

A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN-WESTVILLE

Graham John de Kock

A SCHOOL OF MUSIC

A thesis submitted in partial
fulfilment of the requirements FOR THE
the degree of Bachelor of Architecture

UNIVERSITY OF DURBAN-WESTVILLE

School of Architecture

University of Natal

Durban

1982

GRAHAM JOHN DE KOCK

ABSTRACT

This report, together with the accompanying architectural design proposal, is a response to the requirements of the Faculty of Music of the University of Durban-Westville for suitable accommodation in order that its functional conditions that are conducive to the promotion of the Art of Music.

A thesis submitted in partial
fulfilment of the requirements
for the degree of Bachelor of

The University of Durban-Westville was established in terms of the Extension of University Act of 1959 to serve the Indian community of South Africa. The primary task of its Music Faculty is, therefore, to cater for the tertiary music education of Indian musicians, conductors and music teachers in terms of both the dominant Western European music tradition of South Africa, and a specific focus on traditional Indian music which will play a more dominant role in the future. The University requires a School of Music which will provide accommodation for the needs of 150 full-time students.

School of Architecture
University of Natal

Included in this report are an examination of the historical development of music education in Europe and South Africa, a brief investigation into modern trends in music education, an assessment of the functional requirements of a School of Music based on studies of precedent, and an analysis of the specific needs of the Faculty of Music of the University of Durban-Westville.

1982

A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN-WESTVILLE

Graham John de Kock

A thesis submitted in partial fulfilment of the requirements for the degree of Bachelor of Architecture

School of Architecture

University of Natal

Durban

1982

ABSTRACT

This report, together with the resulting architectural design proposal, is a response to the urgent need of the Faculty of Music of the University of Durban-Westville for suitable accommodation in order that its functional requirements be met under conditions that are conducive to the proper study and execution of the Art of Music.

The University of Durban-Westville was established in terms of the Extension of University Education Act of 1959 to serve the Indian community of South Africa. The primary task of its Music Faculty is, therefore, to cater for the tertiary music education of Indian musicians, conductors and music teachers in terms of both the dominant Western European music tradition of South Africa, and a specific focus on traditional Indian music, which may assume a more dominant role in the future. The University requires a School of Music which will provide accommodation for the needs of 150 full-time students.

Included in this report are an examination of the historical development of music education in Europe and South Africa, a brief investigation into modern trends in music education, an assessment of the functional requirements of a School of Music based on studies of precedent, and an analysis of the specific needs of the Faculty of Music of the University of Durban-Westville.

The site selected for the proposed School of Music is a level portion of ground on the North-Eastern sector of the campus, situated at the end of a spur with a panoramic view from the North, through East, to South. It fulfils the school's preference for close proximity to the Department of Speech and Drama and the Faculty of Education. The site presents no problems in terms of structural considerations and drainage.

Mr W Thomas

Partner-in-Charge

The conceptual solution is based on the philosophy that the University cannot fulfil its role in society if it is isolated from the community which it serves. In addition, Schools of Music need the stimulus of regular performance, knowledgeable criticism and broader public interest and thus can form a valuable cultural bridge between "town" and "gown".

Planning Officer

University of Stellenbosch

The resultant design proposal therefore reflects the duality of the relationship between academic institutions and the community; the musical traditions of East and West; public performance and private practice spaces; existence as an independent school and membership of a greater whole - the University of Durban-Westville and the Indian community of South Africa.

Mr Naguran

University of Durban-Westville

Academic Planner

Department of Indian Education

Miss Barkisson

Academic Planner

Department of Indian Education

Prof E Tollman and final

year studio staff

Department of Architecture

University of Natal

Mrs J Calder

Typist

My wife, Carol

ACKNOWLEDGEMENTS

I am indebted to the following persons for guidance and assistance in the preparation and production of this thesis:

	PAGE
Mr P Beley	Architect
	Ing, Jackson, de Ravel & Hartley
Mr W Thomas	Partner-in-Charge
	Stellenbosch Konservatorium
Mr J Barnett	Partner-in-Charge
	College of Music, Cape Town
Mr H Ruben	Planning Officer
	University of Stellenbosch
Mr Roos	Planning Officer
	University of Stellenbosch
Dr W de V Keet	Acoustic Consultant
	Stellenbosch Konservatorium
Prof H H van der Spuy	Head of Department of Music
	University of Durban-Westville
Prof G Bonn	Head of Department of Music
	University of Durban-Westville
Mr Naguran	Academic Planner
	Department of Indian Education
Miss Barkisson	Academic Planner
	Department of Indian Education
Prof E Tollman and final year studio staff	Department of Architecture
	University of Natal
Mrs J Calder	Typist
My wife, Carol	

TABLE OF CONTENTS

<u>Preliminary pages</u>	<u>PAGE</u>
Abstract	ii
Acknowledgements	iv
<u>Text</u>	
<u>Introduction</u>	
1. The Need	1
2. Historical Background	45
2.1 The Establishment of the University	1
2.2 The Development of the Music School	2
2.3 The Development of Music Education	4
2.4 Music Education at the University of	8
2.5 Durban-Westville	8
2.6 Opportunities for Musicians in South	9
2.7 Africa	68
2.8 Structure	68
2.9 Analysis of Precedent	69
2.10 Fire Prevention	70
2.11 Conservatoire of Music, Stellenbosch	11
2.12 Lang Music Building, Swathmore College,	14
2.13 Pennsylvania	14
2.14 The College of Music, University of	16
2.15 Cape Town	16
2.16 Sam Newsom Music Centre, Boston, Lincolnshire	19

TABLE OF CONTENTS

	<u>Page</u>
5. 2 Conclusions from analysis of precedent	22
<u>Research Report</u>	
1. Client requirements	24
2. Student numbers and growth	26
3. Staff numbers and growth	27
4. Space standards	28
5. Conclusions from analysis of Client requirements	45
6. Site Selection	46
7. Geographic Location	49
8. Technical demands and Environmental standards	53
8.1 Acoustics	53
8.2 Sound Insulation	57
8.3 Air Conditioning	64
8.4 Lighting	65
8.5 Structure	68
8.6 Services	68
8.7 Fire Prevention	69
<u>The Brief</u>	70
<u>Schedule of Accommodation</u>	72
<u>Design Report</u>	75
<u>Technical Report</u>	80
<u>Bibliography</u>	86

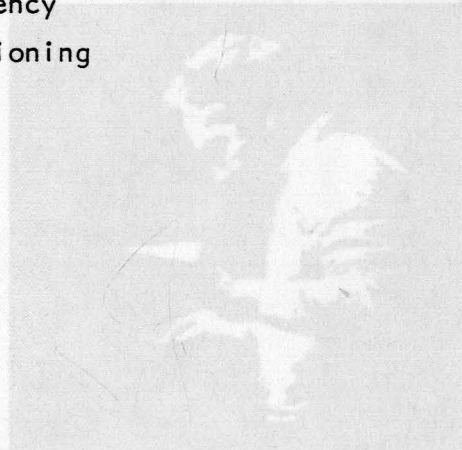
LIST OF ILLUSTRATIONS

- Figure 1 Natal centres of Indian population
- 2 Metropolitan Durban : Indian areas
- 3 Plan of central Durban showing where musical entertainments were held during the last century
- 4 Plan of the Berea showing places of musical entertainment in the last century
- 5 Konservatorium : Site plan
- 6 Ground floor plan
- 7 Sections
- 8 Public entrance from Victoria Street
- 9 Student entrance off Neethling Street
- 10 Public foyer looking towards Fisser Hall
- 11 Auditorium
- 12 Fisser Hall (Rehearsal Hall)
- 13 Student waiting area from the entrance
- 14 Library looking towards the control desk
- 15 Swathmore : Plans, sections and site plan
- 16 Reception/exhibition hall looking towards the upper library level
- 17 S W elevation overlooking the forest
- 18 Auditorium looking towards the forest
- 19 Choral rehearsal room
- 20 Library reading room looking S W
- 21 College of Music: Plans at ground and first floors
- 22 Section and site plan
- 23 Main entrance
- 24 Library looking N W
- 25 Opera rehearsal room
- 26 Orchestra rehearsal room
- 27 Library looking towards the control desk
- 28 Newsom Music Centre : Plans and sections
- 29 Site plan and East elevation looking North
- 30 North elevation showing restored brickwork and river wall
- 31 Reception area looking towards the entrance

LIST OF ILLUSTRATIONS

Figure	32	Newsom Music Centre	Recital hall
	33		Library looking towards the entrance door
	34		Practice room
	35	Space standards :	Seating
	36		Sight lines
	37		Orchestra
	38		Library
	39		Practice rooms
	40	The Campus :	Land use zoning
	41	The Site :	Campus location
	42		Views of the site
	43		Access and parking
	44		Vegetation and soil conditions
	45		Sections
	46		Climate
	47		Design implications
	48	Acoustics :	The relationship between frequency and wavelength of a few instruments
	49		Loudness contours and their relationship to sound pressure and frequency
	50	Technical demands :	Air conditioning
	51		Lighting

INTRODUCTION



I know not how thou singest, my master! I ever listen
In silent amazement.

The light of thy music illumines the world. The life
breath of thy music runs from sky to sky. The holy
stream of thy music breaks through all stony obstacles
and rushes on.

My heart longs to join in thy song, but vainly struggles
for a voice. I would speak, but speech breaks not into
song, and I cry out baffled. Ah, thou hast made my heart
captive in the endless meshes of thy music, my master!

TAGORE,

INTRODUCTION



1. The Need

There is an urgent need for a new building to accommodate the Music School of the University of Durban-Westville. The school, which was formed in 1979, finds its existing accommodation, dispersed as it is amongst the offices and lecture rooms of the Mathematics Department, extremely inconvenient and totally

I know not how thou singest, my master! I ever listen
in silent amazement.

The light of thy music illumines the world. The life
breath of thy music runs from sky to sky. The holy
stream of thy music breaks through all stony obstacles
and rushes on.

My heart longs to join in thy song, but vainly struggles
for a voice. I would speak, but speech breaks not into
song, and I cry out baffled. Ah, thou hast made my heart
captive in the endless meshes of thy music, my master!

2. Historical Background

2.1 The Establishment of the University of Durban-Westville

The University of Durban-Westville TAGORE, GITANJALI. origin in the "separate development" policy of the Nationalist Party which has ruled South Africa since 1948. The Extension of University Education Act of 1959 provided the legal foundation for the creation of separate universities in the Republic of South Africa to serve its different population groups - Black, White, Coloured and Indian (Appendix A).

The University of Durban-Westville was created to serve the Indian population group of South Africa, the founders of which first sailed from India in 1860 as indentured labourers for the sugar plantations established by the English pioneer farmers. They were followed in turn by traders, merchants and craftsmen, importing their cultural identity and religions to establish themselves as a separate ethnic and cultural group.

INTRODUCTION

1. The Need

There is an urgent need for a new building to accommodate the Music School of the University of Durban-Westville. The school, which was formed in 1979, finds its existing accommodation, dispersed as it is amongst the offices and lecture rooms of the Mathematics Department, extremely inconvenient and totally inadequate.

The non-availability of suitable accommodation for the school, and the fact that it is housed in a building which is some distance from the Department of Speech and Drama and the Faculty of Education, with which it has close dealings, makes the optimum functioning of the school extremely difficult.

For this reason, the University has commissioned the design of a School of Music, to be built in 1983. The new faculty building is to be sited on the Eastern sector of the campus, adjacent to the Department of Speech and Drama and the Faculty of Education.

2. Historical Background

2.1 The Establishment of the University of Durban-Westville

The University of Durban-Westville has its origin in the "separate development" policy of the Nationalist Party which has ruled South Africa since 1948. The Extension of University Education Act of 1959 provided the legal foundation for the creation of separate universities in the Republic of South Africa to serve its different population groups - Black, White, Coloured and Indian (Appendix A).

The University of Durban-Westville was created to serve the Indian population group of South Africa, the founders of which first sailed from India in 1860 as indentured labourers for the sugar plantations established by the English pioneer farmers. They were followed in turn by traders, merchants and craftsmen, importing their cultural identity and religions to establish themselves as a separate ethnic and cultural group.

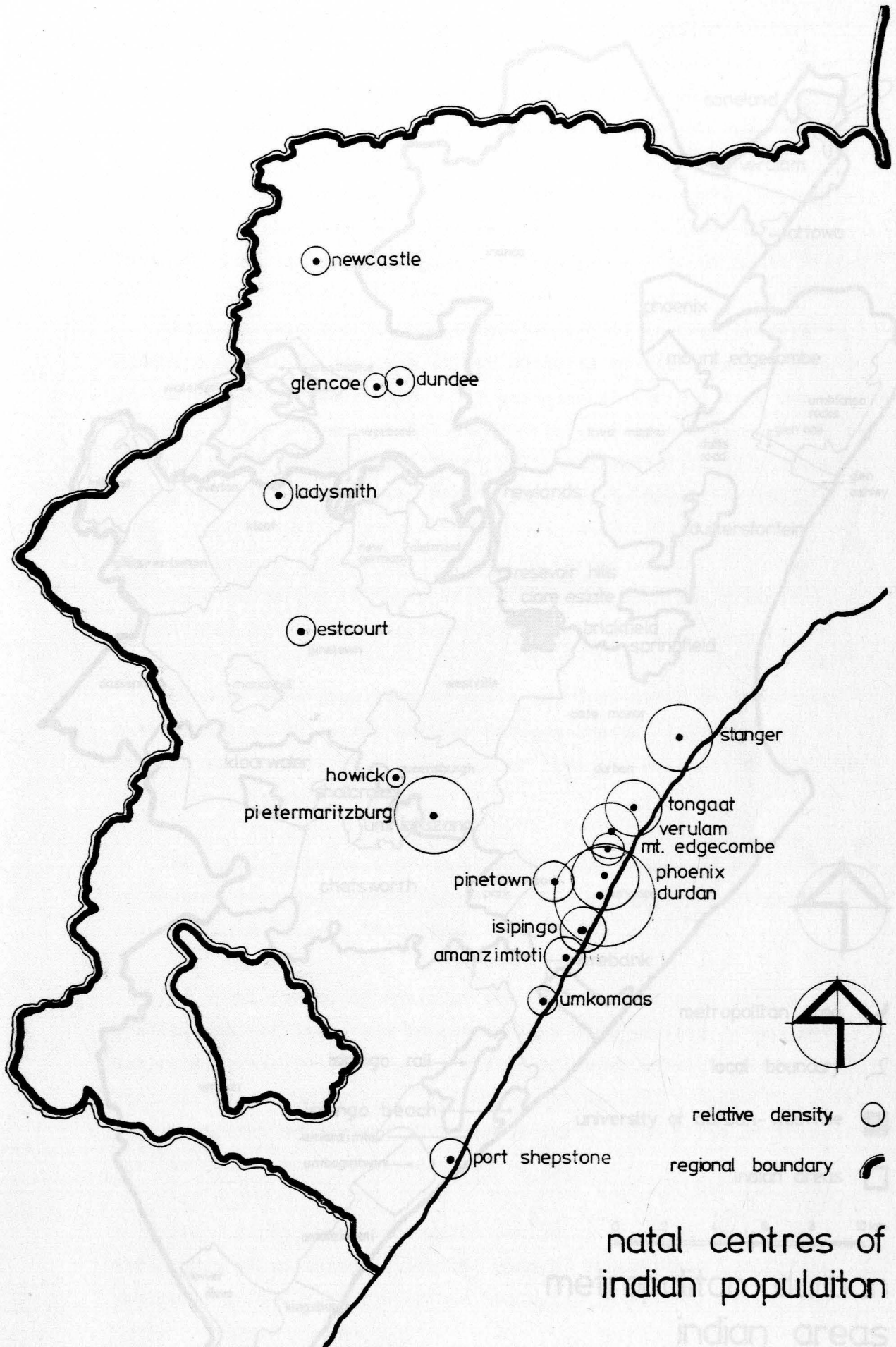


Figure 1

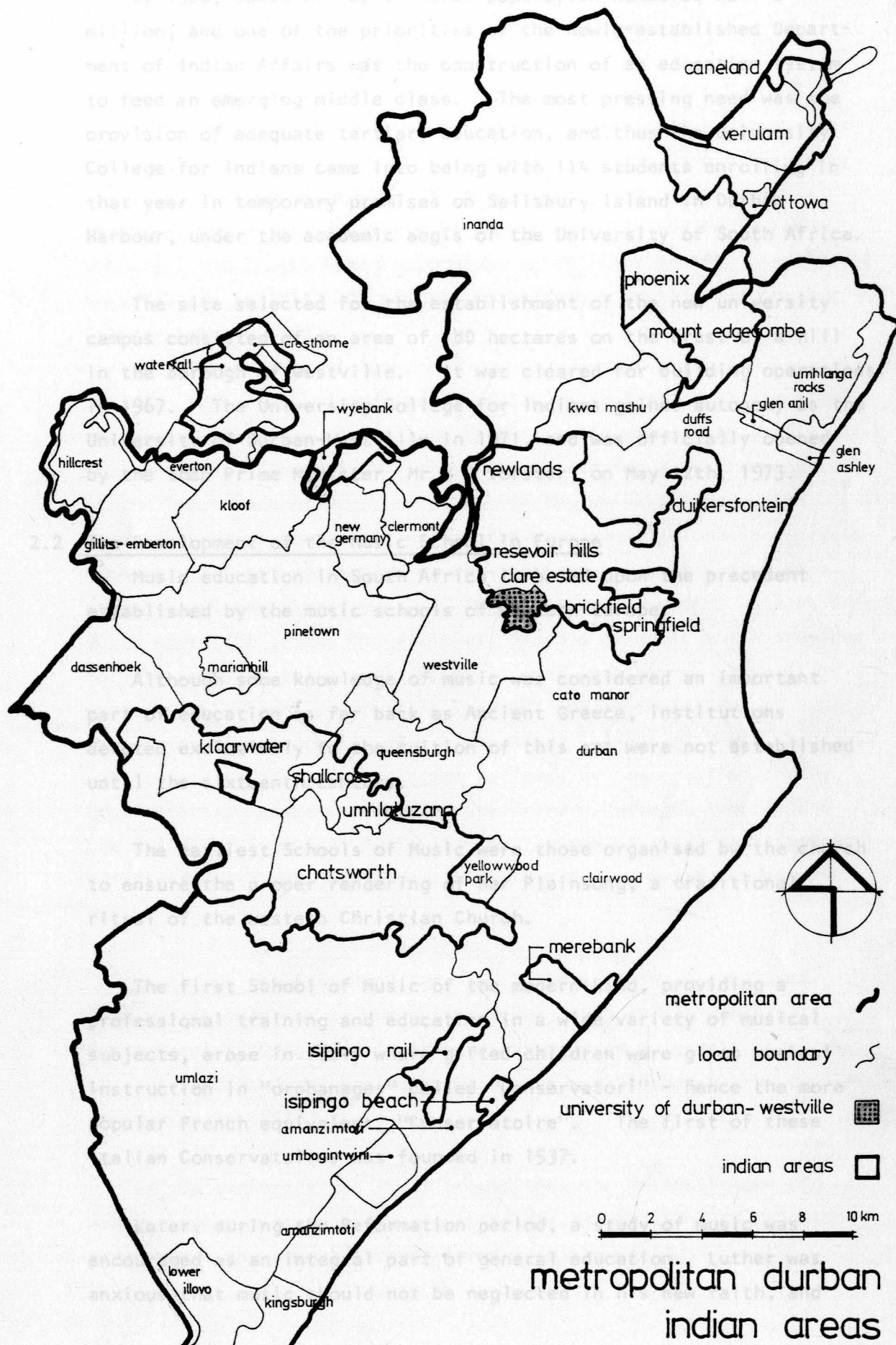


Figure 2

By 1960, South Africa's Indian population numbered half-a-million, and one of the priorities of the newly-established Department of Indian Affairs was the construction of an education system to feed an emerging middle class. The most pressing need was the provision of adequate tertiary education, and thus the University College for Indians came into being with 114 students enrolling in that year in temporary premises on Salisbury Island in Durban Harbour, under the academic aegis of the University of South Africa.

The site selected for the establishment of the new university campus consisted of an area of 180 hectares on the crest of a hill in the Borough of Westville. It was cleared for building operations in 1967. The University College for Indians gained autonomy as the University of Durban-Westville in 1971, and was officially opened by the then Prime Minister, Mr B J Vorster, on May 12th, 1973.

2.2 The Development of the Music School in Europe

Music education in South Africa is based upon the precedent established by the music schools of Western Europe.

Although some knowledge of music was considered an important part of education as far back as Ancient Greece, institutions devoted exclusively to the tuition of this art were not established until the sixteenth century.

The earliest Schools of Music were those organised by the church to ensure the proper rendering of her Plainsong, a traditional ritual of the western Christian Church.

The first School of Music of the modern kind, providing a professional training and education in a wide variety of musical subjects, arose in Italy where gifted children were given musical instruction in "orphanages" called "Conservatori" - hence the more popular French equivalent, "Conservatoire". The first of these Italian Conservatoires was founded in 1537.

Later, during the Reformation period, a study of music was encouraged as an integral part of general education. Luther was anxious that music should not be neglected in his new faith, and

thus established a tradition which led to the rule that all schools in Prussia should provide music lessons thrice weekly.

Apart from the Italian Conservatoires, the earliest founded school for advanced musical education in Europe still in existence was founded in Paris in 1784, and later became the famous "Conservatoire National de Musique". Other conservatoires came into existence in Central and Northern Europe early in the following century: the Prague Conservatory was established in 1811; the Vienna Conservatory in 1821; the Liebzig Conservatory in 1843 and the Berlin Conservatory in 1850.

With the growth of popular education in England, music received new recognition, and instruction in Singing became common. This movement was followed by an increasing demand for a new recognition of the importance of music education in the Universities, which began to provide opportunities for the development of music appreciation as a refined recreation as well as for serious training of a professional character, but only in the theory of music. Apart from music education in the Universities, Schools of Music which provided for the study of all aspects of music came into being. The first professional School of Music in England, the Royal Academy of Music, was founded in London in 1823. The Royal College of Music, London, was founded in 1861, and this was followed by the creation of the Royal Scottish Academy of Music, the Trinity College, London, and the Guildhall School of Music, London. Some of these institutions affiliated with various universities in order to award degrees in Music.

In the United States of America, Schools of Music developed from music societies at the Universities, such as the Oberlin Conservatoire, Ohio (1865), or were established by grants, such as the Juilliard Academy, New York, which was established by the Juilliard Foundation in 1924.

At the present time, it is argued that the United States of America makes more generous provision for the training of talented young musicians than any other country in the world.

2.3 The Development of Music Education in South Africa

From the early period of colonization, South Africa was influenced more by the Teutonic music tradition of Germany and England than the Latinate tradition of Spain and Italy.

Serious music in South Africa can look back upon a tradition almost as long as that of European settlement in Southern Africa itself. Although little is known with great certainty about these early years, some information about the musical life of this period has been provided by the records left by the numerous travellers who visited the Cape during the seventeenth and eighteenth centuries.

During the initial period of colonization by the Dutch East India Company, from 1652 to 1806, there was very limited scope for the teaching of music in the Cape. Music education and advancement was dependent upon the coincidental presence of qualified persons amongst the Cape's military personnel and administrative officials.

Music education in the schools was incorporated into the Religious Instruction course:

"In die Instructien voor den Schoolmeester wat op 15 Junie 1666 deur Kommissaris H A van Rheede onderteken is, is 'Leeren Psalm singen' as een van die pligte van die onderwyser genoem " 1

Up to 1737, such instruction took place mainly in Singing, unaccompanied by any musical instrument.

Carl Christoph Pabst was the first to attempt a focus on formal music education per se when he opened a Music School in Long Street, Cape Town, in July 1802. By the mid-1830's, quite a number of schools existed, both public and private, which offered musical and singing instruction orientated almost exclusively towards the playing and singing of religious psalms. Schools of Music such as Pabst's, which had a short life, were practically no different in terms of method from the type of instruction given by private teachers.

A more ambitious approach was adopted with the formation in 1826 of the "Piano-Forte Institute" at 45 Breede Street, Cape Town, by E K Green and J H Logier, a military musician, where the spatial

requirements of classrooms was a planning consideration. Group instruction was an important principle of the new Institute, together with regular public practical and theoretical examinations. This Institute was based directly on the music institutions of London and Berlin, thus emphasising the Teutonic influence on South African music education.

A significant development in piano-forte was the arrival in the Cape in 1844 of Dutch pianist Carl Junghenn. Junghenn was a pupil of Thalberg, a contemporary of Liszt, and had a great influence in Cape music circles. He was critical of music education methods in the Cape and attempted to improve the standard of piano-forte education by visiting music institutes and also by publishing a 28-page guide:

"The art of playing the piano-forte from the earliest rudiments to the highest state of cultivation " 2

which was printed and distributed by Van de Sandt, de Villiers and Tier, Castle Street, Cape Town, in 1851. Junghenn, who later made his fortune at the diamond fields, was regarded as a valuable and leading figure in Cape music education during this period.

Although the piano had a central position in South African music in the nineteenth century, other instruments began to receive attention largely due to the influence of military musicians stationed at the Cape Town garrison. Military band leader Robert Medhurst arranged yearly concert programmes from 1844 to 1850, performed by mainly amateur musicians.

Although the Cape, particularly Cape Town, had been the focus of South African music education, during the last three decades of the nineteenth century, due to the migration of settlers and the arrival of new settlers from overseas, the growth of music education began in such centres as the coastal towns of Port Elizabeth and Durban, the hinterland towns of Grahamstown and Pietermaritzburg, and the major centres of the Boer republics: Bloemfontein, Pretoria, Potchefstroom, and after 1866, Johannesburg. Private music schools were established, and music education gained greater status when

music was offered as a subject at teacher-training institutions such as those in Durban (1866), Bloemfontein (1876) and Potchefstroom (1877).

In Natal, music had always been recognised as part of a "good English Education", but teachers of music were not regarded as specialists, and were expected to offer other accomplishments too. The earliest advertisement for music pupils appeared in 1846, and offered tuition in languages as well:

"Mr C E Boniface, Law and General Agent, Collector of Accounts and Sworn Translator, begs to intimate to his Friends and the Inhabitants of this Town that he has removed from Loop Street to Burger Street. Private instruction given three times a week in Dutch, French, Spanish and Portuguese Languages and likewise on the Guitar ". 3

Such offers of tuition in music and languages became increasingly common.

A convenient entrance to music teaching was piano tuning:

"A notice prominently displayed on the first page of the first issue of the Natal Mercury, dated 25 November, 1852, advertised 'Mr Daniel Hull junior' as a 'Professor of Music'; and although the main part of his 'professional' duties was the tuning and repairing of pianos, he offered to give regular music lessons ". 4

An alternative to this early form of itinerant music teaching was the more dignified "studio". In 1866 two Durban ladies, Miss Munro and Miss Fyvie, started the first "school of music" in Natal. Their studio was in Field Street, where they also taught Dancing and Deportment. In the late 1860's, Mrs Harrison of the Mansion House boarding school in Smith Street offered lessons in piano playing and voice cultivation.

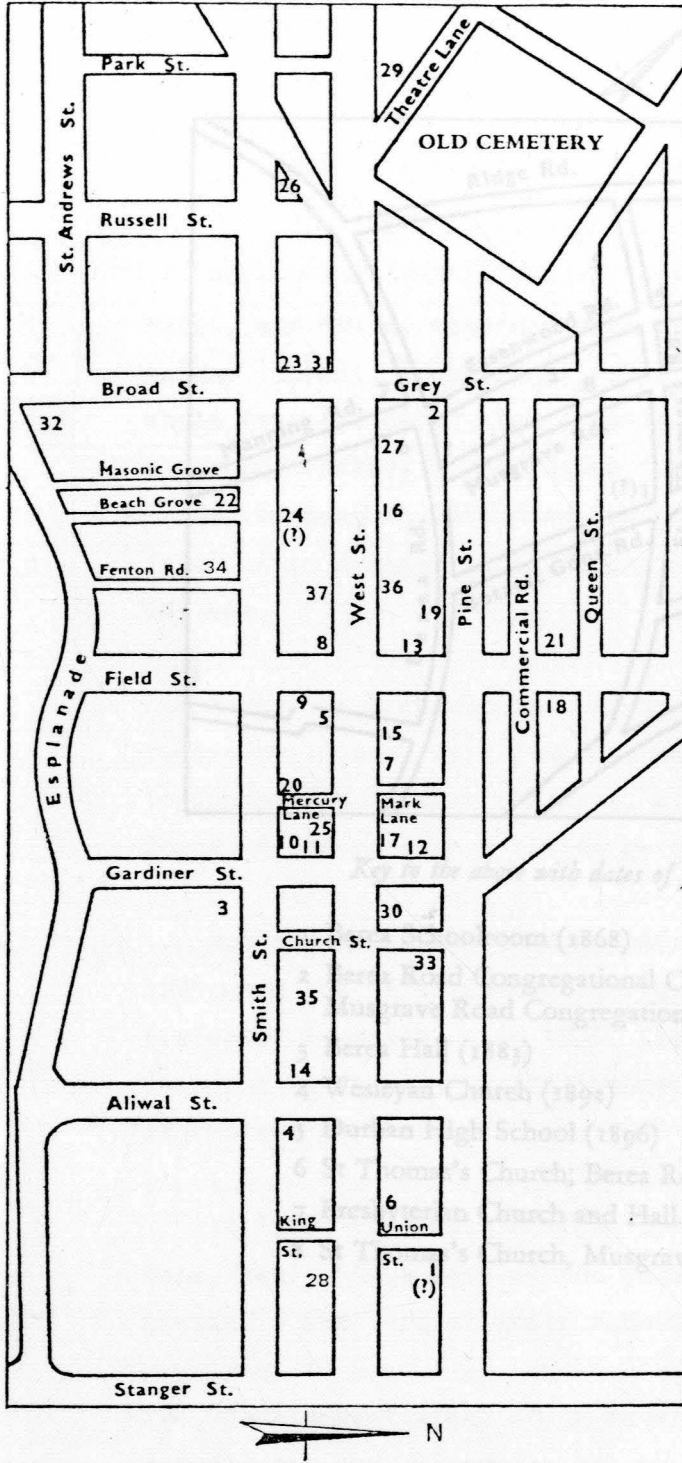
The music studio was the forerunner of the music academy, the first of which was started by visiting violinist and singer "Professor" Florence Machielse, who opened his Academy of Music in

3. Jackson: Music in Durban 1850-1900 p.102

4. Ibid,p.103

Plan of central Durban showing where musical entertainments were held during the last century

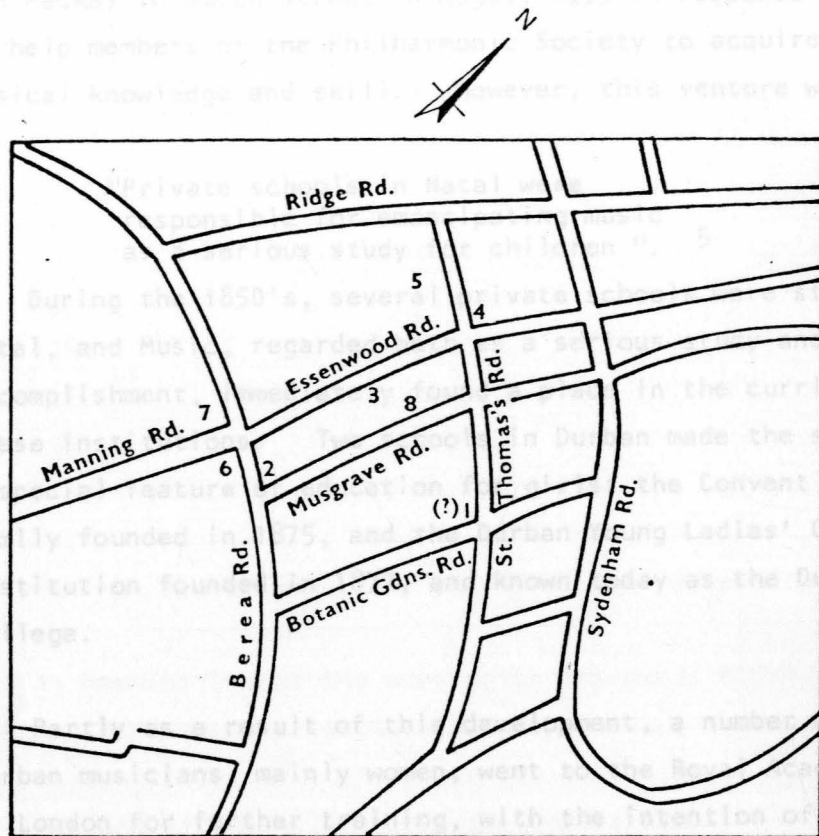
Key to the plan of central Durban with dates of first concerts



- 1 London Tavern (c. 1850)
- 2 Drew's West End Hotel (c. 1850)
- 3 Macdonald's Hotel (1852)
Masonic Hall, Winder's Hotel (1857)
Wood's Masonic Hotel (1859)
Masonic Hall, Royal Hotel (1860)
- 4 Wesleyan Chapel (1852)
- 5 Kinghurst's Store (1852)
- 6 Knight and King's Store (1852)
William Palmer's Store (1853)
- 7 Breede's Store (1853)
Smith's Store (1856)
- 8 Government Schoolroom (1854)
Deer's Hotel (1859)
- 9 Evans and Churchill's Warehouse (1857)
- 10 Beningfield's Store (1857)
- 11 Acutt's Auction Mart (1858)
- 12 Masonic Hall (1861)
County Hall (1864)
- 13 Jonsson's Masonic Hall (1865)
Palmer's Masonic Hall (1867)
Houghting's Music Hall (1868)
Caledonian Hotel (1871)
The Princess Cafe (1895)
- 14 Court House (1866)
- 15 Snell's Store (1866)
- 16 Council Chamber (1865)
- 17 Clarke and Pulleyn's Store (1867)
- 18 Presbyterian Church (1867)
- 19 Trafalgar Hall (1869)
Trafalgar Theatre (1876)
Vaudeville Theatre (1885)
- 20 Congregational Church and Schoolroom (1868)
- 21 Templar's Hall (1875)
- 22 Masonic Hall, Smith Street (1876)
Masonic Hall, (rebuilt) (1896)
- 23 Convent Ladies' College (St Joseph's) (1876)
- 24 "Theatre Royal" (Skating Rink) (1877)
- 25 Wesleyan Church, West Street (1879)
- 26 Young Ladies' Collegiate Institution (1879)
- 27 Kaim's Piano Show Room (1882)
- 28 Oddfellows' Hall (1882)
Philharmonic Hall (1883)
- 29 Theatre Royal (1882)
- 30 Town Hall (1885)
- 31 St Joseph's Church and Hall (1887)
- 32 Durban High School (1888)
- 33 St Paul's Church (1889)
- 34 St Paul's Schoolroom (1891)
- 35 Band Stand (1891)
- 36 Vause and Slatter's Music Saloon (1896)
- 37 Jackson Brothers' Music Room (1899)

Figure 3

Plan of the Berea showing places of musical entertainment in the last century



Key to the above with dates of first concerts

- 1 Berea Schoolroom (1868)
- 2 Berea Road Congregational Church (1881)
Musgrave Road Congregational Church (1892)
- 3 Berea Hall (1883)
- 4 Wesleyan Church (1892)
- 5 Durban High School (1896)
- 6 St Thomas's Church, Berea Road (1896)
- 7 Presbyterian Church and Hall (1899)
- 8 St Thomas's Church, Musgrave Road (1900)

West Street in August 1877. Another Music Academy was founded by J H Mackay in Smith Street in August 1855 in response to a request to help members of the Philharmonic Society to acquire greater musical knowledge and skill. However, this venture was a failure.

"Private schools in Natal were responsible for emancipating music as a serious study for children". 5

During the 1850's, several private schools were started in Natal, and Music, regarded both as a serious study and as a social accomplishment, immediately found a place in the curriculum of these institutions. Two schools in Durban made the study of music a special feature of education for girls: the Convent of the Holy Family founded in 1875, and the Durban Young Ladies' Collegiate Institution founded in 1877, and known today as the Durban Girls' College.

Partly as a result of this development, a number of promising Durban musicians, mainly women, went to the Royal Academy of Music in London for further training, with the intention of returning to South Africa to earn a living by teaching and giving recitals.

Musical education in South Africa was given further impetus in 1905 when the first Conservatoire of Music was established by Professor K Janash. In 1935, the Conservatoire was incorporated into the University of Stellenbosch and was thus able to offer a degree course in music.

In 1910, the South African College of Music was established in Cape Town. As a part of the University of Cape Town, it is presently the largest music faculty in South Africa.

Other universities which have subsequently established music schools are the University of the Witwatersrand (1921), Rhodes (1923), Pretoria (1927), Potchefstroom (1943), the Orange Free State (1943), the University of Natal (1971), and finally the University of Durban-Westville (1979).

3. Music Education at the University of Durban-Westville

The Bachelor of Music course was offered for the first time at the University of Durban-Westville in 1979. Prior to this, the Music division at the University formed part of the Department of Physical and Aesthetic Education. The development of the Music School is reflected by the following enrolment figures:

<u>Year</u>	<u>Total student population</u>	<u>Music Students</u>
1979	4 652	-
1980	5 003	3
1981	4 961	21
1982	4 950	42

Students must choose to pursue either the Bachelor of Music (Education) course or a general Bachelor of Music course. These courses run concurrently for the first two years of study.

An examination of the curriculum (Appendix B) of the degree courses offered reveals that the Music School at the University of Durban-Westville, like the other South African music schools both English and Afrikaans, follows the traditional English pattern of tuition, which can be divided into three main sections:

- a) Principal subject: Practical study of an instrument or singing
- b) Secondary practical subject: Less strenuous study of singing or an instrument
- c) Supplementary subjects e.g. History of Music, Theory

The curriculum extends over four years of full-time study.

To gain entrance to the Music School, prospective students must possess the following qualifications:

- a) Practical requirements: At least 60% in Music as a Matriculation subject or University of South Africa Grade VII
- b) Theoretical requirements: Music as a Matriculation subject or University of South Africa Grade V

In addition, all students are required to attend an audition.

4. Opportunities for Musicians in South Africa

- Performing: a) Orchestral players
 b) Broadcasting
 c) Conducting and Accompanying
 d) Organists
- Theoretical: a) Music Librarians
 b) Programme compilers
 c) Announcing
 d) Research
 e) University teaching
- Teaching: a) Schools
 b) Tertiary institutions e.g. Universities,
 Teacher Training Colleges
 c) Private and class teaching

Although the South African Broadcasting Corporation is now presenting serious South African music more generously in its programmes, it is still very difficult to hear the works of our leading composers regularly and often enough to get a clear picture of the value of their contributions. The fact that South African music criticism is also quite undeveloped - not, in fact, emerging beyond the cursory note in the daily newspaper - must be noted as a factor which has made it difficult to arrive at a clearer assessment.

5. Trends in Music Education

In the Art of Music, as with the other art forms, there is the constant emergence of exciting innovative trends which teachers of music must take into account when formulating curriculum and method.

One of the most striking recent developments in the field of music is the increasing trend towards experimentation in the use of electronic equipment - an inevitable development in our technocratic society. Electronic equipment is used on its own, or in conjunction with traditional music instruments.

In contrast to, but parallel with the use of high technology in music, is a renewed interest in ethnic music, periodic musical instruments and the use of instruments not specifically designed for music making.

A continuing trend in music education is the involvement of all age groups from very young to old, and the bringing together of musicians with diverse backgrounds and experience.

In the Music Schools of Europe there is an increasing movement towards a very low teacher/student ratio; the ideal being, of course, a 1 : 1 ratio where the teacher spends his day in his studio instructing students individually in a more informal manner.

In South Africa, the custom has been to admit students to Schools of Music after matriculation; and only thereafter have opportunities for performance in concert halls become available. However, partly as a result of the argument prevalent in vocationally-orientated countries such as Russia that the potential peak of a career may be reached at the age of twenty, there is a movement towards the removal of this age barrier by the increasing informal involvement of music schools in Youth Orchestras and the structuring of musical training and experience of pre-school, primary and high school students.

Thus Schools of Music are gradually becoming more accessible to the man in the street in order to foster greater involvement with and appreciation of music, and in order to ensure the continued existence and development of Schools of Music.

Future music education in South Africa may also offer increased opportunities for the study of the indigenous music forms of the diverse cultures of South African society. This has already begun at the University of Cape Town where a course in African music is offered, and at the University of Natal where students may study both African and Indian music. It is expected that the School of Music at the University of Durban-Westville will follow this trend by providing opportunities for a closer study of the history, philosophy, symbolism and instruments of Indian music (Appendix C).

ANALYSIS OF PRECEDENT

Examples of precedent are selected and analysed as a response to various questions confronting the architect. These include the context in which the development took place; whether or not there is a typology of plant; and how the architects tackled the physical problems of form, structure, construction and environmental control while at the same time dealing with the aesthetics of symbolism and expression.

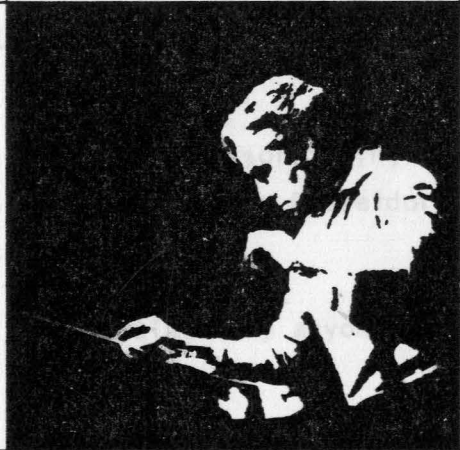
The specific examples selected for study have been categorised in the following order:

1. A new complex on a flat corner site;
2. A new complex on a steep site with access from the upper level;
3. A new complex as a supplement to existing accommodation;
4. The recycling of an existing structure.

By examining a variety of solutions to different site restraints and design criteria the architect approaches the problem from different angles and as a result avoids the stereotyped solution based on a uniform experience.

1. Conservatoire of Music, Stellenbosch

ANALYSIS OF PRECEDENT



1.1 The setting

The complex occupies a flat corner site bounded by one of the major axes within the town: Victoria Street. The fact that the site is centrally situated within the campus makes the conservatoire highly accessible.

5. A Behrens: "The last word ... Conservatoire of Music University of Stellenbosch" Architecture S A, July 1978 p.74

ANALYSIS OF PRECEDENT

Examples of precedent are selected and analysed as a response to various questions confronting the architect. These include the context in which the development took place; whether or not there is a typology of plan; and how the architects tackled the physical problems of form, structure, construction and environmental control while at the same time dealing with the aesthetics of symbolism and expression.

The specific examples selected for study have been categorised in the following order:

1. A new complex on a flat corner site;
2. A new complex on a steep site with access from the upper level;
3. A new complex as a supplement to existing accommodation;
4. The recycling of an existing structure.

By examining a variety of solutions to different site restraints and design criteria the architect approaches the problem from different angles and as a result avoids the stereotyped solution based on a uniform experience.

1. Conservatoire of Music, Stellenbosch

Architects: Colyn and Meiring

This conservatoire has been described by Professor Stein, senior professor of piano from the School of Music in Dusseldorf as:

"..... the most beautiful School of Music
in the world." 6

The sincerity of this statement can be appreciated by anyone who has experienced this building.

1.1 The setting

The complex occupies a flat corner site bounded by one of the major axes within the town: Victoria Street. The fact that the site is centrally situated within the campus makes the conservatoire highly accessible.

6. R Behrens: "The last word ...: Conservatoire of Music University of Stellenbosch" Architecture S A, July 1978 p.74

1.2 Site relationship

The building addresses itself in a sympathetic manner in both mass, rhythm and form to the older buildings around it. The existing street pattern, which is an intrinsic element of Stellenbosch's beauty, is acknowledged. The complex is offset to great advantage by the abundance of planting, grassed areas and paving, although in places the use of non-indigenous plant matter is not always true to what has become synonymous with the character of Stellenbosch.

1.3 Planning

The layout is simple and easily understood while the external forms reflect the internal functions of the spaces. The dual nature of the use of the building - education and public entertainment - is reflected in the general scale of these areas and particularly in the scale and proportion of the entrances.

The hierarchy of spaces, from public on the North relating to Victoria Street, to practice rooms on the South relating to the domestic fabric, is well integrated with the circulation system. Service entry points also respond to the scale of surrounding development.

In simple terms the main public areas, consisting of auditorium, lecture hall and rehearsal hall with their common foyer facing Victoria Street, constitute the bulk of the building. The teaching spaces, practice rooms, library and administrative areas lead off behind the public spaces with access from Neethling Street.

1.4 Internal circulation and appearance

The auditorium is separated from the lecture and rehearsal halls by a splendid and spacious entrance hall and foyer which makes dramatic use of level changes and large scale unifying art work by Professor Scully - a space which needs to be experienced to be appreciated and one which:

"creates a feeling appropriate to the spirit of music".

Difficulty of the control of entry to the auditorium has been experienced but only a managerial solution will eliminate this.

7. J M Miszewski: "Appraisal: Conservatoire of Music, University of Stellenbosch" Architecture S A, July 1978. p.18

The position of the library and administrative areas is excellent as visitors need never penetrate the inner sanctum of the school - the teaching and practice rooms. The barrier between library and public is almost eliminated.

The internalised student waiting areas adjacent to the practice rooms are popular and intimate meeting places where lively discussions take place. Colourful bulletin boards, the bank of lockers, a display cabinet and accent lighting all add to the informal, stimulating atmosphere.

The corridor link between student entrance and waiting area is reduced in apparent length by the change in level and floor material and the use of large picture windows. In the case of practice room studio wings, passages are negative in their termination - a solid timber door with no indication of what is beyond.

The most exciting room in the complex is the rehearsal hall which has a multiplicity of uses, variable acoustics and an atmosphere ideally suited to its main function - the workshop and experimental studio.

Materials used create a mood of quiet opulence without ostentation, and are also functional and easily maintained. Consistency in attention to detail is the hallmark of this building.

