ROYAL ARCHITECTURAL INSTITUTE OF CANADA JOURNAL

FEBRUARY 1963

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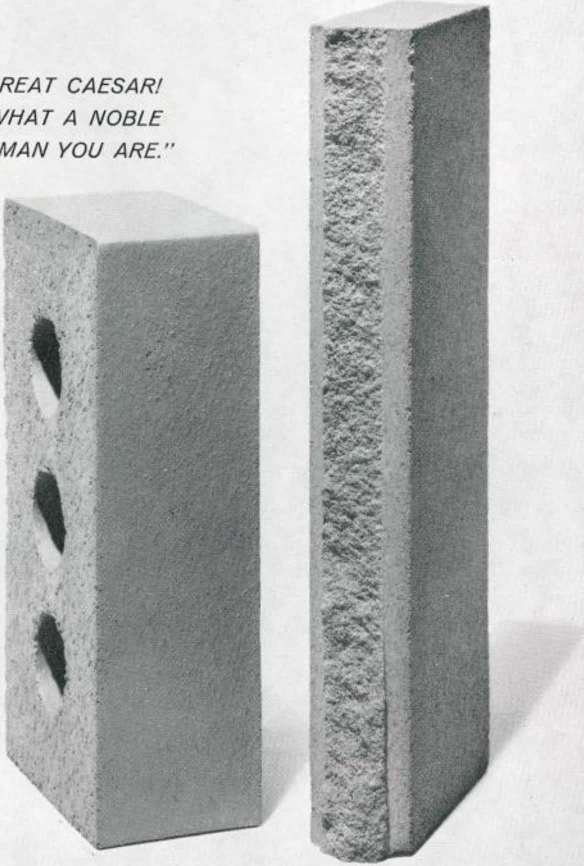

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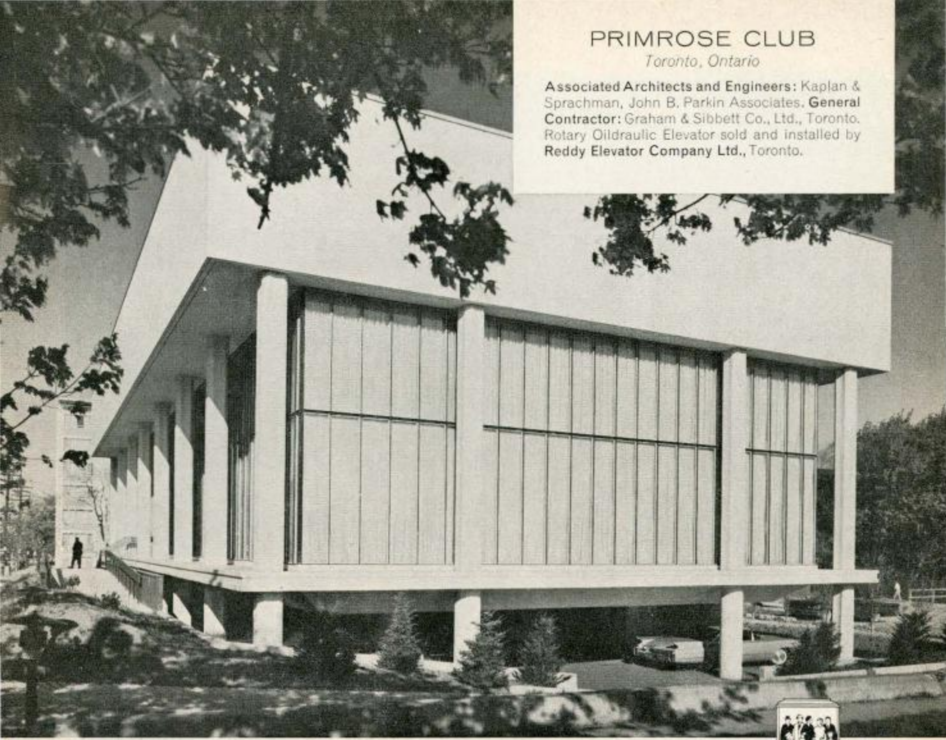

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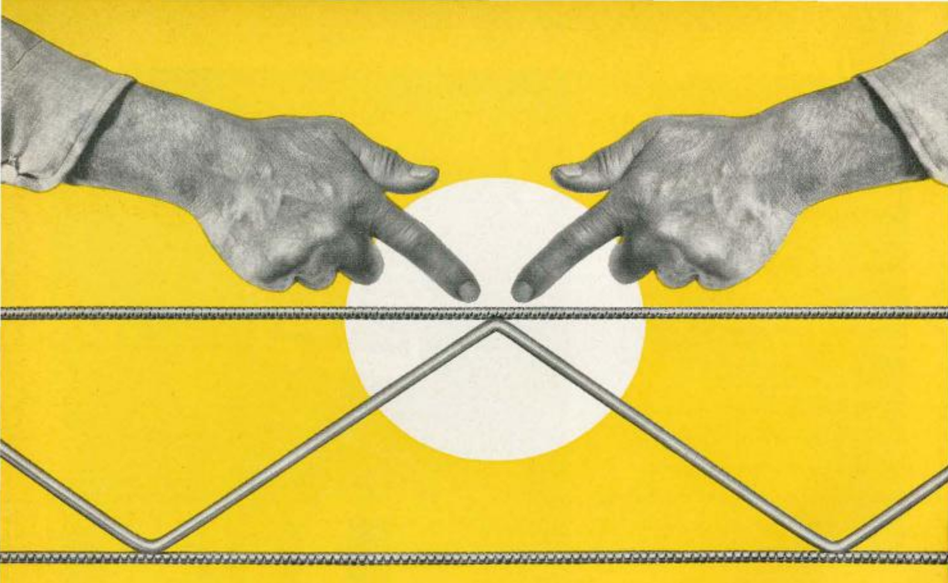

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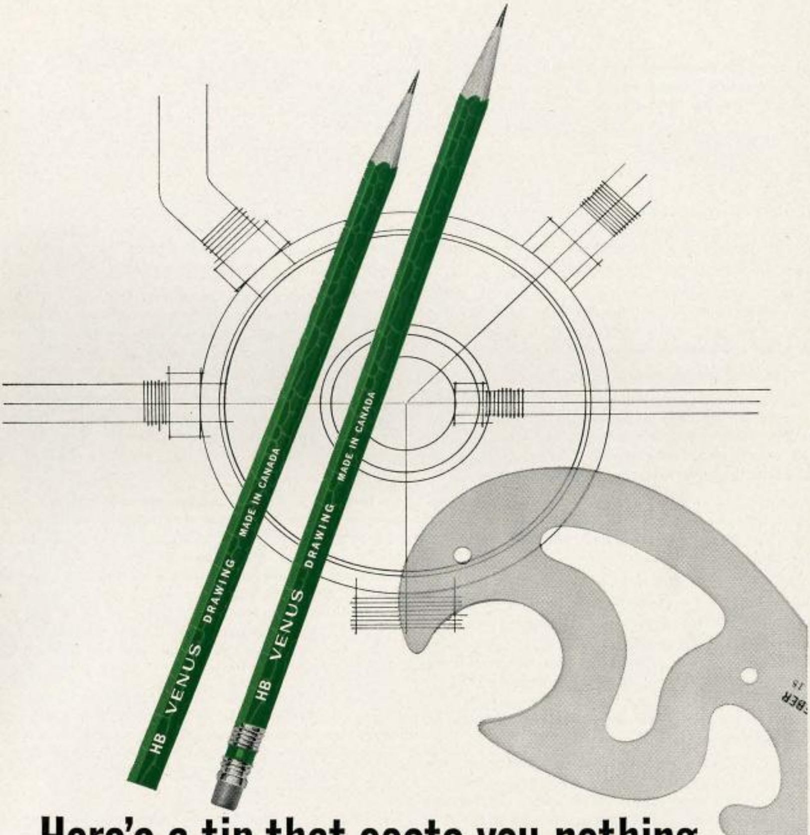

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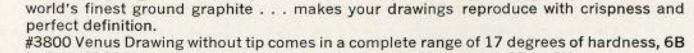

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FACING THE FUTURE

Synopsis of an address to the annual meeting of the Canadian Construction Association, by John L. Davies (F), President RAIC

BESIDES NORMAL GROWTH requirements, Canada's urban areas will be largely rebuilt in the next 50 years. To achieve this undertaking, the construction industry will have to grow even bigger.

For architects, however, there is a shadow of uncertainty – uncertainty we will be asked to carry out the majority of the projects – uncertainty the construction industry will continue to exist as it is today.

It's a truism, but times do change.

When 5,000 years ago, Imhotep designed his pyramid and temple, an inscription noted that he inspected the temple every day during construction, and when he died, he was made a god. Unfortunately, neither of these admirable practices is consistently followed today.

Of course, the first architects were master builders. It was in only the last few decades that the separation between the professional architect and the contractor became established.

Today, there are again signs of change: for example, in South America, it is once more usual for the architect to be the general contractor.

A new situation has developed in B.C. Ten years ago, it was common practice, in pulp mill construction, for the work to be carried out by a general contractor; today, it is more common for the owners to call for separate subcontracts – and the whole project is co-ordinated by professional engineers.

Another disturbing development is government encroachment. Fortunately, this is in a few local areas only. But it affects the opportunities of the private practising architect. This tendency, of course, may grow in the contracting fields.

We therefore go back to the shadow of doubt that I mentioned previously. This doubt should be a warning to those of us who believe that the best way for Canada to carry out its construction program is to use private practising architects and engineers and private contractors and subcontractors.

Architects realize that the growing complexities in the design, organization, and execution of building projects require a constant surveillance of existing methods and procedures.

British architects recently carried out an extensive survey into the practice of the profession in the United Kingdom. They wished to determine how the architect's service to the public could be improved. As a result of this survey, they are already lengthening the training of the architect by one year; they are also advocating further graduate studies, so that architects may improve their ability to co-ordinate various elements of jobs.

Canadian architects, benefiting from the British example, are currently studying the feasibility of conducting a broad-scale investigation into the state of the profession in Canada to find ways to improve our service to the industry and to the community.

The architect must increasingly concern himself with the creation of the total human environment. This means he must expand the present concepts of architectural practice far beyond what are presently called "basic services."

If the architect is to adequately fulfil his own role, he cannot become involved in the co-ordination of the actual construction projects. This is the field of the contractor; yet it is in this regard that the general contractors are often not carrying out their work as efficiently as possible. All too often, the superintendent is not willing or sufficiently skilled to appreciate, fully, the work and problems of the various subtrades. This is far too important a job for an underskilled man, and the industry must accept its responsibilities.

The Division of Building Research is undoubtedly doing wonderful work, but its scope is woefully small, when we consider what should be done for Canada's largest industry. If research improved the efficiency of our industry by only one per cent per annum, the benefits would be enormous.

There is another way the industry can be improved, but we must look for government help. No industry can be really efficient, when its stability is undermined by "stop-go" economic policies. Society pays dearly for idle skills and idle equipment.

The final and most obvious way we can help to improve the construction industry is by closer co-operation among the architect, engineer, contractor, subcontractor, and supplier. We are making progress in this direction.

Joint committees, including the Canadian Joint Committee on Construction Materials and the Joint Committee on Contract Documents and Procedures, are evidence of constructive liaison. But we must accomplish much more. By mutual trust and co-operation, we can remove the shadow of doubt – to the benefit of all Canadians.


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TWO EXHIBITIONS

- **Ontario Association of Architects Exhibition, "The Face of Our Town," reviewed by John Andrews, appeared at the Toronto Art Gallery during January and early February.**

- **Four Centuries of Architectural Drawings from the RIBA Collection, reviewed by Eric R. Arthur (F). At the National Gallery, Ottawa, during February and expected at the University of Toronto School of Architecture during April.**

OAA EXHIBITION

EXHIBITION OF past, present, and future architecture at the Toronto Art Gallery is but a collection of architectural photographs – some of them fine photographs. To attempt to pass judgment on these as individual works of architecture is, of course, impossible. The exhibition, to its credit, makes no attempt to show a building as a building, nor does it have a constant format of presentation, but indicates to the public merely what buildings are considered by architects to be fine examples of architecture.

Much credit for quite a representative display of Ontario architecture must go to the discrimination and perseverance of the committee; discrimination in making what was necessarily a rather restricted choice from a mass of material, and perseverance in getting it presented in a reasonably coherent form.

Even this rigorously selective show was not uniformly high in quality; some fields of architecture are in quality and quantity far better represented than others; some, in terms of their importance, are absolutely neglected. Presentation itself was sensitively handled; the Ursuline plan form reduces the vast Art Gallery spaces and leads you easily and imperceptively from space to space, while the occasional introduction of contemporary sculpture is indicative of a sense of humor lacking in all but a few of the emasculated, stylistic renditions of architecture presented for public view.

An interesting contrast is the section of the Canadian Academy show devoted to architects, which suffers badly in comparison both in manner of presentation and work presented. It seems to me most unfortunate that at a time when architecture is finding it increasingly difficult to maintain its integrity as an art, in a show where the artist, sculptor, and architect as individuals exhibit their work, all architecture shown is the work of large organizations.

Buildings of the past are by and large rather nondescript, and then as now the greatest contribution was in housing. The early form of house with its chinked log construction and adequately pitched roof was an indication of a Canadian character and yet seems to have been swallowed up in the eclectic Renaissance of the last century – a trend continued to this day.

Revivalism, Loyalist, and Italianate traditions have in most cases given way to Breuerism, Miesianate, and Aaltoist influences, but there is no indication of the emergence of Canada as either a culture or a climate. Is the almost total absence of snow in the photographs shown, an indication we choose to ignore our winter, or just a subconscious desire that it go away? If a Canadian image is to emerge time alone will tell.

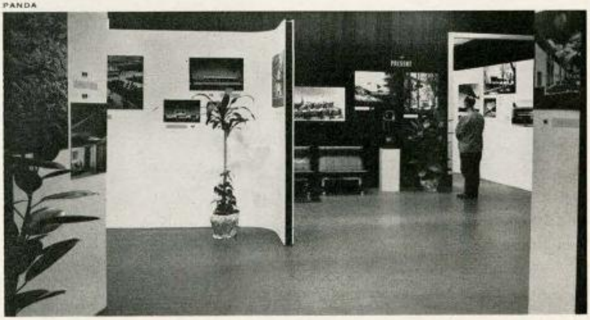
The present is represented by a variety of building types of which the most significant are the low rise multifamily units and single family houses. In the former, a concern for a humanized environment, the use of traditional building materials, and a positive approach to handling the automobile make it quite plain these buildings were intended to be used by people. Influence of Old Europe has a definite impact in the amount of pedestrian spaces and their scale, while the motorized contribution of North America, to our way of life, has been dealt with in a worthwhile manner.

Single family houses – whether of the arts and crafts persuasion, the art gallery type, or reminiscent of ancient walls – all have a distinctly individual quality and together with the multiple family groupings add strength to the belief that good architecture is ultimately the work of a single mind, and

(Continued on page 14)

Born in Sydney, Australia, John Andrews received his B.Arch. (Hons) from Sydney University in 1956 and his M.Arch. from Harvard in 1958. Mr Andrews was one of the finalists in Toronto's 1958 City Hall Competition. From 1958 to 1960, he was senior designer with John B. Parkin Associates. Currently he is fifth year design critic at the University of Toronto School of Architecture. He is also in practise in Toronto, as well as a consultant to architectural firms in Australia.

PANDA



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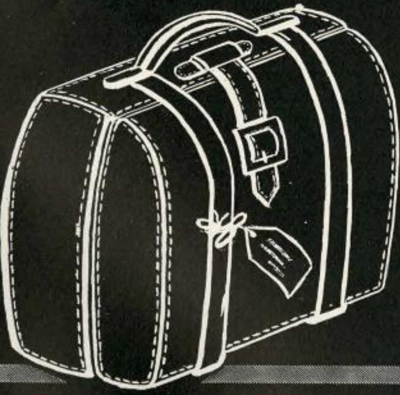

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that this age of conformity has not yet eliminated architecture as an art.

The skill and care devoted to the low rise dwelling was not evident in the high rise apartment buildings, where the heavy hand of the insensitive developer seems all too apparent even in these selected examples.

Office buildings as a whole perpetuate the myth of the curtain wall, making Ontario one of its last strongholds in a general movement towards consideration of climate and function rather than fashion in exterior wall treatment. There is an example where the metal framing unit of the curtain wall has been replaced by one of concrete, an indication of a more sculptural approach, even if at this point it is merely a decorative imitation.

The complete absence of school buildings, in a province where so much educational building is carried out, is disturbing and can indicate only general complacency among architects in a field where the image of an architect-created environment has, perhaps, its greatest effect.

Industry, both heavy and light, was best represented by buildings we all admire and have acclaimed years ago. The fact these are still the best says much for these buildings, but little for our interest as architects in the industrial field.

Smaller public buildings, whether for local government or the social well being of young ladies, were well and sensitively handled with a fine sense of scale and materials and form a sharp contrast to the large institutions for public use, which are invariably nothing more than a three dimensional result of a questionable diagram of function.

It is perhaps an expression of our way of life that small projects are handled by a small office, buildings of medium size are done by larger firms and large commissions bear the unmistakable stamp of anonymous mass production.

A glimpse to the possible future of architecture in Ontario provides us with an interesting lesson in planning: a central planning authority, with the opportunity to provide an overall master plan for the development of the city area, presented piecemeal development with no apparent relation to an overall concept, governed by nostalgic memories of a Toronto long since passed into history.

By way of contrast, we have an intelligent, if rather timid, appraisal of the city as an entity by Group One.

The St Lawrence Cultural Centre, located by the present availability of land and a historic reference to St Lawrence Hall as the cultural centre of Toronto one hundred years ago, is shortsighted to say the least, even if one could condone the idea of another Lincoln Centre. New York has thoughtfully provided us with ample proof of the futility of a concentrated cultural grouping, and the absence of an overall plan for Toronto eliminates the possibility to integrate cultural activities with downtown redevelopment and bring desperately needed life in other than working hours.

The waterfront proposal again is an isolated proposal, restricted by outmoded regulations and giving little recognition to the fact that Toronto as a climate is hard to live with for a large part of the year. Reflecting pools become icy wastes and open plazas – pleasant enough as specific gathering places, hardly suffice as a total environment in which to place buildings.

The Group One plan is a comprehensive overall study, which unfortunately falls down as one examines it in detail. The downtown solution, with its penchant for separation, where level upon level pile up to achieve a complete physical and visual separation of pedestrian and traffic movement, contrasts rather markedly to the approach of a fourth year student group, authors of a fine precinctual scheme for block by block redevelopment of the downtown, providing equal physical separation without concealing the excitement of a bustling city.

The exhibition fulfils admirably its purpose: to show the public fine examples of architecture. It's a pity we didn't have more to show!

John Andrews

(Continued on page 16)

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THE DRAWINGS sent to Canada by the RIBA make such a superb collection that one can imagine the feelings of the librarian, after their departure, being much like those of the curator of the Louvre when he saw the Mona Lisa leave for Washington. One is further impressed by catalogue notes referring to the Duke of Devonshire's collection of old masters in the custody, if not the possession, of the RIBA, that must make the whole treasure house one of the greatest in the world. As I was alone in the room of the National Gallery when I saw the exhibition, it is difficult to estimate public interest. On the other hand, I cannot imagine an architect with any appreciation of history or draftsmanship not being greatly moved by over fifty exquisite drawings. They range in date from a truly magnificent detail of Winchester Cathedral (c.1520) to an undated sketch of a house in East Prussia by Lutyens. Equally dramatic in terms of time are a very peculiar interior with tree trunk columns sprouting palm leaves by John Webb, and a quite magnificent pelican by Philip Webb; a span of nearly two hundred and fifty years.

After an hour or so of merely looking at the exhibition and finding new treasures on every round, I thought it fell into four categories. First would be a type of meticulously drawn elevations (windows without muntin bars) with which we have become familiar through Colin Campbell's Vitruvius Britannicus, followed by perspectives of the late 18th and 19th centuries which were drawn as we do today to give the client as realistic (if sometimes exaggerated) a view of the building as the technique would allow – the technique of the renderer if one may use that odious word.

A third group included drawings (of considerable encouragement to the modern student in architecture who has substituted the 35 millimetre slide for the habit of sketching) by such masters as Inigo Jones, Vasari, and surprisingly, Alfred Stevens. A fourth, which I found breathtakingly out of all proportion to its size, was a series, usually in brown ink, in which the most extraordinary effects of vast scale or rococo splendour were achieved by the merest indication of line or ornament. Where in other categories the drawing repaid the closest inspection, in this one, the smallest drawing revealed a depth of space and glowed with an inner light, at a distance from the picture, quite out of proportion to its size. Perfect examples of this were No. 45, the monument to Prince Franz Ludwig, Archbishop of Mainz by Guiseppe Galli Bibiena, measuring only 20¼ in. by 13¼ in., and No. 51, the Cappella Paolina in the Vatican by Jean Louis Desprez (1743 - 1804). Rather larger than many, this drawing was 28 in. by 19½ in.

Another remarkable drawing in this field of almost "impressionist" art was Mauro Antonio Tesi's design for a stage set, where in a space of 7⅛ in. by 10¾ in. we are treated to a vision of soaring arches and spaces behind columns going we know not where in the distance. It is quite obvious that in this category we are far beyond the limited range of the perspective "renderer". We are in the presence of great artists.

In some cases the catalogue (itself a collector's item, it is so scarce) does not tell us whether the architect was himself the draftsman. It is highly improbable that Sir Charles Barry, for instance, would take the trouble to make an elaborate drawing of Highclere for the second Earl of Carnarvon, or that the father and son team of James Wyatt and Sir Jeffry Wyatville laid hands on the perspective of Ashbridge Park. We do know that the Bank of England interior was done by a pupil of Sir John Soane. It is a handsome drawing that, in colour and in sunlight pouring through clerestory windows, draws one across the gallery – but the juxtaposition of segmental and elliptical arches and a seemingly crushing dome, dampens one's enthusiasm for the building. Pugins' interior of St George's Southwark is signed by himself (1838), but is thin and wiry in draftsmanship in a drawing only 10½ in. by 6½ in. I would say, from memory, that it is far from typical of Pugin who was an able draftsman.

No. 26, "The Westminster Life & British Fire Insurance Company's Office" by Charles Robert Cockerell, might have been done yesterday by a good "renderer." It is a solid building, like many a provincial bank, but expresses its purpose by a frenzied crowd in the foreground accompanying a horse drawn fire truck. A dreadfully bad drawing of a house from the office of Norman Shaw adds nothing to the

(Continued on page 18)

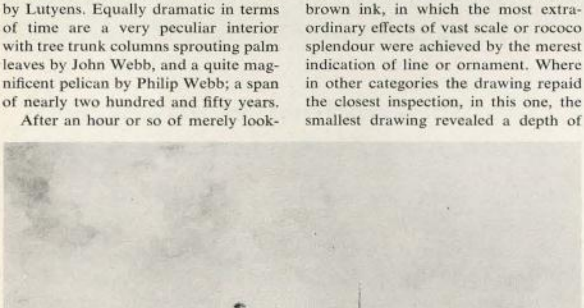
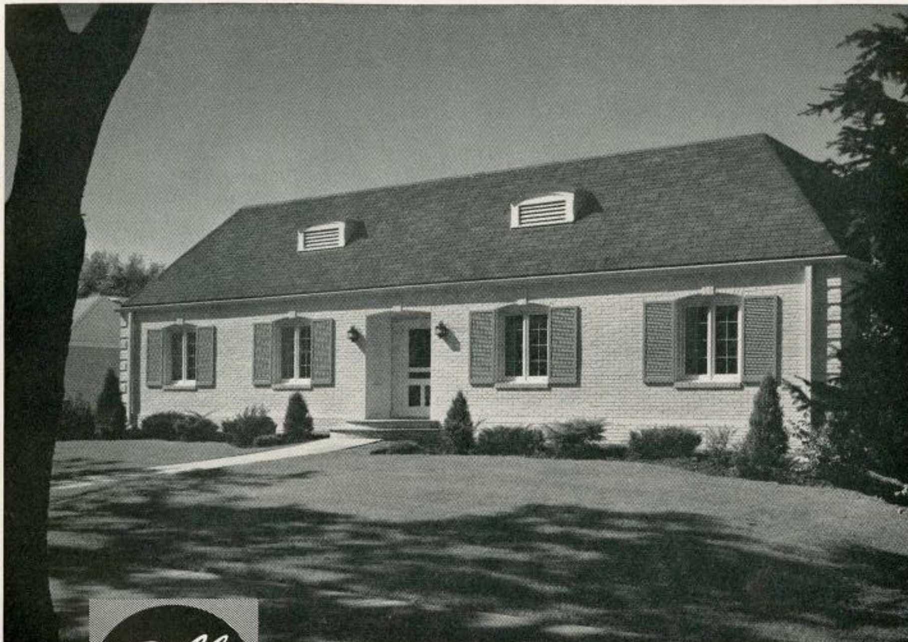


Plate 24: "James Wyatt and Sir Jeffry Wyatville, Ashbridge Park," from the catalog of the Exhibition, shown at the National Gallery from February 5th to 26th.



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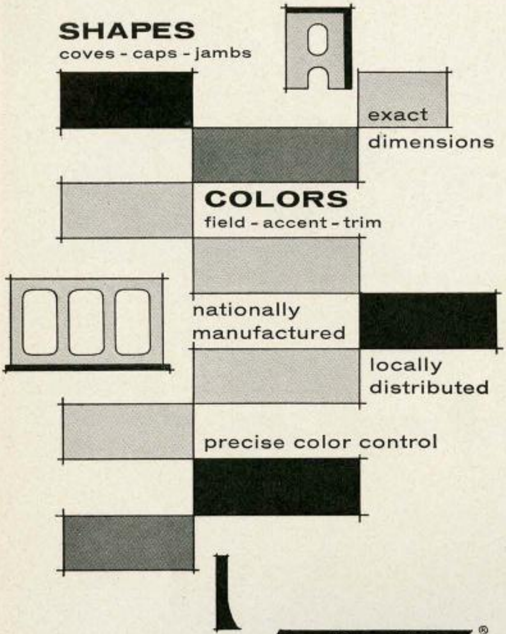

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reputation of that master either as architect or draftsman, and one cannot help but shudder at a green and blue tiled house by Halsey Ralph Ricardo.

We come really up to date in terms of draftsmanship with Voysey and Lutyens. Voysey's two houses are typical of his domestic architecture. Done in white paint on a green paper, one might be in any home show of 1963 rather than in the presence of a drawing of 1894. There are two houses on the same sheet, and one felt something of Voysey's influence as an architect (if not as a renderer) by the sensible arrangement of the plan. There was a concern for the mistress of the house, in the order of the rooms – something Lutyens usually ignored. It does come as a surprise for 1894, to find no w.c.'s, but the occasional e.c. inside the house. Especially when one remembers that Sir John Harington presented the first water closet to Queen Elizabeth I in 1596.

The Lutyens drawing for a house in East Prussia was in no way his best, but as an old Lutyens hand I enjoyed it. I was less interested in the building, which appears only faintly as a sketch in elevation, than in his habit (a trick also of William Kent) of making typical little sketches in the sky or any other irrelevant area. He often put vases in odd places with undisputed authority from Battye Langley to indicate to the old hands that those were proportions that would determine the divisions of the facade. In this drawing he confines himself to such well loved tricks as the key stone at the base of the circular window, a key stone at the head of a window lintel supporting a square block of stone. There are too, indications of colour and notes on materials, a field in which of course he was a master. Lutyens was a great admirer of William Walcott and one rather regretted his absence from the exhibition.

The exhibition will come to the School of Architecture, Toronto and I hope, elsewhere. It was beautifully shown in the National Gallery, but in too large a room. The exhibition will gain, rather than lose from the limited accommodation that is likely to be provided for it in other places. The RIBA is to be thanked for providing us with the kind of exhibition rarely, if ever, seen in these parts. The architect with any sense of history or appreciation of fine craftsmanship should not miss it.

Eric R. Arthur

CONTRACTOR: CAFRITZ CONSTRUCTION CO., ARCHITECT: EDWIN WEIHE

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LETTERS TO THE EDITOR

OAA EXHIBITION

Editor, RAIC *Journal:*

Let us hope that the "Exhibition of Ontario Architecture" currently running at the Art Gallery of Toronto will not establish a precedent for any future shows of similar kind.

There is no doubt that the Exhibition met with a decided success from the viewpoint of public acceptance, particularly the third part of its program: the Past, the Present, the Future. The first two deal with facts, the last with dreams. Dreams, fascinating though they are for the person who lives them, have a bad habit of losing their lustre in retelling, a fate which befell the projects prepared by the School of Architecture, University of Toronto "Ontario Towns, 2000 AD" obviously patterned on Japanese and French solutions. Even so, these excellent models serve well as a genuine conversation piece.

