

STRATEGIES FOR JUDICIOUS RESIDENTIAL INTERIOR SPACE MANAGEMENT

**M.NIRVIKALPA
B.H.SC. (HOME SCIENCE)**

**MASTER OF SCIENCE
IN THE FACULTY OF HOME SCIENCE**



**DEPT. OF RESOURCE MANAGEMENT AND CONSUMER SCIENCES
COLLEGE OF HOME SCIENCE
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY
HYDERABAD-500030**

OCTOBER, 2008

TO MY BELOVED

I dedicate each and every letter of this thesis to my beloved professors and also to my family and friends who have been very supportive at every stage.

Thank you all

M.NIRVIKALPA

HHM/2005-07

STRATEGIES FOR JUDICIOUS RESIDENTIAL INTERIOR SPACE MANAGEMENT

BY
M.NIRVIKALPA

B.H.Sc. (Home Science)



THESIS SUBMITTED TO
ACHARYA N.G.RANGA AGRICULTURAL UNIVERSITY
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
THE DEGREE OF **MASTER OF SCIENCES** IN THE FACULTY OF
HOME SCIENCE

**DEPARTMENT OF RESOURCE MANAGEMENT AND FAMILY SCIENCES,
COLLEGE OF HOME SCIENCE,
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY,
RAJENDRANAGAR,
HYDERABAD-500030
ANDHRA PRADESH
INDIA**

2008, OCTOBER

CERTIFICATE

Mrs. M.NIRVIKALPA, has satisfactorily prosecuted the course of Research and that the thesis entitled, “**STRATEGIES FOR JUDICIOUS RESIDENTIAL INTERIOR SPACE MANAGEMENT**” submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that the thesis or part thereof has not been previously submitted by her for a degree of any University.

Date: 25th October, 2008

Dr. (Mrs.) VIJAYA NAMBIAR

Place: Hyderabad

Major Advisor

CERTIFICATE

This is to certify that the thesis entitled “**STRATEGIES FOR JUDICIOUS RESIDENTIAL INTERIOR SPACE MANAGEMENT**” submitted in partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE IN HOME SCIENCE** of Acharya N. G. Ranga Agricultural University, Hyderabad is a record of the bonafied research work carried out by **Miss M.NIRVIKALPA** under my guidance and supervision. The subject of the thesis has been approved by the Student’s Advisory Committee.

No part of the thesis has been submitted for any other degree or diploma or has been published. The published part has been fully acknowledged. All the assistance and help received during the course of investigations have been duly acknowledged by the author of the thesis.

Dr. (Mrs.) VIJAYA NAMBIAR

CHAIRMAN OF THE ADVISORY COMMITTEE

Thesis approved by the Student’s Advisory Committee

Chairman: Dr. (Mrs.) VIJAYA NAMBIAR _____
Professor and Head
Department of Resource Management and Family Sciences
College of Home Science
Acharya N.G. Ranga Agricultural University
Hyderabad- 500030.

Member: Dr. (Mrs.) P. Radha Rani _____
Associate Professor
Department of Resource Management and Family Sciences
College of Home Science
Acharya N.G. Ranga Agricultural University
Hyderabad- 500030.

Member: Dr. R. Ratnakar _____
Professor
Extension Education Institute
Acharya N.G. Ranga Agricultural University
Hyderabad- 500030.

DECLARATION

I, Mrs. M.NIRVIKALPA hereby declare that the thesis entitled JUDICIOUS SPACE MANAGEMENT STRATEGIES FOR TWO BEDROOM APARTMENTS IN THE CITY OF HYDERABAD submitted to Acharya N.G. Ranga Agricultural University for the degree of MASTER OF SCIENCE IN HOME SCIENCE is a result of original research work done by me. It is further declared that the thesis or any part there of has been published earlier in any manner.

Date: 25th October, 2008

M.NIRVIKALPA

Place: Hyderabad

CONTENTS

CHAPTER NUMBER	TITLE	PAGE
1	INTRODUCTION	1
2	REVIEW OF LITERATURE	15
2.1	Concepts of space and space planning	15
2.2	Interior design space saving techniques	25
2.3	Elements of space saving	25
2.3.1	Furniture	25
2.3.2	Lighting	35
2.3.3	Accessories	41
2.3.4	Colour	51
2.3.5	Pattern	65
2.4	Commercial space planning	67
2.5	Residential space planning	69
2.6	Case studies	91
3	MATERIALS AND METHODS	101
3.1	Research design	101
3.2	Locale of the study	103
3.3	Selection of sample and sampling procedure	103
3.4	Conceptual framework	107
3.5	Tools used for the study	107

CHAPTER NUMBER	TITLE	PAGE	
	3.6	Pre-testing of the tool	109
	3.7	Collection of data	111
	3.8	Analysis of data	111
	3.9	Evolving the design guidelines	111
	3.10	Design space management strategies	113
	3.11	Limitations of the study	113
	3.12	Assumptions	113
4	RESULTS		115
	4.1	Standard dimensions for interior spaces	115
	4.1.1	Anthropometry	115
	4.1.2	Room dimension	145
	4.1.2.1	Living room	145
	4.1.2.3	Dining room	163
	4.1.2.4	Kitchen	173
	4.1.2.5	Bedroom	191
	4.1.2.6	Bathroom	201
	4.1.2.7	Powder room	203
	4.1.2.8	Family room	
	4.1.2.8	Closets and storage	205

CHAPTER NUMBER	TITLE	PAGE
	4.1.2.9 TWO-BEDROOM APARTMENT	209
	4.2 Existing space saving furniture designs	215
	4.2.1 Furniture for living room	217
	4.2.2 Furniture for bedroom	229
	4.2.3 Furniture for dining room	231
	4.2.4 Furniture for childrens' bedroom	235
	4.2.5 Furniture for rooms with small spaces	237
	4.2.5 Kitchen units	243
	4.3 Interior space management strategies	243
	4.3.1 General information	243
	4.3.2.1 Living / dining room	247
	4.3.3.2 Kitchen	261
	4.3.4. Bedroom 1	273
	4.3.5 Bedroom 2	285

CHAPTER NUMBER	TITLE	PAGE
	4.3.6 Bathroom	297
	4.4 Strategies for space conservation in a two bedroom apartment model design	301
5	Discussion	401
	5.1 Standard dimensions of interior spaces	401
	5.2 Existing space saving furniture designs	415
	5.3 Interior space management strategies	417
	5.4 Strategies for space conservation in a two bedroom apartment model design	443
6	Summary and conclusion	445
	Implications of the study	471
	Recommendations for future research	473
7	Bibliography	475
8	Appendices	479

LIST OF FIGURES

Figure number.	Figure description	Page number
2.1	Objects and shapes	22
2.2	Concave or convex	
2.3	Space and dimension	
2.4	Wooden platform beds	32
2.5	Bamboo platform beds	
2.6	Metal platform beds	
2.7	Platform bed sets for bedrooms	
2.8 (a),(b)	Lighting system	
2.9	Illusion of space	56
2.10	Architectural details	58
2.11	Low ceiling	
2.12	Effect of stripes	
2.13	Horizontal stripes	60
2.14	Diagonal stripes	
2.15	The problem 1	
2.16	The problem 2	94
2.17	The problem 3	96
2.18	The problem 4	98
3.1	Hyderabad map	102
3.2	Schematic representation of sampling procedure	104
3.3	Pictorial representation of areas from which the samples and showrooms have been selected	106

3.4	Conceptual framework	108
4.1.1	Standing body measurements (a) Male (b) Female	116
4.1.2	Sitting body measurements(a) Male (b) Female	
4.1.3	Recommended clearances for circulation (a) Male (b) Female	120
4.1.4	Recommended clearances for sitting positions (a) Male (b) Female	
4.1.5	Recommended clearances for circulation. (a) Between high wall (b) walking with elbows	122
4.1.6	Limited access behind chair	
4.1.7	Access between a table and wall	
4.1.8	Access behind a chair	124
4.1.9	Access between a table and cabinets or appliances	
4.1.10	Space between walls for a hand basin	
4.1.11	Space in front of a hand basin and a wall	
4.1.12	Space between walls for a toilet	
4.1.13	Space in front of a toilet and wall	
4.1.14	General access, 850mm; limited access, 600mm	126
4.1.15	Limited access between a table and other furniture	
4.1.16	Armchair by 850mm	123
4.1.17	Table, five to six persons, 1200 by 900 mm	
4.1.18	Double table, 1350 by 2000 mm	
4.1.19	Chesterfield, 2000 by 800 mm	
4.1.20	Table, seven to eight persons, 1800 by 900 mm	123
4.1.21	Single bed, 1000 by 2000 mm	

4.1.22	End table, 650 by 450 mm	
4.1.23	Dining chair, 450 by 500 mm	
4.1.24	Single dresser, 750 by 450 mm	
4.1.25	Coffee table, 1200 by 450mm	
4.1.26	Tables, circular	
4.1.27	Double dresser, 1200 by 450mm	
4.1.28	Occasional chair, 700 by 750 mm	125
4.1.29	Buffet, 1200 by 450mm	
4.1.30	Bedside table, 500 by 400 mm	
4.1.31	Tables, rectangular	
4.1.32	Work surface, 900 by 450 mm	
4.1.33	Horizontal zoning to achieve apparent of activities	128
4.1.34	Vertical zoning to achieve separation of activities	130
4.1.35(a)	Furnishability of bedrooms	132
4.1.35 (b)	Furnishability of living room, dining room, kitchen	134
4.1.36	Living space	144
4.1.37	Sleeping area	
4.1.38	Formal living room	148
4.1.39	Grand room (living and dining)	
4.1.40	Great room (living and family)	150
4.1.41	Symmetrical living room	
4.1.42	Living room furniture placement	152
4.1.43	Plan	
4.1.44	Living rooms considered from the point of view of possible furniture groupings and interference by	154

	necessary circulation	
4.1.45	Dining space	
4.1.46	Minimum clearances, circulation, and conversation areas for living rooms	156
4.1.47	Minimum clearances, circulation, and conversation areas for living rooms	
4.1.48	Combined living-dining room	158
4.1.49	36-diameter round table	164
4.1.50	48-diameter circular table for four – minimum scheme	
4.1.51	Rectangular table with optimum length and width for dining for six	166
4.1.52	Square table for four – minimal scheme	
4.1.53	Kitchen layouts	174
4.1.54	Family room with space for television viewing	202
4.1.55	Family room with media wall	
4.1.56	View of family room from kitchen and breakfast area	204
4.1.57	Wall unit-access by male	206
4.1.58	Wall unit-access by female	
4.1.59	Wall mounted bar unit- access by male	
4.1.60	Wall mounted bar unit- access by female	
4.1.61	Closest sections and arrangement	208
	1) Sofa cum bed	216

	2) Sofa set (3 + 2) and couch	
	3) Sectional sofa	
	4) Sofa cum bed	
	5) Bunk bed	218
	6) Bean bags	
	7) Expandable Diwan	
	8) Resin chairs	
	9) Flexible centre table	220
	10) Centre table with stools	
	11) Centre table	
	12) Shelf table	
	13) Nest of tables	222
	14) Corner/ end tables	
	15) Centre table with storage	
	16) Entertainment unit	
	17) Entertainment unit	224
	18) Display / shoe rack	
	19) Shoe cabinet	
	20) Folding chairs	
	21) Inflatable sofas	226
	22) Love seat	226
	23) Sleeper sofa	

	24) Diwan	
	25) Cot with box storage	228
	26) Foldable bed	
	27) Wardrobe with sliding doors	
	28) Dresser with stool	
	29) TV unit	230
	30) Ottoman	
	31) Night stand	
	32) Dining table set	
	33) Drop-leaf dining table	232
	34) Dining table with double top	
	35) Round dining table	
	36) Chest of draws	
	37) Corner curio cabinets	234
	38) Childrens' bedroom solution	
	39) Bed with side storage	
	40) Children bedroom unit	
	41) Flat boy	236
	42) Bedroom solution	
	43) 2 way book shelf	
	44) Tall unit	238
	45) Foldable seat	

	46) Wooden seat	
	47) Wash with storage	
	48) Wooden partition	240
	49) Study tables	
	50) Computer tables	
	51) Bar unit / partition	
	52) CD rack	242
	53) Shoe cabinet / seat	
	54) Mobile furniture	
	55) Kitchen set	
4.3.1	Living / dining room area specifications	246
4.3.2	Living / dining room wall type and finish	252
4.3.3	Living / dining room wall colour	
4.3.4	Living / dining room lighting type and colour	256
4.3.5	Kitchen area specifications	260
4.3.6	Kitchen wall colour	266
4.3.7	Bedroom area specifications	272
4.3.8	Bedroom wall type and finish	276
4.3.9	Bedroom 1 wall colour	278
4.3.10	Bedroom 1 lighting type and colour	280
4.3.11	Bedroom 2 area specifications	282
4.3.12	Bedroom 2 wall type and finish	290

4.3.13	Bedroom 2 wall colour	292
4.3.14	Bedroom 2 floor type and colour	294
4.3.15	Bathroom area specifications	296
4.3.16	Bathroom wall type and colour	298
4.3.17	Bathroom floor type and colour	
4.4.1	Triangular cabinet for corners	302
4.4.2	Horizontal and vertical cabinet for corners	
4.4.3	Triple duty sofa	304
4.4.4	Added storage	
4.4.5	Corner with a cabinet	306
4.4.6	Two corners and a ceiling	
4.4.7	A box beneath sofa	308
4.4.8	Storage boxes	
4.4.9	Drawers behind sofa	
4.4.10	Sofa beds and Murphy beds	310
4.4.11	Chair beds	
4.4.12	Conversation pit	312
4.4.13	Space between studs	
4.4.14	Storage / dining table	313
4.4.15	In-cabinet space	314
4.4.16	Filling empty spaces	
4.4.17	Ceilings and corners for storage	316

4.4.18	Shallow cabinets make vertical storage	
4.4.19	Shelf over the entryway	318
4.4.20	Movable shelf	
4.4.21	Pots as storage source	
4.4.22	Shallow shelves above wall cabinets	
4.4.23	Can storage at doorway	320
4.4.24	Spot storage	
4.4.25	Mobile cart	
4.4.26	Elevated dishwasher	
4.4.27	Storage for toilet toppers	322
4.4.28	Shallow shelves outside tub glass door	
4.4.29	Shallow cabinets on walls	324
4.4.30	Space above tub	
4.4.32	Pantry on door	
4.4.31	Far end of tub	
4.4.33	Shelving system	326
4.4.34	Hanging baskets	
4.4.35	Corner spaces	
4.4.36	Cart on wheels	
4.4.37	Shelving system under lavatory	328
4.4.38(a)	Den, guest room	
4.4.38(b)	After expansion	

4.4.39	Sewing room behind shades	330
4.4.41	Bar for a wall recess	
4.4.42	Pullman kitchen	
4.4.40	Shelves	
4.4.43	Bathroom space	332
4.4.44	Kitchen cabinets in nursery	
4.4.45	Added storage on countertop	
4.4.46	Division using shelves	
4.4.47(a)	Storage to cabinet doors	334
4.4.47(b)	Storage to cabinet doors	
4.4.48	Storage boxes	
4.4.49	Old army footlocker	
4.4.50	Under- space bed	336
4.4.51	Dishwasher placement	
4.4.52	Peninsula with dishwasher	
4.4.53	Dishwasher garage	338
4.4.54	Bunk beds	340
4.4.56	Living room to a bedroom	
4.4.57	Living room with loose furniture	
4.4.58	Bedroom	342
4.4.59	Bathroom	
4.4.60	Living / kitchen	

4.4.61	Use of organisers in kitchen	343
4.4.62	Modules in bathroom	
4.4.63	Vanity corner	344
4.4.64 (a),(b)	Study room to guest room	345
4.4.65	Book – staircase	346
4.4.66	Book – staircase	
4.4.67	Tank less toilet	
4.4.68	Sofa to bunk bed	
4.4.69	Loft bed	348
4.4.70	Platform bed	
4.4.71	Space saving bed cum display unit	
4.4.72	Corner table	
4.4.73	Oval platform in kitchen	350
4.4.74	Cocktail table	
4.4.75	Living room to bedroom	
4.4.76	Ledges	
4.4.77	Storage cabinet	352
4.4.78	Book shelf	
4.4.79	Desk	
4.4.80	Shelf	
4.4.81	Book towers	354
4.4.82	Multimedia cabinet	

4.4.83	Dining table	
4.4.84	Bed A	356
4.4.85	Bed B	
4.4.86	Bed C	
4.4.87	Bed D	
4.4.88	Bed E	358
4.4.89	Bed F	
4.4.90	Bed G	
4.4.91	Bed H	
4.4.92	Bed I	360
4.4.93	Bed J	
4.4.94	Bed K	
4.4.95	Bed L	
4.4.96	Bed M	
4.4.97	Bed N	362
4.4.100	Bed O	
	1. Floor plan of two bedroom apartment	369
	2. Foyer – perspective	371
	3. Living room – perspective 1 (a)	373
	4. Living room – perspective 1 (b)	375
	5. Dining area – wall perspective with open dining table	377
	6. Dining area – wall perspective with closed dining table	379
	7. Kitchen – perspective	381
	8. Bedroom 1 – perspective 1	383

	9. Bedroom 1 – perspective 2	385
	10. Bedroom 2 – perspective 1	387
	11. Bedroom 2 – perspective 2	389
	12. Toilet – perspective 1	391
	13. Toilet – perspective 2	393

LIST OF TABLES

Table number.	Table description	Page number
4.1.1	Mean body measurements	117
4.1.2	Elemental activities - Dining area	121
4.1.3	Elemental activities - Bathroom	
4.1.4	Elemental activities - Bathroom , Living area	
4.1.5	Typical room sizes in feet	141
4.1.6	Sizes of living room furniture	161
4.1.7	Space requirements tot individual place settings and clearance around table	169
4.1.8	Typical dining area and furniture grouping	171
4.1.9	Various types of kitchen arrangements	184
4.1.10	Minimum frontages for work centers in inches	186
4.1.11	Rod allowance in wardrobe	210
4.1.12	Minimum storage allowance	
4.3.1.1 (a)	Age of respondents	243
4.3.1.1 (b)	Number of children	245
4.3.1.1 (c)	Socio economic status respondents	
4.3.2.1.1	Living / dining room area specifications	247
4.3.2.1.2	Living / dining room furniture	249
4.3.2.1.3	Living / dining room wall type and finish	251
4.3.2.1.4	Living / dining room wall colour	253
4.3.2.1.5	Living / dining room floor type and colour	255
4.3.2.1.6	Living / dining room curtain colour	
4.3.2.1.7	Living / dining room lighting type and colour	257
4.3.2.1.8	Living / dining room space savers'	259
4.3.2.2.1	Kitchen area specification	261
4.3.2.2.2	Kitchen furniture	263
4.3.2.2.3	Kitchen wall type and finish	265
4.3.2.2.4	Kitchen wall colour	267
4.3.2.2.5	Kitchen floor type and colour	
4.3.2.2.6	Kitchen lighting type and colour	269

4.3.2.2.7	Kitchen space savers'	273
4.3.2.3.1	Bedroom 1 area specification	275
4.3.2.3.2	Bedroom 1 furniture	277
4.3.2.3.3	Bedroom 1 wall type and finish	279
4.3.2.3.4	Bedroom 1 wall colour	281
4.3.2.3.5	Bedroom 1 floor type and colour	
4.3.2.3.6	Bedroom 1 curtain colour	283
4.3.2.3.7	Bedroom 1 lighting type and colour	
4.3.2.3.8	Bedroom 1 space savers'	285
4.3.2.4.1	Bedroom 2 area specification	287
4.3.2.4.2	Bedroom 2 furniture	289
4.3.2.4.3	Bedroom 2 wall type and finish	291
4.3.2.4.4	Bedroom 2 wall colour	293
4.3.2.4.5	Bedroom 1 floor type and colour	293
4.3.2.4.6	Bedroom 2 curtain colour	295
4.3.2.4.7	Bedroom 2 lighting type and colour	295
4.3.2.4.8	Bedroom 2 space savers'	297
4.3.2.5.1	Bathroom area specification	299
4.3.2.5.2	Bathroom wall type and colour	301
4.3.2.5.3	Bathroom floor type and colour	301
4.3.2.5.4	Bathroom lighting type and colour	303
4.4.1	The cost range of interiors of two bedroom model apartment	395

ACKNOWLEDGEMENTS

I firstly thank Almighty God for his love and blessings without which I would not have been able to complete my studies and present this piece of work.

I am pleased to place my profound gratitude to my major advisor and chairman of the advisory committee **Dr. (Mrs.) Vijaya Nambiar**, Professor and University Head, Department of Resource Management and Consumer Sciences and Associate Dean, College of Home Science, Hyderabad for her valuable affection, personal guidance, keen interest, immeasurable help, constructive criticism and inspiration given to me throughout my course of this study.

I express my profound sense of gratitude and indebtedness to my advisory committee for their constructive criticism and encouragement during the course of investigation.

I am really grateful for the contribution of my minor advisor **Dr. (Mrs.) P. Radha Rani**, Associate Professor, Department of resource Management and Consumer Sciences, College of Home Science, for her continuous help through out the period for completion of my thesis.

I owe my thanks to **Dr. R. Ratnakar**, Professor of EEI for his worthwhile suggestions and encouragement during this study.

I also thank the staff of other disciplines in **College of Home Science** for their support extended as required.

I am very much thankful to and feel it a great privilege to place on my record with sincere regards and thanks to all the lecturers and staff members of the **Department of Resource Management and Consumer Sciences**, College of Home Science, and Hyderabad for their concern from time to time in the preparation of this thesis.

I am also thankful to the efforts of **Mrs. Shraddha**, Architect, and **Mr. Rishi**, Architect for their guidance as required by thesis.

Diction is not enough to express the love and affection of my parents **Mr. Metta Lakshmi Narasimham** and **Smt. Inguva Varalakshmi**, and my sister **Miss Metta Nirupaplava** including all my family members and friends who constantly inspired, educated and moulded me into the present position and whose encouragement brings out my best in every one of my endeavours.

I owe to express my deep sense of love and affection towards my husband **Sri Adharapurapu Chaitanya** and my in-laws **Mr. Adharapurapu Ramakrishna Rao** and **Smt. Adharapurapu Leela Sarojini** for their support, encouragement and patience in the timely completion of my thesis.

It is my immense pleasure to extend my heartfelt thanks to all my friends, especially **Mrs.Sailaja**, **Ms.Madhavi**, **Mr.Vivek**, **Ms.Srilakshmi**, **Ms.Jahnavi**, **Ms.Pratyusha** and **Mr.MuraliKrishna** for their help extended in innumerable ways during this investigation.

I am very much thankful to **Acharya N. G. Ranga Agricultural University** for their financial support in the form of stipend during the course of my study.

Last, but not the least, I convey my whole hearted thanks to many of my well wishers and to other friends requesting their forgiveness for not mentioning them here by name.

(M.NIRVIKALPA)

Name of the investigator : M.NIRVIKALPA

I. D. No. : HHM/2005-07

Title of the thesis : Strategies for Judicious Residential Interior Space Management

Degree to which it is Submitted : MASTER OF SCIENCE IN HOME SCIENCE

Major Field : RESOURCE MANAGEMENT AND CONSUMER SCIENCES

Faculty : HOME SCIENCE

Major advisor : DR. (MRS.) VIJAYA NAMBIAR

University : ACHARYA N. G. RANGA AGRICULTURAL UNIVERSITY

Year of submission : 2008

ABSTRACT

Space in general is a very important element in the design aspects and needs a critical understanding and managing in terms of the basic needs of the residential or industrial modules. As the growing needs and demands of population are in its maximum accessional position, the space requirements have also become more a necessity than an accessory for the dwellers. As we know, the space taken up by urban localities is increasing faster than the urban population itself, where as recent estimates, based on satellite imagery, indicate that all urban sites (including green as well as built-up areas) cover only 2.8 per cent of the Earth's land area. This means that about 3.3 billion people occupy an area less than half the size of Australia. However, most urban sites are critical parcels of land. Based on the available statistics Hyderabad city's population in 2007 was recorded to be about 6,255,256 and hence the population density of the city has been ascertained at 14,192 per square kilometer. There is an increase in the city limits too. Hence this rapid increase in population resulted in many changes in the lifestyles of the

society. Some of them are, people opting a nuclear family to a joint family and specifically increase in vertical structures and depletion of horizontal structures due to reduction in space. Due to space constraints, there is inflation in the price of its purchase, challenging the buyers to restrict themselves to a limited space. With most of population crowded into towns and cities, there is an acute need for personal surroundings to allow a room to relax in comfort and relative privacy. For many people, moving house to gain another bedroom or a bigger kitchen becomes financially impossible. Due to these circumstances and the availability of space becoming increasingly scarce, the interiors have become multifunctional areas catering to these needs.

Till date, lot of work has been completed by various investigators to utilize every component of the space in an efficient way. A space illusion made by the effect of contrasting patterns of bold & light colours or by the architectural illusionary marvels, if necessary, gives a calming and a soothing effect to the clients based on the personality, ambience and its ecological niche. In terms of residential planning, the complete space has to be utilized based on the placing/arrangement of furniture, decorative items, electrical lighting, storage desks or cabinets etc., for giving a modern look. The use of every accessory has been taken into the present study for analyzing its merits and demerits in the interior design space management strategies so far available, and space analysis is one of the major hurdles needed to be worked upon. The best way is to simulate or create a real domain based virtual model using the necessary inputs needed with the aid of the existing AutoCAD and the conceptual framework.

The present work was carried out in the Pearl City of “Hyderabad” with the following objectives -

General objective:

To evolve judicious space management strategies / modules / framework for effective implementation.

Specific objectives:

- To examine the standard dimensions for residential interior spaces.

- To explore the availability of types of furniture and space modifiers for interiors.
- To assess the existing interior space management techniques.
- To design modules in AutoCAD for residential interiors, with judicious space management strategies.

The study involved collection of information from standard documents, home makers and from furniture showrooms. Hence the most appropriate tools were selected and designed to conduct the study. Content analysis was done to collect information on standard dimensions. A checklist was framed to collect information on existing furniture types from five zones of Hyderabad. An interview schedule was framed to assess the existing interior space management techniques and contains a checklist of elements used in interiors that contribute to visual and tangible effects in utilization of space. The same was given to the home makers of 50 two bedroom apartments which were selected by random purposive sampling technique to collect information. The investigator's observations were also recorded. After data collection, the data was analyzed and tabulated to know the frequencies and percentages of the space modulated. Once the objectives were cleared, the results and inferences drawn from the study on interior space dimensions, furniture types and the opinions of the home makers formed the basis for evolving the guidelines for designing interiors of an apartment.

The guidelines suggested by different architects and designers reviewed in literature survey, were also used as inputs for forming specific guidelines. Various articles from Times of India (2007 and 2008), internet survey and textbooks were collected to form basis for designing an apartment.

The plan of an apartment was selected by surveying the ventures coming up in the city of Hyderabad so as to enable the investigator to concentrate on designing the interiors of an apartment. The design selected was also shown to two architects for their advice on structural modifications. The general assumption is that the module evolved for residential interiors with judicious space management strategies is assumed to have adequate natural light, ventilation and proper orientation.

The model of two bed room apartment was developed in AutoCAD. Floor plans, perspectives and rendered views of each room with space saving techniques (furniture arrangement, furniture design, accessories, colour schemes and lighting features) were developed.

As summary, space was limited for bedrooms, kitchens and bathrooms. Living / dining spaces were observed to be large in size when compared to other rooms. Built-in furniture and movable furniture are the types of space savers found in households that allow the homemaker to treat space as required. Majority of households had light coloured walls with emulsion paint and rough finish, enabling easy maintenance. CFL with white tinge were common lighting systems found in all rooms of households as they are economical and also give cool effect to space leading to space illusion. Marble white flooring is other common type of flooring observed at majority of households, though difficult to maintain, led to illusion of space.

To conclude, the space saving strategies were adopted by homemakers as there is availability of wide range of products that save space. Also because of economic reasons, homemakers are compromised to get satisfied with the available space which provokes then to find ways to save space. Varied ways of obtaining information on space saving techniques have helped the homemakers, space planners , furniture designers and architects to look into space as an important factor and treat them accordingly depending up on the requirements of occupants.

CHAPTER I

INTRODUCTION

Rapidly growing cities, especially the larger ones, include various generations of migrants, each with a diversity of social and cultural backgrounds. Urban life thus exposes new arrivals to an assortment of cultural stimuli and presents new choices on a variety of issues, ranging from families and their organization to what they do with their leisure time.

The space taken up by urban localities is increasing faster than the urban population itself. Between 2000 and 2030, the world's urban population is expected to increase by 72 per cent, while the built-up areas of cities of 100,000 people or more could increase by 175 per cent. The land area occupied by cities is not in itself large, considering that it contains half the world's population. Recent estimates, based on satellite imagery, indicate that all urban sites (including green as well as built-up areas) cover only 2.8 per cent of the Earth's land area. This means that about 3.3 billion people occupy an area less than half the size of Australia. However, most urban sites are critical parcels of land.

As on July 2008, the world's population is estimated to be just over 6680 million. In line with population projections, this figure continues to grow at rates that were unprecedented before the 20th century, although the rate of increase has almost halved since its peak of 2.2 percent per year, which was reached in 1963. The world's population, on its current growth trajectory, is expected to reach nearly 9 billion by the year 2042.

The population in India as at 0:00 hours on 1st March 2001 stood at 1,027,015,247 persons. With this, India became only the second country in the world after China to cross the one billion mark. (India is the 2nd most populated country in the world). About 70% of the people live in more than 550,000 villages, and the remainder in more than 200 towns

and cities. India's average population density is higher than that of any other nation of comparable size. India's population continues to increase in a well-known social phenomenon.

Fifth largest capital city of Indian state, Andhra Pradesh is Hyderabad. Greater Hyderabad has an estimated metropolitan population of 10 million, making it the second largest (in terms of area) in the country. Hyderabad is known for its rich history, culture and architecture representing its unique character as a meeting point for North and South India, and also its multilingual culture, both geographically and culturally. The city's population in 2006 was estimated to be 6.7 million, while the population of the greater metropolitan area was estimated at over 8.9 million. As of a 2007 record, the total population of Hyderabad was recorded to be about 6,255,256 and hence the population density of the city has been ascertained at 14,192 per square kilometer. There is an increase in the city limits too. So the multiplying numbers of Hyderabad's population may be seen in these figures. The rapid growth of the city has resulted in a large and populous metropolitan area. This might be because of boom in information-technology in the 1990s and the retail industry growth over the last few years which have spurred hectic commercial activity.

This rapid increase in population resulted in many changes in the lifestyles of the society. Some of them are, people opting a nuclear family to a joint family and specifically increase in vertical structures and depletion of horizontal structures due to reduction in space. Due to space constraints, there is inflation in the price of its purchase challenging the buyers to restrict themselves to a limited space. Space is the greatest luxury of 20th century. With most of population crowded into towns and cities, there is an acute need for personal surroundings to allow a room to relax in comfort and relative privacy. Space, as in square meters, is expensive. For many people, moving house to gain another bedroom or a bigger kitchen becomes financially impossible.

Lifestyles are progressively changing and are projecting engagements for different activities related to both work and social life. Due to these circumstances and the availability of space becoming increasingly scarce, the interiors have become multifunctional areas catering to these needs. Interior spaces perform a significant role in these areas, as they are additionally demanded to be multifunctional, reactive and aesthetic. Due to the interchanging utility of the area, the interior spaces also need to be able to adapt to the required purpose of the area. As with fashion, interiors have developed through a number of different trends such as Art Deco, Bauhaus, Minimalism, etc. Nevertheless, designers have tried to breakthrough the traditional expectations and reinvent the concept of space utilization in an interior.

Transforming drab, uninspiring spaces into dramatic, comfortable and viable living spaces has become a challenge in the metros. Space has shrunk, but aspirations of living well are high. Handling small spaces is an art. The best things in life come in small packages and needs only to get in touch with the space saving strategies / techniques. It involves in working out an equitable distribution of space that is also aesthetic. It is a great deal of imagination, preferably a degree and a lot of practical good sense.

Minimalism is one of the options. The minimal look is harmoniously understated that is tranquil and not crowded. Walking into a minimalist living room and one would be surprised at how one can live with less, yet find more. A minimalist living combines aesthetics with function in a delightful manner. Decluttering existence is practiced. Well lit and spacious, the rooms combine furniture, floor and wall spaces in a seamless balance of light and energy that is warm and inviting. The remedy therefore lay in the designers coming up with ingenious ideas for the layout of the furniture, use of materials and colour in designs. The goal would be comfortable spaces that evolve into something anyone would enjoy living in.

The aim is to effectively make the most of every inch of available space and even create space that does not seem to be there. The options are that spatially it could be cosy, pretty, intimate and personal or congested, cluttered and comfortable. Volumes enclosed in tight physical envelopes demand all the innovative and creative skills in planning. Structural, technical and organizational ways are employed by which space can be maximized. The accepted spatial limitations of a small room can bring out the special benefits of an enclosed space like coziness and intimacy, the comfortable feeling of having everything within reach, without suffering the drawbacks.

The trouble with space is that we have plenty of it where we do not need it. Space problems are in kitchens and bathrooms, in living rooms and dining rooms, in closets and basements and dens, even outside in yards. A well planned layout ensures each activity has a specific minimum area for comfortable effectiveness. If the plan can include borrowed spaces, like the neighbour's garden, a park for a pleasant view, by all means purloin it with impunity. One may devise the layout to relate to the borrowed scenery by using glass to enhance the illusion, opening up and vitalizing small spaces.

The genesis of the whole process of maximizing space begins with recognizing actual needs. Plans cater to the basics, the actual nature of the activities that will take place, like cooking, eating, bathing, sleeping. A checklist of basic necessities can help in deciding the requirements. In possession of a small space, the arrangement and type of furniture will either drive to distraction or be a source of pleasure. There must be a review of traffic lanes which are governed directly or indirectly by the placement of furniture or other accessories. A layout which incorporates minimum circulation works well, since the primary restriction is lack of space.

According to Anuradha Shah (1998), an architect, while designing the interior of a small space: "furniture must be multifunctional and at the same time visually spacious. It requires detailing. It is important to realize

all the requirements of the client and make sure that a definite area is designed for each of these needs. It is imperative that there is no clutter at the end of a day. Use of materials with transparency is recommended. Use of mirrors for the wardrobes helps in visually increasing space. Low seating, doubling as extra bed for guests, glass topped tables that allow the eye to travel through the whole space are recommended.”

Furniture maintains and reinforces the aesthetic appeal of a room. Next to movement, furniture occupies a major chunk of space. Furniture design should not only save space but also must be used efficiently. Huge objects in small space and smaller objects in small space is an illogical harmony and contradict widely accepted notions that small spaces need to be minimally decorated. Mirrors, light treatments, soft furnishings, colour treatment are major elements that influence space and its illusions. Mirror walls can create the illusion of an enlarged space. Maximizing a space is another option. A single space can cater to different activities. A pleasant living space by day easily converts into a bedroom at night.

The physical determinant of a space is the structure enveloping it. The walls, floor and roof become the deciding factor of the nature and quality of the volume enclosed within them. The claustrophobic spaces can be opened by destroying restricting walls provided there is structural stability. An open plan creates visual spaciousness.

Colour can miraculously enlarge a room, or shrink one which seems massively over-sized. A monochromatic colour scheme with simple forms and clean surfaces like walls, floors and ceiling, visually enhances the space. This scheme can be vitalized by giving one of the walls a different surface treatment. One can keep architectural features like arches and mouldings to the minimum.

The play of light and shade can create a dramatic effect. The basic rule is to get as much light and ventilation as possible, even if it means alterations to the structure to compensate an existing tight physical

volume. Lights, whether table lamps, or free standing up lights or even unusual wall fixtures enliven any small space.

“Spaces are neither small nor big in terms of their existence”, says Architect Manish Banker (2000). “They are like people and what is significant, is the way one deals with them. They respond in the same way, and, like people, deserve to be sensitively handled to understand their true nature. This not only helps to set up a dialogue with them but also gives joy when dealing with them.” Manish treats every space differently and says each has its own unique criteria.

Designing small spaces and making them perform a function within their constraints is extremely challenging. Small volumes tend to rejoice when they are treated with clean and simple elements. Reflective surfaces, monochromatic colours, silent features, diffused light and extended views enhance small spaces, and they generally cannot contain a crowd of colours and elements. Spaces enjoy looking dramatic and stretched, by wearing costumed tailored with reflective materials like mirror, glass and polished stones. To guide, simplicity is the keynote. Avoiding unnecessary furniture and too many accessories is recommended.

There are so many elements controlling the visual appearance of space in interiors. Role of such elements in interior spaces is to be explored in depth enabling the homemaker to treat the available space effectively, hence the requirement of study in this dimension is essential.

Rationale for the study

Space management is defined as “deciding on the use and allocation of space for a proposed user”. With regard to the luxury and of the scale, there are few limitations and no attempt has been made to identify the endless planning options possible. Due to constraint for land and space, the residential buildings lack area for constructing comfortable dwelling units. Hence using the space very effectively is required. To

achieve this goal specified above, there is a need to explore different techniques / strategies to make interiors look spacious. As there were no studies on interior space management that came by the way of the investigator, it was found imperative to take up a study of this dimension so as to assess space saving strategies followed or those that can be followed to make interiors look spacious. The need for getting information about space saving strategies is necessary so as to enable family members to live in the calm oasis of a home after a day's hectic schedule.

Research in the field of developing designer multipurpose furniture is discovered but the utility of such pieces in residence is rarely encountered. It was essential to explore interiors of two bedroom apartments for their space availability, utilization and other decision making capabilities of the home maker to furnish space available in interiors.

Hence the present study on “Strategies for Judicious Residential Interior Space Management” was proposed with the following objectives.

General objective

To evolve judicious space management strategies / modules / framework for effective implementation.

Specific objectives

- To examine the standard dimensions for residential interior spaces.
- To explore the availability of types of furniture and space modifiers for interiors.
- To assess the existing interior space management techniques.
- To design modules in AutoCAD for residential interiors, with judicious space management strategies.

CHAPTER II

REVIEW OF LITERATURE

A lot of search for studies was conducted but due to dearth of research done in this dimension, popular magazines, text books and internet browsing was done to collect related articles and information and the review of literature was done under the following headings

- 2.1. Concepts of space and space planning
- 2.2. Interior design space saving techniques
- 2.3. Elements for space saving
 - 2.3.1. Furniture
 - 2.3.2. Lighting
 - 2.3.3. Accessories
 - 2.3.4. Colour
 - 2.3.5. Pattern
 - 2.3.6. Texture
- 2.4. Commercial Space planning
- 2.5. Residential space planning
- 2.6. Case studies

2.1. Concepts of space and space planning

Space planning (**Prasad Joshi and R. Sadananda, Towards a Knowledge-Based Approach to Space Planning in Industry, Computers in Industry 13 (1989) 141-154**) is the process of selecting, locating and spacing objects to create layouts based on functional, topological or geometrical considerations. It involves the search, carried out in the problem space, for feasible solutions to the problem of spatial arrangement. Space planning, therefore, is concerned with the organization of space under a set of constraints to meet a given set of specifications. It appears possible to solve the spatial arrangement problems by exhaustive enumeration of all the possible arrangements and then selecting a plan which best suits the specified requirements.

However, the search space turns out to be enormous, leading to combinatorial explosion.

In case of industrial space planning problems by Prasad Joshi and R. Sadananda (1989), the shape of the department is equally important. The shape of the objects is predefined and acts as a constraint in the planning. In case of an existing space plan, the location of the existing facilities, loading docks and their weight capacity, windows, lights and sewage, water and power lines also decide the new space plan. These standards put constraints on the space plan.

Inventory Minimization is criterion especially important in case of storage areas on the shop floor. A good space allocation system should ensure that the inventory carded on the shop floor is kept to a minimum. Expansion must be realized that the enterprise may grow and require additional facilities. It is extremely important to make plans at the very beginning for the possibility of any future growth due to increased production new product or any other reason. Flexibility as the shop floor is planned keeping in mind the kind of activities it is going to support as suggested by Prasad Joshi and R. Sadananda (1989).

A space planner could aid in the process. The space planner converts the user's specification of spatial requirements into a spatial arrangement. The main role of the space planner is to assign given objects in a certain space. In recent, years have seen renewed interest in the ancient idea of a 'sense of place' amongst architects, planners and researchers in a number of countries as expressed by Jonathan D. Sime (1986). In contrast to technological fix solutions which appear to by-pass people, concern with the creation and preservation of 'places' reflects an attempt to provide an optimum psychological fit between people and their physical surroundings. This paper considers 'place making': The degree to which a 'place' can be created in architectural design independently of the people who eventually use it. Different approaches to the study of 'place' in architecture, geography and psychology are reviewed. It is argued that

modern architecture has concentrated on the properties of geometric space.

The concept of place should help to integrate design and research issues. A politics of place and the design and research of place patterns are discussed. It is concluded that it is not possible to create a place for building users solely by manipulating the physical environment on 'their' behalf. The concept of place can be traced back to the ancient philosophical writings of Aristotle, Place or 'topos', in his view, was the 'where' dimension in people's relationship to the physical environment, conjuring up a feeling of 'belonging' according to Van de Ven (1978), Jonathan D. Sime (1986). The Romans, centuries later, used the term 'Genius Loci': the 'spirit of a place'. A 'genius' was the 'guardian spirit' of a physical location.

Recent years have seen a revival of the concept of place in the theoretical discussions of certain academics within architecture, 'Designing spaces' is a process ascribed to architects who, in concentrating on the properties of geometric space, may pay insufficient attention to the activities and experiences those spaces are likely to engender for other people. 'Creating places' is what, in contrast, all of the 'best' architecture should aspire to, even if this is difficult to achieve. The concept of place should encourage architectural theorists and environmental psychologists; to not only consider the semiotic meaning of the external facade of buildings, but the meaning of the spaces behind the walls. As Venturi (1966) suggests 'architecture occurs at the meeting of interior and exterior forces of uses and space'. He argued that the concept of 'existential space' is of central importance to architecture as expressed by Norberg-Schulz, (1971) and Jonathan D. Sime (1986). More recently he has used the concept of 'place' to define the characteristics of 'existential space'. Norberg-Schulz, (1980) and Jonathan D. Sime (1986) argued that architecture should direct itself to the 'meanings' as well as physical properties of the environment.

The Modern Movement, according to Norberg-Schulz (1971), has concentrated on the properties of physical flowing space at the expense of the more 'enclosed' spaces regarded as an important feature of a place. In the 1920s the ideal was a continuous flowing space as opined by Jonathan D. Sime (1986) almost completely freed from defined centers and from the distinction between inside to outside. Architects wanted to liberate the static spaces of conventional buildings to express positively the new 'open' world. Recently, however, the need for defined places and interior spaces has again been felt.

Space, both material and immaterial, is a fundamental basis for human existence, development, and evolution; space comprises the outer shell within which life takes place in all its variation. People are directly and inseparably connected to the space that surrounds them. "Lived space," a term coined by philosopher and educator O. F. Bollnow, refers to the close connection between people and the spatial environment. The human life cycle, from its beginning in the womb through to death, unfolds in a wide variety of spatial environments and is subject to specific conditions, is in relation to them, and in exchange with them — that is, as part of a mutual relationship between people and their social and material-spatial surroundings. The characteristics of space are among the conditions of life that affect the course of human development, the quality of life, and the human condition in the different phases and spheres of life. The creative statement, symbolic effect, and impression made by an architectural space determine how people feel within it, to what extent the space appeals to them, and how they identify with it. It also affects how they appropriate it; behave toward and within it, and how they act individually and socially.

In the concept of treating space, Objects and Shapes (Fig 2.1) also play an important role. The perception of the object's shape differs with the light distribution on its surface and with the configuration of the resulting shadows. The direction of the light beam can easily affect the perception of the object's shape as shown in the figure besides. Also, the directed angled light generates

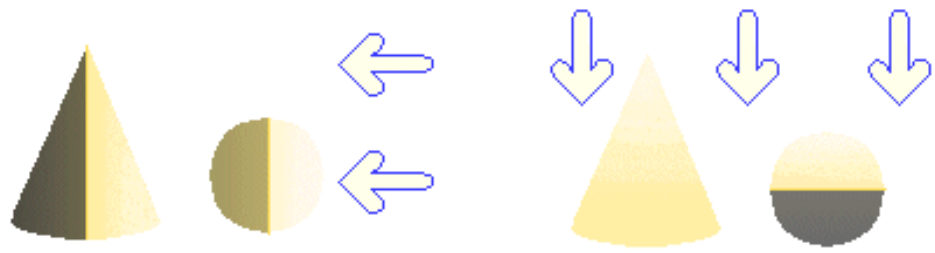


Fig 2.1 - Objects and shapes

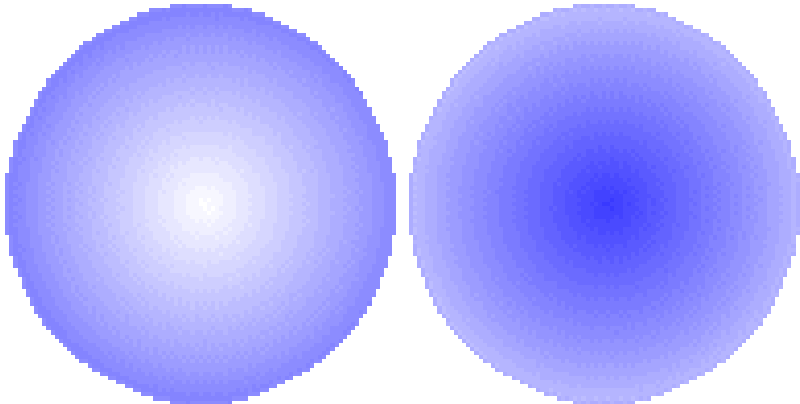


Fig 2.2 - Concave or convex

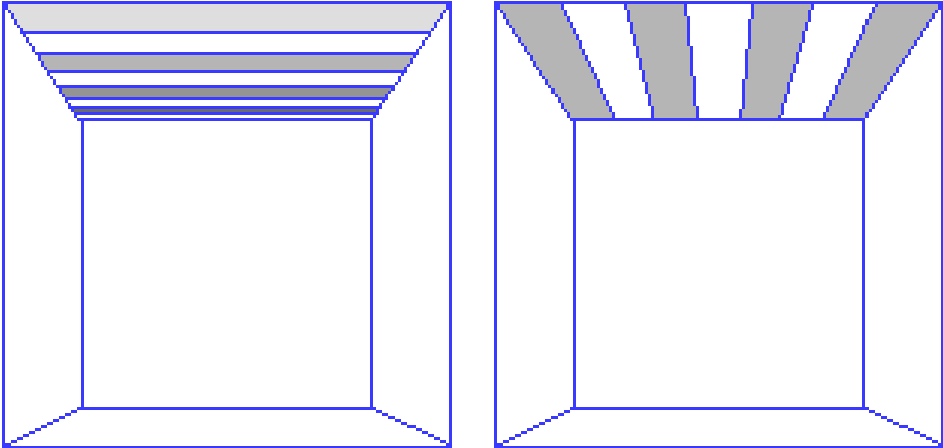


Fig 2.3 - Space and dimension

shadows; therefore it is essential to make a decision if these shadows are needed. Shadows will show the roughness of an imperfectly finished flat surface. Uniform lighting on these surfaces can be implemented. This approach should be used carefully because it can make a three dimensional object looks flat. The combination of direct and uniform lighting is used in many cases. If the light is not uniform on the surface, different areas will appear to be at different distances. Therefore, to light the outer or the inner area of the flat surface will make this surface appear concave or convex as shown in Fig 2.2.

Space and Dimensions (Fig 2.3) - A high level of illuminance in the space can give the impression of large volume. To focus on the variety of internal design elements and to attract attention to specific spots in the space, the lighting systems shall include different illuminance levels or lighting styles. This approach is frequently used to isolate reception areas, stairs, exits, and waiting areas in the space. If the lighting system includes linear ceiling fixtures, the effect will be the dimension enhancement in the direction of the lighting system as shown in the drawing besides. One can get the impression of a high ceiling by good illumination of the ceiling or the upper parts of the walls. Using the light or the light fixtures itself we can easily focus attention on the routine elements in the interior design or make the opposite effect. Light has an effect on the physical nature of the structure. Poor illumination of columns with a well-lighted ceiling deck will focus attention on the nature of the heavy columns (holder) and the lightweight deck. By applying the opposite lighting arrangements a special artistic effects is generated from the impression of the distortion of the physical nature. Similar distortion results when illuminating the area between two components of the interior elements. Lighting the area between the column and the ceiling deck gives an impression that they are disconnected. Lighting systems are used frequently to indicate the directions of the movement in the space. This lighting guide can be achieved easily by increasing the illuminance level in the area where people are expected to move. These areas include stairs, entrances, and most importantly the hallways.

2.2. Interior Design Space saving Techniques

According to McEvoy David, author of “**Interior Space saving techniques**”, as extracted from textbook, avoid everything that is not needed. Walls can be space savers. Shelves placed high up on the wall can be used for displaying items such as photographs, ornaments or plants or anything else that is wanted to be able to see but do not need to use. For items that do not want to see, consider putting them behind a closed door in a cabinet or a cupboard. Televisions and stands can take up a great deal of space in a room so having it on the wall not only saves space, it is easier to view too. Other items that can be wall mounted can include spice racks, soap dishes and dispensers, electrical equipment, shoe rack. Behind closed doors Cupboards and cabinets can hide a multitude of sins storage boxes with lids label with the contents and stack them on top of one another when one open the cupboard, will know where it belongs. If one is choosing new furniture spare a thought for any space saving aspects a coffee table with a couple of drawers, a bed that can accommodate under the bed storage, a display cabinet with closed cabinet space too. There are always ways to maximize the use of available space in any room no matter how small it is. Take a look round home and identify any area that can be better utilized. Look above eye level to the ceiling and below to the floor, and remember to look underneath pieces of furniture too. One will be pleasantly surprised at the amount of wasted space one already has and when one has made the effort to rectify this, one can sit back and enjoy new and uncluttered surroundings.

2.3. Elements for space saving

2.3.1. Furniture

There are always ways to maximize the use of available space in any room no matter how small it is. For example, use of a coffee table with a couple of drawers, a bed that can accommodate under the bed storage.

The best way to find a bargain when shopping for furniture is to buy pieces that can be used for more than one purpose and the same has emphasized in the article “**using multipurpose furniture**”, as appeared in internet, by Jennings Barbara. She said to make the most of each room with furniture pieces that have more than one use. The same amount of space, and just a little bit more cost, effectively doubles the use of one room. The wall bed is another great space saving investment. Bed, lighting, and storage are all contained within a small space when not in use, and are perfect for the den/guest room combination. Daybeds are beautiful in the daytime, and can be used as beds in the night time. Several throw pillows could be used for furnishing as sitting on daybeds comfortably can be a challenge. Chairs that rock, chairs that swivel, and chairs that roll are good buys. Flip top tables when not in use take up minimal space but when employed, can expand nicely to accommodate larger groups. Stack or nesting tables save space when not in use, and can expand to serve larger groups of people as well.

In the article from internet, “**Ideas for multipurpose furniture**”, the furniture was divided into groups depending upon the application they perform in interiors and hence they can be thought of for interiors

Seating -

- Look for scaled-down couches and chairs that fold out into single or twin beds.
- Stools are easy to tuck under tables or put into storage.
- Floor pillows make for easy and fun seating.
- Stackable chairs can be hidden away in no time.

