DEVELOPMENT PLAN OF UNIVERSITY OF ROORKEE WITH SPECIAL REFERENCE TO HOUSING

A Dissertation
submitted in partial fulfilment of the
requirements for the award of the Degree
of
MASTER OF ARCHITECTURE

By

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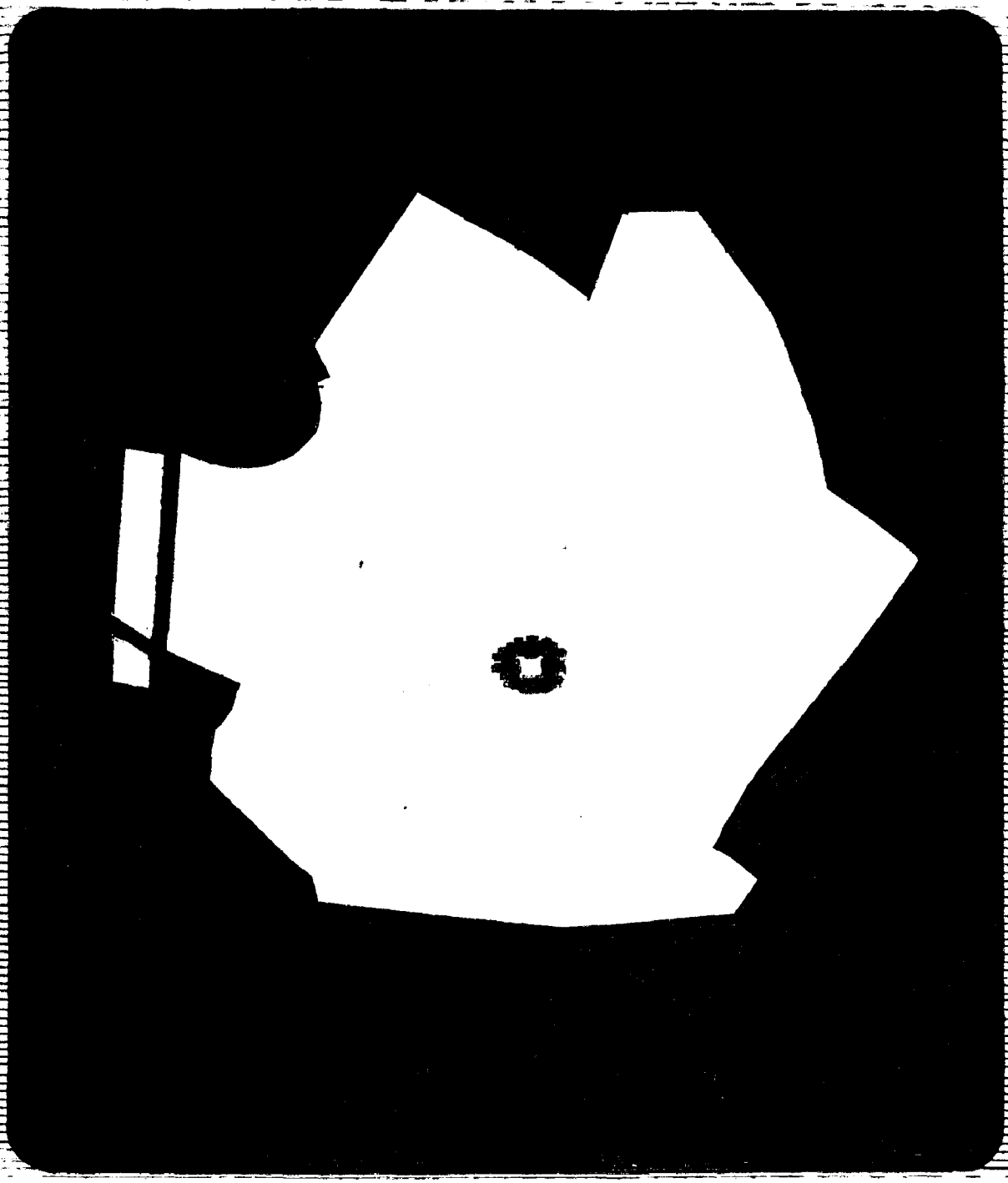

DEVELOPMENT PLAN UNIVERSITY OF ROORKEE

C E R T I F I C A T E

CERTIFIED THAT DISSERTATION ENTITLED "DEVELOPMENT PLAN, UNIVERSITY OF ROORKEE, WITH SPECIAL REFERENCE TO HOUSING", which is being submitted by Shri Ravi Shanker Sharma in partial fulfilment for the award of the degree of Master of Architecture of the UNIVERSITY OF ROORKEE, ROORKEE, is a record of student's own work carried out by him under my Supervision and Guidance. The matter embodied in this dissertation has not been submitted for the award of any other Degree or Diploma.

This is further to certify that he has worked for a period of seven months from January 1974 to July 1974 for preparing the dissertation for Master of Architecture at this University.

ROORKEE

AUGUST 1974

Vijay Kumar 19/8/74

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A C K N O W L E D G E M E N T

I express my deep and heartfelt gratitude to my thesis guide, Professor Vijay Kumar of the Department of Architecture, Roorkee, for the inspiration, encouragement to think originally, and freely giving his valuable time for discussion.

My sincere thanks are due to Prof. R.K. Sahu, Prof. K.C. Kembo, Shree Vishwamitter Thesis Coordinator M. Arch. of Department of Architecture, Roorkee for their kind help and time to time guidance. I must gratefully acknowledge the assistance given by the Staff of S.E.U. Office, U.O.R. in terms of supplying data pertaining to the development of Campus with reference to housing. I will be failing in my duty, If I do not acknowledge the facilities extended by Shri Varade, Architect, H.P. University, Simla.

Last and the most important, I wish to express my heart felt appreciation and deep gratitude to Prof. Rattan Kumar, Head of Department of Architecture, University of Roorkee, Roorkee without whose assistance and able guidance this dissertation could not have been brought to this level.

ROORKEE

RAVI SHANKER SHARMA

AUGUST 1974

P R E F A C E

Campus development and building design comprises a very large proportion of work of architects and planners. This has been true in the past decade, and can be attributed to the vast ten year increase in the volume. When one examines the Literature or the drawing documents presently available, it is observed that most of it deals with the past design and planning procedures, but no document plan depict the system of development with special reference to housing for the campus in future.

This dissertation primary deals with the development plan, of University of Roorkee Campus with special reference to housing, and introduces a system which is new in form, content and procedure. It reflects the techniques, which may not be termed as new, but certainly a boon to the old campuses, which are facing shortage of land and whereas activities are increasing.

The dissertation is mainly in three parts. The first deals with the rebuilding the declined areas and future requirements. The second deals with the appraisal of present campus and lastly the main areas of development for housing and phasing of the plan, but a complete dissertation covering the entire field is beyond the scope of any single thesis; however, the author has endeavoured to make this work comprehensive as possible in respect of housing development.

The development plan is therefore essential to the working of the planning system, and the quality of development plan is important factor in determining the success or failure of the operation.

The author does not claim this to be completely original contribution in all its empassing and the ideas presented can be regarded as an assimilation of data, supplemented by talks with Ex-Architects of the U.O.R. Campus from time to time, survey and visits to some Universities such as Himachal Pradesh University, Simla, Punjabi University, Patiala and author's involvement in the preparation of interim development plan of U.P. Agricultural University, Pantnagar, with Mr. Mack Swing, Head of Architecture Department, University of Illinois.

The author is indebted to those who have been quoted in the dissertation, to those who have contributed to it in the way of ideas or information and to those from whom illustrations have been obtained.

It is further sincerely hoped that this dissertation will provide a guide line for the architects who are involved in the design of buildings in the Campus and over all to those, who are interested in the Campus development.

C O N T E N T S

LIST OF ILLUSTRATIONS

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CHAPTER I

HISTORICAL BACKGROUND

1.0 The Thompson College, the oldest Engineering College in India owes its birth to the waters of mother Ganges. Without the river ganges there would have been no canal of that name, and without canal, no college at Roorkee.

The establishment of an Engineering College at Roorkee was suggested to the Hon. James Thompson, Lieutinant Governor of H.W. provinces about 1846, by Colonel Cautley of Bengal Engineers, who had been Supdt. General of Canals since 1836 and was busily engaged in scheme.

The proposal made to Governor stated, on Sept. 23rd, 1847.

"The establishments now forming at Roorkee near the Solani aquaduct on the Ganges Canal, afford peculiar facilities for instructing Civil Engineers. There are two Workshops, and most important structures in course of formation. There are also a Library and model room, above all a number of Scientific and experienced officers are constantly assembled on the spot, or occasionally resorting thither. These officers however all have their appropriate and engrossing duties to perform and cannot give time for that careful and systematic instruction which is necessary for the formation of an expert

Civil Engineer. On these accounts the Lt. Governor would propose the establishment at Roorkee of an institution for the education of Civil Engineers, which should be under the direction of ~~the~~ the Local Government in the education department".

The proposal obtained the immediate and cordial support of the Governor General in India on Oct. 19, 1847, Lieutinent R. Meclagan of the Engineers, was appointed Principal of the College and on Nov. 25th of the same year a prospectus was issued, the establishment being fixed at a Principal, a headmaster, an architectural drawing master, and two Indian teachers.

1.1 The prospectus provided for the three departments in the College.

1. The first department for sub-assistant Civil Engineers for 8 Nos.
2. The second department for European non commissioned officers and soldiers 10 Nos. as overseers.
3. Third department for Indian desiring free instructions in surveying, levelling and drawing 16 nos.
4.

First students were admitted on 1st January 1848 by the transfer of a few young Indians who were being instructed by Major W.E. Baker of the Bengal Engineers, the Director of the Ganges Canal.

The year 1848 was an important one in the history of Roorkee, 12 years after Ganges Canal work was recommended.

The year 1851 really marks the birth of the Thompson College. At the end of IInd Punjab wave, the Roorkee College, with its then existing establishment and accommodation was barely adequate for the instruction of the students. Mr. Thompson grasped the situation and prepared a scheme for enlargement.

In 1852 the building construction was started resembling Renaissance architecture, the original cost of buildings etc. was estimated at Rs. 1,56,217 and the annual charge for the College Rs. 83898.

The officers responsible for the selection and acquisition of the site for the thompson college and its estate showed wonderful judgement and foresight. They acquired in time 365 Acres of land, including the high ground on which the college itself was built facing North in direction of main range of Himalayas, the land was fertile, the water supply was ample and the locality healthy, while, within a mile or two some of the greatest engineering works in the world were in process of construction. It is recorded that construction work of college was nearing completion in 1854 and that all buildings including main were complete in January, 1856.

By 1873 the Library and Convocation Hall had been built, in 1896 the rear of the college had been closed by providing rooms for science department.

Until the year 1859 the institution at Roorkee continued to be known as the "Roorkee College" but in the year, court of Directors instituted a scholarship to be called the thompson scholarship in memory of Mr. Thompson and Governor General ordered Roorkee College to be called as Thompson College of Engineering.

By 1870, the number of students, had risen to 231, and the names of various classes had been altered. The senior department became "The Engineers Class" while the second Department the "upper subordinate class" and the third department the"lower subordinate class".

1.12 The history of the Thompson College of Civil Engineering since its establishment and subsequent elevation to the status of Roorkee University may be said to be divided into four periods, and the year 1875 marked the close of the first period. This period was characterised by the pecuniary aid given by Government to most students in the form of stipends. It was an area of pioneering in a backward country, and Government had, naturally, to bear the cost. But it was also a period of great industrial development and of great activity in the construction of railways, canals, roads and other aids to industrial enterprise. The public mind was opening to the benefits of public works and to the advantages of engineers as a profession.

1.13 The year, 1875 to 1893 constitute the second period during which, though the pecuiniary aid to students was to

a large extent done away with, most of the students paid practically nothing for their education. The training, however, was limited to Civil Engineering, Surveying and allied subjects. Technical or industrial classes did not exist.

1.1.4 The years 1896 to 1920 may be considered as the third period of the development of the college. It was reorganized in 1896 to the effect that all students henceforward, except soldiers, would pay fees for their education. This change far from injuriously affecting the college, added to its efficiency and activity. The number of applications for admission began to exceed the number of seats available and it became necessary to insist on a process of selection whereby only those who stood highest in a competitive admission examination could be admitted. From this time onwards, the college did not concern itself only with the education of engineers and subordinates but its scope was extended to include industrial and technical education.

The administration of college was transferred from the control of the Public Works Department to that of the Education Department and the College was attached to the Allahabad University. Educational qualifying tests were brought into force in 1895. In 1896 the first revised

entrance examination, applicable to both British and Indian students was held.

In the year 1900-1920 several developments of the college as a technical institute took place. Leiutenant Governor at that time - Sir John Hawett was greatly interested in industrial and technical education. During these years, technical courses in Mechanical, Electrical, Automobile and textile Engineering were developed at the subordinate level. In 1922, the first Overseer class was started.

1.15 The years 1920 to 1942 constitute the 4th period in the development of the thompason College of Civil Engineering. A reorganization committee was appointed under the chairmanship of Late Raja Jwala Prasad (Retd. Chief Engineer and Pro-Vice Chancellor of B.H.U.) to inquire generally into the reorganization of the college. This committee recommended, besides various improvements in the internal working of the college, that the college should be developed as a centre of training in all branches of Engineering, like Civil, Electrical, Mechanical, Aeronautical etc. this committee was further of the view that, instead of being affiliated to any University, the college should be immediately converted into a Statutory and autonomous technical University.

Mechanical and Electrical Engineering Departments were added in 1946-47 and the Thomason College of Engineering

was elevated to the status of an University by the grant of Charter on November 25, 1949, and major construction was started after 1955 when gradually all other departments except Civil, Mechanical and Electrical Engineering departments came into existence.

IF UTTAR PRADESH were a country, the State would be the World's ninth largest in the population, having 73.7 million in the 1962 census. With one of the highest birth rates and one of the lowest per capita incomes in India, the state is one of the poorest in the country .... nonthless, because of the importance of Uttar Pradesh, what happen to its economy will greatly affect the national economy*.

1.2 UNIVERSITY OF ROORKEE, ROORKEE

Introductory

The Thomason College of Engineering was established in 1847. The institution was raised to the status of a University on 25th November 1949 by the University Act of 1948 (U.P. No.IX of 1948).

Jurisdiction

The jurisdiction of the University extends over the district of Saharanpur. There are departments of science and engineering with other core facilities departments.

Constitution

The authorities of the University are the Senate;

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* Techno-economic survey of Uttar Pradesh, National Council of Applied Economic Research, New Delhi, April,1965.

Syndicate; Finance Committee; Academic Council; Boards of Studies. The senate publishes the Annual Report, considers the accounts, selects representatives for various committees, and deals with other allied matters of importance The syndicate regulates the finances. The Academic Council considers the recommendations of the Board of Studies.

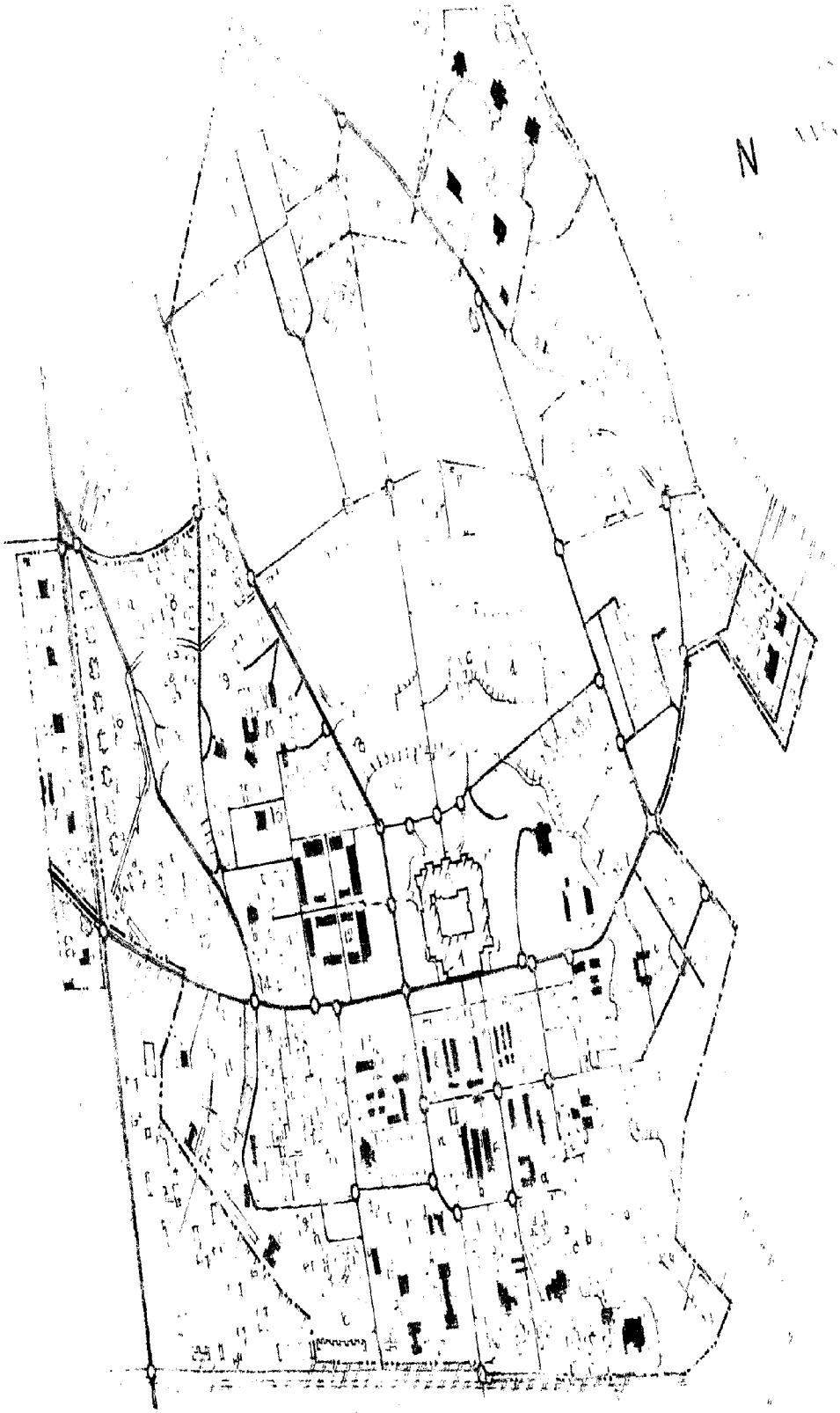
Miscellaneous

The University has Halls of Residence (hostels), maintains a hospital with fully furnished wards, under the charge of a whole-time Medical Superintendent and a Medical Officer. University has separate clubs for the students of post graduate and degree classes exist near their respective Bhawans. Indoor games and recreational facilities are available in them.

With its rapid expanding research and reoriented research, resident instruction, and national service scheme, consolidation M.E. courses, and others is playing a leading role in the technical revolution in the State and contributing greatly to the economic development of Uttar Pradesh. Roorkee University is showing a pattern of development similar to the technical Universities in the United States, gradually expanding the scope of its curriculum from Engineering to applied technology of related fields, and it is likely that in near future that the University's program will eventually include all major areas of knowledge of

applied sciences.

During the past five years, University of Roorkee has experienced a four-fold increase in enrolment. Close to Rs. 60 lakhs has been spent in recent years on construction, largely housing, but this did not begin to match the expanding needs of the University for construction.


N
REFERENCES
MAIN BUILDING
WAR TIME BLDGS.

13 INDEX TO PLAN OF COLLEGE ESTATE PRIOR TO - 1942

26. Staff Quarters
27. Staff Quarters
28. Staff Quarters
29. Staff Quarters
30. Overseer Master's Quarters.

31. Overseer Master's Quarters
32. Overseer Master's Quarters
33. Senior Clerks Quarters
34. Senior Clerks Quarters
35. Junior Clerks Quarters
36. Junior Clerks Quarters
37. Junior Clerks Quarters
38. Dairy Supdts. Quarters
39. Librarians Quarters
40. C.E. Class Hostels

41. C.E. Class Hostel
42. C.E. Class Hostel
43. C.E. Class Hostel
44. C.E. Class Hostel
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48. C.E. Class Hostel
49. C.E. Class Hostel
50. C.E. Class Hostel

51. C.E. Class Hostel
52. C.E. Class Hostel
53. Cook House C.E. Class
54. Indian E.C. Club
55. Engineer Class Mess
56. A Racquet Court
56. B Squash Racquet Courts
56. C 1 Squash Racquet Court
57. Overseer Class Hostel
58. Overseer Class Hostel
59. Overseer Class Hostel
60. Overseer Class Hostel

61. Overseer Class Hostel
62. Cookhouse Overseer Class
63. Dispensary
64. Sote Godown
65. Bullock Shed
66. Bazaar Building
67. Store and Dairy
68. Cricker Pavilian
69. A Well and Pump
69. B Well and Pump
69. C Well and Pump.