The fault of the Exhibition lies in the first two parts. The Past architecture of our province, though very much superior by its consistently integral form, fared poorly through regrettable lack of emphasis. It is simply not enough to add a mere notation under each photograph; something more pictorially stimulating should have been added to underline the riches of the good tradition Ontario still possesses within its borders. A somewhat humiliating thought comes to one's mind as one passes from the static display of the Past to the more fluid, "in the round," presentation of our present decade: are we so much aware of the hidden forces and the emotionally satisfying forms of the past architecture in dire contrast to the ever changing styles and trends of our chaotic decade that, by showing our buildings, like Monet's haystacks, once in full sunlight and then again under the evening lights and by adding more and more close-ups, we succeeded in hushing up the little voice whispering to us that all that is only a fury signifying nothing? One is likely to believe so. Yamasaki has denied most of his early works, calling them bad dogs. The blow-up of the curtain-wall detail to mural size added nothing to the large photograph of the same building hanging by its side. It perhaps created an interesting décor but it also consumed much badly needed wall space. Another two pictures of rustic shelters showed nothing more than the regrettable inability of the present day architect to handle native, organic material. Yet all this was done under the aegis of presenting examples of FINE architecture. There can be small excuse for showing a picture of a large downtown office building, a structure which has been disavowed by the architects themselves on the ground that it is a mere broken fragment of the original Miesian concept, resulting from the sinister interference of local by-laws; nor for displaying other projects where the excellent photography definitely outshines the subject shown.

Any committee's decision is by definition a collective work. Yet, at the same time, it becomes an intensely personal thing. In the sphere of art no two persons can react in exactly the same way to any art object and in the style-formative period of differing trends, confusing theories and warring schools the coming to a common accord is at best a compromise, or a political expediency. In such times the role of a jury (or a selection committee) is not a happy one and the first duty of a jury must be to state the reason for its final judgment, an act regrettably omitted by this committee. It may be the committee felt that no sound explanation could account for the exclusion of works of over 96 per cent of Ontario architects. In that case the least the committee could do was to change the title of this exhibition. The confusion begins when we find that six out of seven members of the committee showed marked preference for their own creations. It is something of a shock to realize that fully 30 per cent of all exhibits were chosen by the selection committee from their own practice. Briefly, every member of the committee, except one, apportioned to himself an average of 4.5 photographs leaving to the rest of 34 architects a meagre ratio of 1.8 photos.

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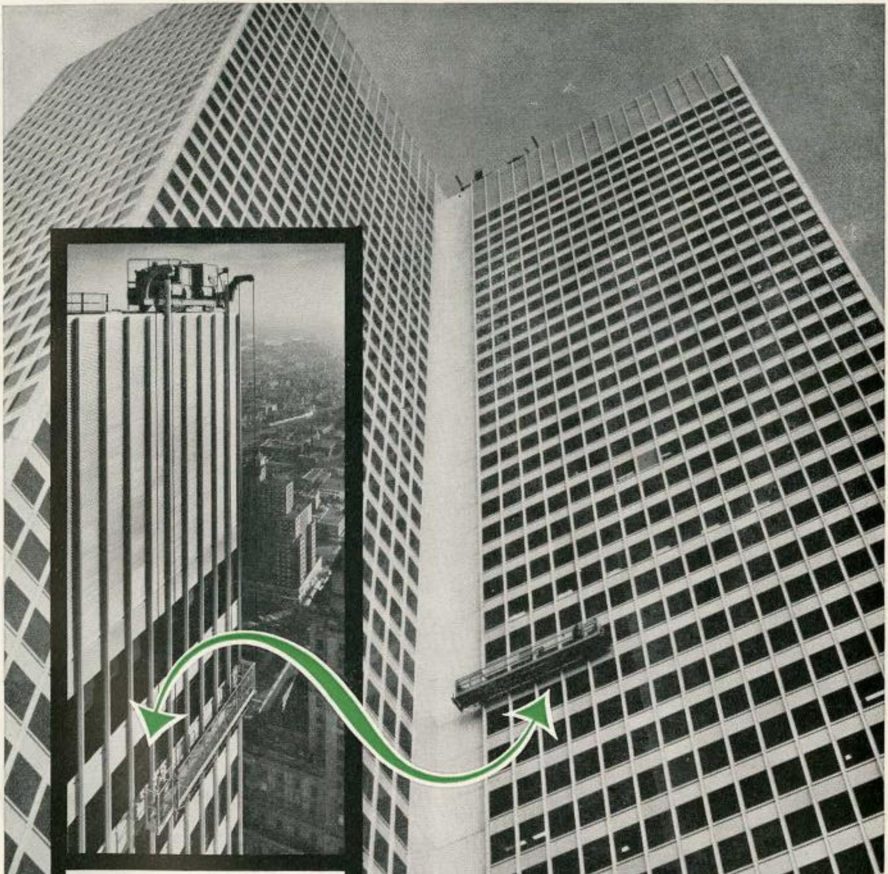

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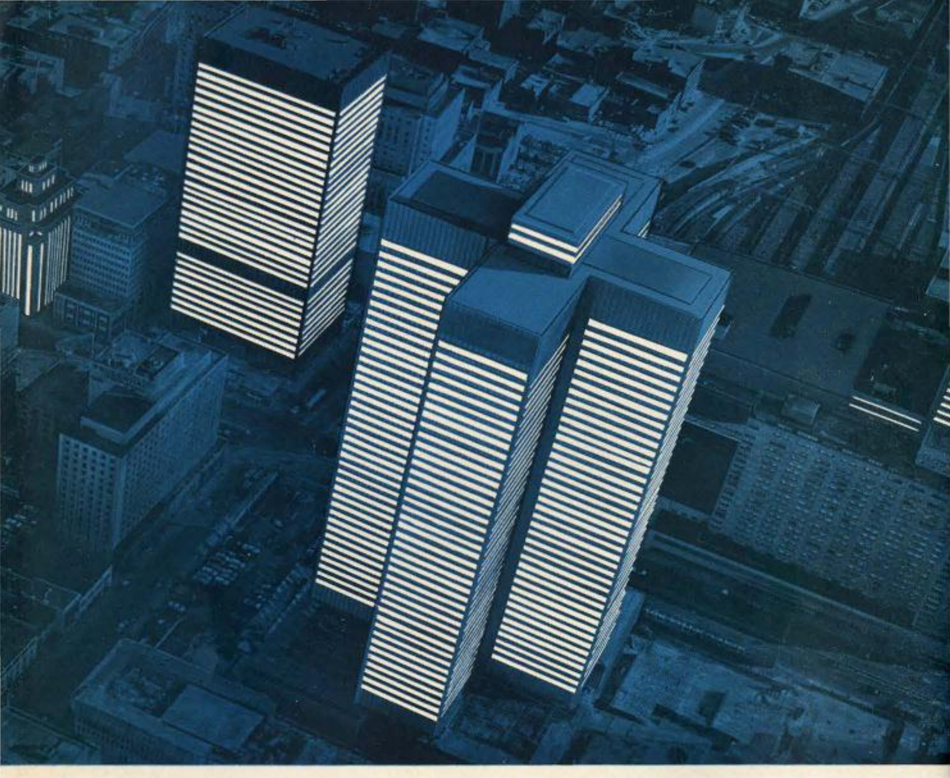

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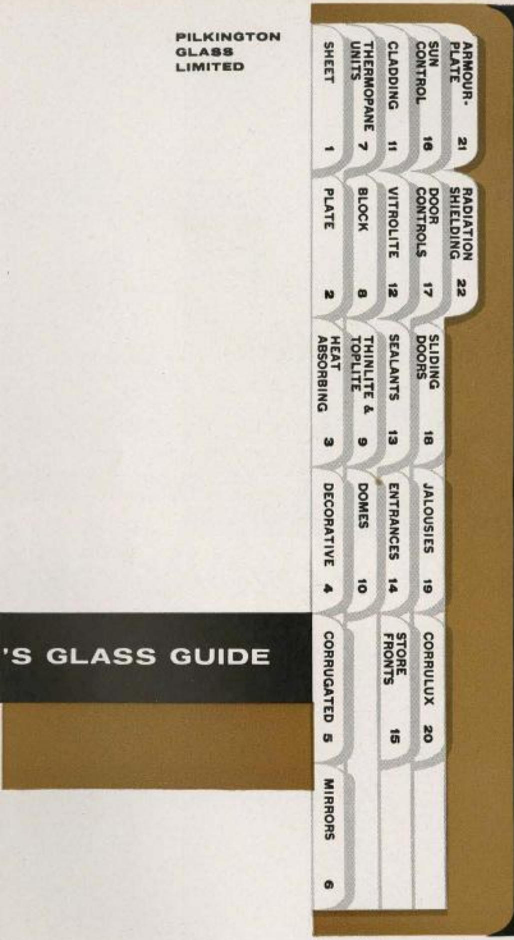

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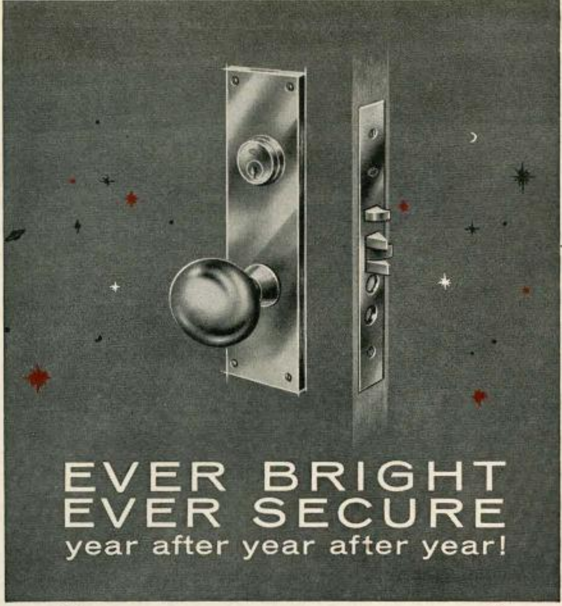

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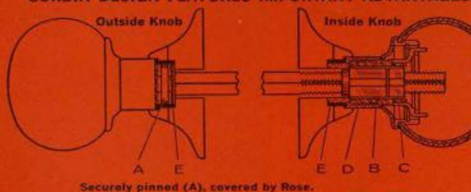

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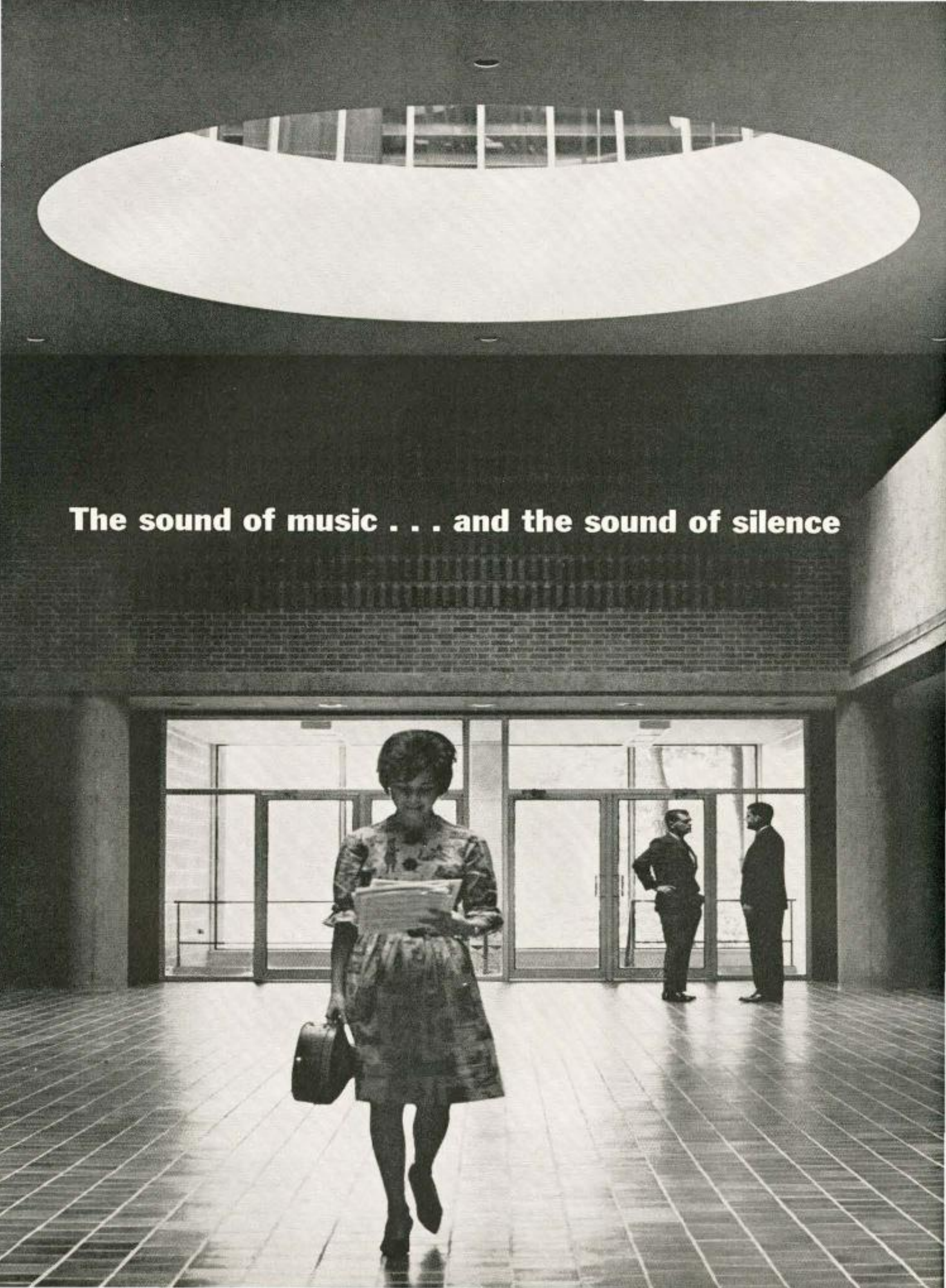

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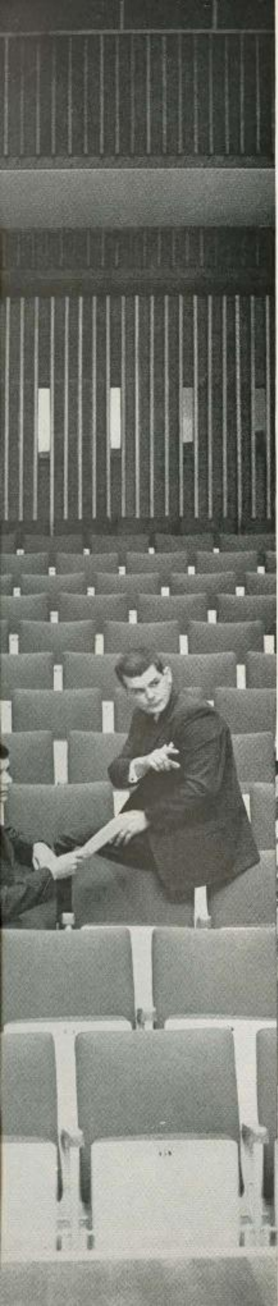

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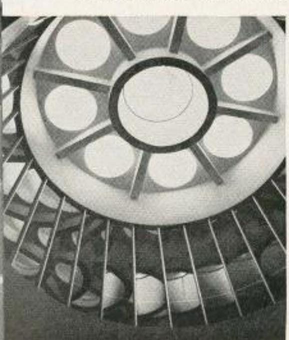

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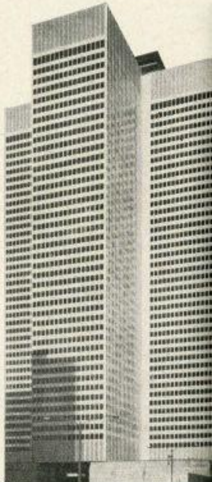

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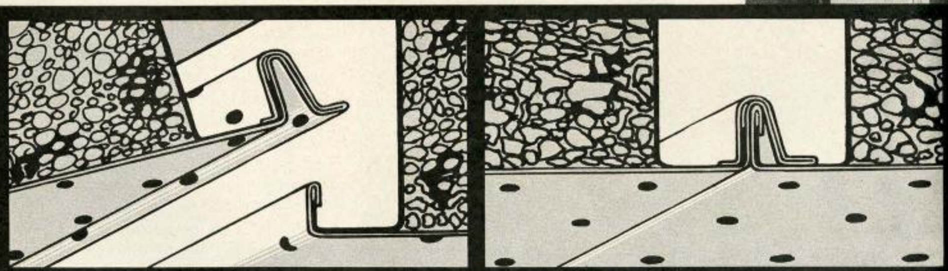

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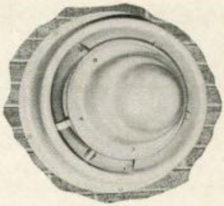

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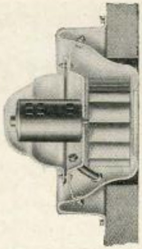

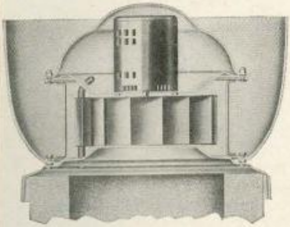

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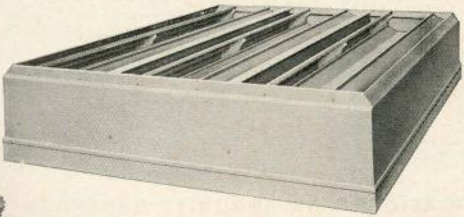

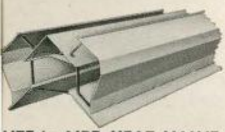

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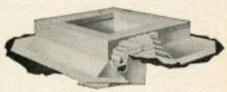

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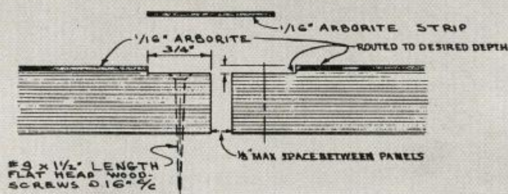
THE SOLUTION: **ARBORITE 6 (1/16") bonded to wood core for walls, and ARBORITE POSTFORMED GRADE bonded to wood core for pillars.**

That ARBORITE has met all these requirements—and met them in full —is attested to by the fact that Imperial Tobacco's plant at Guelph was completed in 1959 and to date all ARBORITE installations have performed as specified.

SUGGESTED ARBORITE WALL PANEL ASSEMBLY



SUGGESTED SPECIFICATIONS FOR ARBORITE VENEERED WALL PANELLING

STUDDING: Wood studding shall not be less than 1¾" x 1¾". It shall be properly spaced and installed in a recommended manner. Studs shall be straight and level, and shimmed if necessary.

CORE: Core material shall be ¾" best grade particle board or sanded plywood.

SURFACES: All exposed surfaces shall be ARBORITE 6 (1/16"). Patterns and colours to be selected by the Architect.

BACKING: A plastic ARBORITE L.B. 20 backing shall be veneered to all strip and panel backs.

Arborite-covered wall on cigarette-making floor in new Imperial Tobacco Co. of Canada Ltd. factory at Guelph.

ADHESIVES: ARBORITE 6 (1/16") with ARBORITE L.B. 20 backing shall be veneered to cores with proper hard-setting adhesive as indicated in the adhesive manufacturer's specifications.

SHOP FABRICATION: All ARBORITE 6 (1/16") with ARBORITE L.B. 20 backing shall be shop applied by a company specializing in this work.

NOTE: These specifications are suggestions based on information we believe to be reliable. They are offered in good faith but without guarantee since conditions and methods of application are beyond our control.

R.A.I.C. and A.I.A. No. 23-D.

For complete information, write the Technical Service Department, the Arborite Company.

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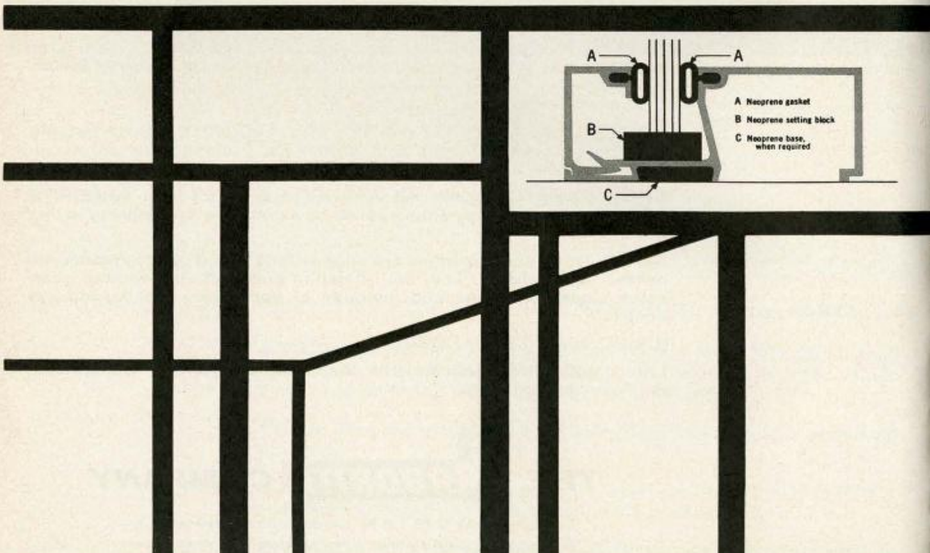

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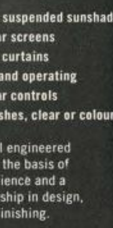

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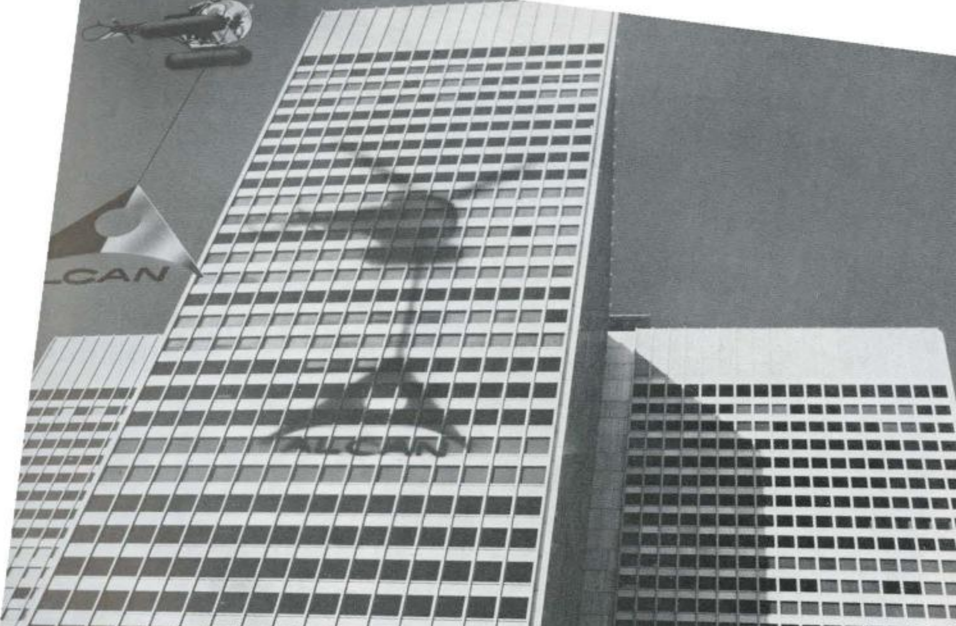

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PLACE VILLE MARIE

LANGFORD STUDIOS

APPRAISAL

By John Bland

WHILE THERE ARE MANY WAYS OF LOOKING at something as extensive as the Place Ville Marie, from the point of view of a fascinated observer it appears to be nothing less than spectacular, but in addition – for one who remembers the area as an urban abyss having incongruous buildings tottering above a tangle of tracks – the improvement in a civic sense could not be more breathtaking. Since 1913, proposals for the redevelopment of the railway property (or the big hole as it came to be called) made periodic and forlorn appearances in Montreal newspapers, but it seemed that each time something was suggested the ugly gap in the city merely grew larger.

Now that the problem has been apparently so skilfully resolved, a glance at the previous proposals not only provides alternatives to which the ultimate scheme can be compared, but shows an amusing progression of redevelopment ideas that have some interest in themselves. In comparing Place Ville Marie with earlier designs, the grandeur of its basic conception becomes even more clear, but at the same time its disregard for the station approach and north-south traffic movement across the site, once thought important, indicates matters worth questioning.

Thirty years ago, Dorchester Street at this point was carried upon a clumsy bridge spanning the railway cut which extended for a couple of blocks either way. On the south side following the erection of the Central Station, development occurred in accordance with a plan prepared after considerable study. It was essentially a scheme to provide a number of rectangular building sites surrounded by superficially normal city streets covering the vast buried track area. To some extent these streets are normal, although they are little used, dismal to walk along, and have no architectural quality.

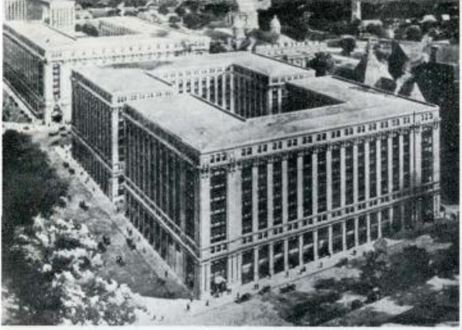
On the north side of Dorchester Street, the Place Ville Marie's substitution of a traffic-free plaza for the former common block and street proposal provides a uniquely pleasant public space and a powerful architectural ensemble. Below its spacious plaza there is a shopping promenade, and below that again there are two floors of garages and service areas, all handled in a unified way.

In fairness to the south side plan one must add that its streets have become pointless, because the system of which they were to have formed a part has not been continued. For example, at one time it was proposed that McGill College Avenue should be made the primary approach to a station plaza below the level of Dorchester Street from which two new streets on either side of the concourse were to have connected with the downtown east-west streets; thereby providing a two pronged additional street to assist University and Mansfield in carrying traffic in the area.

The superiority of the present arrangement over the former proposal from the standpoint of traffic is questionable, but so far there has been no obvious congestion, and now one wonders about the need to widen McGill College Avenue, which was originally set out so nicely on the axis of the centre building at McGill. Its character would be destroyed by a one sided widening as seems to be the intention. At one time the Avenue was to have been the entrance to a plaza of some traffic significance, but now it merely leads to garage doors and cannot be expected to have much importance. A better case might be made for continuing Cathcart Street both east and west as the bulk of the traffic between the mountain and the river is surely in that direction. A widening of McGill College Avenue as far as St Catherine Street has been carried out and is not unpleasant. It forms an agreeable pause in that dreary street and in a way connects the shops under the plaza to those along the street.

