Chapter Four

THEME ZONE AND FACILITIES

Cultural Ribbon: Paseo de la Cultura

Among the highly symbolic urban ribbons, this urban ribbon is to be particularly symbolic, with enhancement of the sense of arrival at the memorial park and the entrance of the Alameda Furthermore, this ribbon is near the commercial axis, and in order to activate it as the area with the highest round the-clock character, it will be necessary to have programming of cultural, artistic, and other outdoor prformances, including nighttime performances Through such activities and performances, it will be possible to protect traditional culture and encourage artistic activities

Further, it will be possible to activate the areas along the sub-pedestrians as outdoor galleries where painting, sculpturing and other creative and recreational activities can take place

In addition to stimulating and encouraging activities of the citizens in these cultural and artistic pursuits, it will be important for this Paseo to be used for the staging of events in the plazas, for the pleasure of the people

Memorial Plaza: Plaza de la Conmemoración

In order to enhance the sensation of having arrived at the Simon Bolivar Great Memorial Park, a wall, about 20m wide and 10m tall, is to be constructed on both sides at the intersection of Avenida Ciudad de Quito and Avenida 63 It is to be embellished with a large relief by a Colombian sculptor and is to have the nature of a Grand Memorial Wall On the front side of the east face of the wall, a large cascade is to be provided, and it is to be the point of origin of the canal which is to pass through the Cinta Urbanos (Canals may be more realistic in physical terms, for it to be composed of three or four water circuits.)

Further, to the east of the cascade, an amphitheatre is to be provided for use on such occasion as New Year's ceremonies, or presentations of plays, operas and other performances, as well as a place for people to meet, relax and talk while being able to enjoy a view of the cascade and Cultural Ribbon.

- Main facilities
  Amphitheatre, cascade
- Symbol facility
  Memorial walls
- Service facilities
  Kiosks, drinking fountains toilets, administration office (with lighting and sound control room), telephone booths, park information display board
- Lighting facilities
  Lighting to be provided for the relief and cascade: about 200 lux to be provided for plazas
- Others
  Dust boxes, pergolas

Serenade Plaza: Plaza de Serenatas

In addition to using this plaza, which is to be composed of a main stage and a stepped terrace as a venue for folk songs, serenades and other musical activities by and for the people of the city it is to be used to prevent performances of folk songs from all regions of the country, and thereby to contribute to their preservation as well as broader appreciation

At times such as weekends, permission will be granted for outdoor stalls to be set up for the further enjoyment of the people

- Main facilities
  Main stage (at water's edge), stepped terrace
- Symbol facilities
  Monument to music
- Service facilities
  Kiosks, toilets, circulation bus stop drinking fountains telephone booths, information display board; entrance to Parque El Lago
- Others
  Pagola, dust boxes, benches
- Event program
  Serenade by professional singers
  Jan. Folk song concours (competition among distritos)
  Feb Bogota citizens serenade concert, folk songs for children
  Mar. Evening concert by famous singers
  April Folk Song Preservation Concert
  May Intercollegiate Songfest
  June Folk song concours (competition among distritos)

Dancing Plaza: Plaza de la Danza

In addition to providing a place for communication and enjoyment by the citizens of Bogota through folk dances, social dancing and other related activities, this plaza will contribute to the preservation of traditional dances of the nation, by providing a place where they may be performed for the benefit of large audiences.

For these activities to take place, it will be necessary to enlist the cooperation of professional and amateur groups, and various individuals, so that reviews, newly-created dance compositions etc. may be presented In addition, on weekends and other occasions, programs should be held whereby visitors may dance and participate in contests

- Main facilities
  Dancing stage; dancing terrace, ponds
- Symbol facilities
  Monument to dance
- Service facilities
  Administration facilities, toilets, telephone booths, circulation bus stop; information display board
- Lighting
  100 lux at dance areas
- Others
  Pergolas, benches, dust boxes
- Event program
  Dance Day
  Dancing teams presentation
  Distritos dance contest
  Bogota Citizens Dance Contest
  Famous dancer performance
  Traditional Dance Preservation Programs
  Bogota Citizens Costume Ball
  Children's folk dance lessons
  Inter-collegiate dance concours

Chronological Ribbon

The Chronological Ribbon is a large mall, about 800m long, from the Latin America Anthropology Museum to the Aqua Plaza

This ribbon will display the culture and civilization of Latin America and Colombia, featuring a historical panorama of Colombia's colonial period, war for liberation, liberation, and establishment of Gran Colombia, showing to visitors the cultural achievement of antiquity, the meaning of liberation and independence, and the flow of history

The colored pavement of the Main Pedestrian will incorporate a chronological table of the nation's history, and in large small plazas in the areas to either side of the Main Pedestrian, displays of symbolic and historical objects, artifacts etc. will be combined with landscaping in a sequence or historical cavalcade

Ancient ceremonies will be presented in revival, memorial ceremonies in honor of historical events, and special programs for schoolchildren could be among the attractions

Plaza de los Comuneros

Gallery Ribbon-1: Caminodelas Bellas Artes

In addition to creating a symbolic space, about 300m long and 50m wide, as the entrance area, five sequential view are to be formed through the combination of the canal, these small plazas, pond, and flowers, shrubbery etc. On both sides of the Main Pedestrian, along small Pedestrians, spaces may be used outdoor galleries, for display of paintings, sculpture, photographs and the like, in addition to which the ribbon will be activated by regular fairs having cultural themes (see below).

- Main facilities
  Poetry Plaza, Painting, Plaza, Photography Plaza
- Symbol facilities
  Poetry monument, painting monument, photography monument
- Lighting
  Small plaza, 20 lux, elsewhere 10 lux
- Others
  Benches, and dust boxes at the pond and small plaza Canal. Color paved Main Pedestrian (Traditional Pattern). Sub-Pedestrians
- Event program
  Amateur photographers, painters, sculptors, illustrators exhibitions
  Poetry reading nights
  Postcard concours
  Book fair
  Poster show
  Flower poem concours
  Paper cutout concours
  Love poem concours; poet of the month concours
  Stamp fair
  Poetry concours; book fair

Gallery Ribbon-2: Camino de las Esculturas

Seven distinctive landscapes are to be created in the 350m long, 40m wide area from the Serenade Plaza to the Dancing Plaza This ribbon will be landscaped so as to be usable for permanent sculpture exhibitions and for concerts. In particular this ribbon is to provide a place for the display and promotion of the prosperity of modern sculpture

- Main facilities
  Permanent sculpture exhibition
- Lighting
  Small plazas, 20 lux; other areas, 10 lux
- Others
  Benches, dust boxes; canal and small ponds; color paved Main Pedestrian (Traditional Pattern); Sub Pedestrians
- Event Program
  College graduates show
  Bogota Citizens Sculpture Exhibition
  Contemporary Sculpture exhibition
  New Sculptors Show
  Schoolchildren's Sculpture Exhibition
  Grand Colombia Sculpture Exhibition (Andes Sculpture Show)
  Abstract Art Show

Ancient Plaza: Plaza de los Aborigenes

A plaza is to be provided, symbolizing Colombia's antiquity, and serving as both the Entrance Plaza for the Latin American Anthropology Museum and the first plaza of the Chronological Ribbon.

In the center of the plaza a replica of the Grand Written Stone, a symbol of ancient Colombia, is to be set up. In the parts of the plaza surrounding it, ceremonies of the Chibuch, Caribe and other tribes will be performed, and Bachue and other legends plays will be presented for children. The plaza thus will be a center for a variety of events.

- Symbol
  Grand Written Stone; pond
- Service facilities
  Drinking fountains, toilets, telephone booths, information display board
- Lighting
  50 lux
- Others
  Pergola, benches, dust boxes
- Event program
  Revival of ceremonies of Familia Chibcha
  Revival of ceremonies of Familia Caribe
  Revival of ceremonies of Familia Arawac
  Revival of ceremonies of Familia Agutinians
  Children s plays, from the Bachue legends
  Children's plays, from the Bochica legends
  Reconstructed archeological sites

Ancient Picture Scroll : Senderode la Cultura Prehispánica

This scroll, about 300m long and 30-50m wide, is to feature, six distinctive spaces created by landscaping on both sides of the Main Pedestrians.

Urban patterns symbolizing of Indio's civilization, the six epochs and huge stone structures and other symbols, and monatures are to be used.

Further, the Main Pedestrian, in addition to having colored pavement featuring traditional Caribe graphics patterns, will have colored representation of the nation's chronology, featuring events from each period of history

- Symbol
  Big stone forms; statues
- Lighting
  Symbol facilities and garden, 20 lux, other areas, 10 lux
- Others
  Azteca garden, Maya garden, Motica garden, Inca garden; canal and small ponds; color-paved Main Pedestrian (traditional pattern); benches; dust boxes; information display boards
- Event program
  Indio Brothers Festival (Azteca Day Maya Day; Motica Day; Inca Day)

Spanish Plaza: Plaza de la Hispanidad

A Spanish Garden is to be made; it will have in it the Colombus Plaza, Mestizaje Plaza, and a Spanish Village It is thought that this will be where events such those commemorating the discovery of the New World by Colombus, to the age of colonization, and those related to social phenomena, are staged.

- Main facility
  Spanish Building (including cafe, kiosk, toilets, telephone booths, rest house)
- Symbol
  Mestizaje monument. Statue of Criollo
- Service facilities
  Drinking fountain; circulation bus stop
- Others
  Colombus Plaza, Mestizaje Plaza Spanish Village; Criollo Plaza, pergola, benches, dust boxes, information boards.
- Lighting
  Symbols and plaza, 50 lux
- Event program
  Colombus Day gathering
  Colonial era plays
  Spanish dances
  Mestizaje festival
  Criollo festival

Independence Picture Scroll, Sendero de la Independencia

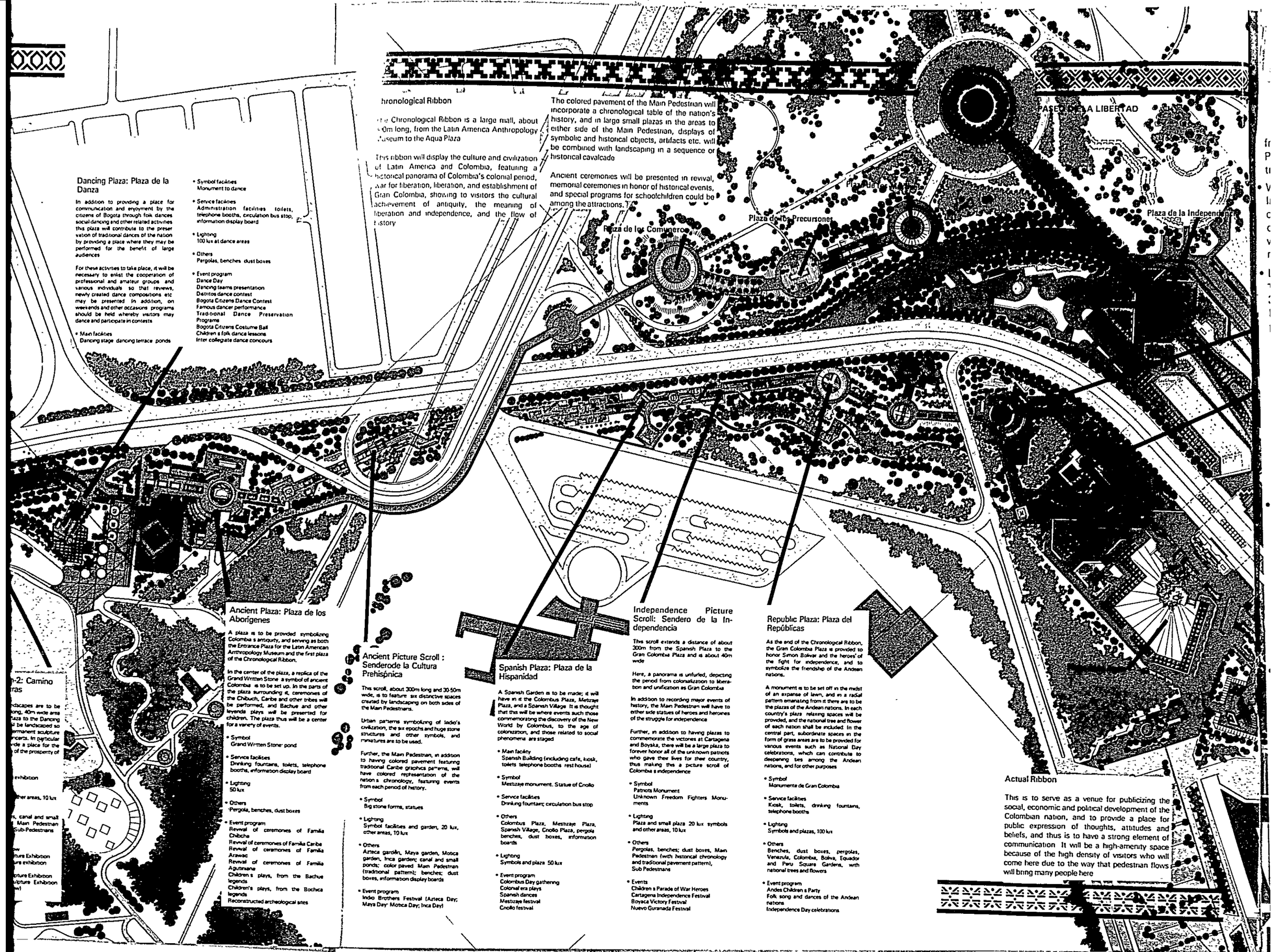
This scroll extends a distance of about 300m from the Spanish Plaza to the Gran Colombia Plaza and is about 40m wide

Here, a panorama is unfurled, depicting the period from colonialization to liberation and unification as Gran Colombia

In addition to recording major events of history, the Main Pedestrian will have to either side statues of heroes and heroines of the struggle for independence

Further, in addition to having plazas to commemorate the victories at Cartagena and Boyaka, there will be a large plaza to forever honor all of the unknown patriots who gave their lives for their country, thus making this a picture scroll of Colombia's independence

- Symbol
  Patriots Monument
  Unknown Freedom Fighters Monuments
- Lighting
  Plaza and small plaza, 20 lux; symbols and other areas, 10 lux
- Others
  Pergolas; benches, dust boxes, Main Pedestrian (with historical chronology and traditional pavement pattern), Sub Pedestrians
- Events
  Children's Parade of War Heroes
  Cartagena Independence Festival
  Boyaca Victory Festival
  Nuevo Guranada Festival



Dancing Plaza: Plaza de la Danza

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For these activities to take place, it will be necessary to enlist the cooperation of professional and amateur groups and various individuals so that reviews, newly created dance compositions etc may be presented In addition, on weekends and other occasions programs should be held whereby visitors may dance and participate in contests

- Main facilities
  Dancing stage dancing terrace ponds
- Symbol facilities
  Monument to dance
- Service facilities
  Administration facilities toilets, telephone booths, circulation bus stop, information display board
- Lighting
  100 lux at dance areas
- Others
  Pergolas, benches dust boxes
- Event program
  Dance Day
  Dancing teams presentation
  Distritos dance contest
  Bogota Citizens Dance Contest
  Famous dancer performance
  Traditional Dance Preservation Programs
  Bogota Citizens Costume Ball
  Children s folk dance lessons
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- Symbol
  Grand Written Stone: pond
- Service facilities
  Drinking fountains, toilets, telephone booths, information display board
- Lighting
  50 lux
- Others
  Pergola, benches, dust boxes
- Event program
  Revival of ceremonies of Familia Chibcha
  Revival of ceremonies of Familia Caribe
  Revival of ceremonies of Familia Arawac
  Revival of ceremonies of Familia Aguitoniane
  Children s plays, from the Bachue legends
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Further, the Main Pedestrian, in addition to having colored pavement featuring traditional Caribe graphics patterns, will have colored representation of the nation s chronology, featuring events from each period of history.

- Symbol
  Big stone forms, statues
- Lighting
  Symbol facilities and garden, 20 lux, other areas, 10 lux
- Others
  Arteca garden, Maya garden, Motica garden, Inca garden; canal and small ponds; color paved Main Pedestrian (traditional pattern); benches; dust boxes, information display boards
- Event program
  Indio Brothers Festival (Arteca Day; Maya Day; Motica Day; Inca Day)

Spanish Plaza: Plaza de la Hispanidad

A Spanish Garden is to be made; it will have in it the Colombus Plaza, Mestizaje Plaza, and a Spanish Village It is thought that this will be where events such those commemorating the discovery of the New World by Colombus, to the age of colonization, and those related to social phenomena are staged

- Main facility
  Spanish Building (including cafe, kiosk, toilets telephone booths rest house)
- Symbol
  Mestizaje monument. Statue of Cnollo
- Service facilities
  Drinking fountain; circulation bus stop
- Others
  Colombus Plaza, Mestizaje Plaza, Spanish Village, Cnollo Plaza, pergola benches, dust boxes, information boards
- Lighting
  Symbols and plaza 50 lux
- Event program
  Colombus Day gathering
  Colonial era plays
  Spanish dances
  Mestizaje festival
  Cnollo festival

Independence Picture Scroll: Sendero de la Independencia

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- Symbol
  Patriots Monument
  Unknown Freedom Fighters Monuments
- Lighting
  Plaza and small plaza 20 lux symbols and other areas, 10 lux
- Others
  Pergolas, benches; dust boxes, Main Pedestrian (with historical chronology and traditional pavement patterns), Sub Pedestrians
- Events
  Children s Parade of War Heroes
  Cartagena Independence Festival
  Boyaca Victory Festival
  Nuevo Guranada Festival

Republic Plaza: Plaza del Repúblicas

As the end of the Chronological Ribbon, the Gran Colombia Plaza is provided to honor Simon Bolivar and the heroes' of the fight for independence, and to symbolize the friendship of the Andean nations.

A monument is to be set off in the midst of an expanse of lawn, and in a radial pattern emanating from it there are to be the plazas of the Andean nations. In each country's plaza relaxing spaces will be provided, and the national tree and flower of each nation shall be included In the central part, subordinate spaces in the form of grass areas are to be provided for various events such as National Day celebrations, which can contribute to deepening ties among the Andean nations, and for other purposes

- Symbol
  Monumente de Gran Colombia
- Service facilities
  Kiosk, toilets, drinking fountains, telephone booths
- Lighting
  Symbols and plazas, 100 lux
- Others
  Benches, dust boxes, pergolas, Venezula, Colombia, Bolivia, Equador and Peru Square Gardens, with national trees and flowers
- Event program
  Andes Children s Party
  Folk song and dances of the Andean nations
  Independence Day celebrations

Actual Ribbon

This is to serve as a venue for publicizing the social, economic and political development of the Colombian nation, and to provide a place for public expression of thoughts, attitudes and beliefs, and thus is to have a strong element of communication It will be a high-amenity space because of the high density of visitors who will come here due to the way that pedestrian flows will bring many people here

Urban Ribbon

Natural Recreational Axis in Bogota: Urban Mall

It is desirable that a Natural Recreational Axis be developed for the distance of about 15 km along Calle 63 which intercepts Bogota in a southeast-northwest direction, from the Forest Conservation Parque Nacional in the southern mountains to the Rio Bogota Riverside Open Space and Parque la Florida in the north. In addition to becoming the "face" of Bogota, as an avenue for leisure and recreational activities of the city's residents, it should be improved as an Urban Mall which is characterized by a varying landscape and has value as an international tourism asset.

Core of the Park: Urban Ribbons

The 3.4 km distance from Avenida Ciudad de Quito to Jardin Botanico, along the Simon Bolivar Great Memorial Park within the Urban Mall, as a center for the cultural, educational and recreational activities of the Bogota citizens, is assigned the status of Urban Ribbons, to give greater prominence and augment the commemorative and symbolic nature of Simon Bolivar Great Memorial Park.

Leisure activities in the great cities of the world now show a tendency toward greater diversification, improved quality, and round-the-clock use, together with increased demand for such activities. Similar to what may be witnessed elsewhere in the world, demand for leisure activities, including the capacity of enjoying those activities around the clock, is increasing in Bogota, and it is desirable to provide safe, high-quality facilities in response to that increase and change in demand. From this viewpoint, the Urban Ribbons are to be a wholesome, high-quality core of a diversity of cultural, educational and recreational activities.

Urban Ribbon

The Urban Ribbons is to be composed of six cintas of 300 to 1,000 m, each characterized by its own theme. At the same time that each ribbon is to possess its distinctive theme composed of cultural, educational, recreational or other elements, each is to have a plaza, each of which is to have an distinctive identity, reinforced by an emphasis on a different basic theme color in each, gardens, and pavement featuring traditional graphic patterns, which shall, in combination, make the ribbons places where events, including those which may be appropriately matched to each ribbon's theme, may be held.

Moreover, as stated in the above note, "Core of the Park," each of the six ribbons are to be provided with lighting appropriate to their being used in the evening, to be planned and to have features which assure the safety of visitors, as well as to facilitate the holding of various activities and programs related to the themes of the ribbons; in addition, the service facility supply standards as well as the location of the facilities are to be such as insure that those activities are of high quality. The changing scenery and incorporation of scenery beyond the ribbons into that of the ribbons themselves is to further enhance their function.

At the same time as the Urban Ribbons are a receptacle within which various activities can take place, it is highly important that in order to augment the vitality of the ribbons, an annual program of events is to be planned and managed by the competent authorities, who shall suitably publicize these attractions.

The main themes of the six ribbons comprising the Urban Ribbons are the culture, history, nature and future of Colombia, and Colombia today, as follows.

Fig. — 28 Concept of Urban Ribbon

Name of Ribbon	Theme		Theme Color	Theme Pattern
Cultural Ribbon	Colombian Culture	Enhancement of traditional & modern culture	Purple	
Chronological Ribbon	Colombian History	History from the Indios civilization to the winning of Independence	Red	
Liberty Ribbon	Colombian Independence	Commemoration of Independence Wars and Biggest Colombian Ceremonial Area	Orange	
Actual Ribbon	Colombians Today	Publicizing and educating visitors regarding the life of the Colombians, the economy, industry and public administration	Yellow	
Youth Ribbon	Colombians' Future	Intellectual, spiritual and physical Improvement of Colombia's youth	Blue	
Natural Ribbon	Colombian Nature	Bogota, the capital of greenery and flowers	Green	

Systems and Modules of Alameda

The modules of Alameda are to be defined in terms of controlled presentation of a varying landscape, and refreshing pathways. The foreground is to be of 50-80m depth and as a unit of Gardening Pedestrians, it is to have expansive spaces, and distinctive gardens. It also is to have spaces for resting, composed of alcoves and small plazas. The middle ground, of 200-300m depth, is to feature plazas which are to function as activity cores for each theme ribbon, to augment the activity of each ribbon through the plazas' possessing consistency with each theme. The far ground, 500-1,000m in depth, in addition to unfolding the theme and story which unifies each theme ribbon, is to have visual completeness by means of a traditional graphic pattern and use of color for the main pedestrian area each to be different in accordance with the different themes.

To facilitate perception of the Alameda as a whole, a single variety of street tree is to be planted along Calle 63 for the entire 3.4 km length, so that those who pass up and down the avenue by car may see the ribbon scenery beyond the vertical procession of tree trunks, and the two ends of the 3.4km distance will be emphasized by placement, at each end, of a large symbolic wall, and large trees.

Location standards for the transportation service system, main facilities, symbol facilities, service facilities, lighting, landscaping, etc. will be determined according to the four visual and functional stanzas on which the modules are based.

- Transportation service system
  Transportation service in the park will be by means of a system of city circulation buses using roads on the periphery of the park. Bus stops are to be provided in each Theme Plaza. As a sub-system, non-polluting small electric (battery) cars may be available within the park and Alameda, as well going by carriage whereby amusement may be combined with functional objectives, but transportation is primarily to be by means of buses. Consideration is also to be given to a bicycle rental facility for non-competitive cycling.
- Facility distribution
  Service and administrative facilities are to conform to a higher standard than in the park; fundamentally they are to be located in the Theme Plazas in the interests of effective, efficient use. Symbols are to be suitably located

from the Theme Plazas to the Gardening Pedestrian, in accordance with the themes and treatment of the ribbons.

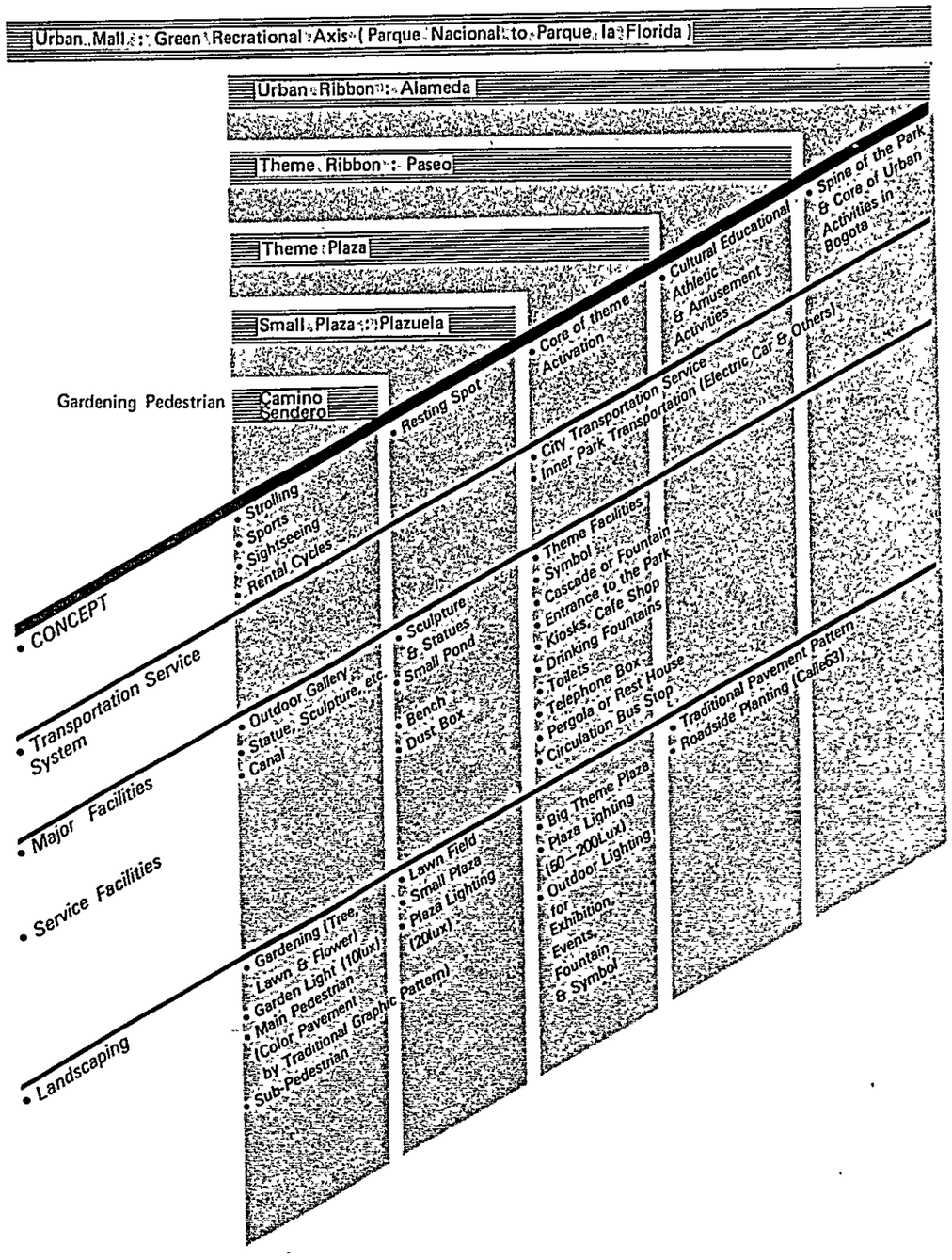
Water-use facilities
Important components of the Alameda to include a south-to-north canal, ponds, fountains, cascades and other water features in variety, which all contribute to and heighten the richness of the Alameda scenery.

Landscaping
The organization of the landscaped ribbon of 30-50m width is to be provision of a Main Pedestrian (having a traditional graphic pavement pattern) of about 6m width, and Sub Pedestrian (for strolling, consistent with the relevant themes) of about 2m width, with lawn, flower plantings, shrubbery etc. between the Main and Sub Pedestrians, and with provision made for enjoying the foreground landscape to a distance of 50-80m. To contain the landscape, on both sides of this landscaped, gardening area, row plantings of trees are to be used. The trees on one side are to also function as street trees on Calle 63. Trees on both sides are to form a skyline to be made so as to conform to the nature of the themes.

- Lighting
  In order to make round-the-clock use possible, and also to insure safety, lighting is to be 20-50 times as bright as the lights provided for safety in the park, and because of requirement for special events and to emphasize water features and symbols, plaza lighting will be higher than elsewhere. It is expected that installation of temporary lighting will be suitable at times when unusually large-scale or important entertainment events are staged during the evening.

- Event program
  In contrast to the large (110 hectares) park characterized by a natural environment and peaceful, moderate activities, it is necessary to plan on increasing the use of the Alameda as activated Ribbon with distinct themes. From this viewpoint, in addition to creating plazas and Gardening Pedestrians which are to serve as venues for activities such as are described above, it is necessary to provide assurance that these activities do take place, by planning a program of events which is attractive and enjoyable to large numbers of people, and publicizing the program among the citizens, as well as properly implementing the program. It will also be important to establish system whereby requests related to the program, from the citizens and various groups, can properly handled.

Fig. — 30 Module of Urban Ribbon



C en Plaza: Plaza de la Cunidad

To vide a place for communication by vth youth, workers, women and s who make up society, and to bute to improvement of the life of ople of the city, the Citizens Plaza is ed for flexible use, for a broad ran of activities In addition to ding a place for the citizens to freely me it will be necessary to plan and car out a program of activities to insure tha the plaza is fully used for the benefit of the people

- Service facility
  Drinking fountain
- Lighting
  Plaza 100 lux
- Others
  Benches dust boxes, pergola
- Event program
  Youth Month events
  Blood Donation Campaign
  Women s Month events
  Used goods exchange
  May Day gathering
  Little Kindness Movement Month
  Handicapped Persons Month
  Beautify Bogota Movement
  Citizens Charity Bazaar
  Traffic Safety Month
  Community Chest campaign events
  Christmas celebrations

Industries Plaza: Plaza de las Industrias

For publicizing and promoting Colombia's industries through various events, to facilitate communication among industrialists and businessmen, and to stimulate a competitive spirit on behalf of further development and growth through contests provision is made for a flexible use plaza

To obtain the maximum benefits from use of this space, it will be necessary to solicit and obtain the cooperation of various organizations in connection with planning and implementation of a program for this plaza

- Service facility
  Circulation bus stop, drinking fountains, fresh water supply
- Lighting and others
  Plaza 100 lux
  Benches, dust boxes pergola
- Event program
  Coffee Festival (tasting sale)
  Pottery market
  Leather products trade show
  Dairy products trade show
  Fruit market
  Glass products show
  Apparel contest
  Emerald Queen contest

Public Administration Plaza: Plaza de la Municipalidad

To provide a place for the government of Bogota to come in close contact with the citizens, so as to promote their better understanding of the roles and activities of the government, and to facilitate the citizens' participation in the civil administration processes, a plaza is to be provided

Permanent information board is to be provided so that citizens may thereby become more familiar with the government's welfare, education, cultural, infrastructural improvement and other programs

- Lighting
  Plaza, 100 lux
- Others
  Information display boards, benches, dust boxes, pergola
- Event program
  Bogota Founding Day ceremonies
  Taxpayers Information Day
  Weights and Measures Day
  Social Welfare Day
  Postal Service Day (combined with release of a stamp or stamps)
  Road Improvement and Road Safety Day
  Water Day

Technology Plaza: Plaza de la Tecnologia

As the entrance to the Transport Museum and Scientific Technology Museum, and as a Festival Plaza to be used in connection with these museums activities this plaza will introduce the technology of the future, in such a manner as to arouse the interest of young Colombians

- Symbol
  Future Technology Monument
- Service facilities
  Drinking fountains, toilets, telephone booths museum entrances, circulation bus stop
- Lighting
  Symbol and plaza, 50 lux
- Others
  Benches, dust boxes
- Event program
  Invention Contest (on National Patent Day)
  Railroad Day (introducing new railroad systems, exhibiting steam locomotives etc)
  Aeronautics Day (airplane exhibition)
  Space Technology Exhibition
  Resources Development Technology Exhibition
  Petrochemistry Exhibition
  Weather Monitoring Exhibition

ABC Path: Camino de Abecedario

In addition planting flowers and trees so as to spell out the alphabet from A to Z in the area of the Main Pedestrian and side paths, statues etc in the forms of animals and various ordinary objects are to be set out so that while strolling mothers can teach the names of them, and their spellings, to the children in a playful atmosphere

A pleasant looking brook is to be provided, with channels so that children can learn water safety by floating leaf boats there

- Symbol
  Alphabet monument, numbers monument
- Lighting
  Symbol, elsewhere, 20 lux
- Others
  Main Pedestrian (with color pavement), Sub Pedestrians, gardens (with flowers, trees, sculpture), splash-away kiddy pool (for leaf boats), Alphabet Tiny Plaza, Numbers Tiny Plaza
- Events
  Boat races
  Spelling bees, quizzes

Mothers and Child Plaza: Plaza de la Madre y el Niño

As a place to commemorate birth and growth of children, a plaza is provided for mother and children to learn various things through play and other activities

It is desirable that a program be developed and implemented so that the plaza can help mothers to raise their children

- Symbol
  Mother and child monument
- Service facilities
  Kiosks drinking fountains toilets telephone booths
- Lighting
  Symbol and plaza, 100 lux
- Others
  Plaza Commemorating Birth Plum Garden, Puppet Plaza Fishpond Animal Plaza Insect Tree Benches Canopies, Dust Boxes
- Event program
  Toy Hospital Day
  Goldfish Festival
  Toys of the world exhibit
  Kindergarten Play Day
  Ice Cream Day
  Mothers Handmade Puppet Day
  Charity Bazaar
  Animals of Colombia Festival
  Puppet shows
  Insect Festival
  Tree climbing contest

Youth Joy Plaza: Plaza de la Juventud

This plaza is to be a place for lovers' rendezvous , and for youth to gather, there is to be a garden with flowers all year round, and a large fountain in the center, Stepped terraces on the sides will be identified with the names of poets from all the world and all ages so that people may use those names to identify places to meet The plaza is also to serve as an entrance to visitors arriving from a northeasterly direction on foot

- Main facility
  Fountain garden
- Symbol
  Lovers monument (statue of Maria Teresa)
- Service facilities
  Kiosks, toilets drinking fountains
- Lighting
  Symbol, fountain, plaza 50 lux
- Others
  Poets Terrace, pergolas dust boxes

Path of Thought: Sendero de los Filósofos

Together with plantings on both sides of the Main Pedestrian, natural appearing brook and paths will be arranged in a manner conducive to thinking Alcoves with benches will be a provided for relaxation

Athletic Road. Camino de los Atletas

Along the distance of about 400m from the gymnasium to the Jardin Botanico, wooden athletic play equipment football area etc will be located in such a manner that anyone can use them for play and exercise Further, small plazas are to be arranged at the intersection of Av 63 and Av 68 at the gymnasium entrance and at the Youth Ribbon end in front of the Jardin Botanico, where there will be places to rest and chat

- Main facility
  Athletic equipment made of wood rope and netting miniature football courts
- Symbol
  Sports monument health monument
- Service facilities
  Drinking fountains
- Lighting
  Symbol and mini football 100 lux
  road 20 lux
- Others
  Main Pedestrian (with colored pavement and traditional graphic pattern) lawn area (around athletic equipment), small plaza benches, dust boxes
- Events
  Physical skills contest
  Athletic equipment race
  Children s tree climbing race

tional Ceremonial Plaza

Plaza de la Gran Colombia

Seudero de la Paz

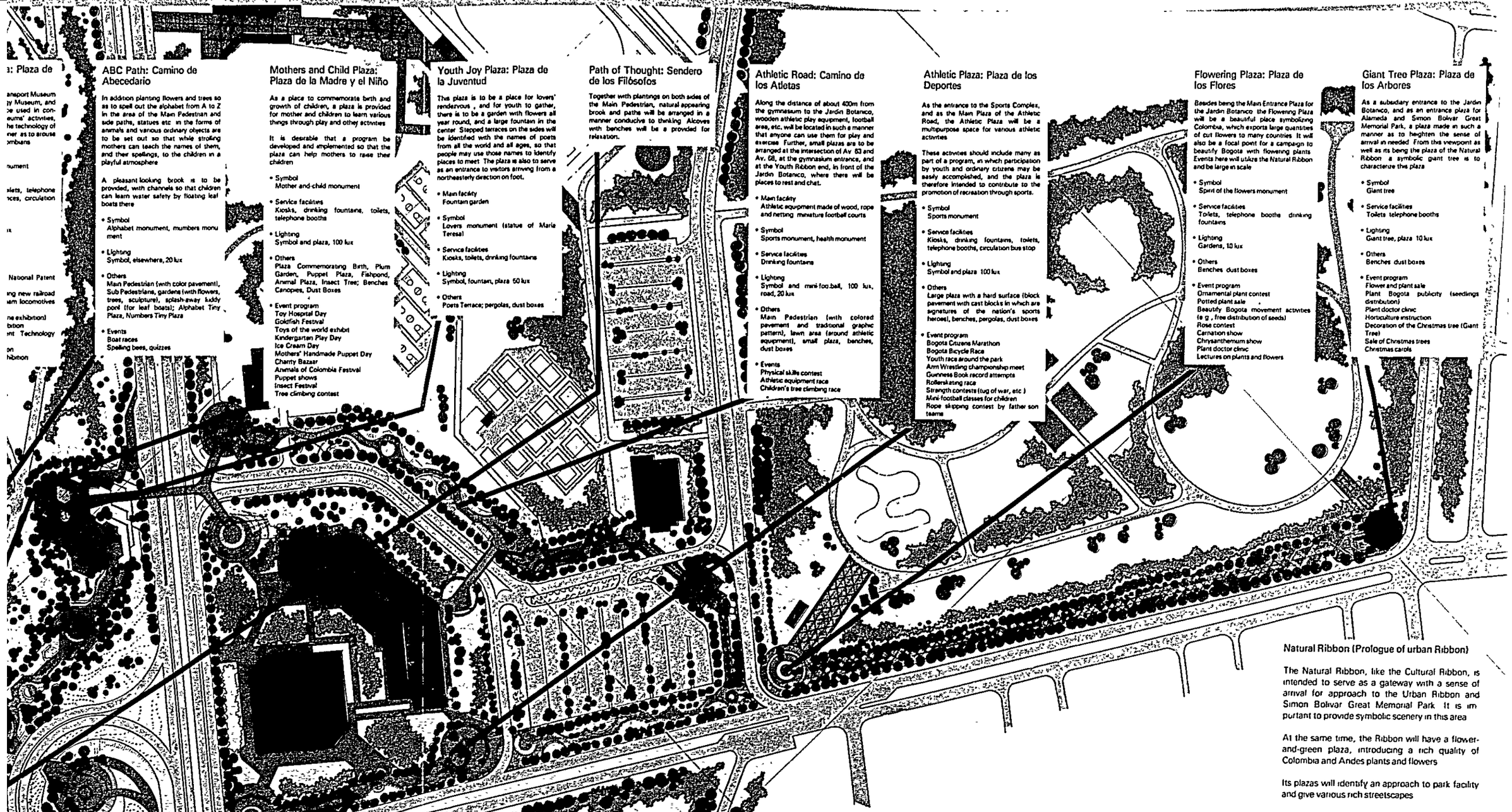
Plaza de los S
Republicas

Youth Ribbon: Future Ribbon

The Future Ribbon is to be a place for the healthy growth and development of the youth of Colombia, who one day shall be the people responsible for the nation and all its people It is to begin with a plaza which celebrates the theme of birth and parenthood, and from plazas for children and youth and their education, is to lead to a Future Technology Plaza, intended to arouse general interest in the technology of the future. Further, there are to be a Youth Joy Plaza, where youth and young lovers can meet, and an Athletic Plaza, for sports and development of sound bodies

By means of these plazas and mails, a contribution is to be made to the mental, spiritual and physical growth and development of youth

Each plaza is to have a close relation to the facilities in the park, is to be located in places suitable for such relations, and is to function as an entrance plaza for park facilities



ABC Path: Camino de Abecedario

In addition planting flowers and trees so as to spell out the alphabet from A to Z in the area of the Main Pedestrian and side paths, statues etc in the forms of animals and various ordinary objects are to be set out so that while strolling mothers can teach the names of them, and their spellings, to the children in a playful atmosphere

A pleasant looking brook is to be provided, with channels so that children can learn water safety by floating leaf boats there

- Symbol
  Alphabet monument, numbers monument
- Lighting
  Symbol, elsewhere, 20 lux
- Others
  Main Pedestrian (with color pavement), Sub Pedestrians, gardens (with flowers, trees, sculpture), splash-away kiddy pool (for leaf boats); Alphabet Tiny Plaza, Numbers Tiny Plaza
- Events
  Boat races
  Spelling bees, quizzes

Mothers and Child Plaza: Plaza de la Madre y el Niño

As a place to commemorate birth and growth of children, a plaza is provided for mother and children to learn various things through play and other activities

It is desirable that a program be developed and implemented so that the plaza can help mothers to raise their children

- Symbol
  Mother and-child monument
- Service facilities
  Kiosks, drinking fountains, toilets, telephone booths
- Lighting
  Symbol and plaza, 100 lux
- Others
  Plaza Commemorating Birth, Plum Garden, Puppet Plaza, Fishpond, Animal Plaza, Insect Tree; Benches Canopies, Dust Boxes
- Event program
  Toy Hospital Day
  Goldfish Festival
  Toys of the world exhibit
  Kindergarten Play Day
  Ice Cream Day
  Mothers' Handmade Puppet Day
  Charity Bazaar
  Animals of Colombia Festival
  Puppet shows
  Insect Festival
  Tree climbing contest

Youth Joy Plaza: Plaza de la Juventud

This plaza is to be a place for lovers' rendezvous , and for youth to gather, there is to be a garden with flowers all year round, and a large fountain in the center Stepped terraces on the sides will be identified with the names of poets from all the world and all ages, so that people may use those names to identify places to meet The plaza is also to serve as an entrance to visitors arriving from a northeasterly direction on foot.