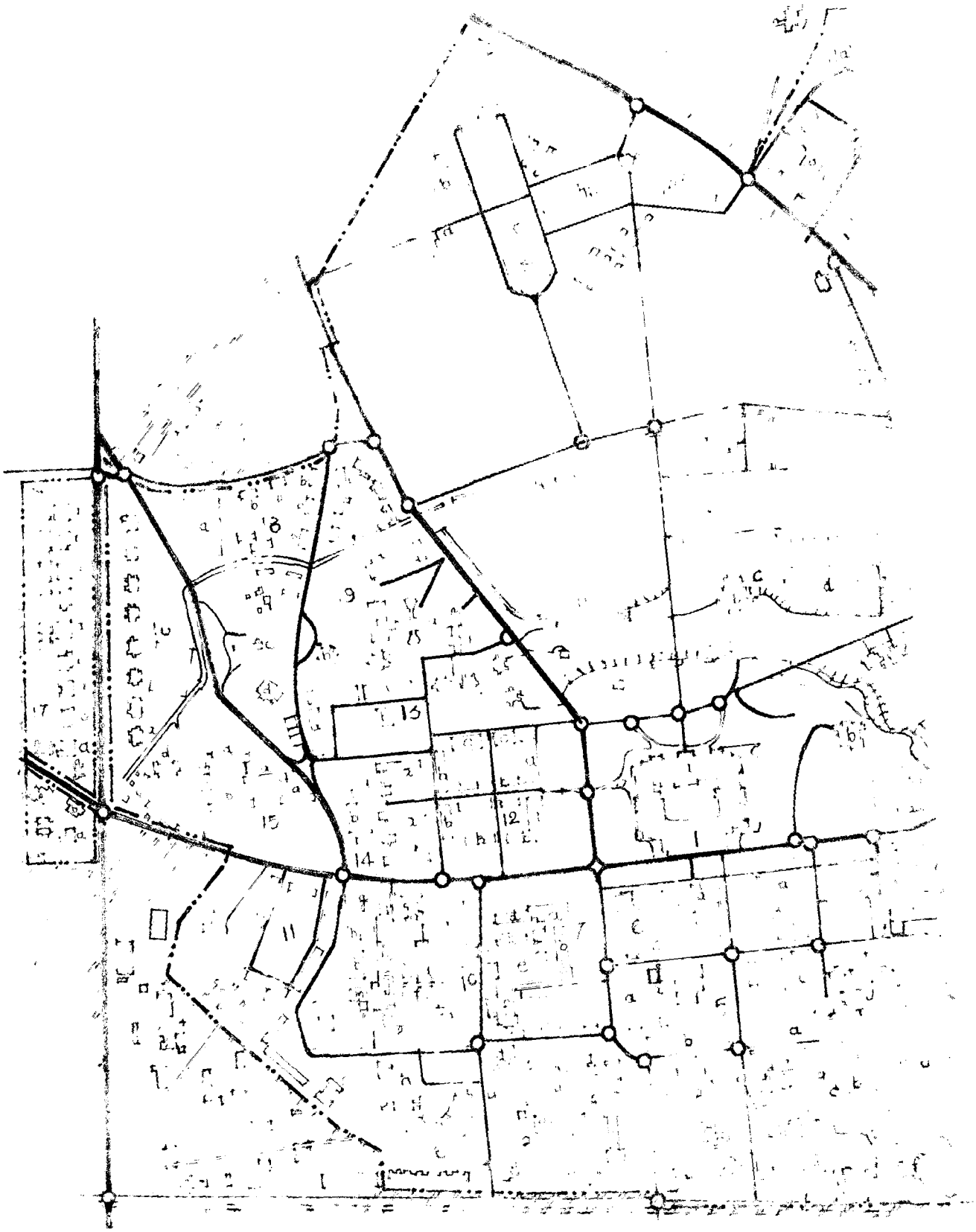
LIST OF S.M.E. BUILDING WITHIN THOMASON COLLEGE ESTATE

CONSTRUCTED FOR S.M.E. 1932

LOCATION	DESCRIPTION	DIMENSIONS	PRESENT USE
1.	Lahore Shed No.6	100' x 40'	Q.M. Stores
2.	Lahore Shed No.7	100' x 40'	T.E.O'S Stores
3.	Lahore Shed No.8	100' x 40'	Stationery & T.E.O's Stores
4.	Lahore S-hed No.9	100' x 40'	I.O.Rs. Canteen Depot Btn.
5.	S.W.P. Hanger	150' x 204'	Exibition Models Shed
6.	Lahore S-hed No.10	80' x 40'	Experimental Shed Officers.
7.	T.G.Shed Extension	37' x 25'	Black Smith Shop
8.	Double T.G.Shed	192' x 38'	Expt-Work shop
9.	Double Lahore Shed	200' x 40'	Refridgerator Shed
10.	Lahore S hed No.5	100' x 40'	Compressor Shed
11.	Lahore S-hed Np.2	100' x 40'	Mixer Shed
12.	S.N. Hut No.3	36' x 18'	E&M No.1 Platton Stores
13.	S.N. Hut No.2	36' x 18'	No.1*Platton Machine Stores.
14.	Twin Nissen Hut No.1	91' x 76'	Plant Shed
15.	Lahore Shed No.1	100' x 40'	Pump Shed
16.	S.M.E. Cinema	70' x 20'	Cinema Pictures.
17.	M.T. Petrol Stores	16' x 16'	Petrol Stores
18.	Carpenter'd Shop Ext.	60' x 25'	Carpenters' Shop Extension
19.	South Side Extension Carpenters Shop	25' x 25'	Carpenters' Shop For Classes
20.	T.G. Shed No.1	96' x 37'	Heavy Stripping
21.	Double Nissen Hut	91' x 7 1'	Engine Shop No.1Platoon
22.	Single Nissen Hut	38' x 19&	Machine Stores
23.	Electric Laboratory	60' x 30'	Electric Shop
24.	Cinema Stores	19½ x 19'	Cinematograph film Stores
25.	Black Smith Shop	70' x 23'	Black Smith shop
26.	Welding shop	40' x 32'	Welding shop
27.	T.G. Shed No.4	96' x 36'	Air Conditioned Lecture Room
28.	Sgts. Quarters	100' x 35'	Sgts. Quarters with two Kitchens of 14'x18'
29.	Sgts. Wquarters	50' x 29'	W.O.& Sgts. Quarters
30.	Sgts. Mess	101' x 33'	B.D. Rs. Mess

31.	Sgts. Quarters	36' x 16'	Sgts. Quarters with Kitchen each 14'x18'
32.	Single Nissen Hut	36' x 18'	U.O.T.C.
33.	Lavotry.Mess	20' x 14'	Mess Lavotory
34.	Extension to QR.49	105' x 16'	Verl. C.H. & Court Yard
35.	Extension to QR.51	105' x16'	-do-
36.	Extensions to QR.50	105' x 23'	-do-
37.	Nursing Sisters' QRS	118' x 34'	Nursing Sisters' Qrs.
38.	-do-	172' x 34'	-do-
39.	-do-	172' x 34'	-do-
40.	Recheation Bk	188' x 28'	Sisters' Recreation Bk.
41.	Cook House to Mess	44' x 26'	Cook House to Sisters' Mess
42.	Out Houses	132' x 27	Un Occppides
43.	Servants' QRS	23' x 18'	Servants' Qrs.
44.	-do-	23' x 18'	-do-
45.	Latrines	50' x 12'	Servants' Latrines
45.	Nursis Quarters	136' x 36'	Nursing Sisters' Qrs.
46.	-do-	203' x 36'	Hursing Sisters' Qrs.
47.	-do-	203' x 36'	Un-Occupied
48.	=do-	198' x 34'	Nusing Sisters' Qrs.
49.	-do-	198' x 38'	-do-
50.	M.T. Vehicles Shed	72' x 38'	M.T. Vehicles Shed
51.	Reserv Water Tank	81' x 50'	Swimming Pool
52.	W.A.C.(1) QRS	85' x 34'	Asstt. Engineers' Qrs.
53.	-do-	43' x 28'	-do-
54.	-do-	132' x 28'	Officers' Mess A.E.
55.	W.A.C.(1) Mess Kitchen	26' x 20'	-do Kitchen
56.	-do- Out houses	19' x 18'	Servants' Quarters
57.	A Servants Latrines	12' x 10'	Sergants Latrines
58.	S.M.E. Depot Bk.	141' x 30'	S.M.E. Students' Qrs.
58-63	-do-	7(161'x30')	-do- with A.C. Sheet Proof
64.	-do-	161' x 30'	V.C.OS' & I.O.Rs. Qrs.
65-67	-do-	3(161'x30')	S.M.E. Students Qrs. with Thatched Roofs.
68.	S.M.E. Deptt: Bks.	161'x 30'	Sappers' Qrs.
68-A, 66-A, 58-A, 57-A	Urinals	5(15'x8')	Students' Latrines
69 to 71	BKS Outhouses	3(45'x23')	BKS Kitchen & Stores
72 to 74	BKS Bath Rooms	3(28'x13')	Students Bath rooms
75 to 78	-do-	4(28'x10')	-do-
79 to 82 and 83	BKS Out Houses	4(45'x23')	BKS: Kitchen & Stores
81.	T.E.O. Stores	73'x22'	T.E.O. Stores
82.	-do-	42'x22	T.E.O. Stores
85.	Reservan Water Tower	20x18'	Reserve Water Tank
86.	Utinals	18'x5'	Urinals
87.	Q.M.S Ration Stores	33'x22'	Q.M. Ration Stores
88.	Depot Bn.Offices	97'x30'	Depot.Bn.Offices
89.	-do-	123'x30'	-do-

89.	II. A. Qrs.	82'x30'	S. M. E. Officers' Qrs.
90.	-do-C. H.	20'x12'	QRS' Coott House
91.	Out Houses	47'x18'	II A Qrs. Out Houses
92.	-do-	47'x18'	11. A. Qrs. Out Houses
93.	Latrines	12'x10'	Servants' Latrines.
94.	Cook House	20'x8'	Cook House to Qrs.
95.	11. A. Qr.	83'x38'	SME Officers' Buglow
96.	Rifle Range	50'x30'	F. Range
97.	S&M. E. Officers' Qrs.	83'x38'	-do-
98.	Cook House	20'x12'	Cook House
99.	Out Houses	47'x39'	Servants Qrs.
100.	-do-	29'x18'	Out houses
101.	Cook House	20'x12'	Cook House
102.	11. B. Bunglow	66'x38'	SME Officers Qrs.
103.	-do-	66'x38'	-do-
104.	Cook House to 11. B. Qrs.	20'x12'	Cook House
105.	-do-	20'x12'	-do-
106.	11. B. Qrs.	66'x38	11. B. Qrs.
107.	11. B. Qrs.	66'x38'	SME Officers' Qrs.
108.	Cook House	20'x12'	Cook House
109.	Out Houses	29'x18'	Servants Qrs.
110.	Latrines	12'x10'	Servants Latrins
111.	Out Houses	29'x18'	Servants Qrs.
112.	-do-	-do-	-do-
113.	-do-	-do-	-do-
114.	-do-	-do-	-do-
115.	F. Range	100x4'	~~xxxxxxx~~ F. Range Wall
116.	Warrant Offrs. Qrs.	137'x30'	B. I. R. QRS.
117.	Cook House	28'x18'	Cook House
118.	Out Houses	56'x18'	Servants Qrs.
119.	Latrines	12'x10'	Servants Ltns.
120.	Warrant Offrs. QRS.	70'x30'	B. D. R. Qrs.
121	Cook House	28'x18'	Cook House
122.	F. Range Wall	18'x2'	F. Range Wall
123) 126)	Polo Ground Qrs.	4(38'x67')	SME Offr's Qrs.
127-133.	Polo Ground Qrs.	7(67'x38')	S&M Qrs.
133-A	Cook House with each Qrs.	11(20'X12')	1 Cookhouse with each qrs.
134.	Out Houses	120'x20'	Servants Qrs.
135.	-dp=	41'x20'	-do-
136.	=do-	80'x20'	-do-
137.	-do-	90'x20'	-do-
138.	Out houses	60'x20'	Se vants qrs.
139.	-do-	60'x20'	-do-
140-141	Servants Latns.	2(11'x10')	Not Used now
142-143	Students Dept) Latrines	2(28'x24')	SME DP HN Datns
144	-do-	33'x 14'	-do-
145.	Partition Wall	102x11'	Partition Wall



1.5 UP TO DATE PLAN 1955 AFTER WHICH MAJOR CONSTRUCTION TOOK PLACE:

Sector No. 1 Administration

a. University Main building.

b. V.C.'s Lodge.

c. Out houses and servant quarters.

Sector No. 7 Recreational

a. Engineering Student Club

b. Cooperative Store - Post Office.

Sector No. 8 - Hostels

a. Wardens Residence.

b. Lecturers Suits.

Sector No. 9 - Hospital

a. Out patient department.

b. Hospital Supdt. Residence.

Sector No. 10 - Educational & Industrial

a to N Workshops

except G.h.

Sector No. 11 - Residential

a. Punjab Engineering College Hostels

b. Central Store.

c. Staff Quarters.

Sector No. 12 - Residential

a. Professors Residences.

b. Lecturers Residences.

c. Readers Residences.

Sector No. 13 - Staff Residential

b. Senior Readers Residence.

Sector No. 17 - Residential

a. Readers Residence

Sector No. 18 - Recreational

b. Staff Residences.

c. Staff Residences.

e. Church

Sector No. 22 - Staff Residential

a. Professors Residences.

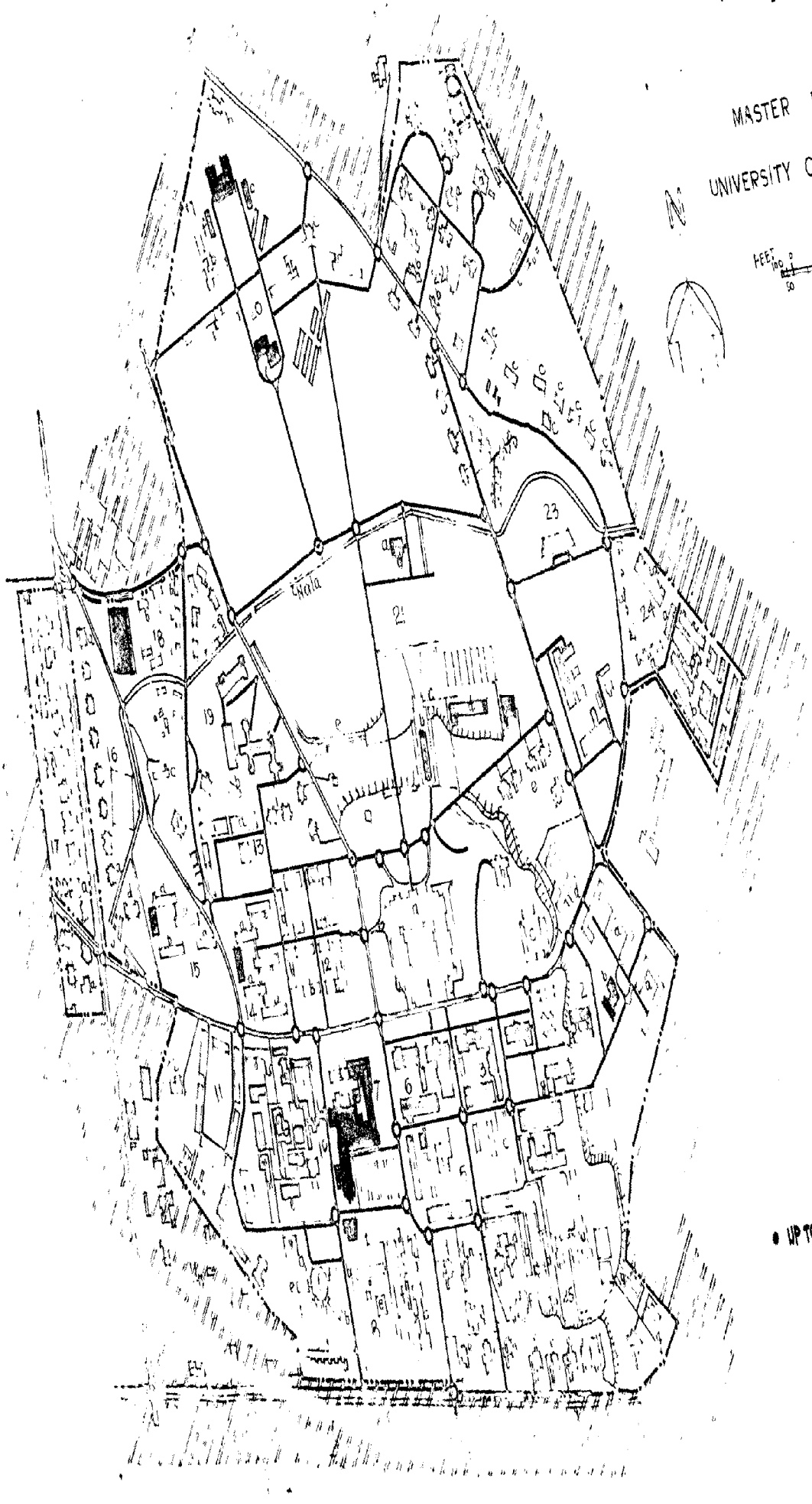
c. Staff Residences.

Sector No. 24 - Residential

c. Junior Staff Residences.

Sector No. 25 - Residential

f. Professors Residences.



• UP TODATE PLAN

FIG. 1·6

1.6 UPTODATE PLAN

SECTOR No. 1 - ADMINISTRATION

(a) University Main building.
(b) V.C's Lodge.
(c) Out houses and Servants quarter.
(d) Sarojini Bhawan.
(e) Professor's residences.
(f) Auditorium.

SECTOR No. 2 - EDUCATIONAL

(a) (Nehru Bhawan) hostel for 300 P.G. & teacher trainees.
(b) Mess block
(c) School of Arch. with provision for school of town planning
(d) W.R. Training Centre and photogrammetry course building.
(e) Department of Geology and Geophysics.
(f) Civil Engg. Deptt. including Soil Engg. concrete and structure highway & P.H.E.
(g) Extension to Civil Engg. Deptt.
(h) Test Hall and wind tunnel.
(i) Model Hall for Civil Engg. Deptt.
(j) Hydraulics Laboratory and its future extension with 1000 feet long ship testing channel.

SECTOR No. 3 - EDUCATIONAL

(a) Department of Electrical Engg. its administration and laboratory.
(b) Electrical Machine Design Laboratory.

SECTOR NO. 4 - EDUCATIONAL

(a) Department of Mechanical Engg. its administration refrigration and air-conditioning labs.
(b) Steam and i.c. engine labs.
(c) Extension to mechanical Engg. Deptt. post graduate block.

SECTOR NO. 5 - EDUCATIONAL

(a) Department of Chemistry.
(b) Department of Physics and Mathematics.

SECTOR NO. 6 - EDUCATIONAL

(a) Library building.
(b) Department of Electronics & Communication (P.G. Block)
(c) Deptt. of Electronics & Communication (Under-graduate-block).

SECTOR NO. 7 - RECREATIONAL

(a) Engineering students club.
(b) Hobbies club (c) Hobbies workshop.
(d) Co-operative stores post office etc.
(e) Dining Hall for 1200 Engg. students.
(f) Dining Hall for 350 Engg. students.

SECTOR NO. 8 - HOSTELS

(a) Hostel for Engg. Students. 350 single s eated rooms.
(b) Hostel for P.G. students 60 single seated rooms.
(c) Lecturers suits.
(d) Amenity centre and cafeteria (govind bhawan).
(e) Wardens residence.
(f) Cycle Stand.

SECTOR No. 9- HOSPITAL

(a) Out patient department.
(b) Ward (c) Ward (d) Ward (e) Family ward.
(f) (i) X-ray department. (ii) electrical treatment department. (iii) operation unit. (iv) laboratory testing unit.
(g) hospital superintendent residence.
(h) nurses quarter 'g' type.

SECTOR NO. 10 - EDUCATIONAL & INDUSTRIAL

(a) Main workshop.
(b) office - pilot production cum-training centre.
(c) Carpentry shop.
(d) Class rooms.
(e) Meal shed.
(f) New hydraulic machine laboratory.
(g) mechanical engg. department production engg.
(h) moulding shop.
(i) carpentry shop.
(j) Sawing section.
(k) Air-seasoning shed.
(l) Frectional horse power motors unit.
(m) garages.
(n) Lavatories.

SECTOR NO. 11 - RESIDENTIAL

(a) Punjab Engg. College Hostels.
(b) Central Stores.
(c) Staff quarters.

SECTOR NO. 12 - STAFF RESIDENTIAL

(a) Professor's residences.
(b) Lecturers residences.
(c) Readers residences.

SECTOR NO. 13 - STAFF RESIDENTIAL

(a) Single storied lecturers residences.
(b) Senior Readers residences.
(c) Double storied readers residences.

SECTOR NO. 21 - RECREATIONAL

(a) Saraswati Temple.
(b) Swimming pool & open air theatre.
(c) Gymnasium (d) Squash courts and badminton courts
(e) Lal Bahadur Shastri Stadium.

SECTOR NO. 22 - STAFF RESIDENTIAL

(a) N.C.C. Offices Refresher Courses in Civil Engg. Public-Health Engg., Architecture etc. & University stores.
(b) Teachers hostel.
(c) School of Research and Training in Earthquake Engineering.

SECTOR NO. 24 - RESIDENTIAL

(a) Staff quarters type d.e.f. (Sheel Kunj).
(b) Staff Quarters type 'g'.
(c) Junior Grade Clerks Residence.

SECTOR NO. 25 - RESIDENTIAL

(a) Afro-Asian Hostel with 100 independent rooms.
(b) Garages and shops.
(c) Servents quarters 34 nos.
(d) Specialists residences (Junior).
(e) Specialists residences (Senior).
(f) Professors residences.
(g) Associate Professors residences.
(h) Squash Courts (Staff association).

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SECTOR NO. 13 - STAFF RESIDENTIAL

(a) Single storied lecturers residences.
(b) Senior Readers residences.
(c) Double storied readers residences.

SECTOR NO. 14 - STUDENTS RESIDENTIAL

(a) (Ravindra Bhawan) Hostel for Engineering students. 328 single seated rooms.
(b) amenity centre & cafeteria for Ravindra Bhawan.

SECTOR NO. 15 - STUDENTS RESIDENTIAL

(a) (Azad Bhawan) hostel for engineering students 219 single seated rooms.
(b) Hostel for engineering students. 57 triple seated rooms.
(c) amenity centre & cafeteria for Azad Bhawan.
(d) Wardens Residence.

SECTOR NO. 16 - STAFF RESIDENTIAL

(a) double storied lecturers residences.
(b) Adarsh Bal Niketan School & Furniture Stores.

SECTOR NO. 17 - STAFF RESIDENTIAL

(a) Readers residences.
(b) T.A.C. residences.
(c) Lecturers residences.

SECTOR NO. 18 - RECREATIONAL

(a) South West pacafic hanger with cinema hall.
(b) Staff residences.
(c) Church.
(d) Bungalow Ex. En. Northern division ganga canal.

SECTOR NO. 19 - EDUCATIONAL

(a) Department of chemical engineering.
(b) Department of Metallurgical Engineering.
(c) Staff residences.

SECTOR NO. 20 - HOSTEL & RECREATIONAL

(a) (Jawala Bhawan) Hostel for engineering students 204 double seated rooms.
(b) (Ganga Bhawan) Hostel for 324 engineering students.
(c) (Cautley Bhawan) Hostel for 312 engineering students.
(d) Dinning Hall for Ganga, Jawala & Cautley Bhawans.
(e) Amenity Centre & Cafeteria.
(f) Squash Courts.
(g) Extension to engineering students hostel.
(h) Wardens residence.
(i) Dipot battalion barracks.
(j) Lecturers residences at Malakpur (unit of Four).

SECTOR NO. 21 - RECREATIONAL

(a) Sarasvati Temple.
(b) Swimming pool & open air theatre.
(c) Gymnasium (d) Squash courts and badminton courts
(e) Lal Bahadur Shastri Stadium.

SECTOR NO. 22 - STAFF RESIDENTIAL

(a) N.C.C. Offices Refresher Courses in Civil Engg. Public-Health Engg., Architecture etc. & University stores.
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(d) Specialists residences (Junior).
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(f) Professors residences.
(g) Associate Professors residences.
(h) Squash Courts (Staff association).

CHAPTER II

EXISTING LAND USES

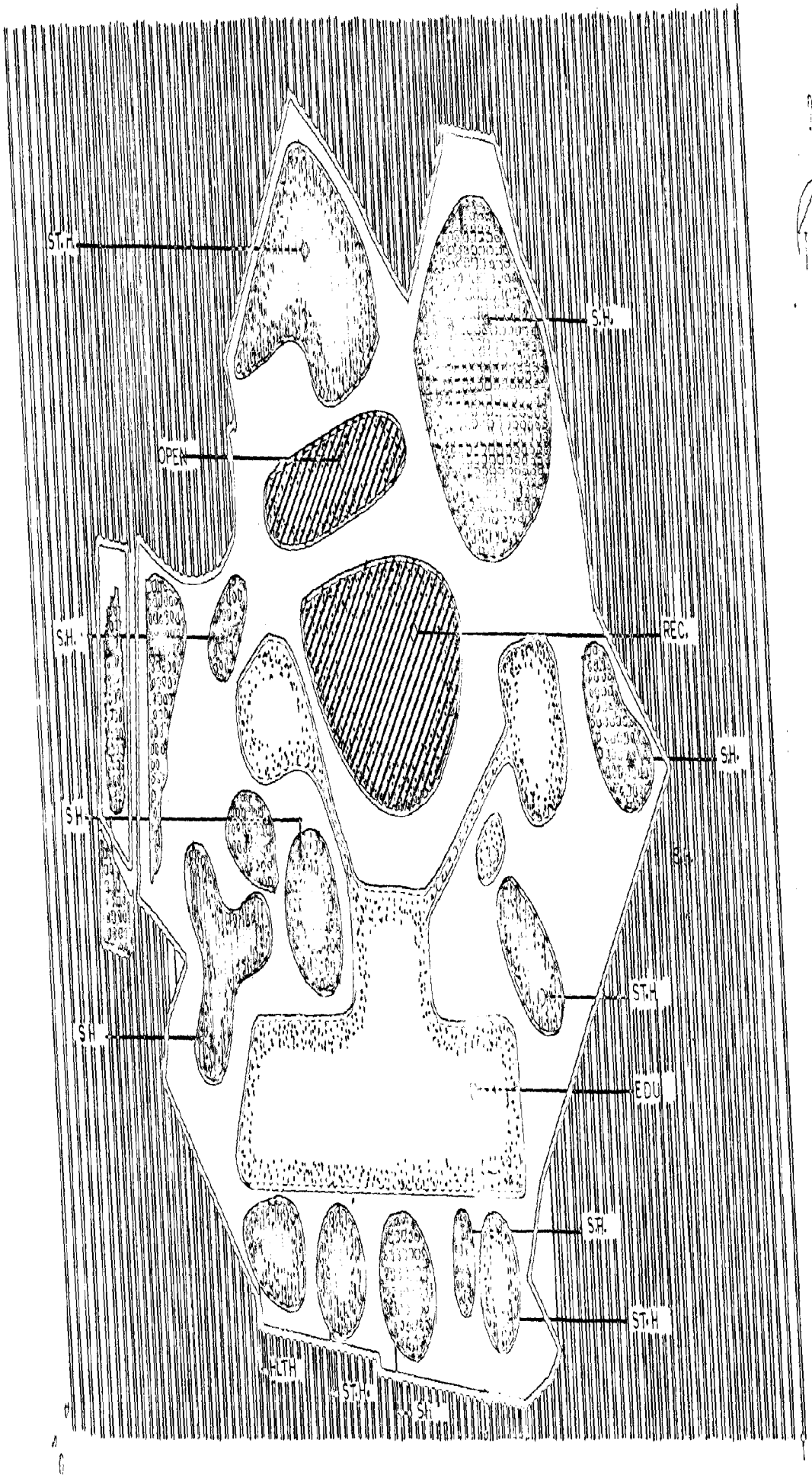
2.1 Special Structure of Land Use Within Campus

The land- use pattern is filled out in parts by the residences of University employees including teachers in the basic activities, and is given a dynamic quality ebb and flow. Open spaces for recreation before 1950 were sufficient but as the campus started growing, these spaces went on reducing due to the compactness of the campus.