The name Place Ville Marie was announced at the height of a typical Montreal furore over the appropriateness of the name of the adjoining hotel. Looking back, it seems to have been a demonstration of the brilliant showmanship of its creator, who has been responsible for so many fabulous and

From 1913 to 1963:

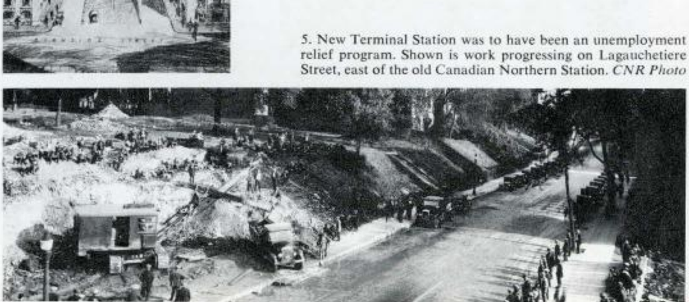


1. First proposal for site of Place Ville Marie, 1913, made by W. S. Painter for Canadian Northern Railway.

2. Site in twenties was a narrow cutting. Canadian Northern Station was on Lagauchetiere Street. Warren and Wetmore were the architects. *CNR Photo*

3. Vast new development was proposed in thirties. Like Rockefeller Plaza, it was to have been a complex of office buildings. Hugh G. Jones was responsible for the studies. *CNR Photo*

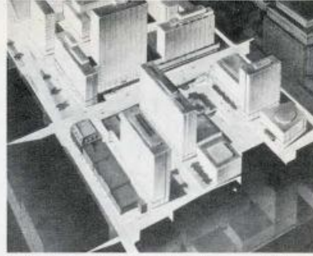
4. The plan was to submerge McGill College Avenue, below St Catherine, to a low level plaza in front of the New Terminal Station. *CNR Photo*



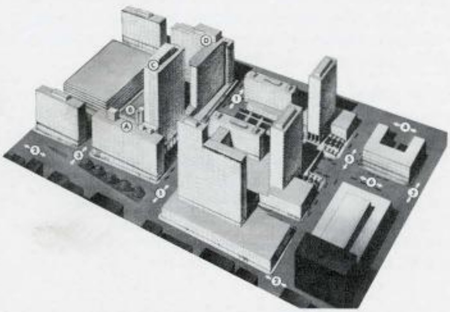
5. New Terminal Station was to have been an unemployment relief program. Shown is work progressing on Lagauchetiere Street, east of the old Canadian Northern Station. *CNR Photo*

50 Years of Redevelopment

7. ICAO, Hotel, and Terminal Building were built, and Dorchester Street was made a boulevard. *CNR Photo*



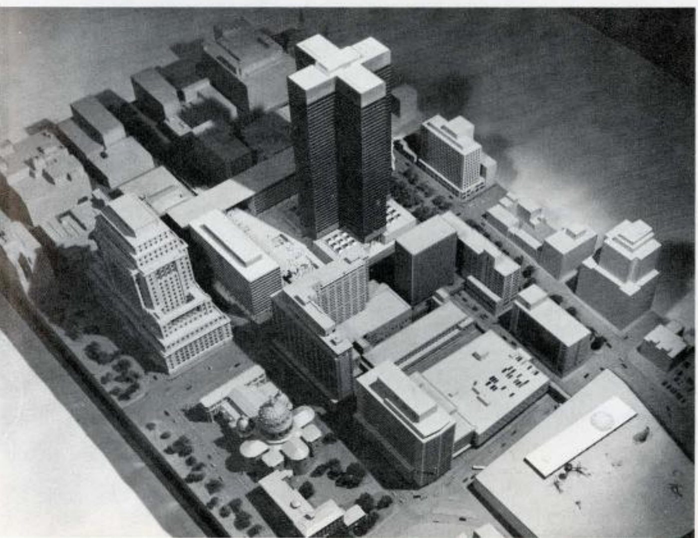
6. In forties, the Central Station was built. Then there was a new scheme for slab buildings. G. F. Drummond was the architect. with Holabird and Root as associates. *CNR Photo*



8. Finally, there was a proposal to make a pedestrian plaza at Dorchester Street level and to sink the approach to Station and Hotel. *CNR Photo*

1) Dorchester Boulevard
2) University Street
3) Belmont Street
4) Mansfield Street
5) Cathcart Street
6) McGill College Avenue
7) St Catherine Street

A) ICAO
B) Central Station
C) CNR Office Building
D) Queen Elizabeth Hotel



9. Place Ville Marie Proposal. Cruciform Building has been completed. Fence Building along Cathcart Street, shown here with a Chandigarh Roof (since abandoned), has been partly completed. The building along Mansfield Street has not been commenced. *CNR Photo*

imaginative undertakings in the United States. One can suppose that it was Mr Zeckendorf himself who saw that the railway cutting near the heart of Montreal could not only be built over as had long been the intention, but that an even greater area could be included by extending the site out to the surrounding streets and dealing with the whole space as one unit. All the previous proposals appear half-hearted compared with this courageous idea of making the huge site the setting for a single great building flanked by two minor ones. The decision led to the most important aspect of the design, namely buildings serviced by trucks and approached by cars in swift and discreet ways, whilst the whole site is entirely clear of vehicles.

In this respect the Place Ville Marie sets a new standard in civic design which makes the normal manner of providing service access to buildings seem crude.

NO OTHER BUILDING IN THE CITY HAS A MORE SPLENDID TREATMENT at ground level than that which has been given the cruciform tower. In fact its presence has entirely eclipsed the station already partly hidden by the hotel, and it is difficult to realize that the now inconspicuous Central Station was the genesis of the whole development. Curiously, the first proposal to develop the land also concealed the station behind the most grisly structures, but in all the later ones the station was the focus and clearly made a significant gateway to the city. Perhaps the day when people were awed by the magnificance of a railway concourse has passed. Now efficient operation is all that is demanded, and if taxis can find their way to the station entrance anything more is superfluous. Nevertheless, it seems wrong that a building with so much social significance should be so submerged.

The cruciform structure is an exemplary piece of modern office building design. Its cantilevered floors allow unusual freedom in internal partitioning which can be brought conveniently to any window mullion. The deep floor assembly contains all the mechanical services which also permits maximum flexibility in office arrangement. The elevators, stairs, and service rooms are neatly contained within the space of the crossing so that all external windows transmit light to rentable space and no unlit areas exist. Its most powerful external features are the four blocks in the angles of the cross which came about when the lower floors were modified to accommodate the Royal Bank. At the time it was feared that doing so would disfigure the building which had been designed to stand on vast pilotis, but it is now difficult to imagine the building without these blocks which have been so skilfully incorporated into the scheme.

In daylight its tight metallic and dark glass skin seems bleak and severe, but at night the building is more lively looking and has more transparency and depth; a rather odd reversal of the old condition when the massive walls of great buildings produced fine deep shadows in daylight, but often appeared papery and thin when illuminated internally at night. The building looked more handsome under construction particularly in the twilight when the tiny construction lights sparkled in parts while other parts were mysteriously clouded by the translucent weather sheathing that was used to enclose the floors where certain delicate operations were proceeding. Under construction, the building undoubtedly gave a greater feeling of its size, and the rhythm of its powerful structure, now unfortunately entirely hidden, was most happily obvious. In its finished state it looks best when one is close to it and can appreciate its texture and form in oblique views. From a distance it seems ugly and the further one gets from it the more flat and uninteresting it becomes.

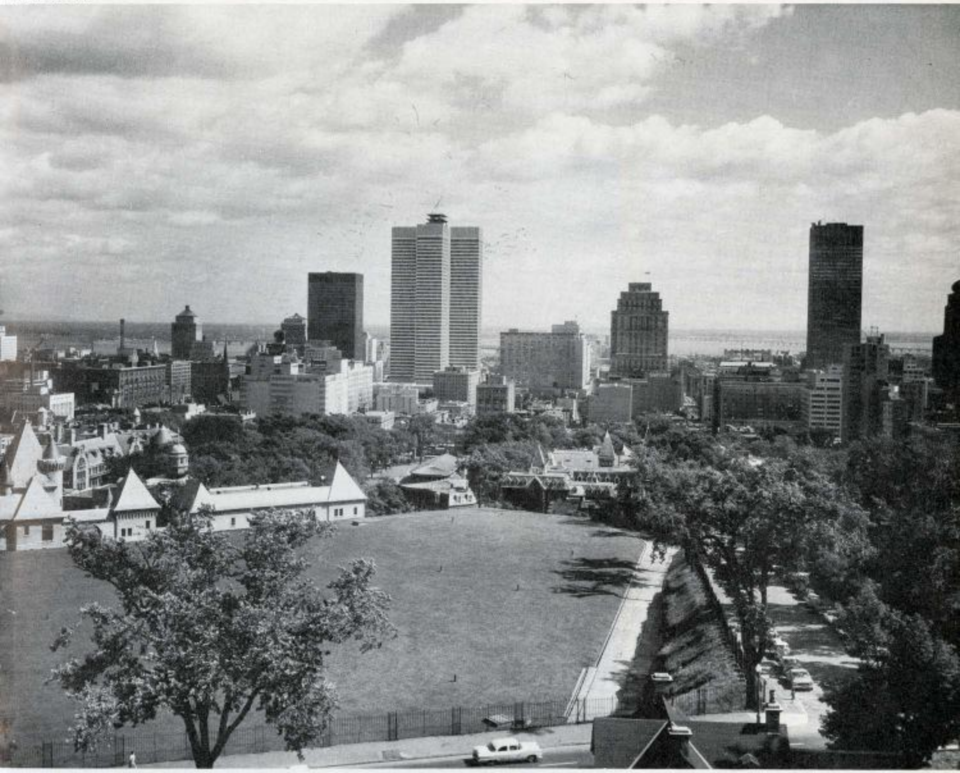
The interior spaces near the street level have a grand character which is drawn from a simple classical treatment of the plan. The banking room which extends through one of the arms of the cross and occupies two of the four blocks at the base is truly magnificent in proportion, material and lighting. The elevator lobbies and entrance halls are also impressive, but their great height appears to make their width seem meagre.

A brief visit to the building gives the impression that its organization is mostly unseen and regrettably one admits ignorance of all the fascinating details of structural and mechanical engineering that probably make the building as notable in their several ways as its architecture. I. M. Pei and his associates have given Montreal a truly monumental building which is a great popular success and has already aroused a new interest in civic design and a spirit of competition which may mean a lot in years to come.

Place Ville Marie + DEVELOPER: **Webb & Knapp (Canada) Limited** + OWNER: **Trizec Corporation Ltd** + ARCHITECTS & PLANNERS: **I. M. Pei & Associates, New York**; Partner-in-Charge, Henry N. Cobb; City Planner, V. Pasciuto-Ponte; Project Manager, Donald H. Gorman + ASSOCIATE ARCHITECTS: **Affleck, Desbarats, Dimakopoulos, Lebensold, Michaud & Sise**; Project Manager & Site Architect, R. H. P. Marshall; Tenant Co-ordinator, A. B. Nichol + STRUCTURAL ENGINEERS: **Brett-Ouellette-Blauer-Associates**; Project Manager, Roger Nicolet; Structural Consultants, Severaud-Elstad-Krueger-Associates + MECHANICAL & ELECTRICAL ENGINEERS: **Jas. Keith & Associates**; Project Manager, Monroe Kert; Mechanical & Electrical Consultants, Cosentini Associates + TRAFFIC & PARKING CONSULTANTS: Edwards & Kelcey + ACOUSTICAL CONSULTANTS: Bolt, Beranek & Newman, Inc. + LIGHTING CONSULTANTS: Richard Kelly + GENERAL CONTRACTOR: **The Foundation Company of Canada Limited**

Place Ville Marie flanked by the other major buildings on Dorchester Street; on the left the CIL Building, and on the right the Queen Elizabeth Hotel, the Sun Life Building, and the Canadian Imperial Bank of Commerce. The view is from Pine and McTavish Streets at the foot of Mount Royal.

DWIGHT E. DOLAN



JOSEPH W. MOLITOR

FINANCING OF PLACE VILLE MARIE

by William Zeckendorf

Chairman of the Board, Webb and Knapp (Canada) Limited

GEORGE CSERNA

WE FACED a great challenge one day, when two gentlemen from Montreal visited us in our office and presented the open site of the Canadian National Railway Station, saying: "This is something that is available to anyone who can qualify and who can have the conception as to what to do with it."

We expressed interest and had the privilege of meeting one of the greatest Canadians I have had the pleasure of knowing, Mr Donald Gordon, chairman of the Canadian National Railways.

Mr Gordon said, "Yes, we are seeking to have a developer come in with certain ground rules." They included the following:

- any money required to build and improve this project had to be supplied by the builder and the developer;
- the concept had to be offered by the CN. Not less than $250,000 had to be spent on research and designing of a suitable concept for this site.

If our proposal was acceptable, we would be granted a lease for ninety-nine years. We accepted this challenge.

We formed a company, Webb & Knapp (Canada) Limited (whose president is now Mr James A. Soden) and the only asset that it had was this privilege to design a building concept. We worked assiduously with our architectural design staff in an effort to come up with a fitting solution to a grand site. This was a fantastic opportunity to provide the centre of Montreal with an exciting new focal point.

We did not wait to get tenants to start building, nor did we wait to get the necessary money, or assurance of money, to start building. We just designed as though we had all the money in the world, as though we had all of the tenants in the great bull market for space. Before long, however, we suffered some very unhappy moments of frustration. We were turned down by every prospective tenant.

Then we got a lift from the faith and confidence and courage of one man, who unhappily has not survived to see the fruition of a dream that he had such a great part to play in making possible. I refer to the late James Muir, then the president and chairman of the board of The Royal Bank of Canada, who had vision and drive and faith to say: "I'll take that space. I'll do what I have to do to make that possible. I cannot build your building; I cannot give you the money for it; but we will occupy an adequate amount of space in that building to assure you of at least the faith and confidence of one Canadian element." And that began a reversal of a tide that culminated in what I will call the fruition of the most ambitious single undertaking that our company has ever been connected with.

Across page: view south on Victoria Street. Below: view from Dominion Square; the Sun Life Building is on the left and the Queen Elizabeth Hotel on the right.

DWIGHT E. DOLAN

The cost of developing Place Ville Marie was met by a combination of equity capital and borrowed funds from Canada, the United States, and the United Kingdom.

Until the fall of 1960, construction was financed from the resources of Webb & Knapp (Canada) Limited, largely from the company's 1956 issue of $25 million long-term 5½% sinking notes.

In 1960, equity and debt financing was arranged for Place Ville Marie to provide for the completion of the project.

A new company, Trizec Corporation Ltd, was formed to take over Place Ville Marie by acquiring from Webb & Knapp (Canada) all the shares of its subsidiary, Place Ville Marie Corporation.

Trizec issued 12,300,000 shares of common stock, of which 6 million were taken by Webb & Knapp (Canada), 6 million by two British companies, Second Covent Garden Property Company Limited and Eagle Star Insurance Company Limited, and 300,000 were distributed by Webb & Knapp (Canada) to its shareholders by way of dividend. Moreover, Second Covent Garden and Eagle Star agreed to purchase $16,279,000 of 7¼% Sinking Fund debentures of Place Ville Marie Corporation.

The long-term financing was obtained with the commitment of Metropolitan Life Insurance Company to take a $50 million mortgage. As a result of this commitment, a group of US banks provided the $50 million interim construction loan. The group was headed by Morgan Guaranty Trust Company, of New York, and also included Chase Manhattan Bank, New York; Chemical Bank New York Trust Company, New York; Northern Trust Company, Chicago; Marine Trust Company, of Western New York, Buffalo; Cleveland Trust Company, Cleveland; and the State Street Bank and Trust Company, Boston.

At the end of 1962, the Metropolitan Life issued its permanent mortgage, and temporary financing from the bank group was retired.

SOME NOTES ON THE DESIGN OF PLACE VILLE MARIE

by Henry N. Cobb Partner In Charge, I. M. Pei & Associates, Architects and Planners

When we look at Place Ville Marie as a vacant site, denuded of buildings, one fact above all others instantly compels our attention. It is the remarkable polarity that exists between the vast pit on Dorchester Boulevard and the imposing profile of Mount Royal. For the visual drama and emotive force of this relationship are deeply stirring. The marvelous vista from Boulevard to Mountain casts a spell that virtually eclipses the clamorous disarray of the immediate surroundings. We feel ourselves momentarily in the presence of a larger, more coherent urban order; the distinctive form of the city becomes articulate here; and the gaping hole, almost in spite of itself, communicates a powerful sense of place.

It is impossible to overstate the significance to Place Ville Marie of this single attribute of our site – its apposite and compelling relationship to the principal topographic feature of Montreal. Clearly, we are dealing


Parking
Stationnement

JOSEPH W. MOLITOR

View north from Dorchester Street across the plaza, looking up McGill College Avenue to Mount Royal.

here not with an isolated enclave, but with a zone of maximum exposure, an intrinsically public place, whose active participation in the main-stream of civic life is irrevocably preordained. This all-important fact has preoccupied our consciousness from first to last, and lies at the root of the design in all its aspects.

The Plaza: By virtue of its situation, our plaza is more than the forecourt to a monumental building and the spatial focus of a private precinct. It is a major protagonist in the dramatic confrontation of city and mountain, and its surface is the principal medium through which Place Ville Marie responds to its environment.

It is fundamental to our conception of the plaza that it should be a plane of strength – a firm "ground" – and that it should limit rather than be limited by the buildings that rise from its surface. We have therefore allowed the plane of the plaza to extend on all sides to the outermost boundaries of the site, so that there is no point on the periphery at which its presence is not clearly felt. On the plaza surface, we have introduced changes of level only at those points where particular concentrations of activity and circulation make them meaningful.

Above: view across the north-west court looking east towards the main banking entrance. In the foreground, stairs to the court leading to the shopping promenade below the plaza.

Below: view east across the plaza from Mansfield Street to the Royal Bank main entrance.

Actual incisions in the surface occur only at the most important points of pedestrian access and around the focal centre of the site, where they have been handled in such a way as to reaffirm the significance of the surface area which lies between them.

The Office Tower: Out of respect for the intrinsic civic qualities of our site, we were concerned from the beginning that this huge building should serve as well as be served by the space in which it stands. We therefore sought to distribute the building volume in such a way that it would participate actively in the space rather than simply overwhelm it. The four projecting wings of very slender proportion do, I believe, achieve this end; and they have the collateral effect of reducing the apparent bulk of the building as seen from any point in the immediate vicinity. As many Montrealers have observed, however, this does not always hold true for distant views: when sun and shadow are absent, the arms of the cross lose their definition, and the building does indeed loom large on the skyline.

The most difficult of the many architectural problems raised by the cruciform plan was that of achieving a satisfactory resolution of the tower at its base. In order to make the cross shape articulate, it was essential that the base of the building be largely transparent and that the plaza surface be seen to flow through beneath it. In our original solution of 1957, the metal-and-glass volume of the cruciform tower was brought to rest on a massive concrete podium in the shape of a cross, within which were contained the four ground floor lobbies. The purpose of this podium was to concentrate the "action" of the building in a sculptural element totally apprehensible at plaza level and in this way to achieve a marriage between the building and the plaza. It was not a completely satisfactory solution, and its weaknesses became ever more apparent as we developed the design in detail.

Fortunately, the entrance of the Royal Bank into the project in spring, 1958, provided us with the architectural means to resolve this problem. Many people at that time felt that the integrity of the original plan had been seriously compromised by the introduction of the four bank "quadrants," which play so prominent a role in the executed building. There is no doubt that these monumental blocks interposed between the cruciform tower and the plaza wrought a significant change in the character of both. Nor is there the shadow of a doubt in my mind that both gained immeasurably thereby.

McGill College Avenue: In one important respect, the urban scheme of which Place Ville Marie is a part remains unfulfilled. For until the widening of McGill College Avenue is extended to Sherbrooke Street, the full drama of Montreal's extraordinary topography will not be felt at the heart of the city.

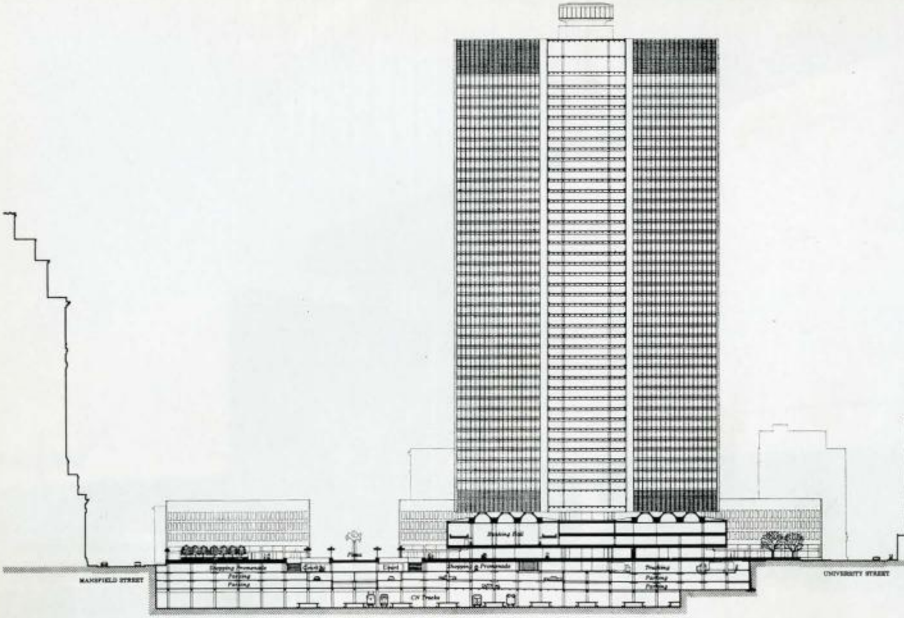
Even in its present partially obscured state, the tree-crowned crest of Mount Royal stirs the imagination to vivid memory and special affection. But with the widening of this Avenue for its full length, not only the crest, but the entire splendid profile and green flank of the mountain, including the lovely University campus, will be brought into view.

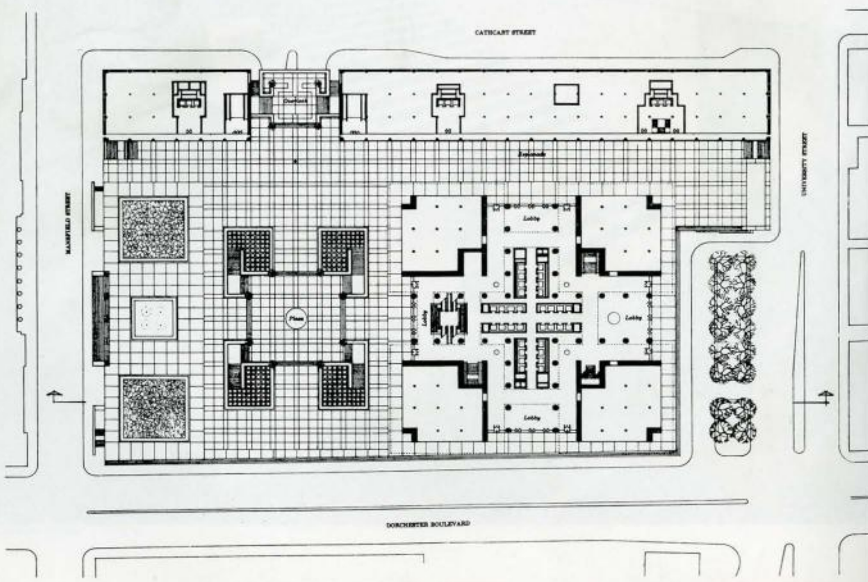
At the same time, of course, the properties fronting on both sides of the Avenue should be redeveloped, with all property owners respecting certain common objectives – as, for example, a uniform cornice line and arcading at street level. Broad paved sidewalks, planted with trees and furnished with ornamental light standards, would complete the scheme and transform McGill College into one of the great streets of North America.

All the preconditions for such a transformation are present. But the opportunity must not be long neglected, or it will be lost forever.

Above: view of the plaza looking across to the corner of Mansfield and Dorchester Streets showing the two south courts.
Left: detail of the stairs of the north-west court. Material is exposed aggregate concrete.
Right: the north-east court showing a detail of the pink and buff pattern in the exposed aggregate concrete paving. A similar pattern is used in the terrazzo floor of the shopping promenade.

JOSEPH W. MOLITOR


MANSFIELD STREET
UNIVERSITY STREET
Shopping Promenade
Parking
Parking
Plaza
Banking Hall
Shopping Promenade
Trucking
Parking
Parking
CN Tracks


CATHCART STREET
MANSFIELD STREET
UNIVERSITY STREET
Esplanade
Plaza
Lobby
Lobby
Lobby
Lobby
DORCHESTER BOULEVARD

PLAZA LEVEL

CO-ORDINATION AND ORGANIZATION OF THE PLACE VILLE MARIE PROJECT

by R. T. Affleck

Affleck, Desbarats, Dimakopoulos, Lebensold, Michaud & Sise; Associate Architects

A PROJECT OF THE SIZE and complexity of Place Ville Marie required a correspondingly large and complex team of architects and consultants to complete the task of design, documentation and supervision. The development of this team is an interesting example of some of the problems facing the architectural and engineering professions in relation to the services they jointly provide for the building industry in general. In the Place Ville Marie project a relatively high degree of integration was attained amongst the principal contributing professions. This was to a certain extent due to the convictions of the architects and engineers involved in the work; but mainly resulted from the imperative necessities of a job of this scope.

The contribution made to the design and development of the project by the structural, mechanical and electrical engineers was of the greatest importance; as was that of the more specialized consultants in fields such as acoustics and illumination. In this situation the function of co-ordination and communication was in many ways the key to the successful carrying out of the architects and engineers responsibilities. This co-ordination was a continuous process, involving frequent meetings and exchange of documents between the two firms of architects and the many consultants involved. The development of the initial concept was only possible through the closest possible involvement of all principal consultants with the architects in the design process, from the very earliest sketches through to the checking and approval of shop drawings and site supervision.

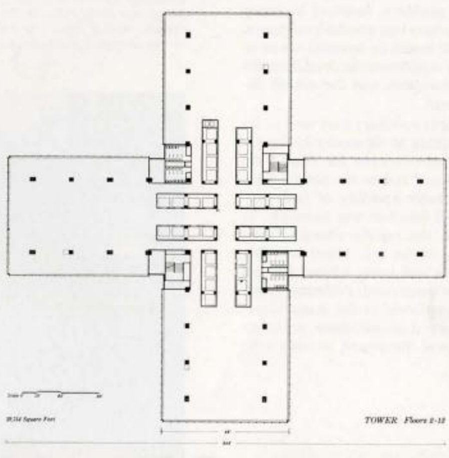
Another important member of the development group was the general contractor, the Foundation Company of Canada. The contractor was brought into the process at a much earlier date than is usually the case; and was thus able to contribute his considerable skills to the development of design and working drawings. This was made possible by the signing of a cost plus fixed fee contract between Webb and Knapp (Canada) Ltd, and the Foundation Company long before the final design or working drawings were crystallized. The contractor's staff was thus able to function in a consulting role, as well as carrying out the traditional technical and management jobs of the general contractor.

This contractual relationship also enabled the development of separate "bid packages" for the principal sub trades, which were tendered competitively as the job progressed. This technique enabled construction to proceed contemporaneously with working drawings and specifications. Needless to say it required careful and constant cost control on the part of the contractor, architect and consultants. The alternative of preparing documents for a single huge stipulated sum contract would have been hardly possible for a job such as Place Ville Marie.

This contractual procedure was of particular value in relation to technically involved sections of the work such as the aluminum and glass curtain wall. This wall was slowly and laboriously developed in co-operation with the general contractor and the sub contractor, Canadian Pittsburgh Industries. The development process included a detailed testing program using a full scale mock-up; frequent visits by members of the architect's staff to the fabricator's plant; and a scrupulous checking of the manufacturer's detailed shop drawings.

As well as requiring a high level of co-ordination the Place Ville Marie job also demanded considerable thought and development around the problems of office organization. Approximately 50 people were employed on the job for over two years in the office of the associate architects alone — engaged chiefly in the preparation of working drawings and specifications, as well as office and job supervision.

In order to cope with this large task, the job was broken down into sections based on the actual physical parts of the structure, as well as certain functional divisions of the work. Each section was in the charge of a job captain, who in turn had an assistant and a staff of architects and draftsmen. The overall team was headed by a project manager,



whose principal responsibilities lay in the area of co-ordination and administration, whereas the job captains functioned in a more technical sense within their particular sections of the work.

The job was divided into four main sections: (1) the lower levels, comprising all work from the railway track level up to plaza level; (2) the Royal Bank quadrants, comprising the four main banking halls and intervening lobbies between the plaza level and the soffit of the tower; (3) the cruciform tower; (4) the Imperial Oil Building. As well as these physical divisions, the following functional sections were set up – specifications, field supervision, and checking. The function of checking was of particular importance due to the many firms involved in producing documents, and the fact that construction was proceeding at the same time as the production of working drawings. Because of this situation it was deemed advisable to set up an independent checking department which complemented the routine checking that went on within each of the four sections. This role of objective checking might be compared to the role of an internal audit department in a financial operation.

As construction progressed and an increasing number of tenants became involved, a separate tenant department was set up within the associate architects' office to deal with the many complex problems of tenant co-ordination. This department was headed by a tenant co-ordinator who in turn had a staff organized along similar lines to the base building sections described above. As well as solving the many technical problems involved in fitting varying tenants into pre-designed space, the role of tenant co-ordination was of particular significance in protecting the building standards and the overall design concept.

The above summary may tend to indicate a rather static quality in the job organization developed for Place Ville Marie. This of course was not the case. A considerable mobility of both personnel and function was necessary to cope with the rapidly changing contingencies of the job. Many mistakes were made and many lessons learned as the job progressed. Although much was accomplished in the sense of organization and co-ordination, no magic formula was discovered to cope with the essentially difficult process of making real a significant architectural concept.

Involvement in the Place Ville Marie project was an experience of considerable breadth and variety; but out of the total experience two factors stand out as worthy of particular mention. First of all, a project of this magnitude, if it is to achieve any architectural success, must be inspired throughout all levels with a strong architectural concept – a concept that is held with toughness and devotion through the many difficult situations that inevitably arise. This basic design contribution is the only real basis for the claim made by architects to leadership of the complex professional team involved in such a project.

