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Sir Michael Fowler, Architect and former Mayor of Wellington, will present the 1985 Hopkins Lecture. Under the title "Cities at Risk" he will consider such questions as the consequence of increased urbanisation upon infra structure and the additional risk which some cities face from seismic action.

Sir Michael was educated at Christ's College and the University of Auckland, graduating with an architectural degree in 1952. Following a period in London with Ove Arup and Partners he started his own practice in Wellington in 1957. In 1968 he was elected to the Wellington City Council, serving as Mayor from 1974 to 1983. He is currently Chairman of the Queen Elizabeth II Arts Council of New Zealand, and on the Directorates of several prominent New Zealand companies. In 1981 he was Knighted for his contributions to New Zealand society.

As an architect, public administrator and author of a series of books on architectural topics he brings to this lecture a unique blend of experience which gives him a strong personal identification with the cities of New Zealand.

THE 1985 HOPKINS LECTURE - BY SIR MICHAEL FOWLER

Limes Room: Christchurch Town Hall. 17.7.85

CITIES AT RISK.

I am honoured to have been asked by the University of Canterbury and the Canterbury Branch of the Institution of Professional Engineers New Zealand to speak with you tonight in the form of the Hopkins Lecture. And doubly honoured to share in this annual event which recognises the enormous contribution which Professor H.J. Hopkins made to the University of Canterbury and the Engineering Profession of New Zealand.

In Professor Hopkins were combined great scholarship along with breadth of interest. To epitomise that balance, you may well be advised to invite a learned scholar in 1986, for this 1985 lecture will more likely illustrate a breadth of interest only.

I have chosen for my subject that of cities for it is an area in which I have some experience as an architect, an administrator and a politician, and most importantly as a citizen and an observer. It is also the primary phenomenon of human habitation which is under the greatest threat through massive urbanisation in all parts of the globe, and where the strain on existing service infrastructures such as the provision of fresh water, the disposal of waste water, the stability of ground, the provision and reticulation of electricity, gas, fuels, electronic communication systems, traffic and transport systems is seldom matched by forward planning let alone community resources.

Hence the title, Cities at Risk. Perhaps, you may think, a slightly dramatic frontispiece, yet I believe it real if for no other reason that I hold all the best advances and excitements in our human culture happen in cities where people communicate, compete, inter-act. Clearly, all the worst things happen there as well, but they are far outweighed by the best. And so I am an urban man.

Now it will be obvious that I am a great deal more aware of New Zealand cities than of other conurbations overseas, yet I have travelled a great deal, and I had thought to illustrate by examples I have seen in other countries the three criteria by which I choose to assess cities, and the areas in which they are at greatest risk. For this exercise I have chosen the criteria of firmness, commodity and delight - in fact the three aspects by which a work of architecture was assessed by one of the great British writers some several years ago, but it seemed relevant to this paper.

In the mid 1950's, I worked in the office of Ove Arup and Partners in London, and one of my first experiences was drawing the 2 metre deep waffle form concrete foundations for a Secondary Modern School in Barnsley in the Midlands. On the second day, when I questioned the somewhat extra ordinary foundation system to carry a two floored relatively light structure I learned that the whole of Barnsley was undermined by coal shafts, and it was quite normal for subsidence to occur and thus new buildings were designed to cantilever or span across sudden depressions of 3 metres by 3 metres.

Three weeks ago I was in Holland, that lovely low and wet country. A company which I chair has an interest in a large tennis and squash centre at Warmont, near the Hague. An addition of ten covered courts is currently being made to the Centre, and I saw some of the 400 17 metres precast concrete piles being driven to support the structure. At the first strike of the pile driver, each pile slid 10 metres into the ground.

During that time in Holland, I stayed in Utrecht a large city with a history spanning a thousand years, and containing many beautiful cathedrals and towers, one particular tower dating back to the 13th century, and founded with such care and foresight that it remains after 600 years as vertical and sound as if built today. Lighter structures, such as housing, inevitably show differential settlement.

Interestingly enough, the massive dykes and reclamations in the north of Holland, the Hook of Holland, have lessened the buffering or absorption factor against the massive Spring Tides which sweep southwards through the English Channel, and are one of the causes of increased flooding into the Thames Estuary, which have led to that miraculous engineering work, the Thames Barrier which will protect London from flooding.

These two small examples, in Barnsley in the Midlands, and Warmont near the Hague illustrate how stability or firmness is achieved against quite massive odds, in city structures.

Of recent times, firmness or lack of it has been brought home to me here in New Zealand in a peripheral way. For some years I have been a director of an insurance company, the M.C.I.C., and during 1981-83 while I was chairman, two major hydro structures on the volcanic plateau collapsed, the Ruahihi canal and the Whaeo canal, both designed by eminent engineering consultants, and both the Dunedin and Invercargill airports, so strangely sited in obvious flood plains, not sup~~r~~prisingly flooded.

How then in the city of Wellington, have we addressed firmness. We do not suffer from mining subsidence, nor necessarily a high water table except in the reclaimed areas, but we are most certainly subject to earthquakes.

I will explain this by drawing from part of the paper I prepared for the Dobson lecture at Victoria University in August 1983.

The geological and human settlement history of Wellington has been marked by seismic effect. Legend has it that the Miramar Penninsular was an island in the early days of Maori settlement around the great harbour of

Whanganui - a - Tara and I have always been comforted by the fact that in at least the last few thousand years, seismic movements in this area have tended to raise the land mass rather than lower it, thus for example, the Miramar Penninsular became linked, albeit by swamp lands, to Kilbirnie by the time European settlement began, yet nevertheless this upward movement thwarted the formation of the Graving Dock which we now know as the Basin Reserve because the excavated canal which we now know as Kent and Cambridge Terraces was raised 2 metres in the 1855 earthquake.

Since European settlement there have been 4 major earthquakes in Wellington 1848, 1855, 1931, and 1942 and it would be unrealistic to assume that there will not be another earthquake in the area of the fault lines which traverse this city.

Interestingly enough however, these 4 major earthquakes, amongst hundreds of others of a lesser intensity felt (or latterly recorded) in Wellington had their epicentre well distanced from the City.

For example, the 1848 earthquake was centred in Marlborough, with an assumed magnitude of 7.1. The 1855 earthquake was centred in south west Wairarapa, with a probable magnitude of 8.1, while the 1931 was centred in Hawkes Bay, magnitude 7.9, and in 1942 again the epicentre was in the Wairarapa, magnitude 7.0.

Even in 1848, our early settlers learned of the lively nature of the Wellington strata to their cost and some fatalities occurred when the rude masonry structures they had erected collapsed upon them and in 1855 a similar occurrence caused widespread panic and indeed it was in that year that my Grandfather foresook Wellington and fled to the safer, albeit less exciting, environs of Awahuri which for those unlearned of this learned audience who will not know its location, is close by Feilding.