Storage-

- Ottomans with removable tops and end tables with drawers are great for storage.
- Trunks double as tables and TV stands.
- Wall units with multiple shelves or cabinets make for easy organization.

Tables and desks-

- Look for bar-style tables with stools that can be hidden underneath
- Office armoires offer storage and work space in a compact form.
- Buy tables with removable leaves. This will give the option to expand while setting up a company.

As specified in the text from **“Must-Have Pieces of Space Saving Furniture”** ([http://www. Contemporary Kitchen Interior Design Tips Guide on Creating a Dream Kitchen.htm](http://www.ContemporaryKitchenInteriorDesignTipsGuideonCreatingaDreamKitchen.htm)) , there is furniture that saves space in each room as described: Kitchen- An under-the-cabinet trash stashed away beneath a cabinet or even hidden away in a closet can be used which means there is no need anymore to spend as much money on trash bags, grocery bags. In Dining Room, Gate leg dining tables are simply dining tables that have two drop-leafs: one on each side of the table. They fold down to accommodate minimal amounts of space and open up to accommodate a fair amount of guests. So they make it simple for serving both small and large parties alike. In the Bedroom, Lingerie chests are narrow and tall, which makes it easy to place them just about anywhere in the bedroom. In the Living Room, Small scale version of a coffee table typically are square or round coffee tables which generally range around 30" W x 30" L or in diameter. Anything larger than that may not be considered small. Rectangular and oval coffee tables will typically range around 30-40" L and 18-21" W. in bathroom, the space savers and organizers are wall-mounted cabinets which not only help in keeping items from wandering all over the place and getting in the way, but they also free up floor space as an additional benefit where something can be placed on the top like a beautiful silk flower, to aid to the decor and charm of a small bathroom.

From the article “**Top Ten Decorating Trends For 2007**”, the trends of the year 2007 was highlighted as below which also form basis for saving space:

- Overall, warm colors, warm woods and natural elements will bring a much needed relaxed, peaceful retreat feeling to living spaces.
- Space Saving Furniture: Big and bulky is out. Multi-purpose furniture is in. Narrower sofas, coffee tables, and dining furniture are all in.
- Counter height sets: A casual dining atmosphere is a reflection of today's busy lifestyles. A less formal setting allows families to relax and share a quick meal together.
- Room Divider Screens: Both decorative and functional, room dividers are definitely making a comeback. Used in studio apartments to define living spaces they provide privacy and a feeling of separate rooms.

The list of furniture that saves space has been listed in the article, “**Top 9 Home Organization Suggestions for Small Apartments**” as

- Wall Shelves
- Shoe Organizer
- Decorative Storage Trunk
- Storage Ottomans
- Under-the-bed Storage
- TV Stand with Shelves or Cabinets
- Stackable Plastic Drawers
- Hooks
- Bed Frame with Built-in Drawers

These furniture types were listed in <http://about.pricegrabber.com> which can become a checklist for buying furniture.

In the article of **Flavours in coffee tables, (Saturday 8, December, 2007, Times of India)**, stated that a glass topped coffee table



Fig 2.4 - Wooden platform beds



Fig 2.5 - Bamboo platform beds



Fig 2.6 - Metal platform beds



Fig 2.7 - Platform bed sets for bedrooms

visually enlarges a small space because it appears to take up less room than a solid table of the same size. It also stated that a tray topped coffee table is most often smaller than a standard coffee table, so works best in intimate seating areas. Twin square shaped coffee tables side by side are an alternative to one long table and one can separate them to use as extra side tables.

From the article **Storage Chests**, (**Saturday 8, December, 2007, Times of India**) stated that large chests are decorative pieces and also provide space saving options. A step chest is effective as a room divider too along with storage. For better storage, one should have proper compartments which depend on what one wants to store. When the lid of chest is flat, it can also be used as a coffee table or display counter which can hold articles, artefacts, cushions, cushion covers, etc. It can also be used as a window seat or for extra seating. Such chests can be used in dining room as counters or side boards, bedroom as foot of bed to store linen, pillows, etc ., and in kitchen as mini seat while storing extra utensils. They can also serve as breakfast for children.

Pendleton Phil wrote an article in <http://www.platformbeds.com>, **“Changing your home bedroom design with new trends in platform beds”** and emphasized the importance of platform beds in present space constraints in interior spaces. A new trend in bedroom furniture gaining a lot of popularity is that of platform beds. Platform beds are beds designed with a built in foundation used with just a mattress. They often sit lower to the ground than mattress/box spring combination sets and the designs in platform beds are most often clean lines and construction in many styles that extend the sides of the bed all the way to the floor. Some of the more popular colors and finishes in platform bed furniture today are that of earth tones. Finishes like these offer a rich look while working well with neutral colours in any home decor. Another popular style of platform beds is offered in bamboo (Fig 2.5). Metal platform beds (Fig 2.6) are another type of bed gaining popularity. These are most often made out of tubular steel and are constructed for use with most mattresses. These beds are

offered in a wide range of metal finishes that are a safe non-toxic baked on finish that chip resistant and easy to clean. People with allergies to wood or certain types of stains or wood sealants find these beds help to alleviate much of their conditions due to the nature of the finish process used in these products. Platform beds are also offered with underbed drawers that offer storage for beneath the bed. Sometimes these drawers are offered independent of the bed system or the drawers are incorporated into the design of the bed and are attached. The newest styles in platform beds offer storage drawers at the footboard of the bed. Many beds (Fig 2.7) are also available with a storage lift that actually lifts the platform of the bed up to allow for additional storage beneath the mattress on the frame within the bed. Saving space and adding storage is becoming easy with newer platform bed designs. This article has offered a glimpse into what platform beds are. They are available in many of the most popular finishes being used today in furniture. Matching case goods like dressers, chests, nightstands and armoires are available to help bring style and a more modern look into any bedroom with platform bed. Bamboo is gaining popularity as a platform bed material for being ecologically friendly as are metal beds which offer safer non-toxic finishes. So many storage options are also available for platform beds making them a great choice for your home decor.

2.3.2. Lighting

These **Practical Bathroom Lighting Tips**, in internet, published the Lighting schemes for bathrooms which adds mood and illusion of space by following list

- ✓ PLC – Slippery floors can cause accidents, so use PLC lights in wet areas, like above the shower stalls, and halogen lights where there is decor to be accented, like above a feature wall.
- ✓ Glowing slowly – Cove (or indirect) lighting adds to the aesthetic feel of the bathroom with a warm, soft glow.
- ✓ Shower power – Avoid spills in the shower unit with lighting bright enough to make shaving and shampooing easier.

- ✓ Tub tip – A recessed fixture, helps provide good lighting for the tub. Aiming the light's beam at the edge of the tub, avoids glare.
- ✓ Vanity fair – Halogen light above the vanity provides cross illumination when used in conjunction with other bathroom lights.

Keyworth Dean (11 March, 2008), former chairman of the BIDA, in his article, "**Good use of lighting can create illusion of space**", advised people looking to create more space to avoid the use of large light features in the centre of the ceiling, which may make it seem low; rather, they should use down lighting, which can divert the eye from the height of the ceiling. There are wall washers, where the light comes out of the bottom and the top, which can make the room seem taller if you have a low ceiling." When selecting furniture for small space, choose smaller pieces that have a more open design. A self-storage system may also be a good way to increase space in the home as it could reduce clutter and organize a space. Every space intended for human occupancy must be provided with natural light by means of exterior glazed openings which have a minimum net area of not less than 8% of the floor area of the room served. All other rooms may be provided with artificial light only. Artificial light shall be adequate to provide an average illumination of 10 foot-candles over the area of the room at a height of 30 inches above the floor level. All new windows must be dual glazed. Natural ventilation of an occupied space shall be provided through windows, doors, louvers or other openings to the outdoors. The minimum open able area to the outdoors shall be 4% of the floor area being ventilated.

In the article sited in internet, "**Home Decorating: Choosing The Right Lights for Your Look and Needs**", by Kathy Burns-Millyard (2000, <http://www.diyhomedecorating.com>), published that a successful lighting scheme that meets practical needs and creates atmosphere plays an important part in establishing the style and character of home. There is more to home lighting than a central ceiling fixture backed up by a couple of wall or table lamps. A well-planned lighting scheme should be both practical and decorative. On the practical side, the right sort of lighting provides illumination for cooking, cleaning, sewing, reading, and many other day-to-day tasks. Decorative lighting helps to create a relaxed



Fig 2.8 (a) – lighting system



Fig 2.8 (b) – lighting system

atmosphere, and should complement color scheme and furnishings. A successful home lighting scheme is made up of several different elements. Most rooms will need a carefully thought-out mixture of these effects to work well. Lighting Choices suggested in this article for homes are as follows and also seen in Fig 2.8 (a) and (b) :

- General lighting provides overall or background light and should be used in every room. A hanging ceiling light is a common type of light fitting, offering a variety of shade styles in materials as diverse as fabric, paper, or metal. A ceiling pendant that is the sole source of light in a room is a limiting choice; it provides a bright central space with shadowy edges.

- Recessed or semi-recessed low voltage down lights spaced across the ceiling will give a good level of clear light. Depending on the type of bulb used, and the housing, a recessed down light can spread light over a wide area or in a narrow beam. Semi-recessed down lights (sometimes called eyeballs) can be swiveled. Controlling down lights with a dimmer system is a good idea because one can then have some of the lights off while others are on, and can vary brightness.

- Task lighting is designed to give concentrated, directional light over a small area and may be used in conjunction with general and accent fixtures. The type of task lighting you choose depends on the activity you have in mind. A desk light with a flexible arm is the perfect example, as it can be adjusted to provide light exactly where it is needed. A reading lamp should be tall enough to shine onto the pages of the book, but not into eyes. A floor lamp positioned behind the reader is ideal. Light for writing, sewing, or any other hobby should be positioned so that it shines down onto the work. Rise and fall pendants are useful for this, especially if you work at the dining table. Recessed strip lighting is useful for providing countertop light in a kitchen. Accent lighting is used to show off plants, pictures, collections, and interesting architectural features. There are many different types, which can be used to light objects from above, below or behind, or at an angle.

- A narrow beam halogen down light may be used to light a single vase or piece of china. The lower part of the object remains in shade, so this gives a dramatic floating effect. Pictures are often lit from

above. An adjustable eyeball or ceiling spotlight focused on the picture, or a special framing spotlight, which will flood the painting with light but leave the walls around it in shadow, are worth considering, as well as the traditional brass picture light. A table lamp with a wide based shade will throw a pool of light onto the surface below it and is an attractive way to light a small collection or some framed photographs. Floor standing drum torchieres can be positioned below large plants to create dramatic leaf patterns on the walls and ceiling. You can light objects on glass shelves very effectively by positioning a row of small halogen spotlights below the bottom shelf. Wall-mounted sconces, wall washers, or tall floor lamp-style designs will illuminate the detail on an interesting cornice or ceiling. Small floor torchieres positioned behind a sofa or armchair will wash the walls with light and make the room seem larger.

2.3.3. Accessories

In the article, **Choosing a Door for Your Home** (<http://www.Bathroom Lighting Tips, Guide to Lighting for the Bathroom.htm>), Creating Space by doors is emphasized. Most doors are hung on hinges and open in, but this can be reversed to give more usable space inside the room, provided there is enough space outside for it to open safely. Types that divide rooms are traditionally hinged in pairs. If space is limited, bi-fold or sliding types may be a more practical option. The sliding types come into their own as room dividers - when they are closed, they offer privacy and bring intimacy, opened up, the space is expanded for larger gatherings. However, one disadvantage is that blank wall space is needed for sliding styles to open. One solution is to construct a false wall in front of the original one so the opening style slides between the two and is completely concealed when open.

In the article, **“using coat racks as decorative pieces”**, by Cherry Meghan (2008), Coat racks have been emphasized for their multipurpose use in interiors. Coat racks have been around for ages and for the most part have given way to closets and other out of the way places. Wall mounted coat racks provide an excellent space for children to

place their clothing, hats, jackets or a variety of other hanging items. Some wall mounted coat racks with shelve designs, trees, traditional designs, have a wide or narrow base with curved or straight bars to hang coat hat on. Racks that have umbrella stands are going to be considerably more ornate for the most part. Traditional Victorian style designs contain umbrella stands. Hall trees come in a variety of styles regular coat racks but are flatter on one side so they can sit flush up against the wall while others follow the more traditional design. Hall trees are designed for a place to sit to take off coat, hat, and shoes as well as a place to put these items when removed. Some even come with mirrors to allow a last minute check before heading out the door. Hall trees are typically used in entryways used in any room home that has room. Hall trees almost always come with a coat rack. Wall mounted coat racks that can be placed anywhere in order to provide an out of the way place to put coats, jackets, and hats.

According to Doty Horn, Director of color and design at Moore Benjamin & Co, "This trend is about the never-ending quest to bring the outdoors in." "A well-dressed home includes soft, pale neutrals and sensible, grounded hues" Ralich Spak says. Furniture and decorative items in this trend look more like what they are actually made of, with a lot of texture and natural imperfections showing through. "All things natural are seriously fashionable right now", adds Jan Jessup of Calico Corners. "As Fabric fashions Masculinity Madness, the same fabrics one might see on a well-dressed man also make for a well-dressed room", says Anne Hood Shiny Sophistication. "Shimmery, specialized finishes are really hot", says Jan Jessup of Calico Corners. "Metallic is warming up in 2008", Jessup adds.

In the article, "**using mirrors the mirrors to create illusion of space in your home**", the author Ackerman Jessica (2007), specified that mirrors can be used creatively to make a small room seem larger, to make a space more light filled by reflecting sunlight around a room. Mirrors can make any room appear larger, and placing them judiciously not only increases visual space but can make them an integral part of décor as

Baldwin, for example, always hung mirrors so they would bring wonderful exterior views into a room whenever possible. When outdoor views were not worth bringing inside, Baldwin positioned mirrors to reflect art on other interior walls. To increase visual space, bring light and desirable views inside and visually correct architectural design flaws. To make a hallway or stairway appear wider than it is, hang mirrors in a staggered sequence on both sides of the walls. To make the same hallway appear longer, hang mirrors at its ends instead of on its sides

- Place a mirror across from a source of light such as a window or under a skylight to bring more light into the room
- Multiply the decorative value of accessories such as candles, flowers and plants by hanging a gorgeous wall mirror to reflect them.
- Hanging a mirror on the wall adjacent to a great piece of artwork will both reflect the image of the art and increase the feeling of space.
- Painting one wall of a room in a dark color and hanging a decorative mirror on the dark wall will increase the visual depth of the room.
- Top a large wall mirror with a floral swag in your foyer. The floral swag will lend a charming note when checking your appearance on your way in or out of the front door.
- Create a grouping of different sized mirrors for an interesting wall arrangement. They will bounce light off the opposite walls as well

Rhonda Morin (2008), as written in her publish “**wonderful world of wallpaper**”, Wallpapers could flow the spaces together by painting the walls the same colour in all the rooms, but use different accent colours to make each room appear different. Small rooms should use smaller more intricate patterns, which will fill the space with more interest. Large rooms should use grand patterns that stretch out throughout the space and keep the room in proportion. Use patterns to add interest to places that lack architectural features. The pattern is matched to the style of the houses architecture.

In the article, “**Personalize your home with art and accessories**”, as browsed in internet, there were few tips highlighted for home to get treated with art and accessories and hence are listed below

- Repeat a color at least three times in a room.
- Relate art to its surroundings. Art prints placed about 6"-9" above a sofa will create a unified look
- Over two thirds of the space above furniture with one or more pieces of art to achieve proper proportion.
- Position artwork at "eye level" to look at the center of it from either a sitting or standing position.
- Vary the height of table top accessories for balance and interest.
- Create a formal look with symmetrical groupings of art. Create an informal look with asymmetrical groupings.
- Place mirrors so they reflect something beautiful. Use them to add dimension, expand space or reflect light in a room.
- Display art on easels to create interest in corners, bookcases or on table tops.
- Custom frame artwork to coordinate with room decor. Select a frame that compliments the decorating style.

In the article written by Chandaraju Aruna in the Times of India, **Unfurl those curtains, (Sunday 11, November,2007)**, curtains are considered to use in interiors to give privacy and style as they add life, colour, vibrancy and even a sense of space. She explained that sheers, a light coloured organdie fabric, or a subtle shade of raw silk, looks good in minimalist home.

From **shimmer effect** in The Times of India, (Sunday 29, September, 2007), the article states that the frosted glass as a partition creates a barrier between spaces but because of the light passing through, it imparts continuity to the volume that gives the area a definition without making it seem cramped.

Kathy Burns-Millyard (2007), expressed the importance of room dividers in the article published at <http://www.diyhomedecorating.com>. The article titled “**Decorating with Room Dividers, Part 1**”, discussed on use and arrangement of room dividers in interior space. From half walls to a well-placed sofa, use room dividers to make the most of the space in home, creating manageable activity areas that still let enjoy the benefits of open-plan living. Most rooms in the house have to serve more than one function. The living room may embrace a host of different activities, from quiet reading to music practice, from watching television to formal dining. The kitchen is often the place where family meals are eaten as well as prepared. Bedrooms double as dressing areas, playrooms, or studies; children's rooms are often shared. Multi-purpose areas require some form of internal organization to avoid chaos and confusion. Room dividers do not increase the space at disposal, but they make better sense of it. A room divider can be as permanent as a half-height wall or as temporary as a freestanding screen. Furniture that one already possesses, such as a shelf unit or sofa, can be pressed into service to distinguish one part of a room from another. Dividers that provide practical advantages of their own multiply the benefits. For example, a counter that hides kitchen clutter can also serve as a breakfast bar; open display shelves offer additional storage space for ornamental pieces and books while partially enclosing a section of the living room. Make sure the dividers do not undermine the basic qualities of the room - one needs to plan carefully to avoid blocking light or creating traffic bottlenecks. Equally, it is important to work with the inherent proportions and decorative character of the room so the final effect appears well considered rather than makeshift. For arrangement of room dividers, make a rough sketch of the room to assess how best one can divide it. Pay special attention to entrances, windows, and traffic routes through the space. Ideally, place dividers so that each portion of the room receives natural light. This means the position of the windows is a crucial factor in layout. Also take care not to obstruct main entrances or make it difficult to move around the room. Think about how much space to allocate to each activity. Study areas can be quite compact, for example, whereas a dining area requires more space so that chairs can be moved comfortably back from the table. Dividing a shared bedroom usually means

splitting the room in half to provide each person with an equal amount of space. Dividers do not have to follow straight lines. A curving counter is an attractive way of separating a kitchen area in an open-plan space. In a similar way, a pair of narrow dividers projecting out from opposite walls to frame an area can provide more visual interest than a single divider extending some way across the room.

2.3.4. Colour

Rhonda Morin, owner of <http://myinteriordecorator.com> and author of *The Decorating Bible*, enjoys writing and teaching others how to decorate the homes of their dreams. According to her, the studies that have been done in the field of colour suggest that the colour itself does not affect us but our perception of that color does. For instance, the color black to one represents stability and elegance. To someone else, it represents death. To some countries it represents purity, its what their brides wear on their wedding days. So, if one were to place the three in a room with everything being black, at least one would come out of the room feeling very stable and elegant. The person who sees death would be depressed and upset and the person to whom that colours represents purity will feel wholesome and good. All three saw the same things. But all three had different perceptions about the color black and thus very different experiences in that room. For some people, however, that color represents the limited funds they have had in their lives to change appliances to newer fresher colors. It limits them and causes strife. For someone who did not grow up in the seventies that color means nothing to them. It's a combination of many things, including culture and individual experiences, but ultimately its perception of a color that determines mood or feelings towards or about a room.

On choosing colour for interiors, the authors express their suggestions as following. "All things Asian are in vogue. Bamboo will be at the forefront of this furniture trend. In the past, the color gray has been mostly associated with masculine, contemporary and urban decor. But

there is a softer side to this versatile hue that can take a room from so-so to sensational,” says Donna Talley of Calico Corners. “If you are not sure where to begin when choosing colour for your home, look towards the clothing you choose—typically, one wears the color(s) one likes best.” says— Debbie Zimmer, The Rohm and Haas Paint Quality Institute.

Edward Tashjian, vice president of marketing for Century Furniture said that “It’s hard to make a mistake with black and white. It’s classic, stylish and versatile. It doesn’t limit your options.” The significance of colours is one can have fun with it and choose colours based on the mood one wants at home to convey.

Lisa Finnin-Ciccoli of IKEA, the black and white trend is proving that ebony and ivory really do live together in perfect harmony. According to Debbie Zimmer of The Rohm and Haas Paint Quality Institute, the black and white combination is striking, clean and simple. Black and white is a timeless combination that not only makes a statement on its own but also provides the perfect backdrop for virtually any color.

In the article, “**Select mat colors that enhance both the art and color scheme**”, from internet browsing, suggestion was given that choosing colors and patterns can make the space seem larger through their tone and scale. Adding a skylight to open the ceiling to more light and visually expand the space, and remove any soffits above the cabinets create a wider ceiling line. Color and scale in mind, patterns such as those in narrow-strip wood and laminate flooring can help to create the illusion of depth and length, and lighter finishes automatically enlarge the room. Keeping the light finish scheme, and incorporating glass-front doors and open shelves add depth. Better use of the storage space adding cabinets with such special features as spice trays and pop-up appliance storage, or only minimal window coverings -- will let in more light and help create a transition to the outdoors. Consider installing a greenhouse window over the sink for even more natural light and beauty, and trim all windows in bright white. Again, color and pattern choices are critical using a higher-

end countertop material will be more affordable small surface dimensions. Task lighting, track lighting units can control shadows set the mood.

In one of the articles published in Deccan Chronicle explained that the colour when planned in coordination for all the rooms in a house will make it appear larger as the colour has power to transform a room in terms of shape and size. One can repeat same colour throughout the house to maintain harmony, but a different colour in each room will add variety. **(Friday 3 august 2007)**

In another article sited in internet, **“Learn to use colors to create the illusion of smaller or larger rooms, higher ceilings, etc.”**, by Johannes, it published that various features in interior spaces can be treated with colours, pattern and texture to create illusion of space. The treatments are as follows

- Illusions of space (Fig 2.9) - To create the impression that a room is larger than it is, paint it in a pale or cold colour. Pale colours seem lighter and more distant than dark colours. As for cold colours, such as blue, green or lilac, they always appear more removed than warm colours. Use these decorator effects to make a room seem larger and airier. The illusion of space rests on warm-cold, bright-dark and quantity contrasts.

Intimate effects - If one is looking for a warmer ambience, choose a warm or dark colour. Tones of orange, brown and red warm up a room and contribute to making it friendlier while darker hues give it intimacy. The intimate effect rests on the warm-cold and quality contrasts.



Fig 2.9 - Illusion of space

- Ceiling effects - If the ceiling seems too high, lower it visually with a darker, warmer hue or one that is more unsaturated than that of the walls. As a bonus, one will find the room more intimate.
- Architectural details (Fig 2.10) - Architectural details such as mouldings, baseboards, window frames and ceiling ornaments constitute assets one should not neglect. To set them off, paint them in a colour that is lighter than that of the walls, and in a paint that is glossier than that of the walls. This way, mouldings will better reflect light. The setting off of architectural details rests on light-dark contrast and on the contrast that arises from the juxtaposition of different finishes.
- If a room includes architectural details that bother you, such as crannies that are too numerous in a small room, paint the entire room in the same colour. If the ceiling is the culprit, do not hesitate to paint it in the same colour as the walls. This way, disruptive elements will stand out less. This is a case where one must avoid contrasting effects.
- If the ceiling seems too low, (Fig 2.11) paint it in a lighter, colder or more saturated colour than the walls. This will create an illusion of height. The effects that make a ceiling appear higher or lower rest on warm-cold, light-dark and quality contrasts.

Dividing space – one can symbolically divide your space with colour. In this room, we have created a well defined bed corner simply by using a different hue at the head of the bed. This chocolate brown wall, with its mural, is enough to create a clear division between the reading corner and the space reserved for resting. To achieve this symbolic division, we have relied on light-dark and warm-cold contrasts



Fig 2.10 - Architectural details



Fig 2.11 - Low ceiling

scheme allows creating an integrated ambience and a smooth transition between rooms that connect directly. The resulting impression will be more uniform than what one would get from a multi-coloured palette. One can also create a chiaroscuro with any hue, as long as it harmonizes well with furniture, carpeting and other decorative elements. The chiaroscuro relies on light-dark and quality contrasts_ and on the use of different hues in the same colour, such as a blue-green or a navy blue.

- Finding a colour palette for the entire house - If one is planning to redecorate the entire house, one will need to find a palette that is restricted enough to unify the whole décor, but complex enough to underline the unique personality of each room. The Voice of Color® Harmony Collection suggests magnificent palettes that can address both these needs marvellously well. Most are made up of two to three colours within the same family, and accent colours. Using the Harmony Card, one can choose hues from the same family to apply to most surfaces and use the other hues on the palette as accent colours to set off the unique character or vocation of each room.

- Open areas - If one lives in an open-plan house, try using a chiaroscuro, a palette made of a single colour used in different hues that are more or less dark or more or less saturated. This way of working colour

- The effects of stripes (Fig 2.12) - Use vertical stripes to give walls more height and make the ceiling look higher.

- Horizontal stripes (Fig 2.13) can create the illusion that a room is longer than it actually is, and has a lower ceiling.



Fig 2.12 - Effect of stripes



Fig 2.13 - Horizontal stripes



Fig 2.14 - Diagonal stripes

- Use diagonal stripes (Fig 2.12) everywhere in a room or on one of its elements to create movement.

According to Wright Angela, author of the “The Beginners Guide to Colour Psychology” (Colour Affects), ‘There are four psychological primary colours – red, which relates to the body, blue to the mind, yellow to the emotions, and green, which provides a balance between the three. Shades and tints of these determine how they affect us.’ Chromatherapy (the use of colour as a health treatment), has been used in the western world since the early 20th century. But long before then, ancient Indian and Egyptian cultures used colour to treat ailments, and feng shui practitioners have always used colour as a means of helping create harmonious living spaces. June McLeod, author of Colours of the Soul , says ‘Colour is the most important consideration for any space, it’s transformational.’ According to them, Blue is good for bedrooms, bathrooms and dieters; Earthborn Paints for Sitting room. Do use green, orange and brown. Green refreshes, restores and brings harmony to our environment. Orange and yellow are optimistic and welcoming, encouraging social interaction and fun. Used well, black and grey communicate clarity and sophistication. Misused, they can be menacing. Black’s friendlier cousin, brown, can convey the same strength and glamour but with warmth that comes from the addition of red and yellow. Don’t use red or dark blue. Unless one wants a pure party room filled with frenetic energy, do not use bright red, which is simply too stimulating for a living space. Conversely, dark blue is cold and formal – save it for the

boardroom. For Hallway, Do use almost anything. As the hallway is where one spends the least time, it's the one space in home where one can go bold and use colours which may be overpowering elsewhere. Do not use mustard yellow. 'Whether one wants to create a light and airy feeling to the entrance of home, or a vibrant, passionate mix of colour, the choice is yours,' says June McLeod. 'The one no-no in the hallway is mustard yellow – a colour traditionally associated with things going missing.' Not so handy when you're looking for your keys. Kitchen/Dining room - Do use white, yellow and orange. White represents cleanliness and hygiene, but too much can strain the eyes, effectively reflecting the full spectrum into them – think interrogation techniques! Add accents with crockery and appliances. Yellow is uplifting and encourages sociability, while orange speaks of the physical comforts of food and warmth, as well as stimulating the appetite – notice how many restaurants are painted in warm, orangey tones. Do not use blue and black. Try serving food in a blue room off blue plates – scientists even recommend fixing a blue light in the fridge. The lack of blue food in nature means one does not have an automatic appetite response to the colour, instinctively rejecting it in case it's poisonous.

Kemp Kate, author of “**How to Create the Illusion of Space**”, as cited in internet, expressed that Color and mirrors can open up a room. By positioning mirrors in the right places, one has the power to make any room appear larger. Whether one lives in a loft, or a four bedroom house, one can follow these tips to make small areas more comfortable. If one is living in a loft, one probably might have pillars throughout the room. Mirror them and they will seem to disappear.

- If one wants a hallway/stairway to appear wider: stagger mirrors on either side.

- If one wants a hallway/stairway to appear longer: a mirror at the end will double its length.
- Make sure mirrors reflect only things wanted to see more of. Do not place a mirror directly across from a laundry basket, or any cluttered/generally dirty area. Instead, one might want to place it across from a source of light, a favorite painting, or a window.

The colours one chooses to decorate a room contribute more than anything to the feelings one associated with it. Remember the following when choosing a colour scheme:

- The best color for opening up a room is bright white.
- If bright white makes you shudder, try adding a few drops of favorite colour for a tinted, warmer look.
- If that is still not cup of tea, try beige or light grey
- Bright colors like yellow and white seem more inviting & open because they reflect light
- Dark, dramatic colors like maroon and forest green seem more intimate because they absorb the light
- Always check paint stores for mistinted paint. One might find an unusual color that appeals, and one will get it at a discounted price.

2.3.5. Patterns

In the process of selecting patterns for an interior space, <http://coasters.PebbleZ.com> in its article “**the basics of using patterns in home decorating**” suggested few ideas to make the room look large by using patterns as below

- Small rooms should use smaller more intricate patterns, which will fill the space with more interest.
- Large rooms should use grand patterns that stretch out throughout the space and keep the room in proportion.
- Use patterns to add interest to places that lack architectural features.

- pattern must be matched to the style of the houses architecture
- Use patterns which have a single consistent color that runs through all of them samples of cloth from the store, matched with paint chips, and magazine clippings.

2.4. Commercial space planning

An article by Murphy Kate, from **Build your dream workspace**, (Oct. 1, 1998, [http://www.10-12-98 BUILD YOUR DREAM WORKSPACE.htm](http://www.10-12-98_BUILD_YOUR_DREAM_WORKSPACE.htm)), The McGraw-Hill Companies Inc., stated that in the process to building a dream workspace, one needs to be very conscious about avoiding discomfort and even disability which lead to buy furnishings that fit. "Don't get anything that may force you into an awkward posture" as told by Scott Wright, an ergonomics consultant in Los Banos, California. The author said that furniture has to be arranged so that there is freedom of movement. Lisa Kanarek, an organizational consultant in Dallas and author of *Organizing Your Home Office for Success* (Blakely Press), says that one should be able to "turn full circle in your chair without hitting anything," and pathways should be clear. She also suggests that one can put everything one regularly uses within reach and that means without having to stretch. A common gripe among home-based workers is a shortage of storage space. Sarah Gaventa, author of *Home Office* (DK Publishing,), advises planning for twice the storage one thinks will be needed. Walls with shelving and corner racks, putting file cabinets under tables are few techniques to increase storage space within available space. Most people would not dream of working at home without a PC. But now printers, copiers, scanners, and fax machines have also become necessities. One might want to consider a unit that does the work of all four but takes up less room and may cost less than buying everything separately.

Brager, G., J. Heerwagen, F. Bauman, C. Huizenga, K. Powell, A. Ruland, and E. Ring, (2000, April) as written in "**Team Spaces and Collaboration: Links to the Physical Environment**", assessed

individual and group worker effectiveness in today's new workplace paradigm. They studied the impact of team workplace design on worker satisfaction and group collaboration. They also conducted a review of existing team workspace design strategies described in the literature, and a detailed analysis of 12 case studies. With the help of Dr. Judith Heerwagen, an environmental psychologist, they developed an overall conceptual framework for the project that builds on existing research and theory in environmental psychology (specifically spatial syntax, communications processes, and the cognitive and social structure of work and teams). Drawing on research in the fields of spatial syntax and communications processes, they evaluated how design features—including layout, degree of enclosure, acoustics, and visual access to people—inhibits or enhances the frequency and effectiveness of team interactions.

2.5. Residential space planning

The author of **The Apartment Therapy**, Ryan Maxwell Gillingham (2008), as appeared in internet, suggested ten tips for treating small spaces. He said, "Feel free to add your own." He also adds on by giving suggestions as below

1. Remove interior doors (use curtains instead on closets and doors).
2. Replace big refrigerator with a smaller, under counter model. It is more than enough room.
3. Treat interiors with sturdy small vacuum. Use track lighting aimed at walls to free up floor space and create an expansive feeling.
4. Install lighting inside closets to see what is in there. They will be easier to maintain and will gain the feeling of more space.
5. Clean windows often so that more light comes in and view is not blocked.
6. Go wireless, transfer all music to computer and sell CDs
7. Use full spectrum light bulbs to energize and enliven home.

8. Have lots of dinner parties. People actually socialize better in small spaces. And, as an added bonus, apartment dwellers that entertain take better care of their homes.

According to Susan Maxwell's five basic principles of design, "If you have anything that seems too large, you may want to consider getting rid of it, putting it in a storage unit or loaning it to friends or family until you need it again." Storage: Maximize every inch of space by taking advantage of storage containers and multipurpose furniture.

- ❖ Stackable: Utilize vertical space for extra seating or storage.

- ❖ Style: Keep everything minimal but still beautiful.

- ❖ Simplicity: Calming colors and monochromatic hues create the look and feel of a larger space. Also, incorporate more textures and fewer patterns. He also added few other tips as below

1. Purchase the largest mirror. Place the mirror in a focal point of the room, and it opens up the room and makes everything appear larger hang the mirror slightly higher than eye level to give the look and feel of more space.

2. Select cool paint colors to fool the eye into thinking the walls farther away than they are. Paint the ceiling and moldings the same color as the walls. A white ceiling will create contrast and make the space seem smaller.

3. Experiment with furniture arrangement to see what works best in the available space.

4. Find accessories that do double duty.

In the site www.myinteriordecorator.com, (1998-2008) the importance of space on life of its inmates and its influence was highlighted which helps the homemaker to arrange the available space. Since home has a deep impact on personality, one should strive to make it an environment, which fosters the kind of person one wants to be. For example, if one tends to be anxious and stressed out, getting violently angry at every little setback, one may want to develop a space which is a tranquil paradise of peace and relaxation. However, if one is lethargic and

unmotivated, finding it difficult to get up the energy to do almost anything in life, then one may want to try and create a home full of interesting and inspiring elements, bold colors, and invigorating decorative pieces. While these subtle personality effects are powerful, the function of home has an even more obvious impact on day-to-day life. Anyone who has ever lost their keys in a cluttered den knows that the wrong environment at home can have a negative impact on ability to get things done in life. In its simplest form, the home is where one keeps all of possessions. Some of the things one owns are worthless, others are priceless, and everything else falls somewhere in between. The problem is that many people do not have a strategy for incorporating all of these different elements into a space. The result is often chaos, with useless decorative mementos making it impossible to find anything needed, or important functional items being placed in prominent unattractive places so that they will not be lost. This is a problem, which could be easily cured by simply getting a little more organized. Home also affects function because it is a location one can use for a variety of purposes. One can conduct business meetings there, have an intimate date at home, or throw parties or family a reunion where one reconnects with the people one cares about. However, ability to pull off events such as these will be determined largely by the appearance and state of home. If trying to conduct business, one will need a space that has a formal air, while throwing a party makes having a home with lots of space and good flow vital.

In the article published as **Great Bedroom Decorating Tips**, (2005), specified that bedroom decoration start with planning as the occupants spend about a third of lives in bed. The aspects to be considered are

- ❖ Occupants – the number of occupants will determine the accessibility of the bedroom space as well as the size of the bed. For example, one may have to choose from a double bed or a king-sized bed for 2 occupants. In turn, this also affects the space in which one positions the bed.
- ❖ Light – this should be well controlled with curtains and blinds during the day and with artificial lights during the night.

- ❖ Power – the positions of power and phone sockets will affect the positioning of lamps, phones and entertainment systems. Thus, it is important to map out these sockets to plan their placement.
- ❖ Storage – a well-designed wardrobe system is more than just adequate shelves for clothing and accessories. It also puts everything at arm's reach, and allows seeing where things are. Where possible, built-in storage is advisable. It provides efficient storage but gives the room a sleek pulled-together look as well as eliminates the need to fill the room with furniture. Beds should never be placed within the arc of wardrobe doors or opening drawers.

In **Overview on Kitchen Interior Design** (2008), as extracted from textbook, the planning process of kitchen was described in which one of the steps included shopping prior to which the homemaker has to keep in mind the storage and organization needs. Take a look at how to maximize kitchen space, especially for those who want to optimize usage with limited space. The basic step should be to create a list of must have furniture and equipment. One of the best ways to enhance the look of a kitchen is to add tiles to it if tiles are against the wall in the kitchen. Purchasing decorative items in various sizes and places are good to be used in the kitchen. Warmth of the colors that are used in certain pictures creates an even more welcoming environment.

When furnishing child's own special space, usually their bedroom, there is a unique opportunity to create the kind of stimulating environment that will nurture their child's growth. In the article, "**Space Saving Kid Furniture for Creating a Stimulating Bedroom**", there are many types of fold-out form furniture - foam loungers, foam sofa-sleepers, and futons. More comfortable and suitable for children are beanbag loungers and chairs because they are sized for children. Beanbags will conform to a child's body shape as they sit in it, giving support to the lower back, shoulders, and arms. Foam furniture and beanbags are lightweight making them easy for the child to move and rearrange themselves. A child's room needs open floor space. Multipurpose furniture that can

change shapes for different needs will be a wise investment. Television and computer can be left in family areas where the child can be monitored what they watch and play but not in the child's bedroom. Bunk beds or futon bunk beds are great space savers of that precious floor space. Bunk beds are once again a space saving piece of furniture. The futon bunk bed is the ultimate space-save for a child's bedroom.

Vaidya Shrinivas (2005), the webmaster of Bedroom designs and decorating ideas.com, in his article, “**How Do Home Furnishing Experts Study an Interior Space?**” described as to how a bedroom has to be furnished according to the requirement of occupants. He says that any empty room without furniture always looks spacious which lacks personality. He compares an empty spacious to crowd furnished rooms and then suggests as to how to decorate bedrooms saving space. He says that the interiors should be planned in relation with the outer space. If the home is located in a crowd urban city space, the choice of design theme would be directly related to comfort level of every individual. Selecting furniture which goes with the entire theme as well as satisfies the person on the comfort scale can change the way the room feels. So the personality of an interior space is largely dependent on what is happening outside the space, rather than the space itself. If home is just next to a busy street, cane curtains on windows would cut off the noise easily. If home is on a sea shore, curtains which would block the heavy wind would be chosen. When these spaces get furnished, the previous identity of an empty space gets blocked by the objects being placed. He clearly specifies that the face of the furniture object is the new face of the room as the furniture occupies quite a bit of floor and wall space. He concludes that any habitual space also has one more important aspect to it which is windows. Depending up on the function of the room the space can have doors as well.

In the article of “**ways of treating the space**”, the author has suggested to think beyond storage. A screen is an excellent way to partition off a bedroom, office area, or other private or “unsightly” section of

home. Thinking vertical can mean coming up with creative ways to hang items.

The article “**Space Saving Decorating Ideas for a Studio Apartment**”, by Jeff, Managing Partner of Apartment Home Living, had given different ways of treating space at studio apartments so as to feel spaciousness. Futon is a great way to maximize space as it would be it folded up during the day and as a couch at night to sleep. Entertainment Center/Dresser unit will help save the space needed on having two separate pieces of furniture. Storage things like Tupperware can be stored under the couch or a shoe rack available by the door. The space underneath the dresser or on top of the kitchen cabinets can be used as a strange area. Instead of using the traditional waste basket get a used oversized football toy box. Usually has a lid and works great. If that is not possible always use a little waste basket under the sink. Use of a wireless router and a laptop in an apartment is a space saving technique and a small stool in the kitchen area can quickly turn kitchen counter quickly into a computer desk. Increasing the lighting of the room and painting it a light colour will make the room look bigger because a dark room seems closed and small. It is suggested to move furniture around once in a while as this keeps the room interesting and allows for finding the best position for the furniture. Buying small furniture gives the appearance of having a larger bedroom as furniture that is big will appear to be taking up a lot of space in the room. Wall mirrors give the illusion of creating more space in a small room. To increase the illusion more the mirror can be arranged to catch light from the window or lamps.

There were some more tips for making the most use of the available space given by the author in the article “**Suggestions on making utilization of space**”. Darker colours, dramatic lighting and big soft sofas will create a warm and cosy ambiance. Deep reds and browns will really warm up any room. Lighter hues may be chosen for really small spaces to instantly create a feeling of spaciousness. Monochromatic tone-on-tone paint techniques, patterns and fabrics can be used to open up a small room. One of the simplest but most effective solutions is to create

space with light. Natural light is best but stunning effects can still be obtained by adding additional light fixtures. Cove lighting, up lights, rope lights and bookshelf lights are just a few options that can be used to transform room. A clear view across the room can be created by eliminating obstructions. After seeing through a space, creates the illusion of being large and open. Furnishings may be arranged to open up areas of floor. Furniture should be chosen such that it matches the colour of walls or vice versa and unlock even more space. Even the most cumbersome of furniture will seem to melt into the background when finished in a colour that is close to the wall tone.

The living space can be most effectively used by maximizing it. In the article “**Maximizing Living Space**”, a similar write-up was given to treat a space, living space. It says that cork flooring, with its sensuous texture, can warm up a modern interior, preventing it from looking stark. Space gives a sense of freedom and helps us relax. It helps the inmates to stay organized and feel in control. It reduces stress level. Clean and simple décor creates an open, airy feeling. It utilizes creative storage to give a clutter-free environment. A light monochromatic colour scheme can be selected. Contrasting or added colours can draw visual lines in a room, dividing it into small sections. Tones of one colour will create openness and flow. Hard-surface flooring has a smooth texture. In a blonde or light-stain finish, it can blend into the wall and disguise where the floor ends and the wall begins, increasing the sense of space. The article specifies that hardwood or laminate is a good choice. The planks should be long and show off an extended flow of wood grain. Cork flooring has a multidirectional grain that is perfect for a small space to avoid the lines created by wood flooring planks. Linoleum which is multidirectional flooring is another that is seamless when laid. The effect is smooth and flowing, once again creating visual space.

In the article, “**how to make a small bedroom larger**”, as sited in internet, and techniques to treat the bedroom space was specified. If the room is too dark it will make a room seem closed-in and small. By increasing the lighting of the room and painting it a light color, one will be

able to make the room look bigger. Because they will block out too much light, furniture could be moved around in a while into different positions. This keeps the room interesting and allows to find the best position for the furniture. It also allows finding creative positions. Furniture that is big will appear to be taking up a lot of space in the room. Buying small furniture gives the appearance of having a larger bedroom. One can choose furniture that has a light colour to make a room look larger and also by placing wall mirrors in it. Wall mirrors give the illusion of creating more space in a small room. To increase the illusion more the mirror should catch light from the window or lamps.

In the times of India, an article titled **Open Spaces** has featured on the utilization of a balcony space. (This article can be seen in **Saturday 15, September 2007**). This says that a balcony can add an extra dimension to room. Balcony railings must be provided instead of a parapet wall adding to their openness, making a small balcony look quite spacious. The furniture to be placed in the balconies must be chosen very carefully so as to allow a comfortable seating to the users in spite of space constraints.

Lasting impressions from the Times of India, narrated by Fatehi Moayyed, (**Saturday 3, and November 2007**), has focused on the entrance lobby of an apartment and given the options as per the size of the lobby is. If the lobby is small and almost enclosed space, he has suggested using lighter tones of colours or pastel shades for surfaces and floors. Frame it with a wooden architrave around the jambs of openings or alternatively with granite or marble. This will create a defined circulation pattern to the other openings in a series, besides making it a focal point. Use cornices of gypsum or wood to define the ceiling. A large mirror in a small lobby will create an illusion of doubling up the space and also increase the light intensity. One can either place a glass or marble topped console or a credenza below the mirror if space is wide or vice versa tall vases or urns with dried flowers on the floor. Complete the ambience with a decorative pendant light and a picture light above the mirror. For narrow and long entrance lobbies, with a high ceiling which also act as double

loaded corridors, the narrator has advised to use various elements and accessories besides a blend of subtle and bold colours to create a composition and also an illusion of compact space. Use of a vibrant colour, one of the shorter surfaces while the longer ones win subtle creams or beiges will create drama and a striking balance. Accessories like contrasting coloured durries, plants, decorative mirror and pictures frames on different walls will further enhance the long and narrow space. A combination of general lighting in the form of a pendant light to accent lights by way of spots will add depth and shade where required and transform the space into a new dimension.

The article titled **Ease away stress** featured in the Times of India, (**Saturday 3, November 2007**), suggested that the Asian cultures certainly get peace of mind when a home designed to ease away stress. Homes that have designed under Asian influence are simple, yet elegant, with furnishings, furniture and art, designed to bring in peace, balance and serenity to the space. Colours used are dramatically, but judiciously used; Chinese interiors, for instance, would have bold red as a dominant colour representing good luck, but it is never overpowering. Water is used in magical ways; its delicate sounds and calm silences, broken by the occasional darting fish, lend just the perfect touch to an Asian home. As a sample one of the houses designed was illustrated where the entire house is done up in shades of cream and brown, with artefacts and splashes of colour to brighten the space. The luxury of a terrace and a Zen pool may not be yours to savour, especially if you are living in one of the busy cities but there are many elements that could be brought in.

Under the title **Making the most of a portico**, published in the times of India, (**Sunday 29, September, 2007**), portico has been given due importance with its functionality. It says that the portico can be used as a place to entertain. This space can also be used for parties, to set up a bar, etc. This place can also be used in the evenings to play board games. It advices that porticos must be used to most while one have them as they are a rarity these days.

In Times of India (**Minimalist Design for living spaces, Saturday 8, December, 2007**) describes how to make the living room look more spacious by using minimalist design. It stated to keep the furniture simple and unostentatious with every piece finding a definite purpose to fit into the minimalist's plan. A minimalist entertainment stand without many racks for the TV is good. A sofa or a divan in a plain rectangular shape without embellishments, fringes, laces and the likes, but with a splash of subtle colour in throw cushions can be chosen. There must be a careful choose of colours that are not heavy on texture and pattern as these can serve as a visual clutter. One should try solid and subdued shades. Side tables can be simple laminate cubes or glass and stone topped metal cubes. There must be a focus on geometric shapes and asymmetric arrangements for the complete look. Foot stools, spare chairs and other visual distractions are not advisable. Keep the floor and all flat surfaces completely clear. An elegant piece of rug can take the place of wall to wall carpeting. Look for out of sight storage for the non- essentials and no other elaborate arrangements are necessary. On walls a simple neutral is important for the minimalist look, as it allows light to bounce around and create an effortless "wow factor". Many purists choose white, softer shades of green, mint or lemon yellow are also used. Avoid deeper shades. Avoid too many hangings on the wall as they cramp up the space. Windows are chosen to leave them bare to allow more light inside, or drape them in solid coloured curtains that fall elegantly. key is to keep it simple. If one has a more contemporary outfit, they can experiment with wood or roman blinds. Choose lamps and shades that are styled in minimalism like in ceramic, brass or wrought iron but not too ornate. Soft lightings add a warm, welcome glow to the room.

An article stated in Times of India (**How to make your room look spacious, The Tip, Tuesday 22, January, 2008**) explained how furniture, lighting and wallpapers influence the spaciousness of room. It says that large piece of furniture should always be placed against wall that is longest in the room that would draw attention away from the small parts of the room and towards the parts of the room that are larger. While purchasing new furniture try to avoid purchasing items that are big and bulky. These

kinds of items will work against your efforts to make the home feel more spacious. Purchase smaller pieces that have their legs exposed. It also says to avoid having light fixtures on the ceiling as the ceiling appears to be lower than it actually is. Having the colour of ceiling lighter than that of the walls and furniture is also considered. It specifies that mirrors improve the spacious feel of the home because they reflect more light and make the room look bigger. Placing Soft lights that do not cast shadows throughout the home is also a tip. Striped wall papers in pastel colours will add height and broaden the walls making the room look larger. Hang striped wall papers horizontally which creates an added illusion of space.

In the article sited at internet, "**Tight Fit: How to Decorate a Small Space**", the writer, Rhonda Morin (<http://myinteriordecorator.com>) suggested in treating small spaces. Few endeavors are more difficult than trying to tastefully decorate a living space smaller than some walk-in closets. A studio apartment with one room and a bathroom is the smallest option imaginable and by far the hardest to decorate. First goal is not to make the whole room match, but rather one wants to split apartment into distinct sections. One can buy screens to help split the room. A sturdy wood screen with fabric in it will offer privacy but also give room a light, airy feel. Another great option is using fabric to separate the space. One can get rods to put the fabric on or could use a clothesline and use clothespins to hold up the fabric. One could also buy remnant fabrics and piece them together like an old-fashioned crazy quilt. Choose fabric so that one can easily find decorations to work with it. Larger apartments will generally have three or four separate rooms. However, there are still decorating challenges in this small space. Generally, the living room, dining room, and kitchen overlap each other, so decorations must in some way match. Best option is to find a couple of colors to focus on in the space. Use different shades of the colors along with coordinating decorative fabrics and accessories in order to pull the space together. For example, reds and yellows are my colors, so on dining room table is a red throw topped with an exquisite red vase from Venice. In order to pull this together with living room, which has lighter reds in it, one can have a small red vase atop a tall, 5-shelf bookcase, then when one

looks down to my light red couch everything seems to make sense. Decorating a small space is a challenge, especially when one has a lot of stuff. Use attractive wicker storage containers to hide things and serve as side tables as well. Also, one may want to use a small bookcase with baskets to hold smaller items. Even when one moves later, these baskets will still be useful and attractive.

In the article, "**Decorating: Creating Special Places in Your Home**", Kathy Burns had expressed the importance of special spaces available in interiors and their utilisation. According to her, in house, one has two types of spaces to decorate: "predetermined spaces" and "free spaces." Predetermined spaces (or entire rooms, in some cases) are those that are needed, exactly how one will use them, and what type of furnishings is needed for them. In bedroom, for instance, one will need a bed and something that stores clothing, such as a dresser. In living room, one will need some sort of seating, such as a sofa. Free spaces do not fall neatly into place as predetermined spaces do. These areas can also be as compact as a corner of a room or even an unused closet or as large as an entire room. A wonderful way to get the most out of a "free area" is to dedicate it to a favorite interest or hobby. Some popular hobbies that could benefit from such a space include these: Artwork, Sewing, Reading and writing, and Computer work

2.6. Case Studies

2.6.1. The Problem: I have converted my attic space and have got room in there for a gorgeous, spacious shower room. I want it to have a hotel bathroom feel, but I also want there to be plenty of storage space. What do you suggest? --- *Mrs Scott, Cambridgeshire*

The Solution: Since you have opted for a fairly austere slate colour for your tiles, you could introduce an organic feel into the bathroom by using a wooden door for your furniture. Keep it contemporary by going for a flat-fronted door and a horizontal wood grain coupled with sleek handles like those in the Shades Tampa range. I would suggest that a



Fig 2.15 – The problem 1

long run of units under the eaves on the right hand side of the room would be a good use of space where you've got limited head height. If you wall-hang the units they will fit perfectly into that area but still allow you to display some pretty items on top of the worktop. Why not go for a mix of double base units and drawers because drawers can be incredibly useful for tucking away bits and pieces for easy access. As for the worktop I would tone that in with the slate colour of the tiles and go for a dark grey or black colour. Your Velux window is crying out for a vanity unit underneath it so that you can wash at the window and look out at the views. Again I would suggest the Shades wall-hung Tampa vanity unit with a semi-recessed basin for a clean, contemporary look. You could add in a couple of slim line base units here too to make the vanity fit proportionately into the space. The beauty of these additional slim line units is that you could even wire in an integral power point inside the cupboard so that your electric toothbrush can be on permanent charge out of sight!