The landscaping makes a significant contribution to and encourages the activities which take place around the building. Foliage provides visual delight and contrasts with painted walls and creates shaded areas and frames through which the building can be viewed.

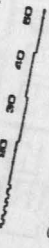
Internal spaces are generous and opulent where they are public, and intimate and refined where they are private. Variation in volume and height of ceiling creates interest, excitement and expectation while adequate glazed areas provide visual relief and a strong link with the landscape.

Victorlastraat

Hofmeyerstraat

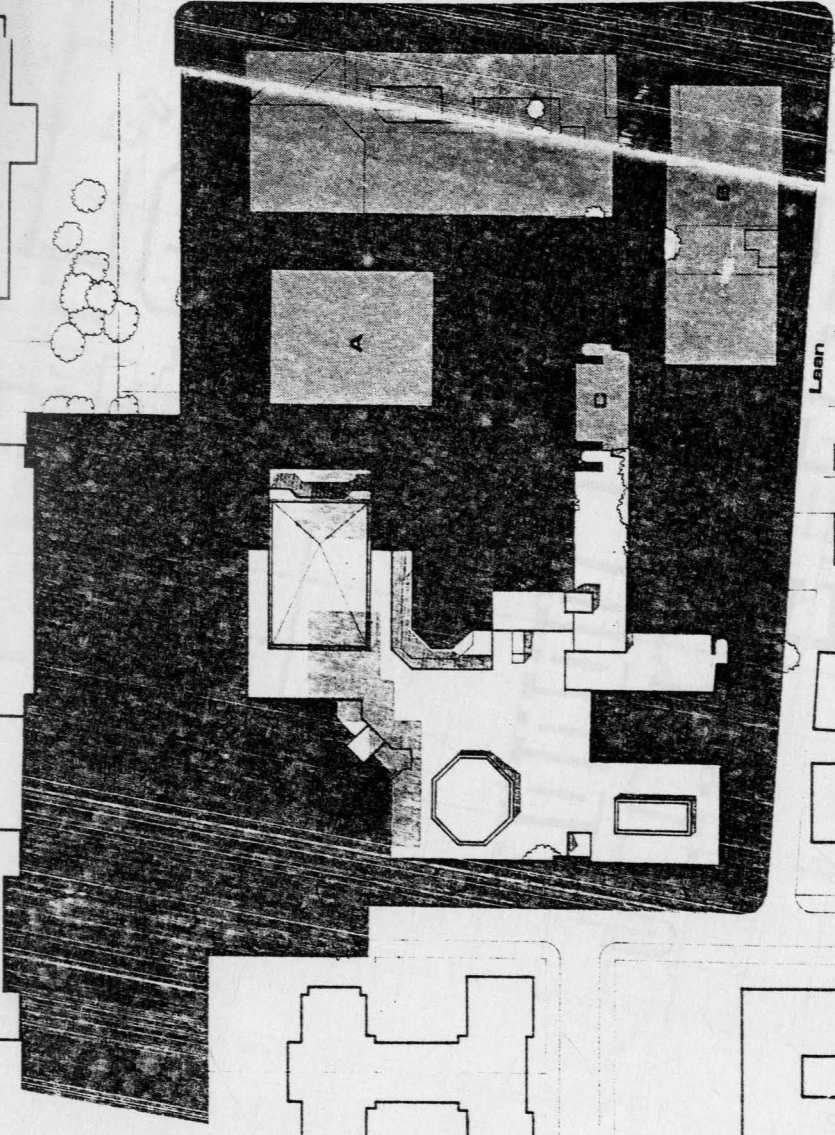
Claassenstraat

- A Voorgestelde Parkeerstructuur - 80 motora
- B Toekomstige Uitbreidings ..
- C Defenkamervakuel .. 128 ..
- D Voorgestelde Nuwe Fakulteit



Site plan : Stellenbosch Konservat...

Figur...

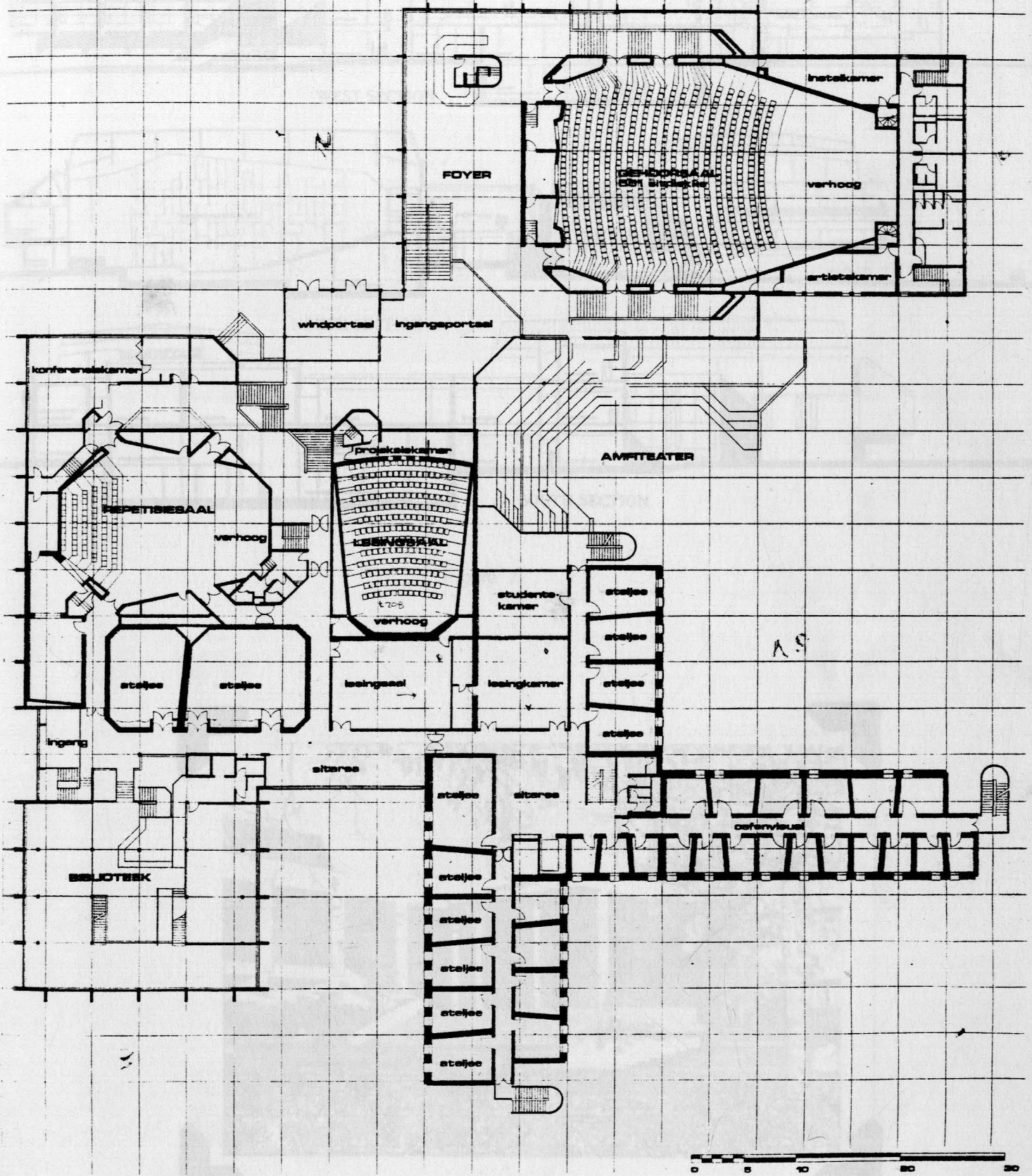


Laan

Murreystraat

Nedehingstraat

Boemanstraat



Stellenbosch Konservatorium
Ground floor plan

Figure 6

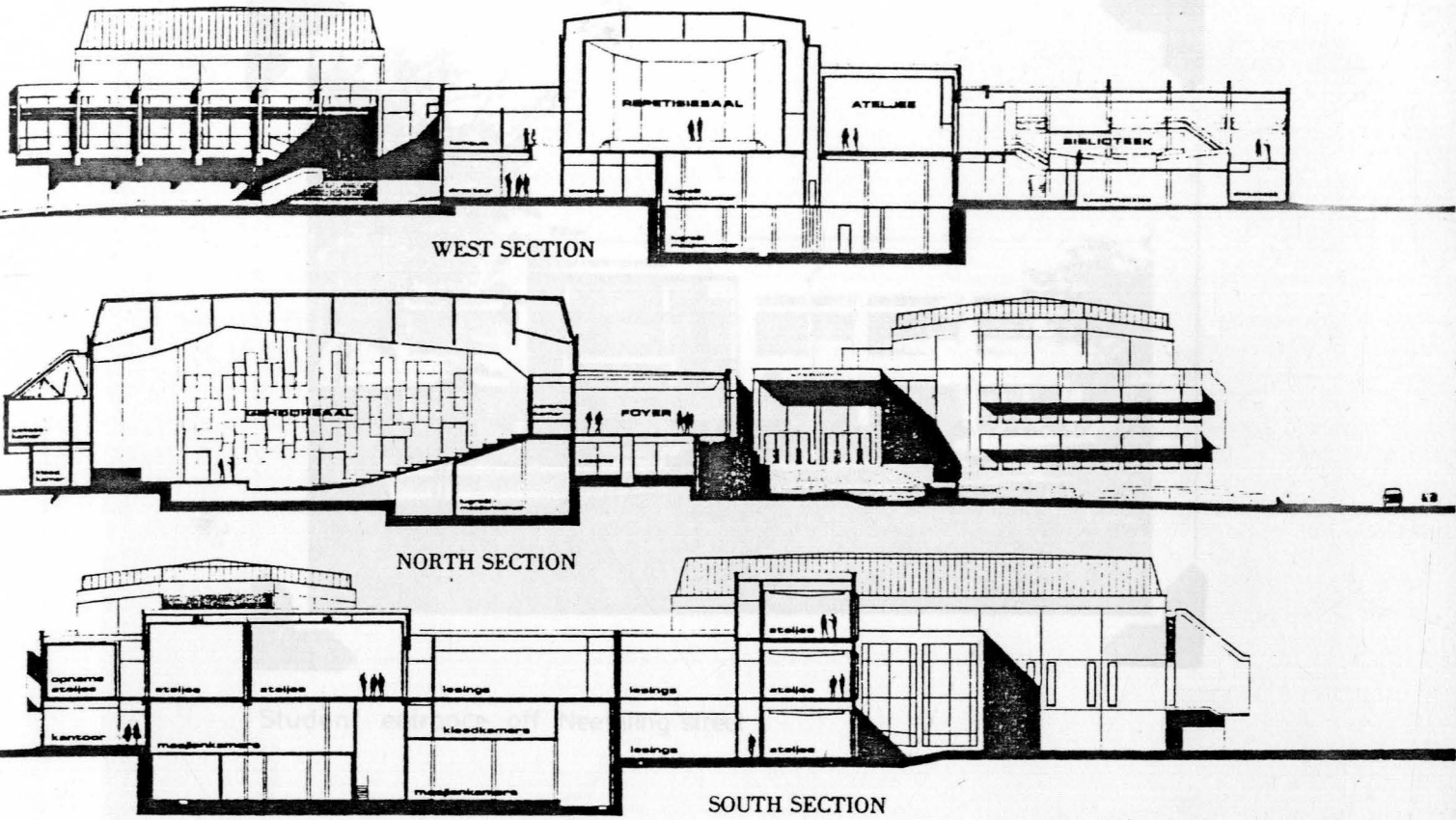


Figure 7

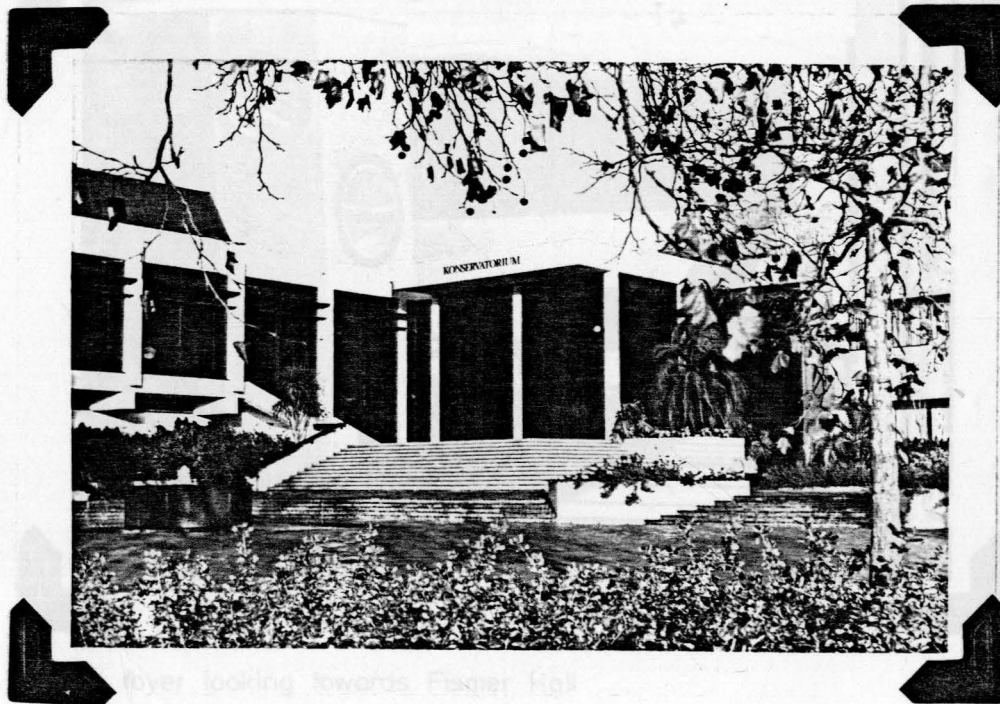
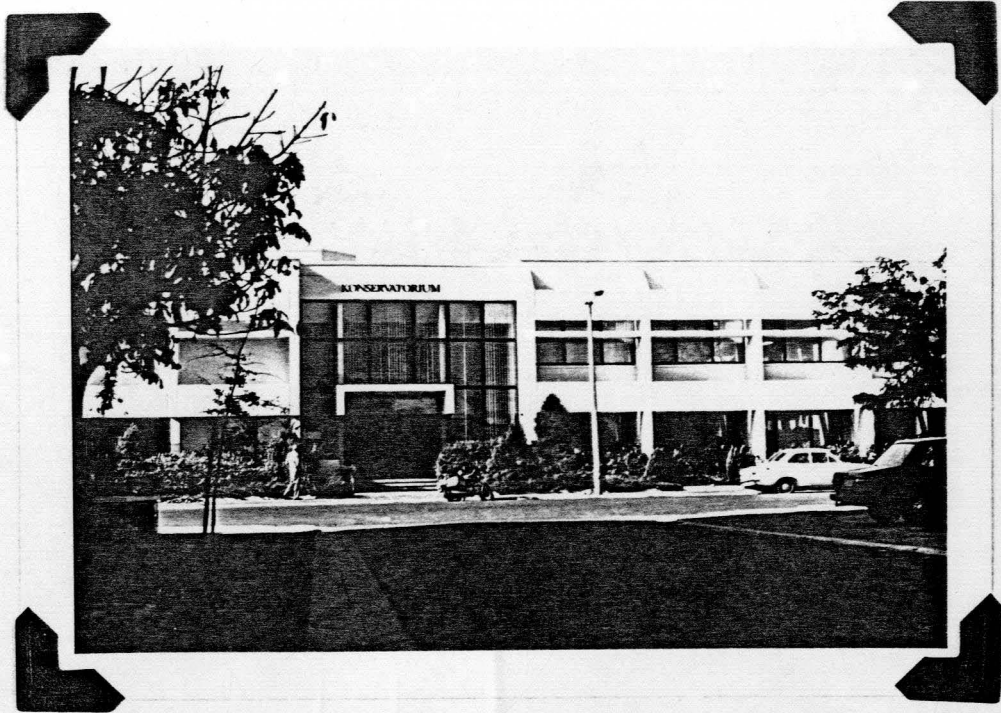
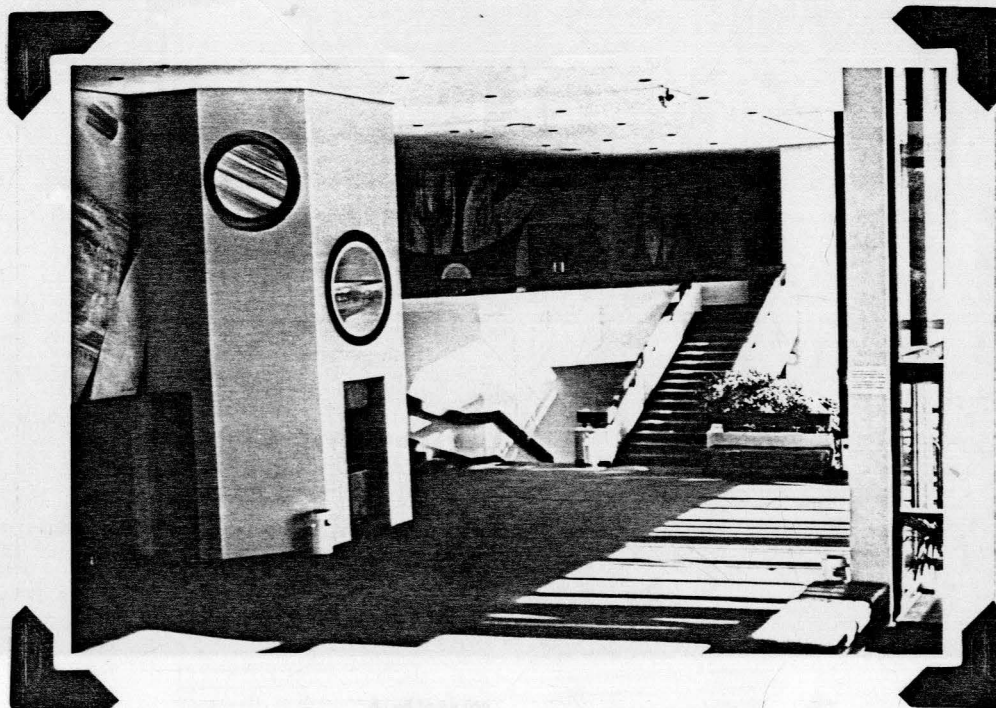


Figure 8



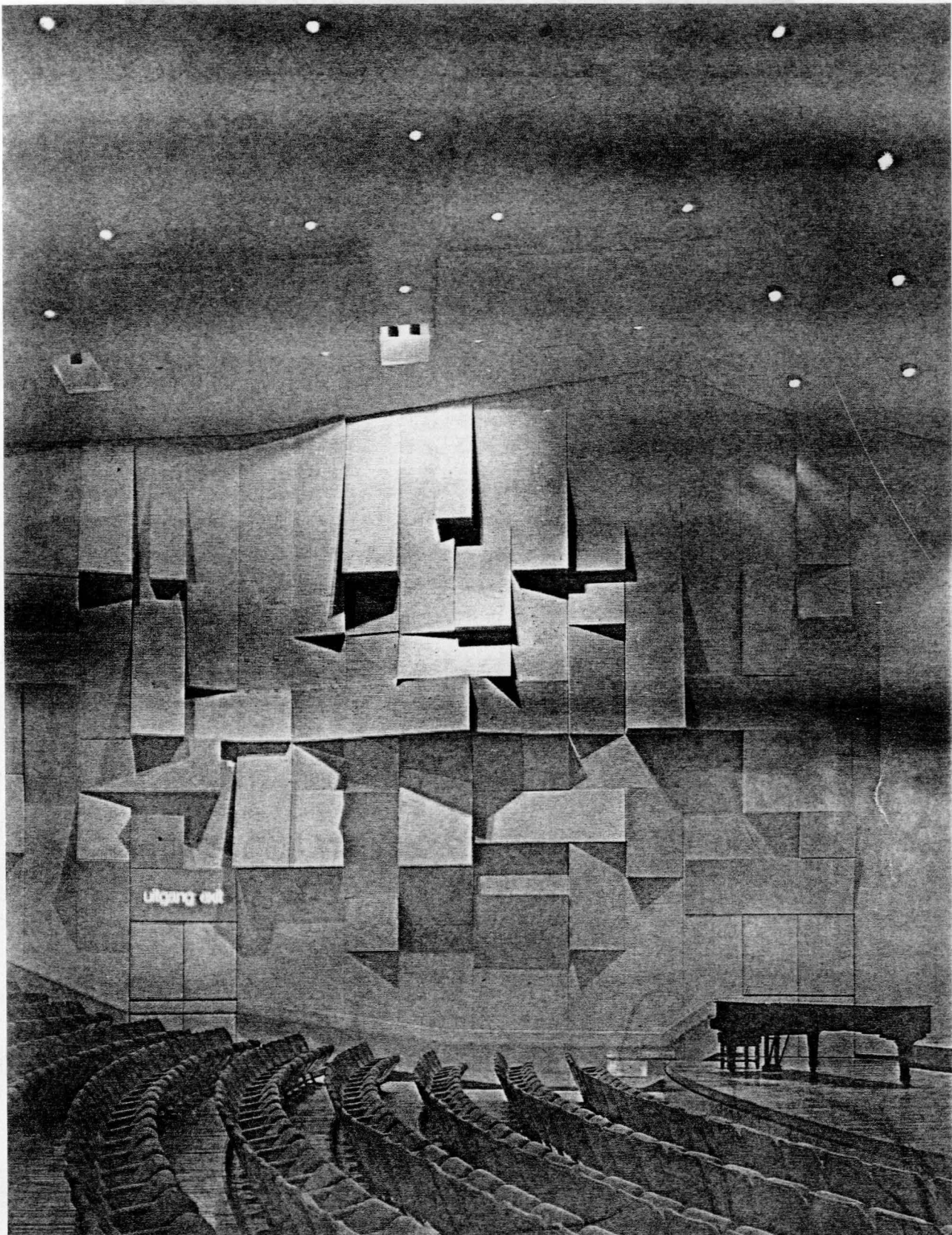
Student entrance off Neethling street

Figure 9



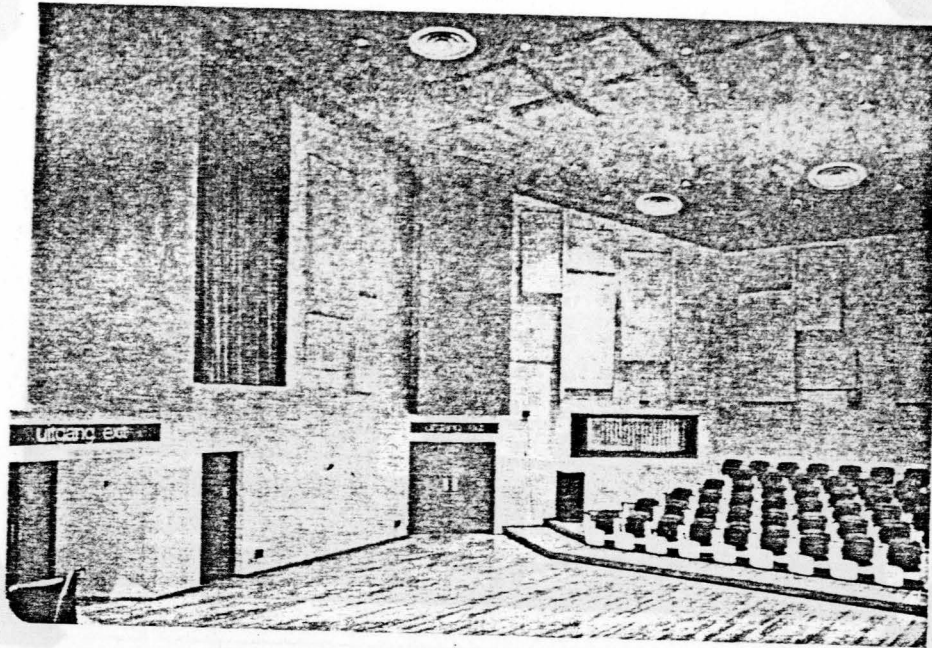
Public foyer looking towards Fisser Hall

Figure 10



Auditorium

Figure 11

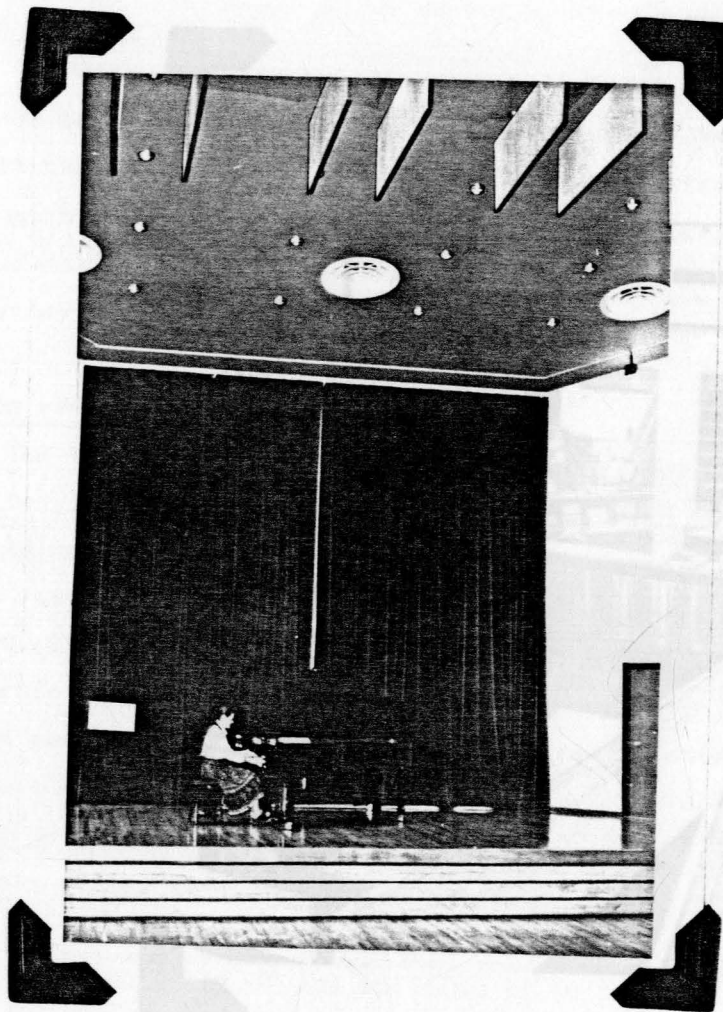


Student waiting area from the entrance

Fismer Hall

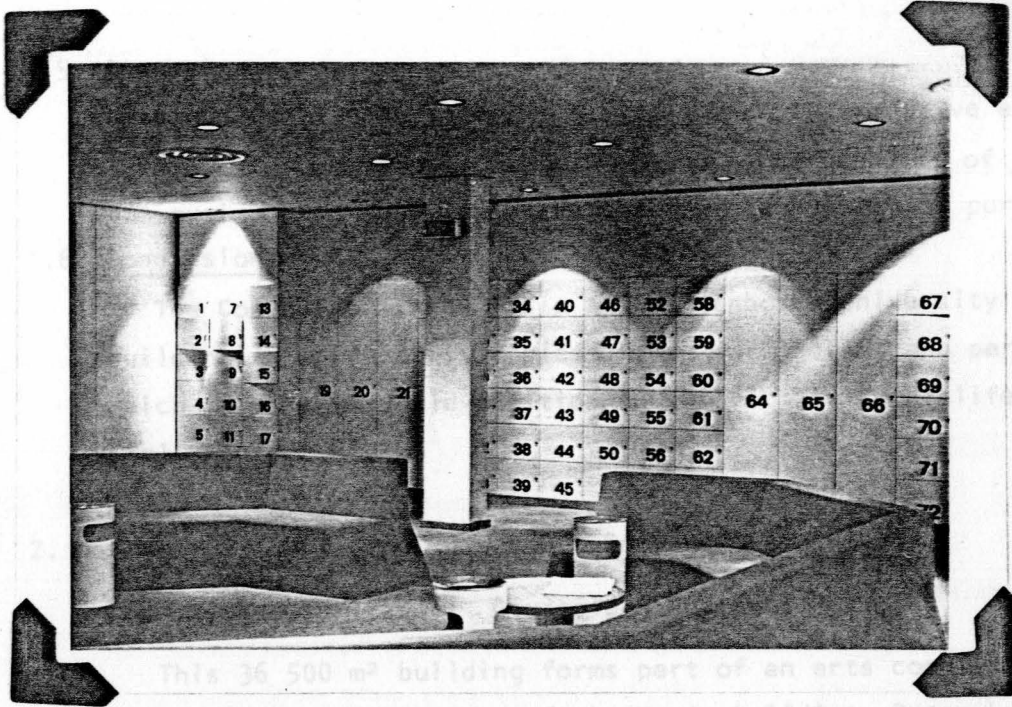
(rehearsal hall)

Figure 13



Library looking towards the control desk

Figure 12



Student waiting area from the entrance

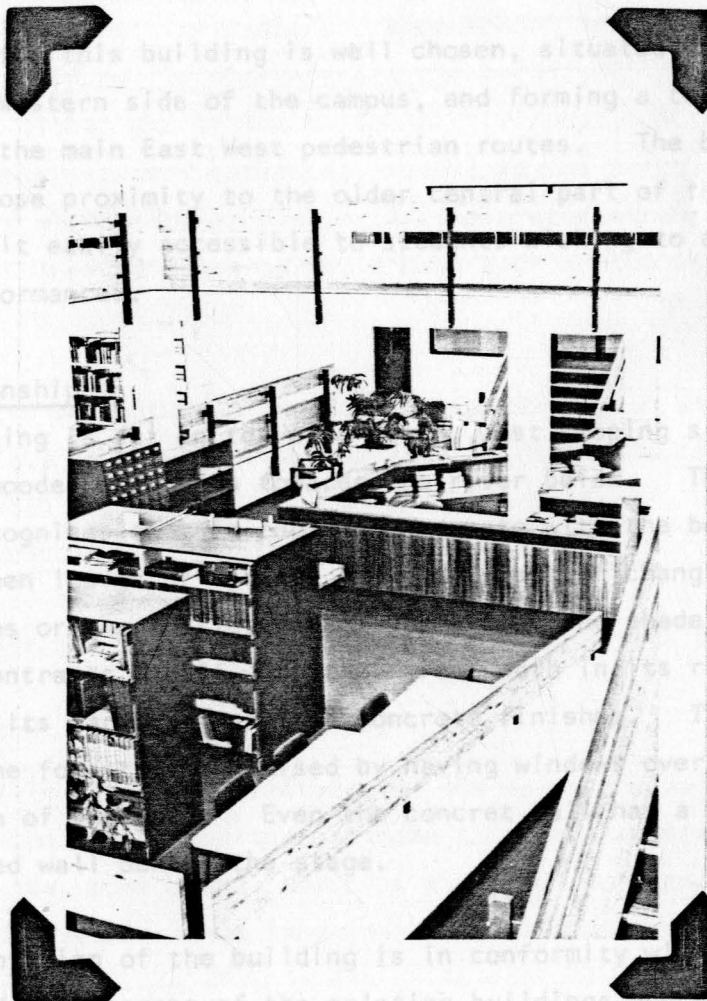
Figure 13

2.1. The setting

The site of this building is well chosen, situated on the quiet South-Western side of the campus, and forming a junction with one of the main East-West pedestrian routes. The building is within close proximity to the side-entrance of the campus thus making it a convenient location for mid-day performances.

2.2 Site relationship

The building is heavily wooded, and the building recognises the lush green surroundings. Autumnal hues of the trees are therefore contrasted with the building's form and in its design, the building's beauty of the form is enhanced by its overlooking this portion of the campus. Even the double glazed windows are a high quality.



Library looking towards the control desk

Figure 14

1.5 Acoustics

Acoustically the building is excellent, an expensive exercise (which could not be compromised) enhancing the quality of the music performed within the spaces to the point of pure delight.

1.6 Conclusion

The Conservatoire of Music at Stellenbosch University is a building in which it is a pleasure to work, study and perform and which makes a valuable addition to the rich cultural life of Stellenbosch.

2. Lang Music Building, Swathmore College, Pennsylvania

Architects: Mitchell Giurgola Associates

This 36 500 m² building forms part of an arts complex for the College campus, comprised of the Music building, Drama building and the Visual Arts building, and is designed to have strong links with the Drama building situated on the opposite side of the road.

2.1 The setting

The site for this building is well chosen, situated on the quiet South-Western side of the campus, and forming a terminus with one of the main East West pedestrian routes. The building is within close proximity to the older central part of the campus thus making it easily accessible to students wishing to attend mid-day performances.

2.2 Site relationship

The building is set on top of a steep, west sloping site which is heavily wooded and drops towards the river below. The building recognises that it could not compete with the beauty of the lush green leaves of Spring, the excitement of changing Autumnal hues or the restless dancing of light and shade, and therefore contrasts itself with the forest both in its rectangular form and in its harsh off-shutter concrete finishes. The dramatic beauty of the forest is maximised by having windows overlooking this portion of the site. Even the concret hall has a 7 m high double glazed wall behind the stage.

The orientation of the building is in conformity with the existing NW/SE alignment of the existing buildings and yet makes excellent use of the dramatic slope of the site and its views.

2.3 Planning

Planning is simple, reflecting the geometry of the building as a whole. The two major volumes - the 420 seat concert hall and the foyer, circulation and exhibition space - are separated by a service core. The choral rehearsal room leads off the entrance foyer at a lower level, while the library forms the bulk of the accommodation on the South-East side of the exhibition volume. The top level wraps around the two main volumes to form seminar rooms, offices and practice rooms.

The circulation corridor to the upper level makes movement between diagonally opposite rooms tedious. However, the skylighting does give this space a light, airy atmosphere which makes it less claustrophobic. Access between the choral rehearsal room and the other spaces is tenuous.

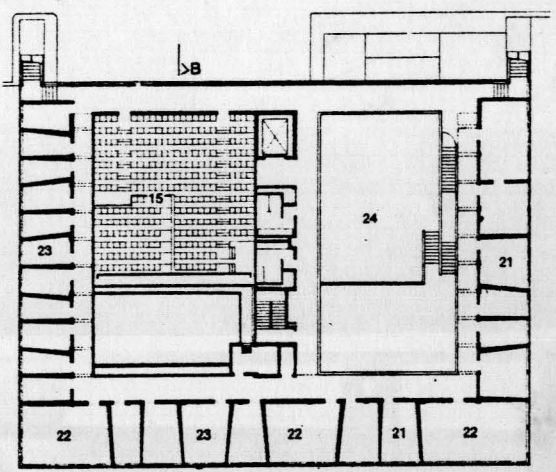
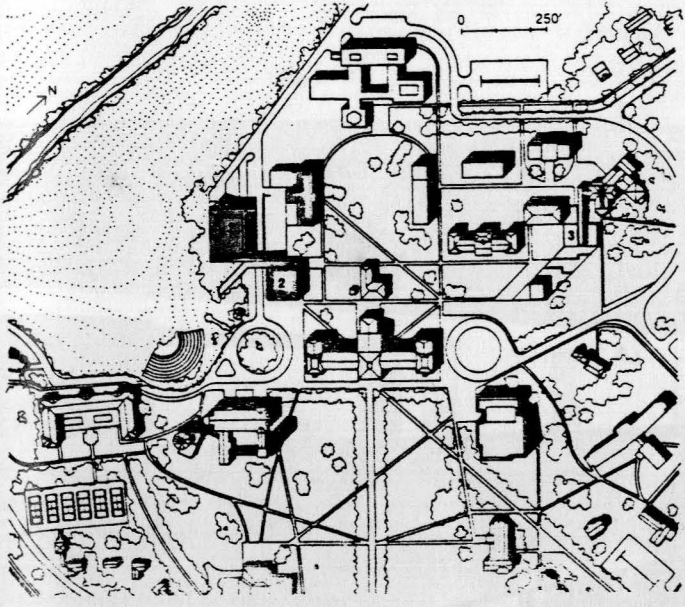
2.4 Internal circulation and appearance

As in the case of Stellenbosch, this school has two entrances - the predominantly public entrance and the secondary student entrances at either end of the building. Without control points on the secondary student entrances, access to the practice rooms could present a security problem. A single student and staff entrance with a reception area would have been a more appropriate solution to the upper floor.

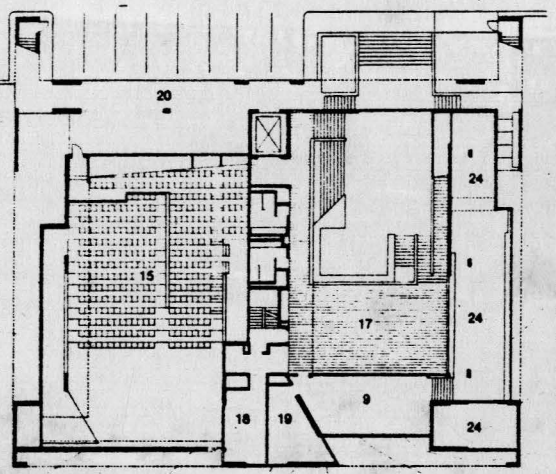
The public entrance, which is approximately 1,2 m below road level, opens out to a large entrance foyer. By manipulating volumes through the introduction of a mezzanine level, the stepping down to both auditorium and choral rehearsal room, and the visual penetration of space by means of views to the forest, a sense of drama is created - a feeling appropriate to the spirit of music.

2.5 Acoustics

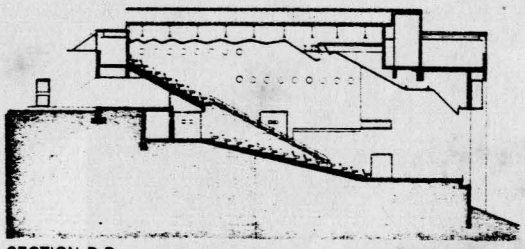
By splitting the hall bilaterally, the balcony level has been linked with the lower seating arrangement. Thus students can gain access from the upper level, while at the same time acoustic benefit is derived from the long, narrow hall and steeply raked seating. The drawback of this design is poor sightlines from stall seats near the main entrance. The concept of variable



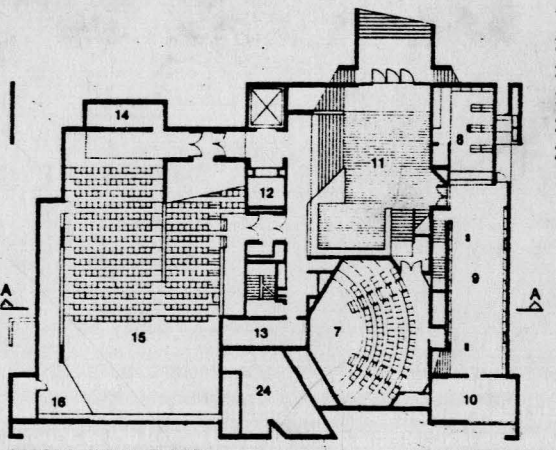
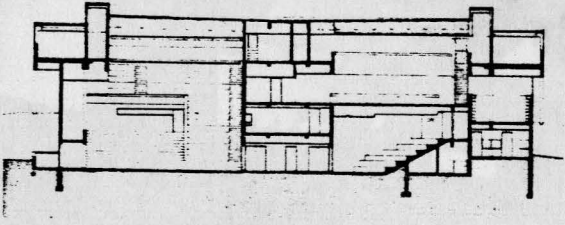
FOURTH FLOOR



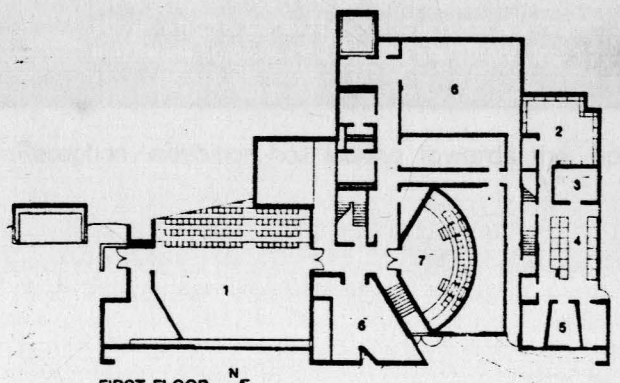
THIRD FLOOR



SECTION B-B



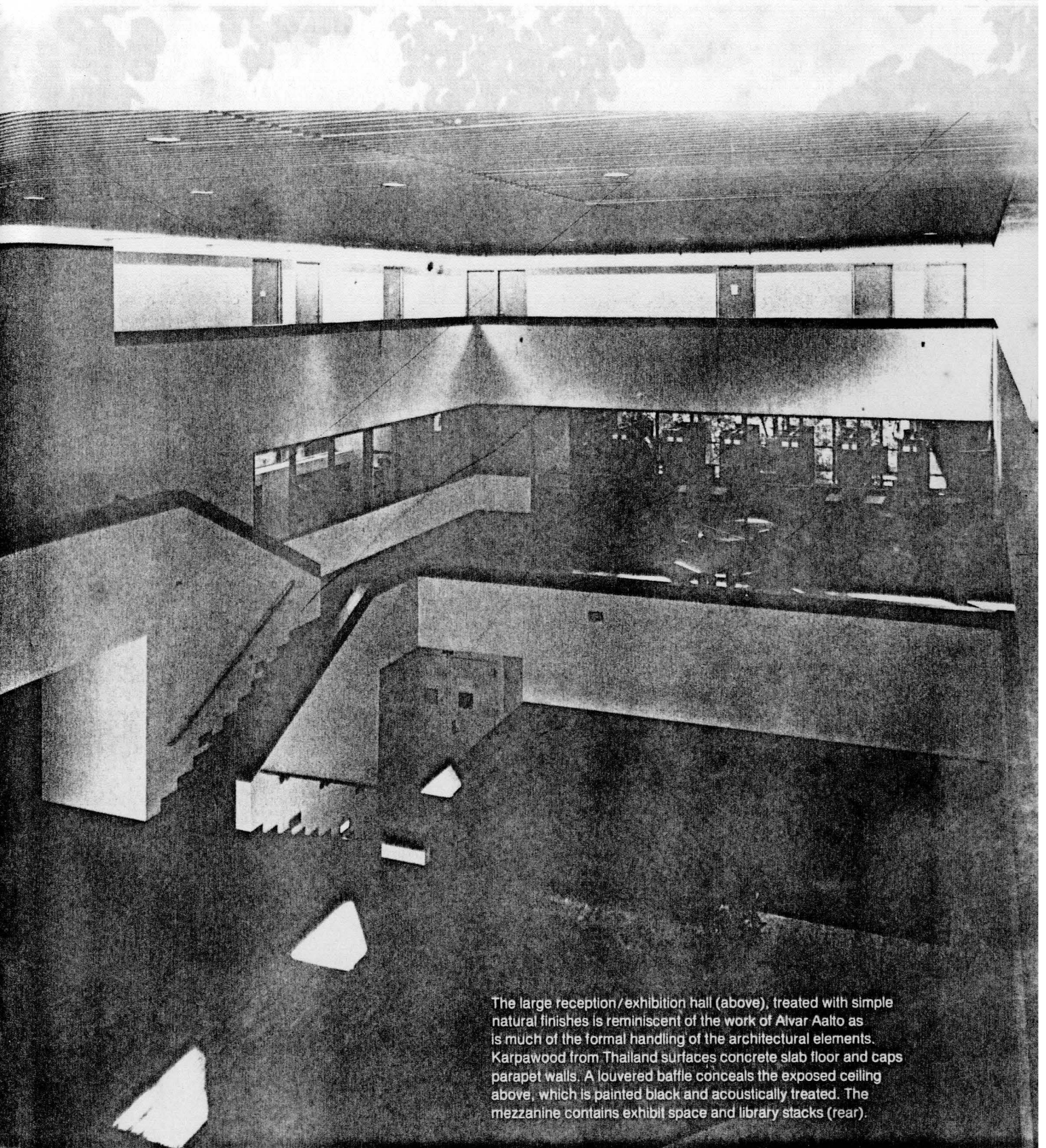
SECOND (MAIN) FLOOR



FIRST FLOOR

- Legend**
- 1 Stage
 - 2 Choral/orchestral stage
 - 3 Microfilm room
 - 4 Listening carrels
 - 5 Listening room
 - 6 Mechanical area
 - 7 Choral rehearsal room
 - 8 Circulation desk
 - 9 Library
 - 10 Librarian's office
 - 11 Lobby
 - 12 Check room
 - 13 Recording booth
 - 14 Projection booth
 - 15 Concert hall
 - 16 Organ loft
 - 17 Exhibition gallery
 - 18 Green room
 - 19 Seminar room
 - 20 Loading dock
 - 21 Office
 - 22 Classroom
 - 23 Practice room
 - 24 Open to below

Figure 15



The large reception/exhibition hall (above), treated with simple natural finishes is reminiscent of the work of Alvar Aalto as is much of the formal handling of the architectural elements. Karpawood from Thailand surfaces concrete slab floor and caps parapet walls. A louvered baffle conceals the exposed ceiling above, which is painted black and acoustically treated. The mezzanine contains exhibit space and library stacks (rear).

