The Monarch Life Building, Winnipeg

Architects: *Smith Carter Searle Associates, Winnipeg*

Mechanical Engineer: *Bowyer Boag, Winnipeg*

Electrical Engineer: *Kummen Shipment Ltd., Winnipeg*

Interior Consultant: *Allison Bain, Toronto*

Landscaping Consultant: *H. Reid, St. Paul, Minnesota*

General Contractor: *Bird Construction Co. Ltd. of Winnipeg*

Photography by Henry Kalen

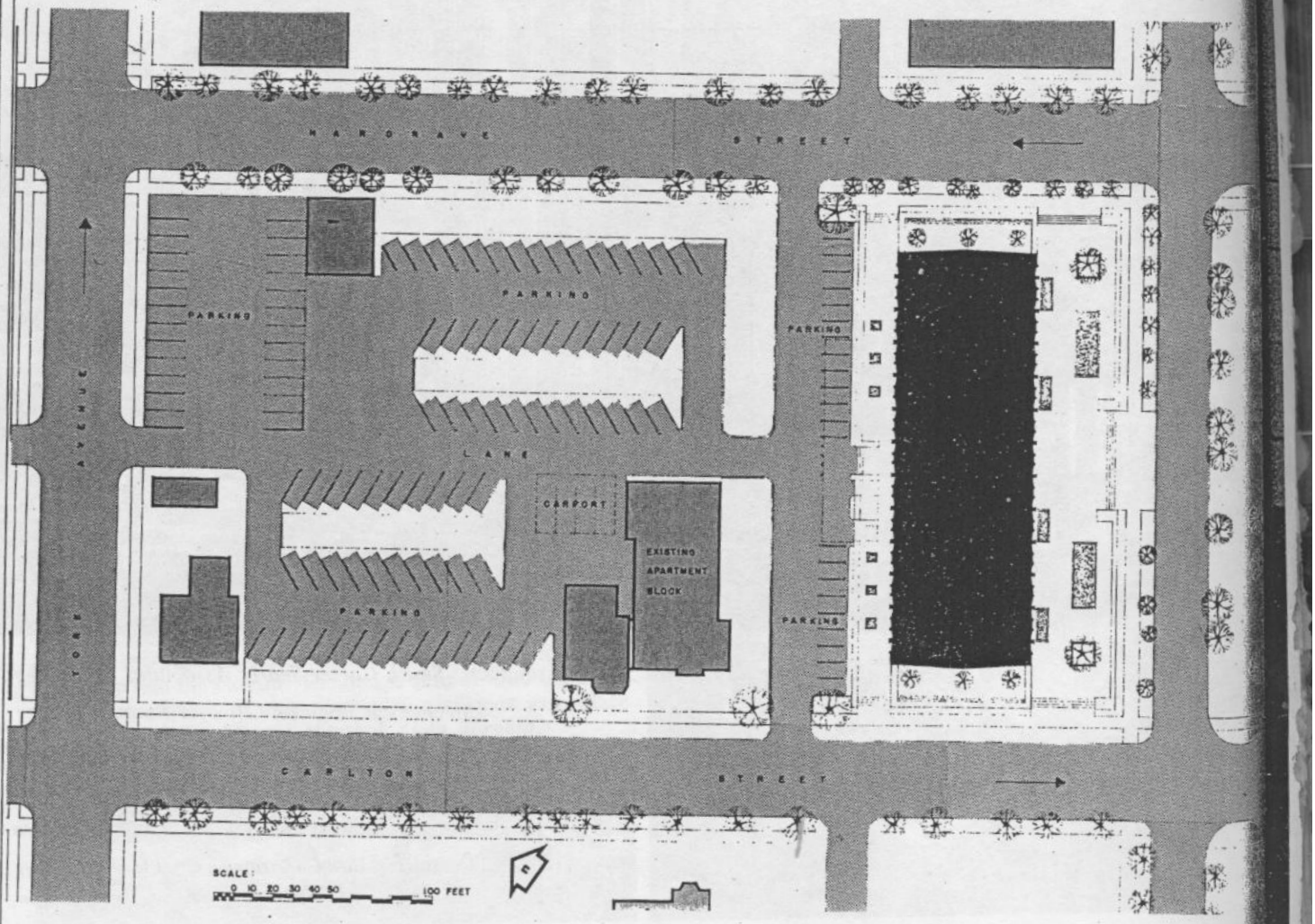
The Monarch Life Building

THE NEW head office building for Monarch Life Assurance Company is situated on the north side of Broadway Avenue between Carleton and Hargrave Streets. Broadway Avenue is fast becoming a new financial district for Winnipeg with several recently completed office buildings. The site along Broadway is 216 feet and extends almost a complete block to the north, providing enough room for ample surface parking.

The building which has a full basement or lower floor, six office floors and mechanical penthouse, sits on a landscaped podium which is raised two to three feet above the surrounding sidewalk level. This provides a generous setback from Broadway with its wide boulevard and avenue of trees. This, together with the overall size of the building, makes an interesting contrast to the surrounding smaller buildings which have generally been built with only the minimum setbacks required by zoning By-Laws.

The exterior of the Monarch Life Building is grey granite with a natural cleavage finish. This is a heat treated surface giving a rough natural texture. The spandrels between windows are of black polished granite which is also used to form the surround to the podium, and small landscaped areas. The stone generally is a 2 inch thick veneer, held back to the steel frame work by stainless steel anchors. The jointing process for the stone was a dry technique using a compressed synthetic joint material called Compriband. This sealer allowed winter work to proceed on the exterior of the buildings, and at the same time provided a really first class joint which is water tight and resistant to the extreme temperature cycles encountered in this area.