2.6.2. The Problem: My shower room is tiny and the sanitary ware seems to dominate the space. **Can I really fit any storage into this small area** and how can I create a look that is timeless so that I don't need to keep re-updating? ---Mrs. Clarke, Hertfordshire

The Solution: The open shelving that you currently have between the WC and basin can tend to make the room feel even more cluttered than it is, but there are ways of introducing storage into even the tiniest of spaces. Because Shades' vanity units are reduced in depth (200mm deep) a vanity unit will fulfil some of your storage needs without protruding into the room too much. I would suggest you fit a vanity unit which can sit neatly next to the concealed cistern toilet. This will give an uncluttered, streamlined look, immediately making the room feel bigger. The reduced depth cabinet offers great storage and reveals more floor-space, again adding to the feeling of space. Have a look at our Country range - the beautiful, yet simple, design of the doors combined with a pear wood



Fig 2.16 – The problem 2

countertop can give a stylish contemporary look perfect for understated elegance. Do not forget that you can also use the wall space to facilitate extra storage. Why not hang wall units above and to the side of a large Shades mirror? The mirror will again help to create the illusion of space while the wall units will offer fantastic storage in an often-ignored space. And if you still want that personal touch, think about including an open shelving unit which will allow you to display some pretty accessories. The bathroom planner will help you plan the new layout of your space by including the relevant WC, basin and bathroom storage units.

2.6.3. The problem: For this luxury residence in Montreal's upscale downtown trendy loft neighbourhood, the owner emphasized the need to conserve the friendly space environment.

Objective: With the assistance of professional interior designers, the homeowner wanted more storage capacity and work space that would perfectly blend into an open home-office space.

Solution: For this new urban loft space trend, Montel designers conceived a practical residential storage system that would inspire a sense of spaciousness

The following high-density custom-designed mobile solution was provided:

- Mechanical QuadraMobile expandable and modular storage system;
- SmartShelf hybrid 4-Post shelving system offering innovative storage features;
- Adaptable shelving system that optimizes storage capacity;
- Aesthetic product giving an elegant and attractive design finish.



Fig 2.17 – The problem 3

2.6.4. The problem: (September 13, 2007 6:41 PM) I am hoping you may be able to help design a setup for the living/dining room of my new condo. Since it's a single space, I am having trouble generating ideas on how to allocate space for both watching television as well as an area for eating. I would like to make it feel larger if I can. As you can see from the plan I have included, there is not a lot of space to work with. The TV is currently located in the upper left corner of the picture, as that is where I have the cable hookup. I would like to have a TV-watching configuration that allows for a sofa-bed (for guests) and a large chair at a minimum. I have tried a small "L" or "U" configuration but can't seem to make it work. I would also like to have a two-person dining table (possibly with expanding leaves) near the kitchen.

Solution: While not, as you described, a large space, the room has good proportions which make it space flexible enough to create any environment you wish. Small space living often requires some compromises in decorating, and colour techniques, furniture arranging, and lighting considerations can all contribute to the illusion of space. The colour of a room's walls has the power to create a mood and affect the room's appearance. Cool blue and green hues will make a space seem larger and airier. Warm reds and yellows cozy a room and can make it appear smaller. It is not necessary to shy away from intense, deeper shades of colour in a small room as deep tones can promote intimacy. For example, using dark colours, soft upholstery, and dramatic lighting can turn any tiny nook into an intimate corner. Light and airy colours will help small spaces feel just a bit larger. A monochromatic of cream and white, icy blues, pale greens, and butter yellows are just a few of the combinations that can open up a small room. Whenever possible, arrange furnishings that create open

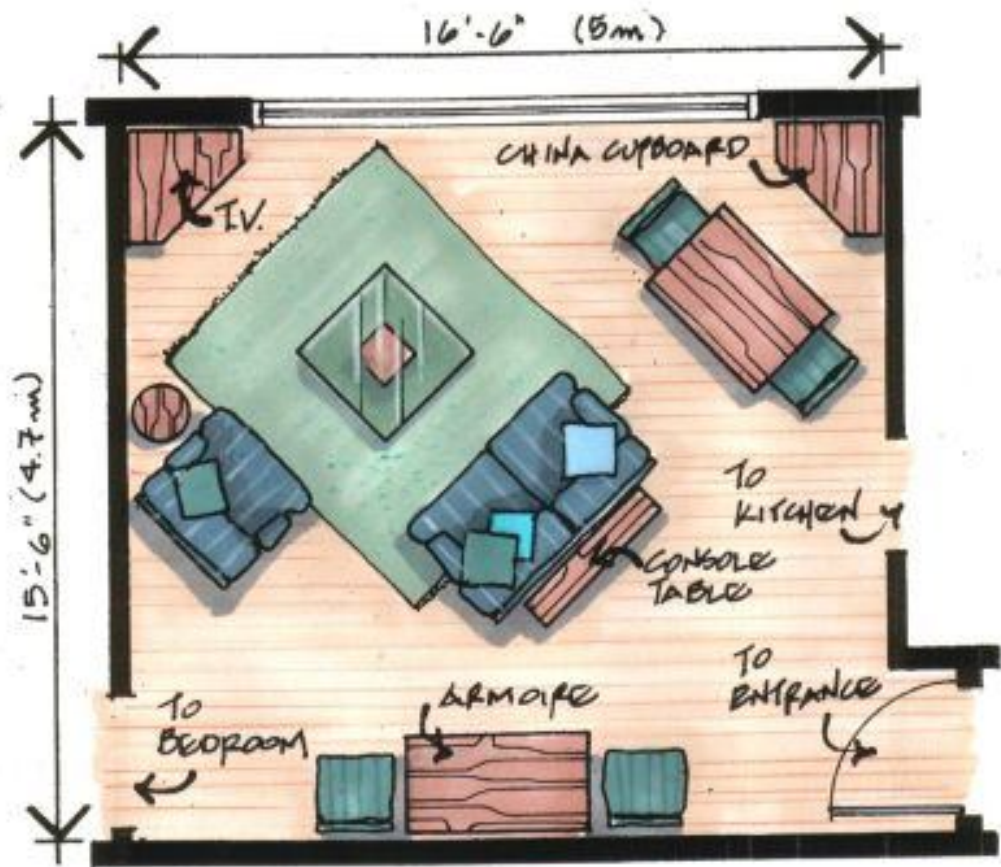


Fig 2.18 – The problem 4

areas and avoid blocking views to windows and doors (low benches, ottomans, and armless chairs can help here). Matching furniture to the wall colour will make even the largest pieces begin to melt into the background. Avoid room-darkening shadows by uncovering windows. Large windows like yours usher in sunlight to bounce off the walls and brighten even the dreariest room. If privacy is required, choose a window treatment that can be adjusted easily. Sheer fabrics as window treatments let the light shine through while adding softness and personality to a space. Adding additional light fixtures will also help. You could consider cove lighting, up-lights or any other of the myriad of light fixtures available. Mirrored surfaces add light reflection and while a framed mirror is a traditional look over a mantle or sideboard, you might consider a more innovative approach like setting an oversize mirror on the floor leaning against a wall (a mirror tabletop is another great way to add some shine). Bring in some transparent style by using glass or acrylic tables that can be useful surfaces as dining or end tables, yet practically disappear in a visual perception of the room. Emphasize a sense of space by covering sofas and chairs with plain or textured upholstery rather than vibrant prints. Neutral tones in lighter colours will usually make a room feel larger, but any colour that works in your decor will do if it's not too busy. In small spaces, it's helpful if some pieces can multitask or can perform different duties when needed. Among the most obvious are coffee tables with shelves underneath that can also be a library of books and magazines; a sofa to conceal a guest bed; a trunk that doubles as an accent table and bedding storage; an ottoman that can be used as a coffee table or as extra seating space. Draw the eye upward to create the illusion of more volume, which makes up for a lack of square footage. Crown moulding, painted a contrasting shade, will define the ceiling. Don't be afraid of large-scale furniture. A few dramatic pieces, such as the large armoire I show on your plan, add necessary storage and serve as focal points to keep each room from feeling too ordinary.

CHAPTER III

MATERIALS AND METHODS

This chapter deals with the detailed description of the procedure adopted for conducting the study on “Strategies for Judicious residential interior space management” which are presented under the following heads.

- 3.1. Research design
- 3.2. Locale of the study
- 3.3. Selection of sample and sampling technique
- 3.4. Conceptual framework
- 3.5. Tools used for the study
- 3.6. Pre-testing of the tool
- 3.7. Collection of data
- 3.8. Analysis of data
- 3.9. Evolving the design guidelines
- 3.10. Designing space management strategies
- 3.11. Limitations of the study
- 3.12. Assumptions

3.1. Research design

The research design is the plan of study. ‘Research’ is to be understood as original investigation undertaken in order to gain knowledge and understanding. It is defined as a systematic approach towards discovery and development of an organised body of knowledge and systematic application of the scientific method to the study of problems (Dhondyal, 1998).



Fig 3.1 – Hyderabad map

The research design adopted for this study is an exploratory and observation research. In this an attempt was made to survey the showrooms for assessing existing furniture trends and their use in residential interiors by the home makers of two bedroom apartments and proposing space saving strategies by developing a two bedroom model house in Auto CAD.

3.2. Locale of the study

The Hyderabad city of Andhra Pradesh, as shown in Fig: 3.1, was purposively selected for the study for the following reasons

- There are more dwelling units as two bedroom apartments due to density of population
- Because of increase in IT services in this city, standard of living has increased, making the home makers to afford treating interiors with a specific intention of reflecting their taste and at the same time getting more out of less available space
- Investigator being a resident of Hyderabad city could get familiarity with the areas and also the dwelling units.

3.3. Selection of sample and Sampling technique

The criteria for selection of two bedroom apartments for conducting research was that the area would accommodate a living room, a dining room, a master bedroom, a childrens' bedroom and a kitchen, and also that these spaces need more attention in treating them with judicious space saving strategies. Homemakers residing in two bedroom apartments formed the unit of analysis for the study as they were considered to be playing a key role in interior space management strategies.

The two bedroom apartments from the five zones of Hyderabad were listed and 50 were selected among them purposively. The zones were listed

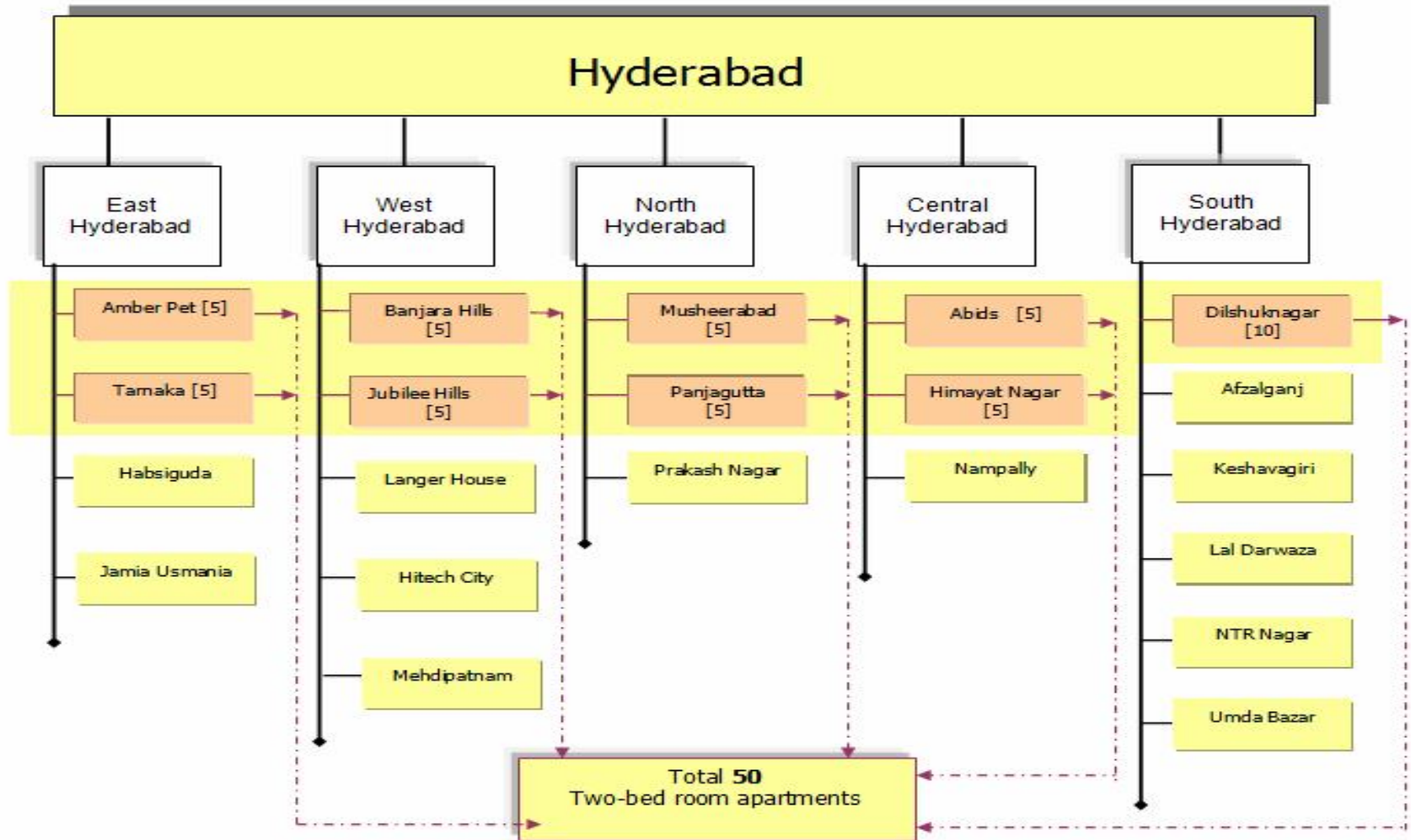


Fig: 3.2. Schematic representation of sampling procedure

area wise from which two bedroom apartments have been identified as represented schematically in Fig: 3.2.

From the same list of zones, furniture showrooms were identified and visited for exploring the availability of types of furniture and space modifiers for interiors as a part of market survey.

The samples and showrooms were selected from the list below which are also represented in Fig: 3.3:

Areas under East Hyderabad

- Amberpet
- Habsiguda
- Jamia Osmania and Tarnaka

Areas under West Hyderabad

- Banjara Hills
- Hitech City
- Jubilee Hills
- Langar House and Mehdipatnam

Areas under North Hyderabad

- Mushirabad
- Prakasham Nagar
- Punjagutta

Areas under South Hyderabad

- Afzal Gunj
- Dilsukhnagar
- Keshavagiri
- Lal Darwaza and NTR Nagar
- Umda Bazar

Areas under Central Hyderabad

- Abids
- Himayat Nagar and Nampally



Fig: 3.3 – Pictorial representation of areas from which the samples and showrooms have been selected

3.4. Conceptual framework

A conceptual model or a schematic model is a diagrammatic representation outlining the dominant elements of a system and their interrelationship with respect of a dependent variable.

Conceptual model was developed for the study, which diagrammatically represents the important dimensions and postulated relationship among the variables. The relationship was presented diagrammatically in Fig: 3.4.

The conceptual framework was formed on basis of elements that influence the management strategies for interior space. The elements are

1. furniture in turn influenced by colour, size, type / style
2. space savers in turn influenced by colour, size, type / style
3. furnishing material in turn influenced by colour, texture and pattern
4. structural envelope in turn influenced by colour, texture and pattern
5. room dimension / size
6. lighting with its influence by intensity, colour, type / style

The effect of each element on the other was depicted in conceptual framework which clearly explains that these elements united contribute to space management strategies in any interior space.

3.5. Tools used for the study

The study involved collection of information from standard documents, home makers and from furniture showrooms. Hence the most appropriate tools were selected and designed to conduct the study.



Fig: 3,4 – Conceptual framework

In order to obtain information on content validity of standard dimensions, time savers standards and other literature books were referred.

For exploring the availability of types of furniture and space modifiers used in the interiors, a checklist has been formed after which the investigator has filled it up depending up on the availability of type of furniture used specially for saving space by visiting identified furniture showroom from the zones in the city of Hyderabad.

This checklist (Appendix 1) was containing the type of furniture, picture and description of it for a detail study on its utility and functionalism.

An interview schedule was framed to assess the existing interior space management techniques and contains a checklist of elements used in interiors that contribute to visual and tangible effects in utilisation of space. The same was given to the home maker to collect information. The schedule was filled up by interviewing the home maker after which the investigator's observations were also recorded.

The interview schedule (Appendix 2) contained two sections. The first section comprised demographic profile of respondents such as name, relationship to the owner of apartment, age, educational status, employment profile and income. The number of adults, children, and income status were classified into different frequencies from which percentages were derived. The second section contained questions on the objective of the study such as characteristics of interior elements like furniture, walls, floor, ceiling, soft furnishings, lighting, space savers and their type, material, size and colour for each and every room.

3.6. Pre-testing of the tool

The interview schedule was pre tested on 5 homemakers who form 10 % of the total selected sample of 50, for confirming the adequacy of information and validity of the schedule.

There was little difficulty in responding as the questions were formed element wise. Later, based on the findings of pre testing, necessary modifications were made and the tool was finalised by preparing the questions room wise. From this complete information was obtained and was easier to answer as per the objectives of the study. Hence, the later one was approved for the final collection of data.

3.7. Collection of data

A list of all major showrooms covering zonal area was prepared and the investigator personally visited the showrooms for collecting information on availability of space saving designs in furniture.

After selection of two bedroom apartments, home makers were approached for information on the interview schedule after giving them a brief input on the content of the research.

Prior to market survey, content analysis of leading interior design magazines was done to identify the style of space saving furniture and techniques for creation of visual illusion of space.

3.8. Analysis of data

The data collected from showrooms were consolidated into a tabular form along with illustrations for proper listing of varied types of furniture available in the market.

The data collected from the interview schedules was consolidated, tabulated, analysed and frequencies and percentages were arrived at.

3.9. Evolving design guidelines

The results and inferences drawn from the study on interior space dimensions, furniture types and the opinions of the home makers formed the basis for evolving the guidelines for designing an apartment. The guidelines suggested by different architects and designers reviewed in

literature survey, were also used as inputs for forming specific guidelines. Further, space saving strategies through content validity also formed the fourth basis for evolving design guidelines for space management strategies of an apartment.

3.10. Designing space management strategies

The data collected from showrooms and home makers along with interior space dimensions and content validity on space saving strategies had become a criterion to design the interiors of an apartment. The plan of an apartment was selected by surveying the ventures coming up in the city of Hyderabad so as to enable the investigator to concentrate on designing the interiors of an apartment. The design selected was also shown to two architects for their advice on structural modifications.

3.11. Limitations of the study

- Only two bedroom apartments form the sample for interior space assessment
- The respondents are homemakers of two bedroom apartment.
- The apartments are identified from the city of Hyderabad.

3.12. Assumptions

The module evolved for residential interiors with judicious space management strategies is assumed to have adequate natural light, ventilation and proper orientation.

CHAPTER VI

RESULTS

The results of the research study have been interpreted under the following heads

- 4.1. Standard dimensions of interior spaces
- 4.2. Existing space saving furniture designs
- 4.3. Interior space management strategies
- 4.4. Strategies for space conservation in a two bedroom apartment model design

4.1. Standard dimensions of interior spaces

4.1.1. Anthropometry

Anthropometry is the scientific study and measurement of the human body. Ergonomics is the science of the relationship between man and machinery and the equipment human beings use, and the working environment. Having something that is called ergonomic means that the item has been designed to maximize productivity by minimizing effort and discomfort. The diagrams on the following page describe the basic and average sizes (based on 90 percentile) of human beings performing various functions and movements. These are here as a tool for interior designers to aid working out how high or how far an average male or female may reach in relative comfort. These are factors that need to be considered when designing joinery or cabinetry, furniture, planning circulation spaces, work spaces, accessible spaces and to generally make the user comfortable in their interior environment. As to examine the standard dimensions of residential interior spaces, a thorough analysis was done. It may be mentioned that all these measurements are in inches and are based on the investigators experience and common industry standards.

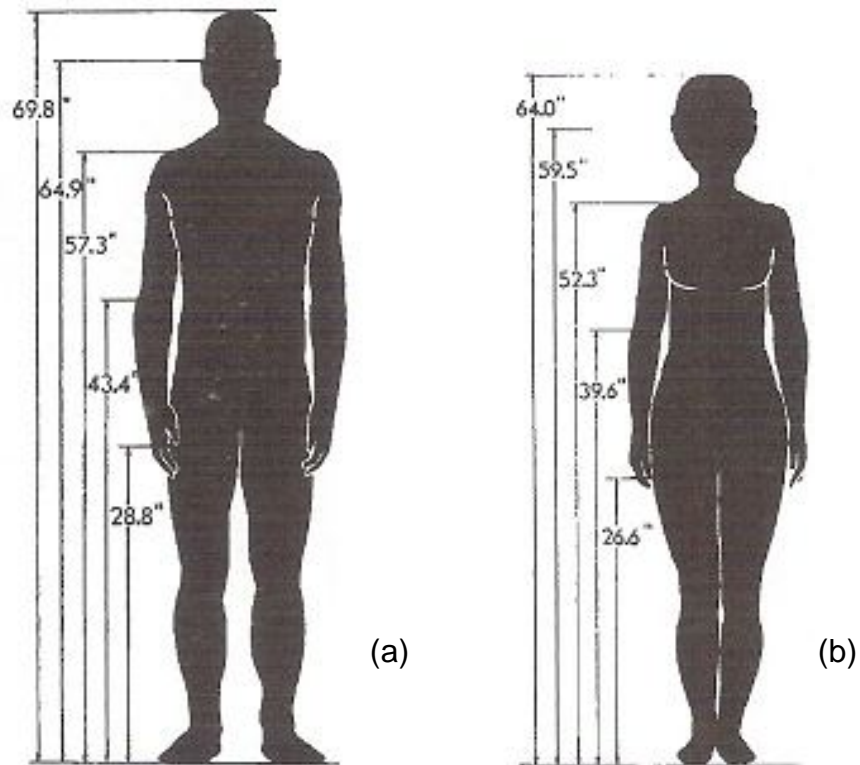


Fig 4.1.1 - Standing body measurements (a) Male (b) Female

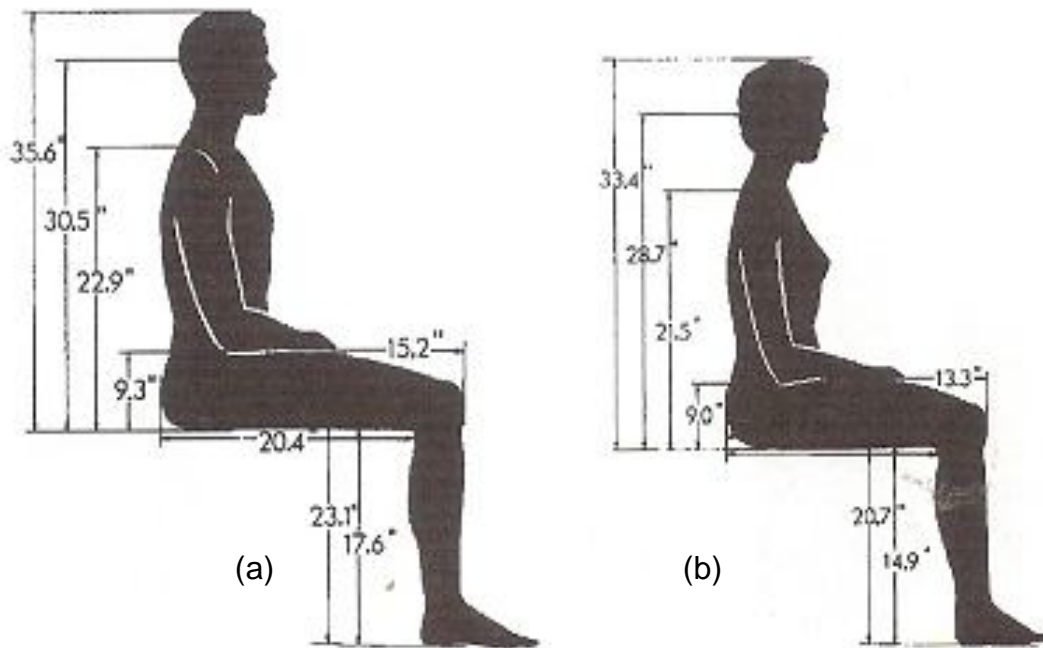


Fig 4.1.2 - Sitting body measurements (a) Male (b) Female

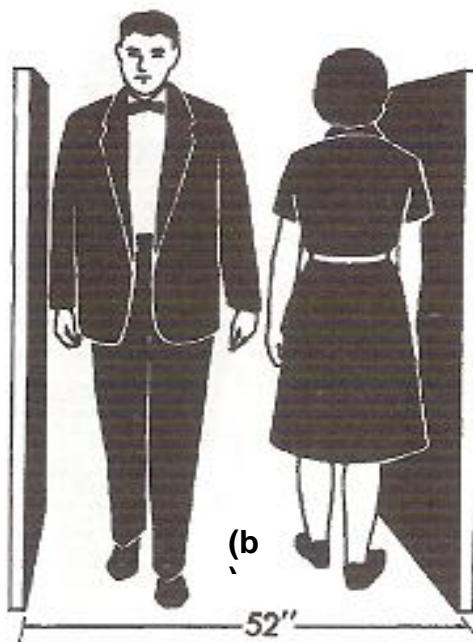
Table 4.1.1 - Mean body measurements

Measurements	Women	Men
Heights, standing, inches		
Top of head	64.0	69.8
Eye	59.5	64.9
Shoulder	52.3	57.3
Elbow	39.6	43.4
Palm	29.7	31.9
Thumb tip	26.6	28.8
Heights, seated, inches		
Seat to top head	33.4	35.6
Seat to eye	28.7	30.5
Seat to shoulder	21.5	22.9
Seat to elbow	9.0	9.3
Floor to under knee	14.9	17.6
Floor to top of thigh	20.7	23.1
Floor to top of crossed knee	24.7	28.0
Lengths, inches		
Sitting (buttocks to front of knees)	23.4	25.1
Seat (buttocks to back of knees)	19.3	20.4
Lap (abdomen to front of knees)	13.3	15.2

Total arm (acromion to thumb tip)	25.0	27.0
Forearm (olecranon to thumb tip)	14.7	16.2
Widths, inches		
Maximum body	18.4	20.6
Shoulders	14.4	16.4
Upper body	17.8	19.7
Lower body (standing)	14.5	14.3
Lower body (sitting)	16.2	16.0
Elbows extended	33.6	37.7
Thickness, inches		
Maximum body	10.9	11.7
Lower body	10.7	10.9
Girth, inches		
Bust, chest	36.6	37.4
Hip	39.0	-----
Bent at hips, inches		
Arms down, length	32.8	33.2
Reach from bent position (buttocks to thumb tips of arms)	45.0	48.2
One-knee kneel, inches	33.5	-----
Weight, lb	140.5	167.4



Walking between two high walls (space adequate for both men and women)

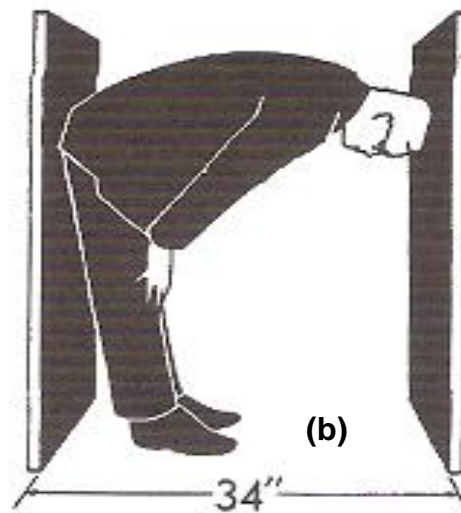


Two people passing (figure derived; twice the space for one person to walk between two high walls)

Fig. 4.1.3 - Recommended clearances for circulation (a) Male (b) Female



Kneeling on one knee



Man bending at a right angle

Fig. 4.1.4 - Recommended clearances for sitting positions (a) Male (b) Female

Recommended clearance

The dimensions given for clearances are based upon studies of the measurements of human beings in major of the activity areas where space is very limited. The intention is to determine the smallest amount of space for comfortable circulation within a room. These dimensions are recommended as being minimum.

ELEMENTAL ACTIVITIES

Dining area

Table 4.1.2 as in Fig 4.1.6 to 9

Limited access behind a chair	850mm (2 ft 10 in)
Access behind a chair	1000 mm (3 ft 6 in)
Access between a table and wall	850 mm (2 ft 10 in)
Access between a table and cabinets of appliance	1200 mm (4 ft)

Bathroom

Table 4.1.3 as in Fig 4.1.10 to 13

Space between walls for a washbasin	950 mm (3 ft 0 in)
Space In front of a washbasin and wall	600 mm 12 ft 0 in)
Space between walls for a toilet	760 mm 12 ft 6 in)
Sparte between front of a toilet and wall	550 mm (1 ft 9 in)

Living area

Table 4.1.4 as in Fig 4.1.14 and 15

General access	850 mm (2 ft 10 in)
Access between a table and other furniture	600 mm 12 ft 0 in)

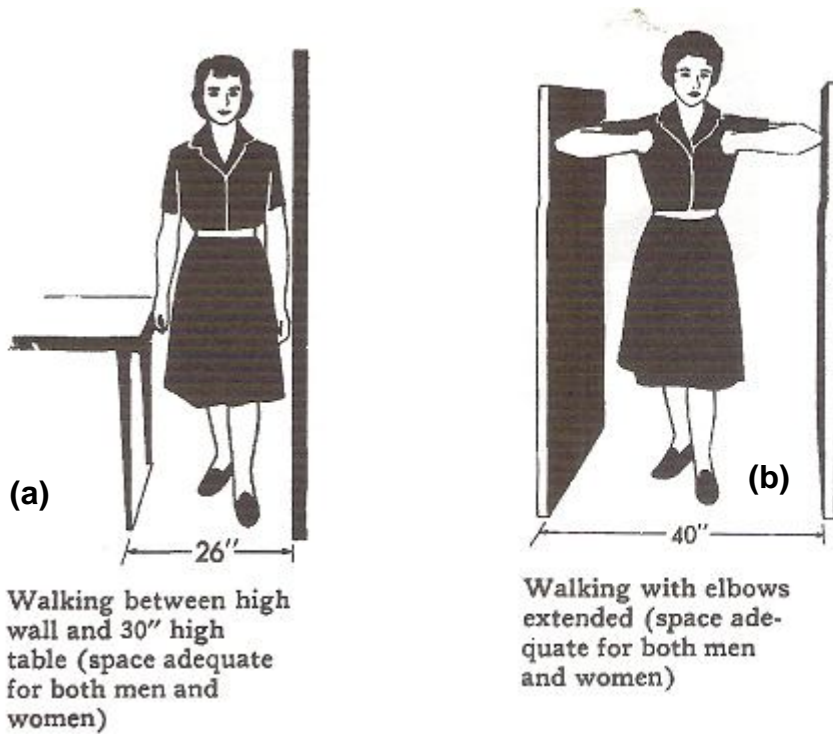


Fig. 4.1. 5 - Recommended clearances for circulation. (a) Between high wall. (b) Walking with elbows

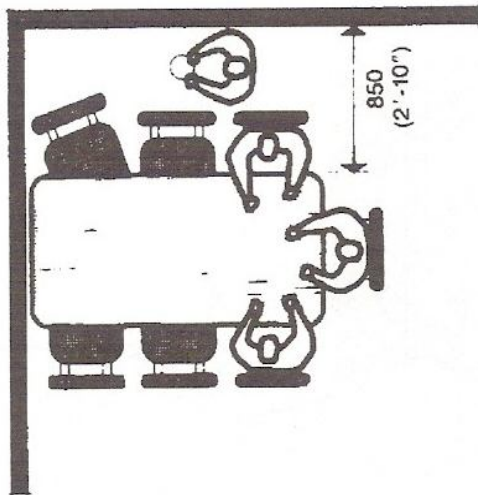


Fig 4.1.6 - limited access behind chair

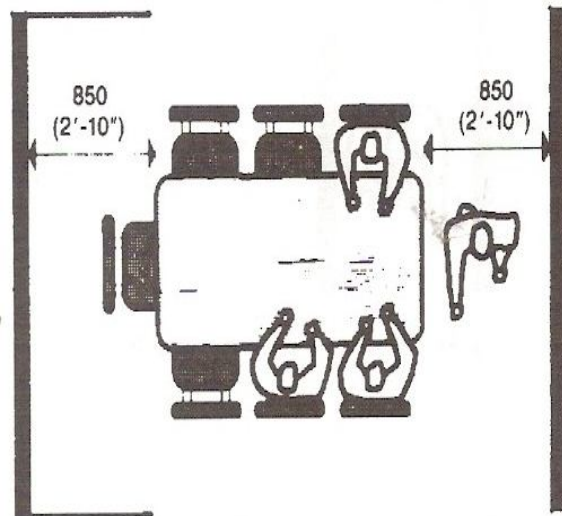


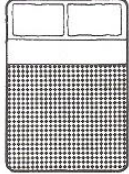







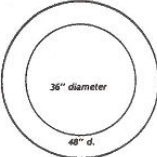



Fig 4.1.7 - Access between a table and wall

Living room	Dining room	Bedroom
 <p>Fig 4.1.16 - Armchair by 850mm</p>	 <p>Fig 4.1.17 - Table, five to six persons, 1200 by 900 mm</p>	 <p>Fig 4.1.18 - Double table, 1350 by 2000 mm</p>
 <p>Fig 4.1.19 - Chesterfield, 2000 by 800 mm</p>	 <p>Fig 4.1.20 - Table, seven to eight persons, 1800 by 900 mm</p>	 <p>Fig 4.1.21 - Single bed, 1000 by 2000 mm</p>
 <p>Fig 4.1.22 - End table, 650 by 450 mm</p>	 <p>Fig 4.1.23 - Dining chair, 450 by 500 mm</p>	 <p>Fig 4.1.24 - Single dresser, 750 by 450 mm</p>
 <p>Fig 4.1.25 - coffee table, 1200 by 450mm</p>	 <p>Fig 4.1.26 - tables, circular</p>	 <p>Fig 4.1.27-double dresser, 1200 by 450mm</p>

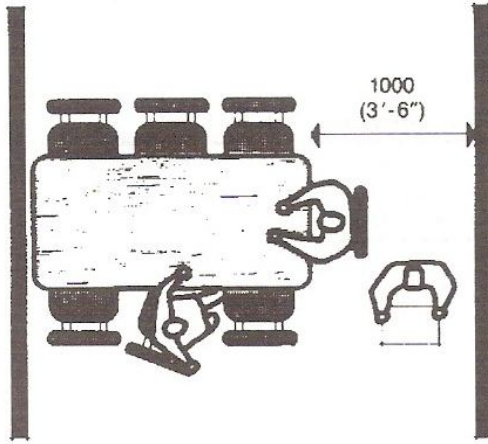


Fig 4.1.8 - Access behind a chair

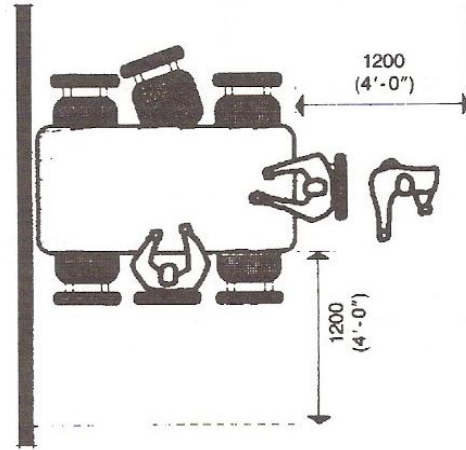



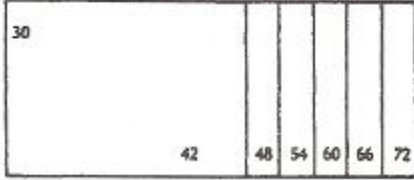



Fig 4.1.9 - Access between a table and cabinets or appliances

<p>950 (3'-0")</p>	<p>Fig 4.1.10 - Space between walls for a hand basin</p>	<p>600 (2'-0")</p>	<p>Fig 4.1.11 - Space in front of a hand basin and a wall</p>
<p>750 (2'-6")</p>	<p>Fig 4.1.12 - space between walls for a toilet</p>	<p>550 (1'-9")</p>	<p>Fig 4.1.13 - space in front of a toilet and wall</p>

 <p>Fig 4.1.28 - occasional chair, 700 by 750 mm</p>	 <p>Fig 4.1.29 - buffet, 1200 by 450mm</p>	 <p>Fig 4.1.30 - bedside table, 500 by 400 mm</p>
	 <p>Fig 4.1.31 - Tables, rectangular</p>	 <p>Fig. 4.1.32 - work surface, 900 by 450 mm</p>

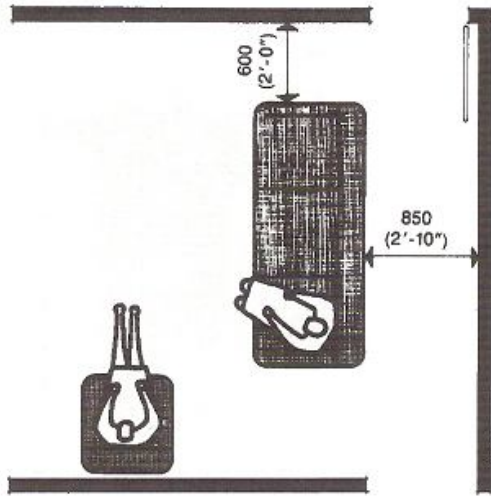


Fig 4.1.14 - General access, 850mm; limited access, 600mm

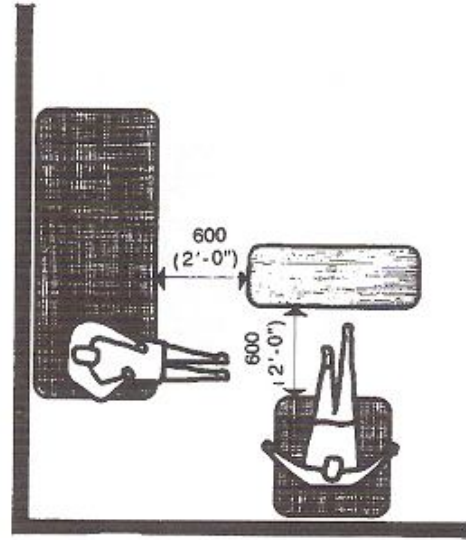
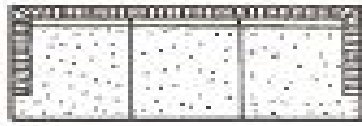
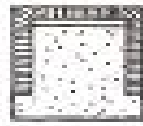


Fig 4.1.15 - Limited access between a table and other furniture

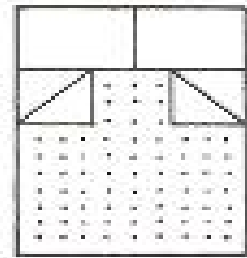
Furniture sizes



Couch
3'-0" x 6'-10"



Easy chair
2'-6" x 3'-0"



Double bed
4'-6" x 6'-10"



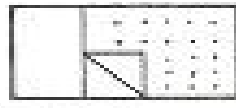
End table
1'-6" x 2'-6"



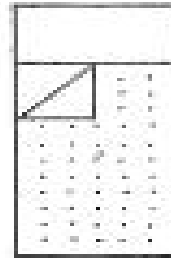
Television set
1'-4" x 2'-8"



Desk 1'-8" x 3'-6"
with chair



Crib
2'-6" x 4'-6"



Twin beds
3'-3" x 5'-10"

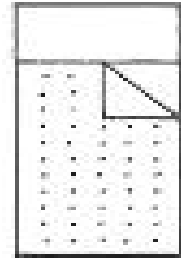


Table for two
2'-6" x 2'-6"

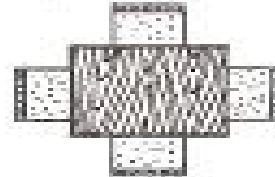


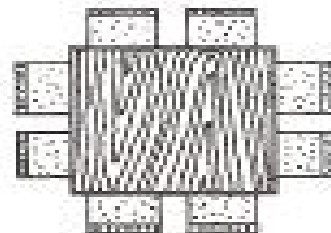
Table for four
2'-6" x 3'-2"



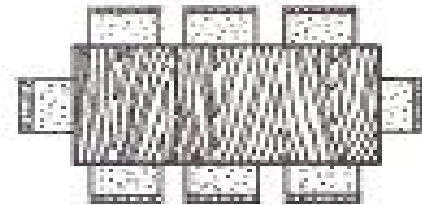
Chair
1'-6" x 1'-6"



Dresser
1'-6" x 3'-6"
or
1'-6" x 4'-4"



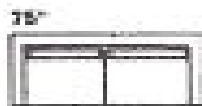
Dining table with chairs for six = 3'-4" x 4'-0"



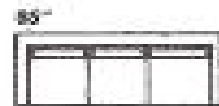
for eight = 3'-4" x 6'-0" or 4'-0" x 4'-0"



60"



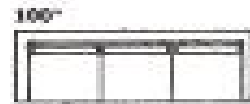
75"



85"



90"



100"

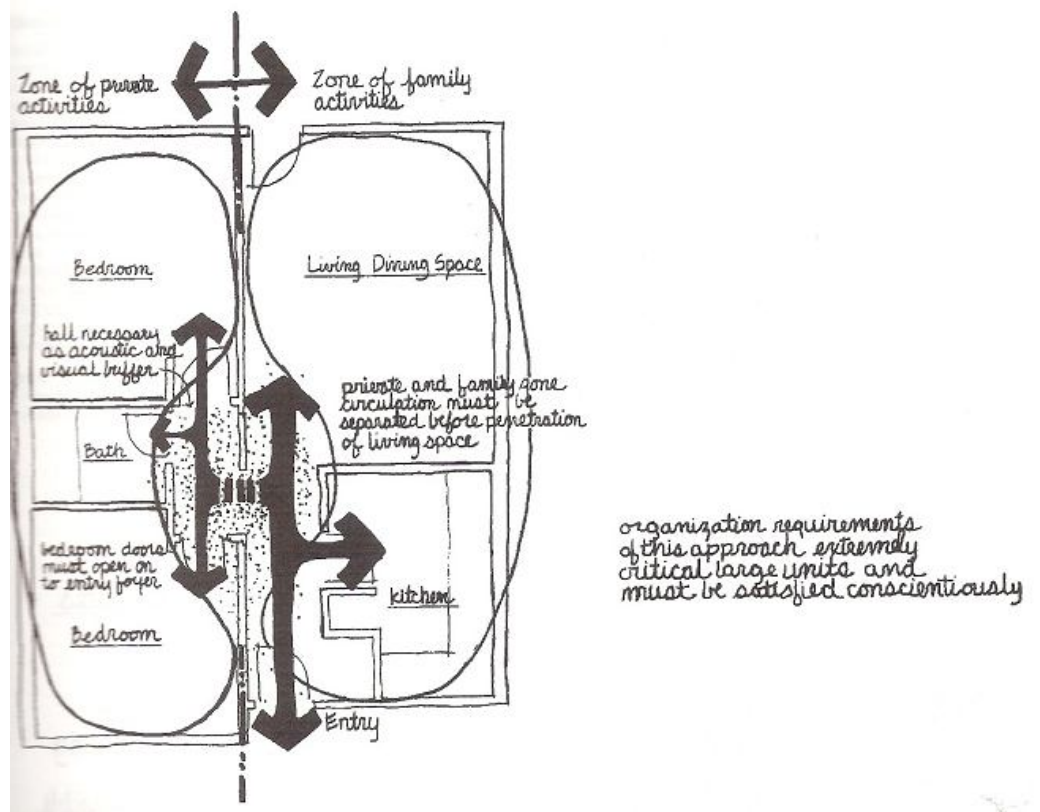
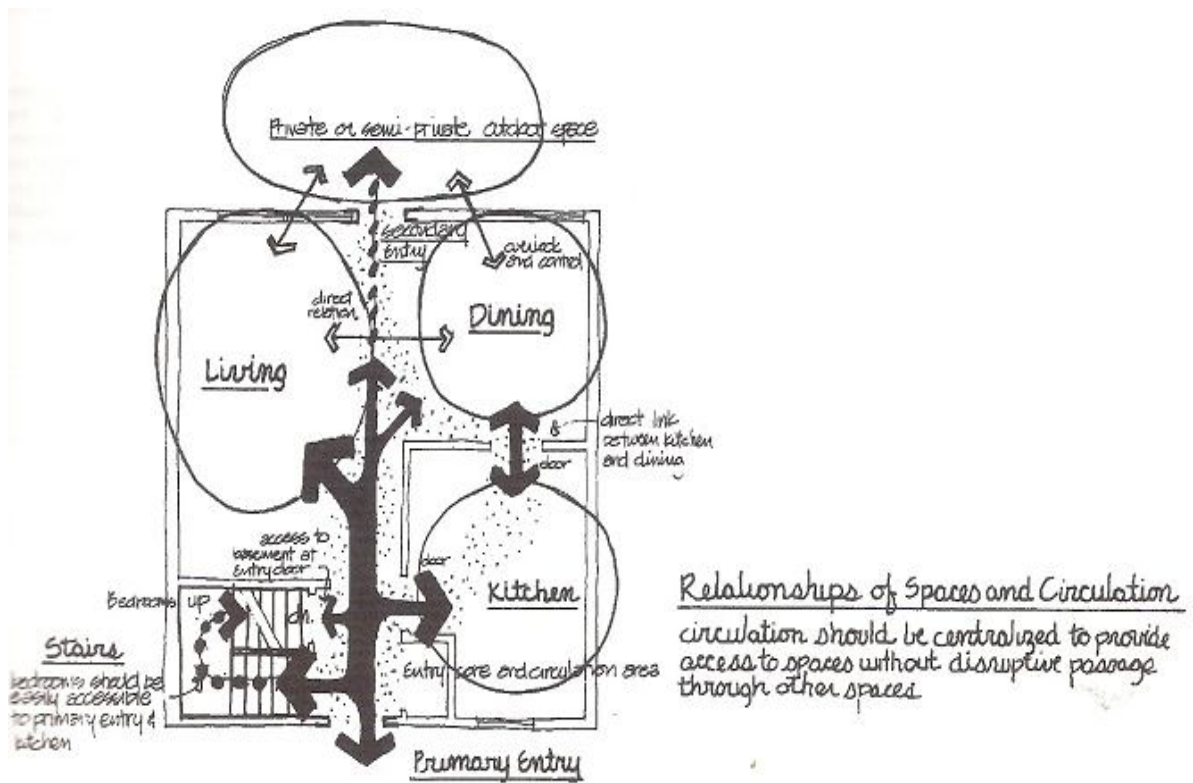


Fig 4.1.33 - horizontal zoning to achieve apparent of activities

A full bathroom should be located on every floor within a dwelling unit on which bedrooms are located. Bedrooms Where possible, bedrooms should all be located on one floor in a multifloor unit. Access, stairs, and circulation one of the essential characteristics of the townhouse type of multiple dwelling units is its ground orientation. Therefore all dwelling units shall have access from both sides of the unit. The secondary access point may be a sliding door. Every effort should be made in the planning of units to avoid the use of rooms as primary circulation paths and to avoid excess floor area devoted to halls. Centralization of both vertical and horizontal circulation should be a design objective. Halls and stairways should be designed to facilitate the easy movement of normal household furniture in and out of rooms. Stairways within dwelling units should be located in close proximity to the primary entrance door of the unit. Basement stair entrances should be visually screened from living or dining spaces.

CHARACTER AND FUNCTIONAL ORGANIZATION

Objective

The organization and character of individual dwelling units and residential buildings cannot be expressed by simple numerical standards, yet they significantly affect the quality of the living environment. Functional organization, privacy, visual appearance, etc., are issues which must be dealt with consciously and rationally if desirable housing is to be achieved. Therefore the following guidelines and performance criteria are set forth to assist the applicant in preparation of plans.

Functional Organization

The following should guide the organization of spaces within dwelling units.

Kitchens

Kitchens should be located in proximity to the primary entrance door of the unit. It is not desirable to depend on the living room and/or dining space for

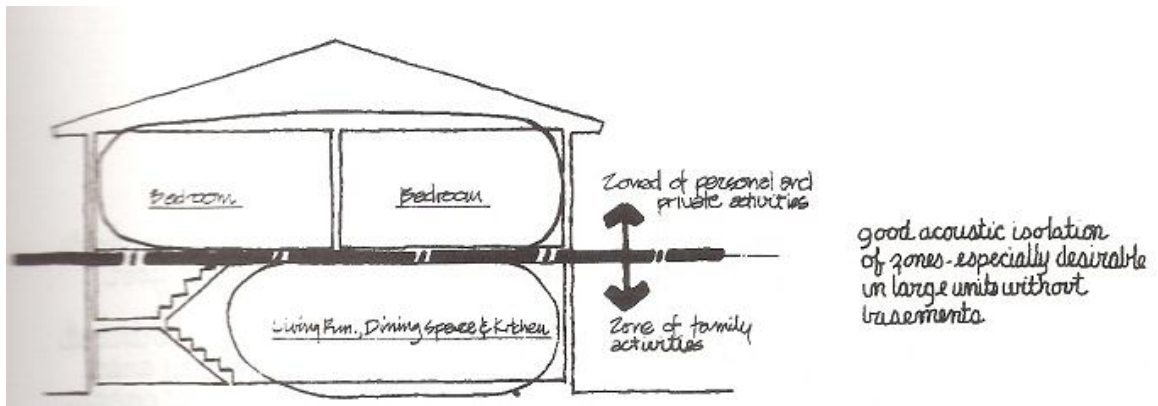
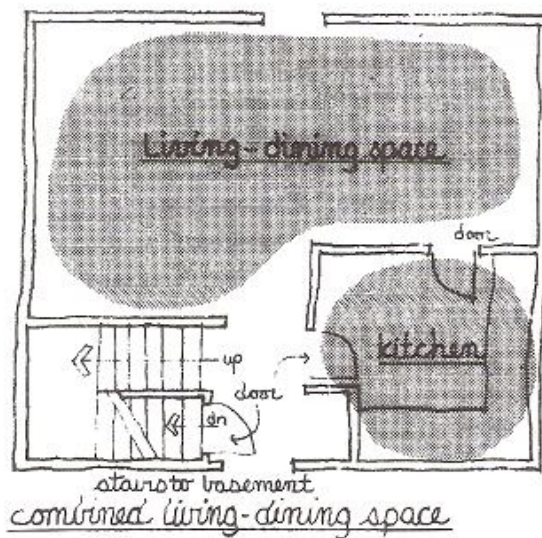


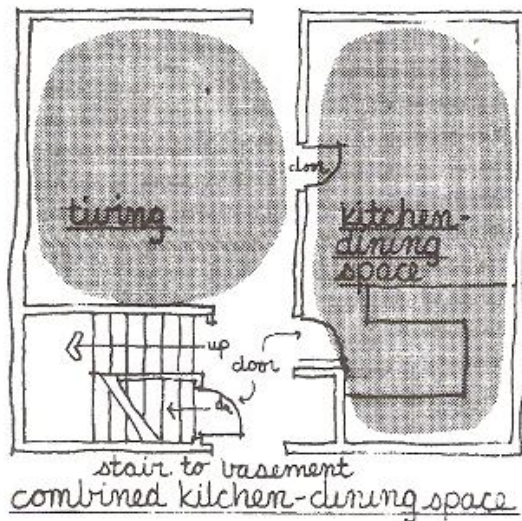
Fig 4.1.34 - vertical zoning to achieve separation of activities



one large and one small activity space

satisfactory where basement is provided

unsatisfactory where no basement is provided, especially in large dwelling units



two medium sized activity spaces

satisfactory where basement is provided

a desirable configuration for both large and small dwelling units where no basement is provided, if economically feasible in such cases, a larger than standard dining space should be provided

access between entrance and kitchen. Convenient access should be provided between the kitchen and private outdoor space. If possible, access between bedrooms and the kitchen should be accomplished without passage through living and dining areas. Where this is not possible, circulation through living and dining areas should not interfere with normal use patterns within these areas. Kitchens should be separated from other areas by doors. The organization of kitchen cabinets, counters, and appliances should afford a logical sequence of food storage, preparation, serving, and clean-up activities which minimize steps and discontinuity of activity. Work and storage surfaces should be provided on both sides of the sink. The range and refrigerator should have work space on at least one side.

