

A history of the regulation of building in New South Wales

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**A HISTORY OF
THE REGULATION
OF BUILDING
IN NEW SOUTH WALES**

PRESENTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR A MASTER OF SCIENCE (BUILDING)

UNIVERSITY OF NEW SOUTH WALES

JANUARY 1986

Thomas Wesley Cox

UNIVERSITY OF N.S.W.

30 JUL 1986

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PRECIS

In 1837, the building act current in London was introduced in Sydney, with minor amendments. This act remained in force, despite demands for a new act, until its repeal by the Sydney Improvement Act, 1879.

In 1916, concrete and steel construction was made possible by the passage of a By-law. New technologies and the growing demand for land in the city centre led to the construction of taller buildings.

In 1912 the Height of Buildings Act was passed, to limit the permissible height of buildings in Sydney. The Local Government Act, 1906 made available for the first time in much of New South Wales, local government powers to control building and subdivision.

Building Ordinances 70 and 70A were published under that act. The Local Government Act, 1919, is the legislation underlying current building regulations. Two ordinances were proclaimed, 70 and 71, respectively for simple and more complex building works. Ordinance

70 was repealed in 1946 and Ordinance 71 extended, the complexities of building having increased. Following the development of the

Australian Model Uniform Building Code, by co-operation between the States and the Commonwealth, Ordinance 71 was replaced by a new

Ordinance 70, based on the Model Code, in 1974. By-laws made under the Sydney Corporation Act, 1934 superseded the Sydney Improvement

Act, 1879, and were in turn repealed by Ordinance 70 in 1974, thereby bringing building in the City of Sydney under the same building

regulations as the rest of New South Wales.

PRECIS

The dissertation reviews the development of the regulation of building in New South Wales. The origins of the first colonial legislation lay in the law which had developed in London. In the first years of settlement regulation of building was rudimentary. The first legislation to affect building dealt simply with the relationship of buildings to streets. In 1837, the building act current in London was introduced in Sydney, with minor amendments. This act remained in force, despite demands for a new act, until its repeal by the Sydney Improvement Act, 1879. Insanitary conditions, slums and overcrowding were a major public concern in mid nineteenth century Sydney, and this concern influenced the legislation. The Great Fire of Sydney, 1890 and the Anthony Hordern Fire, 1901, amongst others, contributed to the development of legislation. There were continued demands, over several decades, for a new building act which would take account of the new technologies and new construction methods which were being developed overseas, and which could not be used under the Improvement Act. Eventually, in 1916, concrete and steel construction were made possible by the passage of a By-law. New technologies and the growing demand for land in the city centre led to the construction of taller buildings. In 1912 the Height of Buildings Act was passed, to limit the permissible height of buildings in Sydney. The Local Government Act, 1906 made available for the first time in much of New South Wales, local government

powers to control building and subdivision. Building Ordinances 70 and 70A were published under that act. The Local Government Act, 1919, is the legislation underlying current building regulations. Two ordinances were proclaimed, 70 and 71, respectively for simple and more complex building works. Ordinance 70 was repealed in 1946 and Ordinance 71 extended, the complexities of building having increased. Following the development of the Australian Model Uniform Building Code, by co-operation between the States and the Commonwealth, Ordinance 71 was replaced by a new Ordinance 70, based on the Model Code, in 1974. By-laws made under the Sydney Corporation Act, 1934 superseded the Sydney Improvement Act, 1879, and were in turn repealed by Ordinance 70 in 1974, thereby bringing building in the City of Sydney under the same building regulations as the rest of New South Wales.

With increasing urbanisation and increasingly complex building, regulation necessarily increases. The opportunities for change are limited, and the mechanisms slow.

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INTRODUCTION

1.1 OBJECTIVES

The objective of this Report is to describe the regulation of building in New South Wales as it has developed in the period since the first settlement of the colony. Over that time there have been significant changes in the nature and extent of building regulations. The report will also describe the sources of the first building legislation introduced to the colony and will review the origins of the English legislation which preceded it. Particular reference will be made to regulations applying to the Town and City of Sydney.

The first building regulations introduced were applied only to a small area at the heart of Sydney, the rest of the continent remaining free of legislation. Gradually, as settlement was extended and towns were established further afield, some legislation was introduced to regulate building in certain gazetted areas. This legislation was simpler and less onerous than that which was concurrently being applied in the heart of Sydney. Indeed, it was not until the early years of the Twentieth Century that significant powers to regulate and control building were introduced for areas other than the City of Sydney, where building has been regulated by legislation since 1837. From very early in the Twentieth Century there have been two sets of building regulations, one applying to the City of Sydney, the other applying to the rest of New South Wales, or at least to those parts of it gazetted for application. This parallel situation continued until

very recently. It in part reflected the differing needs of communities in relation to the density of settlement.

1.2 PARAMETERS AND LIMITATIONS

The report deals specifically with the primary legislative and regulatory instruments of building control in New South Wales. As such it does not deal with codes or controls which might have been devised locally to suit particular local requirements. Nor does it discuss, other than peripherally, the plethora of legislation which, while it may have primary objectives other than the regulation of building, nonetheless does regulate building as a consequence of those objectives.

This legislation is extensive and encompasses such fields as town and country planning laws, construction safety laws, laws regulating industrial practice (e.g. Builder's Licensing Act), the Public Health Act 1902, the Noxious Trades Act 1902, the Explosives Act 1905, the Liquor Act, 1912, the Dividing Fences Act 1912 and even the Air Navigation Act (affecting buildings in the vicinity of airports). There is also legislation related to the various building services - water, sewerage, electricity and gas, which has a material bearing upon building. Furthermore, there is legislation designed to control particular building types, for example the Factories, Shops and Industries Act 1962, the Theatres and Public Halls Act 1908, the Private Hospitals Act 1908, the Public Hospitals Act 1929, the Rural Workers' Accommodation Act 1926 and the Housing Act 1912, the Housing of the Unemployed Act 1934 and the Housing Improvement Act 1936, which last three govern public housing. Butchers' shops, barbers' shops and boarding houses are all controlled by ordinances under the Local

Government Act 1919. Boarding Houses are also regulated by the City of Sydney By-laws.

In addition, some government departments and boards are empowered to control specific matters related to buildings; or even where they are not so empowered, their advice may be relied upon by local government bodies. These authorities include the Board of Fire Commissioners of New South Wales, the Department of Main Roads, the Maritime Services Board of New South Wales and the Police Traffic Branch of the Police Department.

There is some overlap in regulations. For instance, Ordinance 70 under the Local Government Act 1919 has certain requirements regarding water closets. Under the same act, Ordinance 44 deals specifically with closets and cesspits. Other rules again can be applied under local Water, Sewerage and Drainage Board Acts. Further specific requirements for water closets are set out for particular building types in the related legislation, for instance in the Factories, Shops and Industries Act, the Theatres and Public Halls Act and the Liquor Act and in some situations, the last two would be applied to the same building. The requirements under the various pieces of legislation are not necessarily complementary and they may sometimes set differing standards. Even where standards do not differ, the building designer will often have to consult several regulations or regulating authorities for even a simple building.

This brief discussion has touched but lightly on the breadth of regulations affecting building in New South Wales. The extent of applicable current controls is well documented in two places: Authorities controlling building - New South Wales, Practice Note 42A, issued by the Royal Australian Institute of Architects Practice

Division, 1984 and Australian building authorities, published in 1977 by the Department of Environment Housing and Community Development.

The report is discursive and documentary. The primary purpose has not been to produce an interpretative analysis of the material researched, but rather has been to set out clearly the historical sequence of the development of controls on building in order to give an understanding of the legislative origins of current controls. Emphasis has been given to the earlier stages of development of regulation, with a less detailed description given of more recent changes, particularly those of the last decade, which are more familiar and more readily accessible.

1.3 THE OBJECTIVES OF BUILDING REGULATIONS

Building regulations in New South Wales today are concerned with four basic issues: the protection of life, the protection of property, health, and amenity. The protection of life and property have their primary expression in standards related to fire and structural adequacy. The regulations are concerned with the safety of both the users of a building and of society at large, whether as passers-by or more distantly removed. The concern for safety applies whether a building be under construction, in use or being demolished.

Regulations to protect property arise as a consequence of the concern to protect life. The regulations affecting property fundamentally are concerned with the protection of adjacent property from damage, whether due to structural fault or fire. The protection of a particular property is incidental to the protection of the adjoining properties and the protection of life. Consequently, where the risk of damage to adjacent properties is small, for instance where they are

some distance removed, then the required protection of a property will be less than where properties are close together. A factory built in a field will be free to burn down, given adequate protection for human life, while one built in an urban industrial development will be required to have a much higher standard of protection to prevent the spread of fire to the neighbouring buildings. However, even in the latter situation the protection of the building contents is not a primary concern of building regulations. It is considered to be a matter for insurance, at the discretion of the property owner, a private matter not affecting the public good.

Regulations governing the areas of health and amenity reflect concerns for the protection of life and for the quality of life. The majority of this legislation has arisen out of a concern to set standards which will guarantee healthy living conditions and avert the possible inception and spread of disease thereby. Some of the legislation determines the amenity of buildings, that is, it legislates for quality of life. Amenity is the quality of being pleasant or agreeable. In many instances health and amenity are inter-related concerns, so that for instance, regulations requiring the provision of kitchens, bathrooms or laundries do so firstly for reasons of preservation of health, but concurrently they reflect a judgment that all dwellings in this society should be provided with such facilities, because without such facilities the quality of life provided for would not be acceptable to society as a whole. Similarly amenity legislation controlling noise transmission also reflects to some extent concern for mental and emotional health.

Although this is the theory of the objectives of building regulation as presently expounded (1), current regulations are interventionist beyond issues of the common good and beyond the physical protection of

the individual user. The legislators make value judgments on behalf of society at large as to the extent of protection of life and property and provision of amenity, that should be made. Every such judgment involves some cost, whether monetary or other, to society. To the extent that the legislator's decisions reflect the values held in common by the society, the regulations can be held to be valid for the society. The community however is rarely aware of the costs of the regulation to which they might give assent (2).

1.4 THE SUBJECT OF BUILDING REGULATIONS

Ordinance 70, which under the Local Government Act, 1919, is currently the primary instrument of building regulation in New South Wales, is comprised of some fifty-nine parts. These parts together give a good indication of the areas of concern encompassed in modern building regulation. They can be summarised as follows:

1. Enforcement and control
2. Buildings in the course of erection or demolition
3. Siting
4. Buildings in relation to public roads
5. Fire: structural/constructional precautions
6. Fire: egress
7. Fire: fire fighting services
8. Structure: strength and stability
9. Health: drainage
10. Health: disposal of wastes
11. Health: vermin proofing
12. Health: weatherproofing (resistance to moisture)
13. Health and amenity: provision of bathrooms, toilets, kitchens and laundries

14. Health and amenity: light
15. Health and amenity: ventilation
16. Health and amenity: room sizes and heights
17. Amenity: resistance to noise transmission
18. Amenity: access for disabled persons

The report describes the development of the various areas of concern: fire, structural adequacy, health and amenity, and their outworking in the subject matter of the legislation.

1.5 THE EXISTING STATE OF KNOWLEDGE

There is currently very little published on the history of building regulation in New South Wales. Murray Wilcox, in his book The Law of Land Development in New South Wales (3) gives a concise and apart from one error (4), accurate history of Part XI of the Local Government Act, 1919. J.M. Freeland, in his book Architecture in Australia (5) makes particular reference to one of the earlier Acts and describes its impact upon building design. However, while his description is valuable, he is in error in a number of points of detail regarding the legislation (6).

Apart from this material there are histories of local government in New South Wales (7). These histories deal with a much broader field and include reference to the regulation of building as but one small component of the whole. While the histories are valuable contextually, to give an understanding of political developments in parallel with the growth of the country and the need to establish an infrastructure for that growth, they give little specific detail on the development of building law.

Again, there are histories of the development of town planning in Australia (8). These too are valuable contextually, but make little specific reference to building law.

1.6 SOURCES

As there is very little published in the way of historical accounts of building regulation, original source materials have been relied upon for much of the discussion. This however is not the case with the second chapter, which reviews antecedents in English law. This chapter relies heavily upon a book entitled The History of Building Regulation in London 1189-1972 by C.C. Knowles and P.H. Pitt, largely because information on or copies of the antecedent English legislation are not otherwise available in Sydney (9).

The remainder of the report is developed upon a review of the actual Acts, Ordinances and By-Laws. In some cases reports of parliamentary committees and parliamentary debates are used as sources. However, building regulations have rarely been a matter for much discussion either in parliament or in the popular press.

With the later regulations some specialised discussion was published for the edification of architects, builders and the like; by way of commentary published with the Acts or by way of article.

Journals of the Institute of Architects (later Royal Australian Institute of Architects) and the Master Builder's Association have been a source of some commentary upon the regulations. From 1921, the Annual Reports of the Department of Local Government provide some discussion of developments in the legislation.

1.7 DIRECTIONS FOR FURTHER RESEARCH

There are a number of further related areas of research which might be worth pursuing.

1. A parallel history describing regulations relating to specific building types.
2. A parallel history describing the development and regulation of building services.
3. An analysis of the effects of regulation upon buildings built.
4. An economic analysis of changes in building regulations.
5. A social and political analysis of the development of building regulation.
6. A political analysis of the process of regulation.
7. A comparison, analysis and correlation of all current building regulations.
8. A comparison of Australian Building regulations with the building regulations of comparably urbanised countries, states or cities.
9. A philosophical discussion of the nature of and need for regulation in an urban society; including a discussion of the costs of regulation and an analysis of the manner in which collective value judgements are made in such a society.
10. An analysis of urbanisation and regulation.
11. A detailed description of the role played by various bodies e.g. the Commonwealth Experimental Building Station, the Board of Fire Commissioners, the Heights of Buildings Committee, the Building Regulations Advisory Committee, the Interstate Standing Committee on Uniform Building Regulations, the Standards Association of Australia; in the development of

building standards.

12. An analysis of the role of building producers and users (e.g. architects, engineers, builders and investors) in effecting change in building standards.

REFERENCES: CHAPTER 1

1. See Steed, The regulation of building standards, part 1.
2. For instance, American medium density housing can be built and sold for half the price of similar housing in Australia. This can in part be attributed to the American development and building regulations setting less stringent standards.

Were the Australian public aware of the cost differentials involved they might choose to have less stringent standards and lower cost housing; or they might agree with the legislators that the standards established are worth maintaining for the cost incurred.
3. Wilcox, M.R. The Law of Land Development in New South Wales, pp.419-423.
4. See Chapter 2.1.
5. Freeland, J.M., Architecture in Australia, pp. 84-88, 109-110, 238.
6. For instance, Freeland in referring to the 1838 amendments of the Sydney Building Act, says "balconies were to be allowed to project three feet two inches over a footpath"; and also claims of the Act that "while it abolished the need to use parapets on the back and sides of the buildings, it continued to demand them on the streetfront purely on the grounds of appearance" (p.86). The Act in fact makes neither provision. Again Freeland claims that the area of application of the Act was expanded in 1842 to include what is now the main city area (p.88). In fact the application of the Act was extended in 1845 (by 9 Victoria No. 5).
7. For instance, the three volume history by F.A. Larcombe, A History of Local Government in New South Wales; and The History of Local Government in New South Wales by H.E. Maiden.
8. For instance, Leonie Sandercock's Cities for Sale, and Property, Politics and Power: A History of City Planning in Adelaide, Melbourne and Sydney Since 1900.
9. As far as I have been able to determine in my research.

ANTECEDENTS IN ENGLISH LAW

2.1 INTRODUCTION

The first legislation introduced to control building in New South Wales was passed in 1833 (1) and applied only to buildings in the town of Sydney. In 1837 the Sydney Building Act (2) was passed. Wilcox (3) claims

there was no 'common law' regarding building; subject only to the law of nuisance any land-owner was free to build as he pleased. Blackstone, in his Commentaries was able to discuss 'offences against the Public Health' without so much as mentioning buildings. It was not until the urbanisation of the Nineteenth Century that a need was seen for legislation to regulate the erection of buildings. In England the first legislation controlling the erection of buildings was the Public Health Act of 1848. This Act was amended from time to time until its replacement by the Public Health Act of 1975 which consolidated the earlier legislation...Sydney did not lag behind the Mother Country. In 1837 the Sydney Building Act was passed.

This implies that the New South Wales law was developed separately from and in advance of, the English law. However, this was not the case. In fact, antecedents in the English regulation of building can be traced as far back as 1189. As might reasonably be expected, the first building legislation of the fledgling colony was a transposition of the building legislation then current in London. The following discussion traces the origins of that legislation.

2.2 FITZ-AILWYN'S ASSIZE OF BUILDINGS OF ALLAYING CONTENTIONS AS TO ASSIZES OF BUILDINGS.

These regulations, recognised as the first of any consequence in London, were introduced in 1189 by Henry Fitz-Ailwyn, Mayor of London (4). They provided for the resolution of disputes between neighbours in the city of London regarding common boundaries and related matters. Twelve men were appointed to carry out the regulations at the summons of the Mayor.

The Assize dealt primarily with controlling the erection of party walls. Each neighbour was required:

- 'to give one foot and a half of his land on which they shall build at their joint costs a stone wall three feet in thickness and sixteen feet in height'. Arches used as 'Almeria or aumbries' cupboards or larders, could be formed provided they were one foot only in depth (the party wall at the back between the cupboards would be one foot in thickness). A neighbour (adjoining owner) who could not afford to build his portion of the wall 'ought to give unto him who so desires to build by the Assize three feet of his land.' The building owner should then build the wall upon that land at his own cost. The adjoining owner, who gave the land, could then have one half of the wall and place his timber joists and roof thereon. (5)

Objection could be made to an obstruction to view from a window if 'some writing could be produced by the objector showing his right to the light'. The carrying off of water, the fixing of joists in walls and the construction of pits for receiving clean or foul water in the vicinity of a neighbour's land were all dealt with (6).

Furthermore,

A neighbour could object to a building in course of erection adjoining his ground and impede or stop the work. The building Owner could then demand the Assize. The Mayor and his twelve men would then attend, on an appointed day and after hearing the case of complaint, answer to settle the matter. The award they issued could be enforced by the Sheriff at the sole cost of the person offending. (7)

Knowles and Pitt consider that the memory of fires in the preceding century, and earlier, which had wrought great destruction, was the motive for Fitz-Ailwyn's Assize. The standard of construction

established for party walls was followed subsequently by rules for external walls. They suggest that the thickness of three feet was probably dictated by the use of dry walling assembled with poor lime mortar. (8)

Fitz-Ailwyn's Assize represents a significant starting point in the law of building:

Building owner and adjoining owner had their rights defined, probably for the first time and these principles have, with variations, persisted through 800 years and the same may be said of the provisions as to obstruction of light, which now forms part of common law.(9)

The good intentions of the law to provide a more fire resistant form of construction however were not fulfilled, for the want of police to execute it. (10)

With the passage of time further enactments and edicts were made, regulating such matters as roofing materials, the height of parts of buildings overhanging streets, the standard of certain construction materials, the construction of chimneys, furnaces and reredoses and the appointment of officials empowered to order the alteration or demolition of buildings not complying with the standards. No steps to cellars were to project into the streets. Fences were not to be erected in front of houses without the approval of the Mayor and Aldermen. Master carpenters and masons of the City were sworn not to make encroachments "upon the walls or lanes within the City or Suburbs or prejudice the neighbours, when they make their Buildings against the Statutes of old time ordained" (11). There is some parallel in present legislation requiring the licensing of residential builders. In London however, the control depended more upon the moral responsibility of master craftsmen.

The edicts also provided that all persons who lived in great houses within a ward were to have a ladder prepared to help neighbours in case of fire and in summer time to have a barrel of water or a fountain ready for the quenching of fires. This was the first primitive fire services regulation.

In 1580, Queen Elizabeth issued a proclamation prohibiting the erection of any new housing within three miles of the gates of the City of London, other than where houses had already been built. This was an attempt to control the size of the burgeoning population of the city and hence mitigate the danger of outbreaks of plague. It also reflected the conflict of interests which arose as newcomers living on the outskirts of the city and without civic responsibilities started to compete with the craftsmen within the city who had certain civic duties they were required to perform, either by service or payment (12). The legislation reflected the interests of the established craft guilds. It was a means of protecting their work and conditions against the challenge from those outside who, highly motivated to become established and secure, and without civic responsibilities, provided strong competition for the available work.

Further proclamations were made and acts passed restricting building, until in 1619 James I issued a proclamation which was the forerunner of the subsequent Building Acts.

2.3 THE PROCLAMATION OF 1619

The proclamation provided a construction standard for walls and also made certain provisions related to health and amenity, setting a minimum room height of ten feet (seven and a half feet for attics)

and requiring windows of a proportion that would enable adequate ventilation of rooms without endangering the structural adequacy of the walls in which they were installed.

Our expresse will and pleasure is, That in erecting of new Buildings hereafter, every whole Story of and in such houses and Buildings and all and every the roomes of such whole Story shall be of the height of tenne foot of assize at the least and every halfe Story of and in such houses and Buildings shall bee of the height of seven foote and a halfe at the least: and that the forefront and outward Walles and the Jambes Heads and Soyles of the Windowes shall be of Bricke or of Bricke and Stone and the Windows (being of Timber) not to bee put in untill the Jambes and Heads aforesaide bee finished and beare of themselves.

And if the saide Buildings doe not exceed two Stories in height, then the Walles thereof shall bee of the thickness of one Bricke and halfe a Bricks length from the ground unto the uppermost part of the saide Walles: And where the Building shall be (over) the height of two Stories, the Walles of the first Story shall bee of the thickness of two Bricks length, and from thence to the uppermost part of the Wall, of the thickness of one Bricke and halfe a Bricks length.

And that in Building of the saide houses, there shall be no Jutties or Jutting, or Cent-windowes either upon Timber Joystes or otherwise, but the Walles to goe direct and streight upwards and at the setting off a water Table to bee made; Also the lights of the Windowes of every whole Story, to be of more height than breadth, to the end the roomes may receive ayre for health and that there may be a sufficient peere of Bricke betweene the windowes for strength: and likewise the Windowes of every halfe story to be made square every way, or neere thereabouts.

And lastly, that all shops in every Principall Streets of Trade, be made of Pillasters of hard Stone or Bricke and the heads of the Shop Windowes cut in wedges Archwise to sustaine the Wall about it and for ornament of the Streets. (13)

This is the first time that an aesthetic consideration ("ornament of the Streets"), was included in the concern of building regulations.

2.4 THE PROCLAMATION OF 1620

James I issued a further proclamation in 1620. It provided that old and ruinous buildings were not to be strengthened or repaired. The construction of cellars, new brick walls, chimneys and staircases,

new roofs and dormers were all prohibited in old buildings within two miles of the city unless specifically licensed by the Commissioners of Buildings. The Act also provided that -

All new houses and buildings within five miles of the gates of the city must be in brick or stone.
Storey heights of 10'0" and 7'6" confirmed. (the half storey apparently referred to attics and additions).
Outside, division or party walls, to be of brick or stone.
Thickness of walls: Not exceeding two storeys - 1 1/2 bricks for first storey and 1 1/2 bricks above. And so proportionally if there should be more storeys. Piers between windows were not to be less than one-half the breadth of the windows. (14)

These restrictions, together with earlier restrictions of Elizabeth and Cromwell, prohibiting repair or rebuilding, prohibiting building other than on old foundations, or prohibiting new building, possibly represent the first legislation for town planning purposes. The proclamation reiterated some of the provisions of the 1619 proclamation and also provided that all new buildings within five miles of the city gate must be in brick or stone, including all external, dividing or party walls. Piers between windows were to be at least half the width of the windows. (15)

2.5 STANDARD BRICK SPECIFICATION, 1625

The regulation, applying to the city and suburbs, specified the method and period of digging, weathering, moulding, drying and firing in the process of brickmaking and specified that the finished brick size was to be 9 inches x 4 3/8 inches x 2 1/4 inches. A maximum price of eight shillings per thousand at the kiln was fixed and the Commissioners of Building had power to regulate the charge for cartage. (16)

2.6 THE SEVENTEENTH CENTURY: PLAGUE AND THE GREAT FIRE OF LONDON

The population of London at the middle of the Seventeenth Century has

been variously estimated as being of the order of half a million people. Legislation such as An Act for the Preventing of the Multiplicity of Buildings in the About the Suburbs of London and Within Ten Miles thereof: Year 1656, continued to be introduced in an attempt to stem the flow of new settlers to the city, thereby to limit the increase in population density with the associated health risks. There were no sewers. "Rakers" and stormwater were relied upon to clear away the waste discharged to the centre channel of the roads. Other proclamations again required all buildings to be of brick or stone, prohibited new building except on old foundations and prohibited the erection of buildings overhanging streets.

However, in the winter of 1665, a plague commenced to take toll of the people. Through the hot and sultry summer days the infection spread with increasing intensity. The doors of houses marked with a red cross denoted the presence of the dreaded fever within and by night carts carried away the dead to be buried in common pits. The winter of 1666 brought relief from the visitation but some 100,000 persons had perished. Towards the close of the summer of 1666 the city was swept away by fire. The most devastating plagues of London in the 17th Century are recorded as follows:

1603 -	there died of plague	30,500
1625 -	there died of plague	35,400
1636 -	there died of plague	10,400
1665 -	there died of plague	100,000

The Great Fire of London commenced in the early hours of Sunday morning 2nd September, 1666 in a baker's shop in Pudding Lane, a narrow thoroughfare running north and south of Thames Street. The houses in this quarter were practically all of wood and the fronts jutted out over the lanes to almost meet in the top storeys. Thames Street adjoining contained warehouses packed with combustible materials from spirits and oil to tar and pitch. Fanned by a strong east wind the fire spread rapidly and raged for four days. On the third day, seamen brought from the dockyards, commenced to blow up blocks of property to form fire breaks. Towards nightfall the wind abated and on the fourth day the situation was under control, but fires in vaults continued to burn until the end of the year. The narrow lanes were useless to check the flying sparks and leaping flames which swept across them devoured the timber-fronted houses with incredible speed. Nightfall presented the scene as a fearful spectacle the city being covered with lurid flames crackling and roaring; an old description reads - 'the bellowing wind drove the flames forward and their noise was like to a thousand iron chariots beating together upon the stones.' Nearly four-fifths of the city was destroyed including St. Pauls and eighty-seven Parish Churches, the Guildhall, the Royal Exchange, The Custom House, forty-four Halls of the City

Companies, four Prisons, four Gates, numerous commercial buildings and thirteen thousand two hundred houses. Two hundred thousand people were rendered homeless. The loss was estimated at ten million pounds. (17)

2.7 AN ACT FOR REBUILDING THE CITY OF LONDON, 1667

The Act provided that all buildings were to be erected in accordance with the regulations and that where a building was not so erected, it was to be deemed a common nuisance. The Lord Mayor and the justices of the peace were empowered to order rectification or demolition of the work. The Lord Mayor and Council were further empowered to "appoint one or more discreet and intelligent person or persons in the art of building to be surveyors or supervisors to see the said rules and scantlings well and truly observed". (18)

For the first time buildings were classified. There were to be four classes of building:

- (a) The first or least sort of house fronting by-lanes
- (b) the second sort fronting streets and lanes of note
- (c) the third sort fronting high and principal streets
- (d) the fourth and largest sort, of mansion houses for citizens or other persons of extraordinary quality not fronting either of the three former ways. (19)

The Lord Mayor and Council were required to define and mark out the streets coming within each category within two months of assent having been given to the Act. This would appear to be the first instance of zoning. Building height was to be limited in direct relation to the width of the street addressed. Thus on narrow streets it was no longer possible to build tall buildings. The Lord Mayor and Council were also empowered to prohibit 'noisom or perillous' trades which might be fire risks on the principal streets.

The Act set out specific structural requirements for external and

party walls; directing that -

the outsides of all buildings in and about the city were to be - 'of brick or stone or bricks and stone' except 'door-cases, window-frames, brest-summers and other parts of the first storey to the front, between the piers, which are to be left to the discretion of the builder to use substantial oaken timber instead of brick or stone for conveniency of shops.' The doors and window-frames also the brest-summers were to be 'discharged of the burden' of carrying the load above by 'arch-work of brick or stone either straight or circular.'

The number of storeys for each of the three sorts of buildings and the thicknesses of the external and party walls were specified in a table to the Act. Those of the fourth sort - being mansion houses - were required to have the same scantlings as set out in the table, but the number of storeys and the height thereof was left to the discretion of the builder providing always that not more than four storeys could be erected. A balcony, projecting four feet and a pent-house were permitted to houses fronting high streets. The pent-house had to be covered with lead, slate or tile and sealed with plaster and apparently it could extend for the whole width of the building. Down pipes were required to convey rain water from the roofs and from projections to the street channels. Stall-boards to shop fronts could, when let down, extend only eleven inches from the buildings.

The clauses of the Act relating to party walls enacted that they should be built equally on both owners land and a special instruction from the Privy Council issued at Whitehall on 8th May 1667 called for the following procedure: That the Surveyors shall take care for the equal setting out of all party walls and piers and no persons be permitted to build till that be done; therefore, for the prevention of any exaction in the taking of such surveys, and of all quarrels and contentions that may arise between the builders, that no builder shall lay his foundation until the Surveyors or one of them, shall view it and see the party walls and piers equally set out and that all persons observe the Surveyors directions concerning the superstructure to be erected over the said foundation. (20)

Prior to commencement of work a Builder was required to give notice of his name and the location of the proposed building and to pay a fee. The Council Surveyors would then set out the foundations.

Authority was given to the Council to construct common sewers, to be paid for by a tax imposed on property benefitting from it. The Council was also required to widen certain streets and a minimum width of fourteen feet for lanes was established.

Sections XLIII-XLVI dealt with construction matters and included a

table of thicknesses for walls and heights of storeys; a schedule of timber scantlings was also set out therein. Section XLVII contained general rules relating to:

1. Foundations
2. Timber near chimney jambs
3. No timber within the tunnel of any chimney with penalty and weekly continuing penalty against the workmen.
4. Joists not to exceed 12" apart.
5. Bearing of joists not longer than 10' or single rafters longer than 9'.
6. Roofs, window-frames and cellar floors to be made of oak.
7. Tile-pins of oak.
8. No summers or girders to lie over the head of doors or windows.
9. No summer or girder to lie less than 10" in the wall, joists 8" to be laid in loam. (21)

There was also in the legislation provision for some aesthetic control, a concern for maintaining the quality and consistency of the streetscape, while allowing for individual variations and adaptations. The Privy Council's instructions issued on 8th May, 1667, contained the following:-

It is ordered that the Surveyors take special care that the best summers of all houses do range of an equal height house with house, so far as it shall be convenient and there to make breaks by their directions. And that they do encourage and give directions to all builders for ornament sake, that the ornaments and projections of the front-buildings be of rubbed bricks: and that all the naked parts of the walls may be done of rough bricks neatly wrought, or all rubbed at the discretion of the builder, or that the builders may otherwise enrich their fronts as they please'.

That in all the streets no sign-posts shall hang across but the signs shall be fixed against the balconies or some other convenient part of the side of the house.' (22)

The Act was comprehensive in its establishment of building controls and standards in London. Its primary concern was to set a standard of construction which improved fire safety. At the same time opportunity was taken to make some improvement in health standards. Fire, however, was the motivating force.

In 1707 An Act for the Better Preventing Mischiefs That May Happen by Fire was introduced; its main objective being the formation of a fire brigade. It provided amongst other things for the fixing of fire cocks to water mains in the pavement. It also specified that party walls were to be eighteen inches thick in the cellar and ground storeys, thirteen inches thick above. It required that the party wall extend as a thirteen inch wide parapet for eighteen inches above the roof. There was to be no timber under the eaves. There were further requirements regarding chimneys and hearths and the building in of timber to brickwork. Timber door and window frames were to be set into the walls four inches, to reduce their exposure to fire. One requirement was concerned with structural adequacy. No brickwork in the external and party walls was to bear on timber, due to the great damage which frequently resulted from the decay of timber. (23)

In 1724 An Act For the Better Regulating of Buildings and To Prevent Mischiefs that May Happen by Fire Within the Weekly Bills of Mortality and other Places therein mentioned was published. It dealt with the rebuilding of old and defective party walls, and also provided that to avoid the spread of fire openings in party walls were prohibited, except where the premises were joined together as one occupancy. (24)

The Building Act of 1760 contained the first regulations for dealing with dangerous structures. It required that, on the presentation of a notice a hoarding was to be erected and the premises were to be repaired or taken down within six days. It also dealt further with the rebuilding of party walls, requiring two and a half bricks thickness (twenty three inches) in the cellar and two bricks thickness in the floors above. (25)

The Building Act of 1764 again dealt primarily with party walls and their rebuilding. It also provided that every builder erecting a building after 1st July 1764 was to have the building surveyed by one of the Council Surveyors within fourteen days of the building being completed. The surveyor was to certify before a Justice of the Peace that the building had been erected in accordance with the requirements of the Act. (26)

A further Act was introduced in 1765, again primarily controlling construction with regard to party walls.

2.9 THE BUILDING ACT OF 1774

The Act established seven classes of building. The first class included churches, warehouses, factories, large dwellings (in excess of nine squares) and other buildings at least four storeys or thirty one feet above ground level. The value of the premises had to be above 850 pounds. The second class was a storey lower and less than 850 pounds value and so on until the fourth class contained two storeys, with a cost not in excess of 150 pounds. Thicknesses of party and external walls were specified for each class.

The fifth class were buildings isolated four feet from any public road and sixteen feet from any other building and could be built of any dimensions and with any materials. (27) This was the first time that the idea of the type of construction being determined in consideration of a building's exposure to fire source features was incorporated in legislation. In the 1774 legislation the concept is implicit, but in modern New South Wales legislation it is explicit. The seventh class included special structures such as crane houses,

windmills and watermills, and also workshops and drying places situated outside the Cities of London and Westminster. The seventh class could be built of any dimensions.

There were no limits on the height of building under the Act. A first class building of any height could be built fronting any width of street, lane or court. This Act of 1774 repealed the Act of 1667, under which the city had been rebuilt. Knowles and Pitt believe -

in this respect it constituted a retrograde step from the point of view of Town Planning. The limited height of buildings on narrow streets under the Act of 1667 had gone and the high buildings on narrow thoroughfares, that we know today, began to come into being. (28)

Party walls were dealt with extensively in the Act. Parapets were to be extended eighteen inches above the roof. The only openings permitted in party walls were between warehouses or stables and were to be protected with one quarter inch thick steel doors. Floor area limitations were introduced for the first time. Warehouses were limited to thirty five squares on ground plan and stables to twenty five squares. Thus compartmentation of larger establishments was achieved, limiting the risk of spread of fire.

Section XLVI of the Act called for every external wall or external enclosure of every building of the first to the fifth rate class of building to - 'be of brick, stone, artificial stone, lead, copper, tin, slate, tile and iron together, except the necessary piling, bridging and planking for the foundations of the same and also except the necessary templates, chains, bond-timbers and also except the doors, sashes window-shutters and door and window frames to such buildings - all which window-frames and door-frames shall be set in reveals and recessed at least four inches from the front of the building in which they are fixed'. Storey posts under the corners at the meeting of two walls and next the junctions of two streets were to be of oak or stone at least twelve inches square.

Sections XLVII & XLVIII. Roofs dormers etc. were to be covered with - 'glass, copper, lead, tin, slate, tile or artificial stone, every coping, cornice, fascia, window-dressing, portico, balcony, balustrade or other external decoration or projection whatsoever, shall externally be of brick, stone, burnt clay, or artificial stone, stucco, lead or iron; except the cornices and dressings to shop-windows'. All water from roofs was to be

taken by pipes to drains or channel stones in or below the surface of the ground. Bow windows were prohibited beyond the general building line, but shop fronts on streets less than thirty feet wide could project five inches and ten inches on streets over thirty feet in width. The shop cornices could project thirteen inches and eighteen inches respectively. (29)

The Act brought into existence Surveyors to administer the Act in the City, in Westminster and in certain suburbs. The Surveyors were required to take an oath regarding the carrying out of their duties. Twenty-four hours notice had to be given to the appropriate Surveyor before the commencement of any building work and a fee paid. Within fourteen days of completion of the work the person responsible was required to arrange for the work to be inspected and if upon inspection the Surveyor found the building to have been built in accordance with the Act, he was to make an affidavit to that effect before the Mayor or Justice of the Peace.

The Act also dealt with dangerous structures, the protection of the public, the issue of notices and such further action as might be required. It also dealt with other matters, including the provision of fire engines and penalties for keeping unswept chimneys.

The Act had a significant influence on the face of London, being effective at a time of considerable growth.

The Act of 1774 remained in force until 1845, or nearly 71 years and it had important results on the growth of London. The population of these years increased from 800,000 approx. in 1774 to 2,250,000 approx. in 1845 an increase of $2 \frac{3}{4}$ times. It will be noticed that the objects of the Act were firstly and mainly the prevention and control of fire, secondly the restriction of encroachments on streets and thirdly the procedure for dealing with dangerous structures. Although buildings had to be enclosed with incombustible substances, openings for windows etc. could be made therein to an unlimited extent and with no restrictions on the heights thereof, considerable danger existed from the spread of fire across narrow streets. The fact was that houses were disappearing from the city and tall commercial buildings taking their place, Town planning or the ordinary welfare of the citizens had no part in the Statute. The width of new streets was not controlled and the many narrow courts, cul-de-sacs, bottle-necks etc. must have followed. Buildings could be erected to any height on any such street. Dwellings could be built without open spaces at

the rear, with no restrictions on the height of habitable rooms or the lighting or ventilation thereof. (30)

When Captain Arthur Phillip and his fleet departed Portsmouth for New South Wales on 13 May 1787, it was this building legislation that was current in the London they left behind.

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3. Wilcox, The Law of Land Development, 1967, p.419
4. Knowles, C.C. and Pitt, P.H. The History of Building Regulations in London 1189-1972, p.5.
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6. Ibid
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9. Ibid
10. Ibid, quoting Sir Walter Besaut.
11. Op. cit., p.8
12. Op. cit. p.13
13. Op. cit. pp 19,20
14. Op. cit p.21
15. Ibid
16. Op. cit. pp. 21,22
17. Op. cit. p.28
18. Op. cit. p.31
19. Ibid
20. Op. cit. p.32
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1788-1837

3.1 SETTLEMENT

After the arrival in Botany Bay on 19th January, 1788 and the landing in Sydney Cove on 26th January, Captain Arthur Phillip was sworn in as Captain-General and Governor in Chief of New South Wales. Then began the hard labour of establishing European civilisation in what was at first an unreceptive land. Labour was turned to the felling of timber, the gathering of stone, the clearing of land, building, and the provision of food for the settlement.

The earliest building methods met with little success. The local timber was hard to work and the tools brought from England of inferior quality. The sandstone that was readily accessible was close to the surface and consequently soft and not very durable. Bricks were in production within three months of landing, but in the rush to produce, drying times and firing times were reduced and the bricks were soft. Roof tiles proved porous as a result of the same production methods. Lime was available only in very limited quantities obtained by the burning of oyster shells, until a few years later when limestone was found in Van Diemen's Land. Until that time, bricks and stone were laid in a mortar made of mud, clay and hair or grass.

The first structures were of wattle and daub construction, then of timber slabs and some of brick. They were built in Sydney without eaves in the same way as buildings were built in England. However, the

heavy downpours of Sydney rain washed the mud from the wattle and daub walls and the mortar from the brick walls, often resulting in collapse. Roofs too were often far from sound, whether constructed of bark, thatched grass, straw or even timber shingles. The structure and construction methods were poor. Apart from the difficulties experienced in obtaining satisfactory materials, the situation was aggravated by the shortage of skilled tradesmen. Initially almost all work was carried out by unskilled labour, often with little direction or control from anyone skilled in building. The situation gradually improved but poor construction remained a problem for more than twenty years. Although by 1800 better standards were being achieved, the buildings remained primitive and unskilled in execution.

The town grew up around the Tank Stream. Proximity to a water source became the generator of the planning of Sydney. The first proclamation in any way affecting building was a Notice published in April 1809 (1) requiring the residents to keep the streets and paths adjacent to their dwellings clean and in good repair and to keep the fences of properties adjoining the Tank Stream in good repair to keep pigs and cattle away from it. It also prohibited "Washing, cleaning, filth, or any other dirty Work ...at the Tanks".

3.2 GOVERNOR'S PROCLAMATION, 1810

Lachlan Macquarie was sworn in as Governor of New South Wales in January of 1810. He was a man of vision, energy determination and ability. On August 11, 1810 he issued a Proclamation which established the width of streets and had as its purpose the enforcement of a town plan. For the first time in the colony the Governor's consent was required prior to the commencement of building.

The proclamation read:

His Excellency the Governor, deciding it expedient and highly necessary for the Improvement and Ornament of the Town of Sydney to enlarge the Streets and Avenues thereof, for which Purpose a Party of the Military are now employed at Work and who are to be paid for their Labour out of the Police Fund.

The Governor therefore orders and directs, that as far as circumstances will admit, the width of the Streets shall be Fifty Feet, including a Footway on each side; that the Paling or Palisading on each side shall be of a uniform Height of Four Feet and put up in a neat, regular and durable manner; and he trusts and expects that such Persons as have it in their power will voluntarily afitt, by removing back their own Palings and Inclosures.

Should any Homes stand in the Way of the intended Improvements, which it may be necessary to remove, they will be erected again at the Public Expence or a fair pecuniary Remuneration allowed to the Proprietors, in case they should prefer it.

His Excellency, the Governor further orders and directs that no Person whatever shall erect any Home or Dwelling in the Town of Sydney, whether on Leasehold Ground or otherwise, without previously obtaining his Permission through Mr. Meehan, the Acting Surveyor, who has a Plan of the Town, recently made out and approved by his Excellency, with Instructions respecting the several parts thereof which the Governor deems most proper to improve and have uniform Buildings erected thereon. A Non-Compliance with these Orders will subject the Proprietors to have their Houses pulled down, and further incur the Governor's Displeasure. But he trusts, the Inhabitants, whose Interests may at first view appear to be affected by these Regulations, will yield a ready and cheerful Obedience to the Orders now published, on account of the great Benefit the Public at large will derive from them and the additional Convenience and Ornament the Town will acquire by their being carried into complete effect. (2)

3.3 ESTABLISHMENT

Macquarie ensured too that the other towns being established were well laid out, with sites allocated for a church, a courthouse and a school.

To ensure that the standards of his towns would not be destroyed by those who could not see what he saw, he promulgated on 15 December 1810 a Government and General Order that laid down: 'The Dwelling Houses are to be either made of Brick or Weatherboard, to have Brick chimnies and Shingled roofs and no Dwelling-house is to be less than nine Feet high - A Plan of a Dwelling House and Offices will be left with each District Constable to which each Settler must conform in the erecting of his Building.'

This was the earliest regulation controlling building in Australia and applied only to the five Hawkesbury towns. When, twelve months later, with uncharacteristic foresight, he wrote similar regulations for Hobart and then for other towns such as

Liverpool and Campbelltown, each time geographically limiting their application, he introduced a pattern of local building control that has bedevilled Australian architects and builders ever since. The system has spread so that today each of numerous authorities has its own requirements which not only overlap but are often superimposed and frequently contradictory. The lack of any uniformity of building regulations on a regional, state or national basis is a bane that plagues Australian building still. It is one of Macquarie's least valuable legacies. (3)

Macquarie appointed Francis Greenway as Civil Architect in 1816 and in the ensuing six years Greenway designed and had built a great number of public works. In the process he also raised the standard of workmanship and industry practices. By direction and instruction and by refusing to accept the work that was then current, he improved the quality of work that was done throughout the industry to a fine level of craftsmanship. (4)

Macquarie was succeeded at the end of 1821 by Governor Brisbane. The public building programme was much reduced under Brisbane. Private building however developed rapidly. The centre of Sydney started to lose its spread out rural character and some sub-division of allotments took place. Economic conditions were improving and more free settlers were arriving, including many skilled craftsmen. The time was ripe for an increase in building construction.

Brisbane was succeeded by Governor Darling. In March 1829 Darling issued regulations for the guidance of the government surveyors in setting out new towns. The regulations established allotment sizes, street widths and patterns and building setbacks.

In Sydney in the 1820's the problem was not so much to get wide streets as to get streets at all. Without any sort of control or guidance after Phillip's first abortive attempt the town had grown haphazardly with buildings erected practically anywhere until its streets had degenerated into twisted and tortuous alleys. Macquarie's order of 1810 setting sixty-six feet as a standard street width had operated effectively in towns like Liverpool; but in Sydney the line of the central streets was already out of hand by the time his order came. In December

1827 the first building regulations for Sydney were issued as the result of an Act passed in the Legislative Council. Their purpose was to tidy up the streets and to avoid having to later compensate landowners at high prices for land that was alienated in the uncontrolled days. It was not concerned with the building as such but required only that intending builders should inform the Civil Engineer of their intentions 'for the purpose of having the line of front laid down with reference to the street and existing buildings. (5)

3.4 THE POLICE (SYDNEY) ACT, 1833

In 1827, the leasehold of land in Sydney was changed from five to seven year terms to leases in perpetuity. With the increasing population pressures, a growing economic confidence and certainty of tenure of the land, a land and building boom ensued. Land was sub-divided. Detached buildings were superceded by those built right to the boundaries and to the street. Buildings were now at least two storeys high.

As a consequence of the surge of building development, new building regulations were introduced in 1833. The Police (Sydney) Act of 1833, An Act for regulating the Police in the Town and Port of Sydney and for removing and preventing Nuisances and Obstructions therein regulated the building process to maintain the safety of the public during building construction. It also had other objectives unrelated to building. Penalties were to be levied for the placing of building materials on the road or footpath, unless properly enclosed.(S.16) Conditions were set for the protection of excavations in or adjoining streets (S.31) and for the erection of hoarding and scaffolding (S.35), for which a licence had to be obtained. Blasting of rock required notice being given to the Town Surveyor, the work to be carried out in accordance with his directions (S.36).

The legislation permitted the erection of an awning in front of a shop or house, at least seven feet above the footpath, with the posts at the outer edge of the footpath (S.18). Gutters were required to

prevent rain from falling from the eaves onto the footpath (S.32). The consent of the Town Surveyor had to be obtained for the construction of drains and sewers (S.39). Night-soil was to be removed at night (SS.33,34). The police were empowered to remove "any privy, hog-stye or other thing" which might be a nuisance to the inhabitants of the town (S.24).

The Act also prohibited the making of cellars, cellar windows and doors below the footpath (S.29). People wishing to pave the footpaths were to do so in accordance with levels issued by the Surveyor (S.53). Such was the extent of building regulations in New South Wales in 1833 and even these regulations applied only to that small area gazetted as the Town of Sydney under the provisions of Section 46 of the Act. Their impact on buildings was limited. The concern of the legislation as it affects building was entirely in the public realm, concerned only with building to the extent to which it directly and physically impinged upon public life and activity. Under the Act there was no requirement that application be made to any Authority for approval to erect a building. The Act made no attempt to control building within the boundaries of private property, except in matters such as the control of blasting, which affected public safety.

3.5 THE POLICE (TOWNS) ACT, 1838

In August of 1838 the Police (Towns) Act was introduced. This was "An Act for regulating the Police in the Towns of Parramatta, Windsor, Maitland, Bathurst and other Towns respectively and for removing and preventing Nuisances and Obstructions and for the better alignment of Streets therein". It extended to various towns similar provisions to those of the Police (Sydney) Act of 1833.

3.6 EXTENSIONS OF THE POLICE ACTS

Similar provisions were again extended to scheduled suburbs and

places in the neighbourhood of the City of Sydney in October 1853, by the Police (Sydney Hamlets) Act, "An Act to extend to the Sydney Hamlets certain of the provisions of the Sydney Police Act". In this Act the minimum awning height was set at eight feet, compared with seven feet under the earlier legislation. The provisions affecting building were otherwise similar.

The suburbs and places included - Rushcutter's Bay, Blackwattle Bay, Glebe, Camperdown, O'Connell Town, Chippendale, Redfern, Surry Hills, Botany, Paddington, Double Bay, Balmain and St. Leonards (as then defined).

The Police (Towns) Act of 1853 prohibited internal communication between public houses licensed for the sale of liquor and any adjoining property, but otherwise did not affect building.

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3. Freeland, J.M. Architecture in Australia, 1972, p.31
4. Op. cit., p.36
5. Op. cit., pp.65,66

1837-1879

4.1 THE SYDNEY BUILDING ACT, 1837

In 1837 London had a population approaching two and a quarter million people, and had been established as a town and then city for millions. Sydney had a population of twenty thousand and had been established by the first European settlement of the continent fewer than fifty years earlier.

The first act to deal with the regulation of building in Sydney in any substantial way was the Sydney Building Act of 1837, An Act for regulating buildings and party-walls, and for preventing mischiefs by fire, in the town of Sydney.

The preamble to the Act commenced "Whereas it is expedient for the safety of the inhabitants of the town of Sydney, and the security of property therein, that provision should be made for the better regulation of buildings and party-walls, and for the prevention of mischiefs by fire, in the said town: Be it therefore enacted....." and went on to apply the legislation to all buildings, whether existing or new, in the town.

In view of the increasing density of building in the centre of the town the Legislative Council had determined that some further regulation of building was required, beyond the controls on street alignment and protection of the general public which then existed.

The danger of the spread of the fire was the primary concern to be addressed in the legislation.