The podium slabs are precast exposed aggregate squares to the building module of 5′ 8″.



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Window frames and metal work are generally in stainless steel. The windows on the upper floors are glazed in structural rubber gaskets, using a heat reducing, glare reducing grey glass. The same glass is glazed directly into stainless steel on the lower floors.

The main columns of the building are on 17 foot centres and carry the body of the building which is cantilevered at both ends over the high space of the main floor level.

Generally the planning and structure of the building is based on the 5′ 8″ module. This module has been carried through in lighting, air conditioning, mechanical and acoustic materials in the ceiling, where all services have been integrated to form a system which has the maximum flexibility in partition arrangements and office planning.

The building services such as elevators, washrooms, staircases and mechanical ductwork have been located at the centre of the building in two very compact cores which allow for the maximum amount of usable floor space on the remainder of each floor.

Lower or basement floor contains cafeteria and auditorium, some storage areas and mechanical equipment, including air conditioning equipment to serve the basement and first floor. Lower floor facilities which can be rented to outside organizations, are connected to the main floor by elevators, and a staircase from the main lobby of the building down into the staff lounge area.

The cafeteria is served by complete kitchen facilities on the east side, whilst on the west there is a multi-use auditorium which can seat in the neighbourhood of 400 people.

Very careful consideration was given to the lighting technique in the lower area so as to eliminate the characteristics usually associated with basement space. Wall panels are surrounded by concealed light, and a complete suspended ceiling grid with lighting above was used. The floors in the cafeteria and auditorium areas are vinyl tile, and the floor of the staff lounge is carpeted.

MAIN FLOOR

The main floor, which has an 18 foot ceiling height and a completely luminous ceiling, contains the main entry lobby into the building, the Winnipeg Branch Office of the Monarch Life Company to the east, and a branch of the Toronto-Dominion Bank to the west.

Partitions in this area are taken only

to a 10 foot height, and the ceiling system continues through above them.

The two main core sections at this level are surrounded in polished granite – the same type as used on the exterior.

The main staircase down to the lower floor area has a glass balustrade in stainless steel frames, with the handrail covered in black leather over sponge rubber.

Floors 2 to 5 are mostly office space with the Monarch general offices taking the 4th and 5th floors, and the 2nd and 3rd being for tenants.

All office partitions on these floors are on the 5′ 8″ module and are of baked enamel on steel, with the use of the full glass divisions where required. Doors have a steel core with plastic laminate surface. All services such as intercom, telephone and alarm systems, are run through the concrete cellular floors on all office floors.

The sixth floor contains the Monarch Executive offices, the Board Room and President's Suite to the south, and two smaller divisions of the Company to the north.

The executive offices are carpeted throughout. Steel stud partition walls are covered with plaster and a finish of either hardwood or vinyl fabric. The main corridor partition dividing the executive offices from their secretaries, is of stainless steel with unpolished plate glass running from floor to ceiling.

Lighting in the executive offices is recessed incandescent with fluorescent panels over the secretaries' desks in the executive corridor. There is an acoustic plaster ceiling throughout this area. The hardwood wall finishes are teak with a waxed finish.

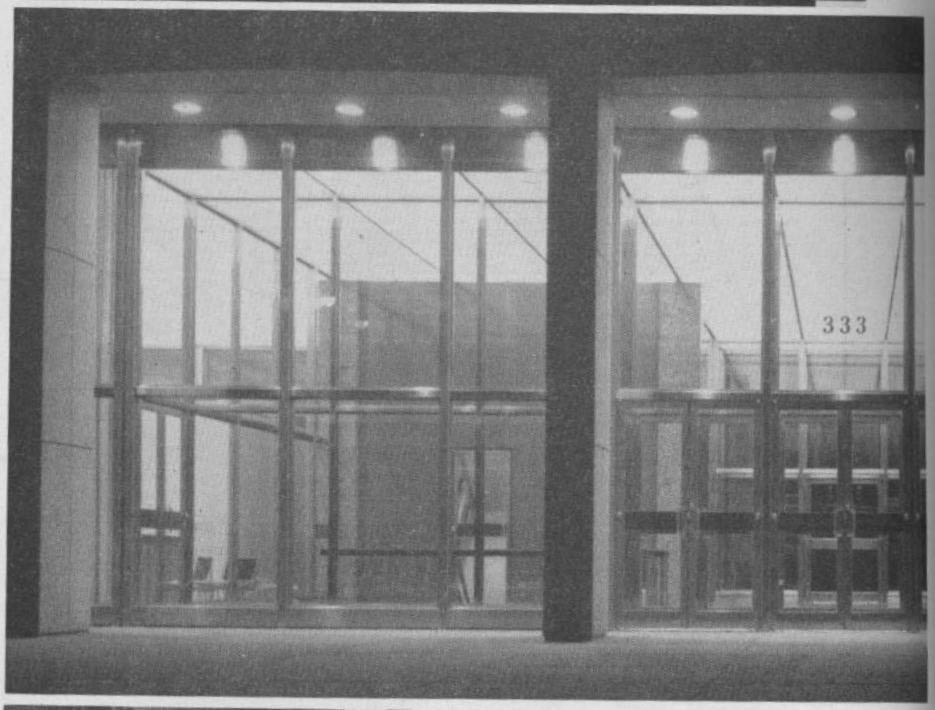
The roof of the building overhangs the windows on this floor, forming an adequate sun canopy. The outside glass walls of the executive offices are set back from the main face of the building.