- Main facility
  Fountain garden
- Symbol
  Lovers monument (statue of Maria Teresa)
- Service facilities
  Kiosks, toilets, drinking fountains
- Lighting
  Symbol, fountain, plaza 50 lux
- Others
  Poets Terrace; pergolas, dust boxes

Path of Thought: Sendero de los Filósofos

Together with plantings on both sides of the Main Pedestrian, natural appearing brook and paths will be arranged in a manner conducive to thinking Alcoves with benches will be provided for relaxation.

Athletic Road: Camino de los Atletas

Along the distance of about 400m from the gymnasium to the Jardin Botanico, wooden athletic play equipment, football area, etc. will be located in such a manner that anyone can use them for play and exercise Further, small plazas are to be arranged at the intersection of Av 63 and Av. 68, at the gymnasium entrance, and at the Youth Ribbon end, in front of the Jardin Botanico, where there will be places to rest and chat.

- Main facility
  Athletic equipment made of wood, rope and netting miniature football courts
- Symbol
  Sports monument, health monument
- Service facilities
  Drinking fountains
- Lighting
  Symbol and mini-football, 100 lux, road, 20 lux
- Others
  Main Pedestrian (with colored pavement and traditional graphic pattern), lawn area (around athletic equipment), small plaza, benches, dust boxes
- Events
  Physical skills contest
  Athletic equipment race
  Children's tree climbing race

Athletic Plaza: Plaza de los Deportes

As the entrance to the Sports Complex, and as the Main Plaza of the Athletic Road, the Athletic Plaza will be a multipurpose space for various athletic activities

These activities should include many as part of a program, in which participation by youth and ordinary citizens may be easily accomplished, and the plaza is therefore intended to contribute to the promotion of recreation through sports.

- Symbol
  Sports monument
- Service facilities
  Kiosks, drinking fountains, toilets, telephone booths, circulation bus stop
- Lighting
  Symbol and plaza 100 lux
- Others
  Large plaza with a hard surface (block pavement with cast blocks in which are signatures of the nation's sports heroes), benches, pergolas, dust boxes
- Event program
  Bogota Citizens Marathon
  Bogota Bicycle Race
  Youth race around the park
  Arm Wrestling championship meet
  Guinness Book record attempts
  Rollerskating race
  Strength contests (tug of war, etc)
  Mini-football classes for children
  Rope skipping contest by father son teams

Flowering Plaza: Plaza de los Flores

Besides being the Main Entrance Plaza for the Jardin Botanico the Flowering Plaza will be a beautiful place symbolizing Colombia, which exports large quantities of cut flowers to many countries It will also be a focal point for a campaign to beautify Bogota with flowering plants Events here will utilize the Natural Ribbon and be large in scale

- Symbol
  Spirit of the flowers monument
- Service facilities
  Toilets, telephone booths drinking fountains
- Lighting
  Gardens, 10 lux
- Others
  Benches dust boxes
- Event program
  Ornamental plant contest
  Potted plant sale
  Beautify Bogota movement activities (e g , free distribution of seeds)
  Rose contest
  Carnation show
  Chrysanthemum show
  Plant doctor clinic
  Lectures on plants and flowers

Giant Tree Plaza: Plaza de los Arboles

As a subsidiary entrance to the Jardin Botanico, and as an entrance plaza for Alameda and Simon Bolivar Great Memorial Park, a plaza made in such a manner as to heighten the sense of arrival in needed From this viewpoint as well as its being the plaza of the Natural Ribbon a symbolic giant tree is to characterize this plaza

- Symbol
  Giant tree
- Service facilities
  Toilets telephone booths
- Lighting
  Giant tree, plaza 10 lux
- Others
  Benches dust boxes
- Event program
  Flower and plant sale
  Plant Bogota publicity (seedlings distribution)
  Plant doctor clinic
  Horticulture instruction
  Decoration of the Christmas tree (Giant Tree)
  Sale of Christmas trees
  Christmas carols

Natural Ribbon (Prologue of urban Ribbon)

The Natural Ribbon, like the Cultural Ribbon, is intended to serve as a gateway with a sense of arrival for approach to the Urban Ribbon and Simon Bolivar Great Memorial Park It is important to provide symbolic scenery in this area

At the same time, the Ribbon will have a flower-and-green plaza, introducing a rich quality of Colombia and Andes plants and flowers

Its plazas will identify an approach to park facility and give various rich streetscapes

Youth Ribbon: Future Ribbon

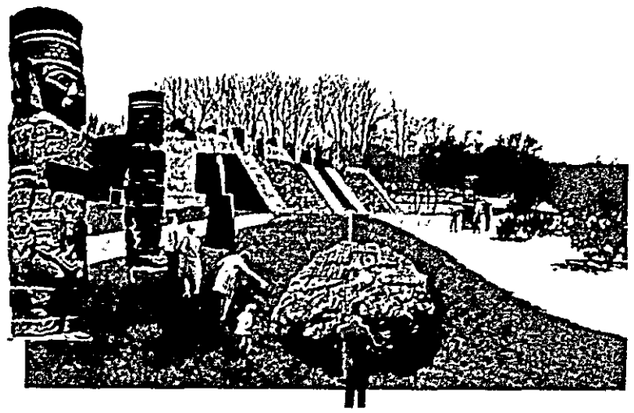
The Future Ribbon is to be a place for the healthy growth and development of the youth of Colombia, who one day shall be the people responsible for the nation and all its people. It is to begin with a plaza which celebrates the theme of birth and parenthood, and from plazas for children and youth and their education, is to lead to a Future Technology Plaza, intended to arouse general interest in the technology of the future. Further, there are to be a Youth Joy Plaza, where youth and young lovers can meet, and an Athletic Plaza, for sports and development of sound bodies

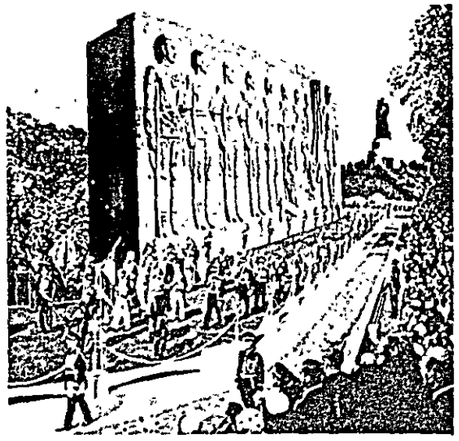
By means of these plazas and malls, a contribution is to be made to the mental, spiritual and physical growth and development of youth.

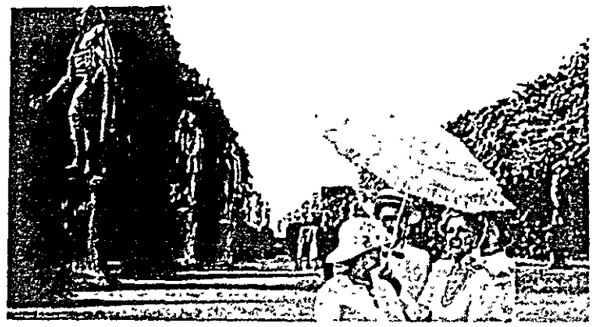
Each plaza is to have a close relation to the facilities in the park, is to be located in places suitable for such relations, and is to function as an entrance plaza for park facilities

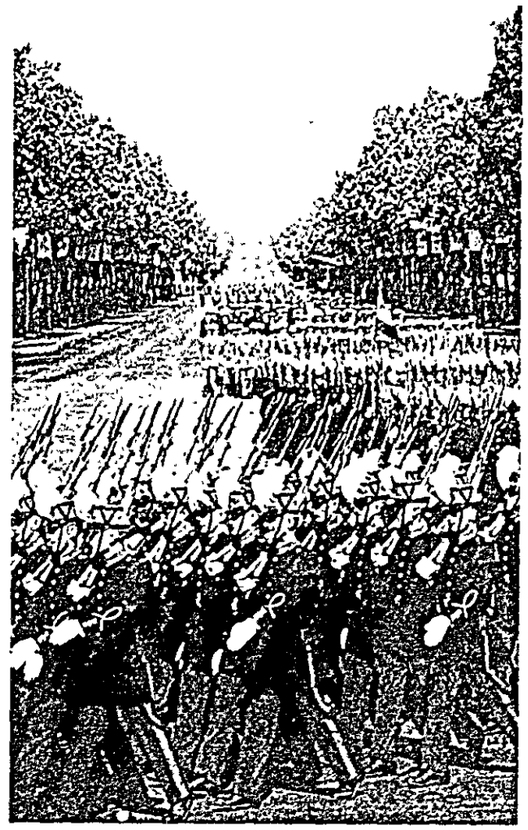
alameda

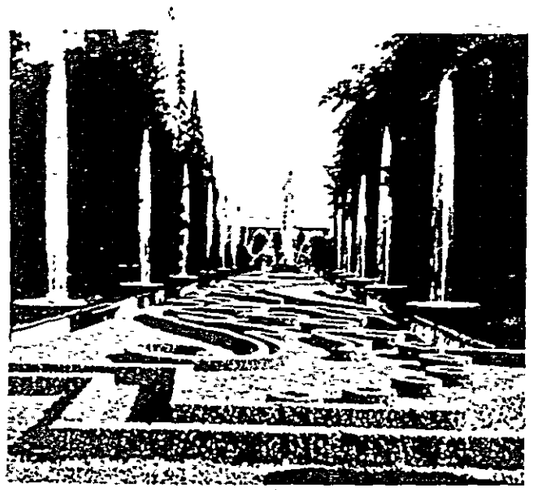
Imaginable Collage of Paseo

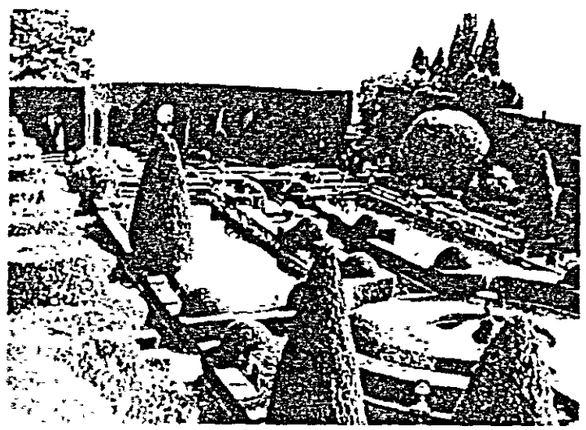












National Ceremonial Plaza

Not only is the National Ceremonial Plaza the physical and functional (including symbolic functions) center of the park but it also is to be a symbol of the unity of the people of Bogota and of Colombia. Here there will be presented and held events and ceremonies of both national and international importance, such as ceremonies celebrating the birth of Simon Bolivar; ceremonies in remembrance of his death; Independence Day celebrations; presidential inaugurations; opening ceremonies for meetings such as of Latin American national leaders; memorial parade reviews; World Cup sports meets; carnivals, exhibitions and other programs on national holidays, and so on. It is to be a place for all the people, rich and poor, young and old, men and women, boys and girls; a place where every citizen of Colombia should be at least once in his or her lifetime, and herein lies the significance of constructing this plaza, which will do so much to emphasize and express the symbolic nature of the park.

Activity and Space

The first requirement in determining the spatial structure of the National Ceremonial Plaza so that it may accommodate all of these diverse events is the analysis of functional relationships between the activities and the space. In the actual performance or occurrence of activities and events in this plaza, although at times they would be combined, or have reversed roles, basically all those present may be considered to be in one of two categories which we may call "performers" and "spectators" here.

- Performers space for activities:
  - Speechmaking, lectures etc.;
    1–30 persons; 2–3m²/person
  - Ceremonies, mass games, dances etc.;
    50–200 persons; 10–30m²/person
  - Parades, marches, etc.;
    max. width, 30–50 persons abreast; length, 500m to 2km or more; vehicles; floats and military equipment to be included
- Spectators space for activities:
  - Fixed seating;
    0.4–0.5m²/person; graduated elevation
  - Standing room;
    0.25–1.0m²/person
  - Free room;
    2–5m²/persons; considered as part of the scenery at times of ceremonies

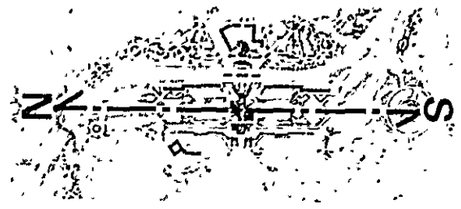
At present when large gatherings are held in Bogota, the facilities used are Plaza de Bolivar (1ha; 30,000 persons), Campin (50,000 persons) and others. In view of conditions related to actual use of these facilities thus far, and the distance over which events may be comfortably witnessed, as well as the nature of this plaza's being intended to be the largest ceremonial plaza in the nation, it is to be planned to normally accommodate 30,000–40,000 persons, and to be capable of use by a maximum of 50,000–60,000 persons.
The following three levels of space are to be used for activities in the plaza (see table below).

Spatial Structure

- Orientation

  Orientation is to be with the north-south direction used as the axis, to minimize the influence of early morning or late afternoon sun.

Fig. – 32 Orientation of Ceremonial Plaza



- Multiple Activity Core

  In addition to being able to accommodate a large throng at times of ceremonies, and also to insure that the space is easy to use, a balance of large area and human scale is needed. Different kinds of plazas are to be located on the north-south and east-west axis, and are to be capable of being used independently of one another.

Fig. – 33 Activity Core of Ceremonial Plaza

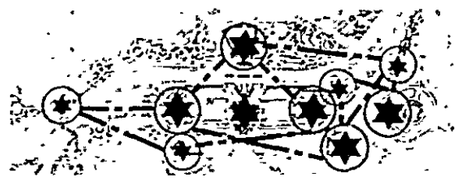


Table – 18 Performance Capacities of Ceremonial Plaza

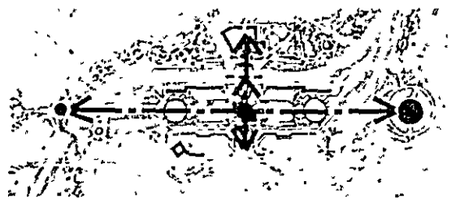
		User population	Performance Area	Spectators: Fixed seats	Spectators: Standing	Spectators: Other	Distance between performers & spectators
Level 1	1ha	5,000–10,000	100– 500m²	5,000	5,000	–	0.5– 50m
Level 2	3ha	10,000–30,000	1,000– 2,000m²	5,000	10,000	10,000–15,000	5 –150m
Level 3	5ha	50,000–70,000	10,000–20,000m²	10,000*	30,000	10,000–30,000	50 –500m

* including temporary seating

● Axis and eye stop

The Historical Museum is to be located to the south side of a north-south axis parallel to Calle 63, as an eye stop. At the end of the axis will be seen the high-rise buildings of downtown Bogota, and the mountains, as the background. To the north side a monument in the Urban Mall will be positioned, also as an eyestop. An east-west activity axis will be positioned perpendicular to the first axis. Between it and the plaza will be a VIP dais, and stage.

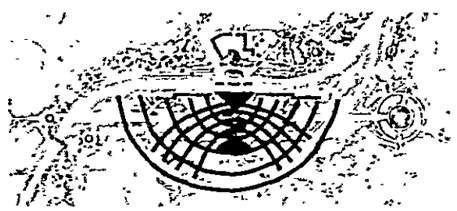
Fig. – 34 Axis of Ceremonial Plaza



● Stage and spectators seats

A stage is to be provided on both sides of the east-west axis; it is to be of such nature as to be usable for many kinds of ceremonies. Spectator seating will be built on a stepped terrace in and adjacent to the plaza. In order to permit as many spectators as possible to have a clear view when very many gather for a ceremony or other special event, the formation of banks in the lawn area will be useful as a flexible approach in park management and will permit them to be used for sitting.

Fig. – 35 Stage and Seat Layout for Event



Visual Analysis

Analysis has been performed with regard to visual aspects of factors determining the scale and form of the plaza, as follows:

● Horizontal visual analysis

The following modules are used regarding the relationship between horizontal visual distance and spatial perception (relationship of distance and human awareness).

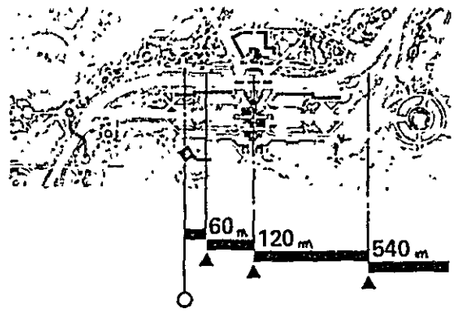
6–20m	Facial expressions are understandable; communication is possible (Contact)
20–60m	Can recognize face of friend or familiar person (Near)
60–180m	Can distinguish sex, age, mannerisms (Selective)
180–540m	Can recognize objects as human being (Equal)
540–1,600m	Can tell if something is moving or still (Remote)

● The limit to what can be felt to be one space, outdoors, is that within 450–500m. It will be possible to control perception say of a parade, so that when a parade is being viewed from one end of the plaza, it will first be perceived as a mass at the far end of the plaza, and as it approaches more details will become perceivable, in a dramatic manner.

● Vertical visual analysis

Differing from an urban plaza which is surrounded by buildings in the middle of a city, in the case of this plaza it is necessary to harmonize it with the park environment, and also to assure the safety and ease of movement of the people using the plaza, so that to an extent it must be "open". But when a plaza is on a perfectly level site, it is by no means easy to organize and define it. Therefore, the ground is to be graded so as to have some variation in level, and by this and careful use of planting, a gentle enclosure will be effected, to facilitate perception of the plaza as one coherent space. A gentle slope of 1.25% will be formed at 120–130m from the center of the plaza in the direction of the long axis. which is believed to be an appropriate distance, to limit vision and assist in creating a sense of enclosure. In the direction of the short axis, use of street trees will similarly provide enclosure, and a minimum gradient of 14° is to provided.

Fig. – 36 Visual Stanza of Ceremonial Plaza

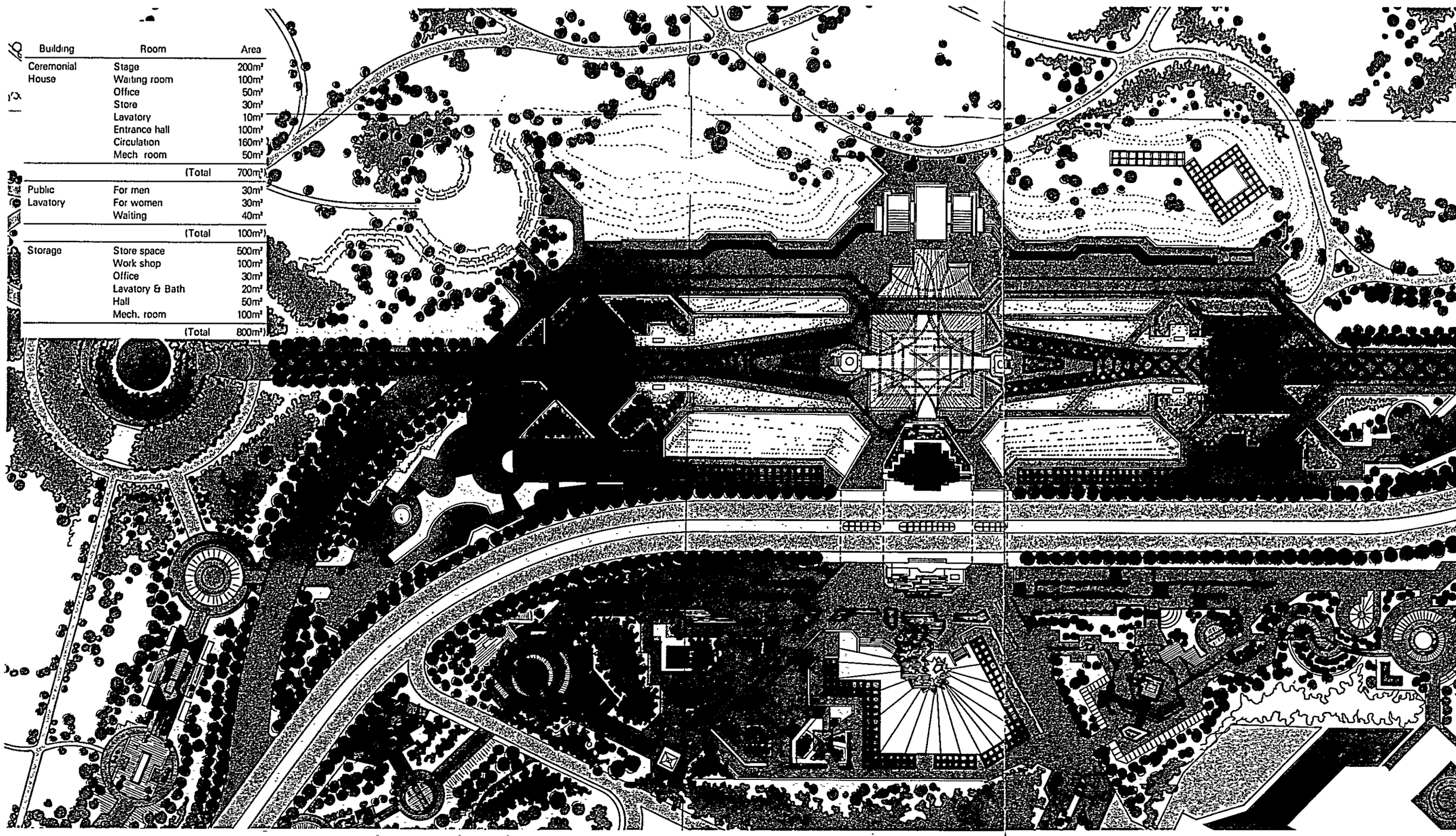


Supporting Facilities and Installations

The following are facilities and installations required for the various ceremonies and other special events. It will be necessary to attain an optimum balance of effective services and investment in deciding on the basis of frequency of ceremonies and special events as well as the peak demand made by those performing or watching of the type of both temporary and permanent facilities installations.

Function	Required Flexible Installations	Fixed Installations
Service	Movable seat Temporary toilet Kiosk First aid	Public toilets Storage Restaurant
Decoration	Buntings, Flags, Stage	Flag pole Multiple use structure
Lighting	Illumination Laser beam units	High pole light
Broadcasting and Audio-visual	Temporary speaker system, Wide screen	Broadcasting system
Control	Rope, Guide post	Sign board
Utility	Temporary power supply (Generator)	Flexible type of utility network

Building	Room	Area
Ceremonial House	Stage	200m²
	Waiting room	100m²
	Office	50m²
	Store	30m²
	Lavatory	10m²
	Entrance hall	100m²
	Circulation	160m²
	Mech. room	50m²
	(Total	700m²)
Public Lavatory	For men	30m²
	For women	30m²
	Waiting	40m²
	(Total	100m²)
Storage	Store space	500m²
	Work shop	100m²
	Office	30m²
	Lavatory & Bath	20m²
	Hall	50m²
	Mech. room	100m²
	(Total	800m²)



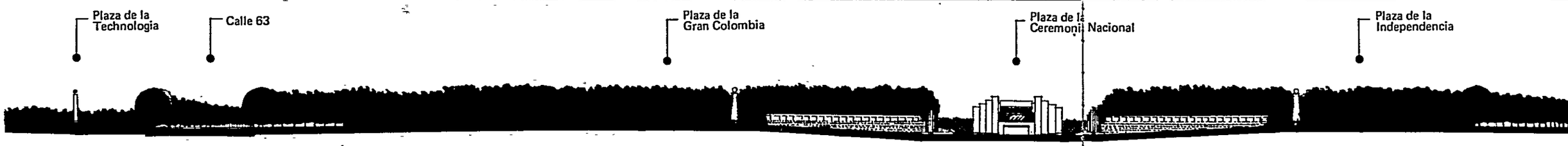
Plaza de la Technologia

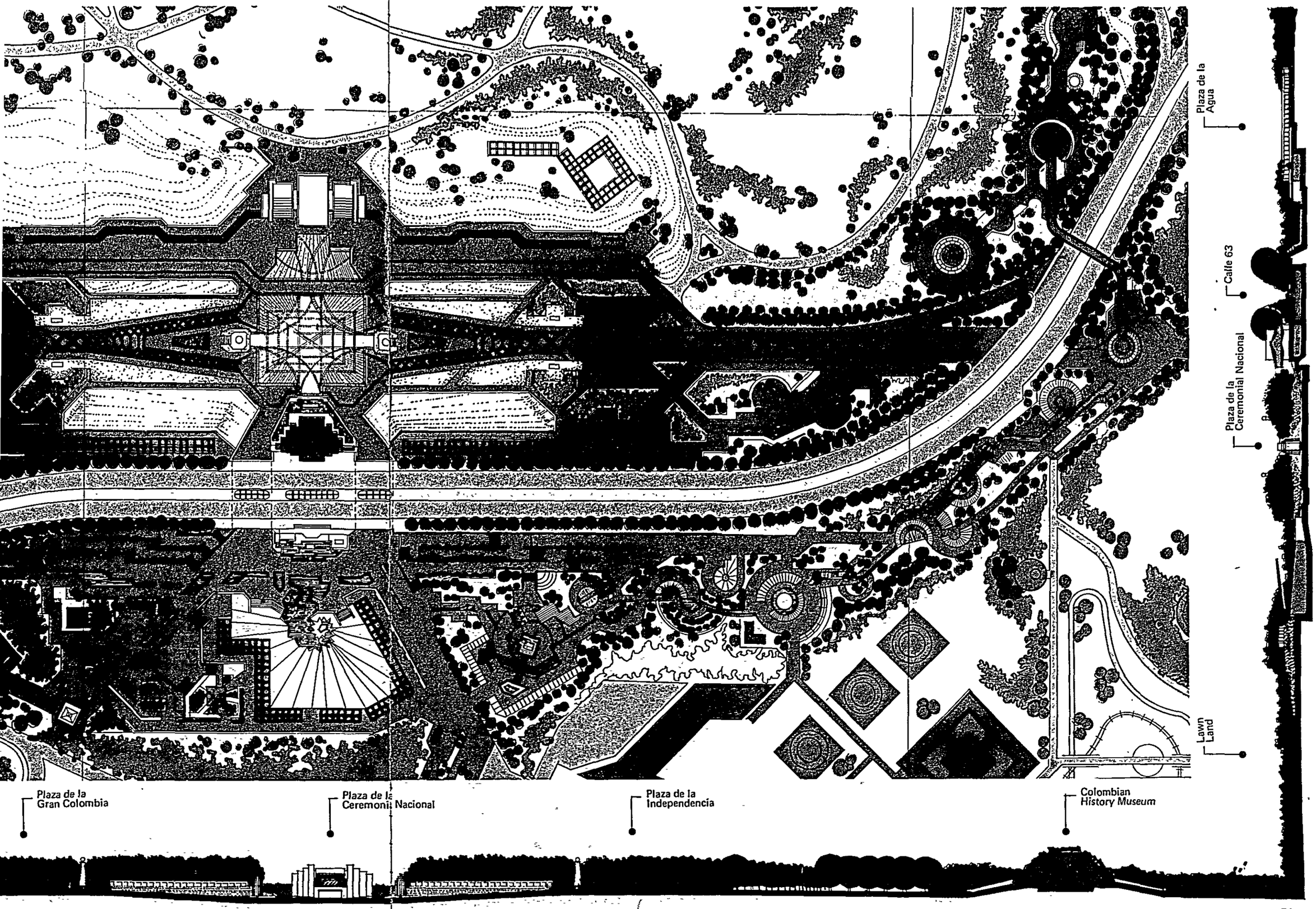
Calle 63

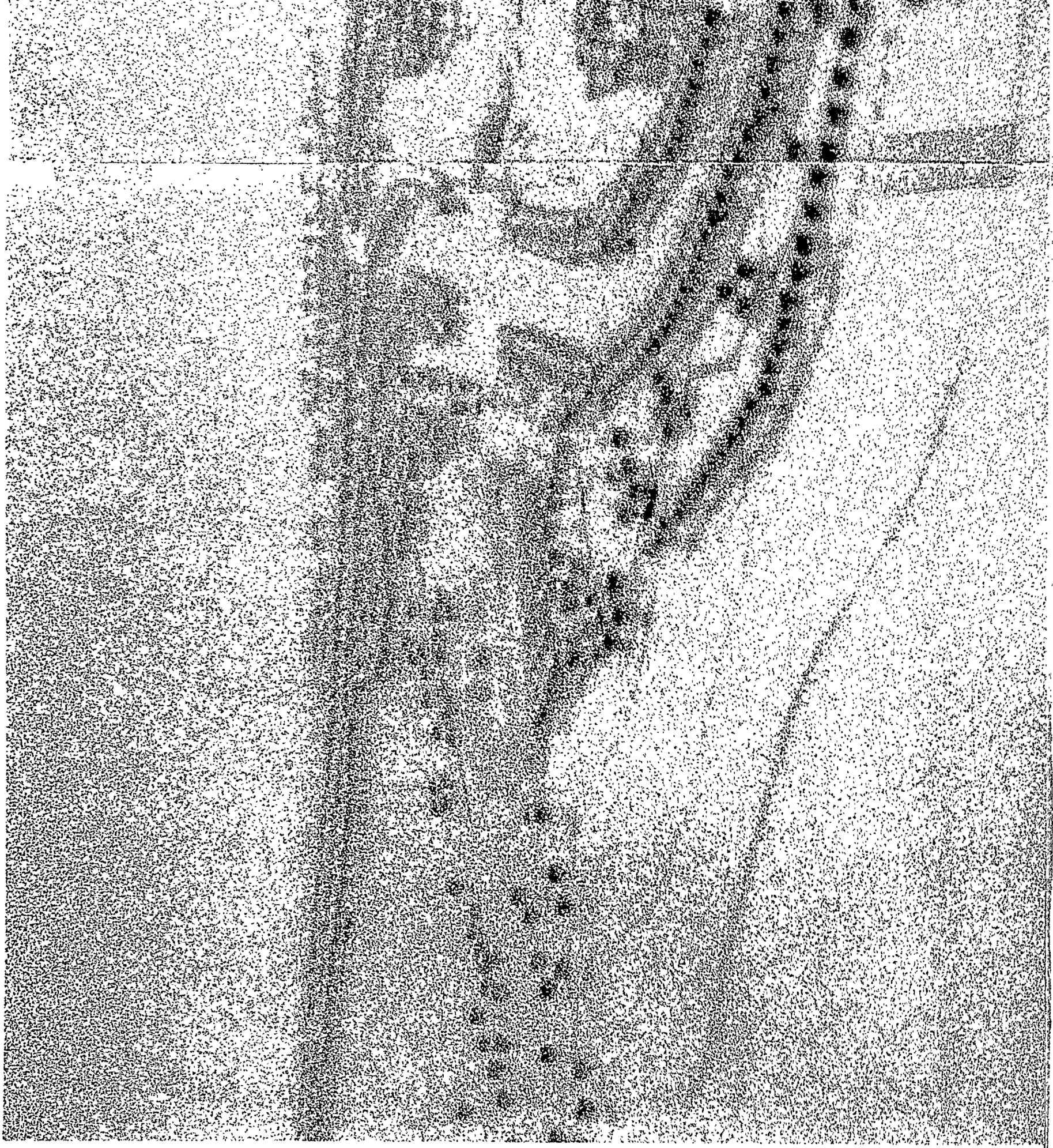
Plaza de la Gran Colombia

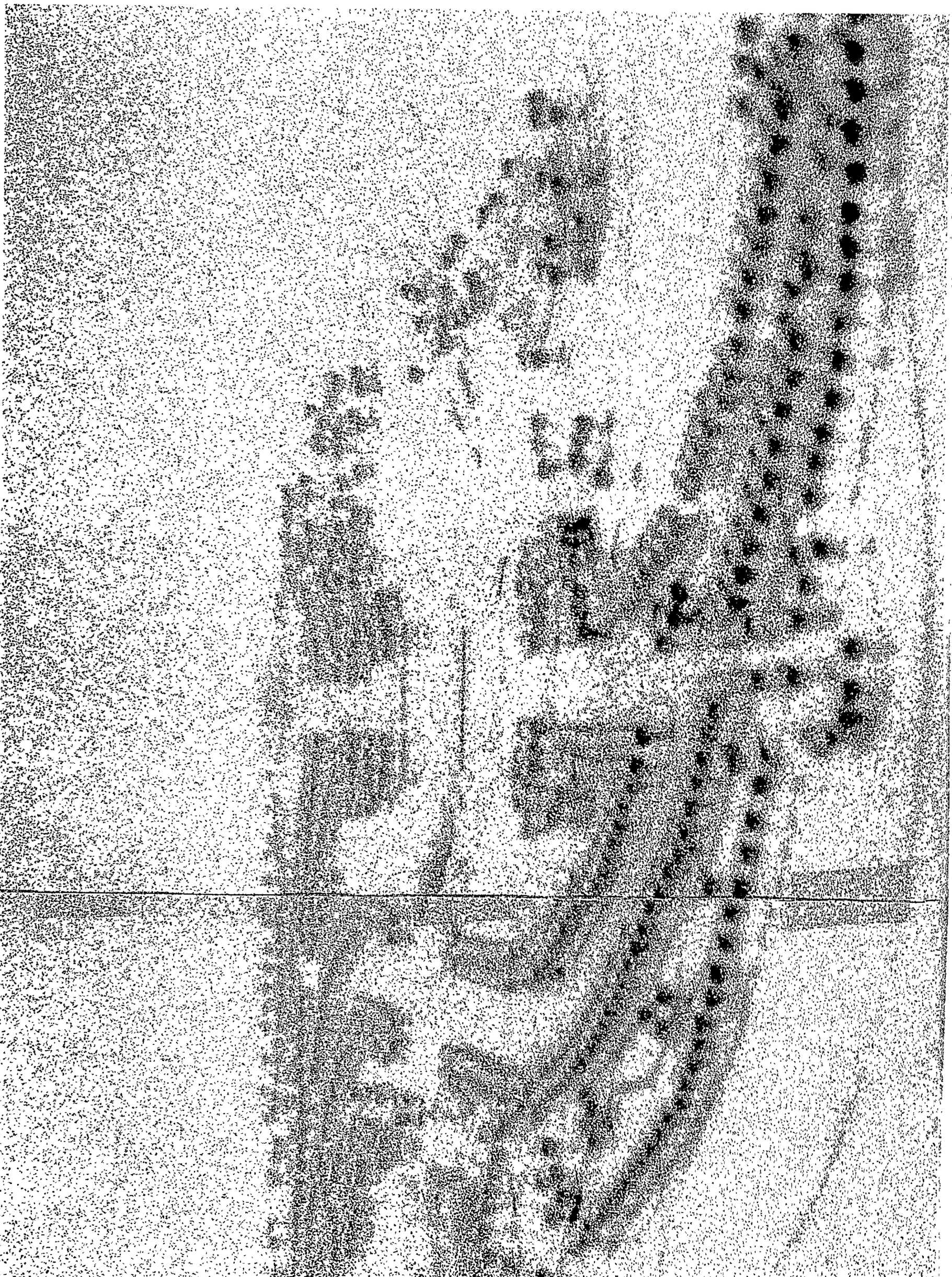
Plaza de la Ceremonial Nacional

Plaza de la Independencia




Plaza de la Gran Colombia
Plaza de la Ceremonial Nacional
Plaza de la Independencia
Colombian History Museum
Lawn Land
Plaza de la Agua
Calle 63
Plaza de la Ceremonial Nacional





Commemorative Symbol Zone

By means of creation of scenery whereby a grand effect of nature is brought into the center of the city, the Commemorative Symbol Zone, the center of the entire park, will be a tangible means whereby the original intention of the Colombian planners, namely to create a memorial park, will be realized. It is centrally located with respect to each special-purpose zone where a variety of recreational activities will take place, and will attract park visitors from all these zones, and provide them with a place for rest and relaxation. For the throngs of people who will gather in the National Ceremonial Plaza, it will serve as a background of sorts and a means of adjusting the real and perceived density of people and prevent injuries such as might be caused by overcrowding. It also will have a perfectly unobtrusive function of providing a place of refuge in the event of a catastrophy which forces large numbers of the population from their homes. By artificially making forests and a lake it will help insure a good environment in the future in keeping with growth of the city of Bogota, and will help maintain ecological balance.