The table no. 2, classifies the various uses of land, during respective five year plans starting from 1951. In this overall comparison is brought out in percentage of building bulk, community facilities, co-relation of land uses, etc.

The U.O.R. elevated from a level of a single college, on Nov. 25,1949 continuing to have the total area of 365 Acres as against 426 acres when the Thomason College of Engineering was started.

The residential colony of Central Building Research Institute and that of Central Structural Engineering Research Centre, has not yet been included in the municipal limit, since both the institutes are within the University campus.



UNIVERSITY OF ROORKEE

100 0 700

LAND USE TYPE BY ACRES

	EXISTING
RESIDENTIAL	45.54%
EDUCATIONAL	19.70 "
RECREATIONAL	20.66 "
ROADS	11.74 "

DENSITY/ACRE

OVER ALL	15
STUDENT	25
RESIDENTIAL	60

S.H = STUDENT HOUSING

ST.H = STAFF HOUSING

FIG. 2.3

LAND USE

Land to these institutes was given by the University on its similarity and functions and set up, it is sought proper to be treated under one head for the purpose of land use study.

The total area thus comes to 426 acres. University 365 acres and CBRI 61 acres falling on east side of civil lines and North of Roorkee Contonment. The major land uses in this division are as under:

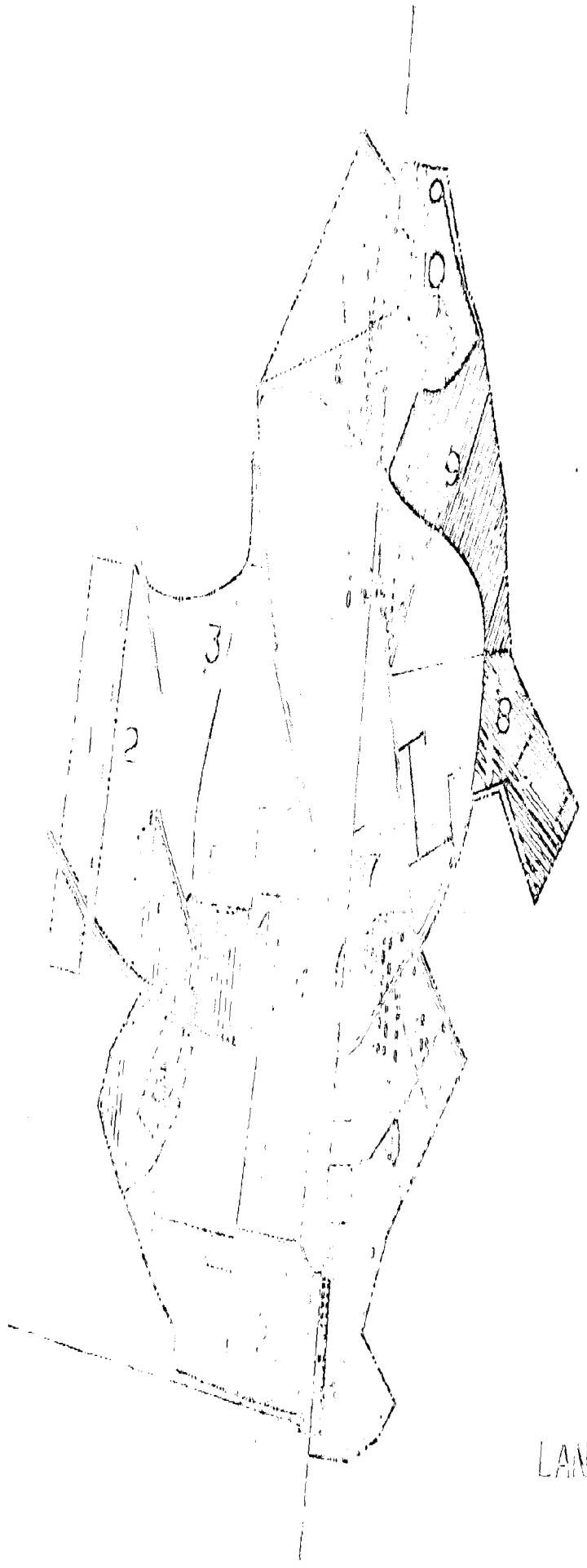
1. 45.54% is for residences of staff and students.
2. 19.70% under educational and research.
3. 20.66% is under recreational use having play grounds, clubs and stadium etc.
4. 11.74% goes to roads of the total area.

2. Residential Density

1. The campus having an area of 365 Acres, the overall density/acre is 15 persons.
2. The density with student population is 25 persons/acre.
3. The density is almost uniform from 30 to 60 persent/acre in residential areas.

The density is specially low due to the open play-grounds so necessary in educational institute of full residential nature.

As traced from last phase developments, it has been found that more %age of the campus area was utilized for recreational purposes and open spaces. Very



LAND USE : POPULATION DENSITY

FIG. 2.3.1

limited number of buildings were in existance, later on when campus started developing then bulk of educational building came and all centered on the Western side of the main building.

This action was most probably taken to save the view of Himalayas, open green spaces which make the main building as focus from west, 80% of the open lands were in front of main administrative block facing North.

Later on with the increase of educational buildings on Western side, the main building and its front lost the importance as per the functional requirements and remained secondary.

2.3.0 Academic Expansion

The land use on this campus has been of many purposes.

1. First priority for the land use has been for academic programs including the main teaching spaces/ buildings and other outdoor space requirements.

2. Academic facility development has been occuring at different levels of intensity as indicated by the stipulated area ratio, enrolment distribution of graduate and under graduate, and faculty and staff distribution.

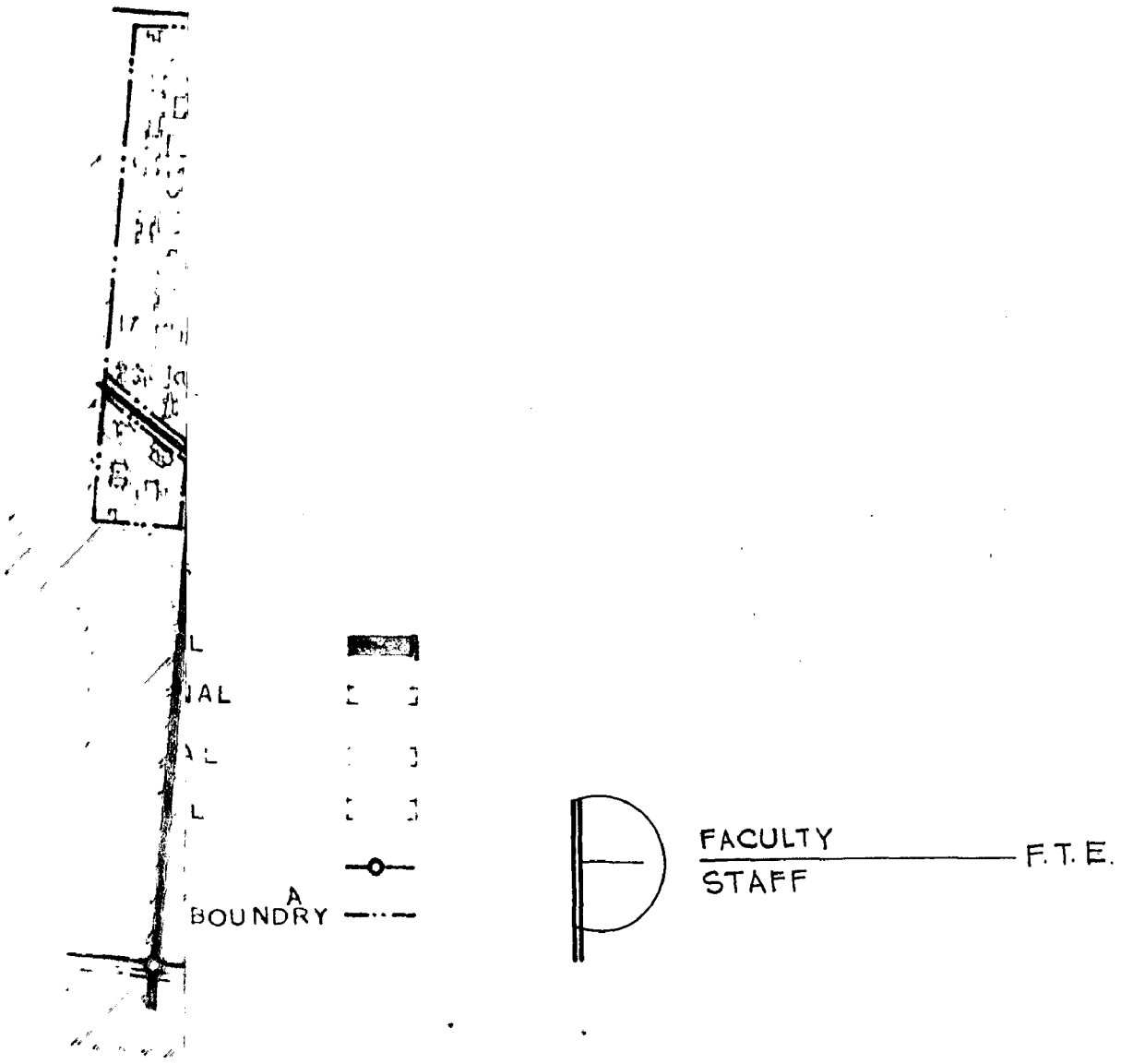
This distribution can further be elaborated by the F.T.E. which is full time equivalent. F.T.E. is the ratio between faculty and staff; and ratio between undergraduate and graduate.

The two figures no. 2.1. $\frac{2}{1}$ and 2.1. $\frac{2}{2}$ show the distribution of the areas occupied by each faculty. In existing land use analysis this distribution helps in calculating the area which is occupied by individual faculty and additional area needed for the possible future expansion in terms of staff housing and student housing.

Mainly the staff housing is dependent upon the development and expansion of the faculties. Presently the number of existing staff is known with the location of houses and for future requirements it helps to decide the number of houses and their proposed locations.

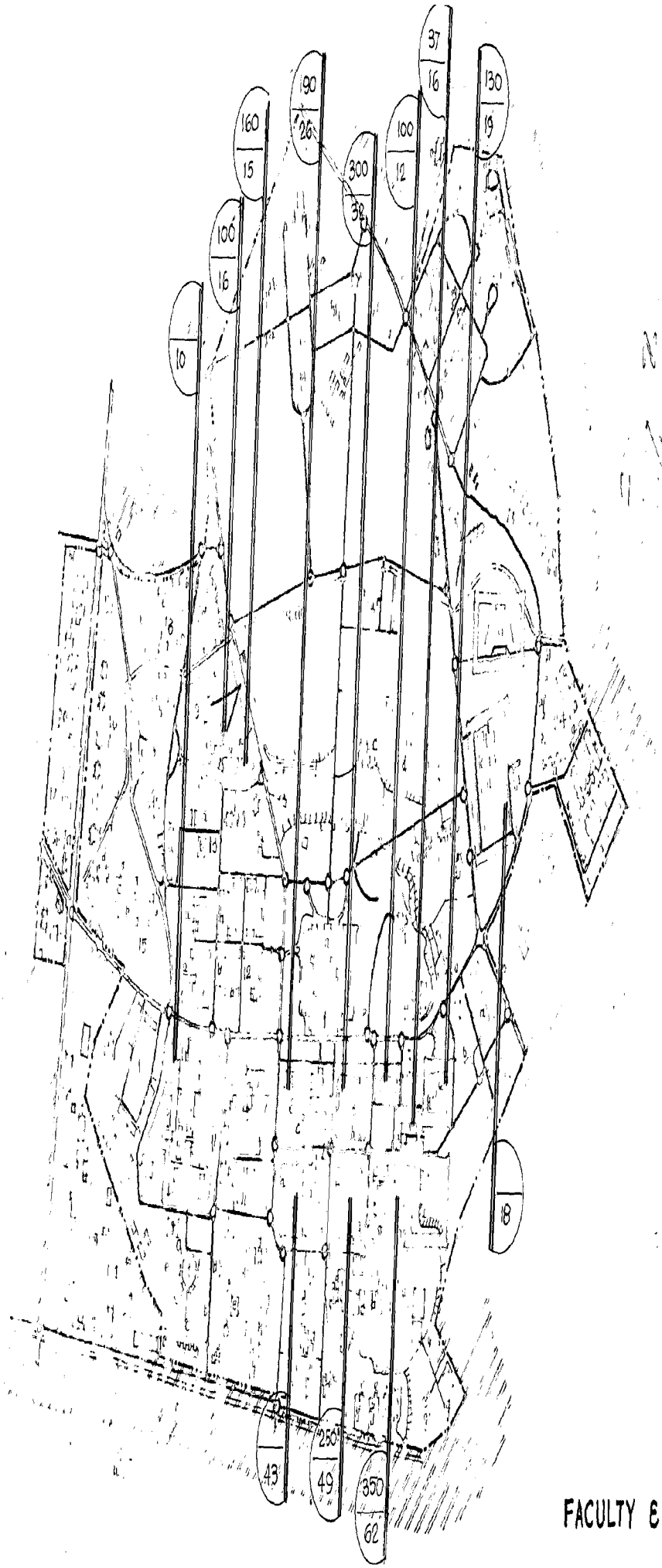
PLAN

F ROORKEE



DISTRIBUTION F.T.E. FULL TIME EQUIVALENT FACULTY & STAFF.

FIG. 2.3



...STE PLAN

...VERSITY OF ROORKEE

REFERENCES

EDUCATIONAL

RECREATIONAL

EDUCATIONAL

RESIDENTIAL

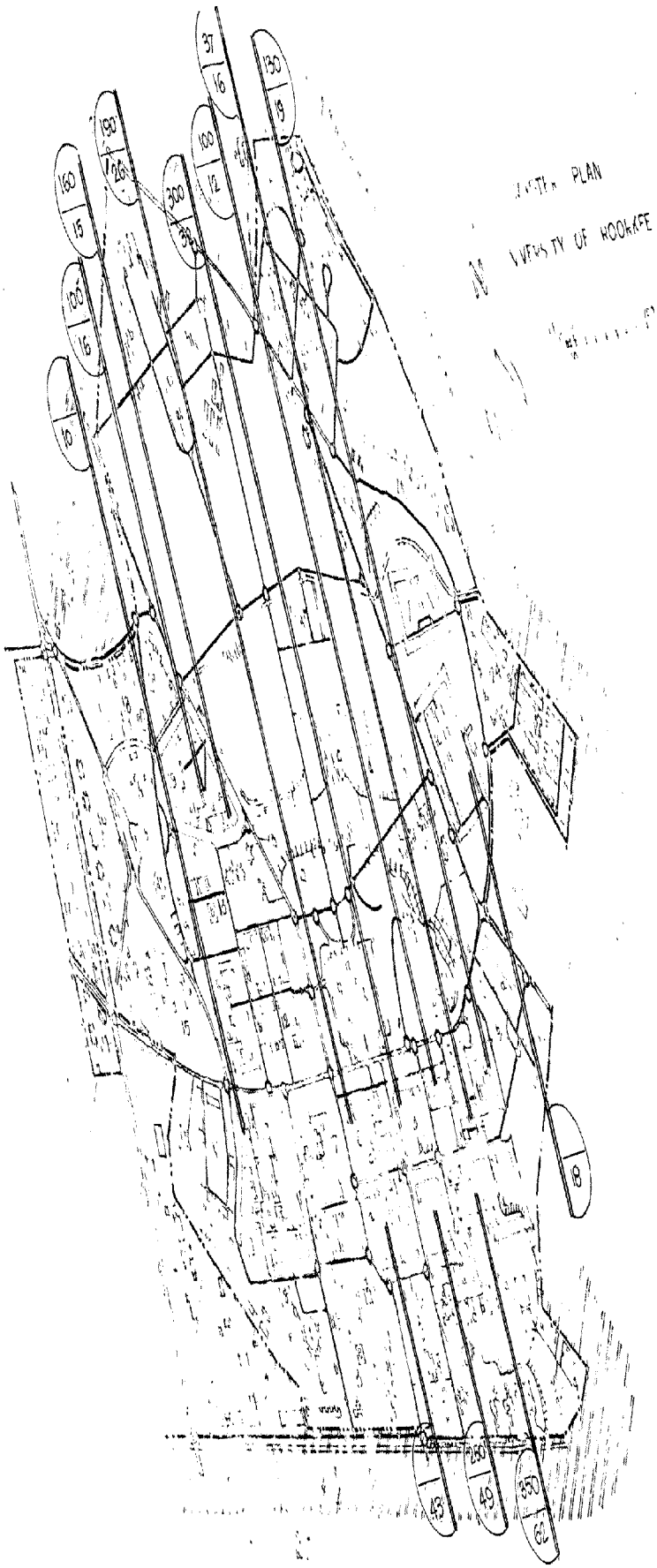
ROADS

UNIVERSITY BOUNDRY

FACULTY — F.T.E.
STAFF

FACULTY & STAFF DISTRIBUTION F.T.E. FULL TIME EQUIVALENT FACULTY & STAFF

FIG. 2.3



...STER PLAN

...VERSITY OF ROCKAFE

REFERENCES

EDUCATIONAL

RECREATIONAL

EDUCATIONAL

RESIDENTIAL

ROADS

UNIVERSITY BOUNDARY

FACULTY — F.T.E.
STAFF

FACULTY & STAFF DISTRIBUTION

F.T.E. FULL TIME EQUIVALENT
FACULTY & STAFF

FIG. 2.3

3. Academic facility expansion has been on Western side of the main administrative building which is focal point of the campus and the total academic area has been so closely knitted that there seems any possibility of future academic activities in the open pockets of land available within and around these academic buildings.

The close knitted academic buildings are as under :

i) Department of Civil Engineering

ii) Department of Electrical Engineering

iii) Department of Mechanical Engineering

iv) Department of Geology and Geophysics

v) Department of Electronics and Communication Engineering

vi) Water resources and development training centre.

vii) Departments of Physics, Chemistry, Mathematics and humanities which are core-facility departments.

viii) Department of Architecture

The other three departments which are not included in close knitted academic area are viz:

ix) Metallurgical Engineering Department and

x) Chemical Engineering Departments are located on

the N-E side of the main academic activities are

xi) Department of Earthquake Engineering.

xii) Department of refreshers course.

It is obvious from the present land use pattern that besides being Thomason College of Engineering the academic expansion was so rapid and to find space in the centrum of the campus. Gradually all other departments came one after the other and with a sufficient gap of time, and lands were allotted to these without giving thought in advance for future land uses and planning that's why so close knitted pattern has emerged out of that.

In the conclusions the new departments got sanctioned from time to time and were adjusted closeby main academic activities then, and todate with rapid expansion and increase of time, the most of the departments are clustered such that it is difficult to sort or distinguish with each other. The three departments, Metallurgical Engineering, Chemical Engineering, and Earthquake Engineering have been pushed out from the main academic core this has been only because of non-availability of land in the close vicinity. But seems now a right judgement on seeing the present jumbling of land

uses in academic side, which may be termed as by chance.

2.4 OPEN SPACE

Open spaces are considered as the second priority use of land. Open spaces are permanently preserved and expanded accordingly to proposals calling for an additional acreage for such development.

The ultimate creation of an open spaces in parks and play fields encircling the high density centres and a system of open spaces within the concentration of academic facilities, mainly the use of these open spaces in academic centres and other residential areas fall into two categories.

i) Positive open spaces

ii) Negative open spaces

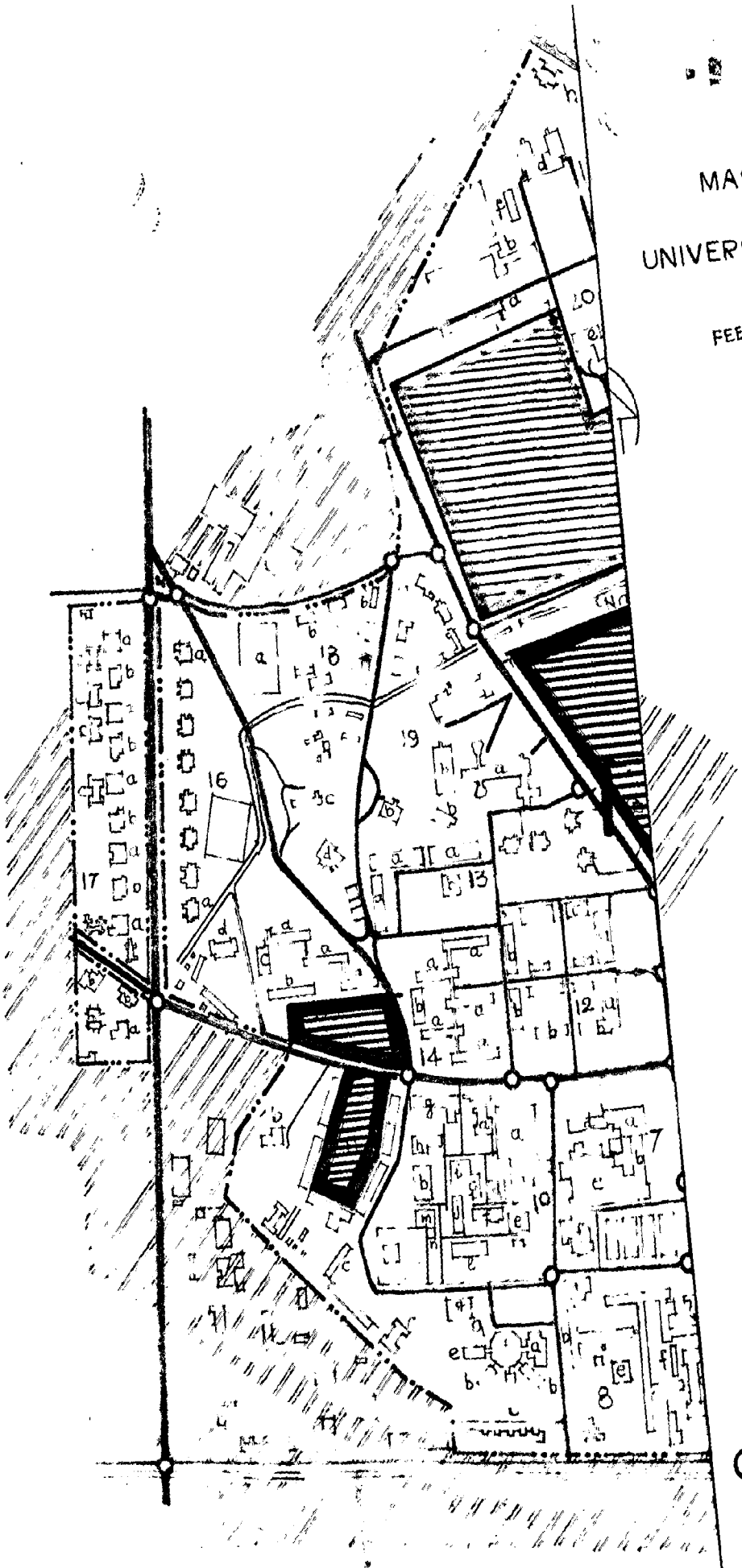
Positive spaces are those which are used for different and practical activities besides achieving proper ventilation and environmental aspects and the utilization should be to the extent of 80%. Such spaces amount to be 80% of the total open space within and around the existing structures.