It was of course the Napier earthquake of 1931 which introduced to the New Zealand building standards some observations of the need for lateral bracing to resist seismic effects and therefore it was in the 1930s that throughout New Zealand a basic code was developed in building bylaws to take account of earthquakes.

The Earth's lithosphere is divided into a number of rigid plates at the boundaries of which most of the world's earthquakes occur. New Zealand is directly on the intersection of two major plates, the Indian and the Pacific. Indeed the plate intersection is roughly below the line connecting the Alpine Fault in the South Island to White Island in the Bay of Plenty. Between these two points of course, and connecting them, are the Wairau and Wellington Fault lines. Fortunately, the close relationship between the earthquakes and the surface faulting found in California, such as along the San Andreas Fault, is not present in New Zealand.

Thus in 1935, a seismic requirement was introduced to the New Zealand building codes and remained in force for 30 years, till 1965.

In essence, an earthquake generates horizontal forces or waves through the ground, and to counter such action, a structure must be capable of withstanding lateral forces.

During those thirty years the standard requirement was to apply .08 g (8% of the weight of the building) as a horizontal load to each side of the building at each floor level, at the design stage and to provide the strength in the structural design to withstand that loading.

Consequent upon further experience and research, both here in New Zealand and in countries abroad, this lateral design loading was increased in 1965 to .12 g (12% of the weight of the building) and further refinements in the form of design criteria were then incorporated, as they were again in 1976, with particular reference to the effect of 'whip-lash' in high rise buildings, the variable frequencies of oscillation of adjoining dissimilar structures resulting in requirements for variable seismic gaps between, and so on.

In the 1960s, New Zealand was categorised into 3 earthquake risk zones, zone A being the zone of highest risk, which approximates the main fault lines referred to above. Wellington lies in this zone. Zone B, of lesser risk, includes Canterbury in the south and the Waikato/Taranaki in the north, while Zone C covers coastal Otago and Auckland.

All this interest and activity in the 1960's led to consideration by the Government for introduction of legislation to amend the Municipal Corporations Act thus allowing Boroughs and Cities to declare themselves as areas recognising themselves as a categorised earthquake risk and thus to take to themselves powers requiring the upgrading of buildings to meet that risk.

This amendment to the MC Act was passed in 1968 and the Works Department of the WCC immediately addressed itself to this question and as Appendix A to this paper I attach a copy of a letter from the then City Engineer, Mr J.S. Roberts dated 25 September 1969 in which this matter was first brought to the Council's attention.

Subsequently his recommendations were considered by the Council Committee on the 4th February 1970 when they debated the issue; it was not a simple issue because inherent in the recommendations the principal one of which was that the Council make application under the provisions of the MC Amendment Act 1968, Section 22 to be declared a Council to which the Section applies that it would immediately effect Council expenditure because to enable the Council to proceed 3 additional staff would have to be employed. Firstly a senior structural engineer to take charge of and direct the work. Secondly two inspectors experienced in doing construction to be attached to the structural branch.

The Council was also aware that in adopting a policy of discouraging prolongation of the life of old buildings which were not up to the satisfactory standards of earthquake resistance, that it would immediately run into opposition from property owners and building owners.

However, the Council was also aware that it had the power under the MC Amendment Act 1968 to use a most persuasive tool; i.e. it could withhold a building permit to alter or amend a building if the required strengthening was not undertaken concurrently.

In the full knowledge of the risks the Council adopted the recommendations on the 11th February 1970 and how right it was to anticipate those risks. Firstly over the last 13 years the Council from time to time has been castigated for the rigour with which it has pursued the withholding of building permits unless the subject building was strengthened. Secondly it did not take long for our friends of the Wellington Chamber of Commerce to mount a strong advocacy against the Council's intentions.

In summary the Chambers submissions were as follows

- a) That it has been reliably estimated that up to 75% of all buildings, other than houses, could be involved in Wellington in the application of the Council's powers to deal with earthquake risk buildings.
- b) That the implementation of the legislation could require the complete rebuilding of a large part of the cities and towns throughout New Zealand.
- c) It is doubtful whether the full scope of the legislation was appreciated at the time of its implementation.
- d) No provision is made for the meeting of the cost which will fall upon a limited number of people, the building owners and their mortgagees. The Associated Chambers of Commerce made representations on this point to the Local Bills Committee when the legislation was being dealt within the House of Representatives
- e) There is evidence that the Wellington City Council is making use of the powers under the legislation in an undesirable manner.

Notwithstanding this advocacy the Council proceeded, and in February 1972 the then City Engineer recommended that buildings in the main retail streets, known as the Golden Mile, be replaced by new buildings or that existing buildings be strengthened by 1982 and that other earthquake risk buildings be replaced by the year 2000.

The survey work had already begun and the Council in May of 1973 confirmed its policy and resolved to notify the owners that demolition or strengthening would be required once a programme had been established.

The survey was completed by 1974 and established that 187 earthquake risk buildings existed in the main retail streets. As a matter of interest some 9 years later this number has been reduced to 94, i.e. a 50% reduction. It is worth commenting that the Council is constrained to deal with each building, property by property in our statistical records, and some of the remaining buildings, with but few exceptions such as Kirkcaldie and Stains, are relatively small.

In other areas of the CBD the survey established 405 earthquake building risks and this number has been reduced within 9 years to 271, representing a 33% reduction.

The overall numbers of buildings in the various City areas which have been demolished or strengthened are shown in the attached Table I.

Thus in the 10 years or so of the Council's programme operation, almost 40% of the EQR buildings in the CBD have been dealt with, and at this rate the total CBD programme will be completed by the year 2000.

The completion of the programme could nevertheless be delayed by economic pressures, but in my view it is more likely that economic pressures will accelerate the rebuilding and making safer the CBD. It would be foolhardy to suggest that the massive rebuilding programme in Central Wellington is but the result of the Council's resolve, to enforce compliance under "The MC (Earthquake Dangers) Order No.2" 1970 which was issued on the 23rd November 1970, declaring that Section 301 (a) of the MC Act applied to the Wellington City Council.

Clearly parallel with this discipline has been a feature common to most capital cities in the Western world, namely the increase of Government services and therefore the provision by Central Government of resources in the form of manpower and computers and along with that the increased perception by lobbyists, be they head offices of banks, finance houses and oil companies, etc. as well as professional groups, to locate themselves around and about a Government Centre, so that they can influence decisions of Government.

This growth within a capital city is not peculiar to Wellington but is common to Victoria, Ottawa, Westminster, Canberra, and Washington.

But it is inarguable that the Wellington City Council's determination in the early 1970's has accelerated the thrust of rebuilding in Wellington and has also highlighted a desire by some members of the public to retain more of the older buildings. This desire is to be applauded because after 143 years of European settlement it is right that today's society should wish to retain part of its heritage and the fabric of parts of the older city. One cannot help but ponder however that a moderately damaging earthquake could nevertheless accelerate the completion of the programme envisaged in the early 1970's.

