, retained on a

normal fee basis after approval in principle by all agencies clears the way for design development.

It suggests that one of the first assignments of the new government-construction industry review board should be a reassessment of the relationship between architects and all government departments, Crown corporations and agencies. A table appended to the report shows wide variations in contractual procedures.

The RAIC also volunteers to provide the Government, upon request, a team of impartial experts to furnish impartial recommendations on specific architectural projects and schemes.

ENVIRONMENT

Quieting the din of cities

"We need noise zoning maps of all metropolitan areas for planning future land use."

This is Vancouver architect Warnett Kennedy expressing an opinion at a recent conference on noise abatement in Vancouver.

The conference, sponsored by the B.C. Medical Association and Workman's Compensation Board, was attended by 250 management, labor, and medical delegates from across B.C.

Major discussion points ranged from how to quiet the din of cities to what to do about the roar of airplanes and the whine of lawn mowers.

Kennedy told the audience he felt the new federal Ministry of Urban Affairs should attempt to co-ordinate the differing policies on noise of the three levels of government. At present, for example, he said, municipalities can sell land for residential development right in the path of major airport runways.

The advantages of legislative control of noise were also outlined by Dr. G. J. Thiessen, head of the acoustics section of the National Research Council, Ottawa.

Legislators, in drafting present noise control laws, have avoided the responsibility of a precise definition of noise and passed the buck to the judge, he said. Anti-noise laws now use such terms as "unnecessary and unusual noise" which enables everyone to put his own interpretation on these terms.

EDUCATION

Course on business law

Among the courses being offered this winter by the Centre for Continuing Education at York University is one on business law for architects, engineers and other members of the construction industry.

The course has been designed to teach a practical legal approach to business problems. A series of case studies will be presented which will combine such problems with legal decisions. The instructor, lawyer Sheldon Godfrey, will relate the student's practice to the law, pinpointing specific problems.

The 40-hour course runs from Oct. 18 to Mar. 6, 7.30 to 9.30. For further information write The Centre for Continuing Education, 4700 Keele St., Downsview 463, Ont.

ERRATUM

An unfortunate typographical error in the last issue of *A/C* credited John B. Parkin, Architect, with the design of the Art Gallery of Ontario addition. The architect for the project is John C. Parkin, Architects and Engineers.

The New Building Program Fund Raising Committee objective is \$5 million through a public campaign. The Ontario government is contributing a capital grant of \$12.7 million. Total building cost is \$17.9 million.

BOOKS

Debunking downtown myths

People and Downtown: Use, Attitudes, Settings, A. L. Grey, D. L. Bonsteel, G. H. Winkel, R. A. Parker, University of Washington, Seattle, 1970, 149 pages.

The main value of *People and Downtown* is that it serves to debunk a number of myths that have crept into the great North American crusade for downtown renewal: the myth of the liberated pedestrian, free to roam the length and breadth of the Central Business District once the car has been harnessed; the myth of the boutique and the luxury shopping precinct as the key to downtown rejuvenation; the myth of the instant mall, produced through impromptu street closures unrelated to the real pedestrian needs of its projected users.

Instead, the study concludes that the Central Business District consists of a set of user "sub-systems" which would seem to negate the concept of the unitary CBD advanced by Victor Gruen and adopted by most contemporary Urban Designers. In this sub-system context pedestrian movements may be extremely intensive around certain nodes but insignificant in the valleys between the sub-systems; any public space or mall system that is derived solely from spatial considerations and does not recognize these natural movement patterns is doomed to failure. Incidentally the authors of the study make a plea for a special type of public space: adequate waiting space for transit stops, a commodity which may be crucial to public acceptance of public transit as a viable alternative to the private automobile.

The methodology chosen by the authors of *People and Downtown* ranges between direct pedestrian movement surveys and conventional land use and condition surveys. These different approaches have not been integrated very effectively and one gets the impression that some arbitrary conclusions have found their way into the study, notably the conclusion that the recent communications explosion has reduced



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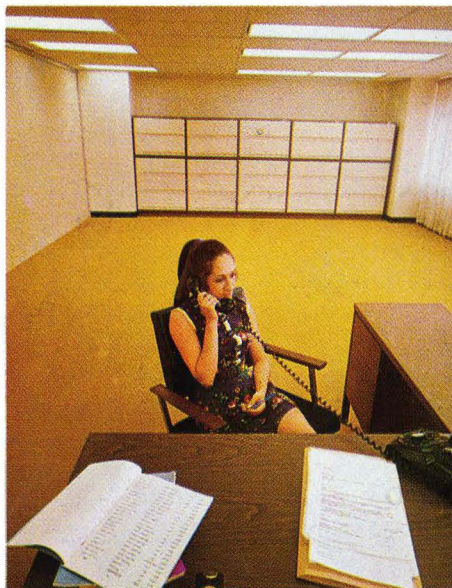
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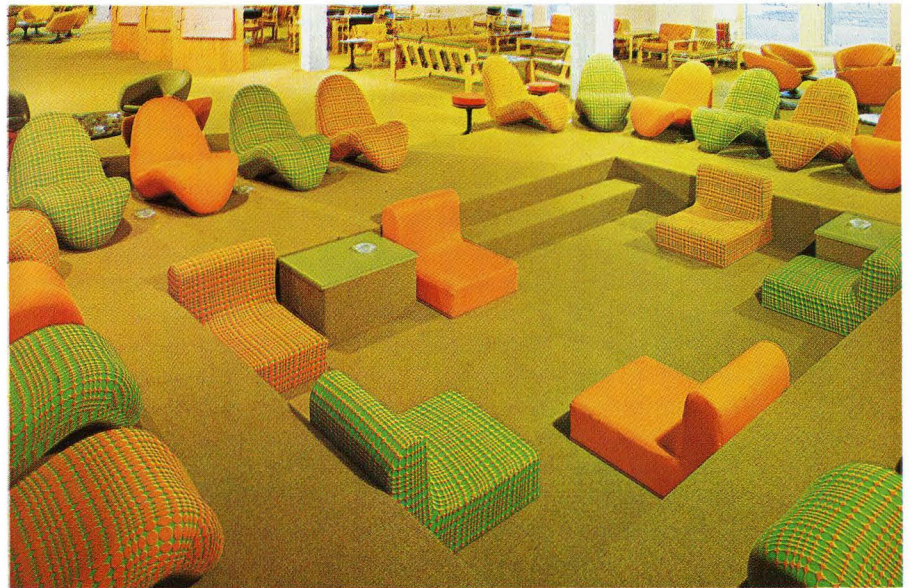
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the role of downtown in interpersonal business transactions. The same lack of integration and, perhaps, forcefulness is to be found in the summation of the study. The authors failed to complement some very scholarly conclusions with the type of recommendations for action that spell the difference between immediate application and shelving for future consideration.

D. Procos, Halifax

A fingernail sketch of FLW

Frank Lloyd Wright – Public Buildings, Martin Pawley, Oxford University Press, Don Mills, 1971, \$8.00.

Martin Pawley has set himself the very difficult task of explaining Frank Lloyd Wright's architecture in a fingernail sketch.

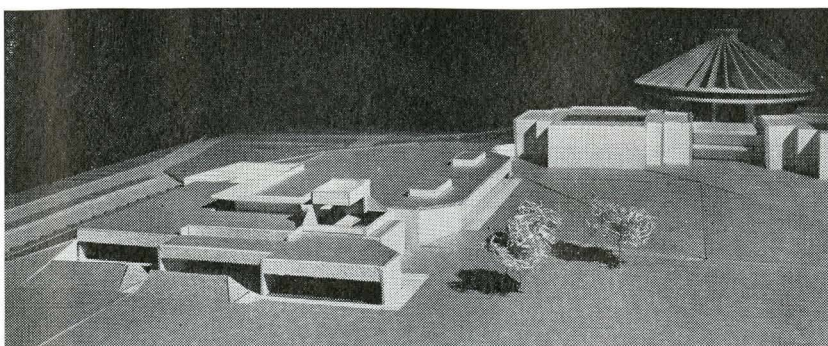
Pawley's book is interesting because he seeks an understanding of Wright and his work through a historic (social) relevance. Since the book does not dedicate itself to Wright the man but to a specific class of his buildings, we must assume that the different aspects he pursues are mainly to bring about an appreciation of Wright's public architecture and must be assessed on this basis.

Pawley's effort is channelled along three paths towards an understanding of the topic:

- 1) The social milieu in which Wright worked and developed.
- 2) Present a representative cross-section of Wright's public buildings. (He included most of them.)
- 3) Present an assessment of these buildings from both the social and esthetic point of view.

Pawley decided to separate Wright's work into two different categories and deal with them separately; in two volumes. In volume one he deals with Wright's public buildings. In volume two he deals with the residential work.

As volume two is not yet published (yet referenced) we can only judge the validity of such a differentiation and separate treatment of Wright's work, on what we can read into volume one. While the relativity of the social milieu is well looked after in this way, the book falls down badly in tracing and explaining Wright's design philosophy. Surely it would be of immense interest to try to get some understanding of Wright's own vocabulary of form. I believe that the feelings and sense of freedom, always the mainstay of his work, are no longer apparent when his work is dissected by Pawley. However, it must be recognized that Wright's design philosophy and personal development knew no such separation between his residential and public work. His thoughts on design can probably not be traced nor understood outside of the complete and contiguous context of all his work. I feel strongly that in this area the author's assessment of the Guggenheim Museum is wrong. On the other hand the social aspect of



It's a 'grass roofs structure' that architects McCarter Nairne & Partners have proposed for the new Vancouver Centennial Archives Building. The structure will be visible when viewed from two directions only. Parkland on top is for public use.

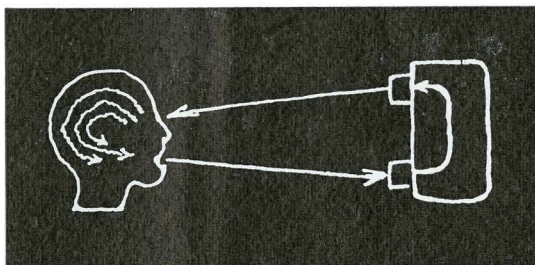
Japan comes to Canada

This Expo '70 pavilion, for Sanyo Electric, is now in pieces on the UBC campus. Under architect Donald Matsuba it is soon to be reconstructed as UBC's Asian Studies Centre – a gift from the Japanese people.



The Architecture Machine

The computer as an "ethical robot" is the subject of a recent and fascinating little book by Nicholas Negroponte. Entitled "The Architecture Machine", (MIT Press, General Publishers in Canada) it is, according to the author, "for people who are interested in groping with problems they do not know how to handle and asking questions they do not know how to answer". It explores how the computer and the architect can be partners in creating a more human environment. A sample of some of the delightful illustrations, right and below:

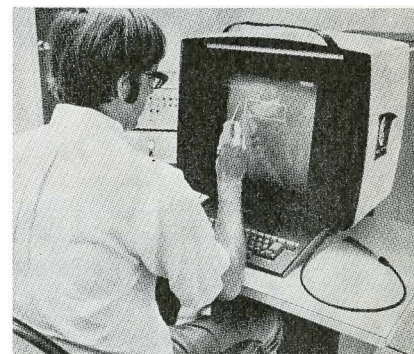


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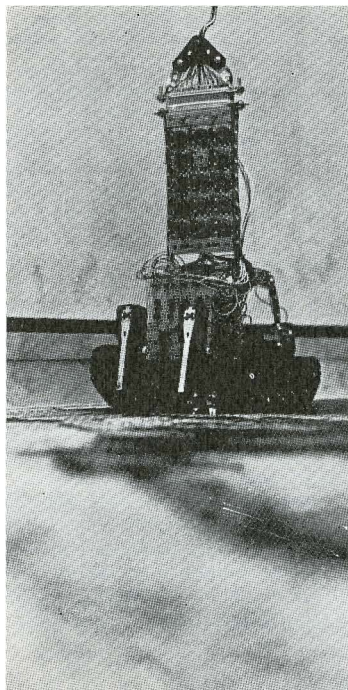