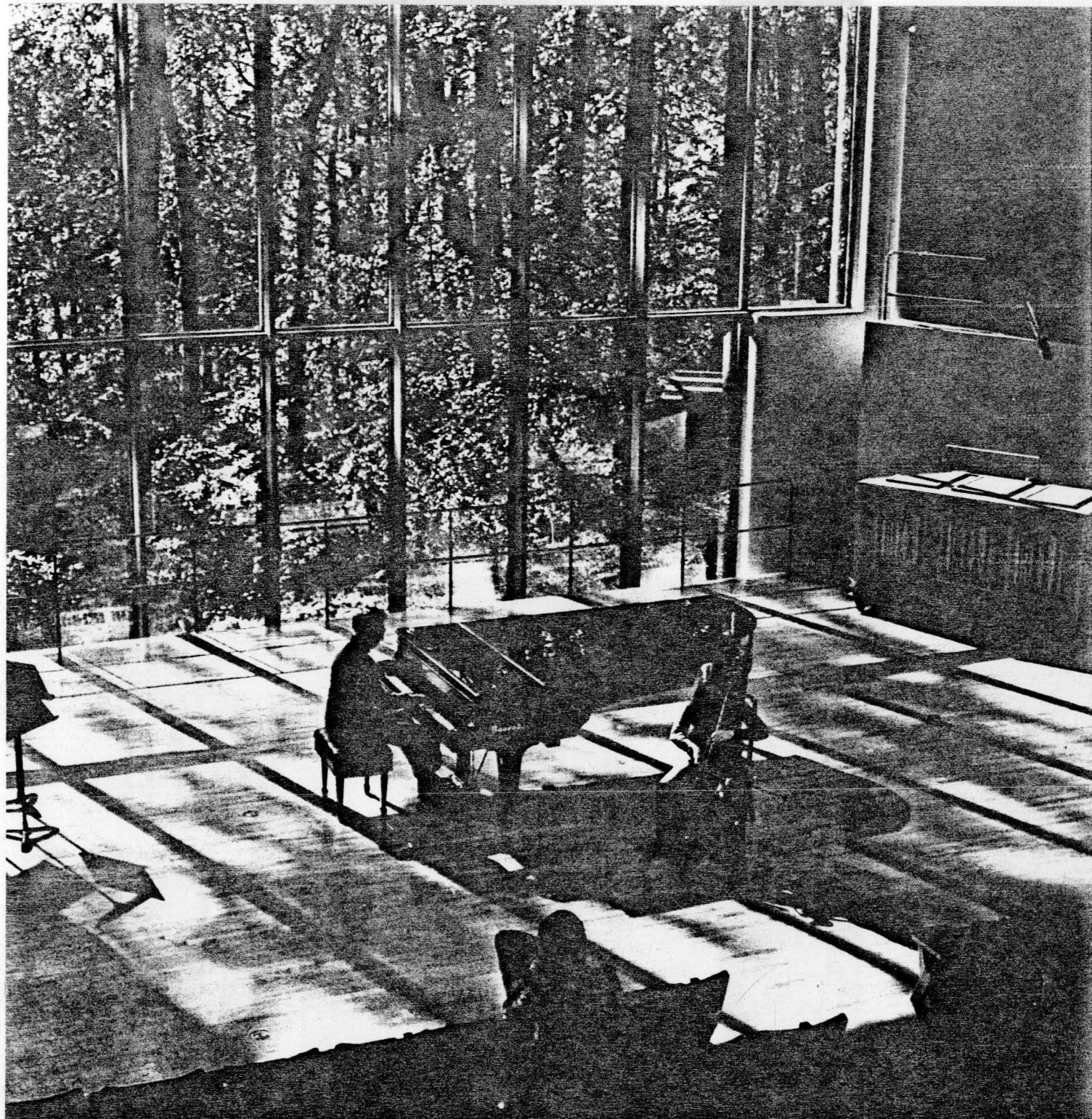
Reception/exhibition hall looking towards the upper library level

S.W. Elevation overlooking the forest



S.W. Elevation overlooking the forest

Figure 17

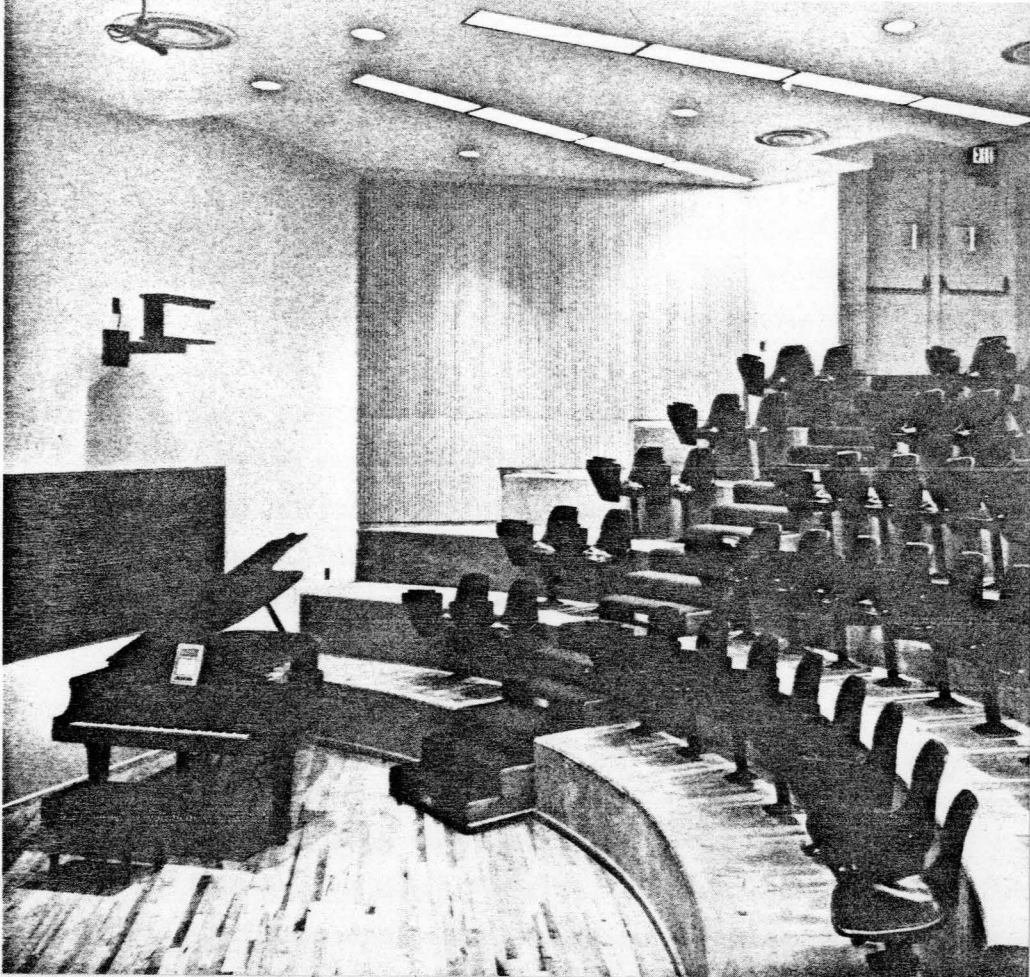


Auditorium looking towards the forest

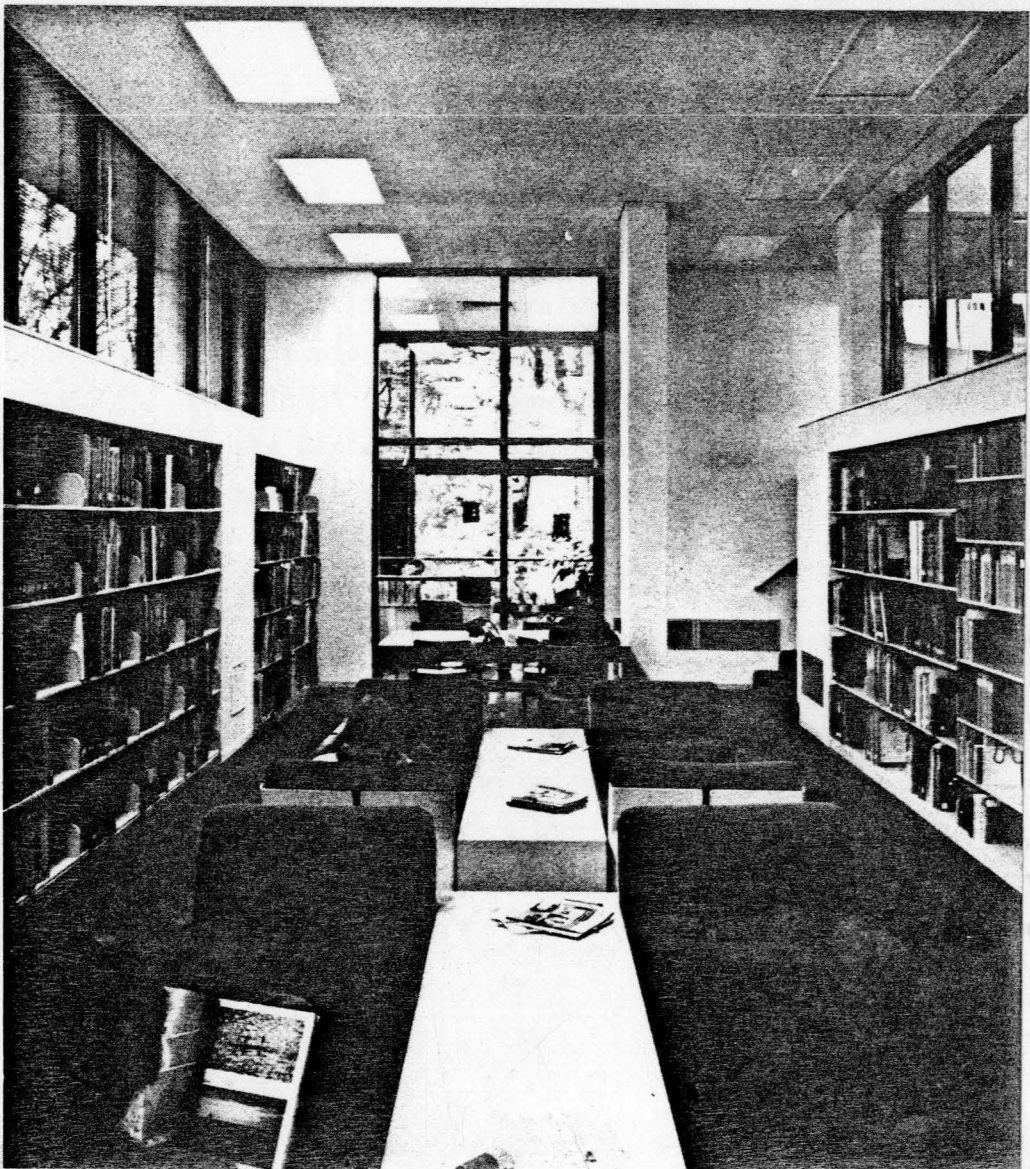
Library reading room
looking S.W.

Figure 18

Figure 20



Choral rehearsal room



Library reading room
looking S.W.

Figure 20

acoustics has been adopted in the main hall using curtains and wood panels. Structural considerations include massive external walls and floating floor slabs, while double glazed windows and door gaskets further enhance its acoustic performance.

2.6 Conclusion

The music building is plain and straightforward, and does not aspire to any philosophical or symbolic statement. It could be argued, however, that the massiveness of the walls (which makes acoustic sense), like the trunks of the trees, is rooted in the ground, while the bands of finestrations to the top floor symbolise and reflect the lightness of the boughs and leaves and their aspirations to reach to the sky.

Thus Lang Music building recognises its asset - the forest. By stepping down the site, service and pedestrian access is gained from the road while providing an uninterrupted view to the area beyond.

3. The College of Music, University of Cape Town

Architect: Jack Barnett

This very low budget, three storey building forms additional accommodation to the existing College which is accommodated in the stately old house "Strubenhalm". It is also designed on a functional level to operate in conjunction with facilities housed in the Baxter Theatre complex, sited across the road to the East of this building.

3.1 The setting

The setting for this building is made difficult by the fact that it has to relate directly to the Strubenhalm facilities and at the same time have relatively close links with the Baxter complex. Since the building was designed and built in 1973, numerous changes have been made. One of these is the parking arrangement and access to the site which makes it very difficult for a first-time visitor to the complex to find the entrance.

3.2 Site relationship

The strong geometric shapes of both the library and the main block are well-complemented by the softer amorphous lines of the landscape treatment. The building form and texture has been well handled in that it does not try to dominate Strubenholm, or to compete with it in terms of subtlety of detail, yet it harmonises well with the Baxter in terms of materials, attention to detail and apparent mass at road level. Matching canopies to the pavements give the impression of the two buildings being much closer together than they really are.

3.3 Planning

The layout is simple and quite easy to understand. Externally, the two forms obviously house different functions. Adequate windows to the library make it easy for a passer-by to guess its function, while views into the ground floor practice rooms facing the road give people glimpses into the rooms indicative (besides the melodic sound emanating from the practice level) of their function.

The entrance, as mentioned, is rather obscure but once there, a visitor either goes right to the foyer, administrative and lecture rooms level with the large teaching suites and Record Library upstairs, or left to the new building.

The new building has three levels: ground floor for student practice rooms; central floor consisting of teaching studios on the periphery of a rectangular corridor with practice rooms internally; and the top floor consisting of two major volumes of equal dimensions: an orchestra rehearsal room and an opera rehearsal room with a large store and a sound studio in between. These spaces are contained by a circulation corridor with smaller rehearsal rooms, change rooms, storage areas and a foyer on the periphery.

The library is on two levels and circular in shape. It has three entrances: one from the car park to the West, one from Strubenholm and one from the new block. For security reasons, however, the Strubenholm entrance, which consists of a roofed link throughout the courtyard (very tenuous and exposed) is used.

3.4 Internal circulation and appearance

Circulation is, as with the other examples, elementary. By entering the new building at a half level, access to at least two floors is made easy, while a lower ground floor is provided to take up the change in site level.

The circular library functions very well and the design intention of one person being able to visually control the area is adequately achieved. The library is well-lit by a large clear storey window. Because of its circular shape and convex roof shape there is an acoustic problem in the form of an echo, which is not compatible with the atmosphere a library should generate. The lower level is intimate and well-lit, has a good relationship with the outside and functions well; but circulation is disconcerting as a circular route produces a constant sense of the unknown.

The main block is oppressive and claustrophobic. The reasons for this include the lack of obvious modulation of ceiling heights; the cell-like uniformity and proportions of the practice rooms; the badly-lit and uninteresting passages; and the drab colour scheme. Links with the outside are inadequate. External rooms have windows which are horizontal, non-opening and high up - difficult to see out of even when standing up.

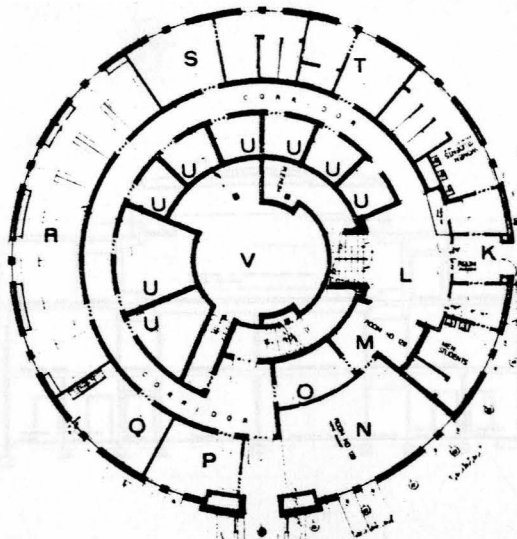
The ventilation system is only capable of heating the air, which does create problems in summer.

Not all rooms are functioning as they were intended. For example, the upper level opera store room is used as the staff common room, while the rehearsal theatre foyer is used as the student common room - the door to the glass staircase is permanently locked. The store room and adjacent men's make-up room and the ladies' make-up room is being converted, due to a shortage, to practice rooms. Access to the orchestra rehearsal room balcony, which is through the main store, is unsatisfactory.

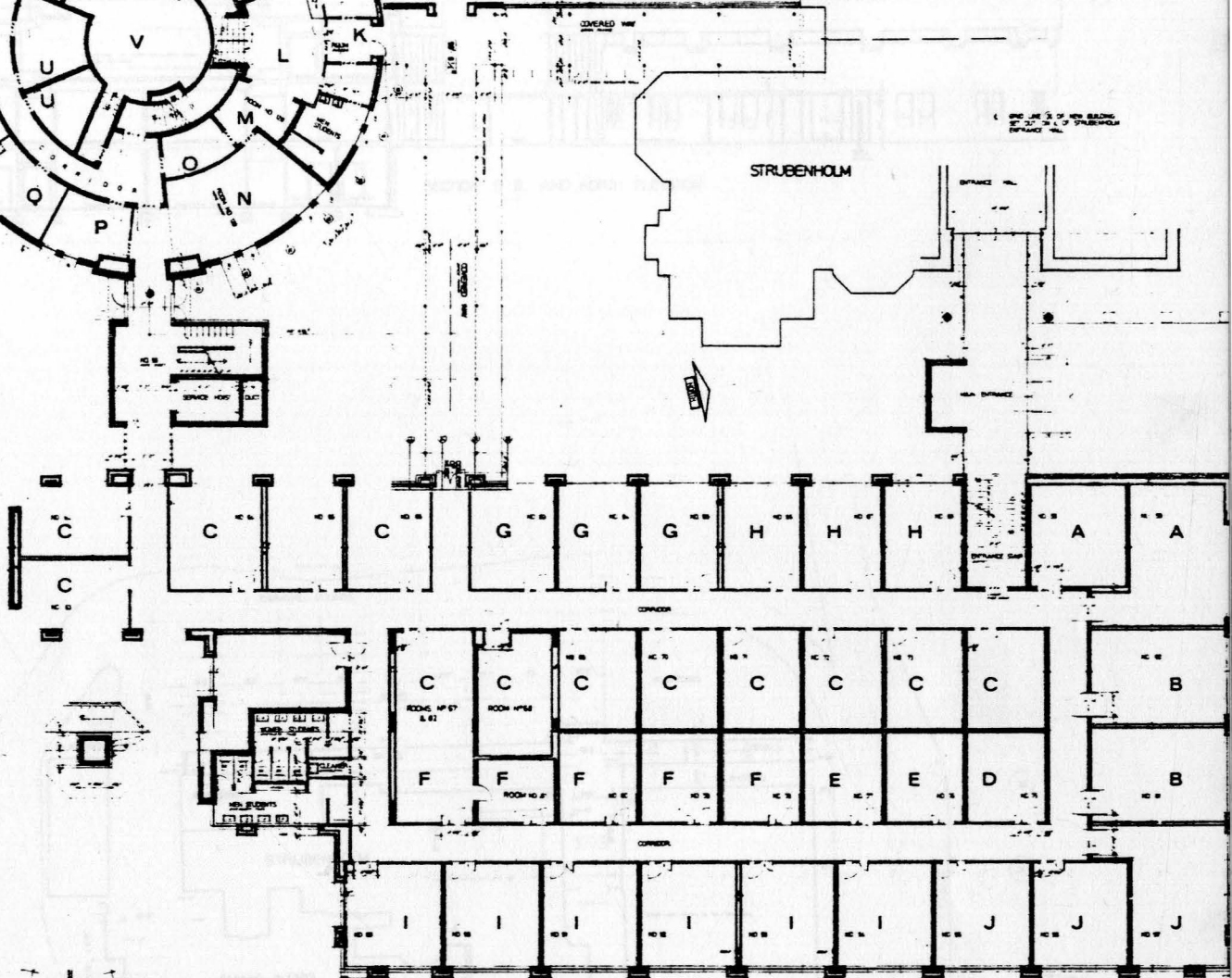
3.5 Acoustics

In principle the measures taken to combat the acoustic problems are good ones. However, financial restraints which dictated

Ground floor plan of the Library. K and L: entrance lobby and foyer. M: Cloakroom. N: Workroom. O: Photocopier. P: Librarian. Q: Bookbinding. R: Stockroom. S and T: Staff rest rooms. U: Listening rooms. V: Store room.



Ground floor. A: Brass. B: Woodwinds. C: Piano. D: Harp. E: Strings. F: Singing. G, H and I: Permanent staff singing, strings and piano. J: Organ.



First floor of the main wing. A: Orchestra rehearsal room. B: Opera rehearsal room. C: Opera store room. D: Store. E and F: Men's make-up and change room. G: Choir and ensemble rehearsal. H: Opera production room. I: Opera director's secretary. K and L: Women's change and make-up rooms. M: Stores. O: Rehearsal theatre foyer. P: Refreshment.

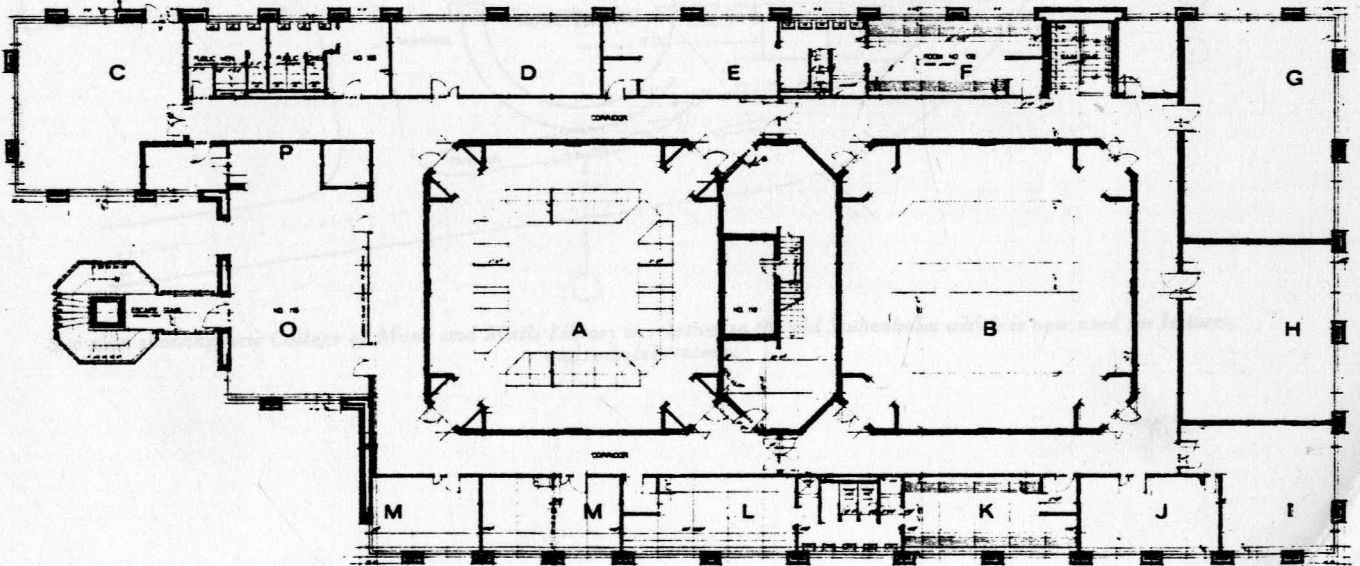
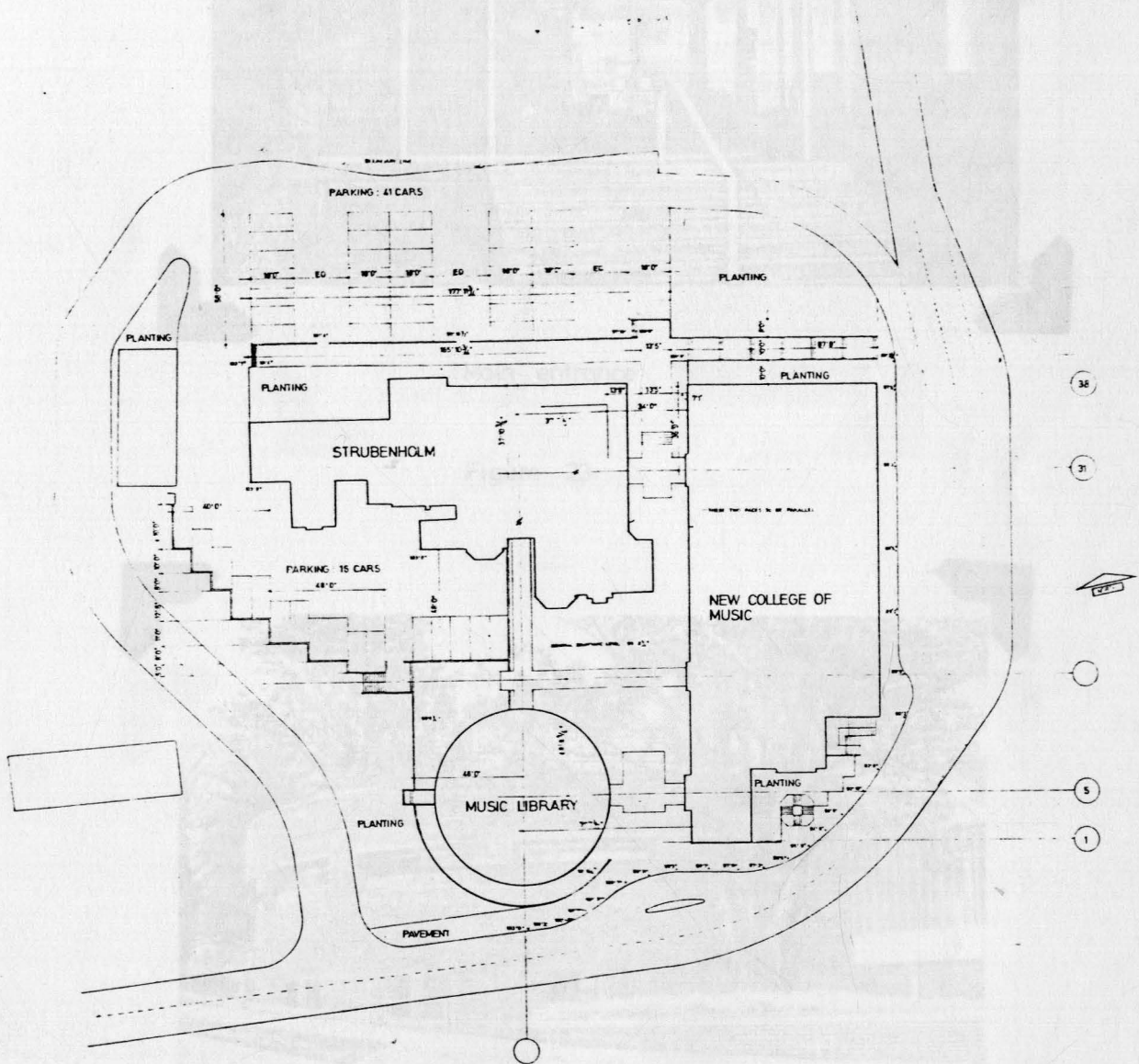
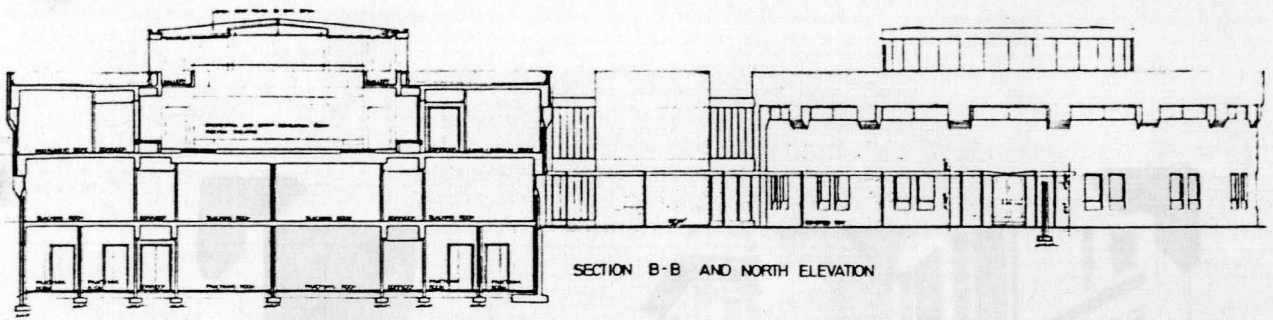


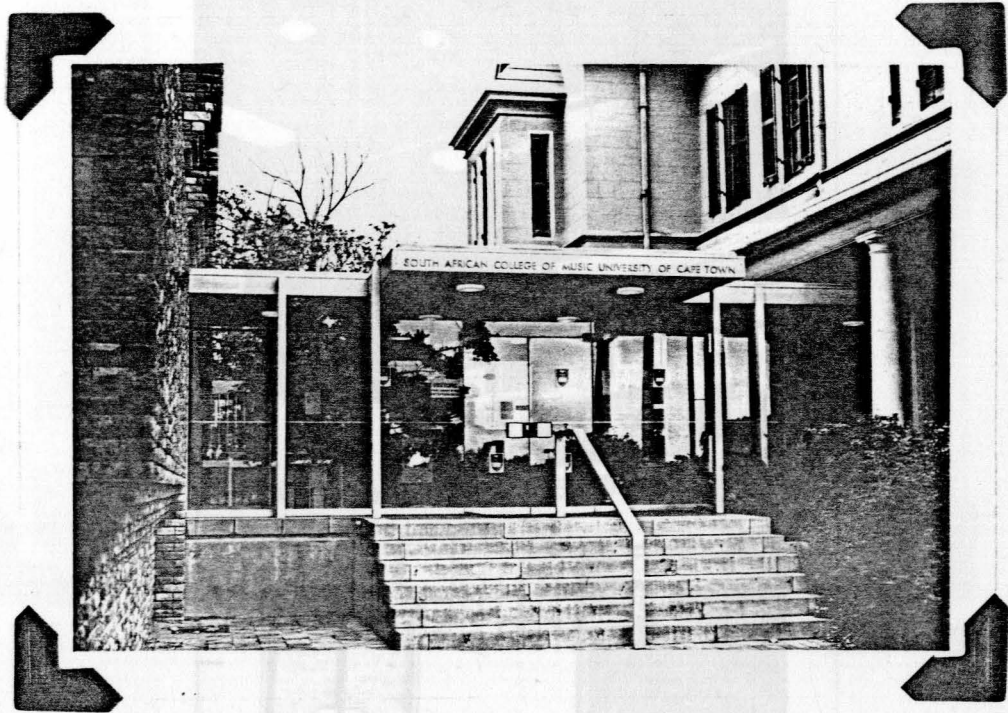
Figure 21



Site plan showing new College of Music and Music Library in relation to the old Stubenholm which is now used for lectures and administration.

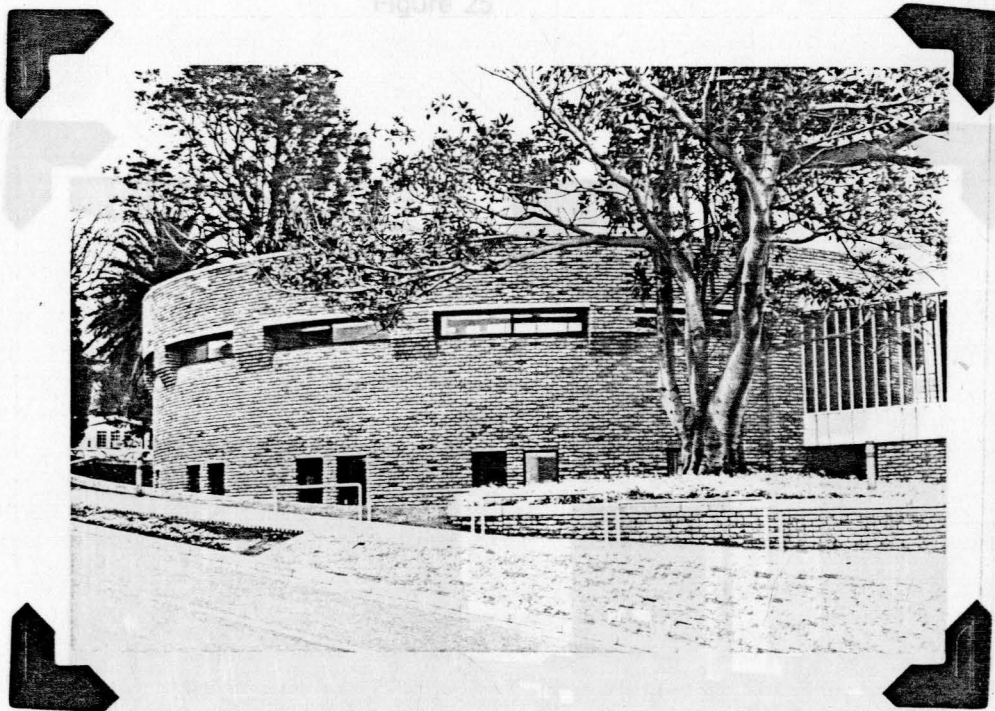
Library looking NW

Figure 22



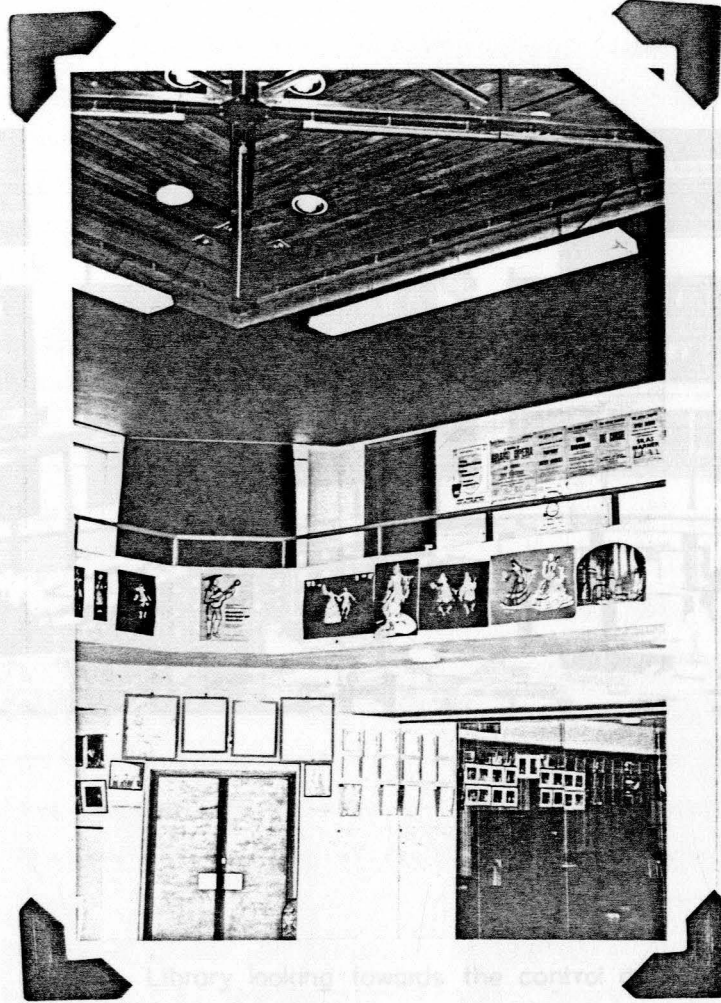
Main entrance

Figure 23



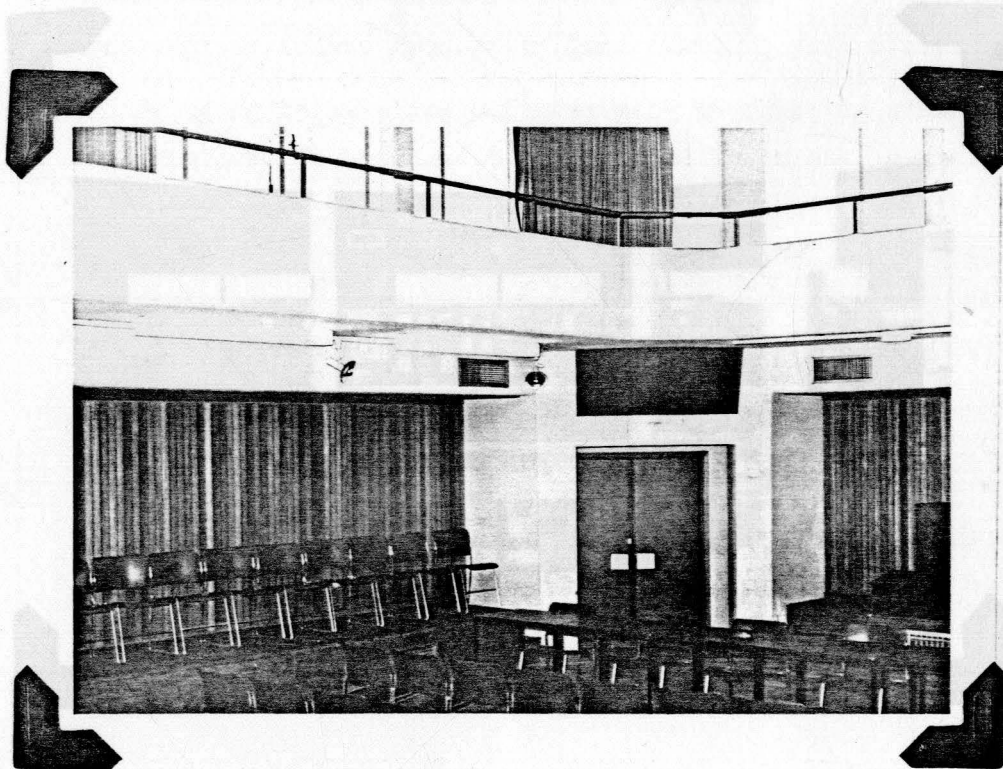
Library looking N.W.

Figure 24



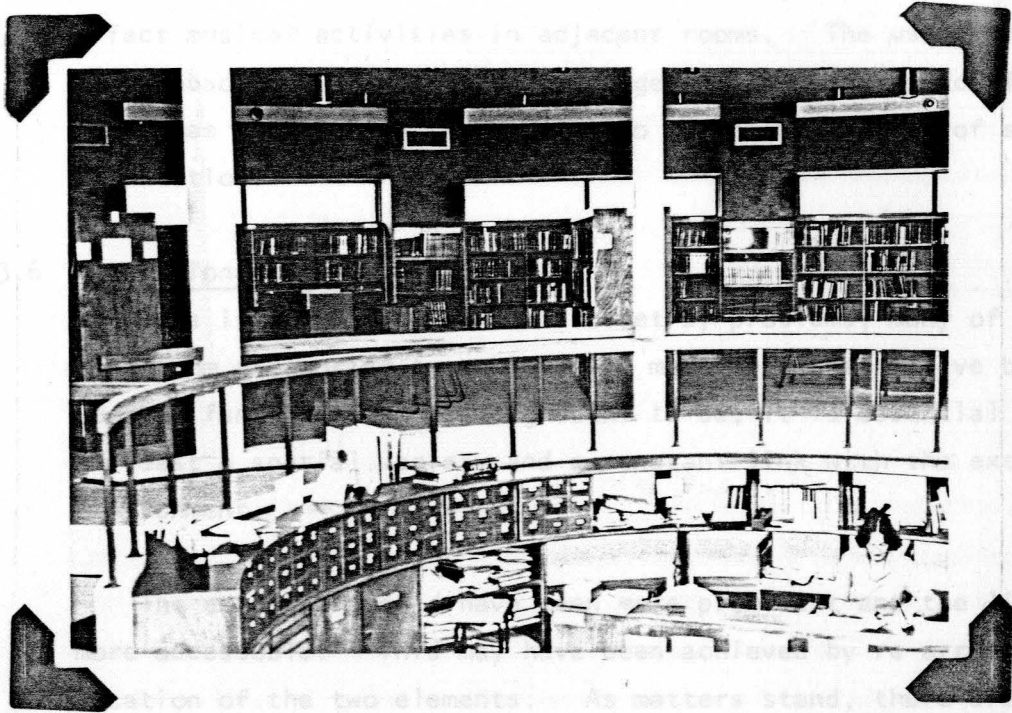
Opera rehearsal room

Figure 25



Orchestra rehearsal room

Figure 26



Library looking towards the control desk

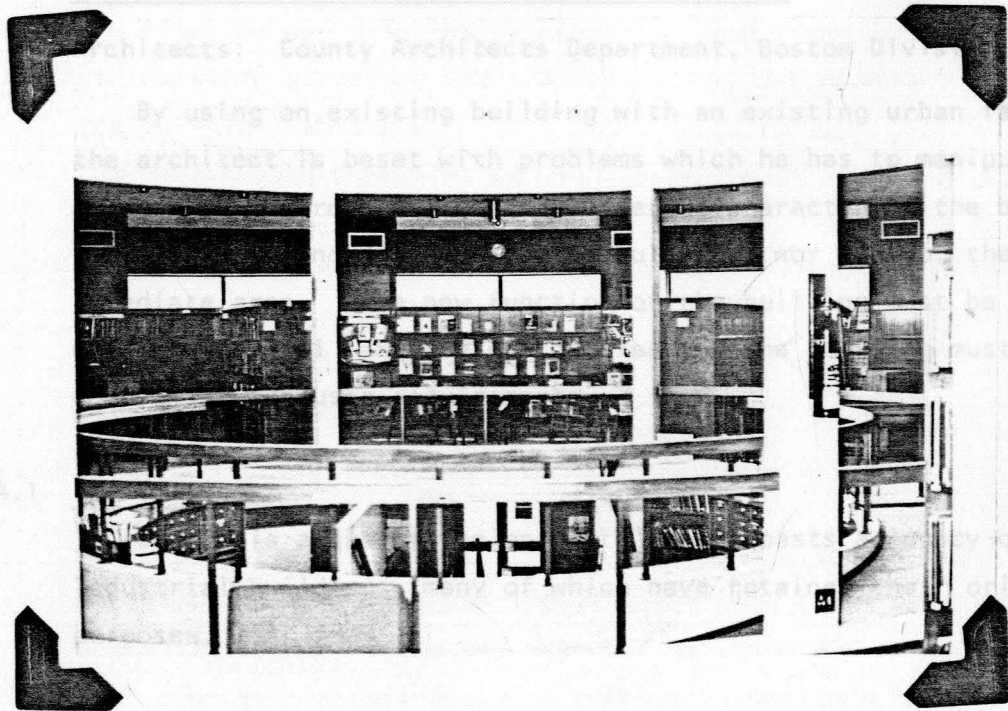


Figure 27

minimal structure has resulted in sound bridges which detrimentally affect musical activities in adjacent rooms. The use of carpeting, sound-absorbent panelling and passage ceilings, and special door seals has not reduced the problem to acceptable levels of sound attenuation.

3.6 Conclusion

This is a building which is beset by problems, many of which stem from attempting to achieve too much on a restrictive budget. However functional a building ought to be, it is essential to have at least a spatial variety and a constant link with the external environment.

The entrance should have been more prominent and the library more accessible. This may have been achieved by re-arranging the location of the two elements. As matters stand, there are poor relations between the College and the Baxter management which, in turn, hinders any sharing of facilities that ought to exist.

The grand spaces of Strubenholm are more inviting and more closely attuned to the spirit of music, even though sound attenuation between rooms leaves much to be desired.

4.3 Sam Newsom Music Centre, Boston, Lincolnshire

Architects: County Architects Department, Boston Division

By using an existing building with an existing urban fabric, the architect is beset with problems which he has to manipulate so that he destroys neither the external character of the building (this is a second schedule listed building) nor that of the immediate area. The new function of the building must be compatible with the general land use of the area and the building must not compromise the user requirements.

4.1 The Setting

Boston is a quaint Fenland port which boasts a legacy of early industrial buildings, many of which have retained their original purposes.

The building used for the project was a warehouse built between 1741 and 1810, and is indicative of the character of Boston. The building occupies a central site close to cultural interests in the town - the Guildhall Museum, Fyde House (an adult education centre) and Blackfriars Theatre and Arts Centre. It is bounded to the West by the River Witham (a tidal river) and what was the main road through the town.

4.2 Site relationship

As the building is an existing one, the problem is one of zoning the accommodation to allow maximum sound damping using the existing mass construction of the 600 mm wall and the quieter aspect of the river. With most of the heavy traffic using an inner relief road, the road outside the centre has become much quieter, and the public use it in relative safety. The narrow, vacant strip of quay to the North serves adequately as a parking area.

The site is a building itself, and therefore the new steel balustraded balcony replacing the original timber walkway overlooking the river is used to great advantage with access from both library and reception.

4.3 Planning

Planning was dictated by acoustic requirements, the state of the existing structure and the reconstruction necessary to make the building habitable.

The main volume consists of the 250 seat recital hall around which the remainder of the accommodation is grouped. The hall was created by removing the early nineteenth century drying room and the failed cross-wall below and re-constructing the roof in its original form.

4.4 Internal Circulation and Appearance

Circulation is simple - entry is from the North with the foyer/reception to the right and the lift and main staircase directly opposite. A doubly loaded corridor serves the minor rooms on the East side of the building. A secondary staircase is at the opposite end of the corridor.

The success of the building is in part due to the attractive atmosphere achieved by the sensitive blending of the old and the new. In reconstruction, original bricks and bricks of a similar type and age from demolition elsewhere were used, while new partitions were erected in common brickwork with a simple emulsion finish. Whitewash was removed from the old walls by sandblasting them.

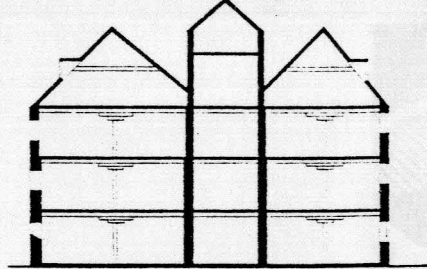
The windows of the recital hall have been bricked up on the inside. The floor is beech-strip lined and the roof is lined with tongue and groove boarding. The walls are illuminated by lighting built into the perimeter of the ceiling, with the main lighting from a suspended spaceframe. Internal fittings such as built-in furniture counters and hand rails have been simply and appropriately detailed.

4.5 Acoustics

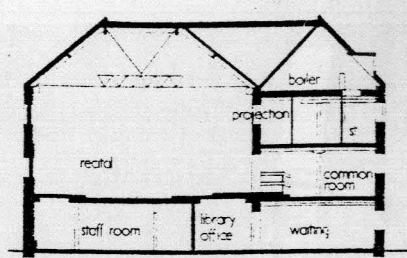
A building used for the playing of and listening to music depends for its success or failure on its acoustics, and the warehouse with its thick walls and small windows has a good starting point.

Practice and lecture rooms have been provided with double glazing by putting in a separate frame within the window opening, the original window having been replaced by a new one to match it.