It was the legislation then current in London (1) which was imported and with few changes applied to Sydney.

The Act established six rates or classes of building. Classification was based partly on building use, but primarily on size. The classes were:-

First Class: Churches, chapels, meeting houses, places of public worship; certain factories involved in high fire risk industries, breweries, foundries; building (other than houses) greater than three storeys (excluding attics) or thirty one feet high; houses greater than nine squares on the ground floor.

Second Class: Buildings (other than houses) of three storeys (excluding attics) or between twenty two and thirty one feet high; houses between five and nine squares on the ground floor.

Third Class: Buildings (other than houses) of two storeys (excluding attics) or between thirteen and twenty two feet high; houses between three and a half and five squares on the ground floor.

Fourth Class: Buildings (other than houses) of one storey or less than thirteen feet high; houses of three and a half squares or less on the ground floor.

Fifth Class: All buildings (except first class non-dwellings) between four and eight feet from a public street, and between sixteen and thirty feet from adjacent buildings in separate possession.

Sixth Class: All buildings (except first class non-dwellings) eight feet from a public street and thirty feet from adjacent buildings in separate possession.

Standards of construction were established for each class of building. For the first to fourth classes the construction of party and external walls, including footings, was specified.

The fifth rate of building could be built of any dimensions. Sixth rate buildings could be built of any dimensions and any materials.

The Act dealt at great length with a broad spectrum of matters relating to party walls, including the treatment of existing party walls, the settling of differences respecting the building of party walls and the attributing of associated costs, the rebuilding or demolition of old party walls, the surveying of party walls to assess their condition, the sharing of the cost of construction of a party wall, the ownership of the wall, the responsibilities of the owners and so on.

The construction of chimneys in first to fourth rate buildings was defined (S.41) setting minimum wall thicknesses, hearth sizes and distances to any timber.

Materials to be used in the external walls of first to fifth rate buildings were limited to "brick, stone, artificial stone, lead,

copper, tin, slate, tile or iron"(S.42), apart from the piling of foundations and such necessary elements as doors, sashes and frames. Window and door frames were to be set in reveals recessed at least four inches from the face of the building.

Storey posts and bressummers were not to be fixed more than two inches deep in any party wall. Further restrictions were placed on the fixing of timber members in or adjacent to a party wall. No timberwork other than bressummer, story-posts and plates was to be laid in an external wall nearer than four inches to the external surface. Storey posts at the corner of streets or public ways were to be at least 12 inches square, built of stone or hardwood.

Section 43 prohibited the projection of bay windows beyond the street line and banned all projections except those "necessary for copings, cornices, fascias, door and window dressings or for open porticoes , steps or iron pallisades".

The floor area of a "stack of warehouses" was limited by Section 46 to 35 squares on the ground plan, including all internal and external walls. Greater area was permitted only by division into sections each of a maximum 35 squares, to be divided by a party wall or walls to the standard of construction elsewhere required in the Act. Communication through such walls was permitted only through an opening with stone cases and sill and a door of wrought iron, at least a quarter of an inch thick.

The floor area of stables was limited by Section 47 to 25 squares including all walls. Provisions mentioned above regarding warehouses were similarly applied to stables.

Sections 53 and 54 provided that every building erected contrary to the Act was to be deemed a common nuisance. The Court was empowered to direct demolition at the expense of the owner.

Building surveyors were to be appointed by the Governor of the Colony pursuant of S.55. He was to appoint "so many discreet persons, skilled in the art of building, as he may think fit, to be, during his will and pleasure, the surveyors or supervisors to see the said rules and regulations well and truly observed in and throughout the said town of Sydney" and was to appoint districts to be under their respective control.

Pursuant of S.56, twenty-four hours notice of building was to be given to the surveyor, who was to view the building to ensure that all rules and regulations of the Act were observed. The surveyor was to be paid a fee by the builder for his inspection. The fees were set out in S.56 and ranged from ten shillings and sixpence to three pounds ten shillings, depending on the class of building and whether the work was a new building or an alteration or addition.

Following advice from a surveyor that a building had been erected not conforming with the requirements of the Act, two Justices would hear the matter and if they found a breach had occurred, could direct the irregular building to be demolished or amended (S.58).

The builder or the person causing building work to be carried out was responsible, under S.59, to have the building surveyed by the surveyor within fourteen days of its completion. An oath was then to be made by the surveyor that the work was in conformity with the requirements of the Act and filed with a clerk of the peace. Failure to obtain such a survey would result in a penalty being applied at the rate of ten

pounds per month, until it was obtained.

Sections 63 and 64 provided that "whereas houses and buildings within the limits aforesaid, are often, either from litigated titles thereto, or the obstinacy, neglect or poverty of the owners thereof, or of the parties interested therein, in so ruinous or dangerous a condition, that passengers thereby are in danger of their lives or limbs from the falling thereof, or of the bricks or timber therefrom: Be it therefore enacted ..." that it would be lawful for the police magistrates to declare a building to be in ruinous condition and to require the erection of a protective hoarding and the effecting of repairs or of demolition within fourteen days of notice being given.

Section 67 provided that police magistrates were required to install firecocks "upon the mains and pipes belonging to any waterworks whatever", and they were to be placed "in each and every street or place, as the said police magistrate shall deem expedient". The top was to be even with the pavement "to the intent such stopblocks or firecocks may, upon occasion of any fire, be opened to let out the water without loss of time in digging down to the pipes". Marks were to be made near the firecocks to identify their location. An instrument was to be kept in the marked house adjoining the firecock for opening a cock and likewise "a pipe for the water to come thereout" was to be kept in the house.

Section 61 excluded from the provisions of the Act any building belonging to the Crown.

The colonial architecture that had developed prior to 1838 had certain inherent qualities which had arisen in response to local conditions. They were generally simple buildings, hip roofed with overhanging

eaves, with verandahs to moderate the climate and window shutters for privacy and security on the street face.

The impact of the new regulations was radical:

The effect of these critical clauses, evolved for the cool sunless drizzle of London, was instantaneous poison to the Colonial buildings of Sydney. In one swift clean stroke the bland, flat-faced, cramped and vertical London Town Georgian architecture was imposed on warm sunny Sydney Town. Window and door frames had, by tradition, been set back into the walls anyway so the effect on these parts was not apparent. But elsewhere the effect was visually immense. Verandahs and window shutters were wiped off the face of buildings and roof overhangs disappeared as walls were carried past the eaves line to form a parapet. Where a series of buildings huddled side by side on narrow-fronted allotments, they were visually separated and their narrowness accentuated by the projecting ridge of their party walls breaching the plane of the roof like a series of dorsal fins. Speculative builders moved in to contribute their rewarding bit by erecting rows of terrace houses. Single, narrow-shouldered, two-storeyed units were repeated from three to seven times. While the repetition of doors and windows resulted in a length of similar buildings, the separateness of the units was made patent by the party walls, sticking through the roof, slicing it into slabs. The simple uninterrupted hip roofs of former times had given the appearance to attached houses of a single unified building but now terraces were expressively a series of replicas stacked next to each other. And all of them, whether a lonely single-storeyed cottage standing forlornly by itself or a series of terrace houses, were flanked at the ends by blank gabled blades of brickwork presenting smoothly plastered flat parapeted faces to the passing parade. (2)

4.2 COMMITTEE ON THE BUILDING ACT

The Legislative Council was petitioned by concerned citizens to amend the Act. A committee comprised of the Colonial Secretary, the Collector of Customs, Messrs. Berry and Blaxland and Sir John Jamison and chaired by Colonel K. Snodgrass, was appointed to report on any amendments which might be appropriate. The appointment of the committee took place on 13th June 1838, less than six months after the Act had become operational.

The committee took evidence from architects, builders, surveyors,

bricklayers and carpenters, as well as from a grocer and a corset maker who had particular complaints about the operation of the Act.

A general concern in the evidence given was that the Act should be adapted to suit it to local conditions. Francis Clarke, architect and surveyor, submitted that

in consequence of the greater degree of warmth in Sydney, I think the number of superficial squares allowed for the several rates of building are not sufficient. I think from a half to one square should be added to each rate; particularly to the third and fourth rates; respecting which complaints occasionally were made in London; but such an addition is more particularly necessary here, where stone is abundant and stone walls require to be thicker than brick walls and consequently occupy more of the allotted space. (3)

Thomas Cowlshaw, builder, proposed that

taking the best of the climate into consideration, there should be some considerable extension in the superficial space as well as the height of the rates of building; more space and more height being required. I think also the Act ought to be restricted to.....the more densely populated part of town. (4)

Many of those giving evidence considered that the allowable area for each class ought to be increased, although varying in the degree of increase considered appropriate.

There was complaint from some quarters about the increased cost of building brought about by the new legislation. Henry Robertson, architect and surveyor to the Australian Fire and Life Assurance Office and builder, argued that

The Colonial Act, if brought strictly into operation in its present form, would greatly impede the extension of the town and would, I have no doubt, stop all speculative building; that is to say, all houses that are built with a view to letting for profit. Previous to this Act coming into operation, money expended on building would realise from ten to twelve per cent; now the Act is in operation, building will cost from twenty to twenty five per cent more than before and consequently reduce the interest of the proprietors in proportion to the additional outlay; or it would raise rents to that extravagant height, that the middle and working classes would have to part with half their income for the single item of house rent. (5)

Henry Scope, builder, argued that the Act "has caused a great stagnation of business. I used to employ twelve men; I have none now. People are waiting, in hopes of alterations being made in the Act".

(6)

Another builder, Edward Flood, had encountered a further consequence of the increased standard of construction required:

I think the rates appointed by the Act are too small. I am building some houses for Mr. Hill, which if there had been no Act he would have built of a larger size, but was deterred from doing so by the increased expense caused by the regulations as to rates. (7)

There was various evidence submitted regarding wall thicknesses, some supporting those specified in the Act, some proposing an increase where stone rather than brick was used and some insisting that the wall thicknesses required were too great, particularly for single or two storey buildings. Charles Jenkin, builder, proposed that "it is the height of the wall which ought to regulate the thickness and not the number of squares of building". (8) He considered the cost of building had increased twenty-five to fifty percent. Matthew Harris, builder, believed that

regulations for the stability of buildings may sometimes be necessary, to prevent people from erecting light or insecure structures, as has hitherto often been done. I think it would be necessary to enforce the building with brickBut, I apprehend, persons building would themselves generally take sufficient care on the point of stability; and that it might be left to them. Useful selections from the Act might be made, but as it is at present, I think it quite inapplicable to the Colony. (9)

However, his laissez faire approach was not generally shared. Edward Flood, for instance, considered that the Act, if amended,

would be a measure decidedly beneficial for the security of the public and the prevention of fire. It would cause people to build better houses and ensure a proper attention to stability, which has hitherto been neglected. I think that some persons would complain, because they are averse to any tax or restriction of any kind whatever. (10)

However, he supported a reduction in wall thicknesses, as did Robert Taylor, bricklayer and carpenter, who complained

of being obliged to have a wall eighteen inches thick, for a cottage of nine feet high and twenty four feet by twenty, as such building would not pay. I think walls nine inches thick sufficient for such a building. In consequence of being obliged to build walls of that thickness, I find it advisable to make it a two storey house. (11)

Similarly Henry Robertson proposed that

the thickness of the walls might with perfect safety be reduced (although the bricks here are inferior to those in London) the timber of this country not being of such an inflammable nature as the American pine or the Baltic fir, generally used in London. (12)

Architects Francis Clarke, Thomas Bird and John Verge all believed there should be no reduction.

There was general support for verandahs and balconies to be permitted to the fronts and backs of buildings, provided some separation was made from adjoining properties. Some proposed construction from stone, steel or other non-combustible materials, while others supported construction in colonial hardwood. Some other concessions were sought for the use of colonial hardwood externally, including for fences, stairs and arches over private passages. Section 42 of the Act provided that no timber was to be fixed closer than four inches to the face of an external wall. At the same time, nothing prevented the use of colonial hardwood shingles on the roof. However, to fulfill the requirements of Section 42 it was necessary to construct parapets on all external walls, together with box gutters. The additional walling and the lead gutters added to the cost of construction. It was generally considered that "dripping-eaves" of colonial hardwood shingles ought to be acceptable on all external walls other than that facing the street, where the water from such "dripping-eaves" fell on the grounds of the same property. The Sydney Police Act required protection of the pavement by the provision of gutters to the wall facing the street and while this was adequate, it

would seem that a parapet facing the street was considered desirable by most of those giving evidence to the committee. Henry Robertson considered that they "prevent public annoyance".

There was some support for the variation of the distance from another building required for a sixth rate building. It was further proposed that the distance ought to be measured from the boundary, rather than from the neighbouring building.

There was considerable support for permitting external venetian blinds and shutters, for reasons of shading, ventilation and security. The Council surveyor, William Buchanan, opposed their provision, claiming to have seen many instances of their having been blown off.

There was substantial discussion on the fees payable to the Surveyor, with some considering them excessive and oppressive, some considering them reasonable and some even suggesting an increase would be warranted. Of particular concern were the fees payable for certain detached buildings, or offices (meaning kitchen, scullery, laundry, water closet, servants quarters and the like) which in London would usually be a basement storey, but in Sydney usually had to be constructed at the rear of a building, the foundation material being rock. It was considered unjust to have to pay an additional fee for each detached building, as well as the fee for the main building.

John Verge complained that under the Act combustible materials could be used for roofing:

There is nothing in the Act to prevent brown paper covered with pitch, or even straw being used, which renders the regulation for party walls of no effect. I think that nothing but Colonial hardwood shingles should be allowed for roofs and that only until such time as slates, tiles, lead, zinc or any other

incombustible materials can be introduced. (13)

He also proposed that

the height of stories should be limited; the fourth-rate to nine feet, the third-rate to ten feet, the second-rate to eleven feet and the first rate to twelve feet clear in principal stories, unless the walls were made thicker in proportion to their height; as the Colonial are not so good as the London materials, where the stories are seldom so high as they are here. (14)

Further he complained that there was nothing to prevent the construction of side walls close to the side walls of other buildings, with the spread of fire possible between openings. He proposed that windows be at least ten feet apart.

Of all those appearing before the committee, Henry Robertson was the most trenchant in his criticism of the Act:

Of late years, there is scarcely an unoccupied spot of ground in London; consequently the greatest precaution is taken to prevent a general conflagration. Sydney, on the contrary, contains much ground that is not likely to be occupied for years and ought to be provided for in the same way as a first-rate market town in England and not placed on the same footing as the wealthiest and first city in the world. There are many objections to the Sydney Building Act; it being too rigorous for the infant state of the colony, and not adapted to its resources, there being clauses in this Act which would compel a Builder to use large quantities of imported material; when from many unforeseen circumstances, the supply may be interrupted; in which case, it would be utter ruin for a Contractor or speculative Builder; but above all, the difference of climate, drainage and servants, require a different arrangement of domestic architecture. (15)

However, the committee was confident that, with the amendments to the Act that it proposed all reasonable objection would have been removed and,

although it can scarcely be expected that any measure of a restrictive nature and attended with some expense to parties building, should on its first introduction, be received without individual opposition, yet when the general benefit to the Community by the security from fire and the stability of building which the Act is calculated to effect, begins to be more generally understood, your Committee confidently hope that the operation of this Act will not only be appreciated, but

cheerfully acquiesced in, by the parties most interested and that it will become with architects and builders in Sydney, as it is in London, a matter consistent only with their professional reputation to see that its provisions are strictly complied with. (16)

The evidence given included some estimates of the number of buildings being constructed at the time. Henry Robertson believed there were 150 to 200 houses in the process of erection or alteration, to be completed within six months. Henry Scope believed there were 300 buildings being erected annually. Thomas Cowlshaw estimated the following break-up, as annual figures, over the preceding two year:

<u>Rate</u>	<u>New Buildings</u>	<u>Alterations</u>
First	20	40
Second	30	50
Third	60	70
Fourth	60	30
Fifth	80	20
Sixth	100	20 (17)

The report was presented to the Legislative Council on 6th September 1838 and the amending Act was passed on the 12th October.

4.3 THE SYDNEY BUILDING (AMENDMENT) ACT, 1838

The amending Act (18) changed the classification of buildings slightly by allowing an additional one square of ground floor area for each rate.

Sixth rate buildings were permitted to be twenty (previously thirty) feet from other buildings in separate possession.

The required thickness of stone walls was increased by six inches, unless the wall was built entirely of squared through stones.

Where a wall was built off a rock foundation, footings were not required.

Blinds and wooden shutters were permitted on the external face of the building. Similarly, verandahs and balconies to houses were permitted, provided they were constructed of local hardwood, or hardwood and incombustible material and provided they were not erected closer than two feet from the corner of a house or were separated from adjoining balconies by a party wall at least nine inches thick.

Materials to be used on new roofs or in recovering old roofs, were limited to glass, copper, lead, zinc, or other metal, slate, tile, artificial stone and by concession to local industry and practice, local hardwood shingles.

The use of local hardwood was also permitted for fencing, gateways external stairs and landings and the arching over of ground level passageways, the latter to be provided with a plaster soffit.

4.4 FURTHER AMENDMENTS OF THE SYDNEY BUILDING ACT

A year later again, on 3rd October 1839, the primary Act was again amended (19) and provided that the Act would have effect only within certain limits within the town of Sydney. That area, broadly described extended from Fort Macquarie, Sydney Cove to the Government

Domain, thence to Hyde Park Barrack and St. Mary's Cathedral to a point on Elizabeth Street - one hundred yards south of Liverpool Street - then south to Campbell Street and Darling Harbour.

In 1845 a further amending Act (20) was published, which redefined the extent of the City of Sydney for the application of the regulations. From that date it was to apply to the boundaries of the City as defined in the Sydney Corporation Act (21) which had incorporated the City in 1842. Administration of the Act remained the responsibility of the Governor. However, in 1850 the City Council was empowered to appoint surveyors exercising the powers conferred in the original Act. (22)

The rest of New South Wales remained without regulation of any kind affecting building, other than the minimal requirements of the Police (Towns) Act of 1838 (23) which were brought to bear upon the few larger towns and such local constraints as may occasionally have been issued at the Governor's instigation.

The eventual influence of the Sydney Building Act, 1837 was widespread; with similar legislation being introduced in Hobart in 1840, Adelaide in 1849 and Brisbane in 1852 (24). So it was that legislation which had been developed to suit the needs of a substantial and long established city in England was transplanted to the colony, to shape the face of building across Australia.

Melbourne, however, differed from the other cities. The Melbourne Building Act became effective at the beginning of January 1850.

It was a singular and most important landmark in Australian building control. Whereas all the other Building Acts had been mild adaptations of other Acts and, consequently, were very similar to those of London, Melbourne's Act was strongly influenced by local needs and conditions. Its most important

departure from its predecessors was fundamental. It expanded its own objectives beyond the concern for fire risk and public safety which had dominated previous thinking on the subject by taking within its purview such matters as the rights of other property owners (e.g. light and air), the health and comfort of the occupants (by setting minimum room sizes and light and ventilation requirements) and the visual responsibility of the owner to the community at large (by setting building heights and approving a list of building materials which varied according to the importance of the street).

In all these aspects the Melbourne Building Act departed basically from the concept of control being for the safety of the public generally to protection of individuals, including the owner himself. Before, this control had stopped short at the outer face of the walls of a building. Now bureaucracy moved inside as well. An owner was no longer an unconfined king within his own walls. In this fundamental matter the Melbourne Act of 1849 set a precedent which all the multiplicity of later regulations accepted without question and used to bind all concerned with the erection of buildings in tighter and tighter bonds. (25)

A Sydney Building Bill was introduced to the Assembly in 1856-1857 but did not reach Council during Session and was not subsequently presented. The 1837 Building Act continued to operate until 1879 without further amendment. The Sydney Police Act, 1833, continued in force in parallel with the Building Act.

1. London Building Act, 1774. See Chapter 2.9.
2. Freeland J.M. Architecture in Australia 1972, pp. 85,86
3. Report of the Committee of the Legislative Council appointed
to consider the Building Act, p.11
4. Op. cit. p.19
5. Op. cit. p.15
6. Op. cit. p.27
7. Op. cit. p.36
8. Op. cit. p.28
9. Op. cit. p.30
10. Op. cit. p.37
11. Op. cit. p.21
12. Op. cit. p.15
13. Op. cit. p.38
14. Op. cit. p.39
15. Op. cit. p.14
16. Op. cit. p.5
17. Op. cit. p.20
18. 2 Victoria No. 25
19. 9 Victoria No. 14
20. 9 Victoria No. 5
21. 6 Victoria No. 3
22. By 14 Victoria No. 41
23. 2 Victoria No. 2
24. Freeland, Op. cit. p.88
25. Ibid

1879-1906

5.1 SYDNEY IN THE 1870s

An English periodical, The Builder, published a report on March 23, 1878 from one of its correspondents, describing his visit to Sydney, from his arrival in Sydney Harbour.

Nestling amongst the trees palatial residences can be descried, and at last one of the finest cities inhabited by the wealthiest, most contented, and most patriotic of the English people, is seen. It is situated all around three of the bays, where the shores are flat, two of which are full of ships which sail from the metropolises to this beautifully-situated part of English territory... every Englishman ought to see the Queen of English cities, - Sydney. Landing at the bay known as the circular quay, we are at once in the midst of some of the noblest architecture in the empire. It is just ninety years since the first party landed there, consequently all that we behold is modern. (1)

However, before he had travelled a mile up either George, Pitt or Elizabeth Streets his admiration of the architecture had ceased. He complained of the poor condition of the streets and footways, of the quality of the sandstone; and of the few bricks used, he considered them of dismal colour and bad quality, so bad that they had to be rendered over. Furthermore,

the quality of workmanship would make any London jerry-builder blush, yet there are no speculating builders in Sydney; this bad work is because few architects are employed, and no clerks of works. There are no Building Acts and no district surveyors. Your London carpenter, mason and bricklayer would think their fellow workmen were working for their lives could they see them, but all this high-pressure haste is fatal to sound workmanship: every scamping trick that man can invent is resorted to, even where the most vigilant architect is employed. (2)

He remarked upon the drinking water which he considered as unfit for drinking "as the liquid in the cesspools". The city, although enjoying such a glorious location and climate, had a death rate as bad as a murky Yorkshire industrial town. And the colonials, far from learning lessons from England, insisted on doing things their own way.

In the building business the conceit of the Sydneyite is particularly noticeable. The good example set by London is derided. In Sydney they go their own way about it, and make a sorry mess of it. The builder is not a capitalist; in fine he is not a builder, but a journeyman mason, bricklayer, carpenter and plumber who, out of his excellent wages, has saved a few pounds. He sees an advertisement that separate tenders for each of the above trades are invited by some architect; he goes forthwith to the architect, and is allowed to take the drawings and specifications away from four p.m. to ten a.m. the next day, and in this time he does what a London quantity surveyor would have 50 pounds for. He sends in his tender which may be 2,000 pounds or 500 pounds - for this difference is not at all unusual; - and if his be 500 pounds he gets the order to proceed, but if more he is surprised that he hears nothing about the job; and when he passes the office he calls in and asks for a list of the tenders. The architect laughs at this simplicity, and informs him that such breaches of faith never occur in Sydney, for the public would see what scandalous muffs Sydney builders are, as the highest tenders would be four times as much as the lowest; yet, in the very next list of tenders the builder who was the highest would be lowest. This is because he is only a young journeyman carpenter or bricklayer, and not a builder, in the London sense. He goes on for a brief period, and loses what he saved as a journeyman, as well as defrauding his creditors, and then he becomes a journeyman carpenter again. His timber-merchant and others get such enormous profits that they can afford to lose much in the shape of bad debts.

...Another class of men besides timber-merchants are doing well in Sydney, viz., the auctioneers. There happens to be an allotment mania, such as probably never was seen in any country before. Some scheming speculator will buy a few acres of land covered with heavy timber, - as all the land is in the neighbourhood of Sydney. He gets a land surveyor to plot out upon paper streets 40ft. wide and 300ft. apart, and divide each side of each street into allotments of from 30ft. to 70ft. frontage, and number them; stakes are then driven in amongst the trees, and in a week the allotments are sold by auction, at prices ranging from 10 shillings to 10 pounds per foot frontage. The process in England is to make a good metalled road, with granite curbing, gutters, and sewers, but in Sydney the street will be built upon from end to end before a tree is cut down in it. The class of houses that are erected in these streets are generally devoid of architectural pretensions, except what emanates from the brain of the iron-founder, for about 5ft. in front of the house is a cast-iron fence, and over it a cast-iron verandah, or rather balcony, with a corrugated verandah over that. All this cast-iron work is tastefully picked out with paint. There is a 9in. wall between the

balcony of one house and the next. The rooms are loftier than in England, and the doors hail from San Francisco, as every mail steamer brings some thousands of them; and the market is so glutted with them, that at the auctions, - where they are sold in lots of about 100, - they only fetch about what the material would cost in Sydney, and there is a duty of 2 shillings per door upon them. Two years ago the lowest price realised at auction was 15 shillings, now it is 7 shillings.

...Nine out of ten of the builders keep their own accounts with a piece of chalk, and neither know nor care whether they can pay twenty shillings in the pound or not. "Harum-scarum" is the way of Sydney; and there is no reflection, no studying of posterity in anything. To make money is the guiding principle which is at the bottom of the infamous disregard to sanitary arrangements. So shockingly bad are the Sydneyites in this respect that the people are not commanded to carry the implement Moses imposed upon the Israelites. There is nothing at all paternal in the Government; adulterations, false weights and measures, and other meannesses to make money dishonestly are not exceptional, but the rule. (3)

Some months later the Sydney Morning Herald responded:

The roads of the city are certainly very rough and very dirty, but it is not true that 'they are made of sandstone'. The city pavements, he says, are flagged 'with the same disintegrating stone'. This is true to a large extent, and it is also true that they are exceedingly irregular. All these things, however, may be remedied with little delay. The roads may be put into fair order and kept decently clean; and, so far as the foot-paths are concerned, the city council will deserve severe condemnation unless they see that the principle pavements are put in perfect repair. Many persons imagine that the reason why the footpaths in the principle streets are defective is to be attributed to the impecuniosity of the city council. This is not so. In many cases the badness of the pavements represents only neglect of duty.

...It must be admitted, however, that we are sadly in want of a Building Act, and we imagine that the irregularity of Sydney architecture is one of the things which will forcibly impress our visitors. They will wonder how it is that we can permit the existence of anomalies such as may be witnessed on every hand. Time will not admit of an immediate rectification of this matter, but it is one of those things which ought to command the attention of the Legislature without unnecessary delay.

...There is one point upon which we cannot join issue with the writer; we must admit that our sanitary arrangements are 'shamefully bad' and far inferior to those prescribed by Moses. For many years past, though, the necessity for municipal and sanitary reforms has been fully admitted here. We have always been going to do the work required, but it is not actually commenced. (4)

5.2 INSANITARY CONDITIONS, SLUMS AND OVERCROWDING

Sydney underwent a substantial population growth in the latter part of the nineteenth century. In 1861 the City of Sydney had a population of 56,840. By 1881 the population had increased to 100,152, and by 1901 to 111,255. In the same time metropolitan Sydney saw explosive growth, from 95,789 in 1861, to 224,939 in 1881, to 480,976 in 1901, a five fold increase in forty years. (5) Concurrently the city grew spatially, so that by 1890 metropolitan Sydney covered some 130 square miles.

Density of habitation also increased. In the City of Sydney, there were, on the basis of census data, 4.88 persons per dwelling in 1871, and twenty years later in 1891, 6.30 persons per dwelling, or roughly 38 persons per acre. Some wards had as many as 8.2 persons per dwelling. This increase took place at a time when there was also significant change of property use occurring, particularly in the central business district and Darling Harbour areas. Residential areas were being redeveloped for retail, commercial and warehousing uses. (6)

The death rate in Sydney was similar to that of many British cities, in some years exceeding the rates for such places as London and Birmingham. Infant mortality was 193.8/1000 in 1875, rising to 210.1/1000 in 1880. Throughout the eighties it remained higher in Sydney than in London (7), this in spite of a commonly held perception of Sydney being a modern and progressive city with a temperate climate, its occupants enjoying the generous fruits of economic growth.

Disease had been a matter of concern to the citizens of the city since the early 1850s, but it came to be of much greater concern in the mid-seventies. The concern was stimulated by outbreaks of a range of conditions, including typhoid, small pox, measles and a wealth of

others:

In 1875, Sydney was troubled by an extraordinary visitation of sickness; children died, stricken by diarrhoea and atrophy, pneumonia and bronchitis, diphtheria and scarlatina, convulsions and measles. Its children were literally decimated. (8)

There was a general consensus that uncleanness was in some way related to the spread of disease. The root cause of disease was believed to be "noxious vapours", and

all classes, the most economically deprived of working people equally with the well-to-do, complained of filthy streets, foul-smelling cesspits, noxious industries, and inadequate water supplies, all of which they believed to produce dangerous poisons threatening the public health. (9)

There was a particular fear that disease which might have its incubation in the narrow back streets and crowded housing of the poor, might easily be spread throughout the city, affecting all classes. As well as being seen as the source of much disease, the slums were also seen as the seat of immorality in the city. City Corporation health officials often condemned the public health conditions and moral evils which they observed in much of the City housing.

The 1853 Sewerage Act had given the City Council the authority to order the cleansing and whitewashing of buildings certified by two medical doctors as being dangerous to health. Some action was taken in 1858 to utilise this provision, but with much difficulty, the Corporation Health Officer often having a problem finding a second doctor to condemn unwholesome buildings, particularly where the property owner happened to be a person of influence. (10) The Health Officer and his successors eventually abandoned efforts to apply the Act to unwholesome housing.

One Health Officer, Henry Graham complained that "I have no power to

interfere with the internal parts of a house, but can only compel the removal of external nuisances". He argued that comprehensive new building laws were required to create an environment where no house could "be erected for the Labouring Man and his family without all circumstances connected with the preservation of health and decency being well considered". (11)

In 1859 and 1860 Henry Parkes chaired a Select Committee on the Condition of the Working Classes of the Metropolis, which recommended that legislation was needed to set minimum standards for room sizes and ventilation, to require the provision of adequate toilet facilities and outdoor space. George Dansey, Health Officer in the seventies, campaigned fervently for a new Building Act for, he complained, "property-holders can build what kind of house they like without any regard to health". (12)

The Sydney City and Suburban Sewerage and Health Board was established in April of 1875, in response to growing concern over the sanitary conditions of Sydney, the increasing incidence of epidemic diseases and a rising urban death rate. It tabled a total of twelve reports in 1875 and 1876, including the eleventh report, which was a survey of the worst areas in the city and some suburbs in 1875-76. The report revealed to the eyes of the general public the squalid and oppressive conditions in which the poor working classes were compelled to live.

In the process of compiling the report the members of the Board conducted extensive surveys of housing in the City of Sydney and some of the inner suburbs. Housing, sanitary problems and public health were now seen to be closely inter-related. The standard of housing and sanitary provisions revealed by their investigations of the back-streets, courts and lanes of the city was often exceedingly poor.

The entire portion of the City west of the great main thoroughfare, George Street, across to Darling Harbour and the Pyrmont Peninsular beyond, and from Miller's Point south in a line behind the wharves to the head of Darling Harbour, presented to the appalled gaze of the committeemen a picture of indescribable poverty and filth where, in a maze of tortuous courts and alleyways, were to be found crowded together rows of mean-looking, ill-ventilated, poorly drained tenement buildings, all seemingly crammed to bursting with the city's poor. Over everything there hung an atmosphere so foul as to appear in some districts unbearable, fed by stinking common cesspits, by improperly connected or cleaned water closets, and by gases arising from the underground sewers and from the banks of filth accumulating under the wharf piers of Darling Harbour. 'How life can be supported under such painful conditions', reported Chapman, 'seemed to us almost a mystery, and our hearts felt sore within us as we noticed the squalid appearance and attenuated forms of the poor little hollow-eyed children scattered about the place. (13)

The standard of housing was deplorable. And yet for the most part, other Sydney residents were unaware, until the publication of the Report, of the extent and gravity of the situation. In part this was due to Sydney's terrain, and the random way in which street patterns had developed in the early days of the colony. It meant that there were many dead-ends, alleys and closed courtyards hidden from the public view. Further,

In the absence of any restraining legislation it had become common, when building on a main street, to leave a small area at the rear, sometimes entered by a lane as narrow as four feet, for a row of cottages. Many of the courts described in the report consisted of two such rows of houses, facing each other across a narrow courtyard. In these circumstances, all the buildings were ventilated only from the front, while this front courtyard also housed the privies and received all the refuse of the buildings. Garrett's Buildings off Clarence Street was an example of this style of housing at its worst. It consisted of ten two roomed, two storied terraces, facing each other within an allotment 34 feet deep. Ten feet on either side was devoted to the buildings, the rooms of which were ten feet by ten feet, with seven feet high ceilings. An additional four feet six inches on either side formed tiny yards. This left a lane five feet wide in the centre, by which to enter the houses. As this lane received all the sewerage and slops of the houses, it had been planked over, to make it navigable. The report records 278 houses with no backyard, usually because of this kind of construction, though occasionally because of back-to-back houses fronting two different streets. Three houses were cited with neither front nor back yard. They backed onto a blank wall, and were entered through rooms which formed a separate dwelling at the front. These had no windows. Altogether, 58 houses and a number of

terraces were recorded as having no windows or windows which had been boarded up. Occasionally windows let in light, but no air, as they were permanently sealed. In many instances, street levelling had left courts, already closed in on three sides, below the level of the main streets, aggravating already severe air circulation and drainage problems. (14)

Light and ventilation were frequently poorly provided for. Rooms were usually small, in general about one hundred square feet. Ceiling heights were often low, in many houses less than eight feet, and in some six feet or less. Each room contained an average of two people. In Rowe Street there were 26 houses, each of four rooms 11 feet square, most rooms containing a separate family, and at least one room containing nine persons. (15)

Sanitary provisions were found to be inadequate. Of 5,400 water closets supplied with water from the Sydney water mains, 4,700 were directly connected. The water was consequently polluted. Furthermore, there were frequently far too few closets for the number of people obliged to use them.

Many of the most objectionable buildings became so because of defective drainage or inadequate sewerage, or both. Treeves Estate, off Sussex Street, housed in excess of 100 people in 21 two roomed houses, provided with three water closets, one out of order. In many houses excreta was either deposited indiscriminately or collected in saucepans and buckets to be subsequently thrown into the streets. Some houses had water closets located in the kitchen, and many had no privy accommodation at all. Of those houses for which details were given, in 183 cases the premises were shared, and between them there were 80 privies or one for every six houses. There is one case recorded of one for 40. Some were too filthy to be inspected, and on several occasions the commissioners' investigations caused actual vomiting. Privacy was not always an accompaniment of a privy, as examples are recorded with no doors, no roofs and often little in the way of sides. In the case of closed courts and yardless houses, they were in front of the houses. Theoretically, water closets were preferable to pans, but as a result of a different report of the Health Board, the water had been cut off to houses where the mains connected directly to the closet. The intention was that this engineering defect be remedied by inclusion of a cistern, but as this was the responsibility of the landlord, the only effect in many houses was to render them without water until the authorities caught up with them. Localised filth was exacerbated in the vicinity of the base of Liverpool Street, by the Darling Harbour sewer outfall, especially obnoxious at low

tide. Uneven topography, especially in The Rocks area, meant that some houses were well drained, by natural means, as all their rubbish simply washed down to the streets below. The problems arising from defective drainage were even greater in the suburbs, where most water was obtained from wells and wastes disposed of in open drains and cesspits. The sandy soil in the area south of the city encouraged percolation from cesspits into wells, assisted by the fact that wells, often placed without reference to the lie of the land, were usually built of unset bricks. These kinds of problems, which could only be solved by extending sewerage and drainage facilities, were compounded by municipal indifference in many areas. 'The streams of filth and sewage' which ran down the narrow lanes in The Glebe near Blackwattle Bay, and the infrequent visits of the corporation cart which swept away rubbish added up to 'studied neglect' in the opinion of the commissioners. Waterloo had no system of scavenging at all, and the closets in Alexandria were found to be so full that in many cases the contents were above the seat, so that closets could not be used in the ordinary way. (16)

The City Council had very limited building regulatory powers and inadequate provision for the control of nuisances. Due to legal difficulties in the enforcement of the Sydney Building Act 1837 its operation had been severely constrained. However, even had it remained effective, it contained little that would regulate any of the aspects of building which the Board were now seeing in its investigations had such a direct bearing upon health. If in the City the regulatory powers were limited, in the suburbs regulatory powers were virtually non-existent, and consequently buildings were often erected in a haphazard, even dangerous manner, with little concern for ventilation, drainage or sanitary provisions. Whether in the City or the suburbs, it was not just the existing old housing stock that was found to be substandard. Even new buildings were substandard, and served only to consolidate the slum problem:

The plan adopted in the construction of cheap dwellings in Sydney is a very simple one. A wall is run up on the extreme back boundary of the allotment, and extending to either end of the ground. This is intersected by a number of partitions, at right angles, at an average of 8 feet apart; a couple of cheap sashes for the upper and lower room, and one door on the ground floor for each house, and lo! the buildings when roofed are completed; and a property yielding good returns is created at minimum outlay. It is of no use to have doors and windows at the back because the ground at the rear belongs to another proprietor and houses without ventilation let readily...there

being no provision for drainage, and no room for it except in front, it follows as a matter of course that all the house slops find their way into this unoccupied space and run along it in a surface drain. Add...three or four stinking cess-pits, all occupying prominent positions in front...and you have a sketch of a block of cheap houses in the back-slums of Sydney. (17)

As a consequence of the Reports of the Sewage and Health Board the government passed three acts: the Water Pollution Prevention Act, the Nuisances Prevention Act, and three years later, in 1879, the Sydney Improvement Act. (18) The first two acts were in response to the Board's recommendations that a comprehensive sewage system was essential, there being major difficulties with existing connections of water closets to sewers, and in the control of cesspits and night soil removal. The third act was in response to a recognised need to substantially increase the control of the standard of building in order to protect the public health. Although the legislation was to have some impact upon substandard housing in the following years, its effect was to be far more limited than the reformers hoped for.

5.3 THE ORIGINS OF THE CITY OF SYDNEY IMPROVEMENT BILL

The necessity of a new building act had been promoted for many years in Sydney. The revelations of the Sewerage and Health Board Reports added further impetus to the move for new regulations. In London the Metropolitan Building Act had been published in 1855 (19) and had subsequently been amended in 1879 (20). These acts set more detailed and more comprehensive standards for building in London, and had generally been well received by architects and builders. The Melbourne Building Act (21), passed many years earlier, was also proving a more effective instrument in that city than was Sydney's Building Act.

The City of Sydney Improvement Bill was presented to Parliament in 1878, but drew a strong response from the building industry. In January and February of 1879 petitions were presented from a total of 82 citizens, builders and contractors, proprietors, house-owners and architects, showing that they viewed the Bill with alarm, and arguing specifically against certain provisions of the Bill. They, nonetheless, had long felt the need for an Act for the proper control and regulation of buildings in the City, and acclaimed the introduction of such an Act.

The Mayor of Sydney, Charles James Roberts, in evidence given before the Select Committee established to consider the Bill, testified that

the old Act has been very defective and almost useless; there are so many flaws in it that we can hardly attempt to put it in force, and the sooner an amended Act is passed the better it will be for the city generally. (22)

The Bill was prepared at the request of the City Council by Edward Bradridge, an architect who had been City Building Surveyor for 18 years to 1878. Over a period of about six years he constructed regulations based upon the Building Acts of London, Melbourne, Brisbane, and the 1837 Sydney Building Act, as well as upon a bill prepared by his predecessor, Michael Golden. He also made notes whenever anyone came to him with a complaint, and if he considered the person entitled to a remedy, included a provision in the Bill accordingly. The Bill was framed by eclectic borrowings from the various Acts as he considered appropriate to the local context.

He referred to the 1837 Act as "the one supposed to be in existence", and testified that no action was taken under it "because the City Solicitor advises the Council that the legal provisions are so

deficient that he cannot secure a conviction". (23) He also expressed to the Committee some of the frustration that he had experienced under the 1837 Act:

I may explain that the present mode of procedure with regard to our present Building Act is this:- A builder goes to the Town Hall, asks for the City Building Surveyor, and sees him or not, but he gives notice that he is going to put up a certain building. That is all he is required to do under the present law. The Surveyor, on receipt of that notice, goes round to inspect the building and to see that the provisions of the present Act are carried out. When the Surveyor gets there perhaps he finds a labourer at work; he asks, "Who is building this house"? "Don't know." "Have you got any plans here"? "No." Next time he comes round the Surveyor probably sees the mason. "What sort of a house is this going to be"? "Don't know anything about it." "Who has the plans"? "Don't know." The Surveyor goes round again in a few days and sees the bricklayer. "Have you the plans of this house"? "No." "Who has them"? "I suppose the builder has got them." He goes round again in a few days, finds the brickwork commenced, probably up 3, 4 or 5 feet. He asks the bricklayer again, "Have you got the plans"? "No." Well, he goes again in a few days more and finds the builder on the ground. "Have you got the plans"? "Yes." "Will you allow me to look at them?" "Yes." The plans are then brought forward; the Surveyor examines them. "These walls are not sufficiently thick, and you are wrong in so and so." "Oh, I know nothing about that - you had better go to the architect." Of course it is not the Surveyor's place to run after the architect, but he goes to his office and causes notice to be sent to the owner:- "I give due notice that such and such a building in course of erection in a certain street is in contravention of the Building Act"; and then at the expiration of a certain time the Surveyor writes a letter to the City Council, informing the Council that such and such a person has committed a breach of the Building Act; the City Council refers this for prosecution to the City Solicitor, and the City Solicitor then summonses the owner or the builder, as the case may be, and the parties have to appear at the Police Court; and if it can be proved before the Magistrates that a breach of the law has been committed, the parties are committed to take their trial at the Court of Quarter Sessions; and then the Quarter Sessions, if, after a Jury has been impannelled, they are of the opinion that a breach of the law has been committed - I would call your special attention to what I am going to state now - orders the parties to enter into recognizances to abate, amend, or pull down the building. That is the present law. You will perceive that under the present law it is the builder, who has nothing to do with the preparation of the plans, that is committed to gaol if he does not pull down the building. The Court does not recognize the architect. My sole object in making provision that plans should be submitted to the Surveyor first of all, is to prevent annoyance to owner, architect, and builder, because when once the plans are prepared it is simply his duty to take those plans and compare them with the Schedules of the Act, and see that its provisions have been complied with. By an amendment of Mr. Lucas's, the Surveyor is bound to state on the plans that they are in accordance with the provisions of the Act, so

that all the annoyance and trouble that is caused under the present Bill is abolished, and the builder and architect are sure that they are carrying out the law. (24)

The Bill which he had drafted included provisions for its extension to any Municipality by the Governor and Executive Council when considered necessary. He considered a Building Act was much needed in the suburbs, more so even than in the city.

Yesterday I went to Croydon, and I saw there several instances showing the necessity for a proper regulation of buildings in these suburban places. I am sure if the Members would go out to the suburbs they would be satisfied also. What I refer to is this - there are nine wooden buildings put up close to the Croydon Station, all of the most inflammable material, and there are no divisions between the walls, and no party-walls of brick to prevent fire from communicating from one building to another, and the amount of space allotted for back yards is so small, and the privies (common cess-pits) so near the kitchen windows, that if ever legislation was required undoubtedly legislation is required there. Legislation is urgently required to prevent the abuses that have sprung up in this city from being continued in the suburbs, and perpetuated, which would have to be met hereafter by legislation; moreover the suburbs are bound to be densely populated the same as the city, and there is more necessity for the provisions of this Bill being extended to suburban municipalities than to the city, because the city is pretty nearly subdivided and built upon, and as yet the suburbs are not. All sorts of abuses are now taking place in the suburbs. One man buys five acres and cuts it up into building allotments in a way to make the most money out of it; another buys another lot, and does the same; and the Municipality has no control over the manner in which the land is subdivided. One man runs his streets one way, another the other way, without regard to anything but his own convenience. (25)

5.4 RESPONSES TO THE SYDNEY IMPROVEMENT BILL

There were objections voiced to many of the requirements of the Bill. Much of the Bill was based upon the London Building Act as amended, and there was general consensus as to the appropriateness of this legislation. The dissent arose where there was divergence from this legislation.

The primary area of concern was the "arbitrary and excessive powers" granted to the officers of the City Corporation, and particularly to the City Building Surveyor. The Bill provided the Corporation officers with extensive powers and few responsibilities. Penalties for some offences were excessively harsh, and there was no provision for appeal against the decisions of the Corporation Officers.

The Bill provided that the Council was to have power to make by-laws, and also provided for its extension to the Municipalities. This was much objected to, as Edmund Blacket, architect, testified:

Now there are thirty-one Municipalities around Sydney, and the city makes thirty-two, and under this clause they are all to have the power of making their own by-laws, as provided for by the next clause, so that we may have thirty-two different sets of masters and thirty-two sets of by-laws to make ourselves acquainted with. It was to stop such a state of things as this that the London Metropolitan Building Act was passed. There were a great number of different authorities - the City of London, the City of Westminster, Lambeth, and half a dozen others - round about London, and the system became such a nuisance that the Legislature abolished it all, and passed the Metropolitan Building Act, placing the whole matter under one authority, the Metropolitan Board of Works. It seems to me that what was found necessary in London will surely be found necessary here before long. Now is the time to apply that Act, while the Municipalities are small and inconsiderable. The Municipalities now growing up will be a nest of nuisances, and in twenty years time they will be difficult to deal with. (26)

Also of great concern to those appearing before the Committee was the lack of any appeal, other than to the Magistrates. It was felt that the Magistrates, knowing nothing of building, would simply hear the Surveyor's opinion and rule accordingly. There was broad consensus in the evidence (apart from that of the Mayor and the Surveyor), that an independent appeal body or board of review was essential, if building was not to be hampered by possibly arbitrary or excessively harsh conditions imposed by Council officers.

George Allen Mansfield, architect, proposed that such a board ought to

be comprised of architects, builders, and "one or two members of the medical profession, to take into consideration points relating to sanitary matters". (27) John Horbury Hunt, architect, considered that a Board of Works ought to administer a Building Act covering both city and suburbs. He felt it undesirable, as did many others, that such an Act be administered by the City Council, considering the possibilities of abuse of aldermanic power, political influence and score-settling. Again, a contractor violating the Act, might tomorrow be elected to Council, making him a judge on his own case. Furthermore, an independent Board of Works would be of assistance to an architect, in giving him some backing when a client might demand a lesser standard of building construction than the architect considered proper.

We of the profession would gladly accept what I may call the assistance of a Board of Works - they would be of invaluable assistance to us at times. I could cite cases where we could not assent to do work in the way asked of us, but we cannot fight our clients too severely. If we had a Board of Works, we could quietly say - Such a matter will be laid before you, we do not approve of it, but it is forced upon us, and you would help us very much by giving it your special consideration. (28)

The Bill required the submission of plans prior to the commencement of building work, but committed the Surveyor to no time schedule for the approval or rejection of the plans. It also made no provision for the return of the plans, and the extent of plans required was considered excessive. Many of the architects had similar questions to those raised by Edmund Blacket:

I entirely approve of the principle of submitting plans and particulars before any building is begun; but are they to be my original plans - and is the Surveyor to keep them, or how long is he to keep them - and who is to pay for them? When is the Surveyor to signify his approval, and am I to wait his pleasure before I can begin my building? (29)

There were also many objections to the Surveyor's power "to make any alterations" to plans submitted for approval. It was felt that if

there were matters to which the Surveyor objected, he ought to so advise the architect, who could then amend the plans, or appeal against the ruling.

Under the Bill, the failure to submit subdivision plans was to be punishable by two years imprisonment. This was generally considered utterly disproportionate to the offence.

A further provision gave the Surveyor power to determine the number and size of door openings in public buildings. Such doors were to be provided "as the Surveyor may deem necessary". This was to ensure adequate means of egress in such buildings. Although the objective was supported, some of the architects testifying objected to the powers it gave to the Surveyor, some considering it dangerous to leave such a matter at the Surveyor's discretion.

William Wilkinson Wardell, architect, who had been Inspector General of Public Works (Head of the Department of Public Works) in Victoria for nearly twenty years, a member of the Board of Land and Works, and of the Central Board of Health, was examined by the Committee. He considered that too much power was given to the Surveyor, and that "in the matter of egress from public buildings the designers will be completely at his mercy." He gave evidence that

In Melbourne they have a fixed rule. Every public building before being used is to be certified by the Head of the Department of Public Works as to the safety of its construction. Questions of ventilation and facilities for egress are referred to the Central Board of Health. In the first place the plans are sent for consideration, and the approval or otherwise is notified to the architect. On completion of the building the Central Board of Health send an officer to see that everything has been carried out as directed. They stipulate for a certain allowance of openings for ingress and egress of air, and also for the egress of the people, and they have a definite standard. (30)

The standards were known and could be observed by builders, and were not left to the Surveyor's discretion. The rule for widths of doorways was 6 feet for one hundred persons, and an extra foot for each additional hundred. The rules governing means of egress also required staircases to be built of incombustible materials. (31) The Bill for Sydney set out no specific requirements.

The Bill also gave power to the Mayor, the Health Officer, the Inspector of Nuisances, and the Surveyor, to enter any property at any time, without prior notice, to make an inspection. This was generally held to be an unreasonable requirement.