PENTHOUSE

The penthouse above the 6th floor contains the two gas fired boilers for the building, as well as major air conditioning equipment which serves the second to sixth floors. The boilers were located on the roof for economic purposes. Very careful consideration was given to the transfer of noise of mechanical equipment through to the 6th floor executive offices and all the noisy equipment was set on isolation pads.

FOUNDATIONS

The heavy column loads were carried by cast-in-place concrete caissons which were end bearing on bedrock about 53 feet below street level.



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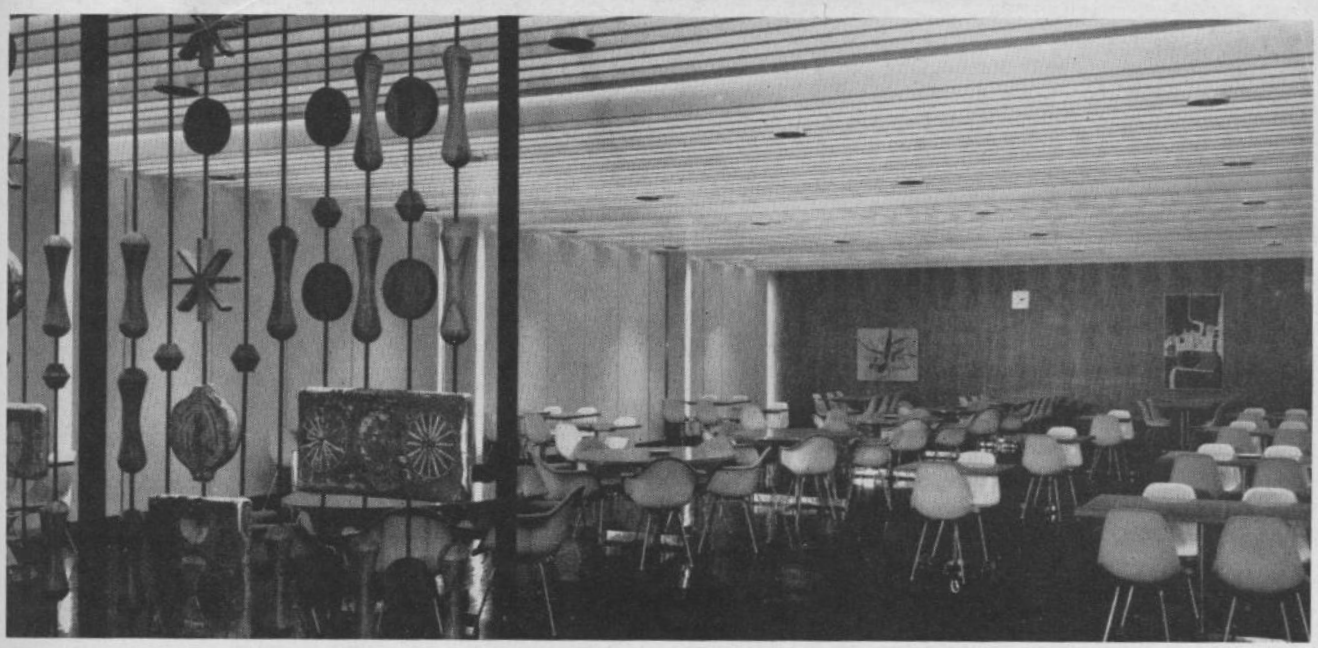
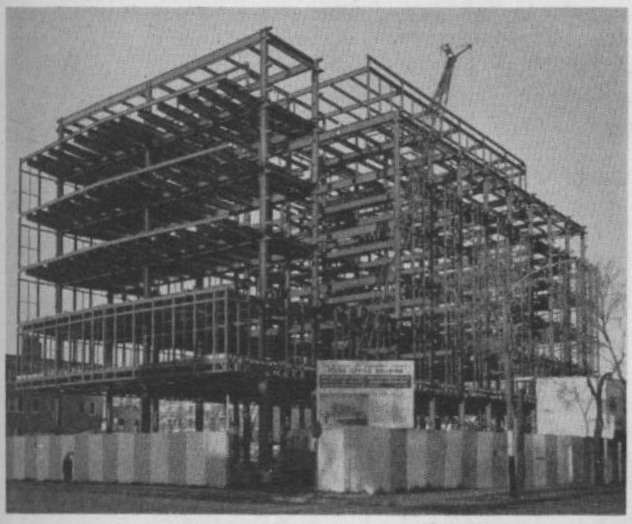
Top Facing: Cafeteria on the lower ground floor.

Centre: The Main Entrance at night.

Bottom Facing: The Structural Steel Frame.





STRUCTURAL FRAME

The six storey structure is a fully welded rigid frame design in the short direction of the building. In the long direction the beam to column connections are semi-rigid bolted type. The principal steel columns were fabricated from welded plates rather than rolled steel sections. This was required on exterior columns in order to keep the flange width constant to suit the stone facing.

The floors are cantilevered 14′ 0″ at each end of the building. This was accomplished by the use of tapered welded girders with their ends tied vertically between floors.

All structural welds were tested ultrasonically for flaws or discontinuities. This was the first building in Western Canada to use the ultrasonic method of weld testing.

