

Architecture Canada

Journal RAIC/La Revue de l'IRAC: November/Novembre 1966





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The Journal of the Royal Architectural
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Walter Bowker (right) Editor of Architecture Canada receives Industrial Marketing Award for Design Improvement from Sid Bernstein, API President.

Architecture Canada wins North American Award for Design Improvement

We are happy to announce that *Architecture Canada* has won the top award in North America for the greatest improvement in design among institutional and professional publications in the past year. The 28th Annual Editorial Achievement Competition was sponsored by the US publication *Industrial Marketing*. There were 346 entries, 31 of them in the institutional and professional class, which includes all the architectural publications in Canada and the United States. *Architecture Canada* was the only Canadian publication to win an award in the competition, and won the bronze plaque in its class. The *Architectural Record*, a runner up in the same class, was given a certificate of merit.

The issues of the magazine entered in the competition were July, 1965, an example of the old layout and typography; and February 1966, (on libraries) a good example of the typography and layout adopted in January this year. The graphics designer is Anthony Mann of Design Collaborative Ltd, Toronto and Montreal.

The comments of The Jury were "Changed type face and layout style, then divided the

publication into nine standard numbered sections (Associate Editor A. J. Diamond's suggestion), the numbers acting as constant coding from month to month and as a graphic identification. The demarcation by numbers also serves to separate editorial matter from advertising."

The presentation luncheon at the Waldorf Astoria Hotel in New York on November 3, was one of the best organized such affairs we have ever attended. A reception for the forty winning editors, their friends and staff, began at 12.00 noon. Lunch began at 12.30, and by 2.00 o'clock, fifteen bronze plaques and twenty-seven certificates of merit had been awarded and a brief but appropriate speech had been heard.

Our only regret was that airplane trouble prevented our senior advertising staff from landing in New York to help carry home the loot.

Also in Typography '66 Exhibit
Architecture Canada also ranked in another Competition this year. No awards were given in "Typography Sixty-Six" competition, conducted by the Society of Typographic Designers of Canada, but of 1,300 entries submitted, 154 examples of typography used in publishing and industrial applications were selected to be hung. Our entry was the only one to be selected in the architectural publication field.

Eric Arthur Honored

Dr Eric Arthur was honored by several hundred former students, friends and colleagues with a testimonial dinner in Toronto on October 20 arranged by the Alumni Association of the School of Architecture, University of Toronto. For Eric Arthur, teacher, fisherman, author, raconteur, critic, professional adviser for great architectural competitions, adviser on the arts, it was a great evening culminating with the presentation to him of an original Harold Town. James A. Murray was Chairman, and speakers included Mayor Givens and former Mayor Nathan Phillips of Toronto, and Ian McLennan of Ottawa.

Garnet W. Wilson, MRAIC

The late Garnet W. Wilson, MRAIC was the eldest of three sons of the late Amon A. Wilson, KC, High Sheriff of Saint John, N.B.

Mr Wilson, although retired from active practice for a dozen years, retained the well deserved respect of his contemporary practitioners and all others who knew him.

Architecture as a life work called him around the turn of this century when, after graduating from High School with honors, he entered the office of my father, the late Harry H. Mott, FRAIC, as a junior draftsman. Mr Wilson diligently applied himself to study and work in the field he had chosen and toward which he had a natural aptitude. He had an orderly mind and meticulous regard for details, which assured his success.

Wishing to broaden his training, and after six years he, with the best wishes of his employer, transferred to the architectural office of the late Mr Stone in Montreal who within two or three years returned him to his native city, Saint John, to supervise the erection of the new King Street Royal Bank Building, one of the earliest fire resistant structures in the area.

Soon after this Mr Wilson established his own office in Saint John and continued to practice there until his retirement. During these years he was favored with a

fair share of general practice. There are many buildings in New Brunswick which stand as creditable examples of his design ability. He was architect for the Simonds Regional High School in East Saint John, which at the time was the largest school of its type in the province.

Mr Wilson was one of the original members of the Architects' Association of New Brunswick and served a term as its President.

Throughout his life and practice he maintained a very high ethical standard. As a contemporary and competitive practitioner I can honestly say he always held my respect as he did that of his fellow architects, his clients, contractors, and all who knew him.

He was a quiet man addicted to golf when time permitted, a student of world history and prophecy, a thorough and sincere Christian gentleman.

As a lifelong friend I am richer because of our companionship and, like all who knew him, poorer for his passing.

H. Claire Mott, FRAIC

Concrete Awards Program - 1967

A Design-Canada Concrete Awards Program to honor Canadian architects and engineers has been announced by the National Design Council and the Department of Industry in co-operation with the Portland Cement Association. Jury members include: K. Izumi, MRAIC, Regina; J. A. Langford, MRAIC, Ottawa; Edouard Fiset, FRAIC, Montreal; and Carl F. Morrison, Toronto; Claude Bourgeois, Montreal, and J. Philip Vaughan, Halifax, engineers. Awards will be given in four categories - buildings costing less than \$1,000,000 and over \$1,000,000 and bridges costing less than \$500,000 and over \$500,000. All entries must be located in Canada and must have been completed during the period January 1, 1964 to March 1, 1967. Important dates to remember are January 20, 1967, last day for receipt of the notice of intention; March 1, 1967, last day for receipt of preliminary submissions; May 19, 1967, last day for receipt of final submissions.

New Awards for Design Excellence in Federal Public Buildings

The Department of Public Works for Canada has announced plans for a program of awards in recognition of architectural excellence in designs created for the department by Canadian consultants. Work produced between January 1, 1964 and January 1, 1968, will be eligible. Winners will receive citation plaques and the Department of Public Works also intends to give special consideration to all winners in future commissions for federal government work. The design submissions later will be

developed into a travelling exhibition which will be circulated widely to promote the aims of the program. John A. Russell (F), Winnipeg, is director of the program.

Canadian Standards in Building Codes

A compilation of specifications and standards of importance called up in the National Building Code of Canada 1965 edition is now available in book form at \$5.00 a copy from the NRC, Ottawa. This volume is a companion to the "ASTM Standards in Building Codes" (ASTM, 1916 Race Street, Philadelphia, \$15.00, \$10.50 for ASTM members), and contains in addition to CSA

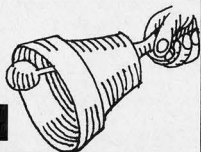
standards reproductions of standards and specifications published by Canadian Government Specifications Board, Ottawa; American Concrete Institute, Detroit, Michigan; American Standards Association, New York; British Standards Institution, London, W1, England.

Farm Building Standards Revised

A revised edition of Farm Building Standards, Canada, 1965, has now been published and is available from the Division of Building Research, National Research Council, Ottawa, for 50c.

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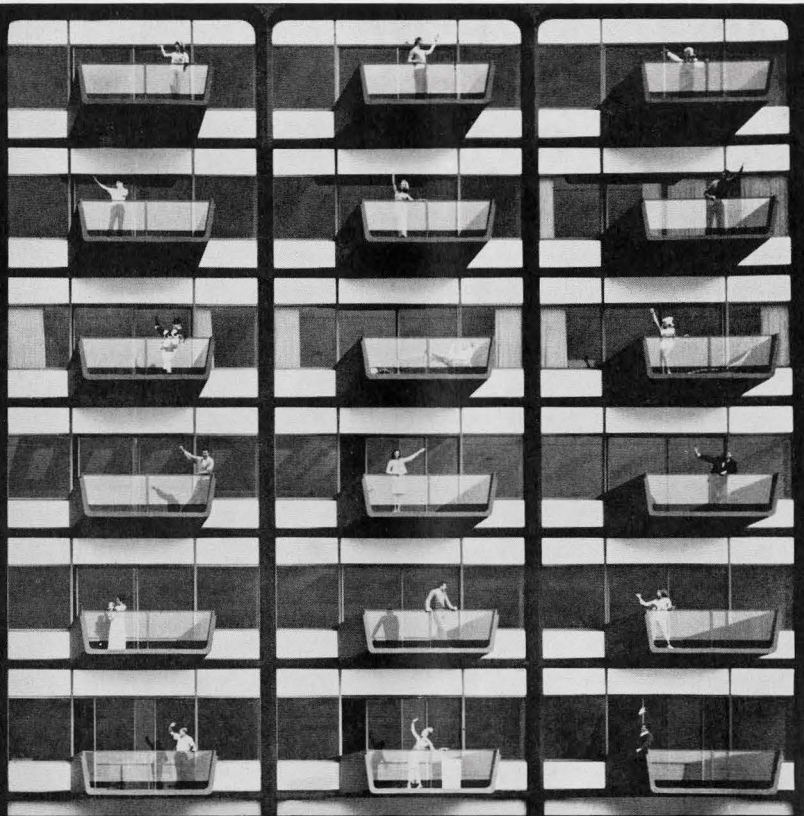


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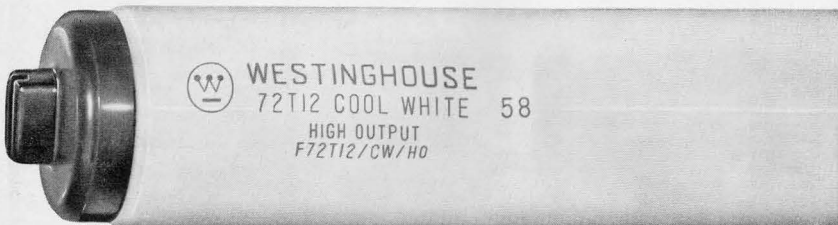
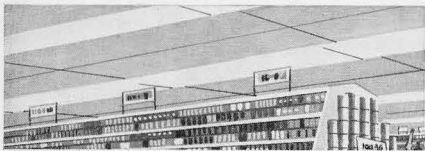
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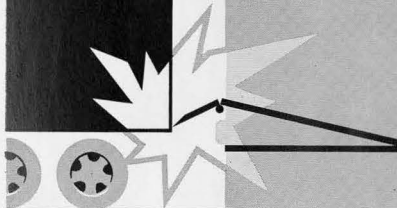
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RAIC Council

Council met on September 23 and 24 in the PQAA Boardroom, Montreal, with all 15 members in attendance and President Charles Fowler (F) in the chair.

Principal item on the agenda was the Survey of the Profession report. The President presented recommendations for its implementation, enlisting the aid of certain committees of the Institute and of some Provincial Associations. Council members reported on discussions with Provincial Councils, indicating a general desire to implement the recommendations of the Survey report — with the exception of Quebec, which has expressed a desire to proceed on a provincial basis.

The President's recommendations were adopted, and negotiations based on them will be pursued, for report to the November meeting of Council.

George E. Bemis, chairman of the OAA Host Committee for the 1967 Assembly, outlined program plans based on the theme "The Building of Cities". Dr John Deutsch and Sir Hugh Casson are to be the main speakers.

Edouard Tremblay (F) reported that the recent PQAA referendum to its members resulted in a majority vote against increasing per capita dues to RAIC to the required \$35.00 amount. Following lengthy consideration, it was agreed that the Officers should request a meeting with PQAA Council to discuss the matter.

Vice-President James E. Searle (F) presented recommendation of the Journal Board that its name be changed to "Publications Board". The change was approved, and will be submitted to the Electoral Board for amendment to the By-Laws.

A. T. G. Durnford (F), chairman of the Scholarships and Awards Committee, was invited to present recommendations for re-institution of the RAIC Gold Medal. It was

agreed that the Medal is "To be awarded to an Architect for great achievement and contribution to the Profession, or to a person of Science or Letters related to Art and Architecture", on an international basis. It is hoped that it may be presented in 1967.

Mr Durnford reported that Miss Michèle Bertrand, Université de Montréal, was awarded the André Francou Scholarship for 1966. Council endorsed the conditions for the first Concrete Design Awards program, being conducted by the Department of Industry.

The President reported on the meeting of the Officers with officials of the Department of Industry, in June, and on subsequent discussions. The Institute has been invited to participate in advisory committees, now being established.

Since information from the National Parks Branch of the Government reveals that the terms of a resolution of the 1966 Annual Meeting on this subject are already being implemented, it was agreed that it would be unwise to proceed further with the resolution.

In view of the very heavy program of activity facing the Institute, as a result of the Survey report, Council agreed that no action could be taken at this time on proposals concerning "Canada's Role in Development of the World Community".

Other matters considered by Council at this meeting included a Handbook of Architectural Practice, arrangements for visiting Architects at Expo 67, Massey Medals for Architecture 1967, and representation to UIA, CIB and the Commonwealth Association of Architects.

Fred W. Price
Executive Director

Le Conseil de l'Institut

Le Conseil a tenu une réunion les 23 et 24 septembre dans la salle du Conseil de l'AAPQ, à Montréal, sous la présidence de son président titulaire, M. Charles Fowler (F). Les quinze membres étaient présents.

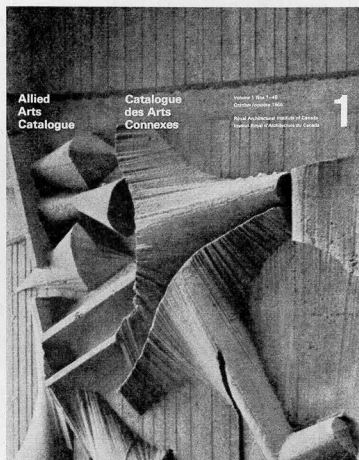
Le principal article à l'ordre du jour était le rapport de l'enquête sur la profession. Le président soumet certaines recommandations au sujet de la mise en oeuvre de ce rapport avec l'aide de comités de l'Institut et de quelques-unes des associations provinciales. Les membres font part des résultats d'entretiens avec les conseils provinciaux. On note un désir général de donner suite aux recommandations formulées dans le rapport, sauf dans la province de Québec où l'on a exprimé le désir d'agir sur une base provinciale.

Les recommandations du président sont adoptées et il est décidé de poursuivre des négociations fondées sur ces recommandations et de faire de nouveau rapport à l'assemblée de novembre.

M. George E. Bemis, président du comité d'accueil établi par l'AAO en vue de l'assemblée de 1967, expose les grandes lignes du programme inspiré du thème "La construction des villes". M. John Deutsch et sir Hugh Casson seront les principaux orateurs.

M. Edouard Tremblay (F) déclare qu'au cours d'un récent référendum les membres de l'AAPQ se sont en majorité prononcés contre le relèvement des cotisations individuelles à l'IRAC au montant exigé de \$35.00. Après une longue discussion, il est convenu que les dirigeants de l'Institut s'efforceront d'organiser une rencontre avec les membres du Conseil de l'AAPQ en vue de discuter la question.

Le vice-président, M. James E. Searle (F) soumet des recommandations de la Commission du Journal demandant que son nom soit changé en celui de "Commission des publications". Le changement est approuvé et il sera soumis à la Commission électorale



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en vue des modifications à apporter aux Règlements.

M. A. T. G. Durnford (F), président du Comité des bourses d'études et des prix est invité à soumettre des recommandations visant le rétablissement de la Médaille d'or de l'Institut. Il est convenu que la médaille sera "décernée à un architecte ayant de grandes réalisations à son crédit ou ayant contribué de façon signalée à la profession, ou à une personne versée dans des sciences ou des lettres connexes à l'art et à l'architecture", sur une base internationale. On espère que la médaille sera décernée en 1967.

M. Durnford signale que Mlle Michèle Bertrand, de l'Université de Montréal, a reçu la bourse d'études André Francou 1966. Le Conseil approuve les conditions du programme de prix d'esthétique pour constructions en béton organisé par le ministère de l'Industrie.

Le président présente un rapport d'une rencontre entre les dirigeants de l'Institut et les hauts fonctionnaires du ministère de l'Industrie en juin et des discussion qui ont eu lieu par la suite. L'Institut est invité à faire partie de comités consultatifs actuellement en voie de formation.

Comme, d'après des renseignements reçus de la Direction fédérale des parcs nationaux, il est déjà donné suite aux termes d'une résolution adoptée à l'assemblée annuelle de 1966, il est convenu qu'il ne serait pas sage d'insister davantage sur cette résolution.

A cause du fort programme d'activité qui s'impose à l'Institut par suite du rapport de l'enquête sur la profession, le Conseil juge qu'il est impossible pour le moment de travailler à la mise en oeuvre des propositions visant "le rôle du Canada dans le développement de la communauté mondiale".

Au nombre des autres questions discutées à cette réunion, il y a lieu de mentionner un Manuel de pratique en architecture, les dispositions en vue de l'accueil des architectes à l'Expo 67, les Médailles Massey en architecture 1967 et la représentation de l'Institut à l'UIA, au CIB et à l'Association des architectes du Commonwealth.

Le directeur général
Fred W. Price



**Someday,
somebody's going to come up with
a better roof insulation.**

**But until that happens
why change a good thing?**

Donnacona roof insulation has structural integrity, excellent compressive and shear strengths, and under Canadian climatic conditions there is no measurable thermal expansion and contraction. Neither the application of the hot bitumen during construction nor the coldest winter day affects it.

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Donnacona roof insulation has been giving trouble-free service for years. So why not specify Donnacona?

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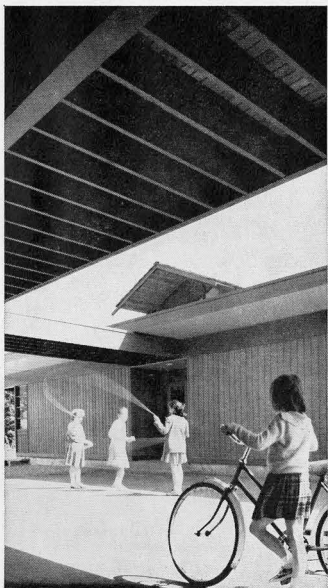
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**For Schools
that put students
and staff at ease!**

Architects McCarter, Nairne and Partners used wood in Ross Road School, North Vancouver, for its structural adequacy, ease of construction, durability, construction economy and the compatibility of wood with the surroundings.

**use wood...
and your
imagination**



An architect commissioned to design a school faces many considerations, of which two are vital: how to deliver the most for the tax dollar and how to create the best environment for learning. Architects generally acknowledge the structural advantages of wood — including laminated wood and plywood — by using it more extensively than ever. But they are intrigued and challenged by the variety of ways in which wood can create the right atmosphere both outside and inside a building.

Outside, wood alone or in combination with other materials, welcomes students and staff.

Inside, in classrooms, recreation areas and assembly halls, cafeterias and corridors, its reassuring warmth dispels the cold atmosphere of conventional institutional design. Wood doors and windows are practical and efficient, and carry along the warmth of wood in fact and feeling.

The friendly personality of wood puts students and staff at their ease.

The book "Environment for Learning" gives much valuable information on this subject.

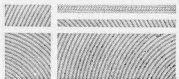
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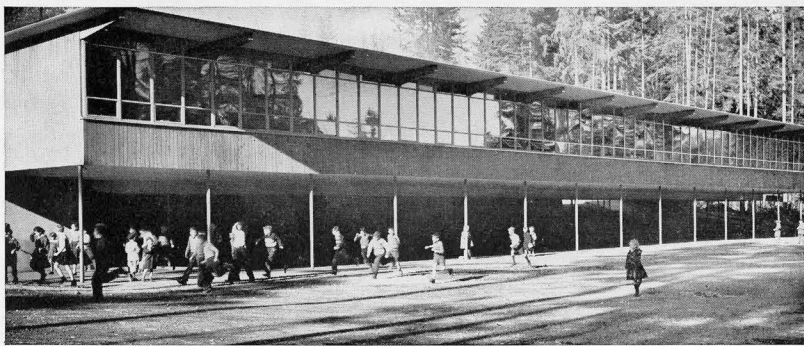
MONTREAL • TORONTO • LONDON

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Laminated wood arches lend beauty as well as structural efficiency to school buildings. Such 'heavy timber' construction fits in well with modular plans and permits economical extension with population growth.

Besides being a fine example of economical construction of native woods, Cedardale Elementary School, West Vancouver, B.C. has other desirable characteristics. It looks at home in the neighborhood, makes students and staff feel at home and reflects a favourable impression of the school system. Architects, Davison and Porter.



The temper control!



Stop temper tantrums from shower shock with Crane-Rada's fitting for simple, accurate control of shower temperature and flow.

This dual-function valve offers the comfort and safety of thermostatic mixing . . . and eliminates fumbling for separate flow controls at the same time.

Because it eliminates separate volume control and non-return valves normally associated with thermostatic valves, the Crane-Rada lets you work with only one functional element in all bathroom plans. Its simple good looks fit every installation. Specify Crane-Rada . . . the thermostatic mixing valve with flow/temperature con-

trol . . . in various assemblies for industrial, institutional, and residential projects.

For information write Crane, Box 2700, Montreal 9. See it at Crane showrooms in Montreal (1170 Beaver Hall Square), in Toronto (123 Eglinton East), and at wholesalers everywhere.

CRANE



add soda and lime...



Take sand add soda, lime and Pilkington ingenuity for Profilit structural glass

To make glass you mix sand, soda and lime. That is the over-simplified but basic formula. But for the exceptional you must have ingenuity and inventiveness. Pilkington has been manufacturing and developing quality glass products for well over a century and a half. It's worth noting that most of the pioneering in glass technology takes place at Pilkington.

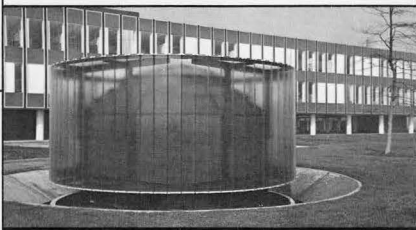
Pilkington
GLASS LIMITED

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Profilit: a new method of expression in glass

This unique Pilkington glass product has a wide variety of decorative and structural applications for both interior and exterior use.