In addition, the Bill required that the position of a cesspit be approved by the Health Officer, the Inspector of Nuisances and the Surveyor. It was argued before the Committee that this was impractical and unworkable, and that the consent of one officer only should be required.

The Bill also dealt with many matters related to the construction of buildings, and in some of these was roundly criticised. The means of determining wall thicknesses met strong opposition. Wall thicknesses were to be determined according to the class of building, there being three classes with progressively more stringent requirements. This was opposed on the ground that the structural requirements of walls were the same, whatever the building use might be. Secondly, the Bill made no allowance for structural stiffness introduced by cross walls, piers or buttresses. Third, the calculation of thickness was made to depend upon the ground floor area in the case of houses, and placed no limitation on the storey height. Consequently, argued Edmund Blacket, in building a cottage of a given area, "if I build a one-storey cottage it would be a first-class building, and the walls must be 18

inches thick, but if I put up three stories they need only be 9 inches." (32) He also complained that the Bill, in determining wall thicknesses for the warehouse class, had "taken as the minimum what the English Act gives as the maximum". (33)

Horbury Hunt argued that the Act should make provision for cavity wall construction ("Hollow walls, a recognised form of building, and one that can be most improperly and dangerously used"), for wall height, thickness and length, and for other structural elements:

- not only the height and thickness should be specified, but most certainly the length; also provide for cross or bond walls and buttresses. Then there should be something said about floors. The Act may not be supposed to attempt to secure that degree of general solidity and excellence which any person for whom a building is being erected ought to secure for himself by the employment of a competent architect; however, the Act should provide for the minimum strength of girders, and columns or piers, as much as for the thickness of walls. If you have badly constructed floors, it is no use providing for strong walls. All floor and roof timbers should be hardwood - softwood not allowed. (34)

With regard to the use of iron doors in fire walls for compartmentation of warehouses and stables, one witness, Alexander Dean, a builder, proposed that there should be two such doors provided, one on each side of the opening, because of the distortion which occurs in the iron under great heat. (35) By contrast, Edmund Blacket could see no use in compelling people to go to the expense of doors which would be left to stand open and would rust on their hinges. (36)

There were objections to a clause prohibiting the use of lead pipe for domestic water supply. It was argued that this was difficult to achieve, and ought to be limited to water for drinking purposes.

The Bill required a fireplace to be provided in every room, for

ventilation purposes. This requirement was roundly condemned.

The Bill also proposed to license persons carrying out drainage work. This requirement met affirmation from all quarters. Many thought as John Horbury Hunt did:

We have licensed gas-fitters and plumbers, and I think the Bill ought to make provision for licensing men to lay drains and make connections with the sewers. At present some of the drainage work is done by the commonest and most careless of labourers; the pipes are put together almost anyhow; and when the drains are finished nobody can get to them to see whether they are properly laid; the fact of their being left uncovered for inspection does not allow one to see what they are like inside at the joints and junctions; they ought to be laid by men who should have some education and fitness for such important work, and who should be examined by a competent Board before being licensed. (37)

In a number of other matters of lesser importance, the witnesses before the Committee opposed requirements of the Bill, or drew attention to areas in which it was deficient.

The Committee presented to parliament an amended version of the Bill, which addressed the major issues which had been raised before it, although not addressing a number of the lesser matters of concern. Significantly, it made provision for an appellate body, and re-constructed the schedules determining wall thicknesses, as well as more clearly defining some of the powers and responsibilities of the Surveyor.

5.5 THE CITY OF SYDNEY IMPROVEMENT ACT, 1879

The City of Sydney Improvement Act (38), An Act to make better provision for the construction of buildings and for the safety and health of the inhabitants within the City of Sydney, was enacted on

June 3, 1879. It repealed three acts: the Sydney Building Act of 1837 and the amending acts of 1838 and 1845. It was to apply to all parts of the City of Sydney, and section 4 provided that the Governor could extend the provisions of the Act mutatis mutandis to any Municipality upon petition of such Municipality.

The City Council was given power to make, alter or repeal by-laws for carrying out the objects of the Act. Section 6 provided for the establishment of the City of Sydney Improvement Board, which was to consist of five members "of whom one at least shall be a professional architect, one a practical builder and one a medical practitioner". The Board was to determine any questions concerning the execution of the Act, and was empowered in any particular case to dispense with the requirements of any by-law, subject to such conditions (if any) as they might think proper. Sections 7 to 12 dealt with the operations of the Board. Any person dissatisfied with the conduct or decision of any officer empowered by the Act could make complaint to the Board. Any "doubt, difference or dissatisfaction" regarding any of the provisions of the Act between any affected parties, could be brought on appeal to the Board.

The Board was to be primarily an appellate body. It was not the Board of Works responsible for the control of building throughout the metropolitan area that some had proposed. Its powers were much more limited. It had no power to initiate action at its own instigation, but was limited to specific matters brought to it to resolve or to rule upon.

The first Board was comprised of Benjamin Backhouse, architect (chairman); W. Bailey, builder; Dr. Craig Dixon, medical practitioner; L. E. Threlkeld and F. Senior.

All drainage and sewerage work was to be carried out by persons licensed by the Council. Penalties were to be applied where work was carried out by an unlicensed person, and Council could direct that the work be removed.

No land was to be laid out or sold for building purposes without the approval of Council. A plan was to be submitted showing disposition of the land, any proposed roads, and proposed drainage. If no disapproval was expressed in writing by the Council within seven days the subdivision of the land could proceed.

The Council was given discretion under S.17 to make exemptions from the requirements of the Act, where the Act was considered inapplicable in particular circumstances. A procedure of application and approval was established.

The Surveyor was to see that all the regulations of the Act were properly observed. He was to inspect all works carried out. He was to inspect ruinous and dangerous buildings and to take all necessary measures. He was also to prevent "encroachments on the public thoroughfare beyond the building-line of all streets".

Fees were payable to the surveyor for both new buildings and alterations and additions, although no fee was payable for an alteration or addition which did not increase or decrease the external dimensions or materials regulated by the Act.

Three days notice in writing was to be submitted to the Surveyor, prior to the commencement of construction of a building, wall or fence; together with a general plan. The Surveyor was to return the

plan, with his decision endorsed on it, within seven days. Buildings erected without notice being given could be declared a common nuisance, and their demolition ordered. Plans of second and third class buildings were to describe provisions made for lighting, ventilation, drainage, and in the case of third class (public) buildings, were also to show the means of egress. Such details were to be reviewed by the Surveyor and the Health Officer. Within seven days of the completion of a public building, it was to be inspected by the Surveyor and Health Officer, to certify whether or not it was fit for public use.

Provision was made for the cutting open of work suspected of being defective. If the work was done in conformity with the Act, compensation could be awarded by the Improvement Board.

All buildings were required to be drained and ventilated in accordance with the Act, and every building was to have sufficient privy or closet accommodation, the location of which was to be approved by the Health Officer, the Inspector of Nuisances and the Surveyor.

The Act dealt at length (S.45 - S.62) with regulations, rights and responsibilities related to party walls. It also required that certain matters of dispute over party walls be determined by arbitration, and described the mechanism by which that was to occur.

The Act established three classes of building:

First or Dwelling-house class: houses.

Second or Warehouse class: Warehouse, storehouse, granary, brewery, distillery, factory or workshop.

Third or Public Building class: church, chapel, place of public worship, college, hall, hospital, theatre, public concert-room, public

ballroom, public lecture-room, public exhibition-room ... any building for the assembly of large numbers of people "whether for public worship, business, instruction, debate, diversion or resort".

Wall thicknesses for external and party walls were to be calculated according to two schedules, one for dwellings, the other for all other building types. The schedules took account of the height and length of walls and the height of storeys and made some allowance for the provision of piers and cross walls.

The gross floor area of warehouses was limited to one hundred squares on a level, stables to twenty-five squares. Larger areas were to be divided by party walls, with communicating openings equipped with quarter inch thick wrought iron doors on both sides.

All buildings were required to be drained to a common sewer if one was available within 50 feet of the building or its fences, or were otherwise to be drained in a manner satisfactory to the Surveyor. Standards were also set for the construction of privies and cesspits.

Materials were specified for footings, as were widths of footings (but not depths). "Anti-damp courses" were to be built in the foundations "when required by the Surveyor".

Materials and the way they were to be built into external and party walls were also specified. As in the earlier legislation windows were to be set in reveals recessed at least four inches. There were also restrictions on the building-in of breast-summers. Party walls were to be corbelled out past the line of projecting eaves at least two inches, and were to extend at least fifteen inches above the roof covering. Chimneys, flues, hearths and the like were regulated in

some detail. Verandahs were permitted in a similar manner to that permitted under the earlier Building Act. Projections beyond the streetline were limited to "copings, cornices, fascias, door and window dressings, pilasters, strings or other architectural decoration, waterpipes and balconies". No cornice or covering of a shop window was to project more than 13 inches or 18 inches, depending upon the street width.

Roof-coverings were to be non-combustible. Hardwood shingles were no longer an acceptable alternative.

From the introduction of the Act every room in a house, other than a bathroom or store room, was to be ventilated by an opening communicating with the external air. All windows were to be openable. Room heights were to be a minimum of eight feet, with one floor of rooms in the roof permitted to be seven feet six inches, except for the sloping part, which was to begin at least three feet six inches above the floor.

5.6 THE SYDNEY CORPORATION ACT, 1879

The Sydney Corporation Act of 1879 was the fourth attempt to establish an effective and efficient City Corporation, at a time of unprecedented growth. The Act consolidated and amended laws relating to the City Corporation. A total of thirty-one acts were repealed in whole or part, including acts controlling sewerage and water services in the City (39), nuisance prevention legislation (40), and the street alignment acts of 1834 and 1835 (41). In the parts of the Act affecting building there is some overlap with the provisions of the Sydney Improvement Act.

Part V of the Act, "Powers of Council as to the Regulations of Public Ways", dealt with a number of matters impinging upon building. It required dangerous buildings to be taken down or repaired at the owner's expense, to the satisfaction of the City Surveyor (S.78). Building materials were not to be placed in public ways without Council's consent (S.80). Building excavations and dangerous places near public ways were to be made good or protected with some suitable enclosure (S.81). Generally, where property owners failed to make good dangerous situations, the Surveyor was empowered to carry out the work, and the Council was entitled to recover the costs.

Hoardings and fences were also controlled (S.84), to the extent that where building works, whether construction, demolition or alteration, were executed that might affect public safety, a fence or hoarding was required. A hoarding license had to be obtained from the Surveyor prior to the work being carried out.

No building work, whether erection, rebuilding, alteration or extension, was to be carried out until seven days after the giving of notice to the Surveyor. Work could then proceed unless the Surveyor had issued a notice refusing consent.

Council, by S.88, was obliged to gazette building alignments for every public way. The distance was not to exceed twelve feet from the kerb stone or external edge of the footpath, except with an owner's consent. Council was empowered to order the demolition or removal of any parts of a building found to encroach (S.91), although provision was made for arbitration where a loss would be incurred by the owner.

Notice of the intended levels of a building was to be submitted to

Council at least fourteen days before the commencement of any digging or foundation work. The notice was to detail the proposed levels of the cellar or lowest floor, and the location and construction of privies, cesspits and drains. The Surveyor was to approve or disapprove the proposal within seven days (S.100).

Section 101 prohibited the construction of rooms, cellars or openings under the footpath. This section was in direct conflict with Schedule F, clause 3 of the Sydney Improvement Act, which required certain basement rooms to be lit and ventilated via an iron-grated void under the footpath.

Part VIII of the Act dealt with matters affecting water supply and provisions to be made to prevent the polluting of water. Part X dealt with the disposal of sewerage and the construction of sewers by Council.

Part IX dealt with the powers of the City Health Officer, with the cleansing of streets, and with cesspits, drains and nuisances. The Council was empowered to make by-laws to regulate all aspects of the construction, dimensions and location of cesspits and closets, and to prescribe the extent of closet accommodation to be provided for houses, factories and other places of business. It was also empowered to require the alteration of existing cesspits and closets "for preserving public health or decency", as well as to regulate a number of other matters affecting the disposal of night-soil (S.186).

5.7 THE UTILISATION OF THE SYDNEY IMPROVEMENT ACT

The 1880s was a period of unprecedented economic growth, and with it

the city population increased very rapidly. Consequently there was an urgent need for more housing. Speculators continued to build the dense and ill-serviced housing which had been the subject of so much investigation and criticism.

The City Concil had some fairly tenuous powers under the Corporation Act and the Improvement Act, to order the demolition of buidings in certain circumstances. However, the public's imagination was caught, and in the press and in public discussion there was much enthusiasm expressed for cleansing the slums, for slum demolition and reconstruction of large parts of the city. The issue of the re-housing of those displaced by such measures was not so vigorously discussed. In fact, in much of the discussion the issue was not addressed at all.

Following the introduction of the Improvement Act, the City Building Surveyor, Thomas Sapsford, began a campaign of discovery of insanitary tenements that might be demolished. However, he soon encountered problems in obtaining the demolition of buildings deemed insanitary. The Improvement Act, continuing the wording of the London Act, required that for buildings to be condemned they must be both "ruinous and dangerous". Recourse to the Corporation Act allowed that buildings must be "ruinous or dangerous", maintaining the wording of earlier local legislation. However, legal opinion obtained by the Improvement Board held that the term "dangerous" in both Acts applied only to buildings that were structurally unsound and did not extend to buildings objectionable for reasons of public health (42).

Under the Improvement Act the City Council was required to obtain the authorisation of the Improvement Board prior to ordering the repair or demolition of buildings. The City Surveyor stopped referring

insanitary buildings to the Improvement Board as ruinous and dangerous structures, not having had success there. Instead he sought court orders for their demolition as common nuisances. However, this avenue depended upon the interpretation of the magistrates involved, as the Improvement Act did not specify that the overcrowding, poor ventilation or bad drainage of a house constituted a nuisance. Consequently, the City Council began utilising a further provision of the Improvement Act which according to legal advice gave it the power to order to be vacated, buildings certified by the Mayor, Building Surveyor, City Health Office and Inspector of Nuisances as unfit for human habitation. They ordered the repair or demolition of such buildings, in so doing somewhat overstepping their legislated authority.

That the Mayor should authorise such a proceeding, and that the press should applaud his initiative rather than question its legality, highlighted the mistaken perceptions of the Improvement Act that had been caused by anxiety at epidemic disease and by the related debate over slum clearances (43).

By November 1880 over 300 buildings had been condemned and directed to be either repaired or demolished. By February 1881, 450 buildings, two and a half percent of the City total, had been condemned. Newspapers praised the action, clamouring for the demolitions to be extended to embrace the systematic removal of all "moral plague spots" and "fever-beds" in the City (44).

Some people voiced misgivings at the extent of the Council's drive for repair or demolition. Others however were disappointed at the small scale of the improvements that were being made, and yearned for the re-development of broad swathes of land. The City Council was not in a position to undertake such re-development, having neither the legislated power nor the finances for such work. Such action nonetheless continued to be urged by many reformers.

Misgivings were also voiced by the Improvement Board. It aggressively maintained that the condemning of ruinous and insanitary buildings was its responsibility.

Conflict between the City Council and the Improvement Board was inherent from the inception of the Board. It was established essentially as a board of appeal against decisions of the Council. The Council had argued against its establishment, claiming that there was no need for such a body, the Council being well able to deal fairly with the public, without the need for review of their decisions by others. Many builders, architects and the like had argued for, and for some time believed the legislation provided for a Board of Works, an executive body to take overall responsibility for the improvement of Sydney. The legislation did not so provide, and Board members, late in 1879, drafted an amending Bill to strengthen the Board's authority. The City Surveyor was to refer all dilapidated and unhealthy buildings to the Board alone (45). The City Council staunchly opposed the amendments. Consequently,

The Improvement Board, peeved by the "ridicule..." with which their amendments were received by City altermen, responded angrily to the insinuations of financial deviouness levelled against them. C.H. Barlee, the Board's secretary, in a letter to the press, spoke provocatively of the City Council's "jealousy of the Board", and Board members went ahead independently and presented their amending bill to the Colonial Secretary. City aldermen meanwhile ordered Sapsford to cease reporting unwholesome buildings to the Board, and to refuse to carry out its instructions. With the Building Surveyor now instructed to ignore them, Board members began to agitate for more ambitious legislative amendments giving them an executive officer of their own. Circumstances were pushing the Board into claiming for itself powers that would formally transform it from an appeal tribunal into a full board of health and works. (46)

An amending Bill was eventually introduced to Parliament in 1880, but did not proceed beyond the first reading. The City Surveyor prepared a Bill in response, giving the City Council power "to demolish

buildings unfit for human habitation", and abolishing the Improvement Board. Appeals were to be heard by the Mayor and four aldermen. It was never introduced to Parliament, but knowledge of its existence only increased the Board's antagonism towards the Council. The Board challenged the government to

"choose between the City Council and the City Improvement Board, and delegate the improvement of the city to that body in which they have the most confidence and which they consider most qualified to discharge the duty." The picture of themselves as simple appeal court judges, arbitrating in disputes over building design, had been pushed to the background. The subject of their attention had become clearing the city of unhealthy slums, and they now demanded action to resolve the question of who should undertake that responsibility. The choice offered by them was between an appointed expert board of health and works, and local municipal government. (47)

At the same time the Improvement Board was soon found to be unnecessary as an appeal tribunal protecting the building industry from arbitrary City Council decisions.

The Town Hall was generous in allowing deviations from the new building rules, and the relieved builders and architects acknowledged that their earlier misgivings about probable Corporation tyranny had generally been groundless. (48)

In 1881 smallpox broke out in Sydney, giving further stimulus to the drive for demolition of the city slums. The mayor and council officers continued their vigorous inspection of dilapidated and insanitary housing over the next few years. At the same time continuing economic expansion was resulting in the clearance of areas of city slum housing for the construction of commercial and warehouse buildings. The Sydney Morning Herald, praising the combined effect of Council action and commercial expansion on the appearance and health of Sydney, commented

As a result of them the condition of the city has been undergoing a sweeping change. We say the condition rather than the appearance, because although the frontages to the main streets present an aspect widely different from that which they presented even ten years ago, it is not only on the face of the main streets that the work has been done. A bird's-eye view

from some elevated point is necessary for a full realisation of the changes that have been wrought in the by-ways and back slums, where houses which had been the habitations of artisans, labourers and the poor have been swept away not merely by the score, but by the hundred. (49)

Slum clearance was seen as essential to improving the housing, health and morality of the working classes. By the demolition of housing it was held that the working man was driven from the city to live in healthier more congenial circumstances in the suburbs. In fact, overcrowding was not alleviated by slum clearance but intensified. The working class poor were, by nature of their employment and their limited income, constrained to live close to their place of employment. Consequently, as the housing stock was reduced, the overcrowding of the remaining slum housing often increased.

In the latter part of the 1880s and into the 1890s the ordering of the demolition of buildings declined. "The central reason for the run-down... lay in the absence of any power actually to cause the demolition of unwholesome building." (50). The City Council was reticent to fully enforce those powers against unwholesome buildings which it did possess, "perhaps swayed by the many large property owners among the aldermen". (51)

Meanwhile, the Improvement Board slowly declined in importance. Despite repeated requests to the government for greater powers to control building, to order the demolition of unwholesome structures, and to carry out resumption for urban redevelopment, no action was taken. Only a few years after its establishment it ceased to function as an appeal tribunal. Eventually, in 1895, after years of decreasing activity, its government funding was terminated, and the Board ceased to function.

Even after the passing of the Improvement Act, some people remained dissatisfied with its provisions, believing it inadequate in certain respects. In 1884 the newly established Metropolitan Fire Board complained about the inadequacies of the legislation for fire safety in tall buildings:

The modern Sydney warehouse, looming up 100 feet in the air, with its enormous cubic capacity, in some instances ten times that allowed in other cities, its shafts for lifts, gas-engines, and other modern developments to aid the fire fiend, is beyond the capacity of any fire department to protect. (52)

Following the fire which destroyed the Evening News office in 1888, the architect John Sulman rushed into print a booklet entitled The fireproofing of city buildings. In it he described the state of construction in the city at the time:

Our present mode of building is to run up brick or stone walls as thin as the Building Act will permit, fill the openings with wooden frames, form the floors of inflammable Oregon joists, cover them with boards, ceil with thin wooden linings, cut them through from top to bottom for lifts, cased in with wood if cased at all, divide the rooms with wooden partitions, erect a wood staircase, and finally cover all in with a wooden roof - what is this but a magnified match box? Should a fire get a start at the bottom of a lofty building so constructed nothing could save the occupants of the upper storeys, the danger of spreading would be increased ten-fold and the risk of general conflagration greatly augmented. On the ground of humanity alone this danger ought to be faced at once, to say nothing of the immense loss of property that is inevitable should such a fire occur. (53)

Sulman proposed that staircases and lifts, which at the time by penetrating the floors of a building and acting as flues rendered other precautions useless, should instead be constructed outside the main body of the building, or inside but in a fire-isolated shaft, the doors to be fire-rated and self-closing.

He discussed a range of methods of achieving more fire-resistant construction for floors, floor support structure, ceilings and roofs. He proposed that the roofs of tall buildings should be of

fire-resistant construction to limit the spread of fire. He also argued that the capacity of undivided buildings should be limited, citing as an example the situation in London, where the limit was 216,000 cubic feet. He further proposed that some form of hydrant and sprinkler protection should be considered in tall buildings.

His proposals drew in part upon European and American experience and practice, and indicated the direction that legislation would eventually take in Sydney, although not until a quarter of a century later.

5.8 THE GREAT FIRE OF SYDNEY

At 2.30am on October 2, 1890 a fire broke out in the premises of publishers Gibbs, Shallard and Company, threatening the central city block bounded by Pitt, Moore, Castlereagh and Hunter Streets, and eventually destroying some twenty large buildings. This gave some opportunity for central city redevelopment. City Council was empowered by the Moore Street Improvement Act to resume land for the widening of Moore Street, to form a part of what is now Martin Place. City Council had sought much broader powers of resumption and redevelopment, but the Legislative Council amended and altered the Bill, substantially reducing the proposed powers so as to limit them in application to Moore Street.

The inquest that followed the fire brought forward a number of recommendations on building regulations. The Metropolitan Fire Board and the Sydney Improvement Board again urged the amendment of the Improvement Act. The Sydney Morning Herald wrote:

As far back as November 28, 1879, the faulty construction of the

law. Year after year the Board have renewed their efforts to obtain the necessary amendments, but without success, although several bills have been prepared and handed in to successive governments. In the annual report for 1889 it is pointed out that the Fire Brigades Board have sought the co-operation of the board with regard to the prevention of danger proceeding from open lifts in warehouses, and the proper construction of buildings. The board sympathised with these representations and in the report stated that many preventable deaths had occurred in connection with lifts and lift openings, but the Act was defective in this respect, and also for enforcing the construction of all buildings in the city, particularly of the warehouse class, in such a manner as might be found most effective to prevent as far as possible the further danger of the spread of fire when a conflagration took place. Nothing could be done towards carrying out such improvements until the Act was amended... These representations, involving as they do questions concerning the safety or loss of human life are serious, and urgent, and should not be unnecessarily postponed, or lost sight of. (54)

John Sulman, in a letter to the Sydney Morning Herald, wrote his comments as an eye-witness of the fire. He observed that the lift shaft of Gibb, Shallard and Company's building had acted as a flue, the fire then spreading from roof to roof of the adjoining buildings. He commented upon the inadequacy of the water pressure in the mains and proposed an upgraded fire mains system. He also proposed the provision of external iron shutters on the windows of warehouses stored with combustible goods and fronting narrow lanes. (55)

At the end of the month the findings of the inquest into the fire were published. All but two of the buildings were found to have been constructed in accordance with the provisions of the Improvement Act. One building had walls built of a lesser thickness than that required, and another had no walls, its roof being supported on piers built against the walls of adjoining premises.

The jury was pleased to know that an amending Act was "now in preparation to remedy all defects" of the Improvement Act. Given Sydney's climate, they did not recommend the restriction of the percentage of windows in a wall. They recommended concrete rather

percentage of windows in a wall. They recommended concrete rather than stone for staircases, and "a properly constructed fireproof floor" to confine fire to a single storey. They suggested:

that an Act be at once brought into force in the City of Sydney providing that no large buildings be erected in any lane, place or narrow street... without all outside windows being protected inside and outside with iron shutters and, in addition, all such large buildings be provided with fireproof floors and iron shut-down doors, that all bridges over any public or private roadway in the city connecting buildings be prohibited; that partitions composed of lath and plaster, wood, or any other inflammable material be strictly prohibited; and that all lifts, passenger or goods, be enclosed with brickwork, and iron shut-down doors to each floor. (56)

They also considered that the four-inch water main in Pitt street was of insufficient size to cope with the fire, and that the city's mains sizes should be increased.

5.9 THE NEED FOR A NEW BUILDING ACT

An article in the Sunday Times of March 1, 1896 promoted the need of a new building act.

We might, indeed, say simply a Building Act, without the "new", for, strange as it may seem, considering the age and development of our capital, there actually exists in this colony no real Building Act at all, although the utterly unworkable City Improvement Act, supposed to be administered by an impracticable coalescence of the moribund City of Sydney Improvement Board... the Municipal Council of Sydney, and the City Building Surveyor (who is a sort of shuttlecock for the two rival bodies to play at battledore with), is often called the "Sydney Building Act"... But with what childish incompetence it was drawn up let the records of the law courts, the opinions of Attorneys-General and other counsel, and the Improvement Board's own annual reports bear witness; how utterly inadequate to the conditions to be coped with, how oftentimes absurd are its provisions, let every expert in the city testify, and how completely it has failed to fulfil the intentions of the Legislature let every citizen depose who has had practical experience of its working (when the working should be in the interest of the Community), or who is in any way solicitous for the public welfare. Interviewed in 1891... the present head of the Government declared the unreformed condition for twelve years of the City of Sydney Improvement Act, and the absence of any effectual building laws, to be a scandal to the city and the colony; seen

recently, the City Architect, Mr. Geo McRae, held forth like an inspired oracle on the crying necessity for a new Act for the city, and the officers of the Government Architect's Department (Mr. W. L. Vernon), and the President of the Institute of Architects (Mr. Thos. Rowe), enlarged equally on the need of building legislation for the suburbs; while (of) Mr. Wm. D. Bear, the energetic Superintendent of the Metropolitan Fire Brigade... his views have been familiar to everyone for years past, and the absence of proper laws is to him so like the traditional "red rag" to the second constellation of the Zodiac that it is almost dangerous to his health to broach the topic in his presence. (57)

The article declared that everything was wrong with the Act and there was no good in it. It then discussed some of the reasons for which a new Act was needed:

Firstly, then, to take our cue from the Premier himself, there is the necessity for such legislation as shall not only prevent persons of any race or description whatsoever, white or coloured, alien or otherwise, from crowding and herding together in our midst in the disgusting, filthy, insanitary and immodest (nay, immoral) way in which it is well known that certain races do crowd to an extent that would not be believed by those who have never witnessed it, but shall render it impossible for new buildings to be erected, or old ones to be altered, adapted, or still used, for any such purpose.

...In the suburbs, where the greed of the landowner alone creates fictitiously in a block of land a value quite disproportionate to that which such a block would possess inherently in the city, the erection of no house should be allowed upon an area insufficient to afford reasonable paddock, yard, or garden space around ...a step which would do something to restrain the rising generation from making the streets their normal playground, to become a forcing-house for larrikins.

...In the city the needless risk of fire and the abominable smoke nuisance should both of them be resolutely tackled, the former by technical provisions perfectly well known to, and understood by, architects, engineers and surveyors, builders, the fire brigades, and the insurance offices; the latter by means of proper fires and chimneys, or, if necessary, smoke-consuming appliances, capable of preventing men from smothering their neighbours and smothering all their property... At the present it is a farce to try and overcome the fire and smoke fiends.

Another most important matter with which a Building Act should deal is the sanitary planning and construction of all buildings. In certain points the Water and Sewerage Board already possess most stringent powers, but in others neither that body, nor the City Council, nor the Improvement Board, nor the Board of Health, nor any other body has any powers whatever... not only should all inhabited houses be subject to periodical sanitary inspection in such a climate as ours, but no new building should be allowed to be tenanted till it has been duly certified to comply with all the sanitary and other provisions of the Act.

complicated questions of "party walls" and "ancient lights", with the necessity of more effectual powers dealing, not only with "ruinous and dangerous" structures, but with the hideous and slovenly abominations, in the way of signs and awnings, which make the "City of the Beautiful Harbour" more like a mammoth rag fair than the metropolis of a great colony. (58)

The 1890s was a time of economic depression after the preceding decades of rapid economic expansion. The slum eradication which had been attempted in Sydney had ultimately achieved little. Many people still lived under oppressive conditions, their houses both overcrowded and insanitary. Particular concern was voiced in the press about the conditions in which some Chinese lived in the Haymarket area. The conditions were often bad, as the 1876 Reports had attested, but they were often bad amongst the poor white working class community too. The Chinese however, were a different race, with unfamiliar habits. Furthermore, in a depression their cheap labour was less welcome in some circles than it would have been in boom times. Europeans, who required higher pay, went without work as a consequence of the cheaper coloured (Chinese and other) labour. The Sunday Times applauded the Premier, Mr. Reid, for promising that in the first session of Parliament in 1896 the Government

proposed to put the coloured workers of the country under proper supervision as to the buildings in which they lived, not as a protection to trade, but as a protection to health and morals. (59)

The Sunday Times saw hope in the proclamation of a Building Act, to achieve not only the control of building, but also to achieve some social and economic objectives, particularly the resolution of the "coloured race problem".

In close connection with the need for a new building Act, and as a simple solution to the alien difficulty... would be the enactment of a law that shall compel every tenement to be well and substantially built, with proper foundations, materials, and workmanship, upon a healthy soil, and with due provision for drainage, sanitary and bath accommodation, light and air, and ventilation. Wherever more than an ordinary family reside together, the Act should require in sleeping apartments a

ventilation. Wherever more than an ordinary family reside together, the Act should require in sleeping apartments a minimum of cubical space for every inmate. In lodging-houses, the requirements of the Act, the number of beds permissible under them, and a certificate of conformity thereto, signed by a properly authorised visiting inspector, should have to be conspicuously affixed in all such rooms; and all infringements of the Act should be severely punished. By such means the solution of the colored labour problem (so far as the coloured aliens already in the colony are concerned) would be, to a large extent, effected without oppressive class or racial discrimination... Where twenty Chinkies now "pig" bestially together, not more than three or four, perhaps, would, under the new regime, be legally entitled to accommodation. Those unable or unwilling to conform to the new legislation would fire themselves out towards the Flowery Land, amidst the hearty blessings of the white man; while those disposed to stay... would have to lead a cleaner, more wholesome, and generally regenerate life, and, being required to pay considerably higher rents or lodging money than they do at present, could no longer work for the starvation wage which so naturally and direfully vexes the soul of our own more steak and sausage loving artisan.

(60)

In an address to the Australasian Association for the Advancement of Science in January 1898, architect G.A. Mansfield said:

The City of Sydney Improvement Act, which came into force in 1876, regulates the construction of buildings in a fairly effective manner; but outside the city boundaries there is, as far as the writer is aware, no control whatever over the construction of the buildings - every man is left to his own devices - and the suburbs abound with illustrations of the necessity for supervision of some kind.

Happily the sanitation of suburban buildings is better provided for.

The Water Sewerage Board has under its control, no less than fifty suburban boroughs, and in all these the same attention is paid to the efficiency of every detail of household fittings as in the city itself.

It is not contended that for all these boroughs there is required a Building Act of the same stringent and comprehensive character as is applicable to a great city; but it will hardly be disputed that the time has arrived when a modified and reasonable control should be vested in the Borough Councils, enabling them to regulate, at least the thickness of the walls, the construction of foundations, the cubic air-space of sleeping rooms, and some of the simpler provisions for preventing the spread of fire.

In the more thickly populated boroughs the necessity for such an act is very urgent. In those more recently brought into existence it would not, however, be expedient to place too much restriction upon the pioneers of the locality, or to hinder the growth of small enterprises. Hence a Suburban Building Act should be so framed as to come into operation in any particular

borough only by proclamation of the Governor in Council.

Much has been written and been said about the necessity for a new Building Act for the city, and it must be admitted that there is great room for improvement.

The lapse of thirty years since the passing of the existing Act should furnish us with a stock of experience as to the additions and amendments required to bring our laws more into harmony with present conditions.

Amongst the questions of primary importance to be considered in the framing of a new Act is that of fire-proof construction more or less complete, closely connected with which is the limitation of the height of buildings, and the number of their storeys.

In legislating on these points, however, much judgment is required, and a calm and dispassionate study of the somewhat conflicting interests which have to be reconciled is indispensable. The view of the expert firemen is, very naturally, a somewhat partial one. He looks at the subject from one point of view only, and his theories, if carried into practice to their full extent, would hamper very seriously the operations of the architect, and place grievous obstacles in the working of the businesses of the merchant and shop-keeper. The costliness of buildings would be greatly increased, and, generally speaking, it is doubtful whether the advantages sought to be obtained would not be too dearly purchased.

It must not be forgotten that high authorities are by no means at one as to the effectiveness of the so-called fire-proof construction of to-day. In the minds and in the writings of those who have given the most earnest consideration to the subject, there is evidently grave doubt as to the possibility of constructing a really fire-proof building. Examples have been frequent of late which prove that buildings which in their construction contain no particle of inflammable matter, and where iron and steel have been protected from the direct action of fire and water, the whole structure has crumbled into dust under the fierce heat generated by the combustion of its contents.

All this leads us to the conclusion that legislators must keep prominently in view the balance which it is imperative to maintain between over much fire-proofing, and our commercial and domestic necessities. (61)

5.10 FURTHER LEGISLATION

In the period from 1879 to 1896 nearly 3,000 buildings had been condemned in the City, and more than 2,000 of them had been demolished. In November 1896 the Public Health Act belatedly granted

buildings unfit for human habitation. (62)

In 1897 the new Municipalities Act repealed the 1867 Municipalities Act, but the municipalities retained the same building regulatory powers which they had under the earlier Act, and which functions were exercised earlier by the Police Magistrates under the 1838 Police (Towns) Act. The Police Offences Act, 1901, consolidated legislation including the 1838 Act, but did not change the law. The Act had fairly universal application throughout New south Wales. The purpose of control remained to prevent encroachment. There was no concern with buildings as such (63). Again, in 1905 the Local Government (Shires) Act followed the Municipalities Act in vesting in councils the power exercised by magistrates under the Police Offences Act, 1901.

5.11 PLAGUE

In the first seven months of 1900, 303 citizens contracted bubonic plague, and 103 of them died (64). J. Ashburton Thompson, Chief Medical Officer of the Government, wrote

the house to house inspection showed that the Board (of Health) had fallen into a deplorable State from long continued omission of the local authority to execute the ample powers to preserve the public health...under its own Act of Incorporation, 1879 and under the Public Health Act, 1896. The result of this maladministration - now for the first time revealed to the general public, though well enough known in several quarters - was that, though there are good laws, there is an executive authority over a part of it which is at once uninstructed, indifferent, unguided by the routine of an efficient organization, and ungoverned by strict principles of action. (65)

The State Government intervened and resumed a large tract of land comprising the Rocks through to Darling Harbour west of Sussex Street. In 1901 Parliament established the Sydney Harbour Trust, responsible for the Port of Sydney, including residential, dock and warehouse

for the Port of Sydney, including residential, dock and warehouse facilities. It was estimated that 35 percent of harbourside housing was so dilapidated and insanitary that it was impossible to render it habitable. (66)

5.12 THE ANTHONY HORDEN FIRE

At 8.15am on July 10, 1901, a fire started in the basement of the central building of Anthony Horden and Sons' Palace Emporium, with 300 to 400 employees in various parts of the store. The Emporium was comprised of three buildings, separated by a lane and a street, in the block bounded by George, Pitt and Gripps and Hay streets. The Sydney Morning Herald of the following day described the progress of the fire thus:

The fire flew through the upper part of the structure, which was of four stories, separated on each side by lanes from the massive premises belonging to the firm at the corners of Pitt and George Streets. Leaping across these lanes the conflagration attacked the other buildings mentioned almost simultaneously, getting into the Pitt-Street corner block at about the third storey from the ground. This immense place was quadrangular, and seven stories high, being surmounted by a conspicuous square tower. Once the fire had got a hold of the third storey it spread so rapidly and filled the place with such volumes of smoke that the employees there decided on immediate flight. Those on the lower three storeys had a good chance of getting away, but the men on the four higher floors had the utmost difficulty in descending, being desparately scorched and almost overpowered with the smoke...

At 9 o'clock, when the fire had been raging over an hour, the scene from the slope of George Street, coming down from the Town Hall toward the Haymarket, was one of awe-inspiring magnificence. The burning buildings seemed like an extended array of vast kilns displaying red, incandescent and varied hues of flame in all their proportions, capped with volcanic fire. to the right of the prospect was the six-storied buiding on the firm's George-Street frontage, about 40ft from the Gipps-street corner. This was brilliantly alight from the first floor to the parapet. There was a blaze coming out of every one of the 26 windows facing the street, as well as through the roof. All the floors seemed to have fallen in and the interior looked like a white-hot furnace... visible above all the body of the spectacle was the flaming seven-storied Pitt-street corner block, which was alight all over, and the tower of which seemed to be forming

a great flue, attracted the fire to a culminating point and gave a final vent to it heavenwards. (67)

Five people died in the fire, and a sixth in the demolition of the building that followed. Four of the men it appeared had died from smoke inhalation and asphyxiation, but it was the death of the fifth man, Harry Clegg, which captured the imagination of the public and which gave some impetus to the idea of providing means of egress from buildings. Clegg, an upholsterer aged 22, was an employee of the company, and was working on the eighth floor of the building. Finding the floors below him enveloped in flame, he climbed onto the roof parapet facing the street, and waved and shouted at the crowd. The firemen erected their escape ladder, which reached only 82 feet, while Clegg was about 120 feet above the street. After fifteen minutes of clinging to the parapet, enveloped in smoke, the flames billowing up from below, he stood and leapt to his death on the pavement below.

There was a public outcry for provision of means of escape from such buildings. Correspondents recommended such methods as requiring buildings to have balconies with ladders or ropes, that fire stations be equipped with rocket and line apparatus and parachutes to throw to the top of high buildings; the provision of knotted ropes on each floor of a building; the provision of iron escapes. (68)

Superintendent Webb, of the Metropolitan Fire Brigade, seized the opportunity to reinforce points of fire safety that the Board had been promoting for years, in pressing for revised legislation for the control of the construction of large buildings.

"We have repeatedly told people who build these high buildings", said Mr. Webb, "that they must provide precautions themselves. We have advocated that no building should be erected higher than 90ft from the street level, because it is recognised by all authorities that 90ft is the highest practicable height at which a brigade can fight a fire. The people who erect these higher buildings, and those who insure them, must take the risk. There

is a limit to the possibilities of firemanship. We can throw a jet of water over the Town Hall in calm weather, but we could not do it with the breeze this morning. In London the 90ft limit is urged and recognised". (69)

Evidence was given before the coroner's inquest into the death of Harry Clegg that there were 1200 persons employed in the building.

Sometimes, including customers, there would be 3000 or 4000 persons in the buildings. There were no special appliances for escape in the case of fire. Iron shutters had been provided to stop the spread of fire, and the lifts were specially constructed. There was a hydrant on every floor, except the basement, where the fire broke out... In all the departments there were buckets of water to be used in case of an outbreak. (70)

In response to the jury's verdict (which recommended better provision of facilities for egress and the training of staff in the use of fire-fighting appliances), Chief Officer Stein of the Metropolitan Fire Brigade agreed with their findings, but argued for many more precautions, including an 85 foot height limitation, and external staircases accessible at each floor. If there was fear of burglars, the stairs could stop 40 feet above the ground, from which a person could jump into a tarpaulin or descend by the Brigade's escape ladder. He also suggested

that the Board of Health should have power to refer the plans of proposed buildings to an expert committee, consisting of representatives of the Fire Brigade, municipalities, and the Health Board, so that the requirements of health, fire prevention and extinction, and the Building Act may all receive attention, or the Fire Brigades Board should have the power given direct to them to exercise, not only in respect of places of amusement but also in connection with all buildings. (71)

Editorial comment in the Sydney Morning Herald promoted the need for a modernised Building Act, both in respect of city sanitation and in respect of the confinement of fires to the areas in which they originated, the accessibility of buildings to firefighters, and the provision of facilities for escape. It made reference to a report issued by the City Surveyor:

construction in regard to theatres and public buildings, with which may be bracketed hotels, stores and large commercial and industrial establishments. The municipal authorities complain that whenever they desire to take action in regard to such matters they find themselves hampered by the existence of a divided authority. The Government is authorised to issue theatre licenses, for instance, without reference to the City Council. (72)

On the same day a deputation from the Master Builders Association of New South Wales met with the mayor, Sir James Graham, to promote the need for a better Building Act, in the framing of which they wished to participate. They argued that

The need of a Building Act was a very urgent one. Such a measure had been prepared year after year, but went no further, and whenever a calamity occurred there was a great outcry on the subject. The deputation looked to the first Mayor of the reformed Council to bring about a better condition of things. They knew that the Mayor was desirous of doing so, but that he was hampered by politicians who seemed to have the idea of restricting the local government. (73)

The Mayor, in response, held little hope of a new Building Act being passed by Parliament, given their reluctance to extend the powers of local government:

Cities of the old world had been transformed and the rate of accident reduced to a very small percentage by the competence of local governing bodies, but here it seemed to him that their Parliament needed waking up to the value of such works. So far as he could see there was very little likelihood of Parliament taking the matter up. (74)

The City Building Surveyor, R.H. Brodrick, presented a further report to the City Council. He argued that for reasons of health, the risk to life from fire, and other causes, the current Act was inadequate and its scope far too limited for the needs of the time. Both he and his predecessor had since 1891 repeatedly recommended the preparation of a new Act. Furthermore,

to make a building enactment completely satisfactory, it was absolutely necessary to include within its scope all matters appertaining to buildings of every class, instead of, as at present, many different Acts covering various details, and consequently conducing to friction and misunderstanding by

present, many different Acts covering various details, and consequently conducing to friction and misunderstanding by authority being divided among so many departments to control. To make any Building Act thoroughly comprehensive in character it was highly desirable to include and consolidate many provisions which were now contained in the Factories Act, Regulating Places of Public Amusements and Public Health Acts, which in many cases overlapped each other. Among the most important subjects to be dealt with would be the constitution of a satisfactory appeal court... to deal with all phases of building construction, both as regarded stability and sanitation... ample power should be given to the appeal board to frame and enact bylaws from time to time... He suggested several important matters... none of which were provided for in the present Improvement Act. These included the granting of power to the City Council to resume slum areas, to enable vigorous precautions being exercised with regard to the erection of dwellings upon sites that were a distinct menace to the health of the occupants, the deposition of copies of plans of proposed new buildings, or of alterations to proposed new buildings. Under a new Act the City Council should have sole power to issue licences for theatres and other places of public amusement or worship, and large residential establishments. The new Act should provide regulations for due notice of intention to alter premises, so that a special survey might be made as to strength of materials, capability of resisting fire, etc. Provision should be made for regulating the requisite accommodation, escapes, ventilation, and light and construction of tenements and dwellings of certain heights, with due regard to the health and safety of their occupants. Yard space for dwellings should cover an area of at least 200 square feet, exclusive of any outbuildings, such yards to be paved with approved materials, and graded with falls to gully connected to sewer. All staircases in factories, warehouses, and business premises should be constructed entirely of incombustible materials and in their descent should approach direct exits to thoroughfares. In all cases where direct exits were obtainable to public streets, lanes, or right-of-way, at rear or sides of these buildings, back from alignments, an iron stairway should be constructed as an escape, leading from the topmost storey to within 20ft of ground level, and reached from a doorway on each floor by means of a fireproof platform or landing such doorways to have fireproof doors opening outwards and which should be left unlocked and easily accessible during business hours. In cases where such exits were not obtainable or where such would only lead to a confined area or firetrap, open projecting balconies should be permitted to be constructed of incombustible materials at each floor level, access to them being obtained from door or window openings contiguous thereto; such balconies to be connected to each other by wrought-iron stairways to a level from which a comparatively easy descent, might be made to the thoroughfare in case of fire out-break. Gangways from floor to floor in bulk stores, etc., should be sheathed with fire-resisting material, if they are constructed of timber. The front, rear, and side walls of these buildings, where deemed necessary, should be properly bonded together, and anchored to each other at specified intervals with wrought-iron tie anchors at least 3in. in width, and three-eighths of an inch in thickness, and of specified lengths. (75)

continued. However, it was not to be until 1912 that the first controls on tall buildings were introduced, and not until 1934 that the Improvement Act of 1879 was to be repealed.

In 1902, J.L. Mullins published a booklet in Sydney entitled How to frame a model building act, in which he condemned the Improvement Act as inadequate, poorly framed and outmoded. He proposed as a basis for a new Act the London Building Act of 1894, together with the New York Act of 1885. The London Act included provisions for the regulation of light, ventilation, height of buildings, construction and ceiling heights. The New York Act included provisions regulating a number of additional matters: excavations and foundations; the inspection and testing of structural members; material standards and composition (e.g. for bricks, mortar); the fireproofing of floors and stairs; the provision of a fire isolated passage connecting egress stairs to the street; means of egress, and the provision of signs forbidding the obstruction of means of egress; means of egress from public buildings; matters related to theatres; hoists and lifts.

Following a fire which destroyed Her Majesty's Theatre in 1902, and the 1903 Iroquois Theatre fire in Chicago in which 600 people died, the Government established a Sub-Committee in January 1904 to investigate theatre safety.

A Royal Commission into Theatres, Public Halls, and Other Places of Public Amusements or Concourse had sat some twenty years earlier, delivering progress reports in May and August 1882, and the final report in 1886. (76) The report urged immediate action to improve public safety. Recommendations included the submission of plans showing exit doors, stairs and fire plugs (hydrants); the protection of gas lights with fire guards; making fire buckets available;

providing hoses and water tanks; controlling the width of gangways; providing handrails on stairs; and the appointment of an Inspector of Theatres. Consolidating legislation was eventually gazetted in 1897 (77). It provided for the appointment of an Inspector of Theatres, but did not regulate matters of building construction.

The Sub-Committee established in January 1904 presented its report on 8 November 1905, which report was in due course to find fruition in the Theatres and Public Halls Act of 1908. Under that Act Regulations were published to control many aspects of public safety in theatres.

As this discourse is concerned with the mainstream of building regulations, the development of regulations specifically affecting theatres and public halls will not be further canvassed here.

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3. Ibid.
4. Sydney Morning Herald quoted in The Builder, 29 March, 1879, p.352.
5. Source: NSW Statistical Register and Census data, quoted in (ed.) Max Kelly, Nineteenth Century Sydney, p.68.
6. Op. Cit., pp. 69-72.
7. S.H. Fisher, An accumulation of misery? in Labour History, No.40, May 1981, pp 25-26.
8. T.A. Coghlan, The Wealth and Progress of New South Wales, 1886-87, Sydney, 1887, p.177.
9. A.J.C. Mayne, City back-slums in the land of promise: some aspects of the 1876 report on overcrowding in Sydney, in Labour History, No. 38, May 1980, p.27.
10. A.J.C. Mayne, Fever, squalor and vice, St. Lucia, 1982, p.146.
11. Op. cit p.147.
12. Ibid.
13. A.J.C. Mayne, City back-slums, pp 29-30.
14. Fisher, op. cit. p.22.
15. Ibid.
16. Op. cit. pp 24, 25.
17. NSW Legislative Assembly Votes and Papers, 1875-6, Vol.5, p.540.
18. Water Pollution Prevention Act, 39 Vic. No. 7; Nuisances Prevention Act, 39 Vic No. 14; and Sydney Improvement Act, 42 Vic. No. 25.
19. Metropolitan Building Act of 1855, 18 and 19 Vic. Cap.122
20. Metropolis Management Act Amendment Act 41st and 42nd Vic. cap.32.
21. Melbourne Building Act, 13 Vic. No. 39.
22. NSW Legislative Assembly Votes and Papers, 1878-9, Minutes of evidence taken before the Select Committee on the City of Sydney Improvement Bill p.179.
23. Op. cit. p.210.
24. Op. cit. p.212.
25. Op. cit. p.211.
26. Op. cit. p.188-189.
27. Op. cit. p.193.
28. Op. cit. p.205.
29. Op. cit. p.189.
30. Op. cit. p.198.
31. Ibid.
32. Op. cit. p.191.
33. Ibid.
34. Op. cit. p.207-208.
36. Op. cit. p.201.
36. Op. cit. p.192.
37. Op. cit. p.206.
38. 42 Vic. No. 25.
39. 17 Vic. No. 34; 17 Vic. No. 35; 36 Vic. No. 22; 40 Vic. No. 13.
40. 30 Vic. No. 14.
41. 5 Will.IV, No. 20; 6 Will.IV, No. 9.
42. A.J.C. Mayne, Fever, squalor and vice, p.173.
43. Op. cit. p.174.
44. Op. cit. p.175.
45. Op. cit. p.179.
46. Op. cit. p.180.
47. Op. cit. p.181.
48. Op. cit. p.179.
49. Sydney Morning Herald 26 November 1887, p.13.