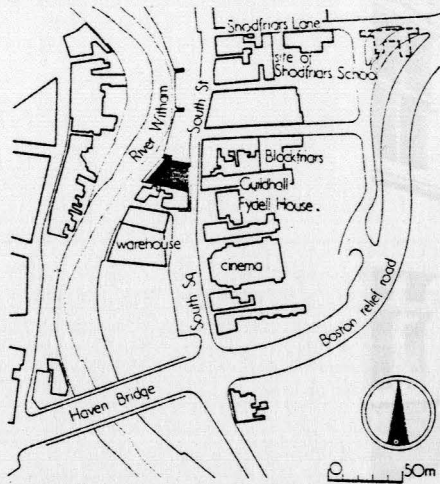
The closing of windows has resulted in the need for a mechanical ventilation system, the plant room of which is situated above the second floor practice rooms, and this is where the scheme has been badly affected. The recital room system is acceptable but the plant for the rest of the building has to be switched off whenever there is a recital. The chief cause of this problem is that the plant room has not been properly positioned. No amount of attenuation in ductwork will overcome the effect of the plant being supported by a comparatively lightweight structure such as the practice room ceilings. With a little ingenuity the plant room could have been accommodated in the boiler room supported by a floating floor slab system with the recital hall extract fans mounted off the massive wall alongside, thus avoiding "bridging" vibrations to the lightweight structure.



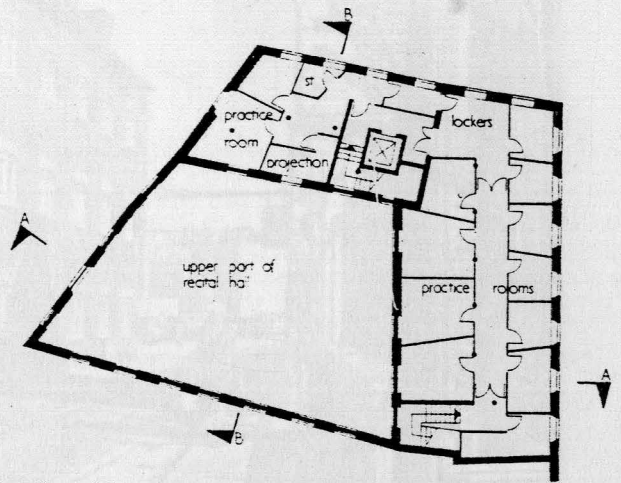
Section BB before conversion.



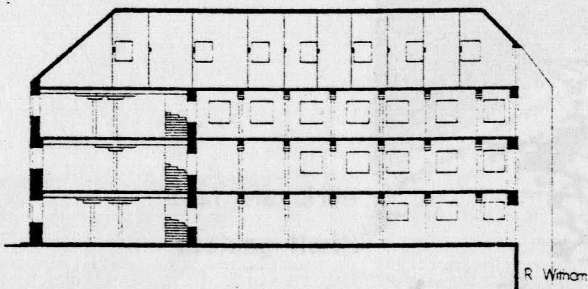
Section BB after conversion.



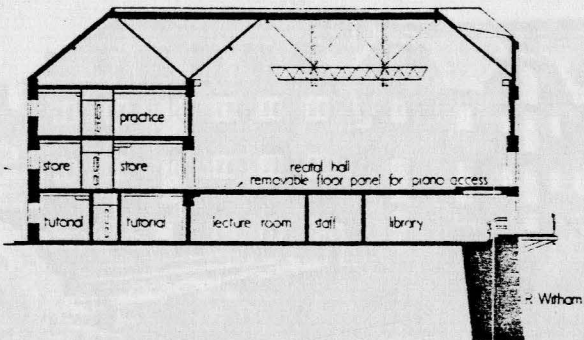
Location plan.



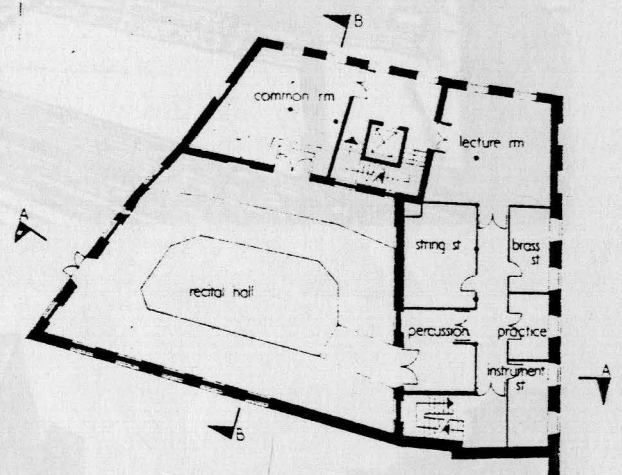
Second floor plan after conversion.



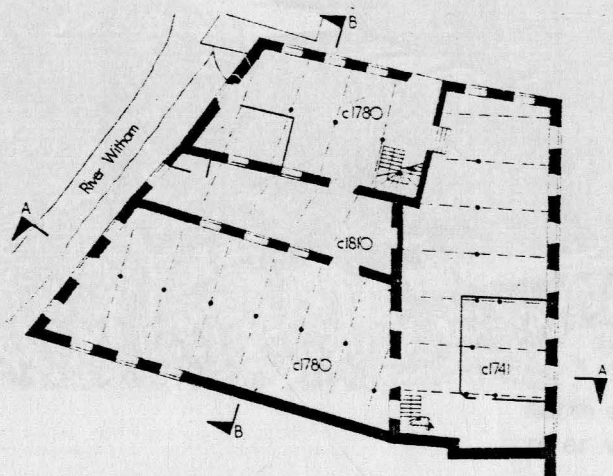
Section AA before conversion.



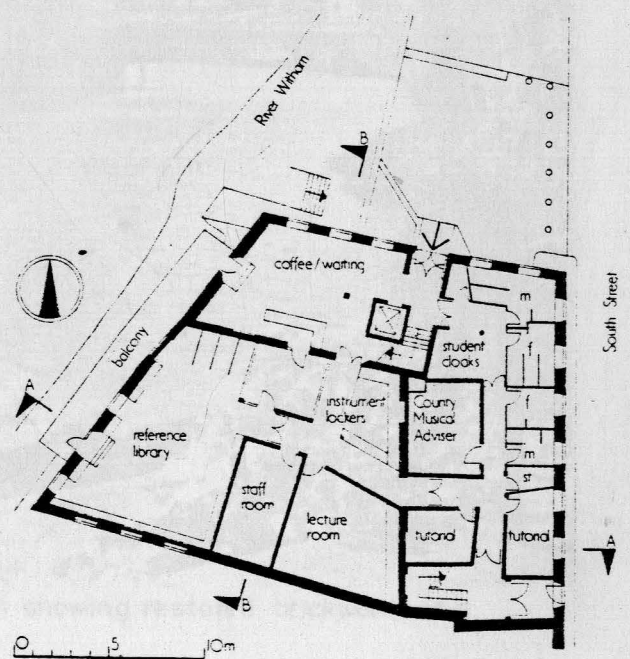
Section AA after conversion.



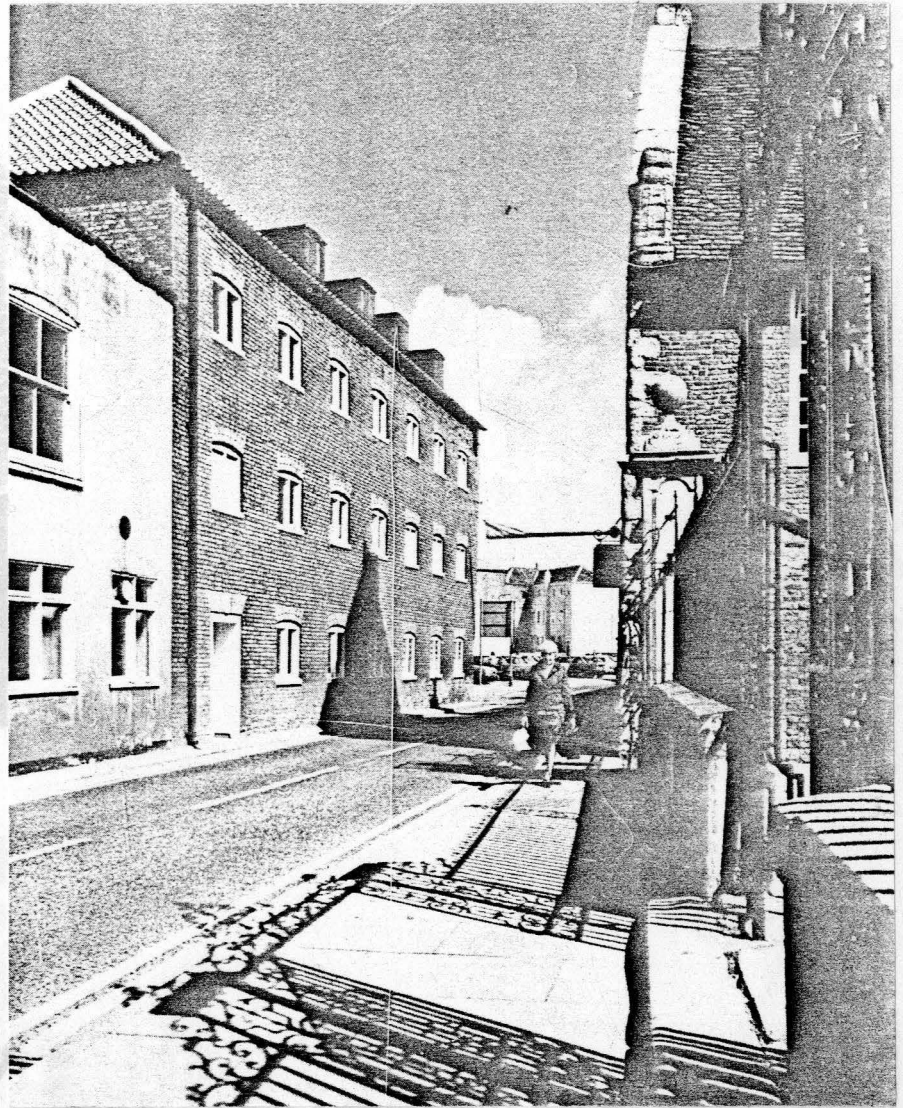
First floor plan after conversion.



Ground floor plan before conversion.

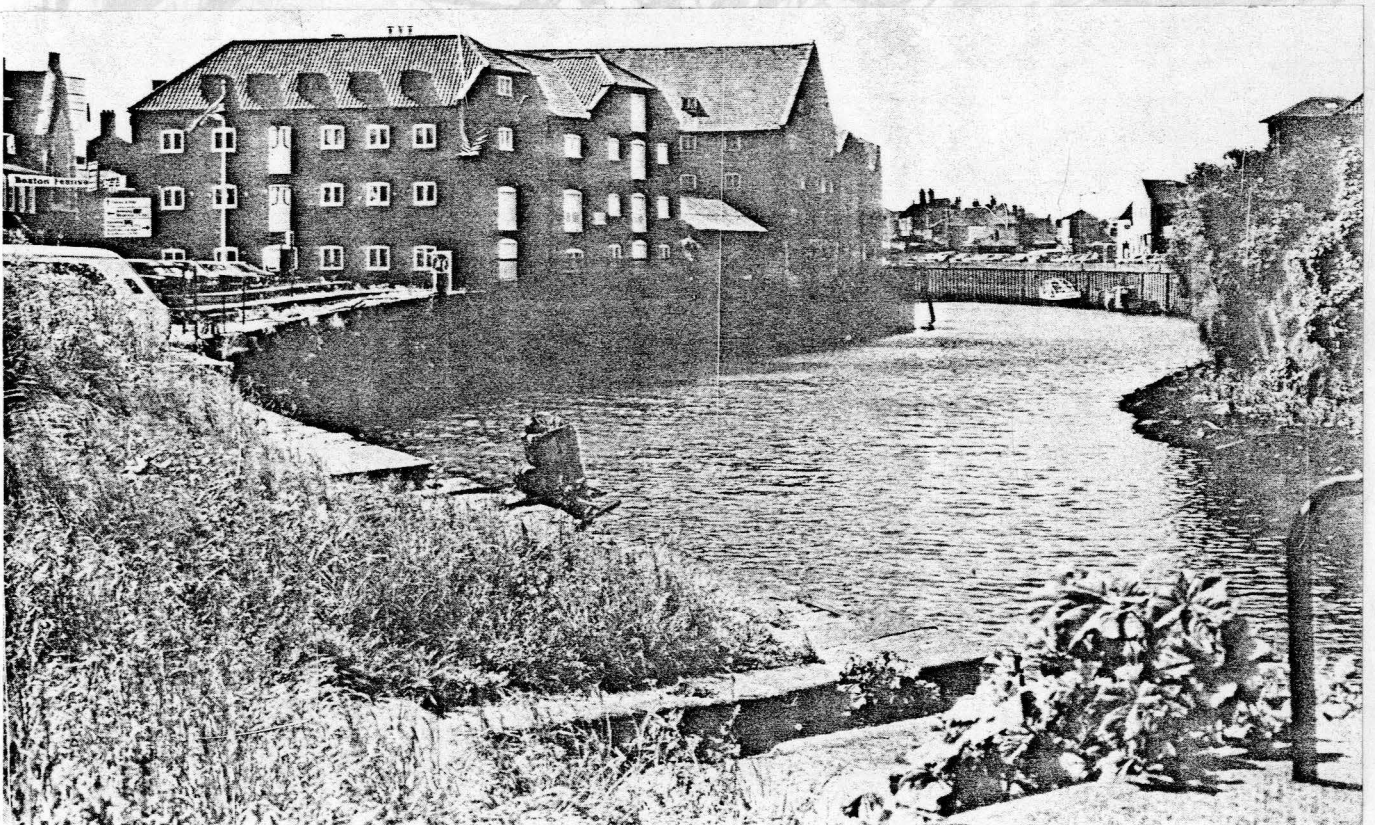


Ground floor plan after conversion.



East elevation
looking North

Figure 29



North elevation showing restored brickwork and
river wall

Figure 30



Reception area looking towards the entrance

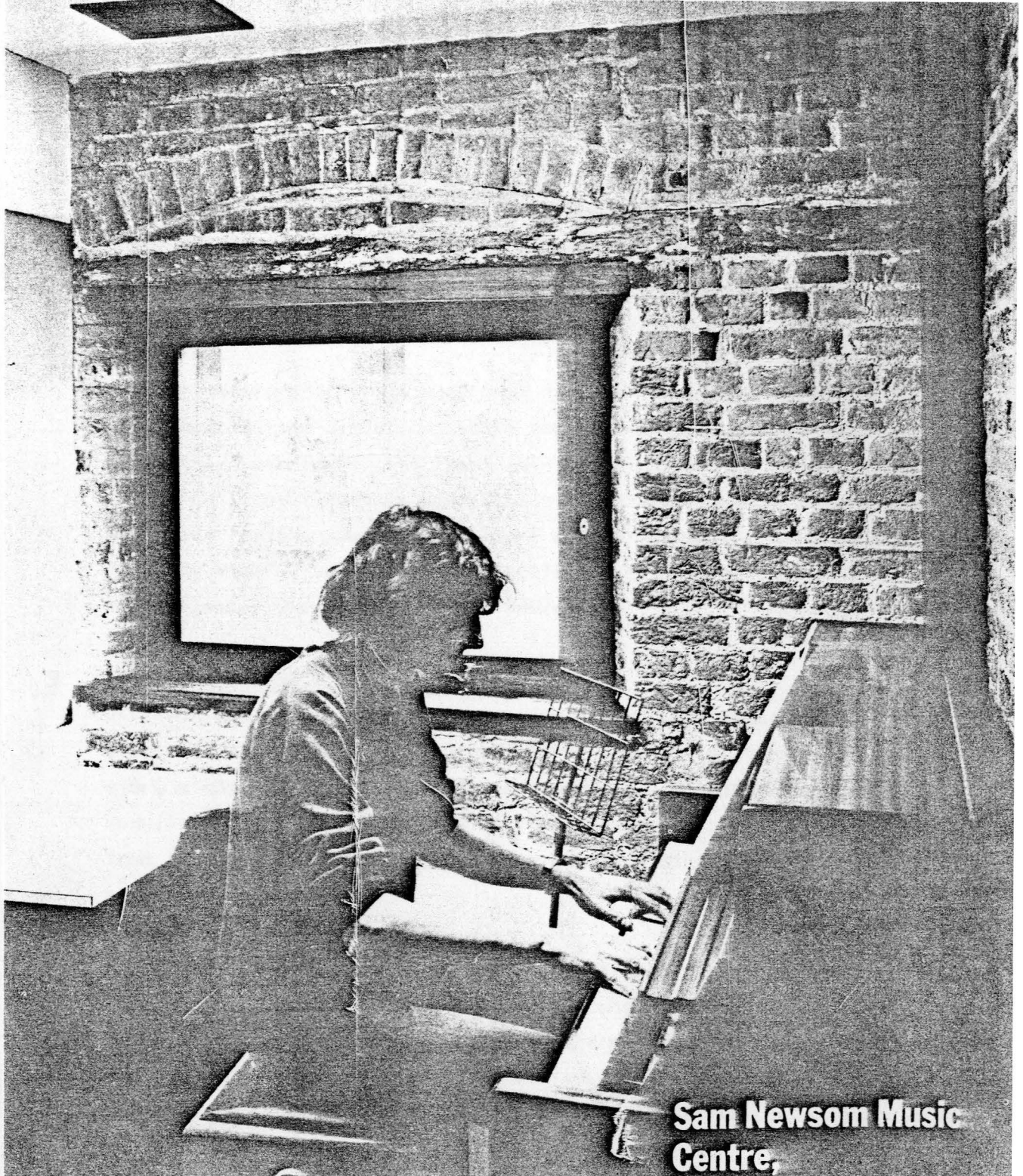
Figure 31



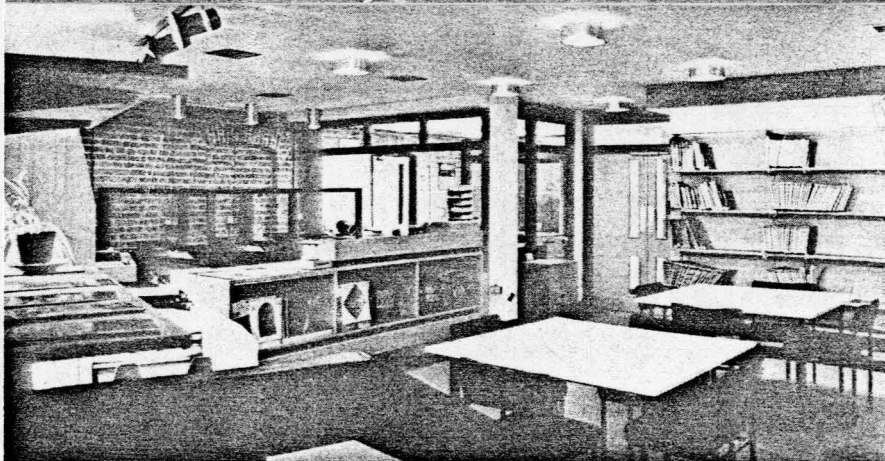
Recital hall

library looking towards the entrance

Figure 32



Sam Newsom Music Centre,



library looking towards the entrance

Figure 34 practice room

Figure 33

4.6 Conclusion

The main lessons to be learnt from this example are that the functions of a music school can be accommodated within a given envelope, and that the importance of acoustic requirements are far too critical to be glossed over without the substantiated knowledge that what is being done is adequate.

The nature of the old warehouse and its shape have helped to produce good room acoustics, while the building itself has adequately catered for its three main functions: to house the Boston College of Further Education's Music Department; to act as a base for the country's advisory and peripatetic instrumental teaching staff; and to provide facilities for the promotion of musical activities in Boston and the county.

5. Conclusions from analysis of precedent

From the study of these four examples, as well as others not discussed above, it is clear that there is no fixed typology of plan, although there is a preferred form for arranging the accommodation. The general format is to separate the public function from the teaching function, yet have adequate circulation access between them.

The music school building, as any other semi-public building, should reflect the values of the society which it serves, yet at the same time it must also reflect and harmonise with the surrounding buildings. In expressing community values and culture, the building must symbolise the progressive spirit of its people and the tradition of its musical forms.

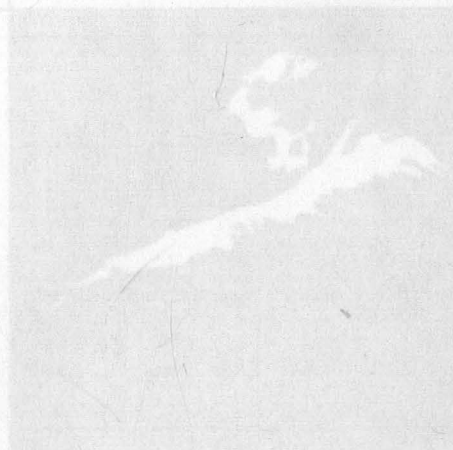
Buildings which maximise the advantages of the site, such as view, orientation and slope, appear to be the most successful. As the building has a public function to perform, its contextual setting is very important. Those buildings which are adjacent to circulation routes or occupy centrally situated sites within a given fabric, receive from, and contribute the most to the urban scene.

Structure, in most examples studied, directly reflects the internal functioning of the space which it envelopes, while at the same time indicating the hierarchical importance of spaces and functions. Construction methods and materials are geared towards dealing with the problem of noise and vibration without detracting from the high quality of detail and finish expected of a building of this nature. Acoustic requirements by and large dictate that the building has an artificial means of controlling the environment. The expensive equipment used requires a constantly stable environment in order to operate perfectly; this does not mean that those who have to use the building must be excluded from the influences of site and climate. Orientation always affects the building, both in terms of its micro-climate and the degree to which it has to be conditioned for optimum functioning.

Judgement of a building of this nature is very subjective, but if the prime functions of the building are borne in mind - those of learning, performing and listening to music - one cannot go far wrong; particularly if the nature of these acts has been celebrated in an appropriate way.

RESEARCH

REPORT



Client requirements

1.1 Introduction

It is not always clearly understood that a university is not merely an institution of higher learning, accessible only to the academic elite where the acquisition of a degree marks the end of study and a guarantee of success in a chosen career. It is certainly the duty of both staff and students to acquire and impart knowledge to satisfy certain standards laid down by the university. However, the university is also a forum which offers close and frequent contact with highly trained minds. It offers the opportunity of realising the vastness of the field of knowledge under study and discussion, and the facilities for communication with others.

It is as a member of such an institution that the Music School must function. Thus, in assessing the needs of the client, there needs to be an understanding of the process of music education and the spatial requirements of this process. Trends in music education, the degree of public interaction and the role of the school in society will all have modifying influences on the specific requirements.

RESEARCH REPORT



RESEARCH REPORT

1. Client requirements

1.1 Introduction

It is not always clearly understood that a university is not merely an institution of higher learning, accessible only to the academic elite where the acquisition of a degree marks the end of study and a guarantee of success in a chosen career. It is certainly the duty of both staff and students to acquire and impart knowledge to satisfy certain standards laid down by the university. However, the university is also a forum which offers close and frequent contact with highly trained minds. It offers the opportunity of realising the vastness of the field of knowledge under study and discussion, and the facilities for communication with others.

It is as a member of such an institution that the Music School must function. Thus, in assessing the needs of the client, there needs to be an understanding of the process of music education and the spatial requirements of this process. Trends in music education, the degree of public interaction and the role of the school in society will all have modifying influences on the specific requirements of the school.

1.2 The curriculum

From an examination of the curriculum (Appendix B) it is clear that equal emphasis is placed on major subjects (5 lecture periods per week) in both curricula offered. The implication of this equal emphasis, together with the requirement of regular attendance of all students at choir practices, ensemble rehearsals, criticism classes and concerts, is that the proposed accommodation will have to cater for the individual as well as the group instruction of students on a practical level while theoretical instruction will be conducted in group form.

1.3 The teaching system

The present teaching system, which is in keeping with the general methods in practice in other South African universities, focuses on five aspects which are dealt with below:

1. Instrument tuition

Each student is required to study two instruments, one of which must be the piano. Practical tuition consists of two lecture periods a week for the main instrument and one lecture period for the second instrument. Instruction is given in the tutor's studio. In addition, the student is required to carry out individual practice of at least one hour for each instrument during the course of each day.

2. Aural training

This aspect consists of two lecture periods per week of individual student training, whereby the student is taught to sound given notes. This is of tremendous benefit to students of instruments, particularly of those associated with Indian music, where pitch is of fundamental importance.

3. Music Appreciation

Each student is expected to familiarise himself with given networks, composers and styles by listening to material on tape and disc. This process is usually carried out in the library's listening room during the student's free time.

4. Group rehearsals

With the formation of ensembles, chamber music and choir groups as part of regular group rehearsals, students are given ample opportunity to exercise their practical ability as players, and their academic knowledge in the form of criticism classes. This not only acts as a form of musical education but also as social education, and can only be of great advantage to students participating in such activities.

5. Student performances

Student performances are encouraged, particularly by the senior students. A number of public performances is required of each student as an integral part of his curriculum. These performances enable the student to gain valuable experience as a soloist.

2. Student numbers and growth

At present the student enrolment for Music stands at 42. The growth of the school since its inception in 1979 has been dramatic (Refer to figures given under 3. Music Education at the University of Durban-Westville, p.8) while total student population figures have remained largely static.

In "University of Durban-Westville master plan report 1985 - 2000"; a report prepared by Ing, Jackson, De Ravel and Hartley and published in 1981; the growth rate in student numbers is expected to decline from its present rate, which is in excess of 10% per annum, to 7,1% p.a. 1985 - 1990; 6,2% p.a. 1990 - 1995; and 4,6% p.a. 1995 - 2000. This situation is considered to be realistic even though it does represent a relatively high growth rate. Growth in full-time student numbers is expected to reach 15 700 by the year 2000, based on predictions from the 1980 figure of 4 000.

The projected full-time student numbers for the arts faculties, of which the Music School is a member, is expected to grow from its present figure of 950 to 3 150 in the year 2000.

From these growth figures it can safely be surmised that the Music Faculty will grow proportionately; in which case a figure of 133 students is obtained from the total full-time student numbers; while a figure of 139 students is obtained from the projected Arts Faculty figures. This gives an average of 136 full-time students registered in the year 2000.

Music has within the past few years become a recognised subject for Senior Certificate qualifications by the Department of Indian Education, which will undoubtedly lead to the increased

growth of post-Senior Certificate students of the subject. It is also expected that with the growth of the subject as a Senior Certificate option, there will be increased opportunities for graduates of the School of Music in the high schools. For this reason the University planning authorities have advised that an increase of 15% on the figure for the year 2000 be allowed, which brings the projection figure for 2000 up to 156 full-time students. With the acquisition of the new complex, the School of Music is expected to have an increased demand for the provision of facilities for part-time and extra-mural musical studies and for this reason a figure of 10 full-time equivalent students has been allowed, based on the calculation that three part-time students use on a shared basis the spatial requirements of one full-time equivalent student.

Based on the above figures, the projected full-time equivalent enrolment of the School of Music in the year 2000 will be 166 students.

3. Staff numbers and growth

At present the teaching staff totals 10, made up of a professor and 9 full-time and part-time tutors. With the chronic shortage of space within the faculty, the permanent lecturing staff has its own offices while part-time staff are assigned a teaching studio which they occupy on a shared basis. There are two administrative staff members.

The staff to student ratio at the university's Music Faculty is at present 1 : 4, which is considerably lower than the average of 1 : 6,5 for the other schools in the Republic. It is envisaged that the staff/student ratio will conform to this national average of 1 : 6,5 in which case the teaching staff will consist of 25 tutors. There will be an administrative staff of 5 persons.

The professor or director of the school will occupy a suite, (which also functions as a studio) while the secretary/receptionist controls a general reception lounge. The school is not large enough to warrant an assistant director. All full-time tutors and lecturers/.....

will have studios or offices. Part-time tutors will share studio accommodation on a three to one basis.

4. Space standards

This section deals primarily with the quantitative and qualitative requirements of a School of Music. Spatial requirements will be dealt with by analysing each room type in terms of its use, location, size and furnishings.

4.1 Concert Hall

4.1.1 Use

The concert hall will be used for performances given by students and visiting performers, ensembles, choral, orchestral and solo recitals. These functions will take the form of lunch-time concerts or evening performances. It will also provide a venue for organ practice and organ examinations with or without a choir while groups or soloists will use the hall for rehearsals prior to a scheduled performance. Guest artists will make appearances as part of the lunch-time concert programme. There will be facilities for the recording of the above performances as well as for the projection of film shows.

For popular performances where there will be a large demand, for example by the National Symphony Orchestra, the great hall will be used.

4.1.2 Location

The concert hall is part of the public domain of the School of Music and as such should be equally accessible to both the public and members of the school. It should, however, be located in such a way that the concert hall and its foyer can be controlled by the school yet at the same time be sufficiently isolated in order that it may be hired out to the public without disruption of the functioning of the school.

4.1.3 Size

The size of the concert hall has to be determined in relationship to the size of the school, the types of functions

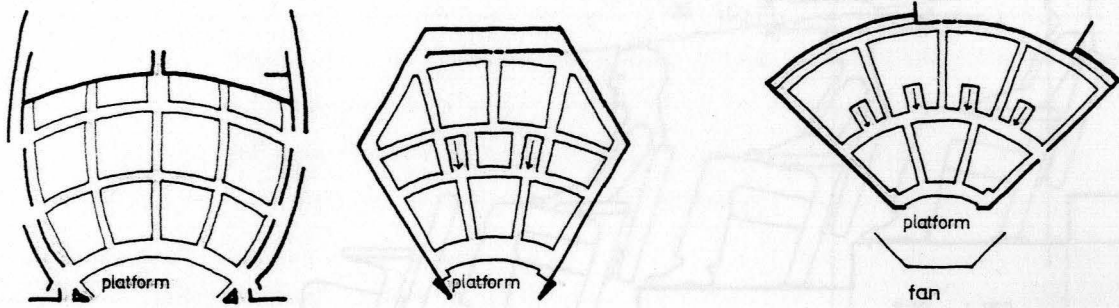
it has to cater for, and the size of larger or smaller halls on the campus. After an examination of concert halls of a number of schools around the country (in relation to the size of the schools) and discussions held with the head of the music faculty, a seating capacity of 350 was arrived at. This figure caters for the demand of most lunch-time concert type functions and public performances where the demand would not justify the use of the great hall, while at the same time not being too impersonal and overpowering for the soloist or duet performers.

To achieve an acceptable acoustic environment, a number of design decisions have to be reached:

a) Plan shape

Traditionally the plan shape of the concert hall has been either "shoebox", horseshoe or fan-shaped. As with theatre, there is a movement towards music in the round; however this is mainly confined to large concert halls or small experimental music spaces. The reason for this is that the size of the central performance area is dictated by the size of an orchestra, and consequently the capacity of a "front row" could be of the order of 60 - 100 patrons. The advantages of the concert hall in-the-round are greater performer/patron contact, uniform sound paths and reverberation decay.

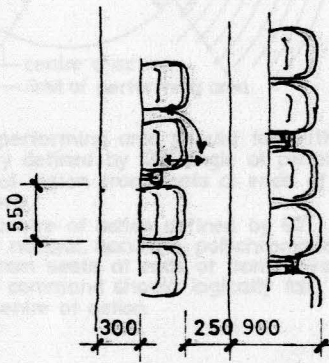
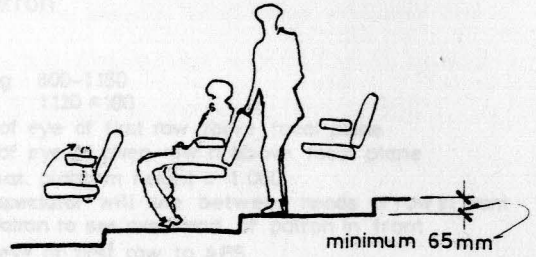
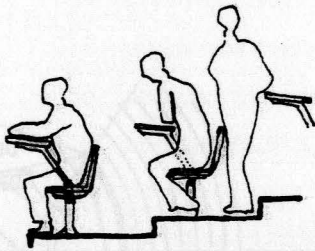
The fan-shaped auditorium has the advantage of placing the majority of the audience at some distance from the orchestra, thus providing them with a more balanced rendition of the orchestral ensemble. The "megaphone" effect of this shape needs to be eliminated by modulation of the sidewalls and ceiling to disperse the sound waves. The ceiling should also provide for a progressive reinforcement of sound towards the rear of the hall. Seating, in any plan form, should be raked to provide good sight-lines and to eliminate the grazing effect on sound as it passes over the heads of an audience seated on a horizontal plane.



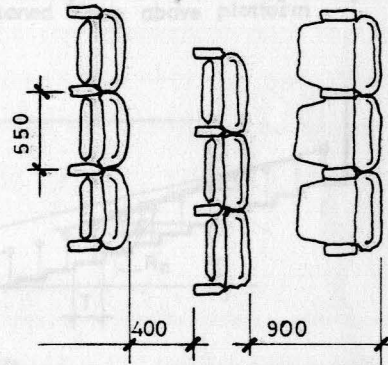
curved

compound

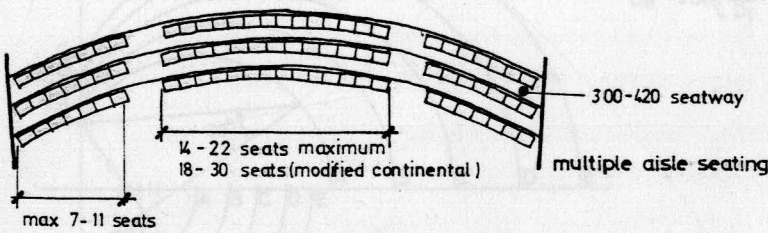
some types of seating arrangement



lecture hall - fixed desks & swinging, swivel seats



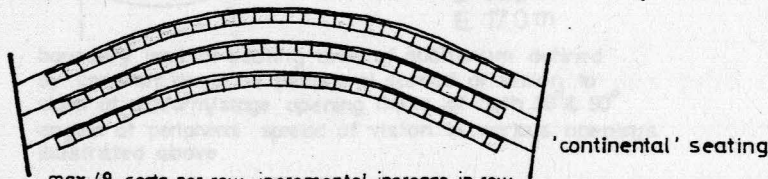
recital hall - staggered



max 7-11 seats

min seatway (between perpendiculars)	seats	max dist of seat from gangway
300	7	3 000
330	8	3 500
360	9	4 000
390	10	4 500
420	11	5 000

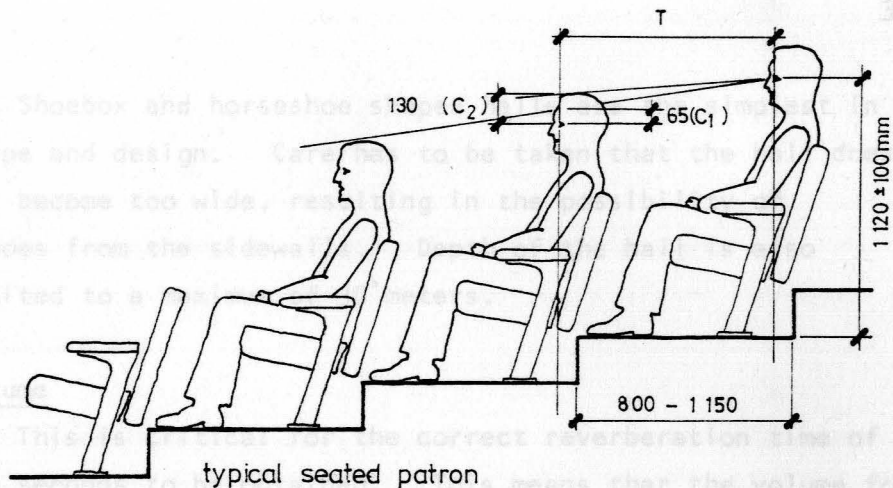
aisle on one side only - double for aisle on both sides



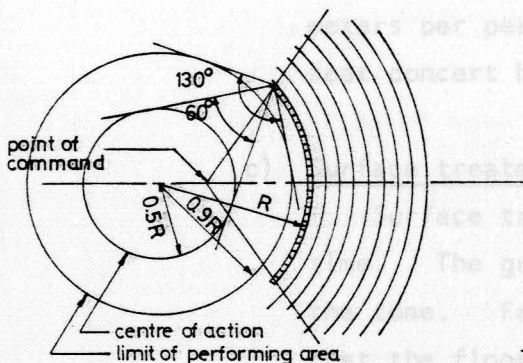
'continental' seating
max 49 seats per row. incremental increase in row length sometimes permitted as a function of incremental increase in row spacing

seating

Figure 35



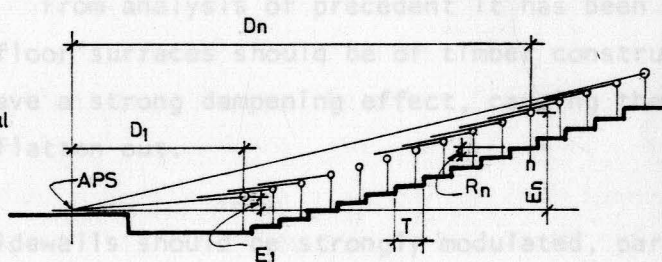
typical seated patron



largest performing area should fall within boundary defined by 130° angle of peripheral spread of vision from seats at ends of front rows.

limit of centre of action defined by 60° angle of normal, accurate, polychromatic vision from seats at ends of front rows. point of command should logically fall within centre of action.

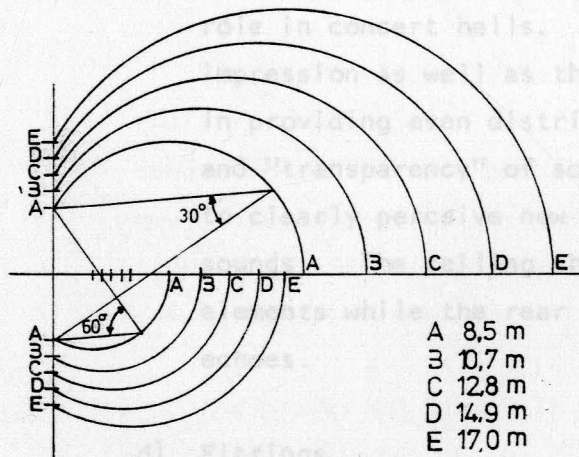
- T = tread of seating 800-1150
- E = eye height 1120 ± 100
- E₁ = vertical height of eye of first row above focal plane
- E_n = vertical height of eye of given row n above focal plane
- E₁ = 0 establishes max. platform height = 1 060
- C₁ = 65 assuming spectator will see between heads of row in front
- C₂ = 130 allows av. patron to see over head of patron in front
- D₁ = distance from eye of first row to APS
- D_n = distance from eye of given row n to APS
- APS = arrival point of sight. intersection of highest sightline at focal plane positioned 50mm above platform.



isicdomal floor slope

exponential shape of floor slope results from generation of site lines from single focal point or APS. isicdomal floor slope makes more efficient use of given total rise.

$$E_n = D_n \left[\frac{E_1}{D_1} + C \left(\frac{1}{D_1} + \frac{1}{D_2} + \frac{1}{D_3} + \dots + \frac{1}{D_{n-1}} \right) \right] R_n = E_n - E_{n-1}$$



- A 8,5 m
- B 10,7 m
- C 12,8 m
- D 14,9 m
- E 17,0 m

boundary limit of seating area of auditorium defined by constant angle of peripheral spread of vision to sides of platform/stage opening. limits of both 30° & 60° angles of peripheral spread of vision to various openings illustrated above.

sight lines

Figure 36

Shoebox and horseshoe shaped halls are the simplest in shape and design. Care has to be taken that the hall does not become too wide, resulting in the possibility of echoes from the sidewalls. Depth of the hall is also limited to a maximum of 30 meters.

b) Volume

This is critical for the correct reverberation time of 1,6 seconds to be obtained. This means that the volume for good musical rendition must be of the order of 6,7 - 8 cubic meters per person; or about 2 575 cubic meters for a 350 seat concert hall.

c) Surface treatment

Surface treatment has a marked effect on the reverberation time. The greater the reflective surface area, the richer the tone. From analysis of precedent it has been concluded that the floor surfaces should be of timber construction as carpets have a strong dampening effect, causing the high notes to flatten out.

The sidewalls should be strongly modulated, particularly where the stage meets the sidewall. According to Dr W de V Keet, the acoustic consultant for the Stellenbosch Conservatoire, early lateral reflections play an important rôle in concert halls. They contribute to both the spatial impression as well as the clarity, while diffusion assists in providing even distribution of sound, evenness of tone and "transparency" of sound; the latter being the ability to clearly perceive new sounds through the decaying old sounds. The ceiling should also be provided with diffusing elements while the rear wall should be broken up to prevent echoes.

d) Fittings

The seats should be designed to provide as little variation in absorption with occupancy as possible. This is done by providing reflecting seat backs and bottoms, and by restricting padding to areas normally covered by the body of the occupant.

4.2 Platform

4.2.1 Usage criteria

The conductor must be able to see all the players and ideally the orchestra should subtend an angle of 140° maximum to the conductor.

It is inadvisable to provide a fixed rostrum as conductors' tastes vary as to position. It also limits the flexibility of the stage. Height adjustment is desirable, but not always practical. A 150 mm module height adjustment is generally preferred. The size of the rostrum should be 900 mm x 900 mm and although some sort of safety rail is desirable, it is felt that this would be unwise as it may inhibit the movements of the conductor.

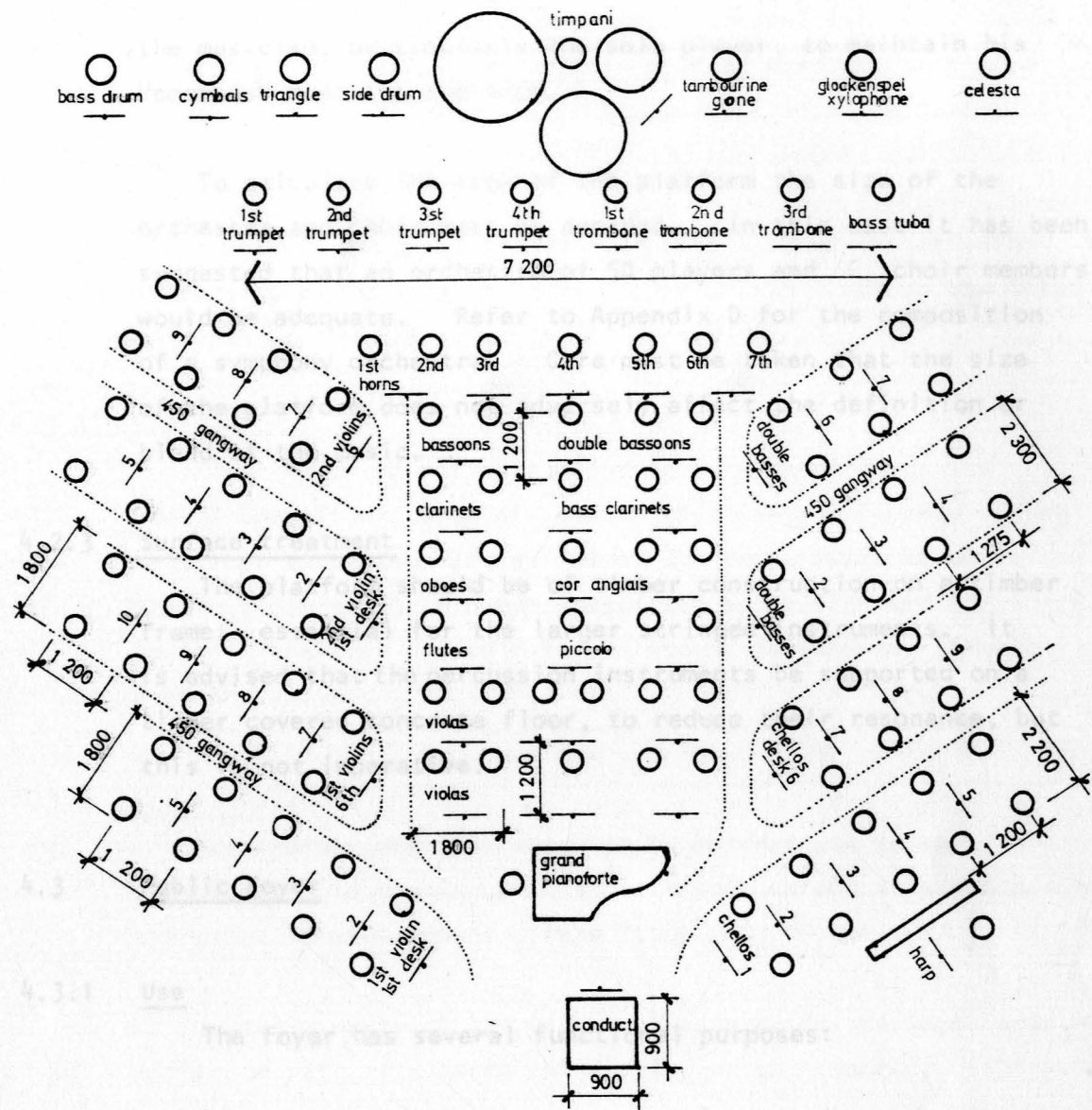
The platform should be as flexible as possible, catering for all possible preferences. The timber platform units should be of modular dimensions, making the units interchangeable and stackable. It is envisaged that the choir area to the rear of the stage should double up as stepped platform space for the orchestra. Loose platform boxes should be stored close at hand. It must be noted that the general trend is for platforms to be flat, with only stepped seating, in loose chairs, being provided for the choir.

The choir stands while singing, but chairs are provided for their rest periods. Good sightlines between players and conductor and players and audience are essential. The soloist needs easy access to the front of the hall. Choir chairs should be made available to students of conducting when not in use by an orchestra.