Dining spaces

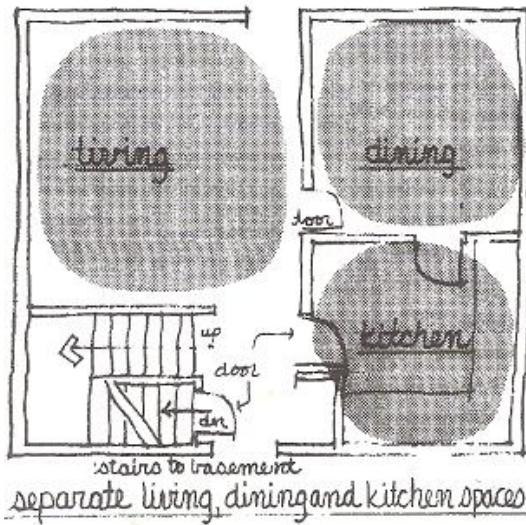
Dining space located in a combined living-dining room or in a separate dining room should be located adjacent and have direct access to the kitchen. Such dining space and its use should not impair normal circulation into, out of, or within the living room. Dining space within kitchens should not impair normal circulation, food preparation, and clean-up activities.

Living spaces

Living rooms should be accessible from main entrance doors and internal stairways without passage through kitchens, separate dining rooms, or other nonrequired living spaces within the dwelling unit. In a combined living-dining space, access to the living area should not require circuitous travel through the dining space. Either the living or the dining space, or both, must overlook and have access to the private outdoor space of the unit.

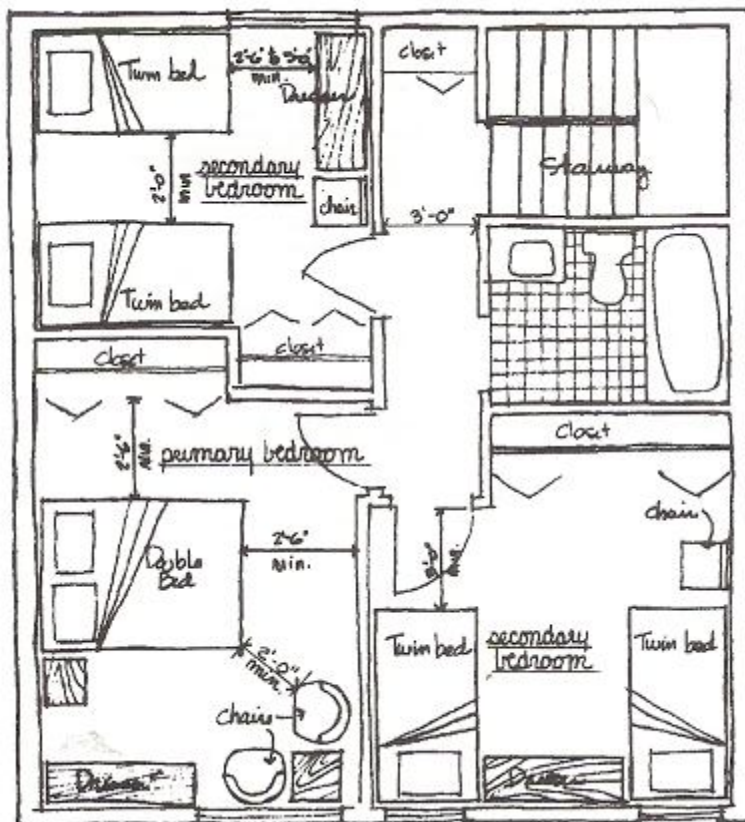
Bathrooms

Bathrooms should be conveniently accessible from all rooms of the dwelling unit without entering a bedroom, except that in units where two full baths are provided one bath may open directly to the primary (master) bedroom. No bathroom should open directly off of the kitchen, living room, or dining space.



three small activity spaces

configuration with three separate activity provide good first floor simultaneous use flexibility, however in dwelling units without basement no large activity area will be available, in such cases, where economically feasible, larger than standard living and dining spaces should be provided



potential furniture organization should be considered when locating windows, closets and doors

Fig 4.1.35(a) - Furnishability of bedrooms

Furnishability requirements

The livability of the rooms within a dwelling unit cannot be assured simply by providing adequate floor area and room dimensions. The ability to successfully accommodate the furniture normally concomitant with a room's anticipated uses must also be assured if livability is to be achieved. Successful furnishability is achieved only when the furniture and activities of a room are accommodated while also providing free room circulation, access to furniture, allowances for door swings and windows, etc. Furnishability, as a test of room adequacy, is a valuable tool for the housing designer. Dwelling units should demonstrate the capability of accommodating at least the furnishings listed below

Bedrooms

In primary bedrooms, there should be twin beds or a double bed, two small or one large dresser, and one chair. In a secondary bedroom for two persons there should be twin beds, two small or one large dresser, and one chair as illustrated in Fig 4.1.35(a) and (b).

Double bed, 4 ft 9 in x 6 ft 6 in

Twin or single bed, 3 ft 3 in x 6 ft 6 in

Small dresser, 1 ft 6 in x 2 ft 6 in

Large dresser, 1 ft 6 in x 4ft 6 in

Chair, 1 ft 6 in x 1 ft 6 in

Living space

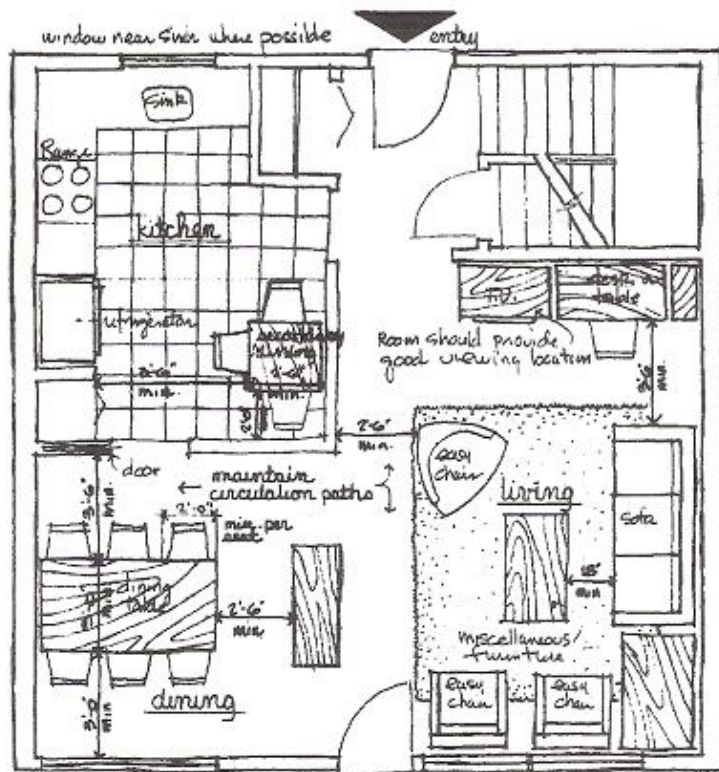
Sofa, 6 ft 9 in x 2 ft 8 in

Two easy chairs, 2 ft 6 in x 2 ft 6 in

Desk or low table, 2 ft 0 in x 3 ft 4 in

Other incidental furniture, 1 ft 10 in x 3 ft 0 in

In three- and four-bedroom units three easy chairs should be shown in living rooms as shown in Fig 4.1.36



room configurations should provide for reasonable furniture groupings that are consistent with room use, orientation, and relationships

living rooms should provide for conversation groups, tv viewing, and miscellaneous activities

Fig 4.1.35 (b) - Furnishability of living room, dining room, kitchen

Dining space

Each dining space must contain sufficient space in a single location for an appropriate table and enough chairs to accommodate the maximum number of persons the unit will accommodate as shown in Fig 4.1.1(b). Dining chairs should be at no less than 1 ft 6 in x 1 ft 6 in. The primary dining table should be not less than 3 ft 0 in in width, with an allowance of 2 ft 0 in lineal feet of table edge for each person to be seated. Only one person may be accommodated at each end for rectangular configurations. Secondary (kitchen) dining tables may be 2 ft 6 in wide. The clearance from table edge to nearest wall or other obstruction should be as follows

- Where circulation is intended and no seating is anticipated—2 ft 6 in;
- Where seating is anticipated in the circulation passage—3 ft 6 in;
- Where seating but no circulation is anticipated—3 ft 0 in except for secondary kitchen dining, where only one seat is anticipated—2 ft 0 in.

Private outdoor space

Private outdoor space that may be connected with a dwelling unit should accommodate casual seating for four persons in one- and two-bedroom units and six persons in three- and four-bedroom units.

GENERAL OBJECTIVES

Human-Centered Needs

The design and planning of living units should have a workable human-centered basis. Provision should be made for the essential needs of people for space, light, food, water, sleep, safety, sanitation, comfort, companionship and periods of quietness. It is necessary that adequate housing quality be provided, yet recommended with minimum cost by the efficient use of space.

Functional Considerations

Space needs should be determined by family size, the functions of daily living, and the normal possessions of the family. Living units should be planned to contain space sufficient to accommodate appropriate furniture or equipment for each habitable room. To demonstrate the furnishability, preliminary floor plans for each living unit design should show the appropriate furniture drawn to scale.

Room Relationships

The arrangement of the rooms should show a proper relation of one to the other, and provide reasonable privacy by

1. Locating exterior openings in relation to exterior conditions
2. Having bathrooms accessible from bedrooms and other habitable rooms

Circulation Pattern

The circulation pattern throughout a living unit should function satisfactorily. Serious conflicts in the appropriate use of each room and its furniture and equipment should be avoided.

Access to Outdoors

Single-family houses and multiple living units at or near grade should have a convenient relationship to outdoor areas.

Indoor Space Needs

The indoor space needs for family recreation and self-service activities should be provided for (play space for children, minor home repairs, etc.

Ceiling Heights

Ceiling heights should be such that the average person can move about comfortably, no difficulty is presented in the placement and use of furniture, and no unpleasant sensation is created by ceilings of insufficient height. The minimum ceiling height of habitable and nonhabitable rooms should conform to the following

Basement

In nonhabitable basement rooms, the minimum clear ceiling height should be 6 ft 9 in. Structural beams, ducts, piping, and other such

construction items in general should be installed with a minimum clearance above the floor of 6 ft 9 in, and in all cases should be installed in such a manner that they do not interfere with safe traffic and utilization of the nonhabitable spaces.

Habitable rooms

For habitable rooms the minimum ceiling height should be 7 ft 6 in. Sloping ceiling should have a minimum average height of 7 ft 6 in and no height less than 7 ft 0 in. When necessary, beams, girders, or utilities such as ducts, pipes, or wiring installed as part of the ceiling and which cannot meet the 7-ft 6-in clearance should have a clearance height of not less than 7 ft 0 in.

Bathrooms, toilet compartments, utility rooms, and private halls

In bathrooms, toilet compartments, utility rooms, private halls, etc., the clear height should be 7 ft.

Public halls

In public halls the clear height should be 7 ft 8 in.

Garages

Driving lanes should be 7-ft 6-in clear height. Parking areas should be 7-ft clear height. Truck unloading areas should be 10-ft clear height.

Other areas

The clear ceiling height in any other area should be 7 ft 6 in.

Furnishability

The criteria for the amount of space provided in habitable rooms of a living unit are its furnishability. The test material for each room provides a list of furniture for which appropriate space must be provided.

Furniture Sizes

Furniture sizes given are standard sizes. However, it is well for the designer to keep in mind that families frequently have on hand or buy large and heavy furniture, particularly for the living room. In such cases, additional space is necessary to have planning arrangements function properly.

Built-in Furniture

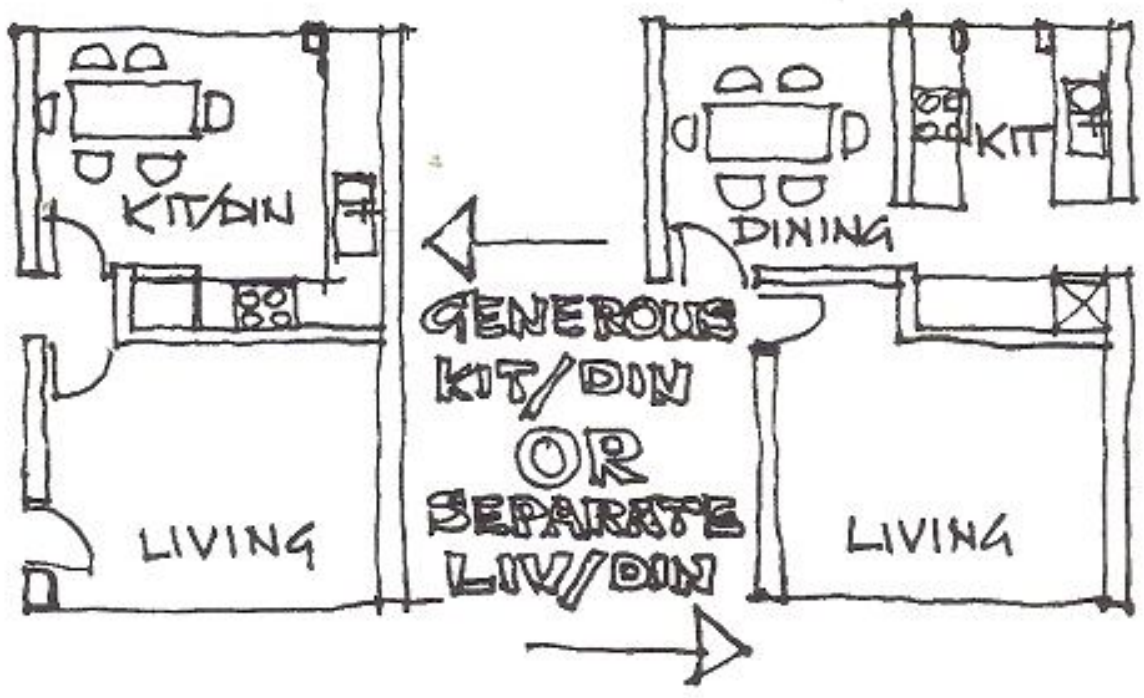
In small rooms the use of built-in furniture can be advantageous as space savers. Properly designed built-in storage units can increase usable

floor space and reduce the outlay for home furnishings. Where built-ins provide a functional equivalent to movable furniture as listed for the various areas of the living unit, their use can be considered an acceptable substitute.

Combination Rooms

The combination of more than one living function into a single space is a most common method of using space intensively and economically. Certain factors are given below.

Table 4.1.5. - Typical room sizes in feet			
	Small	Average	Large
	Basic Rooms		
Living room	12x18	16x20	22x28
Dining room	10x12	12x15	15x18
Kitchen	5x10	10x16	12x20
Utility room	6x7	6x10	8x12
Bedroom	10x10	12x12	14x16
Bathroom	5x7	7x9	9x12
	Additional Rooms/Areas		
Halls	3' wide	6' wide	9' wide
Area	10x20	20X20	22x25
Storage wall	6' deep	12'deep	18" deep
Den	8x10	10x12	12-16
Family room	12X15	15x19	15x22
Wardrobe closet	2x6	2x8	2x15
One-rod walk-in closet	4X3	6X6	4x8
Two-way walk-in Closet	6x4	6x6	6x8
Porch	6x6	8x12	12x20
Entry	6x6	8x10	8x15
One-Car Garage	11x19	13x25	16x25
Two-car garage	20x20	21x22	25x25



Kitchen-Dining Area

A frequent and favorable planning arrangement in lower-income housing is a combined kitchen-dining area. This permits a wide use of the space not only for the kitchen-dining functions but for study and informal social activity for the entire family.

Definition of a Combined Room

For two adjacent spaces to be considered a combined room, the clear opening between the spaces should permit the common use of spaces for the expansion of the different functions. In general, the horizontal opening between combined spaces should be at least 8 ft.

Visual Separation between Areas

A combined living-dining-kitchen area should have the food preparation-cooking area screened from the living room-sitting area.

Limited Occupancy

The living unit without a separate bedroom generally provides more multiple use of space than any other combination. However, its acceptable use is limited to one or two persons.

Other Habitable Rooms

Apartment living units may contain an alcove or a separate room which may have multiple uses. It may be used as a den, a general-purpose family room, or additional sleeping space. Although space for no specific furniture is required for such a room, the floor area should be at least as large as a secondary, single-occupancy bedroom, and it should contain a clothes closet.

UNIT SIZE

Family units (units occupied by adults and children) should have no fewer than two beds. Individual privacy in a family is needed even if that family comprises one adult and one **child**.

UNIT INTERIORS

A generous kitchen-dining area or a distinct dining area with a separate living room should be provided. A living room-dining space and a small working

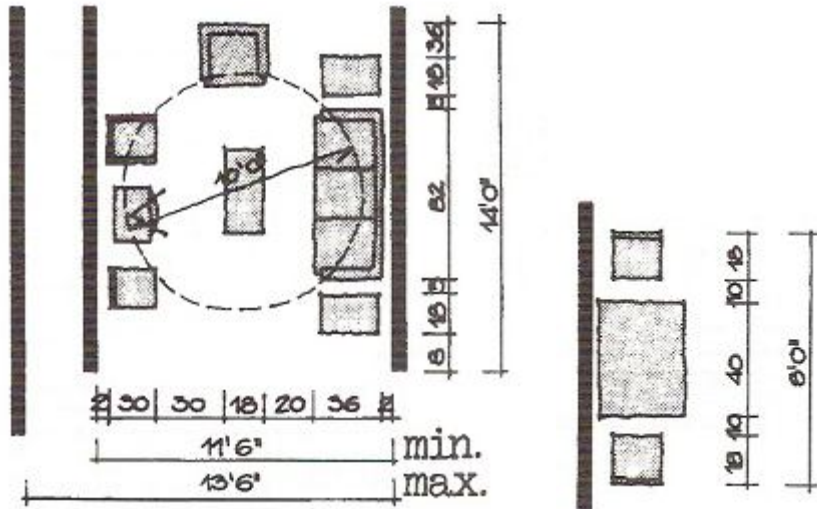


Fig 4.1.36 – living space

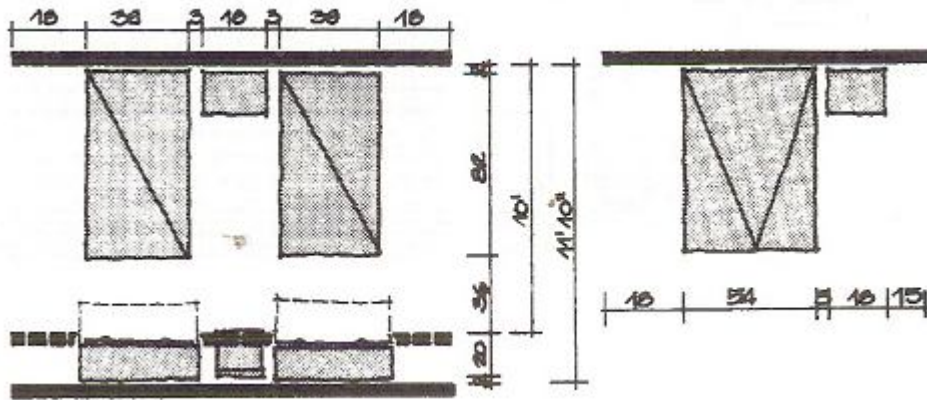


Fig 4.1.37 - sleeping area

kitchen is not recommended. As the unit size increases (i.e., more bedrooms), the kitchen should have more counter space and storage. Recognizing that in family living, the dining area is used for many activities (i.e., homework), provision should be made to allow these activities to occur with minimal conflict with living room activities.

4.1.2 Room Dimensions

4.1.2.1 - Living Area

The dimensions of a room are strong determinants of its furnishability. For example, in the living area one wall should be at least 14ft long to accommodate the standard arrangement of a sofa, two end tables, and one corner easy chair. The more walls that are at least this length, the greater the flexibility in furniture arrangement. The minimum width of the room should be 11 1/2 ft, based on furniture dimensions and access area. This approximates the recommended conversation distance of 10 ft measured from center points of sitting furniture. An additional 2 ft in width, for a total of 13.5 ft, is suggested as a maximum dimension for maintaining comfortable conversation and TV viewing distances as in Fig 4.1.36.

Dining Area

A wall in or near the kitchen should be at least 8ft long for the table, chairs, and access areas, with another wall nearby to accommodate the 42-in-long china cabinet. Enough floor area should be available for seating six to eight persons around a table.

Sleeping Area

In the single-occupancy sleeping area, one wall should be at least 9 ft long. For Double occupancy one wall should be a minimum of 11.5 ft in length to accommodate the standard furniture pieces and necessary access areas. Access to a closet area at either end of the room will require additional space. Minimum room widths are 10ft if no bureaus are to be placed at the foot of the beds and 11.5+ ft if they are, specified in Fig 4.1.37.

FURNITURE REPLACEMENT

Entering

Most residents have a small table or set of shelves for displaying objects or setting packages on when returning to their apartments. A chair may also be used in the entry way for sitting down while putting down and taking off outer wear. This is typically placed near the coat closet where these items are stored.

Visiting

Conversation furniture typically includes a sofa with two end tables, coffee table, rocker, and one or more easy chairs arranged in a closed loop. Recommended distance between seats for comfortable conversation is 10 ft. If more seating is required, dining chairs or floor cushions are often used. When a snack or meal is served as part of the visit, the dining table is typically pulled away from the wall and chairs are arranged around it. For entertaining large numbers, some residents have folding tables and chairs which they keep stored away in closets when not in use. Some also have folding beds which they set up for overnight guests.

Eating

To support this activity, most residents have a dining table and four side chairs as well as a china cabinet. The table is typically placed against a wall with two of the chairs while the other chairs are located in other areas in the apartment. For formal meals with visitors, this table is pulled away from the wall and chairs are placed around it. For many older residents, particularly women, the china cabinet is an important piece of furniture, as it typically symbolizes a previous role in the family as well as serving for the display and storage of dinnerware

Leisure Activities

All elderly residents have at least one TV which in modern times has replaced the fireplace as the focal point in the living room. It typically is placed against a wall directly across from the sofa. The sofa is almost always placed against a wall. Residents avoid putting it under a window where there is a

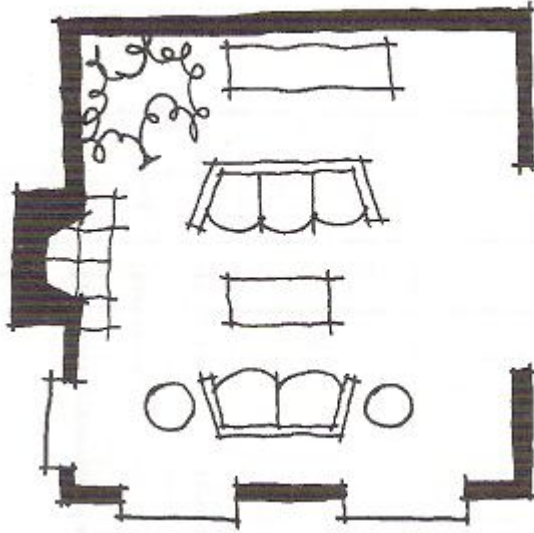


Fig 4.1.38 - formal living room

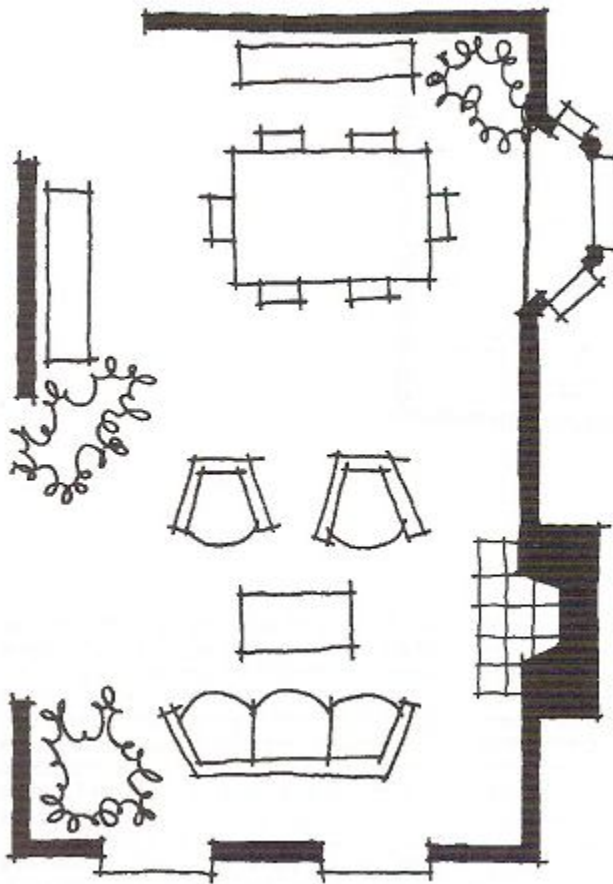


Fig 4.1.39 - grand room (living and dining)

potential problem with drafts on the back of the neck. Residents sit here to watch TV or in their "favorite" easy chair, which is usually placed at the end of the sofa and near a window to take advantage of natural light and outdoor views. This is also the favored setting for other leisure activities like reading, sewing and watching outdoors. End and coffee tables accompany these primary seating areas to hold table lamps and materials associated with various other activities. Depending on the specific interests of the residents, there might also be a sewing machine, work surface, or storage and display piece for a particular hobby. Some residents might define a "communications area" with a desk and chair for telephoning and letter writing.

Sleeping

For single residents, typical furniture in the sleeping and dressing area includes a double bed, two bureaus, a night stand, and a chair. Double occupants (who are most frequently married couples) are more likely to have twin beds rather than a double bed. Heads of beds are placed against walls, perpendicular to a window to permit a view of the outdoors while lying down. Placement of the head of a bed under a window is avoided because of problems with drafts. For ease in making the bed(s), residents prefer to place it so it is accessible from two sides and one end. A nightstand is located at the head of a bed (between twin beds) upon which is usually found a table lamp, clock, medicines, and other personal items. The two bureaus, along with a chair, are typically clustered near the closet(s) to form a convenient dressing area.

THE LIVING ROOM

Drawing room, parlor, minister's room—these are some of the various ancestors of today's living room, a formal space reserved for the most formal of guests. This is the place for serving afternoon tea, inspecting young courtiers, or hosting the card club (Fig. 4.1.38 and 39). With the predominantly informal lifestyle of our contemporary society, there is some debate over how valid the living room really is today. Certainly there are very few households who confine their entertainment to the living room. Invariably, all guests will avoid spending too much time here if it is possible for them to drift to where the action is the

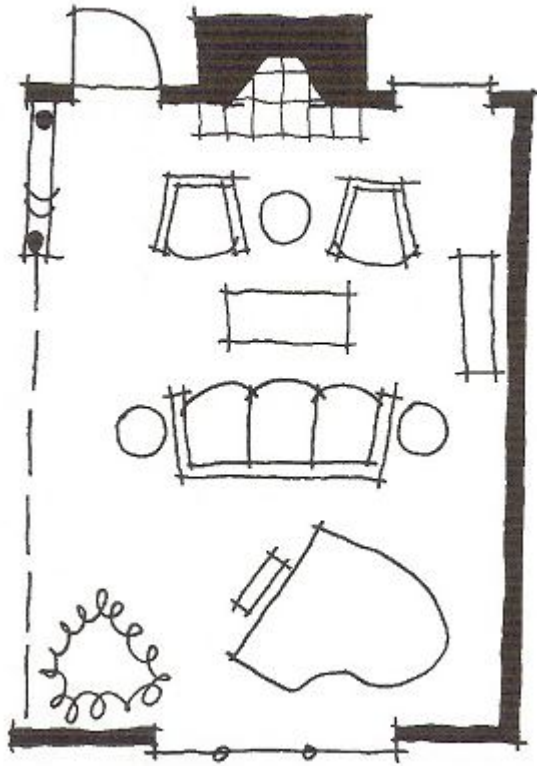


Fig 4.1.40 - great room (living and family)

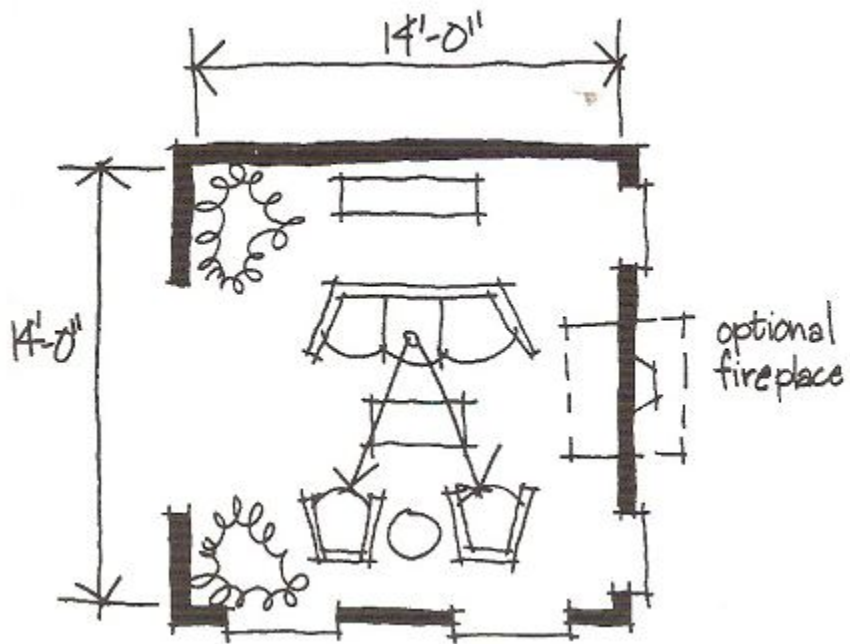


Fig 4.1.41 - symmetrical living room

kitchen. For most households formal occasions have become more informal and more infrequent, but even the most casual home owners enjoy having space that can rise to the special occasions. Recognizing the diminishing use of the living room, many contemporary designers are reconfiguring it into a larger freestyle space that may include the balance of the ceremonial component. As with other transitional movements, this may be more prevalent in the southern climates where new communities devoted to casual, resort lifestyles favor a plan that combines the living, dining, and entry areas into one *grand room* or *great room*. In plans of relatively small square footage, this trend makes more sense than the traditional compartmentalization found in the northern climates. Yet even with this type of space today's designs are incorporating more formal, elements than those of 10 to 15 years ago. The formality of design in the living room also accommodates its role as the household museum or gallery. Here, the finest furniture artwork, and heirlooms can be shown in their full splendor. They enhance the living room and the room compliments them. In family households, this complementary formality also discourages high-volume traffic—which encourages safe preservation of our treasures. When the museum role is considered for the living room, several design objectives become apparent, whether for a separate room or for an area that is part of a great room plan like an art gallery, the living room should include ample wall space for display purposes. Door and window placement that creates interior symmetry and balanced dimensions promote a formal sense. The size of the living room is very dependent on market preferences and price limitations. In very small homes, the living room can be adequately accommodated in a 12- by 12-ft space, but a 14- by 14-ft space is a more acceptable minimum. Although some designs introduce volume ceilings into the living room, generally buyers will prefer more emphasis on materials and treatments, such as crown moldings, chair rails, and lavish wall veneers (Fig. 4.1.40 and 41). Fireplaces for the living room are still popular but increasingly are offered as an option or are included as a secondary location to the fireplace in the family room.

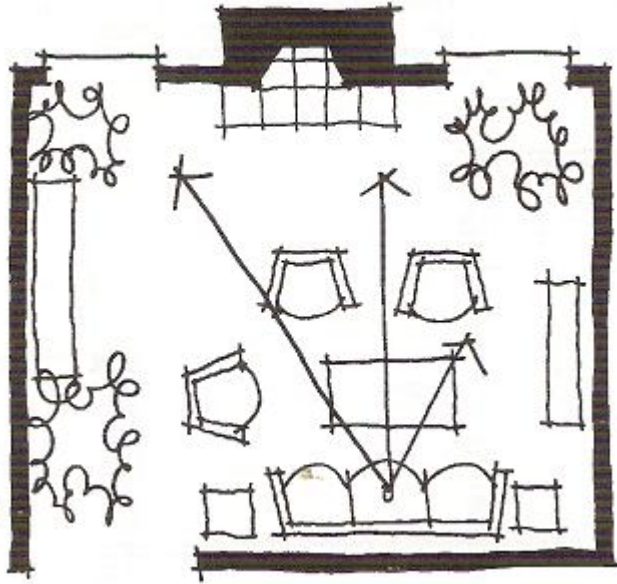


Fig 4.1.42 - living room furniture placement

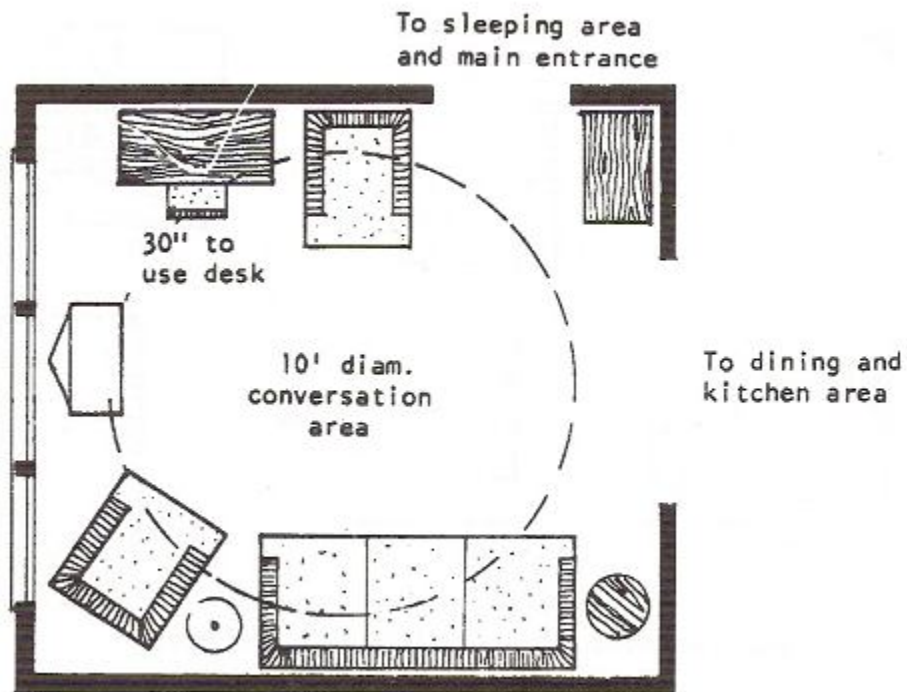


Fig 4.1.43 - plan

Location of the windows and openings to the living room must consider the primary requirements of accommodating furniture for seating, allowing comfort, and promoting conversation as referred in Fig 4.1.42. Placement of windows for this element of the ceremonial component should include recognition that the people using this room will often be seated; lower, narrower windows afford views, as well as light to seating areas. Skylights and clerestory windows also add illumination and interest and are especially helpful to smaller living room plans. Seating areas in the living room should be large enough to contain a sofa and side chairs, with a fireplace and/or specialty window as the focal point of the furniture arrangement. Balancing the room to include a sufficient amount of wall area, furnishing space, and windows is vitally important to the effective design of the living room. An overabundance of windows here will undoubtedly force the owners to partially cover a window with a sofa or chair. The most sensible solution designates one wall as a view wall, and one or two walls as furniture walls. A good view exposure should be assigned to the window wall, with the furniture wall left blank. The view wall may also include the fireplace, which provides the room with a focus for either day or evening uses.

SPATIAL CHARACTERISTICS AND ARRANGEMENT

Living Area

Each living unit should contain space that is conducive to general family living activities, among which are entertaining, reading, writing, listening to music, watching television, relaxing, and frequently children's play. Unless specifically provided for elsewhere in the unit, appropriate space for these activities should be provided in the living area.

Living furniture that can be accommodated in the living area should include the following items

One couch, 3 ft 0 in by 6ft 10 in

Two easy chairs, 2 ft 6 in by 3 ft 0 in

One desk, 1 ft 8 in by 3 ft 6 in



Fig 4.1.44 - living rooms considered from the point of view of possible furniture groupings and interference by necessary circulation. Circles indicate conversational groups dotted lines show circulation.



Fig 4.1.45 - a relationship similar to fig complicated by adding constantly used dining space

One desk chair, 1 ft 6 in by 1 ft 6 in

One television set, 1 ft 4 in by 2 ft 8 in

One table, 1 ft 6 in by 2 ft 6 in

Living room furniture placement

Commentary

Necessary planning considerations should include provision of adequate floor and wall space for furniture groupings, separation of traffic ways from centers of activity, and ease of access to furniture and windows.

Circulation

Circulation through the living room should be as direct as possible, yet it should not interfere with the furniture placement as shown in Fig 4.1.44 and 45.

Doors

The location of doors should fully consider the need for generous wall space for the placement of furniture.

Conversation Area

People gather or congregate during social activities in rather small groups. A desirable conversation distance is of relatively small size, approximately 10ft in diameter.

Planning Considerations

Through traffic should be separated from activity centers. Openings should be located so as to give enough wall space for various furniture arrangements. Convenient access should be provided to doors, windows, electrical outlets, thermostats and supply grills.

Furniture Clearances

To assure adequate space for convenient use of furniture in the living area, not less than the following clearances should be observed 60 in between facing seating, 24 in where circulation occurs between furniture, 30 in for use of desk, 36 in for main traffic, 60 in between television set and seating. Seating arranged around a 10-ft-diameter circle makes a comfortable grouping for conversation as illustrated in Fig 4.1.46 and 47.

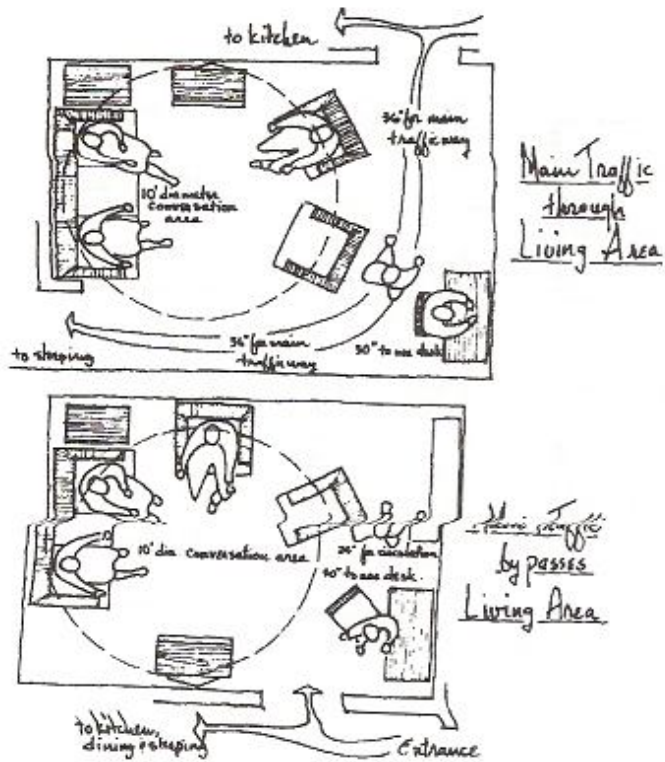


Fig 4.1.46 - minimum clearances, circulation, and conversation areas for living rooms

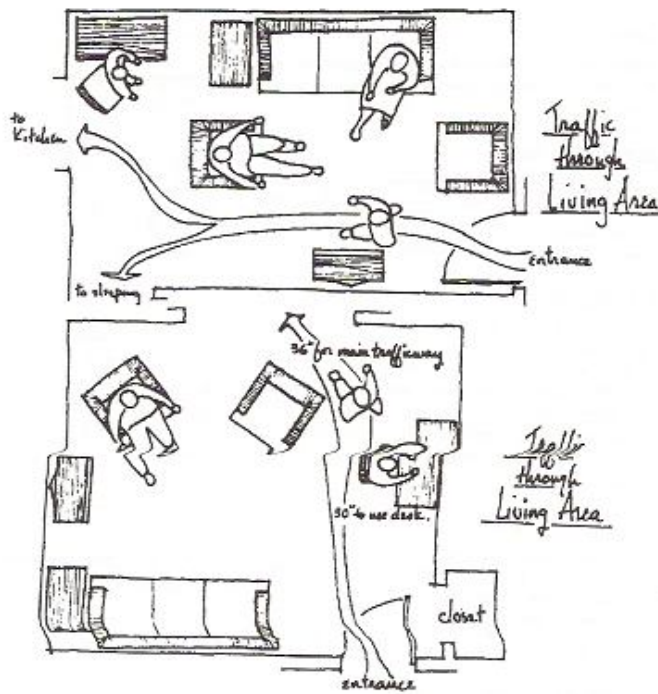


Fig 4.1.47 - minimum clearances, circulation, and conversation areas for living rooms

COMBINED SPACES

A combination dining area-kitchen is preferred by some occupants of small houses and apartments. This arrangement minimizes housekeeping chores and provides space which can be used as the family's day-to-day meeting place. Often several compatible living functions can be combined advantageously in a single room. Some of the benefits of such arrangements are that less space is used but it is used more intensively, its functions can be changed, making it more flexible and serviceable space, it is adaptable to varied furniture arrangements, while visually it can be made more interesting and seem more generous than if the same functions were dispersed into separate rooms. For adjacent spaces to be considered a combined room, the clear opening between them should permit common use of the spaces as in Fig 4.1.48. This usually necessitates an opening of at least 8 ft. A bed alcove with natural light and ventilation and which can be screened from the living area is desirable in a zero-bedroom living unit.

Typical Living Room Arrangements

Many different activities that must be accommodated in the living room complicate the space planning. These activities can be grouped under three headings (1) social, (2) recreational, and (3) cultural. A thorough analysis of just what activities the family normally engages in is the first requisite for planning the space to provide both enough area and properly arranged area for each of the activities. The analysis must include primarily those activities that presumably will be engaged in simultaneously. Those that follow one another in point of time will permit dual use of both furniture and space. As each of the activities usually demands its own quota of furniture and space for its pertinent paraphernalia, all must be enumerated and provided for in the planning. The size of the living room should reflect the size of the dwelling unit and the economic status of the occupants. A living room for a three or four bedroom dwelling unit requires more space for its occupants than one for a one- or two- bedroom dwelling unit. Luxury units will necessarily need more space to

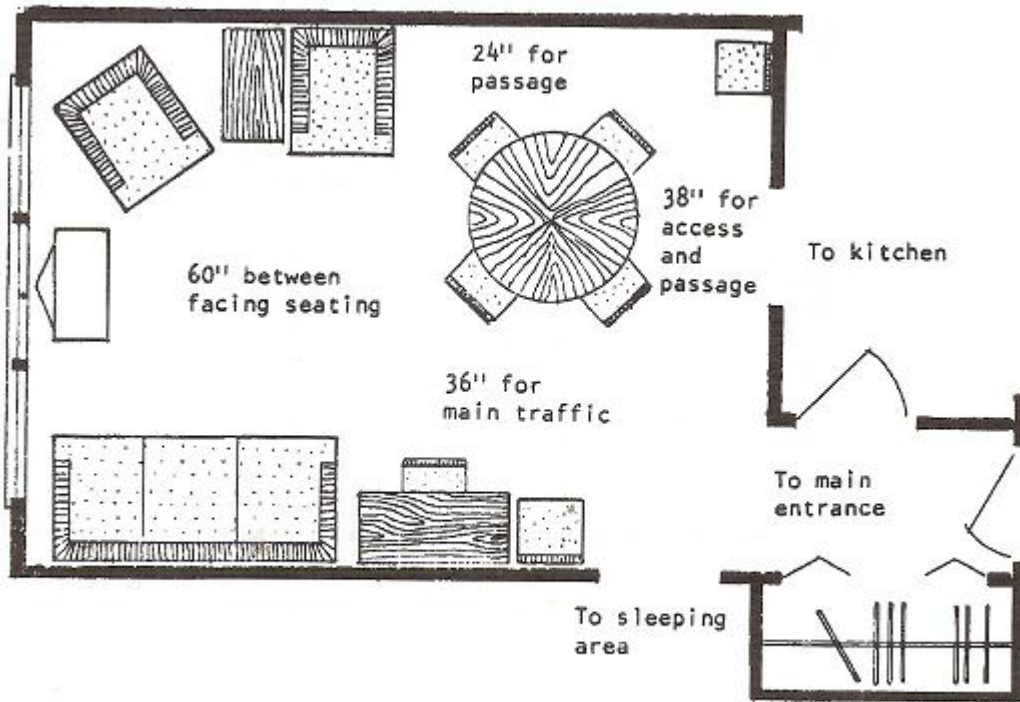


Fig 4.1.48 - combined living-dining room

accommodate more furnishings. In any case, the minimum living room with no dining facilities should be approximately 180ft² but preferably around 200 ft².

Figure a and *b* in the next page, shows two living rooms with typical furniture groupings (no dining facilities). Figure c shows a living room with one end used for dining. This area often is arranged in an L shape to achieve greater definition or privacy from the living activities. Dwelling units with three or more bedrooms should have separate dining rooms or clearly defined dining areas. The range of living activities generally includes a conversation area (sitting area), relaxation area (books, TV, and music center), a work area (sewing machine, desk, and chair), and an entertainment area {bar, card table, terrace}. Often it is the center of child play if there is no space in the kitchen. The minimum width of a living room should be 11 ft to 12 ft. the recommended width is 14 ft 0 in. There should be no through traffic in the living room. Preferably, the living room should be a dead end space with all traffic handled at one end. The major problem is to provide for the necessary flexibility in order to achieve the various activities. Separation and some degree of privacy are required. When a living room is combined with the dining area, the dining area should be offset into an alcove or be clearly identified as such.

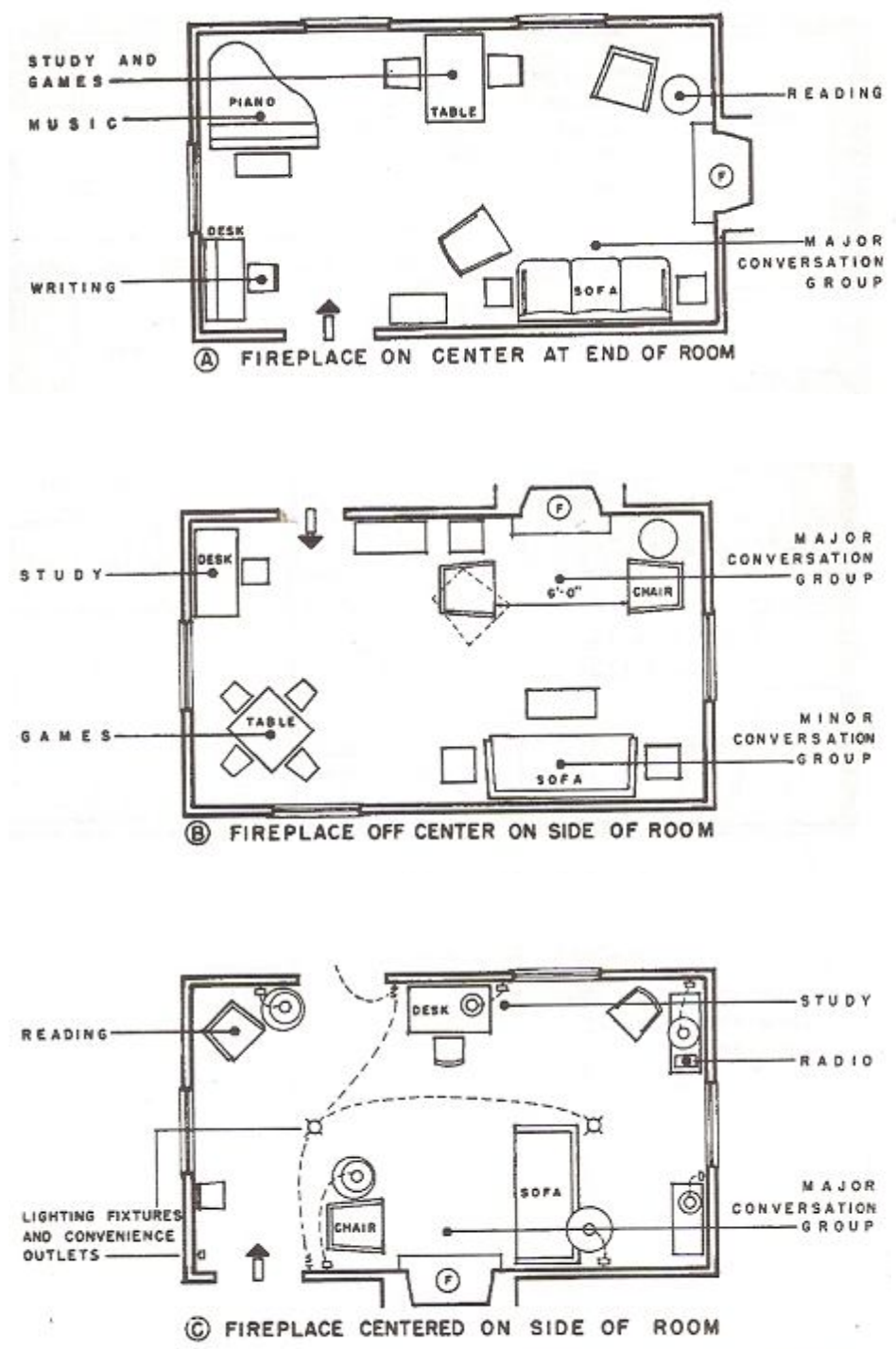
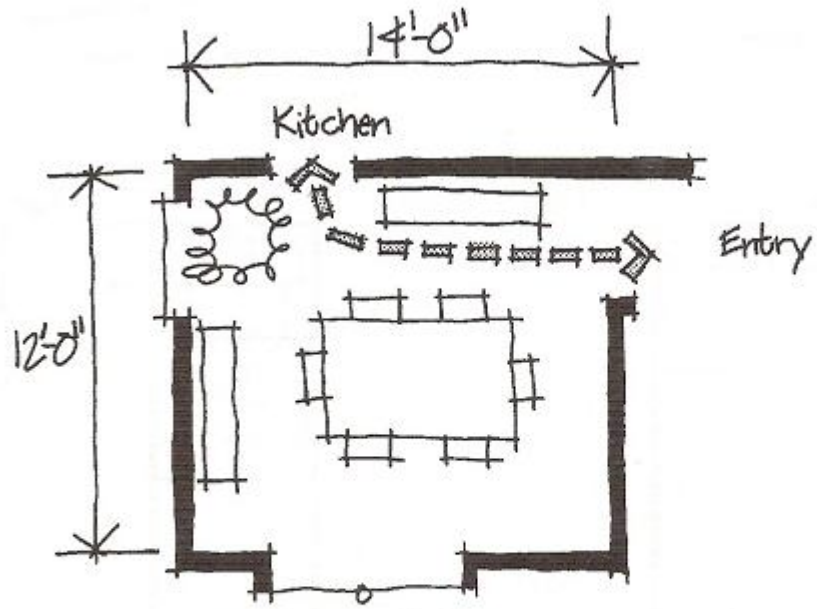


Fig. 15 These plans show how furniture groupings may be adapted to various types of recreational activities with the fireplace as the center of interest.