50. A.J.C. Mayne, Fever, squalor and vice, p.202.
51. Ibid.
52. Metropolitan Fire Board Annual Report, 1884.
53. J. Sulman, The fireproofing of city buildings, p.5.
54. Sydney Morning Herald, 4 October 1890, p.9.
55. Ibid.
56. Op. cit., 29 October 1890, p.3.
57. Sunday Times, 1 March, 1896, p.4.
58. Ibid.
59. Ibid.
60. Ibid.
61. Australasian Association for the Advancement of Science. Report of the seventh meeting, Sydney, 1898, pp.1005-1008. Mansfield, G.A., A review of some of the conditions of building construction and requirements of Sydney, past and present.
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63. M. Wilcox, The law of land development, p.422.
64. M. Kelly, op. cit. p.78.
65. NSW Legislative Assembly Votes and Papers, 1900, Vol.2, p.1252.
66. Kelly, op. cit. p.79.
67. Sydney Morning Herald, July 11, 1901, p.5.
68. Ibid, July 16, 1901, p.8.
69. Ibid, July 11, 1901, p.6.
70. Ibid, July 26, 1901, p.4.
71. Ibid, July 27, 1901, p.11.
72. Ibid, July 26, 1901, p.4.
73. Ibid, July 27, 1901, p.5.
74. Ibid.
75. Ibid, August 7, 1901, p.4.
76. NSW Parliamentary Papers 1887, Vol. 1, pp.149-201.
77. The first legislation affecting places of public assembly was 9 Geo. 4, No. 14, An Act for regulating places of public exhibition and entertainment, gazetted in 1828. An amending Act, 14 Vic., No. 23, was assented to on October 1, 1850. A further amending Act, 36 Vic. No. 8, was gazetted on February 26, 1873. On December 6, 1897, An Act to consolidate the Acts for regulating places of Public Exhibition and Entertainment (Act No. 26, 1897), was gazetted.

1906-1919

6.1 THE LOCAL GOVERNMENT ACT 1906

The Local Government Act 1906 represented the first significant extension to local government bodies of the possibility of acquiring powers to control building. The Act (1) continued to vest in councils the powers exercised by magistrates under the Police Offences Act, 1901, just as the Local Government (Shires) Act, 1905 had done, and before it the Municipalities Act, 1897. Such powers, to make by-laws to control fires, nuisances and public health, had only incidental effect upon buildings.

The 1906 Act went beyond such matters and provided that certain powers (2) could be conferred on a Council by the Governor after a resolution of Council, a petition of rate-payers and approval at a poll. Amongst the range of powers possible to be acquired were the following:

(para. xxxv) The regulation of buildings, balconies, verandahs or other structures abutting on or extending over any public place, and the removal thereof.

(para. xliii) The regulation of the erection of buildings as to height, design, structure, materials, building line, sanitation, the proportion of any lot which may be occupied by the building or buildings to be erected thereon; and the subdivision of land for building purposes so as to secure due ways of access to the rear as well as to the front of buildings erected, or to be erected, thereon. (3)

These powers were widely acquired by Councils, Randwick being the first to do so. For the first time outside the City of Sydney there was opportunity for building and subdivision to be controlled. At last

Councils could set standards for building, and could prevent the erection of unsuitable structures. The Governor was empowered to make ordinances dealing with such matters (4). There was no provision for appeal against the exercise of such power.

6.2 FIRE

Fire continued to be a matter of concern to the public to the end of the first decade of the century and beyond. The journal of the Master Builders Association, Building, while deploring the apathy of the local authorities in failing to legislate for fire safety in buildings, applauded the precautions being taken by many architects and builders.

It is a pleasing sign of the times for even a casual observer to be able to notice greater precautions being taken by architects and builders in the construction of buildings so as to attain a measure of immunity from fire. There are many who assert that it should be a matter of compulsion for precautions to be taken, and, no doubt, building and other regulations in this respect are urgently needed. These, however, having been so long delayed that the practical man is concerned most with what is actually being done in the meantime by those in whose hands such matters lie.

That large additional sums have been expended on buildings in recent years is quite evident, and every credit is due to those who display such excellent traits of good citizenship in securing for those who reside or work in the premises erected by them the greatest possible protection from the dread scourge of fire.

The San Francisco conflagration has, no doubt, been a powerful factor recently in drawing attention to this matter, and one would think that the powers that be, knowing the exceedingly dangerous character of parts of Sydney, would at last have been spurred to action by that calamity.

It would be well for those interested either in the ownership, erection, or maintenance of premises to realise the responsibility that devolves upon them to provide for the reasonable safety of buildings accessible to the public or used as factories, etc.

Much can now be done to that effect, even though a building may not be structurally perfect. The presence of iron doors and shutters, water sprinklers, fire escapes, efficient fire

extinguishing apparatus, chemical extinguishers, etc., in buildings, are all evidences that those in control have done their duty in the matter, and the public will certainly observe and appreciate what is so important to their safety. (5)

On March 11, 1908, Parliament appointed a Select Committee "to inquire as to the dangers to which Sydney and its suburbs are liable from fire, and as to what means of control or prevention would be practicable for the future". On the basis of evidence presented to the Committee, Building published a series of four articles (6) from May to August, 1908, portraying a scenario in which vast areas of the City of Sydney were destroyed by a great conflagration. The object of the articles was to draw attention to the many areas of building and other practice (e.g. the storage of flammable goods) which were inadequately regulated and hence presented very real fire risks to the city. Building commended the Committee for its work and looked forward eagerly to the improved legislation which it expected would be enacted in response to the Committee's report.

The Committee heard extensive evidence from a total of thirty four witnesses, including such people as W. L. Vernon, Government Architect; George McRae, Principal Assistant Architect, Department of Public Works, and formerly City Building Surveyor and City Architect for twelve years; R. H. Brodrick, City Building Surveyor; Cyril Blacket, Architect; E. A. Scott, President of the Institute of Architects; Alfred Webb, Superintendent of Fire Brigades for the Metropolitan District of Sydney; J. D. Wormald of Wormald Bros.; R.C. Dixon of May-Oatway Fire Alarms; and Dr. Otto Wunderlich, manufacturer of pressed metal ceilings and sprinkler systems.

The Committee was strongly of the opinion

that the safety of the metropolis will be better conserved by the strict regulation of the structure of buildings; the division of the existing large city blocks into smaller danger

areas by the erection of "fire-walls;" the enactment of rigid rules controlling the storage of dangerous merchandise; the governing the installation of electricity for all purposes; the more general adoption of automatic sprinklers and fire-alarms; and the exercise of that precaution and vigilance which is the personal duty of every citizen. (7)

The Committee's report argued the following points. The close proximity of very large tall buildings erected in narrow streets, with numerous openings in the walls, was considered perilous. The possibility of devastating fires was increased by the large area of many city blocks. The absence of enclosed lift shafts and stairs enabled more rapid spread of fire. There was the possibility of a great conflagration at any time, which would destroy both property and human life. The existing firefighting facilities would be inadequate to control it. The absence of any law controlling the transport, storage and sale of mineral spirits and other flammable materials was a source of great danger. Defective electrical installations by inexperienced contractors presented a further danger. This was due to

the absence of any power to insure the possession of the necessary knowledge by the men engaged in such business. No inspections are made, by any competent authority, except in insured premises, to insure a safe standard of quality of the material used and the possession of the necessary skill by the workmen employed. (8)

With regard to building regulations the Committee made the following recommendations:

To neutralise as far as practicable the spread of large fires as a consequence of the narrow thoroughfares in Sydney, strict regulations should be laid down as to the character of buildings to be erected, and as to alterations of those already in existence. The latter is especially important when a structure originally intended for one purpose is made use of for another of a different character. In all, except possibly the widest thoroughfares, the openings in all buildings facing each other should be provided with some fire-resisting means of closing them when fire breaks out. It is desirable that if carelessly left open, the heat created should shut them automatically.

Strict regulations should be in force as to the fire safety of all roofs in the city, and no combustible structures should be permitted on them. Nor should any material likely to be set on

fire by wind-carried embers be allowed to remain on them even for the shortest period.

Ground space is so limited in a large city, that although it is extremely desirable to limit the height of buildings to at most the range of the water power used for fire extinction, it would perhaps not be advantageous to make a rigid rule by legislation. Each building, application for the erection of which should have to be made, must be considered on its merits, and dealt with accordingly, consideration being given to the breadth of the street, the height above sea-level, &c. To make this practicable it will be necessary to create some power, which, having the aid of persons with expert knowledge, could come to a decision conserving the safety of the public without unduly interfering with private interests.

The danger, consequent on the large size of the city blocks, would be greatly lessened were they divided by fire walls, erected at such distances as would reduce each danger zone to dimensions more capable of having an outbreak confined to a more controllable area.

The ordinances of American cities classify all buildings according to their height, size, and proposed uses, into types designated "fireproof," "slow-burning," and "ordinary," the construction and material being strictly defined for each. Buildings over 100 feet in height must be of the fire-proof class. Those under 100 feet, but more than 60 feet, must be of the slow-burning kind. Buildings not exceeding four storeys, and 60 feet in height, may be the ordinary type. Special rules are insisted on in hospitals, hotels and boarding-houses, as to internal fire-proof dividing walls, partitions, and stairs, according to floor space.

With the object of reducing the risks from fire now always present from the existence of the dangers set forth, your committee points out the necessity of such legislation on the above lines as will remove or lessen them. (9)

Further recommendations were made with regard to fire safety in theatres and halls. The fire isolation of stages from auditoria was recommended. This was to be achieved by a fire rated wall separating the two, the proscenium to be protected by a fireproof curtain. An independent exit lighting system was considered desirable. A fire extinction system together with portable chemical extinguishers were recommended. Strict licensing and constant inspection were considered essential.

Recommendations were also made regarding hotels and boarding-houses, factories and warehouses, and schools. These primarily concerned the

need to provide adequate means of escape.

The Committee also recommended that workmen carrying out electrical installations be required to first pass an examination, and that inspections be made during the progress of the work, upon completion, and in use. The Fire Underwriters' Association was the only body at the time making any inspection of electrical work, and this only with regard to insured property.

The application of fire alarms, automatic sprinkler systems, drenchers and hydrants was reviewed by the Committee and all were recommended for use.

The Report of the Select Committee was laid on the table of the Legislative Council on December 15, 1908. On December 1, 1909, assent was given to An Act to consolidate the law relating to the prevention and extinguishing of fires, to constitute a Fire Brigades Board, and for certain related purposes (10). However, the Act had no bearing upon fire safety or protection in building construction. Such legislation was not to be introduced until some years later.

6.3 THE NEED FOR A BUILDING ACT

Architects, engineers, builders, the Fire Brigade, the City Council, the press and even a Royal Commission all continued to promote the need for a new Building Act for Sydney. The City Council prepared a draft Bill which in 1907 it placed before the Institute of Architects and the Master Builders' Association for comment, prior to submitting it to Parliament. Art and architecture, the journal of the Institute of Architects, commented in June 1907,

It is to be regretted that the Bill itself should be based upon such an obsolete model as the London Building Act of 1894, which was faulty and inadequate from its very inception, and which those whom it most immediately concerned have been striving to amend for ten years and more. The last Paris Act, or the still more recent one of New York, would have furnished the latest and most approved type of building legislation, but it is understood that they were not available when the Sydney Bill was drafted. It is not yet too late, however, to revise the local measure in the light of modern French and American experience. The delay of a few months can make little or no difference to a people who have waited patiently during twenty years, and the ultimate gain might be incalculable. (11)

In June 1908, Building commented on certain aspects of the Council's Bill:

Of the Sydney Regulations submitted by the City Council, we note the following interesting items:-

A building (not being a church or chapel) shall not be erected of or be subsequently increased to a greater degree than 100 feet exclusive of one storey in roof.

No existing building on a street of less width than 40 feet shall be raised, or new building erected of greater height than the distance from the front of such building from the opposite side of street.

Where a new building is erected adjoining an existing building the owner of the new building shall at his own expense raise the chimneys (if any) of the adjoining building in brick or stonework, to the full height of the new building.

If a mansard roof or any other roof having a pitch of over 60 degrees be placed on any building except a wooden building or a dwelling-house not exceeding thirty-five feet in height, it shall be constructed of iron or steel rafters, and lathed with iron on the outside and plastered or filled in with fire-resisting material and covered with metal, slate, or tile.

Every flat gutter and roof of every building, and of any projection therefrom and of every covered verandah, awning, portico, balcony, or passage, and every turret, dormer lantern light or other erection, etc. . . . shall be covered with glass, iron, copper, lead, tin, zinc, or other metal, slate, tile or artificial stone or cement.

No rooms to be under nine feet high, except the sloping part, which shall begin at no less height than four feet from the floor.

All constructional ironwork in theatres shall be embedded in fire-resisting materials.

The Sydney Regulations, however, are somewhat restricted, particularly regarding thicknesses of walls, no special consideration being given to the saving of wall thickness that

is possible with reinforced concrete curtain walls.

The fire-resisting materials are also rather restricted, as in the case of a theatre proscenium, all decorations thereon must be of fire-resisting materials, which do not appear to include plaster. (12)

Had the proposed regulations been made law, the limiting of building height to the width of the street faced would have had significant consequences for the Sydney townscape. Building construction however would have changed little, inasmuch as both the existing and the proposed regulations required concrete walls to be of the same thickness as load-bearing brick walls. The proposed regulations, despite much discussion, were never to become law.

In 1908 John Sulman again wrote of the need to build city buildings with proper provision for the prevention of fires. He noted that since the publication of his paper The fireproofing of city buildings in 1888,

most of the more important structures have been built in an improved manner. The introduction of fire mains, sprinklers, and drenchers, have also helped to reduce the risk; but on the other hand, as waste spaces are filled up and higher buildings erected, the means of easily getting at a fire are becoming more and more curtailed. Firebreaks or firewalls, solid from top to bottom, have been suggested and are useful in their way, but they do not afford better access. To secure this it is necessary that all valuable and congested blocks should be subdivided by lanes at least twenty feet wide, into sections of limited area. They need not be opened for ordinary cart traffic, but would suffice for a fire engine on occasion. Further they would afford additional frontages, and give increased light and air, but the windows opening thereon should, of course, be protected by fireproof shutters or drenchers, or both combined. Then, if a big fire did occur, it could be got at from all sides, and attacked with confidence that it could be confined to the block in which it started. The time has, I think, already arrived when it might be compulsory for all new buildings within the most congested area of the City, to be provided with fire resisting floors and roofs, the latter preferably being flat. With these precautions, and an adequate water supply, we might safely leave the rest to the vigilance of our excellent Fire Brigade.

From fire prevention to the need of a New Building Act is an easy step, and it is one that is admitted on all hands as

absolutely necessary. The existing Act was framed 34 years ago, and is quite out of date. Instead of being a safeguard, it is a bar to progress, and needs root and branch revision. The City Council, the Institute of Architects, and the Builders' Association have all taken a hand in dealing with the matter, but it is still unsettled. Some outside force seems necessary to make it a question of practical politics, that must be decided and decided quickly. (13)

In 1908-1909 a Royal Commission for the Improvement of the City of Sydney and its Suburbs sat over a period of twelve months. Its report covered a broad spectrum of recommendations for town planning reform and the re-organisation of transportation in the city. It also promoted as "an immediate necessity" the institution of a comprehensive Building Act for the whole of the metropolitan area.

Without such a measure little real progress can be made in city improvement. A draft Bill prepared by the City council, in consultation with the Institute of Architects and the Master Builders' Association, is already in the hands of the Government, and we recommend its adoption with certain additions which we shall set out later. This Bill is designed "to make further and better provision for the construction and alteration of buildings, and for the safety and health of the inhabitants within the City of Sydney, and to amend the City of Sydney Improvement Act."

The following is a synopsis of its main features:-

- The substitution of a court of appeal, viz., Court of Quarter Sessions, in lieu of the late Improvement Board.
- Permission to obtain copies of plans submitted for approval, for registration and record purposes in the Town Hall.
- The alteration of hours of inspection to permit of more thorough survey of premises.
- The extension of the clause dealing with buildings of an inflammable nature to protect the neighbourhood as well as the tenants.
- Stricter regulations dealing with the conversion of buildings of one class into those of another.
- The compulsory enclosure of all vacant lands.
- The compulsory closing of all fire doors and shutters after business hours.
- Authority to take action in cases of dilapidated buildings unfit for occupation or use.
- Regulation and limit of the height of buildings generally - Maximum height, 150 feet.

Power is given the Council to make by-laws relating to the following matters:-

- The licensing, regulation, control, and good government of theatres, &c.

- The stacking of timber and other inflammable materials within the city.
- Compulsory construction of fire-escapes on buildings of three storeys or more in height.
- The regulation and control of sky signs or buildings.
- The regulation of construction and repairs to buildings.
- The regulation of construction of floors of shops and stores.
- The repair of all sky-lights and roof-lights, old and new, within the city.
- The proper construction of dwelling-houses, &c., where built in conjunction with stabling, &c.
- The construction and closing of fire shutters, &c.
- The use of old materials in construction of new buildings.
- The construction of buildings of iron, steel, or reinforced concrete, &c.
- The thickness of walls in which cement mortar is used wholly.

The schedules referred to in the Bill cover numerous items, including the fire-proofing of public buildings; drainage; rules concerning walls of all kinds, footings, recesses, girders, parapets, part-arches, projections from buildings, verandahs, porticoes, &c.; rules concerning chimneys, smoke-pipes, furnace chimney stacks; mansard roofs, roof coverings generally, and rain-water pipes, basements, and floors of same.

With regard to dwelling-houses, the rules provide for:-

- Permanent ventilation of rooms; a minimum yard space of 200 square feet.
- Habitable rooms over stables, &c., to have solidly-constructed floors.
- A bathroom for every house.
- All laundries to have solid floors.
- All yards to be paved, graded and drained.
- Composite buildings to be so constructed as to ensure the safety of occupants thereof, whether in the dwelling or warehouse portion.
- The enclosure of elevators and hoists with fire-resisting materials.

Your Commissioners are of opinion that the Municipal Authorities should have power under a Building Act to make regulations with a view to securing unity of purpose and harmony of design in street architecture. This does not imply that there should be any monotony in the style of buildings; subject to the symmetrical appearance of a street, the individuality of architectural design should not be restricted. It is certainly desirable that some uniform standard of awning should be adopted, as the irregularities of these structures disfigure our streets.

A necessary building regulation is that no sleeping room in a dwelling-house should be erected with less than 1,000 cubic feet of air space. (14)

The Commissioners also commended to the parliament the recommendations

of the Select Committee on the prevention of fire in Sydney and suburbs, relating to building laws. They further recommend the installation of a high pressure fire mains system throughout the city.

In April 1912 the Sydney Morning Herald complained that, with regard to the municipalities,

the failure to regulate properly the rapidly-increasing business of the house and land speculator has resulted in the creation of prospective slum centres. One of the main reasons for this regrettable condition of things is the absence of the power to declare a minimum area upon which dwellings can be erected.... It appears, whilst a local authority may secure the carrying out of a system that is designed to protect the public from the menace of insanitary and unsuitable buildings, it cannot touch the question of the size of the piece of land upon which such building must be placed. The limits of its authority, so far as land is concerned, end with the exterior face of the building, whose plans it has accepted. There are, of course, hundreds of houses coterminous with the land upon which they are erected, so far as their width is concerned. Such is always the case with terraces, which, in the opinion of most people, are an invention of the evil one - a device for depriving dwelling rooms of sunlight and air, the first requisites of a healthy habitation. The narrow terrace house, with its strip of yard at the back, is at once a menace and even an eyesore, and there is at least an improvement attempted in the newer suburbs to secure an air-circulating space round each house, however small.

What is needed is a properly-considered and carefully-drafted Building Act, giving power to each municipality to declare the minimum amount of ground allowable to each dwelling. There is such an Act in Queensland, and it has militated against the abuse of opportunity by unscrupulous and speculative builders.
(15)

The Sydney Morning Herald continued to promote the arguments of architects, local government authorities and the City Council. It complained of the effects which the requirements of the anachronistic 1879 Act were having upon building. In particular, advances in building technology which were being used throughout the world could not be used in Sydney because of the requirements of the Act regarding wall thicknesses. In October 1913 the Sydney Morning Herald wrote:

The need of an up-to-date Building Act in Sydney is becoming more and more evident to those who are responsible for the building of Sydney. Many attempts have been made to get the

Governments of the day to place such a measure upon the Statute Book. Conferences of architects and representatives of the municipalities and other authorities have met and framed a suitable measure, but so far their labours have been fruitless, as no Government has yet brought such a proposal before Parliament with the intention of carrying it into law, and hence building operations in Sydney drag along in the same way as they did years ago. One of the results is that the use of steel for construction work, which is recognised the world over, cannot be applied to any extent in Sydney because of the obsolete Building Act which governs and enforces the erection of heavy brick outside walls. Alderman McElhone, vice-chairman of the works committee of the City Council, remarked recently that the day was not far distant when most of the city buildings would be constructed of steel and reinforced concrete. The saving of space, especially where the land built upon was in the centre of the city, was a great factor in bringing about such a change. Surely, with all that has been said on this subject, an Act could be introduced that would bring about the changes that are called for on all sides. (16)

In January 1914, the Sydney Morning Herald wrote that it was likely a new Building Act would soon be introduced.

Everything points to the probability that Sydney will shortly be brought into line with the world's great cities by the provision of a modern Building Act.

It is no secret that the Premier has been conferring with the Lord Mayor of Sydney in reference to this long overdue legislation. A bill was actually drawn up and approved in 1908 by the City Council, and the Institute of Architects, but was dropped without further progress being made with it. Last night the City Council resolved to press upon the Premier that this bill should be gone on with.

The Lord Mayor stated to a representative of the "Herald," that the bill, which would probably be suggested, would not be a mere replica of the six-year-old proposal. The science of building has developed whole new departments since 1908; any bill which the council is likely to recommend will go considerably beyond the proposals of six years ago. The Lord Mayor stated yesterday that the question of the storage of explosives in the city would certainly be dealt with, and that the building codes of London and New York - the two great examples for other cities in this respect - would be thoroughly studied in drawing up suggestions for the Sydney Act.

The Building Act of New York deals with matters which were not even contemplated in the little draft Act of 1908 - much less in the antiquated Act of 1879, which is all that Sydney possesses in the way of a Building Act. The laws of New South Wales ignore the existence of modern steel construction altogether. Reinforced concrete is more than a generation too modern for them.

The most complete building code in the world is that of New York. It contains about 90 large pages of closely printed matter...

New York law is exceedingly carefully and cautiously drawn. It even goes into the strength and quality of the materials permitted to be used. The London Building Act does not do this; but the New York Act prescribes that bricks must be "good, hard, and well burnt". Sand for mortar must be "clean, sharp, grit sand, free from loam or dirt," and not finer than certain standard samples. Structural steel "shall have an ultimate tensile strength of from 54,000lb to 64,000lb per square inch," and so forth. (17)

The article went on to discuss in some detail the standard of construction in New York, which required "precautions against fire which are not dreamed of in Sydney". The requirements of legislation in New York and London for hotels and theatres were also discussed, the standards established being much more stringent than those in Sydney.

The problem in Sydney was that the legislation governing building was anachronistic. It had been drafted at a time when building requirements were much simpler, buildings smaller and the city less densely developed. The new technologies of steel and reinforced concrete construction were little known in the Sydney of 1879. Other technologies, in areas such as lifts and fire protection systems, had developed significantly since 1879, as the demand grew for taller buildings at the urban heart of cities. This demand arose because the increasing cost of land for building produced an economic pressure to obtain more floor space on a given site.

The article concluded that, even if there were no height limitation for buildings in Sydney,

the skyscraper would be impossible, by reason of our antiquated building law, which simply ignores modern science altogether. The Sydney law neither protects people against fire, on the one hand, nor permits them to make use of the improvements in building methods, on the other hand. The builder of a tall steel construction in Sydney is tied down to the regulations invented for little brick shops and dwellings. He is not permitted by law to make use of the improved methods of other cities, and he is not forced to obey the safeguards against

fire or explosion which every modern city finds necessary. (18)

Two days later a further article in the Sydney Morning Herald quoted a number of architects, all of whom roundly condemned the existing legislation and proclaimed the need for new legislation permitting construction in steel and reinforced concrete. Sydney Jones argued that there should be regulations governing means of egress, "for while underwriters lay down rules for the preservation of the building, the walls and floors... the preservation of human life is no concern of theirs". (19)

Of the Building Act to which a committee of architects had contributed seven years earlier, one committee member, A. C. Kent complained

We thought we were working a live horse. We worked for more than a year to make the draft as perfect as we could. It was then sent back to the City Council. The master builders approved it. The City Council approved it. And it was then presented to the Government of the day... We felt satisfied the whole thing was finished, and the work of giving Sydney a modern building act was complete. We all know what happened. The Minister shelved it, and there it has remained. (20)

The Sydney Morning Herald also made reference to the way in which the political parties had responded to the demand for new building controls in Sydney:

Finally, feeling amongst some of the leaders of Sydney architects as to the way in which architectural and other city reforms had been treated by the Liberal and Labour ministries respectively, is too striking to go unmentioned. It was stated yesterday by one architect that not only had the Liberal ministry refused to listen to repeated representations, but that when the Labour ministry showed itself inclined to support the Bill drafted by the architects, it had to give up the idea, because it understood that the Opposition would regard the bill as contentious. (21)

An article on February 14, 1914, acclaimed a statement of the Premier that "he hoped that a Building Act for Sydney would be one of the measures to be passed into law before the end of the year" (22), and

enthusiastically recounted the benefits of such an Act. A further article in March 1914 reported,

"The architects of Sydney will be well satisfied with the answer which Mr. Griffith gave yesterday to the deputation which urged him to bring in a Building Act not only for Sydney, but for the suburbs and the country; and hundreds of those who love their city and wish to see it at last in a position to rival other great cities, will be well satisfied also. The Minister's answer... bears out the assurance which we obtained from the Premier before his departure (for) New Zealand, that a Building Act will be introduced into Parliament in the next session." (23)

The new Building Act did not eventuate in 1914. In August, 1915, Building published a paper entitled Modern building acts - how Australia lags, which A. J. Hart had read before the NSW Engineering Association. The paper criticised Sydney's "ancient" Building Act and discussed at length the developments in modern building construction which the author believed ought to be incorporated in building legislation. He complained of the wall thicknesses required by the Sydney Act, and compared them with the thicknesses required by the codes of New York, San Francisco, London and Melbourne. In all of the latter codes, steel and reinforced concrete technology was recognised. Steel and reinforced concrete buildings were framed structures. External walls were skins, screens to keep out wind and rain, but having no structural function. In Sydney however, walls were still sized as if they were structural. In Melbourne, a building 150 feet tall constructed with reinforced concrete walls and frames, could have a wall thickness of six inches. In Sydney, a building of the same height had to have walls 39 inches wide at the base, tapering to 14 inches at the top, no matter what construction system was used.

A. J. Hart discussed in detail methods of steel framing, the means of making connections, and the design of columns. He also promoted the need for codes to stipulate design loads for floors and stanchions,

"as all modern building acts now do".

6.4 ORDINANCE 70, 1909

Under the Local Government Act, Ordinance 70 was proclaimed on February 2, 1909. It applied to all Municipalities, the Councils of which had acquired the power of Section 109 (xliii) of the Act; and to the villages and towns in all Shires, the Councils of which had acquired such power. Section 109 (xliii) gave Councils power for the regulation of the erection of buildings and the subdivision of land for building purposes (see 6.1). Ordinance 70 was to take effect in an area a month after a Council advertised that it was to come into force.

Under the Ordinance, anyone proposing to erect, add to or alter a building was required to submit a site plan showing the location and extent of the building; plans and specification showing the building's height, design, structure, building line, sanitary provisions, and materials; and an application for Council's approval of the proposal.

The Council could fix a reasonable fee to be paid with the application, and could refer the application to an engineer, building surveyor, architect, an authorised servant or a Committee of Council for consideration and report. The Council could approve the application or could specify alterations which they considered desirable.

The second section of the Ordinance controlled the subdivision of land for building purposes. The third section provided penalties for non-compliance and provided that Councils could order that any

contravening building work be altered to comply.

6.5 ORDINANCE 70A, 1913

A committee appointed by the Local Government Association in 1911 decided to recommend that the Government immediately pass legislation dealing with the regulation of buildings, the planning of towns and the housing of the working classes. The committee agreed that

there should be a classification of building zones, and that within these zones there should as far as possible be uniformity of laws and regulations relating to buildings; that powers should be given to regulate positions on allotments which the proposed buildings should occupy; that the powers of municipal councils to regulate buildings should be fully defined by law; that while in all things which are simply matters of taste the person building should be free to follow his own desires, the power of the councils on matters of public health and convenience, and town beautification, should be extended. (24)

Ordinance 70 was general in intent, and set no prescriptive standards for building height, design, structure and so on. Individual Councils set their own standards and consequently there was little consistency from area to area.

To improve this situation Ordinance 70A was proclaimed on August 20, 1913. It could be applied to Municipalities and parts of Shires at the request of a Council, by proclamation in the Government Gazette.

Ordinance 70A introduced a number of concepts which are still present in current legislation. These include the definition of a habitable room; the requirement that dwellings occupy no more than two thirds of site area; the requirement that, for ventilation purposes, any door or window should be at least three feet from the boundary of adjoining properties; the provision of a cross-ventilated twelve inch clear

space below ground floor joists (now 200mm is required below bearers); the provision of ventilation of habitable rooms by means of sashes openable to the outside air, the area of glazing to be at least ten percent of the floor area of a room, at least half of which was to be openable (the opening was to extend to the top of the window); and laundry floors were to be graded and drained, and also constructed of an impervious material, unless more than 3 feet 6 inches above ground. A further provision which was applied in subsequent legislation until 1974, was a requirement for fixed ventilation effected by the use of air bricks or other ventilators near the ceiling.

The ordinance also established a number of other standards for building. It provided that Councils could set building lines, which plans were then to be available for inspection by the public. It required proper cleansing and preparation of sites where there was contaminated material. Adequate subsoil drainage was to be provided, and the lowest storey of a building was to be constructed so that the building could be adequately drained. Rainwater was to be conveyed to proper drains or receptacles without causing dampness in walls or foundations. Habitable rooms were to have a minimum area of 100 square feet and a minimum ceiling height of 10 feet, except attics, which were to have at least 10 feet ceilings for two thirds of the room area, and were not to be less than five feet high at any point. (This formula too was carried through to modern regulations, although in more recent times 8 feet has been the minimum height). Footings, unless built on sound rock, were to project on each side at least half the thickness of the wall. Footing width was to diminish in regular steps, and the height of the footing was to be at least two thirds of its width. A chart of wall thicknesses for external and party walls was included, relating thickness to the height and length of walls. The chart was an adaptation of Table II in Schedule B of the Sydney

Improvement Act, with some variations. In addition, reinforced concrete walls were to be permitted and appropriate thicknesses were nominated, according to wall length and height. Internal masonry wall construction was specified, as was the construction of timber framed walls (3 inch x 2 inch studs for a one-storey building, "and shall be suitable increased for a building of two or more storeys". Timber framed buildings were to sit on piers, with galvanised iron or zinc plates on top of the piers. Damp-courses, of lead, asphalt, slate laid in cement, or of other durable material approved by the Council, were required in every wall below lowest floor level, and in parapets and chimneys. Basements were to be constructed with walls impervious to moisture.

Some aspects of the following approval process are still current today. Applications were to be submitted to Councils before commencement of building work, and were to be accompanied by plans drawn at a scale of at least 1 inch to 8 feet, together with specifications, indicating the height, design, structure, materials, building line, sanitation, proportion of site occupied, position of dampcourse, the level of the lowest floor, and the level of adjoining ground. The intended use was to be described in the application. The application was to be accompanied by a description of the intended drainage and water supply, and a statement as to whether the materials to be used were old or new. A block plan, at a scale of 1 inch to 40 feet was also required, to show the street width and the position of buildings on adjoining properties. Fees payable were to be determined according to building area, at a rate of 5 shillings per 400 square feet or part thereof, to a maximum fee of 2 pounds 10 shillings.

A Council could approve an application, or specify alterations required before approval would be granted. If a Council did not so do

within one month of receipt of an application it was deemed to have approved the application. Approval was deemed to have lapsed if building was not commenced within 12 months.

Council approved and stamped plans were to be returned to the applicant, and were to be produced by the applicant upon 24 hours notice from the Council. Two days notice was to be given to the Council for inspection of trenches prior to the construction of footings. Notice was also required prior to the covering up of footings and drains. The clerk of the Council could issue a notice specifying matters in which the building was in contravention of any law or ordinance relating to building, and could require rectification within a nominated period. Upon completion of building, notice was to be given to the Council.

On July 26, 1918, the Ordinance was amended to provide that in a residential flat or tenement building, Councils could require that walls separating flats be $4\frac{1}{2}$ inches thicker than otherwise was required for internal walls.

The same amendment required that plans submitted for approval should show provisions for fire prevention and fire escapes. It also provided that when a Council did not issue its approval or refusal within one month, an application was deemed approved if it complied with the Ordinance.

The amendment also extended the definition of building to include the addition of non-habitable rooms to existing buildings.

Less than a year after the introduction of Ordinance 70A, concern was being voiced about the adequacy of the legislation and about its

enforcement. It was argued that new regulations, based on modern sanitation and town planning principles, were required:

The suburban municipal councils have adopted building ordinances, which take the place of a Building Act; but they are not giving general satisfaction, and a movement is on foot with a view to repealing them. There is no doubt that some new system of controlling the erection of buildings in the suburbs is required. One council will permit a contractor to use a certain class of material which would be rejected by another council. Different aldermen hold different views as to the interpretation of certain clauses in the ordinances, and thus confusion often arises. In some municipalities the letter of the law must be followed, while in other districts the spirit of the Act alone is enforced. Great laxity is also shown in certain quarters in the matter of supervision, and speculative builders have often boasted of what they can do in one municipality as against another.

In some municipalities there are practical builders and architects holding positions of inspectors, and their duty is to advise the councils of defects in plans submitted for approval by the aldermen. These professional men are able to judge whether a building is erected according to the approved plans.

In another municipality, however, the aldermen take unto themselves the duty of passing all plans and inspecting all buildings in course of erection. Most of the aldermen know very little about the practical side of a set of drawings, although they are able to admire a picture, and the result is that the seal of the council is frequently placed upon a set of plans which practical men would have no hesitation in rejecting. The present system, too, is open to abuse. Certain builders can tell of favours they have received which were refused to others. On the other hand, there are objectionable clauses in the ordinances...

Many other demands are to be found in the clauses of the municipal building ordinances which are against common sense.

What is required is an up-to-date suburban Building Act, with a set of regulations based on the most modern ideas of sanitation and town planning principles, with a board of control to see that the Act is properly administered. These ideas have been suggested by practical architects and builders. However, to do away with existing ordinances, bad as they may be, until something better is framed, would, in the opinion of those able to judge, open the door to all sorts of abuse, and the system of "jerry building," which existed prior to the passing of the Local Government Act and its building ordinances, would no doubt be reverted to. (25)

Architect W. De Putron was critical of many aspects of Ordinance 70A.

In an article published in Building in November 1913 (26) he argued that it was impossible to apply uniform regulations to areas which

varied so much. What might be appropriate for Strathfield, which had plenty of space, was impossible in Waterloo and Redfern. Amongst many matters which he raised he was critical of the new responsibilities placed upon the architect and builder, to furnish information to Council and give notice of a completion of certain stages of construction. Furthermore, he argued the members of the profession considered it an injustice that the ordinance did not require councils to pay for plans and specifications.

6.6 SKYSCRAPERS AND THE HEIGHT OF BUILDINGS ACT

With land costs rising due to an increasing demand for property in the city, the pressure grew for redevelopment of city sites to give greater floor space for a given site area. The advent of improved building construction and services technologies made possible the construction of taller buildings.

In 1911, Mr. Harry C. Kent, architect, read a paper (27) before the Institute of Architects of NSW, expressing his concerns about skyscrapers. He referred to the extensive loss of property which might occur were a fire to start in a skyscraper. He objected to the increased construction and fire risks associated with such buildings. He also objected to them on humanitarian grounds,

for streets of skyscrapers must mean that the occupants of the lower storeys of such buildings must be working by artificial light, and though it may be necessary for a certain proportion of humanity to work all their daylight hours by artificial light in mines and the dark places of the earth, I cannot believe that it is desirable for us to so multiply that number by adding to it the great multitude who must work in the lower storeys of our city buildings. (28)

He objected to skyscrapers on aesthetic grounds, and could not

conceive of beauty of proportion in a continuous street of twenty or twenty-five storey towers. He proposed that building height should be limited to one and a half times the width of the street faced, with each additional storey set back two thirds of its height.

In the discussion that followed, most of the architects who commented supported the construction of taller buildings, arguing that the physical limitations of the Sydney business area necessitated expansion vertically, and that the speculator or property owner would inevitably have to build upwards to derive fair value for their land. James Nangle considered that

Sydney was doomed to be a high-building city. Vested interests were so influential that it would be almost impossible to apply preventative legislation. (29)

When the Height of Buildings Bill was submitted to Parliament in November 1912, Culwalla Chambers, by architects Spain and Cosh, had been completed very recently at a height of 180 feet. The proprietors of the Daily Telegraph had gained consent to erect a building 210 feet high. Both buildings still stand, the former circumscribing the south west corner of King and Castlereagh Streets, and the latter, named the Trust Building, and completed in 1914, built on the south east corner of the same intersection. The City Building Surveyor was quoted as saying that seventy five per cent of building applications in Sydney at the time were for buildings in excess of 100 feet high. (30)

Meanwhile, in New York, buildings in excess of 600 feet high had been erected.

On November 5, 1912 Mr. F. Flowers, Vice President of the Executive Council, moved the second reading of the Bill in the Legislative Council, and in so doing explained the sudden urgency with which it

had been introduced:

In moving the second reading of the bill, I offer no apology to hon. members of this House. It was certainly not a question for legislative action until, at any rate, last week, nor was legislative action up till that time contemplated. But the seriousness of the position, in connection with the extraordinary height of buildings in Sydney, has impressed itself so much upon the Government, that it was considered some action must be taken in the matter, and the seriousness of the question must absolve the Government from the responsibility of being charged, as they would have been, with being passive, while buildings of such dimensions were being erected, which, doubtless, would have been proved beyond a shadow of a doubt to be dangerous, not only to the health of the general members of the community, but possibly to life itself.

So impressed was the Government in relation to the question, that I was deputed to interview the Lord Mayor to ascertain whether the City Council, who are the authorities in the matter, would give some assurance that, as far as the city of Sydney is concerned, it should be saved from the mistakes made in other countries by the erection of monstrosities of buildings which have been termed "sky-scrapers".

I interviewed the Lord Mayor and the Town Clerk, who accompanied him and I was assured by him that the Council had already carried a resolution to the effect that no buildings should be erected in Sydney over 150 feet in height. With that assurance, providing it had a sufficient guarantee, the Government would have been content to have taken no proceedings in the matter. I made a request that the Lord Mayor should write a minute signed by himself, on behalf of the City Council of Sydney, giving that assurance; but the following day I noticed that one of the committees of the City Council had met, the Lord Mayor reported the result of the interview with myself, and they concluded that the matter should be held over for a fortnight. It appeared to me that they were not prepared to give the assurance that I had asked for, that is to say, it seemed that they had postponed the matter for a fortnight, and that neither I nor the Government had any guarantee that at the end of another fortnight there would not be a further postponement, until Parliament had prorogued, when the Government would be left helpless, as far as the assistance of legislation in the matter is concerned. The Government came to the conclusion that the best assurance of something being done to bring about the desired end was the assurance of Parliament itself, setting out clearly that it would be an offence against the law, as provided for in this bill, to erect any building in Sydney over 150 feet in height.

I do not think the Government owes any apology to the City Council of Sydney, because, as a matter of fact, the powers under which they are working were given them by Parliament, and the power that gives can always take away. (31)

There was an extended debate in the Legislative Council, and subsequently in the Assembly on November 14. Many members spoke

against tall buildings, putting forward arguments on their adverse civic impact, the possibility of disease, the fire risk, their ugliness, the experience of other cities, and the congestion of streets and transport which would be occasioned by an increased city population. Mr. F. Flowers stated that although retrospective legislation was anathema to him and to many members, he considered that if consent had been recently granted but building not commenced, the House would be justified in saying that permission should be withdrawn. This was doubtless a reference to the building consent granted to the Daily Telegraph proprietors. He asserted that the press, with one exception, were unanimous in their support of the Bill.

Many members considered that "skyscrapers" would have a devastating effect upon the city. Mr. Holman, the Attorney-General, believed that

the citizens of the town, instead of moving about as they do today in open and sunlit streets enjoying the advantages which Sydney naturally presents, will find themselves actually living at the bottom of deep sunless chasms to which the light of day penetrates only for a few hours, perpetually in the shade and perpetually in the cold. It is a fact that the erection of skyscrapers creates enormous wind pressure on the ground levels. It keeps the ground perpetually damp and lowers the temperature and general cheerfulness. These difficulties are immediately traceable to the skyscraper. Further than that, in spite of the best modern systems of ventilation, the tremendous congestion of human beings in limited areas leads to a great multiplication of disease germs and, generally, it increases the liability to disease, and lowers the vitality of those who live in the areas covered by these very high buildings. (32)

Of the tall buildings already erected in the city, Mr. G. Black said

They appear like obscene fingers thrust into the face of high heaven, the ugliest things you could imagine, stuck up at all sorts of angles, with water tanks on top, a disgrace to our city, and a disfiguring thing for all time so long as they stand. (33)

A number of members favoured height limitations such as applied in many European and American cities. The experience of New York and one or two other American cities was considered an aberration, to be avoided rather than to be followed. Some favoured a height limitation

on a building equal to the width of the street it faced. Others would have allowed one and a half times the street width. Others again argued that given the narrowness of Sydney streets, generally no more than sixty feet, such height limits would unreasonably restrict development.

The danger of fire and the resultant risk to life and property in a tall building was the ground for much concern. Several members quoted the opinion of the Superintendent of the Fire Brigades Board,

that as far as New South Wales is concerned, as a matter of fact, it is so in every part of the civilised world, there is no proper control, not even with the most efficient fire fighting plant, over buildings of anything over 100 feet in height... it is simply impossible to get a force of water sufficient to cope with an outbreak of fire in any such building... if special provision is made in a building over 100 feet in height, that is, by the conservation of a force of water on the top of the building and if other precautions are taken, the danger line, as far as buildings of 100 feet and 150 feet are concerned, is in his opinion removed... a building over 150 feet in height has passed the line of safety, no matter what other precautions may be taken. (34)

There were few who argued in favour of permitting taller buildings, but those who did argued that such buildings contributed to improved health and ventilation, that they were an aesthetic improvement in the cityscape, and that they were entirely safe, being built to a higher standard of construction and with improved fire safety and protective measures. Furthermore, they argued, the legislation, if approved, would also increase the number of authorities controlling building, which was undesirable. In addition, to limit the height of buildings was an undue restriction on enterprise.

The most vocal advocate of tall buildings was the member for Canterbury, architect Varney Parkes. He argued that Sydney, being a city whose business area was concentrated upon a peninsula, must necessarily grow vertically. Tall buildings were inevitable. The

demands of the future would make it imperative to erect buildings to a greater height and also to a greater depth.

He argued that the Bill had come about because of hypersensitiveness to danger. Rather than this bill, he proposed that the parliament should pass legislation for the erection of non-inflammable buildings only, in the city. With that done, there would be no need to limit building heights.

The legislation he promoted would contain the following provisions:

In the first place, the buildings must be constructed of absolutely fireproof material, and no wood should be used at all. They must have hermetically sealed floors so that one floor can be shut off from the other. There must be careful supervision day and night on each floor, and better means of escape in the case of fire must be provided. If iron is to be used in a structure it must be veneered with non-inflammable material. If these precautions be taken there is no reason why we should not give property-owners permission to build structures to whatever height they like. (35)

He further believed that

these big buildings breaking the sky-line with irregular ornamentation add immensely to the picturesqueness of the city. In Sydney these high buildings will no doubt be ornamental and attractive, and even if we do pass this bill we shall in the future be compelled to allow them to be erected in order to meet the requirements of our city...

What right have we to put an embargo on an owner of property which will prevent his getting as much as he can get out of that property by carrying it to such a height as he may desire. In proof of the fabulous value which property has reached, it is a fact that no matter how palatial a building was twenty-five years ago, today it is being pulled down (36).

A further issue which arose in the debate was the conflict of interest between the City Council and the State Government. The bill restricted the powers of the City Council by removing their control of buildings more than 100 feet in height. For buildings between 100 and 150 feet, application for approval was to be made to the Chief Secretary, who was to act upon the advice of his officers, the Fire

Commissioners and the Government Architect. Any building higher than 150 feet required the consent of parliament.

Mr. Thomas Hughes considered it

unjustifiable interference with the work of the civic authorities for the Government Architect or any other authority to be given power to interfere with the administration of city government... I do not think we should do it, it is merely perpetuating and accentuating the existing system of dual control when the Government, in any instance - and, worst still, in repeated instances - bring in other authorities and officials, who are, after all, responsible to no one but themselves. The City Council is elected to do the work of the city. (37)

Building height was to be measured from the mean level of the footpath, or ground before excavation, to the top of the parapet, external wall or gable base. Astute architects soon found that additional accommodation could be achieved within mansard roofs above parapet level. Height calculations did not include space exclusively for roof-top water tanks. The Act was to apply within the Metropolitan Police District, and was to bind the Crown.

Building was highly critical of the new legislation, condemning it for its restriction of enterprise, its poor draughting, the creation of an additional building authority, and the suspected political motivation for the measure:

A striking example of the ineptitude of Governments in subjects of a technical character is displayed in the Height of Buildings Act, recently passed in NSW to prevent "skyscraper" construction within the Metropolitan area of Sydney.

We have no doubt that intentions have been good, but the fact does not make amends for the adoption of a measure in every sense futile, and in passages absurd....

Instead of having so uselessly employed their time, the Government would have been better occupied in framing a modern Building Act. The present, out-of-date measure is as much a restrictive tax on constructional enterprise as the Height of Buildings fiasco. The Government itself is being hampered and mulcted in extra expense by the absence of up-to-date building regulations. As we have pointed out, in the Education Offices now being built, in Bridge Street, Sydney, by day labour, the walls are being made 4ft. 9in. thick, whereas if the modern use of steel and reinforced concrete were permitted, the building

could be supported on piers with thin curtain walls of a few inches thickness. Thus outlay and time in building would be saved, with no detracton from the efficiency of the construction...

Although the State Government could never find an opportunity to take in hand a badly required revised Building Act, it can find time to pass a measure dealing with this secondary matter of the height of buildings, and has now, by statute, fixed a maximum of 150 feet measured from pavement upwards and, dealing itself, through one of its departments, with all projected buildings of a height from 100 feet upwards, and, leaving it to the Municipal Council to deal with those under 100 feet.

Two building authorities have, therefore come into being, over a matter that clearly should rest with the Municipal Council along.

The wisdom of all this is very questionable, and judging from the public knowledge of the surrounding circumstances, one cannot avoid the doubt, that the situation has been made, not so much in the public interest, but that the statute has been aimed solely at a newspaper politically opposed, on general grounds, to the present Government, and which was preparing to erect a building exceeding in height the limit now fixed. (38)

On 1 September 1915 the Height of Buildings (Amendment) Bill was debated in the Legislative Council. On the basis of experience since the introduction of the Act, and a report from the fire underwriters' inspector, the architect of the Chief Secretary's Department, and the Superintendent of the Fire Brigades, a number of amendments were proposed. The case for the amendments was put thus:

This bill... is merely an enactment to prevent a certain abuse which has sprung up in connection with the principal act, for, as is customary with all acts of Parliament, all the loopholes have not been closed in the original act. The present law provides that the height of buildings erected in the metropolitan police district shall not exceed 150 feet, measuring from the mean level of the ground before excavation to the top of the parapet. That provision, however, has been evaded by the construction of "mansard" or attic roofs inside the parapet, which, while providing additional accommodation, have endangered the lives of people resident therein from the fact that they are utterly beyond the water pressure of the city, and there is no means of extinguishing fires at such a height. Not only are the lives of the occupants endangered, but the occupants of adjoining buildings are also in danger from the fact that when fires break out and get beyond control the whole building which is being consumed becomes a vent in which the rapid inrush of air carries large pieces of burning carbon, &c., all over the city, with the consequence that other buildings at great distances are often set on fire and the lives and property of the inhabitants in various parts of the city are therefore in great peril. It has been proposed

therefore, in order to make an end of such practices, to provide that the height shall be measured from the footway to the highest occupied portion of the building. (39)

The definition of height was to be amended to preclude the construction of habitable mansards above the height limit. The limit was to apply to the highest part of the building used for human occupation. The space for lift machinery and water tanks could be excluded from the building height calculation, only if it was to a design approved by the Minister.

It was further proposed that buildings taller than seventy feet would require the issue of a permit by the Minister and certification of the fire protection provisions by the chief officer of the Fire Brigades. It was now to be the Minister, in place of the Government Architect, who controlled such buildings.

A further amendment was to give the Government power to make regulations.

Considerable criticism was voiced about the impact of taller buildings on the city skyline. The unornamented side and back facades of some tall buildings were considered an offence and disfigurement of the city, as were the water tanks and unsightly structures on the top of many buildings.

The Legislative Assembly debated the bill on February 29, 1916, and passed it, in the process restoring to 100 feet the height limit at which the Minister's consent was required, and further requiring that the skyline of a building be approved by the Minister (40).

The regulations under the Act were gazetted on October 20, 1916 (41).