FLOOR SYSTEMS

The basement floor was of cast-in-place beam and slab construction free of the ground below. This was required to prevent movement of the floor due to the swelling nature of the clay subsoil below. The other floors were made of a precast concrete cellular type slab units, 8″ deep with a concrete topping. The cells in the precast slab served as raceways for electrical wiring and telephone lines. The precast floor slabs were welded to the structural steel building frame and a cast-in-place horizontal edge beam, placed between the spandrel beam and the precast floor system, serves as a horizontal wind bracing between columns.

FIRE PROOFING

The structural steel beams were given a two hour fire rating by means of a sprayed asbestos fibre cover. Spandrel beams were fire-proofed with concrete. Column fireproofing was achieved with vermiculite plaster on expanded metal lath.

ROOF STRUCTURE

The roof structure was a light gauge steel deck welded to the steel framing members.

MECHANICAL SYSTEM

The mechanical system at the Monarch Life Building was designed to allow a minimum dimension between the underside of the ceiling and the floor above. This reduced the cost of the building and produced better proportions in the exterior elevation. It was decided to distribute the majority of the conditioned air through ductwork running vertically in

the exterior walls and by the use of induction units. Since the building was long and narrow, the result was a very economical use of sheet metal ductwork.
The air conditioning system is therefore made up of the following parts:

(1) Induction unit system for exterior zones—high velocity air and chilled or hot water distributed vertically down furred areas between structural columns and between window sections. Water to the induction units is controlled by a thermostat located at the air inlet to each induction coil. During winter the coils in the induction units provide sufficient heating during the night shut-down when all air handling equipment is not operating.

(2) Low velocity air distribution for the interior zone—distributed through ceiling spaces from two central duct shafts. Control of the interior zone is from thermostats located at the east and west end of each floor, controlling a reheat coil located at the duct shafts.

(3) Separate air handling units in the basement to handle the air conditioning requirements of the cafeteria, auditorium and first floor office and banking areas. These areas have low velocity air distribution and are heated in winter by fin tubing around the perimeter of the areas.

(4) Refrigeration is provided by a 300 ton centrifugal water chiller in the penthouse. Chilled water is distributed to air coils in the large air handling units and to a secondary system distributing chilled water to the individual coils in each induction unit.

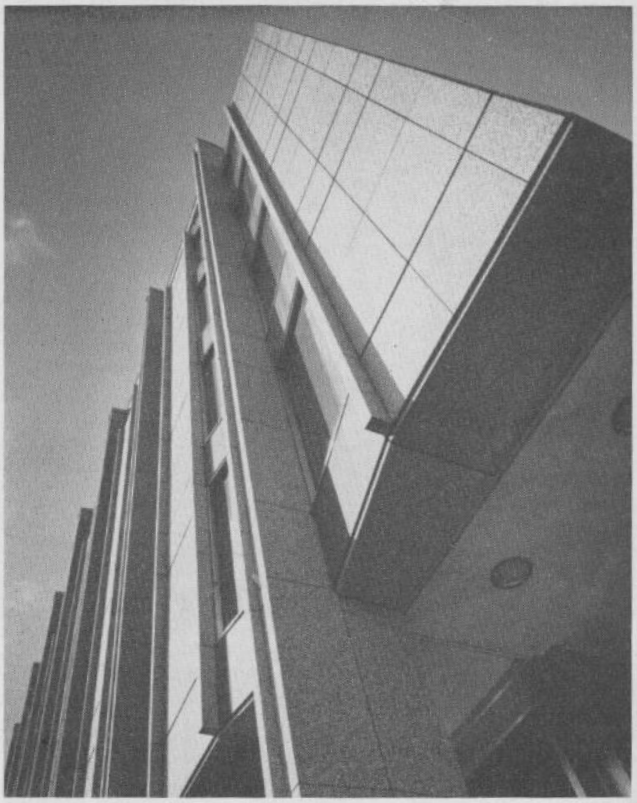
(5) Control of the major equipment is centralized in a control console located in the Chief Engineer's air conditioned office in the penthouse. This console allows the engineer to record the temperature of any control point in the building for any period of time. This saves greatly in assessing the reason for complaints and will help in discovering malfunctions of the system. The console also aids in operating the air conditioning system to attain the best possible efficiency from the component parts.

All rental floors from the second floor to the fifth floor were to be designed to have movable partitions located on each module line to accommodate the requirements of future tenants. The selection of ceiling grilles and lighting to make this system completely flexible became very important. It was decided that the lighting should consist of one 2′ x 4′ fixture per module. The final arrangement of grilles decided was a double row of strip line, ceiling diffusers every third module. These quantities could be adjusted at each grille to allow for proper air distribution with any pattern of partitioning on the module line. Having two ducts connected at the same module line simplified the arrangement of wiring and piping necessary to allow for these ducts in the ceiling space.

The height of the building required booster pumping equipment for the domestic water system. Water distribution systems were therefore designed for city water pressure on the first two floors and a pneumatic tank with a booster pump for the remaining upper floors.

