BankBoston

New Headquarters in Buenos Aires

by Carmen Maldacena, Argentina Correspondent

The new BankBoston office building is the last tower of the last millennium built in the last vacant lot remaining in a most expensive area called Catalinas Norte in Buenos Aires. The 29-floor edifice was designed by the Argentine Architect César Pelli and Associates, Inc., and Fujitec Argentina S.A. provided the vertical transportation.

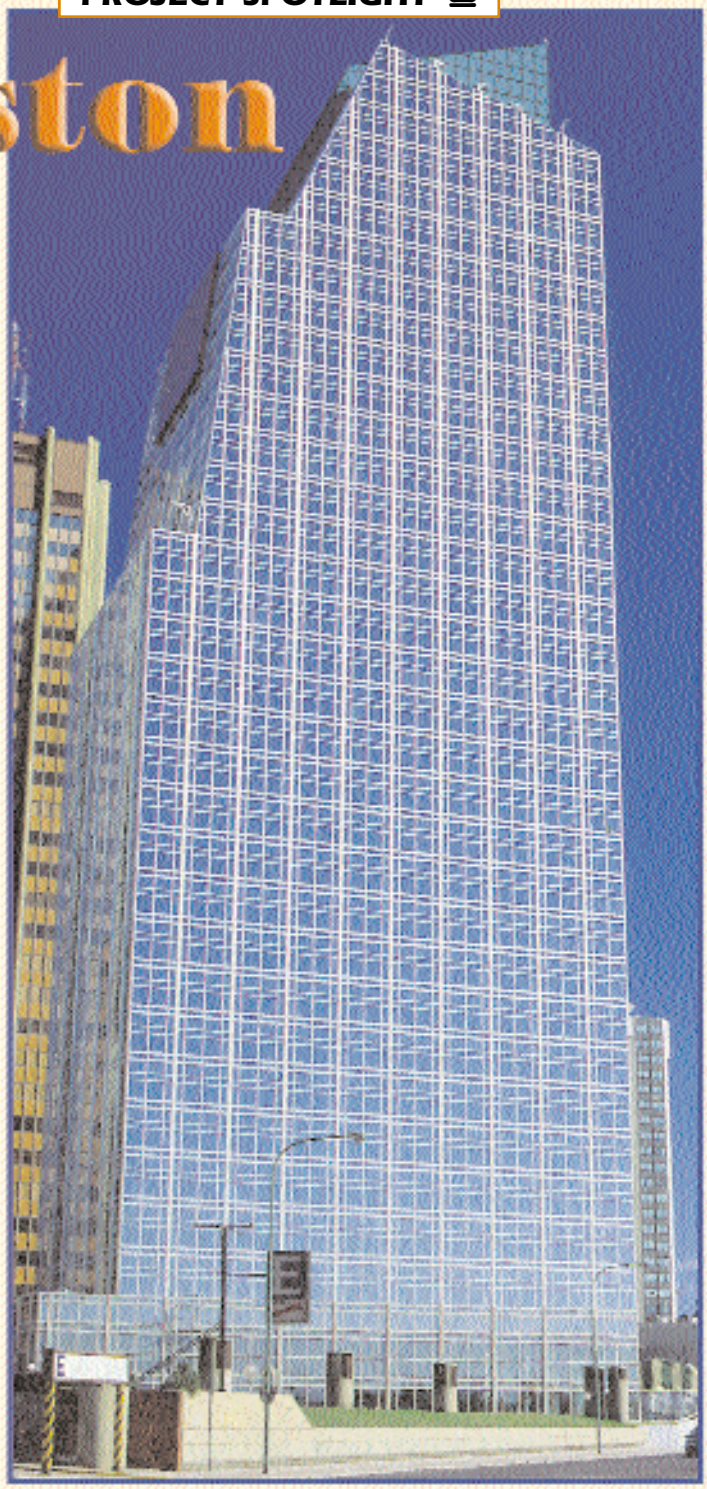
Location: *Catalinas Norte*

The real estate development of the 50,700-square-meter trapezoidal lot started 30 years ago when the tower of the Buenos Aires Sheraton Hotel was finished in 1972. Even though the Municipality of Buenos Aires had proposed the erection of restaurants, parks, shops and houses, the sector ended up with high-rise office towers. The name originated from the Catalinas Convent and it was first occupied by port barracks built by the English Cataline Warehouse in 1872. After the construction of the New Port, the barracks were replaced by the famous Japanese Attractions Park, finally vacated to give way to the new development. As time went by, *Catalinas Norte* proved to be a very successful district on account of its easy accessibility and excellent view onto the River Plate.

The place – preferred by big international companies employing 15,000 persons – houses 10 towers of more than 20 floors. Famous architects displayed their creativity in the area designing intelligent high-rise buildings with central computers to control elevators, alarms, temperature, etc.

Design: *Architect César Pelli*

César Pelli, FAIA, was born in the Province of Tucumán, Argentina. He developed his career in the U.S., becoming Dean of the School of Architecture at Yale University in 1977. Selected by the American Institute of Architects (AIA) as one of the 10 most influential living American architects, he is world famous due to his magnificent creations of which the Petronas Towers in Kuala Lumpur, Malaysia is a well-known example.