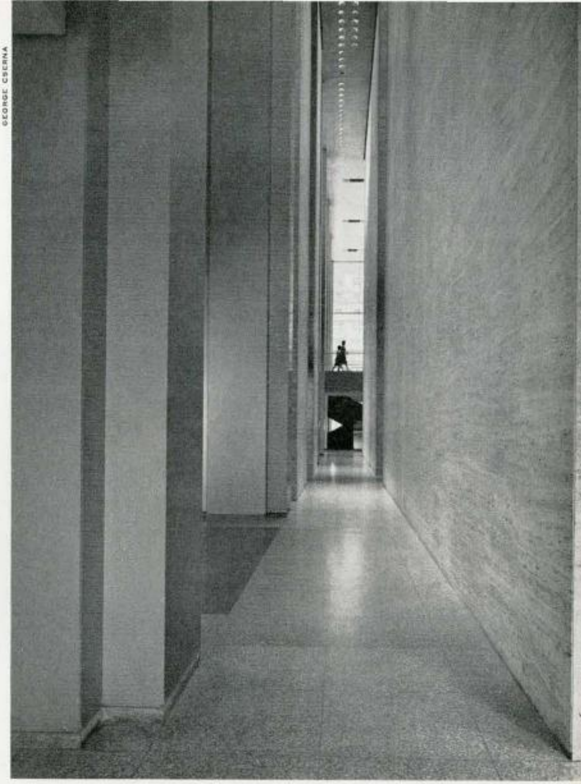
Secondly, an endeavour such as Place Ville Marie would be totally impossible without the contributions of many specialized experts, most of whom are members of our sister profession of Engineering. Any idea that architects are sufficient unto themselves is rapidly dispelled by such an experience. The two significant ingredients that emerge are a strong and well balanced team to perform the creative and technical tasks; and a deep penetration of the spiritual values of architecture throughout the endeavour.

JOSEPH W. MOLITOR

Above & below: The Imperial Oil Building (Cathcart Street building). The north facade viewed from the east end of Cathcart Street; the plaza between the Royal Bank Building and the south facade, viewed from the east. The arched openings give access to the shopping promenade and shop fronts.

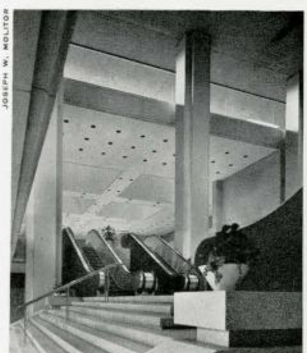
JOSEPH W. MOLITOR

GEORGE CSERNA



The Royal Bank Building
Right: view between the travertine covered walls to the elevator banks showing the aluminum clad columns of the lobby. The floor is finished in terrazzo and the ceilings in glazed ceramic tile.
Below: (left) escalators from the intermediate landing to the main banking floors; (right) the east lobby viewed from the upper bridge linking the two Royal Bank east quadrants.

JOSEPH W. MOLITOR



GEORGE CSERNA

JOSEPH W. MOLITOR

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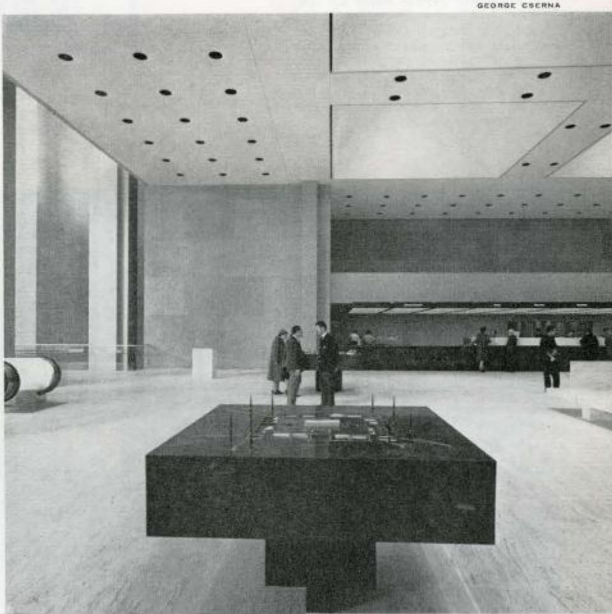
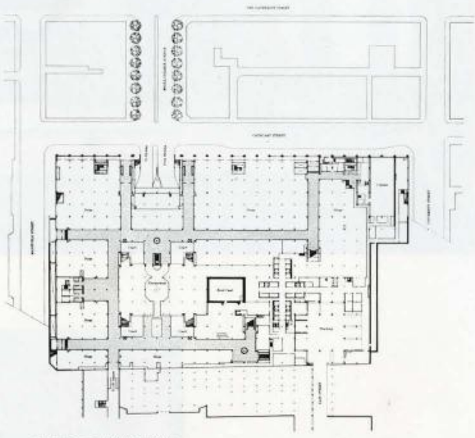
GEORGE CSERNA

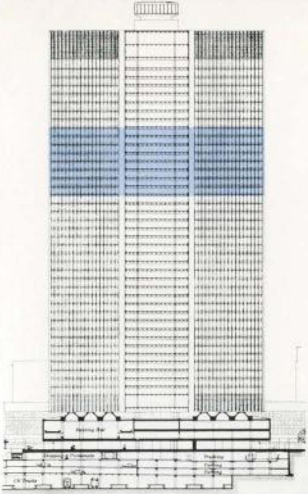


Above: the south-west banking hall seen across the Royal Bank entrance lobby from the north-west banking hall.
Across page: the south-west banking hall from the second mezzanine elevator lobby.
Right: detail of the banking hall.

Left & below: the shopping promenade below the plaza showing interior details and the repetition in terrazzo of the exterior court paving patterns.

MAJOR MATERIALS AND SUPPLIERS
Structural steel: *Dominion Bridge Co. Ltd; Dominion Structural Steel Ltd.* Metal deck: *Robertson-Irwin Co. Ltd. (QFD-2).* Elevators: *Otis Elevator Co. Ltd.* Waterproofing: *B. P. Barrett Co. (membrane).* Blockwork: *Pressure Pipe Ltd. (lightweight concrete).* Limestone: *Indiana Limestone Co.* Spray fireproofing: *E. T. Samson (Cafco).* Curtain wall: *Canadian Pittsburg Industries; Vampco Aluminum Products Co. Ltd; Aluminum Co. of Canada Ltd.* Insulation: *Armstrong Cork Co. of Canada Ltd.* Acoustic materials: *Kemp Corp.; Johns-Manville.* Doors: *Aetna Products Ltd.* Hardware: *Russwin-Belleville Ltd.* Paint: *International Paint Co. Ltd.* Mail boxes: *Robert Mitchell Co. Ltd.* Venetian blinds: *Hunter-Douglass.* Kitchen equipment: *Prowse Range Co. Ltd.* Standard light fixtures: *Electrolier Co. Ltd.* Special light fixtures: *Edison Price Inc.* Electrical equipment: *Westinghouse.* Emergency power: *Dietz Generators.* Plumbing fixtures: *American Standard.* Induction units; compressors: *Carrier Corp.* Controls: *Johnson Control Co. Ltd.* Diffusers: *Hart and Cooley.*





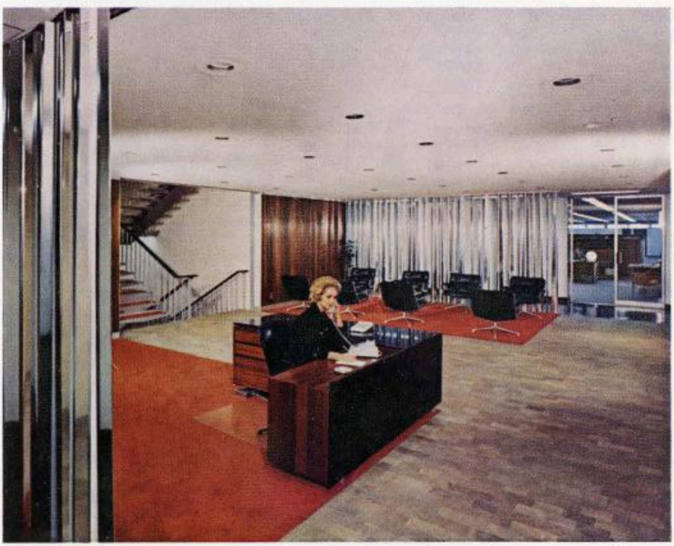
Consulting architects for the planning and initial design:
J. Gordon Carr & Associates, New York.
Interior design and furnishings:
Jacques S. Guillon & Associates Limited, Montreal.
Consulting engineers:
Wiggs, Walford, Frost & Lindsay.

Photos by Panda

OFFICES FOR THE ALUMINIUM LIMITED GROUP OF COMPANIES

Architects: Durnford, Bolton, Chadwick & Ellwood

A typical reception area for floors 28 to 32.



by Michael Ellwood

By 1958, THE ALUMINIUM Limited Group of Companies had for some time contemplated the integration of all their head office personnel under one roof, because by natural growth they had expanded out of the Sun Life Building into various other buildings in Montreal.

Inspired by William Zeckendorf's imaginative Place Ville Marie project, an agreement to occupy space in the proposed Cruciform Building was reached, thus abandoning a previously considered idea of erecting their own building.

Planning was assigned to the principal operating subsiduary company, The Aluminum Company of Canada Limited, and a building committee was charged with accomplishing the move. A preliminary survey indicated a space requirement of approximately 200,000 sq. ft, amounting to six floors of the proposed Cruciform Building, as well as approximately 25,000 sq. ft of basement storage space and other connected facilities.

Requirements from department heads were obtained, and standards of basic office sizes were adopted. It was accepted in principle that private offices would be reduced in size to adhere to, and take advantage of, the 5′ x 5′ module of the building.

A unique feature of the building is that each wing contains only six free-standing columns with a 15′ cantilever from the column centre line to the exterior curtain wall. Thus the smallest perimeter office became a 10′ x 15′ room with two windows unencumbered by any column. Department heads and senior executives were assigned three-window offices, 15′ x 15′, and the top management of Alcan and Directors of Aluminium Limited were assigned four-window, 20′ x 15′ offices.

Different planning systems investigated included a completely open plan with an absolute minimum of private offices, a series of interior private offices, forming a central spine with general office space on the exterior, and the more conventional idea of private offices on the exterior with interior general office space. At one point, consideration was given to abandoning the 5′ x 5′ module in the "interior zone" (that area contained within the columns) and adopting a 3′ 3″ module that would have provided interior private offices of 9′9″ x 13′, instead of 10′ x 10′, and 6′ 6″ corridors instead of 5′, but the idea was discarded.

The scheme finally adopted, amounting to approximately 273,000 sq. ft occupying eight full floors, was the more conventional one of private offices on the exterior. Where possible, large general office spaces were located at the ends of wings to provide natural light. In many cases, 10′ wide "secretarial corridors" occur where the stenographers' or secretaries' desks are adjacent to the private offices, which they serve and are incorporated as a part of the circulation corridor. Wherever possible, open secretary space was provided at the ends of the main access corridors to wings, again to provide natural light.

Planning of such a complex group of functions was a formidable task. Apart from office space, provision had to be made for a full-scale cafeteria and kitchen, a well-equipped medical centre, one large tabulating and computer area and two smaller ones, the largest international central teletype switching centre in North America, three libraries, two large engineering complexes, including drafting rooms, printing areas, etc., mail rooms, reproduction area, a film processing area, as well as a number of other smaller special areas . . .

Vertical circulation for mail and interoffice correspondence was provided for with two high-speed dumbwaiters and a large carrier pneumatic tube system connecting the main mail room in the basement to the smaller mail rooms at each floor and thence to its final destination by messenger.

Aluminum was used extensively throughout the design, but always within the bounds of intelligent application. Of the many applications in the furniture, panel trim strips, and so forth, two outstanding features bear mentioning:

A private interior stair was required to serve five of the floors. Structure, treads and balusters of this stair were all designed in aluminum. Main stair carriage consists of a triangular-shaped hollow extrusion to which are bolted cast aluminum brackets, which in turn support extruded stair treads cut to shape. Precision workmanship was involved in fitting the individual stair treads, which interlock with each other in a male and female V joint, as well as in attaching balustrades at the edge of the treads. The handrail was detailed in rosewood that matches the wood panelling in the lobbies. The whole stair has a sculptural quality, which forms a focal point on entering the reception areas from the elevator lobbies.

Another prominent aluminum application appears in the screens separating the reception areas on each floor from the main circulation corridors. Each set of screens embodies different methods of machining, etching, or polishing of the heavy bars and tapered semitubular members that form the main components.

Of a more experimental nature, the kitchen equipment for the cafeteria and the galley for the directors' dining room was made from anodized aluminum sheet and aluminum components. The fastening of aluminum and handling of anodized sheet required special precautions, but resulted in a most satisfactory installation.

As Alcan change up to ten per cent of their physical space each year, a movable partition system was essential. Considerable time was spent investigating the most suitable system – whether to develop a special aluminum design or select a standard manufactured product. It was anticipated that a special design would prove to be unduly expensive, and therefore a number of manufacturers were invited to submit proposals, using aluminum component parts wherever feasible. Final selection was a modified steel sheet panel system incorporating aluminum top and bottom rails and post caps.

The partitioning system has glazed transom panels at all corridors. Panels below are off-white in color, and the ceiling height partitions between individual offices are light gray. Flush panel doors and side panels (making up the 5′ module width) were specially designed with aluminum extruded framing members and aluminum sheet and have a baked enamel finish in charcoal gray. Neutral colours were chosen to form a background for the furnishings.

In conjunction with the partitioning system, special "storage wall" units were designed to fit into the corridor-office partition. There are three basic units that occur in each office: a 6′ 8″-high coat closet, a 2′ 4″-wide unit, which can be fitted with shelving, and a four-drawer side filing unit with a small storage cabinet that fits on top of the side filing unit. Unique feature of the "storage wall" is that each unit is modular within the panel and can not only be interchanged with each other, but can face either into an office or into a secretarial corridor. Larger offices are fitted with combinations of these units.

Each floor was assigned a key color – saffron, orange, red, ultramarine, blue, turquoise, green, or yellow. This color was used for carpets and chair upholstery throughout a floor. Secondary colors were used at each floor to add variety to furniture or to accent individual walls.

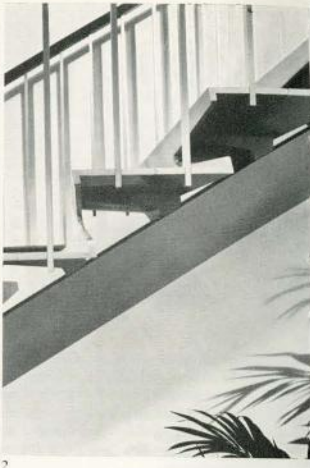
Many areas of Alcan's offices had been previously carpeted; after careful consideration, it was decided to carpet approximately eighty per cent of their space. A special carpet of high quality was developed in two basic colors, light gray and charcoal gray. The eight basic floor colors were also carried out in the carpeting of elevator lobbies, reception areas, conference rooms, and other special areas.

A survey was made of all the types of work performed by the employees from which emerged basic "work stations." It was decided new furniture would be purchased in general office areas, secretarial areas, etc., where the modular type furniture would afford economies of space. Existing furniture was relegated to private offices, and chairs were re-upholstered in the new colors, and desks and tables re-finished where necessary. Selection of new furniture was made from a wide range of manufacturers, embodying aluminum legs, arms, and other component parts.

Special design opportunities presented themselves in elevator lobbies, reception areas, libraries, conference rooms, the board room, private dining room, and executive offices in the Aluminium Limited directors' wing. To maintain a consistency throughout the premises, rosewood was used exclusively for the wood panelling and was found to contrast strikingly with anodized aluminum trim and furniture. Floors in the elevator lobbies and reception areas consist of Alpine quartz with inset carpets; ceilings are acoustic plaster. Walls are finished either in white vinyl or rosewood panelling. In all the other special areas, the floors are carpeted; walls are painted plaster, vinyl-covered plaster; panelling or metal partitioning and ceilings are building standard metal pan. Recessed incandescent lighting was used only in the elevator lobbies, reception areas, and the directors' wing board room, ante room, and dining room; in all other areas the building standard fluorescent lighting was used.

In February, 1962, a mockup of part of a wing was completed to confirm or modify decisions on all aspects of the design. In the meantime, work in the premises had begun and was carried on until the end of August. The move was completed over the Labor Day weekend, and again the group of companies are now housed together under the same roof.

1



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1. The bottom landing of the aluminum stair which links five of the company's floors.
2. Detail of the aluminum stair.
3. A typical elevator lobby for floors 29 to 32, looking towards the reception area.
4. Detail of the stair looking up.

5

6

5. Interior of the oval shaped directors' boardroom.
6. Exterior view of the boardroom.
7. The exterior corner of an executive office.

7

8

8. The secretarial area at the end of a corridor showing a storage wall unit.
9. The directors' dining room.

9


10

10. The main teletype switching centre.
11. Detail of the aluminum kitchen equipment serving the cafeteria.
12. View of the general office area at the end of a wing.

11


12


13. The library.
14. Detail showing a typical aluminum screen dividing a reception area from a circulation corridor.
15. The cafeteria, facing the kitchen.
16. The computer room containing systems development and data processing.


13


15


16

14


PLANNING

Donovan Pinker, AMTPI

CANADA WIDE FEATURE SERVICE LTD

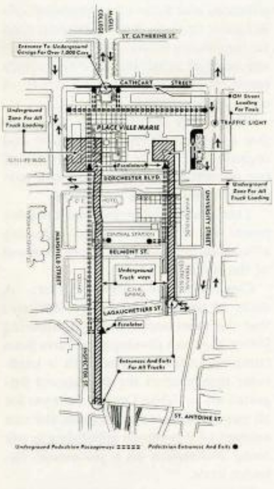
PRESENT ENVIRONMENTAL BLIGHT of our urban areas can all too easily lead to doubts as to whether our social structure and form of government are adequate to meet the challenging need for significant urban renewal. Is there any hope of achieving, in 20th-century terms, the intrinsic human values of older urban centres?

Place Ville Marie clearly illustrates that a city can develop an orderly and organic form within the framework of our present system of democratic government and private ownership.

This dramatic commercial complex points up three noteworthy planning objectives for the long term renewal of the heart of the city.

Comprehensive Development: A study of the history of cities indicates that the most successful and enduring forms of urban development have been comprehensive in scope with a particular appreciation for that almost forgotten art – Urban Design. And yet for all our urban renewal projects, the vast amount of downtown rebuilding is still being undertaken on a piecemeal, lot-by-lot basis.

Enlightened private enterprise has now shown, in Place Ville Marie, the only real way for responsible renewal attuned to the times in which we live. There can be little doubt that like its predecessor of some 30 years, Rockefeller Centre, this complex will be as valid many decades from now, while structures erected on a piecemeal basis will have long since passed into the hands of the wreckers. For Zeckendorf was not just building for today. Place Ville Marie is conditioned by the altogether different vision of the long term investor. Place Ville Marie in fact is but the dramatic climax of a larger 22-acre comprehensive development plan for which Zeckendorf was prepared to spend $360,000 before his architects commenced their working drawings.



The resulting development is the complete integration of this major complex into the structure and fabric of central Montreal.

Circulation & Buildings: Downtown Montreal's street system, as in other cities, predates the automobile age. Present day circulation is further impeded by Montreal's commercial centre being wedged between the St Lawrence River and Mount Royal. Vehicular traffic has thus no alternative but to force itself through this relatively narrow bottleneck.

The planners of Place Ville Marie were quick to see the need for measures to ensure that a major addition of floor space into an already congested area would not bring traffic to a standstill. They first proposed a major expressway ring road to handle the some 30 per cent of all traffic, which presently uses the street system, but is not destined for downtown. From the southern edge of this ring road, they outlined a spur leading directly into the whole CNR complex. Within the specific 22-acre area, they then undertook the complete separation of all forms of circulation. How this was done is an object lesson in the integration of building development and the heavy volumes of traffic that such buildings generate. Nothing was left to chance.

The planners calculated that Place Ville Marie would employ some 15,000 people and daily attract some 60,000 persons and several hundred truck trips to service the complex. In addition to street widening on Dorchester, University, Cathcart, and McGill College, all forms of movement were segregated in a vertical manner. At the lower level are trains, then two levels of parking for 1500 cars. Truck bays are provided at the parking levels with ingress and egress, two to three blocks away to the south and passing, at one point, under the Queen Elizabeth Hotel. Atop all this are two levels for pedestrians, one immediately below ground and passing under Dorchester Boulevard, the other at the plaza level.

This is the scale and form of pedestrian and vehicular separation that we must increasingly seek to implement in the reshaping of our downtown areas. The principles were long since enunciated by Leonardo da Vinci in 1495. Stockholm, London, Baltimore, and now Montreal point the way for other cities to follow.

Downtown Is for People: In our current preoccupation with the automobile and the need to attract new assessment to bolster the lagging financial strength of downtown, it is all too easy to forget that the centre of the city has been, and should be, designed for people. A close look at Place Ville Marie illustrates the consideration that has been given to achieving a stimulating and human environment for people.

Here is an area that will be alive for the better part of 24 hours a day. For the office workers or visitor there will be found a rich variety of activities – all within a minimum walking distance. In our folly for fragmenting the city into a series of specialized centres – be they shopping, office, civic, or cultural – Place Ville Marie brings together a variety of supporting and complementary functions in the grand tradition of the European centre. All these facilities are approachable along pedestrian ways, for the automobile and delivery truck have been physically and visually removed from the scene. All is designed for a pedestrian scale of movement.

Furthermore, at ground level, the generous 4-acre plaza provides a much needed breathing space and foil to the extra human scale of the office skyscraper. And in the Royal Bank building itself the same careful consideration has been given to the human needs of its inhabitants, for nowhere will anybody be more than 40 feet away from daylight and the views over Canada's first city.

What of the Plaza? Is it in the end nothing more than a roof for the shopping promenade underneath whence people can move, free from the discomfort of inclement weather? To walk across it on a bleak December day might lead to such a conclusion. But these are early days. Addition of the two proposed office buildings will do much to give a greater sense of intimacy; and with the response that has been received from various organizations one can feel fairly certain that in a short space of time the plaza will fulfil its intention of becoming a significant social, cultural, civic, and recreational meeting place in the life and heart of the city.

Place Ville Marie is an exercise in faith and vision by dedicated men. If this should be the scale by which to give new life to the heart of the city, we might ask: how can one hope to repeat such a colossal private financial venture? Apart from public sponsored renewal, is the private sector of our society financially equipped to undertake an increasing number of such projects? Perhaps there is some hope if instead of piecemeal renewal for short term speculation, we re-examine the leasehold form of longer term urban investment. Many of the great urban projects of the past were undertaken in this way. So is Place Ville Marie. The scale and problems to be faced should not frighten us. For without the larger vision of comprehensive development, our current piecemeal methods of rebuilding may be to no avail.

Technical Section

Edited by Douglas H. Lee

In his appraisal of the Place Ville Marie, John Bland intimated that the details of the structural and mechanical engineering that have gone into the project might be, in their own particular ways, as notable as the architecture. The following reports by the consulting engineers of their work on "PVM" certainly indicate that this is the case. Apart from the sheer magnitude of the engineering assignment (the mechanical and electrical work alone cost roughly $19½ million out of a total cost of some $80 million) the design conditions imposed by the site and other factors presented many complex engineering problems. How they were handled will be of interest to engineers as well as to our architect readers. The report on the structural design of the Place Ville Marie was prepared by Messrs J. E. Brett, R. P. Ouellette and R. R. Nicolet of the Montreal consulting engineering firm of Brett and Ouellette. It is based upon a paper that was delivered at a general meeting of the Engineering Institute of Canada last year. The description of the mechanical and electrical services is by Mr Monroe Kert of the consulting engineering firm of James P. Keith and Associates, Montreal, who were responsible for this part of the project and E. Losi of Cosentini Associates, the New York consultants. An earlier and somewhat more detailed technical paper on this subject by Mr Kert was published in the September 1962 issue of the *Engineering Journal*. The curtain wall, *overleaf*, also is of considerable interest. Mr G. M. Johnson, B.Eng., Architectural Market Manager for Alcan, has provided us with the following note on the aluminum finish:

"The aluminum sheet and extrusions selected for the curtain wall are normal anodizing quality products. In order to obtain the excellent match between the extrusions and the sheet, which are different alloys, the etching and anodizing times were adjusted. The resultant anodic film on the aluminum components of the curtain wall is the heaviest and best applied of any known in the world; the anodic film thickness on the sheet averages 0.0012 ins. and on the extrusions, 0.0014 ins. This heavy good quality anodic film ensures an easily maintained facade, being practically self washing in the boldly exposed areas. It should be pointed out that the reason such a good finish was obtained is that a good Finish Specification was written and rigidly enforced by means of regular checks made by and reported on by a recognized inspection agency. Copies of this specification are available from Aluminum Company of Canada, Limited."

D. H. Lee

STRUCTURAL DESIGN OF PLACE VILLE MARIE

by J. E. Brett, MEIC

To participate in the realization of an undertaking of the magnitude and complexity of the Place Ville Marie Project is to the structural engineer an unequaled challenge and opportunity.

The genuine desire on the part of the owner to create a landmark, and the understanding shown by the architects for the essence of structural systems, presented an opportunity to the engineers to execute a technically demanding task, and to participate actively in the creative act of the conception of a building. The designers wish to record their appreciation of this opportunity.

From a technical point of view, the adjustment made to the design, necessitated by program modifications, required the use of special design methods and particularly adaptable framing systems. The use of electronic computers permitted the accurate solution of the many advanced and interacting structural problems possible and permitted the designers to maintain accurate control of all new developments.

Royal Bank of Canada Building: Cruciform shape of the building dictates the location of the elevator and mechanical shafts, which are grouped in the core. The wings, which are approximately 82 ft wide, are cantilevered 16 ft from the outside column lines on all three sides, create large unobstructed areas and thus more flexible and efficient office layouts. The exterior walls are of the curtain wall type of construction. Aluminum mullions and window frames are attached to the spandrel beams in a manner permitting unhindered thermal expansion and contraction. Conversely, no support or stiffening of the main structural frame can be expected from the enclosing walls.

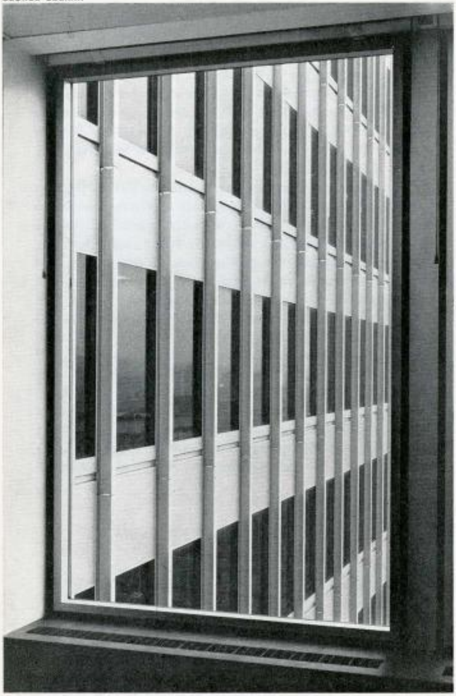
Gross area of one floor is approximately 40,000 sq. ft. The total net area of office space in the Royal Bank of Canada Building is 1,427,000 sq. ft.

Column Layout: Spacing of the tracks dictated the choice of the 25 ft 1 in. module used for the layout of the framing of the building. Wings are supported by "two column bents" oriented perpendicularly to the main axis of the building and located 25 ft 1 in. from centre to centre. Each of these "short bents" consists of two columns and a cross girder with a span of 50 ft 2 in. and cantilevering 16 ft 3 in. on both sides.

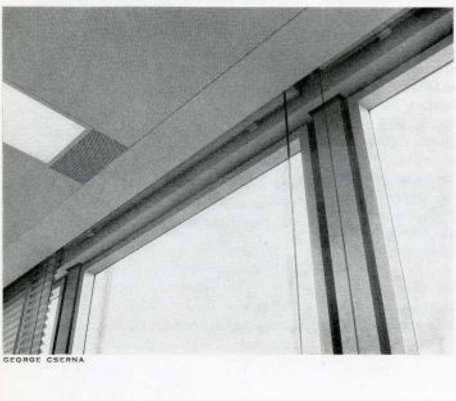
In the core of the building, additional "off module" columns had to be provided adjacent to the elevator shafts. The location of these shafts did not permit the layout of a framing system maintaining column centres on the project grid system.

Wind bracing was provided up to the 27th floor, around the elevator shafts. The "off module" columns therefore perform a dual function, supporting dead and live load, and acting as chord members for the wind bracing system.