Negative spaces are those which are not utilized for activities of day to day pertaining to the section of academic side or society of the residential area, such

MASTER PLAN

UNIVERSITY OF ROORKEE

FEET 100 0 50 700



REFERENCES

EDUCATIONAL

RECREATIONAL

EDUCATIONAL

RESIDENTIAL

ROADS

UNIVERSITY BOUNDRY

OPEN SPACE

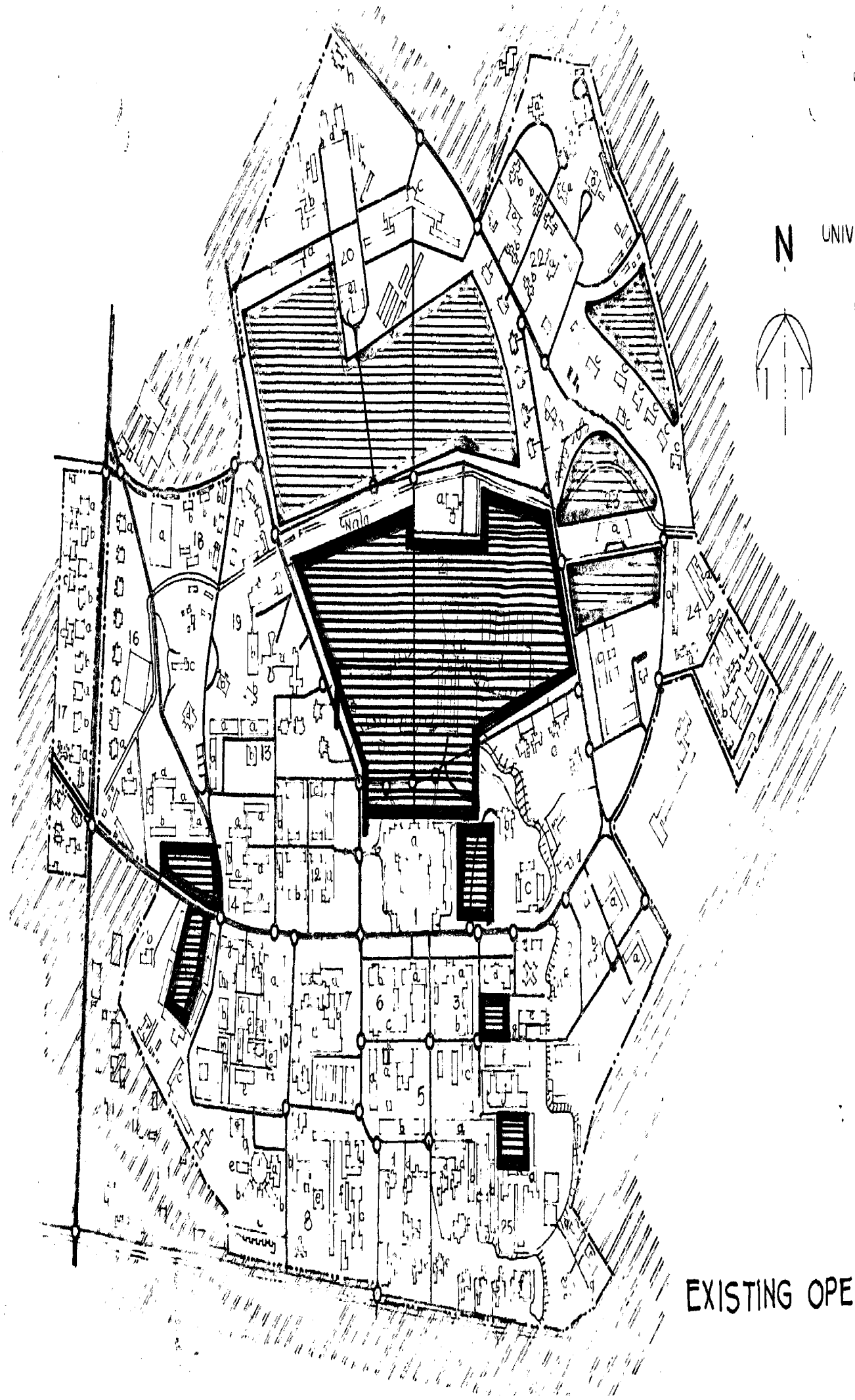
FIG. 2·4

MASTER PLAN

UNIVERSITY OF ROORKEE

N

FEET 100 0 100 200 300



REFERENCES

EDUCATIONAL

RECREATIONAL

EDUCATIONAL

RESIDENTIAL

ROADS

UNIVERSITY BOUNDARY

EXISTING OPEN SPACE

FIG. 2.4

spaces are the creation of improper planning or planning without future thought based development plan. These mostly happen when additional buildings are inserted into the open considered area between the existing structures. For calculation purposes, these areas are termed negative when the utilization is limited to 20% only are such spaces are about 20% in and around existing structures.

In recognition of the value of major open space to the Livability of dense areas and the benefits to both the campus/Academic and adjacent neighbourhood populations, the following open spaces are in existance in the campus which are presently in terms of recreational open spaces and multipurpose free open spaces. They are as follows:

i) Main recreational open space between main administrative building and Saraswati temple i.e. S-N, and on other direction between Earthquake Engineering Department and the Departments of Metallurgical and Chemical Engineering E-W.

ii) Space between V.C.'s bungalow and main building.

iii) Space between Deptt. of W.R.D.T.C. and Deptt. of Civil Engineering.

iv) Space between Hydraulics Laboratory and Afro-Asian Hostel.

v) Spaces in Azad Bhavan on Western side and East Punjab Hostel, Central compound.

The other open spaces which are being considered as multipurpose in the present context are:

i) Space surround by reader's quarters, Jwala Bhawan, Ganga Bhawan and Saraswati temple.

ii) Space behind professors residences on N-E side of teachers hostel.

iii) Spaces behind and in front of refresher's course centre.

2.5 EXISTING LAND DEVELOPMENT CHARACTERISTICS

In the existing land use pattern, with functional and environmental goals which are coming out are with different characteristics of development and is divided into various parts of the campus. Basically, two environmental types encompass the distinctive criteria for campus sub-areas.

These are areas with density such as ACADEMIC and RESIDENTIAL and OPEN SPACE DOMINANT areas.

In the present context the high density concept is applicable to the main academic areas of the campus and housing areas.

These areas are relatively densely put as regards building construction and by the sophisticated design of the interspaces between buildings and other out door spaces which is termed as net work of buildings and spaces. The most of existing housing which is emerging from the U.G.R. plan is located on the periphery of the campus areas. While allowing necessary traffic, inspite of all the limited automobile traffic is experienced in the campus. This results in that padestrian is given priority and where the environment produced is ideal for the pursuits of the University community. Newer areas recently developed have greater density that old existing areas.

The open space dominant concept is looked to be applied to the campus with old buildings and surrounding different density centres. These areas contained buildings but the feeling of out door spaces was predominant. At present the function of these areas is to support certain kind of use but at the same time to provide other values within the context of total development of the campus. They preserve the heritage of natural beauty and ecological viability of the campus

setting. Presently some dominant open areas provide relief and a contrast to the more crowded conditions of buildings in the other areas of campus. Finally these areas provide outdoor and recreational opportunities for the campus population and for the citizens of the community at large.

The uses in the open areas which are space dominant may include campus housing, for single and married students, major parking areas, indoor recreation and athletic facilities as well as service, research and other utilities. To serve purposes of nature enjoyment and study, great portions of these areas should remain as a naturalistic preserve.

The three main and major sub-areas of the campus are there which look, as have been prepared on environment planning and design concepts. These include the following:

1. The centrum of the campus covering main administrative building and its surroundings.

2. Extreme northern part of the campus covering Jwala Bhawan, Cautley Bhawan and Ganga Bhawan.

3. Eastern side of main building, covering Architecture Department, Jwahar Bhawan, and Department of Earthquake Engineering. This section has been prepared

to point out general objectives, type of development of major segment of the campus, mentioning the relationship of different spaces.

2.5.1 Existing functional clustering

The campus purely of academic nature and residential, the clustering of related facilities are of importance and the factor in achieving communication among the University Community. As growth and expansion have continued, four general clusters have emerged.

i) Civil Engineering and other applied construction fields.

ii) Electrical and Electronics Engineering.

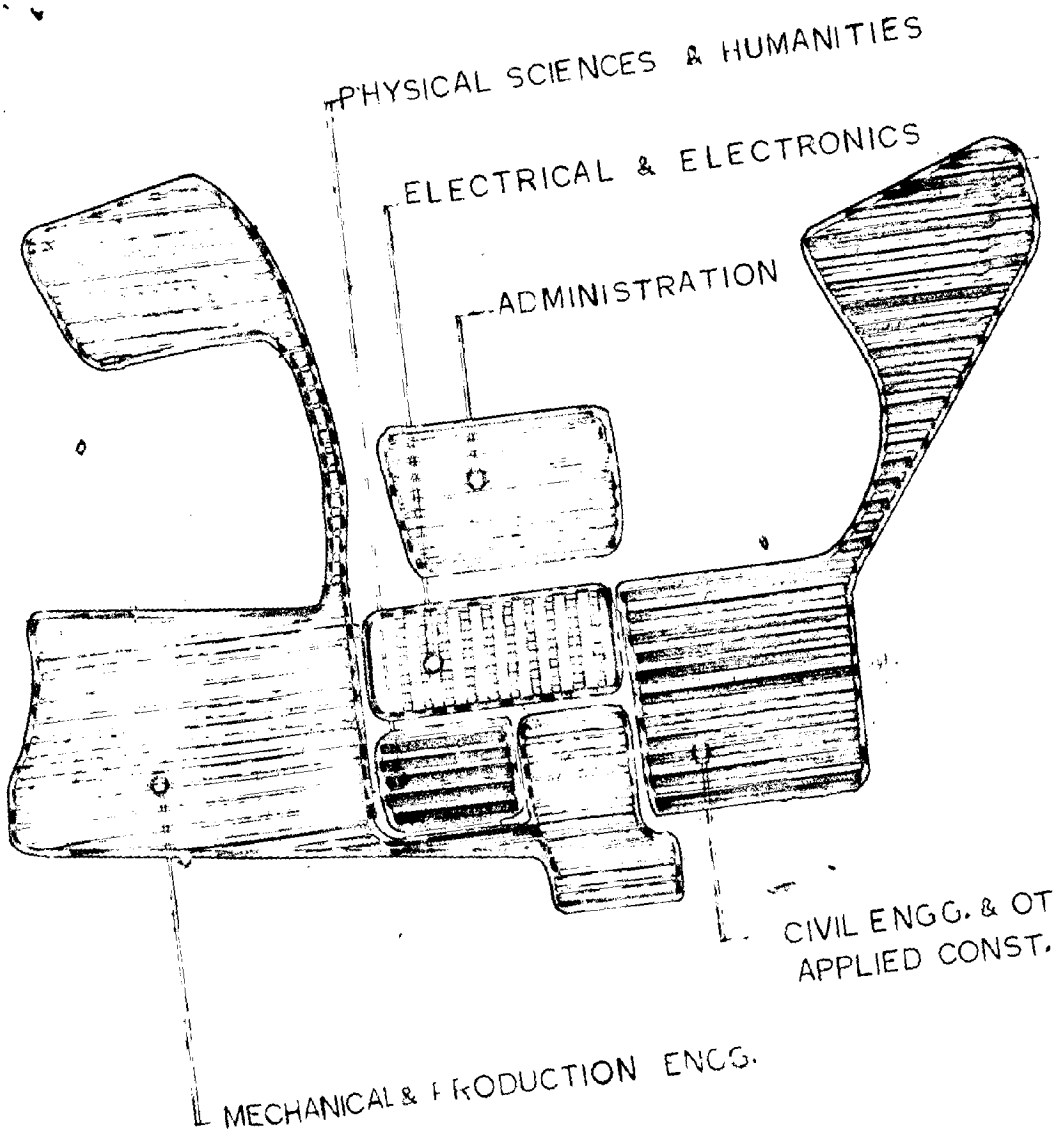
iii) Mechanical and production Engineering.

iv) Physical sciences and humanities, which is a core facility to all departments.

The diagram and table relate this growth to functional clustered areas.

The administration is situated centrally catering for all departments.

As regards planning and placement of different



FUNCTIONAL CLUSTERING

FIG. 2.5.1

departments is concerned, the following observations were foreseen in beginning:

i) Interrelationship of similar activities of departments.

ii) Common objectives of departments.

iii) Interdependence of departments.

Each area was allotted space depending on their requirements for expansion and development and their existing space and densities. With the constant development of more integrated programms that cross functional lines.

2.5.3 Land Prices

Comparatively land prices are Rs. 100.040 Rs. 160.0/ sq.yard in the surrounding areas of the campus and go on decreasing to an extent to Rs. 40-60/sq.yard as the distance increases towards the rather under developed land.

So it is presumed on the basis given above that the cost of land in any part of the campus is equivalent to above. Comparatively land prices are rather higher considering bigger parcels of developed land available in Civil lines area.

The land of University and that of CBRI being of institutional nature is not subject to safe, but the volumes of private owned land on the peripheri of campus towards civil lines is as high as Rs. 200/-sq.yard for obvious reasons. On North and North East of University is the reserved land belonging to Roorkee Cantonment.

2.5.4 Land use Existing and proposed

The land within the campus is used for many activities which here are classified as, educational, residential, recreational etc. They in turn are grouped into two types of areas, working and living. The working areas contain the educational centres where teaching is performed. This activity is the back bone of the campus's existance.

Equally important are the living areas which contain the homes, parks, schools, Religious buildings and other facilities that contribute to family living. In the campus, one cannot exist without the other.

The land use proposed for campus is in map form and shows where these activities should be located for the most satisfying and efficient use of the land. It is concerned with the campus as a whole and indicate generally how best the vacant property be utilized.

The proposed plan is a conception of the campus of the future. The design is rigid in basic features but flexible in detail.

It is presented with full knowledge that there will be desirable changes which cannot now be foreseen.

But more important, the plan establishes an enlightened and attainable goal - one which can be reached without unduly disrupting the present structure of the city.

The plan is a pattern to guide officials and citizens where decisions of change and improvement are to be made. To citizen it means the type of neighbourhood he and his family can expect to live in

the time and distance to his work and to activities he and his family require and enjoy. To the public official, it is the frame work for providing public facilities and services, and for directing redevelopment and rehabilitation programs in aging and obsolete areas. It is the basis for a long-range and short-range capital improvement program. The diagrammatic plan on facing page summarises the major divisions of land into living and working areas and shows the major traffic lines to serve them.

2.6 Concluding Remarks:- This section is intended to analyse the adequacy of open space and recreational development on the campus. The major categories of land use are, educational, residential, recreational and area for services.

Campus land devoted to open space serves several important functions. One is the preservation of the heritage of natural beauty and ecological viability of the campus setting. A second is the relief provided from the crowding of people and buildings where major areas of the campus, of necessity must be developed at high densities. Of equal importance is the development of some portions of campus open space to provide recreational opportunities for the campus population.

CHAPTER III

REBUILDING THE DECLINING AREAS:

3.0 Vast and complex changes in the development of the compus mark the development and rebuilding the "gray" areas to cope up with the requirements.

The success of housing and renewal policies is blocked not only by conflicting interests, however, but by a poor understanding of changes under way in the campus, population growth, mobility, and shifting housing preferences stir up intricate cross currents in the campus and make analysis and prediction difficult. The broad out lines of future prospectus for old and areas with dilapidations, but effective policy-making requires a more careful assessment of rates and directions of change.

It is clear that growth and decline go hand in hand in modern metropolis but it is not true with campus. The campus goes ahead in physical development as the teaching and research programmes are increasing and on positive side.

The rebuilding of old areas has become a matter of national concern, and true with all old campuses. And the picture of campus problems of development/housing that has emerged with this new interest is a grim one.

-2-

3.1 GRAY AREAS:-

Many pockets in the campus look declined or have begun to decline. In the present view old residential structures are rapidly out living, their usefulness and will shortly be ready for clearance and replacement. Further, according to this interpretation, economic and social forces are operating inexorably both to destroy the present usefulness of these parts of the campus and to block efforts to rebuild them as new residential communities or to maintain these pockets as open spaces or rebuild these with residential structure, maintaining the environment of high order. What is the nature of this hypothetical process that seems to ensure indefinite stagnation in the old residential areas?

Changing public taste is expected to bring about a rapid obsolescence of buildings constructed to the standards of past generations, while the buildings deteriorate themselves with age. Residents will move out, leaving behind a set of partially occupied buildings. These semi-abondoned structures are at the base of gray areas hypothesis: there continued presence is expected to constitute a severe liability to the land they occupy.

It is argued on the basis of current experience that such land can be cleared only at a high cost for old structures are expensive to acquire despite their waning utilization.

Desirable building sites can be made available at the lower cost on vacant out land than compared to the cost of gray areas after clearing. The clearance of gray areas, in comparison, seem to offer few present or potential advantages.

(i) The central location of most of these areas is considered as an asset for their developments.

(ii) For the campus living, it is preferred much if housing to its staff is provided within a walking distance between 10 to 15 minutes.

(iii) Cost differentials between built up and vacant land and assumptions about the extent of housing demand for inner locations.

(iv) A further elaboration concerns the type of housing that people will choose.

(v) Multi-family housing can over come high land costs through economies in the amount of land required for each unit.

(vi) The clearing of old sites and constructing new housing units, provide more space and better housing with additional amenities.

(vii) The housing in old cleared sites provide fur the following advantages:

(a) In designing, the different catagories are made as per the requirements of the inhabitants of different categories.

(b) Renewal programs provide new housing in an improved environment.

(c) Improved environments are able to raise the rents to the level found in the vicinity of 10-15 minutes working distance.

(d) An energetic program to rebuild cleared sites need not require an astronomical time span to complete the job.

(e) Even a partially successful program could initiat a policy of rebuilding through gradual replacemen in these sections of the campus where environment deficiencies are least serious.

3. Demand for new housing:-

Precondition for rebuilding calls for a balance between the amount of land to be cleared of deteriorated housing and the amount of land that can be utilised by new housing in the clearance areas. The cost of sites that must be cleared of old structures is generally too high to permit the use of the land for single family houses. Thus the size of the area to be developed for new apartments is a basic factor in establishing the rate at which cleared sites can be rebuilt.

Where the total demand for new housing is small and cannot be increased, the rate of rebuilding must be slow, only a portion of the cleared pocket be utilised for the purpose, but it is different for the campus like Roorkee University where the demand for new housing is exhorbitant

and increasing day by day with the increase of teaching facilities and appointments of faculty staff and administrative staff as well.

The task of next twenty years in most of our large campuses and specially for this campus which is having limited land, for the last 125 years with what it was operated, is more properly one of renovating and preserving the old houses which are scattered in order to prolong their usefulness during a period when they will be needed. Deteriorated areas that are truly ripe for clearance should be measured by acre rather than by square mile. The argument for selective clearance and gradual renewal is developed and tested in the chapter further.

3.2 ECONOMIC SIGNIFICANCE OF EXISTING STRUCTURES:

Economic significance is a term, to be studied for making any decision for clearing the old building sites. The study is based on the following:

(1) Rules of C.P.W.D.

(2) Rules of P.W.D.

(3) Allotment rules.

(4) Level of amenities.

3.2.1 Buildings have completed their life period:

(a) So buildings do not come under standard rent act which is fixed at 6% of the cost of existing structure in present context.

(b) Normally as per standing rule 2.1% spent of total construction cost is spent on maintenance of

buildings or otherwise two months rent.

Both the figures do not fall within maintenance expenditure, so to meet additional requirements.

(c) The special grants are received from State/ Centre Government are sought.

3.2.2 Dilapidated areas are with low density and compared on the following:

(a) Old land costs with present land costs.
(b) More income through rents etc.
(c) More density to meet the requirements of future, where non-possiblity of any expansion of University boundary.

3.2.3 Expenditure on emergent and routine items:

The economics may be justified here as follows:

(a) Presently normal maintenance procedures dictate 1/4th of maintenance expenditure should be spent on emergent items and 3/4th on the routine items.

(b) The above figures have increased and in some cases it is reverse, the emergent items require 3/4th of the routine items expenditure.

3.24 What-ever income through rent, is spent on maintenance and additional amount so loosing game.

3.2.5 The list of routine and emergent maintenance items

Routine Repair items:

i) White and colour washing work (normally one month rent is used).

ii) Minor repairs to pointing, plaster, floors, walls and drains.

iii) Repairs to doors, windows and ventilators.

iv) Replacement of broken, glass panes.

v) Repairs to water supply and sanitary fittings.

vi) Repairs to electric installations.

vii) Minor additions and alterations, desired by the occupants.

3.2.6 Special repairs

i) Replacement of rotten doors windows etc.

ii) Replacement of worn out line terracing.

iii) Replacement of roofs and ceilings.

iv) Pointing of doors and windows.

v) Replacement of worn out floors.

vi) Replacement of broken W.C.

vii) Fixing wire mesh or expanded metal

viii) Fixing guard bars.

ix) Wire fencing and component doors.

3.2.7 Emergent Maintenance Items:

i) Plaster and pointing of walls and ceilings.

ii) Roof repairs.

iii) Replacement of rotten doors and frames.

iv) Refloooring.

v) Replacement of old electric wiring.

vi) Major repairs caused due to storm, fire, theft etc

vii) Replacement of broken W.C.

viii) Remaking of drains.

The emergent maintenance items are only done after sanction of special estimates by the competent authority.

3.3 ALTERNATIVES:

The following alternative procedures are suggested for the construction of the new houses and the maintenance of existing staff residences

3.3.1 Construction of new houses:

(a) Plans for the new houses should be approved by maintenance committee.

(b) The new works should be accepted for the payment of bills by the maintenance committee.

(c) The defect liability period, which is at present of 6 months duration, should be extended to 1 year to cover the rainy season.

(d) The contact clauses and the specifications should be amended to exclude.

i) Steel Windows

ii) Aluminium Hardware

iii) Any other iterms which have no durability.

and to include

i) Flymesh

ii) looking glass

iii) Mosaic flooring

iv) Compound wall with gate and other items which

are subsequently executed through the maintenance grant right from the first year of new works.

3.3.2 Maintenance of existing staff residences:

a) The SUE would supply a list of routine maintenance items and the items which are considered as of emergent nature.

b) The routine items shall be requisitioned anncially where as emergent items shall be attended to by a requisition in the register.

c) A central office of building maintenance shall maintain a register in which the entries of requisition and the date attended to shall be entered.

d) For routine maintenance, the houses shall be divided into 9 blocks corresponding to nine working months of the maintenance deptt.

e) Each block shall be attended to in the respectively month, accounts shown to the occupant and endorsement obtained to this effect.

3.3.3 The maintenance committee shall visit the houses every three months and report any dissatisfaction to the University authorities.

3.3.4 In case, the maintenance Department fails to carry out maintenance of some quarters, the University

may consider permitting respective individuals to get it done himself and submit bills to the University.

3.3.5 Contribution of fixation of rent an economic SIGNIFICANCE of structures:

The following decisions were taken for old and new construction:

Old buildings (built prior to 1950):

I. Factors

i) Period of construction, these from 1856 to 1922.

ii) Different but, from present day standards, large plinth areas.

iii) Alterations and additions done at different times.

iv) Difference in present conditions.

v) Variation in size of compounds, first bearing trees etc.

II. Basis of rent assessment

The following factors are for consideration to enter into determination of rents.

i) Plinth area

ii) Period of construction

iii) Cost in the case of new buildings

iv) Single or double storied

v) Ground or first floor

Main periods of construction of residences in the University have been following:

(57)

Period		Rs.
1856 - 1859	--------	19
1875	-------	2
1904	-------	1
1912	-------	5
1922	-------	3
Since 1950	-------	all the other

The following scales of reduction of plinth area to correlate the period of construction with present cost was decided upon:-

Period of construction*		
1851 - 1875	----- 40%	except V.C's residence.
1876 - 1900	----- 50%	
1901 - 1925	-----60%	
1926 - 1950	----- 80%	
1950 - onwards	-----100%	

For buildings prior to 1950 the rent is calculated at 6% per annum of the cost for the reduced plinth area at existing rate per square foot for new buildings (since 1950) the rent is calculated at 6% per annum of the actual cost.