Buildings were divided into four classes:

Class A: Offices

Class B: Residential

Class C: Warehouses

Class D: Factories

Fire-resisting construction was required throughout with structural steel to be adequately protected. No more than one storey was to be constructed as a mansard roof.

Fire escapes in factories were to be in accordance with the Factories and Shops Act, 1912. For all classes at least two internal staircases, serving all floors and the roof, were to be provided. One staircase was to be "of tower fire-escape design, with approved automatic fire doors at each floor, and placed in front of building" (s.2b). The stairs were to be at least 2 feet 6 inches wide.

In Class A and C buildings the tower escape could be placed other than on the front wall, provided it was accessible from the front of the building by isolated passages on alternate floors to a height of eighty feet. In Class B buildings the escape could be placed other than on the front wall, provided it was accessible from the front of the building by isolated passages on each floor, with the horizontal distance of travel to the stair not to exceed sixty feet (18.288 metres. Ordinance 70, Part 24, currently requires 18 metres in similar circumstances). In Class D buildings the tower escape had to be on a wall abutting a street, with openings through the wall at each level, and with a maximum horizontal travel distance to the stair of sixty feet. The floors of Class C and D buildings were to be partitioned to ensure safe access to either staircase in the event of

fire.

Openings in internal fire walls or communicating with adjoining buildings were to be provided with two approved automatic fire doors. Doors to light wells or external fire escapes were to be protected by single approved automatic fire doors.

Windows to light wells, overlooking adjoining buildings, or adjacent to external fire escapes, and all skylights, were to be glazed with wired glass or other approved material in metal frames, or be protected by drenchers.

All lift shafts were to be enclosed, with automatic fire doors at each opening, or placed in fire-isolated lobbies.

In Class A and B buildings an automatic fire alarm installation was required. In class C and D buildings a wet-pipe sprinkler system was required. In all classes, a 4 inch rising main was required for connection of Fire Brigade equipment, together with 2¹/₂ inch hydrants with hose at each floor level. The main, uncontrolled by water meter, was to extend from the lowest level to the roof, and be located in or adjacent to a staircase.

A sufficient number of chemical fire extinguishers were to be installed on each level.

6.7 CONCRETE AND STEEL CONSTRUCTION

For many years the architects and builders of Sydney agitated for modernising of the 1879 Building Act for a variety of reasons,

including its lack of provision for reinforced concrete and steel construction, which technologies had largely developed subsequent to the gazettal of the Act.

In 1912 Mr. G. Sydney Jones, president of the NSW Institute of Architects, in his final presidential address, as reported by Building,

clearly hinted that unless something in the way of amendment were shortly undertaken, architects would be compelled to act on their own responsibility. He emphasised this point by adding that certain architects had already "taken the risk", because it was becoming more generally accepted that the proverbial "coach and four" could be driven through the Act in its present obsolete state.

All sorts of reasons have been ascribed for what, on the face of it, is unaccountable delay in this connection. We have heard suspicion cast on the restraining influence of the "brick combine" and "timber trust." Some have written us alleging brick interests in quarters where it is possible to block the more general utilisation of reinforced concrete. Personally, we are more inclined to attribute the delay in providing for the more extensive use of reinforced concrete to absolute shortsightedness on the part of the present Government, and, more particularly, its predecessor, and want of enterprise, particularly on the part of the Sydney City Council. (42)

In August 1917, Building described the current development of new building regulations:

Sydney moves. Its obsolete Building Act will shortly be relegated to the rubbish tip.

Professor Warren has submitted to the Committee appointed to frame new building regulations, some draft regulations applying to reinforced concrete construction. These are based upon results and conclusions reached by constructional authorities in various parts of the world, more particularly those of the committee of the American Society of Civil Engineers especially regarding a type of construction known as the mushroom system.

The regulations adopted by the London County Council had also been considered.

The draft as issued to the Committee has been closely studied by Architect John Kirkpatrick, one of the members of the Committee. He intends to suggest the adding of further clauses affecting the responsibility of those carrying out reinforced concrete constructions as well as regarding more effective fire protection.

It would be premature to discuss or mention in detail the regulations as at present drafted; but it may generally be said that they only apply to the construction of buildings of reinforced concrete in which the loads and stresses are transmitted through each storrey to the foundations by a skeleton framework of reinforced concrete, or partly by a skeleton framework of the same material and partly by a party wall or party walls.

It will however be noticed that though all floors, stairs, landing, and other portions of a building carried by a reinforced concrete framework must be constructed of and carried upon incombustible materials; wood framing, boarding and battens may be used in the construction of the roofs.

Permission given under the regulations to erect reinforced concrete constructions will not relieve the architect or engineer who designed the structure from full responsibility for the actual construction. The draft regulations give data referring to floor and roof loads; resistance to wind pressure, working load, weight, ratio of span to depth of beam, bending moments, and moments of resistance in slabs, reinforcement at constructional points, columns, and working stresses.

Data are given referring to materials, an interesting point therein being, that the steel shall conform generally with the British Standard Specification for Structural Steel used in girders and bridges, made by the open hearth process with a tensile strength of 55,000 to 65,000 pounds per square inch, a yield point equal to one-half of the tensile strength, and an elongation measured on a length of eight inches, equal in percent to through 180 degrees without signs of 1,500,000 divided by the tensile strength. The steel shall be capable of bending cold fracture round a pin of diamater equal to twice the thickness of the bar.

For reinforcing slabs, small beams, minor details or for reinforcing for shrinkage and temperature stresses steel wire, expanded metal, or other reticulated steel may be used, with certain unit stresses mentioned.

It will be noted that the reinforcement must be free from flaking, rust, scale, or coating of any character, which would tend to reduce or destroy the bond. Materials may be mixed by an approved mixing machine, or by hand; if by the latter, it has to be turned over at least six times, and until the mass is homogeneous in appearance and colour.

The draft regulations also cover steel frame constructions, the method of encasing pillars, beams, and girders, as well as an appendix giving notations for beams, columns, and slabs, and proves that the distinguished Professor covered a wide field of research in his zeal to best improve Sydney's building regulations.

The draft regulations will be considered by the various members of the Committee for three weeks, when these gentlemen will meet and hear evidence from any architect, builder, or engineer who may desire to make any suggestions. (43)

On 30 November 1917 Sydney Municipal Council By-laws 1103 to 1107, "By-laws in connection with and governing Composite Steel and Concrete and Steel Framing Construction", together with the attendant regulations, were gazetted (44).

The by-laws did nothing to repeal the 1879 Act, but for the first time in Sydney rational reinforced concrete and steel construction was permitted, upon the approval of the Council.

The regulations were largely based on the London County Council regulations of 6 July 1915. They dealt specifically with matters of structural design, and made no reference to other aspects of building design and construction.

The regulations applied to buildings having a skeletal framework. All floors, stairs, landings and other parts of a building carried by a reinforced concrete frame were to be incombustible. Internal stairs and landings were to be of fire-resisting construction. Timber framed roofs, however, were permitted.

Design floor loads for various building uses were tabulated. Design roof and wind loads were also specified, as were provisions for other live loads. The regulations essentially formed a detailed design code. Column, slab and beam design procedures were defined. Standards were nominated for materials, formwork, and the mixing and placement of concrete.

Openings in a wall were to occupy no more than three quarters of the total area. The design and fixing of curtain walls of stone, brick, concrete, and concrete or terra-cotta block, were specified. Constructional requirements for division, partition, parapet, party

and retaining walls were also nominated. Foundation design was dealt with in some detail.

The regulations for steel framed construction provided that all parts of a framed building were to be riveted, tightly fitting bolts being permitted only where rivets could not be driven. The regulations dealt with the structural design of columnss, floors and roof trusses. The standard of riveting and the quality of materials was nominated.

Columns were required to be completely enclosed and protected from fire. Methods of encasing pillars, beams and girders were delineated. There were four acceptable methods:

1. Concrete: $2\frac{1}{2}$ inch cover over the top of the rivet was required. Beams and girders were to be protected by at least 2 inches of concrete. The concrete cover was to be reinforced by metal mesh at least one inch below the surface.
2. Terra-cotta: 4 inches was required, with the voids concrete grouted.
3. Brickwork: $4\frac{1}{2}$ inches was required, with the voids concrete grouted.
4. Metal lath and cement mortar two layers were required, one fixed to the column, and the other rigidly supported by the column and separated by a 3 inch air space from the first.

In March 1918, Building commented:

The passing of these regulations will secure sound building construction, give more space in building by allowing very much thinner walls and greatly diminish the danger of fire...

The regulations have, on the whole been well thought out without any great defect or hardship, and Professor Warren's hand can be seen throughout...

We hope that the City Council is making provision for an expert staff to cope with the new conditions, so that when plans and calculations are submitted to the Building Surveyor there will be no delay in checking same and thus avoid annoyances and loss of money and time. It cannot be too strongly pointed out that

the Council must insist on the passed plans being carried out properly by means of its own Inspectors, as is done in other parts of the world.

This would be, not only an additional safeguard to the Architect and his Client, but protect the honest Builder, Contractor or Manufacturer against his unscrupulous and scamping competitor. It is needless to say that reinforced concrete has proved itself the finest building material of modern times, but it is also the most dangerous, unless in capable hands. Reinforced work must be designed and carried out by Experts to be safe. This fact is now universally acknowledged and Architects and Builders must collaborate with Expert Specialists. (45)

1. Local Government Act, 1906, s.95
2. Ibid, s.109
3. Ibid.
4. Ibid, s.187, paras xlvi and lxix.
5. Building, 21 November, 1907, p.42
6. Building, 19 May 1908, p.48ff.; 15 June, 1908, p.61ff.; 15 July, 1908, p.43ff; 15 August, 1908, p.73ff.
7. Journal of the Legislative Council of New South Wales, Second Session, 1908, Vol. LXXI, p.320
8. Ibid, p.321
9. Ibid.
10. Act No. 9, 1909
11. Art and Architecture, Vol IV, No. 3, May-June 1907.
12. Building June 15, 1908, p.17
13. John Sulman, The improvement of Sydney, 1908, p.16
14. NSW Parliamentary Papers 1909 Vol.5, pp.430-431
15. Sydney Morning Herald, 18 April 1912, p.8.
16. Ibid, 14 October, 1913, p.6.
17. Ibid, 14 January, 1914.
18. Ibid.
19. Ibid, 16 January, 1914.
20. Ibid.
21. Ibid.
22. Ibid, 14 February, 1914, p.18.
23. Ibid, 27 March, 1914, p.18
24. Ibid, 17 June, 1911, p.6
25. Ibid, 9 June, 1914.
26. Building, 12 November, 1913, pp.33-38
27. Ibid, 13 March 1911, pp.45-48
28. Ibid, p.45.
29. Ibid, p.47.
30. NSW Parliamentary Debates, 14 November 1912, p.3212
31. Ibid, 5 November 1912, p.2641
32. Ibid, 14 November 1912, p.3194
33. Ibid, 14 November 1912, p.3208
34. Ibid, 14 November 1912, p.2643
35. Ibid, 14 November 1912, pp.3199-3200
36. Ibid.
37. Ibid, 5 November 1912, p.2646
38. Building, 11 January 1913, pp.64-65
39. NSW Parliamentary Papers, 29 February 1916, p.4864, Mr. G. Black in the Legislative Assembly.
40. Ibid, pp.4864-4866.
41. NSW Government Gazette, 20th October, 1916, No. 175
42. Building, 12 July 1912, pp.119-120
43. Building, 11 August 1917, pp.118,121
44. NSW Government Gazette, 30th November 1917, No. 207
45. Building, 12 March 1918, pp.107-111

1919-1934

7.1 LOCAL GOVERNMENT ACT, 1919

On December 22, 1919 assent was given to the Local Government Act, 1919, An Act to make better provision for the government of areas; to extend the powers and functions of local governing bodies, and for related purposes (1). The aim of the Act was to simplify all the law regarding local government, incorporating it all in one consolidated statute. The Act replaced the Local Government Act, 1906.

Part XI of the Act, sections 304 to 319, dealt with building regulation (2). This legislation, amended from time to time, is the Act under which building is currently controlled in New South Wales.

In s.304, building is defined as including "any structure or any part thereof". Councils were empowered to control and regulate the erection of buildings (as they had been under the 1906 Act). The erection of a building in contravention of the provisions of the Act was prohibited, as was the change of use of a building from non-residential to residential, without the consent of the Council. Similarly, subdivision of land and the opening of roads without consent was prohibited. Councils were able to fix building lines, and buildings were not to be erected forward of such lines.

Under s.309, the Governor, on the application of the Council, could proclaim defined areas to be residential districts and prohibit the

erection therein of any building "for the purposes of such trades, industries, manufactures, shops, and places of public amusement as may be described in the proclamation". However, continuance of an existing use was permitted.

The approval of Council was to be obtained prior to building, and such building was to be in conformity with the Act and ordinances and the application, plans and specifications approved by Council. Application for approval was to be made by the builder, owner or architect, was to be accompanied by two sets of plans and specifications, and was to be accompanied by a prescribed fee. One copy of the plans and specifications was to be retained by Council.

In considering an application for approval of the erection of a building, a Council was to consider:

- a) drainage, ventilation, lighting, and the healthiness of the building;
- b) design, materials, stability, building line, and height;
- c) size, height, and lighting of rooms; height of floor levels in relation to level of road;
- d) size, height and materials of party walls between buildings;
- e) the proportion of the site to be covered by the building and the provision of open spaces and light areas;
- f) the position of the building or any out-buildings or office in relation to other buildings or to the boundaries of the site;
- g) the provision of storage for water for domestic purposes;
- h) Means of access generally and particularly the means of access for the purposes of the removal of nightsoil, garbage, and other refuse. (3)

A Council could approve, approve with conditions, or disapprove an application, and was to do so within forty days of the lodging of the application. Approval was to lapse if the building work was not substantially commenced within twelve months. Councils could prohibit use or occupation of a building prior to completion in accordance with the Approval.

The Act provided that ordinances could be made for:

- 1) the form and contents of plans and specifications;
- 2) the distance from the middle line of any public road within which buildings shall not be erected;
- 3) fixing the building line for various classes of buildings in respect of various public roads;
- 4) regulating or preventing the erection of dwelling-houses so that the front elevation thereof faces any lane or pathway;
- 5) fire prevention and fire escapes in existing and future buildings, including the provision and closing of fire shutters;
- 6) the control and regulation of fixtures attached to and projections from the outside of existing and future buildings;
- 7) the erection of party walls and party fence walls, and the alteration or rebuilding of existing party walls (including in each case the position design materials stability thickness and height of the wall or fence wall, as the case may be);
- 8) defining the respective rights duties and obligations of owners and occupiers of adjoining buildings or lands in relation to external walls, party walls, party fence walls, jambs, flues, or recesses in walls or chimneys on the line of junction, and providing for the recovery by an owner from an adjoining owner of a fair proportion of the cost of the erection or alteration of such walls jambs flues recesses or chimneys;
- 9) the minimum area and frontage of land upon which any building may be erected;
- 10) the conveniences to be provided in dwelling-houses;
- 11) preventing building on flooded or unhealthy land;
- 12) requiring and regulating the enclosure of unenclosed land by suitable walls or fences;
- 13) requiring licensing and regulating the erection maintenance and use of hoards and fences on public places for the protection of the public during building operations;
- 14) permitting licensing and regulating the enclosure and use of portion of any public place for the erection of scaffolding, depositing of building materials, or carrying out of operations necessary to the erection of buildings on the land adjoining such public place;
- 15) excavations;
- 16) the alteration or demolition of existing buildings;
- 17) underpinning and shoring of adjoining buildings;
- 18) authorising the council to order the pulling down, opening, or cutting into any work for the purpose of facilitating inspection where the council has reason to believe or suspect that any has been done in contravention of this Act, or of the ordinances;
- 19) the securing or the demolition of ruinous or dangerous buildings or walls;
- 20) preventing the use or occupation of any building erected or altered otherwise than in accordance with this Act, or the ordinances hereunder;
- 21) providing for the alteration and repair of skylights and roof lights on existing buildings;
- 22) regulating or prohibiting the erection of any structure of calico or canvas or any other textile material;
- 23) the testing of building materials;
- 24) requiring the making of provision for the safety of window cleaners; and for the purpose regulating the construction of windows, the equipment of window cleaners, and the cleaning of windows; and

- 25) any of the matters which a council is by this Part directed to take into consideration in respect of any application for approval to erect a building. (4)

In the years preceding the introduction of the Act there was a growing interest in promoting the need for town planning. The middle class reformers saw town planning as an instrument for the improvement of society. The Act reflected their concerns, in Part XI making new provisions for the establishment of set building lines and, more importantly, the proclamation of residential districts, and in Part XII, which dealt specifically with town planning, establishing new planning standards and powers. Leonie Sandercock writes:

The Local Government Act of 1919 was perhaps the most concrete achievement of the early town planning movement and was therefore appropriately guided through the Legislative Council by one of the 'fathers' of the movement, J.D. Fitzgerald, ex-Labour politician and social reformer. His speech on the bill was designed to appeal to the 'protection of property' instincts of the conservative councillors, but it also indicates that town planning could be used as a quite conservative tool. Fitzgerald described the improvements that the act would bring,

the control of new roads, subdivisions and building - and with that improvement the power to control the number of houses per acre that may be erected in a residential area...the building provisions...will enable us to have town planning on scientific lines...if a council declares a district a residential district no one will be able to intrude into that district.

He went on to warn of the perils of industrial location of five residential areas, citing the North Sydney Gas Company's works and the Burwood brickworks as examples. He claimed that the brickworks, 'put right down in the centre of a beautiful district...destroy land values and the amenities of the residents of Burwood...if we had a system of planning they would have been placed in a suitable locality.' The 'suitable locality', though he neglected to be specific, was usually one of the inner-city working-class suburbs or the Botany-Mascot working-class area. The possibility of protecting the residential amenity of upper-middle-class suburbs appealed to legislative councillors and the bill was passed just before the upsurge in building activity that dominated the twenties. (5)

The Act was generally well received. Sandercock observes that only one group appears to have objected to the planning powers which it

and, although they could be dismissed as having a vested interest in laissez-faire conditions, their complaint in fact raises an issue central to thinking about planning and public welfare. The Master Builders Association objected as follows:

Sydney cries aloud for homes and more homes for its workers of every class...building, health and other regulations make it impossible to erect a home at a figure that has any possible relation to the average worker's resources...It was impossible to put up a dozen brick terrace homes on the minimum frontage required for half a dozen detached cottages. Right away, the biggest individual item - the land - was cut in half.

The objection here is similar to that raised by developers in the 1960s and 1970s. By zoning land for specific purposes, and limiting the area available for development, planning authorities or local councils create an artificial shortage of supply that inevitably raises land prices. It is clear that in the market city, with the scarce resource, land, in private ownership, more or less homogeneous areas of deprivation develop and greatly impede any rescue operation, even one that includes radical budgetary transfers of income. This seems unavoidable in a market society unless social space is allocated independently of ordinary market forces. But the question then arises, how costly to the community in real terms is planning that is markedly at variance with market forces? The Master Builders Association clearly thought it was far too costly. Building regulations were in effect depriving workers of their own homes. But land speculation is also very costly to the community, and the private enterprise housing boom of the twenties was paralleled by a speculative subdivision boom that was enhanced by the provision of public utilities but made the provision of those services costly, inefficient and inequitable. (6)

7.2 THE DEVELOPMENT OF NEW REGULATIONS

The regulations (Ordinances 70, 70A and Ordinance 59, the latter regulating structures of calico or canvas) gazetted under the Local Government Act, 1906 to control building continued in force until their repeal by Ordinances 70 and 71 of the Local Government Act, 1919. These ordinances were gazetted on November 11, 1921.

Following representations by the Institute of Architects and the

Master Builders' Association in 1919, the Minister for Local Government convened a conference to report on and revise the building ordinances. The Institute of Architects prepared a draft ordinance for submission to the conference.

The conference was eventually held on January 27, 1921, with representatives of the Local Government Association, the Shires Association, the Institute of Architects, the Town Planning Association, the Master Builders' Association, Sydney University, the Department of Public Health, and the Local Government Department attending. At the time of a report to the Minister for Local Government in 1921, the conference had met 38 times. The report describes in detail the development of the new regulations:

The Ordinance drafted by the Institute of Architects has been carefully examined and discussed and revised by the Conference.

DIFFERENT POINTS OF VIEW

In the discussions it became evident that the various delegates approached the task with widely separate view-points. One point of view put forward was that in the interest of the owner intending to build, the Architect designing the building, and the contractor for its erection, as nearly as possible all the provisions with which he must comply should be set out in the Ordinance, much after the manner of a specification; so that he would be able beforehand to know that if he made his building conform to the provisions set out in the Ordinance, the Council would have to approve of it. It was stated that it has happened in the past that one man has been refused approval for a feature in his building proposal, and yet shortly afterwards another man has received approval from the same Council to an exactly similar feature. This was considered to be unjust, and to savour of either favouritism, or of a lack of guiding principle in the administration of that Council. Another view-point brought forward was that the Ordinance might provide in detail for a few vital principles, such as the thickness and strength of walls and other cardinal features of a building (principally those relating to stability and health) and leave the rest quite open for the Councils to decide on consideration of each individual application - in brief, that the guiding principle should be that the Council was the body in authority, and that nothing should be inserted which would have the effect of limiting or cramping that authority, except in so far as it might be necessary to lay down technical details of a type which must be acceptable to all Councils (as for example the strength of walls and such like matters). A third point of view submitted was that the Ordinance might lay down guiding provisions as to what the consensus of the expert opinion

present at the Conference considered ought to be the provisions by which a Council should be guided as a general rule, but that there should be further provisions allowing considerable elasticity in applying these provisions to the individual cases, in order that the Council might be free to set aside any particular provision in any case where it found special circumstances which rendered such setting aside advisable.

There was much debate on several occasions, in connection with particular clauses, as to which of these principles should rule the Conference's work. Gradually the Conference, as the work proceeded, though it did not pass a definite resolution to adopt any particular principle, has in effect adopted a middle course. It has inserted in the draft definite fixed recommendations regarding matters which are fundamental, and which it considers it should not be within the power of any Council to disregard. With respect to certain other matters it has left them open to be decided by the Councils for themselves, subject to the Councils not being able to go below a certain irreducible minimum specified in the clauses (e.g., size of allotments, etc); and in other matters it has left questions open to the free control of the Council.

ONE ORDINANCE OR TWO

For some time the Conference was divided in opinion as to whether there should be one or two Ordinances. In the end it decided to recommend that for the Metropolitan Areas of Sydney and Newcastle there should be one Ordinance only (No. 71 replacing the previous 70A), which should run throughout those areas. It was felt that, for building regulation purposes, in any heavily-built-over areas where there is no sharp dividing line caused by open country separating the municipal boundaries, one building law should run through all such areas; that the suburbs of Sydney should be all under Ordinance No. 71, and that Newcastle and its satellite suburbs should likewise have the same ordinance operating through all their territories.

CITIES - NEW PROVISIONS NEEDED - FLATS - FACTORIES - FERRO-CONCRETE CONSTRUCTION.

As these two great mother-cities of Sydney and Newcastle are experiencing, and must continue to experience rapid growth, a great development of residential flat buildings, the introduction of many large new commercial and factory buildings, hotels and the new type of construction in steel-frame and reinforced concrete buildings, the Conference considered that the time had come when it was absolutely necessary to add to the Ordinance special provisions to control those types of structure; and therefore Ordinance No. 71 has been extended to provide conditions which will control and direct the erection and development of these types of building in the future.

COUNTRY - SIMPLER PROVISIONS

Away from the two great cities, however, the Conference did not consider that it would necessary to provide this further detail; and it came to the conclusion that, for the purpose of many, if not all of the country councils, it would probably be sufficient to have an Ordinance which would lay down certain

basic principles providing for stability of structure and for a standard light and air space in all buildings, and would then go on to provide carefully for the proper construction of dwelling-houses, but would not make any special provision relating to other types of building. This it was felt would give a shorter and simpler ordinance for use in country districts which have not yet experienced the modern extremes of building to be found in the great cities. While the Conference considered it essential that Ordinance 70 should apply to the great cities and their suburbs, it decided to recommend that the rest of the municipalities and shires should be free to choose between the full Ordinance 71 and the shorter simpler Ordinance 70.

PUBLIC HEALTH AND WELFARE THE KEYNOTE

Throughout both ordinances the Conference has been guided by one principal undeviatingly, and that is that the public health and public welfare must be the paramount consideration but that where the public welfare would not be affected, the interest of the ratepayer must prevail. It may even be considered that in the effort to be fair to the land-owner the Conference may have gone very close to the line in some few cases, such as the special provisions relaxing the minimum size of allotments upon which a building can be erected in the case of allotments already existing at the time of the making of the Ordinance; but the Conference gave very careful consideration to all of these provisions and decided that the public welfare would not be served by unduly oppressive provisions operating retrospectively.

MINIMUM HEIGHT OF ROOMS

In view of the careful provisions made throughout the Ordinance to secure light, ventilation and drainage, the Conference was able, with the concurrence of the Health Authorities, to alter the Ordinance so as to permit of rooms with ceilings 9ft. high, instead of the minimum of 10ft., previously required. Its object in this (as in several other provisions throughout the Ordinance) was to assist in the cheapening of the erection of dwellings. The Conference is satisfied that in this climate, and in conjunction with the other provisions in the Ordinance, healthy and comfortable dwellings can be constructed, notwithstanding this concession.

BATHROOMS INSISTED UPON

The Conference was unanimous in recommending the provision that dwellings should be provided with bathrooms (except in cases where the Council might give special permission to omit them, as in the case of week-end seaside cottages, or in other cases where the proximity of the sea or some other circumstance might make it reasonable to omit a bathroom). Similarly, the Conference was unanimous in recommending that it should not be permissible to combine the laundry and the kitchen in the one room - considering that the soapy steam, and other circumstances attending a laundry should for the purpose of health and amenity be kept separate from the kitchen where food is stored and prepared and often eaten.

MINIMUM SIZE OF ALLOTMENT

One of the new provisions embodied in the Ordinances is that a Council may by resolution fix a minimum size of allotment on which a dwelling-house may be erected, but it is provided that the Council shall not fix the minimum lower than 2,500 square feet (25ft. x 100ft.). The Conference desires it to be clearly understood that, in this, as in many other provisions, it has fixed 2,500 square feet as the minimum, not as the ordinary standard. The Conference hopes, and fully expects, that wherever it is reasonable, as in most cases it will be, the council will fix a higher figure than 2,500 square feet. The Conference's duty, however, was not to fix the theoretically most desirable size and then impose that upon all the Councils, but in this direction to leave the Councils free to fix the size that was most reasonable in their own districts, and only to provide an irreducible minimum below which the Councils could not go. There are other provisions in the Ordinance where the Conference has followed the same principle, and the Conference desires that this explanation of the principle upon which they are based may be borne in mind.

RESIDENTIAL FLAT BUILDINGS

The Conference has dealt most carefully with the new provisions introduced to regulate the erection of what are called residential flat buildings here, and elsewhere are known as apartment houses. The Conference recognises that, unless the greatest care be exercised over the design (and the subsequent use and occupation) of buildings of this type, they may easily degenerate into a very undesirable condition, and possibly become a new type of slum to replace those which have been removed at great cost. The crowding together of large numbers of people in one building introduces many new and difficult problems for architects, health experts, and local governing bodies to solve. The Conference believes that the provisions which it has included in the Ordinance will be of distinct public service in this respect. These provisions stress the need for space, light, air, and drainage.

COMMERCIAL BUILDINGS - LIGHTING

With regard to commercial buildings, probably the most important provision is that by which it is hoped that adequate lighting shall be secured in order to preserve the eyesight of the workers who may be engaged in the building, adequate ventilation to preserve their health, and the limitation of height to prevent the undue darkening of one building by another on the opposite side of the street, and to prevent the undue concentration of traffic upon a few streets which will unduly accentuate the transit problem.

FIRE-RESISTING CONSTRUCTION

Another new principle affecting all classes of buildings is that which requires that a building of more than a certain height shall be of fire-resisting construction. This is common practice among the better class of building owners; but it is necessary that it should be the practice of all : and the Conference has included it for recommendation to the Governor for adoption. Similarly the Conference has included provisions which will ensure the addition of fire escapes to buildings where necessary; and will require that they be properly constructed to render useful service rather than to become

traps in times of emergency.

The conference also recommended to the Minister that its members be appointed a permanent building ordinance advisory committee, to consider proposed amendments, to consider new methods of building construction, and to advise Councils on architectural design if plans were submitted to the committee.

The recommendations of the conference were largely adopted by the Government. The ordinances were gazetted almost as drafted by the conference. An advisory Committee was appointed. Two significant recommendations were not adopted. The minimum height of rooms was maintained at ten feet. The minimum size of allotment for future subdivisions was set at 3,960 square feet.

7.3 ORDINANCE 70, 1921

Ordinance 70 was to apply to all municipalities, and all shires or portions of shires to which Part XI of the Act applied, except where Ordinance 71 applied. The ordinance had four parts: introduction, general provisions relating to all buildings, dwelling houses, and enforcement. The requirements it set out dealt with procedures for carrying out building work, site controls and town planning issues, structure and construction, health and egress.

7.3.1 PROCEDURAL REQUIREMENTS

The introductory clauses included a requirement that an application for approval to build should describe the use to which a building was to be put. The plans to be submitted were "a general plan and a block

plan", the block plan showing the building's relationship to site boundaries and other buildings on the site. The specification was to describe construction and materials, the method of drainage, sewerage, and water supply, and whether materials were to be new or second hand. Councils could require 48 hours notice for inspection of trenches before foundations were laid, foundations before covering in, and drainage before covering in.

Councils could order the opening, cutting into or pulling down of work believed to be in contravention of the Act or of any Ordinance. Costs were to be borne by the Council if the work proved to be not defective.

Prior to occupation, the Council was to be notified. A Council officer was to make an inspection and was to report to the Council whether the building had been erected without material deviation from the approved plans and specifications. However, the report was not deemed evidence that the Ordinance had been complied with.

Monetary penalties were set for building in contravention of the Ordinance, or for neglecting to comply with any provision of it.

In dealing with a class of building not provided for in the Ordinance, or with buildings exceeding two storeys or with walls more than 30 feet high, councils were to apply the provisions of Ordinance 71.

7.3.2 SITE AND PLANNING REQUIREMENTS

Building sites were to be healthy, not contaminated with faecal, animal or vegetable matter, and were to be adequately drained. Councils could require sealing of the ground surface; and could refuse or postpone approval to build until a site had been rendered dry,

sound and well-drained to the satisfaction of Council.

Building lines set by Councils were to be marked on plans and made available for inspection by the public. Councils could alter building lines because of exceptional site conditions or the nature of the building.

A three feet wide access was required, in unsewered areas, from a public road to the rear of all buildings, for the removal of night soil. For all dwelling-houses a three feet wide access was required for the removal of garbage.

Councils could, by resolution, prohibit the erection of non-masonry external walls in defined areas.

Councils were able to establish minimum allotment sizes for housing. The minimum area was to be at least 3,960 square feet. However, in a sub-division, if public garden or playground spaces were provided adjoining and within the sub-division, such area could be taken into account and credited proportionately to the adjoining allotments, provided the allotment area was not reduced to less than half the prescribed minimum area. On land already subdivided prior to the proclamation of the Ordinance, councils were to grant approval to build on sites of at least 1,500 square feet. On sites of lesser area, councils could grant consent by way of resolution giving reasons for regarding the case as exceptional.

A house was not to occupy more than two thirds of a site, and at least 500 square feet was to be left unoccupied. There were certain exceptions and variations on this rule permitted, such as permitting a dwelling over a shop to utilise a flat roof over the shop for open

space, and similarly including the flat roof of a low level garage as open space.

Where a window or door opening was to be provided in a side wall, the wall was to be set back three feet from the boundary, or five feet in the case of a dwelling of more than two storeys.

7.3.3 STRUCTURE AND CONSTRUCTION

In timber-framed construction, framing was to be at least three inches by two, and was to be suitably increased for a building of two or more storeys. Masonry walls or piers (or timber piers if permitted by Council), were to support timber framed houses. Galvanised iron or zinc plates were to cap the piers, if required by Council.

Proper footings were required for all walls. Footings at the base were to project each side at least half the thickness of the base of the wall, unless abutting an adjoining wall or boundary, when the projections could be omitted. Footings were to reduce to the wall thickness in regular steps, unless of concrete. The depth of footing was to be at least two thirds the thickness of the wall, although a Council could permit less for concrete. Nine inches was the minimum depth for footings.

External masonry walls were to be at least nine inches thick, except that walls of sheds, laundries, outhouses and the like, no more than ten feet high, could be 4 1/2 inches thick, if a Council so permitted. Cavity wall construction was permissible, provided the skins were securely tied together with wire ties, the cavity kept clean of mortar droppings, and weep holes provided.

Party walls were to be brick, stone, concrete, or other fire-proof material, and were to be nine inches thick, except for reinforced concrete walls which could be six inches thick. They were to extend to the underside of the roof covering. Structural timber was not to be placed closer than 4 1/2 inches to the centre line of a party wall.

Damp proof courses of lead, slate bedded in cement, or natural asphalt, were required, although a Council could exempt sheds, outbuildings and the like. The positions in which damp-proof courses and flashings were to be installed were nominated.

Clause 32 dealt with the underpinning and shoring of adjoining buildings, where a building was to be erected in close proximity. The building owner proposing to build was obliged to carry out such works, and had authority to enter the adjoining property at reasonable hours to carry out the work. The rights and responsibilities of the parties were dealt with in some detail.

7.3.4 HEALTH

Every habitable room was to have a volume of at least 1000 cubic feet measured below 10 feet in height. Habitable rooms were to be at least 10 feet high, although bays and inglenooks could be reduced to 6 feet 8 inches. Habitable rooms in a roof were to be 10 feet high for at least two thirds of their area, and not in any part less than 5 feet.

Lighting and ventilation requirements were also set out, and were developed from Ordinance 70A. The space under a timber floor was required to be at least 12 inches clear of the joists, and cross-ventilated. Every room was required to have at least 2 1/2 square inches of fixed ventilation for every 1,000 cubic feet of

space, provided by air bricks near the ceiling or by any other effective means.

Every habitable room, room or alcove for storing or preparing food, bathroom, laundry and privy-closet, was to have at least one vertical external window, at least the top half of which was to be openable. Other ventilation could be substituted in a pantry, with the consent of the council. Bedrooms with only one window were to be provided with cross ventilation of at least 24 square inches unobstructed opening in another wall, by a fireplace, fanlight, air brick or the like. The top of windows in laundries, kitchens and pantries was to be at least 6 feet 8 inches above the floor. Windows were to have a glazed area equal to at least one tenth of the floor area, and in addition, at least 10 square feet for kitchens, 6 square feet for laundries, 3 1/2 square feet for bathrooms, 2 square feet for privies, and 1 1/2 square feet for any other room. Any window, the top of which was more than 12 feet above ground or a slightly sloping roof, was to be able to be cleaned from inside the building. A council could order the alteration or repair of skylights in existing buildings.

Buildings were to be constructed so that they were capable of being drained. Rainwater was to be drained away from the building without causing dampness in walls or foundations, and sewerage was to be connected to the main sewer in accordance with the regulating ordinances, or where there was no sewer, was to be disposed as required by the council.

A kitchen and laundry were not to be combined in one room in any dwelling. Every house was to be provided with a completely enclosed bathroom, or combined bathroom and laundry, and with washtubs and

copper or other means of washing clothes, with water supplied to it. The floors of bathrooms, and of laundries above the ground floor, were to be impervious, graded and drained. Wash-tubs, copper and bath were not to be placed in the kitchen.

One bathroom in each house was to be at least 30 square feet in area, and a combined bathroom and laundry at least 56 square feet.

7.3.5 EGRESS

Egress from rooms for places of assembly, where not constructed under the Theatres and Public Halls Act, was specified in detail. Similar provisions remain in force today. A room with an area of at least 450 square feet, if on the first floor was to be provided with two exits, and if on higher floors was also to have access to two staircases connected to the ground floor, or one staircase and a fire escape. The total width of such staircases, exits and passages was to be 20 inches for every 600 square feet of floor area, with a minimum width for any exit of 3 feet 6 inches, and a maximum width of 10 feet. Risers were to be no more than 7 inches high, and goings at least 10 inches wide. Handrails were required each side of a stair, and over six feet in width a centre rail was required. Doors to such rooms were to be fitted with panic bolts, and were to open outwards.

Hospitals were to have at least two means of exit, as remote from each other as possible, with corridors and stairs of ample width for the removal of patients in the event of fire. A timber framed hospital was not to exceed one storey, and hospitals greater than two storeys were to be of fire resisting construction. The minimum width of doors in the path of egress was to be 3 feet 6 inches, and the minimum width of passage 4 feet. The building was to be planned so that occupied

beds could be wheeled or carried to the exits.

7.4 ORDINANCE 71, 1921

Ordinance 71 incorporated the provisions of Ordinance 70, and extended further controls over dwellings, residential flats, commercial buildings, hotels, hostels and lodging houses, to provide a more comprehensive act. The same basic issues were addressed. In addition, requirements for fire resisting construction were set out, and a requirement was made for the provision of fire fighting services in certain circumstances. Specific requirements regarding sites, town planning issues, construction, egress, health and amenity were set according to building types. Particular attention was paid to residential flat buildings, as construction of this building type was rapidly increasing.

The following discussion describes the requirements of Ordinance 71 which are additional to the requirements already discussed in 7.3 above.

7.4.1 PROCEDURAL REQUIREMENTS

The general plan submitted to Council was to be drawn at a scale of 8 feet to 1 inch and the block plan at 40 feet to an inch. The general plans were to show

a plan of each floor section and elevation of the building which shall indicate the height, design, construction, and provision for fire prevention and fire escapes, if any, the levels of the lowest floor and of any yard or open space belonging thereto, and levels of adjacent ground. (8)

7.4.2 SITE AND PLANNING REQUIREMENTS

Building height, measured from ground level at the centre of the front of the building, to the highest ceiling level, was not to exceed 100 feet. A parapet could extend 10 feet higher. Roof-top equipment, if not to a design approved by the Council, was to be included in the calculation of building height. Buildings taller than 100 feet were to comply with the Height of Buildings Act.

7.4.3 STRUCTURE AND CONSTRUCTION

Buildings greater than two storeys high, of steel or reinforced concrete construction, were to be erected in accordance with the Sydney Municipal Council by-laws of 1917.

Detailed requirements for brick, stone and concrete wall construction were set out in two parts (clauses 23 and 24) for the Domestic class and for the Commercial class. The first applied to dwellings, residential flats, hotels, hostels, lodging-houses, and shops no more than two storeys high. The second applied to all other buildings. The parts specified permissible maximum dead loads, and tabulated the wall thicknesses required according to mortar type, wall height, wall length, and position (storey) in a building.

Permissible practices regarding the construction of recesses in external and party walls, of recesses for elevators and stairs, and for chases in walls, were set out.

Where party fence walls were to be masonry, standards were set for the thickness of masonry in relation to height, the size and number of piers, and the footing required.

A table of allowable bearing pressures for various soil types was included in the general provisions, for use where the bearing pressure had not been tested.

7.4.4 EGRESS

Fire escapes were to be "tower-type" enclosed fire-resisting staircases for buildings over 100 feet high, and for buildings of lesser height could alternately be an external stair extending from the roof (if flat) or top floor to within 12 feet of the ground. With the permission of Council external stairs could overhang back lanes. Risers of external stairs were to be not more than 8 inches, and treads not less than 8 inches. Flights were to have no less than two risers and no more than sixteen, and were to be at least two feet clear width. Egress via the roofs of adjoining buildings to an escape at each end of a block was permitted where the building owners so jointly agreed.

7.4.5 FIRE RESISTING CONSTRUCTION

A building more than four storeys high was to be of fire-resisting construction. Walls were to be of brick, stone, concrete, or other incombustible material. Floors, flat roofs and stairs were to be built entirely of brick, stone, concrete, iron, or other incombustible material. Combustible materials were not to be used in partitions, lintels, lift doors and enclosures. However, timber could be used for floor finishes, handrails, doors and frames, window frames, trims and fittings.

7.4.6 FIRE FIGHTING SERVICES

Every building more than 75 feet high, where a public water supply was available, was to have means of boosting the water pressure for fire fighting.

7.4.7 RESIDENTIAL FLAT BUILDINGS

Part IV dealt with residential flat buildings. A building of not more than three storeys, or having a common flat roof, could occupy two-thirds of a site. A building greater than three storeys could occupy half the site, except where it had a common flat roof. Setbacks from side boundaries were 3 feet for the first two storeys, with an additional 18 inches for each additional storey.

Building height was not to exceed one and a half times the horizontal measurement from the part of the building to the alignment on the opposite side of the road.

Flat buildings not of fire-resisting construction were not to exceed four storeys. External and dividing walls were to be brick, stone, concrete or otherwise incombustible. Wood could be used in ten per cent of partition walls, in floors, stairs and joinery, but wooden floors were to have ceilings "of some fire-resisting material".

Requirements for kitchens, bathrooms and water-closets were set out. In a flat of five or more habitable rooms the water-closet was to be in a separate compartment (minimum width 2 feet 9 inches, minimum area 12 square feet). The minimum width of one bathroom in a flat was to be 5 feet and the minimum area 30 square feet. The length or width was to be increased 1 foot 6 inches where the water-closet was installed in the bathroom.

Privacy within flats was protected by requiring that bedrooms were to be separately accessible, and one bathroom and one water-closet were to be accessible without passing through a bedroom.

Walls and floors between flats were to be constructed "to minimise the conducting of sound". Dividing walls of brick, stone or concrete were to be at least 9 inches thick, or of two skins of terracotta with a two inch cavity.

The widths, lighting and ventilation of common halls (which served as means of egress) were set out in detail. The width of halls and stairs was to increase in proportion to the number of habitable rooms served, from a minimum of 3 feet 6 inches. Natural light and ventilation was required in the same proportions required in Part II for rooms.

Every residential building was to have "a yard at the rear, extending across the entire width of the allotment, open to the sky at every point..."

Permissible lengths and widths for both internal and external courts or shafts were tabulated relative to building height. Horizontal air intakes of specified size were required at the bottom of internal courts. Habitable rooms, kitchens and pantries were not to open onto a vent shaft. The required construction and drainage of shafts was also set out.

Residential flat buildings more than two storeys high were to have a fire escape in addition to the main staircase. A second internal staircase was acceptable in buildings of fire-resisting construction,

in lieu of the fire escape. For fire escapes the Ordinance provided that

Each such fire escape shall, subject to the special provisions of this clause, comply with the general provisions in Part II of this Ordinance; shall be so constructed as to be directly accessible from each flat which has not direct communication with the ground; shall be shut off by self-closing fire-resisting doors, which can be easily opened and shall have an automatic fastening capable of being readily opened from the inside; shall be so constructed that it shall not be necessary to pass the well or shaft of any staircase or unprotected lift shaft to reach the fire escape, and in such manner that a fire bursting through the windows or doors of any one room could not block both the staircase and the fire escape at the same time; and shall extend from the roof (if flat) or the top floor (in other cases) to the ground level.

In every non-fire-resisting building, where there are more than 80 habitable rooms above the ground floor, an additional fire escape as aforesaid shall be provided for every 80 habitable rooms or fraction thereof. (9)

In residential flat buildings not of fire-resisting construction, and of more than three storeys, adequate appliances and water supply were to be provided for fire fighting. Where a public main was available, a 4 inch rising main, with street level connections for the Fire Brigades' apparatus, plus 2 1/2 inch hydrants at each level "supplied with adequate hose, branches and fittings" was required. The main was to be unmetered, and placed in or adjacent to a staircase.

7.4.8 COMMERCIAL BUILDINGS

Part V dealt with commercial buildings, which could occupy the whole of a site. Height was limited to three times the least horizontal measurement from a part of a building to the middle of the road to which it had frontage.

Requirements for natural lighting were set out at length. Internal courts were to have a width of at least one-third of the height (minimum 10 feet wide). Length was to be three quarters of the width

of the site. Furthermore,

No part of any floor of an office, shop, factory, or workroom shall be distant more than 30 feet from an unobstructed window fronting a road, lane, or public place, or 25 feet from a window fronting an internal court - or laterally, from a roof light, other than one over a highest floor, the area of each of which shall be at least one-tenth of the floor area lighted by such window or roof light, and a roof light over a highest floor shall have a total area of at least one-twentieth of the floor area lighted by it. (10)

Under some circumstances the maximum distance to unobstructed light could be increased to sixty feet. Similar provisions, but requiring lower light levels, applied to warehouses and bulk stores.

Councils could require that permanent notices be displayed stating the bearing capacity of floors in commercial buildings.

Fire escapes were required in commercial buildings more than three storeys high, and retail stores and office buildings were to have additional fire escapes in the proportion of one fire escape for every 30,000 square feet above ground floor (60,000 square feet for buildings of fire-resisting construction). Councils could also require the provision of escapes in buildings three storeys high.

7.4.9 HOTELS, HOSTELS AND LODGING HOUSES

Part VI regulated hotels, hostels and lodging houses. Many of the controls applied to residential flat buildings were also applied to hotels, hostels and lodging-houses. In addition the number of bathrooms and their provision for each sex was regulated.

7.5 CHANGES IN BUILDING ORDINANCES

On the recommendation of the conference which had drafted the new ordinances, the Minister appointed an honorary Building Regulation Advisory Committee comprised of

Mr. James Peddle, F.I.A., Institute of Architects; Mr. Robert White Pickering, F.I.A., Institute of Architects; Mr. Edward Harman Buchanan, President, Master Buildings' Association; Mr. Finlay Elgin Munro, Vice-President, Master Buildings' Association; Mr. William T. Sturgess, member of the Carpenters and Joiners' Amalgamated Federal Council; Mr. Lionel Thomas Courtenay, President Local Government Association; Mr. Albert Robert Bluett, Secretary and Solicitor to the Local Government Association; Mr. Thomas Glassop, Secretary Shires Association; Mr. John Sulman, F.R.I.B.A., President, Town Planning Association; Mr. Walter Pearson Young, President of the Health Inspectors' Society; Dr. William George Armstrong, Acting Director-General of Public health; Professor Leslie Wilkinson, Professor of Architecture, university of Sydney; and Mr. John Garlick, Under Secretary for Local Government (Chairman). (11)

The functions of the Committee were to be:

(a) To consider any proposed amendments of the Ordinances under the Local Government Act relating to building, and to recommend whether or not they shall be made; (b) to consider new methods of building construction submitted to it, and advise whether or not such new methods should be permitted as an experiment or for permanent use, and if necessary to recommend amendments of the Ordinances so as to provide for such new methods; (c) to advise Councils in the matter of architectural design if plans are submitted to it; (d) to advise and, if the Committee think fit, to express an opinion upon any matter arising out of the Building Ordinances submitted by or with the concurrence of the Council. (12)

The Committee met regularly in the years that ensued, and reported to the Minister on a wide range of matters. The value of its deliberations in the process of developing and updating building regulations is demonstrated by its continued existence today. The Local Government Annual Reports give some indication of the operation of the Committee and the type of matters considered. Matters of varying import came before the Committee, some of them resulting in recommendations to the Minister or the drafting of new ordinances for submission to the Minister. We will not review in detail here the recommendations of the Committee, but will briefly note a few issues which it addressed.

In the mid twenties, over a period of some three years, the Committee prepared a draft ordinance for the regulation of hotels and hotel premises. It was eventually submitted to the Attorney-General for consideration at the end of 1925.

The Committee discussed the danger caused to buildings by excavations on adjoining properties. It was suggested that the ordinances should be amended to require a builder to provide adequate support to prevent movement or settlement of such buildings due to excavation, however, the Committee considered

the question was too large to be dealt with by ordinance, and the whole matter would need reconsideration when a general amendment of the law respecting building is proposed. (13)

The control of fencing was considered by the Committee and amendments were recommended to the Minister, the Solicitor-General having given an opinion that erection of fencing did not require approval by Councils. A Local Government Amendment toward the end of 1926 gave Councils full control over fencing.

The Committee also recommended that rather than Councils having to take a case to the Equity Court to obtain the demolition of building work done without permission, that the Act be amended

to give councils power to apply to a magistrate for an order for the demolition of any building or part of a building erected other than in accordance with the approved plans, and that such order may be made by the court at any time within twelve months of the commission of the offence. (14)

Forty-eight hours notice was required by the ordinances prior to the covering in of trenches, foundations and drains. Notice was also required upon completion. The Committee recommended that such notice be given in writing. The amendments were proclaimed on May 31, 1929.

Over a period of a few years there were discussions relating to "the betterment of flat life", apparently arising in response to the standard of accommodation being provided in some residential flat buildings. The Committee was concerned to provide for "greater air space" in flats, and adopted a suggestion that a verandah or balcony should be provided for every flat. In 1930, the Committee felt

that many of the flats being erected at the present time were detrimental to the health of the people. Flat buildings were erected on allotments on which Councils would not allow of the erection of semi-detached cottages. The committee finally decided that provision should be made in the Ordinances that every flat should be so planned that there should be at least one window, not less than 3 feet wide, with an area of not less than 10 square feet, which should be of a distance of not less than 40 feet from the boundary line of the allotment facing the window, and from which there should be an unobstructed outlook measured at right angles to the window for the said 40 feet... (15)

The amount of clear space left around flats also engaged the attention of the Committee. Ordinance 71 permitted site coverage of up to two-thirds, however,

It was pointed out that very often the ground remaining after the erection of the flat building is divided by the building into such small areas that it is practically useless for the purposes of ventilation or playground space. The Committee thought also that the Ordinances as at present framed favour the building of flats more than of cottages. After full consideration of the matter it desired to recommend that the minimum area of land which might be covered by a flat building should be half of the land, or where the open spaces, such as parks, beaches and the like adjacent to the building would not be sufficient, the council might require that the building should not occupy more than one third of the allotment. (16)

The Minister subsequently requested a report setting out the views of the minority on the Committee who did not favour the alteration. Mr. E. A. Scott, the representative of the Institute of Architects, agreed to submit a report for the Minister's consideration.