GEORGE CSERNA



Interior and exterior detail of aluminum curtain wall, Place Ville Marie



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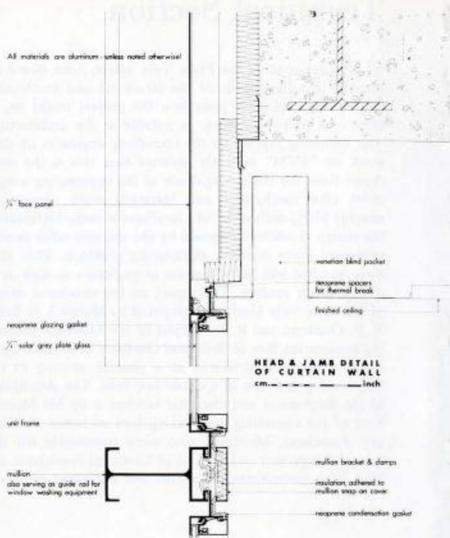
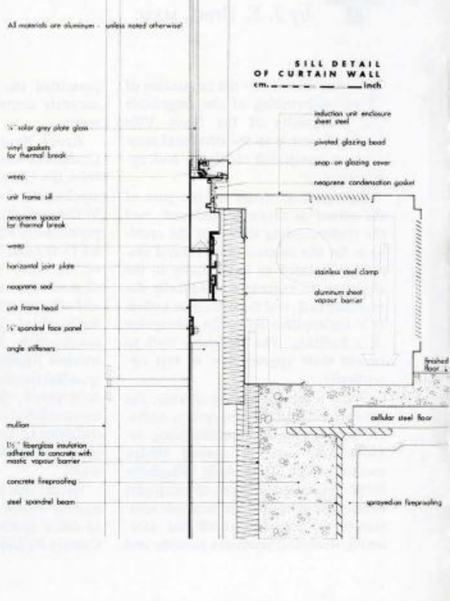




The particular arrangement of the core necessitates a transfer of these "off module" columns over to grid line columns in the lower levels.

Floor Construction: After a thorough investigation of various types of floor construction, metal deck was selected for the wings of all office floors of the building. Flexibility requirements presided over the choice of a QF-D2 system, i.e., two normal corrugated units alternating with a single unit with bottom plate. To stiffen the wings laterally, it was decided to specify a continuous bottom plate in the area bounded by the main building columns. Haydite concrete of an ultimate strength of 3,000 psi was used as fill over the metal deck. The total thickness of the fill is four inches, including 1 in. of monolithic finish. To control shrinkage cracking in the floors, light gauge wire mesh was provided over the entire area. Additional reinforcing bars were also placed over the main building girders, where the deflection of the filler beams would impose a "convex" deformation-shape to the floor slabs. Asbestos spray fireproofing proved to be the most economical method of ensuring protection of the construction. Haydite concrete slabs were chosen for the framing of the core areas.

The lower mechanical floor and second floors act as diaphragms and carry a heavy wind shear load. Reinforced haydite concrete slabs were used, in thicknesses ranging up to 13½ in. in the core area.

The upper mechanical levels and the roof are framed with reinforced haydite concrete slabs. The construction depth available allowed the placing of the steel beams at the level of the bottom of the slab, thus gaining the greatest benefit from composite action. L-type, 2½ in. high shear lugs of ½ in. diameter were used. The asbestos spray fireproofing was protected by a coat of cement and water in areas where it was feared that flaking would adversely affect the operation of the mechanical equipment.

Stone concrete slabs were used for the framing of all floors at and below street level. One-way slabs of 8 ft 4 in. spans were selected for the lowest level in order to simplify formwork over the CNR tracks. The most economical method of framing the remaining lower levels was achieved with the use of a two-way slab spanning 25 ft 1 in. Headroom requirements, mechanical problems, flexibility requirements and particular tenant layouts frequently altered the basic cost relationships. One-way slabs were used wherever flexibility of space layout was required. In areas of very tight headroom, flat slab (with drop panels) construction was selected.

At all four levels, headroom conditions were such that the tops of finished concrete slabs were maintained only 2½ in. over the tops of the structural steel beams. L-type ½ in. diameter shear connectors only 1¾ in. high were provided on all beams where composite action proved to be advantageous. Special push-out tests were carried out at Lehigh University, at the manufacturer's expense, to establish the permissible stress level of this particular type of stud.

Typical Floor Framing: The 32 elevators serving the building are grouped in four banks of eight, the west bank serving floors two to 13, the east bank floors 14 to 23, the north bank floors 24 to 33, and the south bank floors 34 to 41, the upper mechanical levels and the roof observation facility. These banks of elevators are grouped in the core of the building. Stairwells, most mechanical risers and ventilation ducts are located in the reentrant corners of the building.

The wings were therefore free of obstructions and thus a regular framing was possible. The main girders forming part of the "short bents" described above were restricted to a 24 in. depth because of architectural and mechanical considerations. The two 16 ft 3 in. cantilevers partially balanced the high bending in the 50 ft 2 in. span. The cantilevers and the rigid connections to the columns, which are required for frame action, dictated the choice of double girders. Structural haydite concrete fill placed around longitudinal bars between the two halves of the girder helped to increase their stiffness appreciably (up to 40% of the total in the lower floors). Sonovoid forms were used to reduce as much as possible the dead load of this fill. Wherever practical and particularly at the lower mechanical floor above the 57 ft lobby, the girder depth was increased (up to 60 in.) to obtain greater stiffness.

Parallel to the longitudinal axis of the wings, and parallel to the filler beams, 25 ft long tie-girders were placed between the columns. These beams carry little dead and live load, but, rigidly connected to the columns, form the "long bents", and resist most of the horizontal loads.

The core area framing varied from level to level as shaft sizes changed and elevator banks were reduced.

Column Design and Check of Stability: The large floor areas carried by the wing columns resulted in very high column loads. At footing level, for instance, the total reaction on the outer west wing columns exceeded 12,000 kips. After a thorough investigation, columns built up from one or two 14 WF 320 core sections were selected as the most economical solution. Fabrication considerations dictated the choice of individual laminations of a thickness not exceeding 1⅛ in. A-7 steel was used throughout, except in the lobby where A-242 steel was selected to reduce erection weight.

One of the most remarkable aspects of the structural analysis of the Royal Bank of Canada Building was the verification of the stability of the structure. The "long bents", the wind bracing up to the 27th floor, the system of shear walls up to the second floor and the rigidity of the floor plates provided sufficient stiffness to prevent instability of the whole or of any part of the structure by translation. In an hypothetical torsional mode of failure, all "short bents" would move in the same direction of rotation. The "long bents" and the wind bracing system below the 27th floor would be subjected to limited deflection because of their proximity to the centre of rotation.

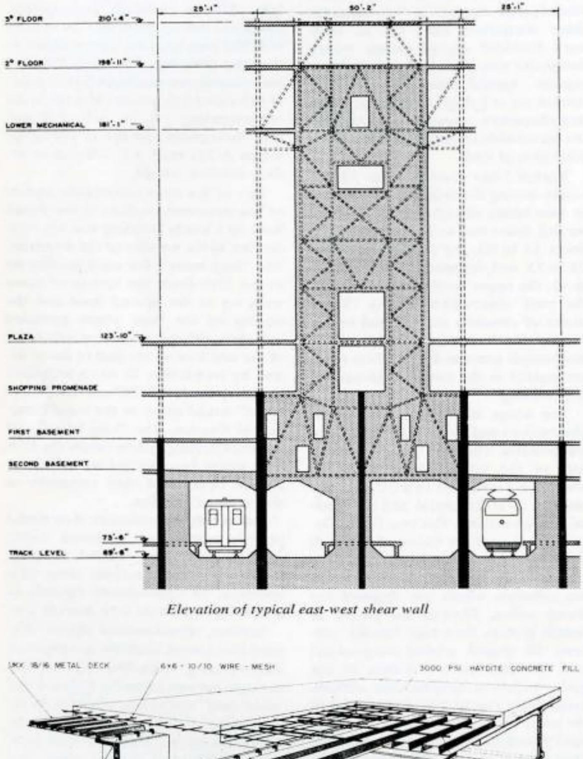
Conversely the resistance they would provide against any torsional movement would be very limited. In order to establish more precisely these relationships, an approximate analysis at a few typical levels was carried out.

Various considerations clearly dictated that a more accurate investigation was necessary. It was therefore decided to single out one complete typical outer "short bent" and to investigate its buckling modes. Full lateral support of the frame was assumed at the second floor, lower mechanical floors, plaza and shopping promenade levels. The "slope deflection method", in the manner first suggested by *Dr E. Chwalla*, was used to calculate the critical loads of the frame.

Wind and Earthquake Design: Lateral forces applied to the structure consisted of wind as specified by the Montreal Building Code and acceleration forces due to earthquakes. In the absence of specific requirements, it was decided to follow the National Building Code for the earthquake design. It was not deemed necessary to combine both wind and earthquake forces. The deflection of the building was limited to ¼ in. per storey to avoid excessive movement in the curtain wall and to prevent cracking of masonry walls.

The exact shear distribution between the various resisting elements was too complex to be established by an approximate method. Furthermore, the precise effect of the shearwalls could only be determined by an exact analysis. The stiffness of each bent was first established by submitting the structure to a unit deflection. The conditions that the sums of these shear resistances at each level be equal to the applied load, and that the deflections of all bents be identical at all levels permitted the writing of a system of 128 simultaneous equations with 128 unknowns. An IBM 704 computer was used to obtain a numerical solution of this system.

As an additional check of the adequacy of the design of the structure, wind tunnel tests were carried out. The results of these tests proved that the particular shape of the building did not create a wind loading pattern not adequately covered by the provisions of the Montreal Building Code. It was furthermore established that no torsional vibrations were to be expected, even for wind velocities far exceeding the maximum design speed.



Elevation of typical east-west shear wall

Typical floor, construction details

Lower Level Transfers: The location of the tracks and platforms necessitated the transfer of the core area columns to the main grid system. Transfer trusses twenty ft in height were therefore provided between the second basement and shopping promenade levels. Milled bearing joints between columns and diagonals were required to permit the transmittal of the very high loads.

The wind bracing system was also affected by the track arrangement. In the north-south direction, the bracing planes were transferred from the elevator shafts over to the grid system. The shear wall construction combined with a suitable reinforcement of the core area slabs greatly simplified the offset of the shear panels.

The tracks prevented the construction of suitable shear anchor panels in the east-west direction. A system of heavy reinforced concrete frames, representing the clearance portal specified by the CNR was therefore provided.

It can thus be said that the horizontal forces applied to the building were resisted by the structural steel framing above the second floor and by the reinforced concrete shearwalls below the second basement level. Between these two levels, a composite system of steel bracing encased in reinforced concrete walls was provided.

Foundations: The excavation originally carried out for the Central Station yard was well below rock level. The footings of the building were therefore located just below the railway ballast. The allowable bearing pressure on the sound limestone rock was established at 30 kips per sq. ft. Because of the horizontal stratification of the limestone formations, it was judged advisable to make control borings at the bottom of the excavation for each footing. Additional excavation was always carried out whenever this exploration revealed the presence of seams of such thicknesses or at such levels as would have been incompatible with the construction of a sound foundation. In practice, the seams were found within the first 20 ft of rock below track level. A boring to a depth of 150 ft confirmed the continuation of a sound limestone formation under the project within the necessary limits.

The Royal Bank Quadrants: At the base of the tower in the interstices of the cross shape, four stone "quadrants" provide a 100,000 sq. ft branch bank for the Royal Bank of Canada. The four buildings are not structurally connected to the tower. The two west quadrants form the main public banking spaces. This banking hall has a length of 300 ft. Each quadrant is supported by four main columns located 75 ft on centres. This arrangement results in a column free space of over 5,600 sq. ft. The two east quadrants provide two levels of branch bank office space. The basic framing layout is however very similar to the two west quadrants.

The quadrants' floors are cantilevered 25 ft (20 ft on the building side) from the column line. Wall construction is solid limestone on the outside and marble facing on the inside of the public spaces.

The heavy walls were supported by wall trusses. As the thickness of the structure was to be kept to a minimum, and because wide-flange supports were to be provided for the stone work, plate diagonals were chosen. Where these trusses are penetrated by the access bridges connecting the quadrants, braced panels were replaced by rigid frames.

Support of the wall trusses, the roof framing and the floors was provided by the four intersecting main frames.

Lack of symmetry of the cantilevers and the large concentrated loads in some of the corners caused high bending moments at the connections of the cross girders with the bulkheads. As such concentrations occurred at the intersections of the various frames, the erection of the members was extremely delicate, and special welding procedures were necessary. The design of the "bulkheads" as finally adopted allowed the tenant a maximum amount of flexibility for subsequent layout adjustments and for the design of the mechanical services.

The Imperial Oil Building: The structural design of the three-storey Imperial Oil Building was governed by the necessity to provide flexibility for future extension of the building. The framing was to be designed to carry an additional three storeys, and a heavy roof structure. Flexibility dictated the use of structural steel. Below street level, the addition of a theatre and the complex system of transfer girders required to bridge the CNR tracks, necessitated members which could not practically have been designed in reinforced concrete.

Despite the 450 ft length of the east Imperial Oil Building, no expansion joints were provided in the structure. Great care was exercised in the design of the limestone skin to ensure that it would not be damaged by thermal movements of the framing.

The roof proposed for the six-storey building would connect the east with the west building. Great rigidity of the frames is required to minimize the problems of differential movements. It was therefore decided to provide concrete shearwalls for the full height of the building.

MECHANICAL AND ELECTRICAL SERVICES FOR PLACE VILLE MARIE

by Monroe Kert, P. Eng., and E. Losi, P. Eng.

DEVELOPMENT OF A PROJECT as complex as the Place Ville Marie requires the close co-operation of the owner and tenants, the architect, structural, mechanical, and electrical engineers, contractors, sub-contractors and suppliers. Consider, too, the CNR staff, city authorities, insurance underwriters, and other agents.

Acknowledgement is made to the many people who participated in this project and their fine co-operation to make it all possible.

Steam Services: In accordance with the Emphyteutic lease, the CNR furnishes all steam requirements for the PVM development.

The steam plant is 5000 ft from the PVM Mechanical Service Room. New steam and condensate mains were added from the steam plant to the CNR Mechanical Room located below the CNR Station. This is the central distribution point for the Station, Track Service, Terminal Building, International Aviation Building, Queen Elizabeth Hotel, and Place Ville Marie site. Lines are all metered.

Steam is used directly for ventilation and air-conditioning coils, convectors, rads, fan coil cabinet heaters and unit heaters. Where steam is used in kitchens, heat exchangers are used to ensure no contamination of foods from boiler water treatment.

Sanitary and Storm Drainage in The Royal Bank Building: Main sanitary drainage is from two banks of toilet and lavatory facilities located in the core of each floor. Each bank contains eight water closets, three urinals, seven lavatories, and is served by an 8 in. soil and 10 in. vent.

The Royal Bank Quadrants: A separate system of sanitary stacks and vents is provided for each Quadrant for sanitary facilities, equipment drains, and cafeteria waste.

Imperial Oil Building East: Sanitary facilities are grouped in two banks of toilets consisting of six lavatories, six water closets, two urinals with 6 in. stack and 6 in. vent. Drains are collected and combined with rain water at the base and run to University Street sewer.

Shopping Promenade and Garage Levels: All sanitary drainage originating on these levels is collected into sewage tanks and is then pumped to house drains and flows by gravity to the street sewer. Drain stacks, which run between elevation 90 ft and track level 69 ft, are insulated and traced with electric heating cable as this is an unheated area.

Storm Drainage: The storm water drainage systems consist of roof drains, leaders, and area drains designed to convey storm water from the roof and plaza areas to the combined city sewers in University and Mansfield Streets.

The Royal Bank Building: Six in. leaders from the roof are collected into two 10 in. horizontal storm water drains and thence routed express to the building wall where combined into one 12 in. city sewer in University Street.

The Royal Bank Quadrants: Leaders from the Bank Quadrants are sized to include drainage from the tower walls that spill onto the Quadrant roofs.

The storm and sanitary drainage from the Royal Bank Building and Quadrants require a total of four 15 in. and two 12 in. combined sewers to University. To limit the surcharge on the street, sewer connections are a minimum of 10 ft apart.

Plaza Drainage: Drainage from the Plaza is collected in metal lined pits and conveyed through piping to city sewers in University and Mansfield Streets.

Three specially designed metal lined pits are provided in the plaza for melting snow. Snow will be manually collected and dumped into these pits. A mobile rig with an oil burner located on the plaza, discharging the hot gases through a duct, will melt the snow in the pit, where the water is run into collector pits, and is pumped to the drainage system.

Domestic Water Supply Systems: Domestic water supply is furnished by the city by means of two 8 in. services from University Street. Normally one service only is used. Water is stored in 500,000 gal. concrete tank located at track level. Tank is arranged in two sections to allow for cleaning and maintenance. Each section is divided into three compartments so that in case of failure of one section, a limited amount of water will spill into CNR track area.

The Royal Bank tower has three systems, a lower zone house tank, a high level zone house tank and a hydropneumatic system for the uppermost floors, observation tower and penthouses.

The low level house tank is located on the 27th floor. It has 17,000 US gal. capacity, 10,000 for domestic water and 7,000 for fire protection. It is divided in two sections to allow for cleaning and maintenance.

The high level house tank is located on the second mechanical penthouse, 17,000 US gal. similar to the lower tank.

Upper high levels are served by two 400 and one 50 US gpm vs 60 psi hydropneumatic system.

A wet stack is provided in each wing of the Royal Bank of Canada Building for tenants' use with valved hot, cold, and circulating return provided at each floor.

Royal Bank Quadrants, lower levels 92 ft, 101 ft, 110 ft, are fed directly from city service with separate hot water tanks. Hot water is preheated by a coil in the main condensate return receiver. The garage is provided with separate metered service. A hot and cold water loop at 101 ft level ceiling is provided for the store areas and submeters will be installed later as required.

Fire Protection: The basic structure is fireproofed in accordance with city and insurance regulations. The track area is ventilated to remove diesel fumes and the CNR tunnel through Mount Royal connects on the north side of property. Track platforms are covered with a dry pipe sprinkler system. Areas at 92 ft, 101 ft, and 110 ft levels below the Royal Bank Building are sprinklered. Track area is vented by means of 500 sq. ft of stack area through the Imperial Oil Building.

The site is fully protected with fire hose standpipe and hose systems. A fire road with access from St Antoine Street is provided at track level. Facilities were made for firemen to drop hose from the street level to the tracks. Primary water supply is taken from University and Mansfield Streets.

Outside hydrants and high and low level pumper connections are provided at the 124 ft level. Secondary water supply is provided by the 500,000 gal. reservoir. Two 2000 US gpm 100 psi pumps, one diesel and one electrically driven provide service for the lower areas. The electrical pump is started automatically on drop of water pressure. The diesel driven pump is started manually.

The Royal Bank Building is protected with fire hose standpipes and hose stations in cabinets and extinguishers. Primary water for the Royal Bank of Canada tower is provided by the two 17,000 gal. water tanks of which 7,000 gal. is reserved for fire protection. Secondary water is taken from the reservoir at track level. Pumps are manually operated from a signal system with stations located at each standpipe on every floor.

A coded electrical system supervises the fire protection system and senses and alarms on punch registers located in the lobby and site control office in the penthouse of the Royal Bank Building. A site fire brigade will be on duty at all times.

Heating, Ventilation and Air-conditioning Systems: The construction of the PVM project necessitated a ventilation system for the CNR track area below, as it is intended to use diesel engines. Supply air is drawn from Lagauchetiere Street through a system of ductwork exhausting the track area and discharging to stacks that serve as fire vents in emergencies to the roof of the Imperial Oil Building. These systems were furnished and installed by CNR and their consultants in co-ordination with PVM architects and engineers.

Ventilation of the garage and storage areas is provided by drawing in outside air through filters and heating coils and exhausting it to the roof of the Imperial Oil Building.

The ramp connecting Cathcart Street to the Garage, CNR Station, and Queen Elizabeth Hotel is mechanically ventilated with supply and exhaust air. The entrances to the ramp and truck dock, where doors will be open for long periods of time, are heated and protected with air curtains.

Miscellaneous supply and exhaust systems are provided for transformer rooms, diesel emergency generator, paint shop, pump, and fan rooms ex-

CANADIAN

BUILDING DIGEST

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BITUMINOUS MATERIALS

by P. M. Jones

UDC 691.16

Bituminous materials have had wide application in the building industry for a great many years. As early as 3800 B.C. they were used in construction because of their adhesive and waterproofing properties. Obtained from naturally occurring deposits these bitumens were used by the rulers of the Assyrian, Sumerian and Chaldean empires to waterproof their palace walls.

In spite of the passage of many centuries, bituminous materials are still used extensively in construction; they retain their excellent adhesive and waterproofing properties although it is recognized that they can be adversely affected if the materials are improperly used. For example, under the influence of water, excessive temperature and solar radiation, bitumens can be slowly broken down to carbon dioxide and water. Their service life, however, can be greatly extended if they are given a measure of protection. It is the purpose of this Digest to discuss the properties of bituminous materials and the manner in which they should be handled to derive the maximum benefit from their use.

What are Bitumens?

Many terms and definitions of terms are used to describe bitumens. "Bitumen" itself is a generic name applied to mixtures of hydrocarbons, which can be gaseous, liquid, semi-solid or solid and are completely soluble in carbon disulphide. Within this class of materials there are many substances, the most common of which are tars, pitches and asphalts.

Tars are dark brown condensates produced by the destructive distillation of materials such as wood, peat, shale, bone and coal. Fractional distillation or partial evaporation of tar results in a solid or semi-solid residue known as pitch. Coal-tar pitch is the most common material of this type that is used in construction.

Asphalts are dark brown to black solids or semi-solids that gradually liquefy when heated. They are found in the natural state but may also be obtained from petroleum. Essentially, the origin of natural asphalt is the same as that of asphalt produced by the refining of petroleum, except that the latter process is accomplished at higher temperatures in a much shorter time.

The largest commercially exploited natural asphalt is a lake over 300 feet deep and covering an area of 100 acres on the island of Trinidad. Other natural asphalts occur as rock asphalt in Kentucky and as very hard asphalts such as Gilsonite in Utah and Colorado.

The removal of gasolines, oils and other volatile products from crude oil results in a residual asphalt often called a straight-run asphalt. The properties of this product depend upon the nature of the crude source and the conditions of refining. Residual material is often used directly, but on occasion further refining is necessary to produce a harder material. This can be achieved by an air-blowing or oxidation process in which air is blown through heated residual asphalt, control of the process producing various degrees of hardness. The actual chemical and physical process is not fully understood, owing to the complex nature of the bituminous materials; they are thought to be colloidal and to consist of a dispersion of high molecular weight material in a fluid having a lower molecular weight. The bitumen is changed physically if this colloid system is disturbed, as may be seen when a bitumen is overheated. Some of the lower molecular weight material is distilled off so that some of the flexibility and adhesive qualities are lost. Consistency can also be increased by using a pulverized mineral filler whose chief function is to increase viscosity. This achieves the same result as oxidation without sacrificing the serviceability expected from soft asphalts.

Properties

Adhesiveness of bitumen to a surface depends upon both the nature of the surface and the state of the bitumen. For an adhesive to act it must be able to wet a surface. In a fluid state bitumens can wet a dry solid surface and good adhesion will result, but the presence of water will prevent adhesion. The temperatures of the solid and the bitumen also influence the bond, as will any dust on the surface of the solid and the nature of the solid itself. Even after a bitumen has been successfully applied, the bond can be decreased or even destroyed by the entrance of water into the bitumen-solid interface.

A number of additives to improve adhesion of bitumens to solid surfaces have been proposed. These compounds have a powerful wetting and adhesive action, and when present in small amounts in bitumens they displace water from the solid surface and permit a good bond. They also prevent any deterioration of the bond should water ever reach the interface. The creation and maintenance of a good adhesive bond between bitumen and a solid is an essential requirement for satisfactory performance.

The water resistance properties of bitumens depend upon the degree of impermeability and water absorption inherent in them. Even a very thin layer (1/64 inch) in a continuous film provides an excellent water barrier. In practical applications the degree of impermeability will be affected by the nature of the filling materials and the continuity of the bituminous coating. For waterproofing and roofing applications, fabrics or felts are used to build up a membrane to provide and maintain continuous waterproofing films.

Under certain conditions water may be absorbed by the bitumen itself or by minute quantities of inorganic salts or fillers in it. The normal solubility of water in bitumen is in the order of 0.001 to 0.01 per cent by weight and is so small as to be negligible. The presence of water soluble salts in any quantity will result in a large capacity for water absorption by osmosis. For this reason oil refineries de-salt the crude oil before refining it. Fillers also can absorb certain quantities of water, the amount varying with the composition and granular size of the material. As a result it has been found that bitumens in permanent contact with water absorb it in varying amounts, and various claims as to the relative water absorption properties of coal-tar pitch and asphalt have been made.

Results of recent tests on asphalt and coal-tar pitch have reported water absorptions of 0.5 to 2.4 grams/sq ft for commercial coal-tar pitches and 2.0 to 3.9 grams/sq ft for commercial asphalts after one year. This rate of absorption is very low and there is very little difference between the two. It is more significant that the rate of water penetration into the bitumen is also very low.

The viscous or flow properties of bitumens are of importance, both at the high temperatures encountered in processing and application and at the low temperatures to which bitumens are subjected in service. Flow properties are complex and are further confused by changes in the colloidal nature of the bitumens that occur with heating. When the temperature is high enough for the bitumen to be liquid, the rate of shear is directly proportional to the shearing stress. As the temperature drops, however, these flow properties are complicated by elasticity and other effects. This has necessitated empirical tests, which are used by the producer and consumer to measure the consistency of the bituminous materials at temperatures comparable to those encountered in the service life of the bitumen. Among the most common of these tests are the penetration and softening point tests and various indices using them.

The penetration test measures the depth of penetration in tenths of millimetres that a weighted needle achieves in a bitumen after a known time at a known temperature. The most common combination of factors is a weight of 100 grams applied for 5 seconds at a temperature of 77°F. The penetration is a measure of hardness, and typical values obtained are approximately 10 for hard coating grade asphalts, 15 to 40 for roofing asphalts, and up to 100 or more for certain waterproofing materials.

The softening point test measures the temperature in degrees Fahrenheit at which a steel ball falls a known distance through the bitumen when the test assembly is heated at a known rate. The usual combination of factors is a ⅜-inch diameter steel ball weighing 3.5 grams sinking 1 inch through a ⅝-inch diameter ¼-inch thick disc of bitumen held in a brass ring, with the whole assembly heated at a rate of 9F degrees per minute. The resulting measured temperature is not the melting point, but merely gives a measure of flow under controlled conditions. The softening point value is used to grade bitumens into groups. Typical values would be up to 240°F for coating grade asphalts, from 140°F to 220°F for roofing asphalts, and down to approximately 115°F for certain waterproofing materials.

When chilled sufficiently all bitumens lose their viscous properties and behave as brittle elastic solids. The interval between the softening point temperature and the temperature at which a brittle condition is reached gives a measure of the temperature susceptibility of the material. This can vary a great deal, depending on the crude oil source and the bitumen processing. Successful use of bitumen usually results if a material has been chosen that will be subjected in service to temperatures well within the limits defined by its brittle condition and softening point.

Lack of compatibility between different bitumens is also of importance, and exhibits itself by staining and the appearance of oil spots or large cracks. If a coal-tar pitch and an asphalt are incompatible, one will be softened and the other hardened, the nature and extent of incompatibility depending upon the chemical composition and internal physical structure of the bitumens. The reaction of asphalt towards pitch can be manifested in two ways:

1) If asphalt is applied over pitch it can soften and flow off, leaving exposed pitch that will weather rapidly.
2) If pitch is applied over asphalt, the pitch may harden and crack.

These reactions do not always occur and sometimes asphalt can be applied over pitch, or vice versa, with no ill effects. It is considered advisable, however, to avoid contact of the two bitumens if possible, and for this reason asphalt should not be used with tar-saturated felt, nor should tar be used with asphalt-saturated felt. If any doubt exists on the compatibility of bituminous materials, a test has been devised to establish it (ASTM D1370-58).

To enable bitumens to wet the surface that is to be protected, they are often applied in the hot liquid state. The temperature to which they should be heated depends upon both the consistency of the bitumen and the temperature of the surface to which it is applied. As a maximum temperature exists, however, above which chemical degradation of the bitumen occurs, it is not advisable to heat asphalts above 450°F and coal-tar pitches above 400°F. Coal-tar pitches and one grade of asphalt for built-up roofing have a softening point of about 140°F; it is thus possible, by heating these materials even to 350°F or lower, to obtain a liquid that will wet a dry solid surface and enable the bitumen to be applied so that it can act as a waterproofing agent.

It is occasionally desirable to avoid the use of a hot material. At such times bituminous products are used in so-called cold applications, with the bitumen in liquid form as a cutback or an emulsion. (A cutback material is a solution of the bitumen in a suitable solvent.) After application of the bituminous solution to the solid surface, the solvent evaporates leaving the bituminous film to act as a coating. Numerous solvents are sufficiently volatile and are good solvents for bitumens, but many are either too expensive or too hazardous. To control the drying times of the solution, care must be taken in the selection of the bitumen and solvent.

Emulsions are dispersions of very small drops of bitumen in water. A satisfactory emulsion is smooth in appearance, usually brown in colour, and can be made from bitumens having a wide range of consistencies. Emulsions usually contain a mineral material and are often called clay emulsions, although the mineral can also be coal, shale, metallic oxides, portland cement or asbestos. The most widely used is a special clay known as bentonite. An obvious advantage of emulsions over other bituminous products is that they are easy to handle, addition of water being all that is necessary to decrease their viscosity. Curing involves, primarily, a loss of water by evaporation; its stability, however, depends upon many factors such as asphalt concentration, size and distribution of asphalt droplets, freezing of the water and the nature of the stabilizing agent.