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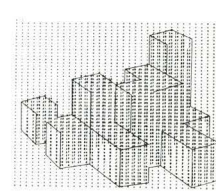
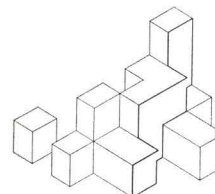
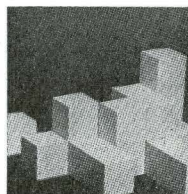
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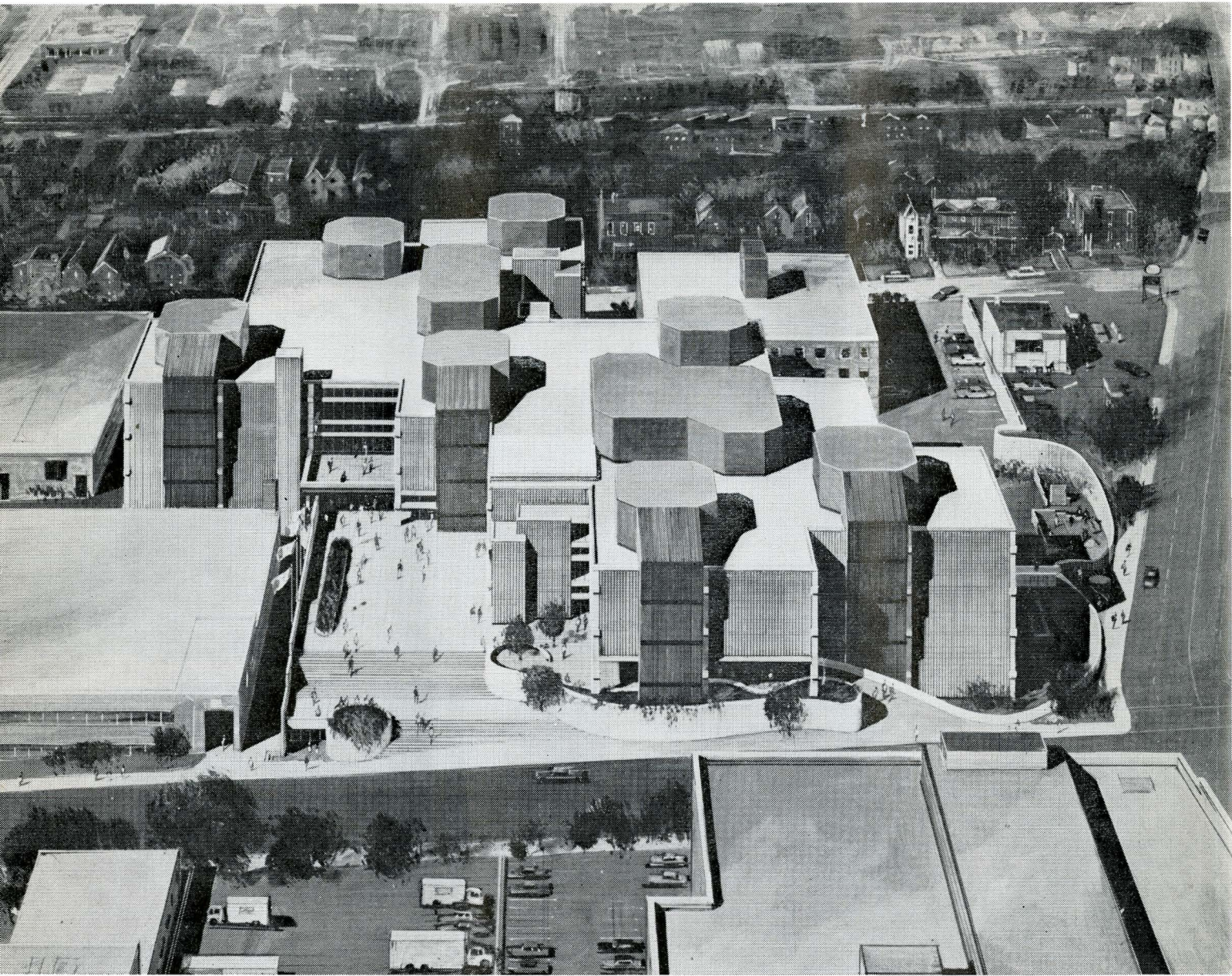
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1. Diagram by A. P. Yershov, USSR, (1965) showing man-machine interaction; 2. GROPE, an \$80 computer that crawls over maps to seek out "interesting things"; 3. Computer drawing by Morse Payne of The Architects Collaborative; 4. Computer drawing underway; 5. Part of the MIT Minsky/Papert experiment on "machine learning through machine seeing".



\$6½-million George Brown College is being built between existing buildings on a Toronto city block bounded by Davenport, Kendal, Dartnell and Bridgman.

Wright's architecture is well covered.

In spite of this I really enjoyed reading the book; it is in effect a tremendously compressed overview which, when carefully perused, gives a rare perspective of Wright and his milieu. When we, for instance, are told that at the time of Wright's birth Queen Victoria ruled England and the U.S. had only 38 million people, then there is a tendency on our part to grant Wright much more credit for his work than when we try to understand it against our own prevalent social concerns. Yet at the same time the railroad was already built linking New York with San Francisco so why shouldn't a boy, raised in the country, stack wood and stone together in a way which appealed to him. He had probably never been subjected to the burdens and persuasions of social coherence.

What does emerge from the book

is the image of Wright's architecture as an intense commitment to a social philosophy of individuality and self-reliance in a world which was rapidly developing the genes of further social overindulgence and irresponsibility. Wright felt that man could only be individualistic and self-reliant in the right social context. He intuitively directed his architecture towards structuring the social context as he desired it.

Pawley infers that Wright may be the nineteenth century architect. In studying the complexity of form and freedom from convention inherent in the many excellent photographs in the book, the reader might decide that Wright was really the forerunner of today's social self-examination which will set the social and architectural stage for the next century. Do read the book.

T. Bjornstad, Waterloo

SEMINARS

College Design Workshop

The School Planning and Building Research Section of the Ontario Department of Education is holding its fourth College Design Workshop at the Skyline Hotel in Rexdale, Ont., Nov. 16 and 17.

Discussion will focus on the development of educational philosophies and facilities in Colleges of Applied Arts and Technology. Some of the topics will be: appraisal of college development, libraries, student social spaces, the campus of tomorrow and the building industry in transition.

Registration fee is \$25. For more information, contact the School Planning and Building Research Section, Ontario Dept. of Education, 21st Floor, Mowat Block, Queen's Park, Toronto 182.

TRANSPORTATION

International airport for Calgary

Expansion of the Calgary airport begins next May.

In announcing a go-ahead on the long awaited airport program last month, Mayor Rod Sykes described the new airport as being able to meet the city's traffic needs well into the 1980's and large enough to handle the world's biggest planes.

Calgary has been negotiating with the federal government for an upgrading of present facilities since selling the airport to it. The federal government promised in 1968 that new facilities would be completed by 1972.

Architects for the new terminal are Stevenson, Raines, Barrett, Hutton, Seton and Partners.

Flexibility is to be the design key-

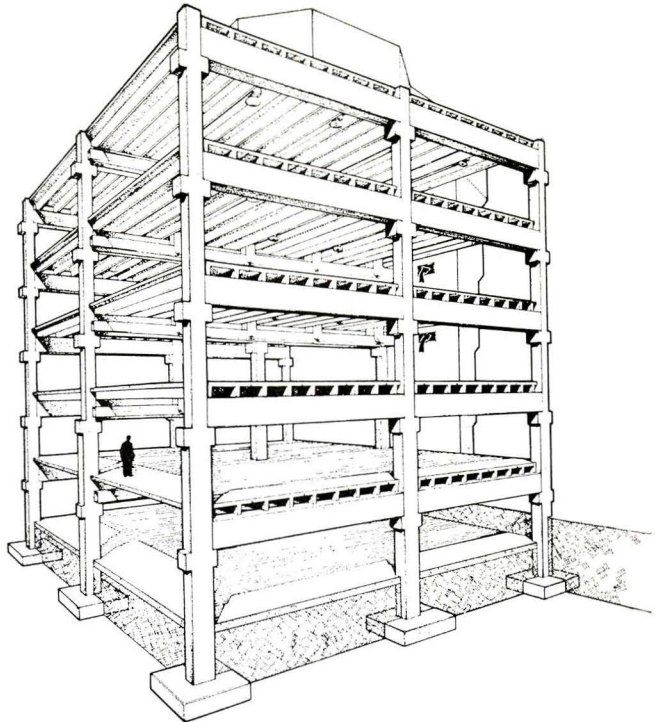
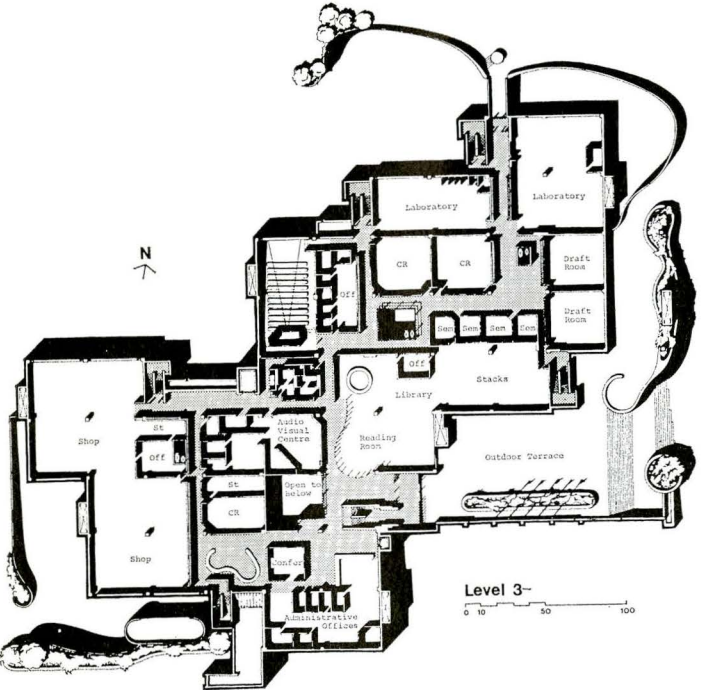
Low cost system building

Fairfield & DuBois, Alan R. Moody Architects put two priorities at the top of the list in designing a new building for the Casa Loma campus of George Brown College, Toronto. One was that the building be flexible enough to keep up with this decade's fast-paced technological changes, hence changing teaching programs for this college of applied arts and technology, the other was that cost be the "lowest reasonable".

Cost control was initiated at the start of the project so that each design decision was based on the cost factor as well as functional efficiency and appearance. This is paying off it seems – the building, now under way for completion next year, came in at tender at \$18.50 per sq. ft. net, nearly \$3 below project budget.

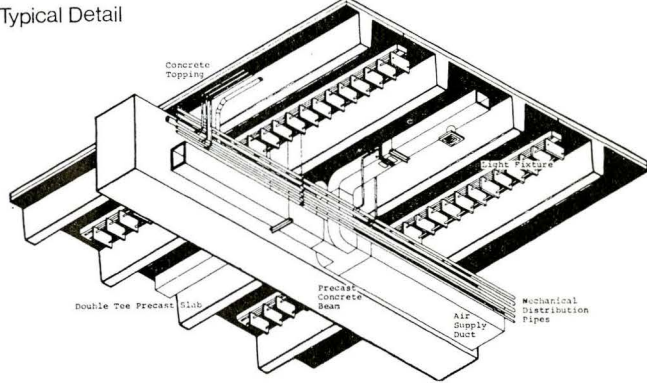
As far as the system building goes the architects say, "the objective was to develop a building system providing for maximum repetition of each detail, structural component and equipment assembly. Products of standard make and customary production-run manufacture were selected. To satisfy special teaching requirements and reduce cost, mechanical and electrical services are generally being left exposed".

To encourage greater contact between students at different levels and in different courses, corridors are widened at several locations to provide gathering areas. Two-storey visual links and lockers in the corridors further achieve this end



The Basic Planning Module

Typical Detail



note – the terminal is being planned to expand as traffic warrants.

The location of the new terminal is northeast of the existing one along with cargo, service, parking and air traffic control facilities. The airport is to grow to the southeast on several thousands of acres of farmland.

PEOPLE

Two new officers have been appointed to the Manitoba Association of Architects council. Herbert S. Briggs is new president, replacing David Aitken, and new executive vice-president and treasurer is Marshall Haid, replacing Jack Duncan.

Both Aitken and Duncan are leaving the province: Aitken is joining Erickson/Massey in Vancouver as director of operations; Duncan is

moving to Toronto and the firm Wilson Newton. The new MAA president, Herbert Briggs, is a partner in the Winnipeg firm, Number 10 Architectural Group. Haid is a principal in his own firm Haid & Malkin.

The two are filling the vacancies on the council until the MAA annual meeting, January 21.

Two Central Mortgage and Housing appointments have been made recently: Alain de C. Nantel, 37, is new vice-president. Noel Guilbault, 41, is Quebec regional director.

Nantel, of Montreal and former director of the Corporation's Quebec Region, has been with CMHC since 1966. The office of the vice-president is located in Ottawa.

Guilbault, a native of Ottawa, joined CMHC in '51. Since last summer he has been manager of the

Montreal office. He will remain in Montreal and will be responsible for the co-ordination of field operations and supervision of operating procedures within that province.

MISCELLANY

... The latest entry into the 'what will they think of next department' involves a San Francisco cable car, on wheels, that travels the country. The car, which is really an authentic cable car adapted for cross-country travel, was used by Prescolite this summer to promote its latest light fixtures. Its interior was especially wired to permit on the spot demonstrations throughout the U.S. and Canada. It took off from, where else, Las Vegas.

... Surface markings on 4,000 miles of paved trunk highways and provincial roads in Manitoba got a re-

paint this summer. It was the start of a new uniform system of color-coding which has been adopted across Canada. Centre-lines on roads with two way traffic were painted yellow, four lane divided highways got white centre lane markings.

CLASSIFIED

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Positions Wanted

Available: Montreal architect, bilingual, highly qualified in all of the activities of an architectural office, including office supervision and project management; 20 years' experience in the hospital, governmental, institutional and commercial fields. Reply to Box 175, c/o *Architecture Canada*.

"Frozen Music" in Steel

"Architecture... is frozen music". (Friedrich von Schelling — 1775-1854)

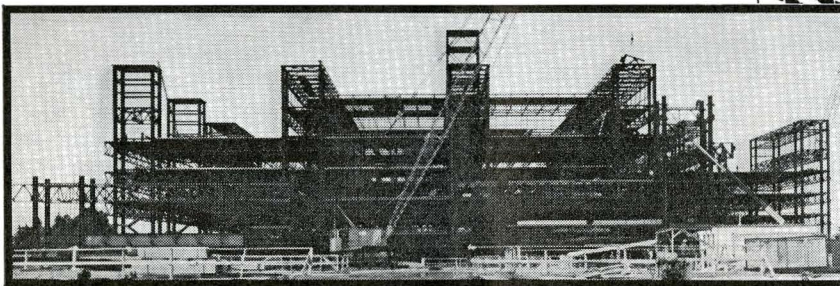
Masterpieces in steel - by Canron -
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Breath-taking...

Commerce Court West, Toronto,
tallest building in the
Commonwealth. Steel and erection
by Canron in a joint venture.