The science of retrofitting existing buildings has advanced apace in the last decade. Retrofitting is the ability to stabilise a building created for one use and converted as a structurally sound fabric for another use. This work was highlighted in San Francisco in the 1970's and an exponent of it was a Wellington Engineer named Peter Cully, and I was delighted when he was able to visit this country in 1977 at the invitation of the Wellington City Council and the NZIA and the IPENZ. Many here will recall his visit and the illustrated papers he gave at that time describing his practice and the work he and his partners had done in the lateral bracing of masonry structures on the West Coast of the United States where the same seismic requirements apply.

Subsequently some consultancy practices in Wellington, notably Brickle Moss and Smith Leuchers have developed an expertise which have stabilised structures such as the DIC, the State Opera House, the Maritime Building in Customhouse Quay, the AMP Head Office, the ill-fated Commercial Travellers Club building, and others numbered amongst which will hopefully be the Hunter Building, and the Public Trust Building, and the existing Town Hall.

Progress in the suburban areas is slower than the CBD although there has been substantial movement in Newtown and Kilbirnie. However, within the next 20 year period there is likely to be a substantial reduction in the number of EQR buildings in the suburbs.

I turn now to the second criterion by which we are assessing cities at risk, and that is commodity. Commodity is defined by the Oxford Dictionary as "any of the kinds of thing that meet needs".

In 1975 I visited Moscow as the guest of that city's Soviet. During a long discussion with Mr. Promyslov, the mayor of Moscow, he told me that he and his colleagues were rigorously holding the population of the city to 8 million. No one was permitted to move to Moscow from the surrounding areas or other Soviet States with the exception of those with building construction skills. It is obvious that the established city is grossly overcrowded by western standards, and the enormous residential building programme, astoundingly worthy though it is, is well behind the demand.

When we left Mr. Promyslov in company with our Russian colleagues, one turned to me and said, "he means well, but the present population of Moscow is nearly 11 million, and we have no way of controlling its growth".

I was reminded of this some 5 years later in Savannah, Georgia, which I visited specifically to observe a community organised programme which is regarded very highly in the United States. Savannah is a river town on the Eastern seaboard, and was laid out in the 17th century on a grid pattern with parks,

not unlike Christchurch, and the programme addressed the upgrading of the large 18th and 19th century houses and their conversion to apartments, attempting to avoid the "gentrification", the depopulation of inner city areas where the affluent single family deposes the less affluent families from houses converted to apartments. The programme was innovative and interesting, yet the gloss was somewhat removed when some three days later on an alternate route to the airport we passed the Savannah Trailer park, a desolate area containing in my view a population at least that of the entire city of Savannah. This is a phenomenon of the sun-belt cities of the States, where industries have re-established themselves from the colder and more crowded north to exploit less rigorous labour laws, and the flexibility that air conditioning has given to assembly plants in those warmer climates.

The fragility of economic resources and the determination of priorities in these two cities is starkly mirrored in Johannesburg and Capetown, where the contrast between the white suburbs and Sowheto in the first instance, and Crossways in the second is writ large.

That commodity fragility is perhaps nowhere more evident than in the two Pacific cities of Singapore and Hong Kong, where almost the entire water supply is drawn from Malaysia

for Singapore and the Peoples Republic of China for Hong Kong. And that excuse for a city which in reality is the amalgam of 4 rail terminals, Los Angeles, draws its water supply from several hundred miles north yet happily in the same state.

And the disposal of waste water has yet to reach any heights of sophistication in many great cities - Bangkok still uses large open drains feeding to the river, Sydney has large areas of suburbia without sewerage reticulation, and even Auckland is engaged, and will be for years in separating sewerage and stormwater reticulation.

We tend to take for granted in New Zealand the generation of electric power by hydro schemes and the reticulation of power lines to sub-stations on the edge of cities, and thence undergrounded to industrial, commercial and, in a growing number of cases to residential areas. It strikes us as bizarre in many overseas countries to see coal, gas or oil fired power stations centrally located, with great pylons marching across the cities fabric.

And the transport systems of cities, and those in fact such as the London Underground, the Paris and Moscow Metros, the Washington and New York underground systems, which by their very existence have allowed the cities to grow and without each of those cities would fail immediately - and

the ubiquitous growth in the private ownership of that most mobile and attractive commuter item, the motor car, have put our global cities at risk to an alarming degree.

Returning to New Zealand, how have we addressed these matters. At the risk of boring you, I will concentrate my answers on the Wellington scene.

I always find it interesting to see the earliest European (and for that matter Maori) settlements in Wellington disposed against the small creeks which drained the hill watersheds. Thus in Thorndon the Europeans and Maori vied with each other for land holdings against the Tinakori stream, as they did near the Terrace against the Kumutoto Stream, now culverted into Shell Gully and under the Wellington Club. Similarly, in Aro Valley.

The construction of the Kaori Reservoir in the surprisingly early year of 1868 allowed much greater freedom of land development, and although built right across the main earthquake fault line served the city well and solely for nearly 50 years. Indeed it is still in use, but principally as a storage reservoir and "header tank", for water now brought in from some 40 kms from the ranges beyond the Hutt Valley.

At the turn of the century, Wellington was blessed with a city engineer, Mr. R. V. Morton who not only conceived of the fresh water reticulation, but oversaw its installation, and as well designed and supervised the waste water system through a main interceptor tunnel to discharge at Moa Point into the strong currents of Cook Strait. For some years we imagined the raw sewage disposed towards the Chilean coast, for there was no contamination on our southern beaches, but research has more recently indicated that the stronger currents flow westward, thus Australia might well cop it, which seems appropriate.

Recent population growth and an extended catchment area, coupled with reasonable public demand for greater awareness of pollution have caused the Wellington City Council to move toward primary treatment of the outfall at Moa Point by milliscreening and secondary treatment of sewage at a later date. There is of course, a predictable outcry for immediate tertiary treatment such as Christchurch enjoys, and I guess the Council will address that in some priority in due course.

The coal burning generators where the new Town Hall is sited, and in Evans Bay, have long since disappeared, and the M.E.D., similar to your own, purchases our electricity from the national grid.

The public transport systems in Wellington are legend, and in a way unique. An electric rail system carrying 25000

commuters daily from the eastern and western corridors, a cable car, 68 electric trolley buses and 160 deisel buses, not forgetting 330 taxis. An airport but 10 minutes drive from the CBD, and a 7/8ths completed motorway system.

As in all cities of the world, Wellington has staggered under the strain of the private motor vehicle - indeed, because the CBD is constrained between the water and the hills, perhaps more than any other New Zealand city.

Nevertheless, earlier diagrams have illustrated the extraordinary growth of office buildings in the capital city, and perhaps the current dramatic growth area is now that of parking buildings mainly promoted by the private sector. That of course is predictable, because of the current return on investment in such ventures is high. One parking space in such a building is currently selling for \$25,000 plus maintenance costs.