Profilit is a channel shaped glass, 10 $\frac{3}{16}$ " wide overall with 1 $\frac{1}{2}$ " deep flanges. It is $\frac{1}{4}$ " thick. Available in lengths up to 16', with or without parallel strands of wire set 1" apart.



Profilit Wireline enclosure for an air conditioning and cooling tank.

As it is a structural material, unlimited horizontal runs are possible without mullions.

The uses for Profilit are varied, and simple installation methods eliminate standard metal frames.

The Pilkington Contract Department can provide you with complete details on the use and installation of Profilit. A 'Total Service' for architects provides advice and technical assistance at the design stage.



The curved elevation on the second story of this building is glazed with Profilit Glass.

Should you have any questions about the use of Profilit structural glass, please call your nearest Pilkington Contract Department.

STRUCTURAL STEEL IS THE BASIC MEDIUM OF MODERN ARCHITECTURAL EXPRESSION IN NEW BUILDINGS ACROSS CANADA

WASCANA CENTENNIAL AUDITORIUM

An imaginatively conceived building, the Wascana Auditorium is a beautiful addition to the growing city of Regina and a fitting monument to Canada's Centennial. Built and finished in an intriguing variety of building materials, it has a steel superstructure incorporating Algoma Welded Wide Flange Shapes. Steel framing provides the greatest opportunities for the finest expressions of modern architectural concepts.



TORONTO DOMINION BANK TOWER

Already familiar to most Canadians as the tallest building in the Commonwealth, this 56-story office tower is a superb example of the modern use of steel construction. Algoma Welded Wide Flange Shapes are used in the steel floor system where openings for services can be made with ease. This feature of structural steel provides the flexibility so necessary to the most functional and economical interior organization of a commercial building.



WINNIPEG GENERAL HOSPITAL

Welded structural shapes were used in this combination laundry building - parking garage, designed to suit the limited building site available. This structure proves once again the superiority of steel over competitive building materials in speed of construction. 280 tons of beams and columns were erected in only thirteen working days in typical winter weather—the warmest day was 10 degrees below zero.



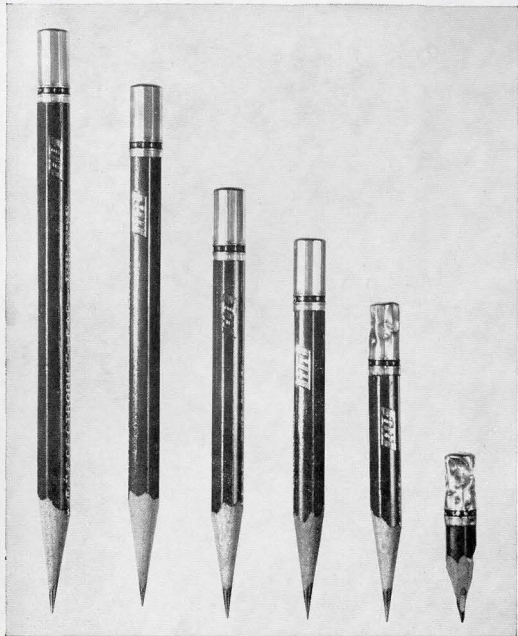
QUEBEC PAVILION—EXPO 67

In a setting that will be the showplace of the world in Canada's Centennial year, this building is a striking example of the creative use of steel. The pavilion contains 377 tons of Algoma Welded Wide Flange Shapes in sizes from 36" to 48" deep. In addition, Algoma has also supplied a wide variety of other rolled shapes for this unique steel frame structure.



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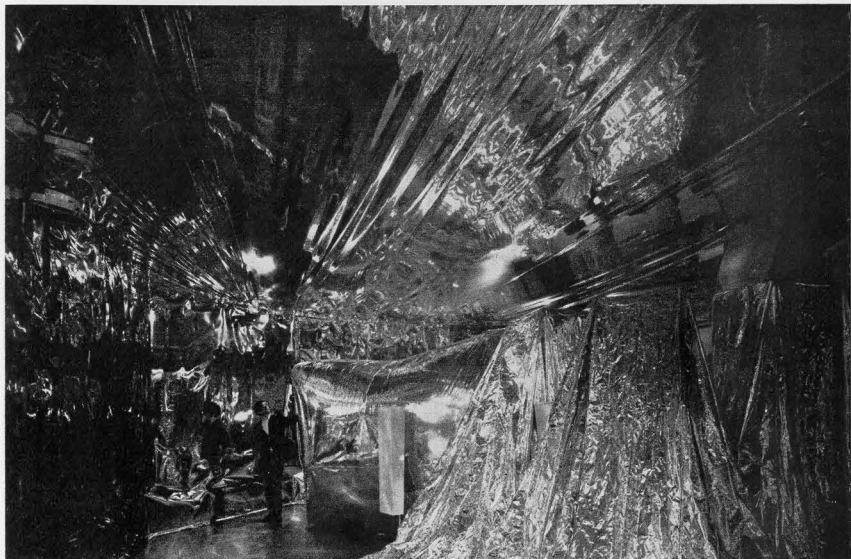
For instance, Sweet's means that you don't have to squander time checking through several filing cabinets searching for loose or loose-leaf product information which may have been lost, misfiled or thrown out. The comprehensive content of Sweet's seven volumes makes it quick and easy for you to find the material you need—it's broken down into 16 divisions and indexed by product, company and trade name in English and French.

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1

There are two sets of twins in the family of Art and Architecture, the Siamese twins of *total architect* and *artist* and the identical twins of the *integrators*. For this issue let us look at the problems set by the Siamese pair.

The surgical knife of functionalism in the development of the industrial era has cleaved the twin body into two separate entities of artist and architect, each pursuing a separate course. As separate entities each is not too well aware, or respectful, of the other's existence as an integral part of society. The wounds of architecture were antiseptically healed by the sterile application of technological beauty, bound and bandaged by specific purpose. Under this prospect,

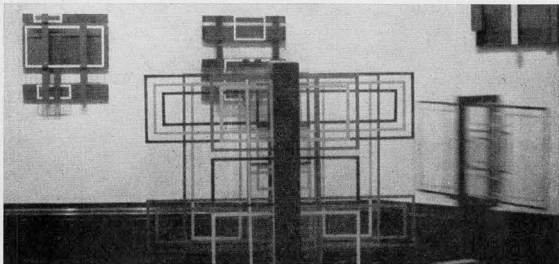
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"Slipcover", *total art* by Les Levine
"Slipcover", *art total par* Les Levine

the economic success of the profession of architecture is assured without question. Never has the architect been more materially rewarded or had less moral demands made upon him. Society, on the other hand, has, in return, for the architect's social security and freedom from romantic demands, been rewarded with what surely must be the most uninteresting and ugly cities in history. Aesthetic uneasiness has pushed the more sensitive architect into the narrow personal calling of creating the perfect building ignoring the collective horror of its own environment. The *total architect*, indifferent to the damage done to the fountainhead, or lacking courage to correct the situation, seeks to express in his own terms complete beauty in a self-centered unit of his own creating.

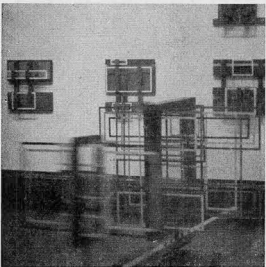
Similarly, the *total artist* has emerged although through a different process. By comparison, superficially at least, it would seem that, except for a small percentage, the artist and his profession is an economic failure. Torn away from his romantic association with architecture, he has run his separate path, to be finally, the creator of functionless forms of pure mysticism — the manufacturer of art for contemplative purpose only. In truth, however, in spite of the artist's hazardous existence and poor material rewards, he has a real place in economic society as one who provides the means of existence for one of the biggest secondary industries in industrial times — to quote a well-known English Gallery director — *The Spivs on Art* (printers, publishers, gallery directors, the public gallery attendant, photographers, *art teachers*,

2, 3

Zbigniew Blazeje's *One Man Show* at Ontario Gallery of Art, Toronto, January 1966
 Exposition solo de Zbigniew Blazeje à la Galerie de l'Ontario, Toronto, en janvier 1966



2



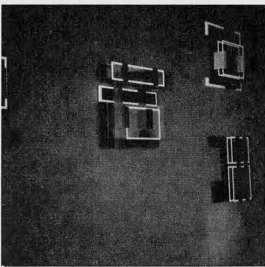
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critics and journalists) making lucrative livings from the images of artists. For this favor the artist is rarely paid or protected by copyright. For the undrugged and non-alcoholic member of a metropolis society whose perceptions are not entirely dulled, this is often the only aesthetic excitement offered.

That the *total* architect is unaware of the worth of *total art* is evident in his reluctance to afford it house room in his living galleries of schools, hospitals and commercial halls of his creation. That he is coerced by legislation is shameful. The total artist, once having created is equally indifferent to the state of presentation of his image to society. It is manifest in an unprofessional inertia to control the improper use of his product.

4

Blazeje's *Regina* /66 Audio Kinetic Environment in ultra violet light
 Environnement audio-cinétique à Regina en 1966 dans une lumière ultra violette par Blazeje



4

Esoteric gallery, museum and general public display rarely presents the *god-heads* in an entirely worthy fashion. Decapitated icons, writing totems are captured and crowded into unsympathetic rooms. They ridiculously posture and vie with each other for immediate attention in temporary settings. Similarly small works of art are treated as items of home decoration, punctuating space in conjunction with plastic plant or floral arrangement as innocent beguilements. This wickedly traduces the true purpose of the total artist.

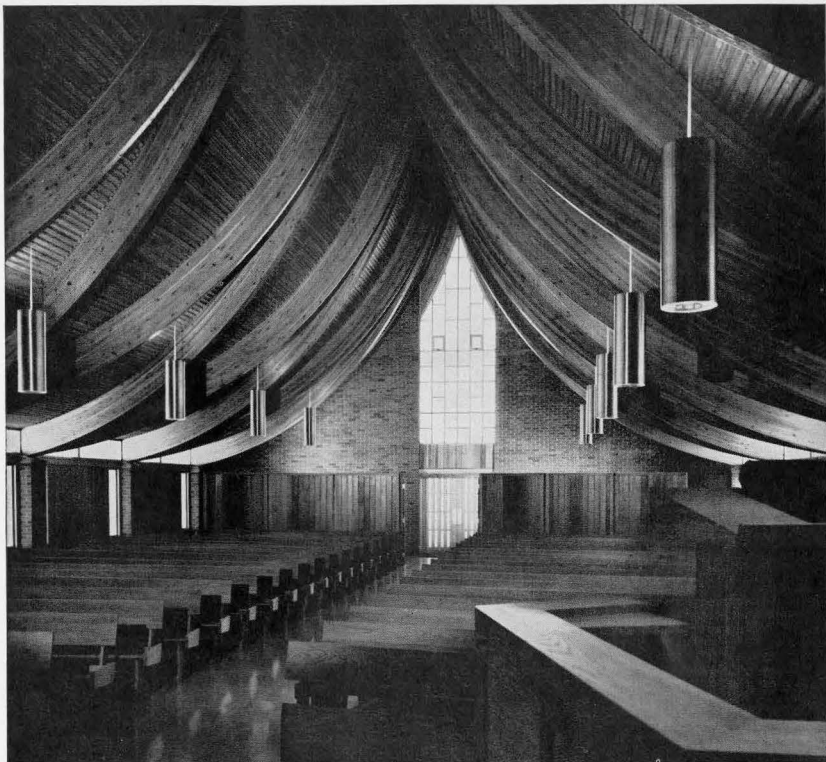
In the light of time it is amazing that the artist has been so preoccupied so as to suffer such ridiculous patronage. However, a warning bell has been sounded loud and clear. The new art movement of *The Total*

Environment sounds a theatrical trumpet loud and brassy enough to blast down those architectural walls of Jerico which, as battlements have been erected against environmental space for art. Certainly it is theatrical and temporary in nature, but is none the less valid for that. These innovators have created a temporary architecture for total involvement. What's more it is not for sale. Existing for total public experience it belongs to every man. This year, in North America, we will see the current fashion of Pop which has certainly reached the man on the street, superseded by total environment artists such as Les Levine and Ziggy Blazeje. These men are the phenomena in art born of frustration, forced to create fitting architectural atmospheres for their own imagery.

A local critic may have found the Levine show *Slipcover* (Ontario Art Gallery, Sept. 23—Oct. 23) boring, but the public did not. This critic conditioned by the timeless icon and monumental stoic has failed in his perceptions to see this exhibition as a successful, if desperate, attempt to draw attention to the plight of total art. He has rescued it from false patronage and housed it completely and worthily where environment and involvement become a unified experience, easily accessible to the common man.

There can be no compromise. When man is deprived of nature's aesthetic excitement by the builder-architect who plunders the landscape for his own edifices, the demand is for a comparable aesthetic compensation through the excitement of art. This is not to be a pale substitution of potted plant or artificial garden but an open admission that the town is *not* the country and that provision be made for the noblest of excitements which thrive in a metropolis . . . to wit, total *art* and the top exciters of the scene this century . . . the total artist. In this situation that total architect should not be too precious or fearful of vulgarity but admit his edifice would be more complete with clearly defined space for the total and exclusive involvement with contemporary art images. This is to be no chamber where items become a mere collection, but space which allows a total image to fully operate without qualification or distraction. Next issue . . . *The Integrators*

Anita Aarons



WESTMINSTER PRESBYTERIAN CHURCH—Barrie, Ontario
Architect: Salter and Allison, Barrie, Ontario

electric heating gives you new freedom in design

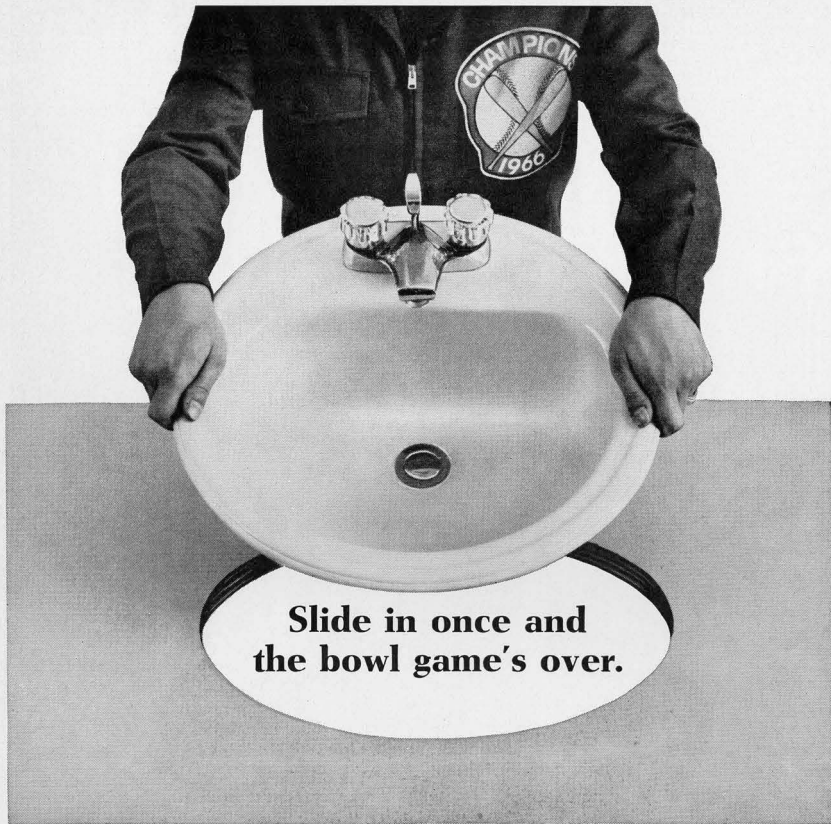
There are over 240 electrically heated churches in Ontario. One of the most important factors influencing the swing to electric heating is the substantial saving in capital costs. Electric heating dispenses with the need for space consuming, fuel burning equipment. Moreover, actual installation is simpler and more economical. This also shows to advantage when extensions to the building are required. Many architects have applied these savings towards the use of more exciting materials or methods of construction.

The absence of piping, ductwork and chimney also leads to greater freedom in design.

Electric heating offers many other benefits. The flexibility of zoned temperature control avoids the expense of heating the entire church at times of partial use. The system requires little or no maintenance. It is extremely clean, quiet and safe. In fact its safety often results in an appreciable reduction on church insurance rates.

Consider the advantages of electric heating for your next church design . . . or for any building. For more information, ask your Hydro.





Crane *Cush'n Seal* makes the Cortina instantly watertight.

Cut out hole, slide in basin, tighten clamps. It's instantly watertight because of *Cush'n Seal*, the automatic rimming gasket from Crane. A one man job in one third less time. And time is your money.

Cush'n Seal now comes on the cast iron Cortina. Semi-elliptical bowl in the 18" round design, hidden front overflow, and comes in seven fashionable decorator colours and white, of course.

So when people insist on cast iron—you profit more with watertight *Cush'n Seal*.

And that says nothing for *Cush'n Seal's* no-maintenance

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CRANE



Project: Le Chateau Champlain, Montreal Architects: D'Astous & Pothier General Contractors: Cape—Janin; Joint venture Hardware: Durand Hardware Company

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chose **Russwin**
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Canadian Pacific Hotels Ltd., pay close attention to detail; they know Le Chateau Champlain, with 640 rooms, is only as good as its fine points. When you work with this point of view, you'll find that your Russwin representative is a good man to work with. He has quality locks and door hardware to suit every need and location. Each piece is made with strictest attention to detail and designed for the easiest possible installation. Russwin locks and hardware are noted for their great durability, beauty and trouble-free operation.

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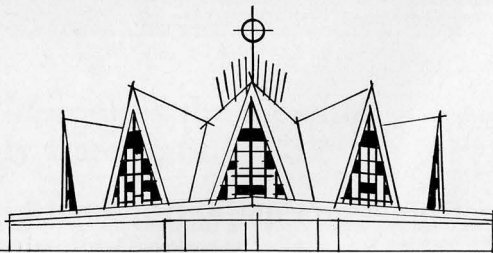
RUSSWIN LOCK DIVISION
BELLEVILLE, ONTARIO



stressed skin panels... new scope for design freedom

This church reflects the dramatic design freedom of a new era of architecture. More than ever before, these new designs are making extensive use of versatile, progressive Fir Plywood structural component systems. The Wexford Presbyterian Church in Toronto is an exciting example of a new use for stressed skin panels. These panels can be fabricated to any shape to meet most design specifications. As roof spans, they are particularly economical in the 12 to 24 foot range. Exciting designs like the Wexford Church demonstrate the limitless possibilities of plywood components in the world of modern architecture.

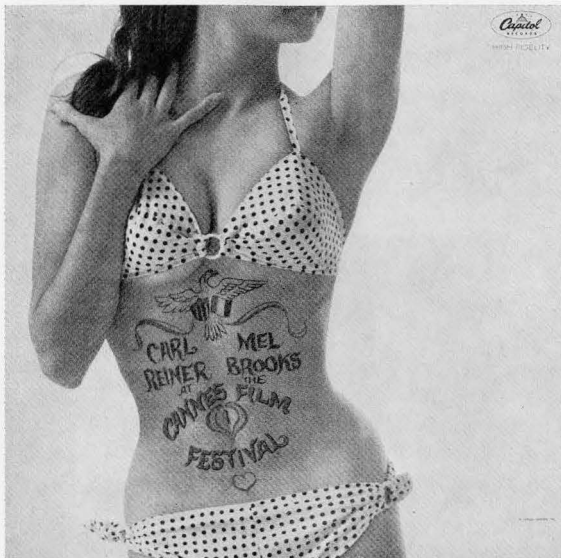
Write PMBC for your copy of 'Fir Plywood Stressed Skin Panels' (No. 60-72R64), introduction to design procedures.



Architects: Dunlop, Wardell, Matsui & Aitken — Toronto

PMBC FIR PLYWOOD

The edge-mark PMBC EXTERIOR identifies plywood manufactured with waterproof glue. Plywood Manufacturers Association of British Columbia, 1477 W. Pender St., Vancouver, B.C.



"Signage" See this month's Features Section

The above photograph is the cover for a jazz recording at the Cannes Film Festival reproduced from an article on Modern Jazz Record Jackets in *Graphis*, No. 124, 1966.

The following is an extract from an editorial in "Arts & Architecture" which reflects our own view as expressed in our July 1966 issue, page 5. *It would be much easier and much less expensive to get out a glossy picture magazine without regular significant editorial content.* "Arts and Architecture" says,

"To put it bluntly, your architectural journals have become little more than pretty picture books, entertaining and trivial, a medium for public relations. And this at a time when

architecture is deeply troubled, when the gap between what is professed and what is performed widens with each new building and the clash of theories has split the profession into profoundly opposed factions, groups, divisions and sub-divisions. Indeed, within many American architectural schools this clash has assumed bitter destructive proportions. . . .

"Your journals have not provided, as they should, a forum for the ideas behind these conflicts, although the disputed concepts are much nearer the heart of architecture than most of the buildings published. With the exception of isolated (and usually non-staff

written) articles, there is no attempt to clarify the confusion of values and ideas that lies behind so many of the seductive, misleading photographs supplied by the architects; no attempt to stir the reader to independent thought. There is no real and consistent involvement with architecture below the level of personalities and appearances. Readers are offered no observable unequivocal point of view to analyze; no stand is taken that might offend anyone.

"In short, your American architectural journals have totally abandoned the traditional role of the press to educate and enlighten; they make no contribution to an architectural direction. On the contrary, their indulgent editorial policies permit publication of the most insignificant architectural limerick provided the name is right or the project a sufficiently arresting mutant. This permissiveness serves to perpetuate the confusion of standards, goals and values already so manifest in your architecture and environment. . . .