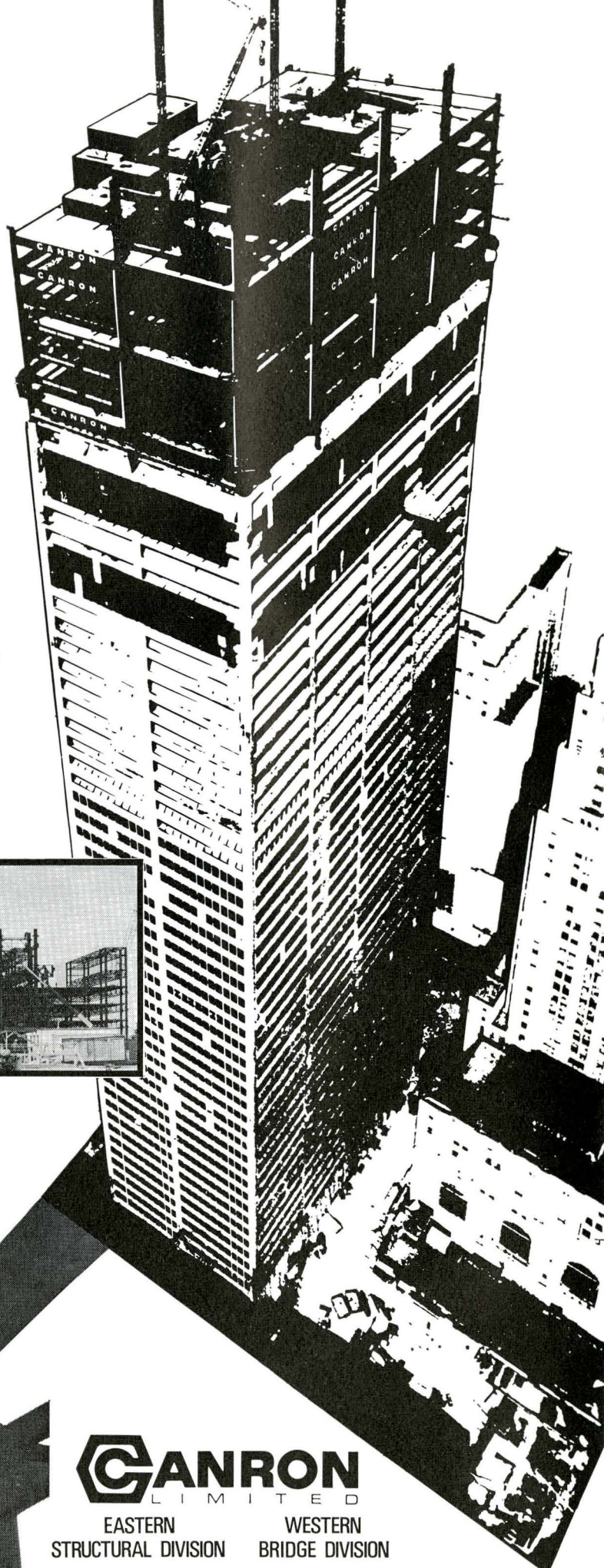
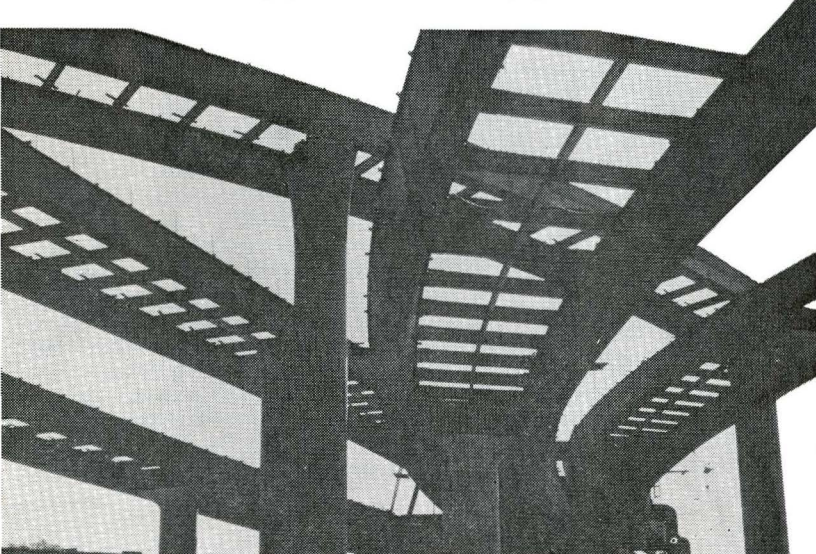
Thought-provoking...

McMaster Medical Centre — designed to meet
a hospital's constant need for change. Steel
supply and erection by Canron.



...or Eye-opening

West and East Interchanges for the new
Fremont Bridge, Portland, Oregon. Computer-
aided design, and steel fabrication, by Canron.



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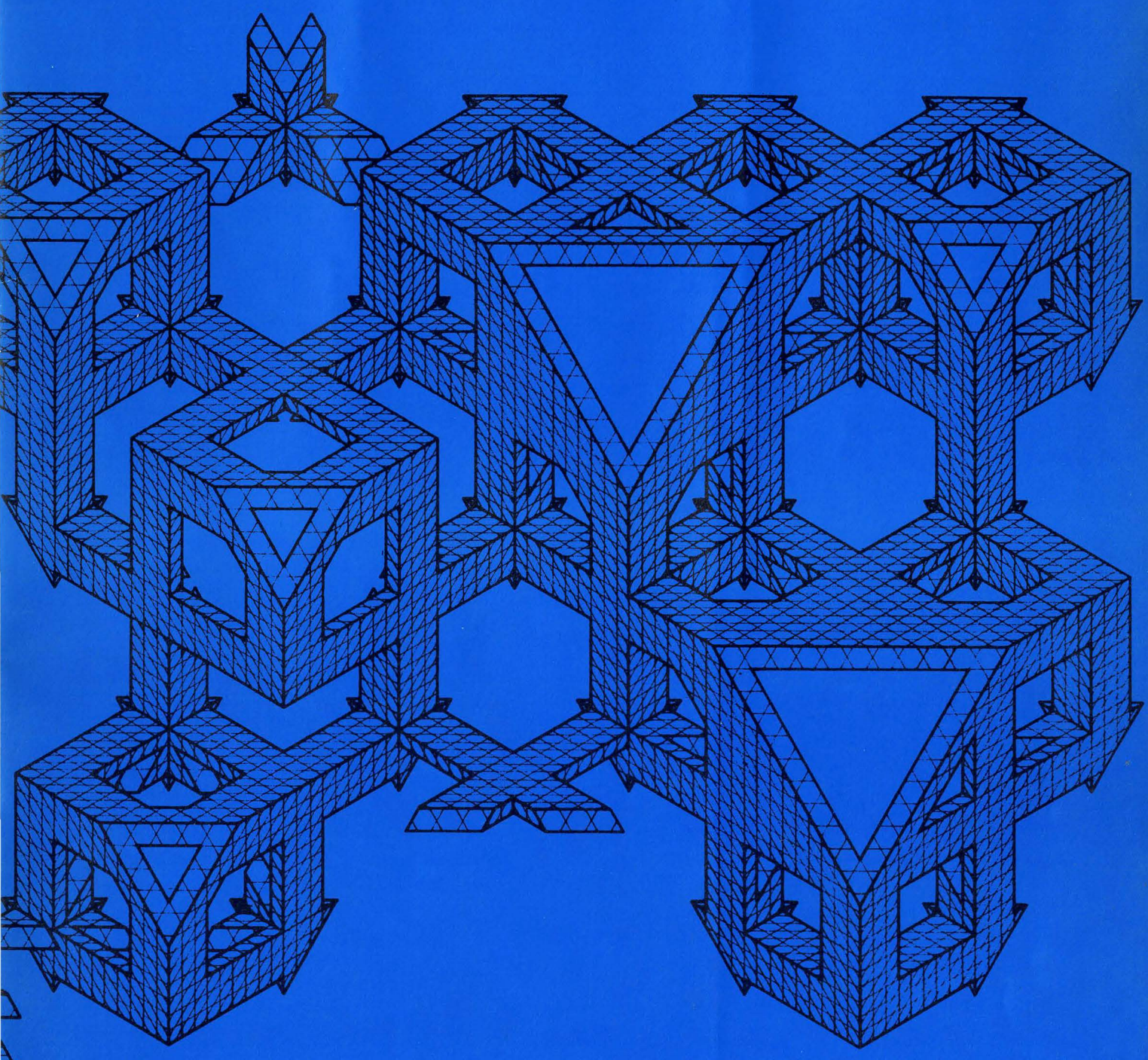
WESTERN
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Plants: Rexdale and Ottawa, Ontario; Vancouver, B.C.

Who's building in steel and why?
A compendium of steel design
and construction specially designed
for the busy reader.

STEEL

October, 1971



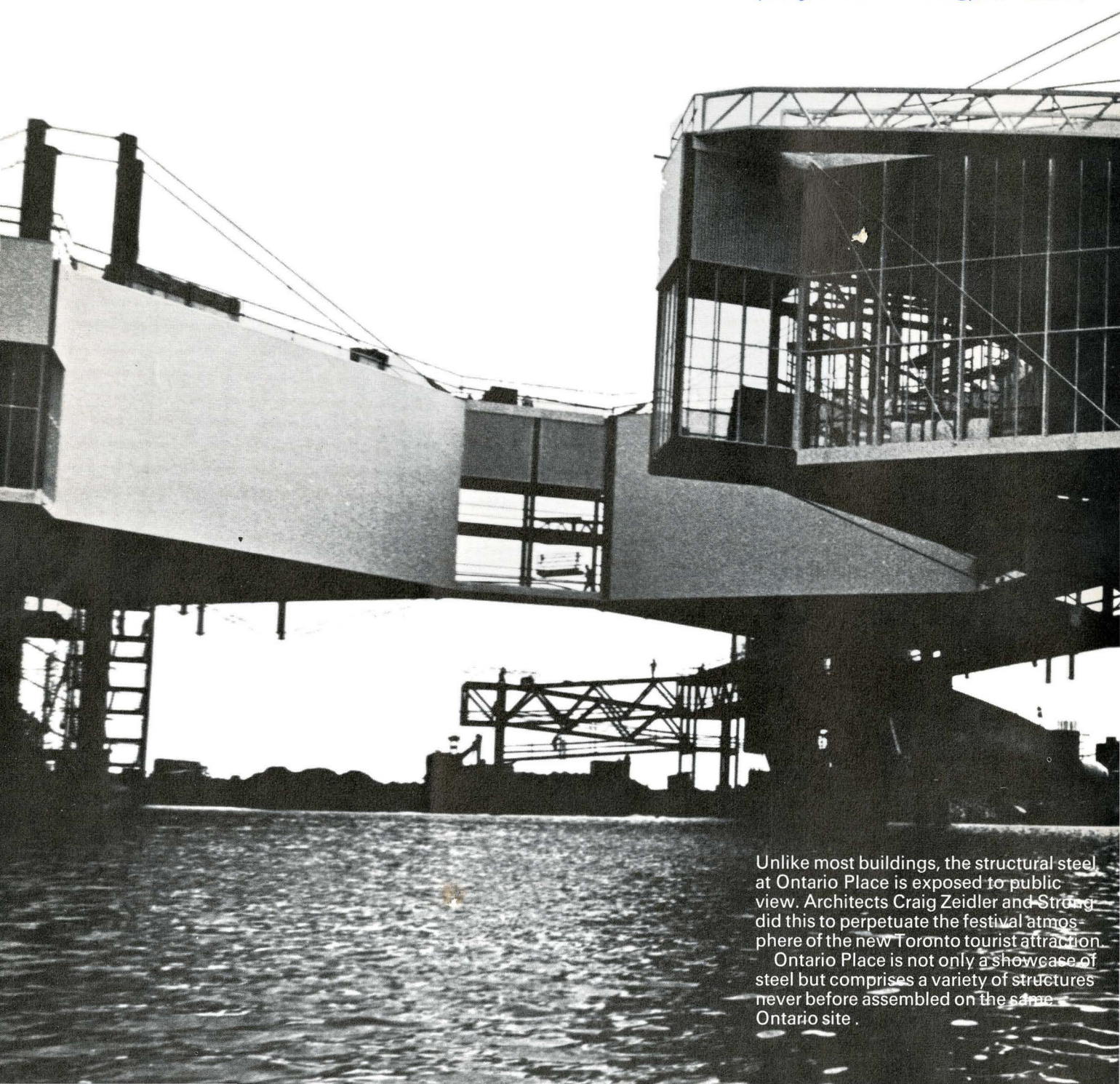
Who builds with it and why

Steel is specified by many of Canada's top architects and developers. The reasons why are the subject of the next ten pages.

What are the major factors in choosing steel over some other materials? Developers say that one reason they like to specify steel for office buildings is speed of erection. Labor time is cut and the "faster you get a building up the faster you get it into the rental market." It is for this reason that some developers, with their architects, have even switched from original designs in concrete.

Developers Albert Reichman of Olympia and York; Kenneth Rotenberg, of Y & R Properties; S. Bruce McLaughlin of S.B. McLaughlin & Associates, Toronto, and Emile Mashaal of Yale Properties, Montreal, discuss this further on the pages following.

The flexibility steel allows is another big plus according to architects. Eb Zeidler (Craig, Zeidler and Strong), for instance,



Unlike most buildings, the structural steel at Ontario Place is exposed to public view. Architects Craig Zeidler and Strong did this to perpetuate the festival atmosphere of the new Toronto tourist attraction.

Ontario Place is not only a showcase of steel but comprises a variety of structures never before assembled on the same Ontario site.

says "don't look at the initial cost of a building but the cost over a 30 year period ... user needs will change at five to ten year intervals at least." Architects who discuss in the next few pages why they use steel include : Bill Leithead, Vancouver ; Peter Hemingway, Calgary ; Eb Zeidler, Toronto and Harold Ship, Montreal.

Another reason for designing in steel is the service that Canada's steel industry can provide. Through the Canadian Institute of Steel Construction, the industry has been steadily forging a program aimed at those who make decisions about building. This year, a typical one, the Institute is : 1) sponsoring extensive research ; 2) offering internationally recognized cost analysis and computer design programs ;

3) preparing manuals to assist designers ; and 4) staging workshops across the country on the latest developments in steel usage.

Steel is primarily a big building material but can be used for smaller jobs too. Industrial designers have discovered its possibilities for furniture, artists are using it for sculpture. Some of their ideas are included here too.