Commemorative Landscape

By artfully incorporating, through the mystically endowed forests, the expansive lawns spreading in all directions of the compass, and the distant boundary lines where water touches the sky, the grandeur and mystique of nature, which surpasses the life cycle of man, park scenery possessing dignity and magnificence befitting a memorial park will be created. These natural elements are of importance for ordinary parks as well, but in the case of the Simon Bolivar Great Memorial Park these elements are scaled up, to approach their limits in terms of function and technology, and further, through their inclusion of long-range vistas which further emphasize grandeur, displace the surrounding urban environment to the extent that visitors in the park are totally caught up in the natural environment it offers.

Sub-Zoning

The following sub-zones are distinguished within the Commemorative Symbol Zone.

- Conservation greenery zone: It is proposed that the recreation within the natural ecological environment be such relatively static types of recreation as walking in the woods, observation and study of nature, etc., provided, it can also be used as field athletics courses.

- Windbreak greenery zone: The tall trees in this zone for protection against the south-east wind will also provide an appropriate atmosphere for enjoyment of walks.

- Aesthetic greenery zone: Resting, group gatherings and other activities are suitable amidst the sparsely planted tall trees of this zone.

- Lawn zone: This is a place that will allow for comparatively active type recreation activities ranging from light sports to group and family activities.

- Lake zone: Linking the Templete and Urban Complex in a diagonal manner, the lake will serve to increase the apparent scale of park scenery and also will provide a good deal of diversity, through the boating on it, fountains, reflection of buildings so as to make them appear larger, and the rich plant life in and at the edge of the water.

- Entrance zone: The section provided as the park's major entrance and exit, on the east, will be where the park administration office, information center, and similar or related facilities will be located, and will be so arranged as to attract people into the park, and orient them toward their destinations, by affording views of the park's attractions in the distance.

Entrances and Exits

In addition to the main park entrance, in the east there will be the following sub-entrance and exits.

- South gate: Connects the Urban Complex and Symbol Zone by a bridge over Calle 53.

- Southwest gate: Provided for visitors using Urbanizacion de Salitre, and the south side bus stop.

- West gate: Provides access to the Salitre Sports Complex by means of a bridge over Avenida 68. Bus stop to be provided below the bridge. Can be used for getting to the Symbol Zone and Sports Complex.

- North gate: The gate include a plaza which is continuous with the Urban Ribbon, at the intersection of Calle 63 and Avenida 68. Can be used by arrivals using cars on Avenida 68.

- East gate: Approached from Parque el Lago by means of a pedestrian bridge located at the side of the fly-over crossing Calle 63.

- Urban Ribbons: Free access is to be provided from the Urban Ribbons which is planned to follow Calle 63 on the north side of the Symbol Zone but in consideration of park management, a degree of control is necessary, and it is planned that access and egress is primarily to be by means of the plaza.

Circulation and Visual Structure

Movement within the park will primarily be by walking. It is generally the case that the distance a person will walk in a park is 1—1.5km but it is also possible to walk much longer distances depending on the scenery, and the facilities which the people want to go to.

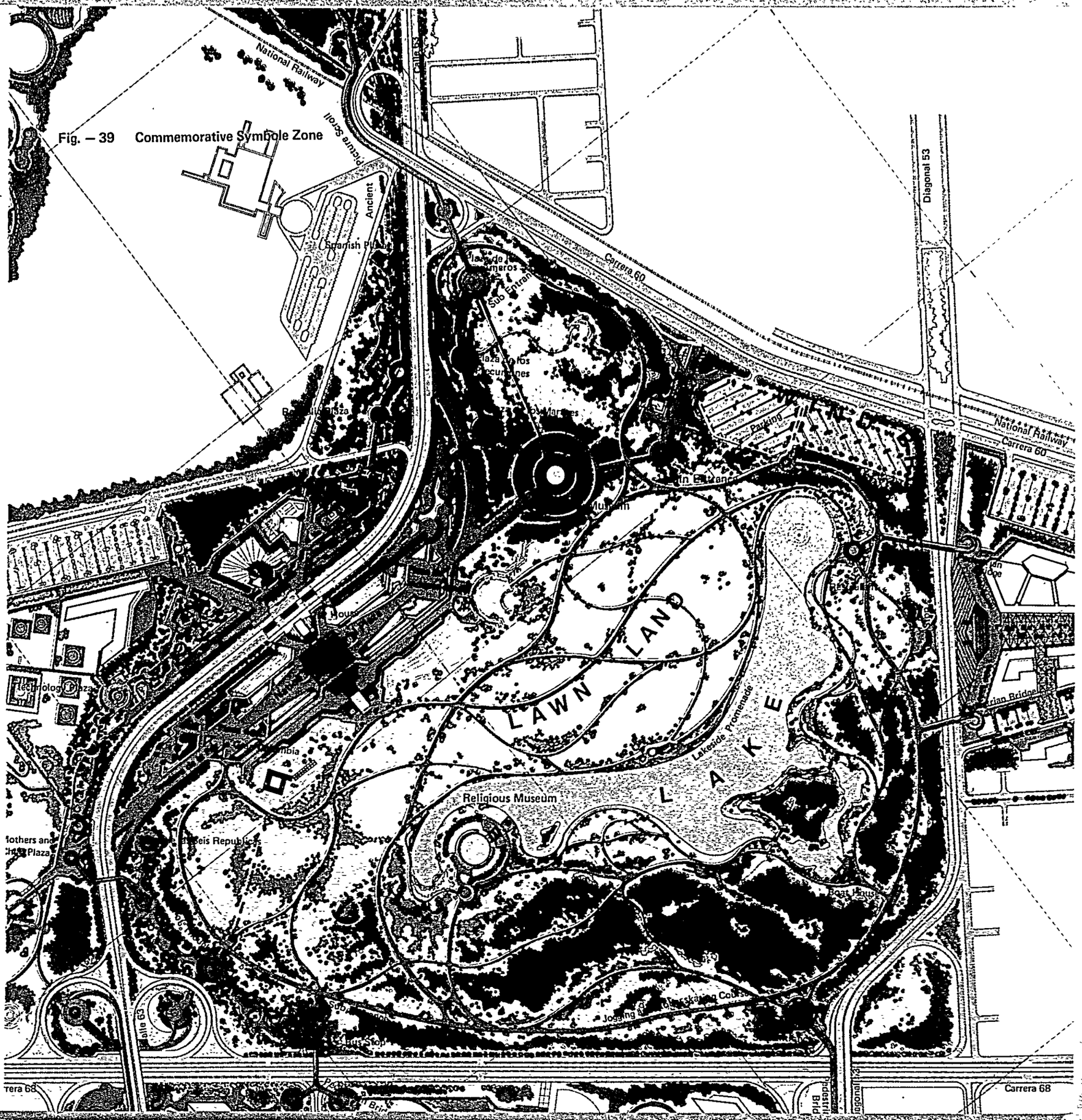
The circulation routes within the Symbol Zone is composed of two circuits and the routes from the gates to the lake.

- Lakeside circuit: Walking along this circuit will enable visitors to enjoy scenes of the trees on the far side of the lake, fountains, the Templete, islands, etc., now revealing and now concealing their objective; the distance between the visitors and the lakeside will vary as they progress along the circuit.

- Grand circuit: This route, which circles the artificial hills surrounding the Symbol Zone, in addition for being planned for use by service vehicles between sub-gates, will also be good for jogging and rollerskating.

- Gateways: These routes will be inclined and will extend between the sub-gates and the central lake, passing through the artificial hills. Arrangements will be such that direct view of the contents of the park will be avoided on these routes, and once the hills have been ascended, the surprise with which the grand sights below can be seen will heighten the visitors' sense of arrival in the park.

Fig. — 39 Commemorative Symbole Zone



Colombian History Museum

Objectives

For the education and enlightenment of the general public, easy-to-understand display methods will be used to present the history of Colombia up to and concentrating on the founding of Gran Colombia in the age of Simon Bolivar.

Design Policy

With the walkway between the Colombian History Museum and the Latin American Anthropology Museum as a Liberty Ribbon, it will have along the way outdoor exhibits matching the age given on the mall to enable visitors to have the feeling of having personally experienced something of ages gone by, and to integrate, spatially and conceptually, the interiors of the museums and outdoor space linking them.

Because this is located on the north-south axis of the National Ceremonial Plaza need is felt for an eye-stopping monument but in order to maintain harmony with the park scenery, an architectural structure should preferably not be openly presented but instead monumentality is to be expressed through Earth Architecture whereby the total structure is integrated with nature.

Spatial Program

The museum interior is to be of three levels, with displays for different ages of Colombia's history allocated to each. The central portion of the building will be vertically open and extend to the roof, to accommodate particularly large displays.

Because the roof will be the point of highest elevation in the entire park, arrangements should be made so that visitors may go there and use it as an observation terrace.

Fig. – 40 Access to the History Museum

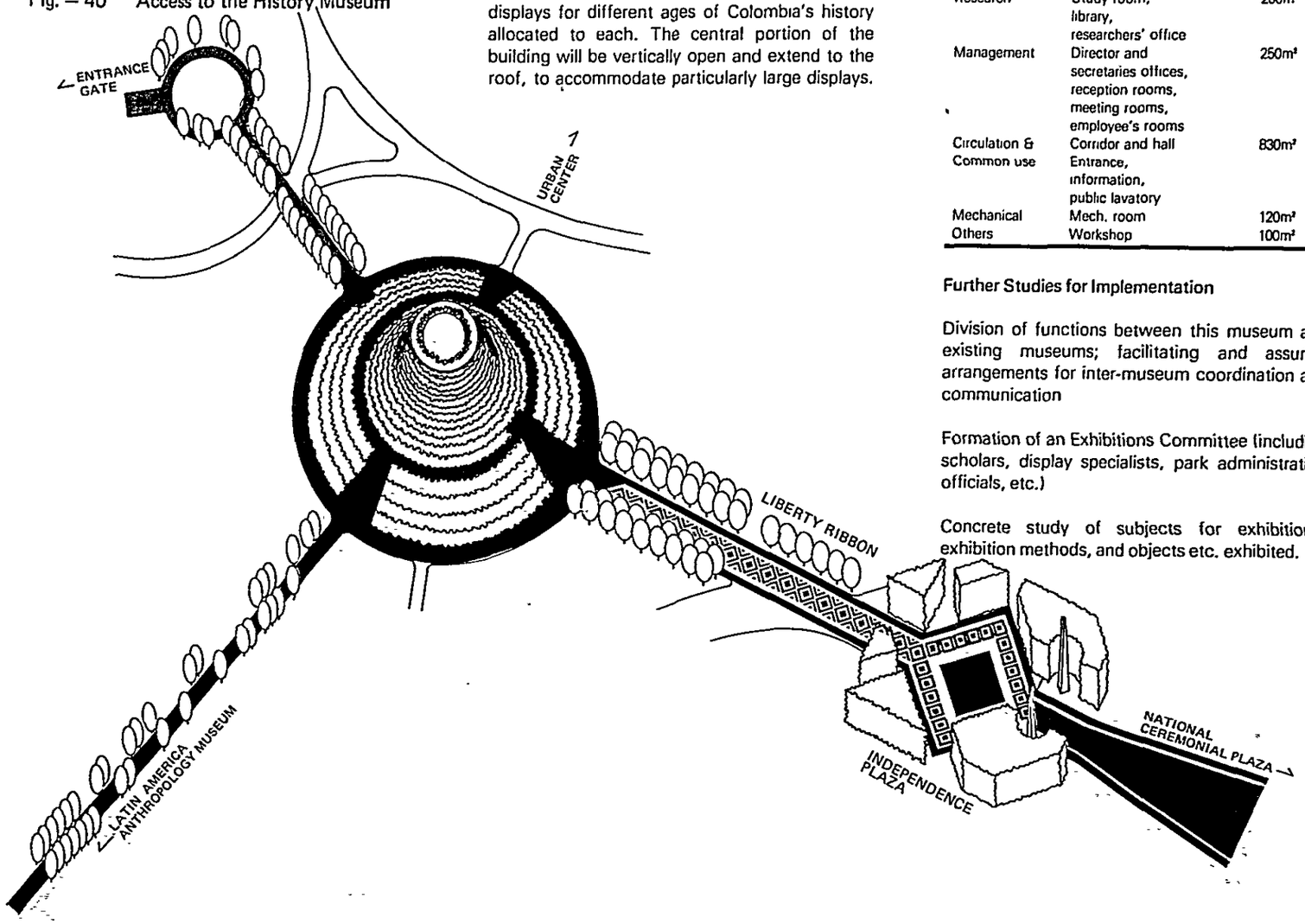


Table – 21 Room Requirement of History Museum

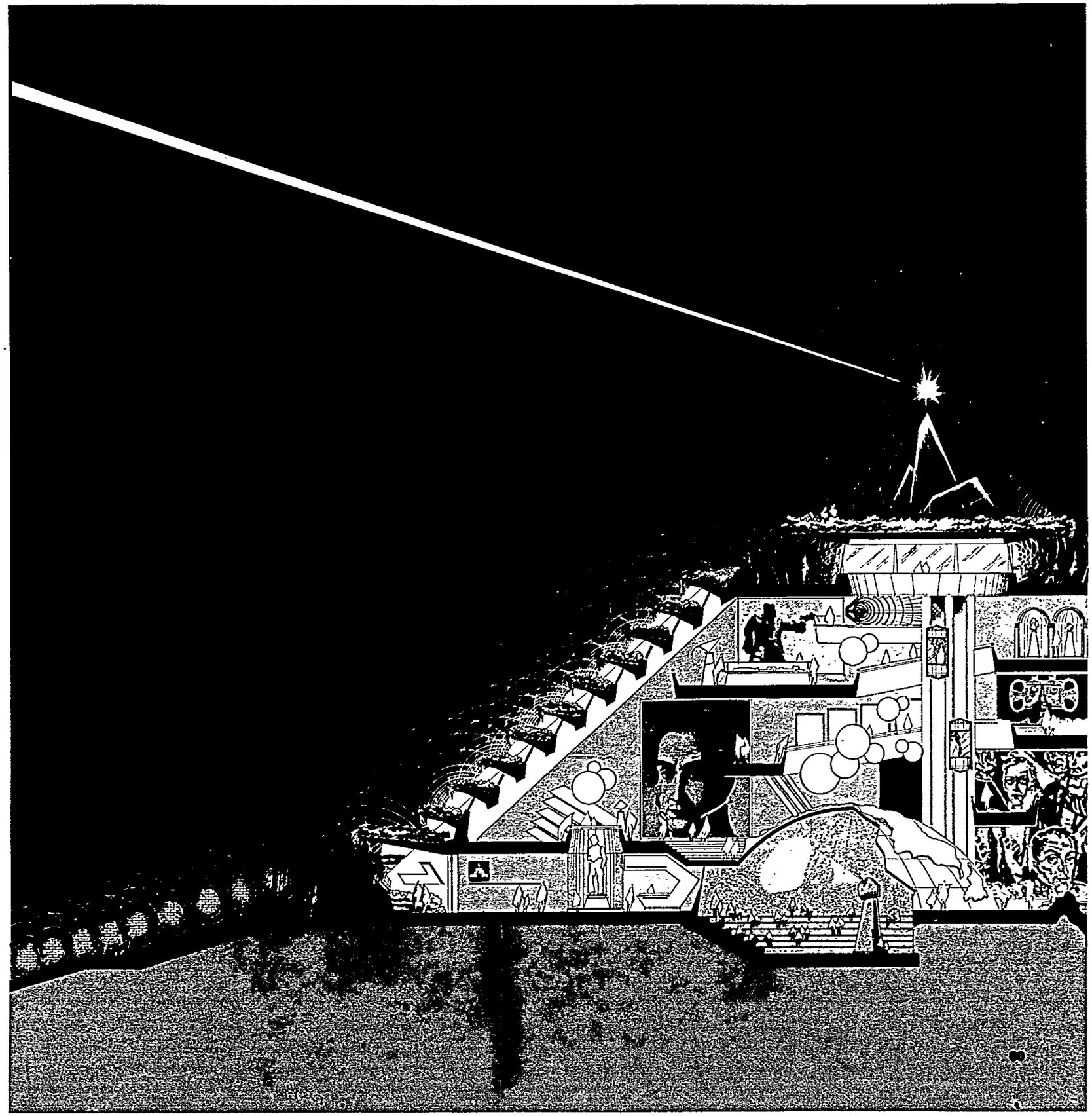
Site Area		10,000m²
Building Area		2,000m²
Lot Occupancy Ratio		20 0%
Building Floor Area		3,000m²
Function	**Room**	**Space**
Exhibition	Permanent ex. rm temporary ex rm	1000m²
Store	Safekeeping, preparation, packing, storage	500m²
Research	Study room, library, researchers' office	200m²
Management	Director and secretaries offices, reception rooms, meeting rooms, employee's rooms	250m²
Circulation & Common use	Corridor and hall Entrance, information, public lavatory	830m²
Mechanical	Mech. room	120m²
Others	Workshop	100m²

Further Studies for Implementation

Division of functions between this museum and existing museums; facilitating and assuring arrangements for inter-museum coordination and communication

Formation of an Exhibitions Committee (including scholars, display specialists, park administration officials, etc.)

Concrete study of subjects for exhibitions, exhibition methods, and objects etc. exhibited.



Religious Museum

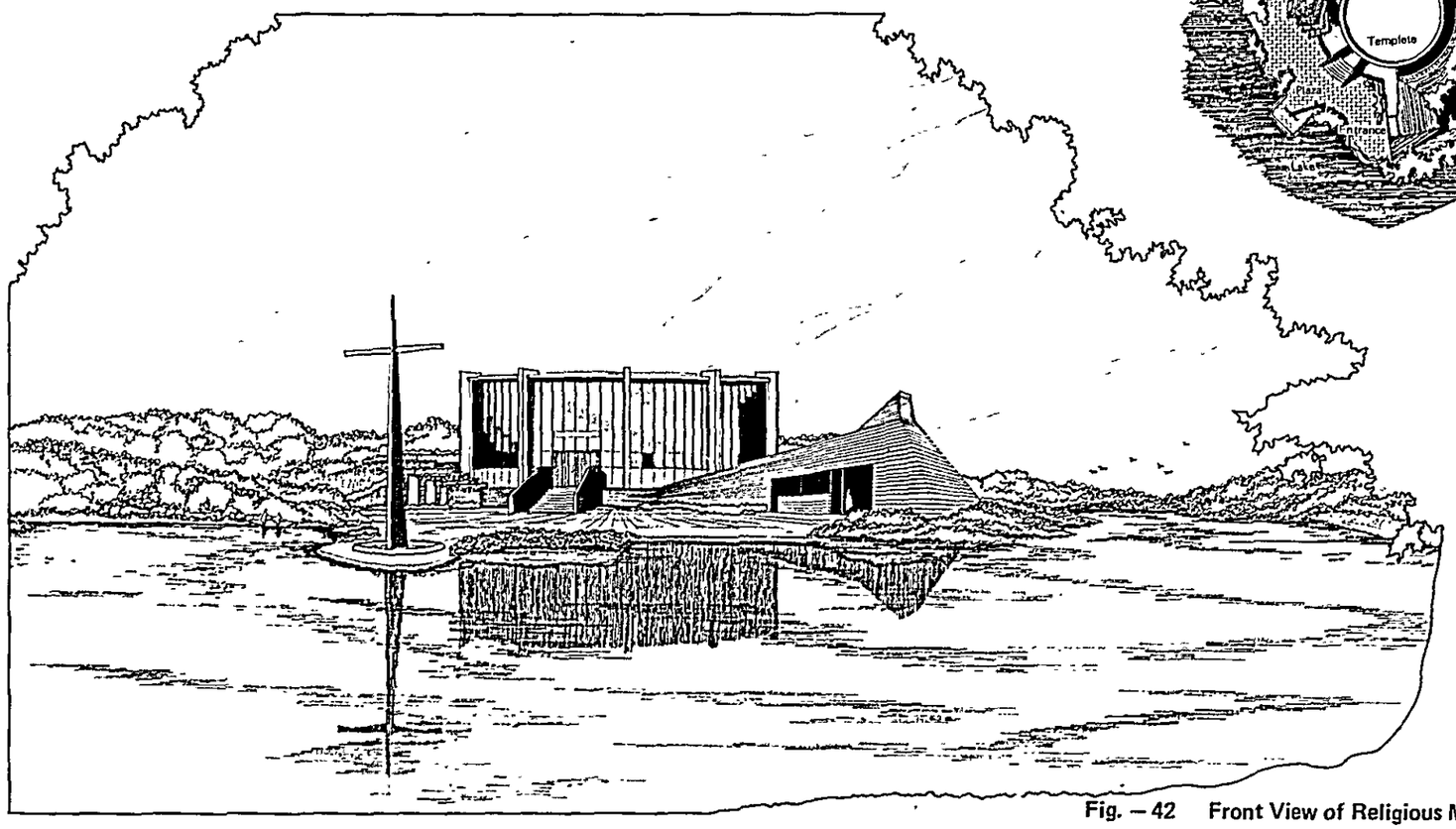


Fig. — 42 Front View of Religious Museum

Objectives

In order to make the Templete which was constructed in connection with the 1969 international Catholic conference and to commemorate the visit the Pope, to be more conveniently and frequently used by the people, on the occasion of construction of the park, a Religious Museum is to be constructed in conjunction with the Templete, so as to harmonize with the rest of the park and add an art museum to the city's cultural assets.

The museum is to display paintings, sculpture, relics, religious articles and the like.

Design Policy

While seeking to harmonize with the Templete which by nature is endowed with symbolic meaning, and with the park landscape, the building is to be designed so that it has prominent form, and combines well with its surroundings.

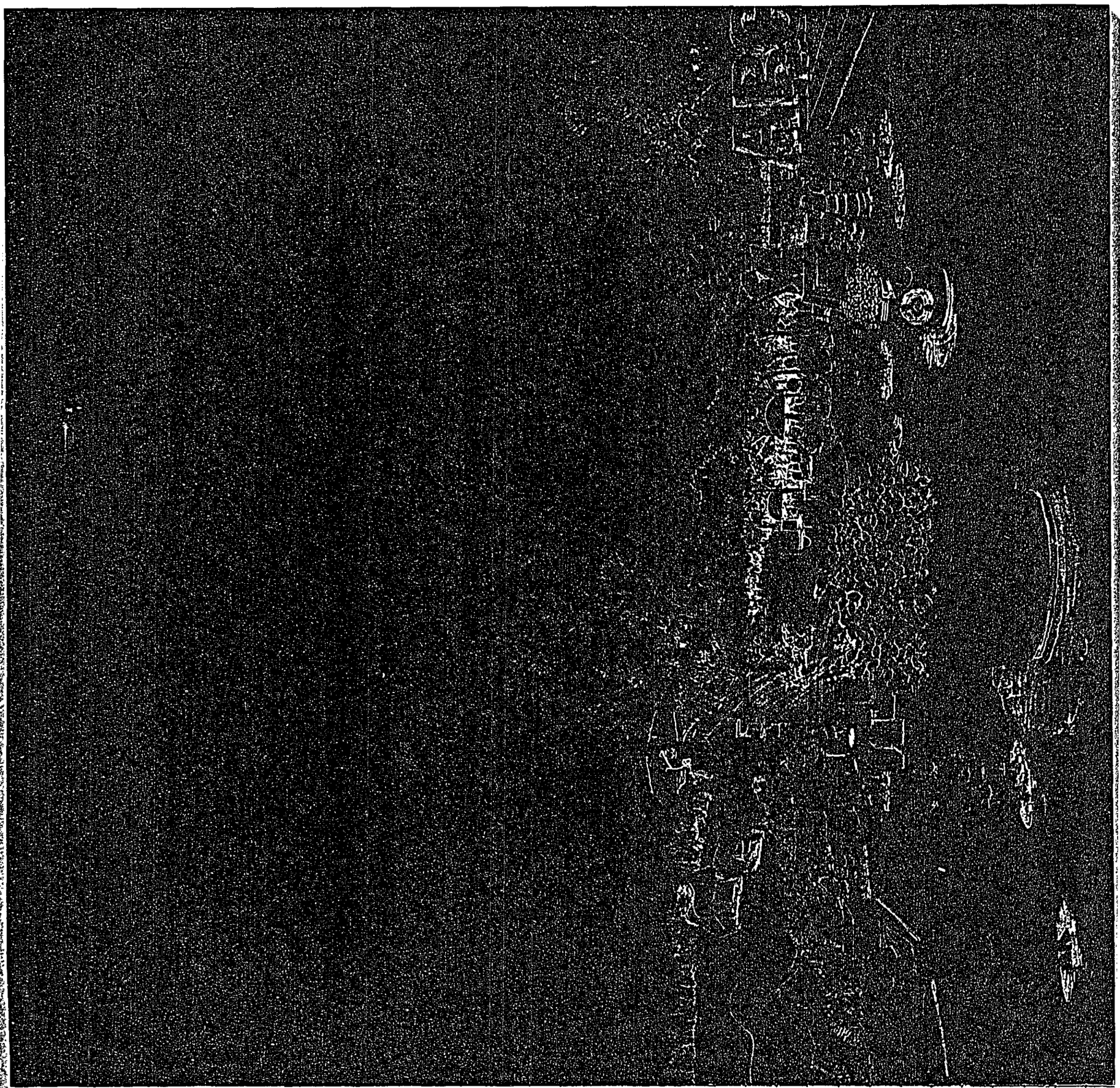
The Religious Museum will be fan-shaped, spreading around the round-form temple, and enclose between them a courtyard garden; planting on the roof will be provided to form one part of the park landscape. Within the museum, control of a combination of natural and artificial lighting will be achieved in order to create a religious atmosphere.

Spatial Program

The museum's display space is to be limited to one level. Paths will enable visitors to circle the temple. Administration offices, storerooms and service facilities will be located in the rear to perfectly separate activities associated with them from the worshippers and visitors.

Table — 22 Room Requirement of Religious Museum

Site Area		10,000m²
Building Area		1,500m²
Lot Occupancy Ratio		15.0%
(Including Templete)		30.0%
Building Floor Area		1,500m²
Function	Room	Space
Exhibition	Galleries	750m²
Store	Safekeeping, preparation, packing, storage	175m²
Research	Study room, office	100m²
Management	Director and secretaries offices, reception rooms, meeting rooms, employee's rooms	100m²
Circulation & Common use	Corridor and hall Entrance information, public lavatory	250m²
Mechanical	Mech. room	75m²
Others	Workshop	50m²



Development Framework

10-year Development Plan

It is suggested that the Simon Bolivar Park Development and Improvement Projects extend over a ten-year period from 1981 to 1990, the target year. This period can be divided into three phases: Phase I (1981—1982), Phase II (1983—1986) and Phase III (1987—1990). The following is an outline of the work items for the different development phases.

Phase I (1981—1982)

As multifaced preparatory activites, during this phase there can be establishment of an implementation organization, studies of feasibility of facilities to be introduced, determination of facility content and the facility provision program, completion of detailed design, preparation of a nursery, etc.

While the preparation work is progressing, urgent implementation of work on the National Ceremonial Plaza shall take place for the strategic reason that the ceremony for the 200th aniversary for the birth of Simon Bolivar must be held in 1983 at the plaza.

Phase II (1983—1986)

Since the 200th anniversary of the birth of Simon Bolivar and the Football World Cup are included within this period, it is necessary that there be a program for provision in stages of the corresponding facilities. The development during this phase should concentrate on core facilities that will strongly impress upon the citizens the distinctive features of the Simon Bolivar Great Memorial Park as based on the master plan and service facilities sufficient to accommodate the number of visitors expected in the initial period as well as provision of the main park infrastructure (landscaping, infrastructure, main park roads, etc.). As for the planting, which will provide the major elements of the park scenery, there will have to be some transplanting of mature trees in the central area of the park and at other main scenic points.

Phase III (1987—1990)

In the third phase the park and its environment will be perfected through provision of more park facilities, large-scale greenery formation, expansion of planting for landscaping purposes, provision of small-scale landscapting facilities, park lanes, small plazas, micro land formation, etc. Also during this period a diversified use program is to be implemented on the basis of the know-how accumulated in Phase I and II with respect to operation and management.

Post Phase III (1991—)

After Phase III the content of the park facilities will be reviewed on the basis of new social needs, study will be made of facility demand resulting from extension of the use program, and new park development plans will be drafted and implemented.

Development Area

The figures for areas that will be involved in the development and improvement works to be carried out in the context of the 10 year development plan are as follows.

Table — 23 Development Area List

Zone	Development Area (ha)	New Devt. (ha)	Improvement (ha)
Grand Mall Zone	43.0	43.0	
Commemorative Symbol Zone	94.2	94.2	
Static Recreation Zone (Parque ellago)	16.1	3.1	13.0
Cultural Zone (Mi Tierra)	21.6	21.6	
Amusement Zone (Parque el Salitre)	40.1		40.1
Sports Recreation Zone (Unidead deportiva)	44.4	19.1	25.3
Botanical Garden	16.9		16.9
Urban Complex Zone	24.7	24.7	
Total	301.0	205.7	95.3

* Entrance zone has been included in the Commemorative Symbol Zone and Amusement Zone.

For general index of target, the areal ratio of development for each phase is proposed as follows: Phase I, 10%; Phase II, 60%; Phase III, 100% of Whole Park Area.

Planned number of visitors

The following figures have been set as the target number of visitors to each of development phases on the basis of visitors demand analysis. The total number of visitors in the target year 1990 has been set at 46.6 million and at the peak hour on a peak day in 1990, 14.9 thousands of visitors will use the whole park area. Among those visitors, 23% will be expected to spend time in the Commemorative Symbol Zone and Urban Mall. target number of visitors for the development period has been estimated on the basis of prospective development area ratio to Whole Park Area.

Table — 24 Expected Number of Visitors by Year (Unit: 1000 persons)

Year	Demand of Visitors	Visitors to Commemorative Symbol Zone and Urban Mall	Visitors to the other park areas
1980	32,920 2	—	8,377.0
1981	34.237.9	—	
1982	35,609.3	8,138.5	27,470.8
1983	37,034.3	—	—
1984	38,329 0	—	—
1985	39,669.7	—	—
1986	41,064.1	9,388.5	31,675 6
1987	42,496.7	—	—
1988	43,983.0	—	—
1989	45,285.4	—	—
1990	46,626.1	10,727.4	35,898.7

The premises for estimation are as follows;

1. Density in the Urban Mall is two times that of the relative zone.
2. Visitors for special events and/or ceremonies are not considered.
3. Operation area will be expanded at the end of each development phase.

Implementation Program

Policy for Improvement of Existing Parks

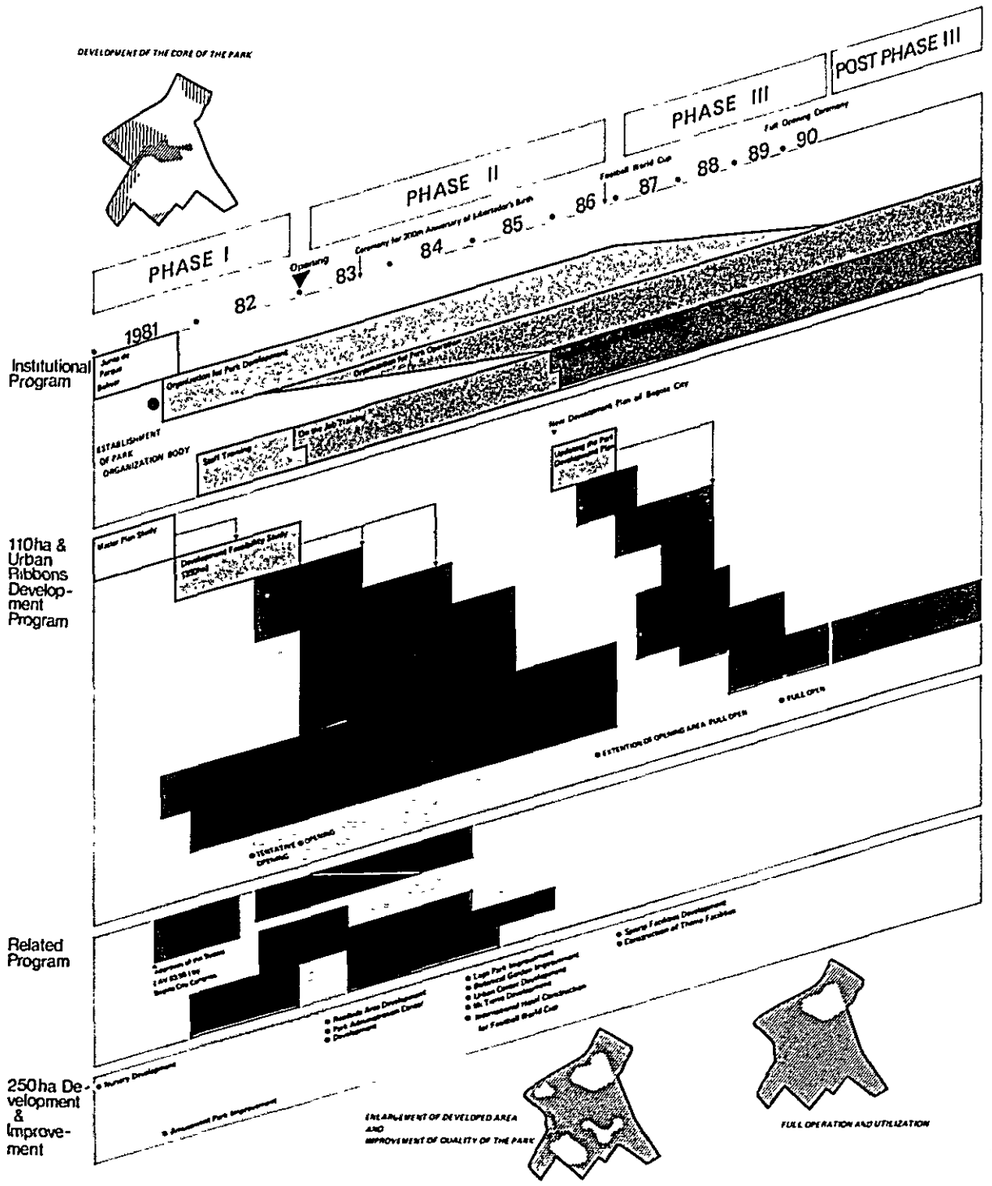
Even during the implementation period of the park development, it is necessary that existing parks such as El Lago, El Salitre, Unidad Deportiva and Jardin Botanico shall be opened to public as usual, for supplying valuable recreational spaces in Bogota. On the basis of the well considered implementation plan, these existing parks and facilities should be improved, extended and/or relocated, and be integrated to Simon Bolivar Park finally, in accordance with the development strategies and improvement plan set forth on this Master Plan. The following is a improvement policy for existing parks and facilities.