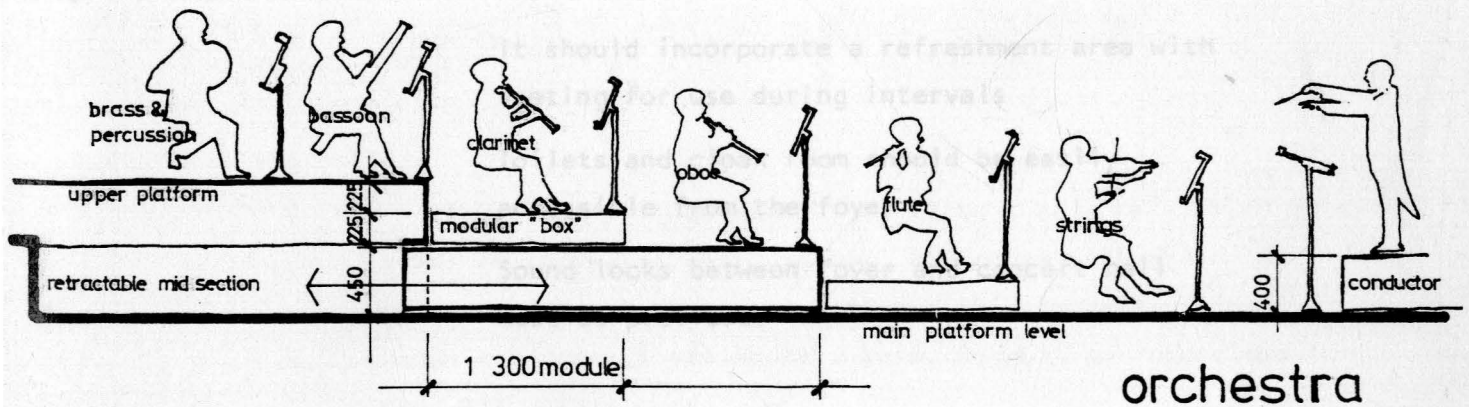
The preferred format in this country appears to be for the whole orchestra to occupy the flat portion of the platform. Chairs and stands should not be fixed.

4.2.2 Size

Platform height should be between 600 mm and 1 200 mm above the lowest level of the concert hall floor. This is to enable



the position of various instruments within a large orchestra



typical platform arrangement

Figure 37

the musician, particularly the solo player, to maintain his "command" over the audience.

To calculate the area of the platform the size of the orchestra and choir must be decided. In this case it has been suggested that an orchestra of 50 players and 30 choir members would be adequate. Refer to Appendix D for the composition of a symphony orchestra. Care must be taken that the size of the platform does not adversely affect the definition or blend of the music.

4.2.3 Surface treatment

The platform should be of timber construction on a timber frame: essential for the larger stringed instruments. It is advised that the percussion instruments be supported on a timber covered concrete floor, to reduce their resonance, but this is not imperative.

4.3.3 Furnishings

4.3 Public Foyer

4.3.1 Use

The foyer has several functional purposes:

To provide a gathering space for patrons prior to a concert and during the intervals

To act as an area where patrons can queue to buy tickets in comfort

It should incorporate a refreshment area with seating for use during intervals

Toilets and cloak room should be easily accessible from the foyer

Sound locks between foyer and concert hall must be provided.

4.4.2 Use Apart from these functional requirements, the foyer has a psychological function as well. It must capture the pre-concert atmosphere and a feeling appropriate to the spirit of music. Space should be dramatic and complimentary, not compete with, the volume of the concert hall. Surface treatment should exude a sense of quiet opulence, appropriate to the occasion while also projecting an equally appropriate image of the School of Music as a whole.

4.3.2 Size

From time and motion studies done by Harold Bayer and Edward Cole it has been discovered that foyer occupancy during intervals is between 70 and 75% of the total audience while one square metre is the minimum acceptable space standard per 2 - 5 seats. Wherever possible foyers should be generous in both area and volume.

4.3.3 Furnishings

Furnishings and fittings will be appropriate to the occasion and in keeping with the artistic nature of music and the creative environment of the School.

Suitable works of art will be displayed in the foyer area, either as part of a permanent display or on temporary display.

Seating, planting boxes and ashtrays will be designed around a modular, upholstered, backless seating system.

4.4 Green Room

4.4.1 Use

This room will be used by performers as a relaxation area prior to and after performances, for rehearsals prior to performances and as a rest area during intervals. Small backstage parties may be held here, as well as interviews, meetings, etc.

4.4.2 Location

Within easy access of the main circulation areas and the platform, dressing rooms, ablutions and practice rooms.

4.4.3 Size

An area of 125 - 175 m² allocated for this purpose takes into account the respective sizes of the orchestra and choir, together with a small number of guests.

4.4.4 Furnishings

These will include seating, a small bar fridge, counter and storage area.

4.5 Rehearsal Hall

4.5.1 Use

This room, which could also be called the General Purpose Music Laboratory, will be used for all forms of rehearsal including:

Solo piano

Orchestra with or without choir;

Chamber music rehearsal;

Choir rehearsal and voice training;

Performance and conducting classes;

Experimental music;

Critiques, large lecture groups and examinations.

This hall could also be used by the Department of Speech and Drama for rhythmic classes. It must also be possible to make recordings of music performed in this room.

4.5.2 Location

The Rehearsal hall could be situated adjacent to the concert hall with easy access to the concert hall, foyer and student entrance. The rehearsal hall should have its own instrument store and entrance to the Rehearsal hall platform should be on the same level as that of the instrument store.

4.5.3 Size

The room must have a platform able to accommodate a full size orchestra. The central floor area should also be large enough to accommodate the orchestra if the platform is being used as seating for the choir. Fixed seating for about 100 students should be provided opposite the platform for lecture and criticism class purposes. The ceiling height should be between 5 - 7 metres in order to give a reverberation time equal to that of the concert hall. The ideal size would be 20 x 15 metres.

4.5.4 Furnishings

All surfaces should be reflective surfaces with moulded side and rear walls providing lateral reflection and diffusion. The acoustic properties of the hall should be made adjustable by employing heavy drapes housed behind reflective panels; which when drawn will cover the side wall scatterboxes.

Seating will be designed to remain in the seat-up position when not in use thus reducing absorption of sound. Each seat will have a fold-away writing tablet.

Floor, platform and fixed seating platform will all be of timber construction. Walls and ceiling will have plasterboard scatter panels.

A grand piano will be permanently on stage with other instruments within close proximity. Equipment will also include a turntable, reel-to-reel and cassette tape decks, and an amplifier with free-standing speaker units. Stackable chairs housed in the hall's store room (\pm 115 chairs) will be used by orchestra, choir and/or patrons as the case may be.

4.6 Recording Control Rooms

4.6.1 Use

These will be used to make sound and video recordings of recitals in both concert hall and rehearsal hall, and for projection purposes in the concert hall.

4.6.2 Location

Adjacent to two main halls within visual contact through double glazed windows.

4.6.3 Size

3,5 m x 5 m will be adequate to house the necessary equipment which will include reel-to-reel tape decks, video recorder, closed circuit monitor, mixing desk and a projector unit for the concert hall. The rooms must be soundproof and have black-out facilities.

4.7 Lecture Room

4.7.1 Use

Predominantly for first or second year lecture groups where BMus(Ed) and BMus courses are combined. It can also be used by the Speech and Drama Department and for public lectures and critique classes. Types of lecture activities will include:

- History of music
- Theory of music
- Musicology
- Analytical studies of music pieces

4.7.2 Location

As the lecturing facilities will be used by students of music and by students from other faculties and members of the public, this facility would be adequately accommodated in the rehearsal hall with its variable acoustic qualities.

4.7.3 Size

The largest lecture groups will be those taking first year courses e.g. History of Music. With the projected size of the school at 168 students, the estimated first year size is 66 students (40%). A 20% increase has been allowed on this figure for students outside the school who may be taking a music course. This brings the total to 80. These students could be comfortably seated in the rehearsal hall.

4.7.4 Furnishings

The seating requirements of a lecture hall are identical to those provided in the rehearsal hall.

The stage is about seven metres from the front row of seats of the Rehearsal Hall and is therefore unsuitable for the delivery of speeches or lectures. This problem is solved by the use of a movable rostrum (housed in the store when not in use). This rostrum contains a turntable, reel-to-reel and cassette tape decks, an amplifier, lighting and projection control panels and is connected to a power supply through a recessed, floor-mounted power/remote control outlet.

The front wall will accommodate a screen for slide and film projection. To eliminate the need for a 'blackboard' (which can be a messy teaching aid) an overhead projector will be provided. This system is desirable as it is clean, transparencies can be prepared in advance and re-used, it is particularly suited to 'overlays' and perhaps its greatest advantage is that the lecturer is always facing his or her students i.e. improved 'audience' contact.

A small projection room behind the rear wall with access from within the rehearsal hall must be provided to accommodate 2 x 35 mm slide projectors and a 16 mm ciné projector. The projection port can be glazed with a single layer of 9 mm float glass.

The projection room could be incorporated with the recording control room but it is not essential as sound attenuation and other performance criteria for these spaces are different. The video recording camera could be housed in and operated from the projection room.

As already discussed, the rehearsal hall acoustic properties can be adjusted by the use of heavy drapes on the sidewalls. Additional drapes can be provided to cover the rear wall thus providing a variety of options to suit the requirements of the particular use to which the hall is put.

4.8

Library

The policy of the university with respect to libraries is in accordance with a number of universities in South Africa; namely that of centralisation of services, with each faculty being allocated a 'resource centre', which would house a limited number of books, (on long term loan from the main library), current periodicals and other such items as may be needed for use by students and staff on a regular or daily basis. There are both advantages and disadvantages to this system and opinions differ widely: The university is reluctant to give the faculty a full branch library and the faculty feels that it is impossible to provide an adequate service otherwise. Under these circumstances, it is perhaps wisest to take a middle course and provide a resource centre of adequate size which would be able

to accommodate the facilities provided by the central library, as well as tapes, discs, scores and books which will be purchased and owned by the faculty. Where the contents of a library are owned by a faculty (as exemplified by the two record and tape collections at the South African College of Music), the condition of the goods is far superior to that of the main library's collection.

4.8.1 Use

The library will primarily be for the benefit of music students and staff members, but this does not preclude other students, members of staff and members of the public from using the facilities during school hours.

The library will contain a limited number of books, current periodicals (up to a year old) relating to all aspects of music and music education, tapes, discs and scores. It will provide facilities for listening to tapes and discs; making supervised recordings; photostating and reading.

4.8.2 Location

It should be accessible from both public and student access points. South orientation is desirable with advantage being taken of any views that are to be had.

4.8.3 Size

The library will accommodate the following material:

Books	1 000 - 1 500
Box files (scores)	500
Current periodicals	±40 + 440 back issues
Discs	7 000
Tapes	600

(Refer to Appendix E for space allocation)

Other facilities will include:

a photocopy machine service	
listening carrels	18 persons
reading tables	12 persons
study tables	18 persons
library control desk	12 m ²
seminar room	15m ²
office	12m ²

4.8.4 Functional requirements of spaces

a) Control

The control point should be located directly adjacent to the library entrance and should command an overall view of the library. Ample storage space for stationery should be provided. A desk is required for administrative work, while a counter is required for the issue of books.

b) Book stacks

Catalogue cases should be adjacent to the point of entry and control. Stacks should be in rows at right angles to the control desk. Ceiling height may be kept to a minimum in this area. Periodicals should be made available wherever there is good natural light and adjacent to a seating area.

c) Reading and Studying tables

These should be situated in a quiet part of the library, away from the general library activities as these areas will, during certain times, be extensively occupied. Reading tables should be slightly more accessible from book stacks and periodical racks and could act as a lounge area.

d) Listening carrels

These must be remote from the library activities yet fairly accessible from control desk, record stacks and tapes. Bays are 1 m wide and will include tape deck and turntable.

e) Seminar room

Generally used as a multi-functional room. Furniture will consist of a table and chair arrangement for about 8 persons. It could also operate as a lounge/waiting room.

f) Office

For staff use. This room can also act as a small workshop for minor repairs to books and periodicals.

4.9 Music Studio

4.9.1 Use

These rooms will be used by small to medium sized groups of students for instruction and seminar purposes. These rooms compliment the larger lecture space.

4.9.2 Location

They should be grouped together off a common passage with easy access to a student waiting area.

4.9.3 Size and number

Sizes will vary from a room able to seat 30 students to one that can seat 15, catering for small senior classes to medium sized junior classes. After discussions with Professor van der Spuy of the Music School, it was decided that four would be an adequate number.

4.9.4. Furnishings

Each music studio will have comfortable, free-standing chairs with a fold-down writing tablet; a large notice board; a "blackboard" (melamine surface using felt-tip markers) of the sliding type with clear and staved panels; and an upright piano.

4.10 Teaching suites

4.10.1 Use

These rooms are used by tutors for the practical instruction of individual students and as office accommodation.

4.10.2 Location

Teaching suites should be located at ground level for acoustic reasons and close to a student area. Views and orientation are desirable.

4.10.3 Size and number

Staff figures fluctuate from year to year as the school operates on a system of having lecturing staff on loan from other institutions. For the foreseeable future, the school will require six suites. This will cater for three full-time tutors and twelve part-time tutors. As there are at present only two main instruments studied at the university, piano and recorder, the suites will be used accordingly.

From the acoustic environment standards (refer 8.1), it will be seen that 6 x 4,75 m is ideal as a size for a teaching suite.

4.10.4 Furnishings

Piano teaching suites will have two pianos, one baby grand and one console, while other suites will have one console piano each.

4.12.1 Each teaching suite will contain:

a desk and chair

two extra chairs

a bookcase/counter unit
a locker unit

two music stands

4.12.2 Location

a full length mirror
a large notice board
a blackboard (staved with melamine surface)

4.11 Practice rooms

4.11.1 Use

Use by students for individual practice and composition.

4.11.2 Location

Preferably together and with a view. Should be related to the entrance, a waiting area and teaching spaces.

4.11.3 Size and number

From the acoustic requirements (refer 8.1) and from the SAPSE-101 report, which lays down space norms for post-secondary educational institutions, it has been found that an area of 15 m² is adequate and desirable for this type of room.

Although a student is expected to practice as often and as much as he can, this is not always possible. In calculating the number of practice rooms required, a ten hour a day availability is assigned to each room. The total projected student number is then assigned one hour per day, which gives a total of 17 practice rooms. This means that the present student numbers will have to double before a normal two-hour practice session per student per day is theoretically exceeded.

4.11.4 Furnishings

Eight practice rooms should contain a console piano and two chairs, a small desk and a full length mirror. Four rooms should contain a desk, two chairs, a mirror and two music stands.

4.12 Lecturers offices

4.12.1 Use

Used by full-time and part-time lecturing staff not involved in the practical teaching of music.

4.12.2 Location

Location close to library, lecture rooms and staff common area. Views are desirable.

4.12.3 Size and number

Eight offices are required: six to accommodate full-time lecturers and two to accommodate part-time lecturers on a shared basis.

15 Square metres is deemed adequate for their purposes.

4.12.4 Furnishings

Each office will contain a desk, chair, two guest chairs, a bookcase unit, a small cabinet and a notice board.

4.13 Common rooms

4.13.1 Use

There should be two common rooms; one for the staff and one for the students.

4.13.2 Location

The staff common room will be used for small conferences which may involve all staff members.

4.13.2 Location

The staff common room should be within close proximity of the teaching suites and music studios. Although it is desirable to have it close to the administrative areas it is not imperative. If physical communication between administration and staff common

room is not possible, an intercom system will suffice. Advantage should be taken of views.

The student common room must relate to the entrance foyer and have a good visual link with the site and any views. It must be the hub of activity.

4.13.3 Size

The staff common room should be comfortable ($\pm 2 \text{ m}^2$ per person). A small tea kitchen will supply refreshments.

The student common area must be intimate. Snacks or refreshments need not be provided as these can be obtained elsewhere. 110 m^2 is considered adequate.

4.13.4 Furnishings

The staff room will be carpeted and fitted with easy chairs and coffee table. The room will be suitably decorated to create a calm, relaxed atmosphere.

The student area will have an open seating area with locker facilities close by. There will also be a display cabinet within the area and as much notice board space as possible.

4.14 Administration

4.14.1 Use

This area will be used by the Professor, his secretary-cum-typist/receptionist. The school records will also be kept in this area.

4.14.2 Location

It is desirable to be fairly close to the public entrance foyer and at the same time reasonably accessible from the student entrance and car parks. Good views and natural lighting are essential in all the administrative offices.

4.14.3 Size

The administrative area should contain:

The reception area with a small waiting area;
receptionist's desk including PABX, intercom

system, typing table and chair; a filing cabinet. The professor's suite must be accessible from the reception area.

A records room.

The professor's suite consisting of an office (40 m²) which includes a grand piano.

4.14.4 Furnishings

This is an area where important visitors are received and therefore the fittings and furniture must be of a suitable quality and style. The space should be opulent but intimate. Planting should be incorporated in the layout. Carpeted floors, appropriate sculptural elements, paintings and accent lighting will complete the picture.

4.15 Instrument storage

4.15.1 Location

Attached to the two main halls should be suitable storage, easily accessible from all spaces where music is performed. It should be close to an outside service entrance. If instruments are required on more than one level, adequate means of getting instruments to performance spaces is necessary. Generally once a large instrument is within a performance space it is housed in a storeroom when not in use.

4.15.2 Use and Size

Thirty m² for the main store is adequate, with smaller storage cupboards attached to the music studios. The store rooms should be able to accommodate at least:

Two concert grand pianos

Four console pianos

A full set of percussion instruments (Eastern and Traditional European)

30 racks 800 mm x 400 mm x 1,5 m high for storage of string and wind instruments.

5. Conclusions from analysis of Client requirements

From the preceding investigation into the client's requirements and the space standards necessary to meet those requirements, a number of desirable relationships have become apparent.

For an education-orientated faculty to make a positive contribution towards the functioning of the campus, it needs to relate to faculties with which it has, or might have, reasonably close dealings. Since more than 50% of all students in the School of Music are reading for the B.Mus(Ed) degree, and this trend will continue for the foreseeable future, it would be desirable to situate the new school building as close as possible to the Education faculty.

It is envisaged that the School of Music will develop closer ties with the Faculty of Speech and Drama, particularly if there is a demand for studies in the field of opera, and therefore the building needs to be situated close to this faculty too.

Performances which will have a high audience demand will, as mentioned, be held in the Great Hall. A direct relationship with the Great Hall is not deemed to be necessary, for the majority of these performances will be by "imported" artists who would, by and large, use their own instruments and equipment.

The dual function of the School of Music, that of place of learning and place of public performance, suggest a dual entrance - one for the formal aspects of the building's operation, and another informal entrance to cater for the student movement in and out of the building. The formal entrance must have a direct line of access between it, a parking area and one of the major access routes of the campus. The student entrance, on the other hand, must recognise the existing and planned pedestrian routes of the campus. It must also take cognizance of the direction from which the bulk of the students will approach the building and how accessible it will be to the rest of the campus in terms of lunch-hour concerts, film shows or slide-lectures.

The scheme calls for two major spaces, the concert hall and the rehearsal hall. It is around these two elements that the rest of

the accommodation calls for good orientation, natural lighting and good views. A site with good, all round views is highly recommended.

From the foregoing analysis and conclusions, sufficient data has become available for a site selection and an analysis of the chosen site to be made.

6. Site Selection

6.1 Location requirements

The present development of the University of Durban-Westville campus is confined, largely, to the crest of a ridge running from West to East and contained by the Northern and Southern Ring Roads. Within this complex of buildings, the faculties of Fine Arts and Speech and Drama (which from study of precedent are normally associated with a faculty of Music) are located to the South-Eastern and Eastern sectors respectively of the present campus. It follows then, that the location of the School of Music building would be within the present confines of the inner ring road system and within reasonable proximity of the Education and the two Arts faculties.

A further consideration is that the school should be located within acceptable walking distance of the central campus area, which also happens to be the most highly populated area of the campus. This requisite is to enable the lunch-hour concerts, film-shows, etc. to draw as large an audience as possible.

At the present level sites for development on the campus are at a premium, yet at the same time there is a need for additional parking facilities for the growing numbers of cars on the campus. By situating the School of Music adjacent to an existing car park, the need to develop a new car park, at considerable cost, would be obviated.

6.2 Site size requirements

The ideal situation for a building of this nature, where acoustic requirements demand complex structural solutions in a multi-level solution, is a single level development. However, costs, extended circulation routes, and site restrictions all play a limiting rôle.

There is however a limit to the amount of accommodation that can be assigned to an upper level and for this type of building it is obvious that the large volume spaces of the Concert Hall, Rehearsal/Lecture hall, all Public spaces and entrances, together with plant and machinery, would all be accommodated at ground level.

From these requirements a minimum building area (based on sizes taken from the client's requirements) of 5 000 m² has been calculated, includes ground floor circulation space and ancillary accommodation.

6.3 Alternative sites

A site has already been chosen for the development of a School of Music for the University of Durban-Westville; thus in evaluating alternatives, sites were inspected with a view to ascertaining whether or not they held advantages over the already chosen site.

From analytical charts of the site in which natural features such as soil conditions; micro-climate; natural vegetation; slope and orientation were examined, a land-use zoning map was produced. This map indicates areas for development; areas for conservation of the eco-system and areas for the preservation of the natural vegetation.

Three major preservation areas have been designated: to the South East, South West and North Western part of the presently developed campus. Two large conservation areas were designated, namely the watercourses to the South West and the North of the present Women's residence. These stream valleys will include the development of small sports fields, nature areas, pedestrian areas and other compatible uses.

Having established the boundaries of the preservation and conservation areas, the remaining vacant land is available for development. Of this available land, the only suitable alternative site is the strip of land on the lower side of the Northern Ring Road, North West of the main staff car park.

6.4 Evaluation and site choice

In the process of arriving at a choice, the two sites were weighed up against a number of criteria:

6.4.1 Visibility

The problem with the Durban-Westville campus is that there are three points of entry and a number of alternative routes that can be taken; which means that there is no sense of arrival and no logical progression, and that which appears to be the centre of the campus is inaccessible by car: all very confusing to the stranger. It is easier to arrive at a destination if the end point can be seen. By siting the building at the end of the spur, adjacent to the Education Faculty, views of the building are to be had from the two main points of entry to the campus: the Southern and Eastern entrances. By siting the School on the alternate site it is obscured from all three entry points, which makes it that much more difficult to locate for members of the public - an aspect which must be considered important in a building which holds public performances.

6.4.2 Access

Access to the building for the motorist and the pedestrian is important, and therefore proximity to a large car park is necessary. Ease of movement between car park and entrance foyer is desirable, while pedestrian access should relate to an established pedestrian route.

By placing the building on the same side of the road as the staff car park and having it at the end of a major pedestrian route, accessibility is increased. By placing the building opposite the car park, the road must be crossed by those wishing to use the building. The roadway then, in fact, becomes a psychological barrier, while the car park in its present form is even more of a barrier.

6.4.3 Orientation

Both sites have good orientation, but the site adjacent to the Education faculty has a commanding view of the hills and valleys, which should be used to advantage.

6.4.4 Topography

The upper site is level with steep banks to the East and South. The lower site has a slope of 5 - 10% which could be used to great advantage in a building of this nature.

7.3 Aspect and Prospect

6.4.5 Site size

The upper, level site is restrictive in size; the boundaries of the site being prescribed by roads, banks, parking lots and adjacent buildings.

The lower site has a lateral growth potential and therefore can cater for a more elongated, linear building which can expand if there is a demand for additional accommodation.

6.4.6 Context

Because the lower alternate site is on the 'wrong' side of the road, any building on that side would have to be able to function, to a degree, independently of the 'adjacent' buildings.

The upper site would have the opportunity of having close ties with both the Education faculty building and the Speech and Drama building.

From the above examination and the conclusions under 5 above, the site adjacent to the Faculty of Education is deemed to be the most suitable for the School of Music.

7. Site Analysis

The chosen site is analysed in drawing form with a short description on various aspects of the site and an analysis thereof.

7.1 Geographic location

The University of Durban-Westville is situated inland on the outskirts of Durban and borders on the Borough of Westville. The site is at the North Eastern end of the university campus, adjacent to the faculties of Education and Speech and Drama. There is a large staff car park to the West and a smaller service/parking area to the South.

7.2 Orientation

The orientation of the site is on a NW - SE axis. The adjacent buildings, however, are orientated at right angles to this.

7.3 Aspect and Prospect

The site is a level piece of ground 76 x 54 m in extent, which falls away steeply to the East and South. There are four, one and two storey buildings forming the Western perimeter to the site, while the Northern Ring Road forms the boundary to the North and East. A parking area and electrical substation form the Southern limit to the site. There are panoramic views from the North West, to the Umgeni River Mouth in the East, to Jan Smuts Highway and the main campus entrance in the south.

7.4 Access

The main vehicular access to the site is from the North off the Northern Ring Road. Servicing can also be off this road as well as from the parking and service area to the South of the site.

Pedestrian access is from established routes which run in front of both the Education and Speech and Drama buildings, terminating at the site, which is used as a temporary student car park.

7.5 Vegetation

The area is grassed with a few small trees on the Northern boundary (\pm 2,5 m high).

7.6 Geology

The rock formation of the site is of the Dwyka Series, which consists of tillite, lenses of sandstone and in some places varied shale, which will not give rise to any problems as far as the foundations of buildings is concerned.

7.7 Topography

The site is flat with a 4 m drop in level to the car park forming the South boundary and a 3,5 m drop in level to the main staff car park. The road drops away, from being level at the Northern entry to the site, to about 10 m below the general level of the site at the East corner.

The general slope of the ground to the North is 5 - 15% while to the East it varies from 15% to in excess of 25%.

7.8 Climatic conditions

The area has a warm, humid sub-tropical climate which plays an important role in the weathering process. It is situated in a summer rainfall region with an annual average of 1 000 mm and a relative variability of only 18%. Daily temperatures vary from an average maximum of 27,5°C during February to 22,0°C during July. Average daily minimum temperatures are 20,6°C for February and 10,9°C for July. Absolute maximum and minimum values of 41,9°C and 4,1°C respectively, have been recorded. Average daily sunshine for the area is 53% of the possible time (7,4 hours) or 69% of the maximum. October has 5,2 hours sunshine, or 41% of the maximum, per day. Only 9,7% of the total number of days receives more than 90% sunshine while 8% receive no sunshine.

On the micro-climatic scale the site is subjected to wind which blows up the valley from the North East. The South West sector of the site is protected somewhat by the buildings along that boundary, but again wind is funneled up the valley parallel with University Road. This site does however receive more sunshine than most other areas on the campus, due to its prominent North Eastern position at the end of the ridge.

7.9 Physical and Legal restraints

The only restraints placed on the site are those of physical extent: the existing buildings, the road and the parking areas.

7.10 Contextual

Consideration must be given to the overall development of the campus, the general massing of the forms, continuity of design aesthetics, movement systems, landscaping and future development patterns.

7.11 Design implications

From an analysis of the site certain points emerge which may be regarded as major design determinants.

It has been established that the public approach to the building will be from the N/W while the majority of students will be arriving from a westerly direction, passing in front of the Faculty of Education building. These two directions of arrival could be combined to form one entry point.

Maximum use should be made of the almost 360° view which the site offers. This implies that rooms with a high occupancy rate should be situated on the perimeter of the building envelope while rooms which do not need a visual link with the outside and have a controlled environment, should be internalised. In essence the internalised rooms are the large volumed concert hall, and the rehearsal hall, which also all need to be isolated from air-borne and structure-borne sound intrusion.

Orientation determines to what degree the internal environment of the building is controlled. This aspect has to be evaluated in terms of the prospect of good views and these two considerations may be in conflict with each other, which has to be resolved.

The manner in which the School of Music building is sited will have to maintain the continuity and the NE/SW axuality of building form. This will depend on how the building links up with the existing campus buildings. Topography, however, modifies this situation in that the building becomes a node about which future development splits to form two arms: one in a North Easterly direction along Varsity Drive and the other in a South Easterly direction linking the female residential units with the campus. This implies that the building must acknowledge its nodal function in its form, bulk and the way it contributes to the skyline.

The existence of an electrical high-tension sub-station on the South Western corner of the site implies a service zone for the building with vehicular access from the parking area adjacent to it.

The above determinants indicate major planning decisions around which design objectives will be formulated.

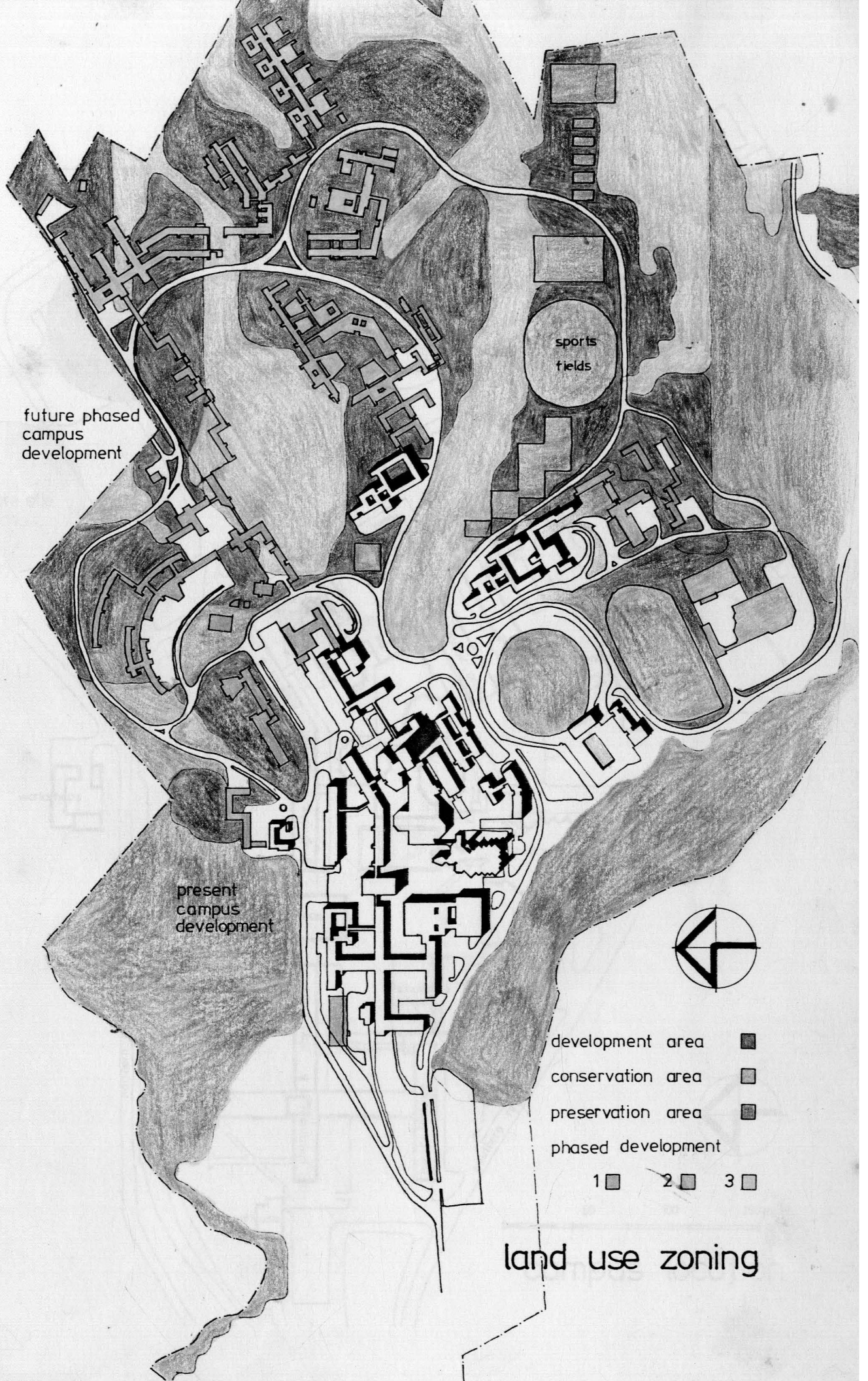


Figure 40

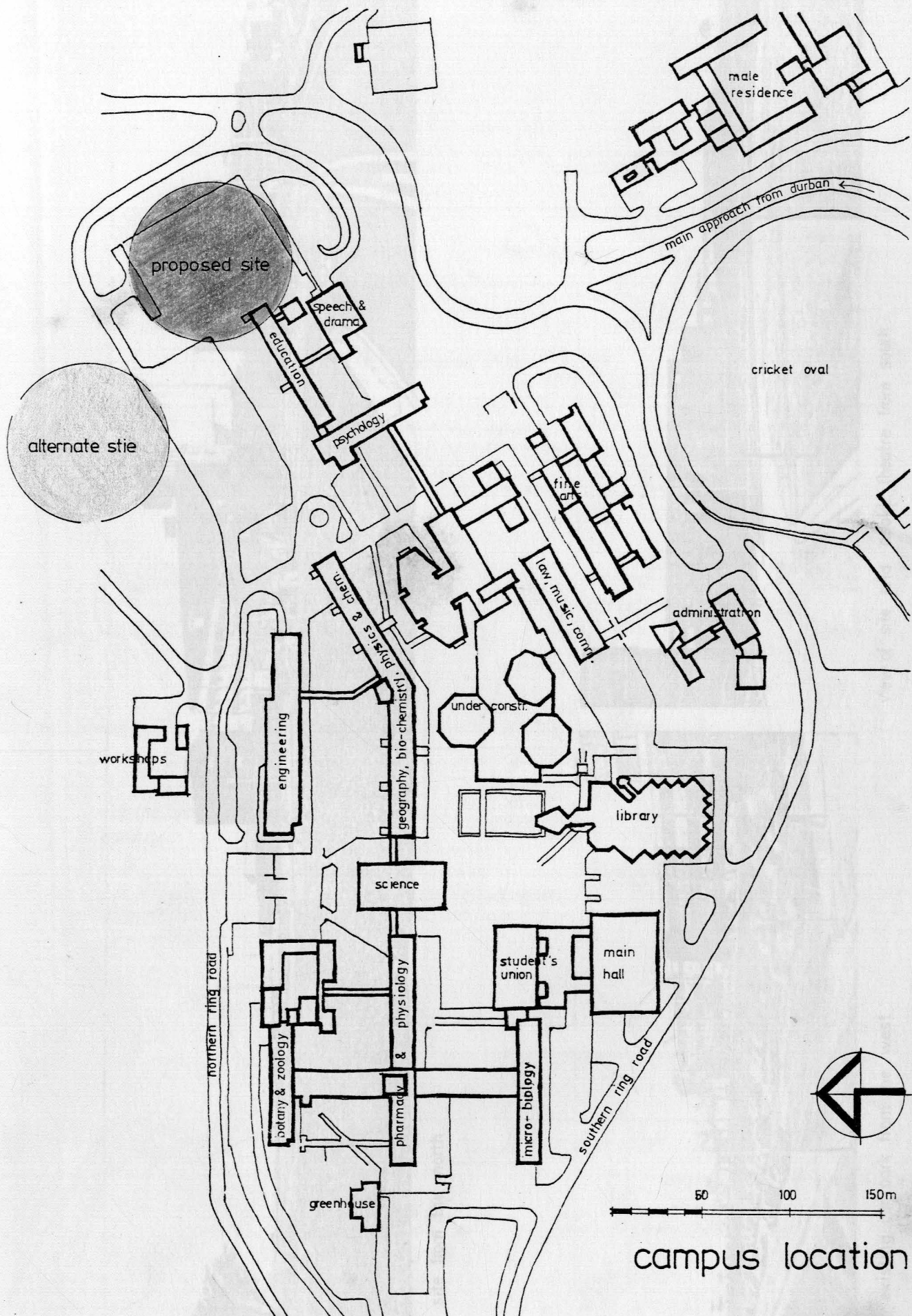
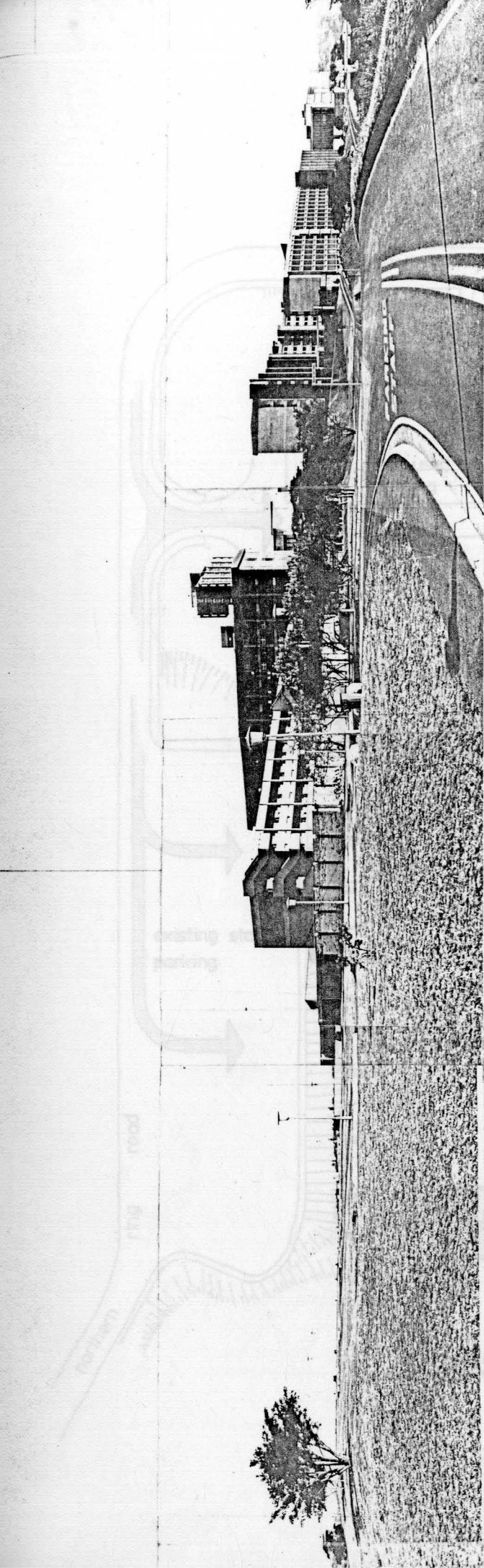
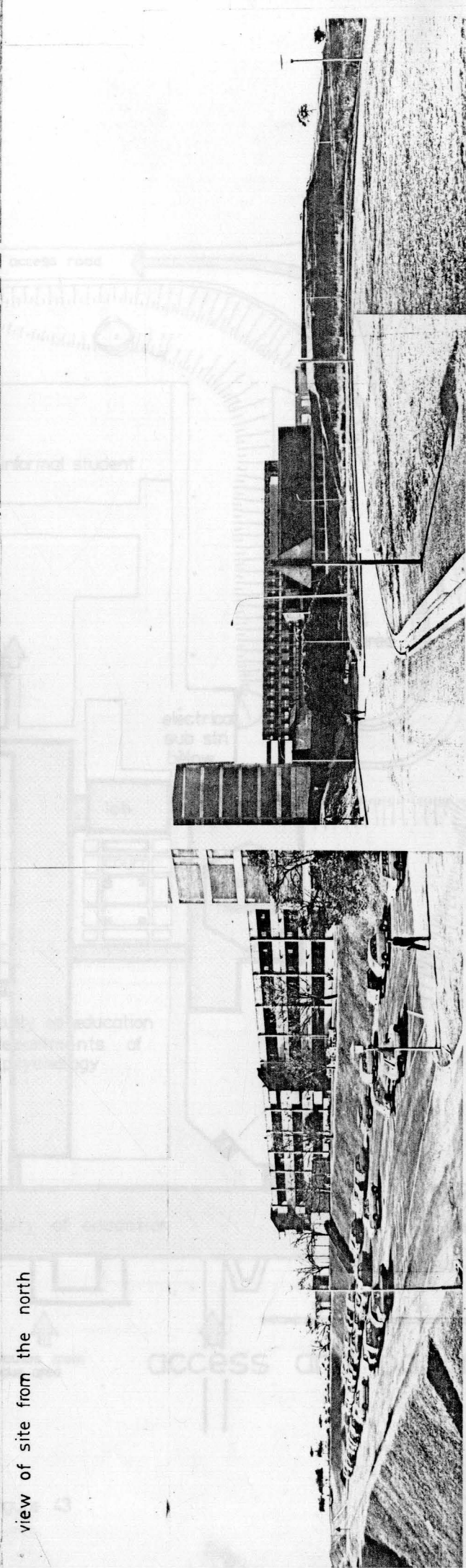


