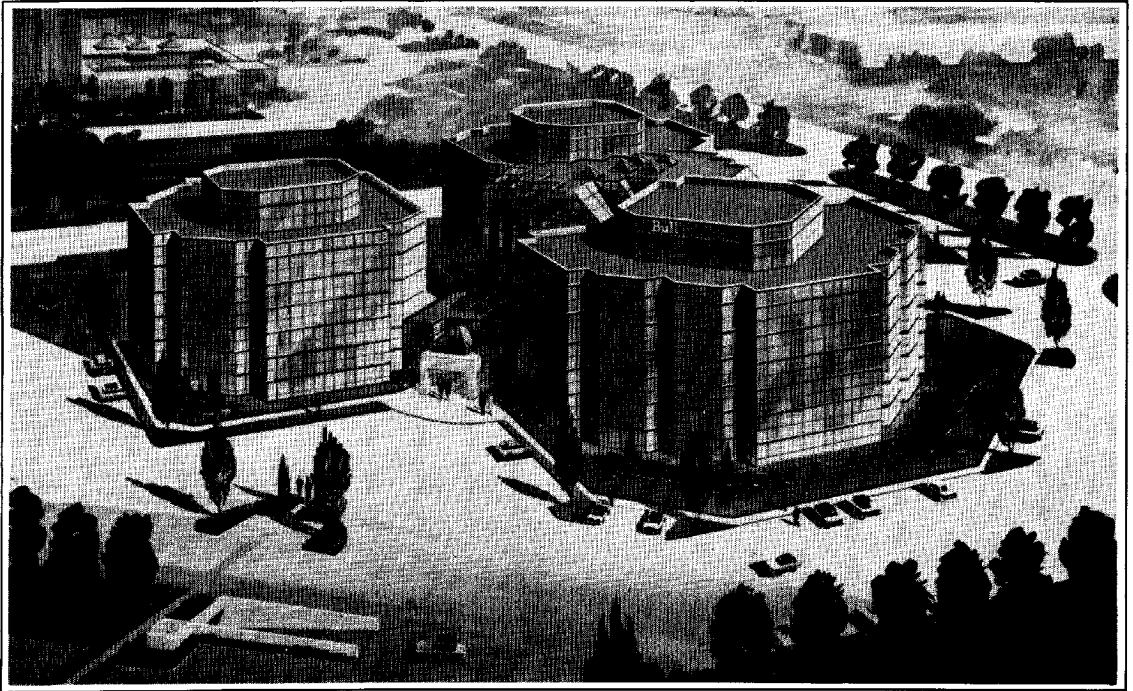


# RSIO

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## REINFORCED CONCRETE WAS THE ONLY LOGICAL CHOICE FOR THE BULL CORPORATE CENTRE



The decision to build the Bull Corporate Centre in reinforced concrete was basically a "self-made one," says John Miolla, senior project engineer for Inducon Development Corporation. "It was simply the most logical choice."

Elaborating, Miolla points out that the multi-building office development in Markham, Ontario is not rectangular in design. Irregular floor

plates and "odd shapes" lent themselves perfectly to reinforced concrete construction.

"We felt the economies were there," the engineer said, noting that it was important to keep floor heights to a minimum as the project is subject to height considerations imposed by its proximity to Buttonville Airport.

The project will eventually involve three, six and seven storey office buildings on

about a four-acre site. Two of the buildings were started last September, for early 1991 completion, and the third will be built as space in Phase I is leased.

Phase I will deliver about 69,675 m<sup>2</sup> of office space and one-and-one-half levels of underground parking. The parking garage's first level covers the entire site.

About 2800 tonnes of reinforcing steel will be placed in

the first phase of the project, and the parking garage and ground floors of the buildings are using epoxy-coated rebar for corrosion control.