- Improvement and completion
  To be carried out for El Lago and the mechanical attractions' area of El Salitre, for a more clear definition of area and reinforcement of actual uses and character, substantially by means of greenery planting.

- Extension
  That will affect the sports recreation zone by expanding the Unidad Deportiva El Salitre through the incorporation of 19.08 ha of Distrito's land on two adjoining plots. This area should include the new recreational pool, the hockey rink transferred from El Salitre, sport fields extension (soft-ball, tennis, basket-ball, volley-ball) and the park's own facilities including the administration tower, nursery, workshops, and greenhouses.

- Modification
  On the part of El Salitre park that is located within the Grand Mall Zone modification is to be made to accommodate more significative facilities related to the core of the park and the ceremonial plaza, like the museums of science and transportation with extensive open space exhibition areas. Provision is made also for the Urban Ribbon. In between those facilities and the recreational area will be located the small Children's Kingdom.

Fig. – 43 Implementation Program

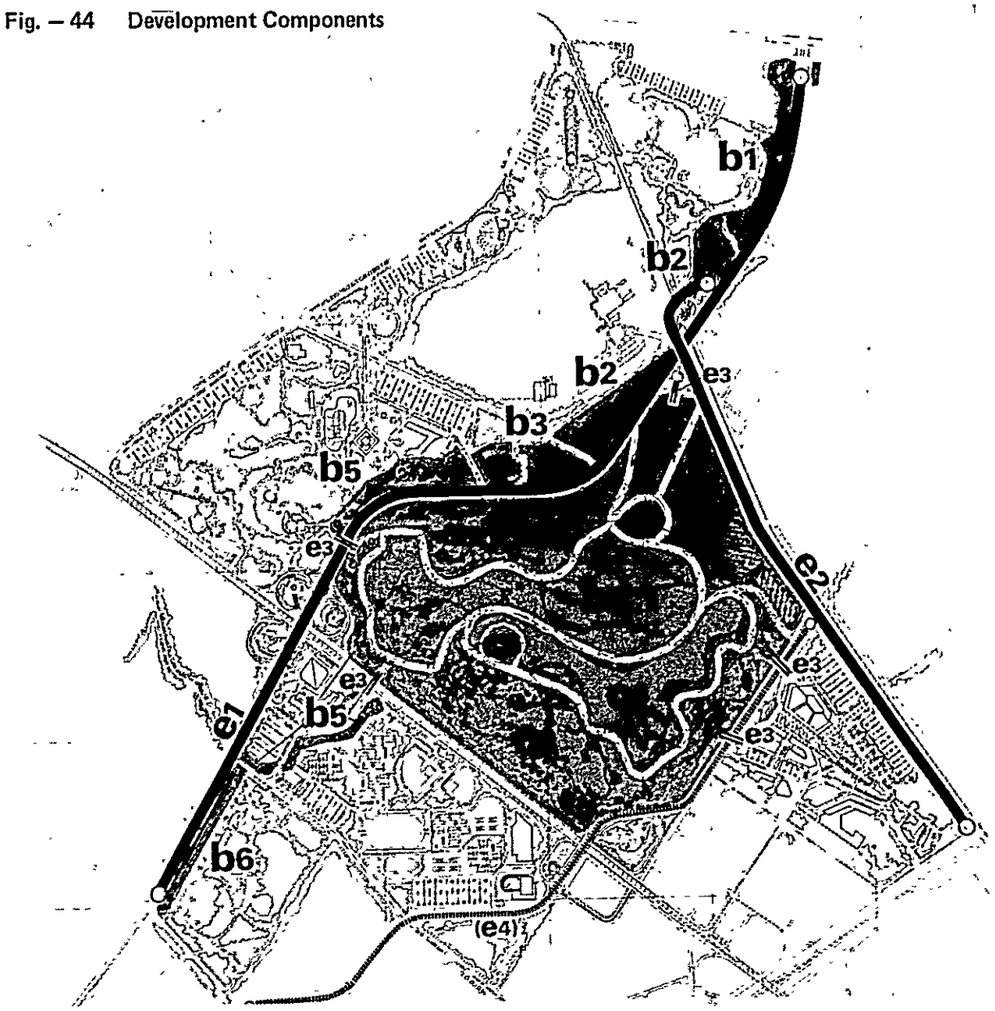


Development Plan

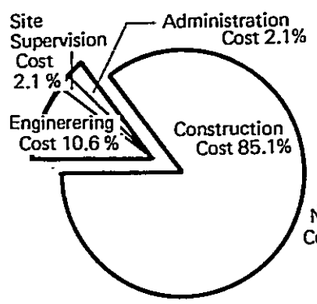
Table – 25 Whole Project Catalog

Development Project		Development Area (ha)	Development Year Phase I 81	82	Phase II 83	84	85	86	Phase III 87	88	89	90	Development Cost (Colombian Pesos) Total	Construction	Engineering	Development Cost by Phase (Colombian Pesos) Phase I	Phase II 1	Phase II 2	Phase III
A National Ceremonial Plaza Development		17.0	■	■									315,088,000	268,160,000	46,928,000	315,088,000	–	–	–
B Urban Ribbon Development		26.0											428,846,800	364,976,000	63,870,800	–	428,846,800	–	–
B-1	Cultural Ribbon	3.5					■	■					73,079,125	62,195,000	10,884,125	–	73,079,125	–	–
B-2	Chronological Ribbon	5 9					■	■					102,026,425	86,831,000	15,195,425	–	102,026,425	–	–
B-3	Actual Ribbon	1 8				■	■						46,098,775	39,233,000	6,865,775	–	46,098,775	–	–
B-4	Liberty Ribbon	2 0				■	■						30,749,750	26,170,000	4,579,750	–	30,749,750	–	–
B-5	Youth Ribbon	11 5					■	■					158,229,025	134,663,000	23,566,025	–	158,229,025	–	–
B-6	Natural Ribbon	1 3					■	■					18,663,700	15,884,000	2,779,700	–	18,663,700	–	–
C Commemorative Symbol Zone Development		94.2											870,436,475	740,797,000	129,639,475	–	371,181,325	349,079,575	150,175,575
C-1	Main Gate Area	13.3					■	■					149,243,800	127,016,000	22,227,800	–	149,243,800	–	–
C-2	Lawn Land	28 1	□	■	■	■	■						129,705,900	110,388,000	19,317,900	–	–	129,705,900	–
C-3	Wood Land	36.1		■	■	■	■						219,373,675	186,701,000	32,672,675	–	–	219,373,675	
C-4	Lake and Lakeside	13 2	□	□	□	□	□	■	■	■			150,175,575	127,809,000	22,366,575	–	–	–	150,175,575
C-5	Colombian History Museum	2 0				■	■						160,873,950	136,914,000	23,959,950	–	160,873,950	–	–
C-6	Religious Museum	1.5					■	■					61,063,575	51,969,000	9,094,575	–	61,063,575	–	–
D Infrastructure Development		(137 2)											261,489,200	222,544,000	38,945,200	76,330,450	100,510,340	84,648,410	–
D-1	Earth Work		■	■	■	■	■	■					32,254,925	27,451,000	4,803,925	9,730,175	3,904,290	18,620,460	–
D-2	Storm Water Drainage Work			■	■	■	■	■					52,851,500	44,980,000	7,871,500	19,521,550	14,020,000	19,309,950	–
D-3	Fresh Water Supply Work			■	■	■	■	■					15,611,050	13,286,000	2,325,050	5,651,750	6,158,175	3,801,125	–
D-4	Sanitary Sewerage Work			■	■	■	■	■					19,240,625	16,375,000	2,865,625	14,000,125	2,494,525	2,745,975	–
D-5	Electrical Work			■	■	■	■	■					108,417,250	92,270,000	16,147,250	11,167,200	66,351,075	30,898,975	–
D-6	Telecommunication Work			■			■	■					33,113,850	28,182,000	4,931,850	16,259,650	7,582,275	9,271,925	–
E Road Improvement and Development													1,137,765,425	968,311,000	169,454,425	273,024,175	864,741,250	–	–
E-1	Improvement of Calle 63	11.9	■	■	■								499,211,675	424,861,000	74,350,675	273,024,175	226,187,500	–	–
E-2	Modification of Carrera 60	3.5			■	■	■						476,991,250	405,950,000	71,041,250	–	476,991,250	–	–
E-3	Pedestrian Bridge	(5 bridges)				■	■	■					161,562,500	137,500,000	24,062,500	–	161,562,500	–	–
Grand Total		152.6											3,013,625,900	2,564,788,000	448,837,900	664,442,625	1,765,279,715	433,727,985	150,175,575

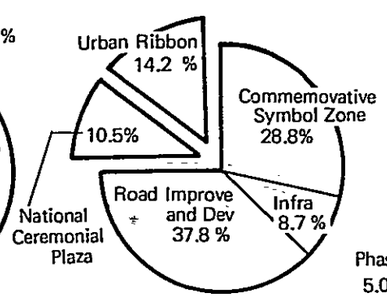
Fig. – 44 Development Components



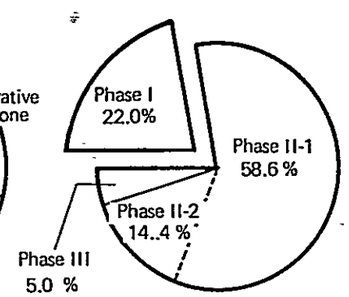
Project Cost by Item



Project Cost by work



Project Cost by Phase



DEVELOPMENT COST ESTIMATES

The below table gives rough cost estimates for park development in the area of 137.2ha, with which JICA Study is concerned, in Colombian pesos.

PROJECT COST IN GENERAL

Construction Costs	$2,564,788,000
Engineering Supervision and Administration Cost	448,837,900
Total	$3,013,625,900

PROJECT COST BY WORK

National Ceremonial Plaza Dev.	$ 315,088,000
Urban Ribbon Dev.	428,846,800
Commemorative Symbol Zone Dev.	870,436,475
Infrastructure Dev.	261,489,200
Road Improve. and Dev.	1,137,765,425
Total	$3,013,625,900

PROJECT COST BY PHASE

Phase I	$ 664,442,625
Phase II	2,199,007,700
Phase II-1	1,765,279,715
Phase II-2	433,727,985
Phase III	150,175,575
Total	$3,013,625,900

CONDITIONS FOR COST ESTIMATES

The above cost estimates have been made on the basis of the following conditions.

1) Date of estimates is July, 1981.
2) Estimates have been made on a unit price cost basis.
3) Construction cost is including indirect cost of contractor.
4) All figures of construction cost include a 5% contingency addition.
5) Engineering, supervision and administration costs has been estimated as follows.

— Engineering Cost
12.5% of construction cost
(including technical survey, preliminary and detailed engineering and prepoaration of contract documents)

— Site Supervision Cost
2.5% of construction cost

— Administration Cost
2.5% of construction cost

Development Procedure

The implementation of area studies by the JICA study team is divided into three phases according to the 10 year Development Plan.

Phase I is the construction of the area having the National Ceremonial Plaza as its major facility, which must be implemented in a short period of time.

Phase II—The development of both the Urban Mall ranging from Carrera 68 to the railway site along Calle 63 and the area around the entrance of park.

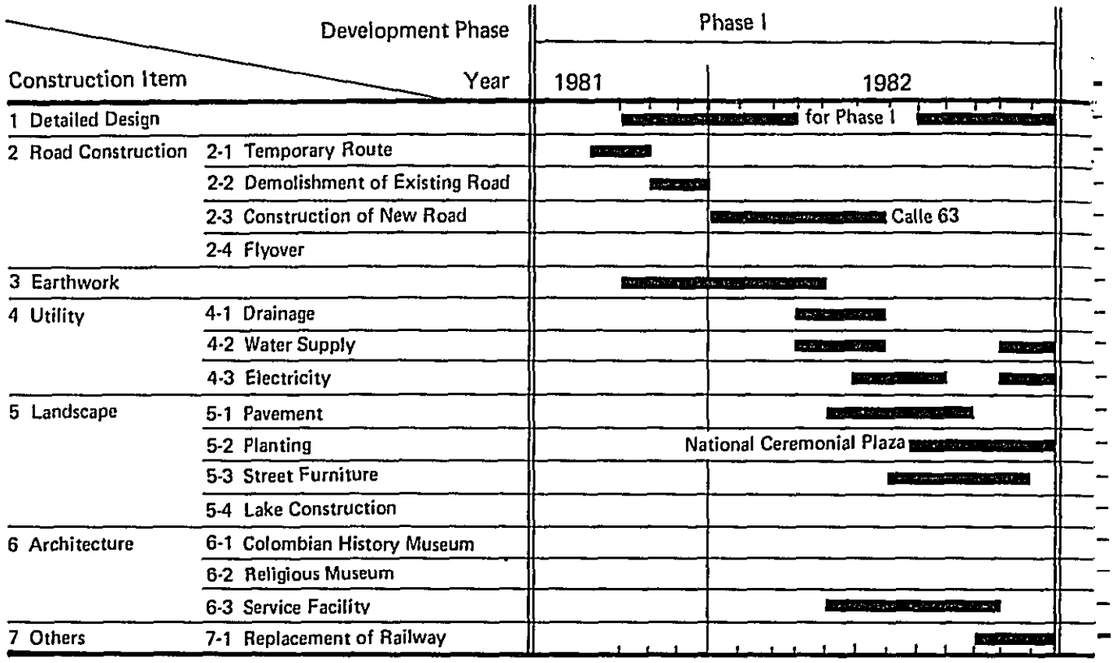
Phase III—Implementation of work on the part of park consisting of lake, woodland, grassland, etc. and on the remaining area.

In the implementation of work for the individual phases, the work items of different nature (in terms of construction component) are conducted in relatively wide areas.

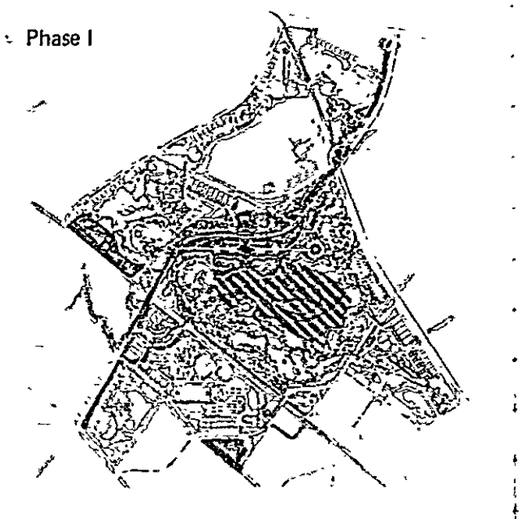
Especially in phase I, when a large scale of earthwork must be carried out a huge volume of earth must be procured mainly from inside of the park for both temporary road construction (which is to enable the continued use of existing Calle 63) and embankment. On the other hand, the auxiliary type projects such as those for the drainage system, utility network, etc. must functionally be distributed in the whole plan of implementation of work.

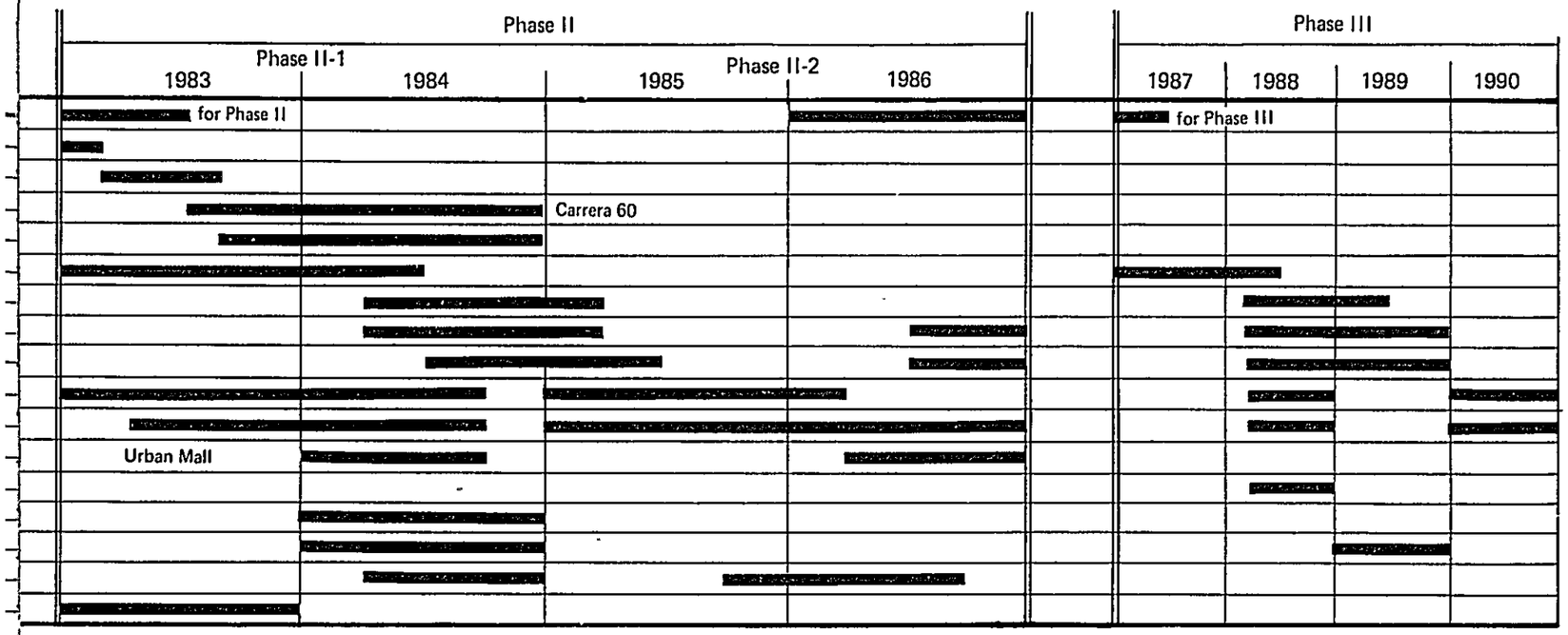
Therefore in order to control the implementation of the project economically and safely over a long period of time (during Phase I and Phase II) it is very critical to combine different construction components skillfully while utilizing the land effectively. Although various elements are included in the implementation of park construction, the most effective procedures throughout the respective phases can be illustrated in the diagram shown at the right.

Construction Schedule Fig. – 46

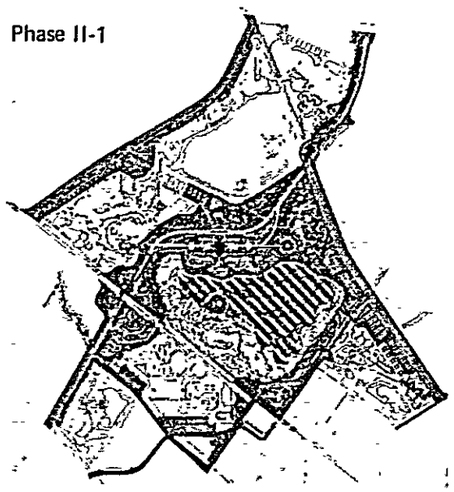


Development Phasing Plan Fig. – 47

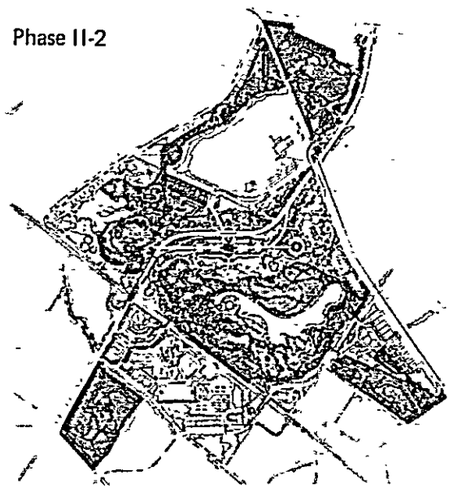




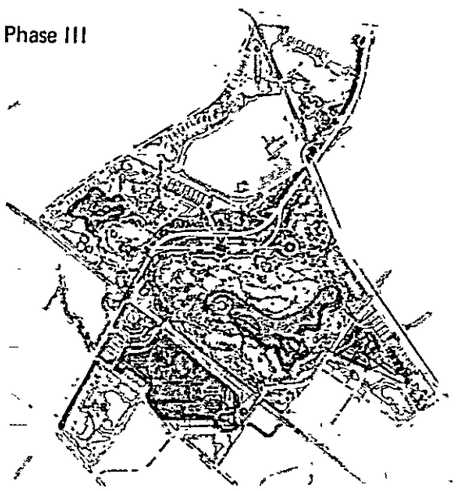
Phase II-1



Phase II-2



Phase III



Park Organization

Park Organization for Development

In order to conceive the most effective organization structure for the development of Simon Bolivar Great Memorial Park, various studies and research on the organizations and related functions of the existing recreational institutions have been conducted, and based on the result of these studies and research, planning of the integrated organizational structure has been made

It is to be noted that because the park shall be a large integrated city park to be completed by improvement of the existing parks (Salitre and Lago) and other recreational and cultural facilities (Jardin Botanico and Sports Complex) and by new development of a 110 hectares lot to be planned for the central core of this park, the lot belonging to Beneficencia to be planned for the commercial urban center, and the area along the northern boundary of the park to be planned for the folk center, together with the modification of the existing roads, there are several different governmental agencies and institutions having specific organizations either currently functioning for operation and maintenance of the existing facilities or forming a group for research and planning of the new development.

Because Simon Bolivar Great Memorial Park shall be developed, improved, modified, and operated and maintained as a integrated, single park with many different zones and facilities, it shall be fundamental and vital that the organization responsible for the development, improvement, modification, operation and maintenance be a single integrated body for functional, economical and effective managerial reasons. Therefore, integration of the existing organizations and establishment of a very strong, powerful and effective organization structure functioning to execute aforesaid purposes on a permanent basis, shall be made immediately with full cooperation and coordination of those agencies and institutions concerned for this park.

The recommendable organization responsible for the aforesaid objectives, in a practical way, in accordance with the process of development phases I to III, shall be a fairly large autonomous body at the final stage when the full-fledged operation of the park starts toward the end of 1980's, expanded from a original organization formulated into a single body after integration of the existing different organizations, with a flexible organizational development.

There would be two typical organization structures recommended for this park development, which are described as follows.

Organization at Development Stage:

The function of the organization at this stage shall be research and study, design and evaluation, contract and financial control, construction supervision and security.

Due to the fact that the whole park area is to be developed and improved in close coordination with various governmental agencies it would be suggested to establish a very strong and efficient body which consists of the representatives of the governmental agencies and other institutions closely related to this development project, such as MOPT, Bogota D.E., C.A.R., etc., with a leader who should have strong coordination ability and influence to such agencies and institutions as well as to the subordinate bodies.

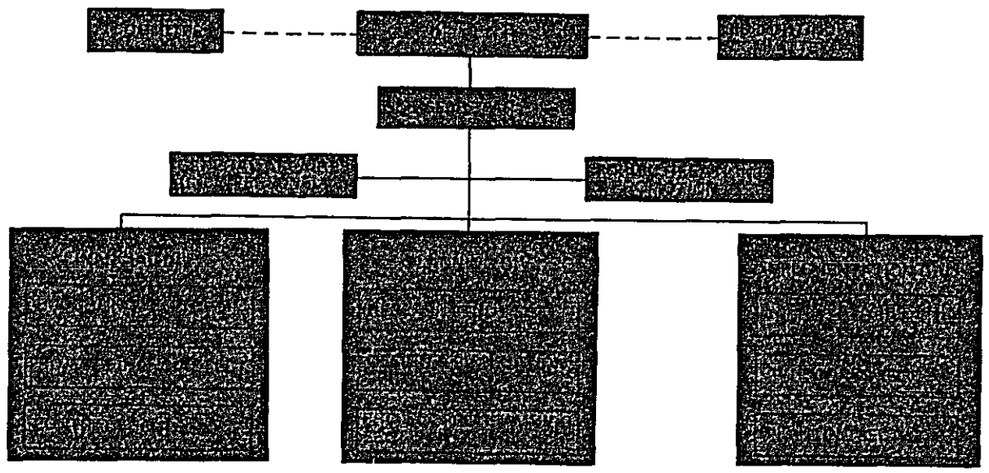
The organization structure shall consist of three line-divisions namely financial, planning and implementation and two staff-divisions namely, general affairs and public relations and promotions headed by the director and his assistant, secretary who shall actually administer the body.

In consideration of the significance and nature of this park development project in line with ways and means of each development phase including the improvement of the existing zone and facilities, it is recommended that this body shall have a permanent office either in Ministry of Public Works and Transport or in the Bogota Special District Office and a branch office at the job site

The number of staffs to be needed for this body is estimated to range from about 20 persons at the start of the development phase I up to more than 200 persons toward the end of the development phase III in which time most of the zones of whole park area would have commenced operations.

Apart from above, a program for training 30 gardeners/semester is included in the contract between MOPT and Universidad Nacional on the establishment of the nursery.

Fig. – 48 Park Development Organization



Park Organization for Operation

The body to administer the park operation and maintenance shall be a sort of autonomous institution responsible not only for the project area of 110 ha. but also for the whole park area. The functions of this organization are: first,to make promotional activities including public relations; second, to execute park operations; third, to be in charge of maintenance of the various park facilities; fourth, to manage the security measures, and fifth, to administer, manage and control the total internal functions of the park. In consideration of the phased construction of the park facilities, the majority of the personnel are to be transferred from the organization at the development stage and the personnel needed for new mission and responsibility are to be newly employed keeping the minimum adequate number of permanent staff at all the time and fully utilizing the temporarily employed laborers when such needs arise.

The organization structure shall consist of four line-divisions comprising an administrative division responsible for general affairs, personnel, financial and communications, operational divisions formulated by each park zone like the 110 ha. area (central core of Simon Bolivar, having National Ceremonial Plaza, Historical and Religious Museums, lake and ponds and a large greenery areas), Salitre, Lago etc., security division with same zonal sub-divisions and maintenance division with subdivisions formulated by each maintenance function such as maintenance and repair of the building facilities, entertainment facilities, road and so on.

The administrative structure at this operation stage shall be very similar to that of development stage, having the chairman and director general of the autonomous body as the top executives with very strong coordinating ability and influence to the various' governmental agencies and institutions as well as the management capability needed by this organization.

It is to be noted that at present the steering committee made up of the representatives of the different entities involved is considering the appointment of a director who would manage the whole area and services of the park, with specific sections and areas or zones included which are responsible for performing the various functions such as security, gardening, utilities workshops, etc.

The number of staffs needed for this organization in 1990 is estimated to be about 500 personnel excluding temporary labourers, and as for 110 ha area, about 80 persons are estimated to be needed with exception of those staffs for National Ceremonial Plaza at special event days The estimation of the number of personnel at each zone of the park is done based on the areal scale and the density of the projected number of visitors to each zone with co-relation of the basic figures of the Salitre Park administrative doby on manpower allocation and job descriptions. The follwing Table shows the estimated numbers of staffs at each zone in 1990.

With regard to the allocation of personnel in terms of job classification and wage levels at 110 ha area, it is estimated that three (3) perosns are needed at administrative level, 5 staffs at middle management level, 24 staffs at field mechanic/engineer/technician level and 48 field labourers are to be needed, and also additional 16 temporary field labourers are to be needed in this area.

Fig. – 49 Park Operation Organization

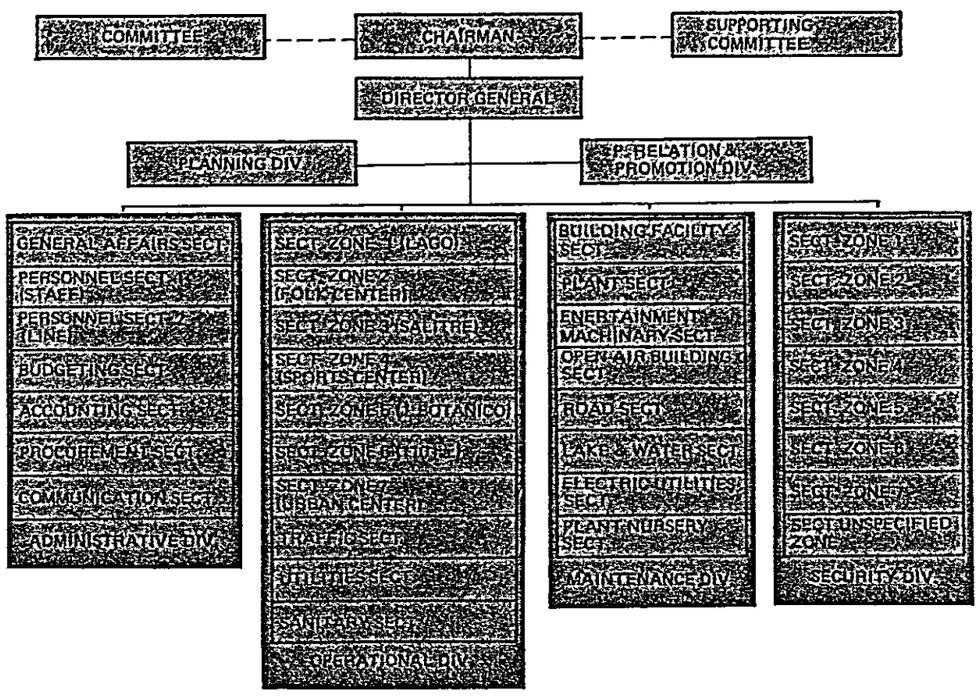


Table – 26 Estimation of Operation and Maintenance Staff

Zone	Area (ha)	No of visitors per ha/day (person)	No of Personnel (person)
110 ha	113 0 (205 4)	187 (34 7)	80 (71 3)
Salitre	55 0 (100 0)	539 (100 0)	110 (100 0)
Lago	20 6 (37 5)	187 (34 7)	15 (13 0)
Mi Tierra	21 6 (39 3)	363 (67 4)	30 (26 5)
Sports Center	45 9 (83 5)	539 (100 0)	95 (83 5)
Urban Center	24 7 (44 9)	1,616 (300 0)	150 (134 7)
Jardin Botanico	19 2 (34 9)	37 (6.9)	15 (2.4)
Total	300 0	426	495

* Remarks
1. Source of the basis is "Organization Chart of Salitre Park, 1981" (IPU)
2. Figures in ( ) are exponents based on Salitre Park as 100
3 No. of personnel in Jardin Botanico was adjusted by existing conditions.

Operation and Maintenance Plan

The basic plan for the operation and maintenance of the Whole Park Area is worked out based on the field survey of the existing parks and other recreational facilities in the city of Bogota D.E. and by the discussions with the various officials concerned and the Colombian counterpart of the JICA Study Team.

Basic Approach to the Park Operation and Maintenance

It would be necessary to plan such programs so as to effectively promote the free and voluntary activities for recreation and sports for every citizen of Bogota at each social level.

A flexible administrative approach shall be needed so as to hold a variety of cultural, educational and entertainment activities and events so that all the people of each income level in Bogota D.E. can participate in such activities and events to be held in the various zones of the park.

It is necessary for the park to be equipped with ample space, facilities and information systems which immediately and effectively function to cope with an emergency or disaster and will provide the first-aid facilities and countermeasures on such occasions for the city of Bogota D.E., preferably with the same standard as those of other international cities.

The maintenance and preservation of the plants in the park shall be emphasized so as to maintain the large area of green environment represented by the spirit of El Libertdor, Simon Bolivar, which shall be the will and pride of the citizens of Bogota D.E. and shall be maintained to high standards of quality for generations to come.

Basic Operational and Maintenance Plan

This park is located in the central part of the city and due to its easy accessibility and the handy availability of various transportation means, it is assumed that this park will be more highly utilized than the other parks in the city, especially on weekends and holidays. Therefore, an adequate operational and maintenance system shall be worked out to cope with quality and quantity of projected demand, including that at the peak time on those holidays and for special events.

It would be a critical issue to establish effective safety measures in the large expanse of the park, especially at night. It would take a considerable time to reach the state that the morals of the citizens are elevated so that the park can be safely utilized even at night. At the present stage, it would be adequate to close the park at night with the exception of some special facility or zone, but further review and planning shall be needed for the final programming after each component facility allocation and detailed designs are determined.

Because the park site is in general flat-land formation, it is indispensable to execute new landscaping and planting. In order to accomplish the scheduled planting a number of years will be needed to have grown and self-sustaining trees. Therefore, for this purpose it is necessary to work out a very precise and detailed planning for development and maintenance of the planted trees at the first stage of the park operations, which eventually will affect the development and maintenance costs greatly.

In order to maintain the environmental quality standard of the park, it would be necessary to work out the very extensive and integrated maintenance and inspection systems to comply with the needs from the various sub-systems such as surface water discharge, sewerage, illumination lightings, water supply and from the various park facilities such as public welfare, rest and leisure, and administration. It would also be needed to establish the systems for garbage collection, cleaning and sweeping, and the first-aid measures.

With regard to the plans for operating hours of the park it would be adequate that most of the zones of this park open at 08:00 hours and close at 18:00 hours on weekdays with the exception of the sport complex and the sport facilities within each zone of the park where the closing would be 21:00 hours. The operating hours on weekends (Saturday and Sunday), special event days and national holidays would be preferably longer by extending the closing hour to 20:00 hours and the same exception shall be applied for sporting facilities.

As to the fees for entrance, utilization of the various facilities in the park and for car parking, it is suggested that there would be no entrance fee to each zone of the park in order to stimulate the use of this park from the areas where the low income groups are dwelling. The entrance fee to the various museums located in the park premise shall range from 5 to 10 pesos for the adults and there would be no fee for infants and children. The charge for the mechanical attractions shall range from 1 to 5 pesos for the children and for infants accompanied by either mother for father no charge is recommended. It is also recommended that there would be no charge for utilization of any of the sporting facilities located within each zone of the park open-air area with exception of those facilities located in the Sporting Complex. The parking fee is recommended to be about 30 pesos because those who come to this park by cars are in the higher income groups.

Security Measures

The existing security measures being taken at the various parks operated in the city of Bogota D.E. mainly comprise protective fences surrounding the park which prevent theft of flowers and other articles belonging to the park after its close, and the patrol of the watchmen within the park on foot or by vehicle, sometimes carrying a transistor transmitter/receiver and occasionally with weapons.

The new security systems and measures conceived for the new park shall be formulated in consideration of the following three components; first, the protective physical facilities like gates, fences and ditches, etc.; second, the manpower allocation and maneuvers of the watchmen and guards and their security activities; and third, the protective communication systems and finally on the landscaping itself, taking into account the following factors.

1) Areal factors :	Zones	Commemorative zone (110 ha), and other related zones like sports, lake park, urban complex, folk center, etc. (mainly 7 zones)

Facilities Buildings, utilities, forest, plaza, pond & lake, forest, flower beds, lawn, etc.

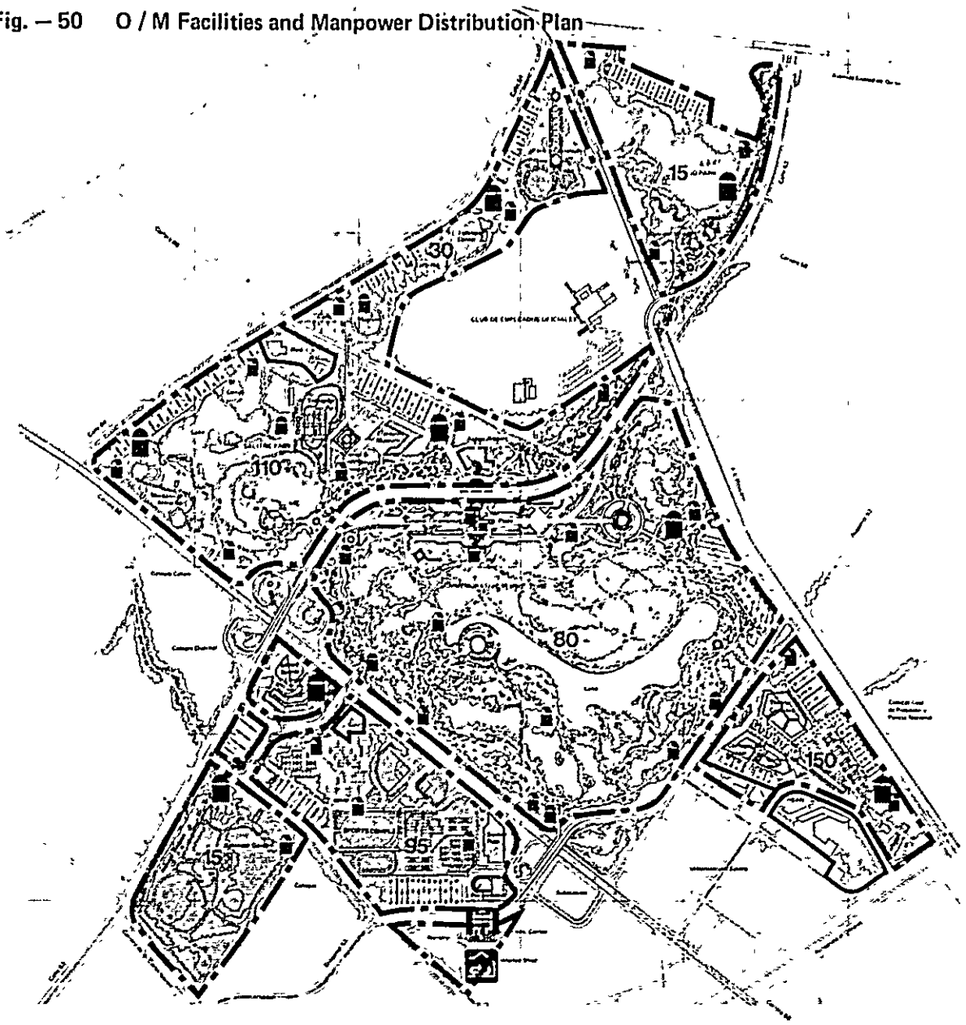
2) Time factors : Week days, daytime and night
Weekends, daytime and night
Special days with big events at daytime and night

3) Others : Fire and other natural disasters, and social and political disputes and mobs, and riots, etc.