"(I'm speaking of the major, national journals and not their innumerable regional imitators, which are wretched, hopeless travesties.) For example, after finding with difficulty the editorial section of a recent issue of one of the most profitable of your journals, what does one see? An illustrated article on three museums, including the disaster in Los Angeles. Instead of doing as it has a magnificent public relations job for the three architects involved – at least two of whom need no such help – why not an honest and responsible appraisal with the title, say, 'The Museum: Must It Be A Mausoleum?' followed by a discussion of why museums succeed or fail from the viewpoints of artists, curators, collectors and trustees. . . .

"This explains the editorial tone, the dedication of your journals to the defense of the status quo.

"Further on the author (Prof John Tebbel of NYU) states, 'It is a bizarre commentary . . . that more than one periodical today is read for its advertising rather than its editorial

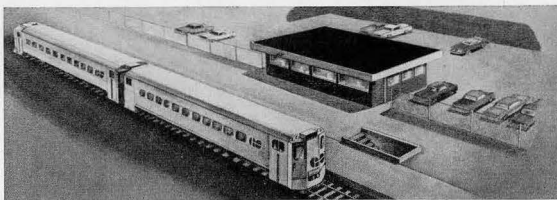
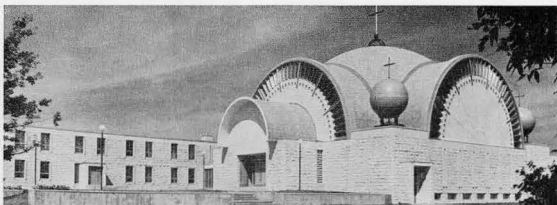
content. The ads, whatever their quotient of truth may be, offer originality and imagination, freshness and variety, all qualities which are conspicuously missing from tired or uninspired editorial formulas. . . .

"In the final analysis, it is the reader who will have to act to bring your journals back to the mark. The publisher now concerns himself with the subscriber only in the aggregate and secondarily — as the means to obtain advertising. If the reader continues to be satisfied with this insulting role and the equally insulting, dropsical magazines he currently receives, there is little hope for improvement. D.T."

Corny symbolism of the worst literal kind (1), "Ukrainian" domes in Winnipeg built in reinforced concrete for the Ukrainian Catholic Church: (2) railroad tracks and I beams set in a concrete display case for the Casimir Gzowski memorial, Toronto. Sir Casimir was a builder of roads, bridges and railways in the middle of the 19th Century. What a faint-hearted memorial to a pioneer!

(3) is a drawing of a prototype station for the government of Ontario transit. (4) is a drawing (the building is nearing completion and looks much worse than the perspective) of the Metropolitan Toronto Rosehill Pumping Station. The appalling standard of public works that these projects exemplify should not go without comment. The station exhibits a bankruptcy of imagination and a crudity of detailing, besides not being remotely connected with an architecture that has any relevance to transit systems. The pumping station, dressed up in false "architectural" detail, not only displays crude taste and inappropriate self-consciousness, but desecrates the edge of a public park. Instead of being quietly retiring (it might even have become part of the adjacent bridge abutment) and as anonymous as possible, it proclaims its vulgarity in strident, scaleless tones.

A. J. D.





WESTROC VINYLBOARD

new opportunities for creative wall panelling

Westroc Vinylboard is tough, colour-fast vinyl laminated on a solid, non-combustible, non-shrinking gypsum panel.

The prefinished surface gives maximum resistance to abrasion, stains and chemicals with the minimum of maintenance. Panel installation is quick and simple with one-time, one-team application. Installing Westroc Vinylboard is less expensive, less troublesome than building a wall and then applying a vinyl surface.

Westroc Vinylboard's wide range of colours and textures, and the variety of dividing battens and widths, provide unlimited opportunity for creative wall panelling in all areas requiring a durable wall finish.

Vinawood: The rich, masculine tones of Nutmeg Vinawood make it ideal for executive offices, boardrooms or other areas requiring distinctive elegance. The black "T" and extruded aluminum divider sets a modern mood to the overall décor.





Coarse Suede: The practical beauty of Coarse Suede lends itself perfectly to school rooms, auditoriums and other heavily trafficked areas. The bright, distinctive colours (e.g. Brass Green) provide an excellent teaching atmosphere. Economically finished with a butt joint, Coarse Suede will give years of worry-free service.



Bombai: The contemporary elegance of Alberta Sand Bombai would create a favourable first impression in any reception area . . . especially when used in 2' panels with a contrasting 2" walnut divider. The Bombai line's wide range of colours also gives unlimited opportunity for new decorating ideas in offices and apartments.





Briar: Panels of Yellow Gold Briar are divided by a 1" black "T" batten and harmonize well with any furnishing design. The clean, bright colours in the Briar line add new scope to the decoration of lobbies, corridors and other areas where a durable wall finish is important.



Travertine: This series offers new dimensions in contemporary design for meeting rooms, banquet halls and other large assembly areas. Travertine's decorative effect can be fully realized when contrasting battens are used. Here, Aqua Travertine panels divided with 10" teak set new standards for meeting room décor.



TECHNICAL DATA ON VINYLBOARD SURFACE

THICKNESS	.010 Bombai Pattern. .006 Briar, Coarse Suede, Travertine, Vinawood.
BOARD SIZE	Width: 4 feet. Thicknesses: $\frac{3}{8}$ " , $\frac{1}{2}$ " and $\frac{5}{8}$ ". Lengths to order.
COMPOSITION	A vinyl compound of poly-vinyl chloride resin combined with plasticizers, pigments and stabilizers to produce a durable and resistant surface.
ABRASION RESISTANCE	Meets D.P.W. specification 4-20A, section 5.3.
COLOUR FASTNESS	Meets D.P.W. specification 4-20A, section 5.4.1.
WASHABILITY	Good; no effect on the surface when cleaned with mild or common household cleaners.
STAIN RESISTANCE	Resistant to most stains; should be cleaned as soon as possible after staining.
CHEMICAL RESISTANCE	Resistant to most dilute acids and alkalies. Can be affected by active organic solvents.
HEAT RESISTANCE	Unaffected by normal temperatures.
MISCELLANEOUS	Resistance to cracking, peeling or chipping of the vinyl surface is very good under normal usage.
FLAME SPREAD	Flame spread 10. Fuel contributed 5. Smoke developed 5.
FIRE RESISTANCE	See ratings for gypsum wallboards.
METHODS OF ATTACHMENT	Can be used with most movable partition systems. May be attached to steel or wood studs, to backing board or to existing walls by 3 basic methods: (1) Nail or Screw (2) Adhesive nail-on method (3) Lamination.



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Page 37

Le "Signage" en tant que composant de l'ensemble d'un environnement.
par Anthony Mann

Le mot "signage" a été inventé par les concepteurs pour indiquer l'ensemble d'enseignes, plaques et lettrages architecturaux sans toute fois s'appliquer aux réclames commerciales. Le signage nous aide à nous retrouver dans l'environnement complexe que nous ont créé les architectes, planificateurs et hommes d'affaires. Le bâtiment public ne peut pas fonctionner sans signage mais il est rare que l'architecte considère le signage comme partie intégrante d'un édifice, sauf en arrière-pensée.

La conception d'un système de signage comprend une étude approfondie de fonctions, circulation et services d'un bâtiment sans quoi l'usager se trouvera en face d'une collection d'enseignes disparates servant à le confondre plutôt qu'à le guider. C'est le devoir de l'architecte d'insister sur un budget pour l'incorporation du signage dans le plan général dès le début.

L'Aérogare de Toronto est la meilleure exemple de la nécessité d'incorporer le signage à l'architecture. Dès le début, les enseignes étaient nettement insuffisantes. Pour y remédier, d'autres enseignes ont été ajoutées ici-là sans rapport à la conception et au dessin général des enseignes originales.

Le signage est un problème humain. L'individu dans son environnement subit les défauts d'un mauvais système et en souffre. Les inconveniences, l'irritation, la gêne, la fatigue, la perte de temps, sont rarement pris au sérieux; en fait, le signage devrait avoir une importance égale à l'importance des services mécaniques d'un bâtiment, ce n'est que l'architecte qui pourra l'assurer.

Page 40

Les Facteurs humains dans le Dessin et l'application du Signage.
par Martin Krampen.

L'architecte est responsable de l'organisation des espaces pour la fonction humaine y compris la coordination et le dessin des signes indicateurs, le signage. Malheureusement, le signage est trop souvent considéré

comme chose secondaire ou décorative, non pas en fonction du facteur humain. Nous voulons souligner que la question de signage a été l'objet de recherches sérieuses et que l'architecte se doit de consulter les résultats de ces recherches et de profiter des talents des concepteurs graphiques sachant traduire les recherches effectivement et esthétiquement.

La lisibilité a été l'objet des recherches les plus approfondies. La forme des lettres, leur grandeur, style qu'elles soient majuscules ou minuscules influencent la lisibilité. D'autres recherches sur les proportions ont démontré que les lettres légèrement élargies sont plus effectives et que le meilleur rapport entre hauteur et largeur des lettres noir sur blanc est de 1:3, que les traits plus minces sont plus effectifs si les lettres sont blanches sur noir.

Moins évident est l'influence du style sur la lisibilité. Les lettres sans-serif sont plus effectives pour un court message sur la route et serif pour un texte plus long; en général, les lettres serifs influencent l'oeil plus que les sans-serif. Les lettres majuscules et minuscules présentées ensemble sont plus effectives que les majuscules seules. Les recherches indiquent aussi que les symboles (v.g. les flèches, voir figs. 4 et 5), sont plus efficaces puisqu'ils prennent moins de place qu'un texte. La lisibilité dépend également du rapport entre le symbole et le fond, de la grandeur de surface, de l'espacement entre les lettres, entre mots, lignes, entre dessin et marge. Quant aux couleurs, il paraît que bleu sur blanc, noir sur jaune et blanc sur vert ou bleu offrent la meilleure lisibilité.

L'emplacement d'une enseigne devra être considéré par rapport aux autres enseignes, aux supports existants, aux niveaux (qui devront être standardisés par rapport au niveau de l'oeil) etc. En appliquant une enseigne sur un bâtiment, on devra l'allier à l'architecture et respecter les facteurs humains et la lisibilité, avant de considérer le style. En conclusion, on peut dire qu'un manque de valeur visuelle pourrait réduire de 50% la lisibilité d'une enseigne.

Page 44

Le Système de Signage pour l'Université de Carleton, Ottawa.

Client: L'Université de Carleton, Ottawa.
Concepteurs: Paul Arthur & Associates Ltd.
(Gerhard Doerrié).

Peu d'universités ont entrepris la tâche de fournir un système de signage unifié. La situation à Carleton est aggravée par les deux méthodes de circulation pour piétons – au niveau du sol et en dessous. Le système de tunnels reliant les édifices produisait un désordre aigu à cause de l'insuffisance de signes indicateurs. Les concepteurs ont conçu un système intégré ayant pour seul but la provision d'information aux piétons et aux automobilistes, où la couleur indique la division géographique, le symbole indique l'édifice, tunnel, stationnement, direction et le message typographique indique ce qui reste. Un plan de l'université est affiché dans chaque aire de stationnement; il indique les entrées des tunnels, les voies, les édifices, parkings, etc. avec explication du système de code en couleur. Par exemple, un visiteur qui cherche un bâtiment du code rouge n'a qu'à suivre les signes rouges pour trouver son chemin. Des répertoires, des panneaux indicateurs et d'identification complètent le système. Tous les panneaux extérieurs sont dégagés, montés sur poutres – l en acier, auto-illuminants. Les panneaux intérieurs sont présentés soit sur de l'arborite (fig. 10), soit sur des bandes acryliques. Toute autre enseigne intérieure est basée sur le module d'une plaque de porte (fig. 8 et 11-14) dont les autres enseignes sont les multiples. Donc, un répertoire est simplement le nombre de plaques pour portes requis assemblés l'une par dessus l'autre.

Page 46

Dispositifs de Contrôle de Traffic, Haymarket Square, Saint-John.
Client: Development Office, Saint-John.
Concepteur: Paul Arthur & Associates Ltd.

Le problème était de communiquer aux automobilistes les directions nécessaires à

négocier un rond-point populaire à 40 milles par heure. La confusion résultant du manque de signes indicateurs et de passages pour piétons était monumentale dans ce rond-point où circulaient 40,000 voitures par jour. Les concepteurs ont conclu que si les voitures étaient triées avant d'entrer au rond-point, les difficultés résultant des changements de vitesse et de voie pourraient être à moitié résolues. Donc, sur chaque îlot, ils ont placé un grand panneau informant l'automobiliste de ce qu'il faudrait faire de façon à ce qu'il ait le temps de le faire. Le problème des piétons était résolu par l'installation de clignotants jaunes annonçant un passage pour piétons et de chevrons jaunes pour marquer le passage. Là où le stationnement était défendu, les bordures de trottoir étaient peintes en jaune. Ainsi la trentaine de panneaux prévus par la Ville a été remplacée par 5 grands panneaux sur les îlots, des clignotantes et de la peinture.

A 1,500 pieds du rond-point, l'automobiliste en est averti; 500 pieds plus loin, deux panneaux aériens de 3'3" sur 12", chacun au-dessus de la voie appropriée, lettrage 11" sur fond bleu reflétant indiquent la voie à prendre. Arrivé au rond-point, des petites enseignes sur bornes indiquent qu'il faut serrer à droit empêchent la rencontre avec le trafic venant dans l'autre sens; sur les îlots, les panneaux dégagés auto-illuminants, 9'3" sur 12' de largeur sont placés 7' au-dessus du niveau du sol. (Lettrage blanc 6 1/2" de hauteur sur fond bleu). Des globes jaunes clignotantes de 11" sur poteaux de 8' noir et jaune signalent l'approche de passages pour piétons et les lampadaires sont peints en bleu.

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Enseignes de Chantier standards et permanents pour les Projets du Centenaire.

Cliant: La Commission centenaire, Ottawa.

Concepteurs: Paul Arthur & Associates Ltd. (Gerhard Doerrié).

Le problème était d'établir la continuité visuelle à travers le pays quant aux enseignes de chantier pour tous les projets du centenaire. N'importe quelle communauté devrait pouvoir les exécuter en anglais, en français et d'autres langues sans être obligée de consulter les concepteurs ou la Commission. Il a fallu trouver des matériaux et des méthodes d'application standards pour tout le pays, puis établir un module pour pouvoir placer les messages systématiquement afin que les divers types de renseignements puissent avoir la même position relative sur chaque enseigne. Une brochure allait rassembler les dessins, photos, diagrammes, ainsi que les spécifications et les dessins d'exécution pour fabricants. Ce programme n'a jamais été adopté ou mis en exécution à cause de l'impossibilité de résoudre le problème de bilinguisme.

S'ils avaient été exécutés, les enseignes auraient été basées sur un module de 4' en contreplaqué avec fond blanc, symbole rouge, lettrage bleu et noir, messages typographique en vinyl adhésif assemblé en légendes pré-espacées, sur support en poutres-I acier.

Quant aux enseignes permanentes, le problème était d'établir et maintenir une continuité d'apparence pour les projets dont les éléments n'auront aucune uniformité de style ou d'objet. Il fallait les concevoir de façon à ce qu'elles soient appropriées, permanentes, indérochables, capables d'installation extérieure ou intérieure, murale ou sur poteau, unilingue ou bilingue et coûtant en-dessous de \$250,00. Une plaque de 8" carrés en aluminium 3/8" roulé était choisie. "Dual Tone" d'Alcan, pour ses propriétés de lisibilité, permanence et résistance.

Page 50

La Technique de Fabrication d'enseignes et le Besoin de Normes améliorées. par Anthony Mann.

Généralement la fabrication d'enseignes au Canada est effectuée par de petites compagnies. Ce n'est pas une industrie sophistiquée et elle possède un style unique à elle-même n'ayant pas beaucoup de rapport aux développements des arts graphiques depuis 1930. Le mauvais goût des enseignes de nos jours contraste avec les traditions de bon goût du 19^{ème} siècle quand l'artisan était respecté et fier de son œuvre, donc, l'architecte ne peut se fier à l'industrie lorsqu'il s'agit de trouver un système de signage esthétiquement satisfaisant. Le concepteur graphique est le seul spécialiste capable de résoudre les problèmes de signage.

Du point de vue coût, création et production, il nous faut des normes; puisque l'art de produire les enseignes n'a pas développé, le niveau esthétique de l'industrie ne changera pas avant que les techniques et les lettres standardisées ne soient développées. Le choix de matériaux et de techniques de reproduction est dicté par les considérations de coût, de quantité, durabilité et apparence, ce dernier étant le facteur plus important pour le client. Bien de techniques doivent être rejetées parce que les matériaux ou lettrages ne plaisent pas.

Les diverses techniques employées sont les suivantes: la sérigraphie (à ne pas employer sur surfaces courbées ou inégales), assure le contrôle de qualité, s'applique au contreplaqué, métal, verre ou plastique; durable; pas de problème de couleur. Lettres appliquées: Letraset; signage intérieur, temporaire (expositions); contrôle de qualité difficile.

Feuilles de plastique adhésif: refractant ou non-refractant (Compagnie 3M); à employer surtout pour les autoroutes, avions;

le choix de lettres laisse à désirer mais le système pourrait s'adapter à toutes fins de signage et offre les meilleurs possibilités d'adaptation dans l'avenir. Les lettres découpées: traditionnellement en métal, bois, plastique, liège; formes standardisées, choix limité; moulées ou découpées à la main.

Lettrage incisé: gravé à la main sur métal, pierre, marbre, plâtre, bois ou plastique; coûte cher et nécessite des gabarits.

La photogravure: pour petites enseignes mais choix de lettrage limité et normes sans style. Le lettrage en relief peut être coulé en métal ou plastique; se fait en béton.

D'autres méthodes: l'anodisation, la céramique, les techniques photographiques, offrent des avantages certains. Quant aux supports et matériaux, le problème est simplifié si le système de signage est conçu en même temps que l'édifice en question.

En groupant les supports et les attaches par rapport à leur fonction, le nombre et le type de support pourront être réduits. Lorsque les systèmes sont complexes et les additions sont anticipées, il faut prévoir un signage simple et effectif – en ajoutant d'autres panneaux ou en ajoutant l'information au même panneau.

Le signage pourrait être un élément unifiant dans l'organisation d'un complexe architectural; le même support pourrait être employé pour les enseignes, les lampadaires, etc. Le Département de l'Industrie pourrait persuader les autorités locales, provinciales et fédérales de se mettre d'accord sur les normes standardisées; l'architecte se trouverait bien placé pour accepter ou non des systèmes de signage qui ne répondent pas à ces normes et il pourrait consulter un concepteur graphique là où la possibilité se présente. □

Signage as a Component of Environmental Design

Features Projets

5

by Anthony Mann

Mr Mann is a principal of Design Collaborative, consultants in industrial and graphic design. He studied product design in London, England, 1946-51, and came to Canada in 1962.

Signage is what helps people find their way around in the highly complex environment which architects, town planners, legislators and businessmen have created.

Without it our cities could not function: the scale and complexity of urban life requires a continual transfer of information to the user.

Signage informs, regulates, directs.

Signage is a word that has been coined by designers to cover all forms of signs, notices, plaques, nameplates and architectural lettering; it is not normally used to cover commercial advertising such as posters, bill boards or show cards.

Signage tells you where to find the elevator, which road to take, what room to go to, where to park and which building is which.

The average public building could not operate without signage. Yet the responsibility for planning and designing architectural signage is rarely considered by architect or client as being part of the basic design of the building. There is generally no budget set aside for signage and no attempt to incorporate it into the architecture except as an afterthought.

Whose responsibility is it to determine what information will be required by those using a building, and to ensure that all such information is effectively incorporated into the design?

Unless the client is willing to engage an outside consultant for the job, the responsibility to ensure that the signage is properly considered and efficiently executed would seem to fall squarely on the architect.

Designing an effective signage system is

not a job for a junior draftsman: it requires special skills and experience. It is a job for a graphic designer with the specialist knowledge necessary to assess the requirements of the project, to design both an overall system and the individual signs, and to specify the appropriate techniques and materials for production.

Except in very simple structures, signage is needed to orientate the user of a building, since it is usually impossible for the architect to provide all necessary information by the form of the building alone. A good plan may mean less signage, a good signage system can partly offset the failures of a bad plan. But properly considered, the building and signage system should evolve together, each providing clear, unambiguous information to the user as to the functions and amenities of the building, as well informing him of relevant restrictions.



The following operations are typical of those which might be required by a visitor to a centre for the performing arts. He is arriving by car with his wife and family for a theatre show. At each operation he will require information from both the form of the building and the signage system. In finding the main entrance to the centre, for example, the visitor would perhaps rely more on the form of the building, whereas in learning parking and traffic restrictions he would rely on signage.

Find district
find street
find Centre
find entrance to Centre
select traffic lane
learn traffic system
find entrance to theatre
park for passengers to alight
select meeting place
find car park
find entrance to car park
learn parking system
learn rates
learn traffic system
find parking position
learn position
learn level
find elevator
find level
find meeting place
find box office
find cloak room
find entrance to auditorium
find aisle
find row
find seat
learn restrictions (no smoking etc.)
learn amenities (emergency exits etc)
find refreshments (at interval)
find washrooms
relocate auditorium
relocate seat
relocate exit (after performance)
find elevator
find parking level
find parking position
learn traffic system
find exit
learn payment system
find meeting place
select waiting position
find exit
learn street

Planning a system requires a careful examination of all traffic functions and services. If this study is not complete, the system will not provide sufficient information to the users of the building, causing confusion which will result in haphazard additions being made to the signage system. Any architect who has been saddened by folk-art paper notices in ball point pen fixed to his building by sticky tape, or signwritten horrors firmly screwed to the wall by order of the building superintendent, really has only himself to blame.