Table 4.1.6 Sizes of living room furniture					
Sofas	2 ft 6 in to 3 ft 6 in deep by 6 to 7 ft long	Governer Wintnrop	2 ft by 3 to 3 ft 8 in	Tables, circular	
Love seats	2 ft 6 in to 3 ft deep by 3 ft 6 in to 4 ft 6 in long	Secretary	1 ft 6 in to 2 ft deep by 3 10 4 ft long	Lamp	2 ft diameter
Chairs		Highboy, lowboy	1 ft 6 in to 2 ft deep by 2 ft 6 in to 3 ft 6 in long	Coffee table	3 ft diameter
Club	2 ft 9 in by 3 ft 6 in	Tables, rectangular End	1 ft 6 in to 2 ft deep by 2 ft 6 in to 3 ft 6 in long		
Wing	2 ft 6 in by 2 ft 9 in	Coffee table	2 ft 3 in by 1 ft or 1 ft 8	Drum	3 ft diameter
Bridge	1 ft 6 in by 1 ft 6 in	Bridge	2ft 6in by 2fl 6in	Piecrust	3 ft diameter
Desks		Console	1 ft 6 in by 3 ft	Pianos	
Flat top table	2 ft to 2 ft 6 in deep by 4 to 5 ft long			Grand	4 ft 10 in to 5 ft wide by 5 to 9ft long
				Upright	2 by 5ft



Formal dining room clearances and circulation.

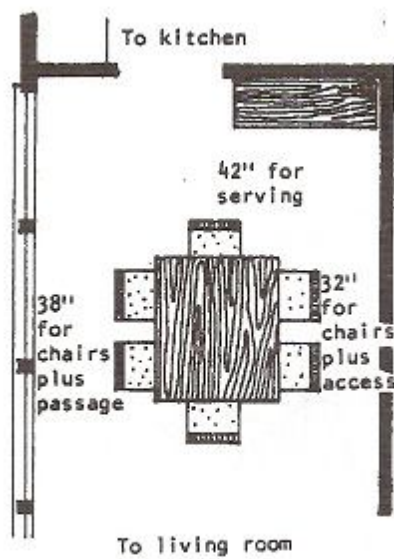


Fig. 6a Dining room, six persons, three-bedroom living room.

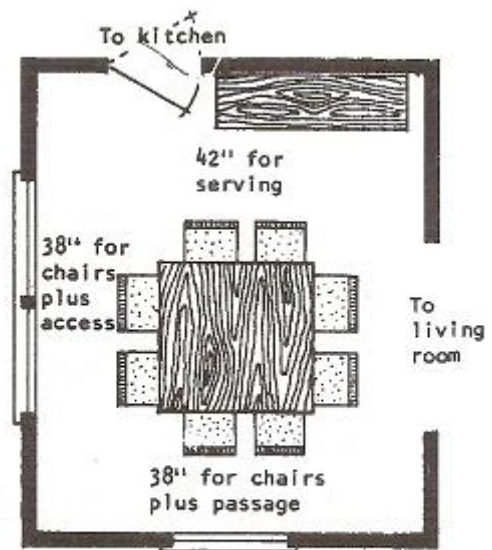


Fig. 6b Dining room, eight persons, four-bedroom living unit.

4.1.2.2 THE DINING ROOM

For many of today's households, the dining room plays only a vestigial role in daily life. Fewer families gather regularly for evening meals, and most singles will bemoan how little time they spend preparing genuine evening meals. For all buyers, formal dining is also much less important. In response to this trend of increasingly casual lifestyles, some designers and builders have reduced the dining room to an area in the great room, even for large homes.

In recent years buyers have again begun to demand a "real" dining room, and today's new homes include either a dining room that is separate from the living room, or a more formal design treatment for the dining area of a great room floor plan. As with the living room, when the dining room is utilized, it is for special occasions of major significance. In fact, the infrequency of its use contributes to the significance of the meals shared here. Its importance is also heightened by the fact that it is the backdrop for the oldest and most enduring of social rituals-offering hospitality through the medium of food. Because of this context, the dining room is very much the epitome of the ceremonial component, and minimal "container" design will not suffice. As with the living room, the dining room should emphasize grace and dignity through window placements, quality finishes, and materials. Because of the room's limited use, and because much use occurs during evening hours, provision for prime views to the outdoors is nice but not a mandatory requirement. And because most use is at night, the dining room is generally the only room in the house equipped with a fancy light fixture as standard equipment. If handsome views are easily available within the overall context of the floor plan, window placement should be low enough to afford views from a seated position. Dimensions for the dining room should be no less than 12 ft by 12 ft, and a 14 ft by 14 ft space is far more comfortable. A rectangular configuration (12 ft to 14 ft) is also very acceptable and functional, as it can accommodate a rectangular dining room table.

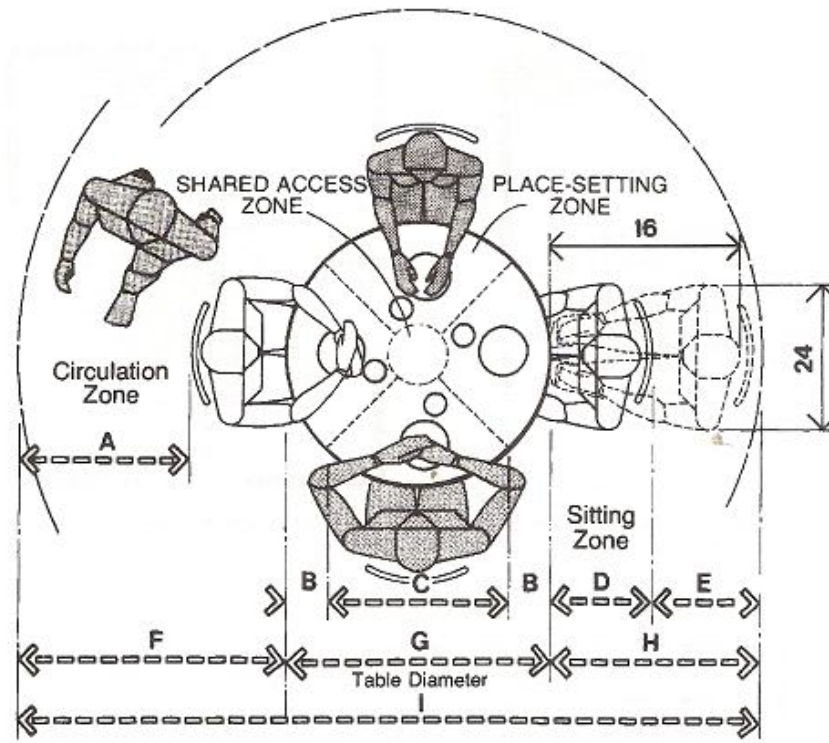


Fig. 8 A 36-in diameter breakfast/kitchen table for four. (See Table 1.)

Fig 4.1.49 – A 36-diameter round table

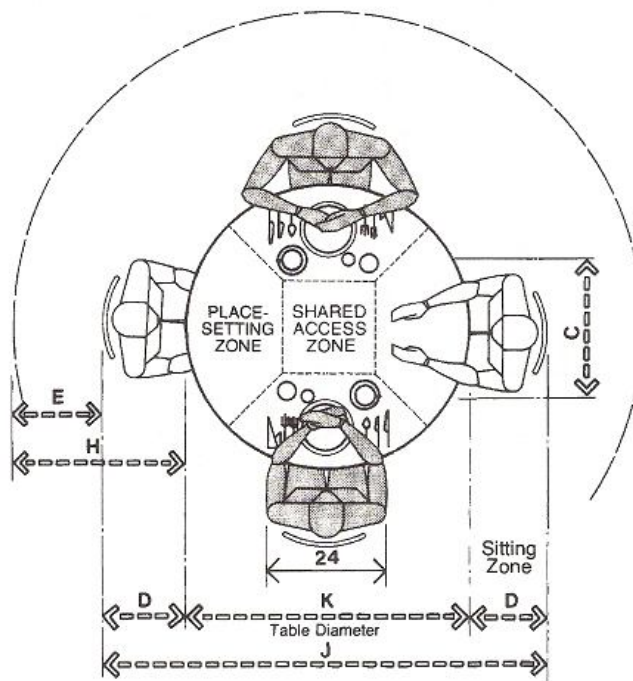


Fig 4.1.50 - A 48-diameter circular table for four – minimum scheme

CHARACTERISTICS AND ARRANGEMENT

Requirement

Each living unit should contain space for the purpose of dining. This area may be combined with the living room or kitchen, or may be a separate room.

Criteria

The amount of space allocated to dining should be based on the number of persons to be served and the proper circulation space. Appropriate space should be provided for the storage of china and large dining articles either in the dining area itself or in the adjacent kitchen.

Space for accommodating the following sizes of tables and chairs in the dining area should be provided, according to the intended occupancy, as shown

1 or 2 persons 2 ft 6 in by 2 ft 6 in

4 persons 2 ft 6 in by 3 ft 2 in

6 persons 3 ft 4 in by 4 ft 0 in or 4 ft 0 in round

8 persons 3 ft 4 in by 6 ft 0 in or 4 ft 0 in by 4 ft in

10 persons 3 ft 4 in by 8 ft 0 in or 4 ft 0 in by 6 ft 0 in

12 persons 4 ft 0 in by 8 ft 0 in

Dining chairs 1 ft 6 in by 1 ft 6 in

Buffet or storage unit 1 ft 6 in by 3 ft 6 in

Commentary

Size of the individual eating space on the table should be based upon a frontage of 24 in and an area of approximately 2 *ft*². In addition, table space should be large enough to accommodate serving dishes. A desirable room for seating is a clear 42 in all around the dining table. The following minimum clearances from the edge of the table should be provided 32 in for chairs plus access thereto, 38 in for chairs plus access and passage only, 48 in from table to base cabinet (in kitchen). In sizing the separate dining room, provision should be made for circulation through the room in addition to space for dining. The location of the dining area in the kitchen is desirable for small houses and small

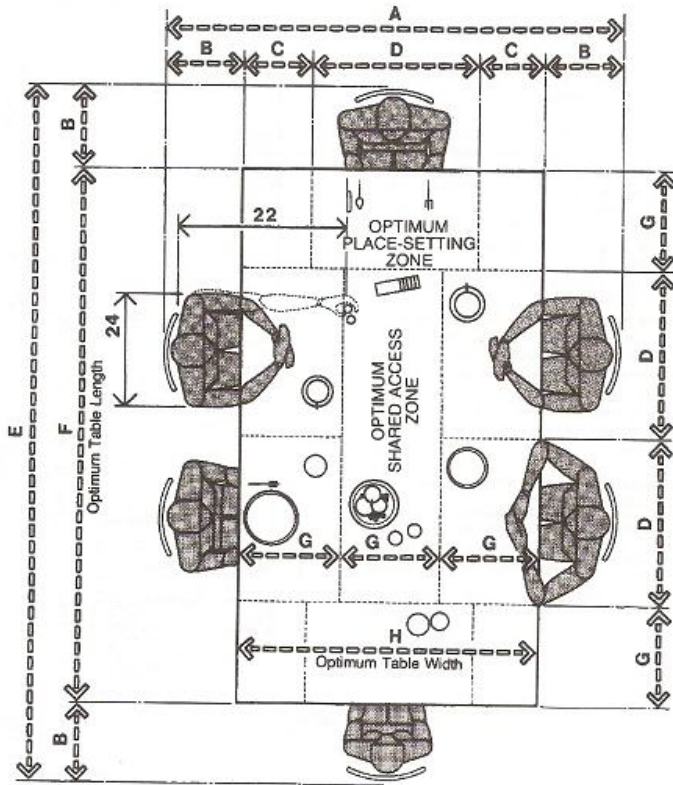


Fig 4.1.51 - rectangular table with optimum length and width for dining for six

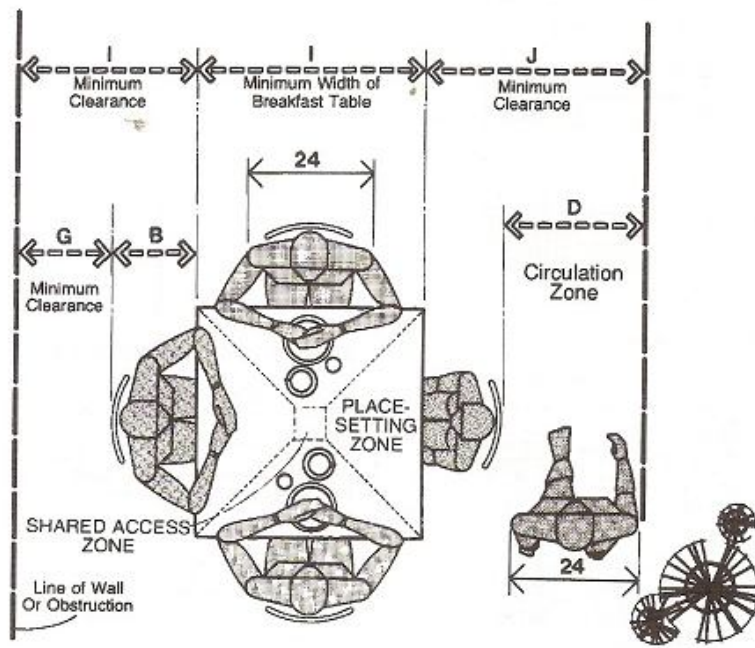


Fig 4.1.52 - square table for four – minimal scheme

apartments. This preference appears to stem from two needs (1) housekeeping advantages; (2) the dining table in the kitchen provides a meeting place for the entire family. Where only one dining location is feasible, locating the dining table in the living room is not recommended. Fig 4.1.49 illustrates a 36-in diameter round table seating four people and shows the necessary clearances around the perimeter. Four people cannot function comfortably around such a small table for anything but the lightest snacks. The individual place-setting zones are extremely restricted, and the shared access much in the way of serving dishes, platters, or decorative elements. A 48-in clearance between the perimeter of the table and the wall or nearest physical obstruction is the minimal clearance necessary to allow circulation behind a seated person. A distance of 30 to 36 in between the table perimeter and the wall is the minimum clearance necessary to permit access to and adjustment of the chair. The 48-in diameter table shown in Fig 4.1.50, however, can function adequately for four people. The place-setting zone is reasonably sufficient to accommodate the various place-setting elements and provides generous elbow room as well. Although the central shared access zone is restricted, it provides far more space than the 36-in diameter table shown in Fig 4.1. 50. If used for light snacks or coffee, the table can seat five. The clearances for circulation are the same as for the 36 in table.

Fig 4.1.51 applies the optimal incremental unit discussed to a rectangular table for formal dining for six. The table size shown is 54 in by 96 in. the size will provide each person with an individual place setting zone of 18 in by 30 in and will allow a shared access zone at the center of the table with a depth of 18 in. the 30 in width provided for each person allows for elbow room. Figure in contrast shows the minimal square general purpose table for informal dining. Although the width and depth of the place setting zones are the same as in the larger rectangular tables, their angular configuration reduces the area significantly as well as the area of the shared access zone. To allow clearance for the chair and head on circulation behind the chair, and minimum distance of 48 in must be maintained between the edge of the table and the wall or nearest physical obstruction. A clearance of 36 in to 42 in can be provided to allow

Table of measurements for fig 4.1.51	
	inches
A	30 min.
B	6
C	24
D	18-24
E	12
F	48-64
G	36
H	30-36
I	114-126
J	84-96
K	48

Table of measurements for Fig 4.1.52	
	inches
A	96-102
B	18-24
C	12
D	30
E	132-144
F	96
G	18
H	54
I	36-42
J	48

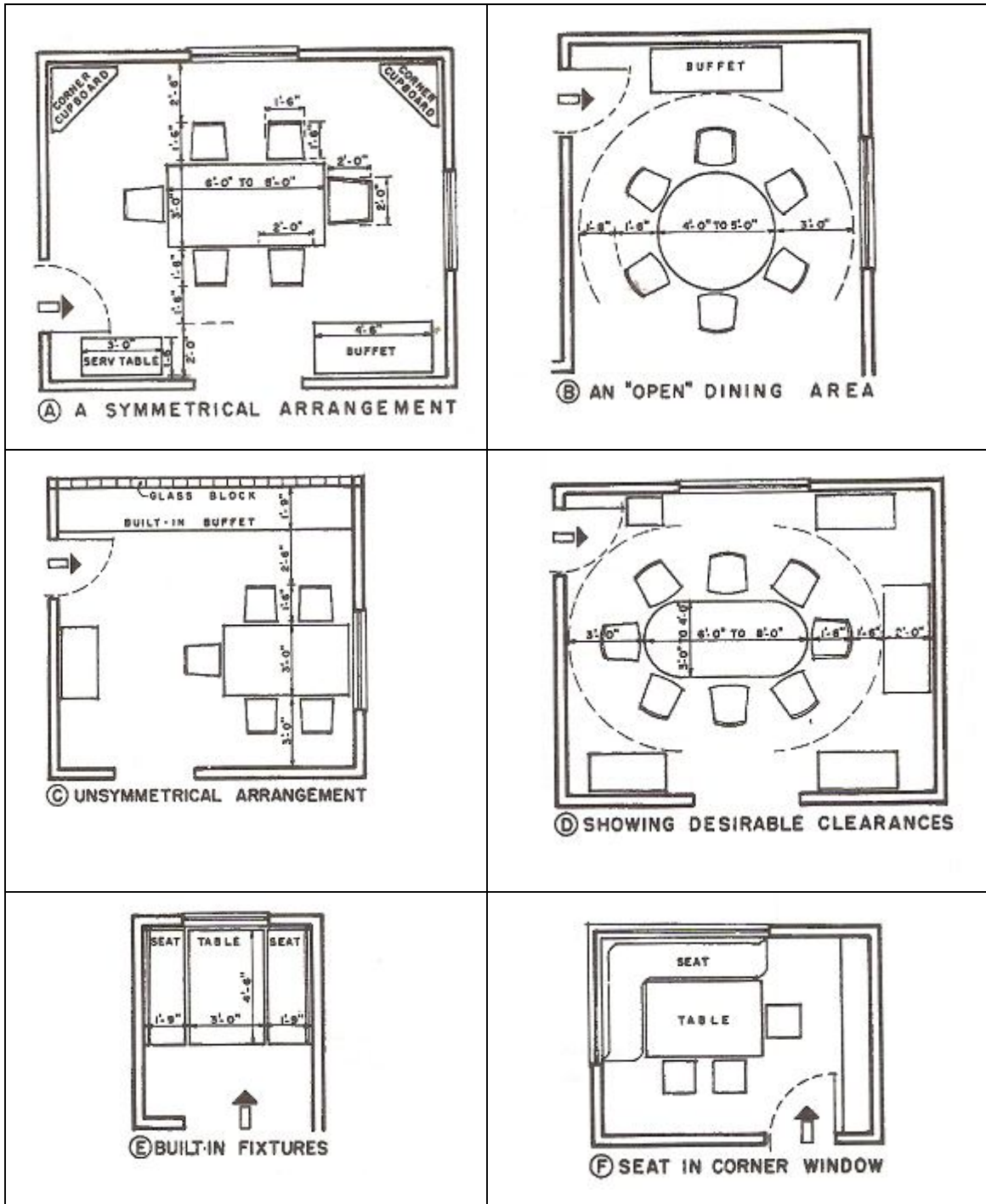
restricted circulation. This will require a person to side step or the seated person to adjust the chair to allow passage. Dining spaces for serving family meals to six persons are illustrated in Fig 4.1.52. The size of table and space around the table for serving meals and clearing away dishes while people remain seated are shown for two seating arrangements—people on four sides and people on two opposite sides. The table space allowance for each individual is 24 in.

Tables and Chairs

Dining areas for eight persons with free-standing table 72 by 40 in, one armchair, and seven armless chairs (calculated on the basis of edging space on sides where there is not serving space, so that all persons can leave their seats without disturbing others).

TABLE 4.1.7 Space Requirements for Individual Place Settings and Clearance around Table		
Item	Minimum	Liberal
Space, Inches, for individual place settings (cover);		
Width, side-to-side	24	29
Depth	12	15
Clearances, inches table edge to wall		
Getting up	24	30
Serving	30	36

Table 4.1.8 - Typical dining area and furniture grouping



4.1.2.3 KITCHENS

SPATIAL CHARACTERISTICS AND ARRANGEMENT

Requirement

The basic activities in the kitchen consist of food preparation, serving, and cleanup after the meal. The kitchen design should permit efficient operation in the performance of these functions. In addition, storage space for staples, dinner-ware, and utensils should be provided.

Location Criteria

The kitchen should be conveniently located near the dining area, living area, and utility area. The user should have easy access from the service entrance, or the only entrance if in an apartment. The kitchen should provide direct access to the dining area.

Space Criteria

The size of the kitchen should be determined by the number of bedrooms provided in the living unit. Work centers for the following equipment, cabinets, and space for their use should be provided

1. Range space with base and wall cabinet at one side for serving and storage of utensils and staples.
2. Sink and base cabinet with counter space on each side for cleanup.

Wall cabinets for storage of dinnerware.

3. Refrigerator space with counter space at latch side of the refrigerator door.
4. Mixing counter and base cabinet for electrical appliances and utensil storage. Wall cabinet for staple storage.

Light and Ventilation Criteria

Artificial ceiling light should be provided and ventilation should be provided by natural or mechanical means.

Fire Protection and Safety Criteria

Kitchen range should meet the provisions of the following

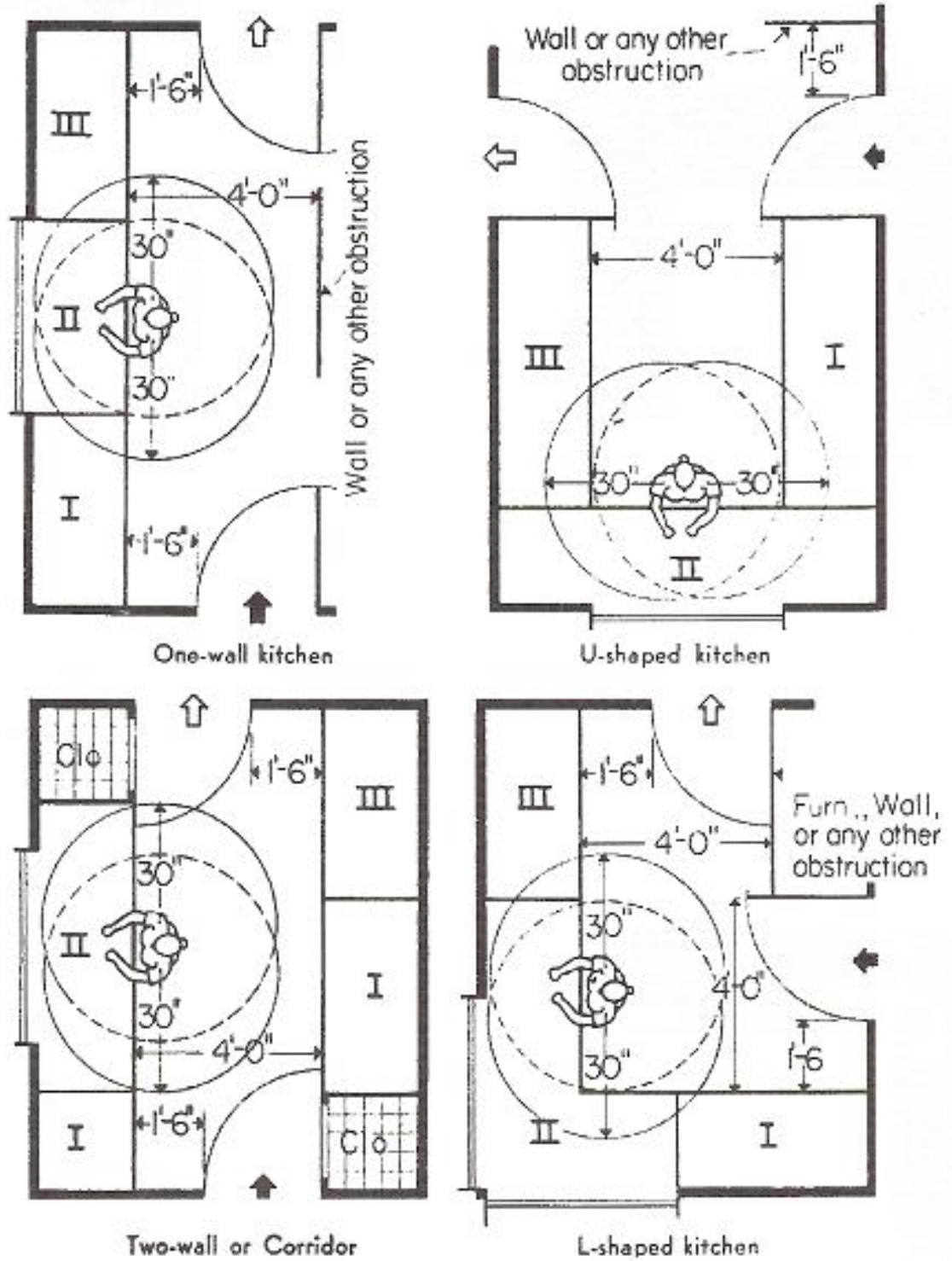


Fig 4.1.53 – Kitchen layouts

1. Gas ranges, AGA "Directory of Approved Appliances and Listed Accessories."

2. Electric ranges, UL "Electric Appliances and Utilization Equipment List."

Commentary

Table shows recommended minimum space standards for kitchen work centers. The spaces to be provided are sized according to the number of bedrooms in the living unit.

Height of shelving and counter tops

1. Maximum height of wall shelving 74 in. Height of counter tops should be 36 in.

2. Minimum clearance height between sink and wall cabinet 24 in; between base and wall cabinets 15-in clearance.

Recommended minimum edge distance

Equipment should be placed to allow for efficient operating room between it and any adjacent corner cabinet. At least 9 in from the edge of the sink and range and 16 in at the side of the

Circulation space

A minimum of 40 in should be provided between base cabinets or appliances opposite each other. This same minimum clearance applies when a wall, storage wall, or work table is opposite a base cabinet.

Traffic

Traffic in the kitchen should be limited to kitchen work only. Serving circulation to the dining area should be without any cross traffic.

KITCHEN ARRANGEMENTS

Kitchens and Kitchenettes

The most common types of kitchen arrangements are the (1) straight-line or galley, (2) parallel, (3) U type, and (4) L type, as in fig 4.1.53. The galley-type arrangement is used for kitchenettes that require a minimum of equipment. The parallel and U arrangements are considered the most efficient in regard to

movement and working relationships. The L is more common when used in a large kitchen, which makes possible an eating area.

Kitchen

The kitchen is an area where many different functions occur. These normally include

1. Food preparation and cleanup
2. Food storage
3. Utensil and general storage
4. Eating
5. Laundry
6. Other, miscellaneous activities

The kitchen receives intensive use by most families, whether it is in a single-family house or a high-rise apartment.

Food Preparation

Food preparation function has received a great deal of study and analysis. The sink, the range, and the refrigerator have been the traditional elements of food preparation and cleanup. Over the years, each of these elements have become increasingly more extensive. For example, from a simple sink it follows into a double sink, disposal units, and a dishwasher. The range has evolved into a wall oven, double oven grille, barbecue pit, rotisserie, and infrared oven. The refrigerator has evolved into a large-sized refrigerator, separate freezer, and ice making equipment. The development of the sink disposal units and compactors has helped greatly in the cleanup of food preparation. The increasing use of a large battery of mechanical appliances, such as mixers, blenders, and slicers, is adding to the complexities of the kitchen. This constant evolution of the food-preparation area of the kitchen is expected to continue and become more complicated.

Food Storage

Over the years, the type and packaging of foods available on the market have changed considerably. There has been a tremendous increase in

prepackaged and semi prepared foods. All kinds of frozen foods are now available. It can be reasonably anticipated that additional storage space for frozen foods will be needed. Sufficient storage for canned goods and other foods not requiring refrigeration is also needed.

KITCHEN AND DINING AREAS

It is common misconception that a kitchen is only a work area. Considerable social activity is carried on there, not only among family members but also between residents and neighbors. To create a feeling of space in a small unit, an open kitchen, dining, living area is frequently provided, in doing so, one sacrifices the possibility for several activities conveniently taking place concurrently with minimum infringement. Most families with small children prefer a large eat-in kitchen plus a multipurpose room which can be used alternatively for play or for formal dining. Alternatively, a kitchen-dining area with minimal separation (for example, an open counter) provides for both formal and informal use. In apartment buildings, where there is greater pressure for young children to remain in the apartment, the added flexibility of this arrangement may be especially important. Younger children can play at the table under the supervision of the parent. Older children use the area as an evening study space.

1. Kitchens for larger units (i.e., more bedrooms) may not require more actual floor space than small ones but will require more counter space, a larger number of burners on a range, a larger oven, and more refrigerator and storage space.

2. Each center requires appropriate adjoining counter space and storage facilities. Dimensions on the following diagrams should be viewed as providing generous counter space. A *layout* that provides a continuous sequence of sink-worktop-range has been shown to be the most functional. In this respect, the galley layout is in fact the least desirable of the alternatives.

L or U layouts provide a more flexible working space, especially when more than one person is using the kitchen. This fact may recommend the use of

these layouts in family units. Dimensions are minimum requirements for two-bedroom units. Bracketed dimensions apply to three-bedroom, five person units and larger. It is recommended that the following widths of counter space be provided near the work centers

Range	18 in
Refrigerator	36 in (door side)
Sink	18 in (each side)
Serve	36 in

Work triangle

The heart of the kitchen is the work triangle— by lines connecting the center fronts of sink range and refrigerator. The sum of the work triangle should not exceed 23 ft. As the major activity area in the area should be out of the path of most traffic through the room to adjacent areas. The four basic design categories of work triangles are straight walls, u shape, l shape and corridor. In planning a new kitchen it is ideal for each of the kitchen centers to be a maximum of 12 to 24 ft apart.

Traffic flow

Most traffic through a kitchen is bound for the backyard or an adjacent dining room or meal-serving area. A combination of hot dishes, appliances, kitchen utensils, and traffic flow can cause accidents. Good planning will keep traffic out of the work area and provide adequate clearance between fixtures and appliances. A minimum of 48 in should be provided between cabinets and appliances placed opposite each other. When such fixtures are placed at right angles to each other and separated by a passageway, they should be spaced a minimum of 30 in apart. In an "L" or "U" shaped kitchen, the minimum edge distance between an appliance and an adjacent corner should be 9 in from the edge of a sink, 16 in from the refrigerator, and 14 in from the center of the nearest range burner. These recommended distances allow people to pass each other safely while using the fixtures, carrying hot foods, and opening and closing cabinet and appliance doors and drawers.

Kitchen Storage

Each kitchen or kitchenette should have (1) accessible storage space for food and utensils,(2) sufficient space for the average kitchen accessories,(3) sufficient storage for those items of house hold equipment normally used and for which storage is not else where provided.

Utensils and general storage

Space for utensils includes storage for dishes, pots and pans, utensils and appliances with the increased use of such electrical appliances. Their storage becomes a significant problem. General storage requires space for linens, towels and kitchen supplies. Included in this category are brooms, mops and other cleaning equipment and supplies.

Kitchen Dimensions

This section gives recommended minimum counter space dimensions, comments on points to be considered in the layout, and illustrates various shapes of kitchens. All dimensions given are measured along the front of base cabinets. The dimensions may be angled around a corner and provided that the minimum distances of equipment of base cabinet corners are observed. No dimensions should overlap with each other. Base cabinets, including counter top, should be 900 mm (3 ft 0 in) in height. The space between the base and wall cabinets should be approximately 400 mm (1 ft 4 in) in height. The top of all wall cabinets should be 2100 mm (7ft 0 in) in height from the floor. The latch or opening side of the refrigerator should be on the side nearest to the working area of the kitchen. A pantry or full-height food and storage cupboard may be provided in addition to other cabinets and appliances. The depth should be a minimum of 280 mm (11 in) and should not exceed 400 mm (1 ft 4 in). Wall cabinets should not be located over a range unless a fire-rated exhaust hood, the full width of the range, is provided. At least one drawer should be provided in the base cabinets; it should be located adjacent to the sink, between the sink and the range. Other drawers in base cabinets are highly desirable. A splash back, at the junction of the counter top and wall, should be provided of a minimum width of 100 mm (4 in).

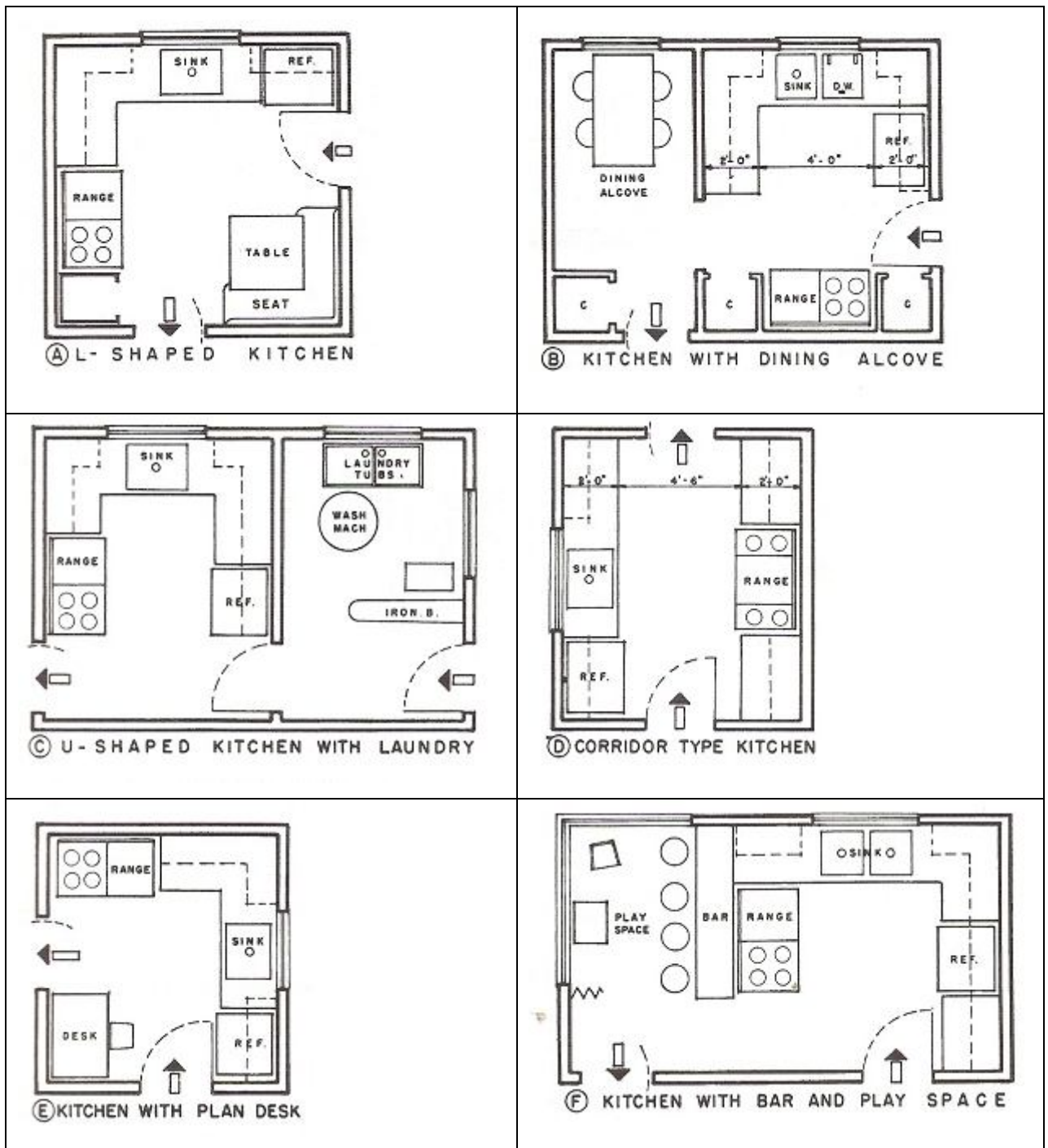


Table 4.1.9 represents various types of kitchen arrangements. Suggested plan types showing basic arrangements and also possible combinations of standard kitchen facilities with other activity areas and their equipment

The sizes given for counter space dimensions are the recommended minimum for kitchen design. If the sizes can be increased, consideration should be given to enlarging, first, the space between the sink and the range; and second, the space to one side of the refrigerator. When provided in one- and two-person accommodation, the counter space dimensions for galley-shaped kitchens can be varied to locate the range and refrigerator against the same wall and against side walls, provided that there is a minimum counter space between them of 500 mm (1 ft 8 in). The sink should have a minimum space of 400 mm (1 ft 3 in) to one side. In all kitchen layouts for one- and two-person accommodation, the range may be placed against a side wall.

Alternative kitchen shapes

Five storage items at the minimum should be the kitchen to improve the accessibility and functionality of the plan (Fig. 4.1.9). These items include, but are not limited to, interior vertical dividers, specialized drawers, built-in bins/racks, swing-out pantries, or drawer/roll-out shelves greater than the 120-in minimum for small kitchens or the 165 in minimum for larger rooms. Corner storage, for a kitchen with usable corner areas in the plan should be included with at least one functional corner storage unit.

Counter top clearance must be 15 to 18 in between the countertop and bottom of wall cabinets. A window or skylight should equal at least 10 percent of the total square footage of the separate area or of a total living space that includes a kitchen.

KITCHEN PLANNING

Three work centers are involved (1) storage and preparation, (2) preparation and cleaning, (3) cooking and serving.

Arrangement

As long as the operation sequence (from I to III) is preserved, organization of kitchen equipment may be varied to suit other requirements. Of the layout diagrams in Fig. 4.1.9, the U-shaped plan is most efficient in that work centers are most closely related and are entirely separated from general traffic areas.

TABLE 4.1.10 - Minimum Frontages for Work Centers, Inches

Work centers	Kitchenette			Kitchen	
	Zero bedroom	One bedroom	Two bedrooms	Three bedrooms	Four or more bedrooms
Sink	18	24	24	24	36
Counter and base					
Cabinet at each side	15	18	20	24	30
Range	21	21	24	30	30
Counter and base					
Cabinet at one side	15	18	20	24	30
Refrigerator (space 1	30	30	36	36	36
Counter at letch side	15	15	15	16	18
Mixing (base and wall cabinet)	20	30	36	36	42

Notes

- Work centers may be combined the kitchenette multiple-use space should at least equal the largest frontage of any one of the work centers being combined; the kitchen multiple-use space should it least equal the largest frontage Of any one of the work centers being combined plus 6 in,
- Provide a drawer at each base cabinet.
- Frontage may continue around a corner, except a space less than 12 in should not be counted.
- A 72-in compact kitchen with 72-in wall cabinet may be substituted.
- The frontages are based on typical cabinets. Base cabinet approximately 24 in deep by 36 in, in height with one shelf end a drawer. Wall cabinet approximately 12 In deep by 30 in in height with two adjustable shelves.

Work Center Units and Sizes

Dimensions given are desirable minima to meet average small house requirements and to provide adequate working clearances.

I. Storage and preparation centers include a counter space. Average linear wall space of 4 ft 10 in to 5 ft 10 in should be allowed.

II. Preparation and cleaning require a sink, cabinets, and the greater part of the counter space. Sinks and special equipment vary greatly in size, but linear wall space of 5 ft 4 in to 6 ft 6 in should be allowed.

III. Cooking and serving centers should contain the range, counter space and storage cabinets. Average linear wall space required is 5 ft to 5 ft.10 in.

Counters

Cabinet counters should be flush with installed appliances to provide a smooth, clear work area. For convenience and efficiency, a height of 36 in room the floor is recommended. The trim used on counter top edges should be free of sharp edges, burrs and points.

Doors

Door swings which conflict with, or restrict the use of, appliances should be avoided. Doors should be installed to swing against the side or end of a cabinet or out of the kitchen. Where standard hinged doors would present a hazard, the use of sliding or folding doors is recommended.

Cabinets

The size, number and location of cabinets should be determined while the kitchen is being designed. Base cabinets and counter tops with wall cabinets above should not exceed 24 in depth. This permits easy access to the rear of wall cabinets without standing on stools. For counter tops without wall cabinets above, a 30 in depth is the recommended maximum. The top shelves of cabinets should be placed no more than 72 in above the floor and the world cabinet depth should not exceed 12 in maximum.

Eating

One of the primary functions of the kitchen has been to provide a place for informal or family eating. This is different from guest or formal dining in a separate dining room or area. The informal dining generally consists of breakfast, lunch, snacks, or just serving coffee to a neighbor. This eating area should be clearly defined as a separate functional area. A frequent and desirable arrangement is the combined kitchen-dining area. Another arrangement is family room.

Cabinets

Critical dimensions of the principal types of stock kitchen cabinets, of both metal and wood, are illustrated on the following pages. These dimensions should be used only for preliminary planning purposes, and specific manufacturers' data should be consulted before final selections and working drawings are made, since not all manufacturers make every cabinet in every size indicated. The dimensions have been drawn from the current catalogs of the leading manufacturers of stock metal and wood cabinets. Special sizes, features, materials, and finishes are not individually discussed. Such items should always be investigated with the specific manufacturer.

Wood Cabinets

All base cabinets are 34 1/2 in high without tops, 36 in high with tops, and 24 in deep. Wall cabinets are 13 in deep and vary in height. A wide assortment of filler moldings and panels and side or end finishing panels are available for all cabinet sizes and types. Numerous special-purpose base cabinets are also available, such as mixer storage, tray storage, vegetable bins, breadbox drawers, linen storage, pull-out tables, and towel racks. In addition to such specially designed and equipped cabinets, many accessory items are available for installation in stock units.

4.1.2.4 BED ROOMS

SPATIAL CHARACTERISTICS AND ARRANGEMENT

Requirement

Each dwelling unit should have space (s) allocated to sleeping and such related activities as dressing and personal care, and study or reading. Sufficient space should also be provided for clothes storage and housekeeping in the bedroom areas.

Criteria

Although the required area in a primary bedroom varies depending upon the given room layout, adequate space should be provided to permit comfortable use of essential furniture and circulation as follows

Two twin beds, 3ft 3 in by 6ft 10 in

One dresser, 1 ft 6 in by 4ft 4 in

One chair, 1 ft 6 in by 1 ft 6 in

One crib, 2 ft 6 in by 4 ft 6 in

One table, 1 ft 6 in by 2 ft 6 in for sewing or other work

A secondary double-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture

Two twin beds, 3ft 3 in by 6ft 10 in, or one double bed, 4 ft 6 in by 6 ft 10 in
One or two dressers, 1 ft 6 in by 3 ft 6 in

One chair, 1 ft 6 in by 1 ft 6 in

One desk, 1 ft 8 in or 3 ft 6 in, or storage chest for toys

A secondary single-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture

One twin bed, 3 ft 3 in by 6 ft 10 in

One dresser, 1 ft 6 in by 3 ft 6 in

One chair, 1 ft 6 in by 1 ft 6 in

One desk, 1 ft 8 in by 3ft 6 in
Dormitory-type (extra large) sleeping spaces to serve three or four persons may be provided in living units containing at least three other bedrooms. The design and area should accommodate the required

number of beds (not bunks) and other necessary furniture and have appropriate closet space.

Each bedroom should have proper provisions for natural light and ventilation.

Visual and auditory privacy is needed for all bedrooms.

Commentary

1. For reasonable access to and use of bedroom furniture and equipment, the following minimum clearances should be observed

42 in at one side or foot of bed, for dressing 12-in clearance for least-used side of double bed or pair of twin beds. The least-used side of a single bed may be placed against wall

6-in clearance from side of bed to side to dresser or chest

36-in clearance in front of dresser, closet, or chest of drawers

24-in clearance for major circulation path (door to closet, etc.)

22-in clearance on one side of twin bed

2. It should not be necessary to move double

3. Bedrooms should be of sufficient size to permit an alternate arrangement of furniture if at all possible.

4. Primary bedrooms should have at least one uninterrupted wall space of at least 10 ft. There should also be space provided for private working or resting separate from dressing

Location

1. The bedroom or sleeping area of the living unit should be located away from the living and working areas for privacy.

2. In the analysis of the bedroom area, there should be a regard for the makeup of the family. With preschool children, it is convenient if the master bedroom is located close to children's bedrooms. With teenage children, separation of the master bedroom from other bedrooms wherever possible to reduce noise is desirable.

3. The location of doors, windows, and closets should be planned to allow the best placement of the bed and other furniture.

4. Placement of the closet so it is next to the door into the bedroom minimizes the use of wall space.

ROOMPLANS

The room plans presented are designed to illustrate various techniques for providing choices in the use of living space in the home. It must be remembered that a reduction in room size inevitably limits the options for alternative arrangements of furniture but it should be always possible to use more than one layout in any room designed to the minimum requirements of residential standards.

The bed room

The bed rooms illustrated show the approximate size and shape of rooms that will permit at least three variations and furniture layout. In each case the location of closet, door and window should be noted.

Parents Bed room

This bed room has an approximate size of 10ft 6 in by 11ft (115.5 sq ft) the size of this bed room will only just permit the use of twin beds if placed together.

One person bed room

The bed room has an approximate size of 9 ft 3 in by 9 ft 6 in(87.9 sq ft).

Two person bed room

This bed room has an approximate size of 10ft 6 in by 14 ft 6 in(152.2 sq ft).

THE MASTER SUITE

The master suite's role within a contemporary home is one of isolated retreat for the heads of household. Although we generally think of the master suite as having two spaces—bedroom and bathroom—the ideal configuration of a well-defined master suite contains five distinct areas sleeping, sitting, dressing, closet, and bath. A careful balance of function, perceived value, and emotion dictates their relative sizes and relationship to one another (Fig. 17).

Sleeping area

Of the five areas in the master suite, the most hours are spent in the sleeping area, but the location of the sleeping area may be subordinate to view considerations for the sitting area. The sleeping area may be one area of home where darkness is an asset. The sleeping area should accommodate a king size bed with 30 in of clearance around the perimeter. The bedroom configuration should be designed to accommodate a bed on at least one wall, with an option for an alternative location if possible. If the bed wall is an exterior wall, window placement should recognize headboard location. Besides being aesthetically undesirable, a window blocked by the headboard or other bed framing is also unreachable for operation, which diminishes comfort and privacy. If the bed is to be located along an interior wall, use of the adjoining space must be considered. As with any bed room, the master suite should not share common walls with such active, noisy rooms as the laundry or bath. Although the bed is the major furnishing to be accommodated additional standard items to consider when dimensions are established include two night stands, one for either side of the bed and two dressers, a location for a television should also be anticipated , one which accommodates viewing both from the reclining position of the bed and the sitting area.

Sitting area

The sitting area is the other space that should be provided for in the bed room portion of the master suite. Even when seldom used a sitting area extends the master bed room adding graciousness to the entire suite. in smaller suites the sitting area may simply be a location for two chairs while and larger suites it may be a well defined niche or even a separate room. in the latter case the sitting area should accommodate at least several chairs and possibly a sofa for reading, relaxing or conversing. The sitting area should receive primary consideration for views, access to a balcony or patio. Natural light is a vital ingredient of the design, and since pleasant views will most often be enjoyed while one is sitting or lounging, lower sills on these windows are desirable. In some cases sitting room

can function as a separate library or a guest bed room. Sitting alcoves can be separated from the sleeping area by discrete room dividers. Changes in ceiling height or wall materials can be reinforced the definition of the alcoves. Master suite layouts should keep the sleeping area out of immediate view.

Closet

Out of sight from the rest of the suite is the closet. In master suite walk-in closets are preferred. Linear closets should be used only if square footage is truly at premium. Closet dimensions should reflect the true maximum configuration for storage of clothes. Rod and shelf length is the measurement of performance. Probably the optimal shape is the rectangle, with rods and shelves on both sides and circulation down the middle. With this configuration the closet door should swing out, so as not to block any of the interior rods or shelves. The minimum width of a double loaded walk-in closet is 6 ft.

Dressing area

Adjacent to the closet and the bath but slightly out of view from the balance of the suite is dressing area. This is the locale for selection and donning of clothing, for primping and preparing to meet the world. The focus of dressing area is vanity. This may include one or two wash bowls, with an integral place to sit a large mirror should be located above the vanity, and the entire space should incorporate generous lighting. Vanity lens of six feet are desirable as a minimum. A sorter vanity should include only one wash bowl, as two will reduce valuable counter space. Drawers below and medicine cabinets at either side wall of the vanity will provide for necessary storage of toiletries. The dressing area should have a generous linen closet, either under the vanity or along a wall near closet.

Bath area

The garden or oversized tub is the focal point of the master bath. Although the shower will probably be used as the facility for daily washing, the bath area is more than symbolic. A luxurious tub is highly desirable for soaking and relaxing and day dreaming. Although in smaller bath rooms the garden tub must double as a shower, a common alternative is to separate the shower enclosure. The design

of shower is evolving away from the standard 3/3 ft bay , which showers stalls increasing to 4/6 ft or larger, with generous glass doors and low curb steps for easy access. The next essential item is the toilet. The toilet should be discretely tucked away from the view by screening with partial wall heights.

4.1.2.5. BATHROOMS

Each dwelling unit should have a bathroom with enough area to accommodate a lavatory, a water closet, and a bathtub or shower. Arrangement for fixtures should provide for comfortable use of each fixture and permit at least a 90° swing unless sliding doors are used. The bathroom should be convenient to the zone and accessible from the living and work areas. Linen storage should be accessible to the bathroom but not located within the bathroom. Each complete bathroom should be provided with the following

- 1) Grab bar and soap dish at bathtub
- 2) Toilet paper holder at water closet
- 3) Soap dish at lavatory (may be integral with lavatory).
- 4) Towel bath
- 5) Mirror and medicine cabinet or equivalent enclosed shelf space.
- 6) A shower rod with showerhead.