**Owner:**  
Howard Orfus Investments

**Design/Consulting:**  
Inducon Development Corporation

**General Contractor:**  
Daicon Contractors Inc.

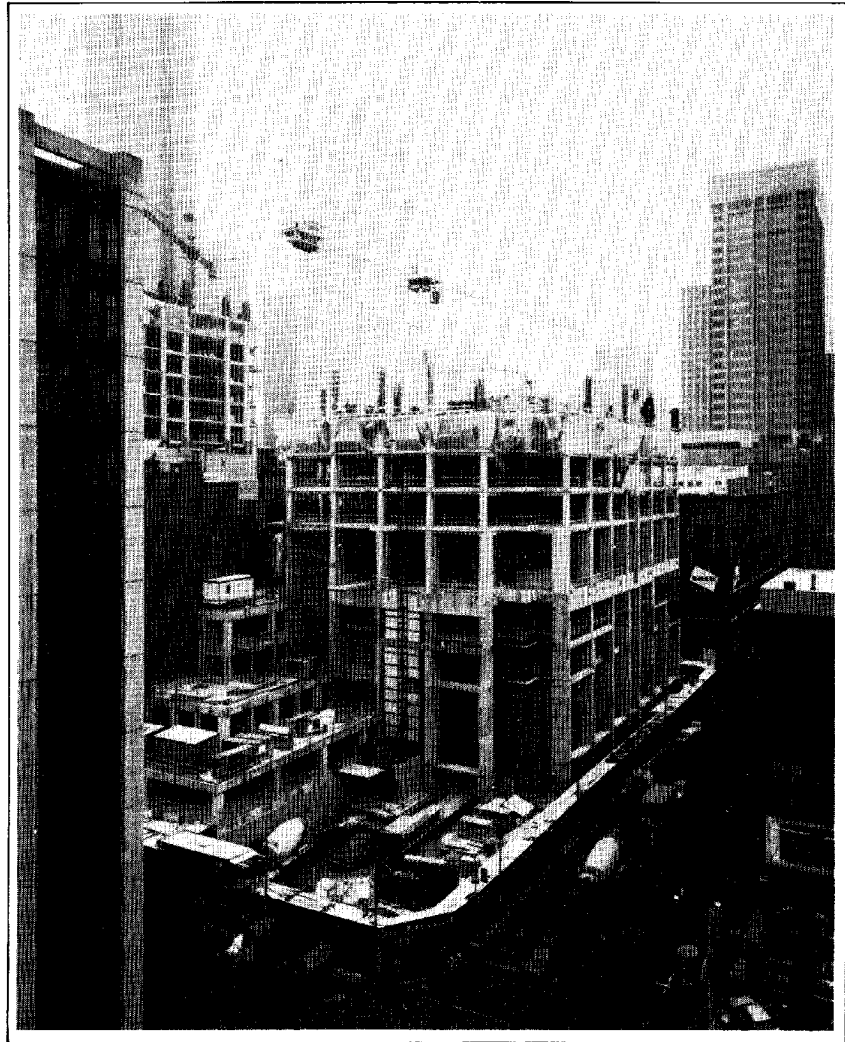
# "One Queen Street East"

Bramalea Limited's "One Queen Street East" office building at the south east corner of Yonge and Queen Street is literally on stilts, with the first office floor beginning at the eighth floor says Barry Charnish, a partner at the structural engineering firm of M.S. Yolles & Partners Limited. The reinforced concrete 56,670 square metre office tower, with a net rentable area of 37,460 square metres, is projected for completion in Fall 1990.

Dominating the building upon entrance is a 20 metre soaring atrium. "We wanted to create as much open space on the ground floor as possible, hence the need to reduce the core to the barest minimum," says Derek Buck, the architect and a partner with Page & Steele Architects. "We wanted the people using the building to be able to look through space, not into a massive core and walls. This is particularly important, since on the south side of the lobby there are five stories of offices that look into the Atrium and on through to Queen Street."

The 28-storey building is a fairly regular 1,860 square metre office plate building except for one outstanding feature. The typical core stops at the eighth floor, where there is a two-storey high mechanical and electrical plant area and transfer system.

This is accomplished by a system of transfer beams and walls says Charnish. The transfer beams literally sit on four massive columns. All



the core walls which enclose the typical floor mechanical, electrical, stairs and wash-rooms are cleaned out except those required around the elevator shaft.