For it is the architect, more than anyone else, who should recognize the need for signage in his building, who should insist on an appropriate budget being set aside for the purpose, and who should ensure that proper consideration is given to the subject at an early enough stage to incorporate it in the structure of the building.

The problem is not simply one of aesthetics; a glaring example of the failure of a signage system in an otherwise successful building is Toronto's Malton Airport. Those signs which were part of the original design are tastefully executed, but the system fails to provide sufficient information to travellers, many of whom are passing through the building for the first time: the positioning of the signs on plan, the sight-lines, the wording and the lack of foreign languages on essential signs can all be severely criticized.

It is difficult to learn the plan of this building and one must rely heavily on signage. For passengers who do not speak English, the one directional sign worded "washrooms" is hardly sufficient information.

The failure of the system is clearly indicated by the number and variety of the signs which have been put up at different times since the opening of the airport. There has been little or no attempt to bring these additional signs into line with the original signage and where signwriters have attempted to do so there is an obvious lack of adequate supervision.

It is extremely difficult to anticipate every sign requirement for a building with such a complex function as an air terminal. In such cases it is essential before the completion of

the building to set up the machinery for planning and producing additional signs. If the architect is concerned, as he surely should be, to ensure that the building does not deteriorate under a rash of ill considered and badly executed notices, he must warn his client of the need for a signage program to continue beyond the opening of the building, and of the necessity of establishing strict control over all additional signage.

A close study of the traffic flow within a building and careful listing of the many minor functions, services and restrictions, should eliminate much of the additional signage and will reduce costs in the long run.

Signage is, above all, a very human problem. The defects of a system are soon felt by the individual using the environment. On highways, in factories, military establishments and hospitals these defects may well lead to loss of life. The inconvenience to the individual, the irritation, fatigue, embarrassment and loss of time are difficult to assess and rarely considered seriously, unless such individuals happen to be on the staff of the management or in a position to effect change.

It is the architect's responsibility to ensure that the signage in his building is adequate and that it really works effectively, since it is as much a part of the architectural environment as plumbing, heating and elevators.

Whether the problem is numbering doors so that the janitor can find his keys, identifying a building complex or regulating parking, signage is an important component of any environment, both visually and functionally.

It is not a job for junior architectural draftsmen or janitors. □

1-7

Toronto International Airport, Malton. The piece-meal addition of signs by various authorities has led to an untidy and confusing signage system. In such a complex environment as an airport it is essential that the machinery for updating the system should be built into the original plan. Aéroport International de Toronto à Malton. L'accroissement des signes par des autorités diverses aboutissait dans un pêle-mêle ou on s'y perd facilement. Dans un environnement aussi complexe qu'une aéroport, il est essentielle que la technique pour moderniser le système soit inclus dans le plan original.



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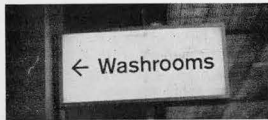
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In spite of ten illuminated, tri-lingual signs on these telephone booths at Malton, it is still impossible to read them, unless one is outside the airport or almost opposite the telephones themselves. Two signs at right angles would have done the job better. Malgré dix signes trilingues illuminés sur ces cabines de téléphone à Malton, il est toujours impossible de les lire à moins qu'on se trouve à l'extérieur de l'aéroport ou est tout juste devant les cabines. Un meilleur résultat aurait pu être obtenu avec deux signes sous angle droit.



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15

Human Factors in the Design and Application of Signage

by Martin Krampen

Dr Krampen's background covers a wide field of design, research and teaching in Europe and North America. He has a PhD in communication arts from Michigan State University and is at present on the faculty of the University of Waterloo, Ontario.

1 Scope of the architect's responsibility

The scope of the architect's responsibility is not confined to the mere provision of housing. It is not limited to a defense of aesthetic values in artifacts and buildings. It has to do with organization of space for human life functions as a whole.

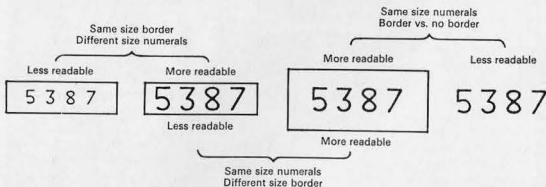
In this sense it encompasses the coordination and design of signage, from the large scale neon advertising on the roof of a factory to inscriptions on the outside of buildings or name plates on doors inside a building. Especially when the overall image of a corporation is at stake, the architect cannot leave directional and informational signs to chance. He has to include signage in his planning. Unfortunately this aspect of architectural planning is very often treated as a secondary matter or an addition of decorative nature. On the highway, where a sign may be a matter of life and death, certain principles and findings of human factors research are respected; but signs on public or private buildings, in railroad stations, airports or factories, are still treated as occasion for the "expressive needs" of the architect, if they are not left completely to dilettantes. We want to indicate here that the question of signage has been seriously researched

and that the architect should avail himself of the knowledge that is available and of the talents of those graphic designers who can translate research results into effective and aesthetically pleasing signage.

2 Legibility

In the design of signage, the area which has been most carefully subjected to human factors research, is legibility. The study of legibility is an attempt to detect the factors involved in the causes for a sign message to be seen first (priority value of a sign) and for a sign message to stand out (target value). Night versus day conditions have been tested. What is legible in a sign at a glance, especially to the driver on the highway or in the dense traffic of our cities? Unfortunately, most of this research has been carried out for motor traffic and little is known about pedestrian conditions. However, many of the results which are valid for the motorist should apply also to the pedestrian.

One of the factors affecting legibility is letterform. The influence of letterform on legibility has been studied under the headings of lettersize, letter style and whether upper case letters are more legible than lower case letters.



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That legibility is a function of increasing letter size is obvious. However, this function is not necessarily linear and varies for narrow and wide letters as well as with good or bad vision (fig. 1). It has been suggested that the height of letters on a sign might be

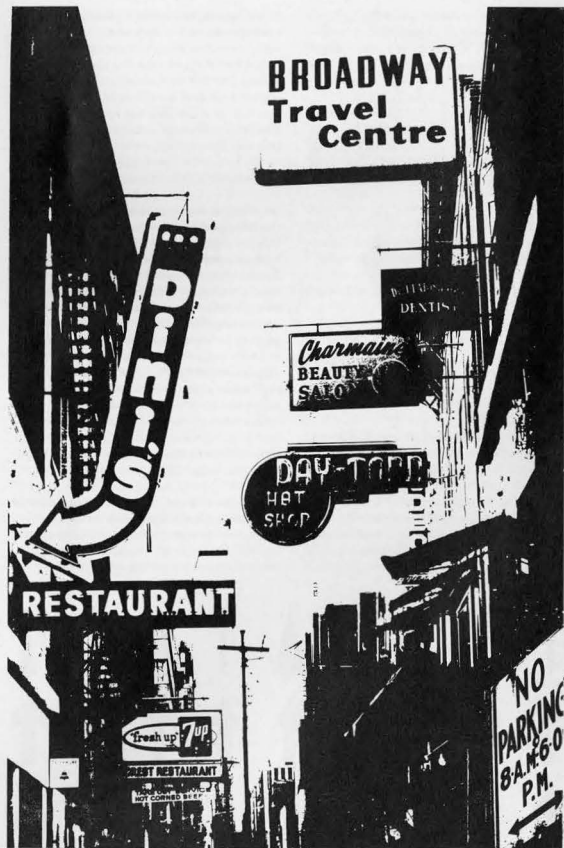
$$(N + 6) V + S$$

computed by the formula $\frac{(N + 6) V + S}{100}$ 10

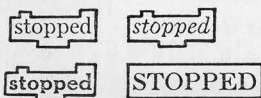
where N is the number of words on the sign, V the average speed of the vehicle in mph and S the distance (in feet) from the driver's path. This formula should underestimate the letterheight for inscriptions on buildings or street name signs since it is derived for the frontal approach of a driver to a sign.

Other research results on letter proportions (width to height ratio and stroke width to height ratio) are published in current human factors text books. Slightly expanded letters seem to be somewhat more legible than narrow letters. The optimal stroke width to height ratio for black letters on white background is approximately 1:8, while thinner strokes are more effective for white letters on black.

Less obvious is the influence of letter style on legibility. Broadly speaking, letter styles can be divided into serif and sanserif alphabets (see page 40). Research results seem to indicate that short messages as they occur on road signs are more legible in sanserif type faces, whereas it is typographic practise to use serif type faces for longer text matter. No results are known for texts of medium length under pedestrian conditions as might occur in museum or exhibition captions. The effectiveness of letter styles might very well be influenced by early conditioning. Children who learn to read sanserif letters might end up producing experimental results in favour of sanserif letters. However, serif typefaces have been said to form stronger word units by virtue of the binding qualities of the serifs. This assumption has been borne out in an experiment. A stereoscope with divided channels for each eye was used. The same word was fed at the same time in its sanserif version into one eye and in its serif version into the other eye. Serif words showed a strong predominance in this experiment.



Word shapes are more characteristic when presented in upper and lower case or only lower case form. Words in only upper case letters form horizontal bars. (fig. 2).



2

Unfortunately, the use of only upper case words for building inscription is very widespread in architecture. It seems to be a traditional hangover from Roman monuments or Renaissance architecture.

Research results seem to indicate that, in summary, building inscriptions and signage with short messages should be designed in large upper and lower case letters of medium stroke width.

Pictorial symbols such as arrows and pictographs are more advantageous than verbal texts since they occupy less space. However, the object depicted in a pictograph is understandable to a person only to the extent that it is part of his past experience. A picture of an elephant will not mean much to an Eskimo. The legibility of different

arrow designs has been tested in various experiments. In one experiment 45 subjects were given test cards containing circles with 12 arrow positions in a clockwise layout. The different arrows designs were exposed for brief durations in various clock positions and the subjects indicated the positions they perceived on the test cards (fig. 3). The best arrow design was the one which totaled less erroneous perceptions as indicated on the test cards (fig. 4).

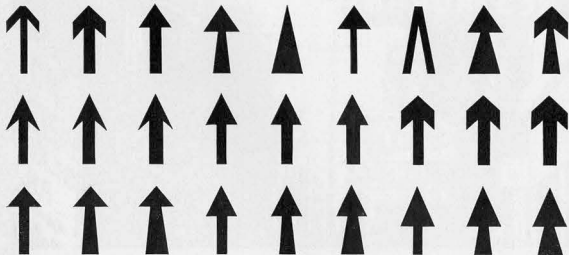
Legibility of letters and symbols alike depends also on the figure-ground characteristics of a sign. The size of the available surface will dictate lettersize, spacing between letters, between words, between lines, layout and margins. But within the constraint of a given surface, research results indicate certain optimal solutions. Somewhat wider spacing between letters and words results in better legibility, especially at night. Spacing between lines can be less for messages in upper and lower case since ascenders and descenders of the lower case letters open up more space between lines than only upper case letters of the same size. Interlinear spacing should be not less than two stroke width.

The layout of signs has not yet been studied sufficiently. We do not know whether symmetrically centered sign layout is more legible than flush left - ragged right alignment. However, there are experimental

results on margination. Where there is little space available on a small sign, legibility is increased if the letters or numerals are made as large as possible, with as little as one stroke width as a surrounding border, although figures touching the border may be misread. Naturally, where space is not at a premium, a larger border improves legibility (fig. 5).

The question whether black letters on a white background are more legible than white letters on a black background has been investigated in several experiments. The results are contradictory. Much seems to depend on the brightness of the surrounding in which the sign is seen. White configurations have a tendency to "spread" into their black background. This spreading is particularly accentuated under illumination at night. The effect is known as "irradiation effect". Under night conditions white letters on dark backgrounds should therefore have a thinner stroke width than under normal reading conditions.

Highway experiments showed that for low sign brightness there is no difference between black-on-white and white-on-black messages; for somewhat higher illumination levels the legibility of white-on-black increases, but decreases again for high illumination levels (because of the irradiation effect). In general, there should be sufficient con-



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trast between figure and ground. This contrast may be measured by the formula

$$\text{Contrast} = \frac{B1 - B2}{B1} \times 100$$

where B1 is the brighter of two contrasting areas and B2 the darker of two contrasting areas. Thus if the sign background has a reflective quality of 80% and the letters 10%,

$$\text{the contrast would be } \frac{80 - 10}{80} \times 100 = 88\%$$

For any given brightness level of the surroundings, only larger targets can be detected at the lower the per cent contrast. The higher the per cent contrast, the smaller the detectable detail.

Several experiments have been carried out to determine the effect of certain color combinations on legibility. Here too, results are contradictory. However, blue (or black) on white, black on yellow and white on green or blue seem to emerge as the most legible combinations.

Color coding can be used in signage as long as the designer keeps in mind that approximately 8% of the male and 4% of the female population is color blind. Also, people can only distinguish a limited number of colors (10 - 12 hues).

Informal evidence from outdoor advertising suggest that "warm" colors have a great "carrying power" especially when viewed in contrast with "cold" or dark background colors.

However, when colors are used in signage, well established color codes (red = danger, yellow = caution, green = safety etc.) should be respected.

3 Readability

Readability (as opposed to legibility) does not depend on the physical form of the message, but on its "content". Generally, the more complex a message, the less readable it is. Complexity is a function of the number of words, word familiarity and other factors. The familiarity of a word has been indexed by researchers as a function of its occurrence in samples of text.

Several readability formulas have been

developed which allow comparison between texts of various difficulty. Readability decreases when more than three words appear on a sign.

4 Illumination

Signs can be illuminated by outside sources or can be transilluminated. There is no particular experimental evidence as to which of the two methods is more effective. However, signs which are illuminated by outside sources, such as highway signs, should be reflectorized. Where a sign has to stand against a constantly lighted background, flood light is better than reflectorization. For transilluminated letters a stroke width to height ratio of 1:6 has been found optimal. The best width-height ratio of transilluminated letters is achieved when the width of the letter is 85 - 100% of the height.

As a general rule, night legibility should be considered more critical than day legibility.

5 Siting

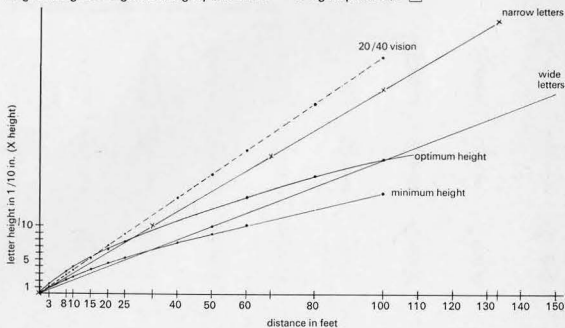
Signs should be sited so as to avoid clutter and the obscuring of one sign by another (see page 40). If a sign has to be installed, the designer should ascertain whether he can make use of existing supports, in order not to increase the number of already existing vertical elements in the environment. The height of signs of a given category should be

standardized with respect to eye level, bushes or shrubs and other elements of street furniture.

If signs or inscriptions are to be applied directly to buildings they should be in sympathy with the architectural concept, while at the same time respecting human factors requirements of legibility. There is some indication that certain letter styles may be more expressive of one content than another. By the same token, one letter style may suit better one style of architecture than another. There is, however, no clear-cut experimental evidence on this matter when it comes to architectural application of signage. It would therefore be reasonable to fulfill first of all human factors requirements in architectural lettering and keep personal expression needs in the background.

6 Summary

The target value of a sign, *i.e.* the characteristics that make it stand out, depends on its relative size which in turn is determined by the size of the letters or symbols composing its message. There should be sufficient contrast between message (figure) and sign (background). The sign should be simple in layout and message. More important signs should be placed in more important positions and should be isolated for attention. Lack of target value may reduce the legibility of a sign up to 50%. □



Signage System for Carleton University, Ottawa

client: Carleton University, Ontario

designers: Paul Arthur & Associates Limited (Gerhard Doerrié)

Gerhard Doerrié is the design director of Paul Arthur & Associates Ltd, Toronto | Ottawa. He is known mainly for his achievements in printed graphic design, for which he has received awards in Canada and the United States.

The problem

A university like Carleton has so many different types of persons for whom information must be supplied (staff and students are only the beginning) that the signage problems are generally considered insuperable. This "beaten before they start" attitude may be responsible for the fact that so few universities have ever considered tackling these problems, despite the fact there are few building complexes which are in greater need of providing information in a unified, systematic way. In addition to the diversity of types of people (regular students, extension students, visitors, the new student, etc.), Carleton, like other universities, must cope with the car — getting it off the highway (at present Carleton is on the edge of town) and into the right parking lot. Unlike most universities, Carleton provides the pedestrian with two methods of getting about — above ground and below, in the tunnels. These interconnected tunnels, while providing links with all the buildings and protection from the weather (and from the mud — Carleton has been a building site for more than ten years), are also a source of the most exquisite confusion insofar as they are at present quite inadequately signed.

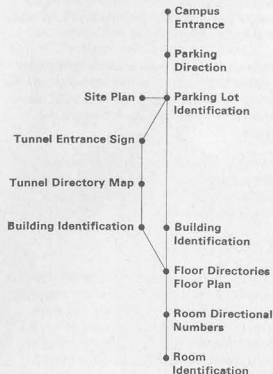
The solution

What the designers evolved is an integrated system whose sole purpose is the provision of information to motorists or pedestrians. A connection matrix was drawn up to establish the nature of traffic flow. Study was given to the *means* whereby information could be imparted and a system evolved employing color, typographics and pictorial graphics — each being used to denote a different *kind* of information. Thus color was used to denote geographic areas in the university (not functions), pictorial symbols were for buildings, tunnels, parking lots, directions, etc., and typographic messages for the rest. How the system enables, for example, a visitor to get from the street that brought him to the entrance of the university to a given staff members' room is shown on page 45. A large sign tells him that he is at the entrance, others indicate the direction for appropriate parking lots, and still others identify the lots themselves. In each parking lot is a plot plan of the university which shows tunnel entrances, the road system, parking lots and buildings. It also explains the color code system so that at this point the visitor, knowing he is looking for a building coded, say red, need not look at signs in any other color. From then on he proceeds by surface or tunnel until he comes to the building which, from the point of view of signs, is treated like the microcosm for the whole university. It also has a plot plan, directories, directional and identification signs.

- 1 Large entrance sign
Grand panneau d'entrée
- 2 Typical exterior directional sign
Panneau de direction extérieur typique
- 3 Exterior identification sign
Panneau d'identification extérieur

The execution

All exterior signs are free standing, post mounted on steel I-beams, and self-illuminated. The graphics for each are screened on diffusers of opal acrylic set slightly away from the clear acrylic which forms the signs' outer face. Thus the graphics are easily withdrawn to make corrections (changes are frequent) and they are also tamper proof. Interior signs are screened either on Arborite or on acrylic strips. Fig. 10 for example, is on Arborite. All other interior signs are modular and one detail (basically a door name plate) in multiples of itself, is used for all other signs (figs. 8 and 11 — 14). Thus a directory is simply the requisite number of door name plates, assembled one above the other.



4
Plot plan of the university providing information about locations, road systems and tunnel entrances

Plan parcellaire de l'université, renseignant sur l'emplacement des points d'intérêt, des systèmes routiers et des entrées de tunnels

5
Typical exterior building identification sign, color coded as are all signs on the campus
Panneau extérieur typique identifiant un édifice; tous les signes sur le campus sont codifiés à l'aide de différentes couleurs

6
Typical exterior directional sign
Panneau de direction extérieur typique

7
The plot plan above ground is complemented (for tunnel users) by a plot plan of all tunnels

Le plan parcellaire au-dessus terre est complété par un plan parcellaire de tous les tunnels pour tous ceux qui les utilisent

8
Typical interior directional signs, employing the same module (basically a door name plate) as figs. 11-14

Panneaux de direction intérieurs typiques à base de la même module comme figs. 11-14 (fondamentalement une plaque à identifier les portes)

9
Typical interior (tunnel) building identification sign
Panneau d'identification typique à l'intérieur (tunnel)

10
Typical building (lobby) directory
Plan typique de l'intérieur

11
Typical interior building plan
Répertoire d'étage typique

12
Typical floor directory
Répertoire d'étage typique

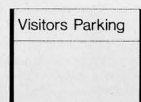
13, 14
Typical room identification signs
Panneaux d'identification pour salles



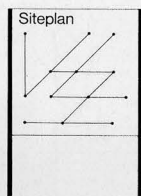
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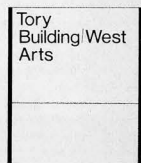
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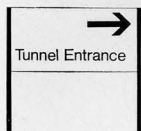
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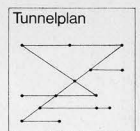
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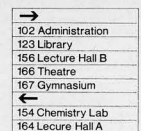
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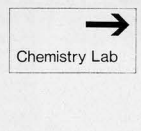
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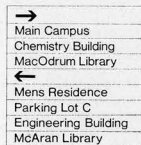
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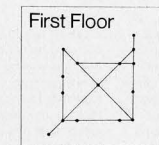
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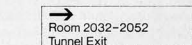
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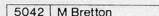
10



11



12



13



14

Traffic Control Devices for Haymarket Square, Saint John, N. B.

client: Redevelopment Office,
City of Saint John

designer: Paul Arthur & Associates
Limited



1

The problem

To communicate essential directional and other information to mainly vehicular users of a heavily travelled and at present completely unsigned roundabout at the entrance to the city. To drive on an unsigned roundabout at 40 mph is like being whirled around in a revolving door from which there seems to be no exit. Many of the 40,000 cars a day using the Square (about the same as University Avenue in Toronto) go round and round searching for the appropriate exit and not finding it. Haymarket Square, on the other hand, is a new and potentially efficient creation from a former patchwork of streets and is carefully landscaped. Its overall dimensions are approximately 200 feet in each direction. Further complicating the whole problem is the plight of the pedestrian, who could literally stand forever wondering where it might be safe to cross. Because no crossings were marked, they naturally crossed everywhere, thereby adding to the already existing confusion.