Finally, let us turn to that element of our assessment of cities which I have chosen to call delight. What is it about these great concentrations of peoples that in part, seldom in whole, touch us, move us to applaud the gathering of peoples and buildings, to become alive and aware of heritage, history, light, form, contrast, proportion, order, texture, pattern - or conversly, and increasingly, of chaos confusion, disorder, disharmony, ugliness.

Some years ago, I stayed in Toronto with the then mayor of that

city David Crombie. One day as we were driving down a delightful street of masonry terrace housing, I commented how pleasant this inner city area appeared. "It's a damn disgrace" he answered "Its been all bought by the white painters." What he was explaining was a trait common to many central city areas. In his critical view, the young affluent professions were buying up the old terrace houses, uprooting the several families per unit, painting the brickwork white, slapping on shutters and flower boxes, and occupying a house with their friend or lover or spouse or alone, which building had previously housed maybe 8-10 people.

Shades of present-day Ponsonby, or Thorndon, or Worcester Street west.

But the contrast was made for me a few years ago in Newport Rhode Island. That famous naval point and erstwhile home of the America Cup races, is also the home of Doris Duke the tobacco heiress. She has devoted several years to buying and restoring scores of 18th and 19th timber framed houses within the town to their original colonial style, and leasing them at modest rentals to retired naval persons, and that has begun a renaissance of like restoration, and sympathetic new building such that the majority of Newport has a unity and attractiveness seldom equalled on the eastern seaboard.

But each of you will have seen and can recall some part of some city which touched you -

It might have been Bath, or a row of Hamstead houses, the New Town in Edinburgh, an enclosed quadrangle at the Inns of Court, the Midan in Isfahan, the sweep of Regent Street, the curves of Lambton Quay, the facades of 5th Avenue, the great contrasting openness of Central Park, of Hyde Park of Hagley Park, the intimacy of a Tuscan Village, of one of the few remaining shop-house streets in Singapore such as Smith Street, of Peter Beaven's Pitarua Court in Wellington.

And equally you might recall the horridness, the brashness of a mid-west Main Street, of Rotorua's Fenton Street, the overpowering scale of gaunt apartments in the 10th arrondissement of Paris, of new 30 floored apartments on the Lenin Hills, in Bombay, Hongkong, the chaotic dispersement of Los Angeles, the deadening dullness of the new towns of Fasta and Vellingby out of Stockholm, the horrid plethora of stand-alone mirrored octagonal towers sprouting across central Auckland without thought of site or relationship or townscape.

I return to Wellington.

There is no way that I would, or could claim that it fulfills the criteria of firmness, commodity and delight.

I would however claim that it is unique, just perhaps, as you could claim and rightly so that Christchurch is unique.

Wellington is unique for different reasons. It is a hill-girt harbour city, of steep terrain, enjoying, at least in the CBD

level land only through reclamation.

I believe it is also unique in that the Wellington community has come of age, has recognised the uniqueness of its city and is addressing the retention and enhancement of that uniqueness.

No longer is your poet Denis Glover's throw-away lines of his adopted city relevant.

Wellington.

"Where they could turn and throw
Applecores down ships funnels
People walk dully home, up steps
or go through tunnels"

I don't believe they do now.

I cite one example, concerning the encouragement to retain the older fabric of the city.

Additional Development Rights

Notwithstanding the above provisions, any building which is classified as an earthquake risk building in the City Engineer's Register and/or is partly or wholly registered as being an object or place of special interest shall be deemed for the purposes of this Ordinance to occupy a site entitled to a basic plot ratio of 5.5.

If the actual plot ratio of such registered building is less than the plot ratio entitlement then the difference (in this Ordinance referred to as a 'Development Right') may be transferred

by the owner of such building to a development for the benefit either of the subject site or on to any other site or sites, provided that -

The building is upgraded to meet the City Engineer's structural requirements etc.

Here are some illustrations to make the point, drawn from the District scheme and current papers from the City Planners office, addressing density, vistas, wind, scale, texture, cityscape.

I must conclude that Wellington and all cities, are at risk. The very fragility of their attraction is threatened by the rate of urbanisation, the move from rural to urban areas; for the very things that attract us in our townscapes are the contrast of the old and the new, the small intimate vista, the enclosed space, with the large view, the vertical elements of spire or tower or hill and the horizontal element of road, receding facade, verandah, the curve of river or a street following an old beach line, the contrast of textured masonry with glass or metal, the relationship between solid and void, the very fabric of the built environment encompassing our heritage, made real for us by its observance and expression of its time.

When I spoke to my colleague the City Planner of Wellington about this paper, he wrote to me along these lines.

"Finally, for your happy ending, what about the Midland Park. I still reckon that it was the single most bravest act done while you were Mayor - pulling down the old building against protest in the central part of the city and creating a park at a cost of about \$1,500,000. That took some courage".

Well, firmness wasn't there - the Midland Hotel was an earthquake risk without equal; the park meets the needs of hundreds of people, particularly at lunchtimes, and I guess its a delight.

Excelled however, by my criteria, here in Christchurch by the Arts Centre.

Now nearly strengthened throughout against modest seismic forces, that most generous gift of any government to any city illustrates the sensible re-use of beautiful buildings adapted from one purpose to another, and without question it is a delight. Congratulations.