BankBoston Tower by night

Pelli described his BankBoston project as, "A tower that follows the *Catalinas Norte* characteristics: One face towards the city and a different one towards the river. Its shape corresponds to a very strong context of vertical prismatic buildings with a pure outline and well-defined edges as proposed during the 1960s. But there have also been changes in the way things are appreciated in the artistic world and the attitude of architecture towards the sky – when the building reaches the top it must do it in the correct way – like a celebration to enter that special and sacred place."

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The floor pattern is very efficient, and the pinnacle has been built with special dark glass to accommodate a variety of elements for electronic communications with the necessary transparency to broadcast waves in a 360° operating range. The façade was designed as a curtain made of anodized aluminum and low-reflecting glass panels that adapt themselves to the contour like a glove.

The total 46,000-square-meter surface is divided into 29 floors, two underground levels for parking and refreshment facilities and the ground floor, which houses the lobby and a BankBoston branch.

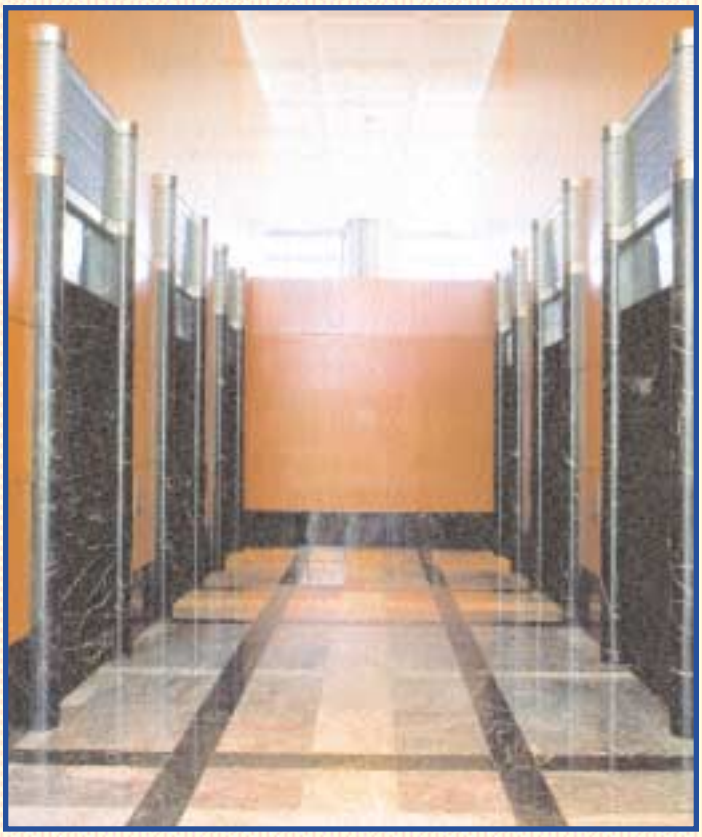
Elevation System: *Fujitec Argentina SA*

Fujitec Argentina S.A. was responsible for the provision and installation of 13 elevators and two escalators at the BankBoston headquarters. To achieve the best vertical transportation performance, the building was divided into a high area served by six main units and a low area served by four main elevators. One service elevator travels from the second underground level up to the 29th floor and two hydraulic units were the choice for the two underground levels. Two parallel escalators facilitate the traffic between the lobby and the cafeteria located on the first underground level.

Some additional features deserve special mention, such as Pelli's design of the lobby lanterns and the elevator cars, decorated with marble floors, wooden panels and stainless steel, a material also used for the curved ceilings.

The contract included the development of a standard interface provided by Fujitec to connect all the elevator systems to the Building Management System (BMS) based on the industry standard protocol MODBUS. It uses the connectivity capability of the new ELVIC-PC LINUX system to control, reprogram and monitor all the elevation systems. In this way, all the building operations – central heating, air conditioning, elevators, etc. – are centralized and can be accessed from the building's central PC.

Luxurious car design by Pelli



Elevator lobby with lanterns

ELVIC-PC: *The Monitoring System for Elevators and Escalators*

The ELVIC-PC monitoring and remote controlling system installed at the BankBoston tower provides:

A) Available Controls for Each Elevator

Parking – Its goal is to save energy putting one or several units out of duty according to traffic needs. With this function, the selected car "parks" at a predetermined landing and remains out of service.

VIP Operation – It prioritizes a landing call by separating a car from the group for exclusive use.

Independent Operation – It allows the exclusive use of an elevator which operates independently from the group.

Floor Lockout – This control suspends the elevator service at one or several landings. Consequently, landing and car push buttons corresponding to those stops remain inactive.

Return to Designated Floor – The elevator returns directly to a predetermined landing once it has answered all the car calls.

B) Available Controls for the Elevator Battery

Change Traffic Pattern – The regular traffic pattern is changed according to building usage: up-peak, down-peak and lunchtime. The "brain" – NEUROS – in each battery automatically activates this function at predetermined hours or by monitoring traffic conditions.