The security control system for this new park shall have two functional components, that is, one for the safety and comfort of the normal park visitors within the premises of the park and, second, for the emergency aid and medical care in case disasters or riots occur in Bogota D.E., when the park premises is to be used as a safe refuge for the citizens.

Taking all the factors and components into consideration, the detailed plans for the security measures of this park shall be worked out so as to provide the park visitors with enough safety and comfort but not give them too much mental pressures. Pertaining to the emergency aid and medical care, the measures should have to be worked out in close coordination with the police department, medical and welfare department and other related departments concerned of the Bogota Metropolitan Government.

Fig. — 50 O / M Facilities and Manpower Distribution Plan



Cost and Revenew of the Park Operation and Maintenance

Comments on Operational Cost and Revenue

Because of the reason that this 110 ha area is featured by vast greenery and lake with national ceremonial plaza, which means there are very few components for the source of revenue in comparison with other zones like Salitre, Sport Complex, Mi Tierra and Urban Center, and consequently, the revenue estimated at 21.98 million pesos covers about 60 percent of the operational cost/expense in this 110 ha area and the deficit of 14.96 million shall be covered by either direct subsidy from the central and the metropolitan governments or by the internal financial and within the autonomous body responsible for the operation and maintenance of the whole park area having operationally profitable zones.

It is to be noted that the following points shall be carefully planned and worked out after this Master Plan.

1) Estimation of developmet cost, operational cost/expense and operational revenue by each development phase and preferrably by annual distribution, in close coordination with the detailed planning and designs.
2) Planning and implementation of the park development by corresponding development phases so that the operational expense and revenue will approach balancing-off or maximize the revenue.
3) In-depth study on financial and economical feasibilities for this zone and other zones.

Table-27 Summary of the Project cost

unit 1,000 pesos at current price at July, 1981		Amount
1. Development Cost	(break down)	3,039,500 9
1) construction cost	2,564,788.	
2) indirect cost	448,837.9	
3) equipment cost	25,875	
2. Operation/Maintenance Cost		36,938 (100 0%)
1) personnel expense	12,648	
2) general expense	6,324.	
3) training expense	632.	
4) maintenance material cost	17,334.	
3. Operational Revenue		21,978 (59 8%
1) car parking fee	8,545	
2) boat, inner transport & bicycle fares	8,044	
3) kiosk, restaurant royalty	5,389.	
4. Balance of Operational Revenue/Cost		(−) 14,960 (40 5%)

Note: equipment cost; purchase cost of finished projects.
row-boat @25,000×35=875,000 pesos
n-transport @1,200,000×20=24,000,000"
'icycle @10,000×100=1,000,000"
30 bicycles for adult and 70 for child)

General Condition and Scope

The cost/expense and the revenue at the operational stage of 110 ha area, was estimated for the year 1980 at the current price at July 1981 based on the operational policy and strategy set forth at this Master Plan. It is to be noted that this estimation covers only 110 ha area excluding Urban Mall and two museums, historical and religious, which seem to be operated by the separate entities in 1990.

Estimation of Operation/Maintenance Cost.

The annual cost/expense for park operations of 110 has. area in 1980 amounts to 36.938 million pesos at current price at July, 1981 and the details of which is shown as follows.

1) Personnel Expenses

Job classification	No. of Personnel	Proposed Monthly Wage	Amount of Annual Wage
• Permanent Staff			
Executive class (Director and manager)	3	80,000	2,880,000
Upper class (Section chie)	5	30,000	1,800,000
Middle class (Engineer and mechanic	24	12,000	3,456,000
Lower class (Field labour)	48	6,000	3,456,000
Sub Total	80		11,592,000
• Temporary Staff Field Labour	16	5,500	1,056,000
Grand Total	96		12,648,000

* Number of Temporary labours is estimated at 20% of that of permanent staffs.
* Following personnel is excluded in this estimation. Staffs for History Museum and Religious Museum Personnels for concessionned outlets (kiosks and restaurants).

2) General Expense
   - 50% of personnel expenses
     12,648,000 pesos×0.5=6,324,000 pesos
3) Staff Education/Training Expenses
   - 5% of personnel expenses
     12,648,000 pesos×0.05=632,400 pesos
4) Material Cost
   - 1% of park construction cost
     173,340,000 pesos×0.01=17,334,000

   Construction cost directly related to 110 ha area which is applied in this estimated is calculated by deducting the costs for road construction of calle 63 and carrera 60 from total costruction cost.

5) Utility Cost
   Utility cost is excluded because utility services to the public facilities are usually exempted from charges in Bogota D.E.

Estimation of Operational Revenue

The annual revenue by park operations of 110 ha area in 1990 amounts to 21.98 million pesos at current price at July, 1981, the details of which is shown on Table

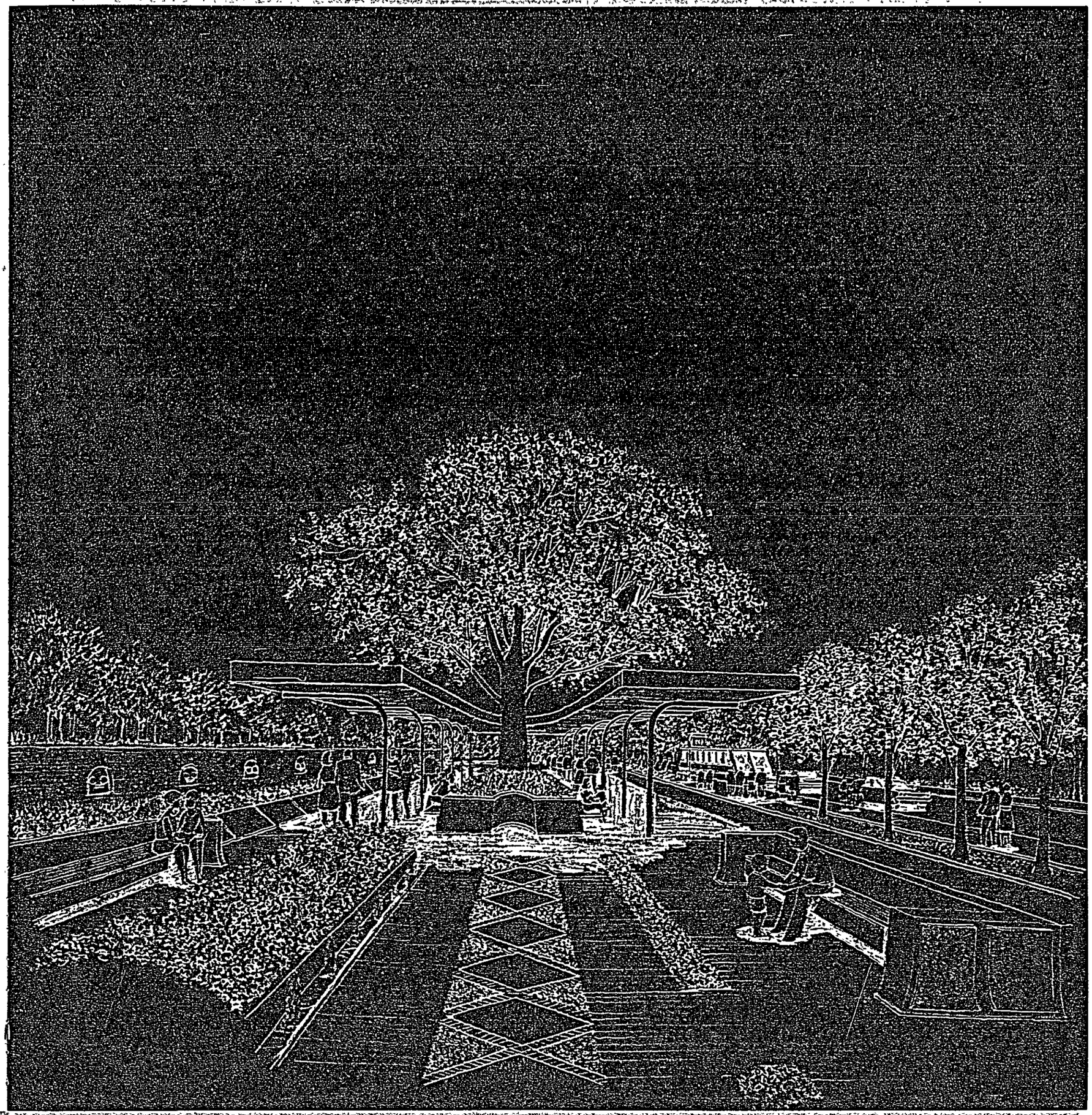
In consideration of the strategy to promote and stimulate park utilization, it would be adequate to apply Plan A on Table−27 which makes the park entrance admission fee to be free, and the admission fees for 2 museums being excluded resulting from the separate and independent operations to be anticipated to them.

With regard to royalty on concession for kiosk and restaurant, key money or bond at the time of contract shall be regarded as one of the sources of fund for development cost.

Table − 28 Park Operation Revenue

Revenue Item	Unit Price (pesos)	Quantity	Annual Revenue (pesos) Plan A	Plan B
1) Park entrance admission fee				
Adult (individual)	3	2,309 400	Free	6,928,200
Child and student	Free	5,488,600	Free	0
sub total			0	6 928,200
Historical museum admission fee				
Adult	10	46,188	–	461,880
Child student (individual)	5	76,980	–	384,900
(group)	2	30,792	–	61,584
sub total			0	908,364
3) Religious museum admission fee				
Adult	10	69,282	–	692,820
Child, student (individual)	5	115,470	–	577,350
(group)	2	46 188	–	92,376
sub total				1,362,546
4) Car parkings fee		(cars)		
passenger car	30	246,336	7,390,080	7,390,080
bus	100	11,547	1,154,700	1,154,700
sub total			8,544,780	8,544,780
		(persons)		
5) Row boat fare	15	30,792	461,880	461,880
6) Inner transport fare		(persons)		
Adult	5	692,820	3,464,100	3,464,100
Student, child	2	1,616,580	3,233,160	3,233,160
sub total			6,697,260	6,697,260
7)Bicycle fare		(persons)		
Adult	30	11,547	346,410	346,410
Student, child	20	26,943	538,860	538,860
sub total			885,270	885,270
8) Royalty on concession		(No)		
Kiosk	134,715	20	2,694,300	2,694,300
Restaurant	673,575	4	2,694,300	2,694,300
sub total			5,388,600	5,388 600
Grand Total			21,977,790	31,176,840

* for 5), unit price is estimated by expected annual sale and royalty rate, for kiosk 2,694,300 pesos/5% and for restaurant 9,623,000 pesos/7%.



Demand Analysis

Sammary

The result of the analysis shows that the number of visitors to the Simon Bolivar Great Memorial Park in 1990 is as follows.

As shown on the table below, the number of visitors to the 110 ha. zone is projected to be about 7.7 million in the year 1990.

The number of visitors on the peak day (Sunday) of the peak month (December) in 1990 is estimated to be 84,700 and subsequently, the estimation of the number of visitors in the 110 ha. zone during the peak hours on the peak day in 1990 will be about 28,200 excluding those visitors to the Mall and National Plaza.

With regard to the number of visitors to the Mall and the National Plaza and those facilities within and connecting to the 110 ha. zone on the special event days, the estimation of the participants or visitors is made based on the capacity of those facilities.

As the inventory of the existing parks in the city of Bogota D.E. and the results of the studies on the recreational activities indicate, it is conceived that the city of Bogota D.E. has the imperative needs for preservation of the greenery zone as the core of the new park development, having plenty of trees and flowers to compensate for the shortage of such zones, which in terms of international standard shall be about 15 square meters per person.

It is also noted that out-door sports facilities of a fairly good quality and service standards are greatly needed for the normal citizens of Bogota D.E., and especially for the low-middle and low income level classes.

User's Analysis

The total number of visitors to the ten parks in Bogota D.E. in 1980 was estimated based on the statistical data of IDR with estimation of the numbers of visitors to several parks under IDR jurisdiction, which account for 18.565 thousand visitors as per Table 2 with details of each park by month. The seasonal fluctuation of the number of park visitors is calculated on the exponent basis as per the Table which shows that the peak month is December with the exponent of 148 and those months which exceed the exponent 100 are January, 109; July, 109; and August, 110 respectively for the average of 10 parks.

In this study, the weekday fluctuation is estimated using data based on the field survey by the JICA Study Team at seven parks in the city of Bogota D.E., and the result of this fluctuation is shown on the Table 3 with the peak day on Sunday sharing about 39 percent of the whole week visitors, against Monday through Thursday sharing about 10 percent each.

Table 3 also shows the projection of the number of visitors to the existing 10 parks during the period of 1981 up to 1990. The number of visitors to these 10 parks is projected to reach about 26.3 million in 1990.

Then, in consideration of the above analysis of the number of visitors to the existing parks, estimation of the prospective visitors to the Simon Bolivar Whole Park Area is done by the adjusted zoning comprising 110 ha., Salitre, Lago, Jardin Botanico, Sport Complex, Folk Center, and Urban Complex. The projection of the number of visitors to each zone is done in such a way as to put a basis on the scale of area and the nature of each zone, which is shown in Table 4. According to the projection by the JICA Study Team, the total number of visitors to the Simon Bolivar.Whole Park Area consisting of about 300 ha. comprising the aforesaid seven zones excluding the road areas, would be 46.626 million in 1990, as shown on the Table 5 the basis of calculation is shown in the Table 6.

The number of visitors to the 110 ha. zone in 1990 is projected to be about 7.7 million on the assumption that none of the Urban Complex facilities are located in this zone.

With regard to the projection of the number of visitors on the peak day (Sunday) of the peak month (December), as shown in Table 7 the number of visitors in 1990 shall be about 84,700.

With the same calculation method, the number of visitors in the 110 ha. zone at the peak hours of the peak day of the peak month in 1990 is projected, and the outcome is about 28,200.

As to the number of visitors to the Main Mall and other facilities within and connecting to the 110 ha. zone on special event days, the estimation of the number of visitors is made based on the capacity of these facilities.

Table – 29 Projection of Number of the Park Visitors

Zone	Area (ha.)	Areal share (%)	Nature	No. of visitors in 1990 (million)	No. of visitors, peak day (thousand)	No. of visitors, peak hour (thousand)
110 has	113.0	37.7	Greenery, lake, plaza, cria	7.7	84.7	28.2
Salitre	55.0	18.3	Sport, machines	10.8	119.0	39.7
Lago	20.6	6.9	Lake, greenery	1.4	15.4	5.1
Mi Tierra	21.6	7.2	Handicraft, folklore	2.9	31.4	10.5
Sport Complex	45.9	15.3	Sports	9.0	99.3	33.1
Urban Complex	24.7	8.2	Convention, hotel, etc.	14.6	160.4	32.1
Jardin Botanico	19.2	6.4	Forest, flowers	0.3	2.8	0.9
Total	300.0	100.0	-	46.6	513.0	149.6

Table – 30 Number of Visitors to Parks in Bogota D.E.

(Unit: 1,000 persons)

Month	Salitre	Nacional	Tunal	Florida	Distrital Del Sur	Kennedy	Timiza	Lago	Gaitan Cortes	Montes	Total	Share	Monthly Flactuation	Average No. of Visitors
1	650	110	405	60	25	4.5	280	67	25	52	1,678.5	9.04%	108.5	167.90
2	680	90	300	65	16	2.0	150	50	18	45	1,416.0	7.63	91.5	141.60
3	610	95	350	58	14	4.6	130	60	16	42	1,379.6	7.43	89.2	137.96
4	560	105	300	55	13	1.5	130	65	15	51	1,295.5	6.98	83.7	129.55
5	570	105	360	60	12	2.0	140	58	22	48	1,377.0	7.42	89.0	137.70
6	610	98	420	62	16	3.5	135	65	26	47	1,482.5	7.99	95.8	148.25
7	700	135	430	64	20	1.8	200	80	13	38	1,686.8	9.09	109.0	168.68
8	610	130	600	54	12	2.1	170	50	20	51	1,699.1	9.15	109.8	169.91
9	570	140	450	52	14	1.0	150	60	18	54	1,509.0	8.13	97.5	150.9
10	580	115	300	68	8	1.3	140	50	16	48	1,326.3	7.14	85.7	132.63
11	600	135	350	70	18	1.4	130	60	21	41	1,426.4	7.68	92.2	142.64
12	892	167	650	88	22	3.4	290	80	28	68	2,288.4	12.33	147.9	228.84
Total	7,632	1,425	4,915	756	190	29.1	2,045	745	243	585	18,565.1	100.00%		1,856.51
Share	41.1%	7.6	26.5	4.1	1.0	0.2	11.0	4.0	1.3	3.2	100.0%			
Monthly Av.	636.0	118.8	409.6	63.0	15.8	2.4	170.4	62.1	20.3	48.8	1,547.1			
Weekly Av.	146.8	27.4	94.5	14.5	3.7	0.6	39.3	14.3	4.7	11.3	357.1			
Day Av.	20.9	3.9	13.5	2.1	0.5	0.08	5.6	2.04	0.7	1.6	50.9			
Area	55ha	50	93	278	11	17	25	15.5	5	26	575.5ha			
Areal Share	9.6%	8.7	16.2	48.2	1.9	3.0	4.3	2.7	0.9	4.5	100.0%			

SOURCE: 1DR Dec. 1980

Table – 31 Projection of Number of Visitors to Existing Park in Bogota by Weekday (1981 - 1990)

Item	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Population	4,297	4,469	4,648	4,834	5,003	5,178	5,360	5,547	5,741	5,911	6,086
Participation rate	4.32	4.32	4.32	4.32	4.32	4.32	4.32	4.32	4.32	4.32	4.32
No. of visitors	18,565	19,306	20,078	20,885	21,616	22,380	23,160	23,972	24,814	25,550	26,307

Table – 32 Fluctuation of Visitor Arrivals on Parque Salitre

	Estimated Visitors to Salitre	Share	Peak Month Dec. 147.9	Bottom Month Apr. 83.7	
Monday	10.0	6.81	10.07	5.70	14.2
Tuesday	10.0	6.81	10.07	5.70	14.2
Wednesday	10.0	6.81	10.07	5.70	14.2
Thursday	10.0	6.81	10.07	5.70	14.2
Friday	15.0	10.22	15.12	8.55	21.3
Saturday	35.0	23.84	35.26	19.95	49.5
Sunday	56.8	38.70	57.24	32.40	80.4
Weekly Total	146.8	100.00	147.90	83.70	208.0

Table – 33 Projection of Number of Visitors to the Park at Peak Time/day

Zone	Area Area/share	Proposed Density	Estimated No. of visitors per year (person) Share (thousand	Average No. of visitors /month /week /day (thousand	Exponent of Weekly Fluctuation in peak month (Dec.) /Mon. - Thr. /Fri. /Sat. /Sun	Weekly Fluctuation in bottom month (Apr.) /Mon - Thr. /Fri. /Sat. /Sun	Projection of No. of visitors per year * (thousand persons) No. in year No. on peak day No. on bottom day No. at peak time/day 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000
110 ha greenery lake plaza	113.0 (ha) (37.7%)	48.1 (P/ha)	5,435.3 (16.5%)	452.9 104.5 14.9	10.5 /per day 15.8 30.8 59.8	0.0 /per day 10.7 20.9 33.8	5,435.3 59.8 6.0 10.9	5,652.9 62.2 6.2 20.7	5,879.3 64.7 6.5 21.6	6,114.6 67.3 6.7 22.4	6,328.3 69.6 7.0 23.2	6,549.7 72.1 7.2 24.0	6,779.9 74.6 7.5 24.9	7,016.4 77.2 7.7 25.7	7,261.8 79.9 8.0 26.6	7,478.9 82.3 8.3 27.4	7,698.2 84.7 8.5 28.2	8,824.0 97.1 9.7 32.4	9,968.7 109.7 11.0 36.6
Salitre machine sports	56.0 (18.3)	138.8	7,034.0 (23.2)	630.0 146.8 20.9	14.8 /per day 22.1 51.8 84.0	8.4 /per day 12.6 29.3 47.5	7,034.0 84.0 8.4 28.0	7,930.6 87.4 8.7 29.1	8,257.8 90.7 9.1 30.2	8,588.0 94.5 9.4 31.5	8,888.3 97.8 9.8 32.6	9,199.2 101.2 10.1 33.7	9,522.5 104.8 10.5 34.9	9,854.7 108.4 10.8 36.1	10,199.4 112.2 11.2 37.4	10,501.4 115.6 11.6 38.5	10,812.3 119.0 11.9 39.7	12,393.5 136.4 13.6 45.5	14,001.3 154.1 15.4 51.4
Lago greenery lake	20.6 (6.9)	48.1	990.9 (3.0)	82.6 19.1 2.7	1.9 2.9 6.7 10.9	1.1 1.6 3.8 6.2	990.9 10.9 1.1 3.8	1,030.6 11.3 1.1 3.8	1,071.8 11.8 1.2 3.9	1,114.7 12.3 1.2 4.1	1,153.7 12.7 1.3 4.2	1,194.1 13.1 1.3 4.4	1,236.0 13.6 1.4 4.5	1,279.2 14.1 1.4 4.7	1,323.9 112.2 1.5 4.9	1,363.1 15.0 1.5 5.0	1,403.4 15.4 1.6 5.1	1,608.7 17.7 1.8 5.9	1,817.4 20.0 2.0 6.7
Folk Center folklore handicraft	21.6 (7.2)	93.5	2,019.7 (6.1)	168.3 38.8 6.5	3.9 5.9 13.7 22.2	2.2 3.3 7.7 12.6	2,019.7 22.2 2.2 7.4	2,100.5 23.1 2.3 7.7	2,184.7 24.0 2.4 8.0	2,272.1 25.0 2.5 8.3	2,351.5 25.8 2.6 8.6	2,433.8 26.8 2.7 8.9	2,519.3 27.7 2.7 9.2	2,607.2 28.7 2.8 9.6	2,698.4 29.7 2.9 9.9	2,778.3 30.5 3.0 10.2	2,860.6 31.4 3.1 10.5	3,278.9 36.0 3.6 12.0	3,704.3 40.7 4.0 13.6
Sports Center sports	45.9 (15.3)	138.8	6,370.9 (19.4)	530.9 122.5 17.5	12.3 18.2 43.2 70.1	7.0 10.5 24.4 39.7	6,370.9 70.1 7.0 23.4	6,625.9 72.9 7.3 24.3	6,891.3 75.8 7.6 25.3	7,167.1 78.9 7.9 26.3	7,417.6 81.6 8.2 27.2	7,677.1 84.5 8.4 28.2	7,948.9 87.4 8.7 29.1	8,224.2 90.5 9.0 30.2	8,511.8 93.7 9.4 31.2	8,769.9 96.4 9.6 32.1	9,023.3 99.3 9.9 33.1	10,342.9 113.8 11.4 37.9	11,684.7 128.6 12.8 42.9
Urban Center convention hotel communication	24.7 (8.2)	416.4	10,285.1 (31.2)	857.1 197.8 28.2	19.9 29.9 69.7 113.2	11.3 16.9 39.5 64.1	0,285.1 113.2 11.3 22.6	10,696.8 117.7 11.8 23.5	11,125.2 122.4 12.2 24.5	11,570.4 127.3 12.7 25.5	11,974.9 131.8 13.2 26.4	12,393.8 136.4 13.6 27.3	12,829.6 141.2 14.1 28.2	13,277.1 146.1 14.6 29.2	13,741.4 151.2 15.1 30.2	14,148.3 155.6 15.5 31.1	14,567.1 160.4 16.0 32.1	16,697.4 183.8 18.3 36.8	18,863.6 207.5 20.7 41.5
Botanical Garden forest flower greenery	19.2 (6.4)	9.6	184.3 (0.6)	15.4 3.5 0.5	0.4 0.5 1.2 2.0	0.2 0.3 0.7 1.1	184.3 2.0 0.2 0.7	191.6 2.1 0.2 0.7	199.4 2.2 0.2 0.7	207.2 2.2 0.2 0.7	214.7 2.3 0.2 0.8	222.0 2.4 0.2 0.8	229.9 2.5 0.2 0.8	237.9 2.6 0.3 0.9	246.2 2.7 0.3 0.9	253.5 2.8 0.3 0.9	261.0 2.8 0.3 0.9	299.2 3.2 0.3 1.1	338.0 3.7 0.4 1.2
Total	3,000.0 ha (100.0%)		32,920.2 (100.0%)	2,743.4 633.1 90.2	63.8 95.7 223.2 362.2	36.2 54.2 126.3 205.1	32,920.2 362.2 105.6 136.2	34,237.9 376.7 109.8 37.6	35,609.3 391.8 118.8 139.2	37,034.3 407.5 118.8 140.6	38,329.0 421.6 123.0 42.3	39,669.7 436.5 127.3 143.5	41,064.1 451.8 131.6 45.1	42,496.7 467.6 136.4 46.6	43,983.0 483.9 141.1 48.4	45,285.4 498.2 145.2 49.8	46,626.1 513.0 149.6 51.3	53,414.6 588.0 171.6 58.7	60,378.0 664.3 193.9 66.3
						(Population of Bogota D.E.)	4,297.0	4,469.0	4,654.0	4,834.0	5,003.0	5,178.0	5,360.0	5,547.0	5,741.0	5,911.0	6,086.0	6,976.0	7,881.0

Park Facilities Study

Activities and Installations

The recreation activities of park visitors are furthered or restricted by the quality and extent of the environment at the places at which such activities take place, the quality of the ground surface at the point where they stand having a particularly great influence. Furthermore, the relative environmental conditions vary according to the use density.

- Basic conditions controlling walking are pavement quality and form, level change, stairs and slopes.

- Facilities for satisfaction of the physiological conditions of park visitors are of greatest importance in the park, particularly seating and rest facilities, which are particularly necessary where there is a concentration of people.

- For the convenience of park visitors, shade, litter bins,information guides,etc. must be provided, it being particularly important that users be able to easily determine the direction in which they should proceed. Furthermore, facilities for maintenance of the environment are of convenience to park visitors at places where there is concentration and slowing down of movement of people.

- In an aesthetic sense, such facilities as walls, alcoves, niches, flower beds, etc. are important for a beautiful environment as elements that attract visitors.

- There must also be detailed provision for control of visitor activities and for the sake of ensuring visitor safety, including fences, rails, level changes, bollard lighting, etc.

Study Regarding Quantity of Service Facilities

Park Utilization Population

Generally, it is necessary to set the scale and capacity of service facilities at those needed for peak days of the year and peak hours in order to ensure the pleasantness of use of the park by the visitors.

If this is done, however, on normal days the use of most facilities is way below capacity. Some facilities can be supplemented by temporary or substitute facilities, and therefore from the standpoint of efficiency of use of service facilities, it is not necessary that the permanent facilities have capacities geared to peak days of the year.

In the case of the city of Bogota, only December is a peak month of park use, the number of park visitors being about the same for each of the other eleven months of the year. The ratio of this December peak to the number of users in an average month is about 1.5 : 1.

This being the case, the service facility capacity should be set at the level of the second-use peak (75% of the level of the peak day of the year), with temporary facilities being used to cope with the peak days and peak hours.

In 1990 the number of visitors on the peak day of the year will be 84,700 persons

And the number of persons in the park at the same time during peak hours on such a peak day (total number of users × turnover rate) will be: 84,700 × 1/3 ≒ 28,233 persons

The capacity of the permanent service facilities will therefore be 28.233 × 0.75 ≒ 21,174 persons ≒ 21,200 persons.

Setting of Service Facility Capacities

The necessary service facility capacities are anticipated as follows on the basis of the rate of use and unit size. Since the criteria for these calculations are based on Japanese case studies as slightly modified for conditions in Bogota as determined in the first field survey. Further study will have to be given to such criteria for better reflection of actual conditions.

Table – 34 Area Requirement of Service Facilities

Type of service facility	Calculation formula	Necessary area
Rest place	21,200 persons × 0.1 × 1.5 m²/person	3,180 m²
Public lavatory	Log Y = 0.872 Log 21,200 – 1.615[*1] Y × 1/2 = 71 Stalls × 3.3 m²/Stall	234 m²
Restaurant	21,200 persons × 0.05 × 1/2 × 1.0 m²/person	529 m²
Total		3,943 m²

Note:
1. The proposed formula has been used for calculation of public lavatory capacity on the basis of Japanese architectural safety ordinances, the necessary number having, however, been set as one-half considering difference in living habits.

Table – 35 Number of Service Facilities

The necessary number of service facilities is as follows as based on the average area of each facility.

Type of service facility	Unit area for each facility	Number of facilities of each type
Rest place	10 m²	320
Public lavatory	25 m² (3 stalls for men and 4 stalls for women)	10
Restaurant	250 m² (200 seats)	2

Traffic Study

Traffic Characteristics of Roads Around the Park

The traffic characteristics of roads around the park area can roughly be recognized from the result of traffic research, which was conducted by Universidad Nacional de Colombia in December 1980.

On the basis of both reports of this traffic research and the result of the site survey (implemented by the JICA Study Team), the problems at the present stage are herein rearranged, and such problems are further studied from the viewpoint of "Park Use Plan", which has the target year of 1990 corresponding to the project's target year.

Problems of Present Traffic Conditions

From the viewpoints that appropriate capacity is exceeded on almost all main roads around the park area and that traffic flows intersect, a very high level of congestion appears at the peak time-zone on weekdays. (Refer to the tables, which show the relationships between peak traffic volume on weekday and weekend and permissible traffic volume.

The traffic source consists of the residential area and Unidad Deportiva Del Salitre in the case of areas surrounding the park area. So, almost all of the traffic, which uses the main roads, is through traffic.

When estimating the development of cities in future, it seems quite probable from the viewpoint of present traffic status that the traffic will be paralyzed completely in 11 years if the growth rate of traffic volume is 3% p.a. If the growth rate is 5% p.a., paralysis will occur in 7 years.

Even from the standpoint of growth of population and public traffic (Conditions in 1990 would be about 1.6 times as bad as in 1980 if no changes take place or are made.), the above forecast implies that countermeasures must be made for improvement of traffic.

Table – 36 Traffic Volume and Capacity of the Surrounding Road s in the Weekend

Intersection	Survey Spot No.	Direction	Way	Lane	Peak hour	Day	Volume	Capacity	Volume/Capacity
Carrera 68 – Calle 63	(07)	N	2	4	13 30 – 14.30	Saturday	1409	2600	0.54
	(07)	S	2	4	12 30 – 13 30	Saturday	1670	2600	0.64
		E	1	3	13.30 – 14.30	Saturday	1372	1800	0.76
		W	1	2	13 30 – 14:30	Saturday	1082	1200	0.90
Carrera 68 – Calle 53		N	2	4	13 30 – 14 30	Saturday	1228	2600	0.47
	(08)	S	2	4	12·30 – 13 30	Saturday	1731	2600	0 67
		E	1	3	12 30 – 13.30	Saturday	697	1800	0.39
Carrera 60 – Calle 53		N	1	3	12.30 – 13·30	Saturday	801	1800	0.45
	(04)	2S	1	3	14·00 – 15 00	Saturday	495	1800	0 28
		E	1	2	12.15 – 13.15	Saturday	572	1800	0 32
		W	1	3	12 15 – 13:15	Saturday	572	1800	0 32
Carrera 60 – Calle 63		N'	1	3	14 00 – 15.00	Saturday	449	1800	0.25
	(03)	S	1	3	12 45 – 13·45	Saturday	633	1800	0.35
		E	1	3	12 45 – 13 45	Saturday	1645	1800	0 91
		W	1	3	13.45 – 14:45	Saturday	1253	1800	0 70
		N	1	3	12 45 – 13 45	Saturday	955	1800	0 53
		S'	1	3	12 30 – 13.30	Saturday	801	1800	0 45
		E'	1	3	17 30 – 18 30	Saturday	955	1800	0.53
		W'	1	3	13 30 – 14 30	Saturday	1372	1800	0 76
Carrera 50 – Calle 63		S	1	3	12 30 – 14 30	Saturday	880	1800	0 49
	(01)	E	1	3	17 15 – 18 15	Sunday	1033	1800	0 57
		W	1	3	13 45 – 14:45	Saturday	1066	1800	0 59
		S'	1	3	13 45 – 14.45	Saturday	553	1800	0.31
		E'	1	3	17 00 – 18 00	Sunday	926	1800	0 51
		W'	1	3	12 00 – 13.00	Sunday	998	1800	0 55

Table – 37 Traffic Volume and Capacity of the Surrounding Roads in the Weekday

Intersection	Direction	Way	Lane	Peak hour	Day	Volume	Capacity	Volume/Capacity
Carrera 68 – Calle 63	N	2	4	7 45 – 8 45	Thursday	2344	2600	0.90
	S	2	4	18 00 – 19.00	Thursday	1841	2600	0 71
	E	1	3	13.30 – 14.30	Saturday	1372	1800	0.76
	W	1	2	7 30 – 8.30	Thursday	1200	1200	1 00
Carerra 68 – Diagonal 53	N	2	4	7·45 – 8 45	Thursday	1998	2600	0.77
	S	2	4	18 00 – 19.00	Thursday	2071	2600	0.30
	E	1	3	18.00 – 19 00	Thursday	704	1800	0.39
Carrera 60 – Calle 53	N	1	3	13·45 – 14.45	Thursday	1561	1800	0 87
	S	1	3	18 00 – 19 00	Thursday	898	1800	0.50
	E	1	2	12.25 – 13.25	Saturday	805	1200	0.67
	W	1	3	7·30 – 8 30	Thursday	1004	1800	0.56
Carrera 60 – Calle 63	N(in)	1	3	13·00 – 14 00	Thursday	963	1800	0.54
	S(in)	1	3	18 00 – 19.00	Thursday	1174	1800	0 65
	E(in)	1	3	18.00 – 19.00	Thursday	1711	1800	0.95
	W(in)	1	3	7.30 – 8 30	Thursday	1573	1800	0 87
	N'(out)	1	3	18 00 – 19 00	Thursday	1360	1800	0 76
	S'(out)	1	3	13 45 – 14 45	Thursday	1561	1800	0.87
	E'(out)	1	3	8 00 – 9 00	Thursday	1334	1800	0.74
	W'(out)	1	3	13 30 – 14.30	Saturday	1372	1800	0.76
Carrera 50 – Calle 63	S(in)	1	3	17·30 – 18·30	Thursday	1255	1800	0.70
	E(in)	1	3	13.00 – 14 00	Thursday	1088	1800	0 88
	W(in)	1	3	7:30 – 8 30	Thursday	1417	1800	0.79
	S'(out)	1	3	12.45 – 13 45	Thursday	875	1800	0.49
	E'(out)	1	3	8 00 – 9.00	Thursday	1803	1800	1.00
	W'(out)	1	3	13 15 – 14:15	Thursday	1590	1800	0 88

Table – 38 Existing Road Classification

Section of Road	No. of Way	No. of Lane	Direction of Operat ion
A	2	3	2
B	2	2	2
C	2	3	2
D	2	3	2
E	2	3	2
F	2	3	2
G	4	2	2
H	1	2	2
I	2	2	2

Fig. – 51 Typical Road Cross Section

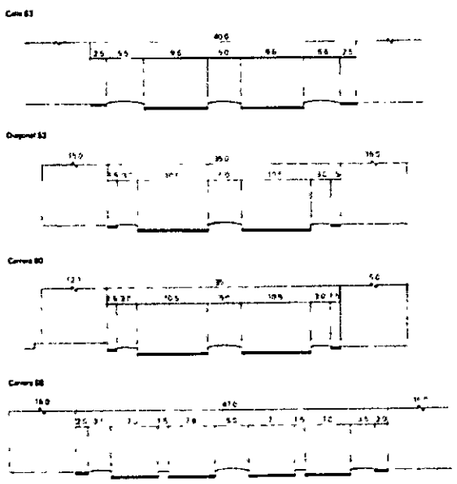
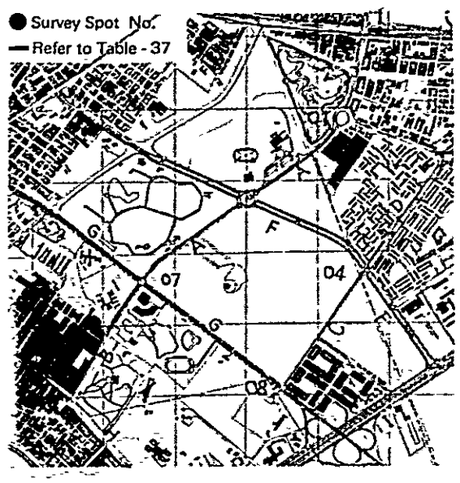


Fig. – 52 Existing Road Network



Control Plan for Traffic in the Vicinity of the Park

General

As shown by the traffic analysis conducted by the University of Colombia, the construction of roads as planned at present, will prove unsuitable for traffic capacity at peak hours in accordance with projected demands by 1990. Especially, for intersections of main roads joining Calle 63, Carrera 68 and Avenida Ciudad de Quito, the grade separation method is unquestionably suitable.