The solution

Assuming that there was nothing here but a communications problem, the designers set about to find the most efficient way of providing the motorist with the information he required, when he required it, to enable him to make his decision in time. If this could be solved, the pedestrian problem would be relatively easy. A careful day-long examination of the Square by the designers convinced them that all the weaving from lane to lane, the non-uniform speeds, the irritations, could partly be solved if, when the traffic got onto the Square, it was *already* partly sorted out – at least as to lane. Prior to the designers being called in, it was the city's intention to provide all traffic directions by some 30 large overhead signs right over the Square itself. Inasmuch, however, as it takes a motorist upwards of four seconds to read such (sometimes complicated) overhead

1

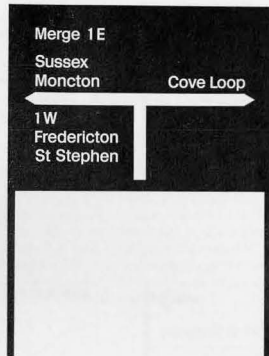
Photo showing large directional sign in position. Note scale. Color of sign face is blue with white graphics, self-illuminated day and night.

Photographie d'un grand signe de direction en place. Notez l'échelle. Couleurs du signe, fond bleu avec lettrage blanc; auto-illuminant jour et nuit

2

Model of typical self-illuminated, free-standing, directional sign.

Modèle d'un panneau de direction auto-illuminant typique



2

signs, he would have overshot them (at 30 or 40 mph) before he had finished reading them, and thus when a second or so later a decision was demanded of him, he could not be expected to know what to do. The designers took an altogether different approach. They established one large sign on each of the islands. These signs have the advantage of providing the motorist with legible information which enables him, first, to know what decision he will be expected to make and, second, gives him plenty of time to make it. The pedestrian problem was solved by the use of flashing yellow beacons (to announce a crosswalk) and brilliant yellow chevrons (on the asphalt). The only other sign that was required was one to prevent parking anywhere and that was achieved by painting all curbs yellow. Thus a great many signs, overhead, and postmounted, were reduced to 5 large signs on the islands, flashing beacons and paint.

3

Plot plan of showing the placement of directional signs (16'3" high), beacons (9'6" high) and crosswalks.

Plan d'implantation montrant l'emplacement des panneaux de direction (hauteur 16'3"), feux d'alarme (hauteur 9'6") et passages à piétons

4

Crosswalk graphics in yellow on asphalt
Passage à piétons, marquage jaune sur asphalt

5

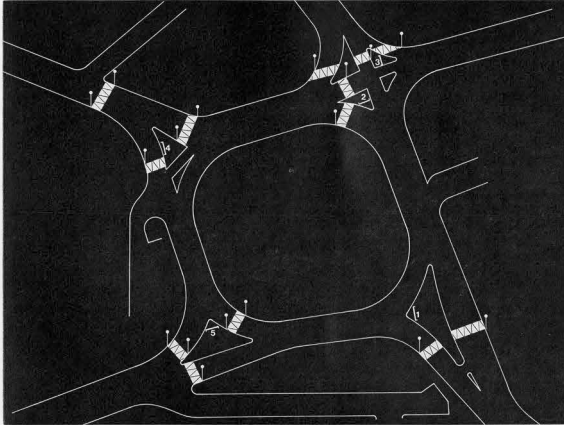
Model of flashing beacon identifying and warning of pedestrian crosswalk

Modèle d'un feu à éclats marquant un passage à piétons

6

Model of bollard directing traffic to keep right

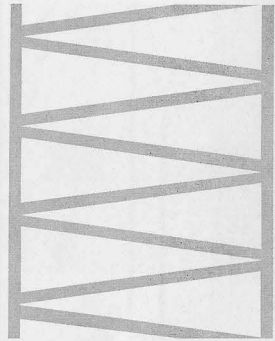
Modèle d'un panneau dirigeant la circulation de trafic de rester à droite



3

The execution

The motorist is informed (some 1,500 feet away) that he is approaching a roundabout. Then some 500 feet further on there are two overhead signs each 3'3" deep by 12' wide, each placed over the appropriate lane. Color is blue reflectorized background with 11" lettering (x-height). On the Square itself small Keep Right signs on bollards prevent motorists from getting into the way of oncoming traffic, and on the islands are large self-supporting, self-illuminated signs, each 9'3" deep by 12' wide and 7' off the ground. The background is blue and the graphics are white with letters 6½" high (x-height). Pedestrian crossings are announced by 18" flashing yellow globes on 8' posts painted black and yellow. The actual crosswalk is painted on the asphalt in a series of chevrons. Luminaire standards on the Square are painted blue.



4



5

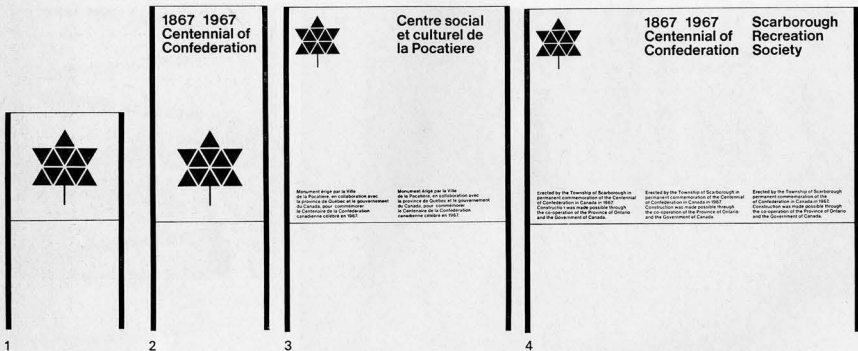


6

Standard Site Sign Boards and Permanent Markers for Centennial Projects

client: The Centennial Commission, Ottawa

designers: Paul Arthur & Associates Limited (Gerhard Doerrié)



Site sign boards

The problem

To establish visual continuity throughout the country for sign boards for every type of Centennial project. It was pointed out to the designers that these boards would be needed for buildings ranging all the way from small additions (such as kitchens) to existing buildings (such as community art centres) to the enormous projects of the Capital Grants program. Thus they should be capable of execution in various appropriate sizes and cost ranges. They would, furthermore, have to be so designed as to be capable of execution in small towns and large centres in English, French, and bilingual areas of Canada. Finally, the designers were told that while the very essence of the program was that visual continuity in Centennial projects was to be established and maintained, it was not deemed practical for municipalities or architects or building committees to have recourse to further assistance in the design of the actual signs from the designers or the Commission.

The solution

Obviously a system was called for that would take all of these conditions into account, be sufficiently rigid to ensure continuity of appearance across the land and at the same time sufficiently flexible to be appropriate to the various types of project (for a few dollars to several million). Above all, the system had to be capable of being transferred to the literally thousands of users without further help from the designers.

The first thing for the designers to do was to look for materials and methods of application that could be presumed to be standard throughout the country. They then established a strict module for the placing of messages in a systematic, organized way so that various types of information would always be in the same relative position in each of the signs. They decided to put all of this information into a standard sign manual which would contain drawings, photos, diagrams of message arrangements, complete specifications and working drawings for the fabricators.

1

The 4' x 4' signs containing the Centennial symbol only. Intended as an attention getter only

Les signes de 4' x 4' avec l'emblème du Centenaire seulement. Destinés comme acquéreurs d'attention seulement

2

Subsequently the 4' x 4' attention getter is joined by the same sized sign board. L'acquéreur d'attention de 4' x 4' adjoint d'une plaque des mêmes dimensions

Created by the Township of Scarborough in partnership with the Township of Scarborough in Canada in 1967. Conception and production through the cooperation of the Township of Ontario and the Government of Canada.

3

The 8" x 8" sign could contain more information than the two smaller ones. Designed as single language signs with two separate signs for bilingual signs. Un signe de 8" x 8" pourrait donner plus d'information que deux plus petits signes. Créé comme signes unilingues, avec deux différents signes comme signes bilingues.

As for 8" x 8" but larger (8" x 12") where a maximum amount of information had to be given—for very large jobs. Comme pour 8" x 8" mais plus large (8" x 12") désigné pour de grands travaux ou un maximum d'information doit être transmis.



5

Permanent markers

The problem

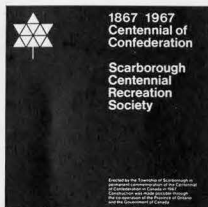
Like the sign boards, opposite, the problem was basically one of establishing and maintaining continuity of appearance in a building program whose elements would obviously have no uniformity of style or purpose. And like the sign boards, it was essential that they could be eventually ordered and fabricated without further recourse to the designers or, for that matter, the Centennial Commission. Moreover, they had to be so designed as to be appropriate, permanent, vandal proof, and capable of being installed indoors or out, wall or post mounted. They had to be capable of carrying unilingual or bilingual messages and finally they had to be designed in such way as to take into account the fact that the plaque could not cost more than the project itself and under no circumstances more than \$250.

5

The 24" square bilingual version of the plaque, installed on a wall. La version bilingue de la plaque de 24" carrés, montage murale.

6

In order to achieve minimal cost, a single 8" square was devised to have no text changes whatever, so that it remains identical in all situations. Pour permettre un coût minimal, un carré de 8" a été choisi qui ne subira aucun changement de texte, afin de rester conforme dans toutes les situations.



6

The solution

Again, a system was needed and, again, one that would satisfy all of the conditions, not just some of them, as there could be no exception to the rule that details for these markers had to be entirely self explanatory to the eventual users. The designers concerned themselves first in the materials that would satisfy the criteria related to permanence, vandalism; appropriateness, legibility, and cost came next. Having established this material as aluminum, they then concerned themselves with the stage of the plaque and the organization of the space in terms of clarity of communication. They were anxious that these plaques would be noted for that high degree of legibility, and considerable research went into ascertaining how this could be achieved while still ensuring permanency. Further research was needed to find a way of creating an elegant plaque that could be made in any one of many shops across Canada—perhaps even as "one of a kind" and still keep within the overall cost allowance. To achieve a plaque with absolutely minimal cost, one (8" square) was devised that allows for no text changes and remains the same in all situations.

7

24" unilingual plaque. Plaque unilingue de 24"



7

The execution

The material chosen was a special 3/8" aluminum sandwich rolled by Alcan and known as "Alcan Dual Tone". This material provides legibility by virtue of the difference of tone or "color" between the aluminum itself (here used for the letter form) and that of the anodized outer aluminum-silicon cladding (here used for the dark background, which is a very dark shade of grey—controllable to achieve various densities). Permanence is achieved because the dark grey color is not a function of pigmentation but is the natural color of anodized aluminum-silicon alloy. The messages are in a standard typeface (Helvetica) and are positioned in accordance with a grid which ensures that all messages will appear on all plaques, no matter where fabricated or installed, in the same relative positions on the plaques themselves. The overall cost was estimated at about \$150 for the largest plaques and \$30 for the smallest. The method of communicating all their details of design, fabrication and installation to the eventual users is a Standard Manual, published by the Centennial Commission.

The Technique of Signmaking and the Need for Improved Standards

by Anthony Mann
Design Collaborative

The sign industry in Canada is made up mainly of small firms. It is not a sophisticated industry, as a glance at any shopping street will show. Throughout North America, the industry has developed its own visual style which seems quite cut off from developments in the graphic arts since the 1930's.

The present low level of taste contrasts sharply with the fine traditions of sign writing. During the 19th century the signwriter was a respected and creative craftsman, a leader in the development of new letterforms. Today, the standards of the craft are at a low ebb, and it is difficult to find a signwriter who can even copy a letterform accurately. The architect cannot rely on the industry for guidance in aesthetic matters and he will find few acceptable standard systems available.

It is the graphic designer who is generally called upon to provide the creative service in signage programs. He is rarely a specialist in this field and, since he is accustomed to working with type, generally specifies typefaces for signage purposes. Since it is rare to find a signwriter who has any feeling for reproducing typefaces, the graphic designer is forced to use photographic techniques for copying, and thus, at the better levels of production, the signwriter has become a signmaker.

Standards are necessary to ensure that additions to a system can be easily made, and to reduce costs, both in design and production. However, the slow death of signwriting as an art has not yet resulted in the birth of new, acceptable techniques and standards, perhaps due to the fragmentation of the industry into small units. Until good standard letterforms and techniques are adopted there appears to be little chance of an improvement in the general aesthetic level of the industry.

Choice of material and reproduction technique for signage is generally dictated by considerations of cost, quantity, durability and appearance.

Cost and quantity are often closely related; one of the problems of signage is that many signs are produced as single items. With large signage programs the quantities often

permit a wider choice of techniques and the opportunity to introduce new designs, rather than being restricted to inadequate standards.

Durability is related to both material and technique, and is particularly important in outdoor signage or where heavy wear or regular cleaning is involved. Appearance is often the most important factor in making a choice, and many otherwise satisfactory techniques have to be ruled out because of standard letterforms or materials being inadequate from this point of view.

The following list covers most techniques in general use.

Silkscreen Printing

Silkscreen printing is widely employed for producing signs. Both hand-cut and photo-copied silkscreens are used, but it is advisable to specify photo-screens in order to maintain accurate letterforms. Artwork must be prepared for each sign and a screen made from the artwork by means of a photographic film-positive. The artwork, often the most expensive element, ensures accurate quality control. The screen can be used for quantity production, but cannot be used to print on curved or uneven surfaces.

Durability is good, depending on the material on which it is printed, and the ink used. Masonite, plywood, metal, glass or plastics are all suitable materials for silkscreen printing and high quality signs can be produced by this technique. Colors present no problem.

Applied Letters

Letraset: Most architects are familiar with Letraset alphabets and this technique can be employed for indoor signage where the signage is not exposed. It is particularly useful for temporary signage, in exhibitions, for example. Skill is required to obtain good letterspacing and quality control is difficult.

Adhesive plastic sheet: A wide range of reflective and non-reflective plastic materials are manufactured specially for the signage

industry. 3M adhesives and plastics are widely employed for road signage and the decals on many aircraft, including Air Canada, are applied in this manner.

Letters can be diecut from these materials either in single letters or pre-spaced into complete words on a carrier sheet. Large letters are hand-cut from master patterns. At present the choice of standard letterforms is not good, but the system is very suitable for signage purposes and offers the best chance of raising the general level of signage in the future. Special alphabets can be cut for large projects. Screen printed decals with adhesive backing are much used in transport identification. Large adhesive backed letters are widely used for highway signage.

Cut-out lettering

Quite distinct from the thin plastic letters mentioned above, are the traditional cut-out letters in wood, plastic, cork or metal. Both standard and custom made letters are used in commercial signs, such as fascia panels, company and building names. Letters may be moulded, cast, fret-cut, die-cut, hand carved or fabricated from sheet.

Standard systems are available for adjustable lettering on directories and notice boards, using die-cut or moulded letters, but choice of letterforms is poor.

Incised lettering

Letters can be engraved by hand in metal, stone, marble, plaster, wood or plastic. Good lettering is still being done this way but it is naturally an expensive process on an architectural scale.

Full size photoprints or templates should be used for checking all forms of handwork before the job is started. Machine engraving from masters, using a pantograph, is a good system for producing small signs, but once again the choice of letterforms is poor and standards are not well designed.

Etching is similar to engraving but can be carried out photographically from artwork. It is an excellent technique for commemorative

signs and uses where durability is important. Metal, glass and plastic can all be etched. Letters are often paint-filled for legibility. Hot stamping is an inexpensive technique where the sign is embossed from ordinary type assembled in a heated platten. Showcards are often produced this way, but again standards are poor in the trade. Brass type is used on plastics and the results are technically acceptable but there is a poor choice of letterforms.

Raised lettering

Cut-out lettering, applied to a pattern, can be cast in metal or plastic. The same system can be used to cast large panels in concrete, with the letters either raised or recessed. Plastic sheets can be vacuumformed, leaving raised letters, and this is widely used in illuminated signs. Many different techniques are available for both incised and raised lettering, but apart from special applications where durability is important, the value of such techniques is questionable.

Signwriting

The term signwriting refers specifically to the brush painting of signs by hand, but it should probably be extended to cover the various masking and spraying techniques which are also essentially hand crafts. Good traditional signs are still produced by brush but the craft has generally degenerated to poster-writing, or the fast production of cheap showcards.

Signwriting is still an important technique, particularly where large size prohibits the use of other techniques because of cost. There is nothing essentially wrong with signwriting as a means of producing signs except the existing low level of craftsmanship and the difficulty of quality control. Full size photoprints or tracings are necessary for any degree of accuracy if a layout and letterforms are to be followed, but do not guarantee success.

Anodizing

Lettering can be reproduced on aluminum by means of anodizing and the results are both durable and accurate in detail. Where the

budget permits, anodizing is an excellent quality technique. As with silkscreen, artwork is necessary and increased quantities greatly reduce unit cost.

Ceramics

Vitreous enamel on steel is a technique still used for traffic signs. The tendency for the glaze to pull away from edges of the sheet is a design limitation and accounts for the rounded corners and borders usually found on these signs. Glazed plaques or bricks can be set into walls, the image being screened onto the ceramic before firing.

Photographic techniques

Although photographic film or prints are used as part of many processes of reproduction they are rarely used as the end product in signage.

With the development of photo-composition and photo-lettering these processes offer certain advantages for such signage as directory boards and names on doors where changes occur frequently. Film positives can be obtained directly from the composing machine and can be inserted behind glass or plastic sheets.

Letterpress

Although the use of normal letterpress printing is restricted to small sizes of letters, the process is useful in applications such as name signs on doors and on directory panels. The different items can be printed on one sheet of card and then trimmed into separate strips. Neoprint is a letterpress system specially developed for signage purposes whereby larger sizes of letters are assembled by hand for reproduction without the use of a printing press.

Fixings, supports and materials

Early planning of a signage system can greatly simplify the design of supports and fixings. By the groupings of signs and by careful consideration of their relationship to the building or environment and to each other, the number and types of supports can be reduced.

Where systems are complex and future additions are anticipated, provision should be made for adding information in the simplest and most effective manner. If it is not possible to accommodate the extra elements on the same panel, it may be possible to mount another similar panel adjacent to the first. Proper planning for additions can avoid clutter at a later date.

The type of supports and fixings can also be used to identify the type of information (eg directional indicators end-mounted; identification signs with double supports; regulatory signs with single centre supports). Materials can also be used to associate or disassociate signs; metal, wood or concrete supports used in different ways can signal the type of sign. Signage can be a valuable aid in defining areas. A campus with a variety of architectural styles may be unified by a consistent signage system working in conjunction with lighting and landscape detailing.

Signs planned as part of a corporate image program can signal property limits by their design alone and can be valuable elements in creating a unified corporate identity. Lighting systems can often be combined with signage if planned in advance; street names can be printed direct onto the glass of street lamps and parking restrictions can use the same supports; room numbers, shelf numbers, exit and elevator signs can all be combined with lighting and so eliminate unnecessary fixtures. Good standard systems are badly needed in all types of signs. Devising custom-made fixtures for names on doors or illuminated street signs is costly and should not be necessary. Perhaps the Design Branch of the Department of Industry could persuade local, provincial and federal authorities to agree upon some sort of standardization as a start.

The signage industry has been slow in realizing the possibilities of good standard designs. Architects are in a position to improve the situation by taking greater interest in the signage connected with their own projects, by refusing to accept signs which are below standard, and by calling in graphic consultants on major projects wherever possible. □

Alpine Village, Whistler Mountain, B. C.

Davidson & Davidson Architects

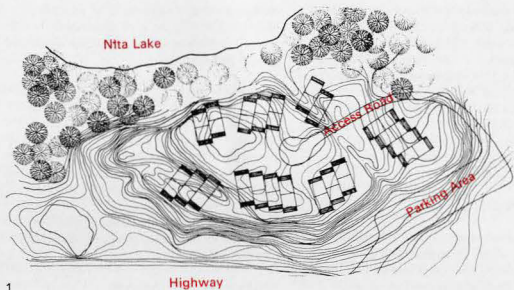
We were approached by the developer in the summer of 1964 who wanted to build some sort of accommodation at Whistler Mountain. We went with him and chose the site because of its spectacular view, trees and uniqueness.

The site suggested some sort of mountain village type of development which we proceeded to do. A careful model was prepared of the site, and the village, consisting of fifty houses, was carefully sited on this model. The model was used to sell the houses. Approximately thirty units were built in the summer of 1965 and pre-sold with the remainder being built this year. The project became one of the first condominiums in Canada when the BC Strata Titles Act was passed this September.

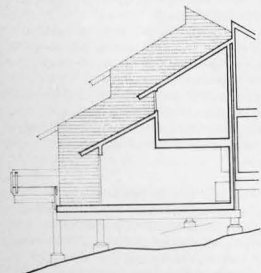
At present all the owners have a share in a joint stock company hence the limitation of fifty shareholders since, if there were more, the company would have to be a public one.

The houses are joined in clusters of six or eight and they are staggered vertically and horizontally and all have the same plan and elevations. They are heated electrically and are of simple frame construction supported on cedar pole columns. Nearly every existing tree was retained as well as the rock on which the village sits. Great care was taken with soundproofing and insuring that the water lines would not freeze. *D. & D.*

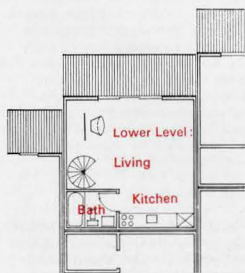
- 1 Site plan
Plan d'emplacement
- 2 Section
Coupe
- 3 Plan Main Level
Plan du rez-de-chaussée
- 4 Plan Sleeping Level
Plan de l'étage des chambres à coucher



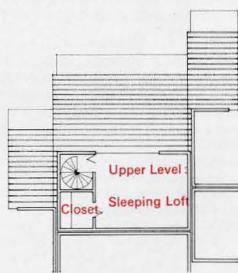
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CANADIAN

BUILDING DIGEST

DIVISION OF BUILDING RESEARCH • NATIONAL RESEARCH COUNCIL



CANADA

Indoor Swimming Pools

by G. K. Garden

UDC 725.74

It is generally assumed that through modern mechanical engineering technology any indoor physical environment can be produced and maintained. There are, however, many indications that there is a lack of appreciation of the fact that the enclosing construction must be appropriate if the desired conditions are to be realized and serious building problems avoided.