Change of Main Floor/Floor Lockout – It allows the reassignment of the main landing to the controlling group or stop cancellations.

Car Call Disconnect – This command temporarily suspends all car originated calls in the group to one or more specific landings. Car call buttons servicing non-desired landings are disconnected.

AC gearless machine (high area)

AC gearless machine (service lift)

Exceldyne geared machines (low area)

NEUROS (N300/N200 – N100): *The Elevator Supervising System*

The elevator supervising system of the series NEUROS is a modern device to monitor elevator groups. The main difference between the models is based on versatility and on the number of units to be controlled.

Fujitec has developed NEUROS, the first system to use artificial intelligence (AI), to meet the increasing demand for more sophisticated elevator control systems according to the requirements of the so called "intelligent buildings," achieving an efficient elevator control in low-, medium- or high-rise constructions.

Aiming at transporting passengers in a better way, AI and group supervision control have specific characteristics.

1. Learning Function – The system learns and updates the traffic situations as they occur during each period of time.
2. Knowledge Base – It contains the information on each possible case of elevator flow, including the elevators' relative movement and position.
3. Inference Decision System – It chooses the most convenient elevator after it has correlated and compared the data obtained from the learning function with each rule stored in the knowledge base. This base contains files with pre-programmed rules which have been formulated on the basis of experts' knowledge and using deductive logic. The decision inferring system receives these rules – known as "fuzzy rules" – and applies them to each elevator to make the best selection.

The difference between conventional computers and those assisted by AI is if the result of the waiting time calculation is of 20 seconds, conventional computers must define the call according to the waiting time: long (1) or short (0). There is no other alternative choice to get a more precise evaluation. However, with the incorporation of deductive logic in the AI assisted computer – intelligent computer – now it is possible to offer a better elevator selection. This is achieved using the membership functions which are closely related to the fuzzy rules stored in the knowledge base. These membership functions allow the system to compute fuzzy rules, or the experts' intuitive sense, changing the data (or rules) into numeric values.

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Architecture/Configuration of the NEUROS Supervising Computers

Each NEUROS system consists of an intelligent computer, a main computer, which incorporates a large/very large integration scale (LIS/VLIS) system and a reserve computer. The use of a distributed control system, which reinforces best performance and more efficient maintenance, is also important.

These are some of the advantages of this system when compared to the former ones:

- Average waiting time is reduced by 15-25%.
- Probability of waiting at landings for more than a minute is substantially reduced by 40-80%.
- Arrival prediction accuracy of the elevator is improved by 60-80%.

During normal operation, the monitoring group control assisted by AI is kept by the main and the intelligent computers simultaneously. However, if an error is detected in the main computer, the reserve computer couples the intelligent one to keep the system properly working.

The system uses multiple groups of rules and each one of them has been conformed according to different points of view regarding evaluation and selection of the best elevator for a given call. If significant changes were noticed among the elevators, the computer would repeat the evaluation and selection, revising, one by one, each group of related rules stored in the knowledge base until the best elevator is selected.

Front view of escalators

Your reporter gives special thanks to Fujitec Argentina Vice President Ing. Ernesto Espoille, who provided plenty of technical material for this story.

Elevator and Escalator Specifications

ELEVATORS	Passenger - Low Area - #1-4	Passenger - High Area - #5-10	Service - #11	Passenger - Parking Area - #12-13
Equipment Type	EXCELDYNE	AC-GL	AC-GL	HYDN
Speed	150 meters/min	210 meters/min	150 meters/min	38 meters/min
Capacity	17 passenger (1350kg)	17 passenger (1350kg)	26 passenger (2775kg)	16 passenger (1250kg)
Front Stops	11 (GF, 1-10)	18: #5-9 GF, 10,15,17 27/19: #10 GF, 10-27	32: 2UG, GF, M, 17-29	3: 2-1 UGL, GF
Rear Stops			1: 1st UG Level	
Travel	41600mm	108200mm	123860mm	7710mm
Total Rise	51800mm	119700mm	133560mm	13810mm
Doors	Auto, 2 panels, Central Opening	Auto, 2 panels, Central Opening	Auto, 2 panels, Side Opening	Auto, 2 panels, Central Opening
Emergency Doors		Lateral, passenger rescue		
Door Opening Width	1200mm	1200mm	1300mm	1100mm
Door Opening Height	2400mm	2400mm	2400mm	2400mm
Car Dimensions	1950mm (W), 1650 (D), 3050 (H)	1950mm (W), 1650 (D), 3050 (H)	1900mm (W), 2250 (D), 4000 (H)	1700mm (W), 1800 (D), 3050 (H)
Car Weight	3350kg	3900kg	3230kg	3050kg
Machine	Geared, 26kw	Geared, 29kw	Gearless, 50kw	Hydro, lat jack, 37kw
Controller	N300	N300	Up/Down Selective	N100

ESCALATORS #1 - #2

Equipment Type:	30°	Step Width:	800mm
Speed:	30 meters/min	Balustrade:	10mm Tempered Glass
Stops:	1 UGL, GF	Lining:	Polished Stainless Steel
Rise:	4600mm	Machine:	5.5kw
Angle	30°		