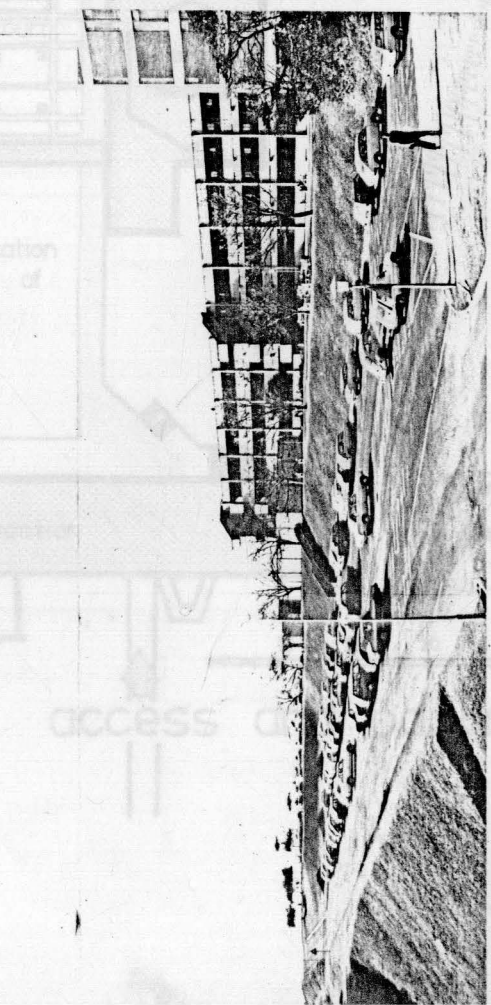
Figure 41



view of site from the north



view of site and asoka theatre from south



view of existing car park from the west

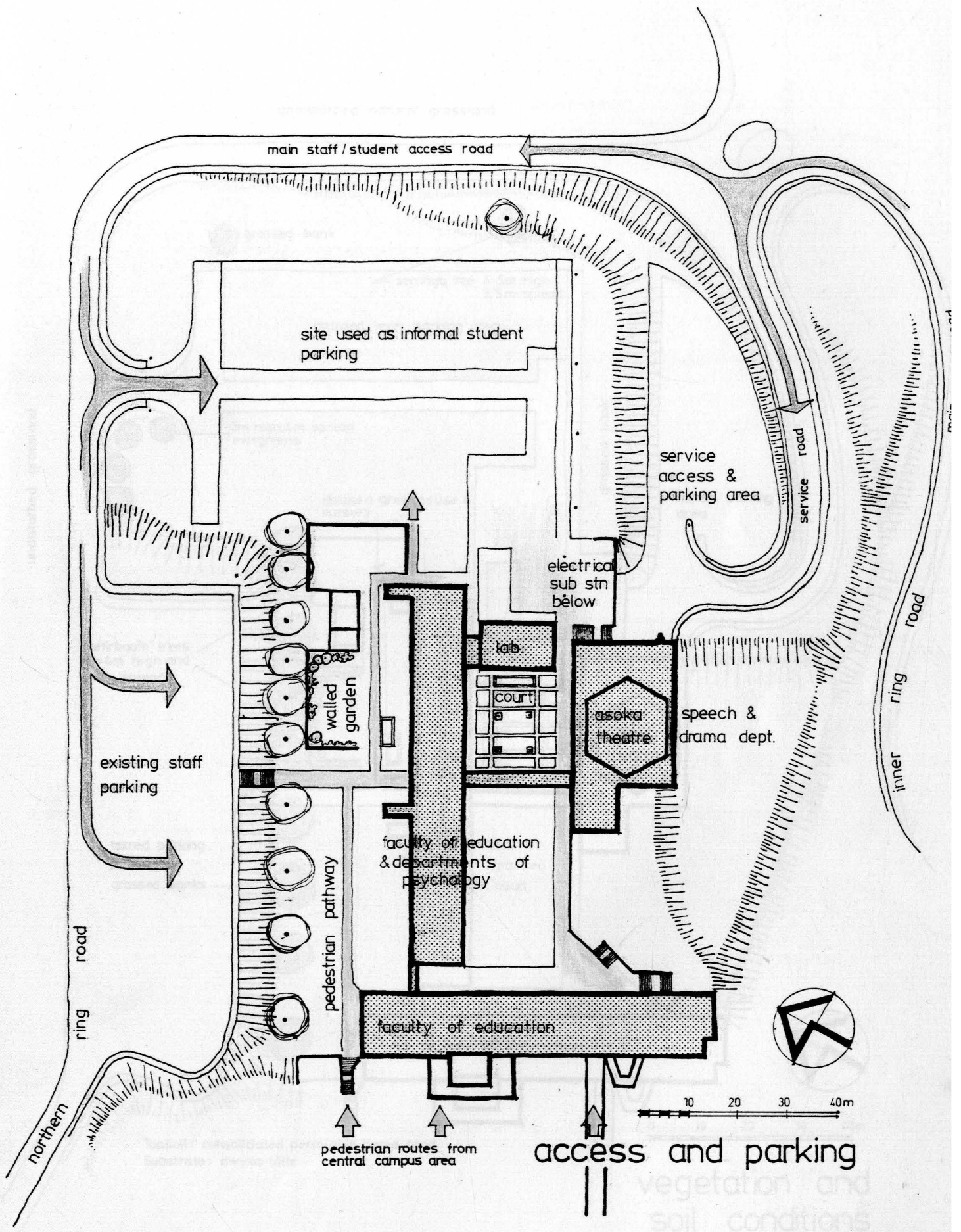


Figure 43

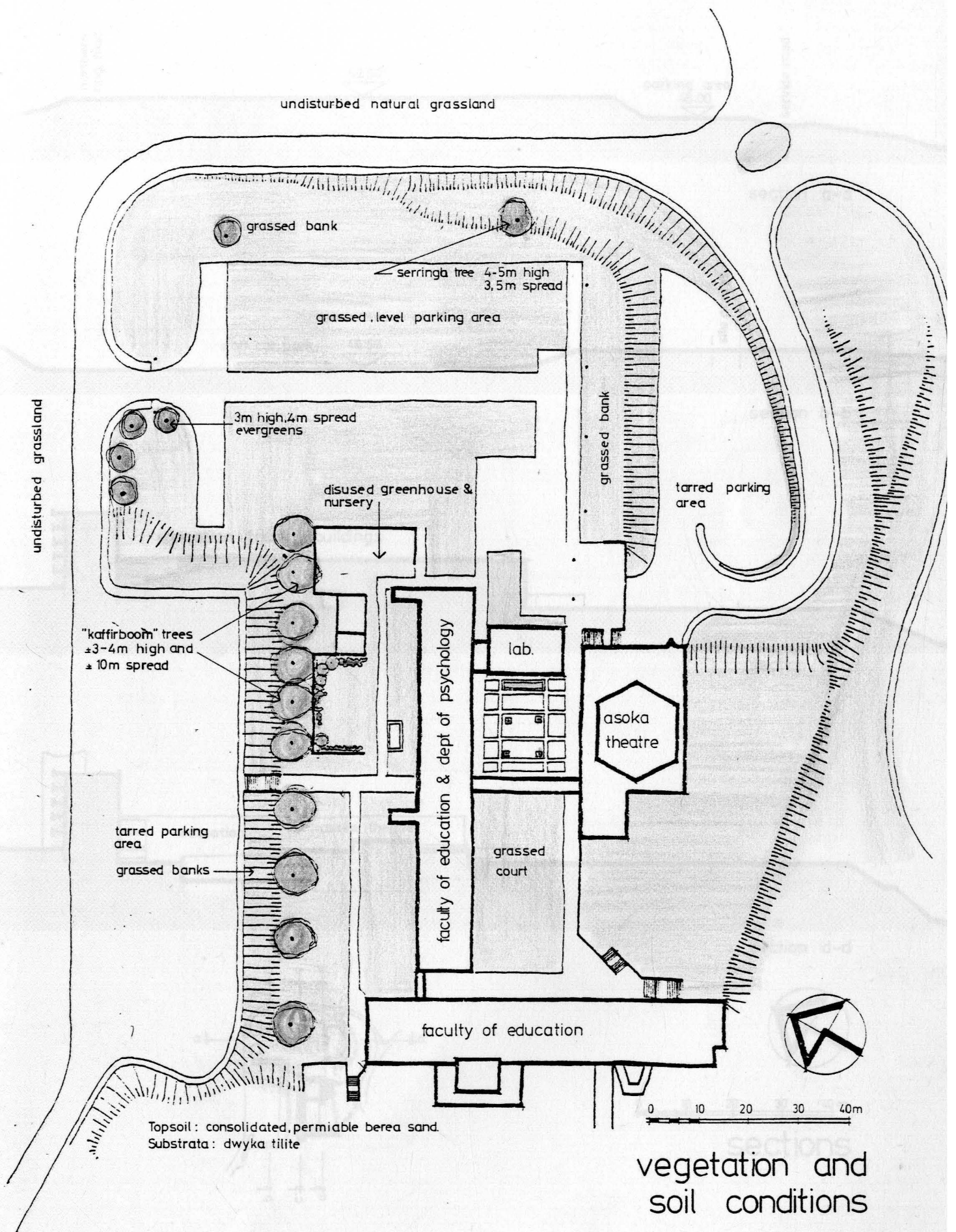
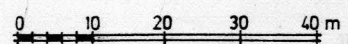
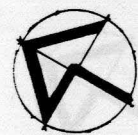
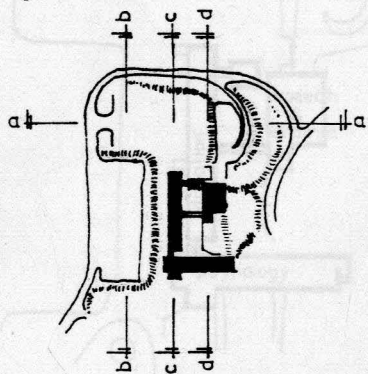
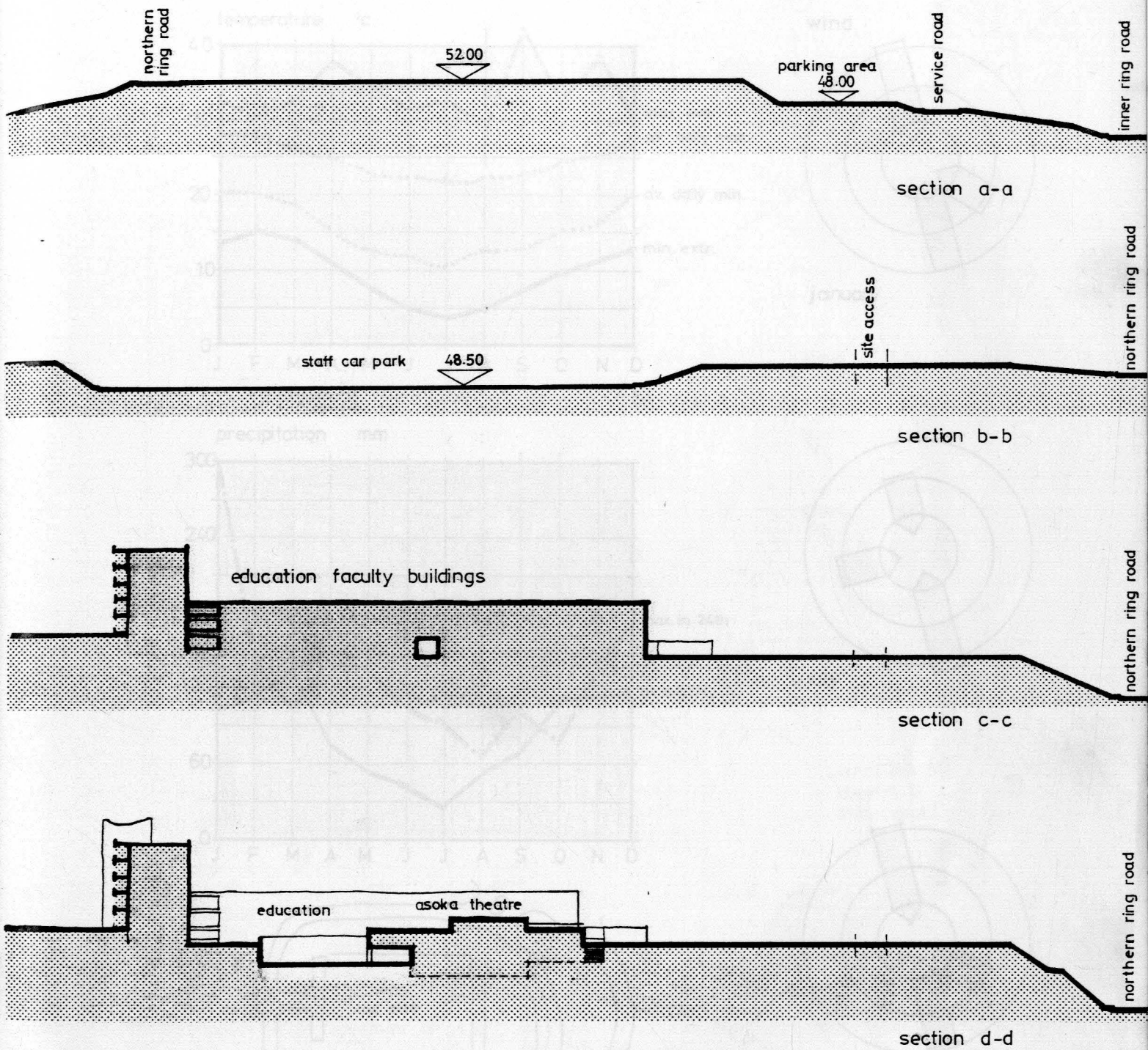


Figure 44



sections

Figure 45

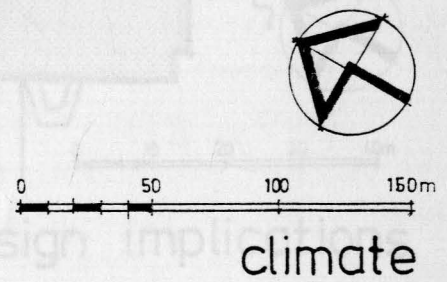
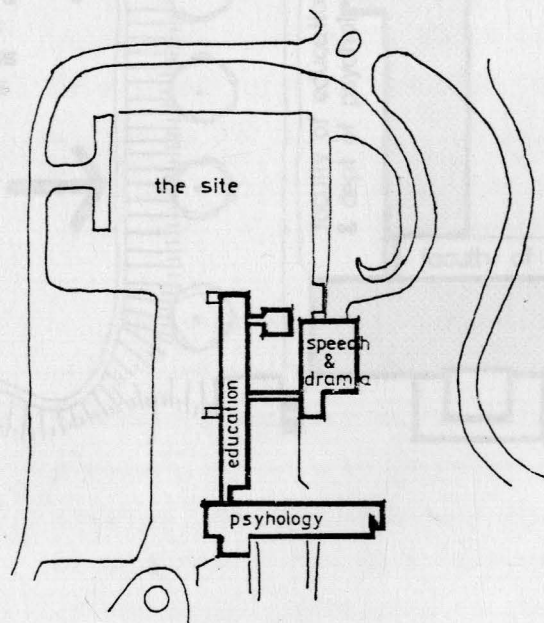
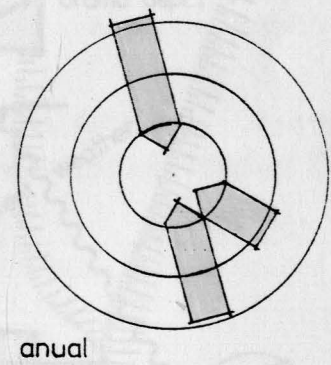
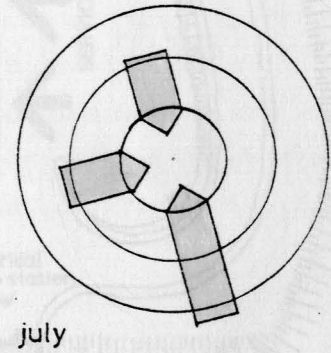
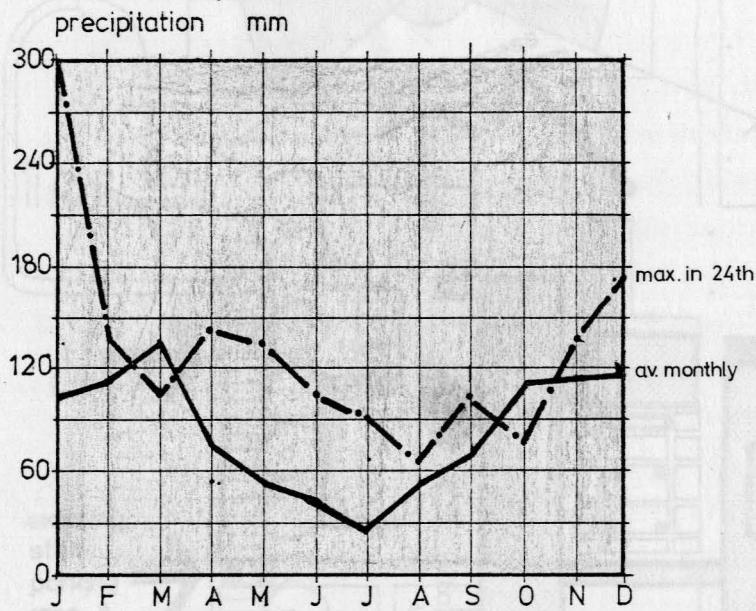
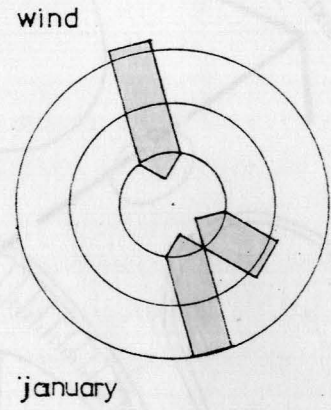
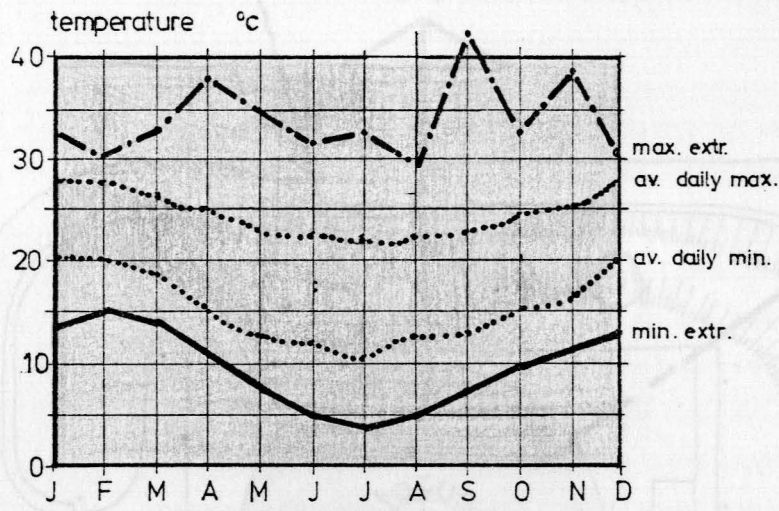


Figure 46

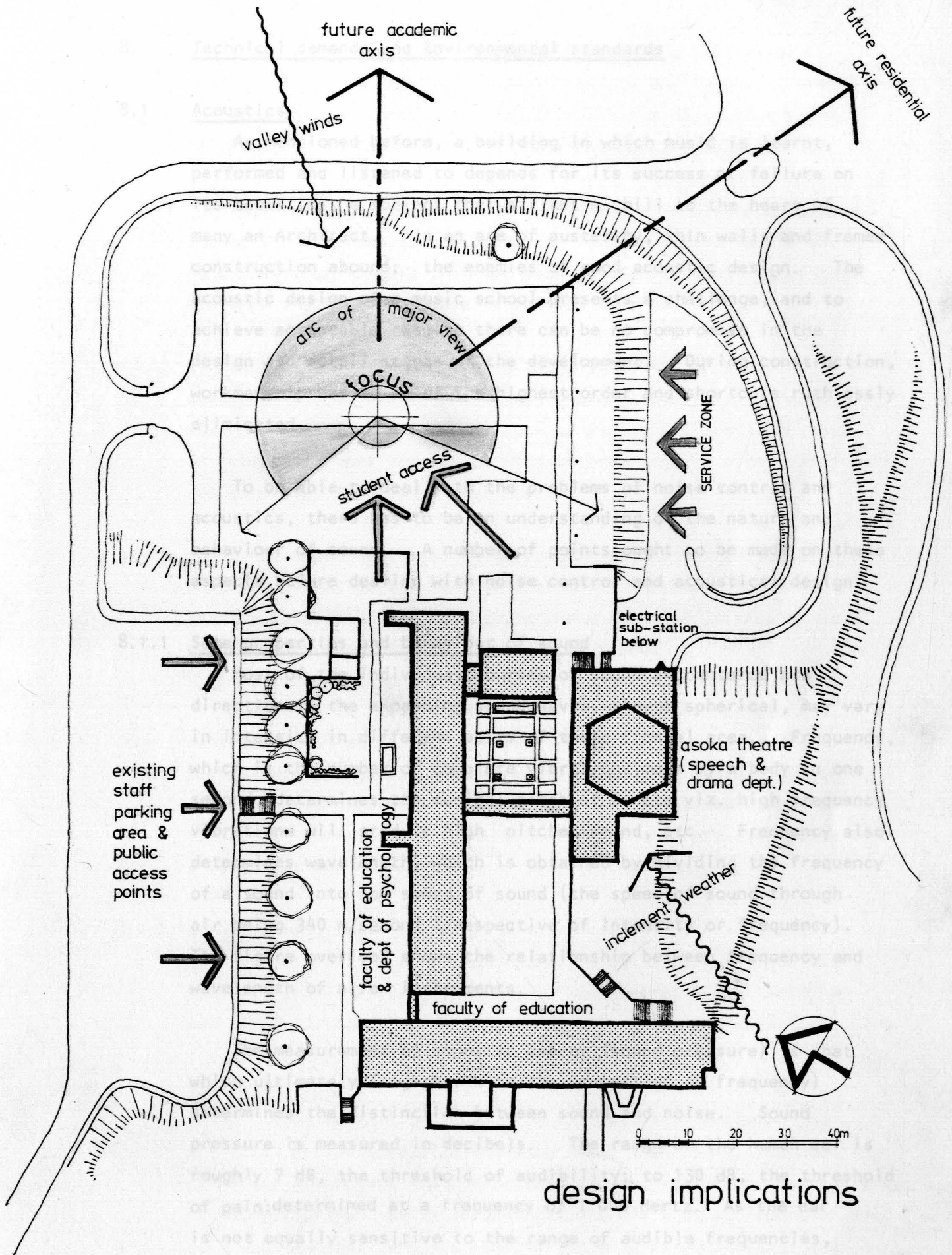


Figure 47

8. Technical demands and Environmental standards

8.1 Acoustics

As mentioned before, a building in which music is learnt, performed and listened to depends for its success or failure on its acoustics, a subject that strikes a chill to the heart of many an Architect. In an age of austerity, thin walls and framed construction abound; the enemies of good acoustic design. The acoustic design of a music school presents a challenge, and to achieve acceptable results there can be no compromise in the design and detail stages of the development. During construction, workmanship has to be of the highest order and shortcuts ruthlessly eliminated.

To be able to deal with the problems of noise control and acoustics, there has to be an understanding of the nature and behaviour of sound. A number of points ought to be made on these aspects before dealing with noise control and acoustical design.

8.1.1 Some properties and behaviour of sound

Most of the individual sources of sound encountered are directional; the expanding sound waves, though spherical, may vary in intensity in different parts of their frontal area. Frequency, which is the number of complete vibrations made by a body in one second, determines the musical pitch of a note viz. high frequency vibrations will produce high pitched sound, etc. Frequency also determines wavelength, which is obtained by dividing the frequency of a sound into the speed of sound (the speed of sound through air being 340 m/second irrespective of intensity or frequency). The figure overleaf shows the relationship between frequency and wavelength of a few instruments.

The measurement of acoustic energy (sound pressure) is that which ultimately (together with the properties of frequency) determines the distinction between sound and noise. Sound pressure is measured in decibels. The range of the human ear is roughly 7 dB, the threshold of audibility; to 130 dB, the threshold of pain; determined at a frequency of 1 000 Hertz. As the ear is not equally sensitive to the range of audible frequencies, differing loudness for equal audibility is required, resulting in

equal loudness contours. Loudness, which is a subjective quality, is a combination of sound pressure and frequency and is referred to as a phon. Typical loudness contours showing their relationship to sound pressure and frequency are shown below.

Sound pressure reduces with the increase in distance between source and listener according to the inverse square law. The nett result of this is that for each successive doubling of the distance the sound pressure is reduced by 6 dB.

Masking or the reduction in intelligibility of a sound, be it speech, music or simply a tone, by another sound, is a phenomenon which is undesirable in rooms such as auditoria, practice rooms or rehearsal rooms yet may be used to advantage in other situations not connected with Schools of Music.

Sound transmission in solid materials consists of two types: particle vibration and panel vibration. Particle vibration is usually associated with structure-borne sound while that of panel vibration is associated with air-borne sound.

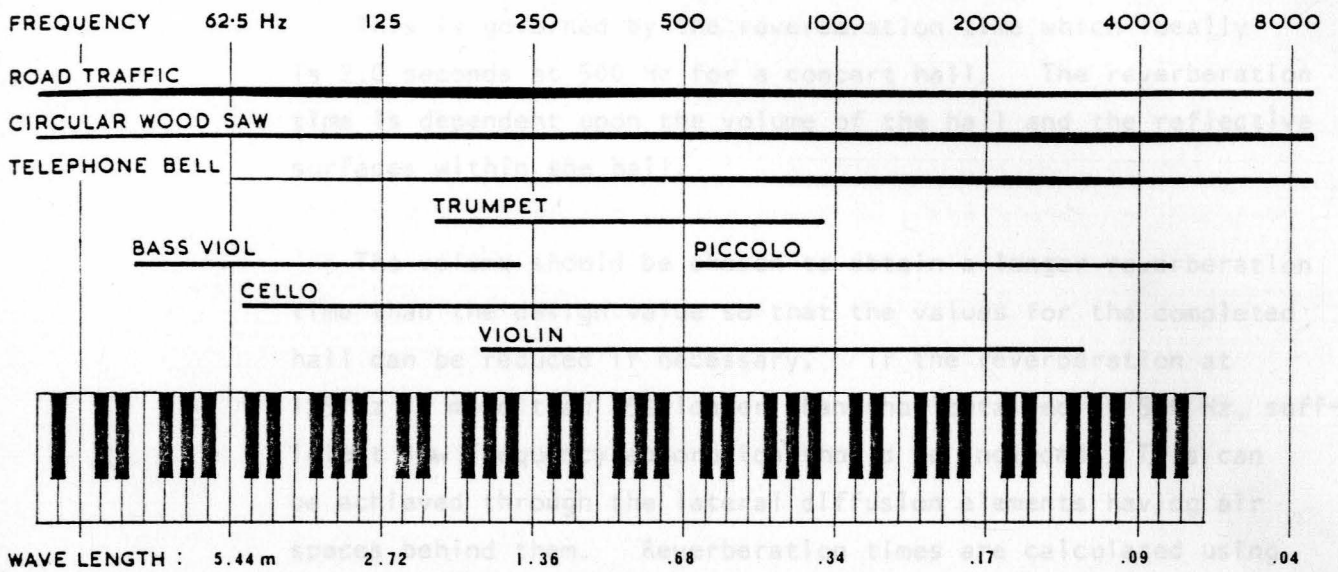
Coupled with panel vibration is the phenomenon of sound reflection, which is the principal "tool" with which acoustic consultants operate in the design of spaces for music. Sound reflection is greatly affected by the mass and texture of the reflecting surface, while the behaviour of the reflected sound is a result of the shape of the reflecting surfaces.

8.1.2 Acoustic requirements for large music spaces

The acoustic treatment of rooms for music must meet certain musical requirements: definition; fullness of tone; balance; and blend, without the obvious faults of echoes and noise intrusion.

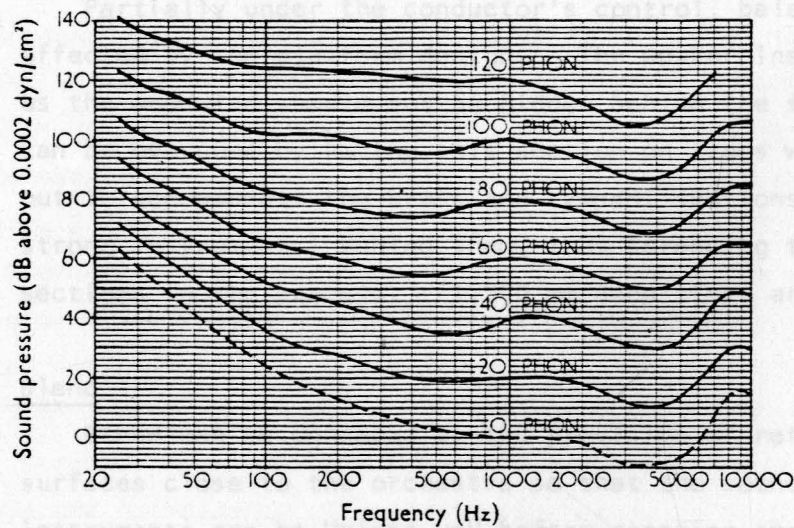
a) Definition

Good definition depends on the listener receiving the first reflections of a sound no later than 35 milliseconds after the direct sound at a strength well above the reverberant sound level. Early lateral reflections play an important role in this regard and are achieved by modulating the wall and ceiling surfaces as close to the source of the sound as possible.



The relationship between frequency and wavelength of a few instruments

Figure 48



Equal Loudness Contours

Equal loudness contours and their relationship to sound pressure and frequency

Figure 49

b) Fullness of tone

This is governed by the reverberation time which ideally is 2,0 seconds at 500 Hz for a concert hall. The reverberation time is dependent upon the volume of the hall and the reflective surfaces within the hall.

The volume should be chosen to obtain a longer reverberation time than the design value so that the values for the completed hall can be reduced if necessary. If the reverberation at 125 Hz is more than 25% longer than that obtained at 500 Hz, sufficient low frequency absorption should be included. This can be achieved through the lateral diffusion elements having air spaces behind them. Reverberation times are calculated using the Sabine formula of:

$$R.T. = \frac{0.16V}{A}$$

Where R.T. is the reverberation time in seconds, V is the volume of the room in cubic metres and A is the total absorption in (m²) sabins.

c) Balance

Partially under the conductor's control, balance is also affected by the platform design. The weaker instruments such as the woodwind should not be hidden behind the strings. This can be overcome by having this section on tiers which level out to accommodate the brass and tympani sections (which are strong instruments) behind them, thus screening those two sections in the process. 1,200 mm deep tiers are sufficient.

d) Blend

Blend can be enhanced by the provision of reflecting surfaces close to the orchestra so that the sounds of individual instruments can be 'mixed up' before reaching the audience.

Reflective surfaces close to the orchestra are needed for members of the orchestra to hear each other playing. The best ratio for a platform is 1 : 1,25. This reduces the problem caused by sound paths from different instruments differing by more than 10 m in one or both dimensions. Wide platforms

detract from the blend as sounds appear to be coming from widely divergent directions.

e) Clarity

The clarity of rapidly articulated sounds will depend upon the preservation of the power of these sounds by limiting the distance to the rear row of seats. A maximum of 18 m to the centre of the audience must be maintained. Clarity is also maintained by reducing audience absorption of direct sound by raking the hall floor and having a tiered platform. This will also increase "brilliance".

f) Faults

The problem of echoes must be eliminated by having a rear wall which is non reflecting and ceilings which are concave. The problems of flutter echoes and resonance are a result of parallel reflecting surfaces. To overcome both of these problems, the surfaces need only be out of parallel by 5° or more or if one of them is absorbent.

8.1.3 Acoustic requirements for small music spaces

The main concern in the acoustic treatment of small rooms, such as teaching suites, studios and practice rooms, is the problem of standing waves. The wavelength of a standing wave is the same length as one of the room dimensions. Thus a rectangular room with parallel floor and ceiling planes has several frequencies that will receive preferred acoustic intensity. These normal modes or Eigentones are accentuated while the sound (from which they developed) is present and will tend to die out more slowly than the other notes when the sound ceases.

A remedy is to choose the room dimensions in such a way as to avoid the coincidence of the different standing waves and their eigentones. The mathematical ratio for this ideal situation of height : width : length is 1 : 1,26 : 1,6. Increments of these ratios and a 5% deviation from these dimensions are permissible.

Another way to avoid standing waves is to angle one of the long walls by 5° and to modulate the ceiling. An alternative to this is to make the floor and two adjacent walls sound absorbent with all other surfaces reflective.

The preferred method of obtaining the correct acoustic environment for these rooms is by designing them with reverberation times of slightly longer than accepted standards which are:

- a) 0,8 seconds for music studios (classrooms)
- b) 0,6 seconds for teaching suites
- c) 0,45 seconds for practice rooms

To achieve an optimum reverberation period for the room 2,1 x 700 mm acoustic panels are used. These can be described as a stand-off type mineral wool blanket in an open wooden frame with a textile covering. The acoustic panel is then hung, picture fashion on a continuous wall rail, with a 50 mm air space behind.

8.2 Sound insulation

In the design of a School of Music, the architect is chiefly concerned with three types of noise intrusion: external noise, structure-borne sound and air-borne sound. Each type has its particular set of origins, methods of propagation and means of control.

8.2.1 External noise

External noise, as the name implies, has its sources of origin outside the perimeter walls of the school and are a result of movement around, past, through or over the building. External sound can also be sound originating from adjacent rooms but this aspect will be dealt with later. Noise sources which have to be considered are:

- a) Traffic noise
- b) General campus noise
- c) Noise from adjacent buildings
- d) Noise from overhead aircraft
- e) The effect of weather conditions

a) Traffic noise is a fluctuating source of sound and as a general rule maximum periods of disturbance would occur at the beginning and end of daily lectures, during lunch breaks and for short periods between lectures. The majority of vehicles using the campus road system are light motor vehicles and motor bikes, which means that ground vibrations generated by traffic are substantially lower than for normal public roads. The average speed of vehicles, road

gradient and verge profiles all influence the degree of annoyance generated.

b) General campus noise is generated by the "to and fro" movement of people, service zones and student relaxation areas.

These problems are as a rule easily overcome by the arrangement of rooms and as these functions are usually related to a vehicular movement system, solutions adopted to combat one source of annoyance, will therefore contribute to the reduction of the other. Where noise is generated within or in close proximity to the school, other methods of noise control have to be adopted.

c) Noise from adjacent buildings is dealt with in much the same way as (b) above. The types of noise source that could be encountered are service yards, mechanical plant rooms or laboratories where heavy machinery is used.

d) The campus falls within the general flight path of aircraft approaching Louis Botha Airport from the North when prevailing weather conditions are South Westerly. As aircraft noise usually affects all parts of the site equally and often from all directions, nuisance depends on noise levels combined with periodicity.

e) The effect of rain on roofs of light construction is generally overlooked, yet can be very disturbing, particularly in the case of an auditorium. Thunder would be regarded much the same as aircraft noise in terms of defence measures.

8.2.2 Some methods of controlling external noise

In considering various means of external noise control, it must be remembered that control of noise really commences with the choice of site. It must also be noted that measures taken to reduce a noise problem by planning may conflict with the requirements of circulation, aspect, prospect and the many other factors which have to be taken into account in the design of a School of Music. The value judgement of the Architect is needed to reflect the degree of success required to resolve these mutually incompatible constraints.

a) Reduction of noise by distance

In a free field, sound pressure reduces by 6 dB each time the distance from the source is doubled. It will be noted that the further away from the source of noise a building is placed, the less effective this distance : reduction ratio will be.

b) Ground absorption

If sound travels over a hard surface, such as a parking area or paving, then by reflection, sound levels may increase. However, when sound travels over an absorbent surface such as grass, the energy at ground level is reduced, and this absorption is progressive.

c) Planting

This form of attempting to control noise is only effective at high frequencies. If trees are planted, they should be evergreens, closely spaced and associated with shrubs to absorb sound near ground level.

d) Screening

If a screen wall is placed between a source of sound and a listening position, the level of sound heard will depend on the amount of sound energy diffracted over the top edge of the wall. The effectiveness of this method will depend on the total distance travelled by the uninterrupted and diffracted sound waves; the angle of diffraction; the frequency spectrum of the noise and the projection of the screen into the direct sound path. An embankment can act as a screen, and buildings which are not vulnerable to noise disturbance can be used to screen sensitive accommodation.

e) Planning

This is the most effective method of reducing the intrusion of external noise in sensitive areas and is achieved by the fenestration of sensitive rooms facing away from potential noise sources and defending sensitive rooms by circulation spaces or rooms in which noise is of little importance.

8.2.3 Structure-borne sound

Structure-borne sound together with air-borne sound, is by far the most important factor in the design of Music Schools and buildings of a similar nature where Noise Criteria curves are of the order of NC 25. However, methods for overcoming these two problems are different.

Whereas mass is a decisive factor in combating air-borne noise, it has no effect on structure-borne noise. Discontinuity of the structure is the most effective means of dealing with structure-borne noise. Discontinuity of structure has the added advantage of eliminating flanking sound which is a major air-borne problem, in adjacent music rooms in particular.

The need to isolate structure cannot be stressed enough, for until all the flanking paths are covered, there is no point in improving insulation on a party wall between two practice rooms to more than that afforded by a three-layer membrane without skim (45 kg/m^2), while the maximum sound insulation that can be expected by treating ceiling and party wall alone is of the order of 60 dB. However, when all flanking paths are covered, insulation is dramatic - in the region of 80 dB.

Impact sound can be prevented from entering the structure by covering the floor with a resilient material such as carpeting, but this does not have resistance against air-borne sound; besides which carpeting is not always practical. The philosophy should be to regard each room as a structural entity and then give it an acoustic character.

8.2.4 Some methods of controlling structure-borne sound

Heavy plant such as air conditioning compressors and fans must be accommodated at ground level and placed on a spring-loaded base which in turn is independently cast and isolated from the main floor. If such machinery is situated within close proximity to sensitive rooms such as the concert hall or rehearsal hall, then the noisy machinery such as chillers and pumps should be encapsulated by means of a double structure and, where necessary, two sets of columns: one to support the roof of the encapsulating structure and an independent, isolated set penetrating the plant

room and supporting the floor slab of the room above. Sound noise levels with a maximum of 33 dBA.

Vibration mountings to all service pipes and ducts must be used and where such services pass through the structure they must all be isolated from the structure (including small diameter electrical conduiting). Where air conditioning ducting passes through a wall it must have flexible couplings on either side of the wall. Suitable attenuators must be used.

Floor slabs in the practice rooms, studios and teaching suites must be of the floating type: a concrete slab of nominal thickness on a 50 mm mineral wool blanket all supported by the structural slab. Ground floor slabs would be supported on terra firma, but independent of the main structure.

d) Mass

For any form of sound insulation to be effective, an efficient system of maintaining structural discontinuity has to be adopted. If bridging occurs during construction, it must be eliminated, for the situation may not be able to be rectified at a later date, through internal insulation or otherwise. Is usually overcome by

8.2.5 Air-borne sound

In a building of this nature certain standards of acoustic insulation have to be met. Of the following sound insulation values, the lower figures are the absolute minimum acceptable, while the upper figures are the preferred levels:

Between teaching studios	55 dB	60-80 dB
Between teaching studio and practice room	55 dB	60-80 dB
Between practice rooms	50 dB	60-65 dB

The desirable noise criteria levels for certain rooms are given below:

Concert hall	NC 20 - NC 25
Rehearsal hall	NC 25
Practice rooms	NC 30 - NC 35
Library	NC 30 - NC 35
Teaching suites	NC 25
Administrative areas	NC 35 - NC 45

General consensus stresses the need for low background noise levels with a maximum of 33 dBA.

A more significant acoustical criterion for design developed by Dr W de V Keet (Stellenbosch Conservatoire) is obtained by adding sound insulation and background noise figures to obtain a privacy factor. For teaching studios this factor averaged out at 97 dB, and 94 for practice rooms.

To obtain these levels of insulation the following points have to be considered:

- a) Flanking transmission
 - b) Discontinuity
 - c) Stiffness
 - d) Mass
 - e) Air tightness
 - f) Frequency response
- a) Flanking transmission

As noted under 8.2.4 this problem is usually overcome by isolation and discontinuity only. Just as party walls must have resilient joints top and bottom to prevent structure-borne sound transmission, so must elements such as suspended ceilings be hung from flexible mountings and kept free of the walls with soft seals.

Doors, windows and acoustic panelling to the walls must all be isolated from the main structure. Wall mounted sockets are a potential weak point in the system so floor mounted electrical outlets are preferred, but special care in preventing leakage through these elements must be taken.

- b) Discontinuity

This has been noted under 8.2.4, however cavity walling is another aspect of discontinuity. The principle behind the use of cavity walling is to obtain a greater insulation factor than would be obtained for a solid partition of the same mass. Cavity walls have a higher insulation factor than solid walls in the upper and mid-frequency ranges but the same value in the low frequencies. Extreme care must, however, be taken

that no bridging occurs. Any form of "tie" is not acceptable. Resilient coupling of the edge conditions, for example by 12 mm cork strips, will allow the partition to float independently of the structure. Cornices and skirtings must have resilient joints with other major elements such as ceiling and floor.

c) Stiffness

Generally, the greater the stiffness of a wall the less it will vibrate. All partitions and walls have their own frequency at which the wavelength of the vibrations within the wall coincides with the wavelength of the incident sound; at this frequency the insulation properties of the wall are reduced.

Heavy walls have a low vibration frequency: for example, a 230 mm brick wall has a coincidence frequency of 80 Hz which is acceptable. A lightweight partition on the other hand may have a coincidence frequency of 2 kHz in which case it is subjectively important. By reducing the stiffness of the partition its frequency will increase to a subjectively unimportant 4 kHz.

d) Mass

Mass per unit area is the most important factor affecting noise reduction between spaces. This can be made ineffective by openings such as windows, grilles, doors, etc.

Windows should be fixed, but if they must open, they must be side hung and all open in the same direction.

Doors in corridors should also open in the same direction. Sand-filled or solid wooden doors should be used with a 35 dB rating for teaching studios and a 30 dB rating for practice rooms.

e) Air tightness

The mass law can only operate under solid non-porous conditions, so unplastered aerated concrete has low insulation qualities. When it is plastered both sides however, it immediately responds to the mass law.

Porosity has a two-fold effect: loss of insulation and the frequency response curve flattens out so that the insulation value becomes the same for all frequencies.

Doors are a major point of concern. Doors with automatic seals and adjustable springs must be used to prevent the leakage of sound. Holes of ducting large or small must be plugged or lined with mineral wool to reduce the weak links that they form.

f) Frequency response

Most walls obeying the mass law show a 5 dB increase in insulation for every doubling of frequency. Where high insulation values are required it is almost always preferable to select mass law walling. Cavity walling composed of homogeneous materials usually exhibit better insulating values in the mid and high frequency ranges than does mass walling, but at low frequencies they are practically the same.

Acoustics is the start or the end of an otherwise good design. The attention to detail and the standard of construction will either turn the sounds to music or they may just be regarded as noise.

8.3 Air Conditioning

Air conditioning, like the acoustic treatment of the building, is critical. Temperature and humidity must be maintained at a constant level throughout the year as both these factors adversely affect the tuning of instruments if fluctuations occur.

In a building of this nature loading on the air conditioning system varies from room to room. Room loading is also variable according to its occupancy during the periods of the timetable. To be able to maintain the critical levels of temperature and humidity, a variable volume, constant temperature system should be used operating from a central plant. There are a number of advantages to be gained from adopting this system:

- Individual room temperature and volume damper controls
- Low capital cost in comparison to other individual room control systems

Economic operating costs	150 lux
Centralization of supply services for conditioning and refrigeration of air	300 lux
Centralization of maintenance	100 lux
Central outdoor air intake	400 lux
Simplicity of operation	400 lux
Minimum apparatus	400 lux

Libraries - general reading 200 - 500 lux

Special considerations required for sound attenuation have been noted in 8.2.4, but one of the major considerations in terms of supply is the air velocity. Generally this should be less than 5 m per second to eliminate excessive turbulence and noise generation at air outlets. This means that ducts have to be large to be able to handle the volume of air which could be of the order of 11 - 14 cubic metres per minute.

quality factors:

Where adjacent rooms are supplied from a common duct, the branch-offs must be fitted with sound attenuators at their entry point into the room, as well as being lined internally with a 25 mm neoprene faced fibreglass layer. Duct mounting must allow for the free vibration of the duct and the coupling with the ceiling diffuser must be of a flexible material. Functions between ceiling panels and the diffuser must be sealed. The precautions necessary to maintain acoustic isolation between rooms and access corridors cannot be over-stressed, and the air conditioning engineer must work closely with the acoustic consultant to obtain the correct theoretical attenuation levels, and with the main contractor to obtain the correct design levels.

8.4 Lighting

The S A B S code of Practice for Interior Lighting, Part 1 : Artificial Lighting (b) recommends the following illuminance levels for various rooms in a school of music:

Concert hall platform	160 - 320 lux	special lighting to be used where necessary
Concert hall seating	50 lux	other than during performances
Booking office	320 lux	
Common rooms	100 lux	

Stairs and corridors	160 lux
Lecture theatres	200 lux
Rehearsal halls	300 lux
Foyers	100 lux
Teaching suites	400 lux
Music studios	400 lux
Practice rooms	400 lux
Libraries - general reading	200 - 500 lux
- shelves	50 - 160 lux on vertical surfaces

8.4.3 Form rendering - research and

study	500 lux
Workshops	900 lux

For lighting to be effective it has to satisfy three major quality factors:

1. Glare elimination
2. Colour rendering
3. Form rendering

8.4.1 Glare

Limiting values of Glare Index have been written into the S A B S code of practice for interior lighting Part 1 (b).

Typical requirements for various spaces are:

10 for exhibition areas
16 for lecture halls
practice rooms
teaching suites
concert halls
music studios
rehearsal halls
19 for libraries
22 for common rooms
public circulation areas
25 for booking offices

There are two types of glare: direct glare and reflected glare. Reflected glare is avoided by the positioning of "work" areas relative to the light source and the orientation of lighting relative to the task. Direct glare is combated by positioning

(e.g. raising or turning fluorescent fittings through 90°) and/or by shielding (the use of reflector-type fittings).

8.4.2 Colour rendering

This is the effect which a light source has on the appearance of objects illuminated by it, which is a function of the spectrum of the light source. A colour rendering index of about 80 for the type of activities conducted in a School of Music is recommended. The "de luxe" range of fluorescent lamps should be used.

8.4.3 Form rendering

Form rendering can be achieved by the use of fittings which give directional illumination, thus giving more life or sparkle to an area by emphasising it. This problem of form rendering is defined by an "Index of Modelling" - the object of which is to define the ratio:

$$\frac{\text{vector illumination}}{\text{scalar illumination}}$$

where vector illumination represents the directional component of the lighting, in both magnitude and direction. Scalar illumination represents the average illumination from all directions converging on a point in an illuminated space.

Experiments suggest that this ratio should lie between 1,2 and 1,8 while the direction of the illumination vector should lie between 15° and 45° below the horizontal plane.

8.4.4 Light fittings

In deciding on the type of light fittings to be used, the main influencing factors are acoustic requirements, thermal loading, lamp life, appearance and the considerations of 8.4.1-3 above.

For small volumes, such as practice rooms, teaching suites and music studios where acoustic considerations are of prime importance, but where there cannot be an excessive heat build-up from incandescent lighting, fluorescent lighting should be used. The ballast must however be located outside the room, preferably in the corridor.

Only incandescent illumination should be used in the concert hall and recital hall while the lecture hall could make use of both incandescent and fluorescent lighting.

Major public areas, such as foyers, waiting areas and exhibition areas should make use of incandescent lighting to highlight objects, bathe walls in light and create the appropriate atmosphere.

Spotlights should be used in the concert hall, particularly for platform lighting and form rendering of the modulated sidewalls.

8.5 Structure

The structure will comply with the requirements of the acoustic demands as laid down in 8.1 in areas where such considerations are required. Areas not subject to stringent acoustic criteria will be constructed in the most cost effective manner.

8.6 Services

Where possible, services should be grouped to make use of common vertical ducting. In any event pipework should be kept to a minimum in order to reduce the necessity of costly acoustic isolation.

Plumbing pipes should be sized to have a low flow velocity, avoid sudden diameter and direction changes, and have valves and stop cocks which ensure easy flow when open.

Electrical conduiting should as far as possible not be chased into walls as this weakens the acoustic performance of such a wall. Where piping passes through structural elements it should be adequately isolated - structural bridging is a major problem. Noisy electrical equipment such as lighting ballasts must be kept out of acoustically critical environments.

Disposal services should be confined to designated zones and as far as possible to ground floor areas where they will not be acoustically obtrusive.

8.7 Fire Prevention

A school of music is a very sophisticated building housing equipment costing many thousands of rands, and therefore at the outset it must be decided to protect this investment and protect it well. Where possible the building should employ non-combustible or fire-retarding finishes.

To cater for the possibility of a fire, vehicular access for municipal fire tenders must be possible while a suitable and adequate water supply must also be provided. The risk to adjacent buildings under prevailing wind conditions must also be considered.

Fire fighting equipment must be well chosen, for water can do as much damage to musical instruments, books, etc. as fire can. For this reason a sprinkler system must be chosen which will provide a maximum amount of protection with the least damage to property. The system which approaches this ideal is a vapourising liquid sprinkler system. As the name implies, the system operates on a vapourised liquid suspended in the air, which unlike other systems, leaves no residue. Although this system is expensive, it is a justified expense. This system will only be installed in the major volumes (concert hall, platform and rehearsal hall) as well as in the library and main instrument stores. Standard equipment will be used in the rest of the building.

Escape routes must be provided to the concert hall, projection booth and from the foyer space. Staircases at the buildings' extremities must provide adequate means of escape.

THE BRIEF

Some of the most important changes in society in recent years include a new emphasis on the social values of self-actualization or self-realization, human dignity and the development of a positive attitude to all individuals. Since music is in part a product of the human mind, it is only natural that it should reflect the social structure of man's environment. Similarly, Cheatham feels that:

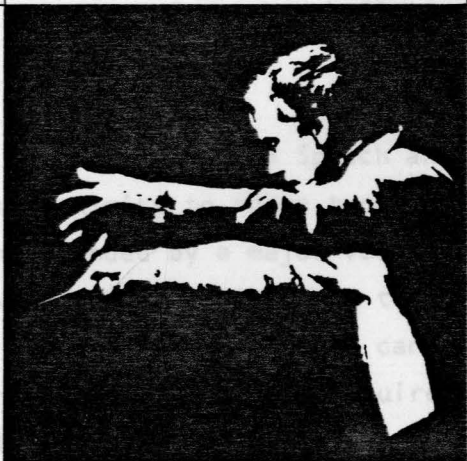
"Nothing is more revealing about the culture and personality of a people than its art - of which music is a prominent part". 8

South Africa is a country of diverse cultures yet only two universities offer courses in indigenous music. It is ironic that in a university which was specifically created to meet the growing needs of the Indian community, cultural roots receive little attention at present.

It is against this backdrop that there is a need for the School of Music to re-locate itself in a new building which will not only provide accommodation which meets the quantitative and qualitative requirements for the proper study and execution of the art of music; but one that will be a symbol of new opportunities and perhaps new directions that the school will take to meet the community's needs for modern music education.

The site, adjacent to the Faculty of Drama buildings has been selected for its facilities. It has the advantage of being a direct route and parking area to the North and South. Panoramic views from the North, however, will be obstructed by future campus developments. The advantages of the site are, therefore, that prospective students will have a direct route to the site, while at the same time enhancing the functionality of the adjacent buildings; extending the pedestrian movement routes and bringing a sense of place to the open spaces.