CLEARANCES FOR BATHROOMS

The standard 5- by 7-ft bathroom **found** in many housing units is grossly inadequate in serving the sporadic heavy use and the variety of demands found in most families. Toilets should be separated from washing facilities. For units designed to accommodate five people or more, a second toilet should be provided. For dwellings on two levels, the second toilet ideally should not be on the same level as the bathroom. Activities commonly performed in the bathroom include washing of hands, face and hair, bathing, elimination and grooming and also such activities as hand laundering and infant care. And often it is also used as dressing room. Major problems in

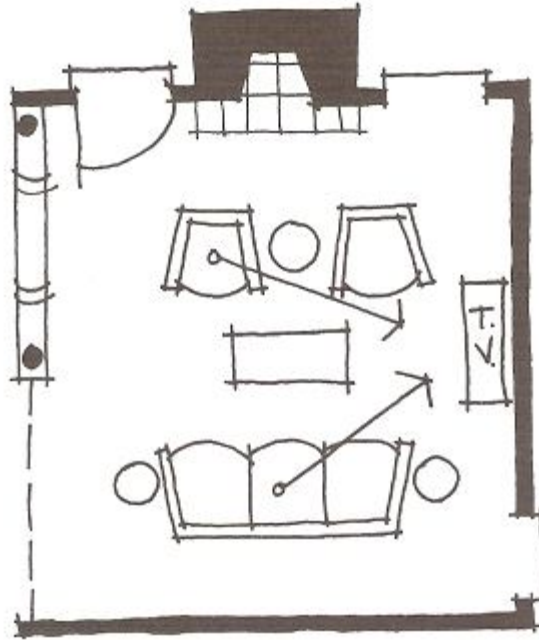


Fig 4.1.54 - family room with space for television viewing

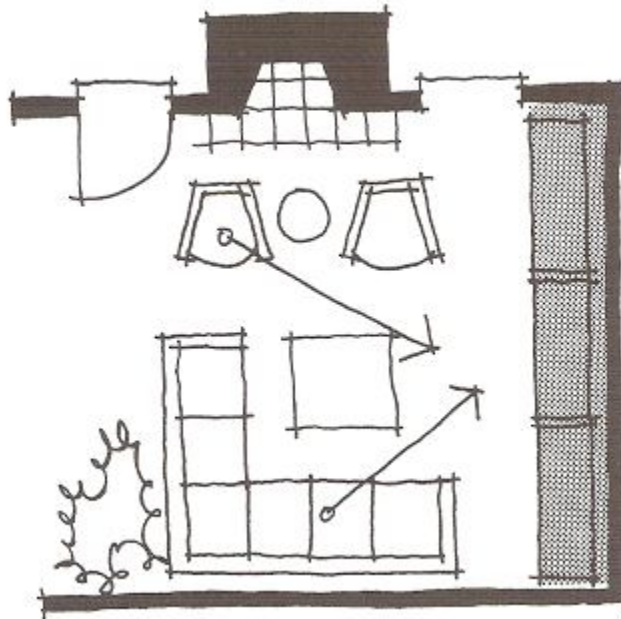


Fig 4.1.55 - family room with media wall

bathroom design include planning for optimum convenience and privacy of all bathroom functions for all members of the household, adequate provision for storage of supplies and equipment and ease of cleaning. Facilities should be conveniently arranged with special attention given clearances. The room arrangement should permit more than one family member to use its facilities at the same time.

4.1.2.6. POWDER ROOMS

Traditionally, the powder room has been extremely small, most often no larger than 3 by 6 ft. In most markets, a 5- by 5-ft space is better as it can accommodate a vanity and toilet side by side. Popular current options in the powder room include pedestal vanities, or "banjo" vanity tops that partially cover the toilet. The powder room may be paired with a guest suite. When this is the case, design may include either a shower/tub combination or a shower, and the inclusion of a window and compartmentalization of the toilet become more important. Design of the powder room should also include careful attention to sound mitigation. Once inside the powder room, guests do not want to feel as if their every move can be heard through paper-thin walls. As with all bathroom locations, such buffer spaces as stairs and closets should surround the powder room to help muffle noise.

4.1.2.7. FAMILY ROOMS

In smaller homes the family room may double as the living room. This is the place house hold members gather in a relaxed manner and share time together. The family room role has gradually evolved into a media center. The television is only one part of the media center but many family room designs provide an entertainment wall that also holds stereo equipment, storage for tapes and records, and a video recorder as depicted in Fig 4.1.54 and 55. With the popularity of home video the family room is now home video providing accessibility to the home snack bar. A *fireplace* is also integral to

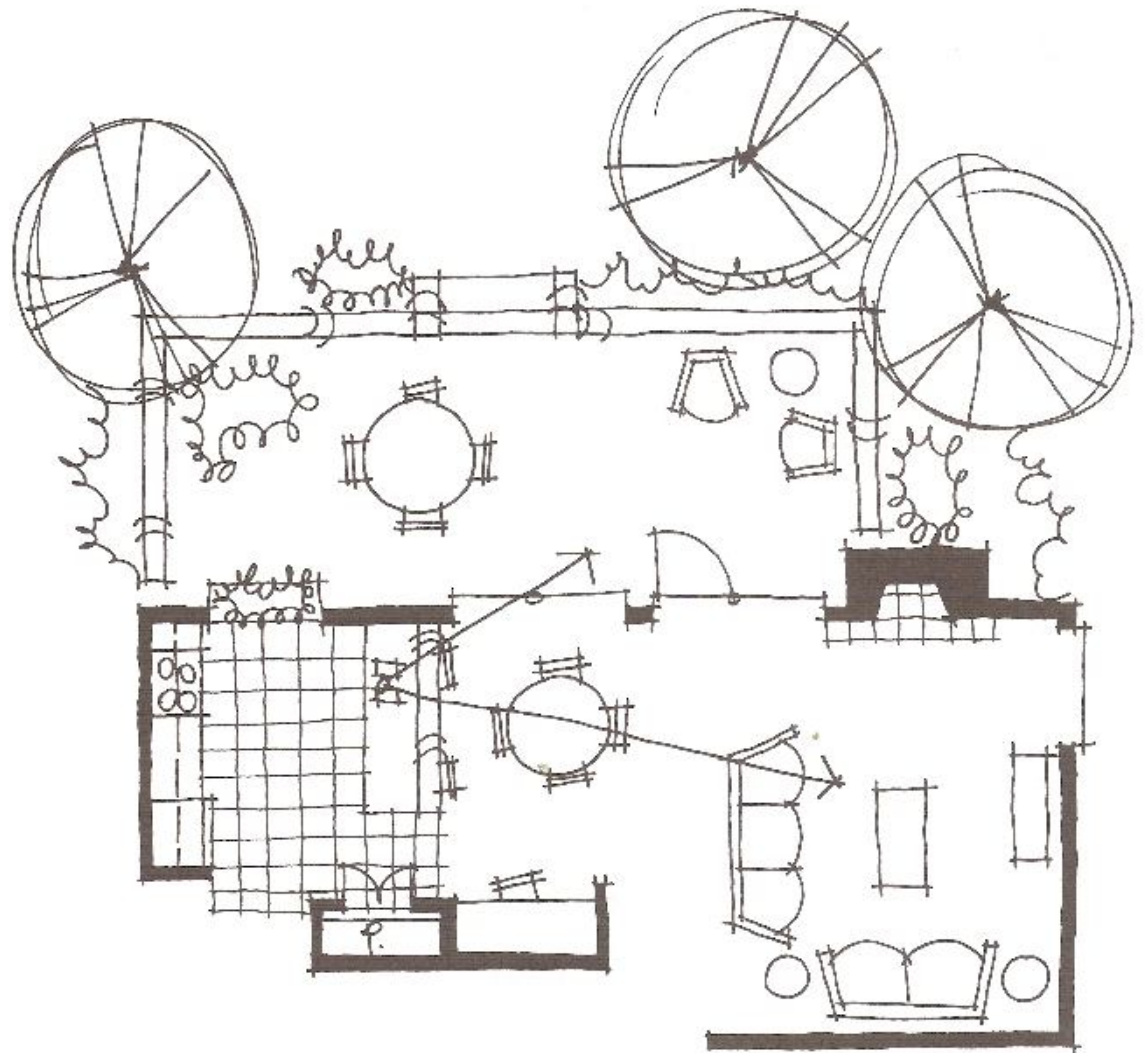


Fig 4.1.56 – View of family room from kitchen and breakfast area

the family room layout. Though in India, this concept is uncommon, Although households seldom use the fireplace if present, this amenity is symbolically important, retaining at least a vestigial role as the true "hearth" and favorite place for intimate gatherings. In addition to the television/media wall and fireplace, the family room must also accommodate group seating, within view of both media center and fireplace. Furnishing plans may include an L-shaped sectional couch or a sofa with two or three side chairs, and the layout should also allow room for a coffee table and side tables. Because of the activity in the community component, space flow between the three areas that form it is extremely important. Occupants of the conversation area should be able to view both the TV and the fireplace. They should also enjoy outdoor views and access, as well as be able to converse with people in the kitchen or breakfast area as shown in fig 4.1.56.

4.1.2.8. CLOSETS AND STORAGE

Requirement

Sufficient closets and storage space should be provided for living and housekeeping within each living unit, All Closets and storage spaces should be appropriately located in relation to their principal uses. Rods take care of practically all clothing on hangers. Usually this will include all dresses, except those for infants, all skirts, blouses, trousers, and coats. Table 1 in the next page, shows the space to allow on the rod for different types of garments. This table also shows how much space to allow from wall to rod and from floor to rod, depending on the width and length of garments hanging from it. If there is a shelf above the rod, a minimum of 2/4 in should be allowed between the top of the rod and the bottom of the shelf.

RELATIONSHIP OF HUMAN DIMENSIONS

Fig 4.1.57 to 60, illustrate the relationship of human dimension and accessibility to low and high storage or furniture usually associated with living spaces. The configuration of the furniture is not intended as a realistic illustration of any specific element of furniture, but rather as a general representation of

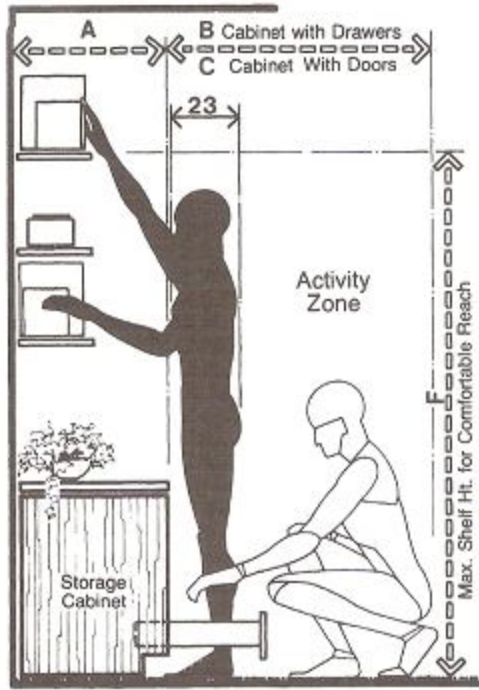


Fig 4.1.57 - wall unit-access by male



Fig 4.1.58 - wall unit-access by female

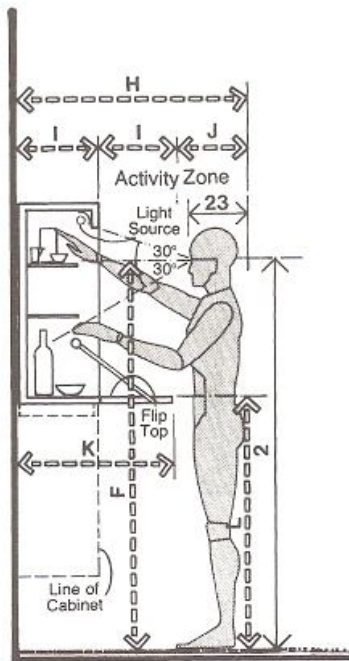


Fig 4.1.59 - wall mounted bar unit-access by male

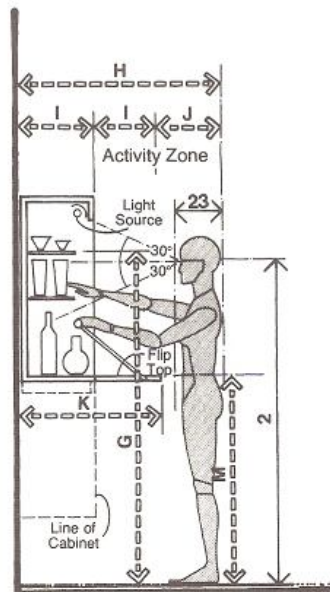


Fig 4.1.60 - wall mounted bar unit-access by female

furniture types normally found in a living space. In situations where the user is not a known entity, either in terms of sex or body size, the body size data of the smaller person should govern, in the event the user is known, dimensions more appropriate to that body size should be used where practical. It should be noted that for each sex two dimensions are shown on the drawing. In each case the lower figure is based on 5th percentile body size data and the larger on 95th percentile data.

TABLE 1	
	Inches
A	18-24
B	48-58
C	36-40
D	46-52
E	30-36
F	72
G	63
H	42-50
I	12-16
J	18
K	24-32
L	32-42
M	36-39

Commentary

1. In bedrooms, the placement of the closet so that it is next to the door into the bedroom minimizes the use of valuable wall space for furniture.

2. Closets should be used between bedrooms and the living-working zones, and between individual bedrooms wherever possible, to enhance privacy.

Unit Storage

The square footage provided for storage may meet a minimum standard, but if it is broken up into areas too small for storing large pieces of equipment, or located inappropriately, storage may still be considered inadequate by users.

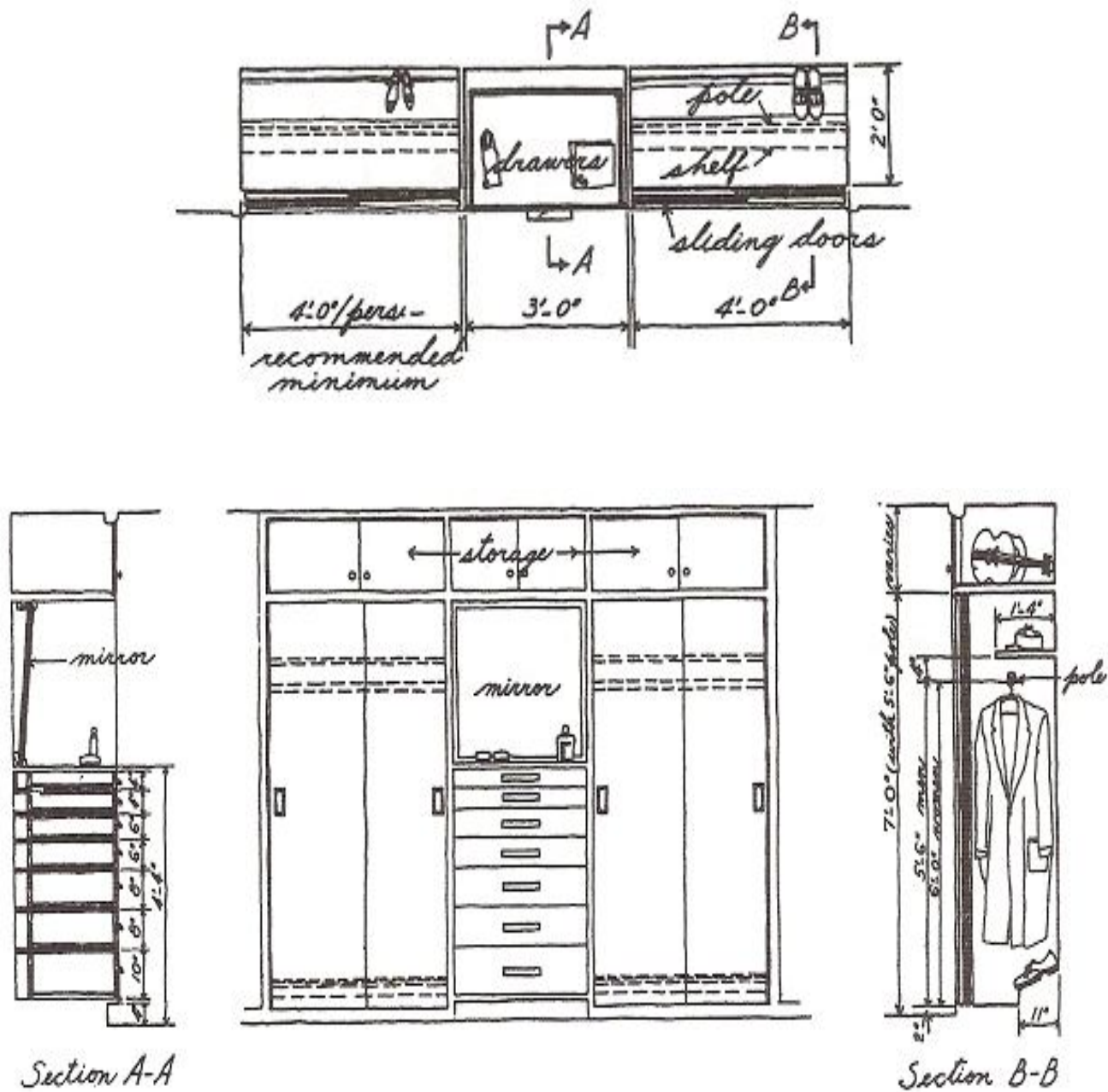


Fig 4.1.61 – closet sections and arrangement

Households with children require a greater amount and variety of space for storage. Infants and young children introduce a considerable amount of bulky equipment such as cribs, bathinettes, strollers, and wheeltots into the household. These items have to be stored close to the areas where they are used if full convenience and utility are to be realized. Locate storage space so that items are near the activity area where they are used. Children's bedrooms should have storage for clothes and toys.

Secure communal storage for bicycles should be provided within easy access of the dwelling (i.e., at grade). The storage areas in Table 1 have been found to be very minimal. Occupants of three-bedroom units identified a need for more square feet of storage distributed between entry, 10 ft²; living, 6 ft²; kitchen, 54 ft²; master bedroom, 12 ft²; child's room, 8 sq.ft at grade (bicycles, etc.), 18ft². Dimensions indicate minimum practical clearances for the storage of articles, commonly used, not their actual sizes. Diagrams and dimensions refer primarily to storage requirements of adults and require adjustment for children. Articles stored on shelves higher than 6 ft 8 in are difficult to reach and should be considered in dead storage. Similarly, 2 ft 6 in is the usual limit of human reach; shelves are in most cases inconvenient if they are deeper than 1ft 3 in. clearance heights and other measurements are listed in table 4.1.11 and 12, and pictorially represented in Fig 4.1.61

4.1.2.9 TWO-BEDROOM APARTMENT

Elements

The two-bedroom apartment consists of two bedrooms, living room, dining area (usually part of the living room), full kitchen, bathroom, and possibly an outdoor terrace. In luxury apartments, an additional half bath, consisting of a water closet and washbasin, may be included.

TABLE 4.1.11 Rod Allowance (or Garments and Location of Rod with respect to Wall and Floor

Garments	Space allowance on rod, in	Desirable minimum distance from wall to rod center, in	Minimum distance from floor to top of rod, in
Adults'			
Skirts	2	12	45
Jackets	3	12	45
Shifts	1 ½	12	45
Suits	2	12	45
Trousers	3	12	45
Dresses	1 ½	12	63
Overcoats	4	12	63
Coats with fur collar	3 -6	12	63
Coats without fur collar	2-5	12	63
Evening gowns	2	12	72
Garments stored in mothproof bags	3	12	72
Children's, 6 to 12 years	--	10	45
Children's, 3 to 6 years	--	8	30

TABLE 4.1.12 Minimum Storage Allowance

Dwelling type	Minimum storage, net ft²
Two- to three-person, two-bedroom	35
Four-person, two- and three-bedroom	45
Five-person, three- and four-bedroom	55
Six-person, three- and (our-bedroom	65

Design

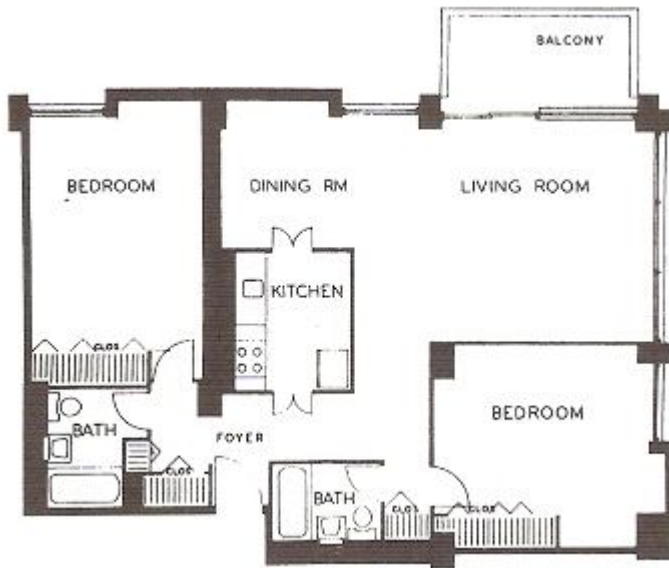
The two-bedroom apartment is considered the average size for a typical family with one or two children. The range of family activities is anticipated within the dwelling unit. The arrangement of rooms should be such as to permit a reasonable separation of living activities (kitchen, dining, living) from sleeping activities. The size of a two-bedroom apartment will range from 500 to 1000 ft². The FHA minimum requirement for such an apartment is approximately 650 ft³. An outdoor terrace is important to add to the livability of the apartment.

Type of Occupancy

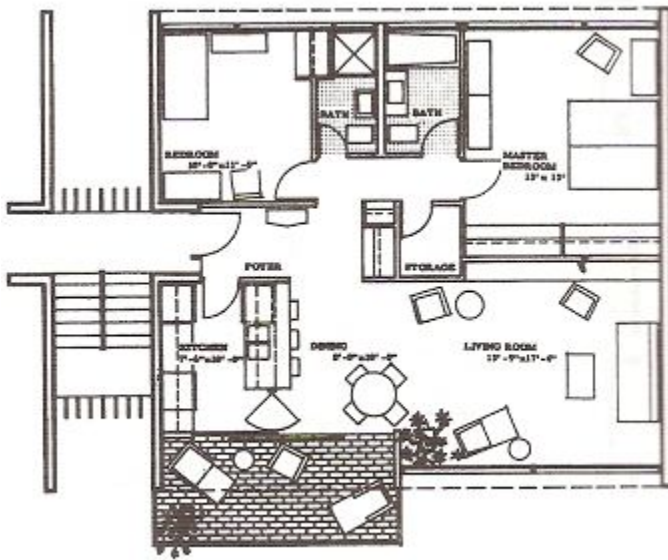
As stated, the average occupancy of two-bedroom apartments will be a family with one or two children. Often a third child or an older relative would be included. Number of occupants will be a minimum of three persons and maximum of four persons.

Planning Implications

Because of the type of occupancy, the two bedroom apartment will yield one or two children of school age. Also, as an average family, they will require a full range of municipal services. The unit has standard room sizes, good entrance privacy, and efficient plan organization. The internal privacy for bedrooms is good, and the circulation paths are organized to minimize disruption of activities. The furnace, hot water heater, and laundry facilities are in the basement. The unit has a primary orientation toward private outdoor space and combined space for living and dining areas.



Carl Sandburg Village, near Chicago. Cordwell & Partners-Architects.



Two-bedroom duplex plan.

The minimum dimensions of activity rooms in a two bedroom apartment are listed below in a tabular form

Features	Dimension s, ft	Area, ft²
Living space	12 x 16.5	198
Dining space		
Kitchen	9 x 10	90
Bedroom 1	13.25 x 10	132
Bedroom 2	11 x 11	121
Bathroom	5 x 8	40

Features	Dimensions, ft	Area, ft²
Living space	16 x 12.5	200
Dining space	10 x 9.5	95
Kitchen	9.5 x 9.5	90.25
Bedroom 1	10 x 13	130
Bedroom 2	9.5 x 14.5	137.75
Bathroom	6.5 x 7.6	48.75

4.2. EXISTING SPACE SAVING FURNITURE DESIGNS

As part of second objective to explore the availability of types of furniture and space modifiers for interiors, a market survey was done so as to collect information on the above. This is used when homemakers are looking out for purchasing new furniture that suits and saves the existing space, and is advised to list the needs / requirements. Well thought out spaces have become an integral part of home design, be it kitchen, living room or the bathroom. With the real estate boom, townships with high end villages and service apartments have created a huge demand for well styled furniture and accessories.

Everybody is looking for furniture that works. One can match the existing feel and look of home with a range of styles and colours. Or one can simply revamp it completely. Any space to be planned to redesign can be matched to specific pieces of sensational furniture, even if redoing the entire room is not thought of.

To finalise on the purchase of any furniture piece depending on the homemakers' requirements, one has to do a deep market survey so as to check the availability of furniture pieces that save space and also those that suit the interior decor. One is likely to spot some of the finest contemporary designs available at a very affordable direct import prices that can also suit the requirement. There are endless choices of ideas, colours and shapes with the most attractive and contemporary designs from around the world.

Along with these, comfort must also be considered as a serious issue. There are finest selection of international furniture and accessories. The living room, dining room and bedroom accessories are exquisite and come in a variety of styles, textures, colours and finishes. Chandeliers as lights are considered to add that extra spark to rooms. They are in vogue.



1) Sofa cum bed



2) Sofa set (3 + 2) and Couch



3) Sectional sofa



4) Sofa cum bed

More and more consumers are opting for modular kitchens. These sleek units are in demand despite the hefty prices as they are designer made and tailor made to suit the needs of the Indian woman who spend a good part of her time in the kitchen. Hence modular kitchens are in vogue, which exude a sense of aesthetics, class and convenience along with using up the available space to the utmost.

A check list was proposed so as to list the furniture that can be functional and space saving and have aesthetic value. The showrooms visited to collect such information were Furniture Walla, Khazana, iStore, Hydro Baths, Godrej Life Space Studiorion and Spice Kitchen from Jubilee Hills, Furniture World, Inner space , Alqove and @Home from Banjara Hills, Lords and Cache from Basheerbagh, A P Furniture, Interior Space and other Furniture stores at Nampally, Home Town and Hyderabad Central at Punjagutta, Big Bazar and Modern Living at Ameerpet, Tumbi from Begumpet, Gautier from M.G.Road, Kreative Furniture at Green Lands, and Style spa from Secunderabad. Also exhibitions conducted at necklace road and Hitex were visited by the investigator for collecting information.

The furniture types found at various stores have been categorised according to their function room wise. Majority of the illustrations given are space savers.

4.2.1 FURNITURE FOR LIVING ROOM

1) Sofa cum bed: Exclusive and excellent space managing furniture, sofa cum bed at Cache has a dual purpose as a Sofa as well as a bed when required. This can be used as sofa in living room and as a bed during nights when there is a necessity to accommodate more than one person at a time comfortably. This piece of furniture is priced Rs.24, 500 only.

2) Sofa set (3+2+Couch) : A beautifully designed sofa set which can be placed as a single unit or can be segregated into two different seats to utilise the



5) Bunk bed



6) Bean bags



7) Expandable Diwan



8) Resin chairs

available space, yet by providing more number of seats is usually observed in every store. The sofa can be separated as 3+2 as one set and a couch as another. So that they can be placed wherever there is availability of space. Such models are available at all stores like Andhra Furniture, Home Town, etc which costs Rs. 30,000 only.

3) Sectional sofa: The most popular contemporary l-shape or sectional sofa makes the living room or media room complete. This model is used where the home maker would be more conscious to use up the corner area also as a seat. The fabric can be changed very easily as all the cushions are detachable and are accessed by zipper. This piece priced Rs. 35,500 only.

4) Sofa cum bed: Yet another model of sofa cum bed made of light weight wrought iron which expands to a size of 5' X 6' , comfortable for a couple to sleep was sited in majority of the stores. The support system on either side extends its strength, preventing the unit from wobbling. The cost of this piece is Rs.16, 500 only and was traced in showrooms like Cache and other exhibitions.

5) Bunk Bed: This model of bunk bed is identified in one of the exhibitions arranged at Necklace Road. This is made of wrought iron and hence is also light in weight allowing the user for free movement. The top of this unit has a bed and the base has a sofa cum bed. This unit is more suitable for a guest bedroom where there could be a chance of more occupancy. The cost of this unit is Rs.23, 000 only.

6) Bean Bags: The leather seats seen these days in the home theatres and lounges are termed as bean bags which are made of foam. These seats can be crushed and kept inside a shelf when not in use. Due to foam density the bags or seats are light in weight hence making their carriage easier. The leather used is available in different colours and quality which justifies its life. The range of price



9) Flexible Centre table



10) Centre Table with Stools



11) Centre Table



12) Shelf table

of bean bags is between Rs.2000 to Rs. 7000 only. These bags were traced at different malls like Hyderabad Central, iStore.

7) Expandable Diwan: The divan can be used as a bed too at night times, if necessary. This divan gets expanded to a 6' bed after the draws from underneath the main plank is pulled out. The cushion placed on it, later, after expansion, acts as mattress and pillows for it to be used as bed. This unit costs Rs. 14,000 only. This model of multipurpose furniture is sited at an exhibition conducted at Hitex.

8) Resin chairs: Resin stackable chairs have evolved into a style all their own. They are easily stored when not in use. A colour matched pillow placed on is a quick way to make them work as an appealing functional piece. The price of each chair starts from Rs. 800 only. This furniture type was seen at @Home and Godrej Life Space.

9) Flexible Centre table: A flexible centre table available at Alqove. This is a flexible centre table which turns out to be a seat after sliding the flaps to either side. The slide is done on channels. The seat in between has been furnished to a cushion so as to give comfort while sitting. The price of this designer piece is Rs.9, 000 only.

10) Centre Table with Stools: Yet another designer model of centre table has been identified at Interior Park, Nampally. This model has glass top and storage unit underneath. It also has small stools accommodated for seating. They can be pushed back inside when not in use and hence saves more space. The price of this set is Rs.17, 490 only.

11) Centre Table: The model of centre table with glass top has got two extra tops underneath for placing papers or magazines. The layer next to the glass top can hold flowers adding colours to interiors. The cost of this piece is



13) Nest of tables



14) Corner/ End Tables



15) Centre Table with Storage



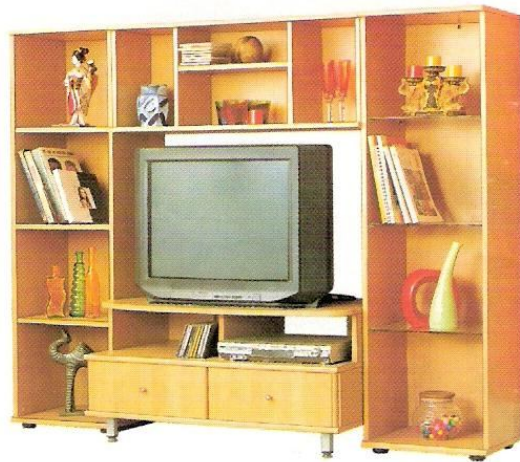
16) Entertainment Unit

Rs.4, 500 only. There are other models with a range starting from Rs.2000. Centre tables of such kind are seen at various furniture showrooms like Andhra Furniture, Interior Park and Khazana. This is named as nest of tables and is a very useful type of furniture. This can have a stack of more than three tables at a place and hence saves lot of space for holding more furniture pieces. When there is any use of more tables the nest is separated for use and after the application, they are stacked back. The cost of this set is Rs.12, 000 only as this is made of bend glass. This exclusive piece was seen in Khazana.

12) Shelf Table: The piece seen here can be used both as centre table and side table. It has multiple tops for which it can hold artefacts, telephone, papers, etc and was observed at Gautier and Modern Living. This has a transparent glass top and is also sleek in nature to get accommodated in compact spaces too. The design is framed in such a way that the second layer has draws to camouflage junk. This is in general seen in almost all the furniture stores. The price ranges up to Rs. 5000 only.

13) Nest of tables: This is named as nest of tables and is a very useful type of furniture. This can have a stack of more than three tables at a place and hence saves lot of area for hold more furniture pieces. When there is any use of more tables the nest is separated for use and after the application, they are stacked back. The cost of this set is around Rs.12, 000 only as this is made of bend glass. This exclusive piece was seen in Khazana.

14) Corner/ End Tables: The glass top small tables are usually placed in the corner and have got more than one top to hold telephone and other artefacts. For the stand steel is used which reflects light. Both steel and glass add to the illusion of space and hence emphasise the ambience. The price ranges from Rs. 2000 to Rs. 5000 only. These designs were traced at Cache and other furniture stores located at Nampally.



17) Entertainment Unit



18) Display / shoe rack



19) Shoe Cabinet



20) Folding chairs

15) Centre Table with Storage: A beautifully crafted bend glass centre table which serves its function as well as adds ambience to the interiors. This glass table has got space to stalk papers and is on castors; hence it can be moved to any place in the interiors. As it is a bent glass, the price is Rs. 6,500 only and is seen at all major stores like Khazana and iStore.

16) Entertainment Unit: This beautifully crafted contemporary entertainment unit can be used as a free standing unit or can be wall hung and is seen at Cache. A similar model is also traced at Khazana. This can also act as a partition between spaces. This has got storage on all sides. This gives a feel of wall panel, yet stores all electronic appliances needed for a television set. Apart from its aesthetic appeal it serves the purpose of storing various gadgets. The cost of this multi purpose unit is Rs. 12,500 only.

17) Entertainment Unit: Entertainment unit shown in the picture here has open shelves and few hidden shelves. This kind of arrangement adds to the available space and since the arrangement of storage is planned towards vertical direction, the floor space is saved but yet no compromise in stacking material. Such designer models are seen at @Home, Home Town and others. The price differs depending up on the size and design. The price of this furniture model is Rs. 28,000 only.

18) Display / shoe rack: The picture seen along side is a model that acts as a display unit and as a shoe rack at the same time. This model is made of wood and occupies less space with more storage facility. The company in which this is displayed is Furniture Walla and it can be customized according to the space available. The piece priced Rs. 11, 500 only.

19) Shoe Cabinet: The shoe cabinet seen is designed to stalk footwear in limited number of racks. The rack placed is divided into a number



21) Inflatable sofas



22) Love seat



23) Sleeper sofa



24) Divan

of partitions to hold more shoes as seen in the picture. The depth of the unit is very less, nearing 12", which occupies very less floor space, yet accommodating more. This rack costs Rs.4,500 only.

20) Folding chairs: Folding chairs offer comfortable and space efficient seating in a living room. One may want to choose a folding chair if you have limited space in living room. If living room is used as party room or a regular meeting point of friends and relatives and living room size is not very large, then a folding chair is the right choice for seating arrangement. Folding chair is useful for mobility and storage. Folding chairs frames are available in variety of materials like aluminium, iron, steel, and wrought iron and wood. These chairs were priced Rs.3, 000 only and were found at furniture showroom of Nampally. Since the chairs are folding, they are easily stackable.

21) Inflatable sofas: The concept of blow-up furniture is really catching on. Inflatable sofas, also called as air sofas are manufactured in multitude of colours and in many different styles and sizes. Most of the inflatable sofas are made of plastic and go very well with modern themed decor. It becomes ideal to provide additional temporary seating in living room and need to add a few more seats. Inflated sofas are easy to inflate, deflate and store. This model is available at iStore and is priced Rs.8, 200 only.

22) Love seat: Specially designed for seating two people, a loveseat is an important item of furniture in the living room. Loveseats are similar to couches but they are smaller in size and commonly have two separate cushions. Loveseat is a great idea for limited space in living room. Each upholstered piece is priced Rs.12, 500 only and was found at @Home.

23) Sleeper sofa: A good sleeper sofa covers several needs at once. It provides comfortable seating for the living or family room while doubling as a spare bed for friends and relatives. This designer model is available at Featherlite and Tumbi and was priced Rs.15, 800 only.



25) Cot with box Storage



26) Foldable Bed



27) Wardrobe with Sliding Doors



28) Dresser with Stool

24) Divan: A divan is useful for a tight space in living room. The Divans can have boxes or built in drawers which help in storage of bed covers, pillows, quilts and many other items. Such models are found at various showrooms and are priced Rs.7,500 only.

4.2.2 FURNITURE FOR BEDROOM

25) Cot with box Storage: Yet another excellent furniture product is available at the Furniture World which gives 15” storage underneath the plank that holds the mattress. This is a cot with storage. In the available space beneath for storing bed linen, pillows, cushions, etc. The mechanism is so very comfortable that the person can lift the plank easily to access the stored items without any stress or effort on muscles. This was costing Rs.23,000 only.

26) Foldable Bed: A light weight fibre made foldable bed which can be easily operated and which does not occupy much space in the room is also seen in few showrooms like Furniture World, Alqove. Because of its design features, it does not appear heavy in the interiors thus giving in illusion of space. The bed can be easily folded and kept against a wall when required. This piece costs Rs.18,000 only.

27) Wardrobe with Sliding Doors: Yet another space manager, wardrobe with sliding shutters seen at Khazana, @Home and iStore. This model has sliding doors instead of conventional openable doors. This type of storage unit can be placed in a bedroom with less square feet area as the sliding doors do not take space to become an access to the storage unit. This wardrobe costs Rs.20,600 only.

28) Dresser with Stool: Functionally designed dresser giving due importance to storage and at the same time saving space for the users due to



29) TV unit



30) Ottoman



31) Night stand



32) Dining table set

its depth is available in various models all over in showrooms. This model of dresser has got minimal storage but also is provided with space that can hold a stool required by the user for dressing. This unit has two draws that can accommodate routine needs. The stool provided can be pulled out when required and can be pushed inside when not. The price quoted is Rs.6, 500 only.

29) TV unit: The illustration given is termed as a TV unit. These kinds of simple units to hold television are usually placed in the living rooms. The unit is on castors for easy movement and also due to its simplicity, the unit looks sleeker in a small space too, having access to storage. Such models cost Rs.6,500 only and is traced at Lords and other furniture stores at Nampally.

30) Ottoman: Ottomans with storage can be used as a table, foot rest or storage space and can easily be moved around a room. The legs can be replaced with castors for easier movement. These seats can be used where ever necessary. The bottom can be used storing articles needed in the room where used. The cost is Rs.3, 500 only. These usually form a part of sofa set and are seen at showrooms like Khazana, Furniture Walla, iStore and Home Town.

31) Night stand: Nightstand can be used as a dresser or desk top or storage unit or as a luggage rack. These can be placed in any bedroom which has arrangements for multitasks. They cost from Rs.4, 300 onwards and are observed as a pair for cots. They are seen at all stores.

4.2.3 FURNITURE FOR DINING ROOM

32) Dining table set: A four seat compact space manager seen besides is a model of dining table. This furniture system can be used both in interiors and exteriors. The design has been taken care of in such a way that it can be expanded enough to place four people and after that the size gets



33) Drop-leaf Dining Table



34) Dining table with double top



35) Round Dining Table



36) Chest of draws

reduced to a table as it accommodates four chairs underneath leaving lot of space around for circulation. The cost of this set is Rs.25, 000 only. This model was seen at an exhibition organised at Hitex.

33) Drop-leaf Dining Table: The table seen in the picture can be used for multitasks such as a study table, ironing table, dining table, breakfast table and sometimes as a coffee table along with storage. The designing has been done in such a way that a table has got foldable planks for extension when ever necessary. The cost is Rs.8, 000 only excluding the price of chairs. Model of this furniture type is seen at Khazana.

34) Dining table with double top: The dining table has a glass top and has a base top underneath it. This base can be used to store plates or any artefact or accessory such as a pepper-salt holder, etc. This set is seen at Cache, Basheerbagh. This kind of set needs longitudinal place to get accommodated. This unit costs Rs.24, 900 only.

35) Round Dining Table: Dining table with four chairs or six chairs, round in shape can be placed in the area with less space as this kind of furniture system enables to use the space judiciously. The chairs are placed along with the shape enabling the user to be left with more circulation space around the system. The price of this set is Rs.23, 500 only and is seen at various furniture stores.

36) Chest of draws: The draws seen in the picture placed besides can be used in dining room to hold cutlery, linens, and also other artefacts. Apart from this, these can also act a low height partition along with storing stuff. The height can be increased to 5' to seal the working place. The price of this storage cum partition starts from Rs. 4000 only.

37) Corner Curio cabinets: It is a high quality collectibles glass front cabinet that is placed at a corner. This piece was found at Khazana, Furniture Walla and Furniture World. This cabinet holds articles like crockery ware, artefacts



37) Corner Curio cabinets



38) Childrens' Bedroom Solution



39) Bed with Side Storage



40) Children Bedroom Unit

and other material. Because of glass and mirror this incorporates illusion of space in interiors. This model was priced Rs.25, 000 only.

4.2.4 FURNITURE FOR CHILDRENS' BEDROOM

38) Childrens' Bedroom Solution: The latest bedroom sets, especially for toddlers and children, are available at majority of stores in the city of Hyderabad. This set contains bunk beds, study table, wardrobe and also provision for storage and display of items for toddler's hobbies. Each and every element of this set has been used very effectively. For example, the steps that take the toddler to second level of bed placement is provided with drawers to store any material inside. Along with the functionalism, a concept is also framed in designing the furniture set which suits childrens' bedroom.

39) Bed with Side Storage: The illustration of the picture shown besides is a model of storage bed which avoids physical strain of moving and lifting it. The unit has storage underneath but in the form of drawers that can be accessed from the side. In this fashion there are four drawers that can be pulled out from either sides of the bed. To pull them out is also easy as the drawers are placed on rollers. This composite piece costs Rs.10, 500 only. This set is seen at BigBazar.

40) Children Bedroom Unit: A beautifully carpented bunk bed which takes care of the minimal storage requirements of a toddler is one of the models available in the furniture showrooms. This model of bed accommodates one toddler onto half level from floor and the rest of the part is all used for store, display, study. This unit is identified at HOMETOWN.

41) Flat boy: From living room to kids' bedroom the Flat boy is a must-have item for every home. It has a varied utilization. The comforting pillow can be used in playroom, study area and also in living room. The children would enjoy and have fun using these Flat boy cushions as they can relax while



41) Flat boy



42) Bedroom solution



43) 2 way book shelf

watching their favorite T.V programs or read some interesting text. The exterior is nylon-coated which can be easily wiped with damp cloth. Measuring 40 x 50 inches the Flat boy will retain its original form no matter how it is used. Once lifted it becomes flat in the shape of a cushion, which can be carried from one room to other. This unique mattress is seen at a furnishing store Studiorion.

42) Bedroom solution: The design mainly featured for childrens' bedroom has two tall units placed on the either sides of bed to act as night table too. In place of foot board, a divan was placed. When space is tight a dual-purpose dressing table-cum-desk and extra storage for work folders with a divan with under-bed storage can be a choice as seen in the picture besides. The cost is Rs.1, 20,000 only. This set is seen at iStore, Banjara Hills.

43) 2 way book shelf: The unit seen in the picture is used to place books for children. One side can stalk books in width wise and the other side would stalk books length wise which results in multi storage. The cost of this piece is Rs.2500 only. This was seen at Home Town.

4.2.5 FURNITURE FOR ROOMS WITH SMALL SPACES

44) Tall Unit: A piled up drawer or in short a chest of drawers designed mainly keeping in view the space in a house or dwelling. It has storage in vertical direction. This is designed to stalk lot of material in vertical fashion. The drawers can categorise the material for proper usage of space without stress. The top of it can also accommodate accessories of furniture and is found in all furniture stores. This can also be used as a shoe rack and is priced as Rs.5,000 only.

45) Foldable Seat: An economical model made of foam which can be used as seat as well as a mattress was identified at the exhibition organised at Hitex, Hitech city. This is made of foam which is folded to use as a seat and opened to use as a mattress.



44) Tall Unit



45) Foldable Seat



46) Wooden seat



47) Wash with Storage

The price of this furnishing accessory is Rs.3500 only and is found at Studiorion.

46) Wooden seat: The designer piece seen in the picture is a model of seat. This has got space to sit and also to store some articles or magazines underneath. The plank seen on to the right side can be rotated to accommodate more people when necessary or else can be rotated back. This was found in one of the exhibitions organised at Hitex and costs Rs.9,500 only.

47) Wash with Storage: This specific storage piece seen besides is a model available at Bath Shoppe, Banjara Hills. This has been done as a sample model which displays a unit to hold wash basin and at the same time providing storage space underneath. The unit has also got free platform space to hold any accessories. The price of it varies depending on the size to which it gets executed. This piece is priced Rs.7,500 only and was found in Hydro Baths.

48) Wooden Partition: The wooden partition seen in the picture is made of wood and has perforations in it. These perforations enable the continuity of space hence resulting in ambience. The piece can be moved to the required place at any point of time without any effort. This acts as a temporary division to spaces and activities yet creating continuity of floor area, with illusion of space and was found in Interior Park and Lords, Basheerbagh. This costs Rs.10,500 only.

49) Study Tables: Designer study tables are seen in the stores with varied models. The colours are also selected in such a way that they suit the interiors of childrens' bedroom. The design is made in such a way that there is a scope for vertical storage system. Such models are found in Cache, Basheerbagh and was priced Rs.6,500 only.



48) Wooden Partition



49) Study Tables



50) Computer Tables



51) Bar unit / Partition

50) Computer Tables: Computer tables are now seen in many models in majority of stores. These concentrate on occupying less floor space but yet storing more material vertically. The design is done in such a way that the piece accommodates all computer accessories and papers in one unit. The price depends on the wood used. The range starts from Rs.2500 only.

51) Bar unit / Partition: Units of such kinds are seen in almost all the furniture stores. They are used for dual purposes, both for bar and partition. This unit is accessible in either direction, and has got space to hold artefacts and other accessories, giving scope for more storage area. It is a sleek unit which can be placed next to a pillar. It is considered as a false partition with functional value. This unit is priced Rs.20, 300 only.

52) CD Rack: The CD Rack unit is also a space saver as it has storage facility in vertical direction rather than horizontal way. This unit can hold maximum CDs and it takes around 9" of floor space. If not floor space it can be nailed to wall directly. There are many sizes available in the market. Hence the home maker can select the required one. The unit is light weight and is portable and are also made of wood and plastic. Such types are quoted between the range of Rs. 3000 to Rs. 5500 depending on the vertical height. This was found in Khazana, Jubilee Hills.

53) Shoe cabinet / seat: This designer piece seen is a custom made furniture accommodating shoes and at the same time providing space for a person to sit on it and dress his feet. The internal partitions are provided so as to accommodate all sizes and categories of shoes of family members. The price of this model is Rs. 4,000 only and is found at iStore.

54) Mobile furniture: Mobile furniture (items that have wheels) also can help home maker use space well. Rolling wooden carts with cabinets underneath can be used in any room. The bed seen in the picture is on castors. The storage behind bed is detachable and can be fixed in any other space. This leaves an option for using space as available. This set was found at @Home, Banjara Hills and priced Rs.1, 35,000 only.



52) CD Rack



53) Shoe cabinet / seat



54) Mobile furniture



55) Kitchen Set

4.2.6 KITCHEN UNITS

55) Kitchen Set: There are a number of companies focusing on the kitchen storage space and also more research is being done in this field. There are a more number of showrooms displaying these research works. The kitchen space solutions have taken a wide revolution helping the home maker enjoy her time in that kind of space within her busy schedule. In the picture, a storage solution option is depicted. Each kitchen set ranges from Rs.1 lakh to Rs. 3 lakh and more. The stores available for such display are Hometown, Spice Kitchen, etc.

4.3. INTERIOR SPACE MANAGEMENT STRATEGIES

The data collected through interview schedules regarding the existing trends followed by homemakers owning two bedroom apartments in the city of Hyderabad, as the third objective, was analysed and the information was tabulated accordingly to frequencies and percentages. The first section of interview schedule consisted of general information about the family. The results are given below.

4.3.1 GENERAL INFORMATION

4.3.1.1- Demographic profile of respondents

Table 4.3.1.1 (a) – Age of respondents

n=50

S. No.	Age range	Frequency	Percentage
1	50 and above	6	12
2	40 – 50	2	4
3	30-40	34	68
4	20-30	8	16

Table 4.3.1.1. (a) represents the age range of respondents. 12 % of respondents fall in elderly age group, 4% of respondents fall in age range of 40 to 50 years, 68 % fall in 30 to 40 years age and new couple in age range of 20 to 30 years are 16%.

Table 4.3.1.1 (b) – Number of families with children

n=50

S. No.	Number of children in family	Frequency of number of families	Percentage
1	1	15	30
2	2	23	46
3	3	7	14
4	nil	5	10

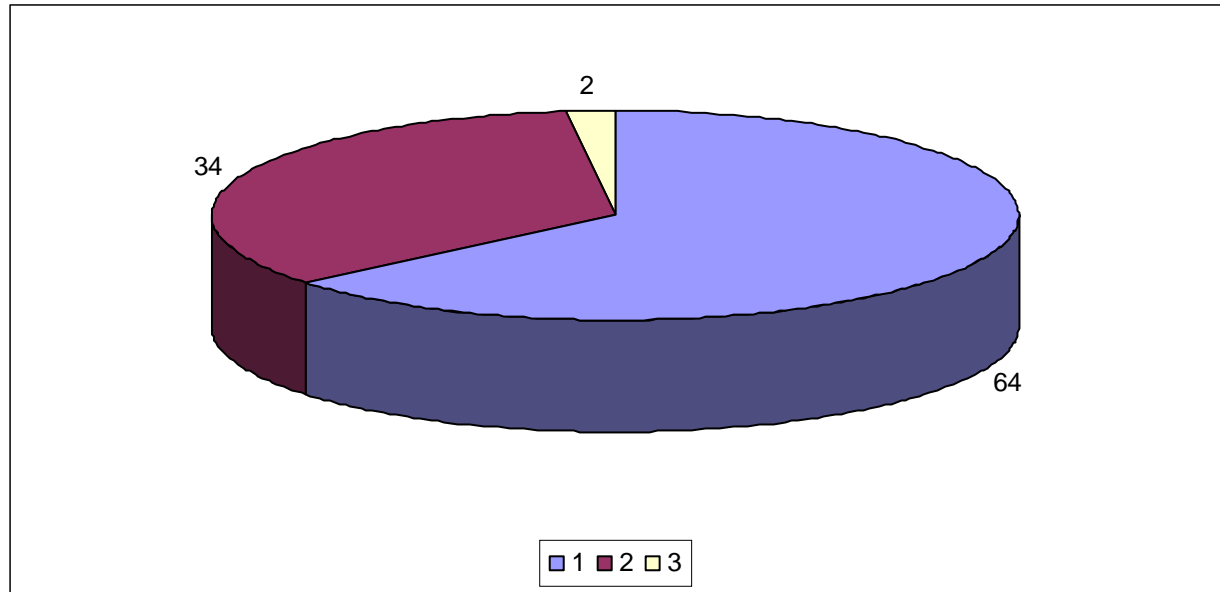
Table 4.3.1.1.(b) represents number of families with 1 child as 30%, 2 children as 46%, three children as 14% and families with no children are 10%.

As a common factor, all the households are owned by the homemaker and the respondents are highly educated.

Table 4.3.1.1 (c) – Socio economic status respondents

n=50

S. No.	Income range in Rs.	Frequency	Percentage
1	5000-10000	1	2
2	10000-20000	5	10
3	20000-30000	4	8
4	30000-40000	7	14
5	40000- 50 000	12	24



1= large room size
2=medium room size
3=small room size

Fig 4.3.1 – Living / dining room area specifications

6	50000-60000	2	4
7	60000-70000	5	10
8	70000-80000	4	8
9	80000-90000	-	-
10	90000-100000	3	6
11	100000-120000	2	4
12	120000-150000	1	2
13	150000-2 lakh	4	8

Table 4.3.1.1 (c) shows income range of respondents. 2% of respondents are middle income group, respondents earning up to 20000 are 10%, up to 30000 are 8%, up to 40000 are 14%, 50000 are 24%, 60000 are 4%, 70000 are 8%, 1 lakh are 6%, 1,20,000 are 4% and income up to 2 lakh are 10%.

4.3.2 SPECIFIC INFORMATION

4.3.2.1 Living / dining room

Table 4.3.2.1.1 – Living / dining room area specifications

n= 50

S. No.	Area	Frequency	Percentage
1	300 sft. To 225 sft. (Large)	32	64
2	225 sft. To 180 sft. (Medium)	17	34
3	180 sft. To 120 sft. (Small)	1	2

From table 4.3.2.1.1, and Fig 4.3.1, it shows that 64% of living / dining rooms were large in size, 17% were medium in size and just 1 household had small living / dining room. The same areas as specified as large, medium and small in further tables of living room data.