Indoor swimming pools and other occupancies that produce or require high humidity need careful consideration of both the interior environment and the building design. Unfortunately it has become common practice to accept the many problems that develop in cold weather as an inevitable part of a swimming pool facility. This is not correct, however, nor is it necessary to accept the loss of amenity, curtailment of function, nuisance problems, disfigurement and accelerated deterioration of the building as part of the price one pays for an indoor swimming pool.

Although swimming pools must provide environmental conditions conducive to human comfort, the conditions differ from one class of user to another. A swimmer's comfort is determined by his activity and the water temperature. Out of the water, air motion, evaporation from the skin, and radiation become

important factors, but their effects on the bather and the spectator are not the same.

Water evaporation from the surface of a heated pool tends to increase the humidity in the air over it, influencing user comfort and producing severe problems in the building fabric during cold weather. The humidity can be reduced in several ways, but proper operation of the facilities is required.

Compromises may have to be made in establishing the indoor conditions that will be maintained in swimming pools as well as in the design of the enclosure. Only if the choices are faced at the outset can an over-all optimum solution be achieved. The considerations involved are the subject of this Digest.

User Requirements

The main user requirement is for a reasonable level of comfort, which may be related to many things — in this Digest, specifically, to thermal sensations. Comfort may be regarded both physically and physiologically as a condition of thermal neutrality under which the body need not strain to reduce or increase heat loss.

The level of physical activity is a major factor in comfort, since it determines the rate

NRC DBR OTTAWA NOVEMBER 1966

CBD 83

of heat generation within the body. In its attempt to maintain a constant temperature, the body must dispose of excess heat to the medium surrounding it. In swimming the skin is in intimate contact with water, and because of the efficiency of the conductive heat transfer the water temperature must be reasonably close to the tolerable skin temperature. Because of the high heat output from the body during competitive or active swimming, a water temperature of 72 to 75°F is acceptable. With a lower level of activity, a water temperature of 75 to 80°F may be desirable. Older people and those who relax in a pool may even prefer 85°F or higher.

A swimmer, out of the water, could be comfortable at an air temperature lower than that of the pool water except for the increased convective cooling effect of moving air, cooling from evaporation of water on the skin, and the radiative transfer of heat to surrounding cool surfaces. To provide comfort, any one of these conditions can be modified, within limits, to compensate for the others.

A swimmer who is very active out of the water will be reasonably comfortable with an air temperature of 75°F and a fairly high relative humidity unless there is exceptional air movement or radiation cooling. Less active bathers will require an air temperature of 80°F or more for reasonable comfort, but when the humidity is low bathers who are wet may be less comfortable than those who are dry.

Spectators require the usual conditions of about 70°F and a relative humidity between 30 and 70 per cent for optimum comfort. Fortunately, these conditions do not conflict greatly with those acceptable for competitive swimming. A spectator can be very uncomfortable, however, when exposed to the higher air temperature required by less active swimmers, especially if the humidity is also high. When there are conflicts between spectator comfort and pool use, it is possible to consider separating spectators and swimmers with transparent walls so that different conditions may be provided for each occupancy.

The Pool and the Building

The water surface presented by a pool must be regarded as a large humidifier capable of adding water to the space at relatively high rates whenever the dew-point of the air is less than the water surface temperature. The thermal characteristics of walls and windows, as normally constructed, usually limit the relative humidity that can be carried in winter to about 35 per cent at 73°F. This corresponds to a dew-point temperature of 43°F and will produce condensation on surfaces lower than that temperature. In pools, which are always well above this temperature, evaporation will take place continuously, with consequent increasing relative humidity in the space above until the level is reached at which evaporation is balanced by loss of moisture from condensation and ventilation.

In this way, condensation will always take place in winter on windows and walls of normal construction enclosing pool areas unless high rates of ventilation with relatively dry air are provided to carry off moisture at the appropriate rate to balance evaporation. When such air is drawn from outside in winter, it must first be heated to indoor air temperature. When no ventilation is provided, evaporation will continue and condensation will be produced on all enclosing surfaces that are below air or pool temperature, whichever is the lower. The condition that exists when the pool is warmer than the air will be recognized as particularly critical. In general, pool spaces must be ventilated continuously in order to prevent high humidity and the possibility of excessive condensation on enclosing surfaces.

The surfaces of large windows are always quite cold in winter and will always experience condensation unless the relative humidity is held to a low level by ventilation. They also produce cooling by radiation, which may be felt by the occupants. Curtains over large glass areas to provide privacy reduce the radiative cooling effect, but they further reduce the surface temperature of the glass as well. In such a situation, condensation will occur on the glass under less severe conditions and over longer periods of time.

It is quite apparent that a swimming pool room must be considered a high humidity space and the design of the enclosure and mechanical services must take full recognition of the nature and probability of condensation.

Minimizing the Problems

Condensation of water vapour, the cause of most problems associated with pools, occurs when the dew-point temperature of the air is higher than the temperature of any surface it may contact. To prevent *surface condensation*, it is necessary to keep the dew-point temperature sufficiently low or keep all surfaces warmer than the maximum dew-point temperature. It has become common practice to select interior surface materials that are not severely affected by some condensation. Run-off from these surfaces can, however, damage other surfaces or enter the wall and window materials to produce a variety of problems.

Air leakage, a very prominent mechanism operating in most buildings, transports water vapour into walls and roofs, producing *interstitial condensation*. This concealed condensation is responsible for much building deterioration in the form of corrosion, masonry failures and efflorescence, wet freezing damage, paint blistering and failure of roofing systems. Reduction in the effectiveness of many insulation materials also occurs, increasing heat loss and further reducing interior surface temperatures.

Air movement from a high humidity space through a building can also cause these problems at points remote from the swimming pool, especially at upper floors. Because of this, it is important to prevent air movement from the swimming pool room to the remainder of the building. It is also necessary to provide a separate air handling system for the pool area. All enclosing walls and roofs must incorporate barriers to the passage of air and vapour from the inside or must be arranged so that contact with the pool atmosphere is prevented in order to avoid condensation within them.

To Reduce Humidity

To reduce evaporation of water from the pool surface, which is the main source of high humidity, the water should be kept as cool as

possible. Because evaporation goes on at all times, it is recommended that designers and owners consider covering the pool when it is not in use. A light plastic film can be floated on the water surface, being placed mechanically or manually, depending upon size and convenience. This would allow a reduction in the rate and thus the cost of ventilation when the pool is not in use; although mechanical ventilation or dehumidification must always be provided to keep the relative humidity within reasonable limits. Mechanical ventilation can be quite successful in winter since the specific humidity of the make-up air is extremely low, but it is considerably less effective in hot, humid weather. Condensation problems, however, are far less probable when the exterior temperature is high.

Design of a Satisfactory Enclosure

The design of building enclosures for high humidity conditions has been discussed in many previous Digests. It should be recalled that maintaining high interior surface temperatures demands sufficient insulation so positioned that it will not be subjected to wetting by condensation from vapour diffusion or air leakage. Air leakage through the construction and around window and door frames, ducts, electrical fixtures and conduits must be prevented.

Improved glass surface temperatures require proper frame design and the use of multiple glazing units. Reflective glasses having a low emissivity can also be used to advantage in gaining higher interior surface temperatures.

The best enclosure design may be one in which the exterior enclosure elements are not exposed to the severe environment of the swimming pool space. This can be accomplished by incorporating a heated space between the interior surfaces and the main enclosing elements and ventilating it with low-humidity air. In this case the inner layers of material will be required to resist the passage of air and vapour, but will not be subjected to a temperature gradient. Any moisture that might leak into the space will not raise the humidity appreciably because it will be removed by the ventilation process. This space can be as little as is required for proper air movement or it can be wide enough to perform as a corridor.

It could in fact, be wide enough to provide the entire space required for spectators or for other facilities.

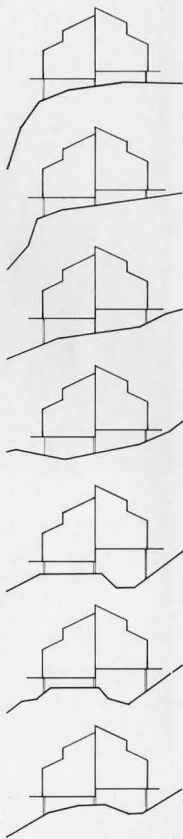
Conclusion

It is important to realize that a wide range of solutions to the total problem of swimming pool design can be found, depending upon the compromises that can be accepted. If a simple, conventional wall and roof system is to be used, the humidity level must be kept low, using a high level of ventilation or mechanical dehumidification and recognizing the high operating costs inherent in equipment and heating. The use of wall and roof designs that

can tolerate the swimming pool environment may involve slightly higher initial cost for building, but a reduced expenditure for mechanical equipment and operation. The implications of a shut-down or improper operation of mechanical equipment must also be considered in the selection of building type.

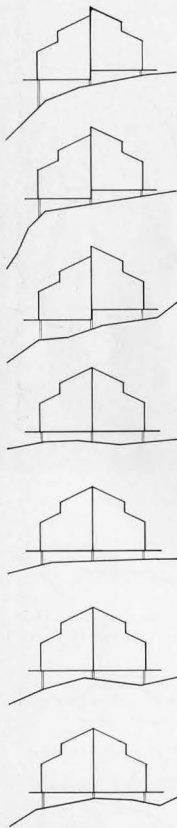
It should be emphasized that some ventilation of the swimming pool space is essential regardless of building design. The owners and operators of swimming pools must be made aware of the fact that mechanical equipment is an essential part of the over-all design and that it must be properly operated if serious building problems are to be avoided.

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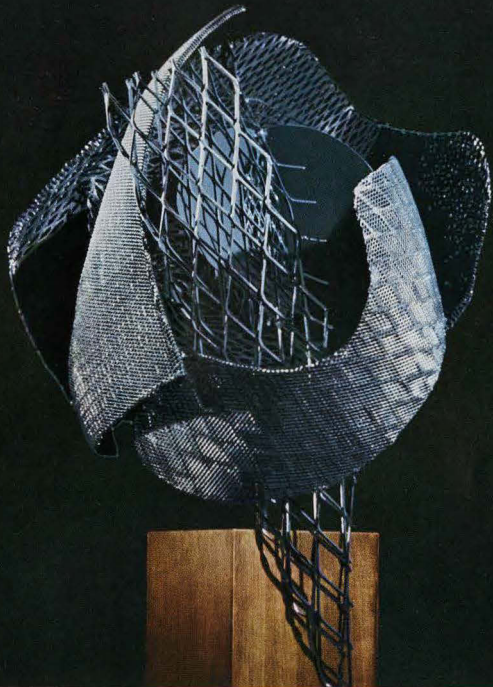


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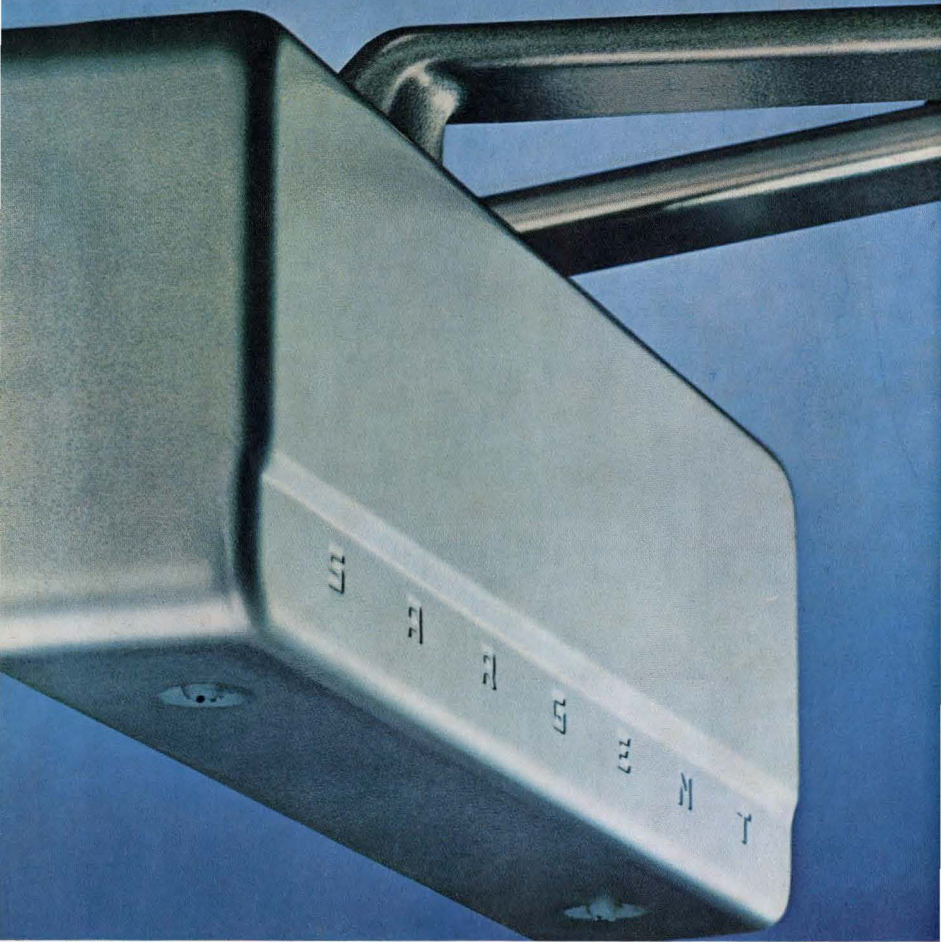
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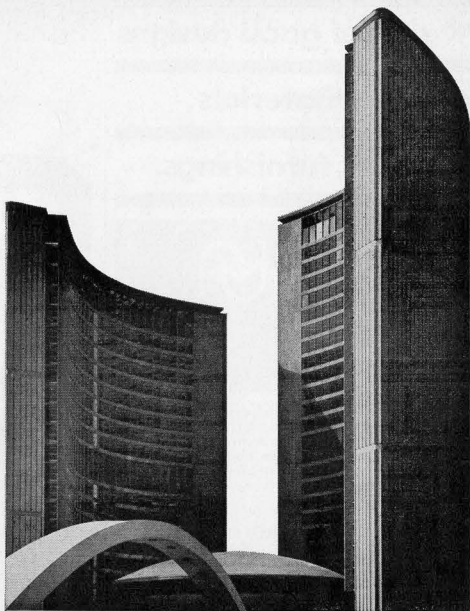


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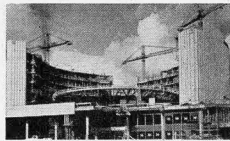
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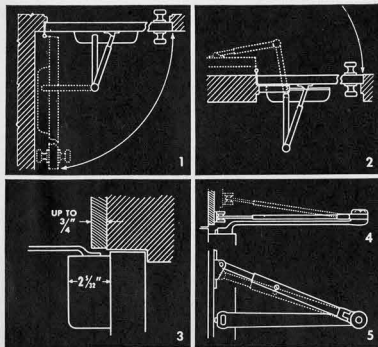
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It's made by American-Standard and it's called the Cadet.

Nothing revolutionary about the exterior design. Simply a straight, clean, architectural look (like the look of the slightly more expensive models). And a full range of colours (six in all plus white).

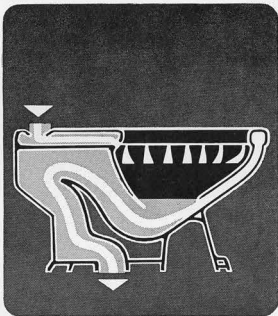
Well now, for a medium priced toilet, such clean design is reason enough to choose the Cadet—maybe not the best reason but a darn good reason.

Another reason is the reverse trap flushing action of the Cadet. (That means that the water goes out toward the back of the bowl).

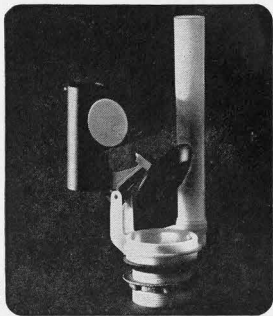
In the cross-section diagram you can see that this reverse action will give a complete, full flush.

And the rim punching, jet and trapway have been completely redesigned for stronger syphonic action. This combination of reverse trap flushing action and redesign makes doubly sure that the total flushing action is powerful.

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1.



But probably the best reason for choosing the Cadet is our new Number Five Flush Valve. Now what in the world is a Number Five Flush Valve?

Well, it's a flush valve mechanism that has a unique delay action which holds the valve open for an extra 12 seconds of flushing. That means lots of water (more than tank capacity) for the most complete flush possible.

So, good looks, reverse flush action, and an extra 12 seconds of flushing. Quite a lot from a medium priced toilet.

And by the way, the Number Five Flush Valve is also available on our wash down Camden toilet.

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by J. D. Kern

Mr Kern is a Consulting Engineer in Vancouver

The newest and the most promising of materials to enter the field of Plumbing and Drainage over the last years has come from the Plastic Industry.

Although plastics have been with us for some time in the area we are discussing, it is only very recently that the volume of this product has made itself felt in the trade and to the public. However, as we will attempt to show, it will be only a matter of time, technical development, marketing, official and public understanding and acceptance of plastic products before most, if not all plumbing materials will be plastic.

To give weight to these statements one has only to quickly glance at other industrial and commercial industries to be made aware of the tremendous inroads carved from traditional materials by this product. Listed below are only a few of many applications where plastic materials are being successfully used.

- 1 Automotive car bodies in place of steel.
- 2 Rugs in place of woollens, and cottons.
- 3 Clothing in place of woollens, cottons, linens, etc.
- 4 Optical instruments in place of glass.
- 5 Insulation in place of forest products.
- 6 Roofing in place of metals, tars and gravel, etc.
- 7 Toys in place of steel, cast iron, etc.

Plastic piping was first introduced in North America around 1940, although it had been in use in Europe since 1930. It was some eight years later, in 1948, before any appreciable quantity was used; principally on rural farms, mines and in the Petrochemical Industry. From this modest beginning in 1948 of \$500,000 a year industry, plastic pipe production in the United States has grown to become a \$125,000,000 industry in 1965. This tremendous growth in the use of plastic pipe has been the result of the technical and marketing programs embarked upon by the various manufacturers. These technical programs, both in research and in production, have led to a great improvement of their products selectively, quantitatively and qualitatively. The marketing programs have been aimed not only at the consumer, but also

the Architect, the Engineer, the Plumbing Contractor, and the Municipal, the Provincial and the National Code associations.

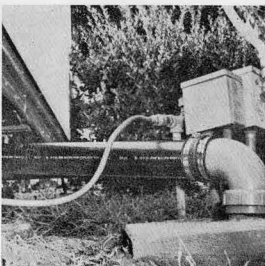
Two types of plastic pipe, acrylonitrile-butadiene styrene (ABS) and polyvinylchloride (PVC) have made a great impact in the mobile or trailer home market, where production of these items, using plastic pipe now exceeds 125,000 units annually in the United States. In these installations the plastic pipe has undergone a severe test and has passed with flying colors.

In more and more industrial and commercial installations, plastic piping of one type or

another is being installed, in an ever widening range of applications, such as water treatment, raw water feed mains, sludge filter lines, underdrainage piping, pneumatic control lines and hydraulic control lines.

The important area by virtue of the largest volume manufactured, however, has been in the water distribution and water service pipe lines.

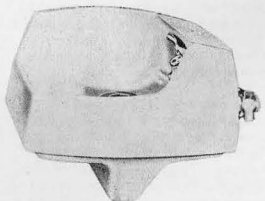
In the United States alone, in 1965 more than 50,000 miles of outside cold water service piping and water main distribution piping was installed. Most recently ABS-DWV (drain waste and vent) and PVC piping have both been approved by Central



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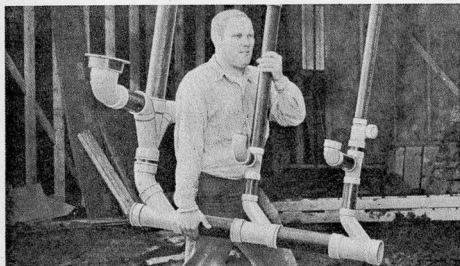


3

1
ABS DWV pipe and fittings designed for permanent or temporary installation of waste disposal lines into park sewer systems, Mobile Home Sewer Fittings by GSR neatly solve what has long been a problem in trailer park maintenance.

2
ABS pipe is up to 87% lighter than comparably sized cast iron pipe. Here, five twenty-foot lengths of four-inch ABS DWV pipe are easily carried by one man.

3
"Dura-gel" drinking fountain has the strength of steel, lightness of plastic and sparkling beauty of ceramics.



4

Mortgage and Housing Corporation for National Housing Association building. This approval, however, is restricted to single detached buildings, not over two stories and not exceeding 36 feet in height, and not to pass through fire separations.

This approval provides the first major inroad to the enormous domestic plumbing market. It is now only a matter of time and further technical development and marketing before complete acceptance and code approval of the products will be obtained.

There are many advantages in plastic pipe over tradition materials and also some disadvantages. Generally speaking the plastic pipe is light weight, allowing ease and economy of installation, and reducing cartage costs. The low friction factor and fouling tendency provides a more trouble-free service, and the low electrical and thermal conductivity self insulation, ease of repair and savings on external protection, painting and wrapping combine to provide a most satisfactory material.