Ventilation of bathrooms and garages was under consideration by the

Committee, from about 1929 to 1934. There was considerable concern raised about the danger of carbon monoxide poisoning. Eventually amendments were drafted providing for additional ventilation in bathrooms in which gas heaters were installed, and the construction of gas heaters to avert the danger of carbon monoxide poisoning. Amendments of Ordinances 39, 70 and 71 were accordingly proclaimed on 24th November, 1933. Councils were empowered to require alterations of existing bathrooms or heaters to ensure adequate ventilation. In new building work, gas heaters were to have flues to discharge the fumes away from the bathroom. In multiple installations, heaters were to be separately ventilated. Bathrooms were also to be provided with additional fixed ventilation of at least 24 square inches.

In August, 1934 two young brothers died of carbon monoxide poisoning in an unventilated bathroom. As a result the Department sent circulars to Councils drawing their attention to the provisions of Ordinances 70 and 71, and particularly to Clause 2A of Ordinance 39, which empowered Councils to deal with bathrooms in existing buildings.

7.6 BUILDING IN THE CITY OF SYDNEY

The Sydney Improvement Act remained in force. The Sydney Morning Herald of June 4, 1930 carried an article entitled "City Building Act restricting operations: another contract held up". It described the decision of the directors of Hotel Australia Ltd., to postpone the extension of the hotel to Martin Place, pending the approval of a new act. The 1879 act was considered onerous and overly restrictive of development. Furthermore, the authorities did not have the legal power to vary the requirements of the act, even though some requirements were considered no longer appropriate to current building

practices. The Herald expressed the hope that the new act would be published as soon as possible, to give an incentive to the building industry, and thus to provide much needed employment.

Negotiations for the sanction of the plans for the new building have been proceeding for a considerable time between the architects and the City Council, the Chief Secretary's Department, and other official bodies, who have to be satisfied before any new building of importance can be erected in the city under the provisions of the Sydney Improvement Act of 1879. The hotel directors desired that the new building should have a ground floor level to conform with the main entrance from Castlereagh-street, but the authorities contended that the height of the building must conform with the mean level of the frontage to Martin Place. This would deprive the hotel of two stories compared with the Castlereagh-street entrance.

There were many other matters in dispute, all of which were eventually referred to the Government's legal advisers for solution, who informed the City Commissioners and the other officials concerned with the plans that the provisions of the Sydney Improvement Act would have to be strictly adhered to. It was, however, indicated that the Government had under consideration a draft bill submitted by the City Council for the amendment of the Sydney Improvement Act which would contain provisions more in keeping with modern building requirements than those in the 1879 Act, which was drafted when the usual means of building was hand-made bricks and lime mortar.

In the belief that this amending Act will shortly be passed, the directors of Hotel Australia, Limited, decided to postpone the letting of a contract for the new building, though provision had been made for the capital required for its construction. This is only one of many big building contracts that are being held up in the city owing to the harsh provisions of the existing building regulations. The aggregate amount of the more important contracts that are pending, and held up awaiting the amendment of the Sydney Improvement Act, is more than 500,000 Pounds.

The proposal that has been submitted to the Government is that the new regulations should be drafted by a committee consisting of representatives of the Government, the City Council, the Institutes of Architects and Engineers, the Fire Commissioners, and the Fire Underwriters' Association, the Master Builders' Association, and possibly the Electrical Employers' Association, and other bodies interested in modern building construction.

Representatives of the different organisations concerned in discussing the matter express the hope that the Government will see the necessity of giving immediate consideration to the passing of this Act. It is emphasised that the period of depression is passing, and that the new Act should be made operative at the earliest possible moment, so as to give an incentive to the building industry and allied trades during a time when there is considerable unemployment due directly to the holding up of real estate transactions and important building contracts.

The debate about the height of city buildings continued, as it had since the introduction of the Height of Buildings Act. Early in 1930 there was considerable correspondence in the Sydney Morning Herald from architects, engineers and valuers on the issue of building height limits. Many argued that the height limit should be raised from 150 feet to 200 feet or even higher. It was argued that the high valuation of city land necessitated higher buildings in order to obtain adequate return on investments in city properties. In many cases additional floor area was being obtained by excavating rock to provide two or three levels below street level.

The Chief City Commissioner, Mr. Garlick, expressed the concern of City Council about "the more serious and pressing problem of providing additional traffic accommodation for the rapidly increasing business population of the city area" (18). The expense of providing additional and improved traffic facilities was a major concern to the Council.

Some proponents of taller buildings had argued that building height should not be regulated by Parliament, but rather by Councils. Objections were voiced to this proposal by some people concerned that the city might suffer as a consequence of such a change:

The suggestion that the height of city buildings should be fixed by ordinance rather than by Act of Parliament is not viewed with favour in Civic Reform circles. It is contended that if the height of the various buildings were to be left to the discretion of aldermen then the different cases would be decided by log-rolling and "underground engineering" rather than on aesthetic and practical merits. (19).

In October 1930 a conference was held to discuss building height limitations. Representatives of the Master Builders' Association, the Fire Underwriters' Association, the Water and Sewerage Board, the City

Council, the Institute of Architects, and others were present. It was argued that current approaches to restricting building height were unsatisfactory:

Mr. Peddle, president of the Institute of Architects, said that there should be a more rational method of fixing the height of buildings. He thought that in streets like Macquarie-street, where there was so much open space opposite, there was no reason why buildings should not be higher. So far as buildings on the harbour front were concerned he saw no reason why they should not go up to indefinite heights.

Mr. Daw, of the Association of Constructional Engineers, agreed with Mr. Peddle's view. In his opinion the height could be conveniently limited in accordance with the width of streets. So far as getting over the fire brigade difficulty was concerned, provision could be made for special fire-fighting appliances above.

Alderman Garden cited New York as being singularly free from fires amongst the city's skyscrapers. Modern methods of construction, he said, rendered buildings particularly free from destruction from fire.

The conference agreed to recommend that the height of buildings should be made the subject of a City Council by-law instead of being restricted as it is now by Act of Parliament. (20)

At the General Meeting of the Institute of Architects on February 7, 1933, the question of whether aesthetic controls should be applied to building was debated. The issue was raised by the Institute's two members on the Advisory Committee preparing by-laws for the proposed new Building Act. They asked the Institute to clearly define a position.

One of the members, Leith McCredie, argued

I do not know why it should be necessary for us to discuss the advisability of Aesthetic Control in Sydney, for not only the qualified architect, but all who appreciate architecture as an art must be struck with the woeful lack of harmony in our city buildings, and it must be realized that if we are to improve the appearance of our streets, then some form of aesthetic control is essential.

The growth of building operations has been great in the past, and although a temporary check has occurred, there is no doubt that development schemes of the future will be considerable; and much that we see around us today will disappear completely to give place to the new, and large sums of money will be

expended in this reconstruction.

It is not too much to demand that these changes be made only with proper regard to the future appearance of the city, and the welfare of its citizens.

If all this work is to be carried forward in the uncontrolled and slipshod methods of the past, and without co-operation between adjoining property owners, and architects, then we may give up hope of ever seeing our city made beautiful.

I realise it is difficult to convince the ordinary layman and even some of those who are practising our profession, that control of any kind should be exercised over design.

And it is particularly difficult in a city where economic and other commercial considerations place art in a subsidiary position...

Sydney building owners and architects alike have been neglectful in this direction, as will be seen when one walks through our streets for the extraordinary lack of thought displayed as to adjoining storey and window heights is painfully evident.

It is not right that we should erect buildings which clash with their surroundings and are out of step with their neighbours.

Sydney, in common with other Australian cities, suffers through lack of co-operation in building matters, and it would be to our advantage if control such as they have in other parts of the world were introduced here...

It is little use trying to console ourselves with the thought that each building may be beautiful in itself, for even beautiful buildings, if jumbled together without thought and each out of keeping as to feeling and material with its neighbours, will result in an unpleasing whole...

The general effect of buildings should be considered in regard to the general good, and in this building owners could assist by exercising moderation and a common-sense attitude towards an art with which the whole community must live.

If it cannot be done voluntarily by the individual, then I see no reason why it should not be forced upon him, just as he is compelled to keep his premises clean or report infectious diseases for the common good.

There is nothing new about aesthetic control, for all important cities overseas have properly constituted authority to guard the interests of their citizens in the matter of building, as in other things.

It is only that we in Australia lag far behind...

For many years European city buildings have been under aesthetic control and the beauty of Paris today is due largely to the realization that control of this sort was essential for harmony in architecture.

Many German States exercise control over design and in Prussia

regulations prohibit the alterations of old buildings as well as the erection of new ones in such a manner as to cause disfigurement to the towns, while in Berlin it is not possible to construct buildings that would be out of harmony with each other or existing good work...

Some of the Continental regulations are very extensive, and cover such things as colour and visible material as well as form; but whatever their extent, it must be admitted that it results in good.

Aesthetic control of buildings has been established for many years in Sweden, Holland, Denmark and Switzerland, while restrictions in one form or other are not unknown in England and America.

We in Sydney have control of nearly every conceivable thing except that of aesthetics.

I do not suggest for one moment that we should have a hard and fast code of aesthetics, for this would be farcical; but there is little doubt in my mind that some measure of control is essential. How far it should be extended is difficult to determine, and for this reason the Advisory Committee now sitting for the purpose of drawing up regulations under the new City of Sydney Building Act has written to various cities abroad, asking for information as to the scope of their regulations and the methods of putting them into operation...

Without control, some measure of protection might be gained in the future if only registered architects are permitted to lodge designs with the authorities for building approval; but as things stand at present, some other method is required if we are to gain harmony in our buildings and an improvement in the appearance of our city. (21)

In a Board of Aesthetic Control, or whatever name it might be given, I can see strength to the architect and a never-failing bulwark to his profession.

The other representative on the Committee, Mr. Green, adopted a similar position.

Another architect, Mr. Waterhouse, proposed that

As the "city is, so are its citizens" and it is our duty as architects to endeavour to establish control over all factors which mitigate against a right appreciation of civic order thus stultifying the understanding of such important matters in the rising generation. Let us have control, and that speedily. To that end I suggest a committee of two architects and one layman as sufficient to exercise the essential control and give advice to the Council. (22)

Mr. Rankin, engineer and Deputy Building Surveyor of the City of

Sydney, said

People in Sydney are very much against restrictions. You will find that if one architect will not put up a particular building wanted by a client, he will get another architect who will do it. I feel there will be necessity for control of some sort, and I think it must be left to some authorities to definitely control the owners in their desires to obtain returns higher than are justifiable in the interests of all concerned. Regarding the Board, I feel that it should be a big one. (23)

Mr. C. W. Chambers opposed the general trend of the discussion. He thought that a Building Act

... should embody everything that is necessary for the proper control of building in the city. As regards height and so forth, regulations should be such that they leave no room for argument as to what the height of buildings should be. It should not be necessary, in my opinion, if the architect is a trained man, that he should meet with criticism by his brother architects as to what is right and what is wrong with his work. If you are going to pass architects' work by a large committee or a small committee, there will be heartburning in the process. The last speaker very wisely said that we have to get our plans through in the shortest possible time, and also that the material is very often forced on the architect by the clients. I think that we all agree that the aesthetic side of architecture would be a very wonderful thing if it could be achieved, but I think the architects themselves should try to protect that side of the work. (24)

Similarly, Mr. Munnings argued

While in favour of some form of aesthetic control of buildings, I feel that in attempting to do so we are likely, unless very careful, to flounder in the quicksands of uncertainty. There appears to be no consensus of opinion on what is good or bad design, and architects themselves are hopelessly divided, if not antagonistic, in their judgements thereon. Professor Hook is probably right in stating that we are already so overburdened and hamstrung by regulations and restrictions in all phases of life that people would accept, without protest, any regulations of aesthetics put forward. That may be, but the main obstructions would not come from the people or public, but from the architects concerned. After all, practising architects, who are responsible for most of our buildings other than houses, are now registered, and presumably fully qualified in all branches of their work, and, speaking as a layman, it seems peculiar that the further regulation of architects' efforts should be necessary; it suggests incompetence. If aesthetic control is to be successful, then it is essential that architects at least should be of one mind and in agreement on the essentials of good design, and I really think this too much to expect of them. (25)

Further discussion ensued, after which Mr. Waterhouse moved a resolution,

That, in the interest of civic improvement, it is desirable to have embodied in the proposed City of Sydney Building Bill a provision for the formation of a Civic Design and Advisory Committee. (26)

Opinion was evenly divided and the motion was lost on the casting vote of the President.

7.7 SYDNEY CORPORATION ACT: BY-LAWS

At the end of August 1931, three by-laws under the Sydney Corporation Act relating to building were substituted for earlier by-laws. They related to the demolition of buildings (By-law 33), awnings (By-law 22), and composite steel and concrete and steel framing construction (By-law 31A). A new by-law (By-law 30) was introduced, regulating floor space and size of rooms in flats. It provided that one room flats were to be at least 172 square feet, and of a cubic capacity of at least 1,548 cubic feet.

Of the substitutions, the most significant was that governing reinforced concrete and steel framed construction. It rescinded by-laws 1103 to 1107 inclusive gazetted on November 30, 1917. In reinforced concrete design, the code included a new section on flat slabs, embodying all the latest developments in that type of construction.

The main alterations to the code involved an increase of about 12 per

cent in permissible stresses in steel. In 1928 the American Institute of Steel Construction had increased its permissible tensional stresses, in the light of improved methods of steel manufacture, metallurgical research, and increased structural engineering skills. Major cities, such as New York and Chicago, followed the Institute's lead. Building proclaimed,

...the City of Sydney has now placed itself in line with the progressive cities of the world... The importance of these revisions will be fully appreciated, when it is realised that it will mean a saving of some 12 1/2 per cent on the costs of structural steel for a building, and the City Council is to be congratulated, not only on the progressiveness of its policy, in keeping Sydney abreast with the most progressive practice abroad, but also in providing a fillip to the building industry at a time when it is most sorely needed. (27)

1. Act No. 61, 1919
2. Wilcox, M., The law of land development, 1967, discusses the history and scheme of Part XI, describing at some length the legal implications of the provisions of the Part. See pp 419-452.
3. Section 313
4. Section 318
5. Sandercock, L., Cities for sale, 1975, pp.82-83. Sandercock's book provides a valuable analysis of the development of town planning in Australia.
6. Ibid. pp84-85.
7. Browning, R.J.; Bluett, A.R., and Peddle, J., Regulations and Law as to the Erection of Buildings in New South Wales, pp. 7-13
8. Ordinance 71, clause 4(e)
9. Ibid., clause 70(b) and (c)
10. Ibid., clause 75(b)
11. Ibid., clause 75(b)
11. NSW Local Government Annual Report, 1922, cl.224
12. Ibid., cl.225
13. Ibid., 1927, cl.188
14. Ibid., cl.190
15. Ibid., 1930, cl.163
16. Ibid.,. 1931, cl.137
17. Sydney Morning Herald, June 4, 1930
18. Ibid., March 26, 1930, p.11
19. Ibid.
20. Ibid., October 28, 1930, p.8
21. Architecture, March 1, 1933, pp 84-85
22. Ibid., pp 85-86
23. Ibid. p.87
24. Ibid. p.88
25. Ibid.
26. Ibid.
27. Building, October 12, 1931, p.70

1934-1974

8.1 SYDNEY CORPORATION (AMENDMENT) ACT, 1934

Part XV of the Sydney Corporation (Amendment) Act, 1934 dealt with town planning and building regulation. It became effective on January 1, 1935. The City of Sydney Improvement Act was repealed to the extent to which it was inconsistent with Part XX of the principal act as amended, or any by-law made under it. The final reprinting of the Sydney Improvement Act occurred in August 1958, some 79 years after its gazettal.

The Minister for Local Government, in his first reading speech before the Legislative Assembly, described the significant features of the bill as they affected the regulation of building:

Revision of the building laws of the city are long overdue, and the City of Sydney Improvement Act of 1879, under which the City Council now operates, is hopelessly out of date. The provisions now submitted follow very closely the lines of a bill that was prepared by the City Council itself some years ago, and was re-drafted by the Civic Commissioners in 1929. It is not proposed that this bill shall interfere with the powers of the Chief Secretary's Department in regard to theatres and public halls, the regulation of the height of buildings, or with the Fire Brigades Board, in regard to fire prevention, etc. The building regulations will not, generally speaking, apply to buildings already erected or in course of erection when the Act comes into force, but certain provision respecting fire prevention is being made with regard to existing buildings. Neither will they apply to a building where council's approval has already been given to the erection if the building is commenced within six months and completed within twelve months after the commencement of the operation of the part of this bill that deals with building regulation. The bill provides power for the City Council to appoint a building advisory committee. This will be a committee of experts, and the bill provides that it shall consist of fourteen members, representative of every phase of the building industry. These

members will be appointed for three years, and will include representatives of public departments concerned in such matters as public health, fire protection, and similar public services. The bill sets out the functions of the committee, and prescribes the procedure for its meetings. It provides that the City Building Surveyor shall be the executive officer of the council over building regulation, and he will be ex officio a member, and the chairman of the Building Advisory Committee.

This committee may and, if required by the council, shall make recommendations as to the suitability of existing by-laws, the advisability of making new by-laws, and any amendments to existing statutes. This committee will be appointed by the council subject to the fact that the bill prescribes the various organisations that will have the right to nominate members to the committee. The bill contemplates that the council shall adopt the recommendations of the Building Advisory Committee in regard to by-laws, which will then be administered by the City Building Surveyor as the executive officer of the council in that regard. There is, however, provision in the bill for the constitution of a board of appeal, which shall be appointed by the Governor and shall hold office for three years. This board of appeal will consist of a chairman, an architect, a structural engineer, and a master builder, and shall not include an employee of the City Council. A member of the Board of Appeal must not sit on any appeal in which he is interested and the bill contains provision for alternative members in cases where a regular member must temporarily retire pending the hearing of a certain appeal.

Division VI of Part XX defines the matters in respect of which the council may make by-laws. These will be found to cover practically every phase of building. The greatest freedom has been allowed to make by-laws in regard to building so as to allow of their being amended to deal with the latest conditions. In this connection, it should be noted that the council must first obtain a report from the Building Advisory Committee before making a by-law, and this committee will be representative of all the interests that are concerned in the erection and regulation of building. (1)

There was considerable debate of the bill, particularly with regard to the establishment of a Board of Appeal. Several members, led by the leader of the Opposition, Jack Lang, attacked the credibility of a Board of Appeal which would have an architect, a structural engineer and a master builder as members. It was argued that inevitably conflicts of interest, and "crook" builders, engineers and architects, would result in improperly influenced decisions being made. There was concern too that the Board would usurp the City Council's power and responsibility:

The board of appeal was another source of protest. Thomas

Shannon saw the proposed authority as a source of jobs for interested persons. When it became known that expenses for appeals against council building regulations would be met out of city funds there would be appeals 'ad lib'. Furthermore the board would possess overriding powers and could therefore ignore the council completely, and Lang described the proposed board as a 'super-veto council'. (2)

The Act provided to the City Council many of the powers provided to local government by the Local Government Act, 1919, as amended. These included the control of the opening of public ways and subdivisions, the proclamation of residential districts and the zoning of permissible land uses, control of the use and occupation of buildings prior to completion and the ordering by the city building surveyor of work to be done.

By Division 3 of the Act, Council was given comprehensive powers to control and regulate the erection, demolition, and use and occupation of buildings in the city. Division 6 scheduled 50 aspects of building for which the Council was empowered to make by-laws. By-laws made by the Council were to be submitted to the Governor for approval, then gazetted and laid before both Houses of Parliament. Either House could by resolution disallow all or part of a by-law.

With regard to buildings existing or under construction before the commencement of the Act, if it appeared to the city building surveyor that in the event of fire, the means of egress or the provision of automatic sprinklers or drenchers would be insufficient, he was to report to Council, recommending what work should be done. Council, if it so elected, could require such work as it considered appropriate, by serving a notice on the property owner. The owner or any affected person could appear before the Board of Appeal, which could adopt the recommendations with or without modification, or could reject the recommendations. Upon adoption by the Board, the recommendations

became binding.

Larcombe, in his history of local government, commented on the complex mechanisms of the Act:

Rather elaborate provisions were drafted for building regulation. Firstly there was to be a Building Advisory Committee, appointed by the council for three years, consisting of the city building surveyor and nineteen members comprising a wide range of interests in building construction. The chief functions of the committee were concerned with by-laws, statute amendments or the drafting of new legislation. The council was empowered to control and regulate the erection, demolition, use, and occupation of city buildings. Machinery was provided for appeals against the council's actions, to a Board of Appeal, consisting of four members appointed by the governor for three years from bodies such as the Institute of Architects, Institution of Engineers and the Master Builders' Association.

The act finally listed fifty matters relating to building about which the council was empowered to draft by-laws. (3)

8.2 DEVELOPMENTS IN ORDINANCES 70 AND 71, 1934 - 1946

Ordinance 70 was originally drafted to provide a simple instrument of building control for country and outer suburban areas. Ordinance 70 was to apply to the Sydney Metropolitan District and the Newcastle District, and provided more detailed controls for the more complex building of the cities. By 1946 building in country areas had advanced considerably, and on the recommendation of the Building Regulation Advisory Committee, Ordinance 70 was repealed on January 11, 1946, and Ordinance 71 was amended to apply also to those areas to which Ordinance 70 previously applied.

There were few significant developments in the preceding decade, in part because of the constraints placed upon building construction during World War II. Amongst developments which did occur were the inclusion of a code nominating structural timber sizes, and the

restriction of the proclamation of "brick areas".

In February 1939, following a recommendation of the Local Government Association annual conference and subsequent recommendation of the Building Advisory Committee, the ordinances were amended to require the use of 4 inch by 2 inch studs, plates and rails in external walls. Many protests were made to the minister against the use of 4 inch by 2 inch framing, and following a report by the Committee, the ordinances were amended (December 20, 1940) to again permit 3 inch by 2 inch timbers in single or upper storey walls. Lower storey walls were to be 4 inch by 2 inch. In 1945 a reconstituted Committee considered recommendations of the Forestry Commission and the Master Builders' Association, and a code was subsequently inserted in Ordinance 71 (on August 30, 1946). The code provided minimum sizes of finished timbers, both softwood and hardwood, for studs, plates, rails, floor joists and bearers, rafters, roof battens, purlins, struts, ceiling battens, and other structural elements.

From 1925 councils had power under clause 18 (f) of Ordinance No. 70 and clause 22 (f) of Ordinance No. 71, to define any portions of their areas, and by resolution to prohibit in those portions the erection of buildings with external walls of materials other than brick, stone, concrete or similar materials. These portions were commonly known as "brick areas".

Many councils made wide use of these provisions, and "brick areas" were defined in some cases which embraced practically the whole of a council's area. Frequent complaints were received of the burden of additional costs placed on home builders by the necessity of erecting houses in brick, in many cases in very sparsely settled districts. The effect of the definition was to set up a particular kind of

residential district, although in the case of all other residential districts the approval of the Governor was needed before they could be proclaimed. The relevant clauses were consequently amended on 24th October, 1941, to require councils to first obtain the approval of the Governor before defining portions of their areas as "brick areas."

The Local Government Annual Report printed in December 1951 commented:

Of recent months, with the increasing cost of erecting dwellings and the continuing difficulty in obtaining materials, particularly bricks, the Department has become concerned at the probable retardation of building by the definition of new "brick areas", and councils which have applied for approval to such definitions have been informed that the Department is most reluctant to add to the burdens of prospective home builders by the definition of further "brick areas" with their consequent severe restriction on the type of buildings which may be erected, and increased costs.

The provisions of the Ordinance permitting the definition of "brick areas" were originally placed there as a safeguard against fire risk in heavily built-up areas and were not intended to be applied so that only the "best class of dwelling" might be erected. Councils have wide general powers under the provisions of section 313 of the Local Government Act, 1919, regarding the design of buildings and materials used in their construction, and those powers reasonably used should go as far as councils need for dealing with the type of construction in any particular area.

Since the amendment of clause 22 (f) in 1941 requiring the approval of the Government to be obtained, "brick areas" have been defined with the Governor's approval in three municipalities and one shire in the Sydney metropolitan area and in thirteen municipalities and twelve shires elsewhere in the State. (4)

8.3 BUILDING REGULATION ADVISORY COMMITTEE 1934-1946

The Committee addressed a number of issues over the period and particularly in the immediate post-war period. The most important issue was the better regulation of residential flat buildings. The Committee's extensive discussions and development of recommendations for appropriate controls were eventually to result in the gazetting of

the Local Government (Regulation of Flats) Act, 1940, which provided improved powers for councils to control the standard of residential flat development:

Prior to 1940 councils had general powers to control and regulate the erection of buildings, including residential flat buildings, within their areas, but these general powers of control were found to be inadequate to deal with the special problems presented by residential flat buildings. Ordinance No. 71 contained a number of special provisions applying to such buildings, including a requirement that a residential flat building might be erected 3 feet from the boundary of the allotment if one or two storeys in height, and for every additional storey above two it was required to be set back an additional 18 inches. If, however, there were no windows or doors in the side wall it might be erected with the side wall adjacent to the side line of the allotment.

The indiscriminate erection of flat buildings throughout the suburbs of Sydney set up a state of congestion which, if allowed to continue unchecked, must inevitably have led to slum conditions. The Local Government (Regulation of Flats) Act, 1940, therefore, enabled the Governor, on the application of a council, to divide a residential district into zones and to prohibit the erection or use in any zone of a residential flat building unless it conformed with the standard prescribed for that zone. The amount of area of the allotment such a building might occupy was to be proportionate to the number of storeys in the building, and its total floor plan area must not exceed one and one-half times the total area of the site. In addition, no residential flat buildings could be built nearer to the side boundaries of the allotment than 5 feet for the first two storeys, except where the council was prepared to allow a building containing shops to be spread right across the frontage. In 1945 Parliament increased the minimum distance of 5 feet to 7 feet 6 inches from each side boundary. (5)

The regulation of flats will not be further considered here. The history of the regulation of residential flat development is well documented elsewhere (6) by P.S. Samios.

Almost all building ceased during the war years and consequently few issues arose. The Committee therefore did not meet over an extended period to May 1945. Over the years preceding the war the interests represented on the Committee changed. With increased membership the Committee tended to become unwieldy, and the interests sectionalised. Further bodies sought representation. It was evident toward the end

of the war that close scrutiny and expert attention to building would be required as soon as restrictions were lifted (7). Accordingly, the Committee was reconstituted on May 23, 1945, and comprised representatives of the Department of Local Government, the Housing Commission, the Department of Public Health, the Government Architect, the Royal Australian Institute of Architects, the Master Builders Association, the Building Workers' Industrial Union, the Board of Fire Commissioners, the Local Government Association and Shires Association, the Institution of Health Surveyors, and the Institution of Engineers.

8.4 SYDNEY CORPORATION ACT BY-LAWS

The procedure by which by-laws were made under the Sydney Corporation Act of 1934 is described in a Report of the Department of Local Government:

In August, 1939, the Municipal Council of Sydney made application for the approval of his Excellency the Governor to proposed By-law No. 31 under the Sydney Corporation Act, dealing with building regulation. This by-law was made by the Council following a report and recommendation on the subject by the Building Advisory Committee appointed under the Act and was designed to replace a number of other by-laws concerning building regulation.

The proposed by-law was referred by the Department for the opinion of the Attorney-General but owing to the voluminous character of the proposed by-law and by reason of the pressure of parliamentary business, the Attorney-General was unable to give it consideration and the Council decided to make a procedural by-law (By-Law No. 50) giving the necessary powers to implement Part XX of the Sydney Corporation Act so as to bring it into operation by prescribing matters required to be prescribed and to withdraw and redraft By-law No. 31 and resubmit it in individual sections for the Governor's approval during 1942 and 1943. They dealt with the following matters: Classification of buildings and general building restrictions, light and ventilation, means of egress, materials, loads and stresses, construction and safeguards during construction, fire protection and fire prevention, chimneys and flues and incinerators, and sanitary accommodation.

The draft by-laws were referred to the Attorney-General's

Department for opinion as to their legality but subsequently after discussion were returned and referred to the Government Architect for report on their technical aspects as a result of which a number of suggestions were made. The Board of Health also suggested certain amendments of By-law No. 58 (Sanitary Accommodation). The council adopted the suggestions with a few variations including in the by-law dealing with light and ventilation, provisions relating to height of buildings and restrictions of areas of allotments to be covered by residential buildings, space for yards, etc.

The proposed by-laws were again referred in October, 1944, for the Attorney-General's opinion and they finally received the approval of the Governor on the dates mentioned later in the paragraph....

By-law No. 50	9-5-41	"Building Regulation (Building Applications, Plans and Specifications)."
51	9-8-46	"Building Regulation (Classification of Buildings and General Building Restrictions)."
52	17-1-47	"Building Regulation (Light and Ventilation)."
53	15-2-46	"Building Regulation-Means of Egress."
54	5-1-46	"Building Regulation (Materials, Loads and Stresses)."
55	22-2-46	"Building Regulation-Construction and Safeguards during Construction."
56	15-2-46	"Building Regulation-Fire Protection and Fire Prevention."
57	15-2-46	"Building Regulation-(A) Chimneys and Flues, (B) Incinerators."
58	15-2-46	"Building Regulation-Sanitary Accommodation." (8)

8.4.1 BY-LAW NO. 50

By-Law No. 50 set out the information which Council required in an application for a Certificate of Approval to build. Council was to provide the Certificate within thirty days. The format of a Certificate of Occupancy application was set out, which was to be submitted if permission was required to use or occupy a building prior to completion.

By-law No. 50 was omitted on January 30, 1953, being replaced by Ordinance No. 86 (City of Sydney - Building Regulation [Building Applications, Plans and Specifications]).

By-law No. 51 classified buildings as public buildings, residence buildings or commercial buildings. It nominated three types of construction: light, ordinary and fireproof. Light construction (timber-framed or other lightweight construction) was permitted for only a very limited range of single storey buildings (such as greenhouses and builders' site sheds). Ordinary construction (external walls of masonry or reinforced concrete, internal structure having timber or unprotected steel or iron components) was basically limited to buildings of two storeys (and hospitals, schools and public garages of one storey) and maximum 10,000 square feet per floor. Fireproof construction (bearing walls, fire walls, party walls, isolated piers, columns and wall supported girders: 4 hours fire resistance rating; beams, floors, roofs, walls, girders: 3 hours; fire partitions: 2 hours), was required for buildings more than two storeys high (and for two storey hospitals, schools and public garages). Public garages in fireproof construction were not to exceed 10,000 square feet per level, public buildings 15,000 square feet, and commercial buildings 20,000 square feet.

Building area was not limited if compartmented by fire walls. The permissible area was increased by 100% where a building was single storey or equipped with automatic sprinklers, and an increase of 200% was permitted where both criteria were met.

Public and commercial buildings of load-bearing brickwork greater than three storeys high were to have the external walls laterally supported by cross walls at intervals of no more than 28 feet. Buildings over five storeys were to be of framed fireproof construction. The roofs of commercial and residential buildings up to five storeys high were

required to be non-combustible but not required to be fireproof.

The By-law also described permissible projections beyond the building line.

8.4.3 BY-LAW NO. 52

By-law No. 52 dealt with the dimensions and ventilation of habitable rooms, windows, building height, open spaces and courts, and mechanical ventilation.

Habitable rooms were generally to have a minimum area of eighty square feet and a minimum volume of 720 cubic feet. Habitable rooms (other than the kitchen) in dwellings were to average 100 square feet. The kitchen was to be at least 48 square feet, and one room was to be at least 144 square feet. Habitable rooms were to be at least six feet wide and nine feet high.

Detailed requirements were set out for the lighting and ventilation of offices, shops, factories and business and workrooms; water closets, slop sinks and urinal compartments; bathrooms, alcoves, stairways and common halls; and rooms below footpath level.

Building height was restricted to 100 feet in a declared Residential District, and 150 feet elsewhere.

The permissible site coverage of residential buildings was specified, as was the size of rear, side and front yards. Minimum dimensions for internal and external courts were nominated, together with the area of air intake required for internal courts.

Mechanical ventilation was permitted as an alternative to natural ventilation. Rates of air change were specified according to room use. Performance requirements for air conditioning were also tabulated.

8.4.4 BY-LAW NO. 53

By-law No. 53, dealing with means of egress, specified the number of exits required, their location, and whether they were to be interior (non-fire-isolated) stairs, fire-isolated stairs, exterior stairs, or horizontal exits. A formula was established for determining the potential population of a building, according to use, and thus the number of exits required. No point on a floor was to be more than 100 feet travel from an exit (150 feet in a sprinklered building). In high fire hazard buildings the maximum travel distance was 80 feet (100 feet in a sprinklered building). Standards of construction were set for each type of exit. Exterior stairs were only to be used on existing buildings, and only where another type of exit could not reasonably be provided.

8.4.5 BY-LAW NO. 54

By-law No. 54, dealing with materials, loads and stresses, rescinded By-law No. 31A of 1931. It was a comprehensive structural design code to regulate design in reinforced concrete, structural steel, masonry and timber, and to regulate welding. The updating was not before time. As early as April 1935, Mr. Dudley Ward, an architect who had spent some time overseas studying the latest developments in architecture,

pointed out in a paper read at the last meeting of the New South Wales Chapter of the Royal Australian Institute of Architects, that the by-laws governing concrete construction in

Sydney were so far behind the recognised practice in other countries that, on the basis of comparison of results achieved by new methods of mixing concrete, Sydney builders were compelled by regulations to use about three times the amount of concrete necessary. It was certainly, he said a grave matter when they considered the millions of pounds spent on concrete construction in Sydney buildings, to realise that two-thirds of the material used was waste due to obsolete regulations...

Mr. Ward gave illustrations to show that the regulations governing structural steel, as well as reinforced concrete, were unnecessarily expensive for property-owners and prevented the adoption in Sydney of modern construction principles now generally applied in the leading cities of the world. He recommended an early revision of the Sydney building regulations. (9)

8.4.6 BY-LAW NO. 55

By-law No. 55 rescinded earlier by-laws No. 495, February 2, 1904, and No. 33, August 21, 1931. It dealt with construction methods and safety during construction. It described required practices for the protection of excavations and the support of neighbouring buildings and walls during excavation. It set out standards and methods of construction for brick and stone masonry, hollow block walls, bonded and veneer facings, mortar, cavity walls, and wall thicknesses. The required thicknesses of masonry walls (external and party walls, and internal division walls), were scheduled according to building class, and length and height of walls. Standards for timber construction were set out. A number of miscellaneous requirements were enumerated, including the use of damp-proof courses and the partitioning of separate occupancies. Safeguards required during construction and demolition were set out. Adequate sanitary conveniences and drinking water was to be provided for workers.

BY-LAWS NOS. 56, 57, 58

By-law No. 56 (fire protection and fire prevention) dealt with the determination of fire resistance (by the Standard Fire Test), the

provision of fire equipment, requirements for ordinary and fireproof construction, the protection of openings in external walls, the construction of shafts and of various roof structures.

By-law No. 57 dealt in detail with the construction of chimneys, flues, fireplaces and incinerators.

By-law No. 58 rescinded by-laws 496 of February 2, 1904 and 685 to 687 of September 4, 1907. It described toilet facilities to be provided, specifying numbers of fittings in proportion to building population. Bathroom accommodation to be provided in residential buildings was specified.

8.5 BUILDING OPERATIONS AND BUILDING MATERIALS CONTROL ACT, 1946

Arising out of the acute post-war housing shortage, and the strong demand for new buildings, which far outstripped the resources available, assent was given to the Building Operations and Building Materials Control Act on January 16, 1946.

Under the Act, building work was not to be carried out, except with the consent in writing of the Minister. Certain buildings were exempted from this requirement: a dwelling house outside the major city and near-city areas (schedule one of the Act), to be used as a permanent residence; a dwelling house within the scheduled areas to be used as a permanent residence where the gross area did not exceed 1200 square feet for timber framed structures, or 1250 square feet for brick and concrete structures; a dwelling house to be used by a primary producer in the locality where his primary production was carried out; structures not costing more than 500 pounds used for primary production; sewerage or drainage connections ordered by a

local government authority; and building work related to an existing house and not costing more than 150 pounds. The Minister, at his absolute discretion, could revoke, suspend or vary the conditions of his consent. He was also empowered to give directions regarding any building operations, whether consent had been granted or refused, and could direct suspension or discontinuance of work. He could further require the furnishing of information, from the person on whose behalf work was being carried out, and from any architect, builder, contractor, engineer, or any other person employed in an advisory or supervisory capacity.

An architect, builder, contractor or engineer employed in any capacity, was not to carry out any work associated with a building operation unless consent had been obtained or was not required. Proper and accurate books and records were to be kept, with all invoices, vouchers, agreements, correspondence and documents, until their destruction was authorised by the Minister.

The co-operation of local government bodies was required. The Minister could require them not to approve plans until a consent under the Act had been obtained, to make a return to the Minister detailing particulars of any application, and to make a report to the minister where there was cause to believe building was being done without consent, or contrary to conditions of the Minister's consent.

Controls were also applied to the use of building materials. In the County of Cumberland and other gazetted areas, neither common nor face bricks were to be used, except for the foundations, floor piers, walls, porches and chimneys of dwelling-houses; workshops, factories, public works, hospitals, schools, day nurseries, baby clinics and kindergartens, subject to quantity limits approved by the Under

Secretary; and structures for which it was proved to the Under Secretary that other materials were unsuitable. Brick suppliers were only to supply bricks to projects having local government authority approval.

The Minister was further empowered to require, by notice in writing, any owner or holder of building materials to sell, supply or deliver such materials in accordance with priorities set out by the Minister, within a nominated time and to specified persons or classes of persons.

The Act was repeatedly extended, in periods of three months, until September 1952.

The Australian Housing Bulletin reported extensively on "the building materials problem in Australia", in its issue of September 21, 1950. The introduction gives an indication of some of the shortages being experienced in the industry:

It has been evident for some time that Australian production of key building materials, especially steel products, sawn timber, asbestos cement sheets, bricks, roofing tiles and fibrous plaster sheets, has not been sufficient for an expanding programme of new houses, commercial, industrial and public buildings and civil engineering works. To some extent these deficiencies in production have been concealed because since the end of the war building activity has been concentrated mainly on housing. In terms of value, some 85% of construction has been housing and only 15% all other types of building. Pre-war housing constituted about 45% of the output of the Australian building industry. In the last five years the erection of factories, schools, hospitals, etc., has been heavily restricted because of the need to devote materials to the greatest possible extent to the housing programme.

The immediate problem is to increase sharply the volume of non-residential building while maintaining a steady improvement in house-building. Demand for new housing is still increasing and it will be necessary to obtain substantial numbers of houses to supplement local housing activity in the next few years. The importation of houses and other buildings, e.g., prefabricated schools, hospitals and factories, together with much of the labour needed to erect them, can be only a temporary expedient, but will be of great value in a period when the local building industry should be expanding to meet from its own resources the new high level of demand for houses and other buildings. The problem facing the industry is to

secure balanced production of all materials required for this building programme. Of the materials in common use for construction, probably the most critical shortages are in timber, steel products (including reinforcing rods), clay products and asbestos cement sheeting. Other shortages, which are particularly reflected in the delays associated with house construction, are water and gas pipes for mains and reticulation, and earthenware pipes for sewerage and drainage purposes.

An examination of present levels and future prospects of key materials production shows at once that there are likely to be serious obstacles to securing adequate, balanced supplies of building materials for the expanding programme of building and construction over the next ten years. (10)

8.6 POST-WAR BUILDING REGULATIONS, 1946-1951

Following its reconstitution in 1945, the Building Regulation Advisory Committee spent considerable time bringing building regulations up-to-date. Ordinance 70 was repealed and Ordinance 71 extended in application. Some amendments arose out of the post-war shortage of building materials, and some out of changing technologies and practices. Many of the changes reflected the immediate concern with housing construction and the need to achieve adequate accommodation in the most economic manner.

8.6.1 MAJOR CHANGES

The major changes made to Ordinance 71 are summarised below:

Brick on edge.- An important amendment carried into effect on 19th July, 1946, enabled the internal walls and the inner skin of the external walls of one-storeyed buildings or of the upper storey in two-storeyed buildings to be constructed in brickwork three inches thick, viz., brick on edge. All such walls must, however, be built in cement mortar. It was estimated at that time that this would result in a saving of about 70 Pounds in the cost of an ordinary dwelling.

Air-conditioning.- The Ordinance now contains provision (proclaimed 11th January, 1946) for the installation of air-conditioning and mechanical ventilation of buildings, in accordance with modern engineering practice, provided the council is satisfied with such means of ventilation.

Experimental types of construction.- Another amendment

(proclaimed 19th July, 1945) authorised a council to grant approval to the erection of a dwelling-house involving a type of construction not in conformity with the requirements of the ordinance, provided that the council is satisfied as to the structural soundness of the building, and the site is not a brick area. This amendment was designed to permit the use of new types of construction which are considered suitable for dwellings subject to proper safeguards. The council may require the applicant to erect such a dwelling to lodge a fee of not more than ten guineas to meet the cost of investigation as to whether the building will be structurally sound.

Divisional walls-timber construction buildings.- Provision has also been included in the Ordinance (on 30th August, 1946) that where the dividing walls of a one-storeyed timber-framed building are constructed of timber, the studs must not be less than four inches by two inches spaced with eighteen-inch centres, and the four-inch space must be packed to the council's satisfaction with sound-proof, fire-resisting and vermin-proof material. This is primarily to cover the case of a timber-framed building which is to be divided into two or more flats.

Cement concrete roofing tiles.- With the difficulty in obtaining suitable roofing materials, it was anticipated there would be an increase in the number of cement roofing tile manufacturers. As a measure of protection against inferior quality provision was included in the Ordinance on 25th July, 1947, requiring all cement concrete roofing tiles to comply with a standard specification approved by the Department of Local Government. In addition, each tile must be clearly and permanently stamped with the manufacturer's name or registered trade mark, and to the effect that it complies with the standard specification.

Steel frame construction.- Although Ordinance No. 71 prescribes the minimum thicknesses of timber used for building purposes, and the maximum spacing of various timber components used in buildings of timber frame construction, no provision was included dealing with steel frame construction. The Ordinance now contains a provision which covers steel frame construction (proclaimed 26th September, 1947).

Scale of fees.- Strong representations were made by certain councils and the Government Statistician that the scale of fees set out in clause 4 3/4 to be lodged with applications for approval of plans and specifications of new buildings should be increased as those fees, which had been in operation since 1924 were not commensurate with councils' expenses to-day in issuing permits and in carrying out inspections, etc. The Ordinance was amended to double the fees (subject to a maximum of 5 Pounds), and this amendment became operative on 1st April, 1948.

Habitable rooms and kitchens.-Clause 30 sets out the size and cubic space of habitable rooms in buildings. The clause has been amended to provide that the minimum shall apply to habitable rooms other than kitchens, and a further provision has been included which prescribes varying minimum sizes for kitchens in residential flats and dwelling houses, according to the number of habitable rooms in each. (Proclaimed 30th April, 1948).

Steel corrosion.- A new clause has been inserted in the Ordinance requiring suitable protective measures to be taken where structural steel members used in building construction, and bars in reinforced concrete beams and columns, are subject to corrosion. (Proclaimed 29th October, 1948).

Occupation of building before completion.- An important amendment was made to clause 83 (proclaimed 29th October, 1948) whereby councils may permit the use and occupation of buildings which have not been completed in accordance with the approved plans and specifications. The amendment is designed to allow, as a temporary expedient, the use of substitute building materials which do not comply with the standard usually required by a council, or the erection of part of a building only. A council which permits a temporary relaxation in building standards may, at any time, give six months' notice of revocation of such permission and a daily penalty rate of five Pounds may be imposed for occupation of a building without the council's permission. (11)

8.6.2 STANDARD SPECIFICATIONS

The Committee also developed a series of standard specifications for use in conjunction with the ordinance, covering types of construction with which the ordinance did not deal:

Important amendments to Ordinance No. 71 permit the use of methods of building construction which were not contemplated when the Ordinance was originally brought into force. Councils now have power to approve the erection of one-storey concrete domestic buildings with walls of less than the thickness prescribed in the Ordinance, also the erection of buildings not more than two storeys in height in materials other than brick, stone or concrete, provided in each case the buildings are constructed in accordance with specifications issued or approved by the Department from time to time. The following specifications have so far been issued:-

Standard Specification No. 1.- A preliminary specification only, issued in April, 1946, for the manufacture and use of precast concrete masonry units (solid blocks only). This specification was replaced by Standard Specification No. 4, which covers more comprehensively both solid and cavity blocks.

Standard Specification No. 2.- For the use of no-fines concrete in single-storey domestic buildings.

Standard Specification No. 3.- For precast concrete slab walls (Type I), using slabs of limited width extending in a single length from floor to roof level and having no additional supporting framework in the plane of the wall.

Standard Specification No. 4.- Replaced Standard Specification No. 1 for the manufacture and use of both solid and cavity precast concrete masonry units.

Standard Specification No. 5.- Precast concrete slab walls (Type II), which deals with complete wall units, as distinct from Standard Specification No. 3 for precast concrete wall panels.

Standard Specification No. 6.- Concrete slab or block walls (Type III), for the use of concrete slabs or blocks which have an additional supporting framework in the plane of the wall.

Standard Specification No. 7.- For the use in single-storey domestic buildings of steel members forming the framework or cover for any foundations, floor, walls, ceiling or roof, such members replacing either partially or entirely the timber, masonry, brick or other members or parts normally used in traditional construction.

Standard Specification No. 8.- Concrete walls (Type IV) for the use of concrete (excluding no-fines concrete) poured in situ for the walls or partitions of domestic buildings not exceeding one storey in height.

The Committee was greatly assisted in its consideration of the Standard Specifications by the Commonwealth Experimental Building Station, Ryde, which gave the Committee the benefit of its experience and advice in the form of recommended codes of practice. The co-operation afforded by the Station was invaluable.

In addition to the specifications abovementioned a further standard specification was issued by the Department to deal with burnt clay and shale bricks. The issue of this specification followed the introduction in Ordinance No. 71 of a definition of "brick" which includes a masonry unit, a concrete brick, a sand-lime brick, or a burnt clay and shale brick which complies with the appropriate specification approved by the Department. The Standards Association Interim Standard Specification No. 306-1948 "Precast Concrete Masonry Units" has been adopted for concrete bricks and No. 315-1949 for sand-lime bricks.

In view of certain complaints received by the Department with regard to the manufacture of burnt clay and shale bricks, provision has been included in clause 14 which makes it an offence for a brick which does not comply with its appropriate specification to be used in any building.

Councils' powers under the Local Government Act and Ordinance No. 71 relate to the control of the use in buildings of materials for which minimum standards are prescribed. The question of controlling the manufacture of such materials has been taken up with the Department of Secondary Industries and Building Materials. (12)

Certain other issues were considered by the Committee in some detail. Amongst those issues were the minimum height of ceilings (an issue discussed here in part 8.8); the enclosure of verandahs and balconies;

the specification of standards for damp-proof course materials; the compartmentation of factories, granaries, mills and commercial buildings for fire protection; the construction of hotels, hostels and lodging houses; the sealing of buildings to prevent the entry of rats; and the provision of stairways in multi-unit residential buildings.

8.6.3 HEALTH

On September 30, 1949, the ordinance was amended in response to a growing trend to enclose balconies and verandahs without regard to light and ventilation, to require that adequate light and ventilation must be provided according to use (i.e. to comply with the ordinance requirements for habitable rooms, bathrooms, laundries and the like).

After a conference with the Board of Health, and on the recommendation of the Committee, Ordinances 70 and 71 were amended in September 1940 to require that dampcourses comply with a standard specification approved by the Board of Health. In July 1946 further amendments were made regarding the use of damp-proof course materials. The Board of Health specification had been framed only with specific types of dampcourses in mind, and it was not an appropriate test for the new dampcourses, such as bituminous coated metals, which were developed because of the acute shortage of lead. The Committee undertook the preparation of a comprehensive specification for all types of damp-proof course materials. A new clause 21, controlling the use of, and materials for, dampcourses was proclaimed on March 30, 1951.

As floor joists built into the inner skin of a brick cavity wall often left gaps, giving rats access to the building, the ordinance was amended, resulting in the practice of seating bearers on engaged piers:

During 1946, the attention of the Committee was drawn to the fact that when dwellings of brick or stone were being erected it was frequently the practice to lay the floor joists so that they rested directly on the brickwork of the inner wall of the external cavity wall, with the result that often a gap was left in the brickwork, or, if the timbers shrank, a gap was caused through which rats or other vermin entered the building from the cavity. The position did not arise with respect to timber dwellings. On the recommendation of the Committee the Ordinance was amended by the insertion of a new clause, 18B, which prohibited the building of floor joists straight into the walls of buildings where the underside of the joists was less than six feet above the inside level of the ground adjacent to the base of the wall. This meant that where the distance referred to was less than six feet the joists would need to rest independently on suitable timber plates supported by means of ventilation walling, sleeper piers or corbelling out of brickwork, or other suitable method.