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* Maintenance record from S.E.U. Office, University of Roorkee, Roorkee

3.4 POLICIES FOR REBUILDING:

ALTERNATIVES FOR REBUILDING HOUSING IN THE CAMPUS:-

The rebuilding of campus declined areas for housing is a matter of importance and the campus is heavily involved in problem of housing and the future of declining neighbourhoods, but the policy which is linked with housing concerns with rebuilding programs is a difficult task.

If basic policy is to serve broad social goals, there can be little justification for clearing away houses as long as they have a useful function. Despite the evident need for old housing, Many cities have already cleared large residential areas for urban redevelopment projects, aesthetic objections to decaying neighbour hoods, and the application of current housing standards to structures built 50 or more years ago are rationales for such clearance programs*.
The major alternatives for rebuilding "gray" areas of the campus are as under:

1. Leave these areas untouched until they are virtually abandoned, clear them, and rebuild the cleared sites for new purpose.
2. Rebuild these areas gradually, replacing the old housing in small parcels as vacancy rates rise.

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* Bernared J. Prieden, "The future of old neighbourhoods", The M.I.T. Press, Massachusetts Institutes of Technology Cambridge.

The first proposal raises serious problems of maintaining public services during the lengthy period of abandonment and dislocating residential population. But the most appropriate will be to rebuild only the portions required for housing for the next 5 years, in conformity with the development plan of the campus for housing.

The second proposal as just supported is more difficult to achieve but avoids the major problems of accommodation in the campus.

If the second objective is adhered then it limits clearance to structures that are no longer useful, and to promote a high degree of residential choice for the campus people.

The action can help create the preconditions for a gradual rebuilding, and the action is vital to establish necessary environmental conditions for rebuilding the older areas.

3.4.1 Gradual rebuilding:

The alternate approach is a process of continuous rebuilding, keeping pace with the gradual abandonment of old housing. Such a program is difficult to manage, but the potential gains are significant. The pattern of change is evolutionary, new residents enter in small numbers each time a handful of new buildings is completed.

This influx would prevent problems of -

(i) Under utilization.

(ii) Services and new facilities would be related to new housing as well as old.

(iii) At no stage would it be necessary to force large numbers of residents out of the area.

(iv) Rebuilding will proceed by small increasements with each stage depending first on priority of the area to be rebuilt as per development plan.

(v) Clearance would be limited to deteriorated and predominantly vacant structures.

(vi) A possible fringe benefit is that gradual rebuilding would promote diversity in an area, rather than the homogenity of a large-scale clearance project rebuilt all at one stage.

3.4.2 Improving the Environment:-

In public view the developers of new housing usually avoid the declining areas where deteriorated old housing is concentrated, although this is not inevitably the case with campus housing.

A major task of development plan committee is to correct whatever environmental factors keep new development out of the old neighbourhoods. Most current efforts in this direction emphasize the selective clearance of run-down properties, the provision of new community facilities like

- Schools
- parks
- playgrounds
- traffic improvements
- Redesigning of streets to enhance their appearance

It is worth mentioning here that mixing new and old housing in residential rebuilding, an area in small stages gives a fine grained pattern. To some observors of real estate practice, this pattern seems impossible to achieve when the old housing is in poor condition.

3.5 Economic Significance for demolitioni-

As described earlier, the economic significance of existing structure in the campus, about ten points have been given for consideration.

A conclusion may be made out right for demolition of an old structure, if any structure falls within 50% of these points. Further in the last but not the least, the economic significance is studied in figures/rupees by the following Linear programming, which says, that if the cost of demolition of old structure is less than the budget allocation for maintenance then building needs demolition which is economical.

To achieve this the following equation is written for calculation purpose.

$$a_1 B_1 + a_2 B_2 + a_3 B_3 + a_4 B_4 + \ldots\ldots B_N \quad X$$

and

$$b_1 B'_1 + b_2 B'_2 + b_3 B'_3 + \ldots\ldots\ldots B'_N$$

where as,

B_1 stands for buildings of one class

$B_2 \ldots B_N$ stands for buildings of another class

a = Cost of demolishing a building of one class.

X = Budget allocation for maintenance.

b = Cost of demolition of another class.

Further cost of demolition can be worked out by the following sub-criteria like carriage of materials to different stations by different vehicles of different

Summary of Five Year Plans in Terms of Land Use from 1951 to 1974

Plan	Period	Percentage of Bldg. bulk	Community facilities	Co-relation of land uses %					
				Res.	Edu.	Recr.	Open	Rds.	Total
Ist Five year Plan	1951-56	10% of total after 1950	Swimming pool, Play fields, School	30	16	16	28	10	100
IInd Five year Plan	1956-61	50% -do-	Hospital, Club, Shopping.	40	18	18	13.5	10.5	100
IIIrd Five year Plan	1961-66	25% -do-	Gymnasium, School library	43	20	16	10.2	10.8	100
IVth Five year Plan	1966-71	10% -do-	-	45	21	15	8	11	100
Vth Five year Plan	1971-76	5% till now	-	45.54	21.7	12.6	8.42	11.74	100

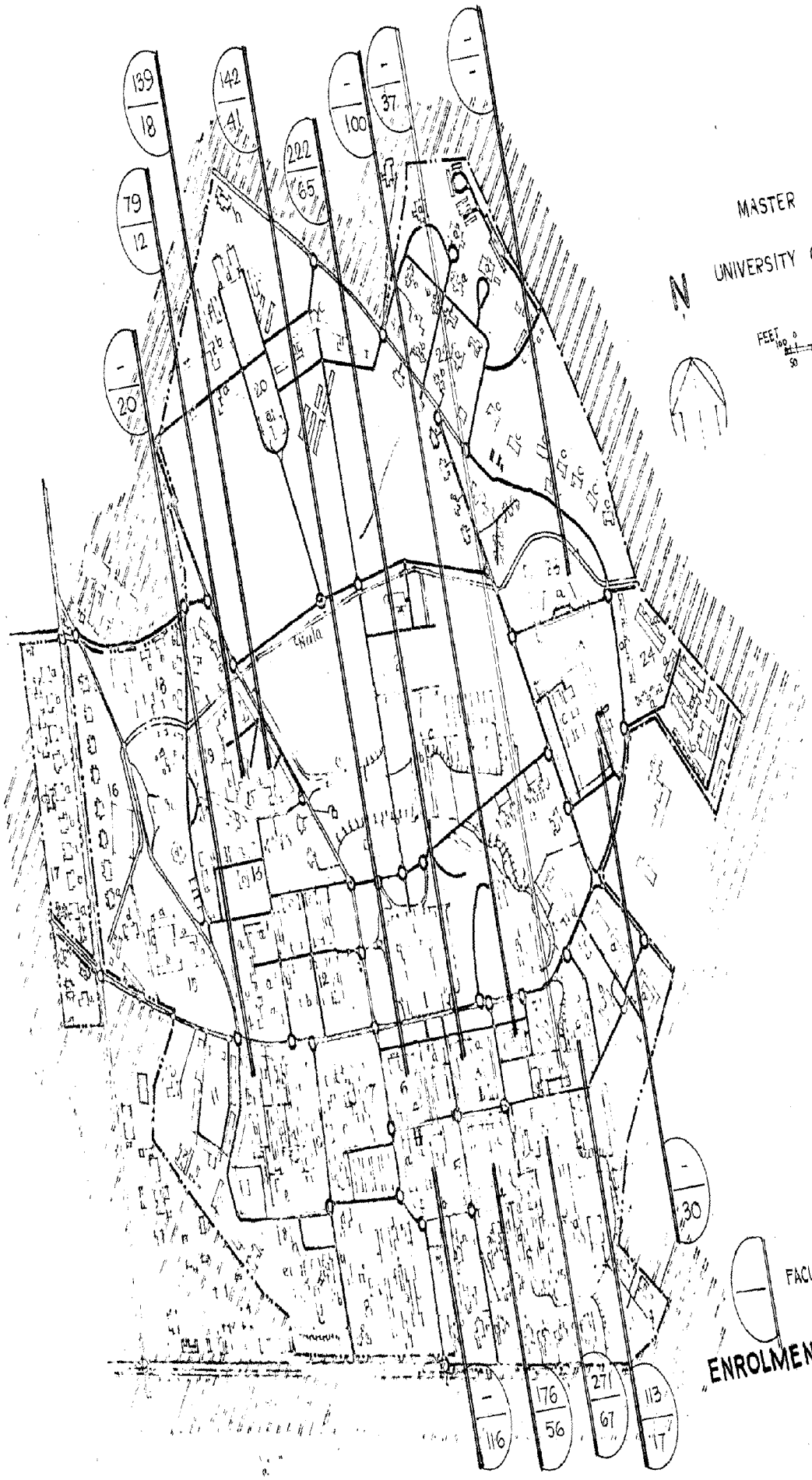

MASTER PLAN
UNIVERSITY OF ROORKEE
N
FEET
REFERENCES
EDUCATIONAL
RECREATIONAL
EDUCATIONAL
RESIDENTIAL
ROADS
UNIVERSITY BOUNDARY
FACULTY UNDERGRADUATE / GRADUATE F.T.E
ENROLMENT DISTRIBUTION
139/18
142/41
222/65
-/100
-/37
-/-
79/12
-/20
-/30
-/116
176/56
271/67
113/17

FIG. 2·3·2

capacity.

STATIONS

Capacity	Vehicle type	S_1	S_2	S_3
C_1	V_1	a	a'	a"
C_2	V_2	b	b'	b"
C_3	V_3	d	d'	d"
C_4	V_4	f	f'	f"

$a S_1 + a' S_2 + a'' S_3 \quad C_1$

$a S_1 + a' S_2 + a'' S_3 + X... = C_1$

a = Cost of maintenance or demolition

S_1, S_2 S_3 are constraints.

To work out the economics of old structures, a plan of age structure with the buildings in tabulated form showing date of erection, value, nature of building, plinth area, cubic contents and remarks available with Supdt. University Estate . Serial numbers are provided as per the life of building in sequence.

3.6 Concluding Remarks:-

Policies to achieve a gradual rebuilding of the old residential areas consist of two separate phases, creating the precondition for rebuilding, and establishing a setting with high density and enough open spaces. This study has focused considerable attention on the pre-conditions and the critical points on which the action is to be taken, the main point is the economic significance of old structures and demolitions should take place where the building is not economical to maintain. It is, therefore, recommended that gradual rebuilding process will be economical.

CHAPTER IV

FUTURE REQUIREMENTS

4.1 OBJECTIVES

Since no overall consideration of its expansion or future perspective has been considered, now the following objectives are put forth for future requirements.

1. To promote orderly campus growth as a planned system of integrated functions in order to create, over a period of time a highly efficient housing complex servicing all the campus needs of the resident population.
2. To plan land uses that the optimum use of land for various purposes can be attained. Concomitantly, it is necessary permit exploitation of resources in a planned manner.
3. To propose an efficient intra-area system of facilities linking its various functional units, and to suggest interim solutions for the most acute problems.

4.2. FIVE YEAR PLANS AND ITS PLACE IN THE DEVELOPMENT OF U.O.R. CAMPUS

In accordance with the decisions of the planning commission the original 5 year plans have been given due preference and re-

cast keeping in view the amount in Rupees that has been provisionally allotted for the development of this University. Assurance was given at the time of discussion that should there be genuine need for additional funds for the advancement of technical education, such demand will be sympathetically considered, the state of affairs of 5 year plans is as follows:

4.2.1 First Five Year Plan (1951-56)

The University of Roorkee was founded in 1949 and had no plan schemes for the First Five Year Plan. Whatever sanctions came were only on Ad-Hoc basis and obviously they did not cover any development programme.

4.2.2 Second Five Year Plan (1956-61)

In the 2nd Five Year Plan the University submitted a Five Year Plan Scheme with the concurrence of the Planning Commission. The total amount of this Scheme was Rs. 1.3 Crore which was reduced to 95.22 lakhs owing to 10% out and later to Rs. 52.5 lakhs (representing S State Government share alone). These Schemes envisaged consolidation of campus facilities, opening of Post Graduate Courses, introducing research, providing for foreign training of teachers, construction of Library building museum and auditorium, addition to the recreation facilities, extending benefit of N.C.C. training to larger numbers, and providing residences for staff.

In addition several schemes including increase in intake of Degree and Diploma courses, opening of Departments of Sciences, School of Earthquake Engg. Students Health Centre, Hobbies Club, Instrumentation Workshop etc. were sanctioned by the Government of India/University Grants Commission during the 2nd Five Year Plan period with a cost of more than a crore of rupees.

The progress on all the schemes though slow on account of procedural delays and scarcity of Foreign Exchange has been satisfactory on the whole.

4.2.3 Third Five Year Plan

The Third Five Year Plan Schemes can be broadly classified under the following heads:

1. Committed Expenditure
2. New Schemes
3. Refresher and Special Courses
4. Water Resources Development Training Centre
5. Development and consolidation of existing courses.
6. Spill Over.
7. Loan and Scholarships
8. Revision of Pay Scales.
9. Administration and Central Office.
10. University Hospital.

11. Special facilities
12. Land and Development.
13. National Cadet Corps
14. Residences
15. Hostels
16. Library.
17. Teaching and Deputation reserve.

4.2.4 Special Facilities, Land and Development

During the Second Five Year Plan period the Intake was raised from 120 to 290 in Degree Courses and from 200 to 300 in Diploma courses. While sanctioning money for this increase no provision was made for development of the site and providing facilities for sports activity etc., and the Visiting Committee stated as follows:

The Committee however wish to record that it is very necessary to provide the above facilities; for which funds should be made.

4.2.5 Residences and Hostels

These provisions are very necessary on 100% basis for this University, because Roorkee is a small place and there are no facilities for residence outside the University campus for the staff and the students. The expenditure on hostels has to be met from

Loan from the Central Government and that on residences from the grant from the State Government. For facility of reference the provision for residences and hostels has been further split up to indicate the amount necessary for meeting the requirements in respect of the existing courses and the new courses seperately for under Graduate and Post Graduate & Research Schemes.

4.2.6 Improvement in University Estate

With the increase in the student population and the teachers and other staff mentioned above, it will be necessary to reorganise the water supply and sanitary arrangements. A tentative water supply and sewage scheme has been worked out and the cost estimated on the basis. The Scheme is more modest than the original and is spread over a much longer period.

Electric installations have to be extended to cope with the increase in population and extensive repairs are required to existing installations.

Old buildings will need special repairs which have to be provided for in accordance with the recommendation of the Special Committee appointed for the purpose, some years back.

It is proposed to do all construction of buildings with the help of the engineering staff available at or

specially recruited for the purpose by the University and thus effect considerable saving in the overheads which would be charged by the P.W.D., if the work is entrusted to them.

(B) Improvement in University Hospital

The present University dispensary is inadequate for the existing staff and student population and will be more so when the number increases. In view of the fact that there will be considerable number of high class specialists and over 100 serving engineer trainees from India and other Asian and African countries in addition to over 1500 students and members of staff, besides their families (total population about 4,000), it is necessary to materially improve the medical facilities at the University. The additional staff and equipment have been worked out on that basis but on a more modest scale than in the original plan.

SUMMARY OF

4.2.6 ABSTRACT OF THIRD FIVE YEAR PLAN (1961-66)

(Rupees in Lakhs)

A Post Graduate and Research Schemes

S. No.	PARTICULARS	REVENUE CENTRE	REVENUE STATE	REVENUE TOTAL	CAPITAL CENTRE	CAPITAL STATE	CAPITAL TOTAL	REMARKS
1	2	3	4	5	6	7	8	
1.	Committed Expenditure	66.24	9.20	75.44	-	-	-	
2.	New Post Graduate Courses and Research Schemes	27.17	29.03	56.20	50.06	49.54	99.60	
3.	Development & Consolidation of existing Post Graduate Courses	5.18	5.17	10.35	19.47	9.23	28.70	
4.	Spill Over (P.G. Courses)	-	-	-	10.44	1.63	12.07	
5.	Loan & Scholarship	44.58	9.87	54.45	-	-	-	
6.	Revision of pay scales	0.50	-	0.50	-	-	-	
7.	Loan for Hostels	-	-	-	11.32	-	11.32	
8.	Residences (P.G. Courses)	-	-	-	-	34.31	34.31	
	GRAND TOTAL	143.67	53.27	196.94	91.29	94.71	186.00	

1. Total Rev. Exp. 196.9
2. Total Capital Exp. 186.0
G. Total 382.9

69

4.4 FIFTH FIVE YEAR PLAN

There is a great need to give more emphasis on the following four aspects of engineering education which will decide the programme for housing for the campus.

4.4.1 Norms

In working out the physical facilities and financial requirements, the following norms have been followed.

1. Under graduate staff student ratio:
   Existing 1:12
   Proposed 1:10
   Post graduate staff student ratio: 1:5
   Professor, Reader, Lecturers ratio:
   For Master of Engineering 1:2:0
   For M.Sc (2 years) 1:2:2
   For M.Sc. (M. Tech) 2:3:3

2. Non-teaching staff including technical and non-technical at 60%

3. (i) Cost of residence for teaching staff average: Rs. 50,000/-
   (ii) Cost of residence for non-teaching staff average:
   (a) Class C-for 50% of total number
   @ Rs. 20,000/-

(b) Class D - for 25% of total number @ Rs. 15,000/-

4.4.2 Brief description of consolidation and new post graduate courses

The University imparts post-graduate education in engineering disciplines as mentioned below:

(i) Civil Engineering
(ii) Mechanical Engineering
(iii) Electrical Engineering
(iv) Electronics and Communication engineering
(v) Metallurgical engineering
(vi) Chemical engineering
(vii) Architecture.
(viii) Earthquake engineering

The teaching staff for post graduate courses has been proposed with the ratio of staff to student of 1:8.

4.4.3 The following new post graduage-courses have been proposed

(i) Post graduate one year course in Traffic Engineering.
(ii) M.E. in building science.
(iii) M.E. in production management.
(iv) M.E. in mechanical system techniques
(v) M.E. in Design and production of turbo Machinery.

(vi) M.E. in high voltage Engineering

(vii) Post graduate one year course in Electronics in strument Technology

(viii) M.E. in corrosion science and Engg.

(ix) M.E. in process design and engg.

(x) M. Arch. in housing and community design

(xi) M. Arch. in regional planning and Environmental Design.

(xii) M.E. in Earth-quake Resistant design of structures.

II - Science Deptts.

Eleven masters courses are proposed.

Housing requirements for the Fifth FiveYear Plan For Consolidation M.E. Courses

Name of Deptt.	Additional Teaching Staff				Non teaching staff	
	Sr. Prof.	Jr. Prof.	Reader	Lecturer	Class C	Class D
1. Civil Engg. Deptt.	2	-	4	-	50% of total	25% of total
2. Mechanical Engg. Deptt.	1	3	8	-		
3. Elect. Engg. Deptt.	1	1	4	-		
4. Electronics & Communication Engg.	1	-	1	-		
5. Metallurgical Engg.	2	-	2	-		
6. Chemical Engg.	-	1	1	-		
7. Architecture	1	1	4	-		
8. Earth-quake Engg.	1	1	4	-		
9. Physics (i)	-	1	2	3		
10. (ii)	-	1	1	-		
(iii)	-	1	-	-		

Table (contd.)

10. Chemistry	2	-	8	9
11. Mathematics	1	-	2	-
12. Geology and Geophysics.	-	1	1	-
	12	12	4	12

Housing requirements for the Vth Five Year Plan for Pre-Ph.D. Courses

Name of the Department	Additional teaching staff			Non teaching staff
	Sr. Prof.	Jr. Prof.	Reader Lecturer	
1. Civil Engineering Deptt	1	1	- -	
2. Mechanical Engineering Deptt.	1	3	- -	
3. Electrical Engineering Deptt.	NIL			
4. Electronics & Communication Engg.	1	-	1 -	
5. Metallurgical Engineering Deptt.	1	1	- -	
6. Chemical Engineering Deptt.	1	-	1 -	
7. Architecture	2	2	- -	
8. Earthquake Engineering	-	1	1 -	
9. Mathematics	-	1	- -	
10. Geology & Geophysics	1	1	2 -	
	8	10	5	

Housing requirements for the Vth Five Year Plan for Reoriented research programme

Name of Department	Additional teaching staff				Non teaching staff
	Sr. Prof.	Jr. Prof.	Reader	Lecturer	
Civil Engg. Deptt.	1	2	-	10 Res. Asstts.	
Elect. Engg. Deptt.	Director 1+2	2	2	2	
Mechanical Engg. Deptt.	2	2	4	2	
Chemical Engg. Deptt.	1	2	2	2	
Chemistry	-	-	2	4+3	
	6	8	10	23	
Inter disciplinary course					
Bio-Engineering	1	2	5	-	
School of automation	2	3	5	5	
Development of new P-G courses M.E. and P.H.E.					
Hydrology - M.E.	1	1	2	-	
" P.H.D.	1	-	-	-	

Consolidation of existing course

Humanities and social sciences	-	1	2	-
Refresher courses	-	1	3	-
	5	8	17	5

These are the requirements for Vth 5 year plan, and for the next 15 years it may be assumed on seeing the present expansion rate that University will continue to expand at the same rate. The figures will be 3 times more that what comes for Vth 5 year plan.

4.4.4 In Vth 5 year Plan additional teaching staff

	Sr. Professor	Jr. Professor	Reader	Lecturer/Res. Asstts.
1.	31	38	32	40

Total = 141

Class C =

Class D = 28

At the end of 20 years from now, figures projected on same pattern of growth

2.	124	152	128	160

Total = 564

3. Non teaching staff

- class C = 100
- class D = 112 at 1/5th of above total

Present position of intake of students

Under gratudates :	1190
4. Post graduates:	
M.E.'s	300
W.R.D.	50
M.Sc.	170
Total	520
Research Scholars: and fellows	150
Total students =	1860

4.4.6 House allotment

Presently as per allotment rules, there are different pools depending upon pay range of staff.

Pool I Pay range

(i) Rs. 1800/- and above

(ii) Rs. 1600/- to 1800/-

(iii) Rs. 1100/- to 1594/-

(iv) Rs 700/- to 1099/-

(v) Rs. 400/- to 850/-

Out of these five, the categories have been reduced to three only as per recent directions from State Government as:

(i) Rs. 1800/- and above

(ii) Rs. 1200/- to 1900/-

(iii) Rs. 700/- to 1300/-

4.4.6 Existing position of staff and No. of residences available.

	Pay range	Total houses existing	Total staff position
Class A	Rs. 1800/- and above Rs. 1600-1800/-	26 nos.	25 nos.
	Rs. 1200/- to 1900/-	104 "	157 nos.
		130 "	182 "
Class B	Rs. 700/- to 1300/-	151 "	179 "
	400/- to 850/-	41 "	70 "
	Total	192 "	249 "
Class C	(i) 300 and above	102 "	251 "
	(ii) 200 to 299	50 "	60 "
	(iii) 100 to 199	40 "	60 "
		192 "	371 "
Class D	Rs. 75 to 99	109 "	200 "

Shortage of houses in category

Class A = 52 nos.

Class B = 57 "

Class C = 179 "

Class D = 99 "

As this University being residential, the accommodation 100% is to be provided to the staff of category A and B whereas about 60% accommodation may be provided to the staff C and D 40% to Staff. As staff of category D is local and having their property in the promimity of campus. So additional housing to be provided for.

	From present	for future period 1975-1980	Total
Category A	52	69	121
Category B	57	72	129
Category C	108	100	208
Category D	99	112	211
Total no. of units			=669

CHAPTER V

APPRAISAL OF CAMPUS

5. APPROACH:

This chapter outlines a check list for a survey and techniques of appraisal which are necessary for sorting out the past and present trends in the development of campus. An old campus or town may be tackled as a number of areas, perhaps according to the age of buildings or the visual completeness of certain parts or areas of specific activities. In present context the entire campus is taken as a whole.

It is said that smaller the area the more detailed approach must be and the more the design and siting of individual buildings will matter. Here the kind of survey which needs to be performed is to have different emphasis from that in an ordinary market town with fewer buildings. The approaches of appraisal are of two categories.

i) Subjective approach

ii) Objective approach

The objective approach is the result of one person (usually the architect) looking at a campus and assessing in an intutive way, the visual and historic qualities that make up the campus's identity. This assessment is of course backed by archaeological evidence and by such historical documents and lists of buildings of architectural and historical interest as are available.