However, the disadvantages to this product must be taken into account and allowances provided for in its installation. Plastic pipe has found resistance to increased temperature, low resistance to high pressures, high thermal expansion rates and poor resistance to fire. The greatest of these disadvantages is thermal

expansion which for PVC is 1" per 100 feet per 10°F and for ABS 3/8" per 100 feet per 10°F.

CSA's approval is enjoyed by the following plastics.

- 1 B-137 polyethylene pipe for cold water service.
- 2 B-137.2 ABS pressure pipe for cold water service.
- 3 B-137.3 rigid PVC for cold water service.
- 4 B-181.1 ABS DWV pipe for drainage waste and vent service.
- 5 B-181.2 PVC DWV pipe for drainage waste and vent service.
- 6 B-182.1 plastic drain and sewer pipe for underground.

Although some plastics *eg* PVC and ABS are suitable for cold water piping in building, wide use has not as yet been realized because of the cost of fittings and lack of universal code approval.

There are plastics available which are suitable for domestic hot water distribution piping, but as yet are not competitive price-wise with copper piping, nor have they received code approval. However, development and technological research is being carried out at this time towards these ends.

There are many plastic products currently

being employed in the Plumbing and Drainage Industry of which not all Architects and Engineers are completely aware. A new and superior "teflon" is now being manufactured and marketed for use in pump bearing, pump seals and valve seats. The interior components of sanitary flush valves, pressure reducing valve diaphragms and toilet tank flush assembly units are now almost completely made up of plastic components. Water closet seats made entirely of plastic including hinges and bolts are now the accepted standard. Plastic plumbing fixtures of various types are now in limited, but expanding use. Plastic drinking fountains and laundry tub are relatively common, while moulded wash basins with integral counter tops together with moulded bathtub with integral walls on three sides have been used in limited custom applications.

We can expect to see within the foreseeable future many more plastic items and equipment pertaining to the Plumbing trade. These could be plastic pipe hangers, plastic water pumps, sewage pumps and sump pumps, plastic supply fittings, plastic manholes, sumps and catch basins, and almost any item that can be brought to mind. □

Estimating

This element may be subdivided into :

- 1 Mains and connections
- 2 Fixtures, services and wastes
- 3 Special services.

1 Mains and connections

The mains and connections are kept separate because a large number of factors bearing little direct relationship with the size of the building varies the cost. Factors such as building proximity to the existing sewers and water mains, soil conditions (do these connections pass through rock or easily excavated material, does the site necessitate great depths of excavation, and backfill ?). The cost of the mains and connections should be separated from the costs of plumbing and drainage within the building.

2 Fixtures, services and wastes

Fixtures, services and wastes includes all of the piping, hangers, insulation, fittings, valves, traps, etc. required to supply water to or remove waste from sanitary fixtures, floor drains, fire hose cabinets, roof drains, etc., and the supply and installation of all sanitary fixtures, roof and floor drains, fire hose cabinets, etc. The cost of these fixtures, services and wastes does bear meaningful relationship with the gross floor area of specific building types. For example, it is reasonable to compare these costs for different schools, or hospitals or office buildings, and find that reasonably consistent prices exist for schools, but it's not reasonable to expect the costs for schools to be comparable with costs for office buildings or hospitals.

3 Special services

The cost of septic tanks, settlement beds, liquid soap systems, compressed air, oxygen, vacuum, gas and other special systems are grouped under this heading. Because this is a highly variable subdivision, it is not reasonable to expect any consistency when comparing the price per square foot for different buildings or different building types. Each service has to be evaluated on its own merits and costed accordingly.

The foregoing article has dealt mainly with plastics used for plumbing and drainage. Therefore a few material costs will be quoted here to indicate the price of plastic piping and fittings.

Drainage Waste and Ventilation

Description	Approx. Wt. in		Approx. List Price / 100 LF
	A.B.S.	P.V.C.	
1 1/4" Pipe	31	43	\$ 50.00
2" "	50	68	80.00
4" "	151	202	240.00
90°E Elbow			
SxSxSx 1 1/4"			ea. .90
2"			ea. 1.20
4"			ea. 5.20
Double Y Branch			
SxSxSxSx 1 1/4"			ea. 1.40
2"			ea. 4.50

Polyethylene and Polypropylene

Description	Approx. Wt. in Lbs. /100 LF		Approx. List Price /100 LF	
	P.E. and P.P.	P.P.	P.E.	P.P.
1 1/4" Pipe	27	22.00	43.00	
2" "	45	36.00	73.00	
4" "	125	122.00	250.00	
90°E Elbow				
SxSx 1 1/4"			1.40	3.90
2"			3.40	5.80
4"			11.80	22.00

Double Y Branch			
SxSxSxSx 1 1/4"	5.20	13.00	
2"	7.60	20.00	
4"	19.30	53.00	

Recognizing all the variations stated above with respect to mains and connections and special services, we give below costs per square foot for various categories of buildings for the whole of plumbing and drainage. These costs are for the Toronto area only in the Fall of 1966.

Cost per square ft.

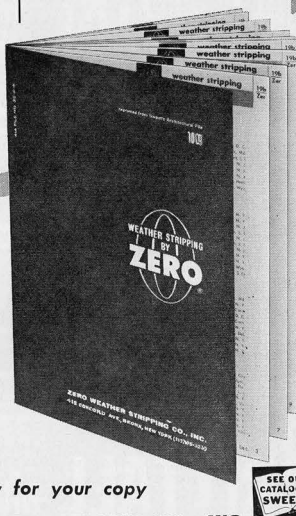
- a Speculative office buildings 70c.-90c.
- b Prestige office buildings 90c.-\$1.10
- c Hospitals \$3.00-\$4.50
- d Laboratories \$5.00 and over
- e Schools \$1.25-\$1.75
- f University residences \$1.00-\$1.20

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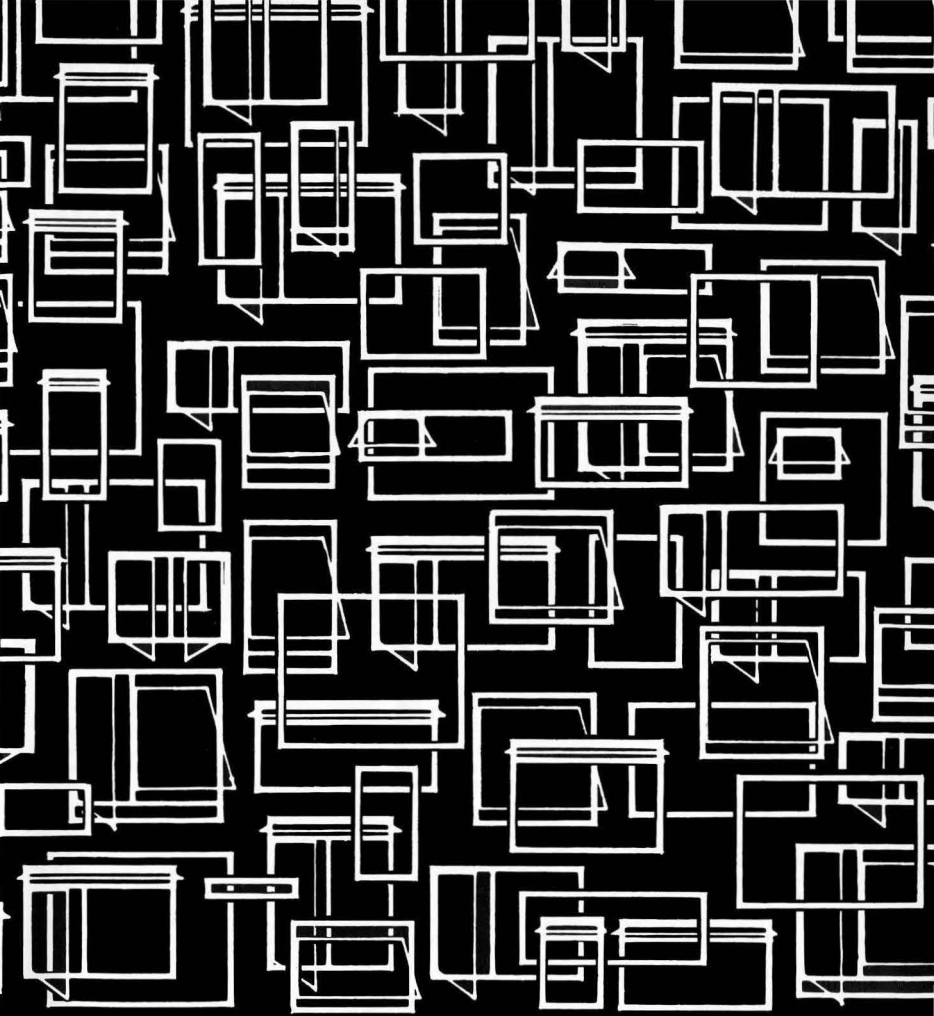
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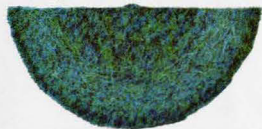
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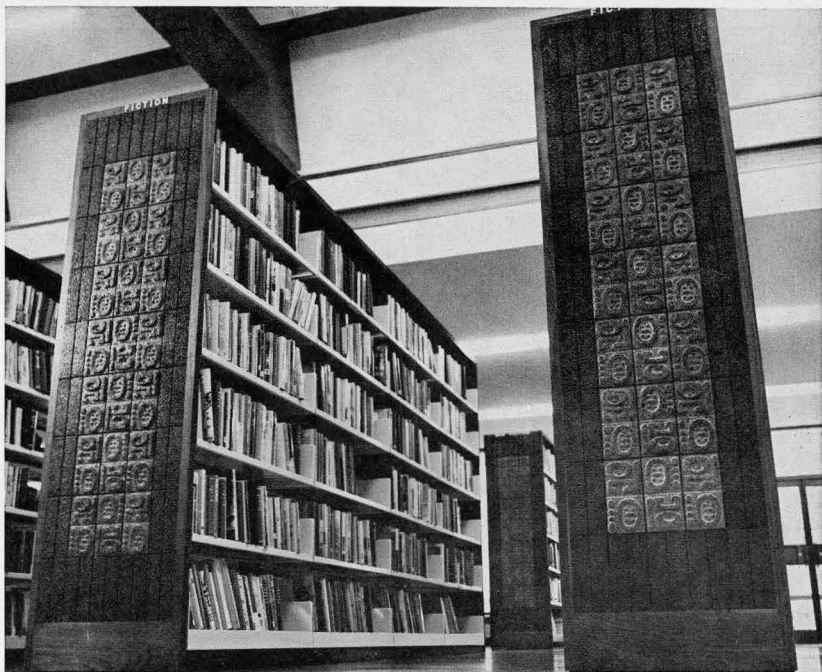
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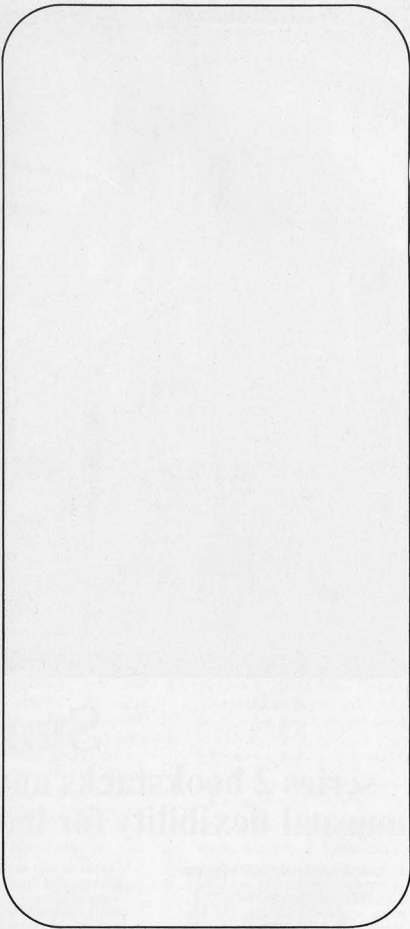
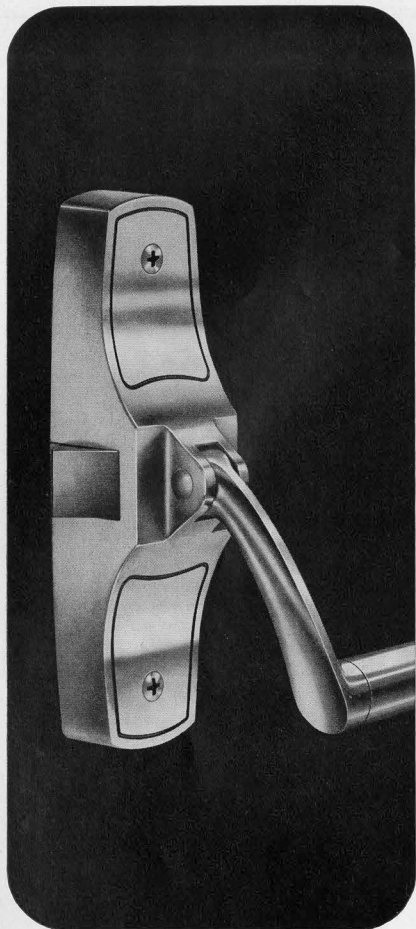
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A study of Courtyards and Court Dwellings, St Jacques and Bourget Wards, Montreal, by Stuart Wilson, MRAIC, who has taught and free-lanced in Montreal for many years, and Third Year Architectural Students at McGill.



Metropolitan Land-use

Aerial views reveal differences or similarities in patterns of land-use in built-up areas. Exploration on foot permits closer study. An examination of a portion of the east end of Montreal discloses a maze of small living and working courts behind and between houses and sheds.

The Site

Nine streets in this district, east of Amherst (now called Christophe Colomb) to Papineau, run in a nominal north-south direction, across the principal east-west streets Ontario and Ste Catherine.

These evocatively named streets, Amherst or Christophe Colomb, rue Wolfe, rue Montcalm, rue Beaudry, rue de la Visitation,

1

*View from rear of Court to Street
Vue de l'intérieur de la cour sur la rue*

rue Panet, rue Plessis, rue de la Maisonneuve, rue Champlain, occupy a smooth-surfaced portion of land. The area lies below the steep bank on the southern edge of Sherbrooke Street, and tilts slightly downwards towards Ste Catherine. The angle of slope increases towards the south, and the whole site is tilted eastwards. Orientation is towards the southeast and protection is provided against wintry blasts from the north.

The quarter may be entered from almost any direction of the compass. But the outsider most often approaches the district from Ontario Street on level ground, or from Ste Catherine Street up inclined streets sloping slightly at varying degrees.

Boundaries are man-made rather than

natural. Streets beyond the heart-area resemble those within.

Sherbrooke Street and Lafontaine Park seem remote, although they lie immediately above on higher land. The climb up the steep streets is arduous and the more elevated district is on a different economic plane.

Pattern, Grain, Focalization

Today, in the more easterly portion of the old St Mary's Ward, from rue de la Visitation to rue Champlain, the streets contain a group of super-blocks, or wider and deeper plots of land than is common. The larger than usual street-to-street widths between these five streets, combined with the development of a special arrangement of vernacular houses and sheds, results in a

typical but different land coverage and building pattern.

Widths of land between building faces on streets in the area vary between 200 and 230 feet. A standard lot size in Montreal is 25 by 65 or 75 feet. Two such lots plus a service lane give a block depth of 145 to 165 feet. In the court area, not only is the block size greater, but lanes for servicing dwellings are lacking and more space is available for building.

When the street-layout in the area was fully developed, population was low. The ample spacing of the streets permitted large lots. Between 1870 and 1890 the large-sized lots began to accumulate more structures. The addition of dwellings and extra sheds in the rear came about gradually.

The pattern was set by individual owners rather than by any central authority.

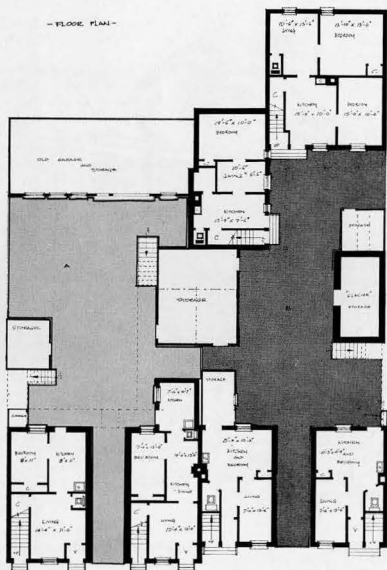
By 1890 city-plans show a more dense array of buildings. During successive years a large number of dwellings had been added within blocks. Properties had been altered to hold more people.

The effect may at first sight appear chaotic, but apparently cluttered areas conceal a sophisticated interlocking of volume, mass and spaces. Sunlight plays a supporting and formative role and reveals the complexity of the formal arrangement.

Houses on streets make a perimeter-screen, concealing the inside of the block. Within the block, sub-divisions or lots contain the courtyard units.

A uniformity of proportion and detail is kept throughout. Houses of the same period, or more recent, are usually in harmony. The smallness of the proportions maintain a certain constancy and balance.

At the corners of most blocks can usually be found small corner stores, snack-bars, restaurants and groceries. Tall ornamented conical turrets crown balconies incorporated into corner-features. More recently the stores below have been well-plastered with



1

colorful signs, usually supplied by soft-drink firms.

Population Density

The area contains 13,200 people. Today the average population density is 140 persons per acre. As some small pockets are unpopulated the actual figure must be higher in places.

From 1941 to 1961 population decreased by 20.7 percent. Young families with children have sometimes moved out and older people have replaced them. Still the streets and courts contain many young people.

Dwellings

Dwelling units are small. A single structure may comprise five households. Houses which consist of apartments or flats or single-family residences may be found both at the edge of sidewalks facing the street, as well as on the side or rear lot-lines facing inwards to a court.

Types of house-forms vary only slightly as many appear to have been constructed at the same time. Most of the street-houses are of two or three storeys. Façades are usually flat, with balanced doors and windows. They edge the sidewalk. A decorative carpenter's cornice with classical references, topped with sheet-iron flashing, surmounts the wall.

Many roofs are flat. In some houses an extra storey occurs in the form of an old-time pitched roof or as a late-nineteenth century false slate-covered mansard. Both types have dormer-windows.

Although many doors and windows are plain and severe, others are richly and even frivolously ornamented.

The tunnel-like opening to the court is usually placed centrally on the façade. Windows sometimes open on the tunnel. Front doors often open directly from living-rooms onto sidewalks. On a fine summer evening the passerby may see TV screens flicker from the darkened rooms. During hot weather the family sits by the front door. Chairs and even children's cots are placed on the sidewalk and people sit on doorsteps.

Houses are shallow rectangles with a depth of twenty-eight feet or less, running along the street or set on the perimeter of the court. Court-houses tend to be smaller than street-houses. Houses are usually two rooms deep. Most rooms are airy and well-lit.

Access to upper floors (2nd or 3rd floor) is by a flight of stairs located within the house-block. In courtyards both interior and exterior stairs are found.

Balconies are rare on the fronts of street-houses. Most balconies are confined to courtyards.

Spatial accommodation is reasonably adequate for small dwellings, but is inadequate for large families. Storage facilities such as cupboards are lacking. Sheds provide storage-space. A shortage of furniture makes rooms appear larger than they are. A typical floor area for a one-floor unit is 400 square feet, or double for a two-storey. Rooms are small. Ceilings are low. Kitchens, which may also serve as living-room or extra bed-room, are the largest spaces. Dimensions of 13 feet by 10 to 12 feet are not uncommon. Living-rooms or parlours are cramped and often serve as entrance halls. Vestibules are uncommon. Sleeping rooms are minimal. Sometimes the

least dimension is below 8 feet, while the largest dimension may be close to 8.

The ratio of the number of persons per room in the district is 0.8 compared to 0.4 and 0.6 for more wealthy and less crowded Montreal districts. The ratio is independent of the size of the rooms.

Dwelling-structure is Quebec plank-frame, brick veneered. Masonry fire-walls act as party or "mitoyen" walls on lot-lines. Sheds are built either of wood studs or plank, covered by wood sheathing and finished with sheet-metal.

Hygienic and service facilities are limited. All houses are provided with a WC. Bath-rooms often contain only a WC. Toilet doors are in conspicuous positions. Although all dwellings have cold running water, only 40 percent have a bath or shower. In the remaining 60 percent washing-up must be done in the kitchen sink.

Few houses are heated by furnaces as most domestic heating is furnished by oil stoves or space heaters.

Cooking is performed on gas stoves or on oil stoves with limited fuel-tank capacity.

Many houses have earth cellars vented by small openings. Winter heating draws humidity into the house.

Some roofs drain directly onto sidewalks or courtyards.

Dwellings are illuminated by electricity and most homes contain frigidaires and TV sets. These amenities appear to be more highly appreciated than other basic comforts and necessary health facilities. Such an observation is misleading and unjust and does not tell the whole truth.

TV sets and fridges are moveable and procurable items. When plugged in they function.

When the tenant can procure such facilities he does so. He improves his standard of living. But when service systems are bulky,

complex, or integral with the house and permanently connected to power systems for city waste and sewage systems, the tenant cannot easily help himself. The hidden and integral character of most mechanical and service systems in houses may also discourage the proprietor from improvement and renovation.

Growth, Change and Flexibility

Not all courtyards are run down. Buildings are in good shape and everything is trim and neat in more prosperous courts.

The courtyard combines the advantages of multi-family apartment dwellings with the privacy of single family houses. Different arrangements are possible.

However, the existing courtyard is too isolated, and sometimes too cramped. Secondary access might be provided to traffic controlled arteries. Pedestrian passages of non-uniform width planted with trees and greenery could traverse street-blocks.