Reinforced concrete was selected for the transfer system primarily because of its ability to bear the gravity

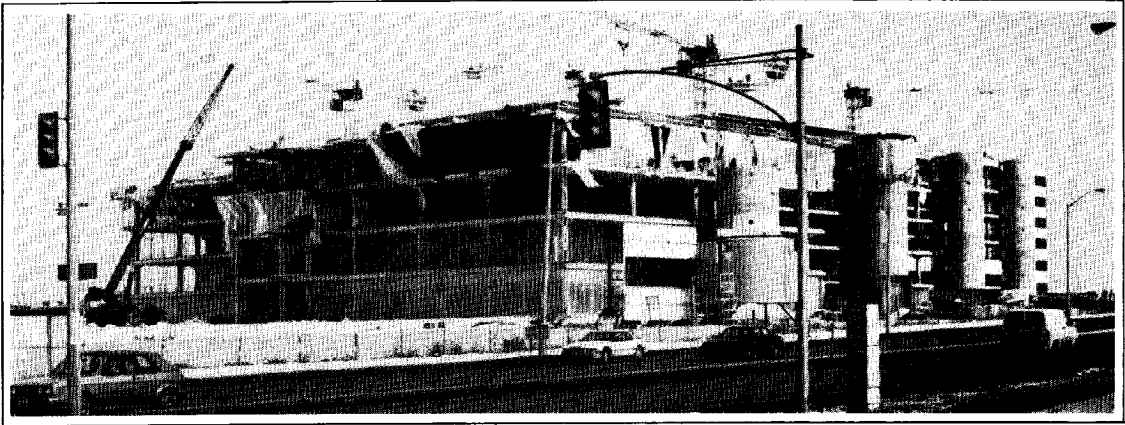
load says Charnish. It creates lateral stability with respect to wind and seismic activity and acts as an outrigger. As well, the use of concrete for the exterior 23 metre perimeter columns was deemed to be compatible in terms of building material says Charnish.

**Owner and Developer:**  
Bramalea Limited

**Architect:**  
Page & Steele Architects

**Structural Engineers:**  
M.S. Yolles & Partners  
Limited

# IBM Canadian Office Complex



On the north side of Steeles Avenue, between Victoria Park and Warden Avenue, the new, intriguingly-contoured IBM building has been assuming its place in the Markham landscape.

Eight towers have been rising gracefully since March 1989, the resulting smooth profile due to the use of reinforced concrete in the construction.

All parts of the building's 79 000 square metres are accessible to each other by means of a tunnel three metres underground or by the enclosed, connecting bridge.

Joining the tops of the four pairs of towers; the bridge

extends from the first pair, which has four storeys. From west to east it ascends one additional floor for each pair, ending at the fourth, and tallest pair, with seven storeys, plus the roof.

Peter Wagner, of Quinn Dressel Associates, the Structural Design Engineers of the building, said that comparative cost analysis indicated a saving of at least 10% over competitive material by using cast-in-place concrete. It was only by this means that the unique shapes of the office building and garage were achieved. With a flat slab design using a 4.8 kn/m<sup>2</sup> live load and a two hour fire rating the struc-

ture becomes cost efficient.

Because of the availability of a 14-acre site to the north of the office building, a 74 300 square metre garage was added.

With spaces to accommodate 2,600 vehicles, like Toronto's Terminal Two, the low-profile garage rises in six staggered levels, from grade.

Of the total 5 000 tonnes of rebar used in the entire project, 1 500 tonnes was epoxy-coated. The whole construction of the parking garage - walls, floors, columns, slabs - are all epoxy-coated in an effort to minimize corrosion damage caused by deicing salts.

Although the IBM office structure consists of several parts, it is still considered to be one building, by virtue of the fact that all components are connected. For this reason, the naturally fireproof properties inherent in reinforced concrete, was an important consideration in the construction.

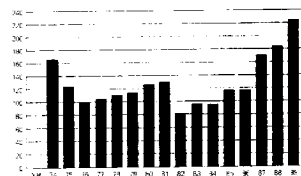
**Owner:** IBM Canada Ltd.