The list of recent exciting Canadian buildings with steel frames is extensive. Several of them are discussed in this issue : Lloyd D. Jackson Square, Hamilton, architect Arthur Lau ; Commerce Court, Toronto, architects Page and Steele, consultant I.M. Pei ; Bell Canada building, Ottawa, architects Webb Zerafa Menkes Housden ; McMaster Health Sciences Building and Ontario Place, Toronto, architects Craig Zeidler and Strong ; Dofasco catalogue housing, architects A. J. Diamond and Barton Myers ; West-

coast Transmission Building, Vancouver, architects Rhone and Iredale ; Pacific Centre, and the UBC Geological Sciences Building, Vancouver, architects McCarter Nairne and Partners ; 390 Bay St., Toronto, architects Webb Zerafa Menkes Housden ; Federated Co-op. Building, Saskatoon, architects Smith Carter Parkin ; Univac Building, Mississauga, Ont., architect W. C. Karleff ; Alexis Nihon Plaza, Montreal, architect Harold Ship.



How 'fast rise' saves money

The swing to steel for office buildings is gaining momentum. One of the reasons why is that steel buildings today are not only high-rise but fast-rise. Elapsed construction time to completion is speeded up since the various trades can be activated more quickly as each floor is finished.

Axiomatically, the sooner a building is ready for occupancy, the sooner it starts bringing a return on investment.

That owners and developers are realizing the benefits and are prepared to switch was demonstrated in the recently completed Bell Canada office building in Ottawa. Originally conceived in concrete, construction was switched to steel by Olympia & York Developments Ltd. and architects Bregman and Hamann.

"It was a heavy winter and we were already experiencing delays," recalls Albert Reichmann, president of Olympia and York, one of Canada's largest private development companies. "We picked up three to four months in construction time. Changeover to steel also meant less column space inside."

The firm adopts a page from the steel industry's book and tries to be "a little better than everyone else and end up with satisfied customers."

The Canadian steel industry is results-oriented too and nowhere is this more evident than in completion of steel work for the 57-storey Commerce Court Tower in Toronto, the Commonwealth's tallest building.

Completed ahead of schedule, the steel frame has the distinction of having the highest percentage of weld metal ever in a structural steel building with 460 tons of weld metal in the 33,000-ton steel frame. It has the further distinction of being the tallest stainless steel-clad building in the world.

Fast-rise was epitomized here in the speed of erection with more than 15 per cent sliced off the scheduled erection time of 15 months. This again proves the resourcefulness and skills of Canadian engineers, fabricators and erectors.

"Speed was the main factor in choosing steel, representing an economy of one winter," Kenneth Rotenberg, Y & R Properties Ltd. president affirms, for an \$18 million office tower in Toronto to be known as "390 Bay St."

"Use of structural steel permits a slightly smaller floor-to-floor height than if the building was of reinforced concrete," says Rotenberg, whose firm builds and owns a large chain of office buildings. "Theoretically the same building in reinforced concrete should cost a little less."

Superstructure for the 32-storey building is climbing three floors every two weeks. Some \$2 million worth of steel is being used.

Olympia & York's York Centre Building, also in downtown Toronto at York and King Sts., has an even better steel erection record — three floors every 12 days.

These faster completion dates are not confined to prestigious towers but are equally common in smaller commercial buildings.

Some other advantages of steel: Off-setting skyrocketing on-site construction costs with a larger percentage of in-plant fabrication possible; specialized services, such as air conditioning, can be built into steel decking, permitting life-long adaptability of interior layouts.

On the West Coast an estimated four months were saved by using steel instead of reinforced concrete for the 30-storey Toronto Dominion Tower, dominating Vancouver's Pacific Centre.

Steel was about 5 per cent more costly than a concrete frame, notes William G. Leithead, of McCarter, Nairne & Partners, the centre's architects, but savings in time permits earlier occupancy and cash flow.

Not only need of speedy erection but the requirement of long, unequal spans (45 and 36 feet) proved steel most economical for the Federated Co-operative Building in Saskatoon, recalls Henry Penner, chief structural engineer of Smith Carter Parkin Architects Engineers Planners.

"Structural steel components were erected at slightly better than one complete floor per week," he explains. "Placement of floor deck followed close behind providing immediate working levels."

A tight budget (\$24 per square foot) didn't deter Westcoast Transmission Co. Ltd. from the unusual technique of suspending its 12-storey Vancouver office building from a centre core on 12 steel cables, attaining economy and attracting world-wide attention.

Case study: switch to steel adds two more floors of office space

Montreal's Alexis Nihon Plaza is taking shape on top of a seven-acre "super block" base in the city's west-central downtown area, providing a three-level shopping centre and a future roof garden atop the podium created.

Steel not only played an important role in construction of the two buildings now in place, but also permitted an additional two floors to be added to the 17-storey office building on the existing base. Originally, it was designed in concrete as a 15-storey structure but a switch to structural steel changed that.

Also on the site is a 37-storey apartment block of 425 suites. The plaza is a joint venture of Montreal Trust Co. and Traders Group Ltd., who plan two more buildings on the St. Catherine St. block.

Porcelain enamel on a steel curtain wall clads the apartment building, supported on a light structural steel frame. The latter also supports insulation and internal finishes.

"The system has turned out to be practical, economical and attractive," enthused Harold Ship, the architect. Outside cladding on the office building is also of porcelain enamel panels on steel.

"The curtain wall, being shop-fabricated in 10-foot panels and not being a "stick" system assembled at the job, was erected at a greater speed and at a much reduced cost than the standard office curtain wall," Ship said.



Computer aid for costing and design

The steel industry not only proclaims the advantages of steel construction but can support its claims with detailed analyses of costs and other criteria.

In a world-first marketing program the Canadian Institute of Steel Construction harnesses computers to provide customer service.

Through its Project Analysis Division (PAD) it has programmed design criteria to the point where it can offer solutions in printout form to a virtually limitless number of design problems. Cost comparisons between steel and concrete are also available as are alternative approaches to a project. As a result there has been a measurable increase in steel design, particularly in office buildings of medium size and high-rise.

PAD's three computer programs, re-searched and produced by CISC, with the Canadian Steel Industries Council, have brought international recognition to this phase of the Canadian construction industry. The three are : STRUDL II-CSA-S16, a structural design tool developed at MIT and modified for Canadian use ; the Column Selection Program and the Floor System Selection Program, both developed "in house". They not only solve complex structural problems but help shorten design times.

Manual structural analyses for a building the size of Commerce Court, in Toronto, would have been next to impossible, according to John Springfield, consulting engineer for the project, a partner of C.D. Carruthers and Wallace.

In fact, due to the volume of input data, small computers were employed to run slave programs punching data cards for later STRUDL analysis.

Structural techniques of the future - today

The beam-and-column frame construction of yesteryear's skyscrapers required a high premium-for-height compared to lower buildings.

However, newer high-rise buildings from 50 to 110 storeys are the result of innovative steel structural systems, many of which have only been developed in the last five years.

The 100-storey John Hancock Centre in Chicago is a striking example. Using the column diagonal truss tube system, it requires only 29.7 pounds of steel per square foot of floor area - the same amount a 40-storey building would use in the traditional beam-and-column frame system.

The rigid belt truss system and the bundled tube system are others aimed at reducing premium-for-height.

Steel showpiece

When the United States Steel Corporation builds a 64-storey headquarters building, the structure will not only sell its product but provide a stage on which each steel component can play its traditional role - and maybe some new ones.

US Steel not only accepted the challenge for the Pittsburgh building to make it a showplace of steel, but examined every possible way project and product could be married.

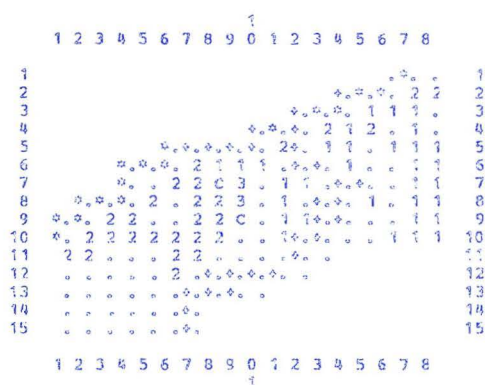
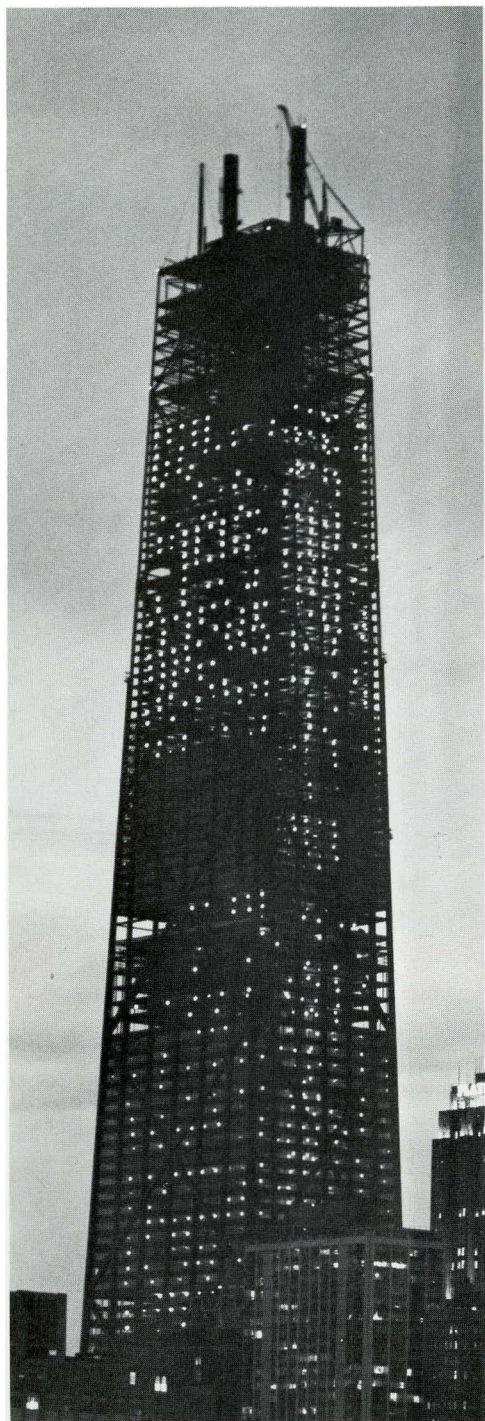
Its spectacular triangular shape alone guarantees the building a landmark rating but the innovative uses of steel are every bit as trend setting. From low-alloy, corrosion-resistant weathering steel cladding to interior columns of the same material the accent was on future trends.

A totally modular system was chosen to allow for room and layout changes. Overall design resulted in column-free floor space of 45 feet, 6 inches and a floor-to-floor height of 11 feet.

In effect, the tower is a series of three-storey buildings stacked on top of each other. Exterior columns support girders and spandrels at every third floor. A space frame at the top ties the shell to the exterior columns.

Beams from every third floor extend from core to outside wall. The floor system is attached to the exterior, stabilized columns.

These are filled with water and interconnected. When one is subject to high temperature, circulation by courtesy of gravity cools the steel. The three-foot space between exterior columns and exterior wall is a fire safety factor in itself. Water circulation keeps temperatures at a level permitting the steel to retain its strength in case of fire.



Artistic forgery

Few persons think of art and steel in the same breath but the metal is proving its versatility and durability in this field too.

Among those using steel in art forms is Toronto's Kosso Eloul, who utilizes it extensively and successfully and seems to defy gravity at the same time.

Russian-born, Kosso (who uses his first name professionally) has frozen stainless steel into "Double You," a tilting art piece for the lawn of a Toronto apartment complex. It appears like twin leaning towers which are about to fall but don't.

He matched this challenge to gravity in spirit but not in form in "Meeting in Space," a second stainless steel sculpture which appears to hang precariously over an office building entrance. Kosso has good welders.

Another sculptor in steel is Hamilton-born Robert Downing. Downing, who is now of Toronto, also exhibits his works internationally. His bag is flexibility; for example, his "Straight Line," of highly polished stainless steel can be positioned in several ways. Make your own dramatic effects!

Case study: limited budget needn't mean aesthetic cutback

Current economic conditions and resultant cutbacks on university spending meant Edmonton architect Peter Hemingway had to work to a limited budget for his pedestrian walkway linking the University of Alberta's Student Union building and a new parkade.

"Accordingly", he says, "we designed the walkway as an exposed steel truss system spanning between concrete piers 70-feet o.c. All exposed framework is steel, with steel deck cladding enclosing the supply air ducts on the lower portion of the structure and the return air ducts for the ceiling space over". Hemingway, winner of two of Canada's Massey Medal honors for architecture last year (one for a low-rise steel office building) used heavy rough cut cedar as the interior finish for the ceiling of the walkway and hardened concrete spanning between steel members for the floor. All exposed steel is painted black, glazing sections are aluminum and the double glazing is of glare reducing glass.

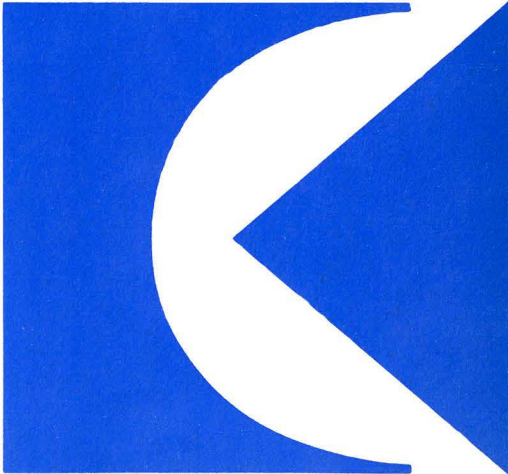
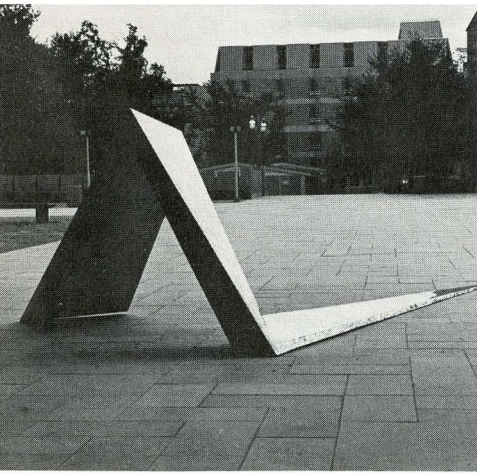
Long span

Improvements in steel are moving at such a pace that almost everything developed appears to be temporary. Tomorrow another new system, a better fabrication or additional strength will be added to the multiplicity of these already available.