Durability

Mention has been made of the changes that bitumens undergo when they are overheated; this is but one of the peculiarities encountered in their handling and service. Among the other factors to be considered are water absorption and photo-oxidation. Bitumens are readily oxidized when subjected to ultra-violet radiation, a process that forms water soluble products and results in a material that is harder and less flexible than it was originally. If it continues until the bitumen can no longer withstand the strains imposed by thermal and structural movement, the material cracks. The loss of volatile materials also causes contractions that frequently cause shrinkage cracks. In the absence of light and heat, however, the rate of oxidation is low and the useful life of the materials can be extended. Light-coloured gravel in built-up roofing construction provides the protection required for satisfactory durability.

Uses of Bitumens

The desirable qualities of bitumens control the uses to which they may be put; the limitations of the materials control the methods of application and their performance in service. Adhesiveness and waterproofing qualities, combined with low cost, make them useful as a protective agent in both built-up and prepared roofing and in prepared siding. They have wide use also as sealants and adhesives. Combined with other materials, bitumens may be used as vapour barriers and as agents to waterproof and damp-proof structures.

Bitumen is used in many forms depending upon the characteristics and properties desired. Saturated felts, used in built-up roofing as a base for prepared roofing and siding, as underlays for floors, and as a membrane for waterproofing, require a particular grade of bitumen that has a low viscosity at the saturation temperature. The flash-point should be above the saturating temperature, however, and a reasonably low temperature susceptibility is desirable. In the preparation of asphalt-saturated felt an asphalt having a softening point of approximately 140°F and penetration value of 50 is used.

Prepared roofing products such as shingles and roll roofing consist of saturated felts coated with asphalt. The coating grade asphalts used for this application are high softening point (200 to 240°F) air-blown products with high penetration values of 18 to 30 at 77°F; they have low temperatures susceptibility. Care is taken during manufacture to ensure that the coating asphalt is compatible with the saturant.

Bitumens are widely used to provide a waterproof coating to walls and to construct waterproof membranes in buildings and engineering structures. Hot applied bitumens used below grade, where they are not subjected to high temperatures, are of a type having a low softening point (115 to 145°F) and a high penetration value (up to 85). Where the bitumen is to be used above grade and may be applied to vertical surfaces exposed to direct solar radiation, a type having a higher softening point (200 to 220°F) and a lower penetration value (15 to 25) should be selected. Emulsions and cutbacks that are applied cold are being used to an ever-increasing extent for damp-proofing and waterproofing. They may be used alone or with felts to build up a membrane.

Asphaltic cutbacks and emulsions have their greatest use in road construction and maintenance. With roofing it accounts for about 95 per cent of the asphalt produced in North America. There are still, however, large quantities of asphalt modified by the addition of mineral matter used in the building industry as sealants, acoustical coatings and paints.

Summary

Some of the more important properties of bitumens have been examined in this Digest. Particular mention has been made of the adhesive, waterproofing and flow characteristics that control the use to which bitumens are placed in construction. An outline has also been given of the various bitumens and the manner in which they are used. Recent studies have produced much information to justify even more research into the properties of bituminous materials. As more becomes available on composition, internal structure, mechanisms of flow, degradation and adhesiveness, a more widespread and even more successful use of this material in construction can be anticipated.

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hausting to the roof of the Imperial Oil Building.

The shopping promenade is air-conditioned. Two cooling towers, each with a capacity of 1800 US gpm 95°, 85°, 75° F are provided at the roof of the Imperial Oil Building. Condenser water, steam, and air is provided by the owner, and each store will have separate fan coil compressor units. The theatre and restaurant will be air-conditioned from the owner's Cathcart Street refrigeration plant located at track level. The restaurants are exhausted to atmosphere at the lower mechanical floor of the Royal Bank Building.

The Royal Bank of Canada Quadrants, retail stores below the Quadrants and the Royal Bank Building are completely air-conditioned to maintain comfortable summer and winter conditions. Each Bank Quadrant contains two fan rooms containing high efficiency dry type filters, heating and cooling coils, supply and return fans. Outside air is taken from the soffit below the Quadrants, and exhaust air is discharged through the soffit area. Air is supplied to each dome in the ceiling to ensure no accumulation of smoke or stagnant air. In the Quadrant with the cafeteria and kitchen, air is supplied to the cafeteria and through a perforated ceiling in the kitchen, and exhausted out through hoods with 1/8 in. steel welded duct insulated with 2 in. magnesia and discharged to atmosphere at the lower mechanical floor. Retail stores below the Royal Bank of Canada Building at plaza level have individual fan coil units with return fans.

Extensive Studies: Extensive preliminary studies were made on various methods of providing air-conditioning for the Royal Bank Building. It was finally decided to provide maximum flexibility for leasing, and thus machine rooms were created at the top and bottom with no intermediate full machine floors (only minimum essential miscellaneous spaces for elevator machinery and water tanks).

Main air and water risers are located in the core with horizontal mains on each floor. The building is essentially split in two sections, the lower machine floor serving the bottom 20 floors and the upper penthouses serving the top 20 floors. Studies and tests were made on the use and economics of single glass vs double glass. From the results it was finally decided that single glass would be satisfactory and fulfil the necessary requirements with an induction system and unit under each window. The induction unit enclosure is 1 ft high and with 5 ft x 7 ft window modules large clear glass areas, providing an unobstructed view of the city, is made available to the occupants. Underwindow unit piping is so arranged to permit easy relocation of control valves to suit the partitions. Induction units are installed with thermostats and control valves to suit tenant's requirements. The peripheral area extends back 15 ft from the wall.

Tests were conducted at Penn State University on the curtain wall and glass with induction units to ascertain the limits of humidity control and operating performance of the assembly. The interior system of each wing has a medium pressure air distribution riser in the core and a branch with pressure reducing assembly, sound trap, and steam reheat coil on the supply and a sound trap on each return for each wing. The ceiling space is used in most cases as a return plenum with connections to the riser in the core. The peripheral system was completely installed with the base building with valves and thermostats arranged to suit the tenants. Interior ductwork for the base building terminated at the core with prv assembly and sound traps and was extended to suit individual tenant requirements.

Exhaust systems are provided for miscellaneous tenant requirements, dry core transformer rooms and toilet rooms. Elevator rooms have individual fan coil recirculating systems located in the space for providing cooling. Lobbies are conditioned with fan coil units in the lower mechanical floor and lobby. Air is supplied for heating through the mullions for the windows and special heating is provided for the doors. Miscellaneous systems for owner's locker and service rooms and observation tower are located in the first mechanical penthouse.

Chilled water for the Royal Bank Building, Bank Quadrants, retail stores at plaza level below the Quadrants, observation tower, lobbies, and elevators is supplied from the refrigeration room located in the west wing of the second mechanical penthouse. Cooling towers are located on north wing of the first mechanical penthouse.

As many tenants have requirements for air-conditioning on 24 hour per day basis, the year round, fan coil compressor packaged units are utilized as required, and the owner has provided a winterized 200 ton condenser water system with risers through the tower.

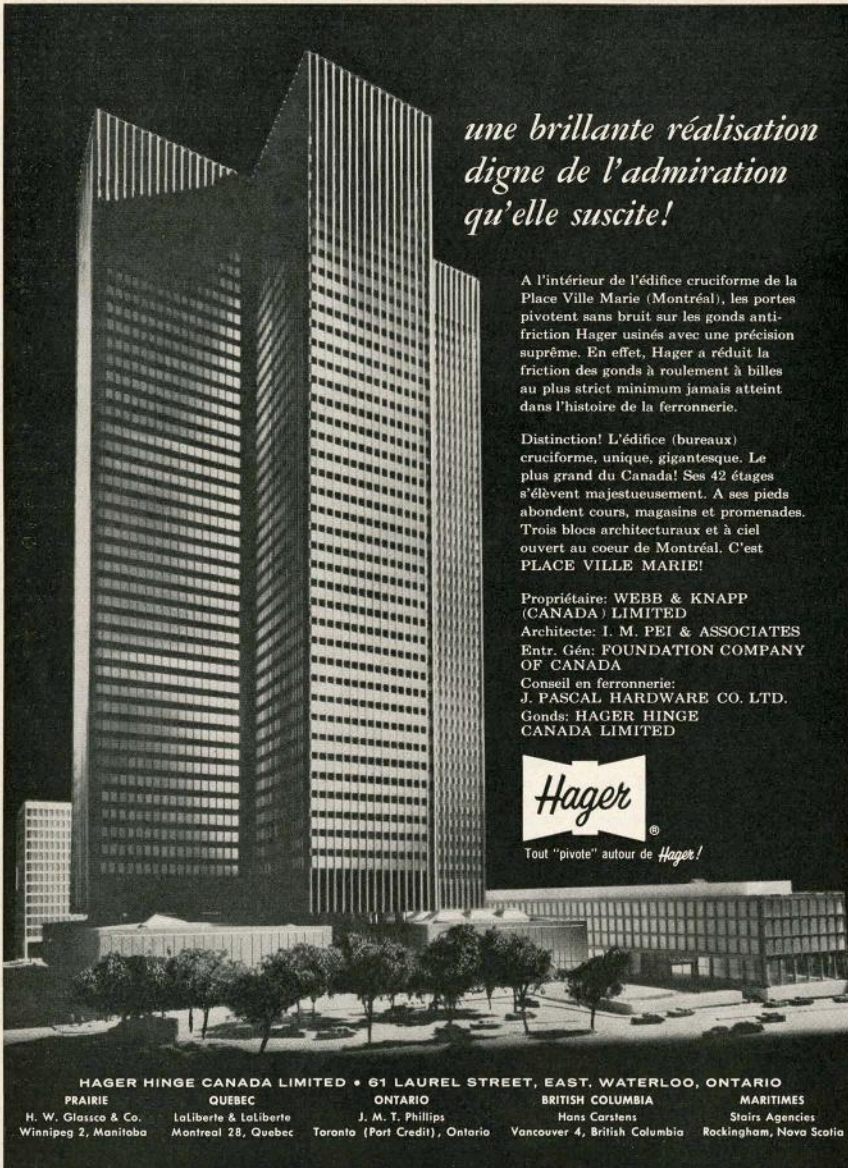
The Imperial Oil Building is comfort air-conditioned with an induction system on the periphery. There is a unit for each window. The air and water system for this building is more conventional utilizing horizontal mains and vertical risers. Fan coil equipment, convectors and secondary water pumps are located in the penthouses on the roof.

Controls: Pneumatic controls are used throughout the project with transmission of actual temperatures and continuous indication of temperatures at the central control panel. Individual fan coil units have local control panels as required. Central control panels are located in the garage and building superintendent's office on the second mechanical penthouse. Fans and pumps can be stopped and started from this point.

Vibration Control: Vibration and noise control for the project were carefully checked, and the recommendations of acoustical consultants followed. To this end, care was exercised in the selection of equipment. Ductwork is lined as required. Pumps and fans are mounted on concrete bases with spring isolators. Piping is hung with spring hangers and fans have flexible connections on ductwork. Pumps will have flexible connections as required.

Electrical Services: Hydro service is supplied to the site from 12 kv 3/60 service from the Dorchester Boulevard sub-station. The incoming service feeders come from University Street and drop to the main switch and metering board at the 69 ft level.

The system had to be so arranged to provide flexibility for metering of owner's services and large and small tenants. Emergency power for the lower levels is provided by a 500 kva diesel generator and for the Royal Bank Building by the 1000 kva turbogenerator located in the second mechanical penthouse. A 200 line owner's internal telephone system, fire protection system, and strap key intercommunication for fire pumps has been provided. Total connected load is estimated at 36,000 kva.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INSTITUTE NEWS

CHIEF ARCHITECT RETIRES

E. A. Gardner (F) retires as chief architect, Federal Department of Public Works, this March. He will then act as adviser to the departmental deputy minister on special building projects and buildings abroad.

Mr Gardner's successor will be J. Langford, of Regina, whose appointment was announced in the January '63 *Journal*.

In 1946, Mr Gardner joined the Department of Public Works – in charge of hospital construction. In 1949, he was appointed assistant chief architect. He succeeded the late C. Gustave Brault as chief architect in 1952.

Under Mr Gardner's direction, the work of the Department grew. At the time of his appointment, the Building Construction Branch was responsible mainly for post office, customs, and immigration buildings. Today, the Department designs – and has construction carried out – for some twenty-one federal departments.

Born in Pembroke, Ont., 1902, and educated in Ottawa public and high schools, Mr Gardner received his B.Arch. from McGill University in 1927, winning the Lieutenant-Governor's Medal for Design. After graduation, Mr Gardner returned to Ottawa, where he was in partnership with Cecil Burgess from 1930 to 1946.

Mr Gardner joined the Works and Buildings Branch, Department of National Defence (Navy), in 1940. He specialized in hospital design and developed the standard plans and construction for navy hospitals.

In 1944, he was loaned to the Department of Veterans Affairs to assist in the design of hospitals and rehabilitation centres and to renovate and enlarge existing DVA hospitals.

In private practice, Mr Gardner was an active member of the Ottawa Chapter of the OAA. As chief architect with the Department of Public Works, he acted on RAIC committees and helped upgrade the Department's fee schedule in 1960.

Mr Gardner is a member of the Advisory Committee of Members of the RAIC, which assists the Department of External Affairs and the Department of Public Works in the review of designs for buildings abroad. He is also a member of the Design Council, which operates under the Department of Trade and Commerce.

E. A. Gardner (F)

In 1928, Mr Gardner received his associate membership in the RIBA. In 1953, Ottawa University conferred on him the honorary degree of Doctor of Science. In 1955, he was elected a member of the Royal Canadian Academy and was made a Fellow of the RAIC.

OBITUARIES

Institute members at large and in particular the group who collaborated with him during his term in office, will undoubtedly have many regrets at the passing of a highly respected past president, Charles David, FRAIC.

He was born and died in his native city of Montreal, where he practiced for many fruitful years under his own name and latterly in partnership with a son Jacques, under the title of David & David.

His general education began in Mont St Louis College which led to his receiving the degree of B.A. at the Montreal Polytechnic School, followed by a Doctorate, Honoris Causa, in Applied Sciences bestowed by the University of Montreal. About the same period he was nominated to Associate Membership in the Royal Canadian Academy. To further develop his education, he spent some years travelling in the United States where he was awarded a certificate from the University of Pennsylvania.

In other fields his activities were quite varied – during World War I he served overseas as a lieutenant with the Canadian Engineers. During World War II he was appointed a director of Wartime Housing, while at the same time he was an original member of the Capital Planning Commission for the City of Ottawa. He sat for several terms as a councillor in the City of Outremont where he resided.

Professional honours included fellowships in the Royal Architectural Institute of Canada and the Royal Institute of British Architects. Members of council who served concurrently with him during his terms as secretary, treasurer, and president, will recall the many pleasant associations created by him at meetings and the gatherings afterwards, when his good fellowship predominated.

While he did not participate in the more active physical sports, his ability as a bridge player was well known in social circles and his reputation as a keen fisherman was widespread. He is survived by his widow, a daughter, and three sons. *J. Roxburgh Smith*

Peter J. O'Gorman was a native of Renfrew County in the Ottawa Valley. He entered the field of architecture by serving with the firm of Angus and Angus. It was in 1914 that he came to Sudbury and opened an office in the Abraham Block; he later designed the Mackey Block which he moved to and remained in until his retirement in 1960.

Buildings designed by Mr O'Gorman can be found in practically every area of Northern Ontario. Some of his major works are the North Bay Civic Hospital, the Sturgeon Falls Civic Hospital, the Ste Elizabeth School of Nursing, the Sudbury and Algoma Home for the Aged, and the Sheridan Technical School.

Mr O'Gorman devoted a good part of his time to social work. He was a member of the Knights of Columbus and a charter member and past president of the Rotary Club. He had been very active in the Boy Scouts and served on both the High School and Separate School Boards for many years. He was the first president of the Northern Ontario chapter of the OAA.

Surviving him are his wife Laura, two sons, Wilfred and Howard, three daughters, Mae, Phyllis, and Lois, and a brother, Patrick.

Bernard T. Barbeau, Sudbury

DU SECRETARIAT DE L'AAPQ

SANS DOUTE EN MARRE de sensationnel beaucoup plus que par souci de relayer le vrai, le vrai dans son entier, et d'éclairer les absents ou les non-admis, un certain journaliste à qui son journal avait payé le luxe de trois journées au milieu des architectes n'a bien voulu mettre l'accent le lundi suivant que sur quelques divergences d'opinions qui n'ont rien d'alarmant en elles-même, mais qui tout simplement démontrent de la vitalité et de l'intérêt aux affaires publiques et professionnelles. Qui cherche la bête noire, la trouve. Ce journaliste a glissé sur l'essentiel; il a omis de dire tout au contraire que le congrès de cette année a suscité de nombreux échanges de points de vue sur maints sujets importants, qui continueront de tenir la manchette encore plusieurs années.

Cent quarante architectes ont acquitté les frais d'inscription à la réunion du Lac Beauport. Aux sept dernières assemblées annuelles c'est la seule fois qu'on ait exigé des droits d'entrée. Formule discutable en général, elle se justifie en partie ici par un programme qui d'année en année s'améliore en qualité et en variété.

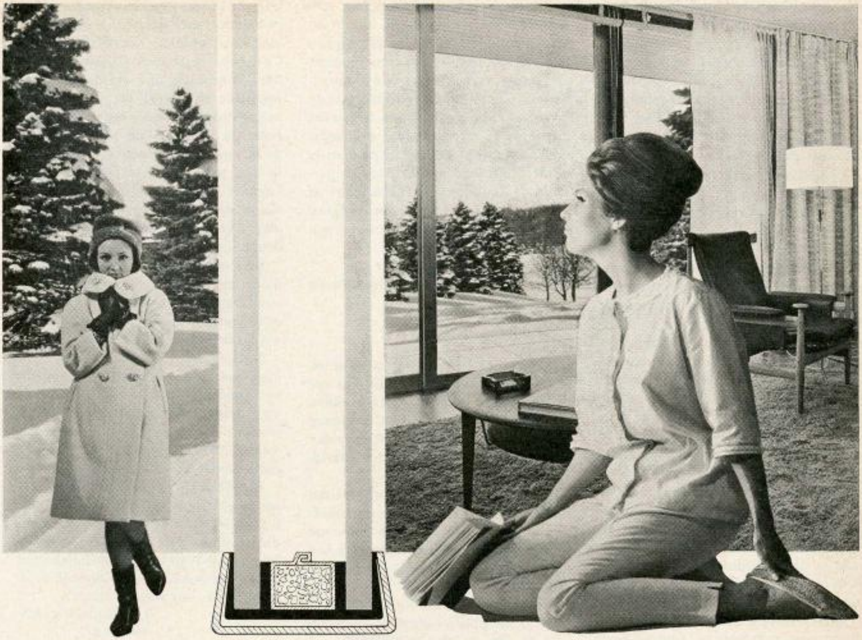
Le tout avait débuté par le déjeuner du Conseil élu où paraissaient quatre nouvelles figures: Bruno Bédard, Michael Ellwood, Roy E. LeMoyne et Jean-Marie Roy. Au terme de ce déjeuner, le Comité exécutif comptait deux nouveaux venus: le secrétaire, Eugène Corriveau, et le trésorier, Max W. Roth. Admis membre de l'AAPQ le 9 janvier 1961, élu au Conseil par acclamation en décembre 1961, Eugène Corriveau devient secrétaire après seulement 2 ans dans l'Association; il s'agit certes là d'un record. Il n'en a pas été ainsi à la présidence; Francis J. Nobbs fait partie du Conseil depuis onze ans. Président du Comité d'admission et bourses les deux dernières années, il avait dirigé auparavant les destinées du Comité de législation & règlements pendant plusieurs termes, sans compter les divers autres comités dont il a fait partie depuis environ quinze ans. Sa vaste expérience des choses de l'Association et ses connaissances de tous les problèmes actuels de la profession lui seront d'une aide précieuse dans ses nouvelles fonctions.

Cédulée pour deux heures trente le jeudi, la première réunion d'affaires n'a démarré que cinquante minutes plus tard. Le nouveau quorum de 35 s'est mis en vedette à plus d'une reprise au cours du congrès. Il est regrettable qu'aucune des séances n'ait pu commencer à l'heure fixée. Il a fallu à chaque fois répéter annonce après annonce et arpenter les corridors à la poursuite des retardataires. Et comme bouquet à toute l'affaire, des journalistes ont eu la douteuse idée de se demander s'il y avait quorum lorsqu'est arrivée la partie considérée la plus importante de l'assemblée, c'est-à-dire l'adoption des résolutions. Toutefois, même en dépit de tous ces contretemps, l'assemblée a refusé d'accueillir une proposition à l'effet de réduire à 30 le nombre de présences requises. On a évidemment jugé que pour une Association de 730 membres 35 est déjà un strict minimum, ne représentant même pas 5% des membres et que d'autre part il y a lieu d'insister pour qu'on prenne plus au sérieux les affaires de l'Association. A cette fin, peut-être serait-il à propos de repenser l'ordre du jour de la première séance et d'en éliminer certains rapports annuels qui, on peut se le dire, n'ajoutent pas grand chose à l'architecture du Québec.

Un item attendu avec impatience et qui devait susciter des discussions serrées et interminables a failli bien au contraire subir un enterrement de première classe. Originaire de Sherbrooke, la question des sociétés entre architectes et ingénieurs voyage d'assemblée annuelle en assemblée annuelle sans recevoir de solution . . . même partielle. Les deux camps restent fermes sur leurs positions; la chose est remise à l'étude.

Une journée d'études comme celle du vendredi a servi à démontrer une fois de plus que l'AAPQ compte dans son sein des architectes qui peuvent philosopher sur des thèmes qui dépassent les bornes de leur sphère et ainsi apporter à la communauté le tribut d'une précieuse collaboration. Des van Ginkel, des Mayerovitch, des Prus et des Affleck, sans nommer tous les participants aux recherches, ont soumis des textes de haute pensée que les administrateurs de l'Exposition universelle se devront de méditer s'ils veulent réellement donner à l'évènement de 1967 un ton de grande allure et de qualité supérieure. L'Expo doit être un medium d'échange d'idées, elle doit exercer une grande influence sur les arts environnants, être basée sur une nouvelle réalité de notre temps, une nouvelle raison d'être, en somme être différente. "Terre des Hommes" implique possession du monde par l'homme ou manipulation active par l'homme des forces naturelles et des structures sociales. Au chapitre de la

G à d: Eugene Corriveau, secrétaire; Gilles Marchand, unième vice-président; Francis J. Nobbs, président; Peter T. M. Barrott, deuxième vice-président; Max W. Roth, trésorier.



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mise en scène, il semble qu'on favorise une exposition incorporée dans la Cité, le plus proche possible du centre nerveux, entre les deux points marquants, la montagne et le fleuve. Et pour clore la journée d'étude, une quatrième équipe de chercheurs a proposé des méthodes à suivre pour réaliser une Expo dans le genre prôné par les organisateurs du congrès.

Endossés en partie par les deux conférenciers d'honneur, le ministre de l'Industrie et du Commerce, M. Gérard D. Lévesque, et Louis Kahn, les exposés, mises en garde, théories et résolutions des quatre séances d'études constituent une mine fertile où les autorités de l'Expo "67" ne devraient pas hésiter à puiser s'ils veulent donner à Montréal et au Canada tout entier un évènement transcendant qui s'inscrira dans l'histoire et fera de la métropole un véritable carrefour d'échanges intellectuels et scientifiques. M. Lévesque pour sa part trouve l'idée d'aménager le cadre physique de l'Exposition en fonction d'activités ou d'aspirations humaines tout-à-fait originale et intéressante. L'aménagement au moins de certains kiosques communs lui paraît indiqué pour une concentration plus globale et une coordination plus logique dans certains domaines, par exemple celui de la recherché scientifique. (Quant à l'allocution de M. Kahn, elle a été communiquée au *Journal* pour fin de reproduction.)

Maintenant que les voix sont tombées et le rideau tiré sur le congrès et la 72e assemblée annuelle, on peut en conclure fièrement qu'il s'agit là d'un autre franc succès de l'Association. Présences, enthousiasme, allocutions, colloques, tout a contribué à faire de ces trois jours des assises profitables. L'un des responsables une fois de plus a été le coordonnateur Jean-Louis Lalonde; les heures qu'il a employées aux préparatifs ne se comptent pas. Il ne faut pas oublier non plus le tour du chapeau de Claude Longpré; les trois derniers congrès ont consacré son talent d'organisateur. Un autre trait réconfortant de l'aventure: une participation largement accrue de la représentation de langue anglaise à une assemblée tenue dans la région de Québec, et ceci grâce en particulier à l'addition d'Art Nichol et de George Steber au Comité du Congrès. En résumé, une assemblée générale qui figure parmi les meilleures.

Jacques Tisseur
le directeur administratif

OBITUAIRE

Les membres de l'Institut en général, et tout particulièrement ceux qui ont collaboré avec lui pendant son mandat, ont sans doute appris avec beaucoup de chagrin la mort d'un ancien président très respecté, Charles David, FRAIC.

M. David est né et est mort à Montréal où pendant de nombreuses années il a pratiqué sa profession sous son propre nom avant de s'associer à son fils Jacques pour former la firme David et David.

Il a commencé ses études au Mont Saint-Louis puis a obtenu le baccalauréat ès arts de l'Ecole Polytechnique de Montréal et, plus tard, un doctorat honoris causa en sciences appliquées de l'Université de Montréal; vers la même époque, il était nommé membre associé de l'Académie Royale du Canada.

Afin de perfectionner sa formation, il a passé quelques années à voyager aux Etats-Unis où il a reçu un certificat de l'Université de la Pennsylvanie.

Dans les autres domaines, il a connu une activité fort variée. Au cours de la première grande guerre, il a servi outremer en qualité de lieutenant avec le Corps des Ingénieurs Canadiens. Pendant la seconde, il a été directeur du logement en temps de guerre et, en même temps, il était au nombre des premiers membres de la commission de la capitale nationale chargée d'établir des plans pour la ville d'Ottawa. Comme homme public, il a été plusieurs années membre du conseil de la ville d'Outremont, où il avait sa résidence.

Ses titres professionnels comprenaient ceux de membre agrégé de l'Institut Royal d'Architecture du Canada et de membre agrégé de l'Institut royal des Architectes Britanniques.

Ses collègues au conseil, alors qu'il était secrétaire, trésorier puis président, se rappellent les moments agréables qu'il leur a fait passer pendant les réunions et plus tard au cours des soirées alors que son esprit de bonne camaraderie prenait le dessus.

M. David n'a pas participé aux sports physiques réellement actifs mais il était reconnu dans les milieux mondains comme un excellent joueur de bridge et il avait une grande réputation comme pêcheur. Il laisse dans le deuil son épouse, une fille et trois fils.

J. Roxburgh Smith,
PP, IRAC

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Legal Notes

PROFESSIONAL LIABILITY INSURANCE

by Norman Melnick

It is planned to discuss the subject of surety bonds in two installments: the first part will concern the nature, uses, and advantages of surety bonds; and the second will deal with the legal aspects: the rights and liabilities of the parties to a bond and some of the qualities of a good bond form.

USE OF SURETY BONDS to protect the architect's client against the default of a general contractor and to ensure payment of subcontractors and material men has notably increased in recent years. Two factors, mainly, have contributed to their growth: (1) the inherent hazards of the subcontractual nature of the construction business, and (2) the inadequacies of our mechanics' liens legislation.

Hazards of Construction: Hazards of the construction business are all too well known to the architectural profession. Indeed, the pyramiding process of general contractor, subcontractors, sub-subcontractors, suppliers, etc., all combining towards the completion of a project, seems to invite disaster at every turn. Because the contractor must quote on a job in advance and then attempt to perform according to the contract, he is an easy victim of rising costs and unforeseen circumstances, which lead him into default and result in the subcontractors and material men going unpaid, the client's project uncompleted, and his investment disastrously impaired. The reasons for default are due mainly to the extreme sensitivity of contractors to a wide variety of market and seasonal fluctuations and to risks which are beyond their control:

1. They must depend upon the vagaries and uncertainties of delivery dates – building materials have to be available exactly when needed in order to avoid the immobility of huge machines, equipment, and large labor forces;
2. The labor market, too, holds its share of horrors – employment is seasonal and the daily productivity of workmen is unpredictable – workmen leave their jobs for more pay elsewhere, and union disputes result in men being pulled off the job;
3. Extraneous conditions such as weather, fire, accidents on the job, death of key personnel, inadequate insurance coverage – all contribute to the common and real hazards of the industry.

And it is so often true that when a general contractor is faltering, because of any number of these hazards, his subcontractors and their subcontractors, in turn, prefer to default rather than to continue and risk non-payment. And so it goes, all down the subcontractual chain.