**Architects:**  
Webb Zerafa Menkes  
Housden Partnership

**General Contractor:**  
Ellis-Don Limited

**Structural Engineers:**  
Quinn Dressel Associates

**MILL SHIPMENTS TO FABRICATORS**  
in thousands of tonnes



**1989-RECORD YEAR**

"As we head into 1990 the greater Toronto office market is still one of the healthiest and most vibrant in North America," said Wayne Mandeville, Executive Vice-President for Royal LePage's Commercial Real Estate services, in an issue of the Toronto Star.

This optimism argues well for the future said Reinforcing Steel Institute of Ontario's President, John Harris, of Harris Rebar, who noted that shipments of rebar from RSIO mill members to fabricator members reached an all-time high of 225 220 tonnes in 1989.

A strong construction market, new technologies such as high strength concrete, the professionalism

of our producers and fabricators, and the benefits of reinforced concrete construction all helped to make 1989 shipments, some 41 000 tonnes more than in 1988, said Harris.

While higher vacancy rates and a slow down in construction are being predicted for the future, Harris said, our industry looks forward to a high level of activity for most of 1990.

# ECONOMICAL REINFORCED CONCRETE CONSTRUCTION

## SUGGESTION:

Use the largest bar size that will meet design requirements. In many instances of reinforced concrete design, utilizing an equivalent area of larger sized bars can provide benefits leading to overall economy;

## BENEFITS:

- **MILL MANUFACTURE** - Larger bar sizes promote greater economies for the steel mill.
- **FABRICATION** - Fewer bars are cut, bent, and handled. This will increase fabrication efficiency and decrease fabrication time.
- **SHIPPING** - Fewer bars loaded and unloaded will reduce labour costs and improve speed. Shipping capacity is also increased since fewer bars can be loaded more efficiently.
- **PLACING** - Fewer bars to be placed in the field reduces field labour. Reduced bar congestion facilitates improved rebar and concrete placing.

## RESULT:

The greatest saving through the use of larger bar sizes is in slabs and walls where the placing of many bars is very labour intensive.

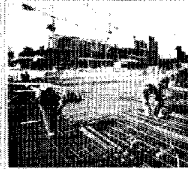
# WATCH FOR!

The next in the series of **RSIO Case History Reports**. This one will feature the DVP/CP Rail Grade Separation.

Read how this unique tunneling method benefited by using cast-in-place reinforced concrete.

# RSIO PUBLICATIONS AND DESIGN AIDS

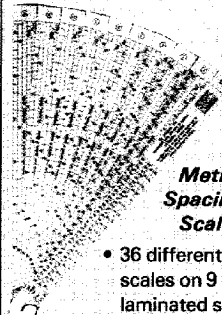
## REINFORCING STEEL



MANUAL OF STANDARD PRACTICE

### Manual of Standard Practice

- Industry Practices for Estimating Fabricating Detailing Placing
- Nationally accepted standard