Ablly demonstrating the span and strength capabilities of steel is the Canadian Pacific Air maintenance hangar at Vancouver International Airport. Here three roof trusses – each 200 feet long – were fabricated to support the main roof.

Weighing 145 tons each, they were the largest one-piece trusses ever erected in Western Canada. In all, more than 6,500 tons of steel were fabricated and erected.

The 870,000 square feet of floor space produced can accommodate three large jet aircraft, measuring 150 by 190 feet, at one time, necessitating the giant trusses.



Looking ahead

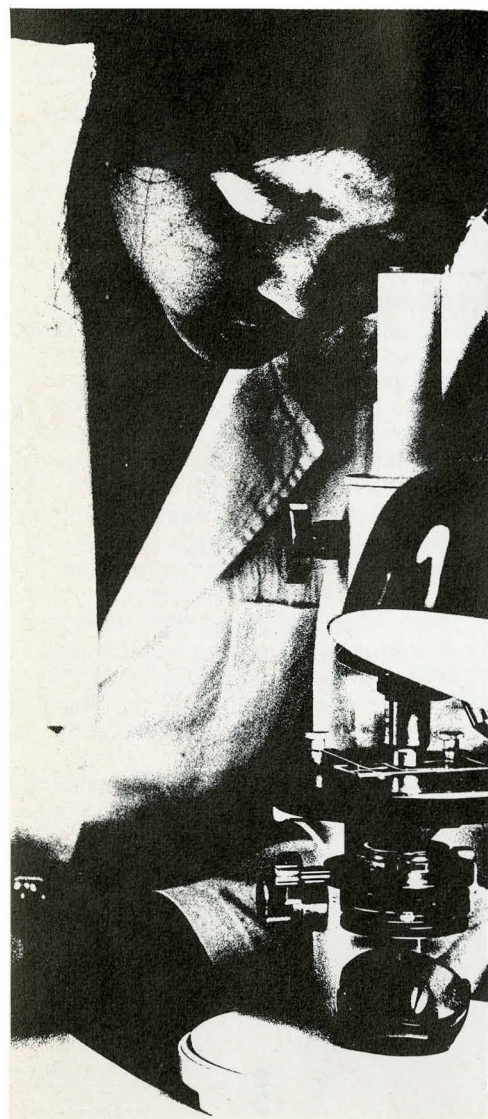
Canadian steel research, although almost as old as the industry itself, since 1967 has taken on a new, dynamic outlook as the country peers into its second century.

Research now involves 17 universities coast-to-coast, with 34 projects completed and nine others in progress. The program, instituted by the Canadian Steel Industries Construction Council, annually invites engineering faculty members to submit applications for research grants. They now total more than \$250,000.

Important benefits are flowing to the design professions. They are being furnished with a flood of important information so that all types of steel structures can be built not only cheaper, but quicker, with more attention given to aesthetics than in the past.

Fruits of the research were attested to last year at the second Canadian Structural Engineering Conference. No less than six papers at the international meeting used material from recent research sponsored by the Canadian steel industry.

CSICC also sponsors a fire research fellow at the National Research Council, complementing work being done at the universities, where researchers have delved into subjects ranging from fatigue of galvanized bolted joints to stresses in beams with circular holes.



Case study: beating a tight schedule

Mississauga's largest office structure, the 11-storey Univac Building, is framed in steel because "we had a tight schedule and almost automatically went to steel," explains S. Bruce McLaughlin, who heads S.B. McLaughlin Associates Ltd.

The firm's Mississauga City Centre in suburban Toronto already has its first three buildings on site — all of steel construction. One is the McLaughlin headquarters.

He endorses steel not only because of its flexibility of design and speed of erection — particularly in winter — but because construction can proceed even if plans and specifications are incomplete.

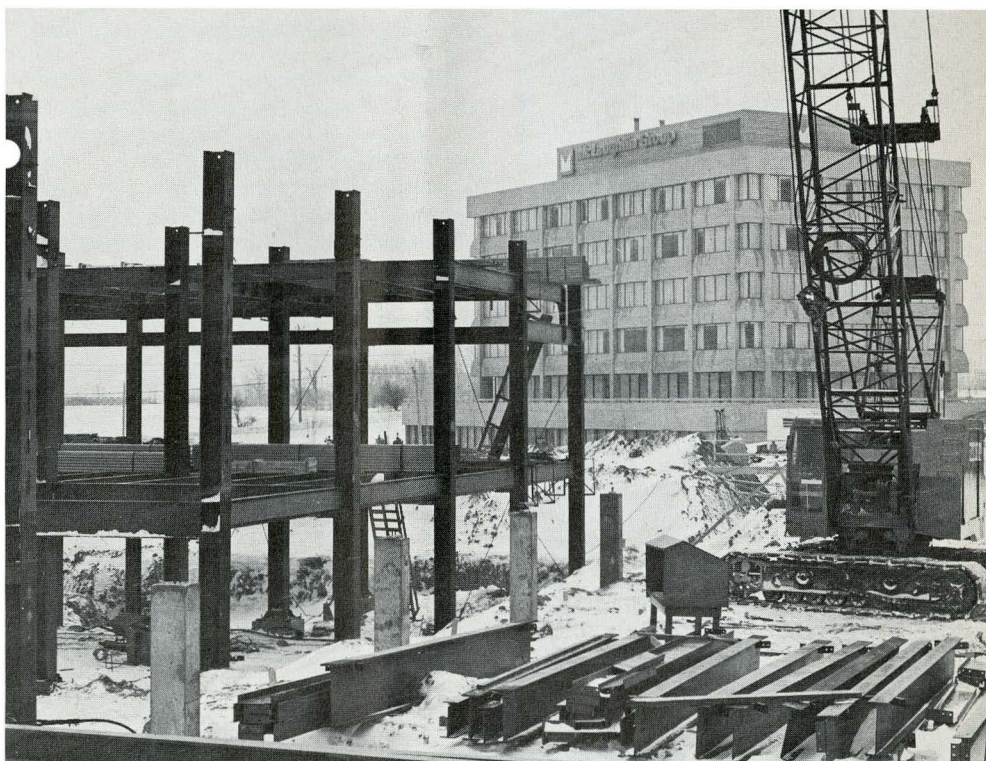
"I think steel is a little more expensive as a bulk commodity but time is an important factor of economics and its advantages outweighed concrete with these buildings," McLaughlin observes.

'De-bricking' the little red schoolhouse

In the search to better the 'little red schoolhouse', Toronto's Study of Educational Facilities, sponsored by the Metro School Board, divided the school building into 10 major sub-systems such as structure, interior finishes, atmosphere and vertical skin.

The idea was to translate changing educational requirements into appropriate up-to-date learning environments without increasing costs. Suppliers and manufacturers were asked to bid for each sub-system — the successful bidders being awarded contracts for all the schools in the project.

How did steel fare in such a competitive arena? It proved particularly well suited to the requirements of the SEF system in meeting spatial needs. It won both the structural and interior space (partitions) sub-system contracts in the first full-scale test of SEF. The three structural steel system bids were all below the lone concrete proposal.



UNIVAC SEF

Buildings can age gracefully

Most dowagers would like to age gracefully but weathering steel, a relatively new product, is able to age both effortlessly and gracefully.

When exposed to weather it forms its own dense and tightly adhering oxide. This seals the surface forever against further corrosion. The material has the ability to blend with natural surroundings, requires virtually no maintenance and no painting — ever.

On completion of a structure the steel is light brown but weathering agents soon darken it and eventually the metal turns to a dark gray-blue hue. Unlike the dowager, a building clad in weathering steel improves with age.

The Trenton, Ont., steel-framed plant and administrative building of Moore Business Forms Ltd. is clad with the material at a cost of approximately \$14.80 per square foot, excluding production equipment. Steel Company of Canada Ltd. *Stelcoloy* was used.

The same product was used for the continent's tallest electronic tower — Bell Canada's 501-foot microwave structure in the Toronto suburb of Scarborough, where the borough's purified air is slowing the weathering process.

Arts One Building at Carleton University also used weathering steel for its main exterior components. The window frame-rain screen units of the \$5-million building were prefabricated, resulting in fast erection time for probably the largest units of their type ever installed in one piece in Canada . . . 15 minutes per screen. Weathering steel was also chosen for the 26-storey Stelco Building, Hamilton, and the 64-storey U.S. Steel Building, Pittsburgh.

Some building owners don't want the steel to be exposed too soon and such is the case with the world's tallest stainless steel building, the 784-foot Commerce Court Tower in Toronto.

It is covered with 3,000 pounds of plastic bandage, hiding its brilliance until all steel panels on all 57 storeys are in place. Then the reflecting metal of the entire building will be exposed in one operation.

Case study: less labor

When Yale Properties Ltd., responsible for creating the \$100 million Lloyd D. Jackson Square, in Hamilton, becomes involved in a project it becomes involved right at the beginning. The firm sees a project through from design to carpeting — and then manages the finished product.

With complete alpha-omega control and expertise, the Montreal-based firm knows if it pays a little more in construction costs the money can be saved later on maintenance, according to Emile Mashaal, one of seven brothers holding the managerial reins of the company. Among other things it has its own construction company.

"When companies are brought into a project in the later stages they can't undo what others have done," he notes. "We know how to design something right from the beginning."

The 18-acre Jackson Square in downtown Hamilton, to be completed in six phases by 1978, will include two office towers, a banking pavilion, enclosed shopping concourse, major hotel and five apartment towers, all in a park-like setting.

With Yale's diversification it was able to save \$2 million by design changes in mechanical and electrical systems for the office tower, Mashaal, the owner's representative in Hamilton, relates. Steel Company of Canada will occupy at least the 10 top floors and the building will carry the company's name.

The company's talents also smooth the way in obtaining financing. "Lenders know when we give them a cost it is not going to go over budget." Dealing with lenders for Jackson Square, which earlier ran into difficulties, was no different. "We are developing in a way that is financially feasible," Mashaal says.

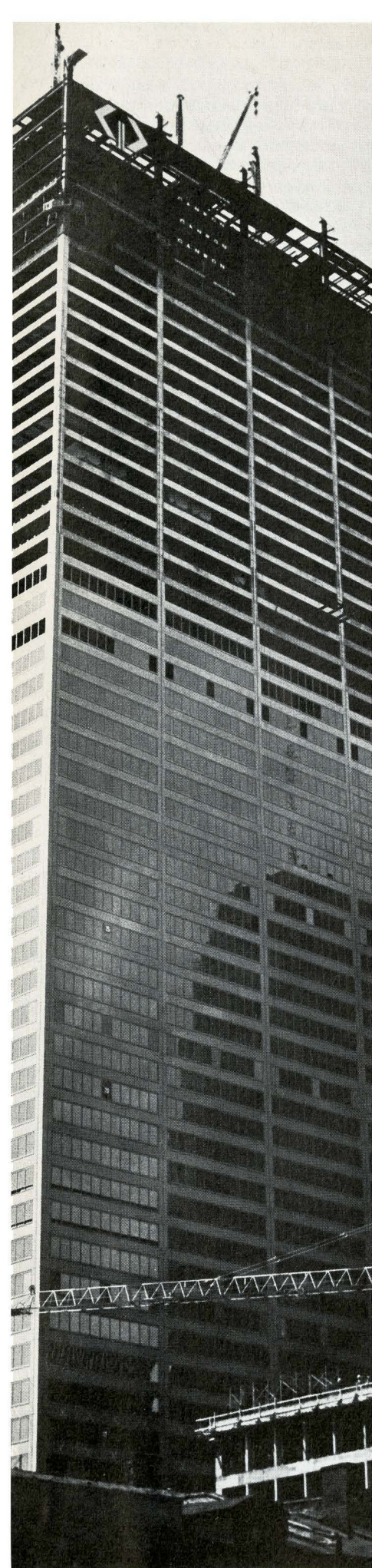
The steel-framed office building with weathering steel facing outward was chosen after cost comparisons with other materials. "A lot of people think steel is more expensive," says Mashaal, "it depends on how you design with it."

"Building a steel building is less labor intensive than one in reinforced concrete," he observes.

Of the Stelco Building he says: "The faster you put it up, the faster you get into the rental market. Steel was more than 25 per cent faster in erection time."

The building will be column-free with 17,000 square feet gross area per floor and 15,600 net. "If we had used concrete we would have had to go into beams, making it much more difficult," the youngest Mashaal brother says.

The Civic Square will be highly pleasing architecturally, he forecasts, integrating as it does shopping, office towers and cultural attractions in one complex. The \$30 million Phase I will have 2½ acres of open space, difficult to duplicate anywhere else in Canada.



Preventing fires

The steel industry is not content merely to see steel erected. It is developing ways of ensuring it stays in place in case of fire.

To this end research is a continuing thing. William W. Stanzak, the Canadian Steel Industries Construction Council's Fellow at the National Research Council, is devoting the majority of his time to fire protection.

One of his fruitful projects is use of sheet steel as a protective shield for main structural members in case of fire.

"The research has proven it is capable of doing the job now," said Roger Hebert, Canadian Steel Industries Construction Council codes engineer.

Stanzak is also investigating a calculation method of protection of steel-constructed buildings versus those built of other materials. His work will soon be completed, with the hope that design aids will be made available and hopefully introduced in Supplement 2 of the 1970 NBC "Fire Performance Ratings".

"Steel is noncombustible. It does not burn, it does not add fuel to a fire and it retains its strength to a high degree at elevated temperatures," Hebert observed.