People and Place

The People in the "Faubourg" are not pretentious. Although many are poor, they appear happy. They are polite, curious and friendly. They intermingle in small groups with one another and laugh easily. Loyal to their group, they help each other out with food or clothing in times of trouble.

They live simply, but at the same time they are materialistic. Conveniences which can be purchased in shops or stores are appreciated. The interiors of the homes are well-cared for. Automobiles, some of recent vintage, are parked everywhere.

Politics are of little interest to local people. They will attend "rallies" to pass an evening. Votes are governed by custom or by personal whims. Exciting social events are enjoyed for their own sake. Country-wide campaign issues do not ruffle their judgment.

The tenants of the courtyards, "les locataires", regard their court as private ground

disconnected, to some extent, from the city. They say that living there is like living in the country. "C'est comme à la campagne."

The area has a village atmosphere. In the past many who settled here came from rural Quebec. Some of the older residents are from the country.

People do not feel physically isolated. They know that a turbulent city-life is close at hand. Travelled streets pass by or through the area. Foreign pedestrians or vehicles penetrate.

While social deprivation may not be a problem, larger social opportunities are limited by economic restraints.

Cheapness of living accommodation looms large for the inhabitants than more elaborate, up-to-date and more expensive quarters. They do not regret living in the locality as they are aware of compensatory advantages.

Courtyard dwellers are sympathetic to their neighbours. The atmosphere is free and easy.

In each courtyard a social hierarchy governs. Visitors or intruders are greeted by the oldest tenant. This authoritarian figure usually owns a dog to provide protection.

Most "locataires" fear for the demolition of their dwellings, especially the elderly. Many tenants are financially incapable of moving into different and more expensive homes.

Four principal classes of people, as defined by working activity or source of income, dwell within the area, about equally divided in numbers:

a Those who are engaged in full-time regular work such as specialized workers or independent tradesmen. This group includes a minority who work at sales, clerical, industrial crafts, technical, professional or management occupations.

b Those who undertake irregular seasonal or part-time work such as dock workers,

longshoremen, as well as workers in transportation and laborers.

c Those who are unemployed and who receive Unemployment Insurance. The sick or disabled, who are assisted by Welfare Agencies and government aid.

d Those who receive the Old Age Pension. Local workers are more oriented towards the trades and occupations requiring physical skill than they are towards white collar jobs.

The life of both adults and children revolves around work or school. On week-ends or during summer evenings men can be seen fixing up their dwellings, improving so far as they are able the living-conditions for their family.

Small children are everywhere. They are always active, and can be seen in streets or courts, jumping, laughing and running. Shriill voices fill the air. Doors slam as they dash in and out of houses.

Three to five children in a family is common. The proportion of children in the area is higher than in some Montreal districts. Children appear healthy, curious and happy.

Family income falls on the average below the \$5,000.00 a year level.

Children are obliged by law to attend school until the age of fifteen. However some children work. It has been reported that parents fail to pay much attention to PTA school meetings except to quickly pick up their child's report card. The parents might be lax or the meetings might be dry.

Teenagers are receiving more education than their parents. About 50% of the students complete high school or the equivalent.

After school, kids play in school-yards, in courtyards or the street. Older children and young people gather at street corners, talking, smoking, watching.

At home indoors, children do chores and watch TV, especially Channel 10. On Sunday night Ed Sullivan is the favorite.

Most children have pets.

Outside organized activities include church clubs, school organizations and summer camps. Going to movies is a favorite recreation.

The automobile is an important element in the lives of younger people. Ownership of TV and car is considered important. TV watching has been adopted as a major pastime, and has competed with the church for audiences. The difficulty of pursuing other leisure activities has caused a diversion of energy to these pastimes.

Ninety-five percent of the inhabitants are of the Roman Catholic faith. Although attendance at church may occasionally slip, the inhabitants respect the church, feel they belong to the parish, and know the priest. This portion of the "Faubourg" includes sections of more than one parish.

Opportunities in education, welfare, recreation and sport have depended largely on the organization and leadership of the church. The large and richly ornamented churches on the edges of the district represent economic and social conditions as they were fifty years ago rather than today.

The school buildings, both within and immediately outside the area, are the largest building masses in the neighbourhood, except for churches and industrial buildings. Severity and austerity are characteristic. Adjacent to schools are the playgrounds, fenced off with chain-link fences.

The immediate neighbourhood does contain a number of social, cultural and religious amenities. The Municipal Library is located nearby, above the area, on Sherbrooke Street. Opposite is the large city park and recreation area, Lafontaine Park.

Social life within the selected area is more present within the smaller elements of the neighbourhood pattern. The home-courtyard unit is not only an important physical element but it is also a principal social component of the community. □



SOIL DESCRIPTION	DEPTH	TYPICAL BORING LOG	SOIL PROPERTIES
LEAD GRAVEL SAND CONCRETE BRICKS	2'		LEADS TO MEDIUM DENSE
SAWMILL WASTE	12'		LEADS TO
BRICK DEPOSITS GRAVEL & SAND SILT SMALLS ROCK	24'		LEADS TO MEDIUM DENSE
GRAVEL TILL 'SANDY' SALT SHRIKER	26'		VERY DENSE N 150 TO 250 S 80 TO 120 SW 4 TO 20 SW Pa 1.5 AT 26' Pa 21
GRAVEL TILL DEPOSITS LEAD & SALT	30'		
DISCONTINUOUS ROCK SAND & SANDSTONE	30'		
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Vancouver, B.C.

STRUCTURAL ENGINEERS:
O. Saffer & Co. Ltd., Vancouver, B.C.

SOIL ENGINEERS:
Ripley Kohn & Leonoff Ltd.,
Vancouver, B.C.

GENERAL CONTRACTOR:
Marwell Construction Co. Ltd.,
Vancouver, B.C.

NUMBER OF FRANKI UNITS:
325 Caisson-Piles with steel cased shafts

WORKING LOAD:
90 Tons

DRIVEN LENGTH:
30'-10"

CONCRETED LENGTH:
28'-9"

Bayshore Inn on Franki

Problem:

The Bayshore Inn in Vancouver was planned by Western Hotels Incorporated, in 1959. The site overlooks Burrard Inlet, about one-half mile from downtown Vancouver, with excellent access provided by the George Street thoroughfare. Across the water lies North Vancouver and the outlying peaks of the Coast Range.

Originally used as a sawmill site, a thick layer of woodwaste of undetermined proportions had been deposited in the water adjacent to the shore. Naturally deposited consistent soils were found well below the proposed working grade and the low water level.

To develop the property to its full potential, the site was extended out into the harbour by the placement of loosely controlled fill that contained assorted soil types, boulders and large concrete chunks.

The hotel was to have nine storeys with individual column loads ranging from 180 kips to 1600 kips.

The structural designers were faced with these problems: —

- 1) About 12 feet of assorted rubble fill in an unconsolidated state.
- 2) About 12 feet of decaying wood chips and bark in an unconsolidated state.
- 3) A twice daily tidal variation producing water level changes from 2 to 12 feet below grade.
- 4) Serious saline attack on all exposed steel and concrete for the life of the building.

The foregoing soil conditions necessitated a deep foundation of Caisson-piles.

Solution:

A system of piling was required that could penetrate the overlying fill down to the bearing layer of very dense till. Driving equipment with high energy capacity was needed to break and dislodge obstructions. Leads had to be stiff enough to give directional control to the verticality of each unit, so the patented Franki Type XVII pile driver, which was designed to serve just these requirements, was brought into use.

Heavy-walled Franki drive casings of 20" diameter were driven with 7,000-pound hammers, using energies in excess of 140,000 foot-pounds per blow. After penetrating all fill and the old shoreline debris, expanded concrete bases were rammed into the sandy till until the necessary amount of energy per cubic foot of concrete had been absorbed by the bearing layer to support a 90-ton working load.

The pile shafts were constructed of 16" o.d. 1/4" wall structural grade steel pipe. In order to protect them from saline attack, all lengths were delivered to the site with a protective coating. This coating was comprised of a coal tar enamel of 3/32" around which a fibre glass strip was wrapped while the tar was still hot. Kraft paper formed an outer cover. All pipes were moved about the site on sleds to prevent damage to their protective coating.

Type II cement was used to make the concrete bases and the fill in the cased pile shafts.

While this site provided an ideal location for a fashionable hotel, Franki's methods, equipment and engineering knowledge provided the ideal answer to the soil complexities of the locality.

As always, Franki has THE RIGHT FOUNDATION FOR EVERY STRUCTURE.

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

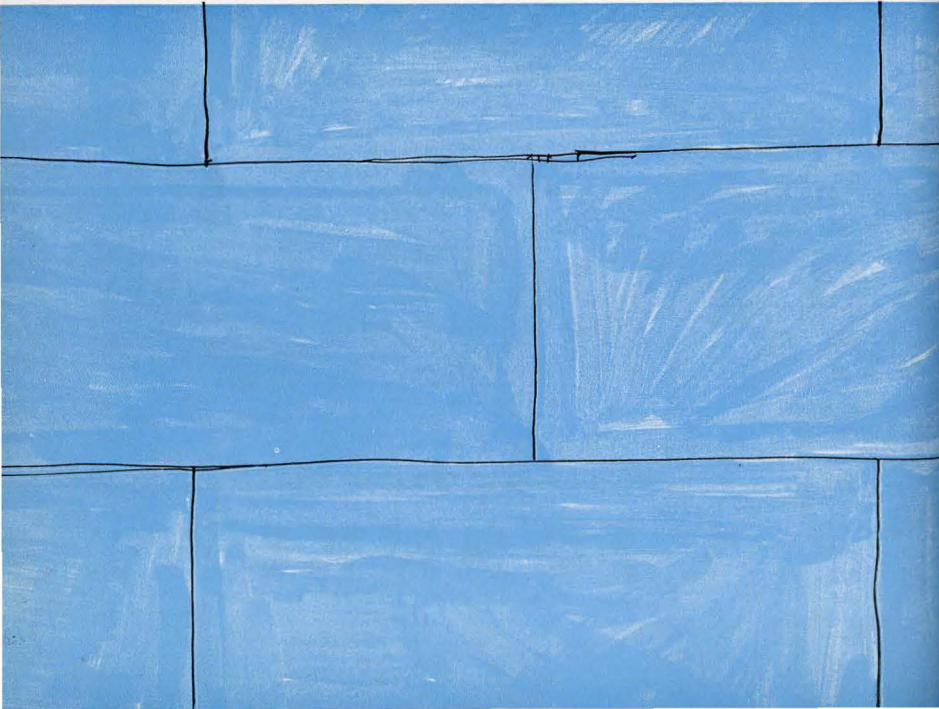


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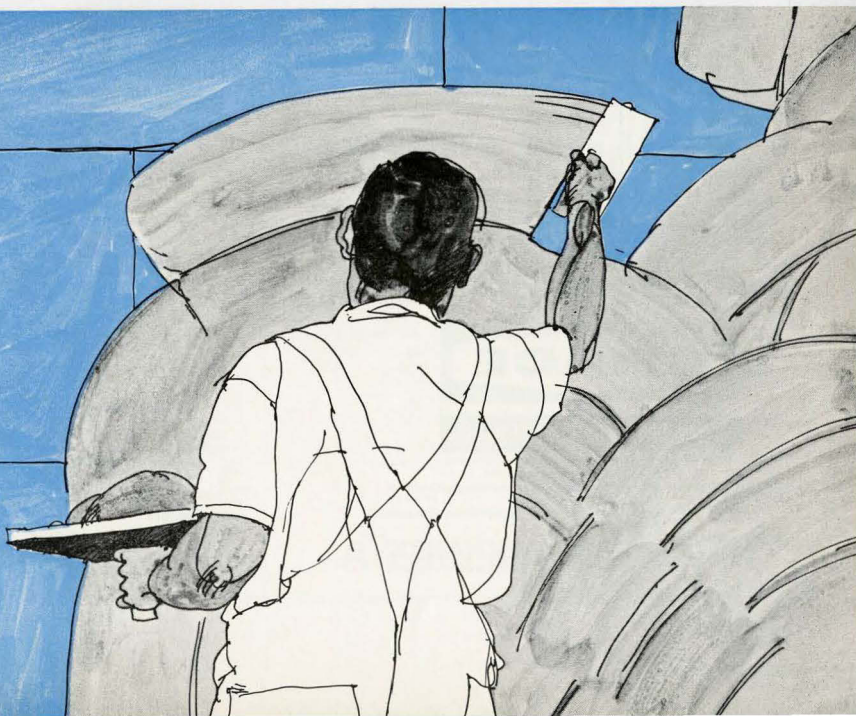
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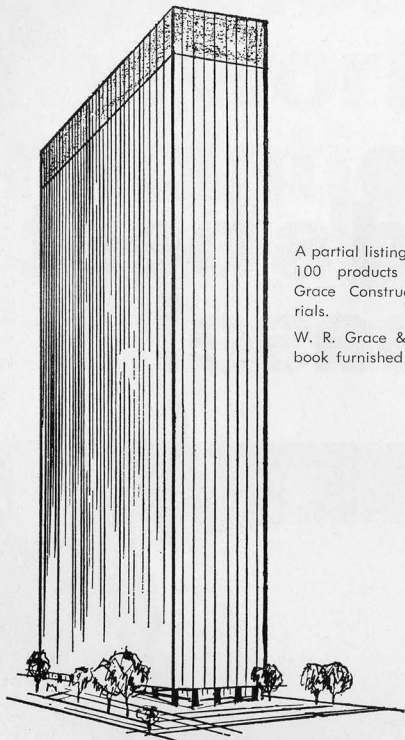
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Correspondence from Patrick Stoker,
Derek Buck, Ian Davidson

The Editors :

Congratulations, the new look is very good.
Mes compliments à tous!

Patrick Stoker, MRAIC
Montreal

The Editors :

I have received over the last few months,
so much favorable comment on the new format
and name change of the *Journal* that I felt
I should pass these on to you.

The change of name to *Architecture Canada*
has made a great impression on those
architects with whom I have spoken. This is
especially true with the younger members
who feel that it is very contemporary and in
keeping with our new graphics and image.

The latter has had a great effect upon the
extent that *Architecture Canada* is read. It now
offers a real invitation to the reader who
finds the editorial matter not only appealing
to his eye but also to his professional interests.
Without doubt, readership is on the increase
and I predict it will continue.

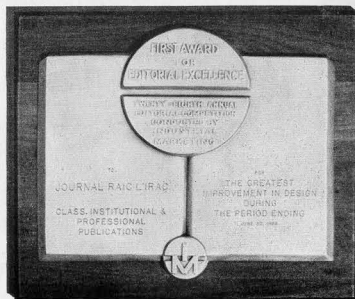
My sincere congratulations to you and to
all members of your staff who have been
responsible for these excellent changes.

Derek Buck, MRAIC, ARIBA
Toronto

The Editors :

I must say that the changes in the *Journal*
have turned it into a useful and interesting
magazine instead of the usual meaningless
collection of bad photographs.

Jan Davidson, MRAIC
Vancouver



We are first in North America . . .

We have just won the first award for editorial excellence in the twenty-eighth annual editorial competition conducted by Industrial Marketing, open to all English language business publications in the United States and Canada.

The basis for the award was "Greatest improvement in design, format, typography and treatment of illustrative materials, so as to achieve: maximum story-telling use of visual material; the visual effect of inviting readership; maximum design effectiveness; harmony of design throughout the publication."

W. N. Greer, MRAIC
Chairman, Publications Board

Walter B. Bowker
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A. J. Diamond, MRAIC
Associate Editor

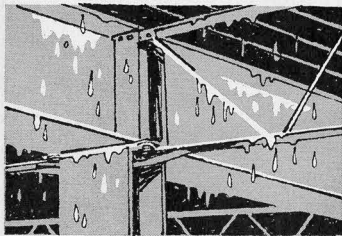
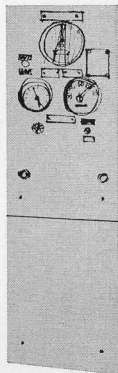
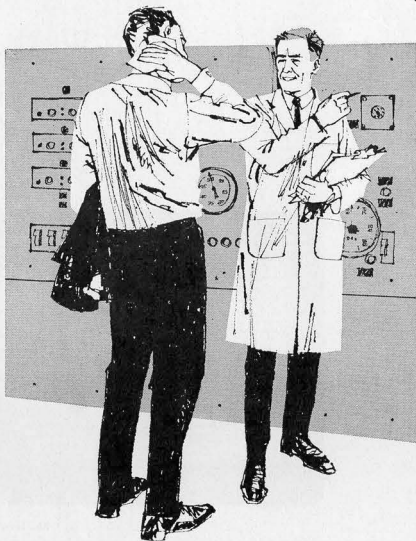
C. Annabel Gerald
Assistant to the Editor

Anita Aarons, ASTC (Sculp)
Allied Arts Editor

Architecture Canada

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MONTREAL, QUEBEC, 1967

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Positions Vacant

Gaudet & Roy, Architects, have openings for qualified Architects, experienced draftsmen Senior and Junior. The evolving solutions to meet new problems of design and organization is the challenge to be met. Salaries and conditions of employment will be established upon contract. Write H. P. J. Roy, MRAC, Gaudet & Roy, P.O. Box 69, Moncton, N.B.

Positions Wanted

British Architect, 43 years of age, 10 years experience Senior Assistant Section Leader private practices, surveys, traditional and industrialized housing shop and office complexes, factories and warehouses, specifications, final accounts emigrating to Canada end of November seeks employment preferably in Ontario or Manitoba.
D. F. Aldridge, "Steepholm", Weston Lane, Bath, Somerset.

Junior Draftsman, second year Ryerson Night School, with six months office experience, wishes employment in Toronto. Contact Mr Bob Cestra, 85 Mulholland Avenue, Toronto 19 (RU 3-7128)

Architect, graduate of the Catholic University of Santiago with over twenty years experience, presently teaching at the University of Caracas, Venezuela, specializing in schools and hospitals, wishes to immigrate to Canada and wishes a position with an Ontario architectural firm. Write Sergio Bruce Saint-Jean, Casilla 217, Talca, Chile.

Young qualified Indian architect, B.Arch. University of Bombay, with some office experience, seeks immediate employment in Canada. Reply Girish Ghatalia, Sobhag bhuran, Narvroy Lane, Ghatkopar, Bombay 77 AS (India).

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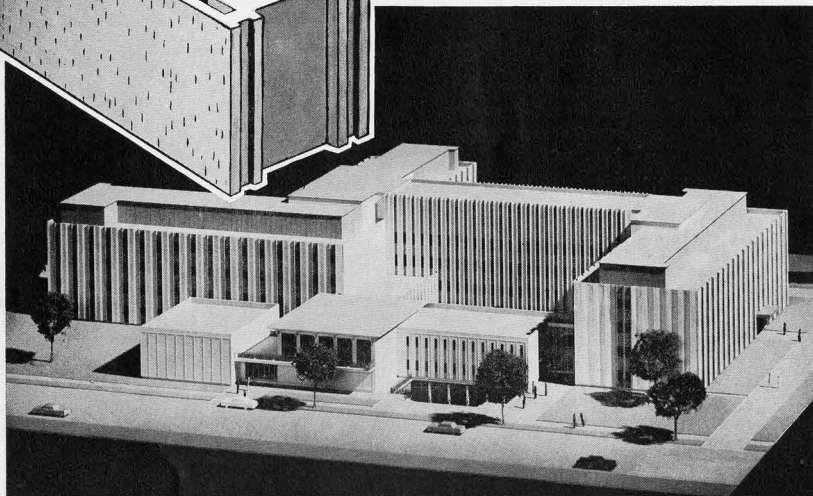
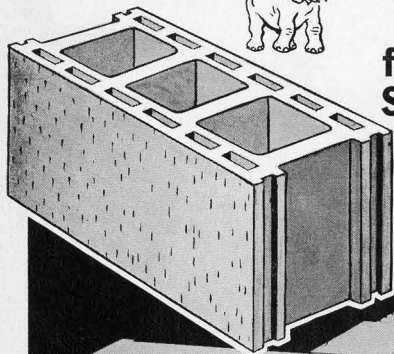
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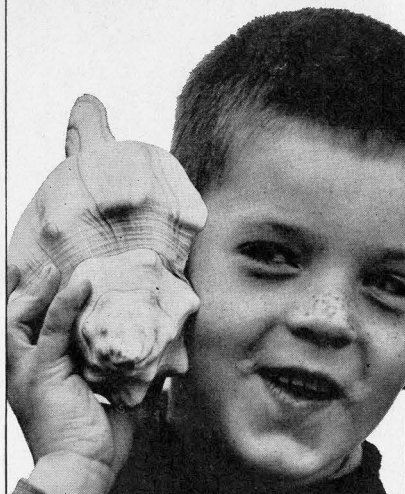
*T.M. Reg'd.

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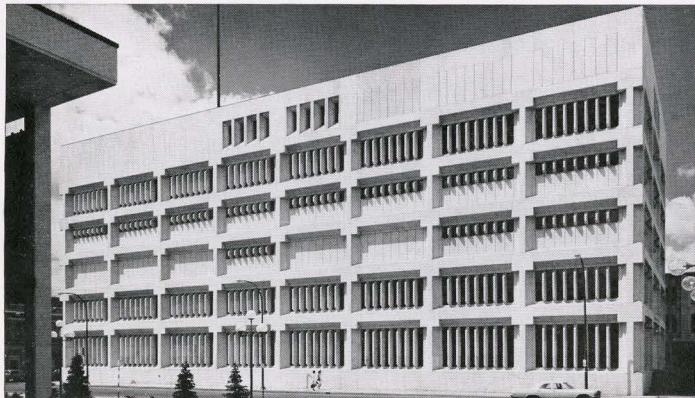


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