### Metric Spacing Scales

- 36 different scales on 9 plastic laminated strips

Rebar Size	Area (sq. in.)	Weight (lb./ft.)	Area (sq. cm.)	Weight (kg./m.)
#3	0.11	1.68	7.06	2.42
#4	0.20	3.12	13.00	4.41
#5	0.31	4.68	19.90	6.41
#6	0.44	6.37	27.70	8.77
#7	0.60	8.79	37.70	12.10
#8	0.79	11.76	49.00	15.70
#9	1.00	15.21	63.50	20.40
#10	1.27	19.24	80.60	26.10
#11	1.56	23.80	99.70	32.10
#12	1.88	28.00	120.60	38.10
#13	2.25	32.80	143.30	44.10
#14	2.67	38.20	167.80	51.10
#15	3.14	44.30	194.00	58.10
#16	3.65	51.10	221.90	66.10
#17	4.21	58.70	251.40	75.10
#18	4.82	67.10	282.60	85.10
#19	5.48	76.30	315.40	96.10
#20	6.19	86.30	350.00	107.10
#21	6.95	97.10	386.30	119.10
#22	7.76	108.70	424.40	131.10
#23	8.61	121.10	464.30	144.10
#24	9.51	134.30	506.00	157.10
#25	10.46	148.30	549.50	171.10
#26	11.46	163.10	594.80	185.10
#27	12.50	178.70	641.90	199.10
#28	13.59	195.10	690.80	214.10
#29	14.73	212.30	741.50	229.10
#30	15.92	230.30	794.00	244.10
#31	17.16	249.10	848.30	259.10
#32	18.45	268.70	904.40	274.10
#33	19.79	289.10	962.30	289.10
#34	21.18	310.30	1022.00	304.10
#35	22.62	332.30	1083.50	319.10
#36	24.11	355.10	1146.80	334.10
#37	25.65	378.70	1211.90	349.10
#38	27.24	403.10	1278.80	364.10
#39	28.88	428.30	1347.50	379.10
#40	30.57	454.30	1418.00	394.10
#41	32.31	481.10	1490.30	409.10
#42	34.10	508.70	1564.40	424.10
#43	35.94	537.10	1640.30	439.10
#44	37.83	566.30	1718.00	454.10
#45	39.77	596.30	1798.50	469.10
#46	41.76	627.10	1880.80	484.10
#47	43.80	658.70	1964.90	499.10
#48	45.89	691.10	2051.80	514.10
#49	48.03	724.30	2141.50	529.10
#50	50.22	758.30	2234.00	544.10
#51	52.46	793.10	2329.30	559.10
#52	54.75	828.70	2427.40	574.10
#53	57.09	865.10	2528.30	589.10
#54	59.48	902.30	2632.00	604.10
#55	61.92	940.30	2738.50	619.10
#56	64.41	979.10	2847.80	634.10
#57	66.95	1018.70	2959.90	649.10
#58	69.54	1059.10	3074.80	664.10
#59	72.18	1100.30	3192.50	679.10
#60	74.87	1142.30	3313.00	694.10
#61	77.61	1185.10	3436.30	709.10
#62	80.40	1228.70	3562.40	724.10
#63	83.24	1273.10	3691.30	739.10
#64	86.13	1318.30	3823.00	754.10
#65	89.07	1364.30	3957.50	769.10
#66	92.06	1411.10	4094.80	784.10
#67	95.10	1458.70	4234.90	799.10
#68	98.19	1507.10	4377.80	814.10
#69	101.33	1556.30	4523.50	829.10
#70	104.52	1606.30	4672.00	844.10
#71	107.76	1657.10	4823.30	859.10
#72	111.05	1708.70	4977.40	874.10
#73	114.39	1761.10	5134.30	889.10
#74	117.78	1814.30	5294.00	904.10
#75	121.22	1868.30	5456.50	919.10
#76	124.71	1923.10	5621.80	934.10
#77	128.25	1978.70	5789.90	949.10
#78	131.84	2035.10	5960.80	964.10
#79	135.48	2092.30	6134.50	979.10
#80	139.17	2150.30	6311.00	994.10
#81	142.91	2209.10	6490.30	1009.10
#82	146.70	2268.70	6672.40	1024.10
#83	150.54	2329.10	6857.30	1039.10
#84	154.43	2390.30	7045.00	1054.10
#85	158.37	2452.30	7235.50	1069.10
#86	162.36	2515.10	7428.80	1084.10
#87	166.40	2578.70	7624.90	1099.10
#88	170.49	2643.10	7823.80	1114.10
#89	174.63	2708.30	8025.50	1129.10
#90	178.82	2774.30	8229.90	1144.10
#91	183.06	2841.10	8437.00	1159.10
#92	187.35	2908.70	8646.80	1174.10
#93	191.69	2977.10	8859.30	1189.10
#94	196.08	3046.30	9074.50	1204.10
#95	200.52	3116.30	9292.40	1219.10
#96	205.01	3187.10	9513.00	1234.10
#97	209.55	3258.70	9736.30	1249.10
#98	214.14	3331.10	9962.30	1264.10
#99	218.78	3404.30	10191.00	1279.10
#100	223.47	3478.30	10422.50	1294.10

### Pocket Cards

- PC 2 - Rebar Identification - Mill Markings
- PC 3 - Bar information standard hooks and laps



### Case History Reports

- Shopping Mall
- Parking Structure
- Office Tower
- Office Buildings
- SkyDome

• For ordering and costs contact the Institute.



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