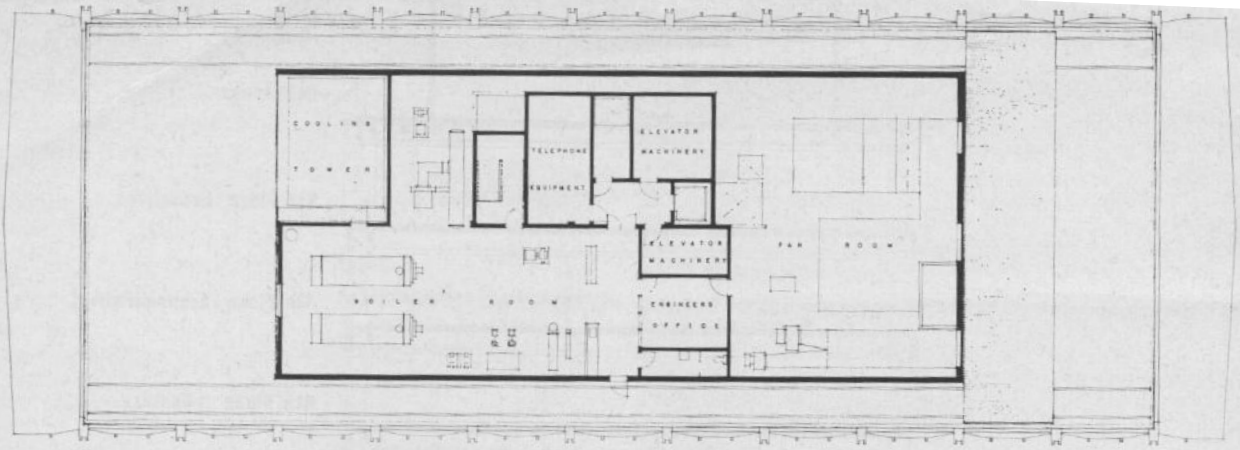
All fixtures were wall hung on chair carriers to facilitate the cleaning of the washroom floors.

All drains in the ceiling of the fifth floor were either screwed pipe or soldered copper. The special ceiling conditions requiring that there be no leaks or bleeding of tar, etc.

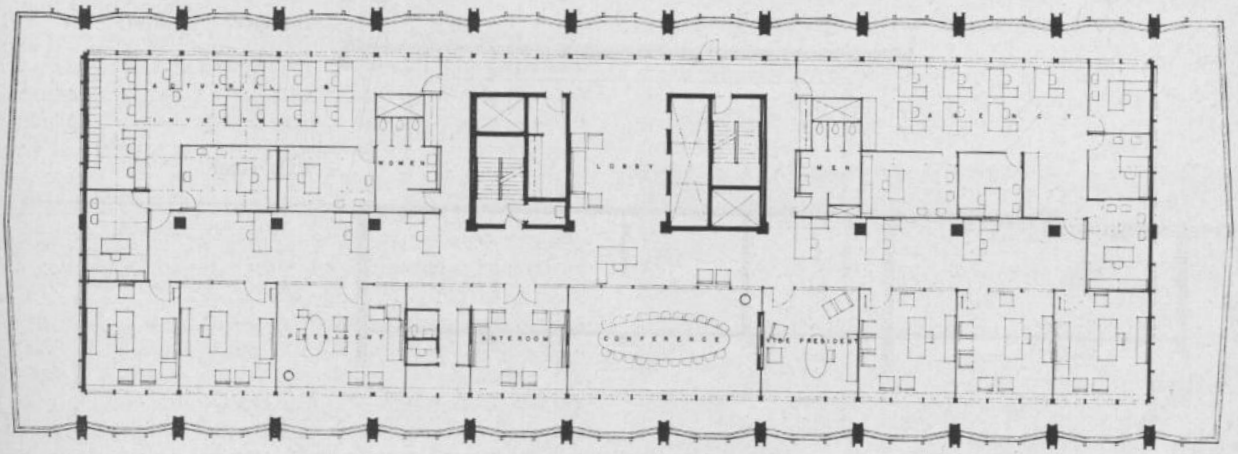


Above: Stairway from Staff Lounge, lower ground floor.