In planning traffic control, taking usage of the park into consideration, the problem occurs during peak hours when the flow of traffic is halted by vehicle and pedestrian congestion. There are three times in weekday rush-hour periods of commercial and private vehicles, i.e. school-commuters' bound cars flooding the roads in the morning (7:30 to 9:00), in the afternoon (12:00 to 15:00) and in the evening (17:00 to 19:00). In addition, there are two peak periods on Saturdays in the morning and in the afternoon. As for the visiting number en route to the park, it is tends to reach the maximum between 10:00 AM and 3:00 PM. Consequently, in formulating the traffic control plan, each overlapping period of park visits and rush-hours must be taken into consideration, i.e. peak hours in the afternoon and in the evening after 5:00 PM during the week and in the afternoon or Saturdays. As it is estimated that over 85% of park visitors will rely on buses as the means of transportation, the quantity of large sized buses should be taken into consideration in planning.

Traffic Burden Forecast

As to expectations for traffic volume in the vicinity of the park and the countermeasures to cope with it, an investigation will be conducted concerning overlap periods of peak hours on weekdays and weekends mentioned above. The forecast for use frequency of the park and the measurement of the traffic volume on future road networks will be made on the basis of investigation and analysis.

Therefore, as to the definite traffic control plan, the detailed countermeasures should be established at the time when investigation into the entire transportation system of Bogota City and future trends related to recreation, and forecasts the number of visitors to the park (the Whole Area: 350 ha), have been completed. The measures will be worked out on the basis of information and data gained up to now, especially by the JICA study team as to the following:

: Smooth traffic of park visitors and vehicles at main crossings and safety.

: Preserving the beauty of the environment.

Features of the Planning

The fundamental conditions in the inquiry into the planning and the features of the planning are as follows:

- There must be compatibility in terms of land-use planning with the land-use pattern in the vicinity for a sense of unity.
- There must be an appropriate approach arrangement that avoids concentration at a single place of incoming and outgoing traffic, with particular attention being given to the individual functions of the different roads in the vicinity.
- Avoidance of hinderance of park functions through segmentation of the park by such roads, ensuring that overall harmony and continuous linkage of the various park functions can be maintained.
- The design conditions of the roads are to conform to those of present city planning streets. Accordingly, the width of the roads is to be the same as those of the present ones. As for design speed, 100 km/h should be appropriate for the Autopista El Dorado (V-O), and the range of 40-60 km/h should be suitable for the other roads around it, the specific speed for each depending on its particular functions.

On the basis of such basic conditions, the separately attached network plan is recommended for the future transportation network of the city of Bogota. (It is necessary, however, that this traffic plan be fully coordinated with the results of future traffic volume surveys and comprehensive urban development plans.)

The following are the main points to be noted with respect to this plan.

Partial Closing of Carrera 60

Carrera 60, which lies between Autopista El Dorado and Calle 63, appears to have a Low traffic volume occurrence judging from the surrounding land use and is not an important route in terms of city planning. Furthermore, most of it runs through the area scheduled for the park.

Accordingly, in the park plan consideration should be given to closing of it between Diagonal 53 and Calle 63 for the purpose mainly of prevention of division of park function, incorporating the right of way of the road along that stretch into the park land-use pattern.

Future study will have to be given, however, with respect to the problem of transfer and maintenance of such facilities as storm water drainage pipes and sewage drainage pipes laid within the right of way of this Carrera 60, the water supply main (42") presenting a particular problem.

Modification of Calle 63

Calle 63 runs almost parallel to Autopista El Dorado right through the center of the park site and is classified as a service road for medium- and short-distance trips as well as being considered as a main route in terms of the street network structure. However, considering the fact that from the point of view of the park area it shares the road function of through traffic, there are difficult elements with respect to incorporation of it into the park plan.

Nevertheless, from the standpoint of its significance to the park plan, it is necessary to deal with it in an integrated manner with the park in view of its role as a symbolic and commemorative urban mall within the city as a whole.

The following will therefore be necessary for the sake of fulfilling the functions and purposes of Calle 63 in terms of the street network while at the same time having it serve as an urban mall.

- It is necessary to separately classify the kind of traffic that it should carry and the kind that it should not carry and to find a way for as smooth handling as possible of through traffic, which rules out direct access to the park by way of this road.
- It is necessary, as far as possible, to avoid diversion of direct traffic between the Chapinero district and the airport, which is expected to increase in the future, onto Calle 63, instead diverting it onto Autopista El Dorado as near the center of the city as possible. A possible way of accomplishing this is by building a bypass road along the railway running east and west along south side of the park site between Calle 63 and Autopista El Dorado so as to lighten the burden of through traffic to the northwest area, at the same time using such a bypass road as the main approach road to the 110 ha area of the park, this proposal also being valid in terms of ensuring the function of Carrera 60.
- It will be necessary to have grade separation at the intersection between Avenida Ciudad de Quito in order to be able to properly handle the large volume of through traffic of both, the diamond interchange type of grade separation being most appropriate.

  As for the overpass, considering the pedestrian traffic and the facility layout in the vicinity of the intersection, the flyover type for both Carrera 68 and Avenida Ciudad de Quito would appear to be recommendable.
- Besides Calle 63's function as an urban mall leading into the park, it will also be possible to form other multipurpose space in connection with it unrelated to park or road functions by providing a grand plaza for national ceremonies consisting of a diversity of small plazas for casual use by its citizens.

The skeletal road alignment for this mall between El Lago and Carrera 68 can be a large, continuous S-shaped curve, with complete separation of traffic lanes and the pedestrian lane, the whole thing looking like an enormous tied ribbon. This is not consistent, however, with the present plan and profile alignment.

- In the section where the grand plaza is located, mainly as a profile consideration there should to a certain extent be clear separation of the functions of the amusement park and the 110 ha park area, with use of the slope of the road for the effect of perpendicular variation of the grand plaza.

For greater ease of motion of pedestrians and in view of the need to keep the amount of earthwork to a minimum considering the ground and drainage conditions, a pedestrian crossing has been provided under the road (architectural limit minimum height of 2.5m). The planned height of the pedestrian road and that of the grand plaza have been set 1m lower than the present ground level as the limit height in terms of drainage planning.

Carrera 68

Since this is an important loop road, it is not appropriate in terms of road function for direct access to the park, such access being only from major intersections, i.e. those of Calle 64, Calle 63 and Diagonal 53

Calle 64

This road is to function as a service road for direct access to the park, receiving traffic from the Main loop roads Avenida Cuidad de Quito and Carrera 68. As for road specifications, the cross section should allow for separation of through traffic and service traffic.

Intersection Design

Various designs are conceived as means to satisfy these functional requirement but as a result of studies, as is shown by the plan, it is intended to handle the main traffic flow by means of a direct ramp approach. It is believed that this use is suitable from the viewpoints of traffic flow, boundary conditions with Urbanizacion La Esmeralda and the land use of the park.

- Calle 63/Carrera 68
  Calle 63 and Carrera 68 are two of Bogota's arterial roads. As both carry through traffic, it is expected that a split-level crossing will be constructed. The city's master plan calls for full access for both of these roads, in principle, and an interchange of relatively high standards is intended. For purpose of park planning, the full access called for by the city's master plan is accepted and a cloverleaf interchange which would permit full access is planned.
  The reason for this type of intersection to be used is that as a result of facilities of the Unidad Deportiva El Salitre beecoming the control point, in order to obtain space for the roadway and facilities, the route of Calle 63 has to be moved to the opposite side, and the overall form therefore becomes linear.
- Calle 63/Avenida 60 (Bypass road)
  The access road located at the 110 ha area's Entrance Zone has both the character of a bypass of Calle 63 and of the Main approach road leading into the 110 ha area.

Therefore the traffic flow which is to be given priority is that between the center of the city, via Calle 63, and the airport, and it is necessary to make arrangement to insure that it has a bypass function in connection with community to and from school and work, and an aproach function when used by visitors going to the park.
Various designs are conceived as means to satisfy these functional requirement but as a result of studies, as is shown by the plan, it is intended to handle the main traffic flow by means of a direct ramp approach. It is believed that this use is suitable from the viewpoints of traffic flow, boundary conditions with Urbanizacion La Esmeralda and the land use of the park.

- Diagonal 53/Carrera 68
  The present plan for Diagonal 53 is for it to originate in central Bogota, fly over Avenida Ciudad de Puito, and pass Urbanizacion Salitre to Carrera 68.
  As indicated in the city's master plan, Diagonal 53 is modified so as to fly over Carrera 68 and to extend in a northwest direction. The park plan recognizes this aspect of the master plan and in keeping with the relationship with the park, the existing road structure is to be retained to the maximum extent possible and the road centerline alignment is planned as indicated in the road network plan.
  In connection with the matter of access to the park, there is not to be direct access from this road. The intersection with Carrera 68, in view of the substation, is planned as a half-cloverleaf type.

- Diagonal 53/Carrera 68
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Fig. — 53 Proposed Intersection Design

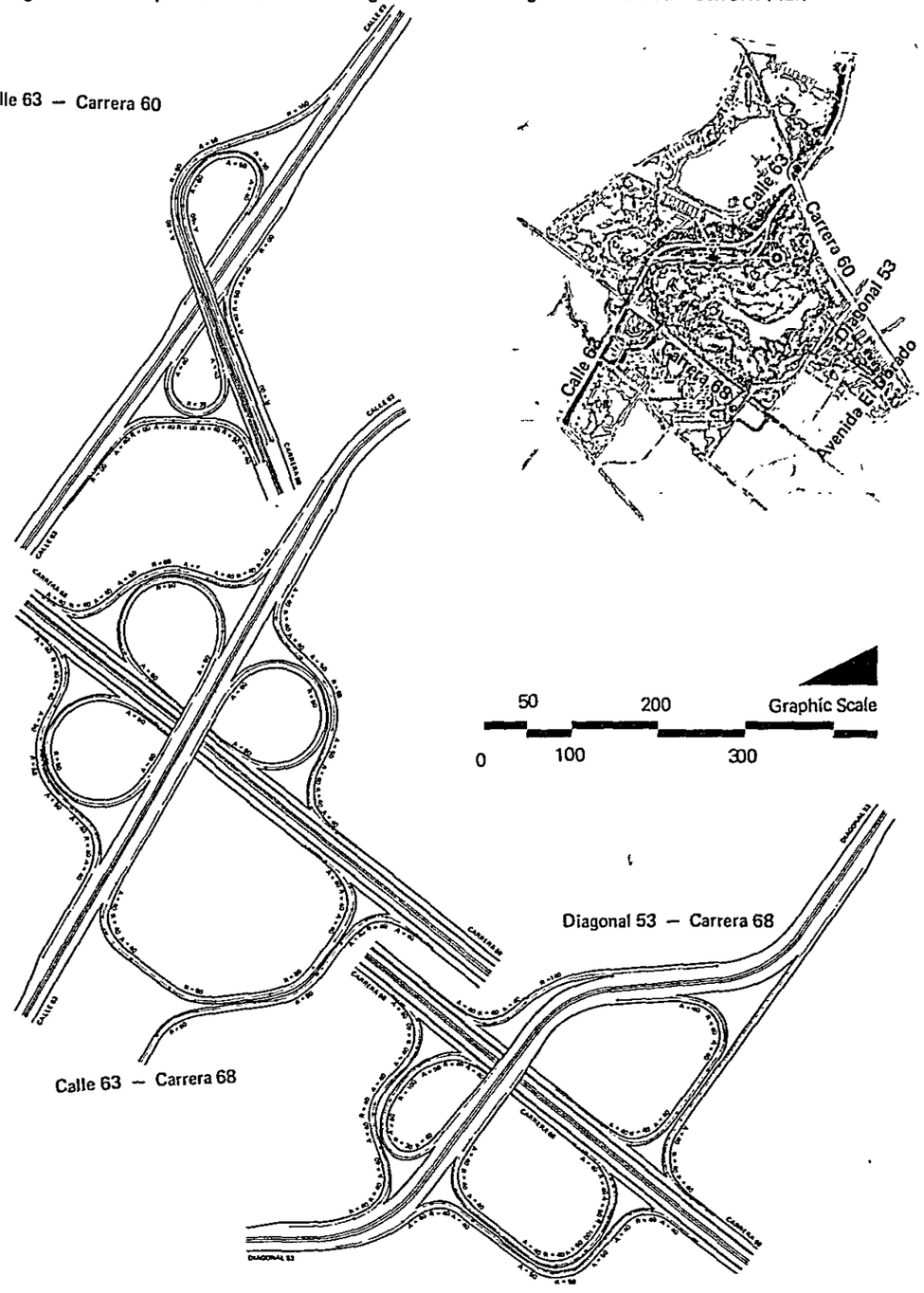


Fig. — 54 Road Network Plan

Landscape Study

Earth Work

Site grading

The grading scheme is developed as a whole, structure elevations being adjusted and readjusted until a balance of all potential site requirements is achieved.
For visualizing the site undulation as a fundamental landscape element, site grading shall be considered to be coordinated with the surface water drainage system.

The following basic policy is proposed for earthwork in the 110ha area considering the various problems with respect to the present conditions.

- Collection of the surface water is to be in the direction of the lake. Which is located near the center of the park. And drainage from the lake is led in the direction of the city main storm water drainage.

- The overall volume of earthwork will be quite substantial on account of the basic conditions of the scenic structure of the park. This will determine the proposed ground formation height on the basis of the planned surface area of the lake and the drainage gradient, the central part of the park being set lower than the existing ground level. This is for the purpose of achieving a balance of cut and fill. However, since a considerable volume of borrow will be required as a whole, ways will have to be studied for creation of mounds with high scenic effect with a minimum of embankment work.

- In order to prevent the use of soil with a high clay content, which is not suitable for planting, surface soil removed in connection with earthwork, must be retained for re-use at the time of final embankment formation.

- Borrowed earth can be sandy or have a certain amount of gravel mixed in it, but it should have good water retention and a considerable quantity of organic matter in it, particularly when it is used as the surface layer.

- There should be a policy of avoiding enviromental disruption through the taking of large amounts of borrowed earth from single places, the matter of how much can be taken depending, of course, on the particular conditions.

- Due to the limitation of the gradient on site drainage. water levels of the lake shall be determined as the lowest formation height. Grading and earthwork will be based on this determination of the water level at the lake. The approximate earthwork volume will be assumed as follows in this study stage.

Cut approximate	494,400 m³
Fill approximate	595,000 m³
Borrowed earth volume	150,000 m³

* Soil shrinkage ratio 0.9

- Average gradient of grass land area is proposed to be approximately less than 1%, Surroundings of the national ceremonial plaza and woodland area are be proposed to be 5% to a maximum of 30%.

The deepest cut will be approximately 3.5m below existing ground level at the Lake area, and highest embankment will be approximately 7.5m above the existing ground level at the woodland hill.

Technical Consideration of the Soil;
Coping with Poor Ground in the Park Area

It has been geologically confirmed in past surveys that the whole park area has a poor deep ground structure.

It is assumed that the ground structure under the surface is the same for all of the borings, and the features of the various strata are as follows.

- The topsoil (capa vegetal, i.e. humus soil or vegetable topsoil) extends on the average to about 60cm below the surface of the ground.

- Below that, there is an extremely soft clay stratum of medium consistency with an average compressive strength of qu=0.5kg/cm² and a thickness of between 1.2m and 2.5m, with considerable variation.

- Below this clay stratum and at least to the depth bored (10-15m from the surface) there is a brownish-gray soft mud (limo gris-carmelito brando) stratum with an average compressive strength of qu=0.3kg/cm², high compressibility and a liquid limit of between 100% and 200%.

- The ground water table is relatively high (with seasonal variation, averaging 1.5–2.0m).

Consideration of the Poor Ground

As described above, the soil in question is cohesive solid with a high clay content and a high silt (or organic matter) content and high percentage of moisture content. In terms of soil mechanics, it is very soft, with a unconfined compressive strength of less than qu=0.5kg/cm².

This being the case, in the planning of embankment works or structural foundations on such soft ground it is necessary to take such a soil structure into consideration.

The items that have to be considered in this respect are the stability and settlement of the embankment itself, the effect of mud wave action on important facilities, private homes or roads contiguous to the planned embankment and selection of the type of structural foundation.

Structure of Foundations of Building Facilities

The conditions for selection of the type of general buildings and the type of foundations for them suitable for construction on ground having the soil characteristics described above are as follows.

- Considering the compressive strength of the soil, the maximum load strength on the foundation should be about 0.5kg/cm². Accordingly, it is desirable that the foundation be set at about 1.5m below the surface, where the bearing capacity is 0.4-0.6kg/cm².

- With such a foundation structure, a square individual footing foundation or a rectangular mat foundation would be adequate in the case of a comparatively small building (one of up to about three stories).

- For a building of more than three stories, however, the foundation should allow for some settlement as well as even distribution of load (this is in order to prevent damage to the building due to differential settlement).

Furthermore, since it is important that the load stress on the foundation be under 0.5kg/cm², the general solution that has been adopted in the city

of Bogota on the basis of considerable experience and research is that of a floating structure for the foundation (creation of a hollow part as a semi-basement).

The advantages of such a foundation structure are that it is not necessary to excavate more than 1.5m from the surface of the ground to the bottom of the foundation and the fact that a spread foundation can be adopted within the soil compressive strength tolerance. While there are, of course, many possible types of floating structure, the geometric center of gravity and the center of gravity of the load from above should coincide, and there should be an integral structure so as to avoid differential settlement.

It is important that there be sufficient leeway at each of the boundaries and junctions in order to cope with difference in amount of settlement between the building proper and the surrounding ground and facilities that can be expected.

Settlement and Fracture of Embankments

As embankments rise, the ground beneath them settles, and there is lateral displacement and upheaval of the ground on the sides of the ground on the sides of the embankments. There is pronounced increase in the amount of settlement and the amount and range of upheaval as the height of embankment increases, and when the embankment increases, and when the embankment load reaches the ultimate bearing capacity of the ground, the embankment suffers fracture along the slide surface.

Let us now estimate the limit embankment height and total amount of settlement that can be expected in the case of the park site considering the given ground conditions.

Critical Embankment Height

The value of critical embankment height can be obtained from the relationship between the average unconfined compressibility of the soft stratum and the ultimate bearing capacity of the ground, this relationship being Height is the weight per unit of volume of the embankment (t/m^3), the value for common soil of 1.8 t/m^3being used here.
When the ground is considered to be a uniform clay, so that critical embankment height will be approximately 7m accordingly.

Let us consider the conditions that have to be taken into account in selecting construction methods to deal with clay ground as well as reviewing some of the construction methods that are generally applied.

All types of construction methods can be applied to cope with clayey ground, except for soil compaction, but in the case of some clay cohesive soil, there is an extreme decline in bearing capacity if the sensitivity ratio is high and irregular. In order to deal with ground having such soil quantities it is necessary to adopt a construction method that entails as little disturbance of the ground as possible.

In the areas in question it would appear that it would not be necessary for any special methods to be applied in general land formation (embankment) as long as the limit embankment height is not exceeded. If however, the embankment does exceed that limit or the construction work involves rapid soil compaction, special care and countermeasures will have to be taken.

In the case of road construction, particular care will have to be taken with respect to embankment since it is extremely important from the standpoint of safety that the surface of the pavement be flat. Accordingly, everything possible must be done to deal with settlement.

In the case of high embankment, such problems can arise as instability of the embankment and mud wave action or substantial settlement during the construction or settlement deep within the clayey stratum. In the case of low embankment there are fewer such problems, but, still, partial fracture can occur quite easily, leading to the occurrence of unevenness on the road surface and fracture of the pavement.

Measures to assure stability of civil structures

As may be understood from existing boring logs from the Club de Empleados Oficiales site, as well as logs of new borings done in connection with this project (Soils Progress Report, Parque Simon Bolivar Report No. 1777/81), the major characteristics of the soil at the site are that almost all of the soil below the surface layer (humus-containing surface soil) has a compressive strength of about $q_u = 5_t/m^2$ and at the depths reached by the boring (30-50m) no bearing layer was encountered and all of the soil to those depths was soft.
This situation requires that caution be exercised in the design and construction of structure and facilities for the park, such as earthwork, roads and buildings, so that their load does not cause sinking or sliding.
It is therefore necessary to undertake structural studies of each of these facilities and the like on the basis of a study of the existing circumstances of building and road structures in the vicinity of the park area, as well as of the settlement due to consolidation and other characteristics of the soil.

- Earth planning within the park
  Because enbankment or fill operations as part of the earthwork for the park will be made to finished grades of no more than 10m above the original grade, and because the earth thus formed will have gently sloping sides, it is believed that there would be no special problems other than the possibility of settlement due to consolidation and therefore planning may proceed without inclusion of stabilization measures.
  It is judged from the bearing capacity of the soil that the maximum embankment height is 7m and in consideration of the intention not to exceed the embankment height of 10m it is further judged that providing that build-up of the load through embankment work is properly phased so that earth is added at a suitably-timed rate, and a suitable period for settling is provided, the overall stability of embankments can assured.
  The speed with which earth can be placed in the case of this project, in view of experience elsewhere, is about 5-10 cm/day. It is thought that the earth permitted to settle for a period of up to 6 months.
  Further, it is anticipated that about 250,000 m^3 of earth will have to be obtained from off the site, due to the nature of the site topography and scale of cut and burrow. This earth preferably should be sandy (mountain origin) but if this is not possible then ordinary earth may be used although it is desirable for it to be mixed with an equal volume of cut from the site.
  Regarding drainage, which is one of the factors influencing stability, because a lake is to be at a central location in the park and surface and underground drainage will be provided, no problem is expected.

- Road embankment planning
  Road embankment work is to be performed separately from other park embankment work, to insure road safety by preventing subsequent problems of uneven settlement and inproper slopes. Further, it will be necessary to give consideration to public service facilities to be provided within the road area, such as drainage pipes, water pipes, telephone lines, etc.
  Various methods of stabilization may be used, such as the sand mast method and laying material method. Selection of methods used is to be done on the basis of such factor as the available construction time in view of schedule for road use, and the relative costs.
  At this point it is judged that as long as the soil characteristics and design are such that the embankment height is not to exceed 7m, there would not be any fracture of the existing foundation and if the slopes are within approximately 1:4 the slopes would be stable and therefore no stabilization measures would be required. If possible, however, the rate of work should be 5 cm/day, and 10cm/day at most.
  Regarding settlement due to consolidation, it is believed that extra banking should be employed, and that sub-surface placement of structure and paving work should be done after residual settlement has reached 10cm.
  It will not be particularly necessary to provide sand at the interface of the existing foundation and the road proper about 1.0m of good-permeability form the viewpoint of facilitating settlement due to consolidation, and further stabilizing the roads themselves.
  Drainage of the roads may accomplished by provision of side ditches at the toes of road embankment slopes, from which water may be made to flow into underground drains.

- Foundation of road structures
  Regarding selection of foundation types for road structures, for box culverts and other structures having low loads such as about 5t/m², direct foundations should be adequate, and for structures having loads greater than that replacement of earth by sand or use of friction piles should be planned.
  For bridges and other heavy structures, the use of friction piles as presently used by Bogota officials (municipal standards) should be adequate.

- Foundation of general buildings
  Regarding foundation types for general buildings, because the existing compressive strength is about 5t/m², types which do not have more than a 5t/m² upper load should be selected. It is through that friction piles will be suitable when loads will exceed that.

Water Surface

Lake Design Study

Tha lake plan for the park site will have a surface area of approximately 98,000 m² and water depth of up, to, 3m for a very large water storage capacity. The foundation of the lake bottom shall be set 0.5m to 3.5m lower than the present ground level so that there will be a comparatively large bearing capacity.

Generally speaking, water supply mains, ground water, rivers, etc. are possible sources of water for lakes of this kind, but in the case of this park, the supply of water from water mains would appear to be most appropriate from the stand-poind of maintaining water quality and securing a stable supply (Since, however, the large quantity of water that will be required could present a problem, it will also be necessary to study the matter of possible future use of ground water for this purpose).

In considering the source of the water, full consideration should be given to such matters as the water supply situation in the context of the surrounding land use, the cost of water supplied by water mains, the cost of electricity, etc.

Another possibility is use of rainwater as a source of water for the lake, but on account of such problems as irregularity of amount of railfall from month to month, increase of turbidity during surface flow, destruction of bank protection works, the large number of inflow points, etc., this cannot be actively considered as a main source. From the standpoint of water conditions and drainage, however, it can be considered as a supplementary source of water for the lake, it being preferable, however, that the amount of supplementation not be taken into account in the calculation.

Water supply outlets should be provided at several points for even supply.

The bottom of the lake should not have very abrupt change so as not to obstruct upstream to downstream flow. One of the most important design conditions for the lake is prevention of leakage. In the way of watertightness construction methods for prevention of leakage, there are four mainly methods.

(1) Clay Facing Method
(2) Waterproof Film Laying Method
(3) Concrete Method
(4) Shot Concrete Method

In the case ot the present park, adoption of the waterproof film laying method would appear to be most recommendable. The features of this method are good watertightness, ease of implementation over wide areas, economy, comparatively good durability and the ability to shape the lake fairly freely.

Lake and its Control Function

• Control Function and Capacity of Control

A "control pond" is basically constructed in order to prevent any false influence to the downstream river or drainage facilities when the volume of drainage is increased due to development.

From the viewpoint that the volume of drainage is rather decreased after the development of these park facilities, the original function of the control pond is not required. In order, however, to prevent any possibility of temporary inundation of the planned area even at the stage of rainfall more than the designed probability of years for drainage network, a control function is imposed on the lake.

The capacity of control, which can cope with the rainfall of 40-years' probability, can be calculated as follows:

$$V = (r_{40} - \frac{r_c}{2}) \cdot 60 \cdot t_i \cdot f \cdot A \cdot \frac{1}{360}$$

wherein,

V: Capacity of control (m^3)

r_{40}: Rainfall intensity of 40-years' probability

$$r_{40} = \frac{3,600}{t_i+17}$$

r_c: Rainfall intensity which conforms with the permissible volume of flow

Rainfall intensity of 5-years' probability = 50 mm/hr.

t_i: Optional rainfall durability (min.)

f: Flow coefficient

- Lake f_1 1.0
- Area other than lake $f_2 = 0.28$

A: Area size of catchment-basin

- Lake $A_1 = 10$ ha.
- Area other than lake $A^2 = 75$ ha.

Therefore,

$$V = (\frac{3,600}{t_i+17} - 25) \cdot 60 \cdot t_i \cdot (1.0 \times 10 + 0.28 - 75) \times \frac{1}{360} = (\frac{3,600}{t_i+17} - 25) \cdot t_i \cdot 5,167$$

The maximum capacity of control is about 8,000 m^3. The rise of water level is approx. 8 cm (8,000 $m^3 \div 10$ ha.).

From the viewpoint that this lake is of the "dig-in structure", any accident such as destruction of bank, etc. will not occur even if there is a rainfall larger than 40-years' probability. Only temporary inundation of the park may happen, and it may be affirmed that the lake itself is fully safe.

• Preservation of Water Quality of Lake and Water Source

From the standpoint of standard of water quality applicable to the usual lakes and ponds, the limit of environmental preservation, to which discomfort is not produced in the daily life (including the walks along the shore), is BOD 8 p.p.m. Bio-chemical oxygen demand).

This lake has two water sources: rainwater and fresh water. Due to these being separate systems, no living waste water can be mixed in the rainwater. Therefore, it seems that the BOD value of rainwater is lower than 3 p.p.m. when it flows into the lake.

The lakes and ponds in the surrounding areas are poor-nutrition lakes, where plants such as duckweeds, etc. are not found in large quantities. Therefore, it seems that this lake can be a poor-nutrition lake in which the qualilty of water is fully preserved. A poor-nutrition lake tends to become a rich-nutrition one gradually if the water's stay time is long.

If rainwater run-off is discharged for the purpose of water purification, it may be defined that the water is replaced every 2 rainy seasons, as a result of calculation of rainwater volume which flows into the lake for the individual month. Therefore, it seems that no rapid deterioration of the quality of water will occur.

Thus, the normal water stream will have the nature of replenishing water against the natural evaporation. The volume of evaporation is expected to be about 3 mm ∼ 4 mm/m^2 against water area size "1 m^2" although this volume is variable depending on the climate and season.

Therefore, the volume of water supply required for this lake amounts to 300 m^3/day ∼500 m^3/day.

• Calculation of Rainwater Flowing into the Lake per Individual Month

$Q = r_m \times f \times A \times 10$

Wherein,

Q: Volume of rainwater flowing into the lake per individual month

r_m: Volume of rainfall per individual month

f: Discharge coefficient

Lake $f_1 = 1.0$

Area other than lake $f_2 = 0.28$

A: Area size of catchment-basin

Lake $A_1 = 10$ ha.

Area other than lake $A_2 = 75$ ha.

$Q = r_m \times (1.0 \times 10 + 0.28 \times 75) \times 10$
$= r_m \times 310$

Table – 39 Volume of Rainwater Flowing into the Lake

Month	Volume of rainfall per individual month (mm)	Volume of rainwater flowing into the lake per individual month Q (m^3)
Jan.	45	14,000
Feb.	55	17,100
Mar.	60	18,600
Apr.	105	32,600
May.	100	31,000
Jun.	60	18,600
Jul.	40	12,400
Aug.	40	12,400
Sep.	50	15,500
Oct.	110	34,100
Nov.	105	32,600
Dec.	75	23,300

Remarks

- Capacity of lake
  10 ha. × 1.2 m (depth)
  = 120,000 m^3
- Volume of rainwater flowing into the lake
  Jan. ∼ Jun.
  132,000 m^3
- Volume of rainwater flowing into the lake
  Jul. ∼ Dec.
  130,000 m^3

Planting

Approach to Purposes of Planting in Urban Parks

Plantings have various meanings in an urban park, and make various contributions to the life of the citizens.

- From the viewpoint of greenification, the planting will work as a base for introducing a large-scale and various species. Through the greenification, the "Green" of a city can be enhanced from the viewpoints of both quality and quantity.
- From the standpoint of preservation of the environment, the natural environment can be distributed, through plantings, in the central area of city in a large scale. It will result in the establishment of a desirable ecosystem with "fauna" and "flora" in a natural environment.
- In regard to the landscape, landscaping consisting of trees, shrubs, etc. is the most "natural" and, furthermore, can be realized in a three dimensional and colorful manner.
- From the viewpoint of the place of recreation activities, the plantings can furnish, to the urban residents, a convenient place where they can enjoy nature fully. The natural environment which is formed by the plantings activates the recreation activities or sports in various ways.
- In addition, the plantings can exhibit various roles and functions through the "planting distribution" and the pattern, figure and shape of plants.

Environment for Plant Growth and Plantings

It is very important for the practice of planting to understand the plant-growing environment fully. It must be a target of planting that a large scale of park functions in an organic manner for a long period of time in future. In this plant-growing environment, there can be considered various factors such as "biological component", "climatic component", "land and soil component", "artificial component", etc. It is essential to study and practice the countermeasures fully according to these respective components.

Allocational Planting Purpose of Allocational Planting

The term "allocational planting" means to determine the layout among various trees, shrubs and ground-cover plants. The allocational planting is variable according to the purpose of planting and area to be planted. It is important, however, to accomplish the purpose of planting while making effective use of the basic topography, which is modified by the ground modelling. It is also critical that the whole plantings are integrated as a park itself and exhibit an organic effect therein.

Procedures of Allocational Planting

In consideration of living and formal characteristics of planting materials, etc. the layout in vertical constitution and horizontal constitution is determined. For this purpose, it is important to understand the growth and form characteristics among various plant species in consideration of the mixture of species, sizes, quantities, etc. required in the planting plan. And , at the final stage, it is required to handle the layout of plants reasonably and aesthetically.

- **Planting Density**

  The density of planting is variable according to the purpose and function of allocational planting. The density of planting in the whole greenification area becomes the criteria for the quality and extent of greening.

- **Vertical Configuration**

  Being the configuration among shrubs and groundcover plants in the vertical direction, this vertical configuration determines various elements such as "degree of shelter and closeness", "security of visibility through trees and/or shrubs", "spread of open space in tree-planted area", "existence/non-existence of space, etc.

- **Configuration According to Plant Size at the Planting Stage**

  This is the configuration among adult trees, young trees, etc. This configuration should be determined in consideration of volume of "green" at the end of the work and also from the viewpoint of outlook of greenification including the passage of long period of time such as "after 10 years", after 20 years", "after 50 years", etc. In addition, factors of wider range such as "succession of plant ecology", "follower trees in view of preservation of green" etc. must also be considered in the determination of this configuration.

- **Group Plantings and Unit Number**

  In the case of a single tree, of its value as a symbol can be comparatively large. In traditional allocational planting, the group plantings consisting of "2 trees", "3 trees", "5 trees" or "7 trees" easily has the character of arranged planting. If the number of trees exceed such a level, the trees show the feature of grove, or wood.

- **Ratio Between Trees, Shrubs, and Lawn Area**

  While the forest (grove) constitutes a vertical spread, the lawn and/or ground-cover plants create a horizontal spread. A space configuration is determined by the spread in vertical and horizontal directions, layout thereof, rate of shelter, etc.

- **Proportion among Evergreen Species, Deciduous Species and Conifers**

  Determining the character of space configuration in the planting zone, this proportion among "evergreen species", "deciduous species" and "conifers" constitute a scene of contrast, continuity, degree of shelter, harmony, etc.

Guideline on Design of Allocational Planting

Being of a large scale, this park has various elements of landscape. For proper allocational planting, the following points are proposed as the design guideline.

- Unity: To have a unification of quality as a whole despite of the possession of variety.
- Simplicity: Being such that individual factors can easily be recognized without confusion.
- Repetition: To have repetitive expressions of shape, texture and color, etc. This repetition is required especially at those areas which are key points for the whole.
- Graduation: To have gradual increase or reduction of the shape, color, etc. By this graduation, a dynamicism can be expressed. In the actual application, the combination of graduation and repetition is required.
- Rhythm: To have a repetition in a single phase, of "repetition" and/or "graduation" being followed by a certain variation of shape, line and color. By this rhythm, a contrasting factor such

as accent, high-low tone, strength/weakness, slowness/rapidity, etc. can be produced.

- Symmetry: To have a symmetrical layout of shape, color, plane expanse, etc. being centered on an axis. This symmetry can express impressiveness, stability or representative space.
- Balance: To have a conflict between two different directions centered at a point. It is very important to give the same impression between these two conflicting factors in terms of quantity and quality.
- Contrast: To have an opposition from the viewpoint of characteristics such as color, shape, etc. This contrast can produce a kind of variety and beauty.
- Harmony: To produce a familiar unity on an overall basis by making small variations of the characteristics such as color, shape, and figure.
- Proportion: To have mathematical relationships, which create a beautiful scene against the "whole" by the large/small degree on volume or area size or long/short degree on a line.

Planting Density and Quantity of Plants

The number of trees to be planted per unit of area will depend on the planting zone and on the species planted in it. In terms of vertical composition, there can be different combinations of tall, small trees and shrubs, and viewed from above, the crowns will overlap at maturity.

The highest planting densities will occur where conservation greenery is newly provided. Particularly where a natural forest type of effect is to be created, the trees and other plants will have a multistrata composition.

In the detailed planning the planting density of such conservation will decline in the order of that which has elements of a primeval forest, that characterized as a mixed forest and that representing a single-tree type forest. Comparatively high planting density will also be required for windbreak greenery, edge greenery and screening greenery. Although the overall density of facility greenery will be somewhat lower, there is normally some high density planting of small trees and shrubs.

The planting of roadside greenery and aesthetic greenery, on the other hand, is characterized by low density, with priority being given basically to tall trees. In mall greenery, high trees are planted comparatively densely, but there is some high density planting of medium and low trees, which has a considerable influence on the overall planting scenery. In the case of turf greenery, there will be coverage by lawn grass, but since green shade trees will be planted along park roads and at other strategic points of the park, the density of the turf greenery will be extremely low. Nursery greenery will be of comparatively high density, but, of course, it will not be permanent.

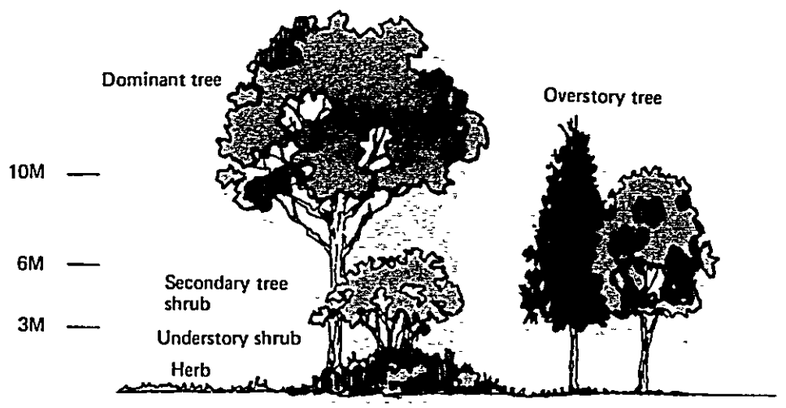
The number of trees to be planted in each planting zone of the park 3110 ha4 will be roughly as indicated as follows.