The objective approach attempts to identify visual qualities by testing public reaction to the encironment, conducting a kind of opinion poll to find out what people notice most about their living space and entire area of campus, what they like and dislike.

For this campus, the subjective approach is attended to, which is based on visual survey backed by the data or information supplied by the past and present inhabitants of the campus. No doubt that the subjective approach is open to abuse because the taste of one person is often too obscure or biased to be a guide to useful visual standards. The objective approach has the obvious flow that people are conditioned to accepting their environment, whatever its qual
to it. It is also
to conserve th
f more p
of their campus.

What ever the approach is attended, the burden of establishing a campus's visual and historic qualities will, however rest finally with the architect on the planning team. It is useful to carry out a simple reconnaissance to establish the main visual and historic features of the campus. A full and detailed survey would then

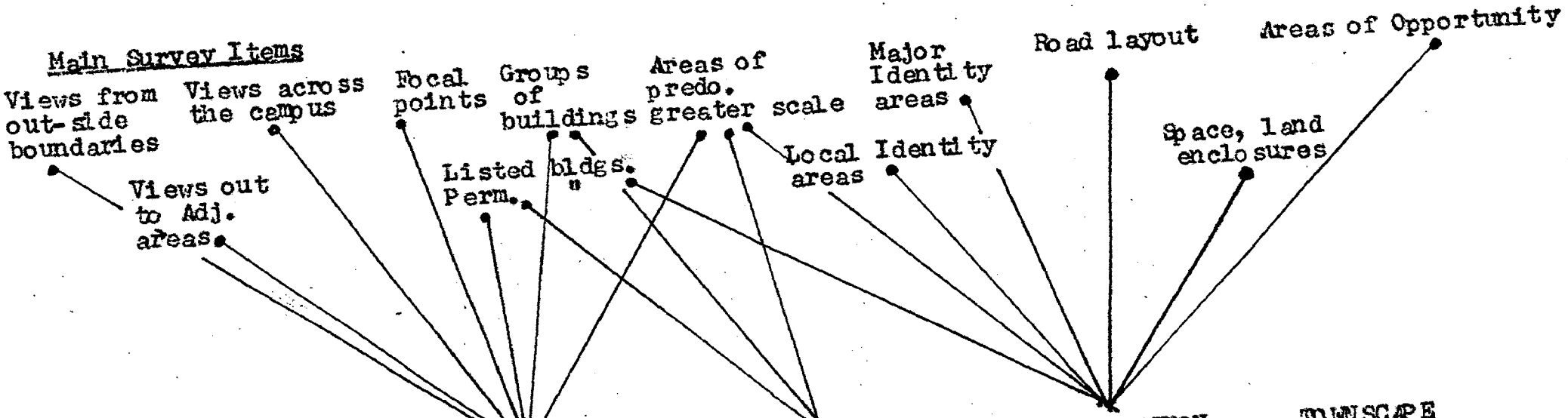
follow giving priority to particular parts or aspects of the campus, which are under immediate pressure and for which planning schemes are urgently required. A reconnaissance in most smaller campuses will, however, reveal that pressures are widespread and the character of campus comes from a variety of sources. The chart 5 lists the various items of survey that might be covered and the policy aims which stem from particular aspects of survey.

Aerial photographs help to clarify first impressions and give an appreciation of the form of the campus. But it is experienced that people never experience the air, only by being in the streets. The order of survey, as shown on Chart I is choosen to facilitate the grouping of the survey items into different sections of policy. Further it does not follow that the surveys would be carried out in that order, nor does it follow that any one item of survey is necessarily more important than another.

The importance of individual items is to be governed by the qualities of campus under consideration:

5.1 The main stages of appraisal are five:

1) The visual and historic survey (As shown in Chart I with other parallel findings on traffic and land uses).



" A trained eye, spending quite a short time in the field, will pick-out the majority of qualities which are important".*

* Source :- Roy Worskett, The Character of Towns, an architectural approach, The Architectural Press, London.

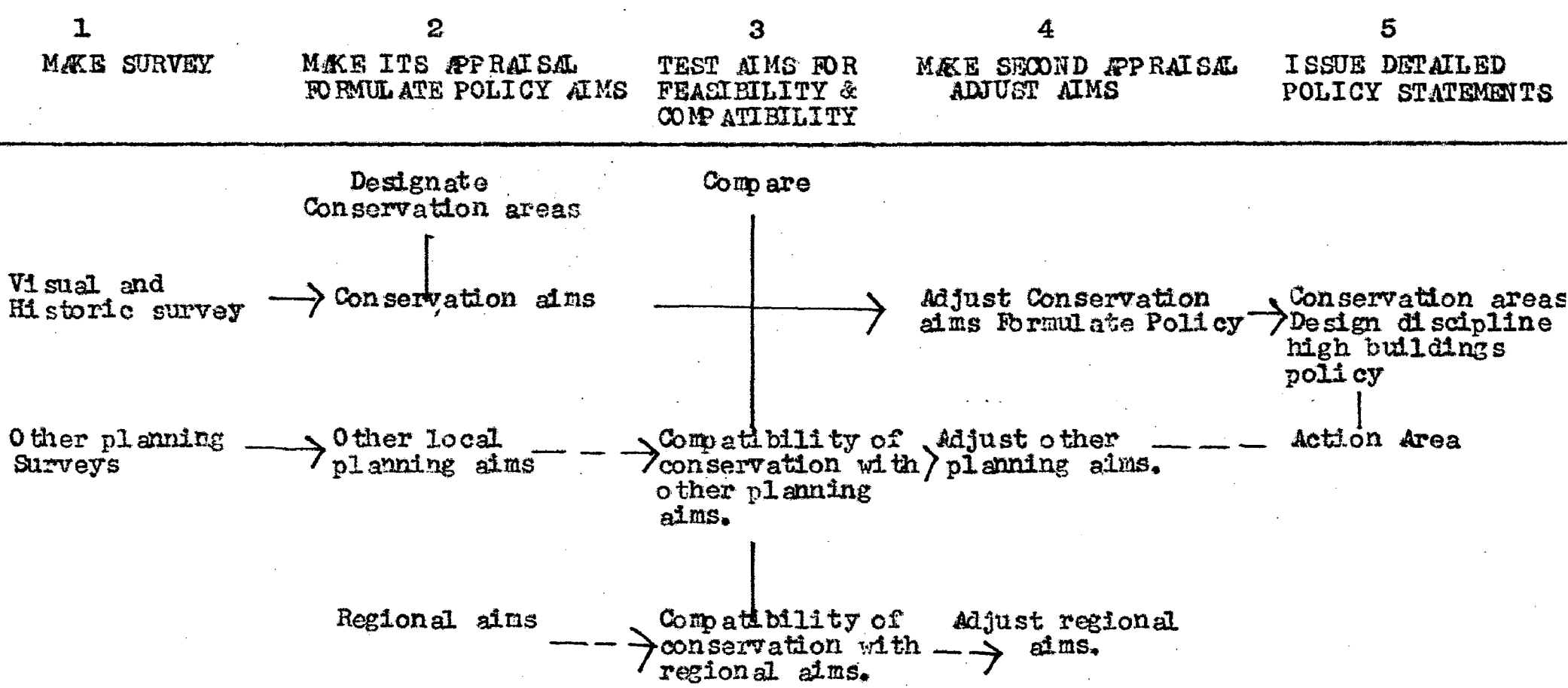
ii) Conservation aims running parallel with other local planning and regional aims.

iii) Associated surveys for assessing the feasibility of conservation.

iv) Examination of alternative aims which are necessary for aims.

v) The conservation policy can now be confirmed as realistic. Where necessary they are incorporated in the campus structure. Conservation areas are designated at an earlier stage as a temporary measure to safe guard the areas of other nature. Action areas are identified as part of the over all programme of development for the campus and any holding action that is required to safe guard aspects of conservation is carried out.

The method of work in above five stages has been out lined in chart No. 2 illustrating the testing of conservation and its interaction with other planning aims.



Source:- Roy Worskett, The Character of Towns, an architectural approach, The Architectural press, London.

5.2 CAMPUS RELATIONSHIP WITH LAND SCAPE AND MAIN BUILDINGS:

The following objectives are putforth to identify the most important features of the existing vional relationship between the campus and the land scape (open lands and recreational lands).

i) To identify opportunities for new development which will not detract from the existing relationship or those that may create a completely new immage which will enhance the existing relationship.

ii) To identify the existing main buildings over the campus as a whole and the appearance and massing of the built up areas as a whole.

iii) To suggest areas where the new buildings for housing and others will not detract from the existing campus sky line or where a positive new sky line might be created.

5.2.1 Method adopted:-

Establishing of the important view points from which the relationship of campus to land scape is seen and/or which give the most valuable views of the massing and sky line to the campus the views are taken from city

walk sides or from open spaces, any where. Establishing where views are dependent on the movement of the viewer, i.e. where the combination of a number of view points together make up a significant ivisual effect.

Marking upon a campus plan the fields of vision showing the campus as a whole.

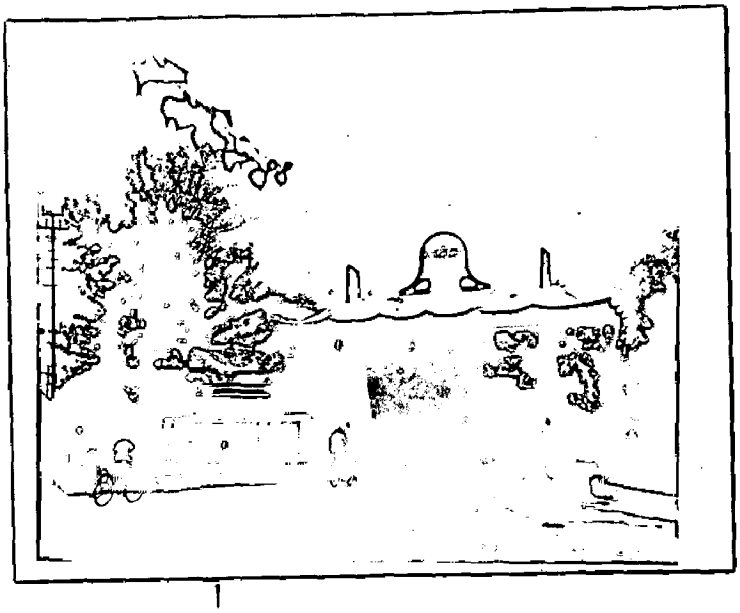
5.2.2 Features noted on Plan:-

i) Views from out-side the campus:-

The views from a single point out-side the campus. The boundaries of the field of vision are drawn to include the area of land of which the viewer is normally consious, assuming that one is able to see ahead and from side to side the sketch illustrates the features of plan and explains the implications of the annotation (A useful aid to establishing view points).

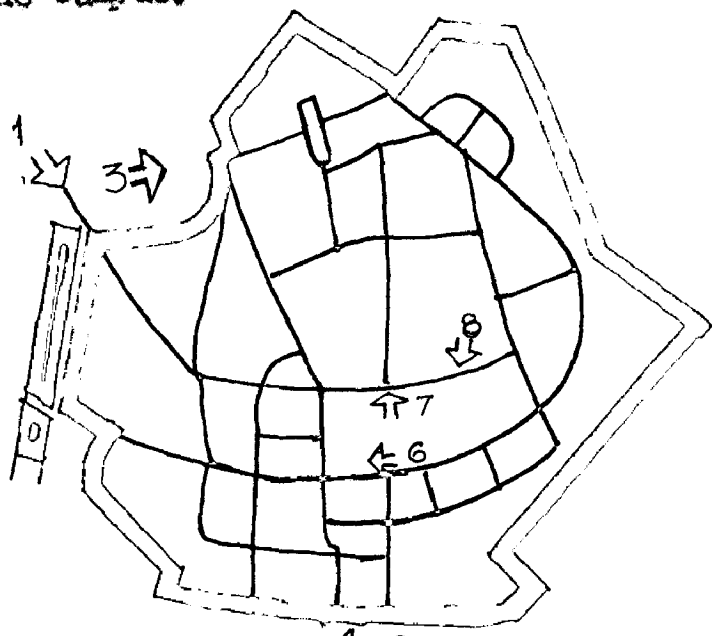
ii) Views out to the adjoining areas and city-side:

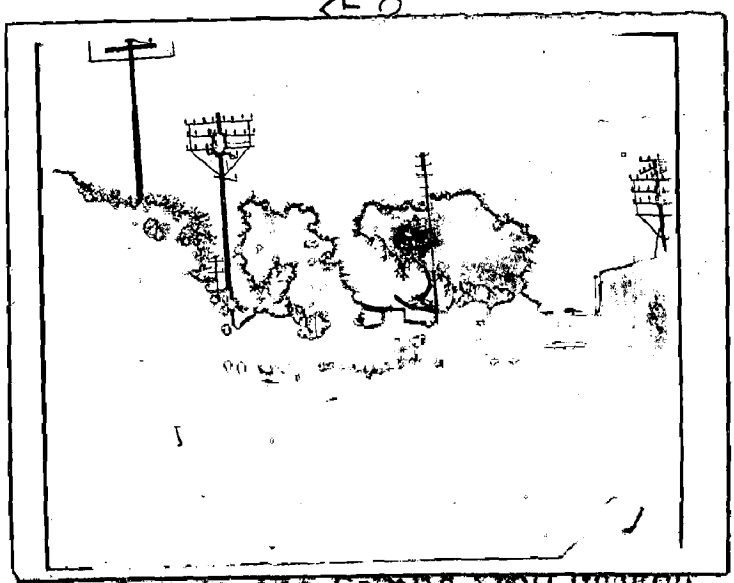
Here the objectives and method are the same as those for views from the out-side, with the exception that they do not normally convern the siting of buildings. There is usually a mixture of broad panoramic views (a wild field of vision), and



Main Centenary Gate
Entrance to the Campus.

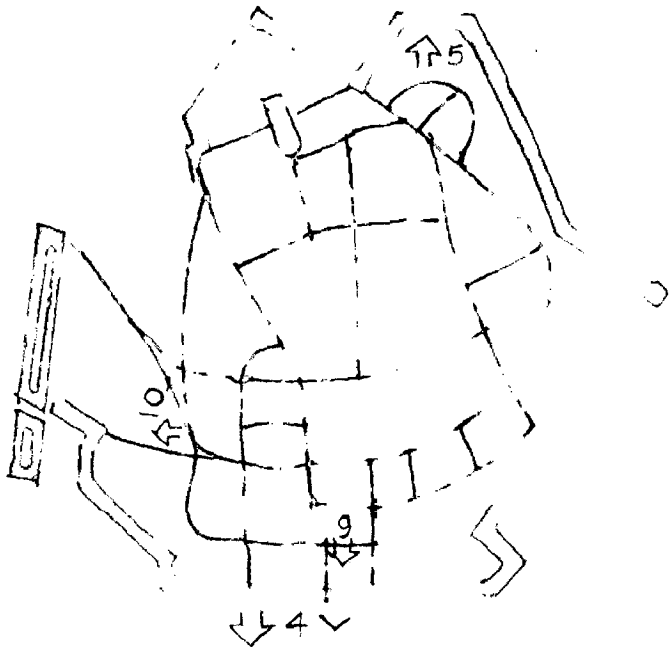
The way going to Cantonment side from U.O.R. Campus.

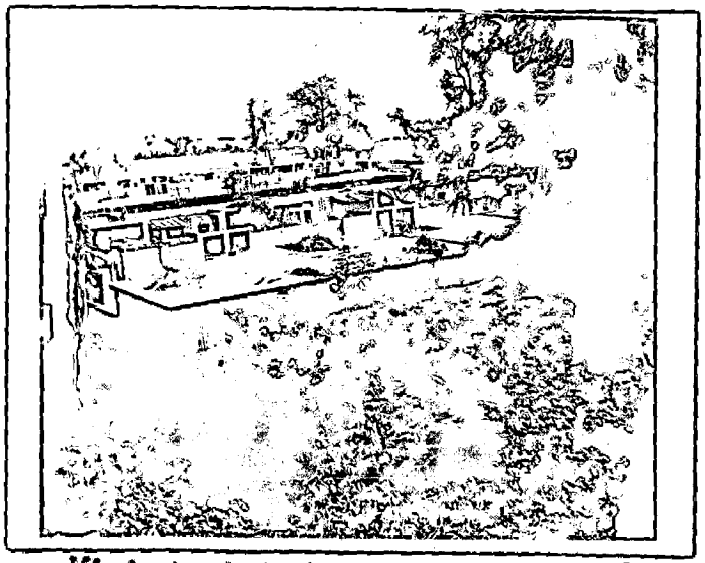




Entering to the Campus from Canton Canal side.

The Main way from Campus going to Cantonment Area.



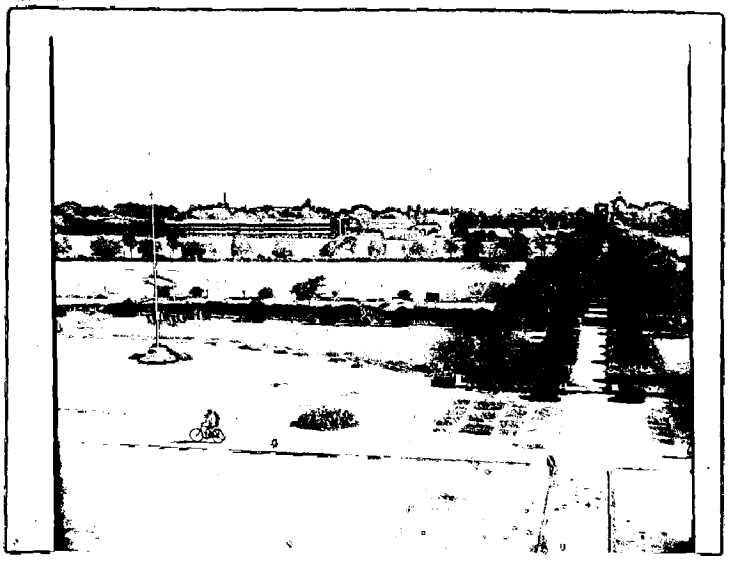


Ministerial Staff Quarters 5

behind Professors Residences

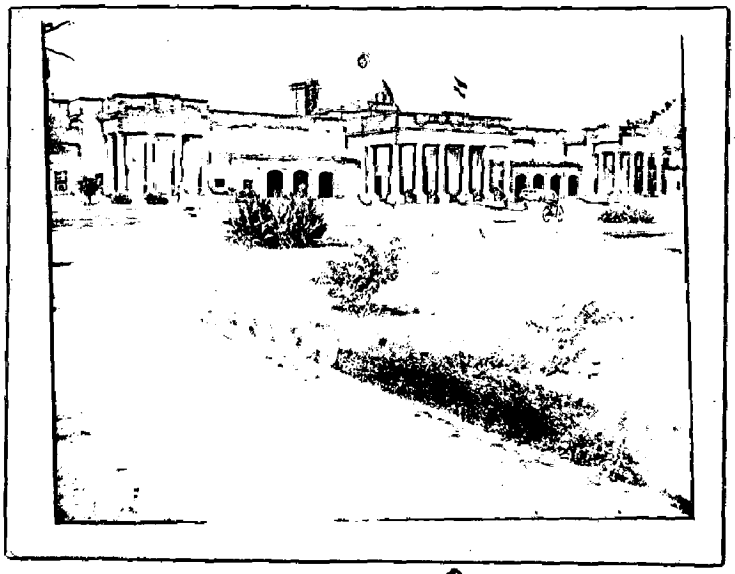
6

The Main road, which is in the heart of Campus, and separates the administration and educational areas.



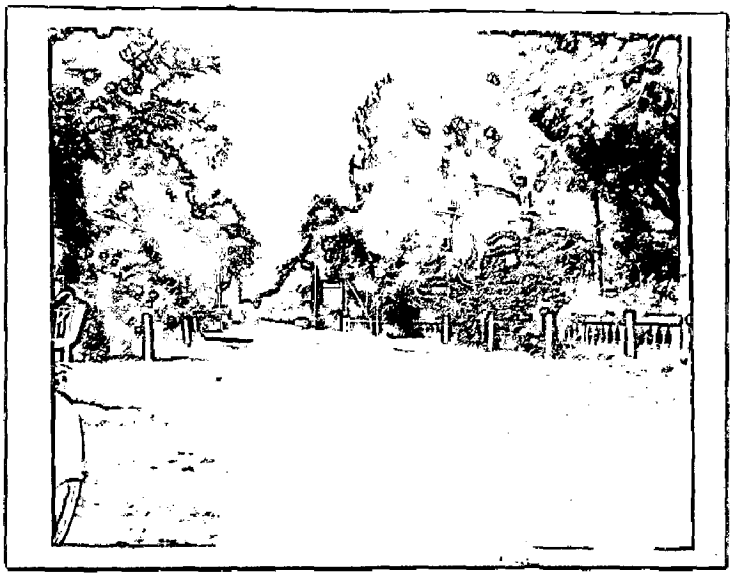
7

The Main recreational areas with road as an axis of the campus.

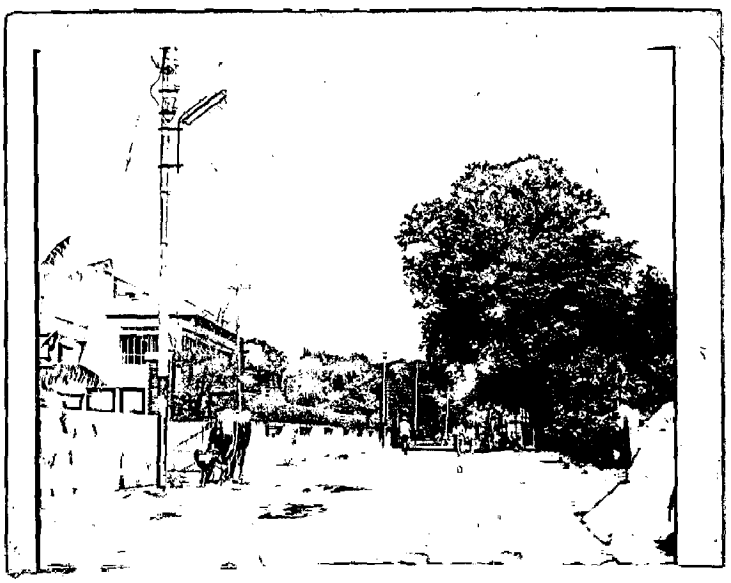


8

Main and the oldest building in the campus, being used as administrative block.



Way out to cantonment area, in past years it used to be considered as the main road connecting the faculty.



The way out to City/Bus stand, side from the Campus.

narrow slot views between buildings.

5.2.3 Survey of Campus with reference to identify areas:-

OBJECTIVES:-

i) To identify the areas of identity over the whole campus and in detail with specific areas.

ii) To identify the main features and lay out of the campus.

iii) To identify the visual qualities of the existing streets in terms of space enclosure and focal points.

iv) To identify the sites of opportunity.

METHOD:- Carrying out a survey by visual observation and the examination of recorded historic evidence of the fabric of the built-up area.

Selecting the most important views of focal points. Marking up the results of observation on plan.

i) Major identity areas:- Plan shows the areas of common identity over the campus as a whole. It also shows by letter the relationship between the various area. Area 'A' is the most visually

and historically dominant and area 'D' is the least dominant. This survey covers all areas regardless of architectural quality. It attempts to show areas which hold together as units, because of their over all identity, whether they consist of historic areas or open spaces.

5.2.4 Local identity areas:-

The local areas are defined in the same way as the major areas but the more attention is paid to details of architectural character. Within for example the central area, the new roads are no more than local distributors or service roads. There may be a need for a degree of padestrain segregation over the whole of the campus centre area. The local identy areas are shown in map attached.

The local areas are lettered to show the significance of each area, one to the other. Where a group of identity areas is found to exist, at some places the boundaries of a conservation Area is coinciding with those of the group.

Closely related to the identy areas is the scale of existing development plan shows the areas which have a greater sense of scale due to massing of buildings.