"Building designers," he maintained, "will have to be more conscious of design details in order to prevent possible spread of fire and smoke in buildings, no matter what type of construction material is used. Punching holes in the floors and all over the place for services defeats the fire protection designed into a building in the first place."

In the United States four high-rise office buildings have appeared with water-filled steel columns as part of the framework to combat fire damage.

The codes engineer said the same system is being considered for two future office buildings in Toronto and one in Ottawa.

The 64-storey United States Steel Building in Pittsburgh has 18 of the liquid-filled and inter-connected columns holding 400,000 gallons of water. When a column becomes heated, cooler water flows to the hot spot and temperatures of 640 degrees would leave the metal unharmed.

Case study: how to increase floor space

Earthquakes are not a major consideration in the design of most Canadian structures but on Canada's West Coast they cannot be overlooked. Briefly the Commonwealth's tallest, Vancouver's Marine Building, of steel frame construction, has survived two severe earthquakes with no apparent damage.

Not without history in mind, almost four decades later, steel framework instead of reinforced concrete, was chosen for the 30-storey Toronto Dominion Tower, flagship of the Pacific Centre and Vancouver's tallest building.

Right from the conceptual stage the entire design team began studies to determine if steel or concrete would be used for the structural frame.

Steel won out, but not before consideration was given to cost of materials and erection, the effect on the design concept and amount of rentable space produced.

"We became concerned that a concrete frame would complicate the placing of reinforcing steel and thereby increase the cost and time of the operation," says William G. Leithead, a partner in the firm of McCarter, Nairne & Partners, Pacific Centre's architects.

When material costs were examined it was estimated steel would be about 5 per cent costlier than the concrete frame.

"However," notes Leithead, "in our estimate of construction time we determined steel frame would take four months less than reinforced concrete. This became a very important factor, bearing in mind placing the building in an earning position at the earliest possible date. This latter factor more than outweighed the additional cost of steel."

And so the all-welded structure became the first major steel-framed building erected on the west coast in 15 years, despite earlier performance of the Marine Building, which, incidentally, is one of Leithead's favorites.

As final working drawings were developed, recalls Leithead, a past president of the Royal Architectural Institute of Canada, the team found they had increased rentable area by 185 square feet per floor due to the steel design. No mean accomplishment when the area is multiplied by 27 office floors!

Concrete floors with ducts were considered and rejected although comparable in cost to the system chosen — a blend system of high bond steel decking with cellular units consisting of three energized cells on the centre line of each module.

Leithead's firm was also chosen to design the University of British Columbia's Geological Sciences Centre with Robert S. Nairne as project architect.

Faced with a limited budget, the firm drew up plans to bring the first largely prefabricated structure of 3½ storeys and 95,000 square feet onto the campus for \$2,700,000. "All the components are on the market," Nairne stressed. "We have merely assembled them into a modern approach."

The centre is framed in light steel through which services are laced. Exterior walls are formed by clipping modular prefabricated panels, a foot wide and eight high, to the framing.

Exterior finish of the panels is reflective colored enamel baked over aluminum. They contain insulation and have a factory-painted steel interior wall finish.

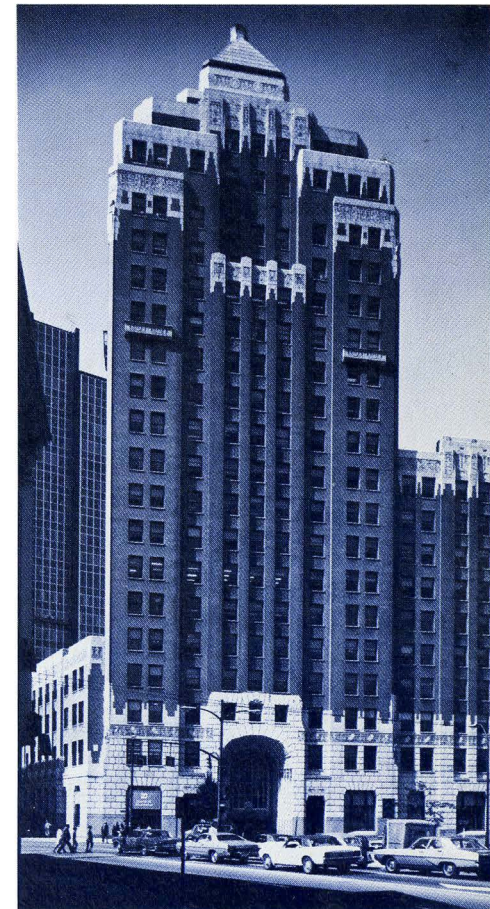
"The design represents a significantly different approach to building on the UBC campus," says Nairne. "Budget limitations forced an industrialized approach. It certainly appears to be in tune with the developing attitude in building."

The centre, on which the final touches are being made, is fully flexible, air conditioned and highly serviced. It is designed for expansion to provide for 60 faculty and post-graduate offices and three lecture theatres.

Main feature of the building is its simplicity. All structural steel was designed and fabricated to allow quick and easy erection. The three-storey high columns were erected in one piece and trusses and joists hoisted into position in record time.

The floor consists of 2½ inches of concrete on 1½ inches composite steel deck supported by 50-foot open web steel joists. Steel trusses carry the joist loads to eight-inch hollow square columns spaced at 20-foot intervals. The steel framing system allowed engineers to cut the weight of steel used by 14 to 20 per cent compared to steel normally used in this type of construction.

Lateral loads are resisted by the steel frame and by a reinforced concrete core which contains stairs, elevators and washrooms.



Speed for systems building

Systems building, although still skeptically viewed by many building industry people, can't yet be discounted as a way of putting up more building for the money. In fact, more people are moving over to the ranks of the convinced every year. The Japanese, for example, are so convinced that this is the way of the future, that they are gearing up for 30 per cent production of housing by this method by 1976.

But perhaps the most dazzling systems success to date is in France, where the Paris architectural firm, Lods, Depondt and Beauclair recently completed a 500-unit apartment and office complex for Rouen. Among international kudos for this project was a \$25,000 award from the R. S. Reynolds Aluminum Co.

LDB started out in the systems business by using concrete-producing units in an off-site factory — but to achieve greater flexibility and cut labor time hence construction costs the firm three years ago switched to a system which utilized weathering steel for structural framing and aluminum for exterior facade. The results were so successful that the City of Rouen has asked LDB to build another 1,000 units despite the fact that Rouen is also the location of a precast concrete factory.

"A blue house for four, please". — catalogue housing comes of age

"What we have here is a genuine manufacturing process that will change the picture in housing."

That's Toronto architect Jack Diamond (A.J. Diamond and Barton Myers Architects and Planners) talking about his firm's design for houses to be made of steel.

The federal government has also realized the possibilities inherent in steel housing and has made a grant to Dominion Foundries and Steel Co. Ltd. to bring Diamond and Myers housing into being.

The result initially will be 66 units of townhousing on a federal-provincial land assembly in the southwest mountain section of Hamilton.

These will undergo intensive studies to determine feasibility of full-scale production which, in time, could see 2,000 produced annually for house-hungry Canadians at National Steel Car Corporation, a DOFASCO subsidiary.

House buyers will benefit most. The homes will be made available to families in income ranges of \$5,000 to \$7,000 at prices ranging from \$13,800 to \$17,700 — a substantial savings over conventionally built houses.

Besides steel interiors, the exteriors will wear steel siding. Some conventional materials will be used but overall the houses will outlast conventionally built ones and require a minimum of maintenance, says Diamond.

Reduced on-site labor costs and speed of erection are additional advantages. Later, a buyer will be able to order a model of his choice and have it delivered anywhere within three weeks. Erection takes one day; complete interior finishing somewhat longer.

Although the first units will be built for the low-income market, where the greatest need exists, the system can also be used for houses valued at \$150,000 or more.

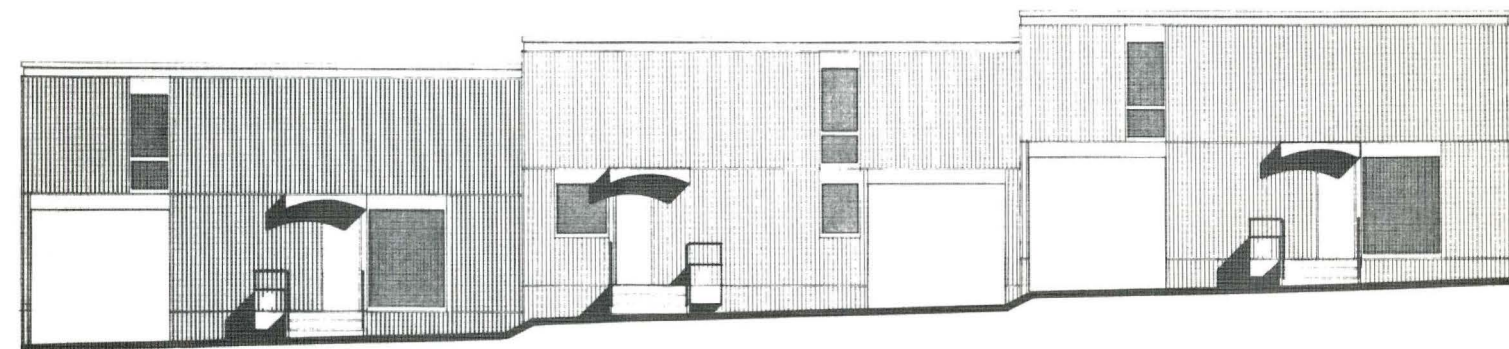
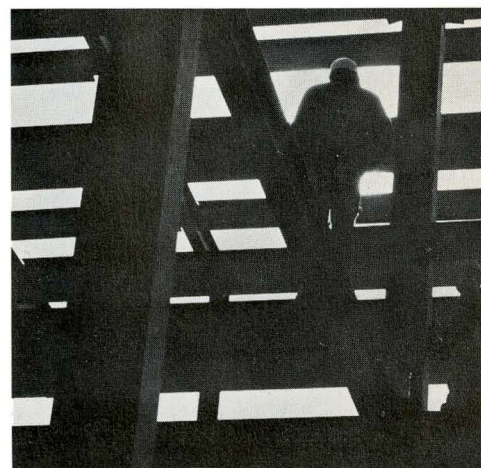
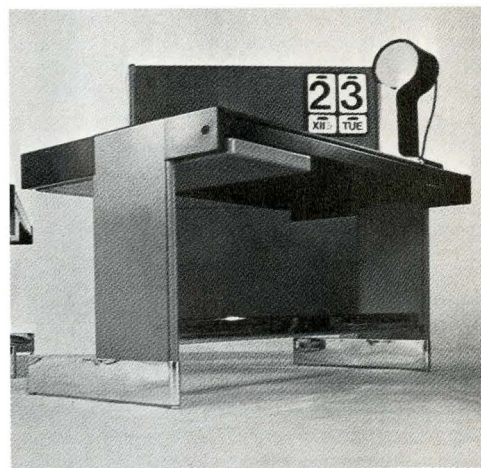
Steel furniture for junior and the boss

Steel desks and filing cabinets are not new. It only remained for designers with their love of color and form to combine their talents with the versatility of steel to add deep beauty to the durability of yesteryear.

Now even the executive suite can contain "something for the soul," in steel, enthuses Montreal sculptor Jacques Besner, and proves it with a 14-piece all-steel office grouping from benches to bookcase to lamps.

In other offices the changes are just as dramatic. Bright colors are in steel workwalls, worktables, desks, filing systems and chairs — in short a total color-coordinated environment.

"Perhaps the main reason I enjoy designing with steel is that one can achieve a tremendous feeling of quality with the material and do it at a relatively low cost," says designer Douglas Ball, also of Montreal.



The age of welding

One of the fundamental changes that has made the whole steel industry more go-ahead is welding. It is among the factors making a properly-designed steel structure possible at lower cost per square foot than 15 years ago.

Welding has also helped Canada approach self-sufficiency in the supply of structural steel. In 1961, The Algoma Steel Corporation, Limited began supplying rolled wide flange beams, up to 24 inches in depth, thus largely supplanting American and European beams in this size group.

In 1965, Algoma began production of welded wide flange beams up to 48 inches deep and welded columns up to 20 inches deep. The automated welding production line, along with the beam rolling mill, enabled the Canadian steel industry to offer a full range of wide flange shapes to Canadian designers.

Other advances in welding have been made by Canadian fabricators. The CIL Building in Montreal, the Sun Life Building in Toronto, and the Toronto-Dominion

Centre are major structures each of which heralded significant advances in welding.

More recently, welding was used extensively (460 tons) in the 57-storey Commerce Court tower in Toronto. Here the structural frame was connected by a combination of high-strength bolts and field welds, aiding speed of erection. Similarly, Vancouver's Toronto-Dominion Bank Tower is an all-welded structure except for high tensile bolts used to tie columns and crossbeams.

Case study: creating a 100-year environment

McMaster University Health Sciences Centre is a textbook example of the flexibility of steel.

"It provides an environment into which anything desired can be put over the next 100 years," comments Eberhard H. Zeidler of Craig, Zeidler & Strong, architects for the \$72 million Hamilton complex.

Of the McMaster centre Zeidler says: "Momentary flexibility isn't what is needed. People don't move partitions every day. We had to anticipate any kind of change, even the most radical, without losing the original capital investment when such change became necessary.

"Steel in this case was the most economical and fastest. When spans exceed 50 feet steel becomes very competitive." The centre has clear spans of 73 feet. Though not completely finished, it is already demonstrating its flexibility by being 25 per cent occupied.