TABLE 1

NUMBER OF EARTHQUAKE RISK BUILDINGS

IN WELLINGTON

POSITION AT JULY 1985

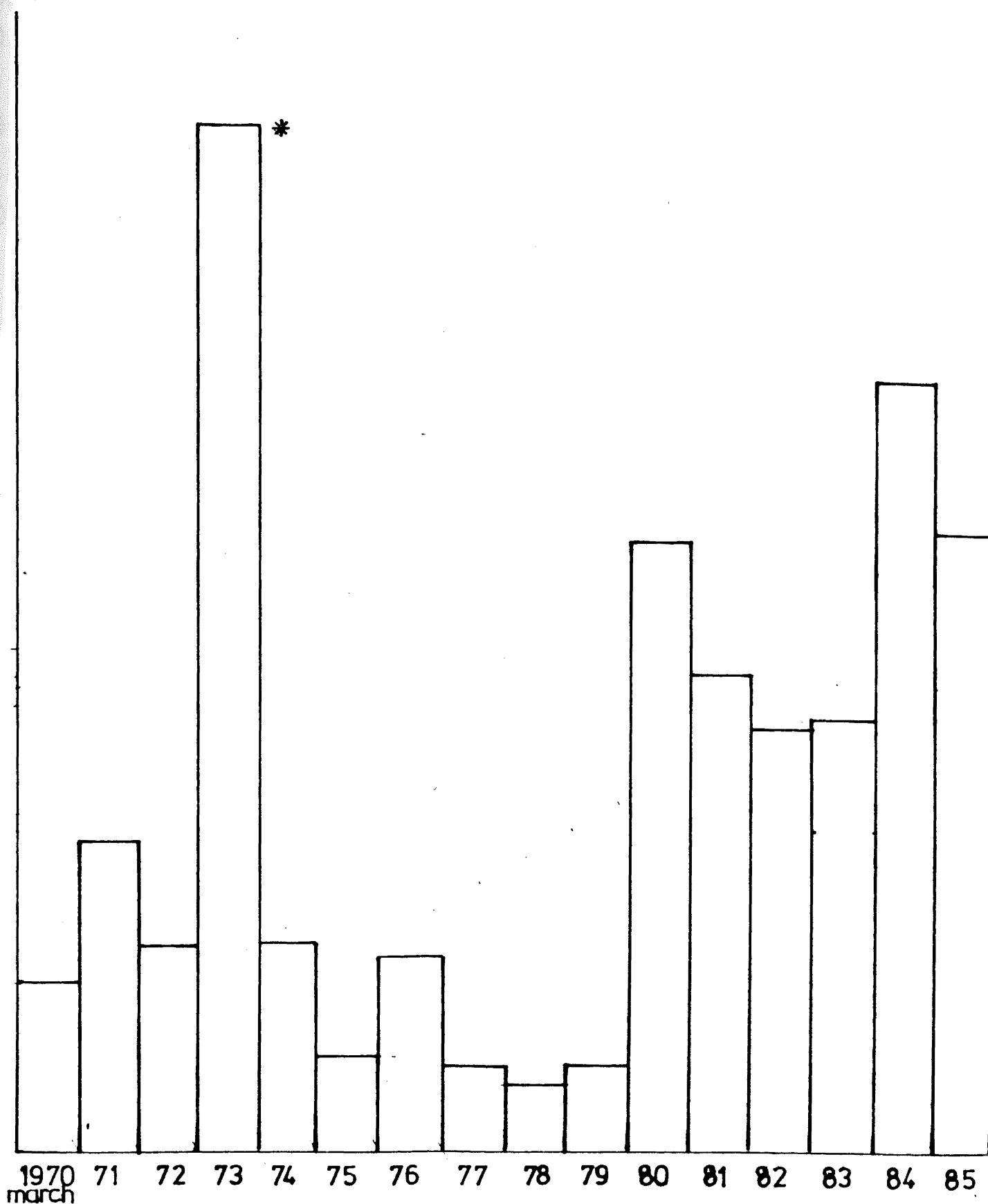
LOCATION	ORIGINAL TOTAL 1973	DEMOLISHED TO JULY 1985	STRENGTHENDED TO JULY 1985	REMAINDER TO JULY 1985
Golden Mile %	187 100%	91 49%	14 7%	82 44%
Other CBD %	405 100%	135 33%	11 3%	259 64%
Total CBD %	592 100%	226 38%	25 4%	341 58%
Suburbs %	166 100%	55 33%	2 1%	109 66%
City Total %	758 100%	281 37%	27 4%	450 59%

TABLE 2APPROXIMATE FLOOR AREAS OF EARTHQUAKE RISK BUILDINGSIN WELLINGTONPOSITION AT JULY 1985

LOCATION	ORIGINAL TOTAL 1973	DEMOLISHED TO JULY 1985	STRENGTHENED TO JULY 1985	REMAINDER TO JULY 1985	NEW COMMERCIAL BUILDING ERECTED 1973 TO 1985
Golden Mile	187	91	14	82	
Floor area m ²	176,875	86,073	13,240	77,562	321,616
Other CBD	405	135	11	259	
Floor area m ²	383,073	127,690	10,404	244,979	465,784
Total CBD	592	226	25	341	
Floor area m ²	559,948	213,763	23,644	322,541	787,400
Suburbs	166	55	2	109	
Floor area m ²	90,312	29,922	1,088	59,302	102,060
City Total	758	281	27	450	
Floor area m ²	650,260	243,685	24,732	381,843	889,460