B. Wallace R. Cheatham Challenges in Music Education p.147



THE BRIEF

Some of the most important changes in society in recent years include a new emphasis on the social values of self-actualization or self-realization, human dignity and the development of a positive attitude to all individuals. Since music is in part a product of the human mind, it is only natural that it should reflect the social structure of man's environment. Similarly, Cheatham feels that:

"Nothing is more revealing about the culture and personality of a people than its art - of which music is a prominent part". 8

South Africa is a country of diverse cultures yet only two universities offer courses in indigenous music. It is ironic that in a university which was specifically created to meet the growing needs of the Indian community, cultural roots receive little attention at present.

It is against this backdrop that there is a need for the School of Music to re-locate itself in a new building which will not only provide accommodation which meets the quantitative and qualitative requirements for the proper study and execution of the art of music; but one that will be a symbol of new opportunities and perhaps new directions that the school will take to meet the community's needs and face the challenges of modern music education.

The site, adjacent to the Faculty of Education and the Speech and Drama buildings has been selected for its proximity to these two faculties. It has the advantage of being bounded by a major vehicular route and parking area to the North and West and a service area to the South. Panoramic views from the North, through East, to South cannot be obstructed by future campus development. The functional requirements of the site are, therefore, that prospect and aspect can be taken advantage of, while at the same time enhancing the functionality of the adjacent buildings; extending the pedestrian movement routes and bringing a sense of place to the open spaces.

In reply, the building must reflect a synthesis of its three main functions; namely that of Teaching, Practising and Performing. The building must also acknowledge the site and its surroundings in the way it meets the ground; the way it meets the sky and the way it harmonizes with (and not mimics) the surrounding buildings.

The building must act as a focus physically in terms of its size, position on the site and future campus development; as well as spiritually, symbolically representing the aspirations of traditional Indian music and sharing in the rich legacy of Western European music as part of the education process.

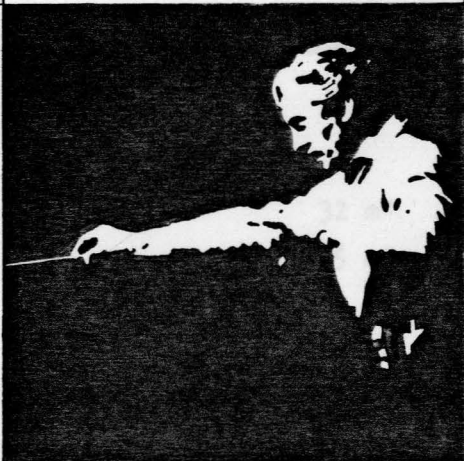
SCHEDULE OF
ACCOMMODATION



SCHEDULE OF ACCOMMODATION

Concert hall (stage)	orchestra 50	110 m ²
	choir 52	
	patrons 350	340 m ²
foyer		370 m ²
Ticket office		32 m ²
Darderobe		25 m ²
Refreshments kiosk		40 m ²
Coffee/student lounge		96 m ²
Ablutions	Female	35 m ²
	Male	35 m ²
		<hr/>
		1 005 m ²
		<hr/>
Lighting control		15 m ²
Projection room		15 m ²
Recording control		15 m ²
Instrument store		80 m ²
		<hr/>
		125 m ²
		<hr/>

**SCHEDULE OF
ACCOMMODATION**



SCHEDULE OF ACCOMMODATION

Concert hall (stage)	orchestra 50	110 m ²
	choir 50	
(seating)	patrons 350	340 m ²
Foyer		370 m ²
Ticket office		32 m ²
Garderobe		25 m ²
Refreshments kiosk		40 m ²
Coffee/student lounge		96 m ²
Ablutions	Female	36m ²
	Male	36 m ²
		<hr/>
		1 085 m ²
		<hr/>
Lighting control		15 m ²
Projection room		15 m ²
Recording control		15 m ²
Instrument store		80 m ²
		<hr/>
		125 m ²
		<hr/>
Rehearsal hall	patrons 100	230 m ²
	choir 100	
	orchestra 50	
		<hr/>
Recording control		32 m ²
Projection room		15 m ²
Instrument store		20 m ²
Chair store		12 m ²
		<hr/>
		79 m ²
		<hr/>

Performers' spaces	artists' assembly area	100 m ²
	green room & bar	130 m ²
	practice rooms	56 m ²
	female changerooms	80 m ²
	male changerooms	75 m ²
Staff common room	seating	<u>441 m²</u>
	bar kitchen	<u> </u>
	seminar space	<u> </u>
Professor's suite	seating	40 m ²
Secretary/receptionist	refectory	36 m ²
Waiting area	lockers	50 m ²
Records room		4 m ²
Store room		9 m ²
Kitchenette		6 m ²
Cloakroom		6 m ²
Staff ablutions	female	<u> </u>
	male	<u>151 m²</u>
Student ablutions	female	37 m ²
Lecturers' offices	number 6 each	15 m ²
Cleaners' ablutions	female 2 each	28 m ²
Teaching suites	male 6 each	30 m ²
Music studios	2 x 30 students	120 m ²
	1 x 20 students	40 m ²
	1 x 15 students	30 m ²
Practice rooms	individual 14 each	15 m ²
Plant rooms	ensemble 2 each	40 m ²
Electrical sub-station	existing	<u>806 m²</u>
Bin area		<u> </u>
General store		21 m ²
Cleaners' stores		26 m ²
Circulation area	13.5% of total	<u>47 m²</u>
Covered entrance/circulation route		<u>400 m²</u>
Library	control & catalogue	25 m ²
	office	12 m ²
	seminar/waiting area	15 m ²
	photostats	6 m ²
	listening room	60 m ²
	book & sheet music stacks	50 m ²

	Tapes and discs	25 m ²
	study area	40 m ²
	reading area	30 m ²
		<u>263 m²</u>
Staff common room	seating	60 m ²
	bar kitchen	16 m ²
	seminar space	18 m ²
Student common room	seating	110 m ²
	refectory	36 m ²
	lockers	20 m ²
Student waiting areas		80 m ²
		<u>340 m²</u>
Staff ablutions	female	37 m ²
	male	37 m ²
Student ablutions	female	37 m ²
	male	37 m ²
Cleaners' ablutions	female	16 m ²
	male	15 m ²
	locker area	14 m ²
	mess room	70 m ²
		<u>263 m²</u>
Plant rooms		200 m ²
Electrical sub-station	existing	
Bin area		8 m ²
		<u>208 m²</u>
Total		4 038 m ²
Circulation area	13,5% of total	545 m ²
Covered entrance/circulation route		400 m ²
Gross area		<u>4 983 m²</u>

Concept

The future planning of the campus was a major consideration in the development of the design concept. This consideration resulted in the acknowledgement and reinforcement of the circulation route from the central campus area which runs to the North of the faculty of Education building (see fig. 43). This circulation route bisected the site which generated the idea of placing the two functions of the school (public and academic) on either side of the walkway. The academic component would then take advantage of both view and orientation. The public spaces would take advantage of the slope of the site and the need to relate to the existing Speech and Drama complex.

The public spaces which are essentially internalized have been seen as a single building mass occupying space. The academic component, on the other hand, has been seen as a building which encloses an oasis of space which is used by students (and staff), as an area to relax in, to look out upon or to perform in on a small scale. Thus the public functions are enclosed, formal and have a totally artificial environment. The "school" on the other hand is open, informal and acknowledges climatic influences. That which is building to the south of the circulation axis becomes the courtyard, defined by the academic building.

DESIGN REPORT



Planning decisions revolved around the concept of the campus circulation route separating the public and academic functions.

Concept

The future planning of the campus was a major consideration in the development of the design concept. This consideration resulted in the acknowledgement and reinforcement of the circulation route from the central campus area which runs to the North of the Faculty of Education building (see fig. 43). This circulation route bisected the site which generated the idea of placing the two functions of the school (public and academic) on either side of the walkway. The academic component would then take advantage of both view and orientation. The public spaces would take advantage of the slope of the site and the need to relate to the existing Speech and Drama complex.

The public spaces which are essentially internalized have been seen as a single building mass occupying space. The academic component, on the other hand, has been seen as a building which encloses an oasis of space which is used by students (and staff), as an area to relax in, to look out upon or to perform in on a small scale. Thus the public functions are enclosed, formal and have a totally artificial environment. The "school" on the other hand is open, informal and acknowledges climatic influences. That which is building to the south of the circulation axis becomes the courtyard, defined by the academic building.

Zoning

The Concert Hall, together with its entrance, has been positioned so as to acknowledge the South East corner of the site, make use of the lower level service zone and (as mentioned) use to advantage the change in level. The Entrance Foyer faces the approach from the main staff/public car park.

The Rehearsal Hall is positioned between the Concert Hall and the Asoka Theatre. This meets the requirement of being accessible to both Music and Speech and Drama students.

Public ancillary accommodation together with the green room is on an upper level, while the performers' accommodation and service rooms are at the lower level.

Planning

Planning decisions revolved around the concept of the campus circulation route separating the public and academic functions.

The Concert Hall/Rehearsal Hall component has been sited to the South of the circulation axis in order to meet the requirement of the Speech and Drama Department having access to the Rehearsal Hall and other facilities. In so doing, the Concert Hall has the opportunity of taking advantage of the four metre drop in site level to a service and parking area. With the large volumes required and the change in level, an interesting approach view of the school is created.

The academic facilities take advantage of the Northerly orientation and the views to the North and East. Together with the Engineering and Physics/Chemistry buildings, the school forms the third side of an open square around the staff parking area.

A 3 m planning module was adopted with a 230 mm structural zone. This arrangement was found to best suit the varying sizes of practice rooms, office accommodation and teaching spaces. The module was also influenced by components such as windows which have acoustic implications in some instances and in others not. The problem of solar radiation was more easily handled with a small grid.

Zoning

The Concert Hall, together with its entrance, has been positioned so as to acknowledge the South East corner of the site, make use of the lower level service zone and (as mentioned) use to advantage the change in level. The Entrance Foyer faces the approach from the main staff/public car park.

The Rehearsal Hall is positioned between the Concert Hall and the Asoka Theatre. This meets the requirement of being accessible to both Music and Speech and Drama students.

Public ancillary accommodation together with the green room is on an upper level, while the performers' accommodation and service rooms are at the lower level.

The entrances are linked by a covered square. The School's "academic" entrance, like the concert hall entrance, is also angled toward the main traffic flow, off which leads the administrative wing and library.

The Staff accommodation is North facing and takes advantage of good views. Teaching suites are at ground level (grand pianos remain at ground level) relating closely to the student common room and group practice rooms (which can double up as music studios/lecture spaces). The examination rooms are located adjacent to the administrative wing and, when not used for examination purposes, operate as student/staff practice rooms.

The student common room has been located on the circulation route with a view to the South East. At this point the pathway has been terraced, as it steps down to the road, in such a way that it can become an external seating space onto which the common room opens out. Internally the common room opens out onto a paved section of the courtyard which can be used as an outdoor seating area and performance space.

Adjacent to the student common room is the ground floor entrance to the library and the listening room/record and tape library. Thus, after normal school hours the library (the record/tape section and listening room is not open after hours) can remain open for public and student use.

The courtyard is grassed with the area adjacent to the student area paved and that adjacent to the administration area is planted with shrubs and herbs. Trees in front of the internal North and North West facades provide shade to these walls and greenery at the upper level.

On the upper level the practice rooms and Music studios relate to a student waiting area.

The lecturers' offices are located above the ground floor staff accommodation and relate closely to the staff common room, lecturing spaces and the library.

Aesthetic considerations

The building has recognised its corner position in that the North facing corner of the building turns East and West with the road. The facade closest to the Education building on the other hand retains the rectangular shape in the way it forms the junction with the skyline. The school also recognises the "pyramid" of building development on the Eastern sector of the campus. The highest point is the tower block (± 10 storeys) stepping down to the two storey development of the Music School.

The aesthetic treatment of the school is in keeping with the general typology of building development along the Northern Ring Road - an emphasis of the structural grid.

This has been achieved by treating the columns and horizontal sun screening panels as white elements, while the wall surface has been ceramic-tiled in brown. Windows are flush mounted, black anodised aluminium. Thus the lighter surfaces read strongly against a dark background and this harmonises well with the rustic facebrick and off-shutter concrete treatment of the surrounding buildings.

The flat-roof aesthetic has been maintained in the complex. On the concert hall and rehearsal hall the roof forms were modulated to break down what could have been an uninteresting expanse of flat roof. The roofscape to the public performance spaces has also been scaled down from the concert hall towards the rehearsal hall so that, where the new building meets the Asoka theatre complex, the roof heights are uniform.

Internally the colour scheme of white, brown and black has been continued with the addition of beige and green. Materials have, where possible, been chosen to minimize maintenance while at the same time, remaining appropriate for the sophisticated needs of public performance spaces and work horse academic spaces.

Design Objectives

The design is a response to a number of objectives which have to be met in order for the building to fulfil its dual rôle of academic institution and public building for one of the arts. The objectives which have been dealt with can briefly be stated as being :

- The acknowledgement of the dual function of the school of music as stated above and the creation of the appropriate atmosphere. The accessibility of the school to students and public.
- The scale of the development must harmonize with that of present development of the campus and at the same time be "human".
- The chosen architectural treatment of the building should be compatible with the existing building to which it must relate.
- Pedestrian circulation routes, existing and proposed should be used to enhance the involvement of the building in the day to day campus activities.
- The use of planting and landscape areas to enhance the spatial qualities of the building.
- The redevelopment of the existing outside spaces in the immediate vicinity of the school to dramatise the setting of the building.

TECHNICAL
REPORT



Structure and Construction

As already mentioned in connection with the academic half of the school, the structural system consists of a 3 x module with a 230 mm zone for support columns. 850 mm deep beams at column centres (1200 x 230 mm external and 600 x 230 mm internal columns) support a 250 mm deep slab. A flat concrete roof (for acoustic insulation) supports a sheet metal roof (for thermal insulation) graded towards the external wall.

Infill brickwork is 230 mm except where music rooms require a 345 mm or 500 mm cavity wall construction for acoustic reasons. Essentially, music spaces are cells-within-cells: ceilings are sprung while floors and walls 'float' on the main structural support system.

The public performance spaces consist of a reinforced concrete framed structure with infill brickwork (cavity wall construction where required), while the roof treatment for the performance is sheet metal on a steel truss system, suitably insulated from external noise. Service and foyer roof spaces are treated in the same manner as the academic wing.

The two main performance halls are structurally separated from adjacent spaces to prevent structure borne noise. For the same reason, the air conditioning plant is located in a separate structure.

TECHNICAL REPORT

Heat gains through the roof spaces are covered by a double layer of covering separated by airspaces (which also act as a thermal break) over a roof structure which is waterproofed to the structural roof.

Windows are protected by the deep eaves and splayed concrete sun control panels. Where West and East facing windows are not totally screened from solar penetration by existing buildings or shading devices, tree planting has been proposed to take care of this.



Where West and East facing windows are not totally screened from solar penetration by existing buildings or shading devices, tree planting has been proposed to take care of this.

TECHNICAL REPORT

Structure and Construction

As already mentioned in connection with the academic half of the school, the structural system consists of a 3 m module with a 230 mm zone for support columns. 850 mm deep beams at column centres (1 230 x 230 mm external and 600 x 230 mm internal columns) support a 250 mm deep slab. A flat concrete roof (for acoustic insulation) supports a sheet metal roof (for thermal insulation) graded towards the external wall.

Infill brickwork is 230 mm except where music rooms require a 345 mm or 500 mm cavity wall construction for acoustic reasons. Essentially, music spaces are cells-within-cells: ceilings are sprung while floors and walls 'float' on the main structural support system.

The public performance spaces consist of a reinforced concrete framed structure with infill brickwork (cavity wall construction where required), while the roof treatment for the performance is sheet metal on a steel truss system, suitably insulated from external noise. Service and foyer roof spaces are treated in the same manner as the academic wing.

The two main performance halls are structurally separated from the adjacent spaces to prevent structure borne sound transmission. For the same reason, the air conditioning plant room has also been isolated.

Environmental Controls

Heat gains through the roof spaces is reduced by having sheet metal covering separated by airspaces (which are ventilated) from the concrete roof slabs. This also provides waterproofing and sound attenuation to the structural roofs.

Windows are protected by the deep columns and a system of horizontal and splayed concrete sun control panels. Where West and East facing windows are not totally screened from solar penetration by existing buildings or shading devices, tree planting has been proposed to take care of this.

The courtyard to the academic wing is protected from the prevailing winds which makes it a pleasant outdoor seating area for students, should the East facing terraced steps become too exposed. The existing matrix of buildings is envisaged to have a positive screening effect against prevailing inclement weather conditions.

Supply Services

Air Conditioning

This is the most important supply service since performance spaces must be internalised to eliminate extraneous sound which by its nature precludes the use of natural ventilation. On the other hand air conditioning systems can be a source of airborne noise.

A single plant room situated adjacent to the existing electrical sub-station supplies chilled water to two air handling plants: one immediately adjacent to the public spaces, and the second located below the professor's office to cater for the academic wing. All air handling and compressor/chiller plant is mounted independently on sprung platforms while the compressor unit is encapsulated to prevent air and structure-borne sound affecting the performance spaces. The professor's suite is likewise screened from plant room noise.

A ducted system supplying conditioned air at a rate of not less than 28 m³ per person per hour is used. Air is fed in at ceiling level and extracted at floor level through grilles in the risers formed by the steppings of the rows. Air is returned, ducted to the air handling plant for re-conditioning. The cooling tower for the chiller is situated on the coffee bar/student common room roof.

A fully ducted supply and return system is used in the academic wing with ducts running within the ceiling space to the passages. All ducting is sprung-mounted with sound attenuators fitted at the point of entry and exit to every 'music' room which is conditioned.

Water

Water supply is taken from the existing Durban Corporation mains. Hot water is supplied to the public ablution facilities and performers' changerooms.

A total of 400 litres of hot water has been provided for the public toilet facilities while a 500 litre tank has been provided for performers' change room. The change rooms provided for the cleaning staff have been provided with two 360 litre geysers, which will also serve the kitchen.

The four remaining kitchens are served by electrically operated geyser units housed under the sink.

Fire Fighting Services

A vapourising liquid installation has been used for the main instrument store rooms. Technical rooms (recording control rooms, etc.) are served by portable carbon dioxide extinguishers, while the rest of the public and performer spaces are protected by a standard sprinkler system, activated by single detectors.

The cellular nature of the academic wing calls for a less sophisticated method of protection. Thus a series of fire hose reels located within the corridor space has been used. The library and listening room is serviced by carbon dioxide extinguishers.

The school is linked to the campus Central Fire Control Station.

Electrical Supply

Electrical supply for the school will be drawn from the existing electrical sub-station (5/57) adjacent to the chiller plant room on the lower ground floor. The additional loading placed on this sub-station by the school is 100 kVA.

Lighting has been discussed under 8.4 and conduiting under 8.6. Dependence for the required level of illumination will be on artificial means supplemented by natural daylight.

Communications

A switchboard situated in the reception/typist area will telephonically interlink all staff office spaces, staff common room, rehearsal hall and technical rooms.

Pay phones will be provided within close proximity of student common rooms, waiting area and the foyer space of the concert/rehearsal hall.

Windows

Disposal Services

Sewage disposal

Planning has been arranged so that soil and waste fitting are grouped around service ducts which house the pipework. The sewer from the concert hall/rehearsal hall ablution facilities feeds into the existing sewer system at manhole No. F3 (cover level 44,47 m) situated in the service road to the rear of the building.

The sewer serving the facilities on the East facade of the academic block passes under the building (cast iron) to link up with the sewer serving the toilets on the North facade. This combined sewer then feeds into the campus system at manhole B10 (cover level 43,35 m) situated in the lower level car park.

Stormwater

Discharge from the roof downpipes is piped into the University's existing stormwater system. Downpipes, as far as possible, have been expressed as visual elements of the building and generally located at corner points.

Surface drainage from the courtyard is collected in a perimeter channel covered by pebbles or a perforated cover (as the case may be) and fed under the building into the external collector pipes.

External surface water to paved areas is graded to drains which link up with the system serving the roof discharge.

External Materials

Roofing

"Dekex" profile colour impregnated sheet metal (already in use on existing buildings) graded at 1 : 60 to parapet gutters. Roof sheeting as mentioned affords protection to a concrete-slab sub-roof.

Walls

Brown glazed ceramic tiles throughout.

Windows

Black anodized aluminium frames flush mounted with external wall. Clear 9 mm float glazing.

Columns and solar devices

Plastered concrete painted white.

Doors

Entrance: Clear "armourfloat" glazed, black anodized aluminium.

Service: Black anodized aluminium frame with horizontally ribbed "architectural metal" panels.

Paving

Precast concrete blocks with rustic brown facebrick edging and setts.

Verandah corridors paved with quarry tile graded to "outside."

Internal MaterialsCeilings

Painted plaster board on suspended framework in general. Music spaces have spring loaded ceilings for acoustic reasons.

Walls

Plastered brickwork in non-music spaces. Small music spaces have "limp" wall panels consisting of three layers of plasterboard fixed to vertical "Z" profile wall brackets. The 75 mm cavity is filled with a mineral wool blanket.

The concert hall and rehearsal hall have painted plasterboard scatter boxes on the sidewalls and textured, plastered rear walls.

Service areas have glazed tile surfaces.

Floors

The concert hall, rehearsal hall, the two ground floor group practice rooms and the teaching suites all have timber floors (sprung). Other music spaces have vinyl asbestos tiles on concrete.

The library, administration (excluding the professor's suite which has a timber floor) and lecturing staff offices are all carpeted. Common rooms and internal passages are also carpeted.

The foyer space is carpeted together with the green room and artist assembly area. Service areas have vinyl asbestos floor tiles.

Doors

Internal doors are generally standard flush panel doors. Practice room, teaching suite and music studio doors are all hollow core units which have been sand filled. These door frames have special neoprene gaskets to head, floor and jamb for sound attenuation.

Windows

As for external windows. Where double glazed windows have been provided, internal window is operable for cleaning purposes.

Colour

As already mentioned, the basic colour scheme is white, brown, black, beige and green. These colours are used in various combinations as a background to objects as exhibits, such as murals in the foyer/reception areas. This combination can also be seen as a canvas against which many people of diverse cultural and ethnic colours meet to perform, study or to appreciate all the subtleties of hue and tone of music.

Technical Objectives

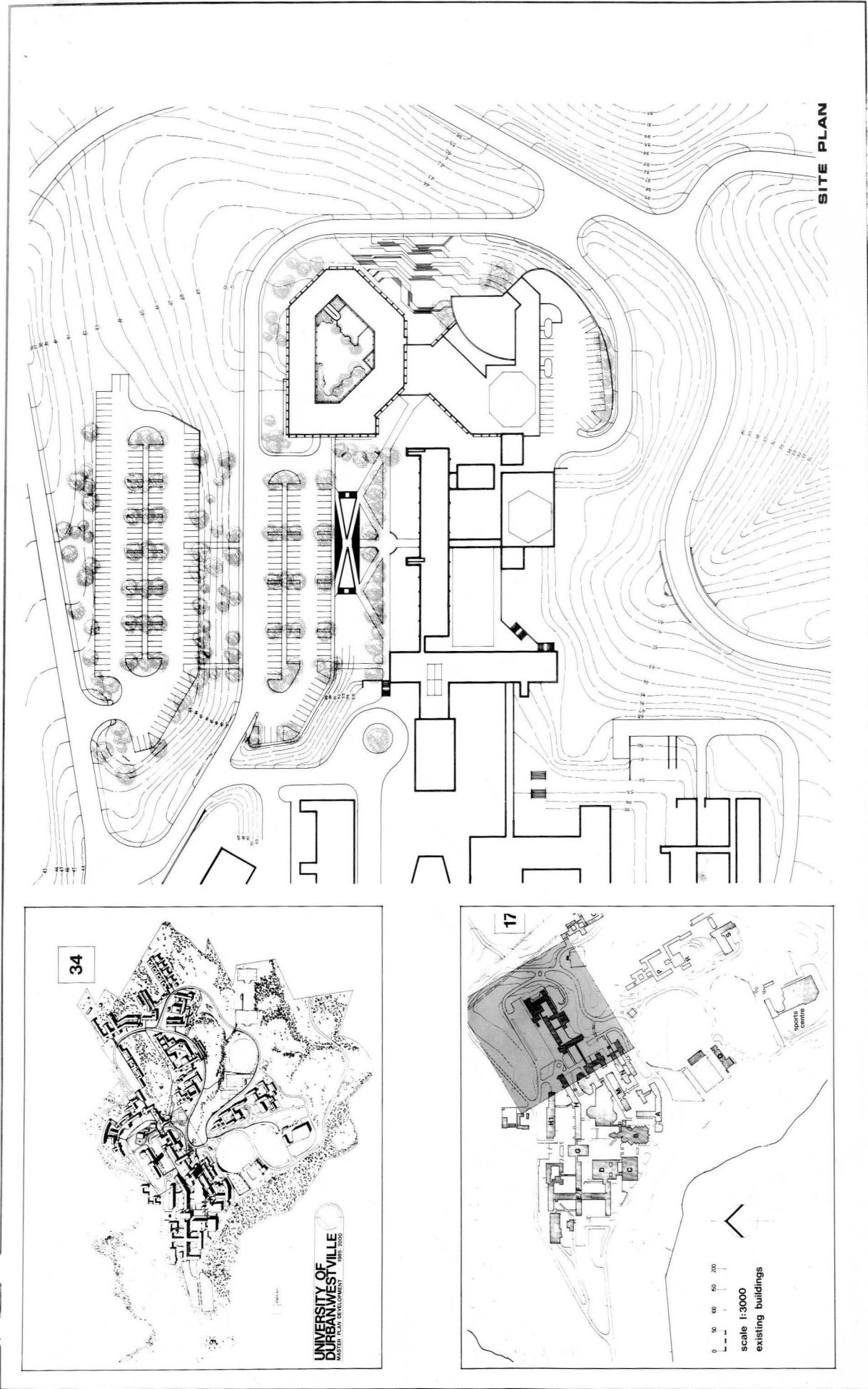
Apart from the desire to create a low-maintenance building, technology in this instance is employed to create an environment free of external intrusion of unwanted sound and hostile climatic conditions, in order that the pureness of music can be enjoyed. Systems used to control the internal environment generally add to the problems of unwanted sound, and in a school of music if this problem (which has been discussed under 8.1 and 8.2) can be reduced to a set of minimum design criteria, a major objective has been achieved.

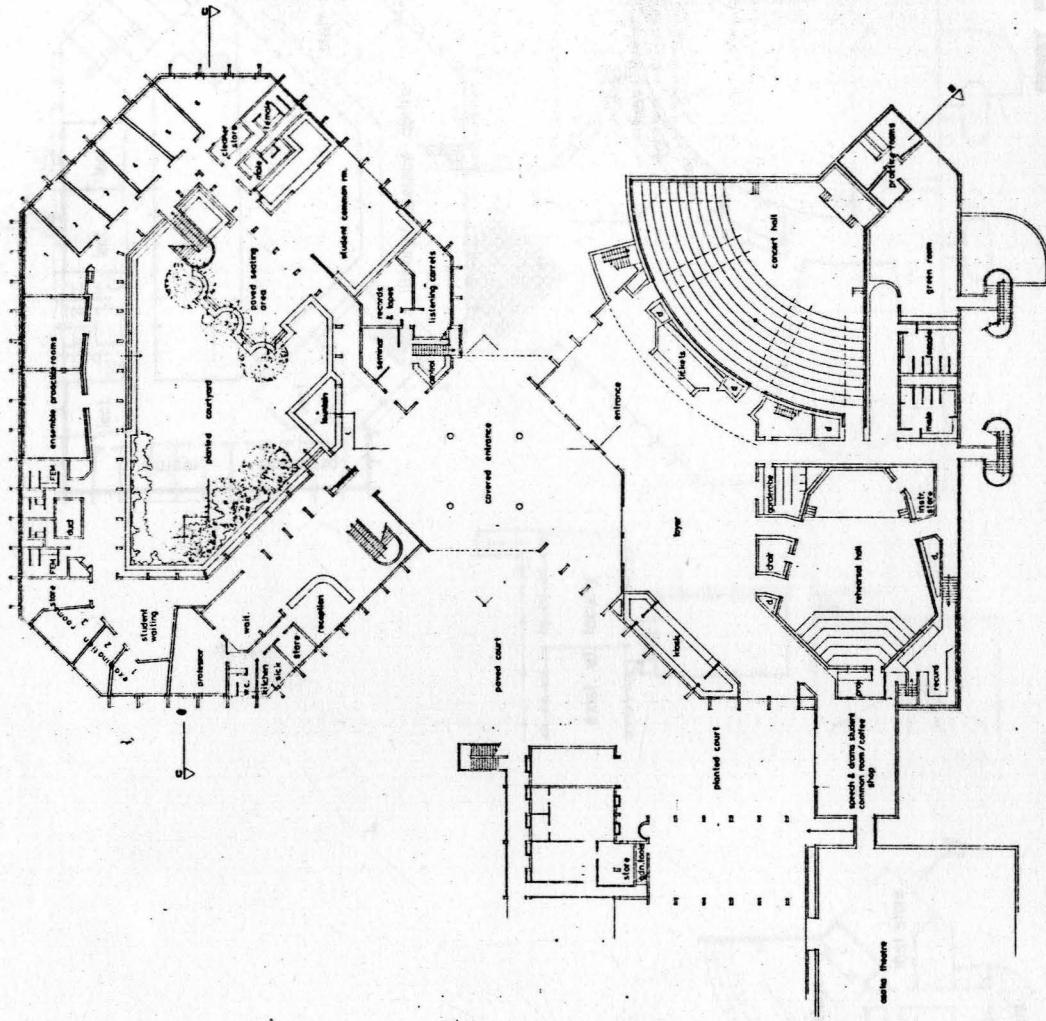


A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN - WESTVILLE

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARCHITECTURE
SCHOOL OF ARCHITECTURE UNIVERSITY OF NATAL

BY
1988



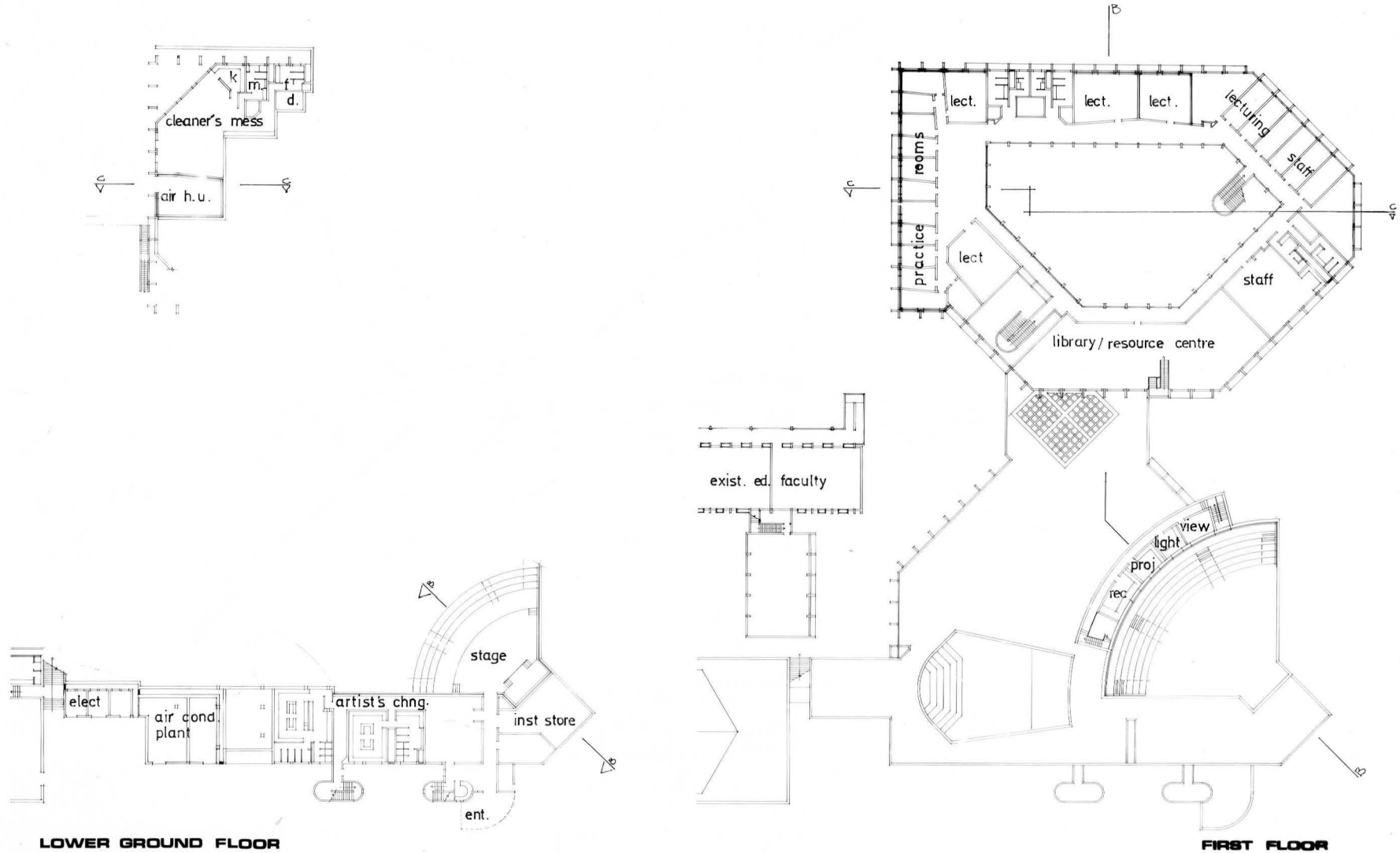


UPPER GROUND FLOOR 0 10

A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN · WESTVILLE

SPRANAN JOHN DE NOCK
 A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARCHITECTURE
 SCHOOL OF ARCHITECTURE UNIVERSITY OF NATAL DURBAN





A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN - WESTVILLE



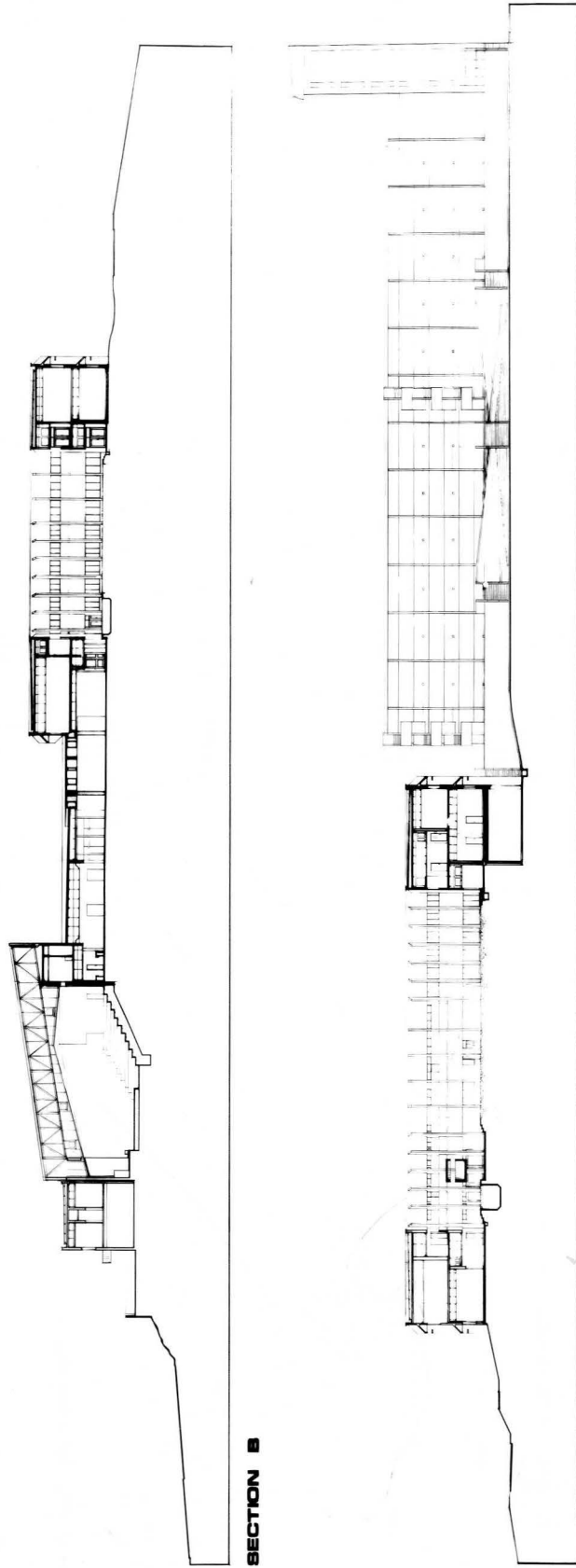
A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN - WESTVILLE

2009

SCHOOL OF ARCHITECTURE UNIVERSITY OF NATAL DURBAN

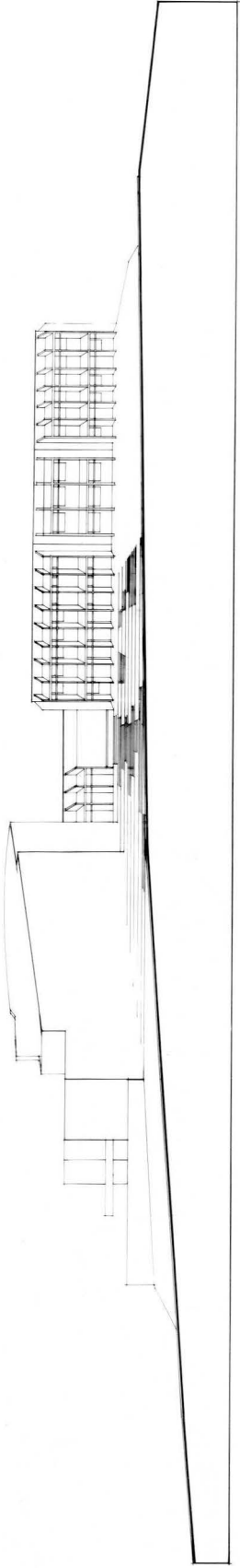
A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARCHITECTURE

BY JOHN DE KOCK

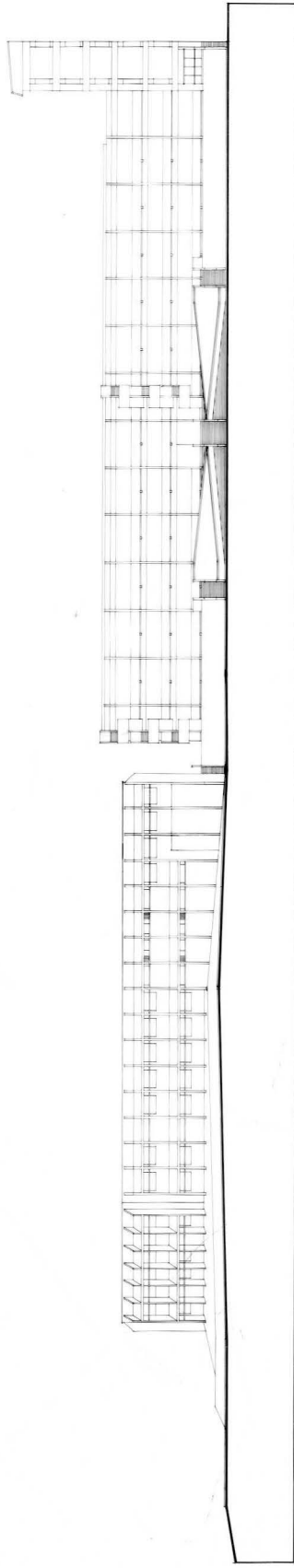


SECTION B

SECTION C



EAST ELEVATION



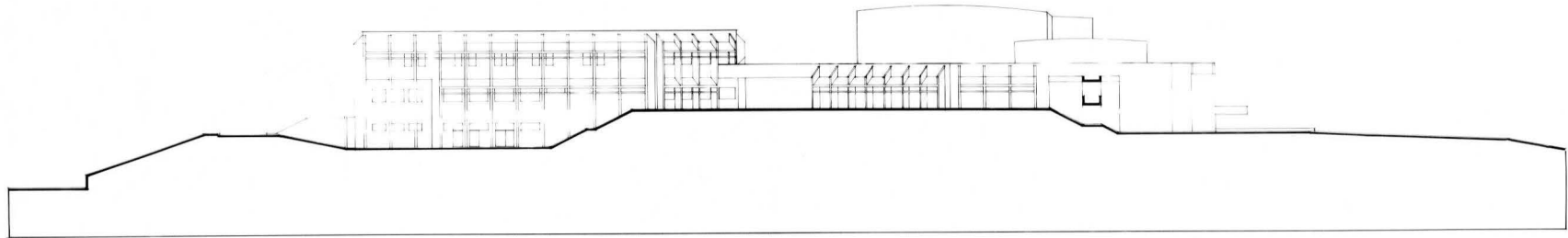
NORTH ELEVATION

A SCHOOL OF MUSIC FOR THE UNIVERSITY OF DURBAN - WESTVIEW

FRANZ JOHANN DE KOCK

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARCHITECTURE

SCHOOL OF ARCHITECTURE UNIVERSITY OF NAT



WEST ELEVATION

SCHOOL OF MUSIC FOR THE UNIVERSITY OF DUBAI

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARCHITECTURE

SCHOOL OF ARCHITECTURE UNIV

BIBLIOGRAPHY

Books

1. Barlow, Denys Musical Instruments
A & C Black Ltd, London, 1968
2. Beranek, Leo L Music, Acoustics and Architecture
John Wiley & Sons, New York, 1962
3. Bouws, J Geskiedenis van die Musiekonderwys
in Suid Afrika 1652 - 1902
Nasou Beperk, Cape Town, 1972
4. Danielou, Alain Indian Music
Typographie Firmin Didot et Cie,
Unesco, Paris, 1952
5. Gary, Charles (ed) Music Buildings, Rooms and Equipment
Music Educators National Conference
U S A, 1966
6. Griffiths, Paul A Concise History of Modern Music :
From Debussy to Boulez
Thames & Hudson, Great Britain, 1978
7. Gosvami, O The Story of Indian Music :
Its Growth and Synthesis
Asia Publishing House, India, 1961
8. Grout, Donald J A History of Western Music
J M Dent & Sons Ltd, London, 1960
9. Hurd, Michael An Outline History of European Music
Novello & Co Ltd., London, 1968
10. Jackson, George S Music in Durban 1850 - 1900
Witwatersrand University Press,
Johannesburg, 1970

11. Moore, J E Design for Good Acoustics & Noise Control
Macmillan Press Ltd, London, 1978
12. Mursell, James L The Psychology of Music
W W Norton & Co. Inc, New York, 1937
13. Parkin, J H Acoustics, Noise and Buildings
Faber & Faber Ltd, London, 1969
14. Popley, Herbert A The Music of India
Association Press, Calcutta, 1921
15. Pryce Lewis, O Sound Advice : A Short Course in Acoustics and Sound Insulation
Hortors Ltd, Cape Town, 1964

Periodicals

16. Sachs, Curt A Short History of World Music
Dennis Dobson Ltd, London, 1949
17. Sharman, Gopal Filigree in Sound : Form and Content in Indian Music
Andre Deutsch Ltd, London, 1970
18. Westrup, Jack An Introduction to Musical History
Hutchinson & Co Ltd, London, 1973
19. Young, Percy M A Concise History of Music
Ernest Benn Ltd, London, 1974

Pamphlets

1. Keet, W de V Some Design Aspects of the New Conservatoire of Music, University of Stellenbosch
(Unpublished) (undated)
2. Keet, W de V Verslag oor Metings by Musiekkonservatorium, Universiteit van Stellenbosch
(Unpublished) 1974

3. Keet, W de V Opsommende Verslag oor Besoeke aan
Musiekkonservatoria in Duitsland
(Unpublished) 1974
4. South African Information Service South Africa : Music
Dagbreek, Johannesburg, 1965
5. S A B S Code of Practice for Interior Lighting Part 1 : Artificial Lighting (b)
6. Venter, R H South African Post-Secondary Education
Nation-Wide Building - Space Planning
System Manual
(Review Edition)
Universities Branch, Department of
National Education, 1979

Periodicals

1. Airoidi, Renato "Architettura del teatro contemporaneo"
Casabella, Vol. 431, December 1977,
pp. 10 - 47.
2. Barron, Orlowski & Chinoy "Faculty of Music, University of
Cambridge"
Architectural Review, Vol. 164, No. 977,
pp. 18 - 23
3. Behrens, Keet & Miszewski "Conservatoire of Music, University
of Stellenbosch"
Architecture S A, July 1978, pp. 14 - 20
4. Brown, S "Extension to the Royal Academy of Music"
Riba Journal, Vol. 86, No. 7,
July 1979, pp. 318 - 319
5. Day, Brian & Reid, Francis "Building Study: The Hexagon, Reading"
Architects' Journal, Vol. 169,
No. 9, pp. 415 - 430

6. Fischer, Robert E & Schmertz, Mildred F "Denver's Boettcher Concert Hall"
Architectural Record, Vol. 165,
March 1974, pp. 99 - 110
7. Forsyth, James Codrington "Berwald Hall, Stockholm, Sweden"
Architects' Journal, Vol. 174, No. 48,
2 December, 1981, pp. 1077 - 1086
8. Ham, Roderick "Building Study : Sam Newsom Music Centre,
Boston, Lincolnshire"
Architects' Journal, 15 July 1981, pp.2 - 28
9. Stephens, Suzanne "Raising the Roof"
Progressive Architecture, Vol. 62,
January - July 1981, pp. 70 - 77
10. Stephens, Suzanne "Swathmore College Music Building"
Progressive Architecture, Vol. 12,
1974, pp. 62 - 66
11. Author unnamed "Conservatoire of Music, University of
Stellenbosch"
Architect and Builder, Vol. 79, No. 10,
October 1979, pp. 10 - 17
12. Author unnamed "College of Music, Rosebank, Cape"
Architect and Builder, Vol. 23, No. 9
September 1973, pp. 2 - 9
13. Author unnamed "Onondaga County Civic Centre,
Syracuse, New York"
Architectural Record, May 1978, pp.126 - 131
14. Author unnamed "Architettura e Musica"
Casabella, Vol. 45, No. 473,
October 1981, pp. 9 - 63

Thesis worksAPPENDIX A

1. Jacobsen, A L Music Education : A Comparative Study of Courses offered at Selected South African Universities
 Bachelor of Music, Department of Music, University of Natal, Durban, 1980
2. McKinlay, M Conservatoire of Music for the University of Natal
 Bachelor of Architecture, School of Architecture, University of Natal, Durban, 1978
3. Richards, C N A School of Music
 Bachelor of Architecture, School of Architecture, University of Natal, Durban, 1974
4. Van Zijl, F D W A New Conservatorium vir Musiek for Stellenbosch
 Bachelor of Architecture, University of Cape Town, Cape Town, 1952

APPENDIX A

Well over eighty percent of South Africa's Indian population is resident in Natal, and on the basis of population concentration, Natal, with an epicentre around the coastal region of Durban, was regarded as the most accessible location for the University.