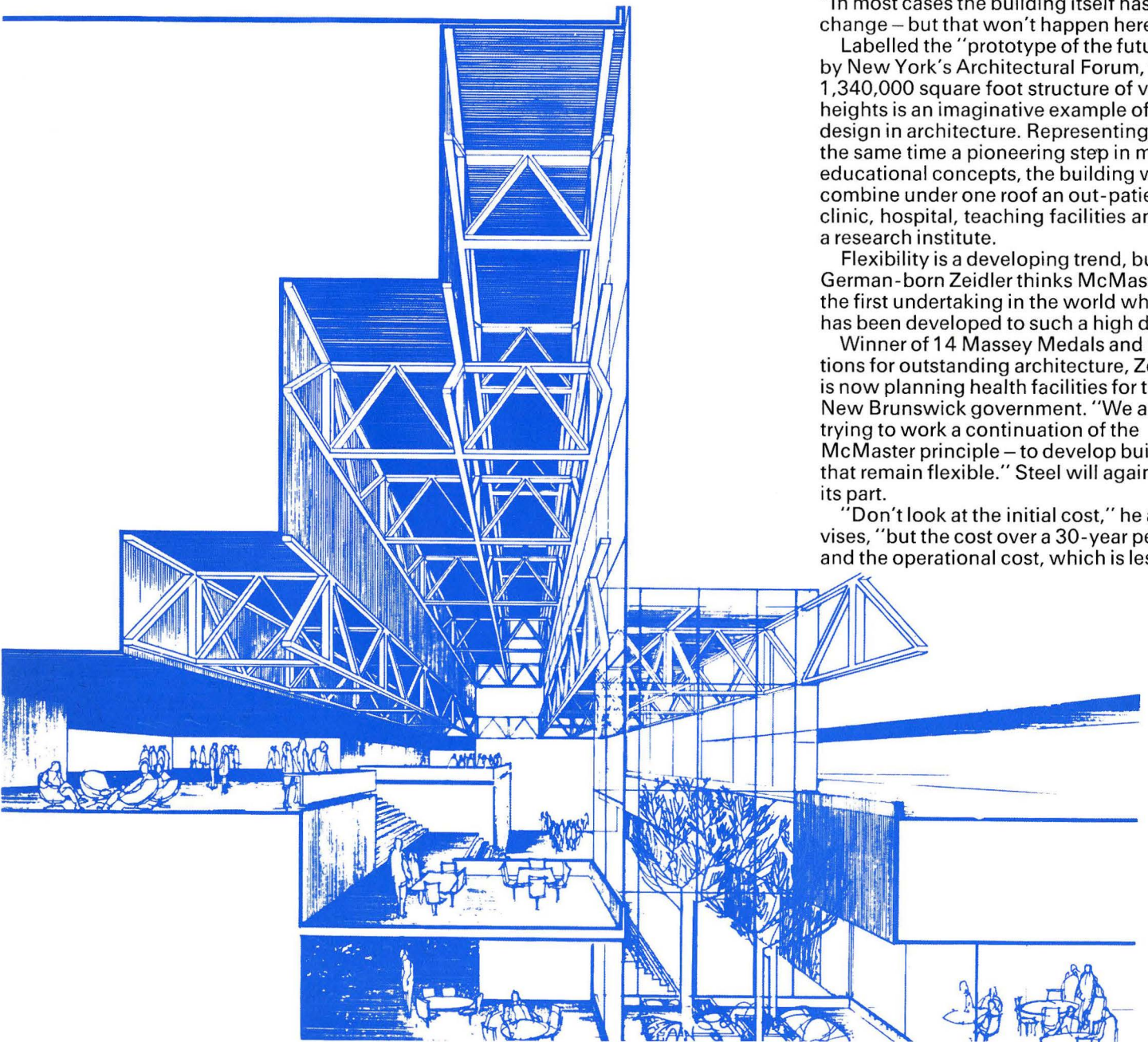
"The key was not to consider the building as one unit. Uses will change at five-to-ten-year intervals, at least," he predicts. "In most cases the building itself has to change - but that won't happen here."

Labelled the "prototype of the future" by New York's Architectural Forum, the 1,340,000 square foot structure of varying heights is an imaginative example of steel design in architecture. Representing at the same time a pioneering step in modern educational concepts, the building will combine under one roof an out-patient clinic, hospital, teaching facilities and a research institute.

Flexibility is a developing trend, but German-born Zeidler thinks McMaster is the first undertaking in the world where it has been developed to such a high degree.

Winner of 14 Massey Medals and mentions for outstanding architecture, Zeidler is now planning health facilities for the New Brunswick government. "We are trying to work a continuation of the McMaster principle - to develop buildings that remain flexible." Steel will again play its part.

"Don't look at the initial cost," he advises, "but the cost over a 30-year period and the operational cost, which is less."



Want to learn more about steel?

A country-wide education program of practical workshops highlighting step-by-step design procedures for steel framed buildings will be held in 14 major Canadian cities, commencing this fall.

The comprehensive one-day workshops will demonstrate practical methods of estimating steel costs for budget purposes; the latest methods of designing in steel economically with special reference to fire protection methods and the use of the computer programs originated by the Canadian steel industry and which have gained international recognition.

At each workshop a sample building design will be completed, meeting the requirements of the National Building

Code of Canada 1970... topics will include Owners' Requirements, Laws and Regulations and Engineering/Economic considerations.

The workshops will be conducted by a team of qualified engineers—V.W. Chorley, R.V. Hebert and D.K. Turner—who have had broad experience in the design of a wide variety of steel structures.

This unique educational program is being presented by the Canadian Institute of Steel Construction (CISC) in co-operation with the Canadian Steel Industries Construction Council (CSICC).

Further information
Canadian Institute of Steel Construction
1815 Yonge Street, Toronto
Phone: (416) 487-2158
or your regional CISC representative

Steel Building Design Workshops Schedule

Western Canada

Vancouver – November 30, 1971

Edmonton – December 2

Calgary – December 3

Central Canada

Saskatoon – November 23

Regina – November 24

Winnipeg – November 26

Ontario

London – October 25

Ottawa – November 1

Toronto – November 9 and 10

Quebec

Montreal – November 5

Quebec City – November 16 (French)

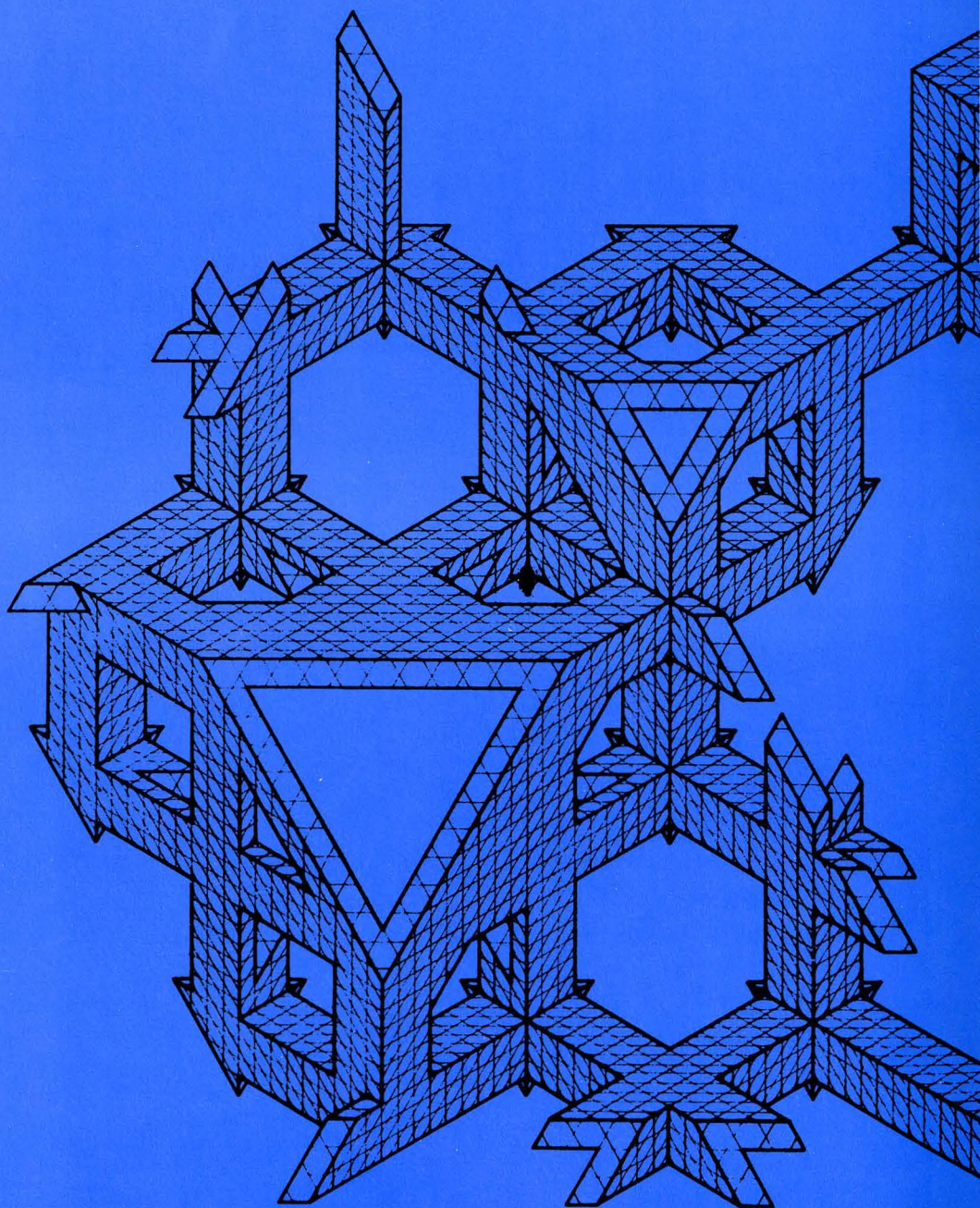
Montreal – November 18 (French)

Sherbrooke – November 19 (French)

Maritimes

St. John – October 27

Halifax – October 29



Drawing by
Affleck, Desbarats, Dimakopoulos,
Lebensold, Sise

Hotels: When steel goes up
costs come down.

Staggered truss design cuts structural steel to 7.9 psf in 18 story tower.



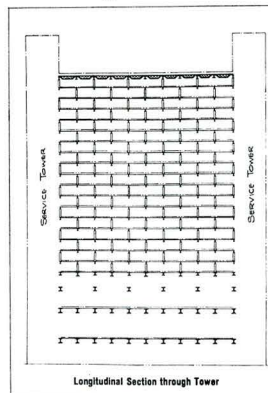
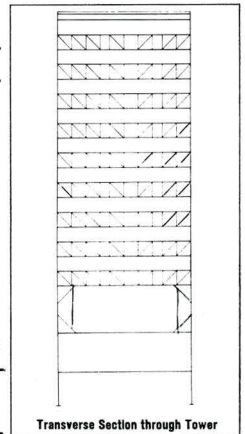
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Architect: The Cerny Associates, Inc.
Structural Engineers: Intertec, Inc., and The Cerny Associates, Inc.
General Contractor: Earnest M. Ganley Construction Co.
Fabricator: Paper, Calmenson & Co.
Erector: L. H. Sowles Co.

A staggered steel truss system won hands down over other structural systems investigated for the Radisson South Hotel in Minneapolis. Compared to conventional braced steel framing and various concrete framing systems, the staggered truss system provided substantial savings.

The bottom three floors of the hotel complex are conventional steel braced frame construction while the Hotel tower, except for the end service cores, utilizes the staggered truss system conceived by M.I.T. in a project sponsored by U.S. Steel. The bottom three stories of the tower employ transfer frames and actually contained more structural steel than the 18-story staggered truss portion that it supports; 505 tons or 47.3 psf versus 501 tons or 7.9 psf. This relatively large amount of steel in the lowest three stories of the tower was required to satisfy the specific design criteria of complete flexibility, via long, clear spans. As a comparison to the staggered truss portion of the tower, the independently framed service cores at each end of the tower required 675 tons of structural steel or about 19.6 psf.

All steel for the trusses is ASTM A572 Grade 50 (USS EX-TEN 50) except for the bottom chords of the trusses in the lowest two stories which are ASTM A572 Grade 60 (USS EX-TEN 60). The use of high-strength low-alloy steel was economically justified because the trusses with their story-to-story depth have small deflections and because of the relatively high bending moments created in the truss chords by the presence of three Vierendeel panels.

This is one of many ways to keep costs down with steel. Used imaginatively, steel usually wins out in first cost compared with other materials. In the long run, there's no contest. Only steel-framed buildings can be altered at low cost when it comes time for re-modeling.