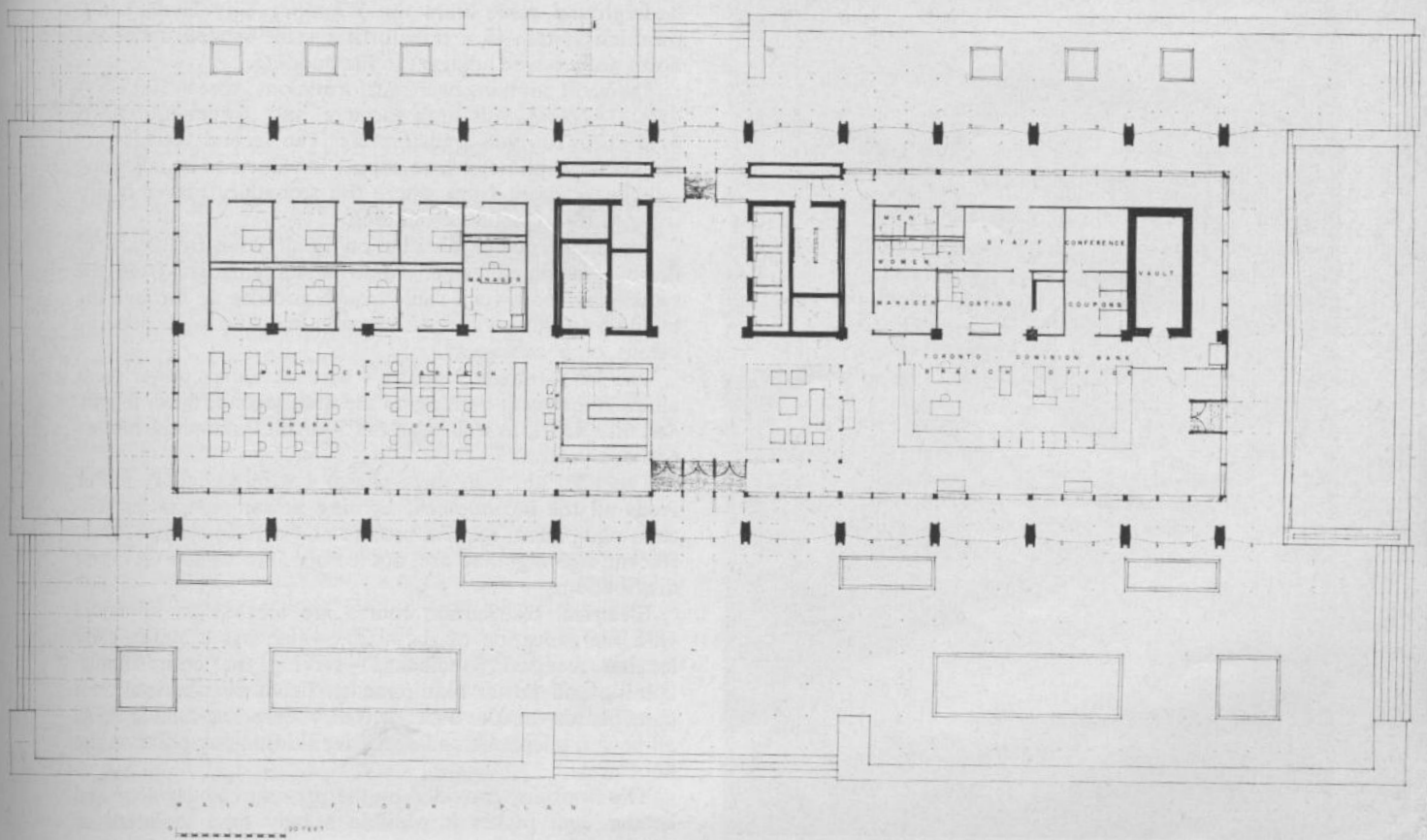
Below: The Auditorium.