Consideration of any other student catchment area must centre on the Witwatersrand, notably Johannesburg and Pretoria, where thirty percent of the remainder of South Africa's Indian population resides.

The University of the Witwatersrand accepts Indian student registration for courses not available at Indian tertiary education establishments.

Duration of Study

On the same basis a small percentage of students study at Cape Town and Rhodes Universities.

Promotion to a following year of Study

Thus the majority of the prospective and registered University students are to be found in Natal. In 1980 only 72 students were from the Cape and 253 from the Transvaal, out of a total of 5 000 registered students.

Curriculum

A choice must be made of one of the following two curricula:

Curriculum 1 : Music Education : BMus(Ed)

Curriculum 2 : General : BMus

These courses will run concurrently for the first two years.

Note - Auxiliary Courses

All music students are expected to regularly attend choir practices, ensemble rehearsals, criticism classes and concerts.

First Year

1. Practical Study I
2. Harmony and Counterpoint I
3. History of Music I
4. Form of Music I
5. Method of Practical Study I
6. English or Afrikaans I

Second Year

1. Practical Study II
2. Harmony and Counterpoint II
3. History of Music II
4. Music Degrees
5. Method of Practical Study II

APPENDIX B

The Degrees of Bachelor of Music (General) and Bachelor of Music (Education)

Third Year

Admission Requirements

General

A student wishing to enrol for this degree must satisfy the Head of the Department in an entrance examination as to his practical and theoretical competence for the course. This will require a minimum practical standard equivalent to (a) Grade VII of UNISA or (b) at least 60% in the matriculation examination in Music and a comparable theoretical standard.

Duration of Study

The curriculum shall extend over four years of full-time study.

Promotion to a following year of Study

A student must pass Practical Study, Harmony and Counterpoint and History of Music in order to proceed to successive years. Only one other music subject and a language course may be carried, but not longer than two years.

Curriculum

A choice must be made of one of the following two curricula:

- | | | | | |
|------------------|---|-----------------|---|----------|
| The Curriculum 1 | : | Music Education | : | BMus(Ed) |
| Curriculum 2 | : | General | : | BMus |

These courses will run concurrently for the first two years.

Note - Auxiliary Courses

All music students are expected to regularly attend choir practices, ensemble rehearsals, criticism classes and concerts.

First Year

1. Practical Study I
2. Harmony and Counterpoint I
3. History of Music I
4. Form of Music I
5. Method of Practical Study I
6. English I or Afrikaans I

Second Year

1. Practical Study II
2. Harmony and Counterpoint II
3. History of Music II
4. Form of Music II
5. Method of Practical Study II
6. A second-year course in the chosen official language

Third YearMusic Education

- Practical Study III
- History of Music III
- Practical School Music I
- Music Education I
- Education I
- Method of Practical Study III
- English Usage or Afrikaans Usage
in official language not chosen
in first and second years

General

- Practical Study III
- Harmony & Counterpoint III
- History of Music III
- Composition & Orchestration I
- Score Study I
- A Course in French, German or Italian
- Sitar students are advised to study
an Indian language

Fourth Year

- Practical Study IV
- Practical School Music II
- Music Education II
- Education II
- Method of Practical Study IV

- Practical Study IV
- Harmony & Counterpoint IV
- History of Music IV
- Composition & Orchestration II
- Score Study II

The Degree of Master of Music (MMus)Admission Requirements

- a) The general rules of the University shall apply.
- b) A candidate shall hold a recognised BMusHon degree.
- c) The degree shall not be conferred on a candidate until at least one year has elapsed since he obtained his Honours degree.

Examination

- a) The degree of Magister Musicae may be awarded either:
 - in Performance, or
 - in Composition, or
 - by Dissertation

- b) Candidate for the degree in Performance shall:
- i) Perform a recital which demonstrates mature artistry and technical proficiency
 - ii) Perform a concerto. In the case of singers give a second recital consisting of operatic and oratorio excerpts
 - iii) Present a dissertation
 - iv) The suggested programmes, and the subject of the dissertation, must be approved by the Head of Department
- c) Candidates for the degree in Composition shall:
- i) Submit a portfolio of compositions
 - ii) Present a dissertation
 - iii) Composition genres and the subject of the dissertation must be approved by the Head of Department
 - iv) Candidates for the degree by Dissertation must present a dissertation on a subject approved by the Head of Department

Note:

Candidates may be requested to present themselves for an oral examination. Composition candidates may also be required to present tapes of the works submitted for examination.

Pass cum laude

The degree may be conferred cum laude on the recommendation of the examiners.

The Degree of Doctor of Music (DMus)

Admission Requirements

A candidate shall hold a recognised MMus degree.

The degree shall not be conferred on a candidate until at least two years have elapsed since he obtained his Master's degree.

Examination

The examination comprises two parts:

- a) A candidate is required to undergo an oral and/or written test in -
 - i) Musical Bibliography AND
 - ii) Aspects of Musicology as prescribed by Senate

This part constitutes 20% of the total mark of the examination and a candidate must obtain a sub-minimum of 60% to pass

- b) A candidate is required to submit a thesis on a field of study on an approved subject. A candidate shall not be admitted to Part (b) unless he has passed Part (a).

Analysis of Subjects

*(L - Lectures per week)

First Year - BMus(Ed) and BMus

1. Practical Study I (5L)* (Practical examinations)

A student will be required to study two instruments, of which one must be the pianoforte

- a) Main instrument (2L)
 - i) Approved pieces from different stylistic periods. Oral questions on the music presented
 - ii) Scales and arpeggios
 - iii) Sight-reading
 - iv) Quick study
- b) Second instrument (1L) - As above, but on a lower grade
- c) Aural training (2L)

2. Harmony and Counterpoint I (5L) (2 papers, 1 practical examination)

- a) Harmony - Diatonic harmony up to and including the dominant ninth; diatonic modulation; melody-writing
- b) Counterpoint - Two- and three-part in the five species
- c) Rudiments (a six-month course) - All keys and scales; all time-signatures and groupings of notes and rests; transposition and intervals; the use of the alto and tenor clefs; terms, signs and ornaments
- d) Keyboard harmony (a six-month course) - Cadences

3. History of Music I (5L) (2 papers)

- a) A study of general musical knowledge
- b) Instruments of the orchestra; elementary acoustics
- c) A general survey of antiquity, the Middle Ages, the Baroque, Classical and Romantic periods and the Twentieth Century

4. Form of Music I (5L) (2 papers)

A study of the basic elements and forms in music:

- a) Motif, phrase, sentence, extension and contraction
- b) Binary, ternary and compound ternary form
- c) Rondo form, theme and variations

- d) Sonata form, its history and development
 - e) Rondo-sonata form
 - f) Sonata as a whole: symphony, concerto, string quartet
 - g) Various one-movement forms
 - h) Fugue
5. Method of Practical Study I (3L) (1 paper, 1 oral)
Method and repertoire of the main instrument
6. English I or Afrikaans I

Second Year - BMus (Ed) and BMus

1. Practical Study II (5L) (Practical examinations)
- a) Main instrument (2L)
 - i) Approved pieces from different stylistic periods. Oral questions on the music presented
 - ii) Scales and arpeggios
 - iii) Sight-reading
 - iv) Quick study
 - b) Second instrument (1L). As above, but on a lower level
 - c) Aural training (2L)
2. Harmony and Counterpoint II (5L) (2 papers, 1 practical examination)
- a) Harmony - Continuation of diatonic harmony, including the use of chromatic chords
 - b) Counterpoint
 - i) Writing a tonal or real answer, as required, with a counter-subject invertible at the octave or fifteenth, to a given fugue theme
 - ii) Writing a short two-part finite canon with or without a free third part
 - iii) Strict counterpoint in three parts
 - c) Keyboard harmony - Elementary use of the primary triads
3. History of Music II (5L) (2 papers)
Capita selecta from the Baroque era and Classical period
4. Form of Music II (5L) (2 papers)
An application of the forms studied in the first year to the four main periods in music: Baroque, Classical, Romantic, Modern
5. Method of practical Study II (3L) (1 paper, 1 oral)
Method and repertoire of the main instrument
6. A second-year course in the chosen official language

Third Year - BMus(Ed)

1. Practical Study III (5L) (Practical examinations)
 - a) Main instrument (2L)
 - i) Approved pieces from different stylistic periods. Oral questions on the music presented
 - ii) Scales and arpeggios
 - iii) Sight-reading
 - iv) Quick study
 - b) Second instrument (1L). As above, but on a lower level.
 - c) Aural training (2L)
2. History of Music III (5L) (2 papers)

Capita selecta from the Romantic and Modern periods. Non-Western and South African music history
3. Practical School Music I (5L) (Practical examinations)
 - a) Instrumental and vocal training
 - b) Instrumentation and vocal writing
 - c) Conducting technique

The above with special reference to the primary school
4. Music Education I (5L) (2 papers)
 - a) Method for the subject in the primary school
 - b) Practice teaching
5. Method of Practical Study III (4L) (1 paper, 1 oral)
 - a) Method and repertoire of the main instrument
 - b) Practice teaching of individual pupils
6. Education I
7. English Usage or Afrikaans Usage

See curriculum UHDE

Fourth Year - BMus(Ed)

1. Practical Study IV (5L) (Practical examinations)
 - a) Main instrument (2L)
 - i) An approved balanced programme. Oral questions on the music presented
 - ii) Sight-reading
 - iii) Ensemble
 - iv) Quick study
 - b) Second instrument (2L). As above but on a lower level. Students are required to reach at least the following standards at the end of the fourth year:

- i) Recorder: Grade VII (Unisa)
- ii) Pianoforte and stringed instruments: Grade V (Unisa)
- c) Aural training (1L)
- 2. Practical School Music II (5L) (Practical examinations)
 - a) Instrumental and vocal training
 - b) Instrumentation and vocal writing
 - c) Conducting technique
 The above with special reference to the high school
- 3. Music Education II (5L) (2 papers)
 - a) Method for the subject in the high school
 - b) Practice teaching
- 4. Method of Practical Study IV (1 paper, 1 oral)
 - a) Method and repertoire of the second instrument
 - b) Practice teaching of individual pupils
- 5. Education II

Third Year - BMus

- 1. Practical Study III (5L) (Practical examinations)
As for BMus(Ed) III
- 2. Harmony and Counterpoint III (5L) (2 papers, 1 practical examination)
 - a) Harmony - The study of chromatic harmony
 - b) Counterpoint - The exposition of a fugue in three or four parts
 - c) Keyboard harmony - The use of all primary and secondary triads and their inversions, including the dominant seventh
- 3. History of Music III (5L) (2 papers)
As for BMus(Ed)
- 4. Orchestration and Composition I (4L) (2 papers and approved compositions)
 - a) Orchestration - String orchestra, woodwind and horns, small orchestra
 - b) Composition - Composition in simple binary and ternary forms; the rondo; vocal writing for choir and solo voices with or without accompaniment
- 5. Score Study I (5L) (1 paper, an oral)
The detailed study of selected major works
- 6. Language Course
See curriculum

Fourth Year - BMus

1. Practical Study IV (5L) (Practical examinations)
As for BMus(Ed) IV
2. Harmony and Counterpoint IV (5L) (2 papers, 1 practical examination)
 - a) Harmony
 - i) Development of chromatic harmony
 - ii) Whole-tone technique
 - iii) Twelve-tone technique
 - b) Counterpoint
 - i) The complete fugue
 - ii) The two-part invention
 - c) Keyboard harmony - The harmonisation of diatonic melodies, including modulation
3. History of Music IV (5L) (2 papers)
 - a) History and methods of the history of music
 - b) Bibliography
 - c) A mini-thesis on an approved topic
4. Orchestration and Composition II (4L) (2 papers and approved compositions)
 - a) Orchestration - Brass and percussion; full orchestra
 - b) Composition - More complicated examples; variations - technique; composition for ensemble; sonata form
5. Score Study II (5L) (1 paper, 1 oral)
The detailed study of selected advanced major works

Music SpecialAdmission requirements

A student wishing to enrol for this course must satisfy the Head of Department in an entrance interview with regard to his practical and aural aptitude

Syllabus

1. Practical Study
A student will be required to study two instruments of which one must be the pianoforte
 - a) Main instrument
 - b) Second instrument
 - c) Aural training

2. Theory of Music

- a) All major, minor and harmonic chromatic scales
- b) Transposition and intervals
- c) Simple and compound time
- d) Terms, signs and ornaments
- e) Triads and their inversions on each note of major and minor scales. Perfect, plagal and imperfect cadences
- f) Writing a melody to given words
- g) Adding an answering phrase to complete a given four-bar phrase

3. History of Music

- a) The instruments of the orchestra
- b) General musical knowledge

4. Form

An introductory course in the basic elements and forms of music

- a) Motif, phrase, sentence, extension and contraction
- b) Binary and ternary form
- c) Compound ternary form and rondo form
- d) Theme and variations
- e) Sonata form, its history and development
- f) Rondo-sonata form
- g) Sonata as a whole

5. General

All music students are expected to regularly attend choir practices, ensemble rehearsals and concerts

Music I

Admission requirements

1. A student wishing to enrol for this course must satisfy the Head of Department in an entrance examination as to his practical and theoretical competence in music. This will require a minimum practical standard equivalent to Grade V (Unisa), with comparable theoretical knowledge
2. Should a student in any course in Music involving practical study wish to be readmitted after an absence of one year or longer it will be required of him to pass a proficiency examination

Syllabus

1. Practical Study

A student will be required to study two instruments of which one must be the pianoforte

- a) Main instrument
- b) Second instrument
- c) Aural training

2. Theory of Music

- a) Triads and their inversions on each note of the major and minor scales. Progressions forming cadences
- b) Harmonisation in four parts of a simple melody or a figured or unfigured bass. Knowledge of chords I, II, IV, V, VI and the dominant seventh. The use of unessential notes
- c) Adding another melody above or below a given melody
- d) Completing a melody of which the beginning is given
- e) Writing a melody to given words

3. History of Music

- a) Instruments of the orchestra
- b) A general survey of the Baroque, Classical and Romantic periods and Impressionism

4. Form

A study of the basic elements and forms in music

- a) Motif, phrase, sentence, extension and contraction
- b) Binary, ternary and compound ternary form
- c) Rondo form
- d) Sonata form, its history and development
- e) Rondo-sonata form
- f) Sonata as a whole - symphony, concerto, string quartet
- g) Various one-movement forms
- h) Fugue

5. General

All music students are expected to regularly attend choir practices, ensemble rehearsals and concerts

Music II

Should a student in any course in Music involving practical study wish to be readmitted after an absence of one year or longer it will be required of him to pass a proficiency examination.

Syllabus1. Practical Study

A student will be required to study two instruments of which one must be the pianoforte

- a) Main instrument
- b) Second instrument
- c) Aural training

2. Theory of Music

- a) As for Music I
- b) The use of chords III and VII
- c) Secondary dominants
- d) Modulations to nearly related keys
- e) Secondary sevenths
- f) All unessential notes
- g) Two-part counterpoint in the five species

3. History of Music

The Baroque and Classical periods

4. Form

The study of suitable examples chosen from the literature of the Baroque and Classical periods

5. General

All music students are expected to regularly attend choir practices, ensemble rehearsals and concerts

History of MusicMusic IIIAdmission requirements

Should a student in any course in Music involving practical study wish to be readmitted after an absence of one year or longer it will be required of him to pass a proficiency examination.

Syllabus1. Practical Study

A student will be required to study two instruments, one of which must be the pianoforte

- a) Main instrument
- b) Second instrument
- c) Aural training

2. Theory of Music

- a) As for Music II
- b) The dominant ninth, eleventh and thirteenth
- c) The Neapolitan sixth
- d) The augmented sixth in German, French and Italian forms
- e) Other elementary chromatic harmonies. More advanced modulation
- f) Writing a tonal or real answer, as required, with a counter-subject invertible at the octave or fifteenth, to a given fugue theme
- g) Writing a short two-part finite canon with or without a free third part
- h) Strict counterpoint in the five species in three parts, with a given C.F.

3. History of Music

The Romantic and Modern periods

4. Form

The study of suitable examples chosen from the literature of the Romantic and Modern periods

5. General

All music students are expected to regularly attend choir practices, ensemble rehearsals and concerts

History of Music

Courses I, II and III as for BMus.

Instrumental and Vocal Technique

To obtain perfect accuracy in the intervals, Indian music favours instruments which allow, by sliding, or pulling on the strings, a constant adjustment of pitch. Similarly in vocal technique only such notes are called for as are absolutely free from vibrato or fluctuation. The volume or mellowness of the tone being far less important than accuracy of pitch, certain voices are considered good which may at first appear

APPENDIX C

THE INDIAN SYSTEM OF MUSIC

The Indian Scale

The Indian system of music is based on properties of sound distinct from those used either in the Harmonic (Western) or the Cyclic (Chinese) systems of music.

Indian music is modal, as was ancient Greek music, and as are the systems prevalent in Turkey, Persia and most of the countries of the Middle East. In this system, the meaning of each note depends on its relation to a permanent sound, the tonic, whether this tonic is played simultaneously or not. The habit of hearing each sound as related to a fixed basic one has to be acquired by people used to other systems.

Since the meaning of each note depends on its position in the scale, memory plays an essential part in the understanding of modal music. In modal music one has to remember the elements of the mode as they appear, one after another, until the modal picture is completed and the expression can be fully appreciated.

The fact that the tonic is fixed in the modal system implies that, in any piece of music, a given pitch always corresponds to a given interval. This has very definite advantages. The ear quickly becomes trained to recognise the interval and expression of even the briefest note. Further, as a result of this correspondence, accuracy of pitch is of great importance and minute differences become recognisable. Hence the modal system of music always leads to a very detailed scale where a difference of one comma may bring about a complete change in colour and meaning. This offers vast possibilities of musical expression.

Instrumental and Vocal Technique

To obtain perfect accuracy in the intervals, Indian music favours instruments which allow, by sliding, or pulling on the strings, a constant adjustment of pitch. Similarly in vocal technique only such notes are called for as are absolutely free from vibrato or fluctuation. The volume or mellowness of the tone being far less important than accuracy of pitch, certain voices are considered good which may at first appear

unpleasant to foreign ears. Likewise, most Western voices seem very unmusical to Indian ears and appear never to maintain a definite pitch.

The Indian Scale

Indian music is based on natural intervals and rejects temperament as detrimental to musical expression. The octave is normally divided into 22 unequal intervals corresponding to simple ratios. Some modes, however, use a few sounds more, bringing the total of intervals in current use up to about 30. These intervals, which are called Shruti, are used with utmost precision and are very easily recognised by their different expression once the ear is trained to appreciate them.

The Modes or Ragas

A certain number of intervals corresponding to definite expressions are chosen to form a mode or raga. Modes are not supposed to have less than five or more than twelve notes. The most usual however, have seven notes.

The tonic and fifth being invariable, the different positions - either flat or natural - of the remaining five notes allow the formation of 72 basic scales. On these can be established an almost limitless number of modes with some differences in their ascending and descending scales. Although the definition of thousands of modes can be found in the ancient theoretical treatises, not more than a few hundred are in common use at the present time. They are taught traditionally with all the particular ornaments which may best bring out their expression, and they form the basis of instrumental and vocal classical music.

Each mode corresponds to a particular mood and is also considered as connected with a particular hour of the day when such a mood is more likely to develop. Some modes are also related to particular seasons.

The scale is not sufficient to define a raga or mode because the notes cannot generally be used in succession. Certain notes can be used only in relation with other notes in definite melodic figures.

The Musicians

The Indian musician requires a thorough knowledge of all the peculiarities of a raga or mode, as well as the faculty to improvise its development.

The Vina is one of the oldest instruments known. Its name
There are no composers in the Western sense, although there are many song composers who furnish the melodic basis of the improvisation. There are also musicians who are able to create, or rather discover, new modes and establish a new tradition.

Popularly called Bin. The basic instrument of Indian classical
The Indian musician must therefore be both a performer and a creator. This explains why the training of musicians is so long and difficult, and why great masters are comparatively rare.

to the tonic, are used only for drone-accompaniment. The strings
The tradition of Indian music has kept its integrity in spite of adverse circumstances, and there are still today a good number of living exponents of the best classical Indian music. Although some attempts are now being made to teach music in specialised institutions, most present-day musicians of some repute acquired their art through the old master-disciple system. They therefore belong to traditional chains of musicians. These chains are known as "Gharana" and are named after some celebrated master who originated them.

wood. This type of Vina, too, has seven strings and twenty-four
The recognised masters of classical music are often called Ustad, a Persian word indicating "mastery, accomplishment".

Rhythm

The Vichitra Vina is a North Indian Vina without frets played
Rhythm in Indian Music is very important and extremely elaborate. There are a great number of rhythms, each rhythm-group extending usually over four bars. The complexity of the rhythms has often led untrained casual hearers to state that the rhythm is irregular, which is never the case in Indian music where rhythm is always followed with mathematical precision.

Indian Musical Instruments

There are sympathetic strings.
According to the ancient Sanskrit books on music, the instruments are divided into four categories: wind, drum, string and percussion. In each category there is great variety.

1. String Instruments

It resembles the South Indian Vina but is lighter and
Of all the string instruments the most celebrated is the Vina. The word Vina really stands for a type of instrument and there are several kinds of Vina in use today.

The Vina is one of the oldest instruments known, its name appearing in texts that date at least from the first millennium before the Christian era.

1.1 The North Indian Vina

Popularly called Bin. The basic instrument of Indian classical music. It is made of a bamboo and two gourds. It has seven metal strings played on twenty-two (or more) frets. Four of the strings are used for playing the melody. The three other strings, tuned to the tonic, are used only for drone-accompaniment. The strings can slide laterally on the frets, allowing the most delicate ornaments. They are played with the fingers or with metal nails.

1.2 The South Indian Vina

A larger and more powerful instrument than the North Indian variety. It was evolved in its present form in the 17th century. The lower gourd is replaced by a large wooden bowl with a flat top on which rests the bridge. The flat finger-board is also made of wood. This type of Vina, too, has seven strings and twenty-four frets.

1.3 The Vichitra Vina

The Vichitra Vina is a North Indian Vina without frets played by sliding a piece of crystal on the strings. It corresponds to the South Indian Gottuvadyam.

1.4 Gottuvadyam

An instrument identical with the South Indian Vina but without frets. The strings are stopped with a sliding piece of wood. There are sympathetic strings.

1.5 The Sitar

A popular North Indian instrument said to have been invented by the celebrated musician Amir Khusru at the end of the 13th century. It resembles the South Indian Vina but is lighter and has adjustable frets which are set to the mode before playing. It is played with metal nails fixed on the fingers. It has usually four main strings but modern sitars have a number of additional sympathetic strings.

1.6 The Sarode

A string instrument of recent origin. It has a rather short stem covered with a skin on which the bridge rests. It is played with a plectrum. It has become very popular in recent years because of its resonance, which is stronger than that of most other Indian string instruments and thus allows playing to larger audiences.

1.7 The Surbahar

A Sitar with sympathetic strings, which give it a deeper and softer sound.

1.8 The Surasaptaka

An instrument similar to the Sitar but slightly larger and with seven main strings.

1.9 The Tanpura

The Tanpura, which corresponds to the ancient Tumburu Vina, is a long instrument with four metal strings giving the tonic, its lower and higher octaves and the fifth. Its bridge is a very long and delicately made piece of ivory which, by coming in to contact at certain points with the vibrating strings, produces numerous and carefully chosen harmonics. It is an essential feature of the accompaniment of vocal music since, according to Indian theory, a constant sounding of the tonic is essential to the accurate perception of the varied intervals of the mode or raga.

1.10 Ekatara

The Ekatara (one-stringed) is a small instrument used to give the tonic in popular music.

1.11 Dotara

The Dotara (two-stringed) is an instrument similar to the Ekatara but with two strings giving the tonic and its octave or fifth.

1.12 The Sarangi

Probably derived from the old Saranga Vina and made of a single block of wood covered with parchment. It has four main strings of gut and many sympathetic strings. It is played with a short bow.

This instrument, used mainly to accompany singers, has remarkable subtlety and great force of expression.

1.13 The Esraj

A long and narrow bowed string instrument used mainly in Bengal to accompany singing. It is of recent origin (c. 15th century). It has 4 main steel and brass strings and numerous sympathetic strings.

1.14 The Dilruba

A bowed instrument similar to the Esraj but with a square sound-box and a larger body. It has 9 or 10 strings like the Sarangi.

1.15 Sarinda

A kind of Sarangi but with metal strings, it is played with a short bow.

1.16 Violin

The violin was imported into India only about a century ago. It has become common in South India but is not yet recognised in Northern India as a suitable instrument for classical music. The shortness of the strings hardly allows the accurate playing of the minute graces which are an essential element of higher Indian music.

2. Wind Instruments

There are numerous wind instruments in India mainly of the flute, oboe and horn families. Instruments of the horn family used in temple-music have not so far been recorded.

2.1 The Flute (Vansari)

There are many types of flutes made of bamboo or ivory, sandalwood, ebony, iron, silver or gold, either straight or transverse. Modern instruments with keys are also in use though the quality of the sound is less appreciated. The bamboo flute has the best tone. The system of fingering is entirely different from that current in Europe.

2.2 The Shahnai

India possesses in the Shahnai what is probably the world's finest oboe with a reed of unrivalled delicacy. The technique is

extremely difficult. Great Shahnai players can produce the most amazing glissandos and graces on this instrument.

2.3 Nagasvaram

This is the main instrument of the oboe family used in South India. It has a delicate reed held inside the mouth and the production of intermediary quarter tones is obtained by regulating the flow of air. The technique is very difficult. The system of fingering and the range are the same as for the flute.

It corresponds to the Shahnai of Northern India.

2.4 Ottu

The drone oboe used for the accompaniment of the Nagasvaram.

2.5 The Harmonium

A very small type of harmonium with three octaves and a hand bellow was imported into India less than a hundred years ago. Because of the extreme facility of the key-board, it rapidly became popular and is much used in the accompaniment of songs. The limitations of a twelve-note keyboard, however, have had a very detrimental effect on the accuracy of the intervals in Indian modes, and the harmonium is generally prohibited in classical performances and in the music schools of high standard.

3.3 Percussion Instruments (Drums)

Drumming is a very great art in India, and Indian drums, with their accuracy of pitch and variety of tone, are musically very superior to similar instruments in any other country.

Although the drum is usually an accompanying instrument, good drummers occasionally give brilliant solo performances.

Drums are by far the most important and independent part of accompaniment. They create, in terms of rhythm, variations on the theme which can be as rich and complex as the melodic variations.

3.1 The Mridanga or Pakhavaja

The classical drum of ancient music, the Mridanga, has a cylindrical body of wood with a skin at both ends tied at the rim. An elaborate system of tension-strings allows the accurate tuning of each skin.

The skin is loaded in its middle with a weight made of a dried rice-paste. This suppresses a great number of unwanted harmonics and gives the drum a clear well-pitched note.

The drummer strikes the rim or the skin in its centre or side with the fingers or the palm of the hand. This allows a number of very distinct strokes which are of a great value in the production of elaborate and subtle rhythms.

Each type of stroke on the drum is given a monosyllabic name. With these names, which are called "bol", the drummer can easily memorize very complex rhythms.

3.2 The Tabla

The most popular drum now in use. It is really a double drum made of two large earthen or wooden bowls covered with skin, each being played with one hand very much like the two sides of the Mridanga.

3.3 Dhola and Khola

Kinds of Mridanga used to accompany popular and religious music, especially in Bengal.

3.4 Tavil

A small drum used in South India for the accompaniment of the Nagasvaram. It corresponds to the North Indian Duggi.

3.5 Duggi

A small drum with a dry sharp sound used for the accompaniment of the Shahnai.

4. Percussion instruments (Other)4.1 Kartala

COMPOSITION A percussion instrument made of two pieces of wood loaded with very small bells which are struck together to mark the rhythm in

A Kirtanas. The number and variety of instruments used in a symphony orchestra is given in the table showing compositions of the B B C

4.2 Manjira and Ghungharu

Small bells. Small bells. itself and suited in numbers and balance to the types of music entrusted to it. The B B C orchestra, A, is abnormally

4.3 Jhanjha

Small cymbals usually made of brass.

4.4 Napura

First Ankle-bells.

Second violins

Accompaniment

Cellos

There are three elements in the accompaniment of modal music.

These are:

1. The drums which provide rhythm.
2. The Tanpura and the other instruments which give the tonic and its harmonics
3. The instruments which support and follow the melody, such as the Sarangi.

Any form of counterpoint is strictly prohibited in Indian classical music since it immediately destroys the modal sentiment. The instruments accompanying the melody follow it exactly or repeat it as a sort of echo.

Harp

These are only standard combinations and frequently provision has to be made on the platform for the addition of a number of instruments in particular sections. For example, in modern music there may be up to five extra woodwinds and brass. A well designed platform should therefore be sufficiently flexible to allow variations within the generally recognised sizes and types of modern orchestras and the desires of different conductors.

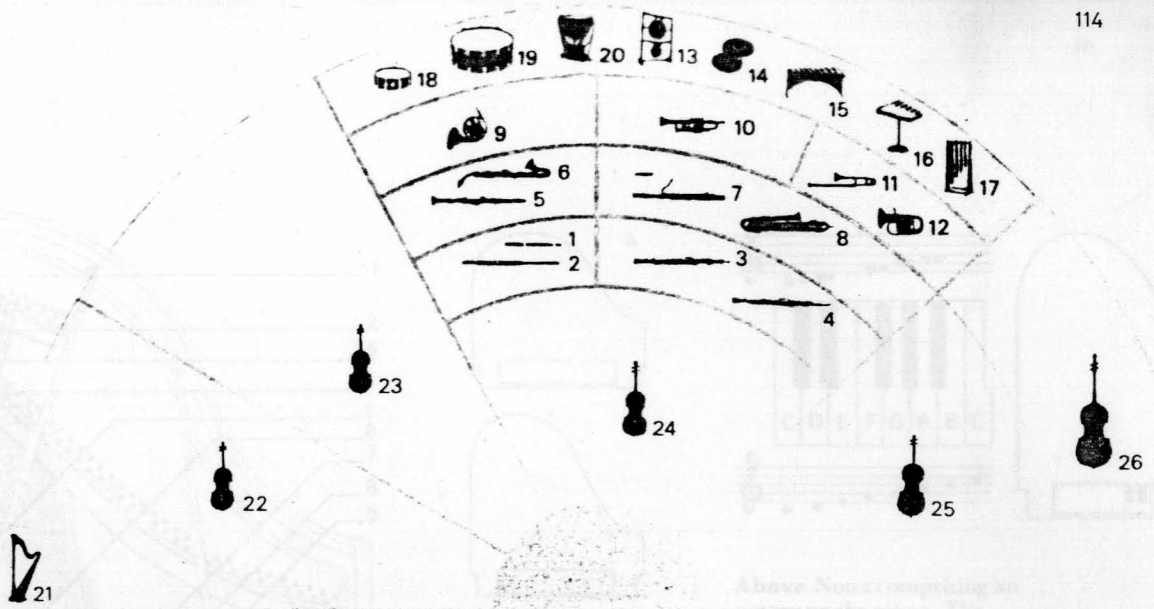
APPENDIX D

COMPOSITION OF A SYMPHONY ORCHESTRA

A guide to the number and variety of instruments used in a symphony orchestra is given in the table showing compositions of the B B C orchestra. The B B C orchestra can be divided up into smaller orchestras, each complete in itself and suited in numbers and balance to the types of music entrusted to it. The B B C orchestra, A, is abnormally large. Few platforms will have to be designed for an orchestra of more than eighty players.

<u>INSTRUMENTS</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
First violins	20	14	6	12	8
Second violins	16	12	4	10	6
Violas	14	10	4	8	6
Cellos	12	8	4	7	5
Double Basses	10	7	3	6	4
Flutes	5	3	2	3	2
Oboes	5	3	2	3	2
Clarinets	5	3	2	3	2
Bassoons	5	3	2	3	2
Horns	8	4	4	4	4
Trumpets	5	3	2	3	2
Trombones	6	3	3	3	3
Tuba	1	1	-	1	-
Timpani	2	1	1	1	1
Percussion	3	3	-	2	1
Harps	2	1	1	1	1
	119	79	40	70	49
		119		119	

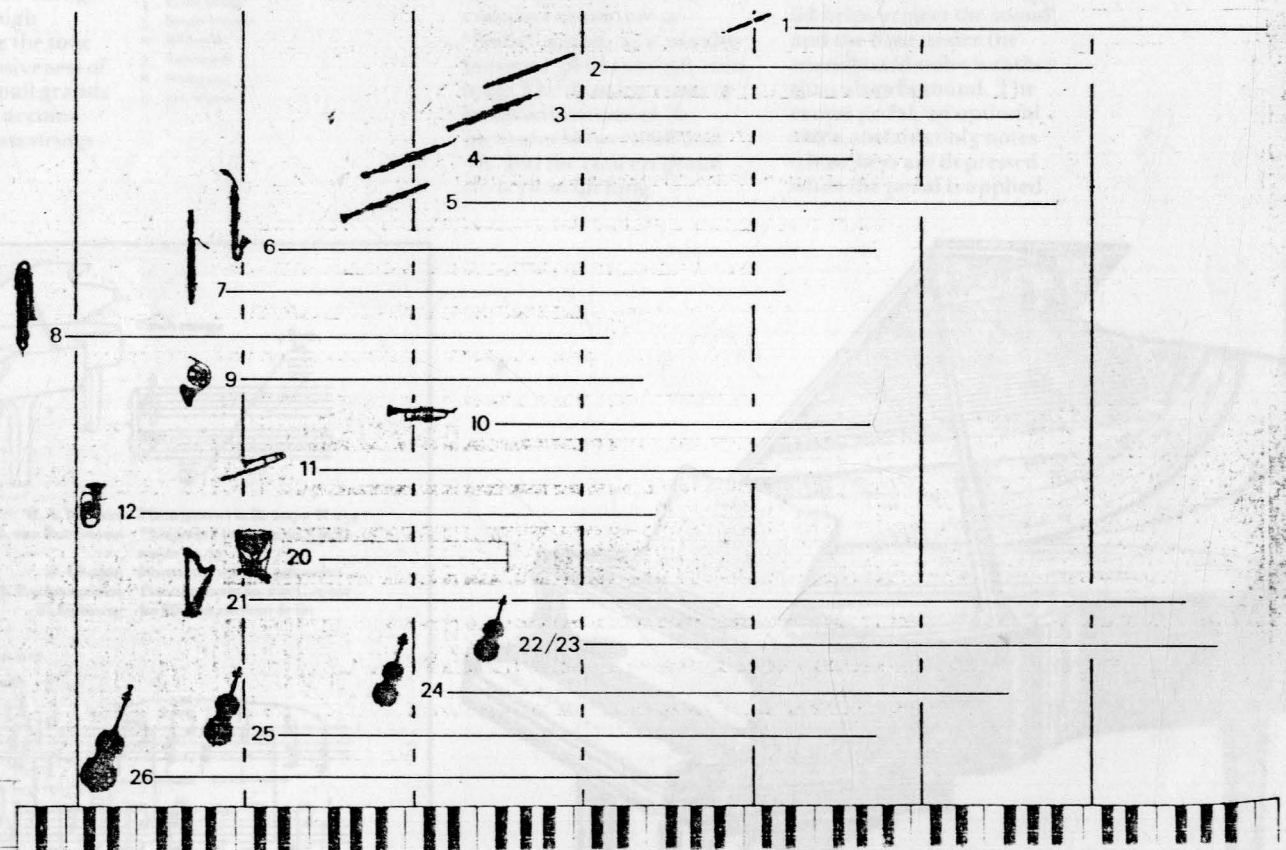
These are only standard combinations and frequently provision has to be made on the platform for the addition of a number of instruments in particular sections. For example, in modern music there may be up to five extra woodwinds and brass. A well designed platform should therefore be sufficiently flexible to allow variations within the generally recognised sizes and types of modern orchestras and the desires of different conductors.



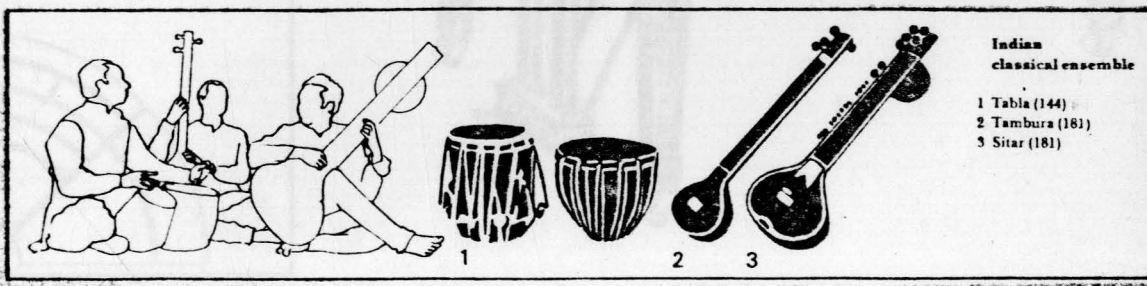
Above Usual orchestral seating plan. Instruments of the four "families" — woodwind, brass, percussion, and strings — are positioned in groups. This arrangement helps blend the tone colors of individual instruments, and helps the musicians play together in their groups.

Below The comparative pitch ranges of common orchestral instruments, shown in relation to the piano keyboard. In the case of instruments — like the clarinet and trumpet — for which written notation differs from actual sound, the diagram gives the actual sound produced.

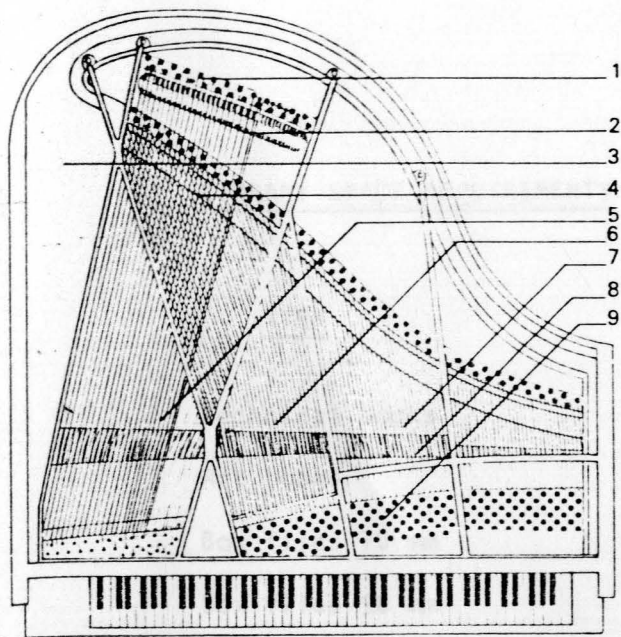
Woodwind	Brass	Percussion	Strings
1 Piccolo	9 Horns	13 Tam-tam	21 Harp
2 Flutes	10 Trumpets	14 Cymbals	22 1st violins
3 Oboes	11 Trombones	15 Xylophone	23 2nd violins
4 Cor anglais	12 Tuba	16 Glockenspiel	24 Violas
5 Clarinets		17 Tubular bells	25 Cellos
6 Bass clarinet		18 Side drum	26 Double basses
7 Bassoons		19 Bass drum	
8 Contrabassoon		20 Timpani	



Right Indian classical ensemble comprising sitar, tabla, and tambura. The sitar plays complex improvisations based on set rhythmic and melodic patterns known as talas and ragas. The tambura, which plays a continuous drone, and the tabla provide the accompaniment.

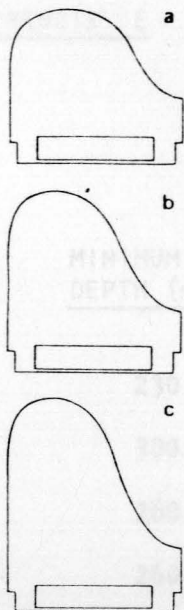


Indian classical ensemble
 1 Tabla (144)
 2 Tambura (181)
 3 Sitar (181)

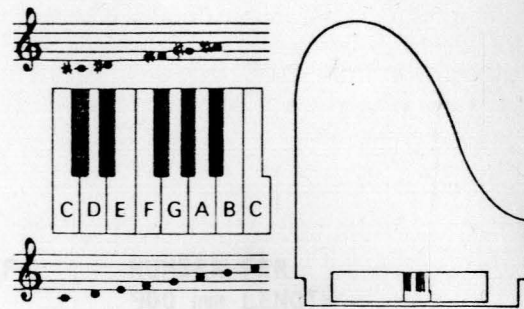


Above Parts of a modern grand piano. The one-piece iron frame allows the strings to be stretched at high tension, improving the tone quality and responsiveness of the instrument. Small grands are cross-strung to accommodate the long bass strings in a shorter case.

- 1 Hitch pins
- 2 Bass bridge
- 3 Soundboard
- 4 Long bridge
- 5 Single strings
- 6 Bichords
- 7 Trichords
- 8 Dampers
- 9 Wrist pins



Above Diagram showing the three most important sizes of grand piano. The compact miniature or "baby" grand (a) is usually between 5ft 6in and 5ft 10in long. The drawing room or boudoir instrument (b) measures between 6ft and 7ft, and the concert grand (c) is 7ft to 9ft long.



Above Notes comprising an octave on the piano. The keyboard is an excellent device for simplifying the playing of a complex stringed instrument. Keyboard instruments have existed for 700 years, and by the early 1400s the keys were arranged in the same order as on the modern piano.

Below Modern concert grand. The grand's main advantages are that its open lid helps project the sound, and the floor under the soundboard reflects rather than absorbs sound. The center pedal, an optional extra, sustains only notes whose keys are depressed when the pedal is applied.

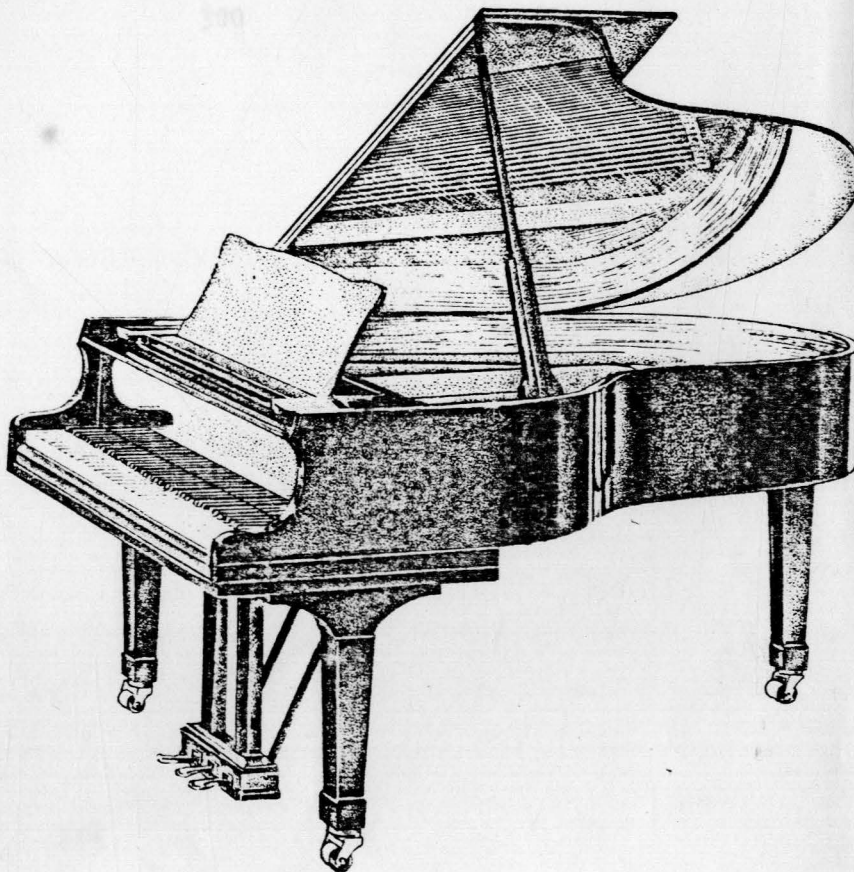
Piano

Pitch range

W. A. Mozart Piano quartet in B \flat major K 454
 L. van Beethoven "Emperor" concerto no. 5 in E \flat major op. 73
 F. Chopin Nocturnes, waltzes, polonaises
 S. Rachmaninoff Piano concerto no. 2 in C minor
 C. Debussy La fille aux cheveux de lin

Brahms Intermezzo, op. 119
Andante sostenuto

(No. * 2nd 3rd 4th *)
 Position with orchestra



APPENDIX E

LIBRARY SPACE REQUIREMENTS

<u>ITEM</u>	<u>MINIMUM SHELF DEPTH (mm)</u>	<u>NUMBER PER 900 mm LENGTH</u>
Technical books	230	21
Art books	300	18
Box files 70 mm	260	12
Box files 90 mm	260	10
Files 25 mm max. 12 mm min.	235	30 - 40
Binder 75 mm	225	11
Periodicals current	25	3
bound	260	19
Tapes 175 mm	180	38
125 mm	130	38
L P Records	300	66