building permits issued for new commercial buildings in the C.B.D. floor areas

1000 sq.metres



* includes BNZ building

building permits issued for new comercial buildings in the C.B.D. value

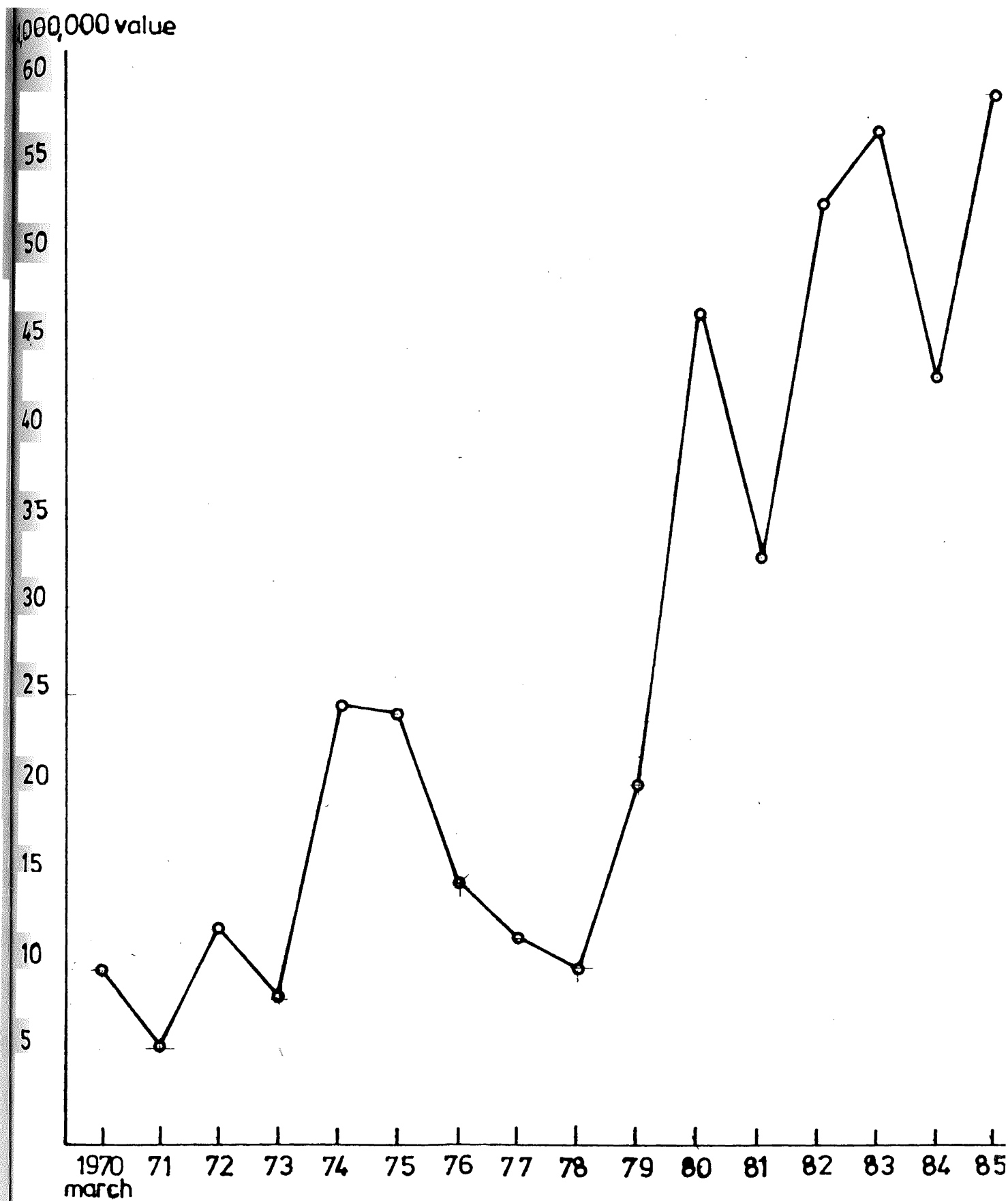
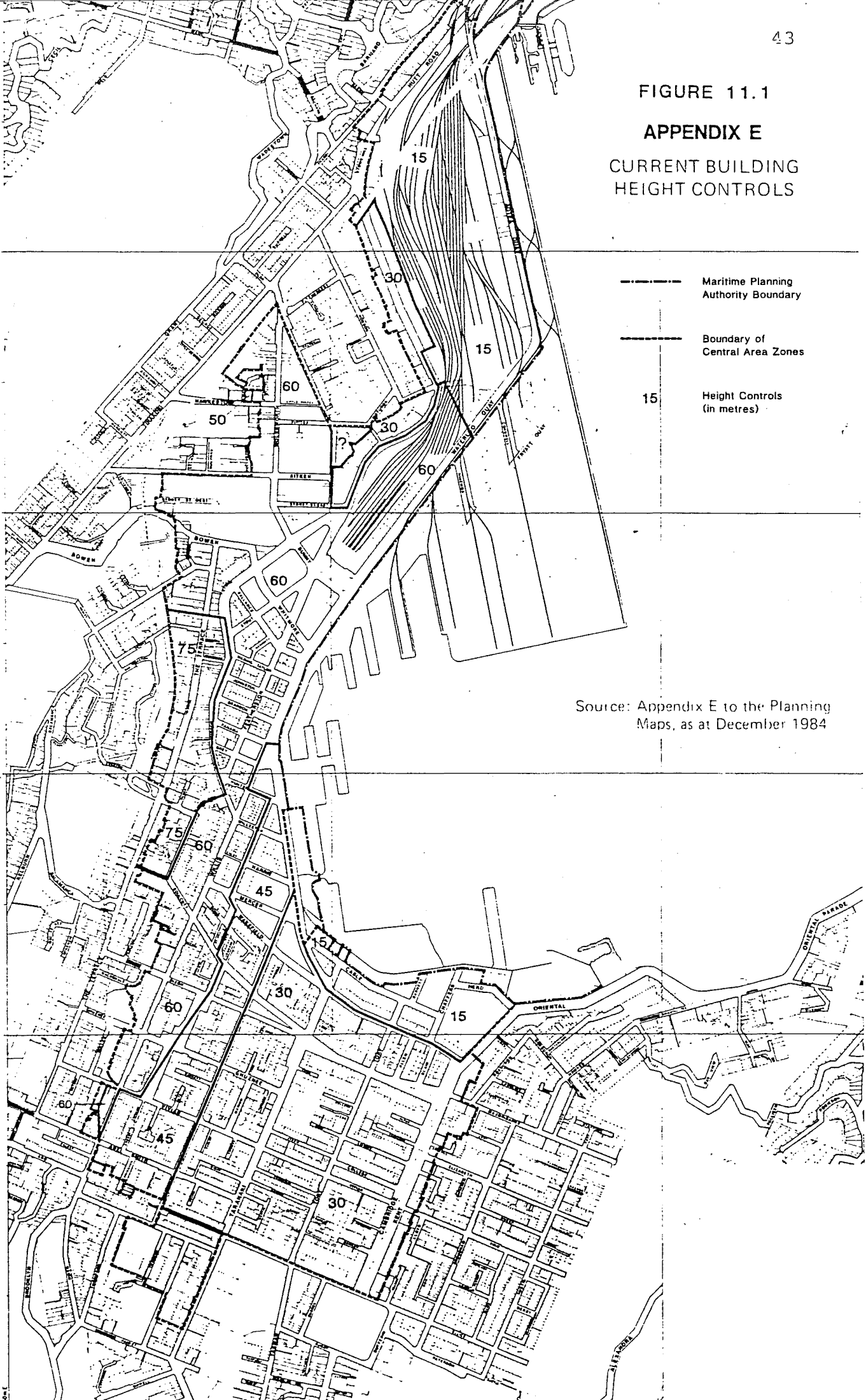