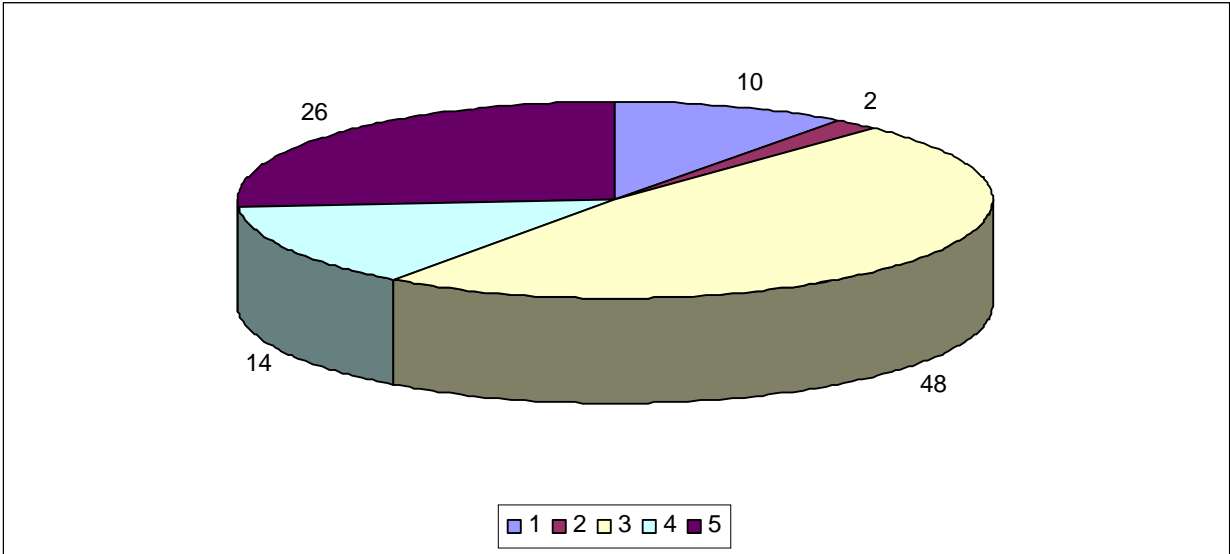
Table 4.3.2.1.2 – Living / dining room furniture

Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
20' x 15' (Large)	Sofa Set	Fabric	Larger	Brown	5	10
			Large	Yellow	5	10
			Medium	Orange	2	4
				Brown	2	4
			Small	Red	1	2
			Wood	Larger	Black	5
	Medium	Brown		4	8	
	Diwan	Wood	Medium	Brown	2	4
		Wrought iron	Large	Yellow	1	2
		Fabric	Medium	White	3	6
	Bean Bags	Leather	Large	Brown	2	4
Total					32	64
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
12'X 10' (Medium)	Diwan	Wood	Large	Brown	2	4
			Medium	Brown	2	4
	Sofa Set	Wood	Large	Brown	1	2
	Diwan and coffee table	Wood	Medium	Brown	3	6
	Sofa Set and Diwan	Fabric and wood	Large	Brown	2	4
	Bean bags	Leather	Medium	Black	1	2
	Sofa Set, Diwan and centre table	Fabric, Wood, Glass	Medium	Blue, Brown and Transparent	2	4
	Sofa Set, Bean bags	Fabric, Leather	Large	Red, Brown	2	4
	Diwan, Centre table	Wood, Glass	Medium	Brown, Transparent	2	4
Total					17	34
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
15' X 8' (Small)	Diwan	Wood	Medium	Brown	1	2

The table 4.3.2.1.2 represents the variety of furniture used in living / dining room. For more details, room size were categorised to large, medium and small, in accordance with dimensions available and then the categorization was done. In large living / dining rooms, 10% were sofa sets, large in size, made of brown fabric. Another 10% were large sofa sets made of yellow fabric. 4% were medium sofa sets made in orange fabric and another 4% were medium sofa sets made in brown fabric. Small sofa sets made in red fabric formed 2%. Large black coloured wooden sofa set were about 10%, and medium brown wooden sofa sets were 8%. There was one household with large yellow Diwan and two households with medium sized brown wooden Diwan. Medium sized furnished Diwan in white was found in 3 households. Bean bags with brown leather were seen in 2 household.

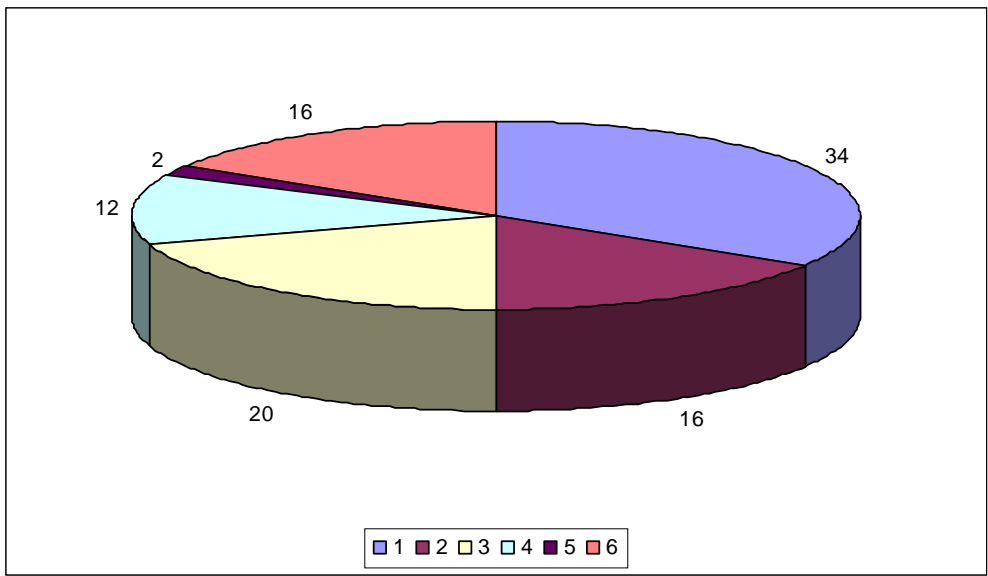
In a medium sized living / dining room, large Diwan with brown wood was found 2 times, large sofa set made in brown wooden polish was found in 1 households, medium sized Diwan with center table was seen in 3 households, medium Diwan made out of brown wood was encountered in 2 households, sofa set of large size made in wood and fabric were seen in 2 households, bean bags of medium size made in black leather were found in 1 households, another 4% of households had combination furniture like sofa set and Diwan, sofa set and bean bags, Diwan and center tables.

In a small living / dining room, a Diwan was placed which is of medium size and is made of brown polished wood.



- 1=texture paint with rough finish
- 2=texture paint with smooth finish
- 3=emulsion paint with rough finish
- 4=emulsion paint with smooth finish
- 5=lappam with smooth finish

Fig 4.3.2. – Living / dining room wall type and finish



- 1=yellow, 2=peach, 3=white, 4=green, 5=light blue, 6= light pink

Fig 4.3.3. – Living / dining room wall colour

Table 4.3.2.1.3 –Living / dining room wall type and finish

n=50

S. No.	Wall type and wall finish	Frequency	Percentage
1	Texture paint with rough finish	5	10
2	Texture paint with smooth finish	1	2
3	Emulsion paint with rough finish	24	48
4	Emulsion paint with smooth finish	7	14
5	Lappam with smooth finish	13	26

From table 4.3.2.1.3 and Fig 4.3.2, as high as 48% of households used emulsion paint with rough finish, 26% used lappam with smooth finish, 14% used emulsion paint with smooth finish, 10% used texture paint with rough finish, where as just 2% of households used texture paint with smooth finish

Table 4.3.2.1.4 –Living / dining room wall colour

n = 50

S. No.	Colour	Frequency	Percentage
1	Cream	17	34
2	Peach	8	16
3	White	10	20
4	Light Green	6	12
5	Light Blue	1	2
6	Light Pink	8	16

From table 4.3.2.1.4 and Fig 4.3.3, it was observed that 34% household had cream, 20% had white walls, 16% each had peach and light pink walls, 12% had light green coloured walls and 2% households only has light blue walls for living / dining room.

Table 4.3.2.1.5 –Living / dining room floor type and colour

n=50

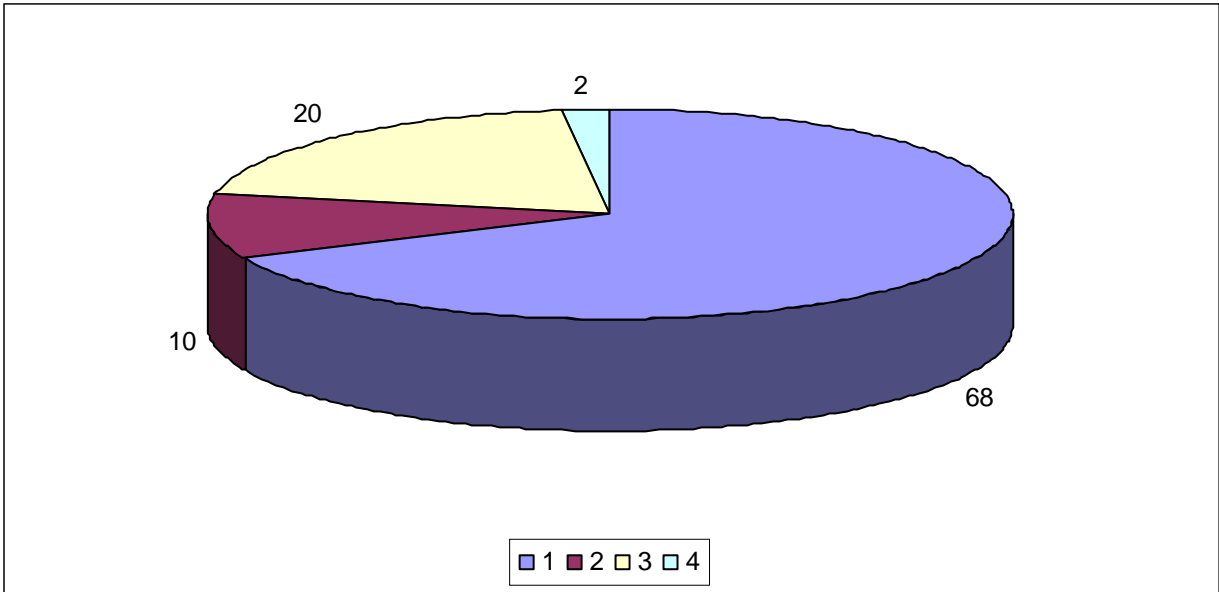
S. No.	Floor type and colour	Frequency	Percentage
1	Marble and white	32	64
2	Marble and green	2	4
3	Tile and white	12	24
4	Tile and black	2	4

From table 4.3.2.1.5, it shows that 32 number of households used marble and white coloured flooring, 24% used tile and white coloured flooring, 2% of households used tile and black, and another 2% of sample used marble and green coloured flooring.

Table 4.3.2.1.6 –Living / dining room curtain colour

n=50

S.No	Colour	Frequency	Percentage
1	Yellow	4	8
2	varied	16	32
3	Orange	6	12
5	Green	7	14
6	Blue	2	4
7	Pink	4	8



1= CFL with white
2= CFL with yellow
3= Focus light with yellow
4= Chandelier with yellow

Fig 4.3.4 – Living / dining room lighting type and colour

8	Brown	4	8
9	Black and white	6	12
10	No curtains	1	2

From table 4.3.2.1.6, as high as 32% of households used combination of different colours for curtains. Yellow coloured curtains were used in 4 households, 12% used orange coloured curtains, 14% used green curtains, 8 % used pink and 4 % used blue coloured curtains in their living / dining room.

Table 4.3.2.1.7 – Living / dining room lighting type and colour

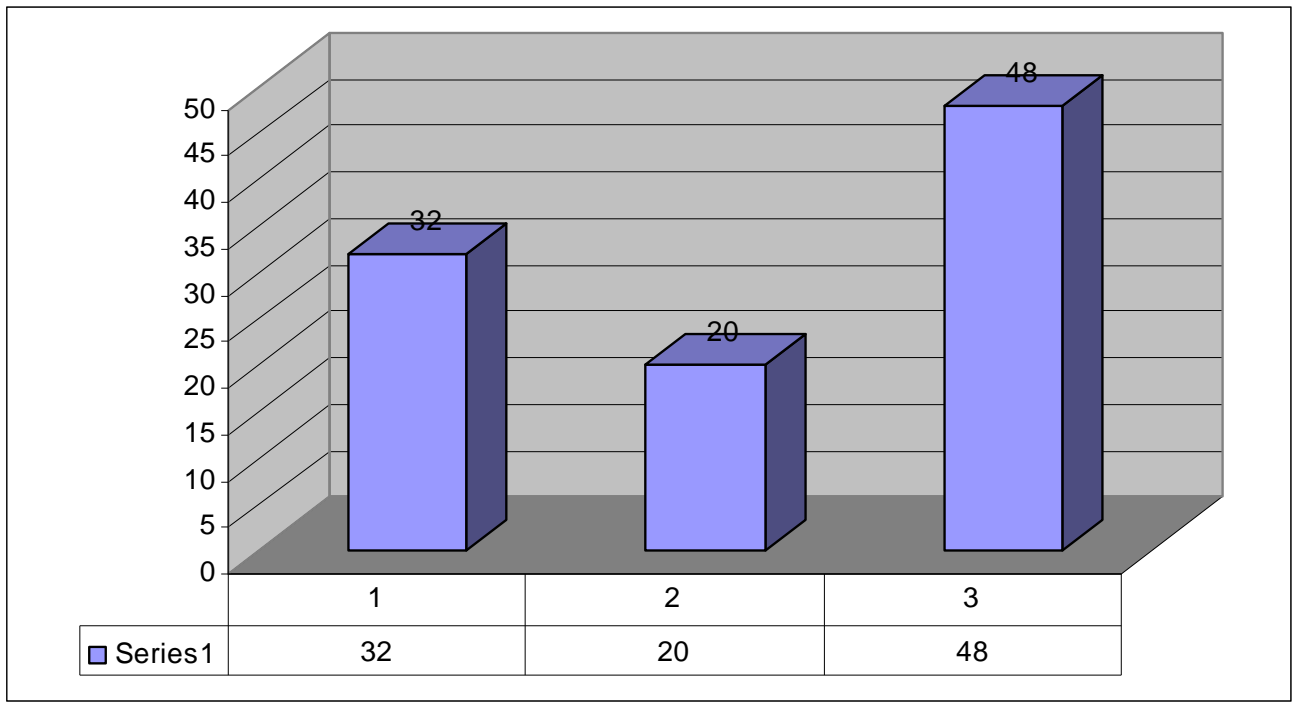
n = 50

S. No.	Lighting type and colour	Frequency	Percentage
1	CFL with white	34	68
2	CFL with yellow	5	10
3	Focus light with yellow	10	20
4	Chandelier with yellow	1	2

From table 4.3.2.1.7 and Fig 4.3.4, it is observed that 34 number of households used CFL with white light, whereas just one household used a chandelier, few household (10) used focus lights with yellow and very few households (5) used CFL with yellow light.

Table 4.3.2.1.8 –Living / dining room Space savers'

Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
20' X 15' (Large)	Built in cupboard	Wood	Larger	Brown	3	6
			Medium	Brown	2	4
		Cemented	Larger	White	3	6
	Flexible Furniture	Wood	Large	Brown	2	4
	Overhead Storage	Wood	Medium	Brown	3	6
	Foldable chairs	Plastic	Medium	White	2	4
				Black	2	4
	Built in crockery unit	Wood	Medium	Brown	2	4
			Small	Black	3	6
		Cemented	Medium	White	1	2
	Round Dining Table	Glass, Steel	Medium	Transparent	1	2
		Wood	Medium	Brown	1	2
	L-Shaped Sofa	Fabric	Large	Red, Brown	2	4
	Centre Table- Storage	Steel, Glass	Medium	Transparent	3	6
Collapsible partition	Plastic	as required	White	1	2	
Centre Table- Stools	Wood, Glass	Medium	Brown	1	2	
Total					32	64
Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
12' x 10' (Medium)	Foldable Chairs	Wrought iron	Medium	Black	2	4
		Plastic	Medium	White	2	4
	Coffee Table	Glass	Medium	Black	13	26
Total					17	34
Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
15' X 8' (Small)	Stackable chairs	Plastic	Medium	White	1	2



1=medium size
 2=large size
 3=small size

Fig 4.3.5 – Kitchen area specifications

As shown in table 4.3.2.1.8, space savers used by homemakers in their apartments are categorised as dimensions of living / dining room. In large living / dining room, 4% of households had medium sized built-in cupboards made of brown wood, 4% of households has flexible furniture of large size in wood, 6 % of houses had large sized Built in cupboard with open shelves, 4% had foldable chairs made of white plastic, 4% had foldable chairs made of black plastic, 2 % of households have Built in crockery units with open shelves, 10% had crockery unit framed with brown and black wood. Some households also had round dining table made of glass and they form 4%. 2 households had L shape sofa. Only one home positioned wooden partition which is collapsible. Centre table with stools and center table with storage, made of wood and glass were found in 42% of households.

In a medium sized living / dining room, the space savers used were wrought iron foldable chairs made in coloured black and were found in 2 households. 2 households had medium sized foldable chairs in white. Other 13 households had medium sized glass coffee tables.

In a small sized living / dining room, one household had stackable chairs made in white plastic.

4.3.2.2: Kitchen

Table 4.3.2.2.1 – Kitchen area specification

n= 50

S. No.	Area	Frequency	Percentage
1	48 sft. (Medium)	16	32
2	63 sft. (Large)	10	20
3	35 sft. (Small)	24	48

From table 4.3.2.2.1 and Fig 4.3.5, it shows that 30 household (60%) of kitchen were 48 sft. in size, 24 households (48%) were 35 sft. in size and 10 household (20%) had 63 sft. in size. The same areas are specified as large, medium and small in further tables of data for living room.

Table 4.3.2.2.2 – Kitchen furniture

Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
63 sft(Large)	L Shape	Wood	Medium	Brown	4	8
	U Shape	Cemented	Large	White	4	8
		Wood	Large	White and Brown	2	4
Total					10	20
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
48 sft(Medium)	U Shape	Cemented	Medium	White	3	6
		Wood	Medium	Brown	2	4
	L Shape	Wood	Medium	White and Blue	3	6
		Cemented	Large	White	2	4
	Double wall	Wood	Large	Brown	1	2
			Medium	Brown	2	4
	Single wall	Wood	Large	White and Orange	1	2
				Black	1	2
			Medium	White and Pink	1	2
Total					16	32
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
35 sft(Small)	L Shape	Cemented	Large	White	4	8
			Medium	White	4	8
			Small	White	4	8
	Single wall	Cemented	Medium	White	2	4
		Wood	Small	White and Green	2	4
	U Shape	Wood	Larger	Brown	2	4
				Orange	2	4
			Large	Blue	2	4
				White and Brown	2	4
Total					24	48

In table 4.3.2.2.2, furniture in kitchen was tabulated as follows: in large sized kitchen with u shape platform, large cemented white colour racks were found in 4 households, large wooden white and brown racks were found in 2 households. In large sized kitchen with I shape platform, medium sized wooden brown racks were found in 8% of households.

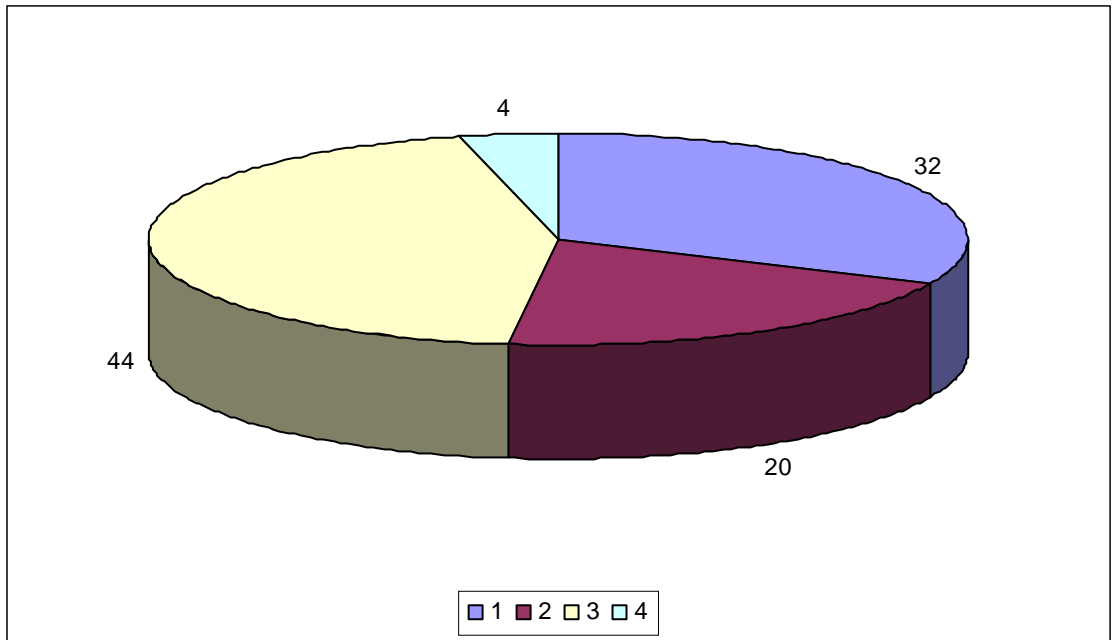
In medium sized kitchen with u shape platform, medium sized cemented racks were found in 3 households and brown wooden racks of medium size were found in 2 households. In medium sized I shape platform, white and blue wooden racks, medium in size were found in 3 households, open racks of large sizes were found in 2 households. In double wall platform, large brown wooden racks were seen in one home and medium sized brown wooden racks were found in 4% of households. Single wall kitchen platforms had large wooden black racks and medium wooden white and pink coloured racks; each in a household.

In small sized kitchen, L shape platform were cemented in 12 households with large, medium and small sizes. Single wall platform were medium sized cemented in 4 households, and wooden in white and green in another 2 households. U shape platforms were all wooden racks found in various colours in about 8 households.

Table 4.3.2.2.3 – Kitchen wall type and finish

n=50

S. No.	Wall type and wall finish	Frequency	Percentage
1	Emulsion paint with rough finish	18	36
2	Emulsion paint with smooth finish	4	8
3	Emulsion paint with tiles	28	56



1=cream
2=peach
3=white
4=light green

Fig 4.3.6 – Kitchen wall colour

From table 4.3.2.2.3, as high as 56% of households used emulsion paint with tiles, 36% used emulsion paint with rough finish and 4% used emulsion paint with smooth finish in their kitchen.

Table 4.3.2.2.4 – Kitchen wall colour

n = 50

S. No.	Colour	Frequency	Percentage
1	Cream	16	32
2	Peach	10	20
3	White	22	44
4	Light Green	2	4

From table 4.3.2.2.4 and Fig 4.3.6, it was observed that 44% household had white wall colour, 32% had cream walls, 20% had peach walls and 2% had green coloured walls for kitchen.

Table 4.3.2.2.5 – Kitchen floor type and colour

n = 50

S. No.	Floor type and colour	Frequency	Percentage
1	Marble and white	21	42
3	Tile and white	28	56
4	Tile and black	1	2

From table 4.3.2.2.5, 28 number of households used tile and white coloured flooring, 42% used marble and white coloured flooring, 2% of households used tile and black, and another 2% of sample used tile and black coloured flooring.

Table 4.3.2.2.6 – kitchen lighting type and colour

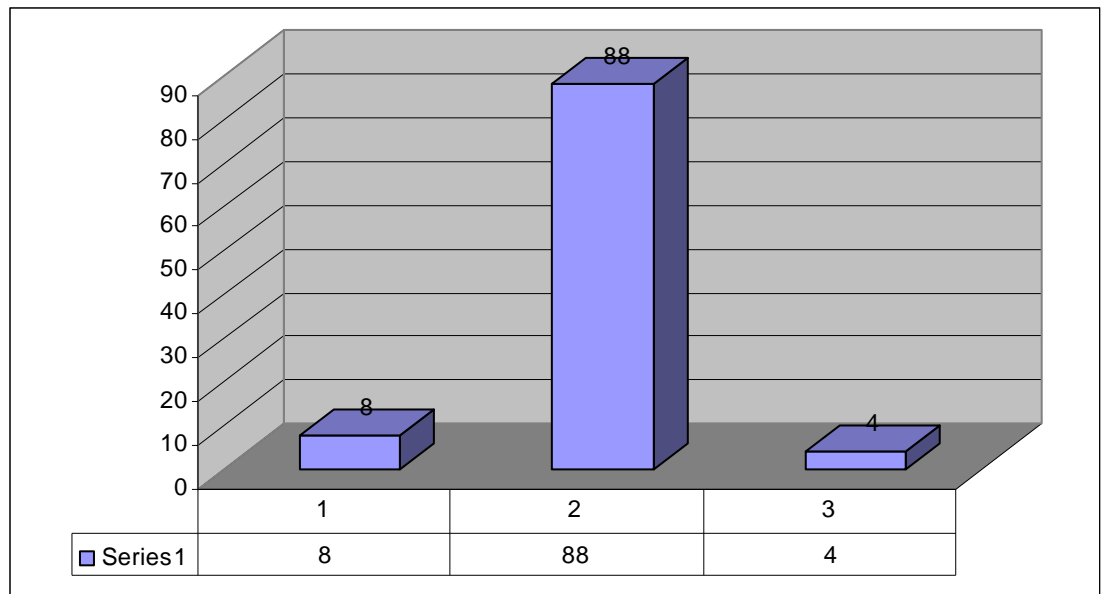
n = 50

S. No.	Lighting type and colour	Frequency	Percentage
1	CFL with white	48	96
2	CFL with yellow	2	4
3	Focus light with yellow	-	-
4	Chandelier with yellow	-	-

From table 4.3.2.2.6, it is observed that 48 number of households used CFL with white light, whereas just 2 households used CFL with yellow.

Table 4.3.2.2.7 – Kitchen Space savers’

Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
63 sft(Large)	Built in Crockery unit	Wood and Glass		Brown and Transparent	4	8
	Built in Crockery unit and overhead storage	Wood and Glass		Brown and Transparent	6	12
Total					10	20
	Type	Material	Size	Colour	Frequency	Percentage
48 sft(Medium)	Built in crockery unit, Loft	Cemented	Medium	White	3	6
		Wood and Glass	Medium	White and Transparent	2	4
				Black and Transparent	1	2
	Overhead and corner unit	Wood	Medium	Brown	1	2
	Built in crockery unit, Loft and Overhead storage	Cemented	Medium	White	2	4
	Tall unit, baskets, loft	Wood	Large	Brown	2	4
				White and Orange	1	2
	Corner unit, Baskets	Wood	Medium	Brown	2	4
				White and Blue	1	2
White and Pink				1	2	
Total					16	32
	Type	Material	Size	Colour	Frequency	Percentage
35 sft(Small)	Built in crockery unit	Cemented	Medium	White	8	16
	Overhead storage and loft	Cemented	Medium	White	6	12
	Overhead and corner unit	Wood	Medium	White and Green	2	4
	Baskets and corner unit	Wood	Medium	Brown	2	4
				Orange	2	4
	Tall unit, baskets, loft	Wood	Large	Blue	2	4
Built in crockery unit and loft	Wood and Glass	Medium	White and Transparent	2	4	
Total					24	48



1=large
 2=medium
 3=small

Fig 4.3.7 – Bedroom area specifications

in the table 4.3.2.2.7, majority of households have inbuilt cupboards and crockery units which save most of the space available. In large kitchens, 10 households had inbuilt crockery units along with overhead storage, covered with wood and glass. In medium size kitchens, majority of shelves were open. 2 households had open shelves for crockery. 2 households had tall unit with draw baskets made in wood. 8 households had corner units done in wood. In small kitchens, 16% of households had inbuilt crockery unit, (with open shelves) 12% of households had open overhead storage units. 8 households had draw baskets in small kitchens.

4.3.2.3 Bedroom 1

Table 4.3.2.3.1 – Bedroom 1 area specification

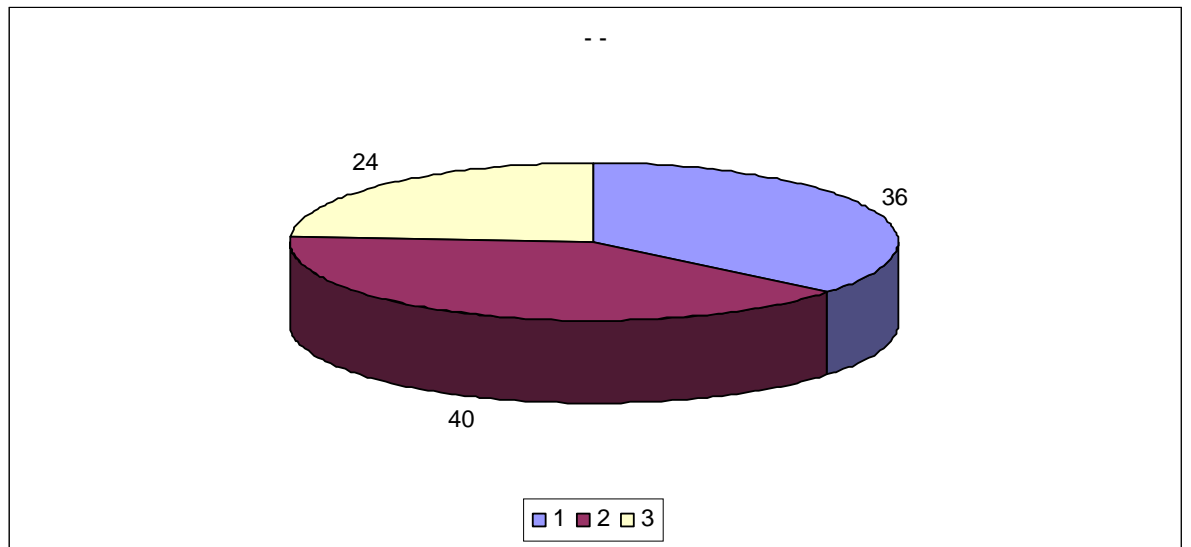
n= 50

S. No.	Area	Frequency	Percentage
1	225 sft. (Large)	4	8
2	180 sft. (Medium)	44	88
3	120 sft. (Small)	2	4

From table 4.3.2.3.1, it shows that 4 household (8%) of bedroom 1 were 225 sft. in size, 44 households (88%) were 180 sft. in size and 2 household (4%) had 120 sft. in size. The same areas as specified as large, medium and small in further tables of bedroom 1 data.

Table 4.3.2.3.2 – Bedroom 1 furniture

Room Size	Furniture						
	Type	Material	Size	Colour	Frequency	Percentage	
225 sft.(Large)	Double cot and Dresser	Wood	Medium	Brown	2	4	
	Double cot, Dresser, wardrobe and study	Wood	Medium	Brown	2	4	
Total					4	8	
Room Size	Furniture						
	Type	Material	Size	Colour	Frequency	Percentage	
180 sft.(Medium)	Double cot and dresser	Wood	Large	Brown	2	4	
	Double cot	Wood	Large	Brown	4	8	
			Medium	Brown	10	20	
				Blue	2	4	
		Wrought iron	Medium	Black	3	6	
			Brown	2	4		
		2 single cots	Wood	Medium	Brown	9	18
	Large			Brown	2	4	
	Small			Red	2	4	
	King size bed, Dresser and wardrobe	Wood	Medium	Brown and Black	2	4	
	Double cot and wardrobe	Wood	Large	Brown	2	4	
	Total					44	88
	Room Size	Furniture					
		Type	Material	Size	Colour	Frequency	Percentage
120 sft.(Small)	Double cot	Wood	Large	Brown	2	4	
Total					2	4	



- 1=texture paint with rough finish
- 2=texture paint with smooth finish
- 3=emulsion paint with rough finish
- 4=emulsion paint with smooth finish
- 5=lappam with smooth finish

Fig 4.3.8 – Bedroom wall type and finish

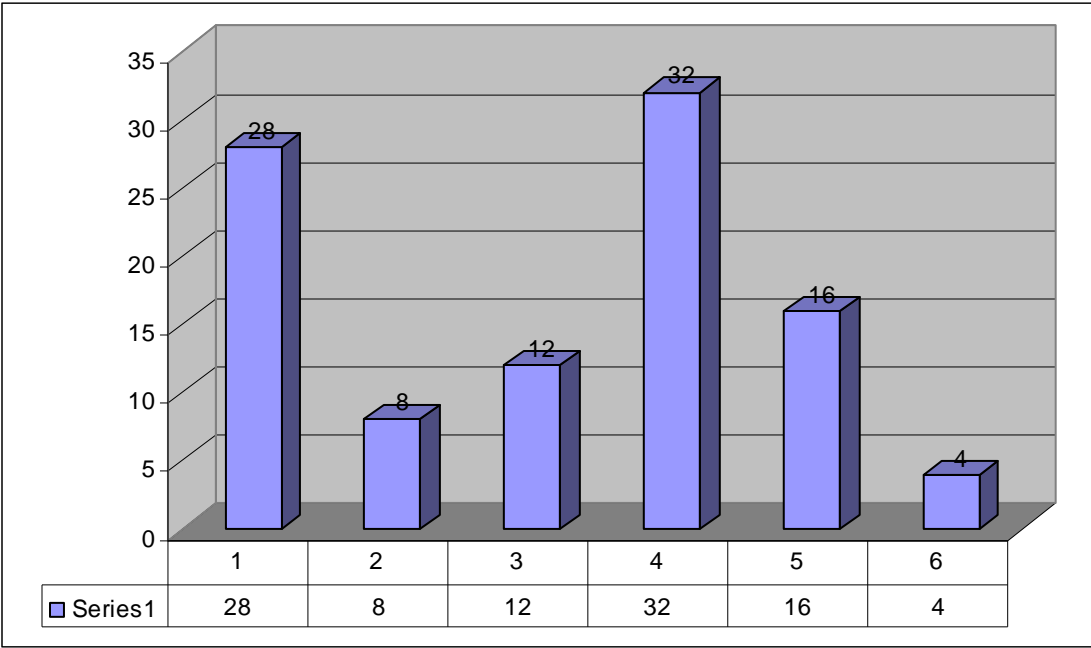
Table 4.3.2.3.2 depicts details of furniture available in bedroom 1 / master bedroom. In large bedroom 1, double cot made in brown wood of medium size was seen in 2 households. In another 2 households, double cot, dresser, wardrobe and study table as a set was found. In medium sized bedroom 1, double cot and a dresser large wooden brown coloured was seen in 8% of households, just the double cot made of wood was found in 36% of households. Wrought iron double cot of black and brown colour is found in 3 and 2 households respectively. 2 single cots made of wood are found in 13 households alone. King size bed, dresser and a wardrobe made in wood and large in size are found in 2 households. In small bedrooms, double cot alone, made in wood was found in 2 households.

Table 4.3.2.3.3 – Bedroom 1 wall type and finish

n=50

S. No.	Wall type and wall finish	Frequency	Percentage
1	Texture paint with rough finish	-	-
2	Texture paint with smooth finish	-	-
3	Emulsion paint with rough finish	18	36
4	Emulsion paint with smooth finish	20	40
5	Lappam with smooth finish	12	24

From table 4.3.2.3.3 and Fig 4.3.8, as high as 40% of households used emulsion paint with smooth finish, 36% used emulsion paint with rough finish and 12% used lappam with smooth finish in their bedroom 1.



- 1=cream
- 2=peach
- 3=light green
- 4=light blue
- 5=light pink
- 6=more than one colour

Fig 4.3.9 – Bedroom 1 wall colour

Table 4.3.2.3.4 – Bedroom 1 wall colour

n = 50

S. No.	Colour	Frequency	Percentage
1	Cream	14	28
2	Peach	4	8
3	Light Green	6	12
4	Light Blue	16	32
5	Light Pink	8	16
6	More than one colour	2	4

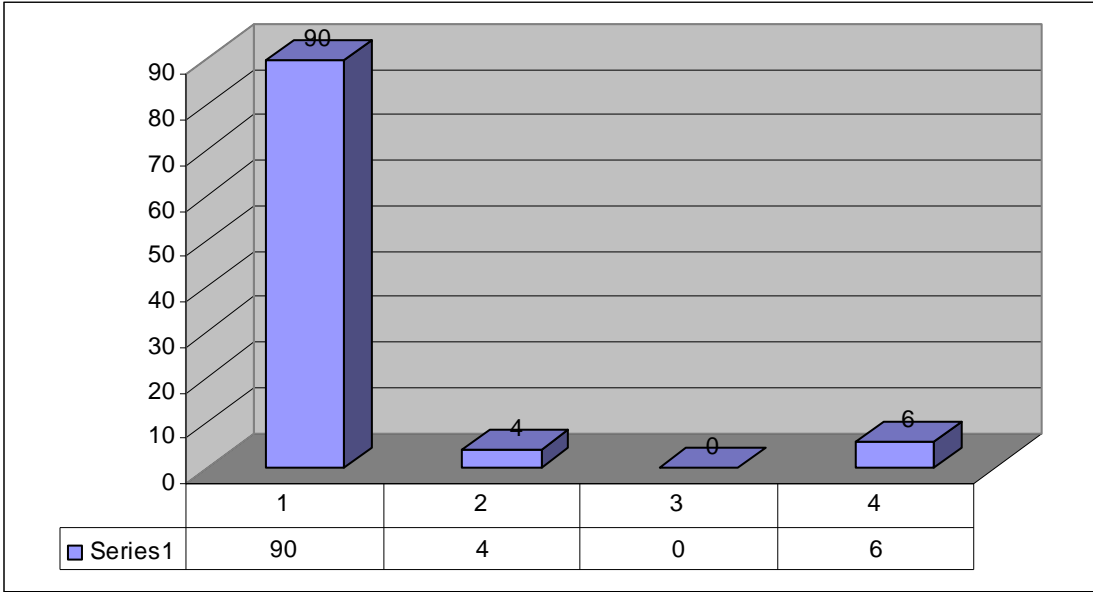
From table 4.3.2.3.4 and Fig 4.3.9, it is seen that 16 (32%) households used light blue wall colour, 14 (28%) had cream walls, 8 (16%) had light pink walls, 6 (12%) had light green for walls, 4 (8%) had peach and 2 (4%) had more than one colour for walls of bedroom 2.

Table 4.3.2.3.5 – Bedroom 1 floor type and colour

n = 50

S. No.	Floor type and colour	Frequency	Percentage
1	Marble and white	32	64
2	Tile and white	16	32
3	Tile and black	2	4

From table 4.3.2.3.5, it shows that 32(64%) number of households used marble and white coloured flooring, 32% used tile and white coloured flooring, 4% of households used tile and black colour.



1=CFL with white
 2=CFL with yellow
 3=Focus with yellow
 4=chandelier with yellow

Fig 4.3.10 – Bedroom 1 lighting type and colour

Table 4.3.2.3.6 – Bedroom 1 curtain colour

n = 50

S .No.	Colour	Frequency	Percentage
1	Yellow	2	4
2	Orange	2	4
3	Green	7	14
4	Blue	6	12
5	Pink	6	12
6	Brown	7	14
7	Varied colours	20	40

In the above table, green and brown coloured curtains were used in majority if households of 7 each. 12% of households used blue and pink coloured curtains in each. Combination of colours for curtains was used in more number of households (40%). Yellow and orange coloured curtains were found in 4 households each.

Table 4.3.2.3.7 – Bedroom 1 lighting type and colour

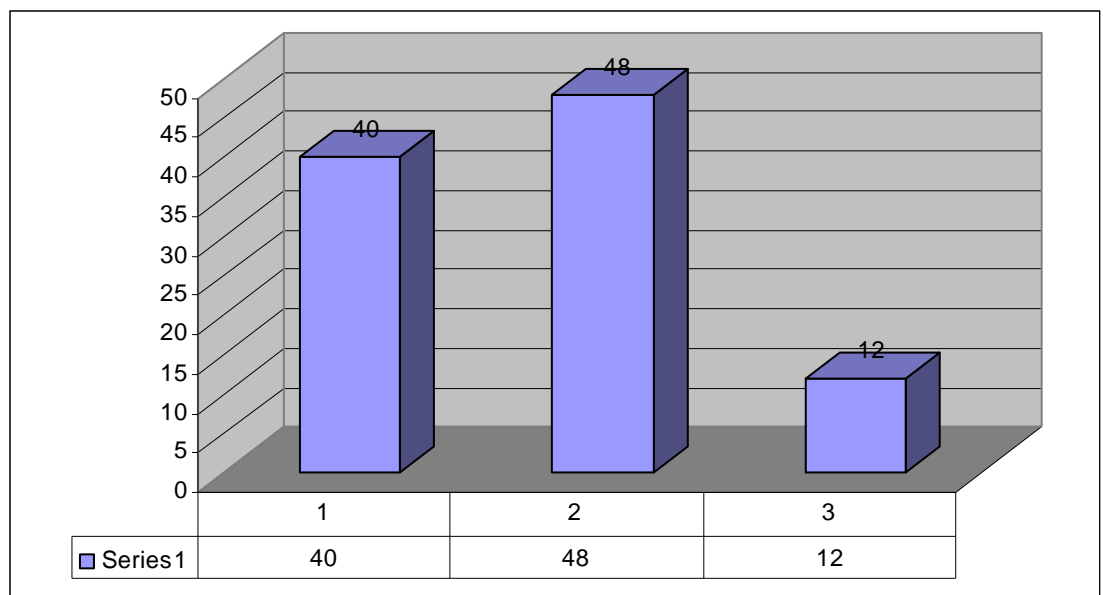
n = 50

S. No.	Lighting type and colour	Frequency	Percentage
1	CFL with white	45	90
2	CFL with yellow	2	4
3	Focus light with yellow	-	-
4	Chandelier with yellow	3	6

From table 4.3.2.3.7 and fig 4.3.10, it is observed that 45 number of households used CFL with white light, whereas just 2 households used CFL with yellow. There were 3 households having a chandelier with yellow.

Table 4.3.2.3.8 – Bedroom 1 Space savers’

Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
225 sft(Large)	Built in wardrobe and dresser	Wood	Large	Black	2	4
Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
180 Sft(Medium)	Built in wardrobe	Cemented	Large	White	8	16
			Medium	White	4	8
		Plastic	Medium	Brown	3	6
	Built in cupboard and wardrobe	Wood	Medium	Brown	4	8
	Built in wardrobe and mirror	Wood and Glass	Medium	Brown and Transparent	5	10
	Built in dresser cum wardrobe	Cemented	Medium	White	4	8
	Built in wardrobe and loft	Wood and Mirror	Large	Brown and Transparent	4	8
	Built in wardrobe and study table	Wood	Large	Orange	3	6
	Storage cot and loft	Wood	Medium	Orange	4	8
	Built-in cupboards	Cemented	Medium	White	4	8
	Stackable chair and Built in wardrobe	Plastic and Cemented	Medium	White	3	6
Total					46	92
Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
120 sft(Small)	Built in wardrobe	Wood and Mirror	Medium	Brown and Transparent	2	4



1=large
 2=medium
 3=small

Fig 4.3.11 – Bedroom 2 area specifications

In the table 4.3.2.3.8, space savers for bedroom 1 were tabulated as follows: in large bedroom, built-in wardrobes were found in 2 households which are made of black wood. In medium size bedrooms, large open built-in wardrobes were found in 8 households, medium open built-in wardrobes were found in 8% of households, brown plastic medium sized inbuilt wardrobe in 3 households. In other households, inbuilt units were seen made in wood and glass.

4.3.2.4 Bedroom 2

Table 4.3.2.4.1 – Bedroom 2 area specification

n = 50

S. no.	Area	Frequency	Percentage
1	180 sft. (Large)	20	40
2	150 sft. (Medium)	24	48
3	120 sft. (Small)	6	12

From table 4.3.2.4.1 and Fig 4.3.11, it is seen that 20 household (40%) of bedroom 2 were 180 sft. in size, 24 households (48%) were 150 sft. in size and 6 household (12%) had 120 sft. in size. The same areas as specified as large, medium and small in further tables of bedroom 2 data.

Table 4.3.2.4.2 – Bedroom 2 furniture

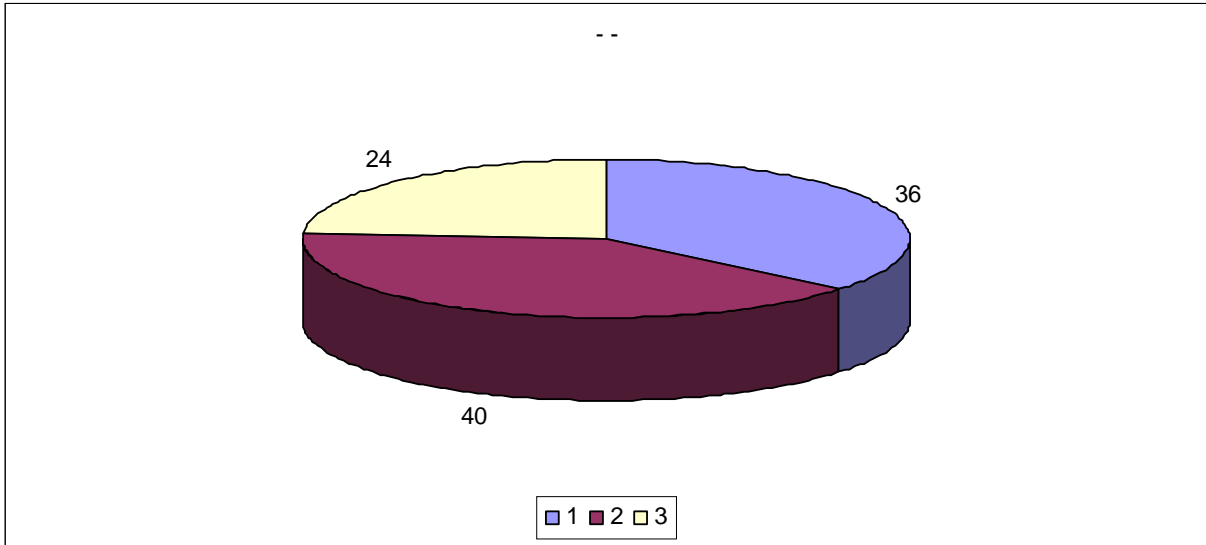
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
180 sft(Large)	Double cot and dresser	Wood	Medium	Orange	2	4
		Wrought iron	Medium	Black	4	8
	Two single cots and dresser	Wood	Small	Brown	4	8
	Single cot and wardrobe	Wood	Medium	Brown	2	4
	Two single cots	Wrought iron	Medium	Black	4	8
	Single cot	Wrought iron	Large	Black	4	8
Total					20	40
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
150 sft(Medium)	Single cot	Wood	Medium	Brown	2	4
		Wrought iron	Large	Brown and Black	2	4
	Mattress and wardrobe	Fabric and wood	Large	White and brown	2	4
	Accent chairs and centre table	Fabric wood and glass	Large	Brown and transparent	2	4
	Study table	Wood	Large	Brown	4	8
	Wardrobe	Cemented	Small	White and brown	4	8
	Double cot cum storage	Wood	Medium	Black	2	4
	Double cot and study table	Wood	Medium	Brown	2	4
	Two single cots	Wood	Large	Brown	2	4
		Small	Brown	2	4	
Total					24	48
Room size	Furniture					
	Type	Material	Size	Colour	Frequency	Percentage
120 sft(Small)	Single cot	Wood	Medium	Brown	2	4
	Single cot with side tables	Wrought iron	Medium	Black	2	4
	Cot under cot	Wood	Medium	Brown	2	4
Total					6	12

In the table 4.3.2.4.2, large sized bedroom 2 had the following furniture: double cot and dresser of medium size made of orange wood was found in 2 households, wrought iron double cot of medium size made in black colour was found in 4 households. Two single cots of small size made of brown wood were found in 4 other households. Single cot and a wardrobe made of brown wood were found in 2 households. Two single cots made of black coloured wrought iron were found in 4 households. Single cot made of black wrought iron was found in 4 other households. In medium sized bedroom 2, single cot made of brown wood was found in 2 households, mattress and wardrobe made of white fabric and black wood was found in 2 households, accent chairs and centre table made of fabric and wood were found in 2 households, study table made of wood in 4 households, inbuilt wardrobe in 4 households, double cot with underneath storage made of black wood was found in 2 households, double cot and study table made of wood in brown colour were found in 2 households, 2 single cots made of wood both large and small were found in 2 households respectively. In small sized bedroom 2, single cot of medium sized made of brown wood was found in 2 households, single cot with side tables made of wrought iron in black colour was found in 2 households, and cot under cot made of wood in brown colour was found in 2 households.

Table 4.3.2.4.3 – Bedroom 2 wall type and finish

n = 50

S. No.	Wall type and wall finish	Frequency	Percentage
1	Texture paint with rough finish	-	-
2	Texture paint with smooth finish	-	-
3	Emulsion paint with rough finish	18	36
4	Emulsion paint with smooth finish	20	40
5	Lappam with smooth finish	12	24



1=emulsion paint with rough finish
2= emulsion paint with smooth finish
3=lappam with smooth finish

Fig 4.3.12 – Bedroom 2 wall type and finish

From table 4.3.2.4.3 and Fig 4.3.12, as high as 40% of households used emulsion paint with smooth finish, 36% used emulsion paint with rough finish and 12% used lappam with smooth finish in their bedroom 2.

Table 4.3.2.4.4 – Bedroom 2 wall colour

n = 50

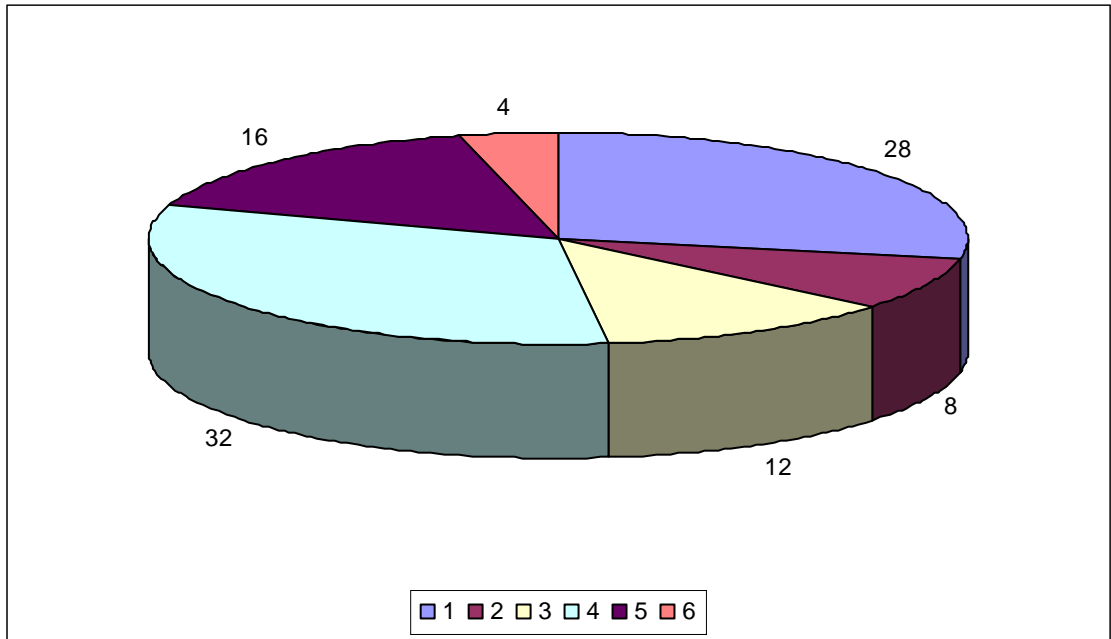
S. No.	Colour	Frequency	Percentage
1	Cream	14	28
2	Peach	4	8
3	Light Green	6	12
4	Light Blue	16	32
5	Light Pink	8	16
6	More than one colour	2	4

From table 4.3.5.4, it was seen that 16 (32%) households used light blue wall colour, 14 (28%) had cream walls, 8 (16%) had light pink walls, 6 (12%) had light green for walls, 4 (8%) had peach and 2 (4%) had more than one colour for bedroom 2 walls.