Subsequently, the Department's attention was drawn to the practice employed by some builders of leaving a brick out of the inner cavity wall for under-floor ventilation instead of inserting a vent brick. As this also gave vermin easy access to buildings in the same manner described in the previous paragraph, Ordinance 71 was further amended and provision inserted in clause 33 (a) requiring the use of effectual methods to prevent the harbourage of rats. (13)

8.6.4 COMPARTMENTATION

The fire protection of factories, granaries, mills and commercial buildings by compartmentation, in a similar manner to that required in the City of Sydney By-law 51 was the subject of much consideration and debate:

One of the most difficult and contentious questions referred to the Committee arose out of a resolution passed at the 1948 annual conference of the Local Government Association, proposing that factories, granaries and mills, etc., and their contents, should be protected from fire hazard by fireproof divisioning of floor space or area to enable outbreaks to be isolated and controlled. The object of the proposal was to restrict as far as possible the spread of fire in large buildings, particularly where inflammable materials were used. The record of fires in such large buildings in this Country and overseas, involving loss of life and property, is long and disastrous.

The Board of Fire Commissioners supported the principle of fireproof divisioning of floor space, the principle having long been embodied in By-law No. 51, applying to the City of Sydney, which dealt with area limitations for commercial buildings. After lengthy consideration the Committee recommended that as an interim measure Ordinance No. 71 should be amended by the inclusion therein of provisions for the fire-proof divisioning

of floor space in factories, granaries, mills and other such buildings, with particular reference to the fire risks attached to the storing or handling of materials producing graniferous inflammable dust, public garages and commercial buildings of non-fire resisting construction. The recommendation provided that if the building was divided into sections by fire walls or fire partitions, the limitations in floor area would not apply if the sections did not exceed the limits laid down and the limits could be exceeded if the height of the building was restricted or automatic sprinklers installed. A new clause, 11A, embodying this recommendation, was inserted in Ordinance No. 71 on 27th January, 1950.

Subsequently representations were made to the Department by the Chamber of Manufactures of New South Wales, the Association of Consulting Structural Engineers of New South Wales and by practising architects, that whilst the basic intention of the clause was unquestionable, certain modern industrial processes, involving quite negligible fire risks, were impracticable within the maximum areas allowed in the new provisions. Suggestions were made that the provision should be varied to cater for proposed important industrial developments in the State requiring larger floor areas than were contemplated by the provisions, particularly such industries as motor and aircraft assembling, steel rolling mills and engineering and textile industries. It was pointed out also that the division of floor areas prevented installation of crane runways and the mechanical transfer of goods from one section of a factory to another. It was represented that it was fundamentally important to, for example, motor assembling, that the cars and their accessory parts should be produced by continuous processes, both longitudinally and laterally and that the new provisions requiring the divisions of such a factory by fire walls into areas not exceeding a maximum of 30,000 square feet would produce completely unworkable conditions.

The Committee reviewed the provisions and recommended that Clause 11A be amended in certain respects which preserved the primary purpose of preventing the spread of fire by the limitation of floor areas in any case where inflammable materials were stored in bulk or processed or from which explosions were likely to arise in the event of fire, but which left unrestricted in floor areas those buildings, including types of industrial buildings requiring large floor areas, where fire hazard was negligible. The Committee also recommended the inclusion of provision enabling a council, if it were in doubt as to whether the requirements of the clause should apply in any particular case, to require the applicant for approval to erect or alter a building to furnish a certificate from the Board of Fire Commissioners that satisfactory provision had been made for the structural restriction of the spread of fire, and upon production of such a certificate, the council, by resolution, could exempt the building from the requirements of the clause. A further provision enabled the clause to be applied in any case where an existing building was proposed to be used at any future date for the purpose of storing in bulk or processing inflammable materials within the meaning of the clause.

Wool was included in the list and representations were made regarding the operation of the clause so far as the erection of wool store buildings was concerned. The representations

stressed that the major consideration in wool store construction from the technical aspect was the provision of satisfactory light on the top floor - known as the show floor - so that wool shown to the buyers for sale could be displayed with the maximum efficiency. From the point of view of economy in operation, everything possible was done to minimise the distance a bale of wool had to be moved whilst in the store, as handling was principally a manual operation and entailed considerable labour costs. It was pointed out that the existing requirement of the clause for internal fire walls would greatly interfere with the light on the top floor by the creation of shadow and would increase handling costs.

The Committee examined these representations carefully and after inspection of wool store buildings in the city area, agreed that the representations were of sufficient weight to justify special treatment in the Ordinance. The Committee recommended that clause 11A be amended by the inclusion of a provision which would not break down the basic purpose of the clause but which would permit the construction of a wool store building having an unlimited floor area without increasing the fire risk in comparison with the existing requirements of the clause. Under the proposed new provision, it is intended that a wool store building may be unlimited in floor area provided that the building is of fire-resisting construction and sprinklers are installed throughout, except that the roof may be of ordinary construction, if the roof trusses are of steel or other non-combustible material.

The Committee's recommendation was approved by the Minister and at the 30th June, 1951, action was proceeding towards the proclamation of the amendment.

As mentioned earlier in the explanation of clause 11A, the existing provisions of the clause are regarded by the Committee as of an interim nature, as the Committee considers that the matter is of sufficient importance to justify some restrictive measures whilst further extensive investigation is made into the nature and effectiveness of similar building codes in force in other cities overseas. A special sub-committee established for the purpose of reviewing the existing provisions of the clause in the light of administration, and to examine building codes obtained from overseas having similar limitations for fire protection purposes, is continuing its activities. (14)

8.6.5 RESIDENTIAL FLAT BUILDINGS : EGRESS AND CONSTRUCTION

Following submissions from the Housing Commission, whose buildings were not legally required to comply with the ordinance, regarding its practices in the construction of residential flat buildings and the provision of means of egress in such buildings, to which a number of councils had objected, the Committee extensively reviewed the provision of means of egress from residential flat buildings. The

Ordinance was accordingly amended to better define the factors affecting egress, and to require flat buildings greater than two storeys high to be of fire-resisting construction:

Clause 55 of Ordinance No. 71 formerly permitted residential flat buildings to be of non-fire resisting construction subject to certain conditions regarding height and materials. Clause 61 contained provisions regarding the width and number of internal stairways based on the number of habitable rooms in the building. Clause 70 contained further provisions relating to the provision of external fire escapes or a second interior stairway if the residential flat building exceeded two storeys in height.

The Housing Commission pointed out that several councils had challenged the commission on its omission of a second stairway in residential flat buildings. In all Commission plans every flat had direct access without the use of corridors to the main stair hall. Such planning complied with the requirements of former clause 61, but it meant that a second stairway included as a fire escape would have to open off the same hall as the main stair and therefore its value in the event of fire would be greatly minimised. The City Council's by-laws permitted the omission of a second stairway in flats of this nature if they were fire-resistant, as were the Commission flats. The Commission was of opinion that the expense incurred and the slight advantage offered did not justify the inclusion of a second stairway in such cases.

The Committee considered at length the question of exits and fire escapes in residential flat buildings in conjunction with the relevant City Council by-laws, which generally adopt floor areas and number of occupants as the basis. To meet modern requirements of exits and fire escapes, the Committee recommended that the Ordinance be amended to -

- (1) limit to two storeys the height of residential flat buildings which were not of fire resisting construction;
- (2) relate the provision for egress from residential flat buildings to such factors as the height of the building, the nature of the construction, the planning of the building and the number of habitable rooms;
- (3) define the kinds of exits which should be provided, for example, interior stairways fire-isolated stairways, passageways and doorways; and
- (4) prescribe minima in respect of materials, heights, widths and other relevant details in respect of such exits.

Appropriate amendments of Ordinance No. 71 incorporating the Committee's recommendations were proclaimed on 30th June, 1950.
(15)

8.6.6 HOTELS, HOSTELS AND LODGING HOUSES

The Committee also devoted considerable time to updating building regulations affecting hotels, hostels and lodging houses.

On 23rd December, 1949, Ordinance No. 71 was amended by inserting new Parts VI and VIA which included all relevant matter relating to the construction of these types of buildings.

The new provisions relating to hotels defined the minimum size of an allotment of land on which any hotel might be built as 3,000 square feet, or such higher minimum as the council might fix in respect of different portions of its area. The hotel must not, if erected in an established residential district, exceed five storeys in height unless the council specially permitted otherwise. Provision was also included dealing with such matters as the proportion of the site which might be covered, courts and vent shafts, fire-resisting and sound-proof construction, fire exits and halls. Any hotel, portion of which was more than two storeys high, must be of fire-resisting construction and every hotel three or more storeys high must have alternative stairways, and one fire-isolated stairway must be provided for every 10,000 square feet of floor area. These provisions were concurred in by the licensing Court prior to proclamation.

A hostel or lodging house was defined to mean a building used or constructed as the common habitation for a number of unrelated persons and containing more than fifteen bedrooms. Large boarding houses were covered by this definition and these buildings were subject to a number of the same requirements as hotels, such as fire-resisting construction, courts, stairways, passageways, and so on. (16)

8.7 LOCAL GOVERNMENT (AREAS) ACT, 1948

The Act, amongst other functions, repealed the Sydney Corporation Act and amended the Local Government Act. Regulations and by-laws made under the Sydney Corporation Act continued in force and were deemed to have been made under the Local Government Act, and were deemed ordinances under that act.

Special provisions applying only to the City of Sydney were incorporated in the Local Government Act. They provided certain powers which the City Council had previously had under the Sydney Corporation Act, 1934. The new section 317D of the Local Government Act gave the Council power to order the upgrading of means of egress

and the improved provision of automatic sprinklers or drenchers, in buildings erected on in the course of erection before January 1, 1935. The section, and following sections 317E to 317J, were drafted on the basis of division 5 of the 1934 act, with essentially only minor procedural changes being made.

Sections 317K to 317Z constituted a Board of Appeal for the City of Sydney, in similar terms to Division 4 of the 1934 Act, thus ensuring continuity of the Board's operation.

8.8 CEILING HEIGHTS

The minimum permissible height of ceilings was a matter much discussed over a long period. The post-war period saw a concerted effort by architects, building researchers and others to argue the case for a reduction in minimum ceiling height from 9 feet to 8 feet. The limited availability of resources at the time provided added reason for the proposed reduction. The Australian Housing Bulletin, No. 4, 1947, published "a study of practical ceiling heights in small houses". It argued that ceiling heights had been subject to considerable variation in the past, influenced by both aesthetic design and economy, but that they "appeared to bear no direct relation to any scientific or health considerations". The study discussed various considerations and concluded:

1. The effects of the accumulation of carbon dioxide in rooms with low ceilings need not be considered under normal conditions of natural ventilation.
2. Removal of expired air, odours and smoke which rise towards the ceiling is best accomplished when opening window heads are close to the ceiling. This is more likely to be the case with low ceilings than with high, unless very tall windows are used.
3. Discomfort from high relative humidity bears no relation to

the height of ceilings and can be alleviated principally by the provision of suitable air currents at the level of the occupants, either by natural air currents or fans.

4. Adverse effects of radiation from ceilings can be controlled by the provision of insulation in the roof and/or ceiling, irrespective of the ceiling heights. (17)

The Building Regulation Advisory Committee discussed the issue at length in the late forties and early fifties. After consideration of the issues, and of a code for prefabricated houses prepared by the Commonwealth Experimental Building Station (which provided for 8 feet ceilings), the Committee was not prepared to recommend a reduction in ceiling heights:

The minimum height permitted for ceilings varies in the different States. In Canberra the minimum was recently reduced to 8 feet, but the cubic space of rooms was required to be not less than 720 cubic feet measured below 8 feet, which is the same minimum cubic space required in this State where it is measured below 9 feet. In Western Australia and Queensland, outside the City of Brisbane, the minimum height is 9 feet. In the City of Brisbane every habitable room must now have an average height of 8 feet 6 inches. In South Australia the ceilings must be at least 9 feet for not less than 80 per cent. of the area of the room. In Tasmania, following a request by the Royal Institute of Architects, the minimum height of ceilings was reduced from 9 feet to 8 feet. In Victoria the minimum is prescribed at 9 feet for the ground floor and 8 feet 6 inches for floors above the ground floor.

The advocates of the reduced ceiling height stressed that the lower ceiling height would conserve building materials and reduce costs, at the same time increasing the rate of construction.

After exhaustive examination of available information on the question of saving of materials and costs, the advisability of insulation for 8-foot ceilings, the matters of practice and structural design and particularly the absence of scientific evidence as to whether a reduction in the height to 8 feet would be detrimental to the health and comfort of the occupants, the Committee was not prepared to recommend a minimum height of less than 9 feet. (18)

The Housing Commission gave some impetus to the move for change when it built twenty houses with 8 feet ceilings, following authorisation by the Minister for Housing, Clive Evatt in December 1948. This

action was roundly criticised by opponents of a reduction.

In June 1958, following similar attempts by others over the preceding decade (19), the issue was revived by Ku-ring-gai Council, which adopted a resolution calling for the minimum ceiling height required by Ordinance 71 to be reduced from 9 feet to 8 feet.

There was much discussion of the issue in the press. The idea received support from individual architects, the Royal Australian Institute of Architects, and leading architectural academics such as Henry Cowan (20) and H. Ingham Ashworth (21). Again considerations of comfort, ventilation, heating, psychology, aesthetics and economics were argued. Sydney architect J. D. MacIntosh wrote:

The 9ft ceiling is costing this State millions of pounds annually and is undoubtedly helping to prevent many people from building their own houses.

The saving per house is, of course, variable. It will depend on the overall size of the structure and the length of internal and external walls. It is true to say, however, that the range of saving on family houses being built today will be from over 100 Pounds in the small timber frame job to over 350 Pounds in the larger brick houses.

Stepping out of the domestic field for a moment, it is obvious that in large city office blocks and apartments we gain one additional storey of accommodation for each present eight 9ft ceiling height storeys, without increasing the overall height of the building. This is a most important factor in its town planning implications.

The 9ft ceiling is imposing hardship on our large population seeking houses and flats, lessening the return investors can obtain on building projects, and wasting this State's resources.

Aesthetically an 8ft minimum will result in better looking houses because their height will be reduced. Popular public opinion constantly refers to the "ranch" type American house and all sorts of efforts are made to increase the width houses occupy on their sites. The major factors contributing to this effect are low-pitched roofs and 8ft ceilings. (22)

Professor H. Ingham Ashworth argued that a reduction in ceiling height to 8 feet would enable another 750 families to be housed in New South

Wales each year with the same expenditure (23). In an editorial the Sydney Morning Herald attacked the government for its failure to lower the minimum height of ceilings, and indeed its failure to undertake any serious review of building regulations in order to cut the cost of home-building, which continued to be a significant problem:

Mr. Landa says that lower ceilings, abolition of separate laundries, and greater use of timber would considerably reduce the cost of home-building. Undoubtedly he is correct. It seems, however, that his views as Minister for housing carry little weight. As far as lower ceilings are concerned one of his colleagues, Mr. Renshaw, disagrees with him, and considers that 9ft ceilings should be retained. It must be hoped that Mr. Landa persists with his advocacy of an 8ft minimum; the weight of expert evidence is certainly on his side, and it is simply ridiculous that Mr. Renshaw should hold fast to out-of-date regulations.

These regulations, which govern building standards and designs throughout the State, should have been thoroughly overhauled and rewritten long ago. They ignore, almost completely, the advances of many years in architectural and building techniques. One strikingly symptomatic example was given recently by the secretary of the N.S.W. Chapter of the Royal Australian Institute of Architects, who pointed out that every house must contain "air bricks" near the ceiling. These, he said, were compulsory in gaslight days to disperse fumes. What are we to say of people who insist on retaining such a regulation?

Essentially, perhaps, that they must be shaken out of their absurd obstinacy. This needs to be done in several levels. There is, first, the State Government level. In matters of taste and design, nobody (one is tempted to say after 17 years' experience) can be more bottomlessly ignorant, more immovably reactionary, than the members of a Labour Government. They are not interested in improving Sydney aesthetically; they give no lead to local councils; they pay lip service to the idea of reducing building costs, but look with the utmost suspicion on any practical suggestions made with this in view. (24)

In 1958 a conference was held of representatives of all public organisations interested in housing, to recommend proposals to end the State housing shortage. Arising from the conference the NSW Housing Advisory Committee was established. In the report of the committee released by the Premier on June 23, 1959, the reduction of minimum ceiling heights to 8 feet was recommended. The government concurrently announced that it would reduce minimum ceiling heights,

but would require all 8 feet ceilings to have 2 inches of slag wool or equivalent insulation. This condition was widely attacked by architects, builders and the press, who argued that, desirable as insulation was, it was not essential and was no more necessary in an 8 foot high room than in a 9 foot high room. Furthermore, many of the cost benefits of reduced height would be negated by the additional cost of insulation. The amendment became law on September 19, 1959.

Following an extensive survey, the Advisory Committee was satisfied that insulation of eight feet ceilings, while desirable for comfort, was not essential for health. With the concurrence of the Department of Public Health, Ordinance 71 and By-law 52 were amended (February 23, 1962) to omit the mandatory insulation requirement, instead allowing councils to require insulation where they considered it necessary.

8.9 UNIFORM BUILDING REGULATIONS

In 1950 the Premiers' Conference agreed to joint action to compile a model building code, in order to work toward some consistency and uniformity in building regulations throughout Australia, in the hope that more efficient and economic construction would result:

Because of the impact of Australia's heavy defence, migration and development commitments on the building industry, it is clear that the fullest and most economical use must be made of building materials and manpower, both of which are below requirements, and that the way must be kept open for the adoption in housing and other forms of building of new techniques and materials that are more efficient and economical than their traditional counterparts, while losing nothing in soundness and durability.

With this aim in view, the State Premiers, whose Governments are primarily responsible for the oversight of building regulations, expressed, at the recent Premiers Conference, their approval in principle of (i) the compilation of a Model Building Code that will serve as a foundation of technical knowledge on which State and municipal authorities may base the drafting or revision of their own building regulations, and

(ii) immediate consultation between the Commonwealth and the States on the need for urgent action to liberalise and standardise the application of building regulations to permit the greatest practicable degree of freedom in the adoption of new constructional methods and materials, subject to the approval of the appropriate Government research organisations.

The Premiers' Conference decisions reflect the importance of building regulations in the present structure of the building industry, an importance of which the building industry itself is fully aware...

The generally accepted purpose of building regulations is to set out the minimum requirements that may reasonably be enforced under penalty, with the aim of safeguarding the community against unhygienic practices, unsafe building methods, use of defective or inadequate materials, etc.

The concept of building regulations, while fundamental and essential, is basically negative, since it visualises building regulations as establishing the limits within which architects, engineers and buildings may operate.

Since the tendency has thus been to emphasise the negative function of building regulations, the type of building code most commonly used in Australia today is virtually a complete series of specifications, giving detailed and explicit directions to the builder. This type of code offers adequate protection against malpractices, but tends to be rigid and conservative, and so to place undue restriction on skilled designers.

The Building Research and Development Advisory Committee of the Department of Works and Housing, which consists of representatives of the building industry and research establishments, as well as Architectural and Builders' Organisations, has drawn attention to defects in most existing building regulations of the specification type, that are tending to impede technical progress, delay building operations and add to the cost of building.

These include -

- * inconsistency and anomalies among the by-laws of various authorities;
- * the restrictive nature of the specification type of regulations;
- * the lack of adequate provision for keeping regulations abreast of modern developments;
- * rigidity of administration.

With the acceleration of technical progress during and since the war, there has come along a growing realisation that building regulations may fulfil a positive function far wider than the negative purpose already described. E. D. Simon quotes the British Standard's Institution's Codes of Practice Committee's definition of the objects of a comprehensive Code of Practice -

(a) To secure in the general public interest that buildings are suitable for their purpose, have satisfactory appearance, appropriate length of life, fit in with the communal provision

of services and provide effectively for the health and safety of the users, the neighbours and the public.

(b) to secure in the general public interest that waste in the use of labour and materials is eliminated.

(c) to provide a basis for the correct use of materials.

(d) to secure the proper use of new materials where there is not a sufficient basis of professional and craft experience in their use to ensure that they are suitably employed.

Something of the same broad and positive principles might well be applied to building regulations, thus extending the function of regulations from the mere discouragement of unsound practices to the active encouragement of the fullest use of new methods and materials.

As an alternative to the "specification" type of code, the adoption of some kind of "performance code" has been widely advocated. This type of code would lay down results rather than methods, stating what performance must be achieved by each structural part, or what general principle must be observed. It would rely on the skill of the designer and builder and the vigilance of the building inspector to ensure that the required results were obtained. Regulations of this type would tend to stimulate and facilitate the use of new methods and materials, since both would be approved automatically if proof were given to the building inspector that they were capable of achieving the standard of performance laid down in the code...

As already mentioned, vital building materials, e.g., brick and timber, and building labour are inadequate to meet the heavy and growing demands upon them. It is essential that the best use should be made of both locally produced and imported materials, and of the existing labour force. The experience of other countries with similar post-war problems, e.g., the United Kingdom and Western Europe - shows that considerable economies may be achieved by such innovations as the use of reduced timber sizes and wide spacing of timber members in housing, new types of roof construction, reduced ceiling heights, the wider use of concrete for internal and external walling, and the adoption of a high degree of factory fabrication. Building regulations in this country, however, do not permit the widest adoption of sound economy measures of this nature, even when Australian research organisations have approved them after exhaustive enquiry. For example, building codes tend to require unnecessarily high standards of construction and performance in small, relatively light structures such as houses....

Some time must elapse before the Model Building Code can be developed. The present state of emergency in housing and other forms of building, however, requires urgent interim action to enable the achievement of the greatest practicable degree of freedom in the adoption of new methods and materials. The Premiers' Conference decisions now make it possible for the Commonwealth, State and local government authorities to combine in identifying and eliminating as far as possible those aspects of the present system that tend to restrict the rapid development of the building industry to meet the challenge of the vast programmes that are an essential part of the expansion

In June 1955 the chairman of the Commonwealth Building Advisory Committee announced that the Commonwealth Experimental Building Station had been asked to initiate the drafting of an Australia-wide code, which would provide a broad basis for construction, with local authorities making by-laws to suit local conditions (26).

On May 18, 1956, R. G. Sutton addressed the Australian Institute of Builders, NSW Chapter, on the need for uniform building regulations in Australia. He made reference to the Australian Building Industry Productivity Report and recent articles in the Institute's journal, Building: Lighting: Engineering, which promoted the establishment of a single authority responsible for writing and maintaining a basic building code for the Commonwealth.

He discussed the complexity of building regulations in New South Wales, and demonstrated the large number of authorities which controlled the various aspects of even a small building project. He made reference to Great Britain's Model Building By-Laws, which introduced performance standards as a means of control. This idea had first been introduced in the United States, and was incorporated in the Uniform Building Code of the Pacific Coast of U.S.A., which had been adopted by 700 cities in 39 states, and in Hawaii, Alaska and Canada.

The Building Industry Productivity Report states further that from the overseas experience there is a need for one Authority to co-ordinate all modern research of materials and construction methods.

I submit that sub-committees could be convened in each State represented by qualified Architects, Engineers, Builders, and Government Officers and each committee should prepare a draft scheme to meet their own needs, (e.g. Building Regulation Advisory Committee).

Following this step, the Central Authority, representative of

all States, could consider all proposals and combine them to form the basis of a uniform Code; one that speaks the same language in Perth, as in Sydney, and in Cairns.

It is obvious that there are many difficulties in this problem; to bring about any radical change of control in a system such as we have would be a political one; one that would no doubt cause wide-spread upheaval in all departments concerned. This in many instances would most likely result in a negative attitude to any reform at all.

Again, using words so aptly penned in the Productivity Report, I conclude by saying: The subject of a National Building Code demands a unified Australian approach.

The Productivity Report goes on to state that it is a particularly good example of what should be adopted, and of the benefits derived from co-ordination.

This Code is under continual expert review and is amended annually and republished every three years.

In all these Codes, full recognizance is taken of the advance in scientific knowledge of all construction materials, the safety of life and property, and the growing influence of population density, zoning control and town planning proposals... (27)

Also in 1956 Morton Herman, architect and historical writer, published an article promoting the need for a uniform building code, and commented:

At least one-third of the buildings in active use in the centre of Sydney were erected outside the control of any Building Act, mainly because there was none under which architects then could work.

A Building Act thus obviously is not a structural necessity, and must be a social one. With the complexities of the sociology of modern life, we find a monumental complex of Building Acts that has now, in New South Wales, reached saturation point of overlapping, stringency, and confusion.

There is no argument that wise building laws are necessary; even in 1810 Governor Macquarie tried to impose sketchy regulations on Sydney, hoping thus to direct its growth, and in 1819 Francis Greenway drafted a building code which was not implemented.

Sydney then grew up in a state of legal anarchy in the structural field, proving, incidentally, that the architects of older Sydney had structural integrity at least, for their work has proved sound enough for a modern city.

It is strange that, for the nearly 50 different Acts and regulations which now plague an architect designing a building, he (the expert in building matters) is only casually consulted in framing them.

Seven Government departments create our building laws, and the co-operation and consultation between them is often politely nominal only...

The model building by-laws of England are administered by ONE department, which revises them only at five-year intervals.

This does not preclude improvements in building techniques during that period, since tests of performance standards are written into the law.

This is an important principle that also applies to many American building codes.

It is far better for the law to state the structural and health standards required of a building, than to lay down in mandatory fashion how that result must be achieved.

To choose but one tiny example of this, more than one designer has found himself compelled to put useless two-foot wide strips of reinforced concrete under the walls of a cottage that rests on bedrock, anyhow!

But even if we are to be subjected to a continuance of the mandatory method, it has become urgent to get some cohesion and organisation into the plastora of acts, regulations, ordinances, and optional rules that govern building in this State. (28)

Meanwhile, there were problems to even achieve uniform application of Ordinance 71 in New South Wales. Various councils were not accepting minimum standards set by the ordinance, but were setting their own more rigorous standards, whether as to timber sizes, footings, damp-courses, ventilators or other matters. Consequently regulations varied from area to area. The Local Government Association, in response to the situation, asked its annual conference of 1959 to accept Ordinance 71 as the building standard for the State, and councils were asked to eliminate local variations (29).

The Master Builders' Association promulgated uniform regulations in 1965, arguing that there were considerable cost benefits to be had. The full benefit of new materials was not being achieved, often because of the conservative and obstructive attitudes of local councils. (30)

The previous year, following a conference of State Ministers of Local Government in July 1964, an Interstate Standing Committee, representing the various States and the Department of the Interior (the Building Authority for Canberra) was established to bring about uniformity in building regulations. The Commonwealth made available the services of the Commonwealth Experimental Building Station for secretarial and research purposes.

The Interstate Committee gave priorities to the various phases of the activities necessary to frame co-ordinated regulations. Fire protection and fire prevention were given first priority. The draft fire code which the New South Wales Building Regulation Advisory Committee had been developing for some time in conjunction with the Experimental Building Station was adopted as the basis for investigation.

Over the ensuing years, the Advisory Committees of the various states expressed their views on the broad principles, and the Building Station, as the secretariat for the Interstate Committee, produced proposals which were then subjected to detailed examination and comment by the individual states. Eventually, after much consideration, and the reconciliation of the views and interests of the different States, draft standards were developed, dealing progressively with the various aspects of building regulation. Over this period there was a continuing interaction between the State Advisory Committees and the Interstate Committee, with much time and effort contributed by all involved.

The Model Code was divided into a number of parts, each dealing with a specific aspect of the functioning of a building or of building

control...

and as far as New South Wales is concerned will represent a completely new form or pattern of building regulation. The first section of the Code dealing with the structural fire protection of buildings, has been completed and will be submitted to the various States and Territories in July 1968, so that action may proceed towards its inclusion in their building regulations, with such adaptations as may be found necessary to suit local conditions. (31)

8.10 THE HEIGHT OF BUILDINGS

In 1931 the Town Planning Association resolved that it was strongly opposed to any extension of the 150 feet limit on buildings, because

experience has shown that the practice of erecting buildings exceeding 150 feet in height is detrimental to public health, city traffic, sewerage, and drainage, real estate values and civic interests generally...(32)

In 1933 the Lord Mayor indicated that he was strongly opposed to any increase in the permissible height of buildings. The president of the NRMA, similarly opposed any increase. City property owners however argued that the increasing rates and taxes on land in the city centre would force the City Council to increase the limit, because of the heavy capital commitments of the Council for road widening and city improvements. (33)

With the beginning of the recovery from the Depression, building work increased. The use of the motor car and its consequent impact on the city streets grew. By 1936 attitudes to building height were starting to change.

The Lord Mayor (Alderman Howie) said yesterday that he was convinced that the height of buildings in Sydney would have to be increased. Under existing regulations, which limited the height to 150 feet, a real estate investment in the city was barely profitable.

Alderman Howie added that this was merely his personal opinion, and that he did not intend to urge an amendment of the Building Act on the lines indicated.

He believed that, to become profitable for purposes of leasing, a building should have at least 14 or 15 floors. At present, because of height limitations, buildings were restricted to 10 floors and basement, and only about 70 percent of the total space could be used for revenue purposes, the balance being occupied by the various necessary services. From some of the city buildings the net rental return did not exceed 2 1/2 percent on capital expenditure. To become a profitable investment he thought the return should be about 4 1/2 percent.

Alderman Howie added that he did not know what attitude the City Council would adopt to building heights, and he did not intend to bring the subject before it. It was a question for the Government....

The Lord Mayor touched on a complex and difficult problem yesterday when he stated that the growth of the city and the consequent rise in land values would force extension of the present limit of 150 feet for the height of buildings. He considered that the height limitation would hinder the city's development, as it did not provide for enough letting space to make building a profitable investment for leasing purposes when present land values were so high. There is, of course, much to be said for this argument, but a number of other important considerations have to be reckoned with in any proposal that Sydney should follow New York in developing skyscrapers. The Lord Mayor's opinion was merely a personal one, and the official attitude of the City Council was expressed earlier this year when it accepted the recommendation of its building advisory committee that no amendments of the Building Act should be sought in the way of extending the maximum height. The committee, in its report, considered that "the complexities which would arise would outweigh any advantages to be gained". It had been suggested that owners of new buildings in the city should be given permission to erect them higher than the 150 feet limit as compensation for their making provision in the buildings for the parking of cars owned by their tenants. This proposal, if agreed to, might help in some degree to solve the car parking difficulty, but it would not answer the question of making building a more profitable investment, since the extra space would be occupied by cars and not by tenants. It has also been proved by experience in New York that skyscrapers are only profitable up to a certain height, and the highest return does not come from the highest building, since the expense of extra facilities, such as lifts for the topmost stories, was greater than the increased rentals obtained.

During the last two years or so the revival in building activities within the city has been proceeding rapidly.

...There has also been a hardening in real estate values, with a general upward trend. In fact, city land values have been described as "fabulously high". (34)

The president of the NRMA, S.C. Watson, again opposed the abolition of height limitations, primarily because of the increased traffic which would be brought into the already crowded city streets by such a move.

He also astutely observed that the value of city land was directly related to its potential development, and consequently the present values were not an adequate basis to argue for an increase in building heights.

The agitation for the lifting of the limit on the height of buildings would seem to be based on the illusion that the market value of a given area of land or a given length of street frontage would be taken advantage of if building were permitted to go higher. The simple fact is that the market value of any attractive area would immediately increase in direct ratio to the increase in the height of the buildings that it could legally carry. Then there would be a demand for still higher buildings. Which would be an excellent picture of a dog chasing its own tail.

The only class that would benefit, even temporarily, by the raising of the height limit would be the owners of the properties affected. The ill-effects would be the public's for all time. (35)

The coming of World War II severely restricted building work. So too, post-war austerity and the measures taken to control building operations and materials substantially limited the potential development of city sites, particularly because much of the construction industry effort was directed at residential construction.

In 1946 the City Council rejected proposals for severely limiting the height of city buildings:

The restrictions were suggested in amendments to city building by-laws, prepared by the Building Advisory Committee and submitted to the council for adoption.

The Building Advisory Committee recommended that the maximum height of all buildings should not be more than one and a half times the width of the street fronting the building. This, in the case of Pitt Street, would be about 90 feet.

The committee claimed that height limitation was necessary to give adequate light and ventilation to buildings and to avoid traffic congestion in narrow streets.

It was stated that Pitt Street was already greatly congested, although the average height of buildings was only four stories - about 50 or 60 feet.

Alderman Carter, who supported the proposals, claimed that the growth of the city would be jeopardised unless a reasonable limit was placed on the height of buildings.

"High buildings will maintain and possibly increase land values, but that will be done only at the expense of the health of the people." he said.

The Lord Mayor, Alderman Bartley said that a limit of 150 feet did not mean that all buildings could be erected to that height. A special permit was necessary from the Fire Brigades Board for buildings exceeding 100 feet.

The council agreed, however, to place a limit of 100 feet on buildings erected in declared residential areas. (36)

In March 1952 the Height of Buildings (Amendment) Bill was debated in both houses and passed with bi-partisan support. The existing legislation, passed in 1912, had applied only to the Metropolitan Police District, with boundaries as gazetted in 1899. Since 1912 the City of Sydney had expanded considerably, and in other centres of the State, particularly Newcastle, extensive development had taken place. Accordingly the Act extended the legislation to the whole of metropolitan Sydney and to the city of Newcastle.

The Act applied to buildings more than 100 feet high, but the amending Act extended the provisions to buildings exceeding 80 feet in height, because it was argued that the fire brigade's services were ineffective for fire fighting at heights greater than 80 feet. The maximum permissible building height remained 150 feet.

The Act also dealt with wireless towers, air conditioning plant and other roof-top machinery; and required consent prior to occupation of a building.

Under the Act the Height of Buildings Regulations, 1955, were gazetted October 7, 1955 and took effect from January 3, 1956. They primarily described the information required to be submitted to the Minister in an application under the Act.

In January 1956 the Sydney Morning Herald revealed that two or three proposed buildings, including a 204 foot skyscraper in Kent Street next to Caltex House (the latter then under construction) were the subject of applications being considered by a committee appointed by the Chief Secretary. (37)

Sydney's architecture, having been cramped by a statutory ceiling of 150 feet since 1912, may now gain some freedom of altitude.

Between 50 and 60 buildings in the central city rise to the full 150 feet prescribed by the Height of Buildings Act of 1912-52...

The present trend towards narrower, taller buildings began in Sydney with the Chief Secretary's approval last year of the Caltex building, to be built in Kent Street. On the Kent Street level, this building will rise to the limit of 150 feet; but at the rear, on Jenkins Street, which is 42 feet below Kent Street, the building will be 192 feet high. Thus the 150 feet "ceiling" had been broken on a technicality. It now remains for an architect to break it in principle.

Collings-Power Pty. Ltd., hastened to submit plans for another building in Kent Street - a tower building which would rise to 204 feet. Despite this height, the building will use only 60 percent of its site...

The Chief Secretary's Department has also received tentative plans for a 235-foot building which the Commonwealth Government plans to erect in Phillip Street. It is understood that approval of these two applications would be followed by more "tower" buildings...

In its discussion, and subsequent submission to the Chief Secretary, the committee may be influenced by the recent relaxation of building restrictions in Melbourne.

Until last year, Melbourne restricted its city buildings to a height of 132 feet. But under a new formula which allows greater height while still limiting congestion, a 230-foot building has already been approved.

...a Sydney architect, Mr. J. M. Brindley has designed the 204-foot "tower" building for Kent Street and is a passionate supporter of altitude.

"I've tried to think of disadvantages to the tower style," he said, "but I can't think of one. By going higher and reducing your depth to, say, 50 feet, you get economy in the form of the building, better light and air, and conservation of the ground area.

"The only slight fault I can see is that it costs the client a little more to get these ideal conditions. But working conditions in a slender tower - light, air, and a view - are worth the extra money. At street level, the circulation of air

is improved by the substitution of tall, thin buildings for low, wide ones." (38)

In March 1956 the Lord Mayor advocated the lifting of building height restrictions (39). The Committee appointed by the Chief Secretary recommended that the Government should lift height restrictions entirely and consider applications for tall buildings individually (40). The recommendation was welcomed by the Sydney Morning Herald, which expected "substantial benefits" and saw "great scope for more imaginative and individual architecture" (41).

The State Government announced that it would take action to allow the building of skyscrapers (42). Architect J.M. Brindley commented,

It is with some pleasure mixed with misgivings that I read that State Cabinet intends to amend the regulations to allow of buildings up to 250 feet high.

This appears to bear some relation to the increased height of 230ft now allowed in Melbourne, bearing in mind the original heights of 150ft and 132ft respectively.

Unfortunately, the similarity ceases there. Melbourne has had a clear formula for the last 12 months - to guide architects.

So far, Sydney architects have nothing but vague statements and rumours, and many contemplating applying for extra height don't know where to start. It is to be hoped that this will be remedied soon. (43)

Sydney City Council aldermen were reticent to apply height limitations. In October 1956 a decision on establishing a floor space index, which had been under consideration since 1953, was deferred for consideration the following year. Although Council planning officers were concerned to check vehicular and pedestrian congestion in Sydney, aldermen were concerned with other possible consequences:

If we continue to restrict building heights, businesses will go to the suburbs to build above us. North Sydney might become the new city centre.

The best answer to traffic congestion lies in the better use of our streets. (44)

In January 1957, the City Council deferred an application by the A.M.P. Society to build a 22-storey, 250 feet high office block at Circular Quay, and sought a conference with the Chief Secretary to discuss permitting higher buildings in Sydney. (45)

Architect Graham Thorp wrote an article discussing the codes applied to determining building height in San Francisco and Los Angeles.

Sydney would do well to study very seriously the codes of these two cities which have so recently spent such a great deal of time and money in ensuring that their regulations are in line with present-day experience.

As skyscrapers of excessive height have proved, present-day costs set their own economic heights (in New York between 30-40 storeys).

The main problem lies in ensuring an efficient commercial centre which will develop and hold a leading position.

That is what the codes of San Francisco and Los Angeles have been designed to do. Sydney should do the same to maintain its position as Australia's leading city. (46)

On March 7, 1957 a bill to amend the height limit was introduced in Parliament. Among its provisions a mandatory requirement of the bill was that a building must not accommodate more people than if it had been erected to a height of only 150 feet. This requirement met strong opposition:

The A.M.P. Society was not prepared to erect its proposed new building in Sydney unless it was allowed to make it big enough to provide for the society's needs in 25 years' time, the Lord Mayor, Alderman H.F. Jensen, said yesterday.

He said that if it was refused permission the society would build in another capital city.

Alderman Jensen was speaking at a meeting of the City Council planning committee which was discussing city building height restrictions.

He said the society wanted to erect at Circular Quay a building with 400,000 square feet of office space although at present it required only 250,000 square feet.

Committee members expressed concern that the Heights of

Buildings Amendment Bill, now before State Parliament, might prevent increases in city building accommodation beyond present limits.

The committee decided to seek an urgent conference with the Chief Secretary, Mr. C. A. Kelly, on aspects of the bill.

Members who expressed concern referred to a provision in the bill which specifies that a building more than 150 feet high may accommodate no more people than if it was only 150 feet.

Alderman Jensen told the meeting that this provision worried him. (47)

The Opposition moved in the Legislative Council to amend the bill to delete the reference to the number of people to be accommodated, but the amendment was defeated.

The Height of Buildings (Amendment) Act, 1957 also established an 11-member Height of Buildings Advisory Committee, comprised of representatives of the Chief Secretary's Department, the Public Works Department, the Department of Local Government, the City Building Surveyor, the Director of Civil Defence, the Board of Fire Commissioners, the Local Government Association, the Royal Australian Institute of Architects, the Institution of Engineers, the Australian Planning Institute, and a traffic expert appointed by the Minister.

The Committee was to examine all applications to erect buildings greater than 150 feet high, and was to report to the Minister after considering:

- (i) the proposed use and occupancy of the building;
- (ii) the total floor plan area of the building in relation to the area of the site of the building;
- (iii) the number of persons likely to occupy the building;
- (iv) the adequacy of natural light and air to the building;
- (v) the adequacy of natural light and air to adjoining sites and adjacent public roads or other thoroughfares;
- (vi) the traffic likely to be generated by the use and occupancy of the building;

- (vii) the provision for the loading and unloading of goods in or from the building;
- (viii) the provision of off-street car parking facilities in the building;
- (ix) the area of the site of the building at street level available for pedestrian movement;
- (x) the likely fire hazards and provisions for detecting and fighting fires in connection with the building;
- (xi) the appearance of the building;
- (xii) any other matters of public safety and convenience relating to or associated with the building;
- (xiii) any matters relating to the building or the site of the building specially submitted by the council of the area in which the building is located. (48) .

Architect Graham Thorp welcomed the new regulations as progressive, and argued that floor space ratios must be kept high enough to encourage investment on the very expensive city sites.

It has been found in such cities as Chicago that a maximum floor area ratio of 14 to 1 or under, does not encourage development of the commercial section of the city, in fact, it is inclined to discourage it. Chicago having tried it for 10 years is now raising its limit to 20 to 1.

The results of too severe restrictions are two-fold. Firstly, investors are inclined to look towards other cities which allow more attractive investment or to other areas and other types of development to give them a reasonable return.

Secondly, owing to the lack of new development, the older existing buildings become more and more down-graded, values drop, rates drop, and the central city loses its attraction for commerce and its income to city councils...

It is certain that Sydney has adopted a reasonable code, though certainly an average one for development.

Sydney's geographical position is not as central as that of Melbourne, therefore it is perhaps wise that everything should be done to supplement Sydney's natural advantages to make the city attractive for investments, to make it an efficient and continually developing commercial centre, and to hold its position as Australia's leading city. (49)

On December 12, 1960 the City Council Building Committee recommended the adoption of regulations limiting city building heights. The code

was adopted by council on April 17, 1961, and applied to the central city area. The Sydney Morning Herald wrote:

The regulations generally will limit the height of a building to twice the width of the road it fronts.

But they will allow greater heights, provided:

. The building is set back for its full height from the kerb level.

. Or, alternatively, it is set back above a height of more than 40 feet from kerb level.

The regulations also will permit height concessions when a building is set back from a side boundary, or boundaries, more than 30 percent of the width of the site.

A further concession will be made for tower-type buildings which occupy only a small proportion of a site.

INCREASES IN HEIGHT

If a building is set back 15 feet from the alignment from a height exceeding 40 feet above the level of the kerb, then the height can be increased by twice the distance of the set-back.

But if it is set back the same distance for its full height above the kerb level, the permissible height is increased by four times the set-back.

Heights also will be determined by floor areas in relation to site areas, and where buildings have frontages to two streets.
(50)

In January 1961, the Height of Buildings Committee approved a State Government office block 400 feet high, on Macquarie, Bent and Phillip Streets. The A.M.P. building, then under construction, was to be 370 feet high (51) and the Metropolitan Water Board building 331 feet (52). The Australia Square tower was to have "about 50 floors", and Blues Point Tower had 27 floors under construction.

The Sydney City Council is trying to regulate the effect of such buildings on light and traffic, but its generous height code seems unlikely to cramp the style of vertical building. This code is designed to restrict not height, but total floor space in relation to site area. If a builder uses all his site area, all the way up, he cannot build very high; if, however, he is prepared to limit his plot ratio (an index of the intensity with which he uses his site) the sky is the limit.

Sydney's code allows a plot ratio of 15 (which is to say, floor space cannot exceed 15 times the site area). New York's allows

10 (with one small exception of 15), Melbourne's allows 11, and London's only five. This means that a 30-storey building can occupy half its site in Sydney, one-third in New York and Melbourne, and one-sixth in London.

But why is Sydney erecting buildings of 30 floors, and perhaps even 50 floors? In fact why is Sydney having a building boom in its centre when the general pattern of its development is one of decentralisation?

One reason is that Sydney is still making up for the hiatus in office building immediately after the war when our building resources were devoted almost exclusively to housing. Another reason is that commercial activity of the kind that is accommodated in most of the buildings erected in Central Sydney recently has not decentralised to the same extent as retailing and manufacturing.

If commerce wants to stay in the city, and needs to renew its premises, why must its tall buildings become taller? The glib answer is that high buildings are produced by high land values. Yet some of the most valuable sites in the city are still occupied by old two and three floor buildings. On the other hand, most of Sydney's very high new buildings have been, and continue to be, built in the less highly valued quarters of the city.

"I am inclined to think that land values are not a substantial factor in the trend towards taller tall buildings in business districts." the chief country planner of the Cumberland County Council, Mr. R. D. L. Fraser, told the Australian and New Zealand Association for the Advancement of Science in Brisbane las month.

"It is the prestige or, more crudely, the advertising value of the tall building which is its main driving force...I think that tallness in a home-unit building is also regarded as a good advertising gimmick although high land values and the advantage of views as a selling device are important factors."

Although concerned at such side-effects as traffic congestion and the obstruction of sunlight, Mr. Fraser is an earnest supporter of tall buildings. "Obviously the owner of the tall building gains - so do the occupants with the vastly improved working conditions that a well-designed tower block affords.

"But it also has much to offer to those who see it from outside. I think it is instinctive in all of us to look up for inspiration, for hope, for interest... The builders of spires and towers and tombs understood that man looking upwards was in his most exultant and inspired frame of mind.

"It is beside the point that this looking-upward instinct might be exploited to encourage the populace to stand in awe of big business or to buy a certain brand of insurance or soap or petrol. To be encouraged to look upwards is enriching and enlivening."

"The object need not be more than arresting or interesting. If it is well proportioned, elegant and of pleasing colour and texture so much the better. The important thing is that it has lifted our sights above the horizontal. (53)

The Height of Buildings Act was subsequently amended by Act No. 47, 1967 which provided for the appointment to the Height of Buildings Advisory Committee of a member of the State Planning Authority in lieu of a representative of the Chief Secretary's Department.

In 1971, Sydney City Council introduced a new floor space ratio code.

The major effect of the council's controversial code is the breaking up of the city area into 33 planning precincts, each with separate floor space ratio provisions.

The most important feature of this is a reduction in the ratio for the central city area from the existing 10:1 with a maximum of 12:1 to 5.5:1 with a maximum of 12.5:1 after the awarding of bonuses.

This will be enforced in the Tank Stream precinct - the area now known as the central business district.

If the council adopts the code next Monday it will take effect from Tuesday, and immediate application will be made to the Minister for Local Government, Mr. Morton, to include it in the statutory plan released earlier this year.

The code is designed to encourage site amalgamation for block development, plazas, colonnades, terraces, and other areas of public open space; to bring back residential "life" into the city; and to encourage the building of theatres, shops, meeting places, hotels and motels.

The code also provides for a method of preserving historic buildings by offering developers the transfer or sale of part of the development potential of the historic building to another site or sites. (54)

It is this code that remains current in Sydney today. Its development is not further discussed here.

8.11 THE DEVELOPMENT OF BUILDING REGULATIONS 1952 - 1974

The regulations applying to the City of Sydney and those applying to the rest of the state developed, for the most part, in parallel, over the two decades. In some matters the City of Sydney regulations were more advanced than Ordinance 71, and some aspects of the ordinance

were revised to correspond with the City of Sydney regulations. In some areas the two sets of regulations were updated concurrently, to establish new common standards. They remained however, different control mechanisms. Reference is made here to the more significant developments which occurred over the period. Amendments generally followed investigation and the making of recommendations by the Building Regulation Advisory Committee.

The Building Regulation Advisory Committee worked on the preparation of a new fire protection and fire prevention code over a number of years. In this work it was assisted by the Commonwealth Experimental Building Station. It also undertook, over many years, the preparation of draft ordinances, to co-ordinate the existing ordinances and by-laws relating to building.

Due to the increasing need for technical examination of building matters a Standing Technical Sub-committee was appointed in 1964 to assist the Building Regulation Advisory Committee. The sub-committee was comprised of representatives of the Department of Local Government, the Housing Commission, the Royal Australian Institute of Architects, the Institution of Engineers, the Master Builders' Association, and the Institute of Health Surveyors.

8.11.1 PROCEDURAL REQUIREMENTS

Following representations by the Royal Australian Institute of Architects, based on the excessive demands by some councils and lack of uniformity in council requirements, Ordinances 86 and 71 were amended (June 28, 1963) to provide that only where alterations to a building were being made would the colouring of one copy of the plans to distinguish the alteration work be required.

In 1970-71 Ordinances 71 and 86 were amended to omit the maximum building fee of \$2,000 formerly prescribed.

8.11.2 SITE AND PLANNING REQUIREMENTS

The addition of laundries, bathrooms and water closets to buildings erected before January 1, 1922, where more than two thirds of the site would be occupied, or the unoccupied area would be less than 500 square feet was permitted by amendment of the ordinance (July 31, 1959).

By-law 51 permitted certain projections from buildings beyond the road alignment. Ordinance 71 permitted no projections. Following representations from the Royal Australian Institute of Architects, By-law 51 and Ordinance 71 were amended (July 28, 1961) to permit those allowed by By-law 51 and additional projections from buildings.

Ordinance 71 required the walls of dwellings having windows or doors to be set back 3 or 5 feet from side boundaries. The ordinance was amended (May 25, 1962) to require all walls to be set back 3 or 5 feet from the boundaries. Councils were given discretion to approve otherwise where exceptional site conditions made compliance impracticable. Councils were also given discretion to require commercial buildings to be set back from side boundaries.