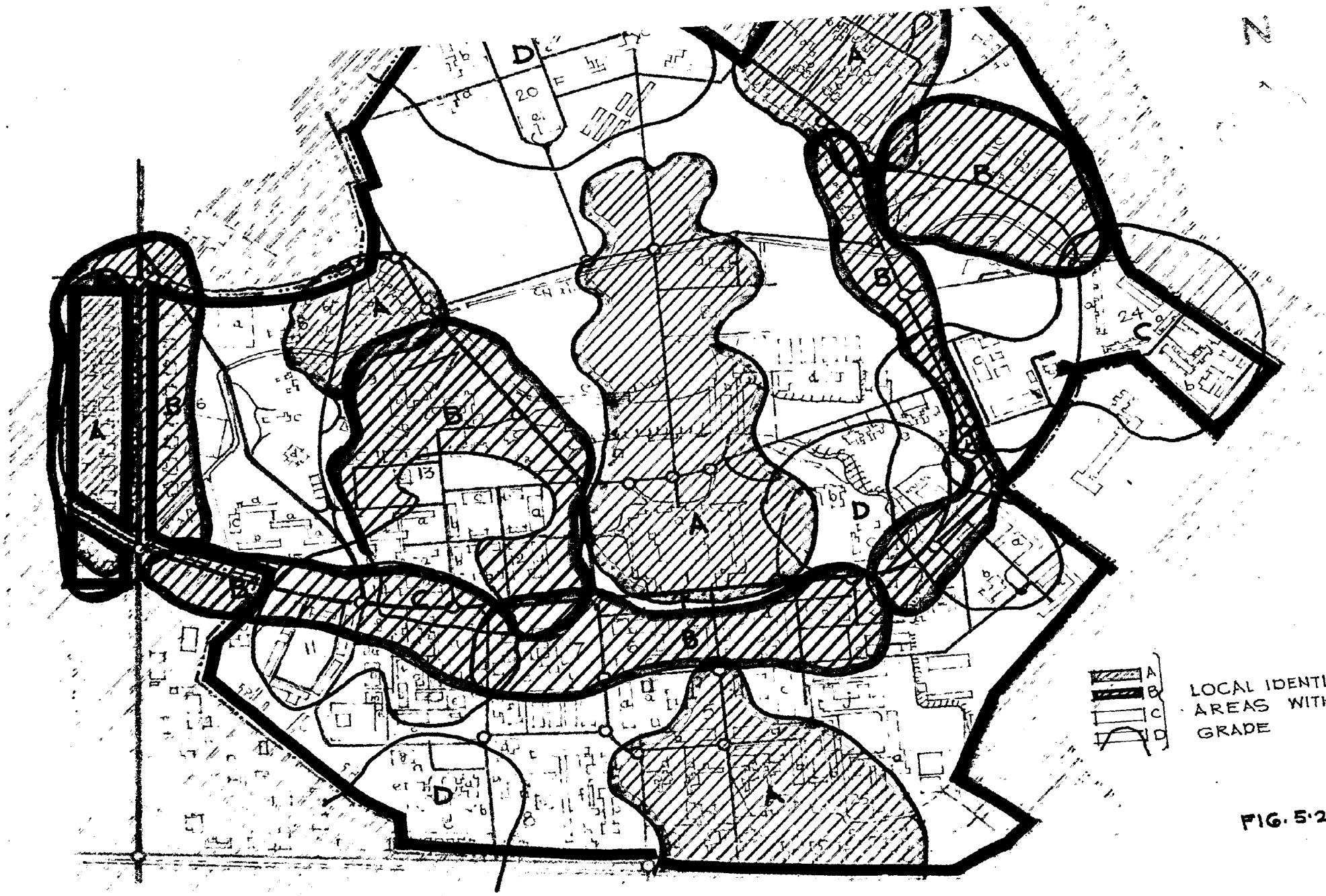


FIG. 5·24

These places of greather scale usually coincide with the areas with the highest letter for dominance. They suggest where new large scale development might take place, providing that it does not conflict with conservation aims. Other areas, not so marked, would only be suitable for small scale development.

This aspect is important for controlling development in the design of infilling.

5.2.5 Spaces:

The plan attached show spaces which are important to the identity of the campus. The areas which are hatched imply that the height of structures around the spaces is important to their enclosure, to the consequent character of the spaces in themselves and the relationship of one space to another.

Some areas stand out from others in campus because of the character of their spaces or the lay-out of the streets in relation to those ground. Such difference between one part of the campus and another suggest a special organization which might well be maintained, they also suggest the boundaries of identity areas and perhaps conservation areas. The plan shown with large open spaces, this campus centre has large open space an Northern side and the surrounding areas particularly on Southern side have smaller spaces, in significant spaces with regard to main open space.

The main road on the rear of main building is acting like a maize where the roads twist and turn and it is difficult to orientate one self.

5.2.6 Frontages Important to Street Enclosures:-

Few frontages are shown in the plan, not necessarily with any particularly architectural unit unit by merit, but are shown as important to the enclosure of certain additional streets and spaces. This includes specially those which, by being on a curve or a change of direction, close off a view out of the street. There is no need to mark frontages which are already shown as enclosing a space that is reconiged as identity of the campus.

5.2.7 Focal Points:-

A number of focal points have been shown on the plan as well as the principal views towards them. The main two types of views are covered namely.

a) Local views to focal points within streets and spaces in the area.

b) Views across the campus where certain buildings are seen from areas out-side the campus centre, say residential area or recreational area. In reverse certain views are shown from the central area, across the campus to the residential areas. These may affect the formulation of building policy.

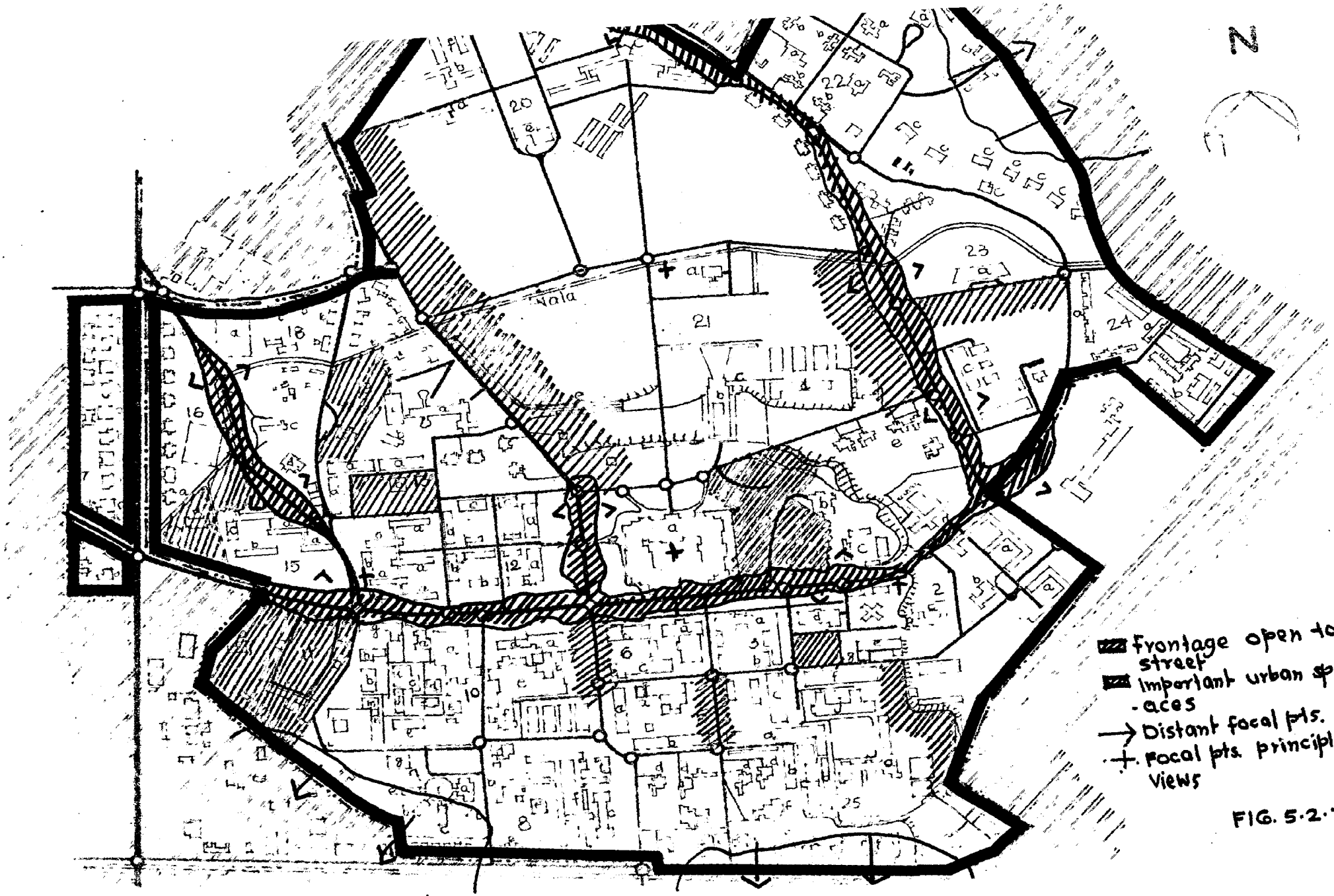

N
Vala
Frontage open to street
Important urban spaces
Distant focal pts.
Focal pts. principle views

FIG. 5.2.7

5.2.8 Views out to the Adjoining Areas:-

The local views out to the adjoining areas from the campus centre are shown on the plan. This makes necessary to judge the contours of the campus ground and its relation with the contours of adjoining area. Normally the dominating area is considered with higher elevation. This views provide guide lines for the setting of structures of creating spaces such that the necessary views can be pleasurable.

5.2.9 Areas of Visual Opportunity:-

(a) Many areas of visual opportunity now can be searched from the plan, such as better enclosure of a space, or where a new building can functionally and positively contribute to the street seen in the place of an existing one, or the removal of an eye-sore or the possibility of replacing a building.

(b) The street pattern as traced out from history is circular one which now depict and functioning as the main arteries of the campus still in existence over a considerable part of the campus, it will be worthwhile to say that entire campus is covered by this system and now as campus developed the system is distinguished by the gridiron layout which contributes to the character of much of the campuses in India.

5.3 SURVEY OF INDIVIDUAL BUILDINGS:-

OBJECTIVES:

i) To identify the buildings of architectural and historic interest and the ancient momments.

ii) To identify other buildings which can be regarded as permanent and which will continue to affect the visual qualities of the streets in the foreseeable future.

iii) To identify groups of buildings which should be considered as a whole and which include or adjoin historic buildings.

The following has been followed:-

i) By examining the calenders of Thomason College of Engineering and other local references.

ii) By studying the groups of buildings by observation in the streets.

iii) Preparing a map showing buildings and group of buildings.

5.3.1 The main features on Plan:-

Listed Buildings, Permanent Buildings and Group of Buildings:-

The Plan shows the buildings architectural and historical interest in the campus, including all those that it is desirable to preserve but which are not

included on the Plan. It also identifies buildings which can be considered as permanent because of their structural condition or value, including, of course, existing new buildings.

Group of buildings are shown in relation to main and permanent academic buildings where there is a need do maintain cohesion.

In addition to this plan a large scale plan can be prepared and properties of each building may be shown which ultimately streamlines the whole process. The emphasis on shape and enclosure may be put by drawing the perspectives taken at intervals down the street.

5.3.2 Appraisal of individual buildings:-

Conservation Area:-

The conservation areas are well defined by aims, the plan shows the identification of a possible conservation Area and in addition an adjoining area which will be subject to control because of its proximity to the conservation Area. The boundaries are drawn to include the main core of the campus where it is intended that change will be minor. It is probable that new major or net work roads will be sited away from the central area.

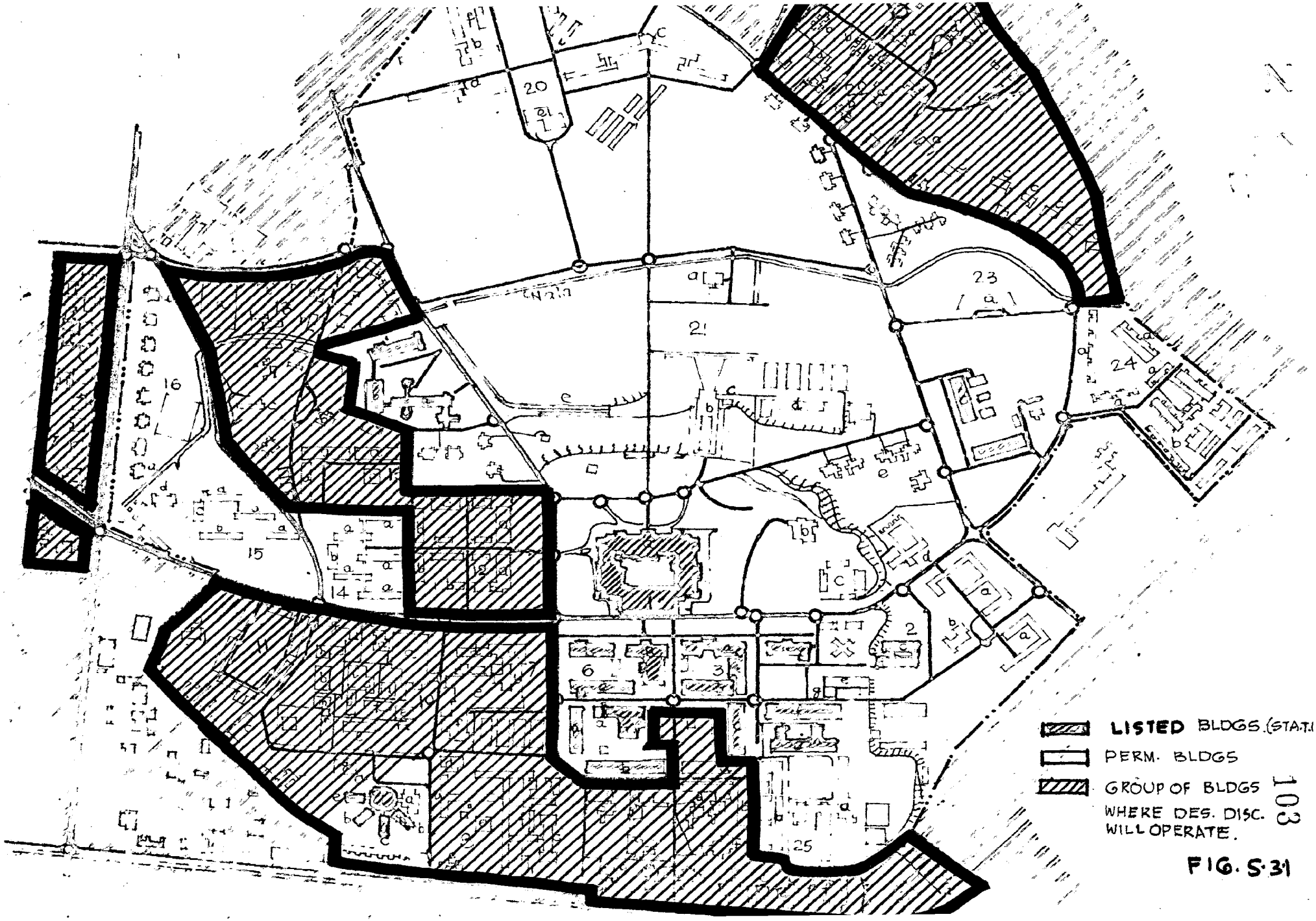

LISTED BLDGS. (STATU
PERM. BLDGS
GROUP OF BLDGS WHERE DES. DISC. WILL OPERATE.

FIG. S·31

The dilapidated structures will be dismentalled and will be constructed in other rebuilding areas.

The conservation policy in sequence of plans state that what priority is given to which sector.

5.3.3 Design Discipline for infilling:-

The group with vional cohesion shown on the plan and the group qualities are analysed in order that any new buildings proposed within them are seen in relation to the groups as a whole the aims of design discipline are set out in an illustrated statement describing each group of buildings.

FIG. (A) Each conservation area has been shown in plan and are not complicated one. A compact central area for example is seldom worth dividing into separate conservation areas. One simple area is usually best and more easily under stood at the designation stage.

FIG. (B) In the plan the conservation areas have been marked with numbers which depict the priorities of different areas of action the importance of these areas has been dealt in the chapter, Rebuilding of declined areas. In the sketch, areas are numbered 1-3 according to priorities.

FIG. (C) Supplementary maps might differentiate between areas of strict preservation (A in sketch), with little new developments and the areas where a larger amount of new development would be permitted (B in sketch), but where this development is to be, need close visual relationship to the existing land scape within the conservation area. The areas of different character are dealt in detail in chapter, rebuilding, declined areas.

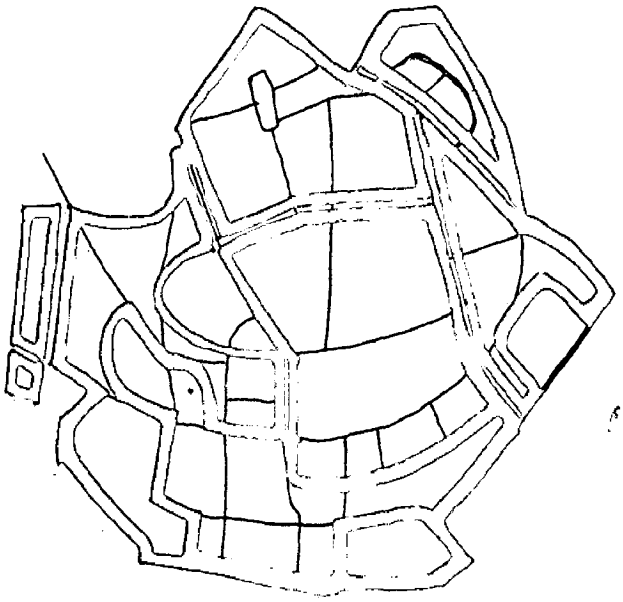


FIG. 'A'

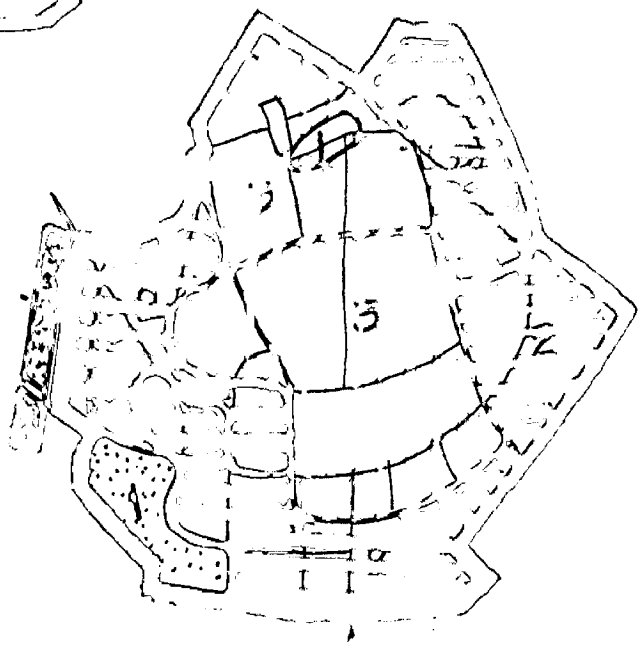


FIG. 'B'

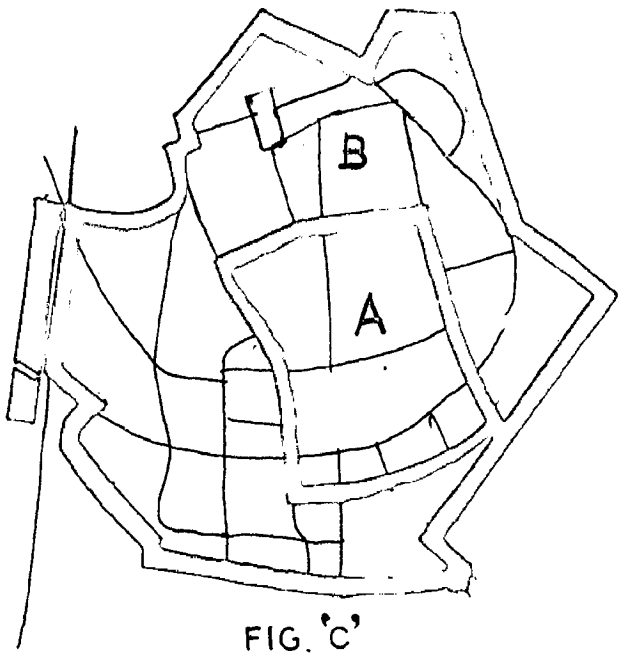


FIG. 'C'

FIG. 5·3·2

CONSERVATION AREAS & POLICY

5.3.4 Assessment of residential Environment

Environmental Rating	Road use	Lay-out	Parking	Out-look surroundings	Open Space	Visual Quality
Class A	Main traffic route	Housing frontage on pavement and/or inadequate space about buildings	Kerbside parking only	Absence of planting and/or without look to noxious land uses.	No garden or only drying green and no access to open space.	Jarring use of materials or unsympathetic or dull design or layout.
Class B (Between A&C)						
Class C	Occasional or light traffic route	Separation from road by front garden	Some garages and off street parking	Some trees or planting outlook to compatible land uses.	Garden, or access to communal garden open space or childrens play ground.	Sympathetic use of material or inoffensive in character
Class D (Between C&E)						
Class E	Residents only service road or culdesec.	Pedestrian separation	Approx. 1:1 garaging and off street parking	Good surrounding land scape, pleasant approach and outlook	Private or communal garden, plus play area or park.	Unified design and layout.

Source :- Stirling Shire, West Lothian and Falkirk growth area joint planning advisory Committee; The Grangemouth Falkirk Regional Survey and plan. Vol. 2 pp. 47.

Sl. No.	Campus	Yr. of Estt.	No. of students residing in hostels	Site in acres			Area per 100 stu.	Percentage of developed Land to			
				Developed	Undev.	Total		Academic	Residential	Other amnities	Roads
1.	I.I.T. Delhi	1963	2000	320	-	320	16.4	17%	33%	42.5%	7.5%
2.	I.I.T. Kanpur	1960	2400	523	517	1040	21.7	21%	38%	28%	13%
3.	Punjab University Chandigarh	1956	2700	356	130	426	13.2	38%	50%	7.5%	4.5%
4.	Punjab University (Agricultural) Ludhiana	1962	2200	453	750	1203	20.5	29%	31%	34.2%	5.8%
	Campus not fully developed			300	160	460	12.5	28%	40%	22%	20%
5.	U.P. Agricultural University, Pantnagar	1960	2400	-	-	-	-	-	-	-	-
6.	Himachal Pradesh University, Simla	-	-	60	120	120	-	-	-	-	-
	(Campus not fully developed)										
7.	Punjabi University - Patiala	-	2000	210	86	296	10.5	.36%	50%	8%	6%
	(Partly developed)										
8.	University of Roorkee - Roorkee (U.P.)	-	1900	335	35	365	17.5	19.70%	45.54%	20.66	11.74%

5.6 Concluding Remarks:-

The appraisal of the campus is a must, as the development of campus in future needs the data of the past and present and the value of the areas which are old and needs renovation. The subjective approach for appraisal is attended which is based on visual survey backed by the data or information supplied by the past and present inhabitants.

The chart 5 depict the systematic approach for survey needed for appraisal. The following areas have been marked separately like:

i) Conservation areas.
ii) Relationship with land scape and main buildings.
iii) Major identity areas.
iv) Local identity areas.
v) Focal points.
vi) Assessment of residential environment.

CHAPTER VI

CASE STUDIES

6.0 THE PURPOSE OF THE CASE STUDIES

The case studies of different campuses conducted, are back bone in the sense to provide sufficient data, to guide for the future development of the Roorkee campus. Study includes and provides wit in the frame work of each.

1. Study provides an immediate yard stick against which developmental decisions can be measured.
2. It serves as a co-ordinating frame for programmes and project under development.
3. It provides the basis for initiating broad land use controls through out the campus.
4. It allows continuing research to be focused upoh plan objectives and to design so as to fill the gaps in the material form.
5. Case studies present, in a comprehensive manner, so that subsequent plan can unfold in a logical manner, increasing in depth and comprehensiveness and enlisting the support of the forces responsible for plan implementation.