FIGURE 11.1

APPENDIX E

CURRENT BUILDING
HEIGHT CONTROLS



	over 90
	80
	70
	60
	50
	40
	30
	20
	10
	under 10

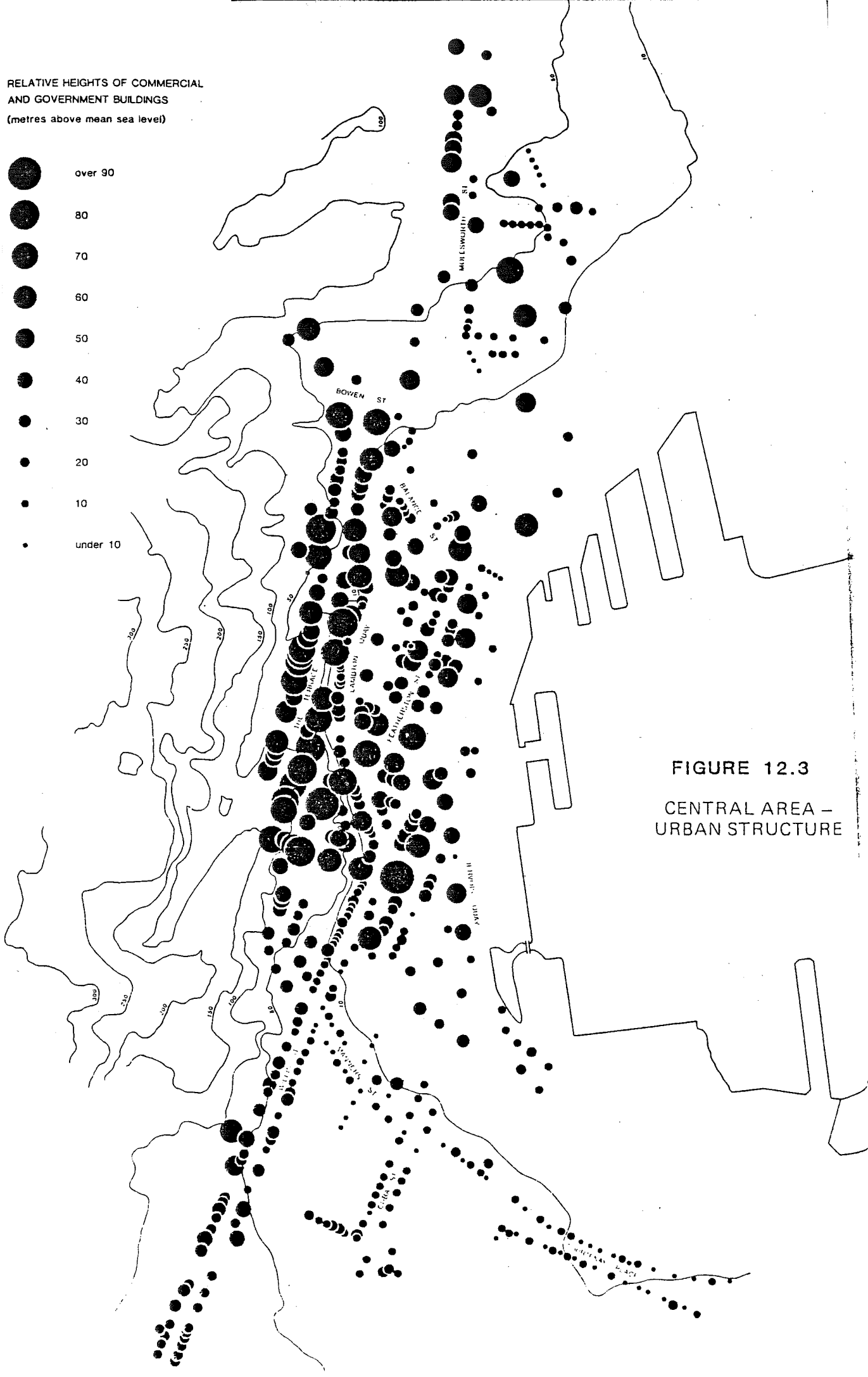
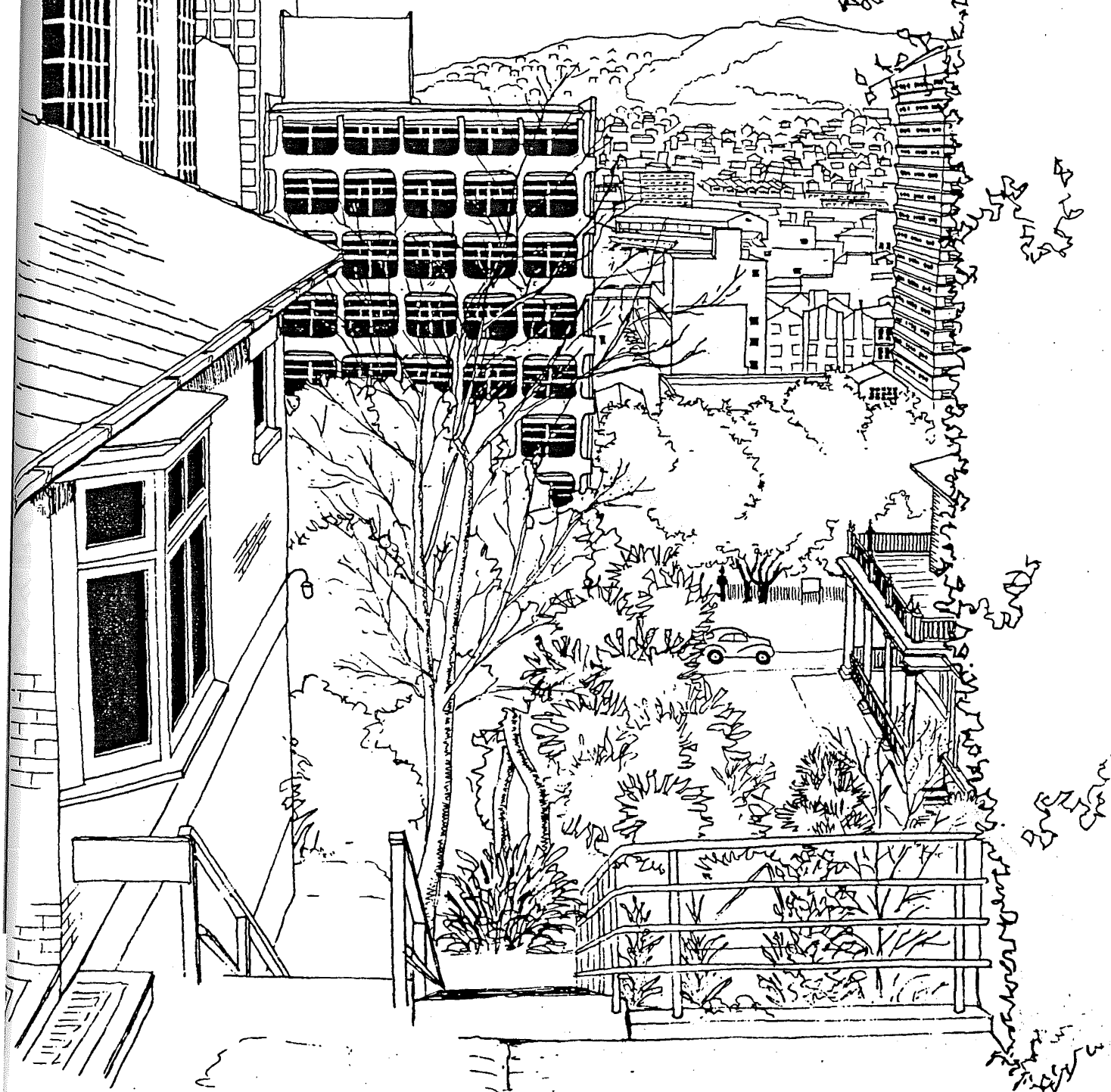


FIGURE 12.3

CENTRAL AREA –
URBAN STRUCTURE

VIEW PROTECTION AND URBAN FORM :