One very important duty of the architect to his client is to make the client aware of these risks and to take all reasonable steps to protect him from them. One guarantee of protection is the architect's insistence on a well-drawn construction contract; another is the selection of a general contractor with a fine record of performance and a healthy credit rating. As important and as fundamental as these two precautions are, without more, the architect's client may still be exposed to harm, and in these cases additional protection may be warranted.

Inadequacies of Mechanics' Liens Laws: Another contributing factor to the growing acceptance of surety bonds by the construction industry is the failure of our mechanics' lien legislation to provide adequate protection. Every common law province in Canada has enacted a form of mechanics' lien legislation, the purpose of which is to give suppliers of labor and materials, whose efforts have enhanced the value of the owner's property, a lien against the property and its improvements as security for payment. These laws are, to some extent, outdated and provide coverage that is insufficient and uncertain, having regard to the hazards of the construction business today; and they are fraught with procedural and administrative complexities and delays that tend to aggravate their inadequacies. Not only do our mechanics' lien laws provide no positive guarantees for the performance of a construction contract, but they allow unpaid claims to accumulate and to become a charge against the owner's land and buildings, so as to encumber the property and endanger the completion of the project. Surety bonding, on the other hand, ensures the owner that no claims will arise, and that the contract will be performed as written.

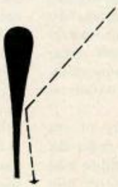
The Surety Bond: The surety bond is not a contract of insurance, but is rather one of indemnity, whereby the corporate surety compensates the owner (obligee) for losses suffered by the default of the contractor (principal). It is a positive form of protection that guarantees that the construction contract will be carried out according to plans, specifications and contract price, subject to the maximum limit or "penal sum" of the bond. The essence of the surety bond contract is one of an extension of credit to the contractor and is a mark of his financial responsibility. There are three types of bonds which are normally used, either separately or as a combination:

(a) Bid Bond
(b) Performance Bond
(c) Labor and Materials Payment Bond.

Government projects, which are outside the protection of the Mechanics' Lien Act, invariably call for a combination of all three bonds in their specifications. As far as private works are concerned, the use of these bonds can afford additional protection to the owner:

Bid Bond: These bonds are used as an alternative to cash deposits that accompany the contractor's bid. They are evidence of a bidder's good faith in undertaking to enter into the construction contract and furnish any performance or payment bonds that may be prescribed by the owner. If a successful candidate, for some reason, reneges and refuses to enter into the contract, and the owner is forced to let the contract to the next lowest bidder, the surety will pay the owner the difference between the two bids. The surety, of course, always has recourse to the defaulting bidder for collection of the sum paid over. In this way, the bid bond is a financial guarantee to the owner of the bidder's integrity. As to the amount of the bid bond, the rule of thumb suggests 10 per cent of the bid price, unless otherwise stipulated in the owner's specifications.

Performance Bond: This bond guarantees that the contract will be performed according to its terms, so that if the contractor experiences financial difficulties and is unable to continue with the project, the surety company will step in and take over the task of completion through some other contractor. The difference between the final cost of the project and the original contract price, up to the limit of the amount of the bond, will be paid by the surety. Although some major public works require a performance bond in an amount equal to 100 per cent of the contract price, normally a 50 per cent bond is sufficient.



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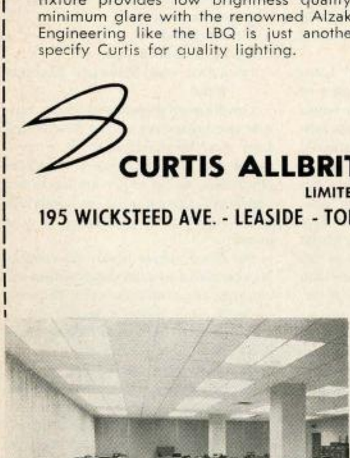

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Labor and Materials Payment Bond: This bond is the principal source of protection for the subcontractor and suppliers of material. It is a specific guarantee for immediate payment. This bond purports to give the unpaid subcontractor or supplier a direct right of action against the surety for payment, thus avoiding the delays and quibbling met with under the mechanics' lien remedy.*

Advantages of Surety Bonds: Public Works: As has been indicated, government projects (whether provincial or dominion) as well as those of government corporations and agencies, cannot be the subject of a lien, and so surety bonding is requisite for these projects. The justification for the requirement is that public funds must not be jeopardized by the default of contractors and the non-payment of subcontractors and suppliers.

Similarly, most of the provincial mechanics' lien statutes specifically exclude the work done by municipal corporations on public streets, highways and services; and accordingly, municipalities, too, insist on bonding.

Private Works: As far as private works are concerned, the decision whether or not to require surety bonds should be made on the basis of the risks involved, the nature of the project, and the reliability of the contractor. And as the costs of bonding are passed on to the owner, cost is also a factor to be weighed against risk. Obviously it may be a redundant and unnecessary expense to bond a contractor of widely-known reputation and financial stability. It may be helpful in reaching a decision to consider some of the following advantages of surety bonding:

1. Bonding offers a positive form of protection to the owner: unlike the mechanics' lien laws, bonding guarantees the performance of the construction contract exactly according to its terms.
2. Bonding provides additional protection at reasonable cost: a performance bond for 50 per cent of contract price may be purchased for as low as $2.50 per $1,000 of

**Nevertheless, this right is of doubtful legal validity, since under our law third party beneficiaries (which is what the subcontractor and supplier are under this bond) have no direct rights. This aspect will be discussed in detail in the next installment.*

price per year, and a payment bond, for as low as \$1.40 per \$1,000 per year.

3. Bonding is a warranty of the financial responsibility of the contractor: the corporate surety investigates thoroughly the past performance record, the financial stability and the extent of current operations of the contractor before it will bond him.

4. Bonding minimizes delays in completion of the project; the labor and material payment bond obliges the surety to make immediate payment to unpaid subcontractors and suppliers in the event of the general contractor's default, thus avoiding the necessity of recourse to the mechanics' lien laws for payment.

References:

See Briggs, *This Business of Bonding*, 1962,
Specification Associate, V. 4, Nrs 4 & 5
Bonds of Suretyship, the Surety Association of America

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MEETINGS ON MODULAR CO-ORDINATION

The Division of Building Research of the National Research Council has announced that public meetings to discuss the progress of modular co-ordination in building in Canada will be held on April 2nd at the Royal York Hotel in Toronto, and April 5th at the Queen Elizabeth Hotel in Montreal.

Mr Lennart Bergvall of Sweden, Chairman of the International Modular Group, will be special guest lecturer, reporting on European progress. Further details of the meeting are to be announced shortly.

A \$10 registration fee will provide admission to the meeting, a luncheon, and a printed copy of the proceedings. Application forms and information may be obtained from L. P. Ruddy, Administrative Officer, DBR, NRC, Ottawa.

COMING EVENTS

American Concrete Institute
Atlanta Biltmore Hotel, Atlanta, Ga.
March 4-7

Pacific North-West
Regional Conference
Illuminating Engineering Society
Empress Hotel, Victoria, B.C.
May 12-14, 1963

Canadian Regional Conference
Illuminating Engineering Society
Hotel London, London, Ont.
May 30-31, 1963

National Technical Conference
Illuminating Engineering Society
Detroit
September 8-13, 1963

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THE CANADIAN JOINT COMMITTEE ON CONSTRUCTION MATERIALS

by Ernest J. Smith (F), Chairman

THE CANADIAN JOINT COMMITTEE on Construction Materials has now been established for some three years. The prime aim and purpose of this committee is to foster a closer liaison between members of the design professions (architects and consulting engineers) and manufacturers and suppliers of construction materials (members of the Manufacturers and Suppliers Section of the Canadian Construction Association).

The committee was not established to research in detail construction materials as such, but rather to encourage and develop improvement in communications and understanding between those who specify and those who provide construction materials and related assemblies.

The initial committee membership of five representatives from the Royal Architectural Institute of Canada and five from the Manufacturers and Suppliers Section of the Canadian Construction Association has been expanded to include one member from the Canadian Association of Consulting Engineers and, most recently, on an associate-basis, a member from the Division of Building Research of the National Research Council.

A four point program was initially approved for the Joint Committee to carry out, and has largely been implemented. The program has since expanded into other related areas.

- The preparation of *"Guide for the Preparation of Effective Product Literature"*. A well-studied document has been prepared, printed by the *Journal* for the committee and distributed to most construction material manufacturers and suppliers and also to major advertising agencies across Canada. The *"Guide"* lays down rules of what the architect and consulting engineer need and expect in the product literature he receives in such great quantity. It also suggests filing systems, standard markings, and format. To date the *"Guide"* has been well received and there are many indications in recent product literature publications that the manufacturers and advertising agencies are following the principles laid down.
- The establishment of local Joint Committees between provincial architectural associations or chapters and members of the materials and suppliers sections of local builders' exchanges. Local committees have been formed in Ottawa, Montreal, Hamilton, Toronto, Fort William, Winnipeg, Regina and Vancouver. A "Guide for Local Joint Committees" has been prepared by the National Committee in order to establish a uniformity of organization for local committees. A form of charter has been designed and printed for presentation to all organized local committees. The work of the National Committee can only be made effective by bringing it to the local level, and it is to this end that the local committees are being established. To date there has been relatively little activity by the local committees, and efforts must be made to stimulate interest.
- The organization of sales training seminars at which sales personnel attend a course which is conducted primarily by principals in the design professions and the manufacturers of construction materials. The purpose of this program is to train personnel, at all levels, in the requirements of the design professions for proper presentation of construction product specifications and properties and performance data on building assemblies. Two experimental courses have been presented in the Toronto area, and future courses will be made available in various centres across Canada.
- A compilation of a directory of films, filmstrips and slide sets concerning construction materials, assemblies and techniques for use by the construction industry and for education and demonstration purposes. This directory has been printed in both English and French and has been circulated to architects and engineers.

A noteworthy project of the committee which was successfully launched in the spring of 1962, is the Product Literature Competition. This is a further development of the committee's initial program. The purpose of this competition is to encourage better product literature design based on *"The Guide for the Preparation of Effective Product Literature"*. It is planned to hold the competition annually, and it is open to construction material manufacturers and suppliers, their advertising agency or consultants. Awards for the first competition were presented to manufacturers and advertising agencies at a presentation dinner held in Ottawa on July 5, 1962. The first Product Literature Competition attracted ninety-three entries, and awards of merit were made to twenty contestants and ten others received honorable mention. Those receiving merit awards are entitled to use the "A" symbol of the Joint Committee on their award literature. Plans are now being made to get the 1963 Product Literature Competition underway.

Assistance to schools of architecture in Canada in their study of construction material is being investigated by the committee. The schools have been contacted by the committee with the aim of assisting them in organizing their training requirements for construction material literature and samples, and of arranging to have such material supplied to them through the Joint Committee.

The promotion of the use of construction material standards in specifications is being pursued by the committee. Resolutions have been presented to the Royal Architectural Institute of Canada and the Canadian Construction Association, advocating the elimination of lengthy description of products, assemblies, qualities and required performance and for the substitution of references to standards of nationally and inter-nationally recognized bodies, such as CSA, CGSR, and ASTM.

The Joint Committee has done initial investigation on Building Centres in Canada, in an effort to determine their success to date and their possible future potential for the construction industry. On the instigation of the committee, Warnett Kennedy of Vancouver wrote an article on this subject for the September 1961 issue of the *Journal*. Robert Legget, Director of the Division of Building Research, attended a recent meeting of our committee and reported on a trip overseas last summer when he investigated the work of various building centres in the United Kingdom and Europe. Mr Legget stressed that the successful ones were a combination of display and information centres, with stress on the information aspect. He reported that approval had recently been given in principle to the Division of Building Research to establish building information centres in Toronto and Montreal, and that these would be developed as resources became available for them.

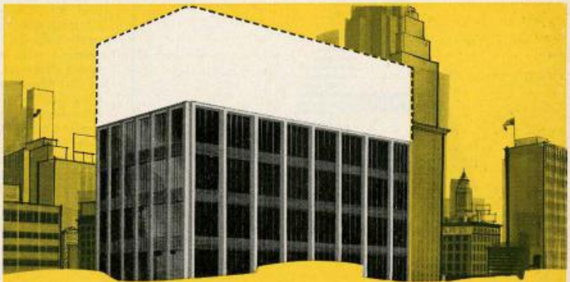
The Joint Committee adopted a resolution at its last meeting concluding that building centres in some form should be established in this country and accordingly a sub-committee is being formed to work towards the eventual development of such centres, by an appropriate non-profit body.

Modular co-ordination, for the designer and for the manufacturer, is a subject which the committee is also investigating. Questionnaires have recently been circulated to Canadian architects, consulting engineers, and construction material manufacturers on this subject, asking the extent of its use at present and soliciting advice and other comments.

The Division of Building Research has for some years been developing detailed information on modular co-ordination. Professor Stanley Kent, who has worked on this for the Division of Building Research, is the foremost expert on modular in this country. Mr Legget reported that after an investigation of the development of modular co-ordination in the United Kingdom and countries of Europe, and elsewhere, he was convinced that Canada must quickly take steps to keep pace with the rest of the world in this important concept. He stated that the Division of Building Research had gone as far as it could go in the development of modular, and that it was now a question of promoting it through the construction industry. The Canadian Joint Committee appears to be a logical body to take on the job and investigation is being made to determine the financial and organizing implications of such an undertaking.

In the spring of this year, the Division of Building Research is initiating two public meetings on the explanation and promotion of modular co-ordination, and our committee is co-sponsoring these meetings with them. These meetings will take place in Montreal and Toronto and the time and the location of them will be announced in the near future.

The work of the Canadian Joint Committee on Construction Materials is designed to help in a very positive way the practicing members of the RAIC and the Association of Consulting Engineers, and the manufacturers and suppliers of construction materials. I would urge that members of the Institute, who have questions or subjects in which they feel this committee could assist or develop – to forward them to us for consideration.



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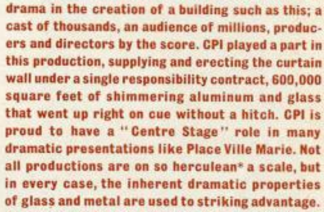

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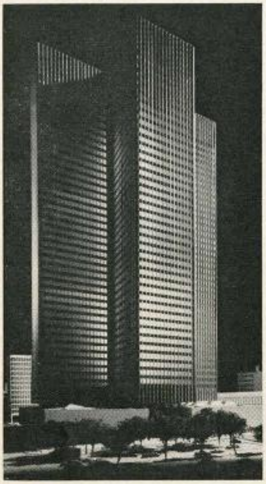

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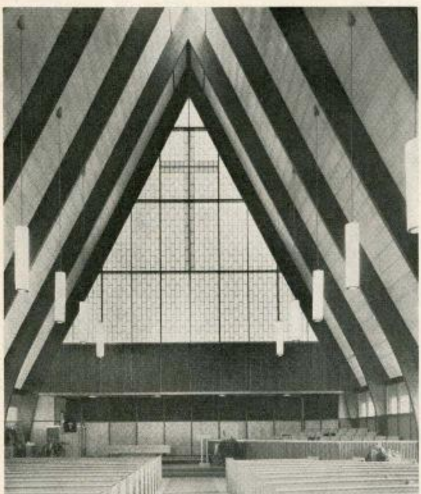

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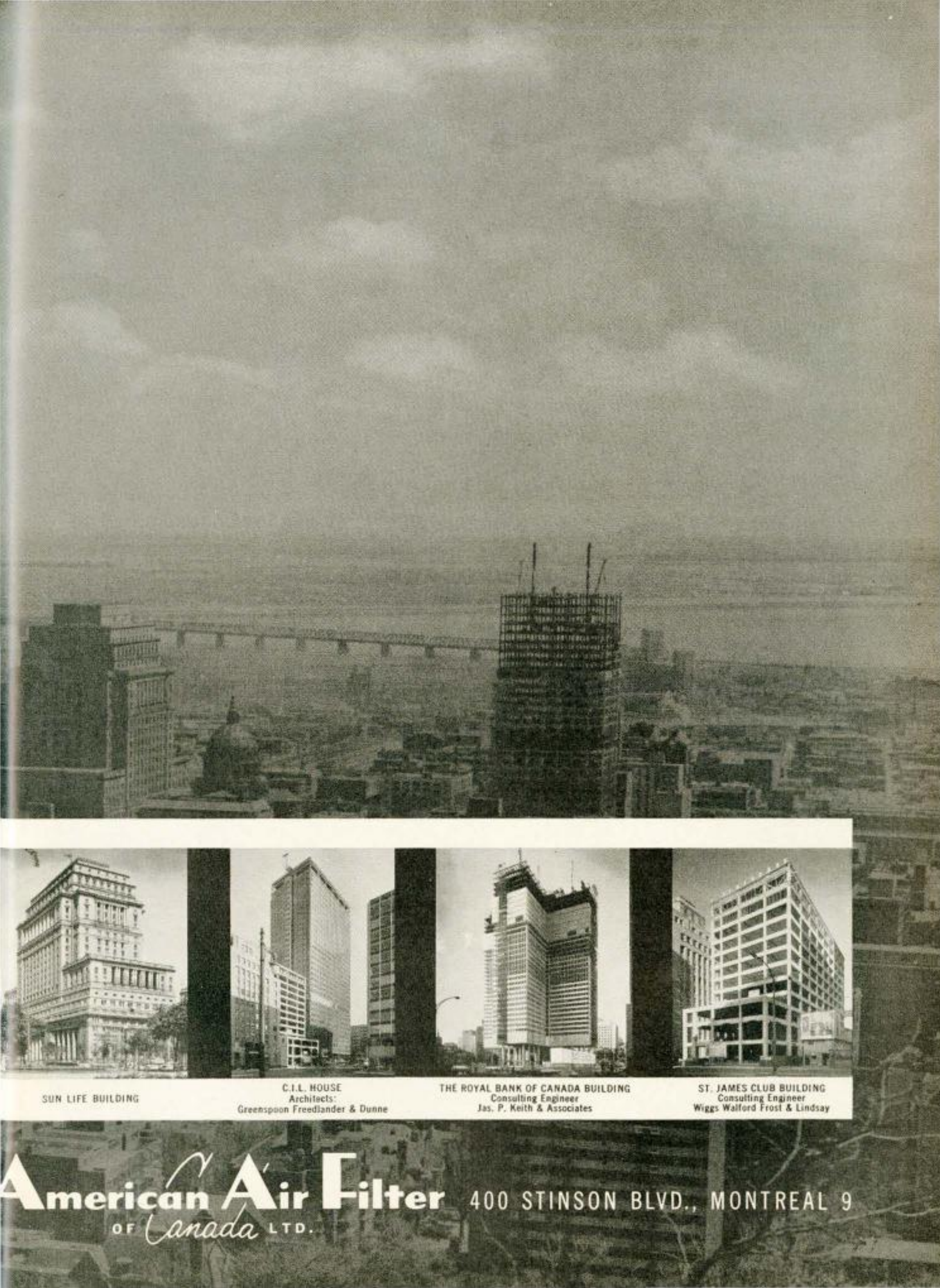
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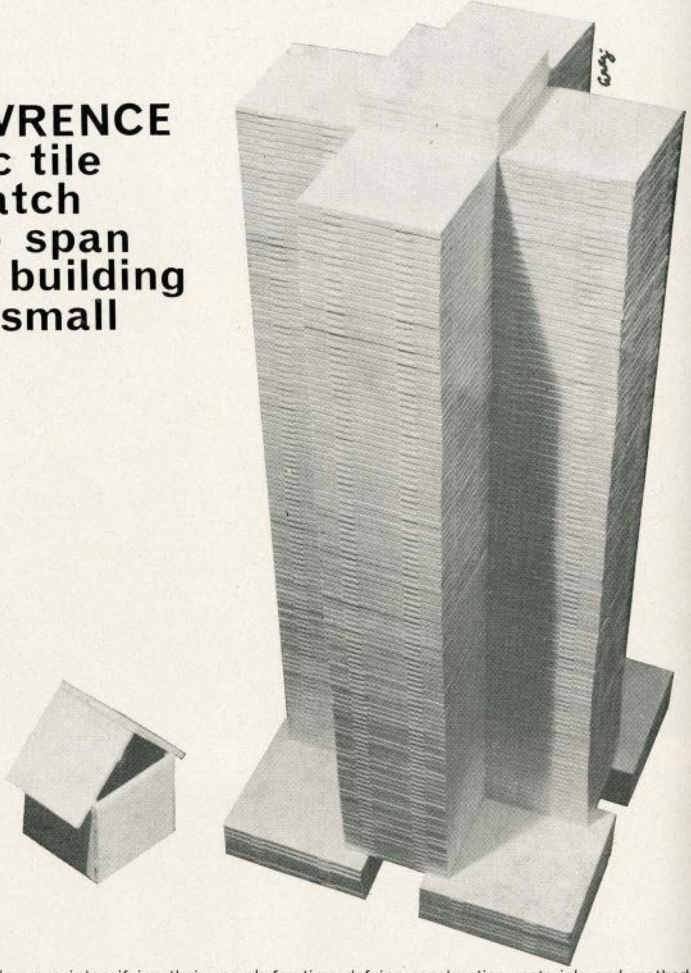

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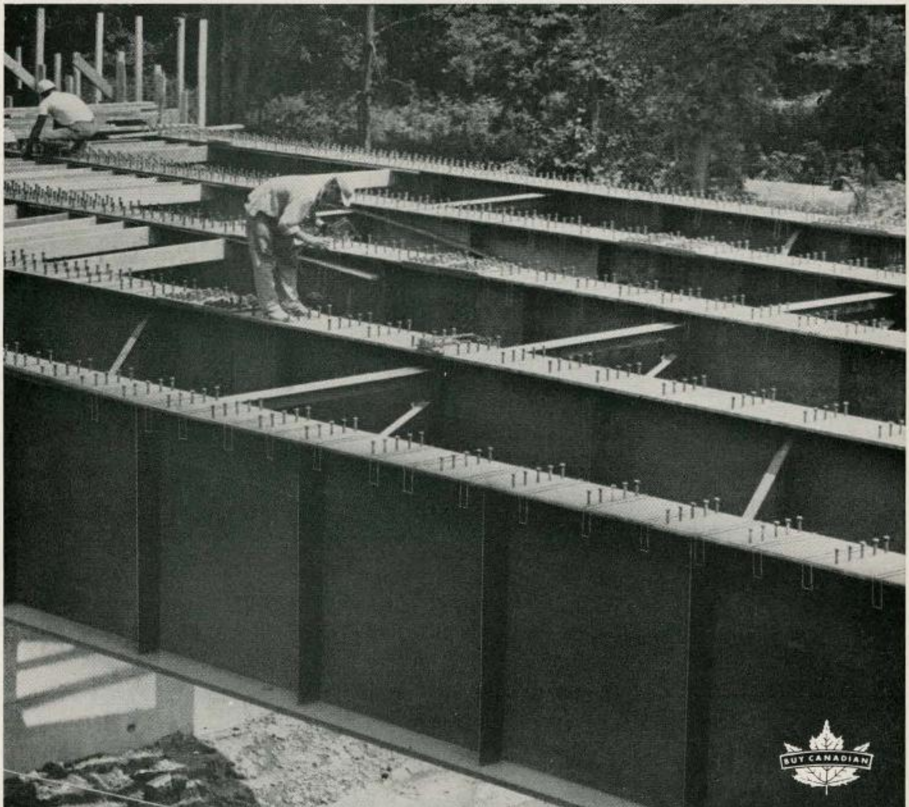

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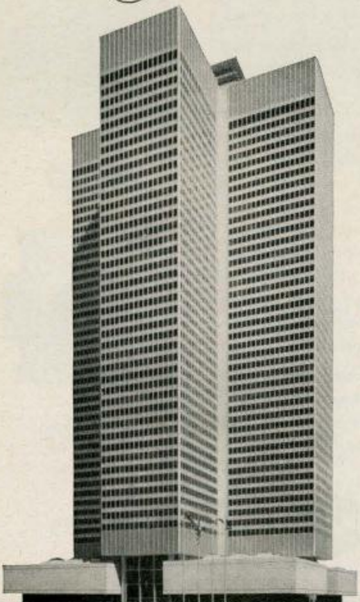

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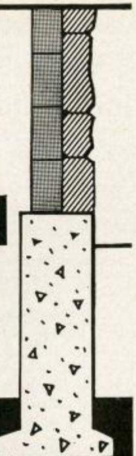

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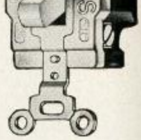

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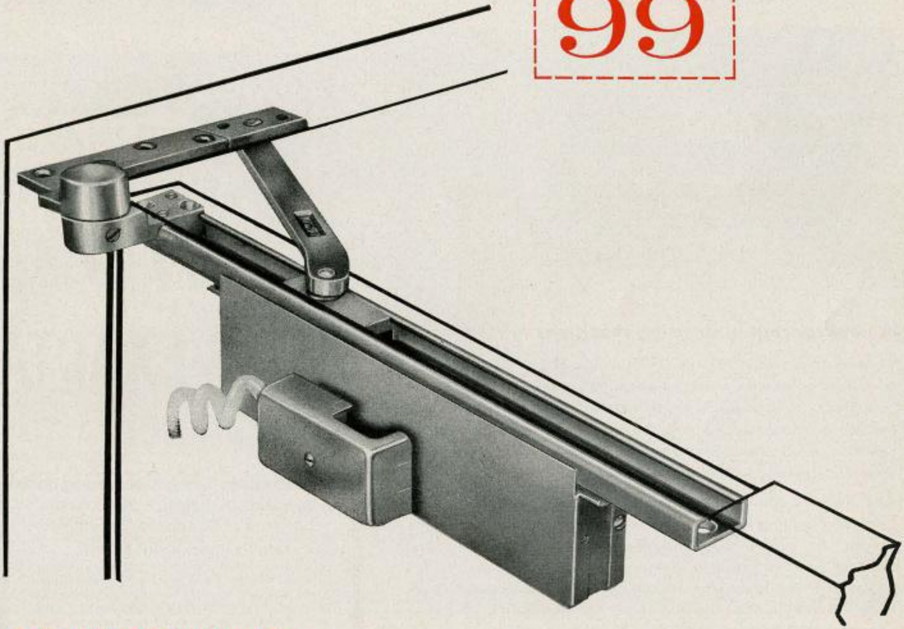

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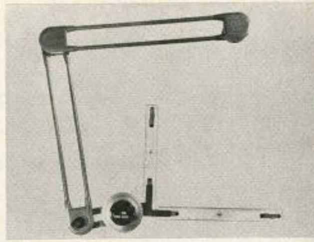

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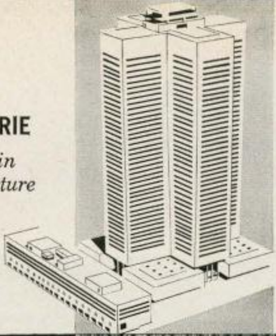

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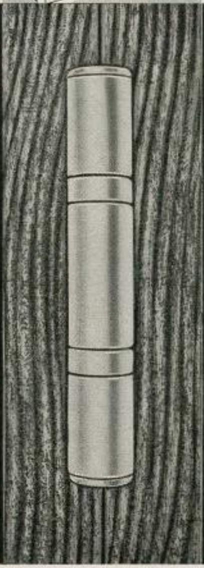

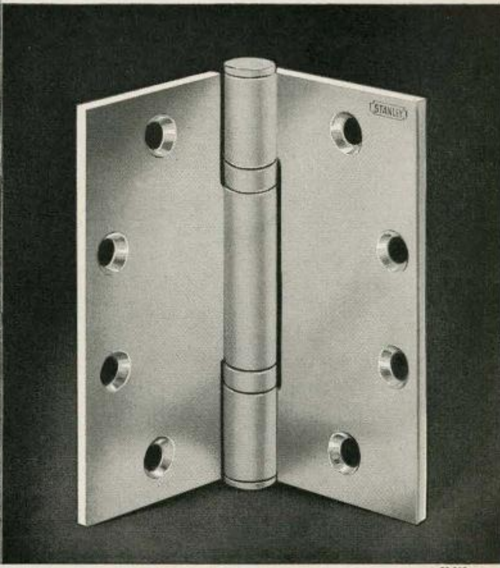

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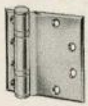

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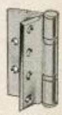

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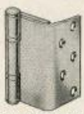

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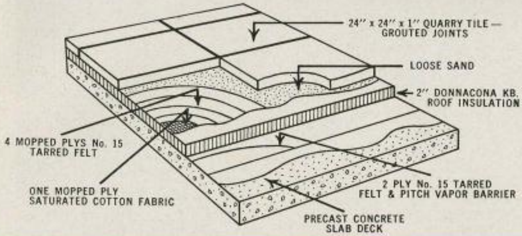