The three case studies of different campuses were conducted to have insight of housing development and over all

planning concepts. These campuses are the following:

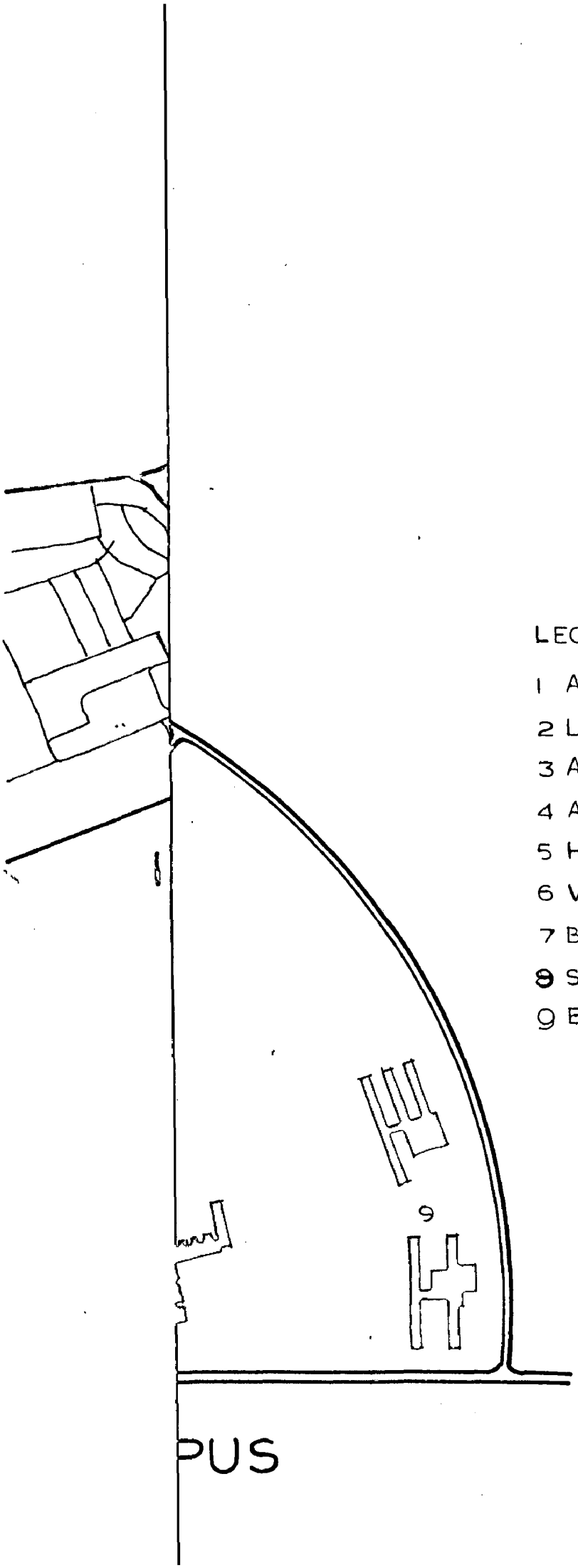
1. U.P. Agricultural University, Pantnagar (U.P.)
2. Himachal Pradesh University, Simla (H.P.)
3. Punjabi University, Patiala, Patiala (Punjab).
4. Kanpur University, Kanpur (U.P.)

for housing only.

6.1 U.P. AGRICULTURAL UNIVERSITY, PANTNAGAR

Design and construction at the Uttar Pradesh Agricultural University has had sporadic planning from its inception a decade and more ago, and the buildings and grounds reflect this " feast and famine" cycle. The campus plan, patterned roughly after the giant half wheel layout of Banaras Hindu University and depicted systematically.

The planner of this University got trained in states and had studied some of the University campuses as per their function particularly the land-grant Universities. This training was through U.S.A.I.D. Scheme.



LEGEND

1 ADMINSTRATION
2 LIBRARY
3 AUDITORIUM
4 AGRICULTURE COLLEGE
5 HOME SCIENCE ,,
6 V.M. COLLEGE
7 BASIC SCIENCE ,,
8 STUDENT HOSTEL
9 ENGG. COLLEGE

FIG. 6.1.1

6.1.1 Problems Areas and Recommendations:-

During the course of conferences with campus development committee and subsequent design, several main problem areas began to be defined. Recommendations vary in scope from the general to the particular, dealing with both campus and architectural planning. Rather than describing in detail the major planning jobs on which some time was spent, it seems more beneficial to suggest some solutions to problems the University is encountering in its expansion program.

6.1.2 Programming:-

The University staff experienced a common difficulty in defining needs when they were asked to have programming or submit the detailed requirements of building supporting with functions.

Programming involves a close look at a program's goals and a meliculous definition of its space needs based on its present activities and its goals. It must be done by the people most closely associated with that work, i.e. those incharge, in collaboration with those who will use the space. The designer, at best can only assist the clients in starting goals and needs. As guide lines to use in programming, the criteria for architectural planning are listed here in order of their priority*

6.1.3 Campus Programming:-

The actual development of campus plans can be considered to be divided into two major parts.

i) The first part involves the development of program.

ii) and the second part the development plan. The program establishes a basis of data. This data relates to the needs and objectives of the University. The more accurate and definite the program data the better chance for good planning. The program serves to guide the planning work, and the planning then becomes a matter of execution of those stated goals and needs of the program.

A. Function:- The activity which the building is to house should determine its form and lay-out more than any other factor, since the activity is the reason the building is being constructed. All else is secondary. Therefore, the work should carefully be defined by the people involved in it to permit a logical, workable, design to house it.

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* This discussion deals primarily with architectural programming, since jack swings report for the summer of 1967.

* Jack swing, Report on campus planning, U.P. Agricultural University, Pantnagar, June 15 - Sept. 1, 1967.

B. Comfort:- The efficiency of the people for whom the space is intended is of prime importance, whether rated in terms of learning, research, extension work or administration. If the psychological need of those using the space are not optimised to permit top productivity, the return on the University investment is lessened.

C. Economy:- The cost of buildings may be measured in two primary ways, the initial cost of construction, and the cost of maintenance (repairs, cleaning and up-keep) for the life of the building. Costs that cannot be measured but that are equally important have to do with whether the buildings design arguments or deters the operation conducted within its spaces. A cheap building (based on initial costs) may end up being a very expensive one if maintenance and function are not primarily considerations in the initial tabulation of costs.

D. Appearance: If a building's design grows directly out of the foregoing critieria and is constructed from materials sympathetic to them, it will be an honest expression, not

superficially stylistic. Its appearance will probably reveal its purpose, and a true and fitting beauty will result. Cosmetics applied after the building is constructed are neither necessary nor legitimate expenditures.

6.1.4 SPACE:-

The most frequently stated problem, of course, dealt with lack of usable space or with improperly related spaces.

A. Space allocation:- Because of lack of in-depth planning for buildings a dispropertionate amount of space exists as corridors and little-used verandans. Also, the effective use of some spaces is hampered because of a failure to tailor them to augment the activity they house.

B. Climate as Criterion:- Some spaces are rendered virtually unusable during some parts of the year because of flooding, unshielded sunlight, in adquate lighting, lack of insect controls, or lack of cooling; this necessitates doubling up on already over-crowded spaces.

C. Relation of Elements:- Effective collaboration between some operations is discouraged or prohibited

because of too great a physical separation between them. Both faculty and students are handicapped if distances prevent convenient access between class-room and lab, between office and green house, be class-room and house.

D. Crowding:- Every college suffers from an acute lack of room for effective operations. This situation is also true for administration, student services, housing, and some extension programms, so that a large volume of construction requiring planning and coordination is justified for many years to come.

6.1.5 The plan for the expanding campus, previously described, will serve the university well at any point in its development further recommended.

A. The campus centrum should be recognizable as the heart of the campus, academically and vionally. Therefore, the "infilling" of buildings should be continued, making a denser center.

The spacing of buildings in the existing layout will permit location of many more within the same core area. Plots between the buildings are hardly large enough to farm, but are too large for economical maintenance as land scaped areas.

Shorter utility lines would cost less initially as well as less for continuing maintenance.

Pedestrain travel time is critical: Students and staff must be within easy walking distance of one class to another; Staff and students will utilise various services and agencies in proportion to their accessibility. Too a healthy crossing of academic lines is encouraged through the placement of the library and SBSH units in the center of the various colleges.

The placement of the library, particularly, is critical to creating the feeling of heart and head of the university, for the library epitomizes the great University, symbolically as well as actually.

B. The exact center of the campus should be located as an open pedestrain mall, which .. as the infilling of buildings continues, will be enclosed with a tight, dense ring of construction, creating a virtual basis within the campus core. The inherent contrast between a large quadrangle and its surrounding buildings has proved highly successful in large, scale developments all over the world.

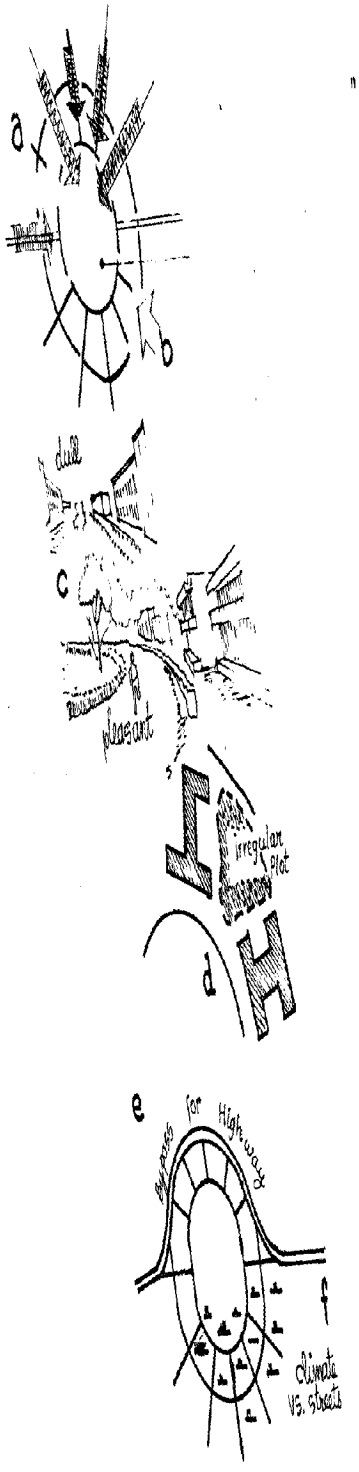
C. The green belt enclosing the colleges is one that should be jealously guarded, because the temptation to construct buildings in this open

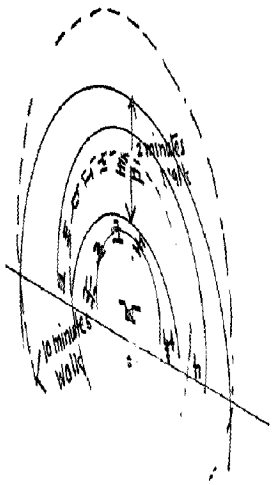
space will likely be strong in the future. The need for this recreation space adjacent to the hostels (which occupy the next larger circular band) will grow as the University expands and enrolment increases. The doughnut spaped open space is not excessively large, so proposals to fill it in must be denied. (Banaras and Ludhiana Universities have reserved inviolable open spaces for similar reasons).

6.1.6 The Growing Campus:-

The primary scheme of the campus envisions a series of concentric rings which contain from centre to peripheri .... the programs fundamental to the entire University, the main college buildings, a green belt, student hostels and staff housing. The various colleges, existing and future, form the first encircling ring around the core. The next established circular band is an open green space, a recreational area, which is circled by a larger band occupied by the hostels which are in turn, circumscribed by a band of staff housing.

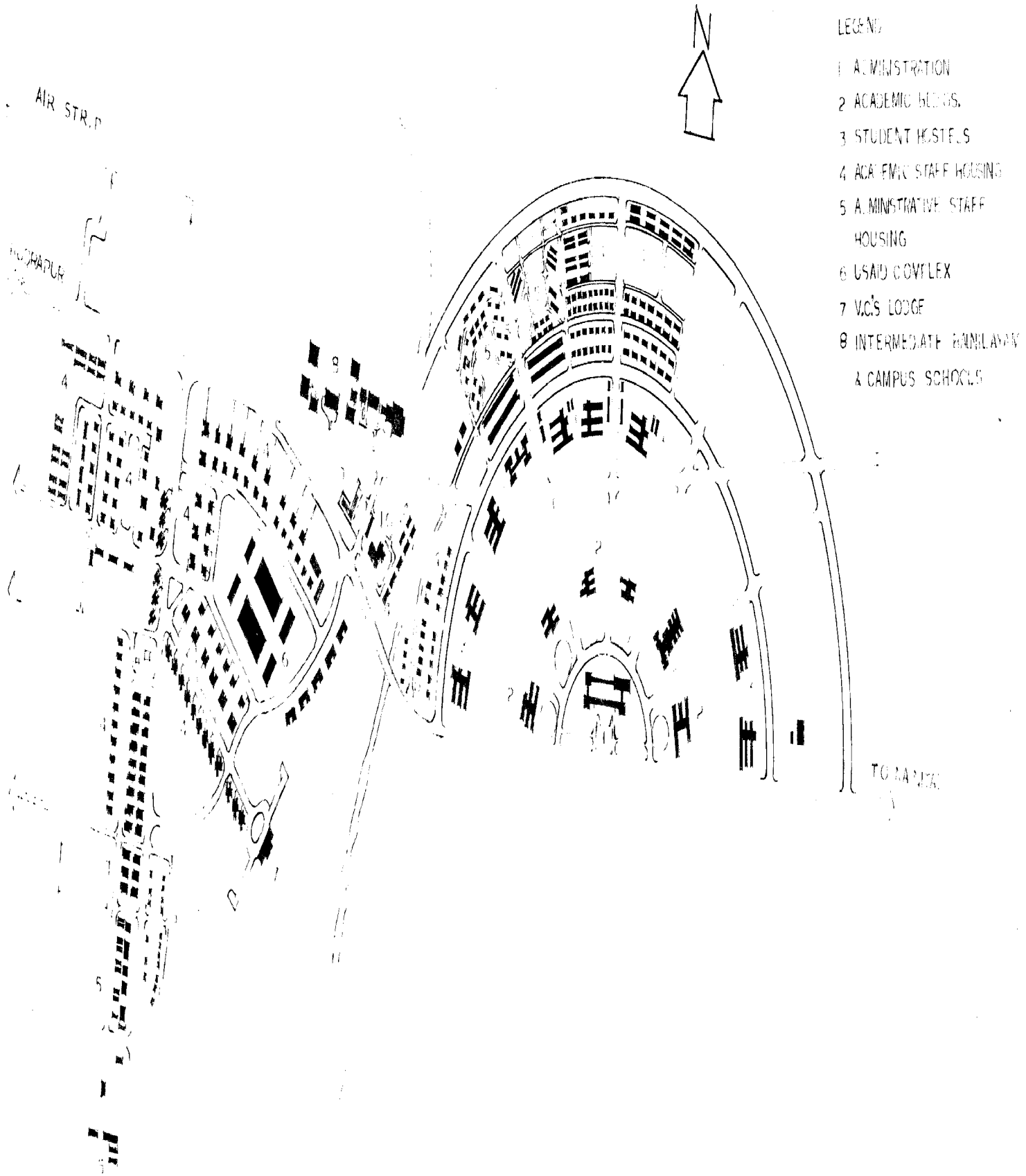
THE SECOND SCHEME, super imposed over the first, aims at bringing together the living and learning areas of the students so that academic communities are formed from parts of three of campus circles. The giant wheel of the campus, formed by the series of concentric rings,





U.P.A.U. PLAN & ITS RATIONALE

FIG. 6.1.6



U. AGRICULTURAL UNIVERSITY
MASTER PLAN

SCALE 1000'

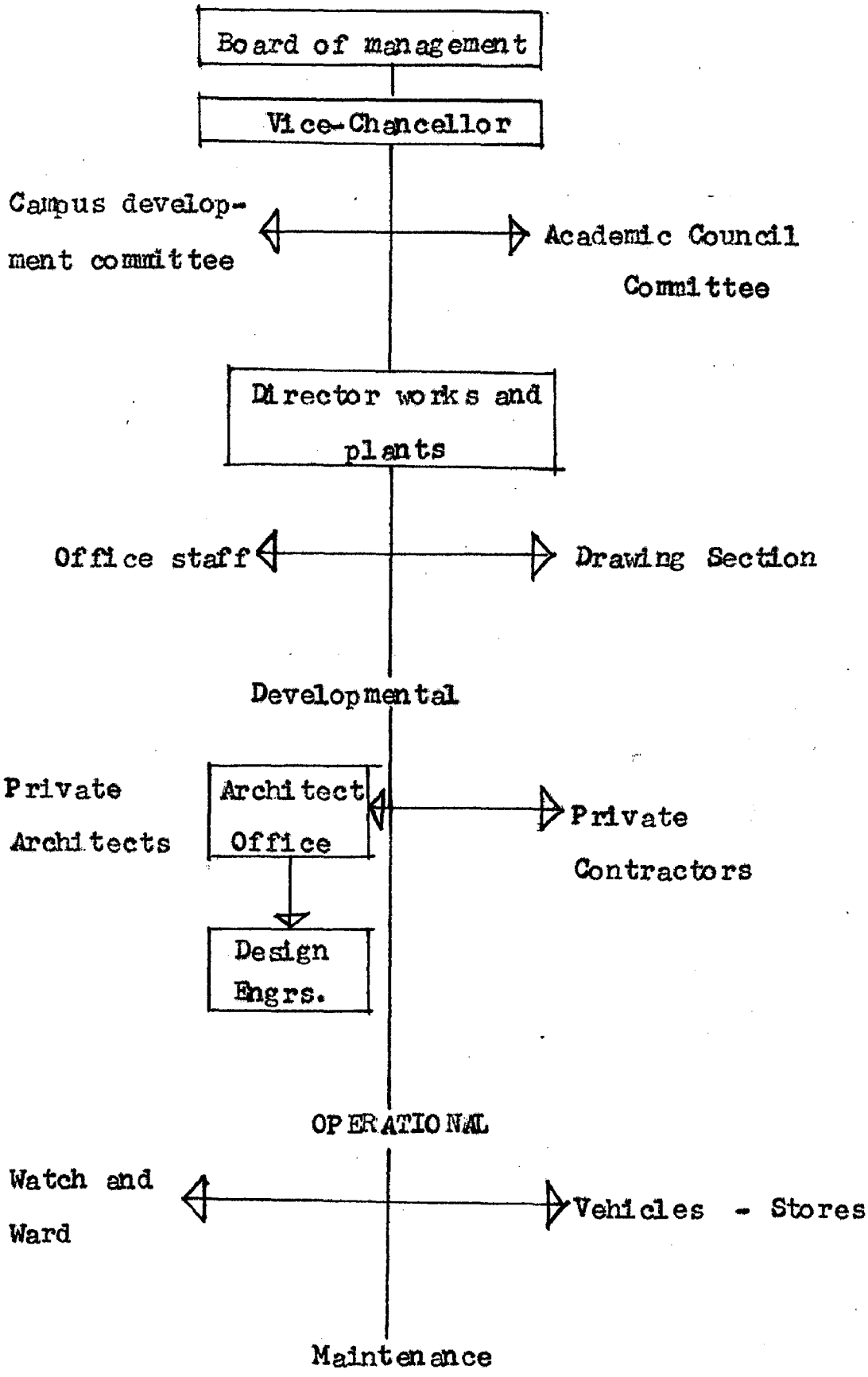
is imaginated as divided radially from the centre, as spokes section a wheel. Each sector contains an academic community, consisting of the specialized instruction area(the college), the recreational area of the green belt, and then the living quarters of the students enrolled in the college, as far as is practicable. Kindered studies are located side by side or conveniently nearby.

All "academic communities" would share a common center, the core of the campus, containing the programs which are basic to the Universities total curriculam and operations. These fundamental programs include basic sciences and humanities (which will have to be moved from there present locations), the library, visual and performing Arts, and student activitees, as well as administrative, extension and other purely "service" areas. To serve entire University community most effectively, the buildings for all these programs should eventually be within the innermost ring road, purposely forming a dynamic high-density centrum around which the University revolves.

The move of SBSH to the centrum would vacate one major academic building, providing space for the beginning of the college of medicine. This location is ideal

for medicine, permitting a coupling with the existing college of veterinary medicine, the two college may naturally share some facilities and faculty. Other expansion may direct Agriculture south into the adjacent segment, Pant College of Technology to the north to fill two segments. Such growth reserves three full segments in the southern half of the wheel of future academic programs in the professions (perhaps low and Architecture) as well as commerce and others.

6.1.7 University Organization for U.P.A.U. Campus DEVELOPMENT*



*U.P.A.U. Organization for campus Development plan/ campus design in India, Achyut Kanvinde and H.J. Miller, P.P. 47.

6.2 HIMACHAL PRADESH UNIVERSITY:

Himachal Pradesh University is the latest newly developed university, which is considered as a hill University. This has come up after the partition of Punjab into three states, i.e. Punjab, Haryana and Himachal Pradesh.

The planning and architectural cell of the University is working in the coordination with the Punjab Agricultural University, Ludhiana. There is a substantial Architectural brain drain from Punjab Agricultural University, Ludhiana.

Presently the H.P.U. is in developing stage, However, the teaching and conducting of corresponding courses is functioning properly. All University activities are being performed in temporary structures, but the interim plan of the campus has been prepared and being followed accordingly phase wise. Firstly major construction which is at present of great volume is of housing for staff.

5.2.1 The major land uses of the campus are of three types and given here as over all.

1. Academic	- Educational		- 24%
2. Hostels	-)		- 40%
3. Staff quarters	-)	Residential	- 36%

LEGEND

1.ACADEMIC BUILDINGS
2.STUDENT HOUSING
3.STAFF HOUSING
4.BUILDINGS FOR CORRESPONDENCE
5.COURSES

FIG. 6.2

Further these uses have been sub-divided into the following:

i) Recreational

ii) Open land.

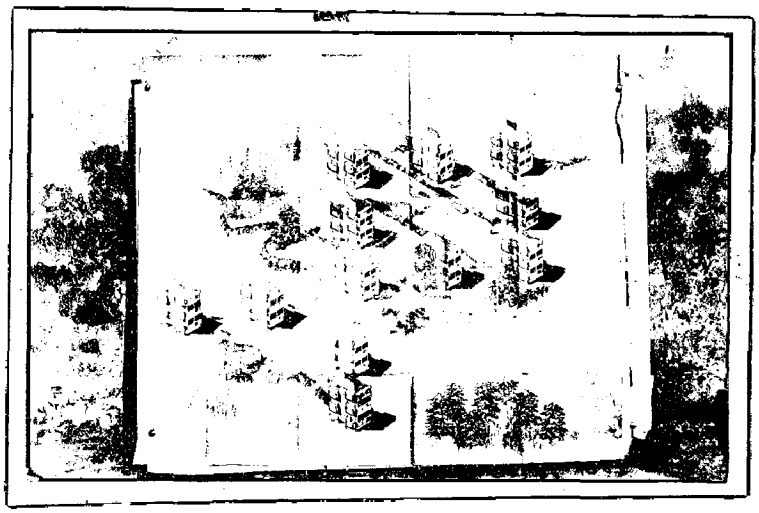
iii) Roads etc.

Sufficient areas are not possible due to the proximity of the elevations steep rise and fall of natural ground. What ever pockets of land were made available have been used for construction of buildings. However, sufficient play-grounds have been provided for student community as their part of activities of day to day. Because of the climatic conditions and hill environment much open spaces are not needed as sufficient exercise is attended to while walking to reach the Academic areas from residential units and again way back.

The campus plan is y-shaped, which is based on natural contours of hill the heart of the campus, from where three branches of Y spront, is provided for Academic activities, while, the right side is for staff housing and left side for students residential area, with play grounds.

The housing, whether of students or staff is multi-storeyed ranging minimum from 3 storeys and upto 5 storeys, this is because of limited availability

H.P. University Simla Campus Plan



Teachers Houses at H.P.University Simla

H.P.University Simla

Readers/Lecturers Residences
at Shimla

Residences at Shimla

Residences at Shimla

H.P. University Shimla