WELLINGTON'S INNER CITY

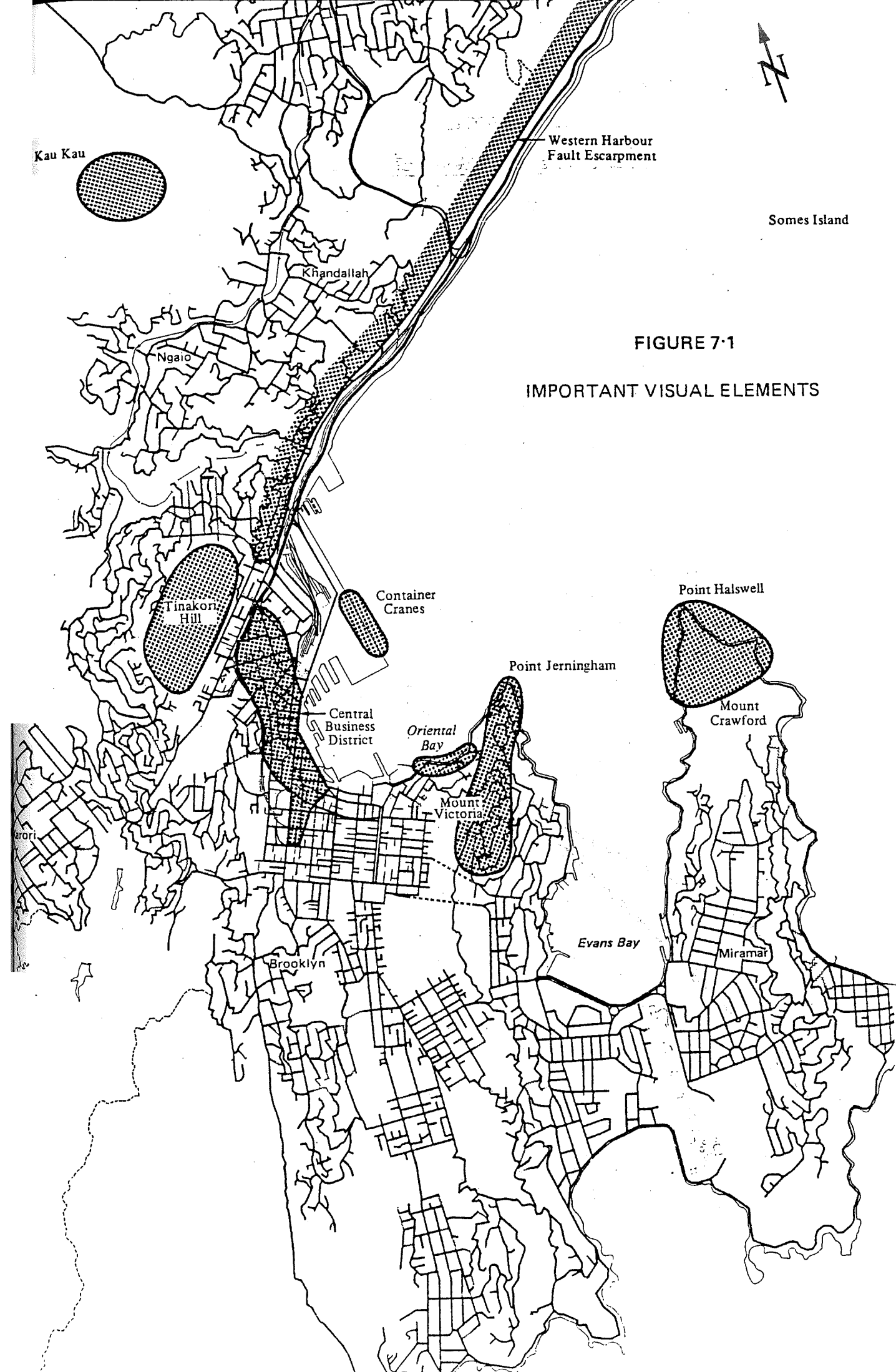
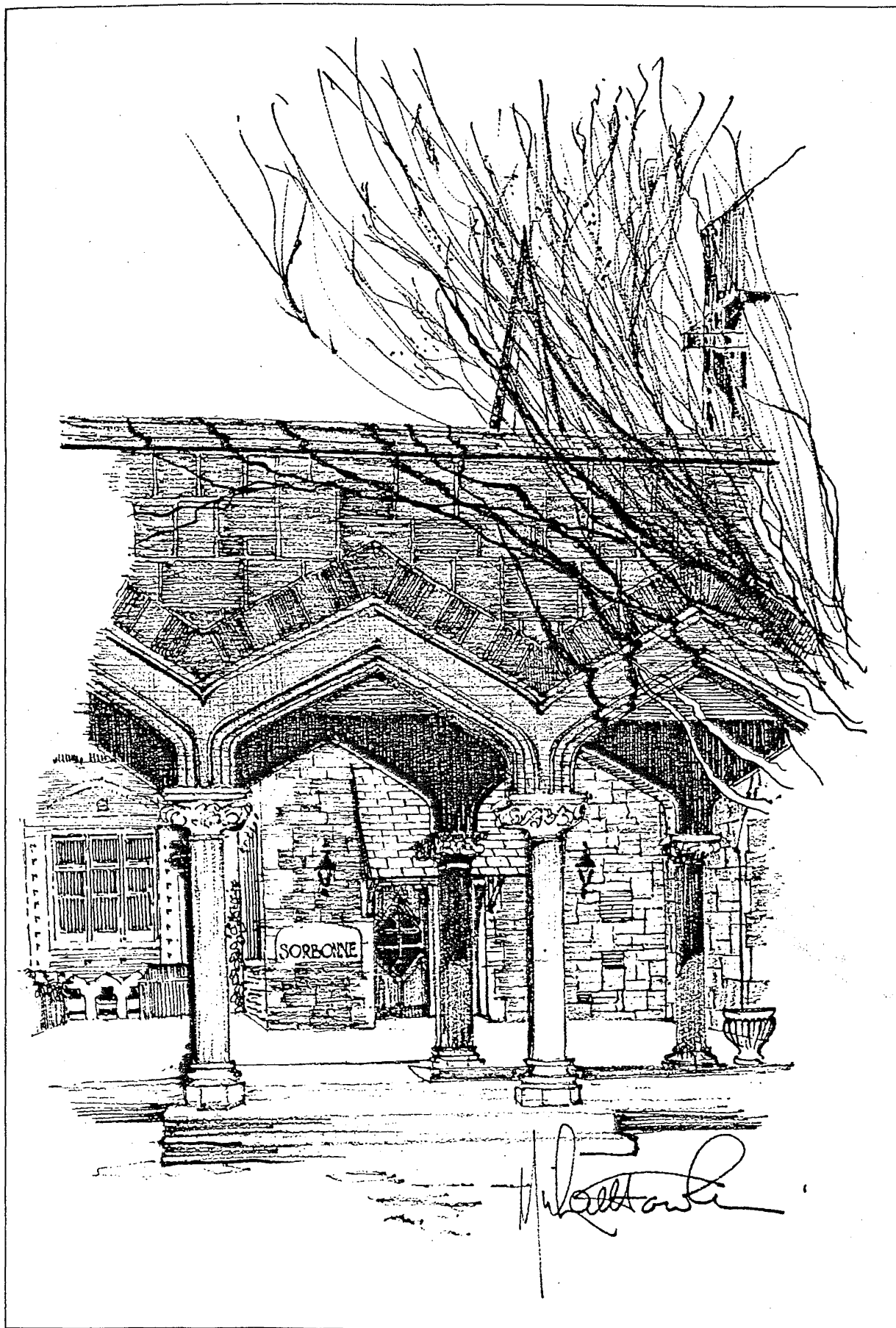


FIGURE 7-1

IMPORTANT VISUAL ELEMENTS



The Sorbonne