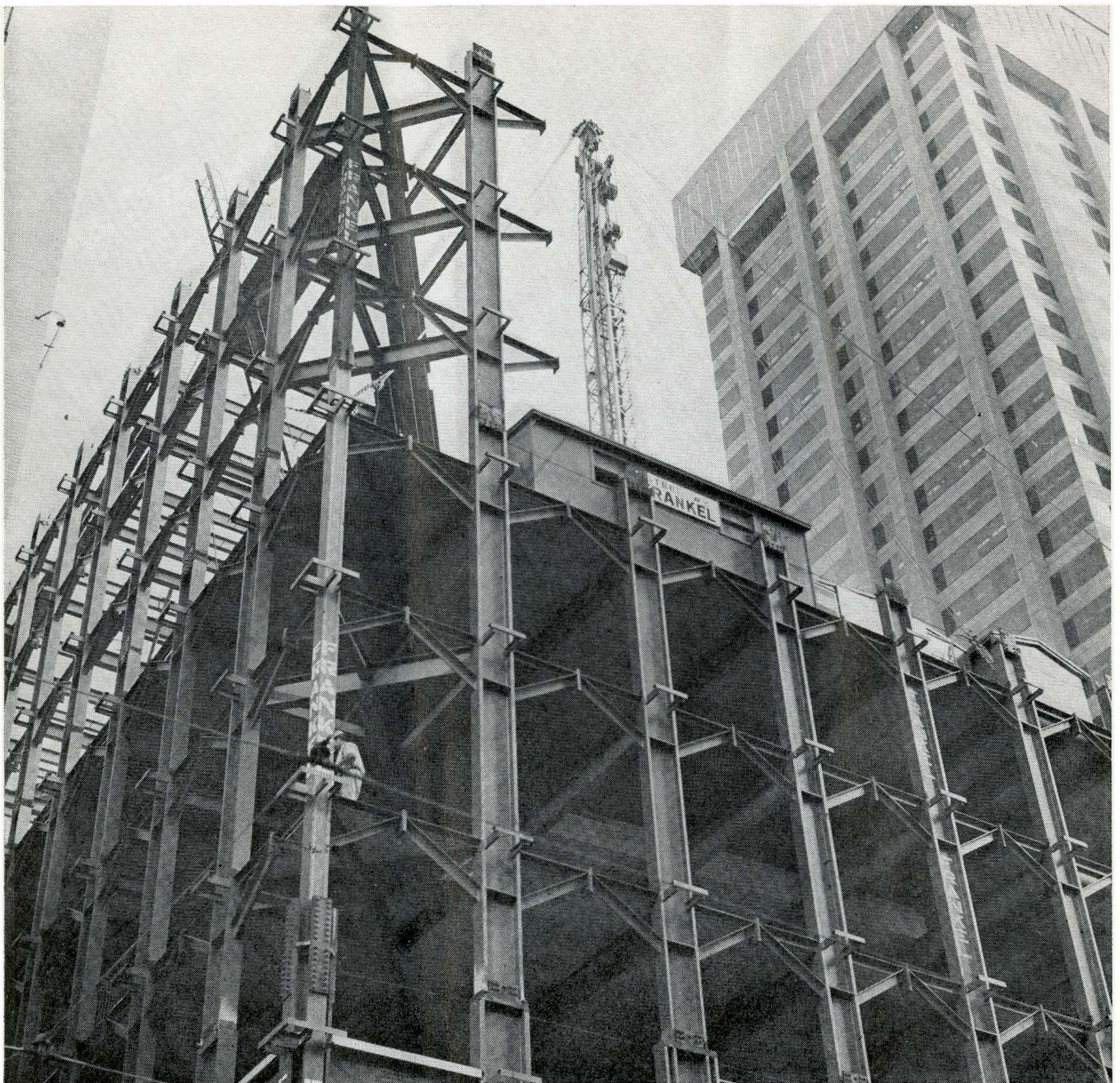
Structural Report

If you're planning a new hotel, apartment house or similar structure, you should investigate the staggered truss system. We'll be happy to send you a copy of our "STRUCTURAL REPORT"—ADUSS 27-4394-01, which details its use in this building. USS and EX-TEN are trademarks.



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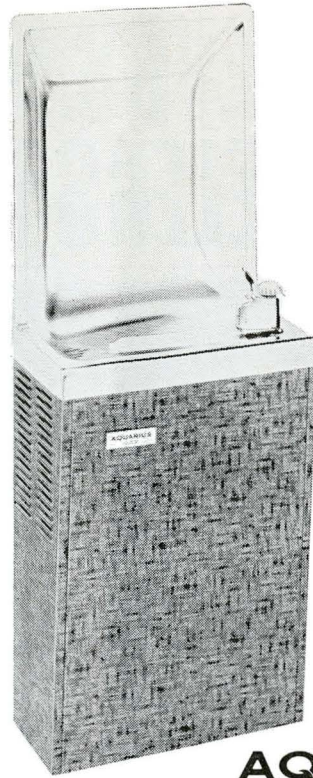
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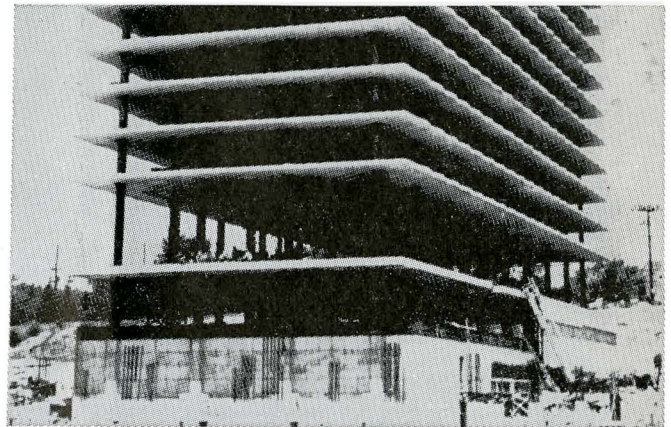
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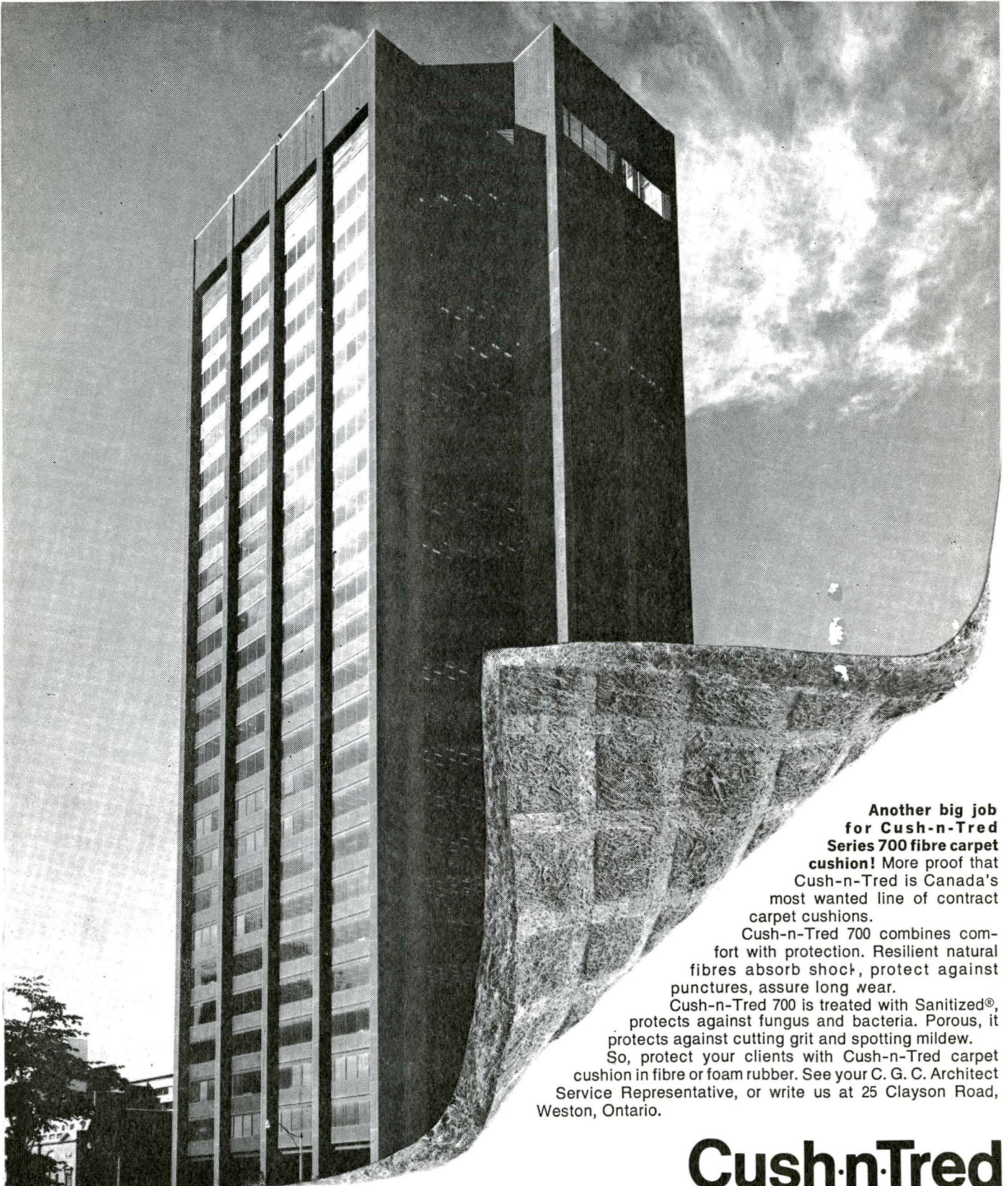
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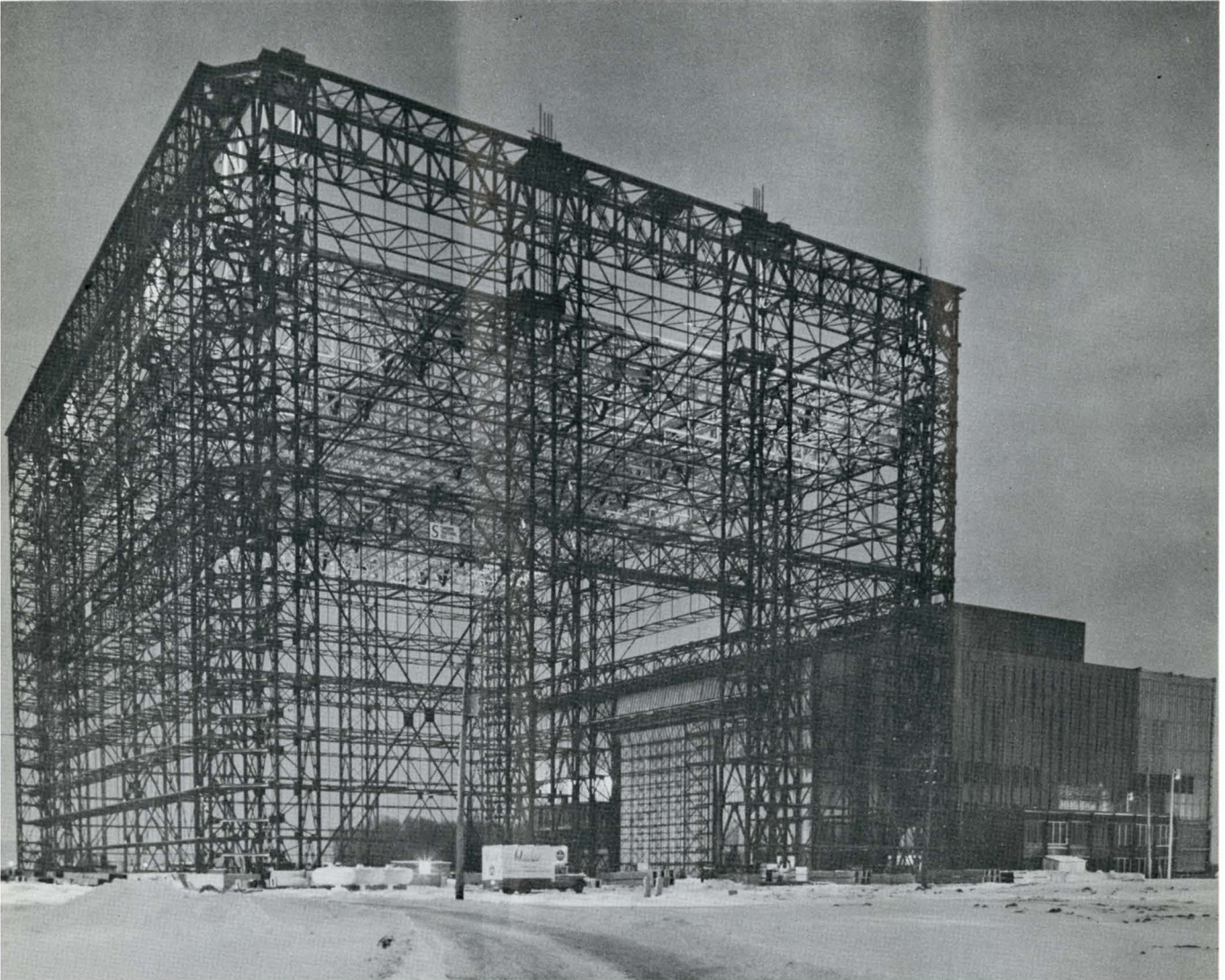
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Beginning December 4, despite blizzard conditions, the hoist was begun, with one man operating four

consoles (each controlling nine of the total 36 jacks). The operation was virtually automatic but crews checked the vertical plane of the walls and adjusted bolts within the column tower bracing members. The 800 ton roof travelled up the guiding rollers in the side walls at a speed of 1/2 - 1 in. per minute—the roof was in position within two weeks.

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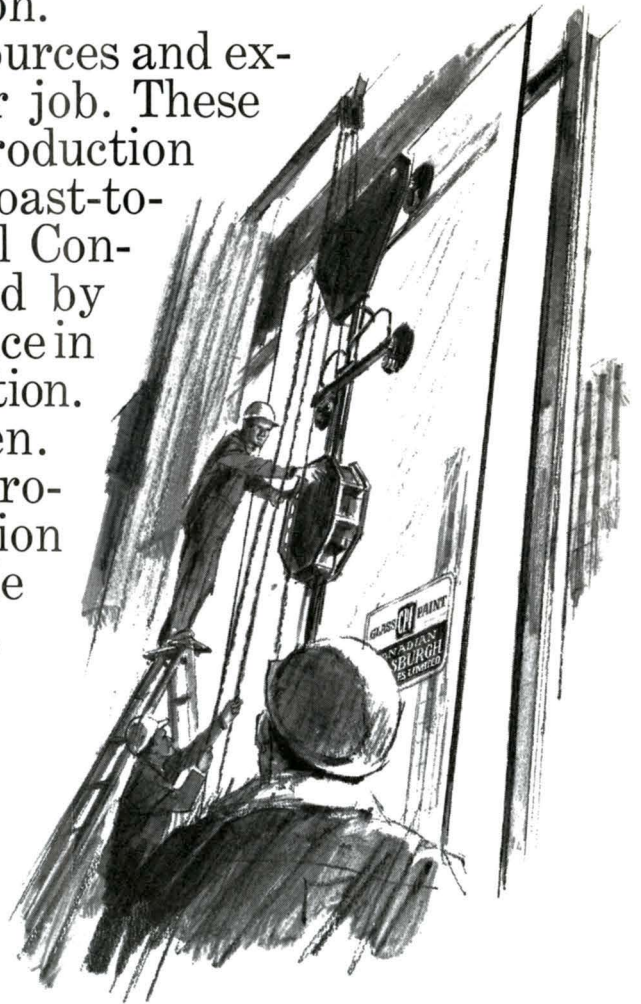
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