Table — 40 Planned Planting List

	Tall Tree	Small Tree	Shrub	Small Shrub	Ground Cover
1.	400	500	1,330	9,975	30,000
2.	98	160	325	2,430	500
3.	175	290	580	4,350	—
4.	20	30	60	450	500
5.	56	91	186	1,338	—
6.	327	545	1,090	8,170	—
7.	41	65		920	—
8.	817	1,165	2,364	6,954	—
9.	780	1,550	2,060	1,300	23,280
10.	4,080	4,700	6,280	15,700	180,500
11.	200	200	150	1,700	17,000
12.	45	90	360	1,350	6,000
13.	55	90	180	1,350	7,500
Totals	7,094	9,476	15,095	51,687	474,800

1: National Ceremonial Plaza. 2: Cultural Ribbon. 3: Chronological Ribbon. 4: Actual Ribbon. 5: Liberty Ribbon. 6: Youth Ribbon. 7: Natural Ribbon. 8: Main Gate Area. 9: Lawn Land. 10. Wood Land. 11. Lake and Lakeside. 12. Colombian History Museum. 13. Religion Museum.

Fig. — 55 Multilayered Planting for Vertical Configulation



Nursery

One of the most important park implementation factors is the planting of trees, shrubs and ground covers which precisely represent park environment.
Simón Bolivar Great Memorial Park contains the park project area of 110 ha. for new planting and other park area of 250 ha for improvement of greenification, so that the Whole Park Area is approximately 350 ha.

If the park project area is to be greenified, it will need approximately 80,000 to 100,000 trees, shrubs and other plants.

In consideration of present supply capacity at nurseries in Bogotá area, total demand for the park planting would exceed existing capacity of young tree supply. For this reason a new nursery for the park must be established at an early period.

Following are important considerations for nursery establishment, operations, maintenance and other related subjects

Planned production to meet exact demands according to park implementation needs

a) Quality of produced young trees and shrubs in regard to their size, growing condition, etc.

b) Delivery target for producing numbers of young trees; tree planting periods in the implementation schedule.

c) Selection of species including with native, exotic and hybrid ones.

d) Quality control of production for diverse species, size, numbers and delivery periods in accordance with detailed operation management schedule.

fig. —1

Introduction of new technology for nurseries

a) Containerized planting for safety care and convenient transport

b) Systemerized irrigation for continuous supply of adequate amounts of water to diverse planting group of species, such as sprinkler system, drip irrigation system and mist spray system.

c) Mechanized transportation system within the nursery for systematic transport and distribution of trees with ease and safety.

d) New transplanting methods to meet sizes, characteristics and other conditions of each group of species. Transplanting operational techniques for well grown young trees are needed such as preparation for transpplanting, cutting roots, making root ball, trimming-thinout etc.

Increase of nursery productivity

a) Incentive production system for supplying enough quantities of young trees according to the schedule, with specified species, equal sizes, and right quantities.

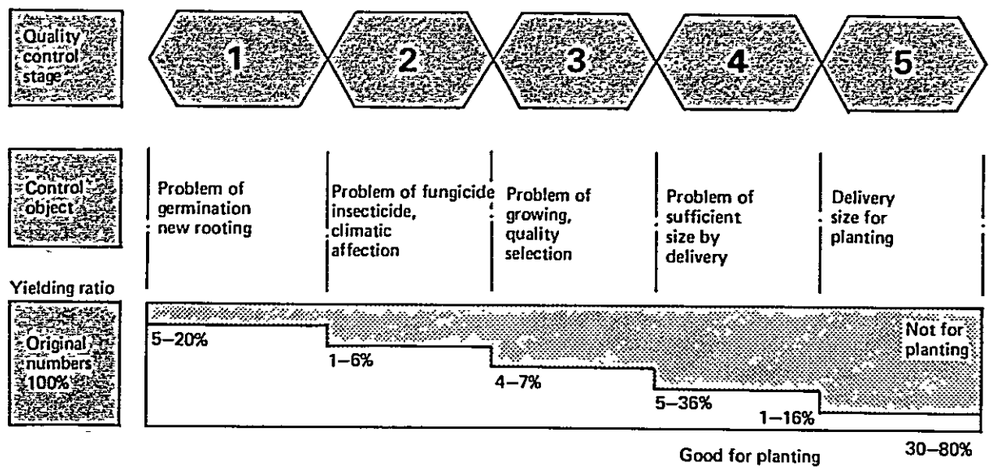
b) Introduction of adequate machinery for planting, transplanting, removing, transporting, digging, lifting and so on. New horticultural tools and nursery equipment also need to be introduced.

Horticultural training and education

A program for training skilled gardeners and planting specialists through advanced technical training and education is a necessary part of nursery management.

The program will contribute to the establishment of new systems of trees and plant maintenance and also to planting implementation in Colombia.

Fig. — 56 Quality Control Flow Chart for Plants Production



Planting Manual

Planting seasons

*Off-season planting should be avoided unless prompt replace*ment is considered important enough to offset the handicaps. Unusual care is required to move plants during seasons ordinarily regarded as unfavorable In the case, plants are set out during the dry season, they will survive only after heavy cutting back, and will remain in a depleted condition, producing little or no leaf effect until the following natural wet and moderate *growing season. Thus, frequently little is gained, and expense* is increased by the necessity of using more careful methods and by the lengthening of the period of artificial watering

Methods of handling

- The method of handling dramatically influences the amount of time required for plants to become established. Other factors being equal, plants taken from containers in which they have been growing start new growth most rapidly

- Plants moved with solid, natural, expertly tied balls of earth enclosing most of *their roots show only slightly less speed of* recovery; and plants moved with roots bare of earth recover more slowly than those handled by either of the other two methods.

- Rapidity of establishment and probability of sucess in transplanting of balled or bare rooted plants are much increased if *the roots are pruned as far in advance of moving* as necessary to induce a compact root growth. In cases of transplanting from the wild, root pruning will make the difference between success and failure.
- Plants with shallow root systems may be root-pruned with a sharp spade, however deeply rooted plants require trenching. Root pruned plants should be plainly tagged or *otherwise marked so that they may be identified at moving* time.

- For the handling during transportation and on arrival, not only is it important to keep the roots from drying out, but also to keep the tops from being subjected to excessive evaporation while the plants are out of the ground.

- Broad-leafed evergreens in excellent condition can be ruined by exposing to the sun and whipped by the wind at high speed.
  Plants should be grouped together and covered, so that transpired moisture may remain in the vicinity. The covering should protect the plants from the sun and wind. When the *plants arrive, they should be immediately tended by placing* in a cool, shady place and by sprinkling unless they can be planted promptly.

Drainage

- *Most plants will die if the soil about them remains saturated* for any considerable length of time. For this reason, adequate drainage must be provided if plants not capable of enduring such conditions are to be used

- It is desirable to dig at least a few plants pits before the plants arrive, and check the *drainage condition.*

- Consideration of using raised beds for the larger and deeper-rooted plants shall be also made.

- Drainage may be accomplished by open ditches, if it is necessary.

Planting operations

- Best weather for planting is an overcast day two or three days after a rain. The soil will be moist but not muddy, and the plants will be spared the wilting effects of the hot sun. *Failing the ideal circumustances*, adjustments will need to be made

- Planting pits and holes. At any rate, pits should be dug at the proper locations. If it is not too wet or poor, it may be treated with humus and other additives and used to backfill the plant. The poorer the soil, *the larger the hole should be*

Setting the plants:

- The plant may now be removed and placed carefully in the pit. In the case of roots with burlap, no attempt is made to remove the burlap, it will soon rot and disappear into the soil.

- With the plant in the pit and level checked so that the level of the plant "crown" and the adjacent ground level are identical, the plant may be rotated until it best side faces the direction most often seen, small amounts of backfill being used and tamped to insure verticality and the backfilling may begin until the top is reached. *Then the pit should finished with generous basin of earth* and watered in throughly.

- Tie the trunk loosely to the stake in order to hold the plant in place temporarily until the permanent guard is installed if necessary.

Pruning

- Unless already accomplished, pruning should be done at this stage. If the material is container grown, there may be little need to prune, or to shape the plant in general.

- *However if the material is deciduous or semi-deciduous*, especially if there is poor root condition, some considerable pruning may be indicated in order to balance the top with the curtailed root system

Mulching

- *Over the surface of the basin should go a mulch* to conserve moisture and reduce evaporation Almost anything that is moisture retentive, inexpensive, and available.

Wrapping

- A sizeable tree with smooth bark, lacking much shade on *the trunk from side branches or other sources, may suffer* from sun scald unless wrapped

- Wrapping would also be required for a young tree transplanted from the wild if the wild environment were shady and new location hot and sunny. *Prior to wrapping, a* judgment should be made as to whether the bark is too tight *or not.*

Guarding

- Trees are vulnerable to a number of circumustances cased *by nature and by man windstorms, bark injury by lawn* mowing machines, vandalism etc. A measure of protection from all these may be afforded by a permanent guard.

Planting ground covers

- The area between trees is to be planted in ground cover, the *surface soil should be treated adequately. The amending* material may be spread uniformly over the surface of the ground and cultivated if possible.

- The ground cover plants will probably be delivered in flats, or in small pots and be planted.

Watering-in

- The final step in any planting is watering-in. Whether sod, shrub, or tree, this should not be delayed.

Utilities Study

Storm Water Drainage System

This plan includes a utility study from a technical point of view to ensure proper, intended functioning of the park.

The study is only for the area which the JICA Study Team is in charge of. It is necessary to coordinate it with the further studies of utility plans of the other parts of the park.

Storm Water Drainage System

Regarding the storm water drainage pipe network around the park area, which will be constructed along the roads surrounding the park, a pipe network has partially been installed for the former chancelled residential development.

The present storm water catchment-basin is generally classified into three drainage directions. This drainage is made into the downstream 3 canals: "Canal Del Rio Salitre", "Canal del Rio Nuevo" and "Canal del Rio San Francisco."

According to "Zonificacion de Acuerdo A la Precipitacion" of "The Empresa de Acueductory Alcantavillado, Bogota, D.E.", this area is positioned almost in the Catchment-Basin Zone 3.

Calculation of Rainwater Drainage Volume and Downflow Capacity of Existing Sewer System

- **Calculation Basis of Formula of Rainfall Intensity**

  Talbot's formula of rainfall intensity is calculated for the individual year of probability according to "Curres-Intensidad-Duracion-Frecuencia" of The Empresa de Acueducto Y Alcantarillado, Bogota, D.E.

- **Calculation by Talbot's Formula of Rainfall Intensity**

  In the Catchment-Basin Zone 3, the 15-minute rainfall intensity and 60-minute rainfall intensity are as follows for the individual years of probability.

Table – 41 Rainfall Intensity for the Individual Years of Probability

	I^{15} (mm/hr)		I^{60} (mm/hr)	
N (YEAR)	q^{15} (ℓ/ha/sec)	$^{15}=360\times q^{15}\times 10^{-3}$	q^{60} (ℓ/ha/sec)	$I^{60}=360\times q^{60}\times 10^{13}$
3	190	68.4	79	28.4
5	209	75.2	79	31.7
10	243	87.5	103	37.1
20	279	100.4	118	42.5
40	316	113.8	132	47.5
100	329 (20 min)	110.9	160	57.6

- **Coefficient of Flow and Rainfall Year of Probability**

The standard values of flow coefficient per individual type of work and use are as follows.

Standard Values of Basic Flow Coefficient per Type of Work

Table – 42 Standerd Values of Basic Coefficient of Rainwater

Type of Work	Flow Coefficient
Roof	0 85 ~ 0 95
Road	0 80 ~ 0 90
Other non-pe rmeable sur- faces	0 75 ~ 0 85
Water surface	1 00
Intermediate non-occupied area	0 10 ~ 0 30
Park having plenty of lawn and trees	0.05 ~ 0.25
Mountain area having little gradient	0.20 ~ 0.40
Mountain area having large gradient	0 40 ~ 0.60
Commercial area or similar residential area having very little intermediate land within a premise	0.80
Industrial area having some permeable intermediate area such as outdoor work place, etc. and residential area having a certain extent of gardens	0 65
Area where intermediate height housing or many detached houses are located	0.50
High-class residential area having many gardens or suburb area with many agricultural farms	0 35

The average flow coefficients in this park area obtained by the above given standard values are as follows

Table – 43 Average Rainwater Flow Coefficient in This Park

Type of Work	Area size A (ha)	Coefficient of flow	A×f
Lake	10	1 0	10 0
Non-permeable surfaces such as road, building, plaza, etc	20	0.8	16 0
Park (green area)	130	0 2	26 0
	ΣA = 160		ΣA×f=52 0

The average coefficient of flow

$$fa=\frac{\Sigma A\times f}{\Sigma A}=\frac{52.0}{160}=0.33$$

The average flow coefficient of the area other than lake is:

42.0÷150=0.28

From these viewpoints, the coefficient of flow is lower than in the residential area, which was originally scheduled for former residential development. It seems therefore that the volume of drainage is smaller that expected.

It is generally practiced in sewage system planning to use 3 years ~ 7 years as the rainfall year of probability, Although the initial rainfall intensity is large in the park-planned area, the rainfall year of probability "5 years" was adopted from the standpoint of the existence of a lake having the retarding function.

- *Classification of Catchment-Basin within the* Park and Calculation of Stormwater Flow Rate

The rational formula is used for the calculation of rainwater flow volume.

$$Q = \frac{1}{360} \cdot f \cdot I \cdot A$$

Wherein,
Q: Flow rate (m^3/sec.)
f: Coefficient of flow
I: Rainfall intensity (5-years probability)

$$I = \frac{2,500}{t+18} = \frac{2,500}{32+18} = 50 \text{ mm/Hr.}$$

t Hours of rainfall duration
$t = t' + L/V < 32$ min.
t': Arrival time at initial stage 7 min.
L: Maximum length of waterway 1.5 km
v: Average flow rate in pipe 1.0m/sec.
A=Area size of catchment basin

Similarly to the present rainwater drainage plan, the catchment basin in the park is classified into three. This water is discharged in the respective downstream channels through the existing drainage pipe network.

The volume of flow from the individual catchment basin in the park can be calculated as follows:

Downflow Capacity of Existing Drainage Facilities

The downstream capacity of existing drainage pipe routes, which lead the storm water in the park to the downstream channel, can be estimated as follows according to the section of pipe and gradient thereof by using Manning's formula.

Table — 45 Capacity of Existing Storm Water Drainage

Classification of stream Area	Section and gradient	Capacity of downflow (m^3/sec)	Flow volume within the park (m^3/sec)
To Canal del Rio Salitre	2.0–0.3%	8.3	1.2
To Canal del Rio Nuevo	1.7–0.25% 1.5–0.3%	4.9 3.9*	3.2 0.2
To Canal de Rio San Francisco	1.75×1.3–0.13%	3.9*	2.8

* Including rainwater of the area other than the park-planned area

It seems from the viewpoint of the above values that the existing drainage pipe network has the capacity to accommodate the flow volume of rainwater within the park area.

Drainage System

Being collected directly by the open channel which is installed along the park roads, the rainwater is discharged into the existing sewerage pipes located downstream.

The rainwater collected at the center of park is led to the lake through the drainage ditches that are installed along the park road. Then, it is discharged from the lake into the existing sewerage pipes located downstream.

From the viewpoint that the plaza is designed low so that it may be surrounded by roads and sightseeing artificial hills, it is not cost-effective due to large volume of soil cover to connect the sewer (for rainwater at the plaza area) directly with the downstream drainage pipes. Therefore, such rainwater is led to the lake, and then discharged into the existing drainage pipes located downstream.

In order to make no change of the existing catchment-basin system, an over flowing weir structure is adopted for the discharge from the lake so that approximately the same volumes of discharge may be accomplished at two points. Thus, the discharge is to the existing downstream drainage pipes.

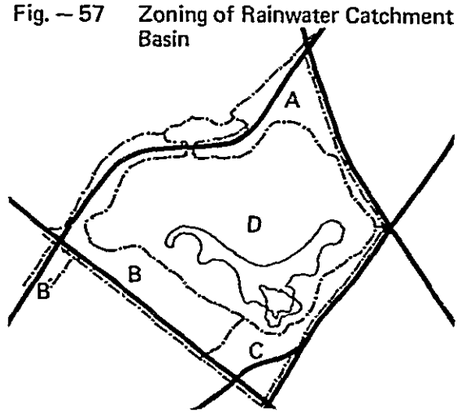
The open channel system is mainly used for the drainages within the park. Where the pipes cross artificial hills, however, the pipe route is utilized on both the discharge sewer from the lake and the sewerage from the plaza to the lake.

The section of drainage routes will be determined according to Manning's formula.

Table — 46 Volume of Rainwater Flow to Existing Each Drainage from the Park

Classification of stream area	Stream area No. in the Park	Area size of stream Area A (ha)	Coefficient of flow f	Volume of drainage (m^3/sec) $Q = \frac{1}{360} \cdot f \cdot 50 \cdot A$
To Canal del Rio Salitre	A	30	0.28	1.2m^3/sec
	B	25	0.28	1.0
To Canal del Rio Nuevo	1/2 of D • Lake	10/2	1.0	0.7
	1/2 of D • Except for lake	75/2	0.28	1.5
	B	5	0.28	0.2
To Canal del Rio San Francisco	C	15	0.28	0.6
	1/2 of D • Lake	10/2	1.0	0.7
	1/2 of D • Except for lake	75/2	0.28	1.5

Fig. — 57 Zoning of Rainwater Catchment Basin



Water Supply

- Hydraulic Pressure and Estimated Supply Capacity of Existing Water-Supply System

According to the data given in "The Empresa de Acueducto y Alcantarillado Bogota D.E.", the hydraulic pressure of existing water-supply pipe-routes is as follows:

Maximum hydraulic pressure 47m (4.7 kg/cm²)
Average hydraulic pressure 37.8m (3.78 kg/cm²)
Minimum hydraulic pressure 32m (3.2 kg/cm²)

It seems, however, that these amounts show the hydraulic pressure of main pipe-route at the park plan area. The present supply capacity from the existing water-supply pipe-routes to the park plan area is not clear. Since it seems that it will be possible that the volume of fresh water, almost the same as the volume of waste water (planned), which was originally scheduled for the residential area (located herein), can be supplied to this park plan area, the calculation of capacity can be made as follows according to "Caudal Promedio de Aguas Negras" of The Empresa de Acueducto y Alcantarillado Bogota, D.E.

1.3 ltr./sec./ha. (Grupe-B) × 160 ha. × 24 hr. × 60 min. × 60 Sec. × 10^{-3} ≒ 18,000 m³/day

- Calculation of Water Supply Volume to Park Facilities

The clean water which is required for park facilities can roughly be classified into the following three types.

1) Living utility water for individual facilities

2) Sprinkling water for around facilities

3) Water source of non-utility water facilities such as lake, cascade, etc.

Regarding the fire-protection water, a fire hydrant is not installed from the viewpoint that no possiblity of a spreading fire exists due to separate (detached) positioning of individual facilities and that the lake can furnish abundant water.

- Calculation of Living Utility-Water Volume in Individual Facilities

The water-supply volume (per day) can be estimated as approximately 230m³ on the basis of the calculation of the demand of individual facilities.

It is less economic and undesirable to install a water-supply system for use by people who have temporarily gathered, such as for a ceremony, etc. Therefore, the volume of living utility water is calculated herein only for the number of persons who will be present at normal times.

In order to cope with the temporary concentration of people, however, it may be necessary to stop the water supply to the sprinkling facilities and lake and open the emergency branching valves installed in the pipe-routes for such sprinkler and lake.

- Calculation of Sprinkling-water Volume around Individual Facilities

The sprinkling operation based on the clean water will be made only for the plants located around individual facilities. It seems that the maximum volume of sprinkling water (per 1m² of planted area) is approximately 5 mm/m²/day.

- Calculation of Water-Supply Volume for Non-utility Water Facilities Such as Lake, Cascade, etc.

The volume of water supply to the lake is 300 ∼ 500 m³/day as described in "Landscaping Study" in this report.

Since a recycling system is to be used for the cascade and stream along the Urban Ribbons, only the replenishment of water to make up for evaporation should be considered in terms of water-supply volume.

It seems that the volume of evaporation is about 3 mm ∼ 5 mm/m² per the water area "1m²" although it is variable depending on the climate and season. Thus the calculation can be made as follows according to the area of water surface.

	Area size of water (m²)	Volume of water supply (m³/day)
Cascade	800 m²	3∼4
Route of stream along Urban Ribbons	Width Length AV. 1.5 m×2000 = 3000 m²	9∼15

- Calculation of Water-Supply Volume to Park Facilities

It can be concluded as a result of the study mentioned above that the maximum water-supply volume (per day) required for the park facilities is about 1,300 m³/day.

This necessary water-supply volume is largely exceeded by the estimated supply volume from the existing water-supply pipe system (18,000 m³/day), which is already installed in the park plan area.

Therefore, the existing water-supply pipe system can fully satisfy the demand if a connection can be made with this existing system.

- Water-Supply Network Plan

Even in consideration that the level of prepared ground foundation (of the park-planned area) is higher than that the surrounding roads, where existing water-supply pipes are installed, no booster pump will be required if the minimum hydraulic pressure of existing water-supply pipes can be secured at 3.2 kg/cm².

Unlike working facilities such as hospital, plant, etc., the use of normal level of water is not required in the case of park facilities (due to their nature) even when an interruption stop of water supply ocurrs because of power failure, etc.

To both main facilities (Colombian History Museum and Religious Museum), however, a water-storage tank (for approx. 1-day's use) and water-supply pump shall be installed from the viewpoint of safety.

• Water-Supply Pipe Network

In the areas other than the plaza, no network connection is required among the dispersed facilities from the viewpoints that individual facilities are dispersed and that the water intake can easily be made respectively by the individual facilities from the existing water-supply pipes located under the surrounding roads.

From the viewpoint that the reduction of hydraulic pressure may occur, if water intake is made at the terminal of auxiliary main routes, at the upstream points in addition to the reduction at such terminal points, both water volume and hydraulic pressure must be secured by making the direct connection with main pipe routes.

It seems from the viewpoint of pipe diameter that the 42" main pipe route running across the park area is installed for supplying water to the population of approx. 100,000.

From the viewpoints that the citizens' life is seriously influenced by an interruption of water supply if such a pipe route is changed, as well as the higher cost, such change is to be avoided unless a new main is required because the old one is no longer usable.

From these standpoints, it is quite important to give no excessive load to the pipes of this main route during the preparation work of the park. In addition, it is desirable in view of maintenance to install the main pipe parallel to park roads.

The volume of use of water at the individual park facilities shall be measured by meters, which will be installed at the respective branching points.

• Plan of Water-supply Pipe Installation and Pipe Diameter

From the viewpoint of maintenance, the water-supply pipe shall be installed under the footpath or park road to the extent that is practical. The soil cover above the route shall, as a rule, be 1.2 m where wheel-load is given and 1.0 m where the route is installed below a footpath or park road.

The diameter of water-supply pipe shall, according to the flow rate, be 8"~6" in the case of an auxiliary main route and 4"~3" in the case of a branched route.

The water-supply pipe must be designed according to the maximum water-supply volume (per hour). In consideration of the nature of park facilities, which are utilized in the daytime only, the living utility water of individual facilities shall have the maximum water-supply volume (per hour) amounting to 3 times the per-day water-supply volume.

In the case, however, of water supply for sprinkler and non-utility facilities, no time variation exists.

Therefore, the maximum water-supply volume (per hour) will be as follows for the whole park facilities.

230 × 3	+	480	+	520	≒	1,700 m³/day
(Living utility water of individual facilities)		(Sprinkler)		(Non-utility water facilities)		

For the head loss and calculation of flow rate of water-supply pipes, the Formula of Hazen-Williams will be used.

Sanitary Sewer

The comparison between the waste water volume of the individual drainage system (calculated from the existing data) and the capacity of existing downstream pipe facilities, which was estimated from the section and gradient of stream according to Manning's Formula It may be defined that the existing drainage pipes can fully satisfy the necessity of drainage in the park.

Through the calculation of waste-water volume, it was presumed that the volume of living utility water supply of the individual facilities is equal with the volume of waste water and that the maximum waste-water volume per hour is 3 times as large the maximum waste-water volume per day.

Plan of Waste-Water Drainage System in Park

- From the viewpoint of maintenance, it is desirable that the sewer pipes be installed below the footpath or promenade as in a large scale as possible
  The minimum soil cover above the sewer pipes shall, as a rule, be 1.20m.
- The minimum diameter of sewer pipe shall be 8".

Lighting and Power Supply

Outdoor Lighting

The illumination should be maintained to the extent that people visiting the park at night will feel safe. As to the lighting method, a mode providing quiet atmosphere, while insuring that objects can be seen clearly, should be adopted. In this planning, outdoor lighting is classified as follows according to the concept suggested previously.

• Plaza Lighting

It is thus planned to erect an about 20 m high pole bearing six HF 1000-W mercury lamps maintaining an illumination of 50 to 100 lux within a range diameter of about 30 m.

• Mall Street Lighting

6-m. poles with decorative lighting fixtures fitted with two HF 250-W mercury lamps will be erected along one side or both sides of mall street providing an illumination of 5 to 7 lux on average. These will be set up extending from the area where the illumination of the Plaza Lighting becomes 7 to 10 lux so that the lighting effect will be harmonious.

• Park Security Lighting

As explained in the "Park Operation Program", the garden is not usually used at nighttime and the lighting for security and maintenance is ample. For this purpose, an average illumination of above 0.5 lux will be maintained by using the 5 to 6 m poles with HF 250-W mercury lamps. Regarding lighting for entertainments, exhibitions, etc., permanent lighting fixtures have been determined to not be necessary, due to consideration to frequency of use and economy. The lighting equipment for the above purposes should be brought in as required. Necessary power sources for such will be installed at strategic terminals.

Temporary Power Source

Temporary power sources for entertainment lighting will be installed as specified below.
In expectation of frequent occupation of the Parade Plaza Space, the power distribution panel will be installed there with a power source of 300 KW in total.

For arbitary locations, a generator is recommended to be employed as necessary.
For lighting small scale exhibitions, power units of about 30 KW will be installed in 10 places.

Power Receiving and Distribution

The comprehensive and nation-wide electric system is planned and operated according to the policy and control of the Secretariat of Electricity. Therefore, the plan for the electric system for the park must be negotiated in advance.

However, in this report, from reasons of economy, we propose that a branch line be connected to the existing distribution cables at each appropriate place, where electricity of high voltage will be received and supplied to each power unit. Transformers will be installed for facilities and areas requiring electricity of capacity above 50 KVA or 100 KVA. To other facilities and localities power shall be supplied after voltage is decreased by means of pad-mount transformer cubicles. Distribution lines within the park will be installed underground so as not to harm the scenic appearance of the park.

Power Demand

According to conditions mentioned above, the power demand forecast has been estimated as 2,500KW.

Telecommunication

The telecommunication network plan will be made according to the conditions below:

1) As a rule, telephone lines within the park will be installed underground.
2) Two to three telephone boxes will be installed in each plaza according to its requirements.
3) In each administration building, more than one telephone for exclusive use and one public telephone will be installed.
4) 10 telephone sets will be placed in different spots within the Urban Mall.

Announcement System

The announcement system within the park area shall consist of the following two systems:
1) General Announcement System
2) System for Acoustic Effects

• General Announcement System
– Speaker
There are two models of speakers concentrating or dispersing sound respectively. For example, the concentrative class of speakers are installed at wide places such as collective farms to convey information. For this purpose, the large trumpet speaker is effective and the cost is low. However, because of the possibility of echo production due to speed of sound travel and the need for fairly large acoustic pressure, a minor nuisance may occur to residents around the area. It is not suited for use in amusements, as the sound quality is not amply modulated. Therefore, to insure a vast range of announcement capacity with melodious resonance, speaker on column type will be installed in different places.

Line Facilities
Messages can be announced by wire or wireless. When the wireless method is utilized, it is obligatory to make previous arrangements with the radio regulatory agency.

When adopting the wiring system method, the cable must be installed underground and the construction cost will be increased.

• System for Acoustic Effect
Construction cost (equipment and installation cost) can be very high, or very low depending on what is desired. Therefore, the kind of system to be used will be determined by directors' way of thinking and budget boundaries. It is further necessary to determine whether the system should be permanently or temporarily installed. With this procedure, a system of a certain level will be selected temporarily and be installed as extra equipment for the park.

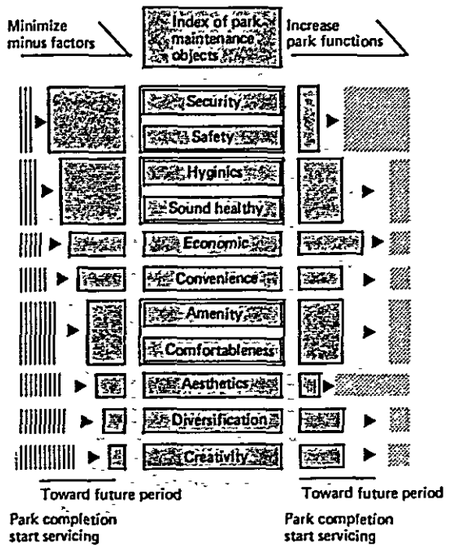
Park Operation Idea

Regular checking and maintenance is required in order for the facilities, equipments, electricity, water supply and drainage systems to function properly. Furthermore, security controls are needed for facility areas as well as whole park area.

Although trees and shrubs are planted in such a way as to suit their individual characters and environmental needs, there tends to be subsequent change in the environment and some unadvisable planting practices because of a desire to keep on schedule in spite of unforeseen difficulties and problems.

Thus, contribution to environmental control and coordination regarding the diversified functions of park and park facilities shall be the main objectives of maintenance in this park.

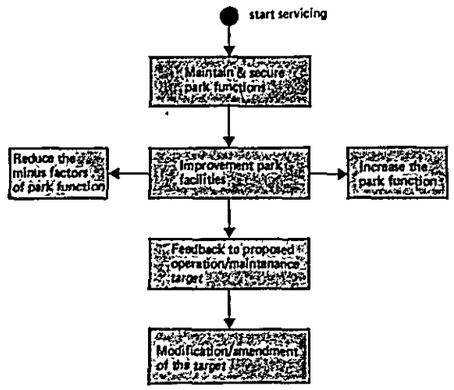
Fig. – 58 Key Factors of Park Maintenance



System and Flow of Park Maintenance

Systemizing the maintenance of the park is the quite complicated, because maintenance objectives of the park is being in the system of natural environmental system. While Man-made landscaped park components shall be classified into two main maintenance aspects: one is minimizing the minus factors of the maintenance of the function of landscaped park components and the other is the increasing the function of these components.

Fig. – 59 Park Maintenance Flow Chart



Maintenance Items and Objectives

The site cleaning and refuse disposal, landscaping and gardening, utility and mechanical care shall be the most important elements of the maintenance of the park which must be carried out according to well defined schedules.

The basic objective of the park maintenance and control is to keep the park facilities, equipment, planted materials and etc. functioning properly, their main functions being enhancement of the efficiency of land use in the park, provision of the amount and quality of public service needed, provision of recreation opportunities, including space and amenities and establishing the greenery.

Maintenance of the Plantings

At the completion of the planting, the trees and shrubs are in immature state of condition, and require much care.

Maintenance should follow planting with such continuity that no period of neglect will endanger the successful growth of the plants. The sequence of operations should reflect not only their urgency, but how they affect succeeding phases.

The amount and type of maintenance will vary with the species, condition of the planting time, size and location, fluctuation of the temperature, precipitation, wind etc. Major items are clean-up, moving, watering, weeding, cultivating, fertilizing, pruning, controlling insect and disease and repair of tools and equipment.

Annual Event List

Operation Idea for Activation of Park Use

In order to achieve a suitably high level of park use, it is desirable that the Operation Division assume the central role in conceiving and planning a program of events and activities, in coordination with Bogota city officials, state officials, and central government officials, which correspond to the themes of the zones, and obtain the cooperation of the related offices and organizations to publicize the program, and implement it.

It is also essential that in each section responsible for management of each zone that a cooperative posture be adopted and communications be maintained with respect to private bodies and government offices which are concerned with cultural affairs, the arts, education, sports and floriculture, and soon, so that they may propose events and activities and that those proposals can be suitable evaluated for adoption. A system must also be adopted so that requests from citizens for use of park facilities can be accepted and processed.

In the programming of such an annual operation plan of events, a workable arrangement whereby there can be discussion, and subsequent cooperation and coordination, by the administrative, maintenance and security divisions. Moreover, a detailed implementation program incorporating seasonal, monthly and weekly schedules should be programmes; a system for providing the public with advance information on the program, and a system for review of events and activities after they have taken place are needed. Arrangements for budgeting and badget control are also essential.

	JAN.	FEB.	MAR.	APR.	MAY.
Plaza de la Commemoración	• New Year's ceremony	• Amateur Theatre, concerts • Other activities requested by citizens • Jazz and rock concerts etc	• Theatre for college students • Book fair • Memorial concert	• Memorial concert	• Brass band concert for college students • Amulet fair
Camino de las Bellas Artes	• Amateur photographers, painters, sculptors illustrators exhibitions	• Poetry reading nights	• Postcard concours	• Book fair	• Poster show
Plaza de las Serenatas		• Serenade by professional singers	• Folk song concours (competition among districts)	• Bogota citizens serenade concert • Folk songs contest of children	
Camino de las Esculturas		• New Sculptors Show		• Schoolchildren s Sculpture Exhibition	• Bogota Citizens Sculpture Exhibition
Plaza de la Danza	• Dance Day	• Dancing teams presentation			• Bogota Citizens Dance Contest
Plaza de los Aborígenes	• Revival of ceremonies of Familia Chibcha		• Children s plays from the Bachue legends	• Revival of ceremonies of Familia Caribe	
Sendero de la Cultura Prehispánica				• Indio Brothers Festival (Arteca Day; Maya Day Motca Day; Inca Day)	
Plaza de la Hispanidad			• Mestizaje festival	• Dia del idioma	• Nueva Granada Festival
Paseo de la Independencia		• Children's Parade of War Heroes			
Plaza de la República	• Andes Children's Jamboly				
Plaza de la Comunidad	• Youth Month events	• Blood Donation Campaign	• Women s Month events	• Used goods exchange	• Dia del Trabajo
Plaza de las Industrias	• Emerald Queen contest	• Coffee Festival (testing, sale)	• Pottery market		• Leather products trade show
Plaza de la Municipalidad		• Bogota City Founding Day ceremonies	• Social Welfare Day	• Taxpyers information Day	• Water Save Day
Plaza de la Madre y el Niño	• Toy Hospital Day	• Goldfish Festival	• Kindergarten Play Day	• World toys Exhibit	• Charity Bazaar
Camino del Abecedario			• Boat races (Bamboo Leaf)		• Spelling bees quizzes
Plaza de la Tecnología	• Invention Contest for National Patent Day)	• Petrochemistry Exhibition		• Railroad Day (introducing new railroad systems exhibiting steam locomotives etc)	
Camino de los Atletas			• Physical skills contest		• Athletic equippment race
Plaza de los Deportes	• Bogota Citizens Marathon	• Bogota City Bicycle Race		• Youth race around the park	
Plaza de las Flores	• Ornamental plant contest	• Potted plant sale			• Beautify Bogota movement activities (e g , free distribution seeds)
Plaza de los Arboles	• Horticulture instruction month		• Flower and plant sale	• Green Bogota publicity (seedings distribution)	
Plaza de los Comuneros					
Plaza de los Precursones					
Plaza de los Martires					
Plaza de la Independencia					
Plaza Ceremonial			• Apertura de Intercolegiados		• 24 Pichincha
Plaza de la Gran Colombia			• Primer Arzobispo de la Republica		• Congreso constituyente de Cucuta • Eleccion del Presidente
Sendero de la Paz					
Plaza de la 6 Republicas					
Mi-Tierra				• Concursos de gallos	• Concursos de musica tipica
Plaza de los Comuneros		• Sanfoco de José Antonio Motin en el Socorro G y Compañeros		• Batalha del Puente Real de Velez	
Plaza de los Precursores					
Plaza de los Martires		• Fusilados de Cartagena			
Centro de la Communicación		• Dia de la Radio		• Dia de la Comunicacion Social	

It is important that there be implementation and control over the events and activities presented by or with the cooperation of related government offices and private bodies as part of the program for park activities.