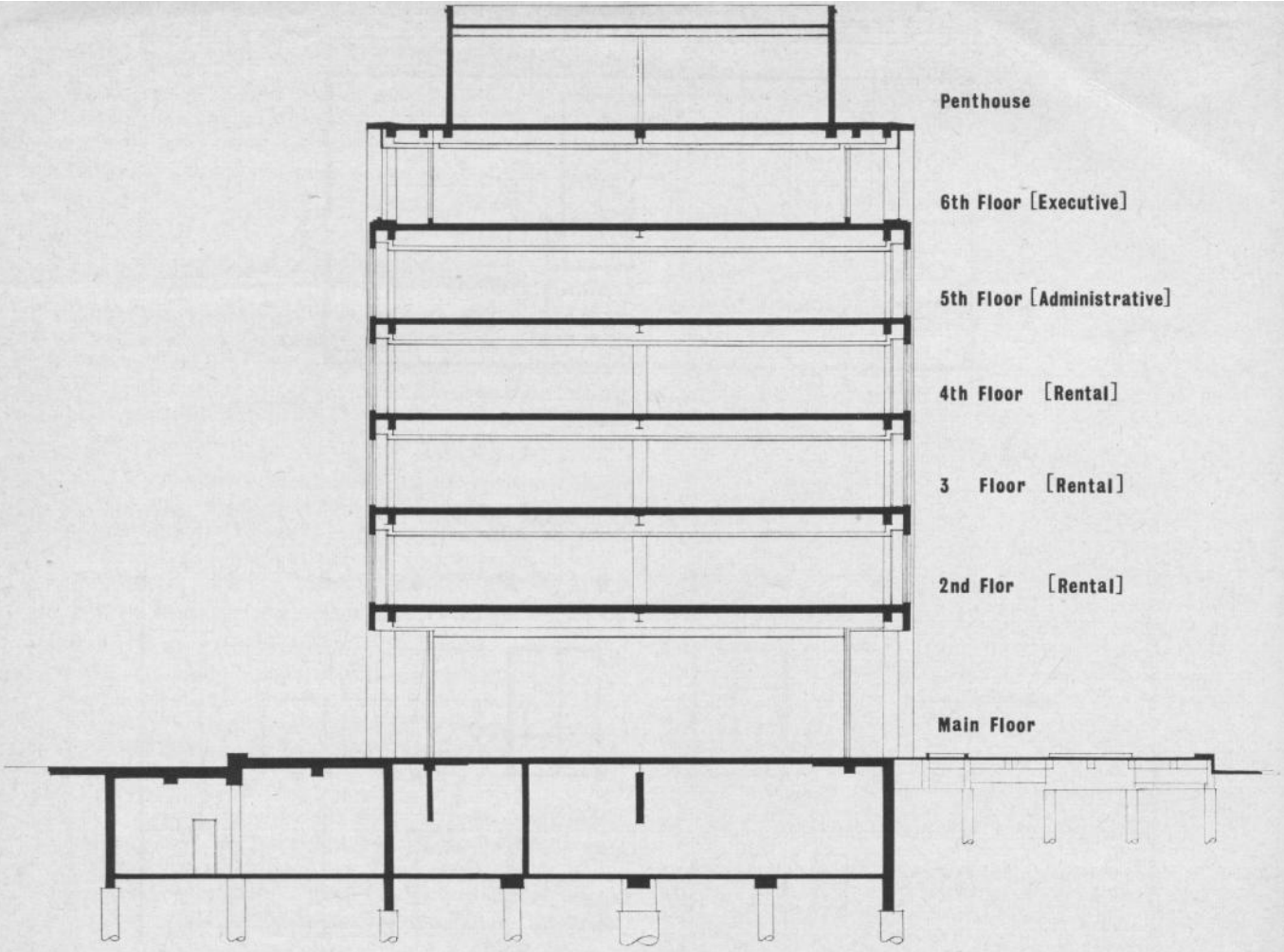
PENTHOUSE FLOOR PLAN



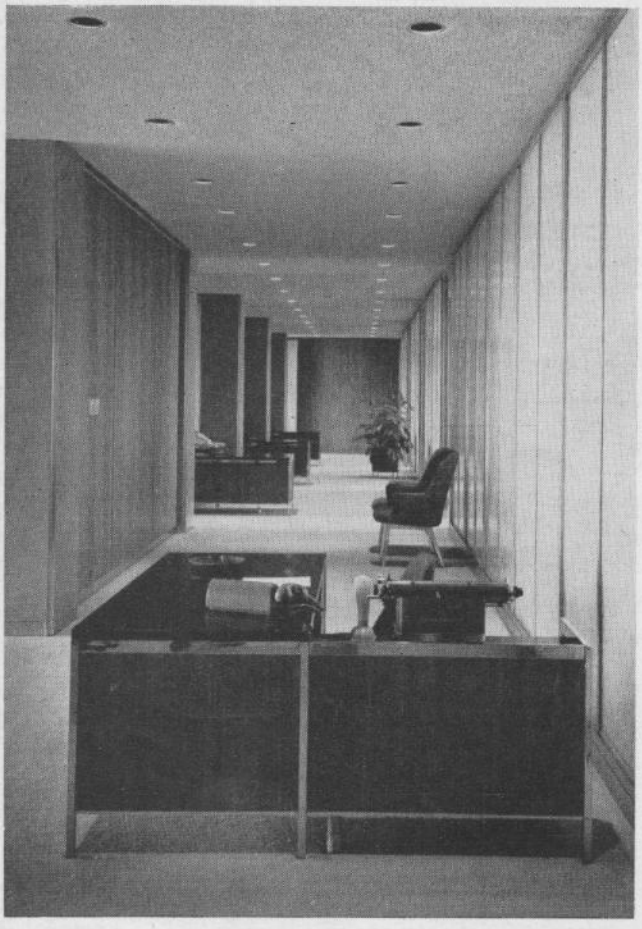
SIXTH FLOOR PLAN



MAIN FLOOR PLAN



Below: The Executive Corridor



ELECTRICAL SYSTEM

Electrical power is fed at 4160 volts, three phase, via underground cable from the Winnipeg City Hydro's distribution system to a transformer vault located under the north podium and adjacent to the building.

The vault contains two transformations: three–500 KVA 4160/347/600 volt transformers and three–200 KVA 4160/120/206 volt transformers. The second voltages are fed via three-phase, 4 wire copper bus ducts to an adjoining switchgear room from where the secondary power is distributed throughout the building.

Secondary power distribution is all done by means of flexible, insulated cable. These cables emanate from the switchgear room via a cable trough and rise up through the building to the various distribution areas on each floor by means of a cable-way.

The 347/600 volt 3 phase, 4 wire secondary power feeds all the fluorescent lighting on the first, second, third, fourth, and fifth floors, as well as all the 500 volt three-phase motors and equipment.

The 120/208 volt, three-phase, 4 wire secondary power feeds all the incandescent lighting power receptacles, kitchen equipment, relative motors and certain areas of fluorescent lighting that are not compatible to the 347 volt distribution.

Electrical distribution rooms are located on all floors with the exception of the sixth, which has a strategically located recessed panelboard – serving the entire floors' lighting and power requirements. From distribution room panelboards–header ducts deliver, via pre-cast cellular floor, all power, telephone and signal facilities to any point on the floor area.

The flexibility provided by the pre-cast cellular floor and header duct makes it possible at any time to install or

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arrange partitions and furnishings according to need, rather than to fixed locations.

Main terminal of the telephone system is in the penthouse, with the Monarch Life switchboard located on the fifth floor. Panelboards, duct riser and terminal boards in conjunction with the header duct system makes any telephone system, possible to install and easy to maintain.

SOUND SYSTEM

The sound system installation is paralleled with the telephone system in that the riser ducts, terminal and panelboards are physically adjacent and the main equipment housing is located in the telephone terminal room in the penthouse area. The sound system offers selected area paging and wired music facilities complemented by an additional system for the auditorium located in the basement. This system is used for important staff announcements and as part of the buildings emergency control and fire prevention system.

LIGHTING

All lighting is controlled by low-voltage operated relays. This modern low-voltage system uses relays to perform the actual switching of the current and these relays are in turn controlled by small switches operating at a low, safe voltage.

On each floor of the building there are three master selector switches which are of the dial-type and can sweep many contacts in a fraction of a second. As the name implies, these master selector switches can also select, or permit, control of individual circuits. In addition to these controls, each floor has motor-operated master switches, actuated by a single low-voltage switch which turns on or off all lights on that respective floor.

This one low voltage switch is also paralleled in the engineer's office in the penthouse, allowing him complete control over every light in the building that is low voltage relay operated.