In 1972-73 the height limitations on buildings prescribed by Ordinance 71 were deleted, it being considered that the bulk and height of buildings were more appropriately matters for councils to control under their town planning powers than under their building regulatory powers.

8.11.3 STRUCTURE AND CONSTRUCTION

In 1953 a standard specification for terra cotta roofing tiles was incorporated in the ordinance (February 27, 1953).

By-law 54, regulating materials, loads and stresses in the City of Sydney, and by Clause 17 of Ordinance 71 applied to all buildings of more than two storeys of composite steel and concrete or steel frame construction, was amended (on August 7, 1953) following suggestions by the Commonwealth Government that in the interests of economy certain Standards Association of Australia specifications for loads on buildings and the use of steel, be adopted. Sydney City Council agreed and S.A.A. Interim Codes 350 (Minimum Design Loads on Buildings), 351 (Use of Structural Steel in Building), and 352 (Manual Metallic Arc Welding in Building) were adopted. Clause 17 was subsequently amended (December 18, 1959) to apply to all buildings, regardless of height.

In 1954 Ordinance 71 was modified to permit the same flexibility in arranging office partitioning as was permitted under By-law 55 (July 2, 1954). This permitted partitions, other than corridor or inter-occupancy walls, to be constructed of timber or other combustible materials.

Ordinance 71 permitted dividing walls between flats in one storey buildings to be constructed of 4 inch by 2 inch studwork, packed with sound-proof, fire-resisting and vermin proof material. If in brickwork dividing walls were to be at least 9 inches thick. Following a submission by Wagga Wagga City Council and a subsequent recommendation by the Advisory Committee, the ordinance was amended to

permit internal masonry dividing walls 4 inches thick, rendered both sides (May 27, 1955).

By-laws 52, 55 and 56 were amended (February 18, 1955) to enable the construction of open-deck parking stations.

Ordinance 71 and the City of Sydney By-laws required, in buildings of fire-resisting construction, fire resistance ratings of 4 hours for external walls, bearing walls, fire walls, party walls isolated piers, columns and wall supported girders; 3 hours for beams, floors, stairs, roofs, walls and girders; and 2 hours for fire partitions. In the light of overseas building practice and the trend toward the use of lightweight prefabricated panels in structural frames, spandrels, floors and other components, the Advisory Committee, after consulting overseas authorities and the other states regarding their experience, and in conjunction with the Commonwealth Experimental Building Station, formulated a code for the use of lightweight fire resisting construction. Ordinance 71 was accordingly amended, and a new Ordinance 86A was gazetted, the latter applying similar conditions to the inner portion of the City of Sydney (July 8, 1955).

The Advisory Committee, over a period of years, considered the surface spread of fire and the fire-resistance ratings of building materials.

The erection of galleries or mezzanine floors was permitted by an amendment of Ordinance 71 (July 27, 1956) in similar terms to the provisions of By-law 52.

The construction of pier and beam footings was authorised by an amendment of Ordinance 71 (September 28, 1956), which also specified maximum bearing pressures. This corresponded with the provisions of

By-law 54. A later amendment (April 24, 1958) permitted other footing designs which complied with By-law 54.

Ordinance 71 and By-laws 55 and 56 were amended (September 27, 1957) with regard to the use of suitable brackets in the external skin of cavity walls and permitting the use of metal brackets in a building of fire-resisting construction without the provision of an incombustible coating.

Following representations by the Royal Australian Institute of Architects the ordinance was amended (May 30, 1958) to permit in buildings exceeding two storeys in height the omission of air bricks from the outer portion of cavity walls, except at the lowest and highest part of the cavity. It was argued that the air bricks permitted water penetration in conditions of heavy rain and high winds.

By-law 56 was amended (July 12, 1957) to provide that the vertical separation between openings in external walls of buildings of fire-proof construction was to be 3 feet of incombustible material with a fire resistance rating at least equal to that required for the external wall. Alternative means of protecting external openings by horizontal reinforced concrete projections were provided.

The minimum sizes of timber framing were varied (February 27, 1959), and the use of light timber roof trusses permitted for spans not exceeding 35 feet, where complying with standard specifications issued by the Department of Local Government. Timber construction not described by the ordinance was to be permitted with the certification of a structural engineer.

The structural design of load-bearing brickwork was revised by

amendment of the ordinance (July 31, 1959) to incorporate data prepared by the Experimental Building Station in a standard specification.

The new Concrete Code (CA2-1958) of the Standards Association was in large part adopted into By-law 54 (December 18, 1959), most of the earlier detailed provisions for reinforced concrete being deleted concurrently.

The ordinance was amended (July 29, 1960) to permit three storey residential flat buildings to have combustible roof construction, with a ceiling having a one hour fire resistance rating, and the roof covering being incombustible.

In the construction of residential flat buildings, the concession permitting the use of non-combustible roof coverings with one hour rated ceilings was extended to apply to buildings not exceeding six storeys in 1971.

By-law 54 dealt with the structural design of composite steel and concrete, and steel framed buildings. It was amended (July 28, 1961) to also apply specifically to reinforced concrete frame construction.

Provision was made in Ordinance 71 (September 30, 1966) to require control joints in brick walls.

On May 16, 1968 an explosion in a flat on the eighteenth floor of a twenty-two storey residential flat building, "Ronan Point", in East London, resulted in the progressive and almost total collapse of one corner of the building. The building was constructed using an industrialised loadbearing wall system. Similar methods had been used

in Australia. The Building Regulation Advisory Committee commenced an investigation at once and recommended certain short-term measures which were implemented by amendment of Ordinance 71 and By-law 54 (May 2, 1969). Following submissions by the Association of Consulting Structural Engineers, a special sub-committee was established to consider the submissions and any further action taken in England. It co-ordinated its work with the Victorian building regulation authorities which were undertaking similar investigations.

In 1969-70 a number of other amendments were made, including the withdrawal of Standard Specification 11, "Light Timber Roof Trusses", and the permitting of any truss design provided the council was satisfied as to structural adequacy. The required width of studs, and minimum thickness of hardwood flooring were reduced. A new clause was inserted in Ordinance 71 regarding termite shields. By-law 54 was amended to provide that structural steel in any building should comply with A.S. CA1-1968 "S.A.A. Steel Structures Code".

In 1970-71, Ordinance 71 was amended to require cross-ventilation of the space below timber framed floors at the lowest level of a building, by evenly distributed openings in the external walls, having an unobstructed opening of at least one square inch per lineal foot.

In 1970-71 Australian Standard CA47 "S.A.A. Brickwork Code" and certain other Australian Standards relating to masonry construction were adopted for Ordinance 71, replacing a number of Departmental Standard Specifications, and allowing the use of more current design criteria.

By-law 54 was amended to adopt Part 1 of Australian Standard CA34 regarding minimum design loads on buildings, in lieu of Part 1 of

In 1971-72, Ordinance 71 was amended to permit the use of Australian Standard CA38, "S.A.A. Light Timber Framing Code", as an alternative to the existing requirements. Other structural timber, complying with neither code, could be approved by a council, with the certification of a structural engineer being required in some circumstances.

Ordinance 71 was amended to permit the use of calcium silicate bricks, following an amendment of the "S.A.A. Brickwork Code" to cater for such brickwork.

8.11.4 HEALTH

In 1952, a provision was inserted in Ordinance 71 to require that the walls of habitable rooms below ground level, and the walls and floors of basements, cellars, shafts, lift wells and the like should be constructed so as to render them free of damp (September 26, 1952).

Councils were empowered (July 29, 1955) to permit the use of artificial lighting in lieu of natural lighting, in shops where mechanical ventilation or air conditioning was provided. This was in response to technological development in lighting and ventilation, and the trend toward building large shopping floors.

The lighting of commercial buildings generally was reviewed the following year, in the light of modern conditions, and the maximum permissible distance from any part of a floor to an unobstructed window was increased from 30 feet to 50 feet (March 23, 1956).

Ordinance 71 was amended (April 24, 1964) to increase the minimum

permissible areas of habitable rooms, to make certain requirements regarding the ventilation of cooking alcoves, and to prohibit the inclusion of cooking facilities in a bedroom or bed-living-room. By-law 52 was amended concurrently.

Ordinance 71 and By-law 52 were amended (April 28, 1967) to omit the requirement that permanent ventilation be provided to all rooms and instead to require it only in certain specified rooms. This arose out of the Sub-committee's draft proposals regarding lighting and ventilation, which were prepared on behalf of the Interstate Standing Committee.

In 1971-72, lighting and ventilation requirements for privy closets, slop sink and urinal compartments were amended. Airlocks to privy closets and urinal compartments were to be required in certain circumstances.

8.11.5 EGRESS

The Building Regulation Advisory Committee continued investigations into the limitation of floor areas and the classification of building fire hazards. They also reviewed the provisions of the ordinance relating to fire escapes, concluding that

in certain respects the existing provisions fall short of modern fire protection measures and they are somewhat scattered. (55)

By-law 53 was amended (March 26, 1959) to permit the erection of office buildings more than 8 storeys high with a single fire isolated stairway, subject to the building being of fireproof construction, the floor area of any floor not exceeding 5,000 square feet, sprinklers being provided throughout the building, and the maximum distance of

travel to an exit being 80 feet.

By-law No. 53 required such a building to have alternative stairways, one of which must be fire isolated. There were in the City of Sydney a number of sites comparatively small in area or with narrow frontages where the insistence on this requirement to provide two stairways would have created difficult design problems and prevented the reasonable economic development of the sites. The Committee was satisfied that in the case of office buildings where the fire hazard was low a single fire isolated stairway was adequate for safety purposes even in very high buildings where some of the occupants would be beyond the reach of any external escape appliances subject, of course, to the additional safeguards abovementioned. (56)

There was a growing trend for the doors of flats to open directly to fire-isolated stairways. As fire or smoke in a flat could penetrate the stair and thereby prejudice the egress of other occupants, the ordinance was amended (November 24, 1961) to provide that no doorway constructed in the walls of fire-isolated stairways was to open directly to a flat or other room (except for common halls and lobbies). One hour fire doors were to be fitted to all doors giving access to a fire-isolated stairway. By-law 53 was similarly amended.

In 1970-71, new clauses were inserted in Ordinance 71 and By-law 53 requiring the display in fire-isolated stairways of a notice prescribing penalties for the impediment of passage. Ordinance 71 was amended to require the labelling of fire doors leading to fire-isolated stairways. Ordinances 71 and By-law 53 were amended to remove the requirement that self-closing one hour fire doors be non-combustible. This permitted the use of timber fire doors.

Ordinance 72, "Fire Safety Measures and Other Services and Equipment in Buildings - Maintenance, Operation, etc.", was proclaimed on September 11, 1970. It made it an offence to place obstructions in fire-isolated stairways and passageways, interfere with fire doors, or remove or interfere with required signs in fire-isolated stairways or

passageways.

8.11.6 RESIDENTIAL FLAT BUILDINGS

Homes converted into residential flat buildings under the Local Government (Regulation of Flats) Act, 1955, were exempted (October 26, 1956) from most of the provisions of the ordinance relating to the materials and construction of internal stairways and stairwells, as many buildings which were otherwise suitable for conversion did not comply with the requirements for stairs, which were often built of combustible materials, or were of a lesser width than was required. The expense of conversion would thus frustrate the intent of the Regulation of Flats Act, which was to generate additional accommodation. In view of this the concession was made.

Ordinance 71 and By-laws 52 and 58 were amended (December 18, 1959) to reduce the minimum size of bathrooms from 30 to 26 square feet, to require every bathroom to be provided with a bath or shower bath, to permit a shower room in lieu of a bathroom in a bed-living-room flat, to permit the installation of a washing machine in a bathroom (installation in a kitchen was banned in 1950), and to reduce the number of common laundries in flat buildings where mechanical washing and drying equipment was provided.

In response to a substantial increase in the rate of residential flat development, and concern about the occupants when access became difficult, due to age or ill health, the Building Regulation Advisory Committee made recommendations regarding the provision of lifts. The ordinance was accordingly amended (April 7, 1961) to require the provision of lifts in residential flat buildings where any storey was more than two storeys above or below a storey from which access to a

public place was provided.

To improve the sound-proofing qualities of walls between flats or between flats and common halls, the ordinance was amended (July 27, 1962) to require dividing walls to be 4 1/2 inch brickwork with 1/2 inch render each side, or equivalent masonry construction.

Ordinance 71 and By-laws 52 and 58 were amended (August 31, 1962) to permit the provision of either a shower or a bath in a flat, bathrooms to have a minimum area of 26 square feet and shower rooms 18 square feet.

Ordinance 71 was amended (October 29, 1965) to reduce the minimum size required for a lift car in certain residential flat buildings from 20 square feet to 15.6 square feet, subject to certain dimensional requirements to provide for stretcher patients.

At the same time a provision was inserted to include a car parking floor as a "storey" for the purpose of the clause. This was done to achieve uniformity because of differences of interpretation by various councils. Some councils regarded a car parking floor as a storey for the purpose of clause 61G while others excluded it. However, this provision was the subject of very strong representations that the requirement of a lift in buildings of three floors of flats above a parking floor would render uneconomic this popular form of construction. After examination of these representations by the Committee and the Minister, the clause was amended on February 25, 1966 to provide that a lift would not be required in a residential flat building where there were not more than three floors of flats above (or below) a car parking floor. The requirement of a lift in normal residential flat buildings of more than three storeys was retained. (57)

8.11.7 SAFETY

In 1971-72, Ordinance 71 and By-law 55 were amended to require the provision of protective balustrades in certain situations deemed to be hazardous, such as roofs, stairways, ramps, corridors, balconies and

verandahs designed for use by building occupants. The provisions did not apply to houses. The ordinance and by-law were also amended to require the use of "safety glass" for shower screens, glass doors, and for fixed panels in public parts of buildings likely to be mistaken as doorways or unimpeded paths of travel. The provisions did not apply to glass doors or fixed panels in a house or wholly within a flat.

8.12 RELATED LEGISLATION

On October 18, 1960 the Local Government (Demolition of Residential Buildings) Amendment Bill was introduced to Parliament. It was to apply to the Counties of Cumberland and Northumberland and the City of Wollongong, and provided that before approving an application to demolish a building a Council had to be satisfied that the building was vacant or, if occupied, that the occupier had reasonably suitable alternative accommodation available. The duration of the legislation was to be limited to three years. The Bill passed the Assembly with minor amendments, but on March 22, 1961 it failed to pass Second Reading Stage in the Legislative Council.

The Local Government (Building Regulation) Amendment Act 1964 (December 9, 1964) had two objects. The first was to provide that councils appoint qualified building inspectors. This arose because of the increasing complexity of modern buildings. The second provision was to encourage the erection of combined commercial and residential buildings in the inner city and similar closely settled localities, which otherwise would have been prohibited by Schedule 7 to the Act (which related the height and floor space of a residential flat building to the area of site it occupied).

In 1971, the Builders Licensing Act was gazetted. It provided for the

constitution of a Builders Licensing Board, and prohibited the execution of any residential building work by a person or company not licensed by the Board. It also provided that all contracts for building work were to be in writing, and were deemed to warranty that the building work would be carried out in an efficient and workmanlike manner, with proper materials, and in accordance with the approved plans and specifications. The application of the Act is not further discussed here.

In 1973-74 the development of a new building code, which had been carried out over the preceding two decades finally came to fruition with the proclamation of Ordinance 70, "Building" on June 20, 1973. To enable councils, the building industry and others time to familiarise themselves with the new regulations, the ordinance did not commence until July 1, 1974. New clauses were inserted in Ordinances 71 and 86 to permit councils to approve buildings under the requirements of Ordinance 70 prior to that date, where an applicant so requested, in lieu of the requirements of Ordinance 71 or By-laws 51 to 58.

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8. Ibid, pp 25, 26
9. Sydney Morning Herald, April 30, 1935, p.5
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11. Report of the Department of Local Government, 1940-1951, p.27
12. Ibid, pp27-28
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15. Ibid. pp 30-31
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21. Ibid, July 1, 1958, p.21
22. Ibid, June 17, 1958, p.11
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30. Ibid, April 13, 1965, p.33
31. Report of the Department of Local Government, 1968, p.13
32. Sydey Morning Herald, April 28, 1931, p.5
33. Ibid, August 8, 1933, p.9
34. Ibid, October 8, 1936, p.10
35. Ibid, November 6, 1936, p.15
36. Ibid, April 9, 1946, p.4
37. Ibid, January 18, 1956, p.4
38. Ibid, January 25, 1956, p.2
39. Ibid, March 7, 1956, p.7
40. Ibid, August 16, 1956, p.1
41. Ibid, August 17, 1956, p.2
42. Ibid, September 12, 1956, p.8
43. Ibid, September 25, 1956, p.1
44. Ibid, October 23, 1956, p.4
45. Ibid, January 30, 1957, p.8
46. Ibid, February 19, 1957, p.18
47. Ibid, March 26, 1957, p.4
48. Height of Buildings (Amendment) Act, 1957, cl.4C
49. Sydney Morning Herald, June 25, 1957, p.14
50. Ibid, December 13, 1960
51. Ibid, January 13, 1961, p.1
52. Ibid, March 14, 1961, p.5

- 53. Ibid, June 13, 1961
- 54. Ibid, November 30, 1971
- 55. NSW Department of Local Government Report, 1954, p.9
- 56. Ibid, 1959, p.10
- 57. Ibid, 1966, p.10

1974-1985

9.1 ORDINANCE 70

Ordinance 70 was gazetted on June 20, 1973 and took effect from July 1, 1974. It repealed Ordinances 71, 86 and 86A, and By-Laws 32, and 51 to 58 inclusive.

The ordinance is based largely on recommendations formulated by the Interstate Standing Committee on Uniform Building Regulations (I.S.C.U.B.R.), after several years of intensive research and a comprehensive study of present-days needs, and is fully metricated. The recommendations are contained in what is known as the Australian Model Uniform Building Code (A.M.U.B.C.).

Except for some variations and additions considered necessary in some matters which were of special local significance or where related to issues which have yet to be determined by I.S.C.U.B.R., the new ordinance has adopted the provisions of the A.M.U.B.C. The ordinance also follows, as far as practicable, the format and language of the A.M.U.B.C.

A number of important new measures have been introduced, including the classification of buildings according to use, the establishment of fire zones, the wider use of "performance" type requirements and the inclusion of "deemed to satisfy" provisions...

The making of the ordinance was approved by the Minister on the recommendation of the Building Regulation Advisory Committee, and following exhaustive examination by the Committee and its sub-committees over a number of years of the provisions of the A.M.U.B.C. Although not unique to New South Wales, the work of the Committee and its sub-committees in the examination of draft A.M.U.B.C. material has been particularly thorough and has contributed substantially to the material finally included in the A.M.U.B.C. The continuing efforts of these bodies and of departmental officers also resulted in New South Wales being one of the first States to issue its new regulations. (1)

Promulgation of the new Ordinance represented an important step in the process undertaken in collaboration with other States and Territory administrations to achieve, as far as possible, Commonwealth wide uniformity of building regulation requirements. The work is not yet complete and certain matters

will need to be reviewed. For these purposes the Interstate Committee will continue to function and its activities will require continuing collaboration by the Department and the Building Regulation Advisory Committee.

To assist councils in their administration of the Ordinance the Department undertook over a period of some months an intensive educational campaign to assist building inspectors in gaining knowledge of the contents and intent of the new centres throughout the State. The Seminar programme was well received and councils are to be commended for making the arrangements necessary to enable their inspectors to attend the Seminars. Special arrangements were made during the course of the programme to assist the Australian Institute of Architects (N.S.W. Chapter) and the Master Builders Association in similar endeavours by them to assist their members. The question of conducting a further programme to help other interested persons was under consideration.

Upon commencement of the new Ordinance certain additional responsibilities will devolve upon councils, particularly in respect of new procedures related to fire zones and classification of buildings. Councils were accordingly reminded during the latter part of the year to arrange for these to put in hand as from 1st July, 1974. Councils were also informed of the procedures for making applications for approval to declare fire zones. A number of such applications were received.

As a further aid to the administration and application of the ordinance, especially its fire safety provisions, the Department completed the preparation of the "N.S.W. Building Regulation Handbook". This document, by diagrammatic and other means gives detailed explanations of these important aspects of the regulations. (2)

Ordinance 70 is currently the primary instrument of building control in New South Wales. As it is a readily accessible document, with detailed commentaries available on its application and interpretation (3), it is not discussed extensively here. The basic concerns of Ordinance 70 are described in Chapter 1.4.

9.2 ORDINANCE 70 : DEVELOPMENTS

The following is a brief chronological description of the major developments in Ordinance 70 from 1974 to 1982. Some material was incorporated as further parts of the Model Uniform Building Code were

completed, other amendments were made in response to particular issues. Significantly, some of the primary changes dealt with issues of amenity, for instance controlling noise transmission and requiring access for disabled persons.

Ordinance 70 was amended (April 5, 1974) by the insertion of a new Part 52 "Noise Transmission".

The provisions of the new Part are designed to reduce sound transmission in Class II buildings of three or more storeys by requiring that certain structural features shall be resistant to the transmission of sound. The Part includes certain "deemed to satisfy" provisions, as well as methods by which the sound transmission class of a form of construction may be determined. A test method was published in the form of Standard Specification No 6 "Airborne Sound Transmission Loss" on 5th April, 1974. (4)

A further amendment (August 9, 1974) permitted the use of extruded clay bricks in fire-rated load-bearing walls.

Since the proclamation of Ordinance No. 70 the Interstate Standing Committee on Uniform Building Regulations has continued its operations and has produced a number of additional draft regulations for inclusion in the Australian Model Uniform Building Code upon which the Ordinance is based. On the recommendation of the Building Regulation Advisory Committee these draft regulations were accepted for adoption in this State and were embodied in Ordinance No. 70. Amendments of particular significance were made to Part 30 to enable councils to exempt certain small and low rise buildings erected in traditional and time tested designs and methods from the requirements of the Ordinance relating to structural design for dead and other loads, and to Part 33 to allow "slab on ground" footings and provide "deemed to satisfy" specifications for brick footings in Class I buildings...

Following the publication by the Standards Association of Australia of metricated Standards to supersede some Imperial Standards adopted for building regulation purposes in Ordinance No. 70, the Building Regulation Advisory Committee recommended that metric Standards be adopted to replace the Imperial Standards concerned. Certain metric conversion figures previously adopted, were amended to rationalise the position. (5)

In 1976-77,

an amendment of particular significance was made to Part 6 with the effect that where a change of classification of a building

occurs councils now have discretion to decide, in individual cases, whether the building needs to be upgraded to such a degree as to conform in every detail with Ordinance No. 70. In using its discretion the council must be satisfied after consideration of a report by a responsible servant that the building is structurally sound and reasonably safe from fire.
(6)

In 1977-78, amendments were made for various reasons, including permitting plastic plumbing to penetrate fire-resisting construction in certain circumstances; regulating the use of lining materials and surface finishes; requiring certain buildings to be protected from fire during their construction; requiring applications for approval to erect certain types and classes of buildings to be referred to the Board of Fire Commissions at development application stage; and including provision allowing the attachment of certain combustible materials to structural members required to have a fire-resistance rating.

In 1979 (December 21, 1979), the Local Government (Amendment) Act made substantial changes to the provisions of the Local Government Act, 1919 regarding fire safety in existing buildings. The primary aim of the Act was to strengthen councils' powers to require the upgrading of defective buildings.

In 1979 (August 31, 1979) Ordinance 70 was amended to permit that where a Class 1 building is brick veneered or re-surfaced its eaves may be extended to no more than 450 mm from side boundaries; to provide more adequate requirements for the cleaning of windows in certain buildings; and to clarify the intent of certain clauses.

A significant development in the regulations was the move to require

access for disabled persons to certain classes of buildings. The issue was extensively researched by The Working Party on Access for the Disabled, of the Building Regulation Advisory Committee.

On 16th July, 1980, the Minister approved of proposals to amend the building regulations to make it mandatory for new public-use buildings to be accessible to disabled people and contain appropriate toilet, shower and parking facilities.

A publicity campaign drawing attention to the proposal was commenced in October and a period until 31st December, 1980, was allowed for receipt of written submissions. The proposals were set out in detail in a booklet (now commonly referred to as the "Blue Book") and were outlined in general terms in a printed pamphlet.

Approximately 2,000 booklets and 11,000 pamphlets were distributed. Over 110 submissions were received in response to the publicity campaign.

The Special Working Party of the Building Regulation Advisory Committee which prepared the proposals was reconvened and five meetings were held between 4th March, 1981 and 2nd April, 1981 to examine the responses.

Arising from this examination by the Working Party and additional review by the Building Regulation Advisory Committee, on 1st May, 1981, the draft proposals were altered in certain, mostly minor, respects.

The draft proposals, which comprised almost all of Stage I of the overall project were approved by the Minister on 19th June, 1981, and were awaiting consideration by Cabinet at the close of the year.

Work to complete Stage I and that associated with Stages II and III was planned for 1981-82. (7)

Ordinance 70 was accordingly amended (September 25, 1981) to include requirements relating to the provision of access for disabled people to buildings or parts of buildings, and the inclusion of certain facilities for their use. This took effect from January 1, 1982.

In 1980-81 numerous amendments were made, including adopting revisions of the Australian Model Uniform Building Code regarding suitability of materials; the adopting of several Australian Standards (fibrous plaster products, SAA Mechanical Ventilation and Air Conditioning

Codes, SAA Boiler Code, SAA Filing code, SAA Concrete Blockwork Code Part 1, SAA Domestic Oil-fired Appliances Installation Code); permitting the fire-resistance rating of structural members supporting stairs in fire-resisting shafts to be reduced in certain circumstances; eliminating inconsistencies affecting mezzanines; amending the requirements for emergency lighting; increasing the fees for building applications and Section 317A certificates; extending concessions regarding the fire-resistance ratings of floors of buildings of Type 1 construction laid on ground; and clarifying certain other issues.

A significant amendment in 1982 (June 11, 1982; effective from January 1, 1983) was the extension of requirements for the use of safety glass in buildings.

In 1980, the Australian Uniform Building Regulations Co-ordinating Council was constituted to replace the Interstate Standing Committee on Uniform Building Regulations, as the body responsible for the development, maintenance and review of the Australian Model Uniform Building Code.

The Council, which is to be ratified by formal Inter-government Agreement, comprises two Commonwealth Government representatives, plus one from each State and the Northern Territory and one from local government. Its Executive has similar representation, except that it comprises only one representative of each member administration.

The terms of the Agreement will provide, among other things, for the-

- (a) appointment of additional Commonwealth staff to service the Council, with appropriate administrative and technical support from the States and Territories;
- (b) establishment of an annual research fund (initially \$100,000) subscribed by the Commonwealth (half) and the States and Northern Territory (half);
- (c) the referral to the Council of the investigation of the need for a national accreditation system which would recognize certain materials, designs, methods of construction or components as being acceptable for

building regulatory purposes.

The inaugural meeting of the Council was held in Brisbane on 6th August, 1980.

The Council has power to set up committees and appoint a chairman to each. It is intended that certain committees will have responsibility for development of model building regulations dealing with specified aspects of the Council's deliberations (for example, fire engineering, structural engineering, access for the disabled, and so on). Each committee will have a membership appropriate to its defined responsibilities and will have the power to co-opt other persons or bodies in a position to assist it. It is anticipated that each committee will operate substantially within the State or Federal Administration to which it is assigned.

As a consequence, New South Wales has been allocated the "General Provisions Committee" which has been assigned responsibility for Group II, General Provisions - Parts 2 to 11 inclusive - of the Model Code (these are reflected in Parts 2 to 11 of Ordinance No. 70).

The Minister has approved of the constitution of this Committee and invitations have been sent to various organisations inviting them to participate. At the close of the period under review responses to those invitations were awaited. (8)

The Committee held its inaugural meeting on April 2, 1982.

The developments in Ordinance 70 which have occurred from 1974 to the present can be traced in detail by reference to publications such as The Regulation of Building Standards and Butterworth's Local Government Planning and Environment Service (NSW), which also documents decisions of The Land and Environment Court as they have bearing upon the administration and application of building law.

9.3 THE HEIGHT OF BUILDINGS (AMENDMENT) ACT, 1979

The Height of Buildings (Amendment) Act, 1979, significantly amended the primary Act, in connection with the enactment of the Environmental Planning and Assessment Act, 1979. It provided that the concurrence of the Minister was required for the determination of a development application for a building greater than 25 metres high; and where a

development application was for a building greater than 45 metres high, the Minister was not to grant concurrence except on the recommendation of the Height of Building Committee, nor was he to refuse concurrence except after consideration of a report by the Committee. The determination of the Minister was to be final, without recourse to the court under either the Environmental Planning and Assessment Act, 1979, or the Land and Environment Court Act, 1979.

The above provisions of the Act were intended to be applied for a limited period only, pending the retirement of the Act on January 1, 1983 or such later date as might be gazetted, at which time the Height of Buildings Act would have no force, except with respect to development applications submitted before that date.

The Building Regulation Advisory Committee engaged in considerable work with a view to incorporating new provisions in Ordinance 70 upon the retirement of the Act. A number of these amendments, including provisions affecting fire services and parameters for the design of atria, have now been included in Ordinance 70.

Retirement of the Height of Buildings Act occurred on December 31, 1985.

1. NSW Department of Local Government Report, 1973, p.12
2. Ibid, 1974, p.15
3. For example, commentaries published by the Law Book Company and by Butterworths, and Steed, A.N., The regulation of building standards in New South Wales.

Steed discusses, under the heading "Basic concepts of modern building regulations", the following issues:

- Fire in Buildings - General Aspects
- Types of Construction
- The Theory of Compartmentation
- Floor Area Limitations
- Fire Walls
- Protection of Openings
- Population Densities in Buildings
- Units of Exit Width
- Basement Storeys
- Exits
- Fire-fighting Services
- Mechanical Ventilation Systems
- Special Requirements for Tall Buildings
- Maintenance of Essential Fire Safety Services
- Structural Sufficiency
- Buildings and Earthquakes
- Acoustics and Noise in Buildings

4. NSW Department of Local Government Report, 1974, p.14
5. Ibid, 1976, p.9
6. Ibid, 1977, p.8
7. Ibid, 1981, p.13
8. Ibid, pp 12,13

CONCLUSION

10.1 REVIEW

The objective of this Report has been to document the development of building regulation in New South Wales. The historical development has been described in some detail, and is here briefly summarised.

The earliest London building law was concerned with controlling the relationship between the rights and responsibilities attaching to the construction of party walls. Protection from the spread of fire was a further concern. Some later London building controls had as a primary purpose social control. They were directed at restricting the growth of London's population, with the attendant social ills and health risks.

In the seventeenth century, plague and the Great Fire of London were catalysts for new legislation which reflected an increased concern for health and, primarily, for controlling the spread of fire.

The first controls in Sydney dealt with the relationship of building to street, and with ensuring public safety during construction. These controls were supplemented in 1837 by the Sydney Building Act, the primary concern of which was the control of the spread of fire. This legislation was the Building Act then current in London, with minor amendment.

The second half of the nineteenth century saw a growing awareness of the slums of Sydney, of overcrowding and of insanitary conditions. Health became a more significant issue to be addressed by building regulations. Sydney grew markedly in the 42 years following the gazettal of the Sydney Building Act and the Act was long considered inadequate. Between 1875 and 1880 a number of measures were introduced to improve conditions affecting health. Amongst them was the Sydney Improvement Act, which also addressed other building issues. It was assembled from various sources, and was intended to be a comprehensive Building Act. The Improvement Act made provision not only for controlling the spread of fire, but also for a range of other matters, including detailed provisions for ventilation, lighting, minimum ceiling heights (all issues related to health), and egress from public buildings. Almost from its inception the Improvement Act was widely condemned by architects, engineers and builders. It remained in force for several decades, becoming somewhat anachronistic with the passage of time.

The late nineteenth and early twentieth century saw substantial technological change. Steel framed and composite steel and concrete framed structural systems were developed. Lift systems and fire fighting services were developed. More economical construction in other than load-bearing masonry was possible. The Improvement Act had no provision to accommodate such change. For a long time there was demand from the building industry for legislative change and the introduction of modern building regulations, but governmental inaction prevented any change until 1916, when a City of Sydney By-Law was passed permitting the construction of steel and steel and concrete framed buildings.

The changes in technology facilitated more readily the construction

of tall buildings. Extensive debate ensued over the control of building height in Sydney, and the Height of Buildings Act, 1912 became the first legislative instrument for such control.

Fire remained a significant concern, particularly in the light of the Anthony Hordern fire of 1901, the Her Majesty's Theatre fire of 1902, and the Chicago Iroquois Theatre fire of 1903. A new Theatres and Public Halls Act was gazetted in 1908. A Select Committee investigated fire dangers in the City of Sydney. In the theory applied to regulating building with regard to fire a significant shift was made. Egress from buildings was now considered an important component of responsible legislation (whereas the nine storey Anthony Hordern retail building had not been required to have any special provisions for emergency exit).

The early twentieth century also saw the extension of powers to control building and subdivision to local government bodies, enabling such control for the first time in most of New South Wales.

In 1919 a new Local Government Act was gazetted. This Act remains the base legislation for the main instrument of building regulation today. Ordinances 70 and 71 under the Local Government Act were introduced in 1921. The Building Regulations Advisory Committee was established concurrently, and has had an ongoing function in the revision of existing regulations and the formulation of new ones. The two Ordinances underwent regular revision, with Ordinance 71 continuing in operation until 1974.

The City of Sydney Corporation Act 1934 enabled the City Council to formulate by-laws specific to the City, superceding the Sydney Improvement Act. The by-laws were eventually gazetted in the

post-war period, and remained operative until 1974.

Growing out of a desire to establish some consistency in building regulations throughout Australia, the Interstate Standing Committee on Uniform Building Regulations was established in 1964. It produced, over the following decade, the Australian Model Uniform Building Code, which formed the basis for a new Ordinance 70, which took effect in 1974, and for similar building regulations in the other states and territories.

10.2 URBANISATION AND REGULATION

Regulation is a necessary component of human society. It defines and facilitates relationships between citizens. How that regulation is achieved depends upon the political, economic and social relationships which exist within the society, and its size.

The question of the appropriate level of regulation is essentially a philosophical and then a political issue. The level of regulation considered necessary will depend very much upon the position adopted. There are a broad spectrum of possibilities, from anarchism, to laissez faire capitalism, to democratic socialism, to totalitarianism.

Urban societies are a complex web of interdependencies. Increased density of human settlement necessitates increased regulation of the inter-relationships which exist between the members of a society. Indeed, the world is now (as Marshall McLuhan observed some years ago) a "global village". Decision making, however, cannot occur in an urban society in the same way that it can in a village.

The Greeks proposed an ideal city-state of ten thousand citizens, in

which all could participate in a truly democratic society. More recently others have proposed ways in which decision-making could be devolved within an urban society, to enable localised participative control (for instance, of building), within an overall societal framework (1). Without radical restructuring of society, it is unlikely that a flexible, adaptive and responsive self-regulating community control of building can be achieved.

Urbanisation is largely a product of industrialisation. With industrialisation, people were drawn to the towns for work. Increasing population densities produced increasing health and fire risks and consequently greater need for controls, for the common good of society. Industrialisation also generated wealth. The growth in national wealth has resulted in changes in societal values, and developments in the concerns of regulations. Minimum space standards were set for housing, health standards were raised, amenity became a consideration.

Industrialisation and technological advances have also provided the means of developing a wide range of sophisticated and complex building technologies. The options available in building today are far greater than they were 100 years ago. For this reason too it is perhaps inevitable that building regulations have become progressively more complex. Dr. F.A. Blakey, Chief of the Division of Building Research, C.S.I.R.O., said in a recent address,

For some five years now there have been continued complaints about the complexity of regulations, particularly specifications and codes, and of the time taken by the regulatory procedures and the amount which this adds to the cost of development and construction.

I have argued elsewhere that the complexity is inescapable if codes and regulations are going to have their present form and purpose. They are and should be a reflection of current building practice which is now a highly technical complex process, and the regulations try to cover every conceivable

possibility which might arise in such a process...

There is an increasing movement which seeks to solve the problems of the present regulatory system by throwing out the whole system and it seems that something of this sort is now being done in Great Britain. To begin with the concept of national building regulations seems to have been abandoned, and the right to formulate regulations has been returned to the local councils. However, it has now been announced by the Secretary for the Environment that greatly increased numbers of buildings will be exempt from regulations and that a new group will be set up of people known as "approved persons" who are recognised as competent to certify their own designs and plans without checking by local authorities. I understand such an arrangement already exists in Hong Kong.

In the spirit of "small government", there have been proposals to go further and remove the whole matter of building control from local authorities and vest it in the insurance companies, which is essentially the arrangement current in France...

The complexity that arises from the overlapping jurisdiction and often contradictory requirements of a number of semi-government authorities and utilities is politically generated and unfortunately must largely wait on a political solution. (2)

In Australia urban policy, Max Neutze argues that building regulations are too conservative, unnecessarily limiting solutions, and limiting the ability of poor families to afford new housing by requiring standards higher than the "safe and sanitary" minimum. He considers, however, that prescriptive regulations may be preferable to performance based regulations:

A further criticism is that building regulations include detailed controls over features such as room size and separation of areas used for different purposes, and conservative and conventional specifications are laid down for the use of materials. Critics argue that the regulations should specify the performance required of a building and that the architect or builder should be able to demonstrate that his building will achieve the required performance (Paterson et al., 1976). Another criticism which applies to all of the controls is that they result in long and expensive delays for a builder or land developer while all of the affected public authorities consider his application before it is approved. Furthermore, there is criticism of the way government authorities exercise discretion. Sometimes delays are used to discourage applications for developments that cannot legally be refused. If there was a move toward performance regulations, however, it seems likely that delays would be even longer and the scope for exercise of bureaucratic discretion even wider. The greatest gains would be made on those occasions when imaginative architects and builders dealt with enlightened administrators.

In other situations, and they may be in the majority, unambiguous regulations may serve best, despite their alleged tendency to produce mediocre design.(3)

On the other hand Michael Johnstone, Manager, Research and Development, A.V. Jennings Homes, argued that in Australia there was too much regulation by too many regulators, regulations were inflexible, poorly framed and worded, and not responsive to change (4). He considered that the regulatory systems had become self-perpetuating. Furthermore, he argued, the average new home buyer paid a 10% surcharge because of building and planning regulations. While he agreed with the need for regulation for safety and security, he believed current regulations far exceeded this responsibility:

At the centre of my submission to you is that until government inspired regulation withdraws to those areas which cannot be controlled by self-regulation by ordinary common law and commercial principles tested by time and understood by ordinary people and until the issues to be regulated are concerned with public health and safety, then we will suffer waste and significant waste. (5)

He further argued that radical change was necessary.

In terms of control, we must proceed to the stage where the number of bodies involved is reduced to the minimum but more importantly the division between their responsibilities must be clearly visible and understood.

The problem of too much regulation will only be cured by a firm commitment by government to regulate only in those areas where individuals cannot self regulate their own activities.

The problem of too many regulators will only be solved by some tough political decision taking. Power bases will have to be toppled, the existing order must change...

In my view there are two basic tenets on which reform must be built.

1. Current control is acting to the detriment of the majority of individuals, the home buyers in our community.
2. A free market is the best way of determining what people

want...

Regulation as I have been at pains to point out is not without its responsibilities. I suspect that the identifiable trend towards conservatism rests at least in some measure on a lack of skill and a lack of knowledge on behalf of regulators whether they be involved in framing regulations or in administering them. There is no greater bar to taking a decision which will affect future events than having no knowledge of the likely consequences of that decision...

Governments should not attempt to do what individuals can already do for themselves. Individuals have sharp vested interests regarding their own rights and possessions and they are usually pretty sensible in deciding how they choose to enforce them. Most responsible members of the building industry would be in favour of very high standards of self regulation as they would view this as being essential to their continuing operation and success. Formal vehicles for self regulation are to date unknown in Australia in the building development industries.

Building and development regulations are infrequently in the headlines and in the editorials. They are not regarded in most circles as considerations which make and break governments. However they are of necessity government inspired. They are to do with very basic infringement and improvement of human rights and are necessarily political. Without the strong injection of political will to seek the necessary reforms, we run the very real risk of regulating ourselves to a standstill. (6)

It is evident however, that the record of laissez faire capitalism, which position Michael Johnstone might be taken to represent, in self-regulation is poor. When profit is the sole criterion, the value of self-regulation will be seen by only a few. It is clear from the documentation of speculative housing built in Sydney in the nineteenth century, that many builders constructed sub-standard housing in a free market, no doubt because there was little governmental regulation constraining them to do otherwise. In this regard it is also significant that in the 1984-5 financial year 19 residential builders were disqualified from holding a licence by the Builders Licensing Board, 106 builders and trade contractors were suspended, the Board received 5,930 complaints and undertook 395 prosecutions (7). Presumably in a deregulated marketplace the chances of self-regulation succeeding are slim.

Urbanisation necessitates governmental regulation once the number of people in a community grows to a point where local self-regulation is no longer possible. Community depends upon a system of balances, the recognising and accommodating of the diverse needs of its members. In urban societies regulation is one instrument to achieve this system of balances.

10.3 CHANGE

Change in the regulation of building occurs for a broad range of reasons. It occurs because of the need to resolve conflicts between adjoining owners (e.g. the construction of party walls); to control the relationship of public and private (e.g. requiring private buildings not be built on public roads; establishing building alignments); to protect the public interest by controlling the spread of fire (e.g. by requiring construction to be of certain materials); to protect the public interest by limiting the spread of disease (e.g. by requiring certain standards of sanitation); for safety (e.g. requiring adequate means of egress); in response to social changes (e.g. in working conditions); because of industrialisation (e.g. changing techniques, new products, new materials, new methods of production); because of political change (e.g. a shift in the balance of power within society); for economic reasons (e.g. post-war privations) and out of concern for quality of life (e.g. controlling noise and pollution).

Change in building regulation in New South Wales has been a slow process. There has been considerable governmental inaction in years past. The Australian Model Uniform Building Code was a significant achievement arising from the committed and concerted action of the Federal and State Governments, over a relatively short period.

Ordinance 70 was a major advance in thinking over what had gone before. It is, however, a complex document lacking in clarity, certainly not accessible to the lay reader and raising many difficulties of interpretation even for the trained reader. Change occurs now incrementally, and Michael Johnstone is probably accurate when he argues that much recent regulation has not been in response to public health and safety, but rather reflects the values of the regulators:

Public health and safety in this context can't be of course treated narrowly. It needs to embrace concepts which include privacy, security, amenity, equity and efficiency to quote but a few. Although it should be the fundamental test, I doubt if much recent regulatory change either by addition or amendment is truly based on questions of public health and safety. It is far more likely to have as its genesis, the value systems of the regulators, traditionally upper middle class conservatives with little interest in promoting and responding to change.(8)

The plethora of authorities, acts and regulations remains a frustration for architects, builders, developers, and others in the building industry. Unfortunately this diversity of control is long-established. There are many governmental and semi-governmental bodies representing particular areas of interest and particular power bases. It is difficult to imagine the effecting of the radical political and structural change necessary to bring about major improvements in the way building is regulated in New South Wales. It is evident that there are a number of other possible approaches to regulation practised in other countries (see for instance Blakey's comments above). However, given the historical development of regulation here, it is unlikely that we will see any major change of direction.

The State Government recently (March 1, 1985) undertook to streamline building regulations:

The State Government has announced a review of regulations and controls governing the NSW building industry.

The Minister for Local Government, Mr. Stewart, told State Parliament yesterday that working parties would be established to consider the various legislative controls over building applications.

"The Government recognises the fact that the proliferation of Acts and regulations over the years has caused difficulties for building designers, contractors, sub-contractors and administrators alike," Mr. Stewart said.

He said that at the completion of the review, a report would go to the Government recommending legislative changes which would help rationalise and streamline the building approval and inspection process.

"The review is in line with the NSW Government's policy to remove any unnecessary regulatory procedures which might inhibit business activity." (9)

It remains to be seen what change will be effected. The history of building regulation in New South Wales to date does not hold great promise for the rationalising and simplifying of regulation in the future.

1. See for instance, Christopher Alexander's ideas in A Search For a New Paradigm in Architecture.
2. Local Government and the Building Sector, Dr. F.A. Blakey, published in The Shire and Municipal Record, December 1981 - January 1982, p.431.
3. Neutze, M., Australian Urban Policy, 1978, p.28
4. Regulation - In Pursuit of the Great Australian Dream, M. Johnstone; in Chartered Builder, vol.30 August 1980, p.23.
5. Ibid, p.25
6. Ibid, pp26-29
7. Sydney Morning Herald, November 28, 1985
8. Johnstone, op. cit., p. 25
9. Sydney Morning Herald, March 1, 1985, p.6

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NUMBER AND YEAR	TITLE	SHORT TITLE
4 William IV. No. 7 [6.8. 1833]	An Act for regulating the Police in the Town and Port of Sydney and for removing and preventing Nuisances and Obstructions therein.	Sydney Police Act.
8 William IV, No. 6 [8.9. 1837]	An Act for regulating buildings and party walls, and for preventing mischiefs by fire, in the Town of Sydney.	Sydney Building Act
2 Victoria, No. 2 [10.8 1838]	An Act for regulating the Police in the Towns of Parramatta, Windsor, Maitland, Bathurst and other Towns and for removing and preventing Nuisances and Obstructions for the better alignment of streets therein.	Police (Towns) Act
2 Victoria, No. 25 [12.10. 1838]	An Act to amend an Act, intituled, An Act for regulating buildings and party walls, and for preventing mischiefs by fire, in the town of Sydney.	
3 Victoria, No. 14 [3.10. 1839]	An Act further to amend an Act, passed in the eighth year of the Reign of His late Majesty King William the Fourth, intituled, An Act, for regulating buildings and party walls, and for preventing mischiefs by fire in the town of Sydney.	
6 Victoria, No. 3 [20.7.1842]	An Act to declare the town of Sydney to be a city, and to incorporate the inhabitants thereof.	Sydney Corporation Act
9 Victoria, No. 5 [12.9. 1845]	An Act to amend the laws for regulating Buildings and Party Walls, and for preventing mischiefs by Fire in the City of Sydney, and to repeal an Act passed in the third year of the reign of Her Present Majesty, Queen Victoria, relating thereto.	
22 Victoria, No. 13 [27.10. 1858]	An Act for establishing Municipal Institutions	Municipalities Act 1858

NUMBER AND YEAR	TITLE	SHORT TITLE
31 Victoria, No. 12 [23.12. 1867]	An Act to establish Municipalities	Municipalities Act 1867
42 Victoria, No. 25 [3.6. 1879]	An Act to make better provision for the construction of buildings and for the safety and health of the Inhabitants within the City of Sydney.	City of Sydney Improvement Act
43 Victoria, No. 3 [4.7. 1879]	An Act to consolidate and amend the Laws relating to the Corporation of the City of Sydney.	Sydney Corporation Act of 1879.
1906, No. 56	Local Government Act, 1906	
Ordinance proclaimed 13.2.1909 under Local Government Act, 1906.	Ordinance 70: Regulation of building and of subdivision of building land.	
Ordinance proclaimed 19.8.1913 under Local Government Act, 1913.	Ordinance 70A: Regulation of the erection of buildings.	
1912, No. 58 [10.12.1912]	An Act to regulate the height of buildings; and for purposes consequent thereon or incidental thereto.	Height of Buildings (Metropolitan Police District)
1916, No. 1		Height of Buildings (Amendment)
Act No.41, 1919	An Act to make better provision for the government of areas; to extend the powers and functions of local governing bodies; to establish bodies to take common action on behalf of areas; to repeal certain Acts; to amend certain other Acts; and for purposes consequent thereon or incidental thereto.	Local Government Act, 1919
Ordinance proclaimed 11.11.1921 under Local Government Act 1919.	Ordinance 70 : Building	
Ordinance proclaimed 11.11.1921 under Local Government Act 1919.	Ordinance 71 : Building	

NUMBER AND YEAR	TITLE	SHORT TITLE
Act No 9, 1934 (part xx)	Sydney Corporation Amendment Act 1934	
By-laws proclaimed under the Sydney Corporation Act		
9.5.41	By Law 50:"Building Regulation (Building Applications, Plans and Specifications)."	
9.8.46	By Law 51:"Building Regulation (Classification of Buildings and General Building Restrictions)."	
17.1.47	By Law 52:"Building Regulation (Light and Ventilation)."	
15.2.46	By Law 53:"Building Regulation- Means of Egress."	
5.4.46	By Law 54:"Building Regulation (Materials, Loads and Stresses)."	
22.2.46	By Law 55:"Building Regulation- Construction and Safeguards during Construction."	
15.2.46	By Law 56:"Building Regulation- Fire Protection and Fire Prevention."	
15.2.46	By Law 57:"Building Regulation - (A) Chimneys and Flues, (B) Incenerators."	
15.2.46	By Law 58:"Building Regulation - Sanitary Accommodation."	
Act No. 12, 1957 ([8.4.1957])	An Act to make further provisions as to the height of buildings; to constitute a Height of Buildings Advisory Committee; for these and other purposes to amend the Height of Buildings Act 1912-1952; and for purposes connected therewith.	Height of Buildings (Amendment) Act, 1957
Ordinance proclaimed 20.6.1973 under Local Government Act, 1919.	Ordinance 70 : Building	