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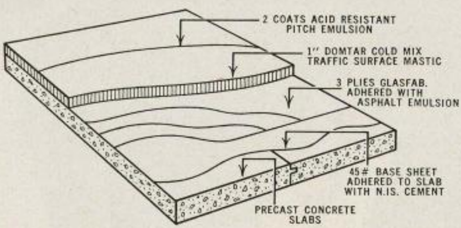

TO ROOF A

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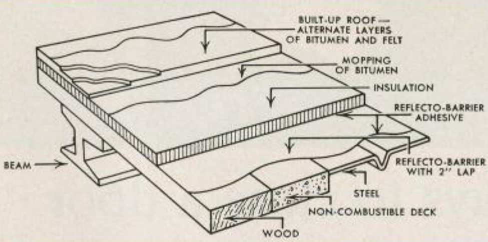

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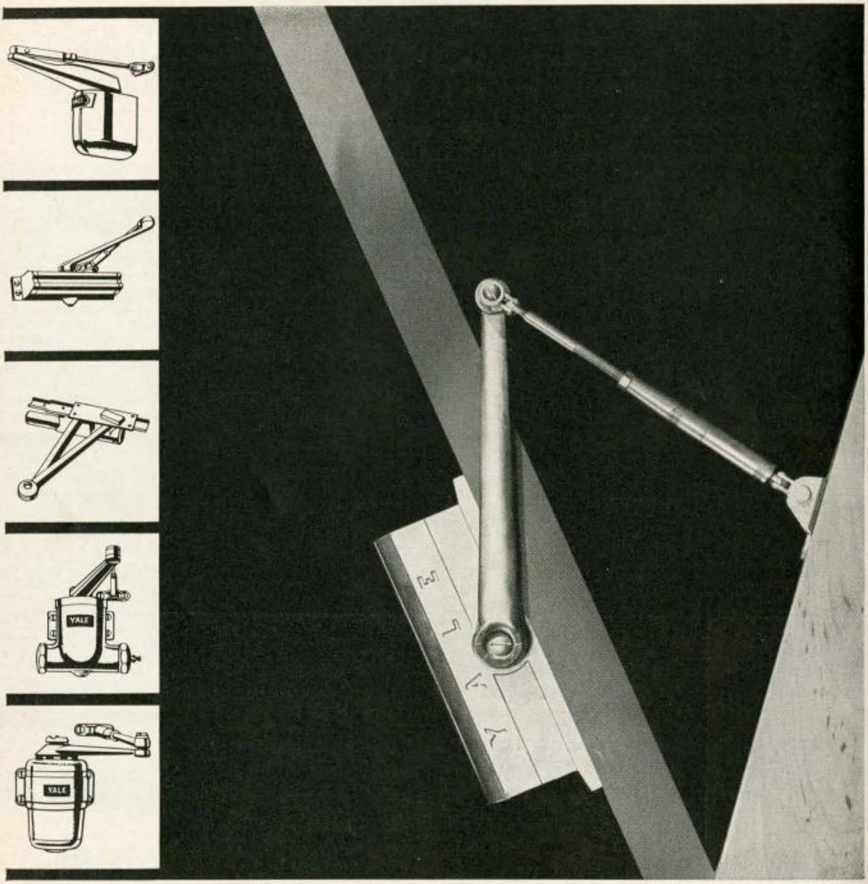

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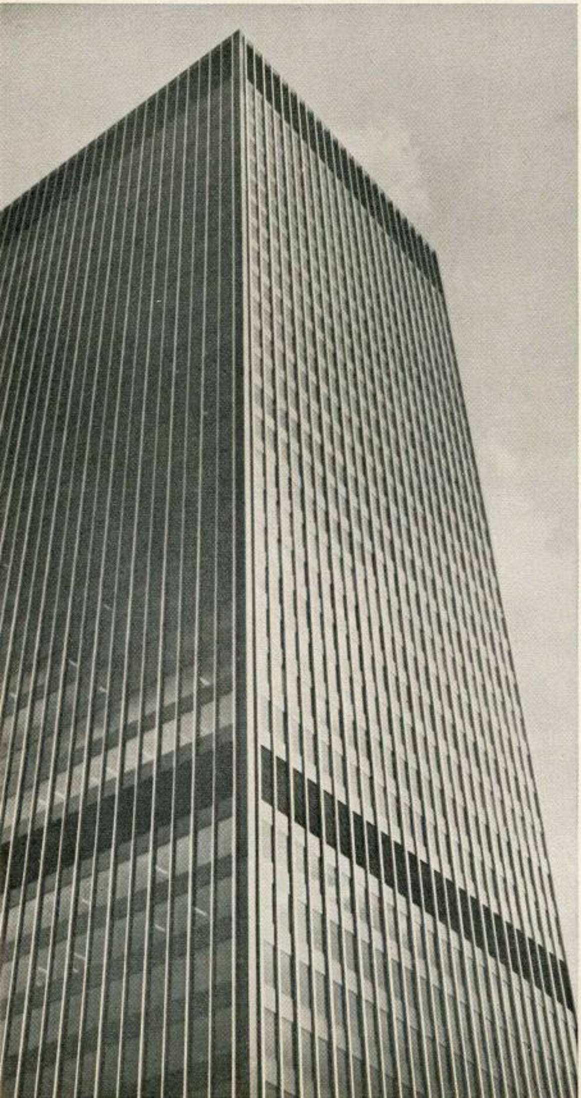

3,720 Solargray Twindow Insulating Window units in Montreal's new 34-story C-I-L House made possible savings in electrical and mechanical equipment.

Because Solargray plate glass transmits only 46% of the sun's total heat energy (compared with 77% for ordinary glass), the building interior is cooler in summer.

Startling economies were made in the air conditioning equipment. Refrigeration compressor capacity was reduced by 220 tons. Cooling tower refrigeration capacity was cut by 660 gallons per minute. Smaller, less costly auxiliary equipment was therefore possible all down the line—water pumps, distribution pipe, valves, fittings, electrical motors and distribution systems, and so forth. Similarly, savings were effected in the perifery induction system.

Less equipment means lower overhead. Sizeable savings in yearly maintenance and operating costs have been projected for C-I-L House as well.

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SOFTENS HARSH GLARE—Solargray plate glass in Twindow Insulating Windows transmits 42% of the visible sunlight. This helps maintain inside brightness, yet provides excellent glare control. Interiors are relaxingly cool looking. There is less eye fatigue. Exterior colour values are not altered. Furnishings are protected from sun-fading and damage.

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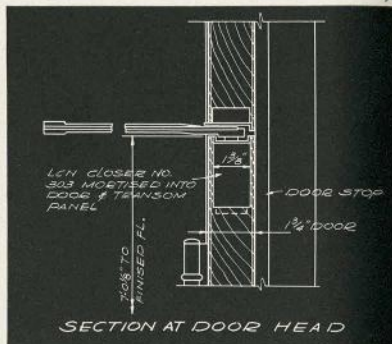

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"TOP FLOOR"

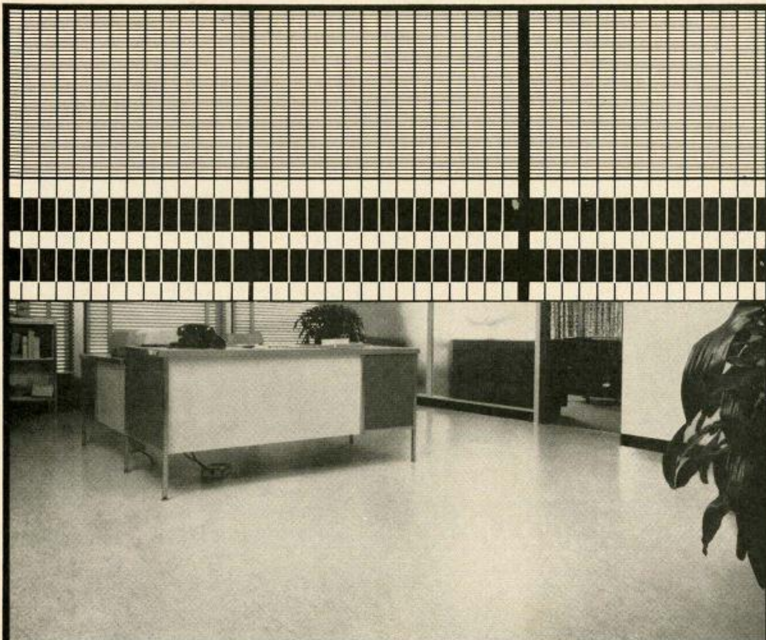
NEW ARCHITECTURAL

MARBOLEUM

in the

TCA offices

in Place Ville Marie



The Marboleum Architectural series is "top floor"—a new pattern effect in muted tones designed specifically from results of a survey among leading architects.

More fashion-wise than ever before, as well as functional—that's the new role played by MARBOLEUM in the attractive Trans Canada Airlines offices in the new Royal Bank Building in Montreal. The new subtleness of colour and pattern provides an opportunity for the blending of shades and design to eliminate sharp contrasts from one room to another.

TCA is only one of many companies in Place Ville Marie—indeed throughout Montreal's business section—who have specified FLOORS BY DOMINION for their modern new offices and shops. Interested? Contact DOMINION OILCLOTH & LINOLEUM COMPANY LIMITED in your area, or at 2200 St. Catherine St. E., Montreal.

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(3) Design assistance for custom-planning motifs, floor crests, etc. (Motifs and crests are prepared ready for installation.)

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Dominion Floor Products Centre is located on the Plaza of *Place Ville Marie*—a place to plan and specify.

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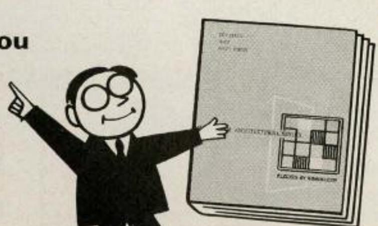

Here's the book that gives you a working knowledge of the characteristics of MARBOLEUM and its applications. The technical information and standard format of the specifications give you a concise reference for the convenience of Architects and Specification Writers. Send for your FREE copy! DOMINION OILCLOTH & LINOLEUM CO. LIMITED, 2200 St. Catherine Street East, Montreal.

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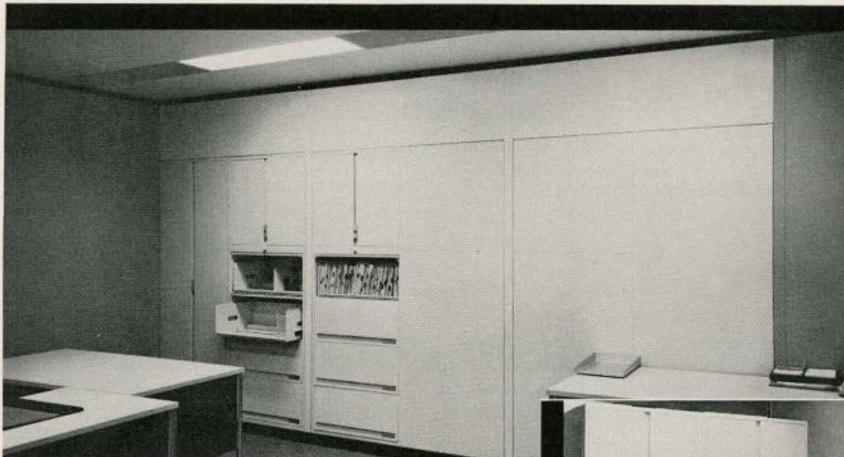

Section of STOR-WAL installation in the offices of the Aluminum Co. of Canada, Place Ville Marie, Montreal.

Architects: Durnford, Bolton, Chadwick & Ellwood.
Interior Decorators: Jacques S. Guillon & Associates.

With drawers fully extended, STOR-WAL side filing units are less than 28" deep. By comparison, a conventional filing cabinet requires 4½ ft. This 26 inches saved allows more free passageway in narrow areas, and adds to the modern, sleek appearance.

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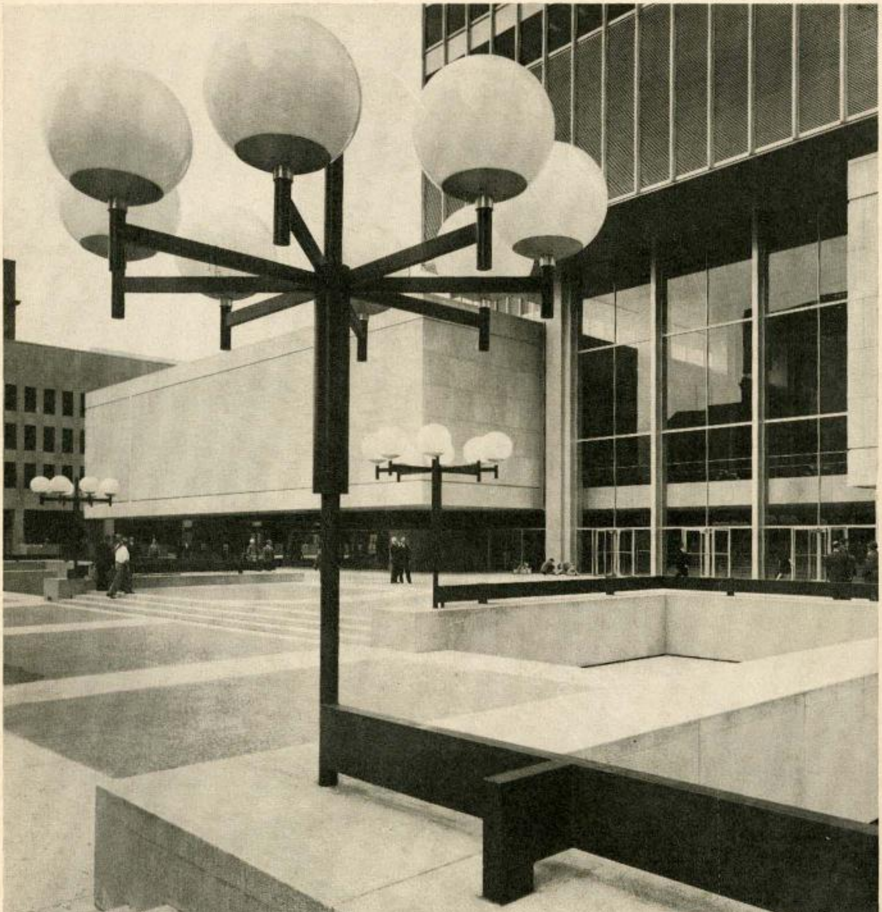

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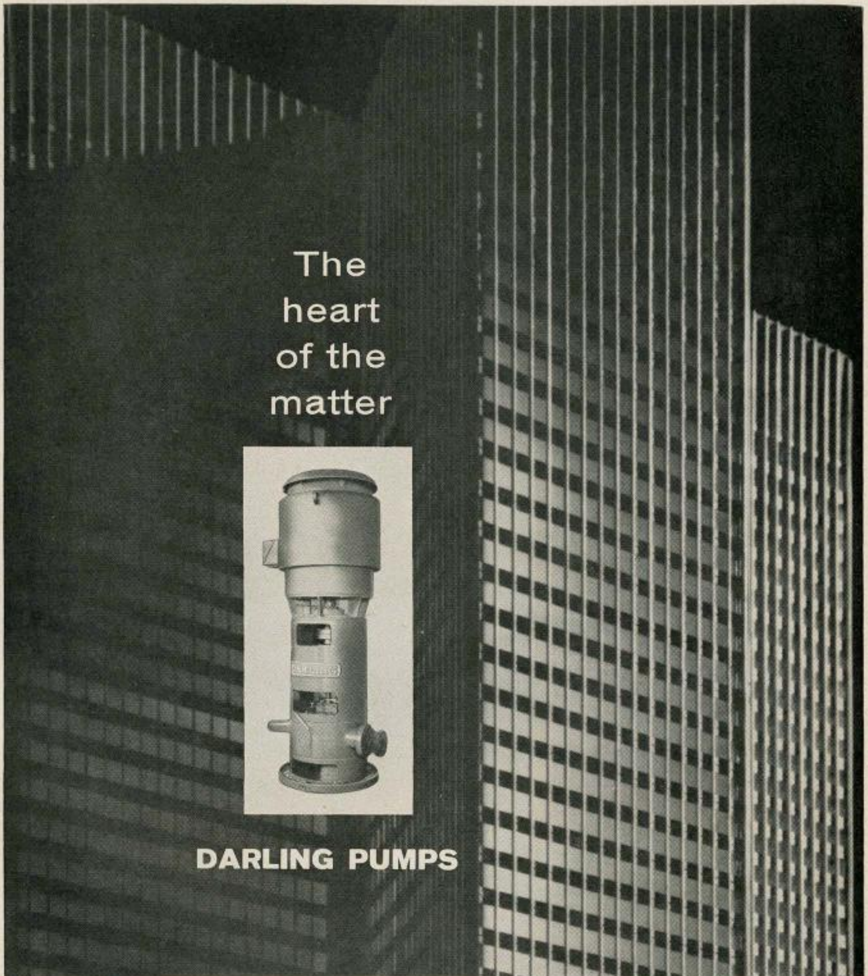

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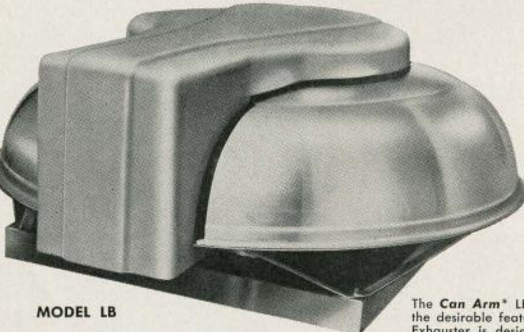

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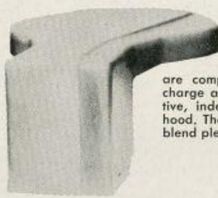
The ***Can Arm**** LB Roof Exhauster is designed to have all the desirable features wanted in a roof exhauster. The LB Exhauster is designed to be very low in silhouette, constructed with a heavy gauge aluminum discharge shroud, complemented by an indestructible housing for the bearings, drive belts, and motor.

ANGLE SUPPORT

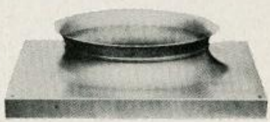
The ***Can Arm**** LB Unit is supported from the base with heavy gauge V-Type steel braces welded to an angle ring on which the spun aluminum hood is supported.

This ***Can Arm**** engineered design gives the LB Unit tremendous strength and rigidity and leaves the discharge area free of obstruction.



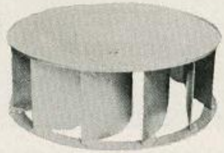
MOTOR COVER

The motor, belt, bearings, and drives on the ***Can Arm**** LB, Low Silhouette Exhauster are completely isolated from the discharge air and protected by an attractive, indestructible, Fiberglass weather hood. The hood is smartly sculptured to blend pleasingly with the roof line.



CURB

A deep cone spun into the rugged base of the ***Can Arm**** LB Low Silhouette Exhauster forming an unobstructed free flow venturi is greatly responsible for the efficient performance of the LB Exhauster.



WHEEL

The backward curved, non-overloading wheel used on the ***Can Arm**** LB, Low Silhouette Exhauster is ruggedly constructed with a deep-dish cone spun in back plate to increase rigidity and reduce turbulence. This insures a smooth running, more quiet wheel.

The ***Can Arm**** wheel is designed to overlap and fit the venturi with very close tolerance, consequently, a more efficient performance.

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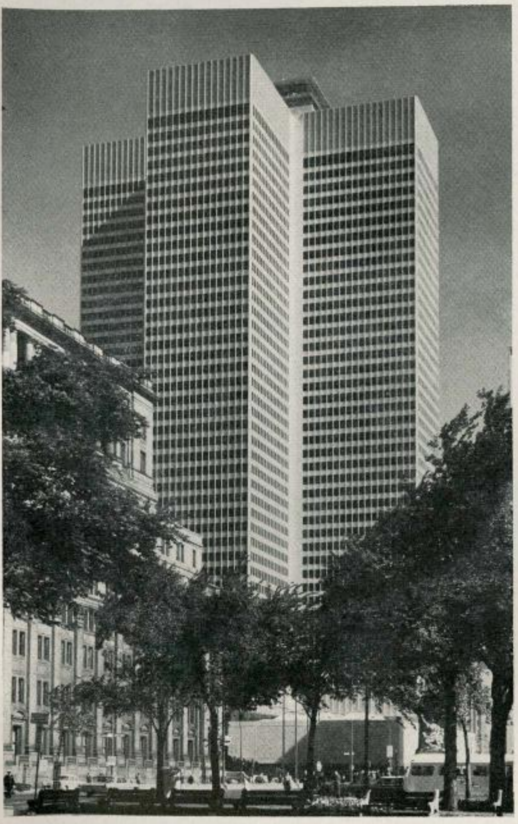
Place Ville Marie — Symbol of a City



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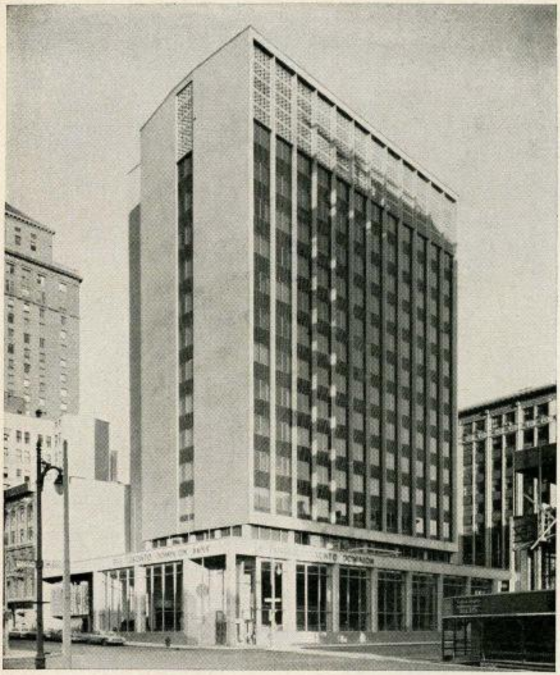

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PLACE VILLE MARIE

Developers: Webb & Knapp (Canada) Limited

Owners: Trizec Corporation Ltd.

Architects & Planners: I. M. Pei and Assoc. of New York (Henry N. Cobb, partner in charge, and Vincent Ponte, city planner).

Associate Architects: Affleck, Desbarats, Dimakopoulos, Lebensold & Sise, of Montreal.

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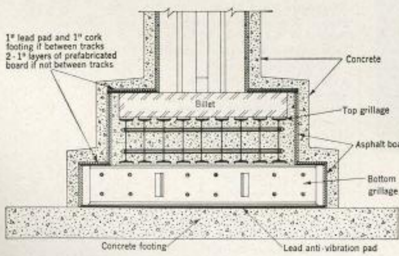
Place Ville-Marie **FLOATS** free from feel-and-hear vibration **ON LEAD** the modern metal



Built a-straddle the CN Central Station railroad yard, Place Ville-Marie's 42-storey cruciform has to shrug off plenty of vibration.

To isolate this prestigious building from *feel-and-hear* vibrations which otherwise would speed through its footings and columns from the tracks below, Canada Metal lead—in the form of lead-asbestos anti-vibration pads—was chosen.

Consult Canada Metal's Technical Service Department on all your *feel-and-hear* vibration problems . . . and just about everything in lead for architecture, engineering, construction and plumbing.

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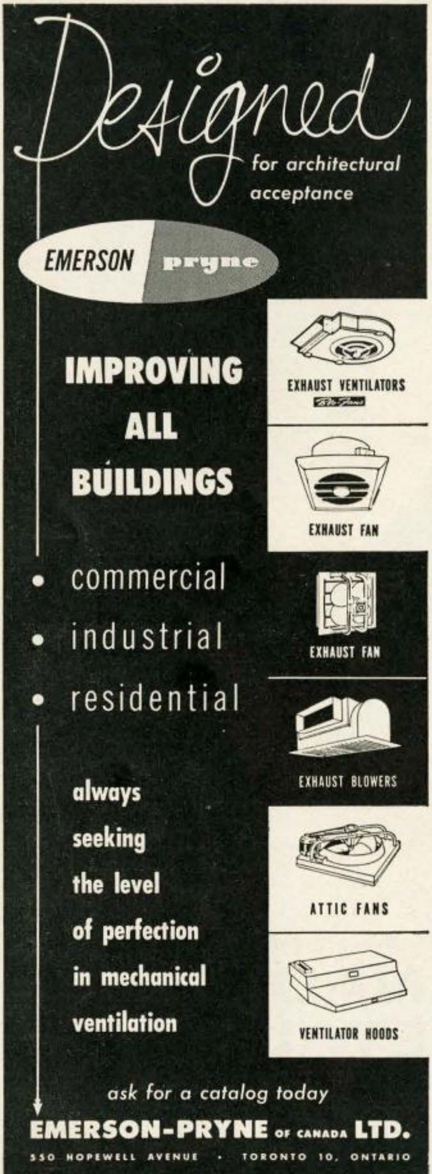

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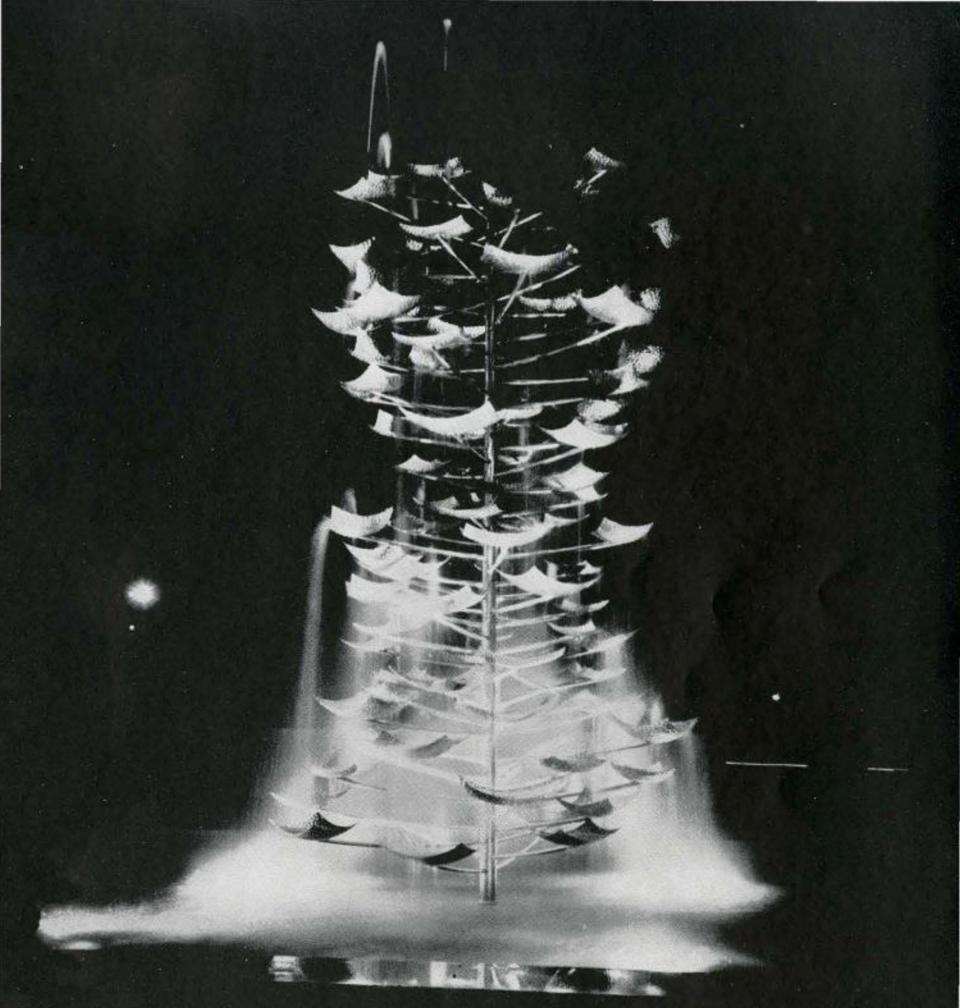

Even the sound is unique

This is the "tree-fountain," focal point of Ottawa's classic Garden of the Provinces. It's a striking new example of art applied to architecture by architect, Norman Slater.

Designed to contrast with surrounding buildings it stands 19' high. Fifty pairs of branches radiate from the main trunk and sprout into one hundred dished leaves. The entire "tree" is made of Atlas stainless steel.

Embossing of the stainless leaves adds interest to the over-all design by reducing metallic reflections to random highlights. Water flows from openings where the branches meet the leaves and, as it contacts them, produces a sound effect that is as unique and pleasing as the design of the fountain itself.

Structural design work was done by Mr. Felix Kraus and fabrication by Canadair Limited. Technical assistance was provided in the initial design stage by Atlas Steels' Architectural Development Department. This department was established in 1957 to assist architects, fabricators and building owners. Their help is yours for the asking. Atlas Steels Limited, Welland, Ontario, Canada's largest manufacturer of stainless steels.

ATLAS STEELS

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General Contractor: Poole Construction & Engineering Ltd.,
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