Comfortable and high level lighting systems were designed and provided in the building. The lower area which included the auditorium, lounge and cafeteria has wall panel silhouette lighting complementing a ceiling lighting system composed of spotlights integrated with a metal grillage which has fluorescent strip lighting as an indirect component.

This grillage also has power receptacles for future spotlighting of displays, etc. The spotlights were custom made to provide a glare-free concentrated light source.

The main floor has a complete luminous ceiling of concept and texture relative to the architectural design of the building as a whole. The building module is expressed by

Above: Staff Lounge. Lower Ground Floor

Below: Typical Office

Bottom: Typical General Offices

major runners with minor divisions necessitated by the physical properties of the luminous elements. An average of eight 40-watt, cool white, rapid start lamps, per unit module results in a level of 150 feet candles of glare-free illumination on all working surfaces with an exceptionally low brightness quality.

Second to fifth floor lighting systems, again reflect the building module, having one 2 foot by 4 foot lighting fixture in each module. These lighting fixtures are complete with 2-F40 cw lamps for the initial installation, but have provision for the addition of two or more—for which the circuiting and switching capacities have been designed and provided.

Lenses selected for these lighting fixtures produce the proper variations in brightness throughout the complete field of view necessary for good visual comfort.

The sixth floor executive offices are illuminated completely with recessed pot lights. Each pot light in an office is independently controlled by a master selector low-voltage control switch, allowing each occupant the freedom of his own choice of quality and quantity of light.

Lighting in the board room consists of a fluorescent luminous ceiling section over the table surrounded by incandescent pot lights in the remainder of the ceiling. The luminous section has three levels of illumination, while the incandescent units are on a dimmer control.

Exterior lighting of the building, initially, has been limited to lighting the soffits. This was accomplished with the use of large wattage recessed incandescent units with a regressed fresnel lens. The regressed portion of the trim was anodized matte black to reduce glare, while the exposed trim was provided in stainless steel. Future floodlight illumination of the building will be provided from installed weatherproof receptacles located in the podium.

Each receptacle is low-voltage relay controlled from the engineers office in the penthouse. The building is equipped with an automatic minute impulse self-regulating master controlled clock system. This system provides automatic hourly supervision for a correction range of 15 minutes slow or 10 minutes fast, if for any reason a clock on the system varies from the master control.

Facilities for the car parking area includes illumination from pole mounted mercury luminaires and weatherproof receptacles for car heater use.

FIRE ALARM

Of special significance is the fire alarm system in the building. Personnel and property are protected against fire, whether seen or unseen by a Faraday "Pre-Signal Coded, Supervised System", with the added protective features of visual annunciation and automatic notification of the Winnipeg Fire Department.

As a safeguard against panic, should a fire occur, the first operation of any station, whether manual or automatic causes certain signals located in supervisory or "pre-signal" areas only to sound, thus alerting key personnel of an alarm.

At the same time, visual indication of the area alarmed appears on annunciators located in strategic points (three in all), while a signal is automatically sent to the City Fire Department, immediately the station is operated.

Should investigation show that a general evacuation of the building be necessary, this is speedily accomplished by use of a special key and the operation of any station, causing the general alarm signals to operate throughout the building.

Areas where a fire might start unnoticed are protected by detectors which operate automatically in the case of an unusual rise of temperature in that particular area.

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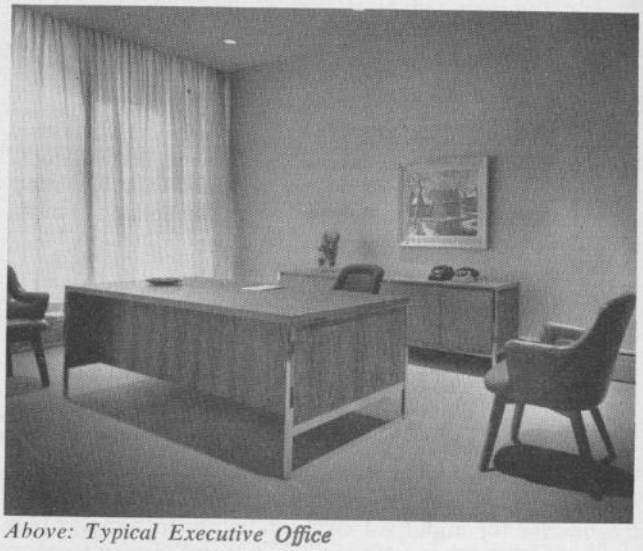
PRINCIPAL SUB-TRADES AND SUPPLIERS. Dominion Bridge Co.— *Reinforcing Steel;* Bridge and Tank—*Structural Steel:* Canadian Rogers — *Roofing, S/M, Kitchen Equipment:* S. E. Gage — *Fireproofing and sound proofing:* United Lathing — *Acoustic Tile:* Pilkington Glass Ltd. — *Glass and Glazing:* Robert Mitchell Co., Ltd. — *Mail Chute:* Turnbull Elevator — *Elevator:* Supercrete — *Pre-Cast Concrete:* T. Eaton Co. — *Floor Covering:* Coldspring Granite — *Granite:* Maple Leaf — *Paving:* Perma-Underground — *Sprinkler System:* Cleaver Brooks — *Boilers;* Crane of Canada — *Plumbing Fixtures:* Consolidated Plate Glass (Western) Ltd. — *Insulating Glass Units:* Fiberglas — *Accoustical Ceiling Panels:* St. Lawrence Ceramics Ltd. — *Ceramic Tile.*



Above: Typical Executive Office

Below: The anti-room to the Board Room