JUN.	JUL.	AUG.	SEPT.	OCT.	NO .	DEC
• Film showing • Concert • Folklart fair	• Drama composition	• Water sound light shows (using laser rays)	• Legend and folk tale month	• Brass band composition	• Poetry night (readings) • Book fair	*Creative theatre month* • Enero a diciembre correcto
• Flower poem concours	• Paper cutout festival	• Love poem concours • Poet of the month concours		• Stamp fair	• Poetry concours • Book fair	• Enero a diciembre correcto
• Evening concert by famous singers	• Folk Song Presentation Concert		• Intercollegiate Song Festival		• *Folk song concours (competition among districts)*	• Diciembre Villancicos
		• Contemporary Sculpture exhibition	• College graduates show	• Grand Colombia Sculpture Exhibition (Andes Sculpture Show)		• Abstract Art Show • Enero a diciembre correcto
	• Famous dancer performance	• Traditional Dance Preservation Programs	• Bogota Citizens Costumes Ball	• *Children's folk dance lessons*	• Concursos de Danzas intercolegiados	• Inter collegiate dance concours
• Children's plays from the Bochica legends	• Revival of ceremonies of Familia Arawac	• Fiesta conmemoracion de los Quimbayas Pijaos y Timanicos		• Revival of ceremonies of Familia Agutinana	• Colombia Archeological Exhibition	
• Colonial era plays	• Spanish dances			• Colombus Day gathering		• Criollo festival
		• Boyaca Victory Festival			• Cartagena Independence Festival	
	• Independence Day celebrations	• Folk song and dances of the Indean nations				
• Little Kindness Movement Month	• Handicapped Persons Month	• Beautify Bogota Movement	• Citizens Charity Bazaar	• Traffic Safety Campaign Month	• Community Chest campaign events	• Christmas celebrations
• Dairy products trade show	• Fruit market		• Glass products show			• Apparel contest
• Weights and Measures Day		• Quitar la fundacion de Bogotá		• Postal Service Day (combined with release of a stamp)		• *Road improvement and Road Safety Day*
• Mothers' Handmade Puppet Day	• Ice Cream Day	• Animals of Colombia Festival	• Puppet shows	• Tree climbing contest	• Insect Festival	
			• Concurso de Pintura Infantil			
• Weather Monitoring Exhibition	• Aeronautics Day (airplane exhibition)		• Space Technology Exhibition		• Resources Development Technology Exhibition	
		• Children's tree climbing race				
• Arm Wrestling championship meet	• Guinness Book record attempts	• Rollerskating race	• Strength contests (tug of war etc.)	• Mini-football classes for children		• Rope skipping contest by father-son teams
• Rose contest		• Carnation show	• Plant doctor clinic	• Chrysanthemum show	• Lectures on plants and flowers	
	• Plant doctor clinic					• Date of Christmas Tree • Decoration of the Christmas tree (Giant Tree)
						• Christmas carols
• Congreso Anfictónico de Panama	• Ley Fundamental de la Union			• Bolivar Santander Primeros Presidente y Vicepresidente		• Fundación de la Republica de Colombia
• carabobo	• Gran desfile Militar • Desfile de la Juventud	• inauguración de los eventos nacionales y deportivos • Junin • Boyacá				
• Bolivar consolado la paz de Quito						
	• Entrevista de Bolivar y san Martin			• Rendicion del Cartagena	• Se Ferma el tratado del Wisconsin • Encuentro de Bolivar y Morale en Santa Ana	
	• Colombia • Venezuela • Perú	• Ecuador • Bolivia			• Panamá	
	• Concursos de Caballos de Paso		• Concursos de corralejas			• Concurso de Comida criolla
• Firma en Zipaquira de las capitulaciones				• Dia de la insurreccion de los comuneros	• Memorial de Agravios	
• Natal Francisco Miranda • Muere Francisco Miranda • Nace Simón E. de Bolivar						
• Primeros fusilados en Santa Fe • Fusilado José M. Carbonell	• Fusilado Jorge I. Lozano • Fusilado en el Socorro A. Santos	• Fusilamientos en Zipaquirá		• Fusilado Camilo Torres, Pedro F. Valencia • Fusilados Francisco J. de Caldas y otros	• Fusilado Policarpoga Salavarrieta y otros	
• Dia de la Prensa		• Dia del Soldado	• Dia de la televisión			

Park Producing

Dramatic Park Producing

In order to create a park as a total environment there is need for a comprehensive "producing" whereby harmonized use is made of large "stage" type elements such as land forms, plantings and the like, as well as "sets" and "props" such as outdoor furniture, and "special effects'+ such as sound and lighting, not to speak of the total graphic design function and effects, expressed in forms such as information display boards and signs.

With regard to Urban Ribbons in particular, it is essential that space from the north and south sides to the Ceremonial Plaza be treated by use of light and sound in a manner similar to composing of music ranging from symphonies to rondos.

Sign Planning

The following is an explanation of basic principles and matters to which attention will have to be given in the graphic design.

What is Graphic Design Standards?

Graphic design standards will help to accentuate the characteristics of the park a great Memorial through graphic design by serving as guidelines for design unity.

They will determine such basic elements as the symbol marks, logotypes, and symbol colors of each park as basic elements and indicate specific sizes and coloring for the design of the park flags, tickets, posters and pamphlets.

They will also determine the type of lettering, pictograms, and coloring of the sign plates and signboards for smooth guidance of the visitors within the parks as a visual communication system.

Signs

The sign planning will aim at the function of visual communication at places of an international and public nature. In a complicated environment the signs will serve as a means of visual communication that will impart the same information to a large number of people at the same time and rapidly and guarantee proper flow of people within the parks. The signs must not only be attractive and functional in their own right but also blend in well with their surroundings, including adjacent buildings.

General Principles for Signs

The following general principles for the signs will ensure that the flow of people within the parks is smooth:

- Standardization: Unity of design within each area.
- Continuity: Signs indicating direction should be placed wherever needed by visitors, and there should be continuity between them.
- Simplicity: The signs should be as simple and readily understandable as possible.
- Readability: The size of the signs should be determined by the distance from which they are to be read, and visitors should be able to read the signs without difficulty under all circumstances.

Besides these principles, the psychological elements of attractiveness, reliability, and pleasantness should be added in the actual design of the sign plates.

Types of Signs

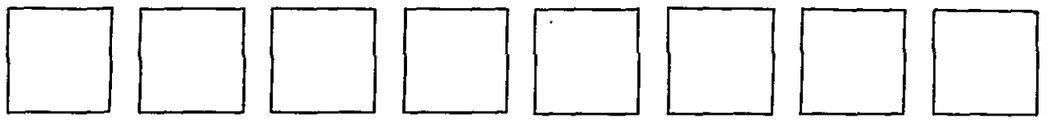
Identification signs:
Signs showing names of theme zone-area, theme plaza, facilities, service Facilities, etc., including door signs.

Direction signs:
Signs indicating the direction to facilities and other destinations, including the distance if necessary, and which are to be located along approach roads and at forks and open spaces for convenience of visitors.

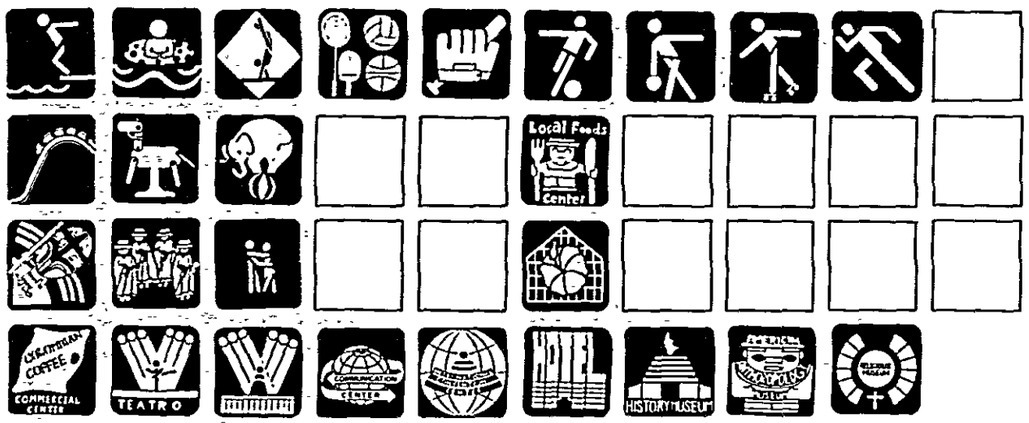
Information signs:
Signs showing the layout of the parks, giving information at the gatherings and entertainment or other events, and indication of prohibition of matters which must be noted.

Theme Zone

Fig. –60 Ideas of Park Sign



Theme Area



Service Facilities

Park Producing by Sound

Ordinarily the element of sound in a park would be comprised of water features such as cascades, fountains and brooks, or the singing of birds. It is particularly through the various sounds of water, in cascades, fountains, etc. whereby aural means will be evoked for forming a continuity pervading the entire park. The singing of birds will be heard in more suitable surroundings of the Bird Sanctuary and elsewhere in the park's forests.

At the same time that such use is made of natural sounds, it will be essential to arrange for musical effects, through the events in the Urban Ribbons and especially the Ceremonial Plaza. In particular, when ceremonies and events for gatherings as large as 50,000 persons are held in the Ceremonial Plaza, it is necessary to have an atmosphere which regulates the flow of the event, and heap up it. A similar requirement exists with regard to the theme plazas of the Urban Ribbons.

Because of the variety of requirements regarding audio equipment, which requirements would depend on such matters as the nature and scale of the events, it would be desirable to use movable equipment rather than equipment fixed in place; thus would also be helpful with regard to maintenance of the equipment.

Park Producing by Illumination

It is particularly important that the Ceremonial Plaza and Urban Ribbons be endowed with the capability of accommodating 24-hour use. As ribbons of light that will stand out from the rest of the park during the evening hours, they are accorded high importance in park planning for the feeling of security they impart, as well as their high drawing capacity as cultural and recreational centers of the city.

At the times of events, it will be indispensable to make use not only of audio effects but also of lighting effects. The use of lighting need not be limited to conventional uses but also could and should include the use of lasers, giant video screens, fireworks displays, etc., and it will be necessary to devise a system which could plan and carry out lighting effects in keeping with the nature and scale of the evening events. It is expected that temporary lighting facilities should be used on an event-by-event basis, in consideration of the temporarily greatly-increased power requirements and the cost of acquiring and maintaining equipment.

In addition, special lighting, whereby attention is also given to color effects, will be needed at cascades, fountains and symbols.

Particular emphasis is to be given to lighting in the Ceremonial Plaza and Urban Ribbons.

Park Producing by Symbols

It is desirable that symbols, in addition to their function of providing the element which creates the commemorative and symbolic nature of the park, have the function of emphasizing the identity of each area of the park and comprise the climax points of vistas created in the park, should at times be outstanding works of art, suitable for aesthetic appreciation.

The monuments located in each plaza and along the Pedestrians of the Urban Ribbons not only are desired to embody the cultural, artistic, historic, educational or other theme of each Ribbon but also the comprise a linked sequence of monuments.

The huge Memorial Walls at the south and north end of the Urban Ribbons, and the Giant Tree, are required to be of such great scale to attain and convey the commemorative and symbolic impression the park is intended to give and they therefore require special lighting at night, and treatment so as to stand out in the proper way when seen from a distance.

Outdoor Furniture

The installation of outdoor furniture to meet four types of functional requirement will be necessary. They may be classified as follows.

- Information function
  Information and sign boards about the park, its facilities, events and moving about in it telephone booths, public address systems, clocks

- Service function
  Kiosks, drinking fountains, toilets

- Amenity function
  Fountains, cascades, ponds, canals, benches, ashtrays, dust boxes, flower boxs, pergolas, illumination, canopies

- Safety function
  Bus stops; traffic signs, road crossings (markings); street lights; security lighting

As is stated above, the major components of the park are water features, lighting, symbols, land forms, facilities and planting. In addition to these, various types of furniture, for functions noted above, are also necessary, and they must be planned in accordance with a coherent, unified design policy. It is further necessary that all furniture be harmoniously matched to the immediate environment of use, so as to stand out at the same time as they blend into their surroundings, which is to be attained by control over design and coloring. Thus, design here is required to fulfill a purpose other than that of conventional physical functions.

Appendix:

PLANT LIST

TALL TREE • Conifer
• Palm
• Broad Leaf
MEDIUM TREE • Normal Tree
• Flowering Interest
SMALL TREE • Normal
• Flowering Interest
SHRUB • Normal
• Flowering Interest
VINES & CLIMBERS
GROUNDCOVER PLANTS
PLANTS FOR SPECIAL INTEREST
FLOWERING PLANTS
• Annuals
• Perennials & Biennials
• Bulbs & Bulblike Plants
• Vines

LEGEND

Origin


Native

Exotic

Recommendation


Best

Good


Experimental

Characteristics


Evergreen


Deciduous


Flower


Fast growing


Leaf


Easy transplanting


Bird's eatable


Hardy to prune


Drought tolerable


Dense foliage


Ornamental

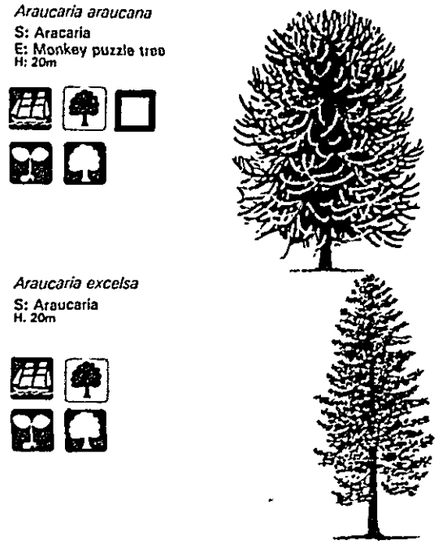

Seeding propagation


Cutting propagation

TALL TREE

conifer

Araucaria araucana
S: Araucaria
E: Monkey puzzle tree
H: 20m



Araucaria excelsa
S: Araucaria
H. 20m

Casuarina equisentifolia
S: Casuarina
E: Horsetail tree
H. 15m

Cedrus deodra
E: Deodar ceder
H: 25m

Cupressus lusitanica
S: Ciprés
E: cypress
H. 25m

Cupressus sempervirens
S: Ciprés italiro
E: Italian Cypress
H. 15–20m

Metasequoia glyptostrovoides
E: Dawn redwood
H. 25m

Pinus patula
S: Pino candelabro
E: Jelecote pine
H 18m

Pinus radiata
E: Montray pine
H. 20m

Podocurpus macrophyllus
E: Yew pine
H: 15m

Podocurpus montanus
S: Pino chaquiro
H. 15m

Podocurpus oleifolius
S: Pino hayuelo
H. 15m

Podocurpus rosigiossii
S: Pino romeron
H. 20m

Sequoia sempervirens
E: Red wood
H: 20~25m

Taxodium distícum
E: Bold cypress
H 20m

Palm

ceroxylon quindiuensis
S: Palma de cera
H 20m

Phoenix canariensis
S: Palm fenix
E: Canary island date Palm

Washingtonia Filifera
E: California fan palm
H 15~20m

Washingtonia robusta
E: Mexican fan palm
H 15~20m

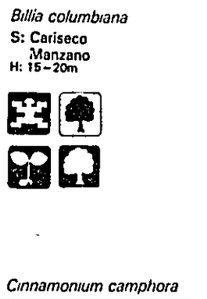
Broad Leaf

Acacia decurrens
S: Acacia
E: Green wattle
H. 20m

Acacia melanoxylon
S: Acacia nigra
E: Black acacia
H: 20m

Ailanthus altissima (A glandulosa)
E: Tree of heaven
H 20m

Billia columbiana
S: Cariseco
Manzano
H: 15–20m



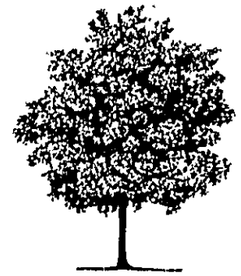
Cinnamomum camphora
E: Camphor tree
H. 15–20m

Eucaliptus biminalis
H: 20m

Eucaliptus globulus
E: Blue gum
H: 25–30m

Eucaliptus pulvelenta
E: Silver mountain gum
H: 15m

Ficus gigantosyce
S: Caucho
H. 15–30m



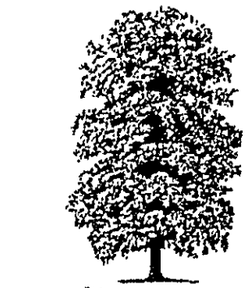
Ficus retusa nitida
E: Indian laurel fig
H: 20m

Ficus tequendamae
S: Caucho
H: 20m

Fraxynus chinensis
S: Urapan
E: Ash
H. 20m

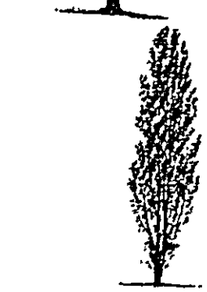
Ginkgo biloba
E: Maidenhair tree
H. 20m

Liriodendron tulipifera
E: Tulip tree
H 25m



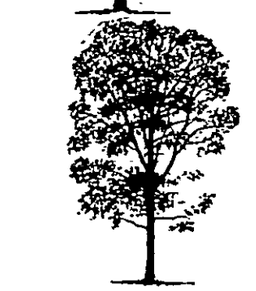
Platanus occidentalis
E: American cycamore
H 25m

Populus nigra
E: Lombardy poplar
H 20m



Sophora japonica
E: Japanese pagoda tree
H 18m

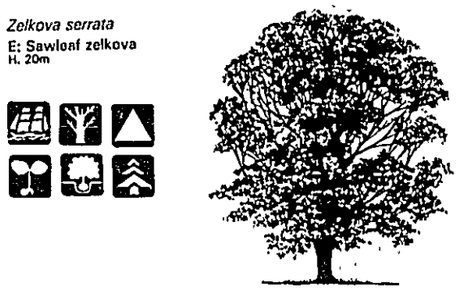
Tipuana tipu
E: Tipu tree
H: 20m



MEDIUM TREE

Normal Tree

Zelkova serrata
E: Sawleaf zelkova
H. 20m



Cedrela bogotensis
S: Cedro colorado
H 12m

Croton bogotanus
S: Sangregao
H. 12m

Escallonia tibar
S: Tibar motilon
H. 10~20m

Euginia jambos
(Syzygium jambos)
S: Pomaroso
H. 10m

Ficus elastica
S: Caucho
E: Rubber plant
H. 8m

Ficus macrosyce
S: Caucho
H 10m

Ficus soatensis
S: Caucho
H 8m

Ficus velutina
S: Caucho
H. 12m

Hieronyma colombiana
S: Motilon
H: 8~10m

Juglans neotropica
S: Nogal
H 10m

Melaleuca leucadendron
E: Cauput
H. 10m

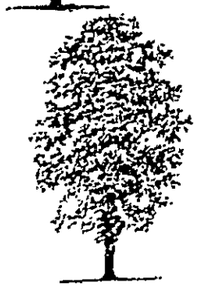
Pasania edulis
H. 10m

Phoebe cinnamonifolum
H: 10m

Quercus humboldi
S: Roble
H: 12m

Quercus phylliraeoides
H: 10m

Rapanea guianesis
S: Cucharo
H: 15m



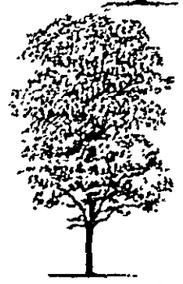
Salix humboldtiana
S: sauce
H: 12m

Flowering Interest

Abatia palvifolia
S: Chirlobirlo
yellow H 10m

Acacia baileyana
E: Baileyanna
yellow H: 12m

Acacia bracatinga
S: Bracatinga
H: 8m



Acacia longifolia
S: Acacia
E: Sydney golden wattle
yellow H: 10m

Eucaliptus ficifolia
S: Eucaliptus pomarroso
Red H: 10m

Grevillea robsta
(Grevilea robsta)
S: Grevilea amarilla
E: Silk oak
yellow H 15m

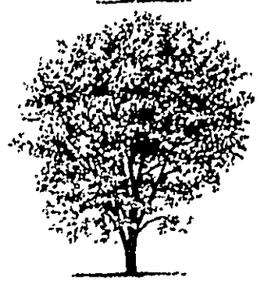
Lafoerisia punicifolia
white H 15m

Magnolia grandiflora
E: Southern magnolia
white H 10m

Prunus campanulata
pink H. 8m

Prunus serotina
S: Cerezocapuli
white H: 10m

Prunnus serrulata
P. indica
P. speciosa
P. yedoensis
white pink H. 10m



SMALL TREE

Nomal

Acer palmatum
E: Japanese maple
H 5m

Alnus jorullensis
E: Alder
H: 6m

Arbutas unedo
E: Strawberry tree
H 8m

Bacconia frutensces
H: 8m

Cercidifilum japonica
E: katsura tree
H 8m

Eugenia foliosa
(Myrthus foliosa)
H: 3m

Laurus nobilis
E: Sweet bay
H: 8m

Ligustrum lucidum
E: Privet
H: 4~8m

Ligustrum japonicum
E: Japanese privet
H. 5m

Myrica pubescens
S: Laurel de cera
H: 5m

Olea europae
E: Olive
H 8m

Oreopanax bogotense
S: Mano de oso
H: 5m

Osmanthus fortunei
H; 4m

Persea americana
E: Avocadopear
H 5m

Phyllanthus salviaefolius
S: Cedrillo
H 4m

Pittosporum umdulatum
S: Jazmin
white H: 5m

Prunus laurocerasus
E: Cherry laurel
H. 5m

Sabina chinensis
(Juniperus chinensis)
H: 8m

Sapium sebiferum
E: Chinese tallow tree
H. 8m

Schefflera bogotensis
S: Mano de oso, yuco
H 3m

Tamarix paraviflora
E: Tamarisk
H. 5m

Ternstromina japonica
(T. gymnanthera)
H: 8m

Viburunum tinoides
S: Garrocho
H 3m

Xylosma spiculiferum
S: Corono
H; 4m

Bambusa arundinacea
S: Bambu
E: Bamboo
H 7m

Flowering Interest

Abutilon insignis
E: Flowering maple
Redish yellow H, 4m

Abutilon verbascifolia
S: Chirlobirlo
yellow H 5m

Camelia japonica
white, pink H, 6m

Camelia sasanqua
pink H. 4m

Cassia velutima
S: Alcaparro
Bright yellow H 5m

Cercis canadensis
E: Eastern redbud
Purple H. 8m

Clusia cagrow
S: Gaques
white H. 4m

Cornus florida
E: Flowering dogwood
white H 6m

Erythrina crista-galli
E: Cockspur, Coraltree
Red H 5m

Meriarua nobilis
Purple H: 6m

Osmanthus fragrans
E: Sweet olive
yellow H. 8m

Schinus molle
S: Falso pimiento
E: Peper tree
Greenish yellow H: 8m

Schinus terebintifolius
E: Brazilian pepper tree
yellow to Red H: 8m

Sparmannia africana
S: Tilo
white H 5~8m

Stewartia pseudocamellia
E: Japanese stewartia
white H 6m

Tecoma stans
S: Chicala
E: Yellow bells
yellow H 3m

Tibouchina lepidota
S: Siete cueros
E: Princess Hower
purple H 6m

Vellea stipularis
S: Ragua
Pink H. 4m

SHRUB

Normal

Aucuba japonica
E: Japanese aucuba
H 2m

Baccharis nitida
H. 2m

Buxus sempervirens
E: Box
H. 1 5m

Dodonaea viscosa
E: Hop bush
H 1 5m

Elaeagnus pungens
E: Silverberry
H. 2m

Escallonia myrtiloides
S: Tibar motilon
H. 2m

Euonymus japonica
E: Evergreen euonymus
H 1 5~3m

Fatsia japonica
(Aralia japonica)
H. 2m

Ficus carica
S: Brevo, Higuera
E: Fig
H. 3m

Hesperomeles goudotiana
S: Mortino
H 2m

Ilex corunuta
E: Chinese holly
H. 1.5~3m

Ligustrum obtusifolium
E: Privet
H 2~3m

Mahonia japonica
H. 1.5~3m

Phormium tenax
S: Lino de N. Zelandia
E: N. Zealand flax
H 3m

Pittosporum tobira
S: Tobira
E: Tobira
H 2~3m

Prunus laurocerasus
E: English laurel
H. 1m

Viburnum japonicum
H 1~2m

Viburnum suspensum
E: Sandankwa viburnum
H 2~3m

Viburnum tinus
E: Laurustng
H. 2m

Flowering Interest

Abelia grandiflora
white H: 1.5m

Abutilon megapotamicum
E: Flowering maple
red, yellow H. 1.5m

Abutilon pictum
E: Flowering maple
Red to yellow H. 2 0m

Acalypha godseffiana
Red, Green leaves H 2m

Azalea sp.
white, red, pink H: 0 3~1.5m

Barnadesia spinosa
S: Espino
pink H 1~2 0m

Beloperone guttata
E: Shrimp plant
white, spotted purple H 1 0m

Buequetia glutinosa
S: Charne
red, purple H: 1 5m

Callistemon lanceolatus
S: Calistemo
E: Bottlebush
red H 3m

Calluna vulgans
E: Scotch heather
rosypink H 0 3~0 5m

Cassia tomentosa
S: Alcaparro pequéno
yellow H 2 5m

Cavendishia cordifolia
S: Uva camaroha
pink H 1 0m

Cestrum elegans
S: Cestrum
purple H 1m

Cotoneaster dammeri
E: Bearberry cotoneaster
red berry H. 0 3m

Cotoneaster franchetti
red berry H 1.5m

Cotoneoster horizontaris
E: Rock cotoneaster
redberry H 0 3m

Crotolaria agatiflora
S: Pajarito
yellow H 1.5m

Daphne odora
E: Winter daphne
pink H 1m

Epacris impresa
S: Cigarrillo
red H. 1m

Feijoa sellowiana
S: Feijoa
E: Pineapple guava
white H. 3m

For-sythia koreanum
yellow H. 2 0m

Fuchsia sp.
red, pink, white
H. 0.3~1.5m

Gaiadendron tagua
S: Tagua
white H· 2m

Gardenia jasminoides var grandiflora
white H· 1.2m

Gardenia jasminoides var. radicans
white H. 0 3m

Grevillea banksii
S: Grevilea roja
Red H 2m

Hebe sp
white, pink, blue
H. 0 5 ~ 1.0m

Hibiscus syriacus
E: Rose of sharon
white, purple, pink H· 2m

Hibiscus mutabilis
E: Confederate rose
pink H 1~3m

Hibiscus rosa-sinensis
E: Tropical hibiscus
Pink, Red H 3m

Hydrangea macrophylla
E: Bigleaf hydrangea
Purple H· 1 5m

Hypericum chinense
yellow H 0 5m

Hypericum patulum
S: Hiperico
yellow H 0 5m

Hypericum thuyoides
S: Chites
yellow H 0.4m

Impatiens balsamina
E: Balsam
white, pink, rose H. 1m

Jasminum odoratissimum
yellow H 2m

Jasminum pubesens
E: Star jasmine
white H 2m

Lantana camara
Yellow, Red, Orange
H: 3m

Ledenbergia secuieroides
S: Mil flores
Purple H· 2m

Malvaviscus arboreus
Red H 3m

Philadelphus inodorus
E: Mock orange
white H 2m

Plampago capensis
blue H 2m

Poinsettia sp (Euphorbia pulcherrima)
E: Spurge shrub
red H. 2.5m

Punica granatum
E: Pomegranate
red H: 2~3m

Pyracantha coccinea
S: Holly
orange red H: 2~3m

Raphiolepis indice
E: India hawthorn
white H. 0 5m

Rhododendron sp.
white pink
H: 0 3~1.5m

Rosa rugosa
E: Romans rose
white, pink, yellow
H. 1.2m

Rosa sp.
E: Rose
white, pink, red, yellow
H: 1~2m

Solanum lycioides
S: Gurrubo
Purple H· 2m

Spartium junceum
yellow H. 3m

Spiraea cantoniensis
white H. 1 5m

Spiraea thunbergii
white H: 1.5m

Streptosalen jamesonii
E: Marmalade bush
orange, yellow H: 1m

Sumbucus nigra
white H 3m

Tibouchina mollis
S: Mayo
purple H 1 5m

Tibouchina semidecandra
S: Siete cueros brazil
purple H 2~3m

Viburunum plicatum
white H 3m

Weigela hortensis
red, pink H: 2m

VINE AND CLIMBER

Bignonia sp.
E: Trumpet vine
yellow, orange-red

Ficus pumila
E: Creeping fig
Dark green

Hedera
E: Algerian ivy
shiny green

Hedera helix
E: English ivy
Dull green

Lonicera japonica
E; Japanese honeysuckle
white H 0 3 – 0 6m

Lonicera sempervirens
Trumpet honeysuckel
orange-yellow

Passiflora edulis
E: Passion fruit
white, purple

Tecomaria capensis (Tecoma capensis)
E: Cape honeysuckel
orange-red

Trachelospermum jusminoides (Rhynchospermum jusminoides)
E: Star jasmine
white

GRANDCOVER PLANTS

Arctotis stoechadifolia
E: African dasy H 0 5m
white, violet, purple

Cotoneaster dammeri (C humifusa)
E: Bearberry cotoneaster
white, red H: 0.2m

Gardenia jasminoides Var. Radicans
white H. 0.3m

Hedera canariensis
E: Algerian ivy
Shiny green H. 0 3m

Hedera helix
E: English ivy
dark green H 0.3–0.5m

Hypericum calycinum
E: Aaron's beard
yellow H 0 3m

Juniperus horizontalis
E: Prostrata juniper
Dark green H. 0 3–0.6m

Lonicera japonica
E: Japanese honeysuckel
white

Lonicera nitida
E: Box honeysuckle
Cleamy white H 0 3–0.6m

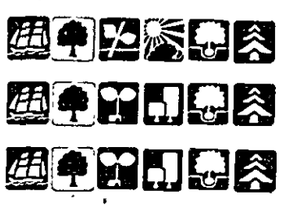
Pachysandra terminalis
E: Japanese spurge
Dark green H 0.3m

Pennicetum clandestinum
S: Kikuyo
E: Kikuyo grass
green H 0 1 – 0 3m

Sedum crussulaisis
E: Stone crop
red H: 0 3–0.5m

Vinca major
E: Periwinkle
lavender blue H 0 6m

Vinca minor
E: Dwarf perinkle
lavender blue H. 0 3m



PLANTS FOR SPECIAL INTEREST

Agave americana
E: Century plant
yellowish green H 1.5m

Arundo dnax
E: Giant read
H 1.5m

Cordyline terminalis
S. Palmita roja
red, yellow H 1 5–2m

Cyathea carocasana
S: Palma baba
E: Tree fern
H. 3 – 4 m

Cyprus papyrus
S: Papiro
E: Papyrus
H 2m

Dicksonia sellowiana
S: Palma Boba
E: Tree fern
H. 3 – 4 m

Nymphaea alba
S: Lotos
E: Water lily
H 0 3 – 0 5m

Yucca elephantipes
S: Bayoneta
E: Giant yucca
H. 5m

FLOWERING PLANT

Annuals

Ageratum houstonianum
Amaranthus
Antirrhinum majus
Browallia americana
Calendula officinalis
Calistephus chinensis
Celosia
Centaurea cyanus
Clarkia
Convolvulus tricolor
Coreopsis tinctoria
Cosmos
Delphinium ajacis
Dianthus barbatus
Dianthus chinensis
Dimorphotheca
Eschscholzia californica
Gaillardia pulchella
Gypsophila elegans
Helianthus annuus
Helichrysum bracteatum
Iberis
Impatiens holstii
Ipomoea
Lathyrus odoratus
Limonium
Linaria maroccana
Linum grandiflorum
Lobelia erinus
Lobularia maritima
Lupinus nanus
Matthiola incana
Mimulus tigrinus
Myosotis sylvatica
Nemesia strumosa
Nicotiana
Papaver rhoeas
Papaver nudicaule
Petunia hybrida
Phlox drummondii
Portulaca
Primula malacoides
Quamoclit pennata
Salvia splendens
Scabiosa atropurpurea
Tagetes
Thunbergia alata
Torenia fournieri
Tropaeolum majus
Verbena hybrida
Viola cornuta
Viola tricolor hortensis
Zinnia

Perennials & Biennials

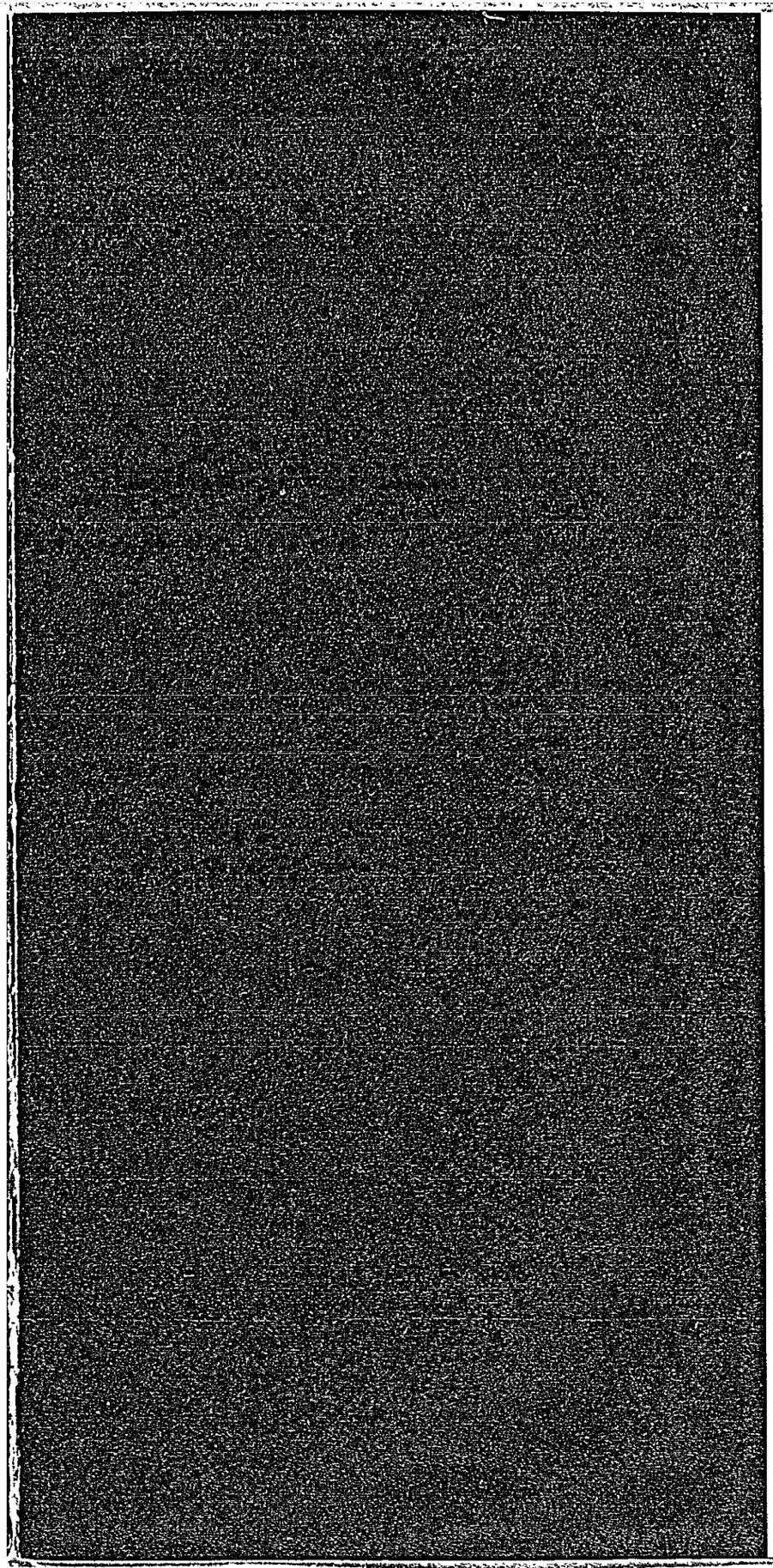
Achillea
Aethionema
Alyssum saxatile
Anemone hupehensis japonica
Anthemis tinctoria
Aquilegia
Arabis
Arctotis
Aster
Astilbe
Aubrieta deltoidea
Bergenia crassifolia
Bellis perennis
Billbergia
Bulbinella robusta
Calceolaria integrifolia
Campanula
Catharanthus roseus
Ceratostigma plumbaginoides
Chrysanthemum frutescens
Chrysanthemum maximum
Chrysanthemum morifolium
convallaria majalis
Coreopsis grandiflora
Cynoglossum amabile
Delphinium
Dianthus
Dicentra spectabilis
Digitalis purpurea
Echinops exaltatus
Francoa ramosa
Calillardia grandiflora
Gazania
gerbera jamesonii
Helenium autumnale
Heliopsis scabra
Heliotropium arborescens
Helleborus
Heuchera sanguinea
Hosta
Hunnemannia fumariaefolia
Iberis sempervirens
Kniphofia uvaria
Lampranthus
Limonium
Lobelia cardinalis
Mirabilis jalapa
Paeonia, herbaceous
Papaver orientale
Pelargonium domesticum
Pelargonium hortorum
Penstemon gloxinioides
Phlox paniculata
Phlox subulata
Platycodon grandiflorum
Primula malacoides
Primula polyantha
Rehmannia angulata
Romneya coulteri
Rudbeckia hirta
Saxifraga
Sedum spectabile
Senecio cruentus
Stokesia laevis
Strelitzia reginae
Tithonia rotundifolia
Tulbaghia fragrans
Viola cornuta
Viola odorata

Bulbs & Bulblike Plants

Agapanthus
Amaryllis belladonna
Anemone coronaria
Begonia
Calochortus
Canna
Clivia miniata
Colchicum autumnale
Crocus
Cyclamen persicum
Dahlia
Eranthis hyemalis
erythronium
Freesia
Fritillaria
Gladiolus
Hemerocallis
Hippeastrum
Hyacinthus orientalis
Iris
Iris kaempferi
Iris unguicularis
Lilium
Lycoris
Moraea
Muscari
Narcissus
Nymphaea
Ranunculus asiaticus
Schizostylis coccinea
Scilla hispanica
Sparaxis tricolor
Tigridia pavonia
Tulipa
Watsonia
Zantedeschia
Zephyranthes

Vines

Antigonon leptopus
Bean
Bougainvillea
Calonyction aculeatum
Cobaea scandens
Dolichos lablab
Dolichos lignosus
Phaedranthus buccinatorius
Trachelospermum jasminoides
Wisteria



EDITING TEAM

JC Press Editing Team
Takashi Onodera
Hiroshi Tanaka
Kanao Itoh
Kiyoshi Yamaguchi

Translator
AARON M. CHOHEN

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Keyaki Printing Co., Ltd.