Table 4.3.2.4.5 – Bedroom 2 floor type and colour

n = 50

S. No.	Floor type and colour	Frequency	Percentage
1	Marble and white	32	64
2	Tile and white	16	32
3	Tile and black	2	4



1=cream
 2=peach
 3=light green
 4=light blue
 5=light pink
 6=more than one colour

Fig 4.3.13 - Bedroom 2 wall colour

From table 4.3.2.4.5 and Fig 4.3.14, 32(64%) number of households used marble and white coloured flooring, 32% used tile and white coloured flooring, while 4% of households used tile and black.

Table 4.3.2.4.6 – Bedroom 2 curtain colour

n = 50

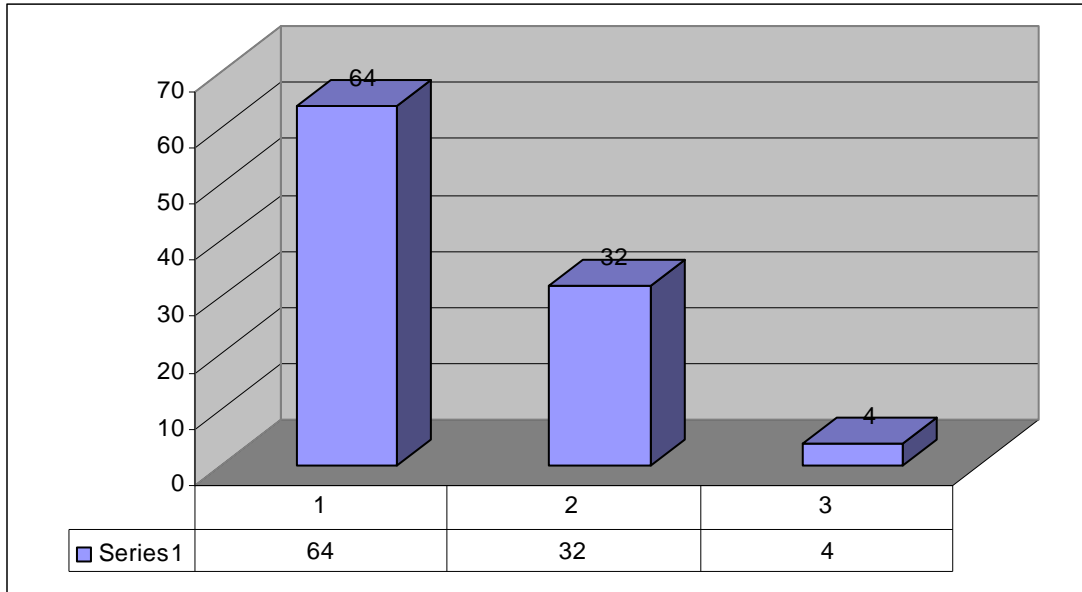
S.No	Colour	Frequency	Percentage
1	yellow	2	4
2	Orange	2	4
3	Green	7	14
4	Blue	6	12
5	Pink	6	12
6	Brown	7	14
7	Varied colours	20	40

In the table 4.3.2.4.6, 40 % of households were using combination of colours onto curtains, 14% each with green and brown, 12 % each with blue and pink coloured curtains, 4% each with yellow and orange coloured curtains in bedroom 2.

Table 4.3.2.4.7 – Bedroom 2 lighting type and colour

n = 50

S. No.	Lighting type and colour	Frequency	Percentage
1	CFL with white	45	90
2	CFL with yellow	2	4
3	Focus light with yellow	2	4
4	Chandelier with yellow	1	2



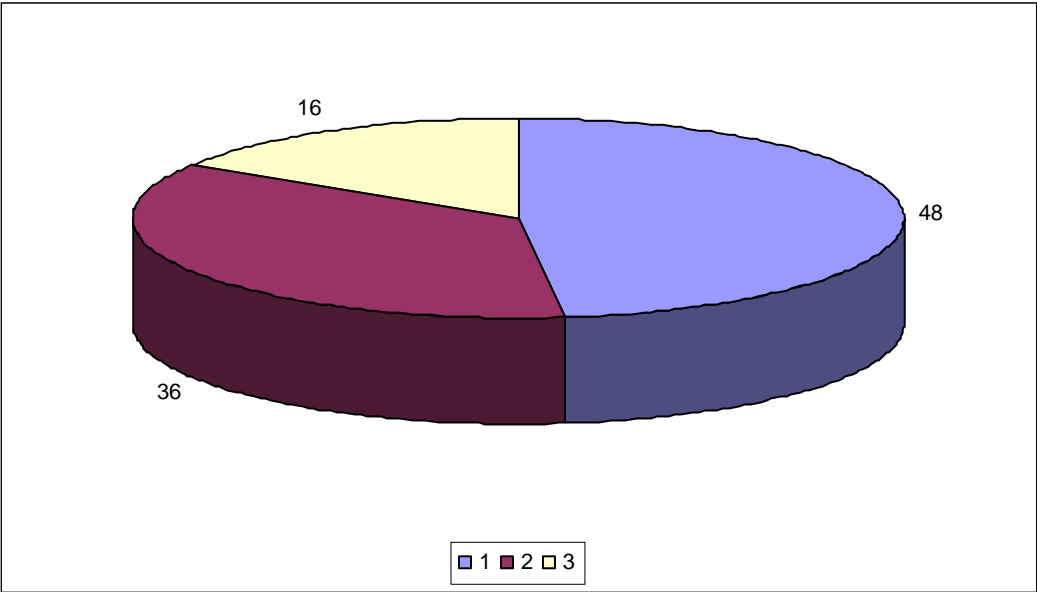
1=marble and white
 2=tile and white
 3=tile and black

Fig 4.3.14 – Bedroom 2 floor type and colour

From table 4.3.5.7, it is observed that 45 number of households used CFL with white colour light, whereas just 2 households used CFL with yellow colour. There were 2 households having focus lights with yellow colour and one bedroom had a chandelier with yellow colour.

Table 4.3.2.4.8 – Bedroom 2 Space savers’

Room size	Space saver					
	Type	Material	Size	Colour	Frequency	Percentage
180 sft(Large)	Built in wardrobe	Wood	Medium	Red	2	4
			Small	Black	4	8
		Cemented	Medium	White	4	8
	Dresser cum luggage	Wood	Medium	Brown	2	4
	Godrej wardrobe	Plastic	Medium	Blue	4	8
		Iron	Small	Brown	4	8
Total					20	40
150 sft(Medium)	Type	Material	Size	Colour	Frequency	Percentage
	Built in wardrobe cum TV unit	Wood and Mirror	Medium	Brown and transparent	2	4
	Stackable chairs	Plastic	Medium	White	2	4
	Wardrobe cum dresser	Wood and Mirror	Medium	Red	2	4
	Built in wardrobe cum dresser	Wood and Mirror	Medium	Brown and transparent	6	12
				Black	2	4
	Night stand cum luggage	Plastic	Medium	White	2	4
	Diwan cum bed	Wood	Medium	Orange	4	8
	Built in wardrobe	Cemented	Large	White	2	4
	Built in wardrobe and flip top dining table	Wood and glass	Medium	Brown and blue	2	4
Total					24	48
120 sft(Small)	Type	Material	Size	Colour	Frequency	Percentage
	Built in wardrobe	Wood and mirror	Medium	Brown and transparent	2	4
	Built in wardrobe cum dresser	Cemented	Medium	White	2	4
	Built in wardrobe and loft	Wood and mirror	Medium	Brown	2	4
Total					6	12



1=large
2=medium
3=small

Fig 4.3.15 - Bathroom area specifications

In the table 4.3.2.4.8, space savers found in bedroom 2 were tabulated. In large sized bedroom 2, built-in wardrobe with open shelves were found in 4 households, inbuilt wardrobes with wooden frames in black and red colour were found in 4 and 2 households respectively. Dresser cum luggage rack made of wood was found in 2 households. Godrej wardrobes made of blue plastic were found in 4 households and brown iron Godrej wardrobes were found in 4 household. In medium sized bedroom 2, built-in wardrobe cum TV unit was found in 2 households which were made of wood and glass. Stackable chairs made of white plastic were found in 2 households. Wardrobe cum dresser made of wood in red colour and glass were found in 2 households. 4 households had sofa cum bed made of wood. Flip top dining table was found in 2 households which were made of wood and glass. In small sized bedroom 2, 6 households had built in cupboards.

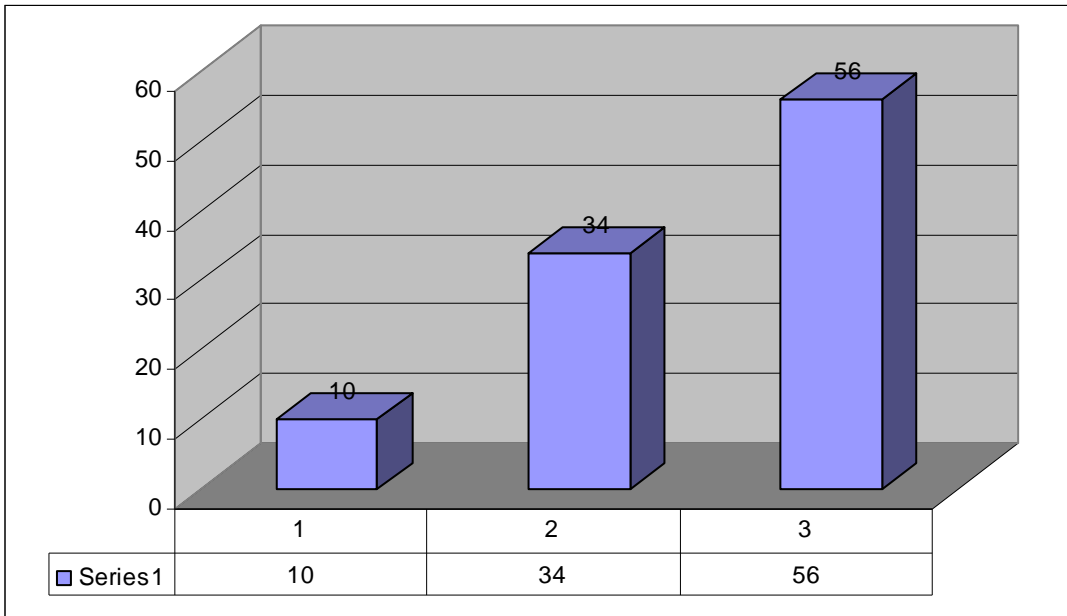
4.3.2.5 Bathroom

Table 4.3.2.5.1 – Bathroom area specification

n = 50

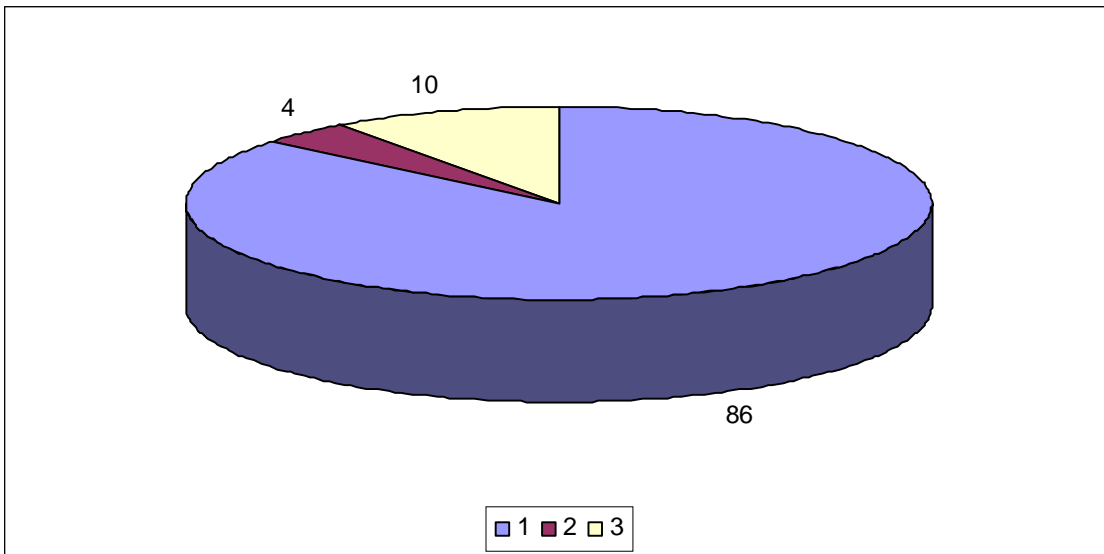
S.No.	Area	Frequency	Percentage
1	35 sft. (Large)	24	48
2	24 sft. (Medium)	18	36
3	20 sft. (Small)	8	16

From table 4.3.2.5.1 and Fig 4.3.15, it shows that 24 household (48%) of bathroom were 35 sft. in size, 18 households (36%) were 24 sft. in size and 8 household (16%) had 20 sft. in size. The same areas as specified as large, medium and small in further tables of bathroom data.



1=tiles with brown
 2=tiles with blue
 3=tiles with pink

Fig 4.3.16 – Bathroom wall type and colour



1=tile with white
 2=tile with grey
 3=tile with yellow

Fig 4.3.17 – Bathroom floor type and colour

Table 4.3.2.5.2 – Bathroom wall type and colour

n=50

S. No.	Wall type and wall finish	Frequency	Percentage
1	Tiles with brown	5	10
2	Tiles with blue	17	34
3	Tiles with pink	28	56

From table 4.3.2.5.2 and Fig 4.3.16, as high as 56% of households used tiles with pink, 34% used tiles with blue and 10% used tiles with brown in their bathroom.

Table 4.3.2.5.3 – Bathroom floor type and colour

n=50

S. No.	Floor type and colour	Frequency	Percentage
1	Tile and white	43	86
2	Tile and grey	2	4
3	Tile and yellow	5	10

Table 4.3.2.5.3 and Fig 4.3.17 show that 43(86%) number of households used tile and white coloured flooring, 4% used tile and grey coloured flooring, 10% of households used tile and yellow colour.

Table 4.3.2.5.4 – Bathroom lighting type and colour

n=50

S. No.	Lighting type and colour	Frequency	Percentage
1	CFL with white	28	56
2	CFL with yellow	22	44
3	Focus light with yellow	-	-
4	Chandelier with yellow	-	-

From table 4.3.2.5.4, it is observed that 28 number of households used CFL with white colour light, whereas just 22 households used CFL with yellow colour.

4.4. STRATEGIES FOR SPACE CONSERVATION IN A TWO BEDROOM APARTMENT MODEL DESIGN

Space planning is the process of selecting, locating and spacing objects to create layouts based on functional, topological or geometrical considerations. It involves the search, carried out in the problem space, for feasible solutions to the problem of spatial arrangement. Space planning, therefore, is concerned with the organization of space under a set of constraints to meet a given set of specifications. In the process of the conquest of interior space, the objective of designing a two bedroom apartment with judicious space management strategies is taken up by following successful space saving strategies which are discussed below. The trouble with space is that we have plenty of it where we do not need it.

A traveler in west Texas once characterized it as "miles and miles of nothing but miles and miles", and, with a proper shoehorn, we could put all of the people in the world into a cubic mile. Our space problems are in our kitchens and bathrooms, in our living rooms and dining rooms, in our closets and basements

Fig: 4.4.1 – Triangular cabinet for corners

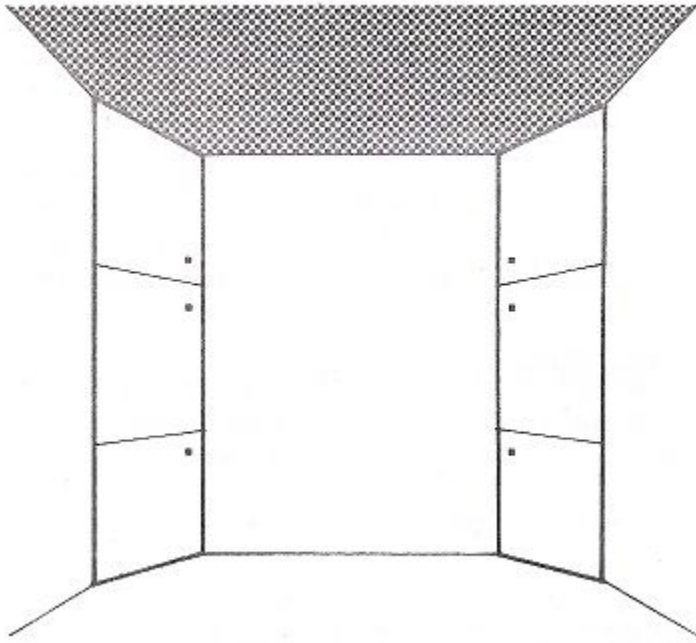
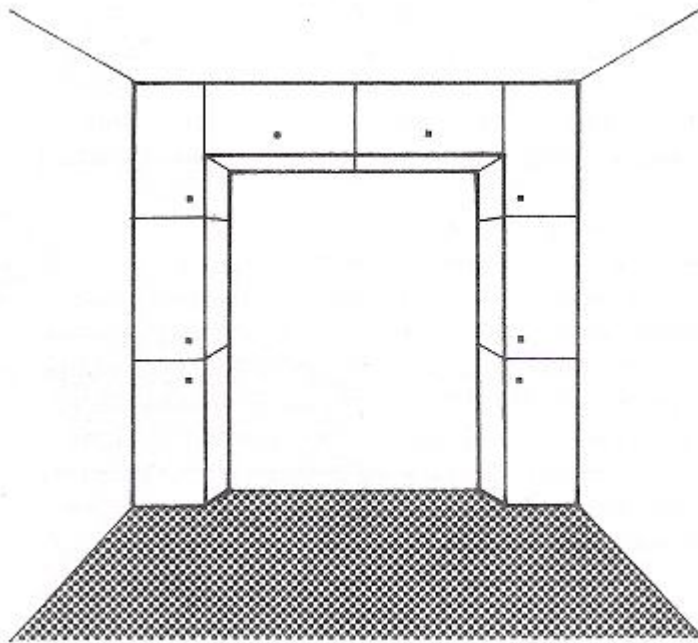


Fig: 4.4.2 – Horizontal and Vertical cabinet for corners



and dens, even outside in yards. All we need is a couple of extra cubic feet. But we need it in every room. And as soon as we get it we need a couple more. There are ways to solve these problems. Some solutions can be very inexpensive, particularly for the person who is reasonably handy with ordinary tools. In other cases the solutions can be expensive, but the important point is that they are *solutions to problems*, and however expensive or inexpensive, they are lot better than the alternatives of living in perpetual clutter or moving to a bigger house.

The objective is to suggest many, many ideas for designing interiors of a two bedroom apartment with judicious space management strategies.. They will solve almost any imaginable home storage problem in all kinds of homes, from the one-room apartment to the big family-size house. This way one will create storage where one had thought there simply was not any space.

Utilizing Space in a New Way

When most people think of storage space they think of things sitting on the floor (chests) or shelving in a closet or on a wall. In the kitchen they think of cabinets, in the bathroom of a medicine cabinet, in the basement or attic they conjure up dark spaces where miscellaneous things can be put away, seldom to be seen again. But now we are talking about limited space, and even the largest space becomes limited in time as we acquire more things we do not want to throw away. So, for new storage ideas, we have to think of space in less conventional ways.

Chests, bureaus, sideboards, credenzas—all are just boxes or collections of boxes. There is space behind them, below them, beside them, above them. These are opportunities for storage when we get imaginative. In the bedrooms we have beds. There is space under them, around them, above them. In all rooms we have chairs. Our big upholstered chairs have no space beneath, but we all have occasional chairs that form little, unwalled

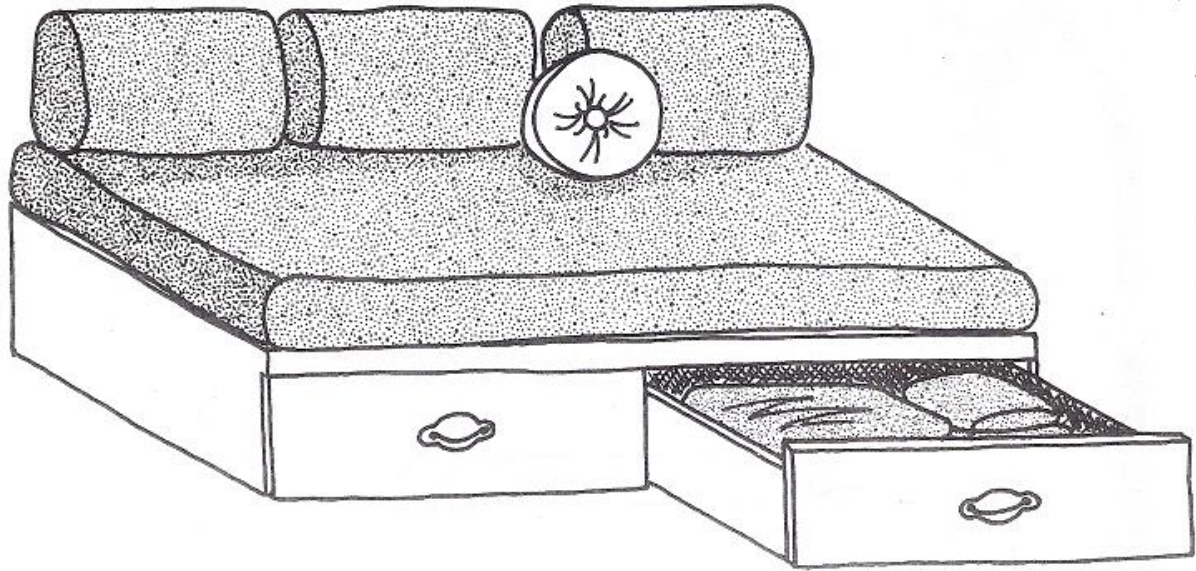
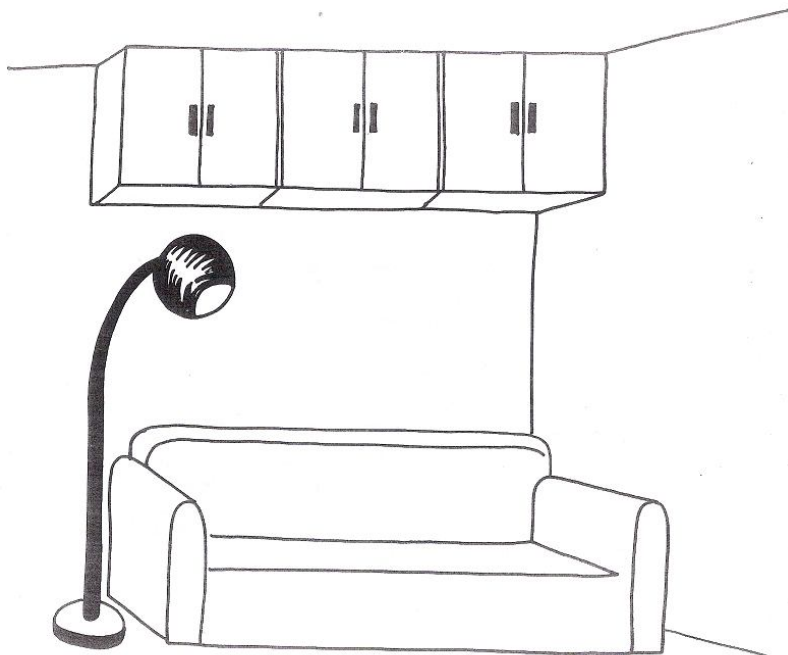


Fig: 4.4.3 - Triple duty sofa



26

Fig: 4.4.4 - Added Storage

boxes of space beneath, and with the addition of walls we create storage. Or we can buy chairs that do double duty as storage boxes, with lift-up seats, or we can build in storage that does double-duty as seating. Every room has corners. Corners are little used. Every corner could stand the installation of a triangular cabinet from floor to ceiling, with doors that open to expose shelves for storage as illustrated in Fig: 4.4.1 and 2. Painted to match the walls, they would be almost unnoticeable, or they could be decorated to accent room decor.

1. IDEAS FOR THE ONLY ROOM

The apartment brings with it all the fundamentals of frustration. Often it is called an "efficiency" apartment. The only "efficient" aspect of such a room is the empty space before furnishing starts. Some one-roomers are more generous than others, and if the dimensions are adequate (as they often are in luxury buildings) such a room can suffice for a lifetime for a single person. It can in fact be very livable, and even a first choice for some if the occupant uses creativity, imagination and will spend some money for the many product, that are available for just such circumstances. In this, let's consider some basic ideas for getting more out of the main room.

1. Sofa for Triple Duty

In an apartment one often can not afford to give up the space for a store-bought sofa, which does only one duty, or even for a sofa bed which does two jobs. If carpenter made, one can get triple duty from the sofa as seen in Fig: 4.4.3.

First get a mattress than can be slept on or sat on. Then get a carpenter to make a storage box to set it on, with two or three drawers that pull out for storage of all bed linens and possibly other items. Now one can sit on it as a sofa, sleep on it as a bed and the space underneath is utilized for storage. If one needs like extra depth in, for lounging while talking, as many people do, one can make this as deep as space permits.

Fig: 4.4.5 – Corner with a cabinet

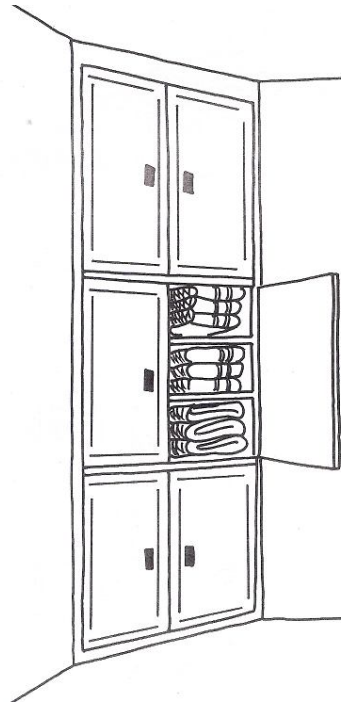
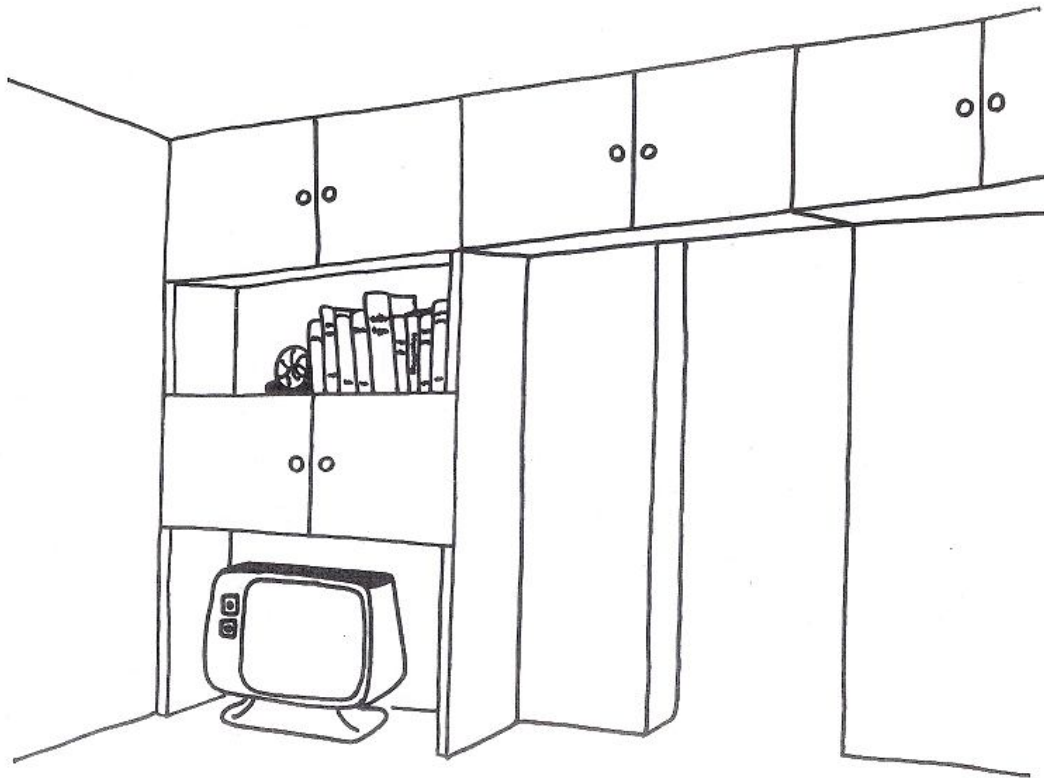


Fig: 4.4.6 – Two corners and a ceiling



2. Added Storage

Ordinary kitchen cabinets can add a lot of storage space in an apartment without impinging on the room space at all. By installing them right at the ceiling along any wall, or all walls, one uses space out of the way of anyone expects. Once measured appropriately as required in the room, these storage cabinets perform really well for storage as illustrated in Fig: 4.4.4, where a storage cabinet was placed above sofa in a living room. These come in various widths. Remember that it is a decorating mistake to put dark objects high on the wall. So if one wants to paint them white, paint them before installing them. It is a good idea to paint the entire wall, and paint the cabinets with the same color.

3. Corner with a Cabinet

Corner cabinets usually waste space, but in an apartment they can be pure gain. These are triangular in shape, cut across a corner to provide valuable storage in a place one normally would not consider. Painted the same color as the surrounding walls, they can be quite unobtrusive. A triangular cabinet is not nearly as efficient as a square or rectangular one. It is best to have the cabinet run from floor to ceiling. In this case one might never get it out unless one has it made in two or three sections that simply sit on top of each other as referred in Fig: 4.4.5. A good feature about full-length triangular cabinets is that all the weight rests on the floor and it might not be necessary to fasten them to the walls.

4. Two Corners and a Ceiling

As suggested in the illustration Fig: 4.4.6, if the room is wide enough one can gain tremendous storage capacity by using the kitchen wall cabinets along the ceiling, supported by a stack of wall cabinets down the corner on either side.

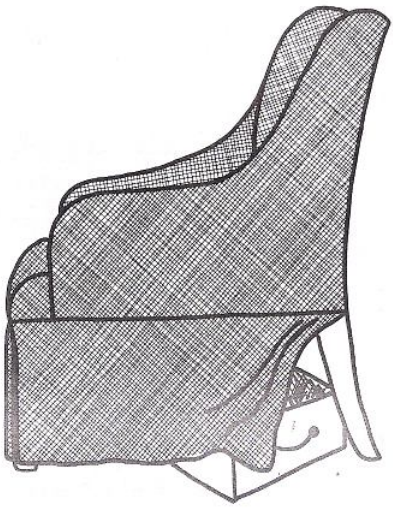


Fig: 4.4.7 – A box beneath Sofa

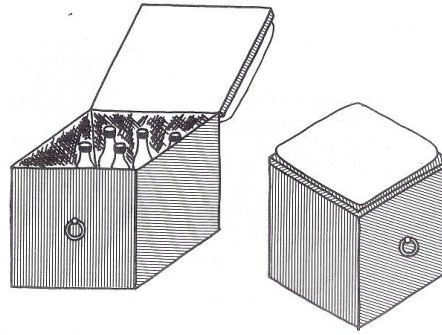


Fig: 4.4.8 – Storage boxes

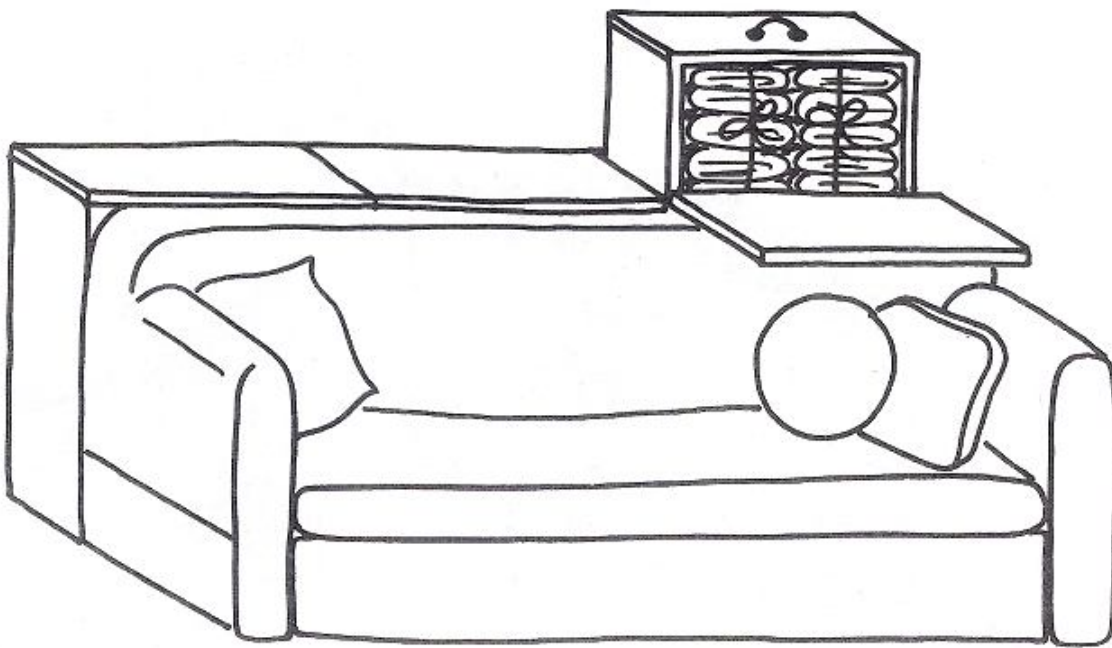


Fig:
4.4.9 –
Drawers
behind Sofa

5. Adding a Box Beneath

A very simple way to gain small amounts of storage in one room is to use chairs that have straight legs and then use the space beneath as seen in Fig: 4.4.7. Good-sized upholstered chairs with spring seats have an unboxed space beneath that measure about 24x24x10 inches, sometimes a few inches less. The simplest way to use this space is to add skirts to the chairs so anything underneath can be hidden, and then one can store anything that fits. A better, although more difficult way, would be to construct a plywood box to fit under the chair, then to decorate its exterior with wall covering or even fabric to match the chair's upholstery.

6. Storage boxes

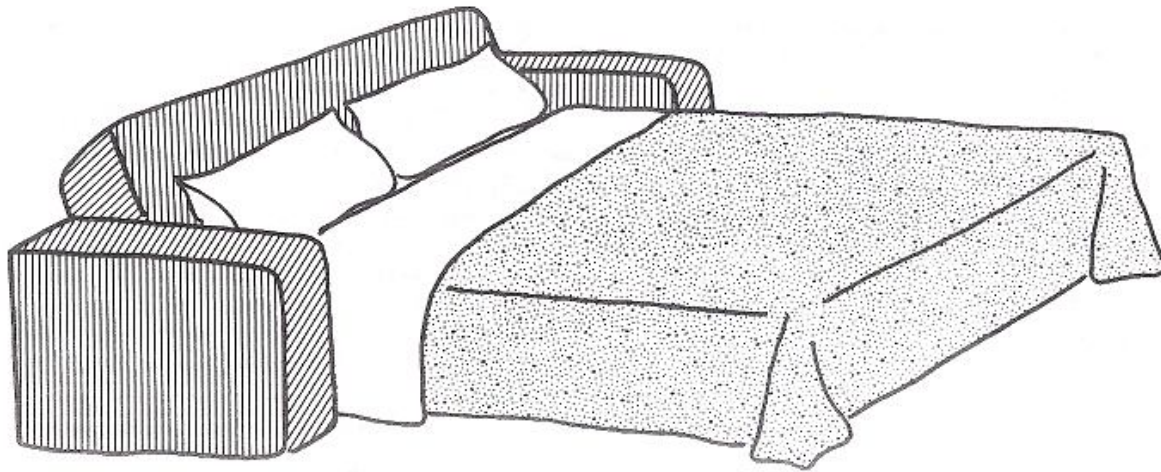
Most furniture stores or departments have hassocks with flip-tops that open up for storage. These become important in the apartment where space is at a premium. Get several and use them for all of seating except for the sofa. These are good for out-of-season clothing, or even for pots and pans if necessary as shown in Fig: 4.4.8.

7. Pull-up Drawers behind the Sofa

When the dimensions of room tolerate moving the sofa bed 10 or 12 inches out from the wall, one can create an excellent storage area behind as illustrated in Fig: 4.4.9. All one has to do is, make a box as the length of the sofa, or even the length of that entire wall if other factors permit, cover it with contact or upholstery fabric, and make several drawers that slide down into the box from the top. Install little eye-hooks on both sides of each drawer, in the inside, so one can tie the stored items down when the drawers are in place, at which time they will be in an upright position. This will only be good for storage of soft goods such as blankets in summer or off-season clothing.

8. Old Standbys: Sofa beds and Murphy Beds

The sofa bed is almost too obvious to mention, especially when we already have suggested a triple-duty alternative. And if one will watch local newspapers, one will almost surely see an ad for a sofa bed that folds out of a wall as referred to in Fig: 4.4.10.



F
ig:
4.4.10
– Sofa
beds
and
Murphy
beds

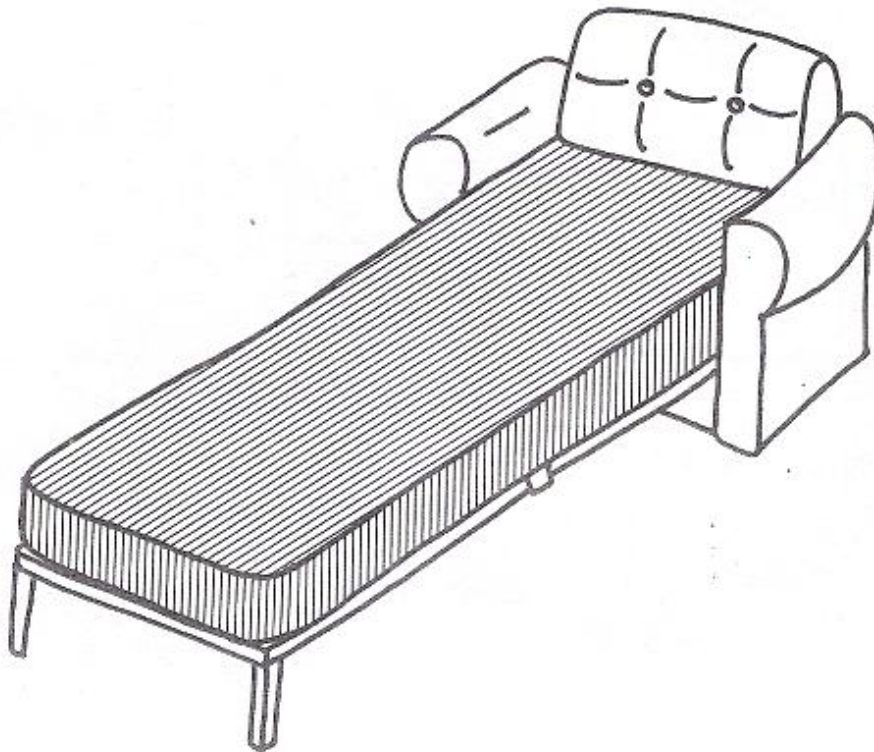


Fig: 4.4.11 – Chair beds

9. Chair-beds

If a sofa bed is good, a chair-bed, as in Fig: 4.4.11, is twice as good where space saving is important, and when one sleeps alone. For a couple, two chair-beds might be better than one sofa-bed because they have more design flexibility in arranging the room and, if desired, they can be pushed together at night. They might even be positioned together in the daytime to form a sofa of sorts.

10. "Conversation Pit"

Many people like the idea of a "conversation pit," but it is difficult to dig one in the floor of an apartment. The idea here is to build or have build an elevated platform at one end of the room as seen in Fig: 4.4.12. It does not have to be attached to the floor, so there should be no hassle with the landlord. And it can be made in sections to be removable. This can be eight inches high, with drawers built-in around the perimeter, and with lift-up covers over the interior part. Floor compartments should take seldom-used items, because they are a little harder to reach. Drawers are easily accessible, and could hold china and glassware or anything else one has no space for.

11. Space between the Studs

Underneath wallboard in apartment there probably are 2x4 studs, spaced 16 inches apart. The wallboard is nailed to them, and the space behind the wall and between the studs is wasted. One can buy ready-built pantry shelves engineered to fit between those studs and simply have to cut a hole between the studs (hoping there is no wiring or ductwork hidden there) and insert the pantry unit as referred in Fig: 4.4.13. If one can not get away with recessing into the wall, these units also are made for attaching onto the wall. And they come in three heights and with a variety of doors. The drawing shows three of these lined up for a pantry wall, with a graphic design painted over them.

Fig: 4.4.12 – Conversation Pit

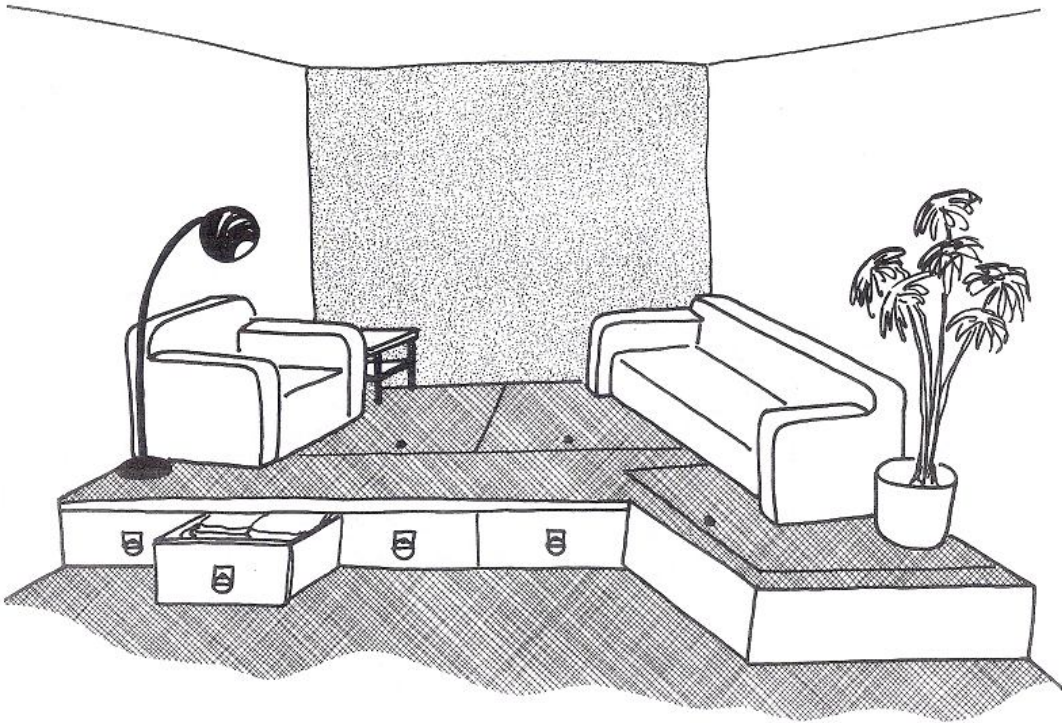
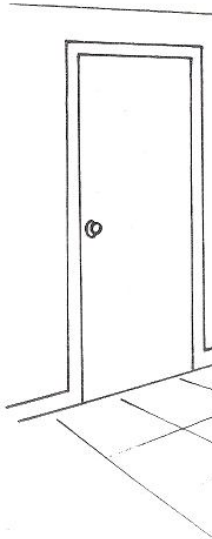


Fig: 4.4.13
– Space between studs



12. Storage/Dining Table

There is no law that says that one have to have all that wasted space under a dining room table. But dining tables do not usually come with storage. So make one that does. Normal height of a dining room table is 30 inches. One can buy four 12-inch-wide kitchen wall cabinets, the standard 30 inches high. (They all are 12 inches deep). Screw them together in a square, or just set them on the floor in a square. Call local plastic fabricator or kitchen dealer, and have him make atop in the color or pattern chosen to fit over the cabinet base along with a plastic laminate on both sides, making the construction balanced to prevent warping. Table base has doors for easy access. In the Fig: 4.4.14, incidentally, the apparent drawers are a door design. Wall cabinets do not have drawers.

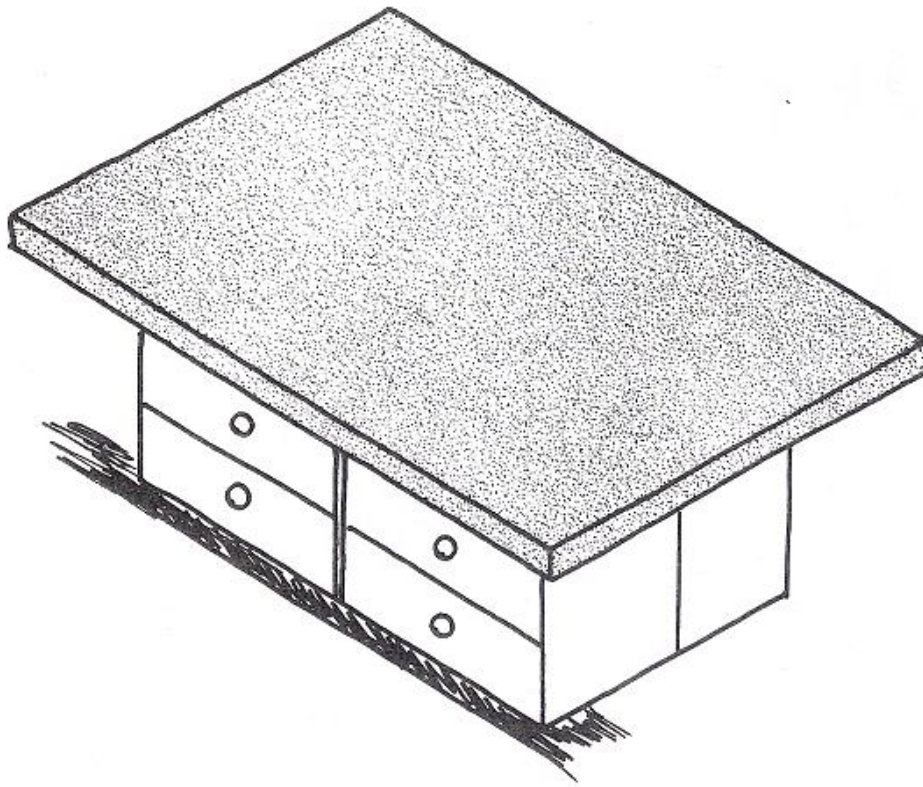


Fig: 4.4.14 – Storage / Dining table

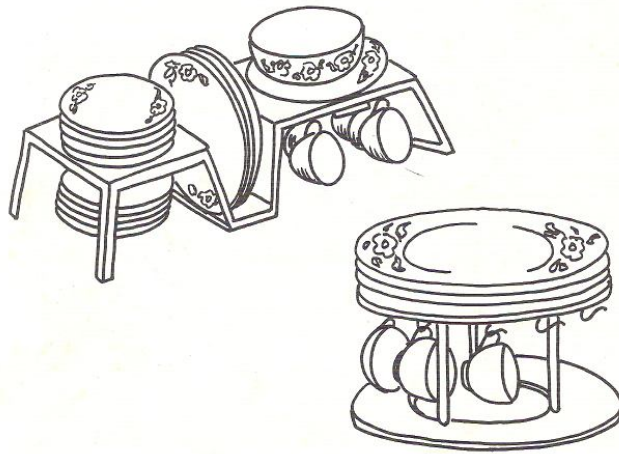


Fig: 4.4.15 – In-Cabinet space

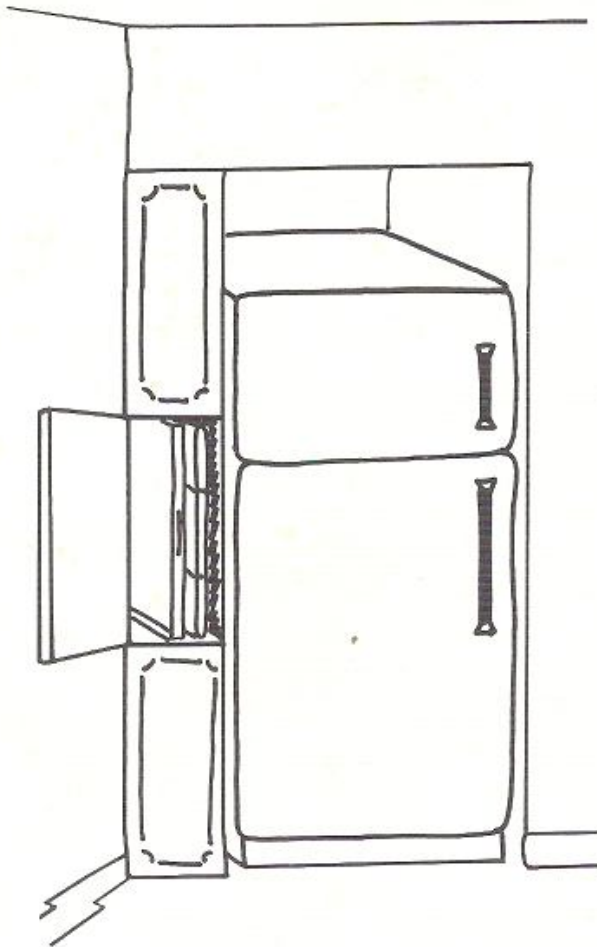


Fig: 4.4.16 – Filling empty spaces

II. Tiny Kitchen

The characteristics of small apartments—and often of open apartments —that a kitchen is provided with barely enough room to turn around in. But if one has to live there, one has to make the most of it and there are things that can be done.

1. The In-Cabinet Space

There will not be much space in the cabinets mainly because there will not be many cabinets. But in any kitchen cabinet, there will be wasted space between the tops of the dishes on one shelf, and the bottom of the next shelf above it. Little cup hooks that can be screwed onto the cabinets made of wood, but not steel, can be bought. But one of the best solutions here is to use the little space organizers as identified in Fig: 4.4.15. These can be used even when the cabinets are metal, because they don't have to be screwed in. A couple of typical examples are pictured here.

2. Filling the Empty Spaces

It is quite common to see a smaller refrigerator in a space that could accommodate a much larger one. In such cases there usually is space above the refrigerator and along both sides. If this is the case, measure the empty space on both sides of the refrigerator and see how much room is available. It is not uncommon to find as much as eight inches. Push the refrigerator all the way over to one side to have all the empty space on the other side. Then make a tall, narrow cabinet to fill in this space as in Fig: 4.4.16. One can make it with as many shelves as needs prescribe, but plan it first so that one can use the space to best advantage.

3. Pantry Cabinets

As recessed cabinets used in the main room of apartment were used, use them again in the tiny kitchen. They come in three sizes. The full-length ones are pictured here, but shorter ones are usually recommended for the bathroom, such as over the water closet. That does not mean they can not be used in the kitchen. Even a mirrored bathroom medicine cabinet is usable if one can make it fit.

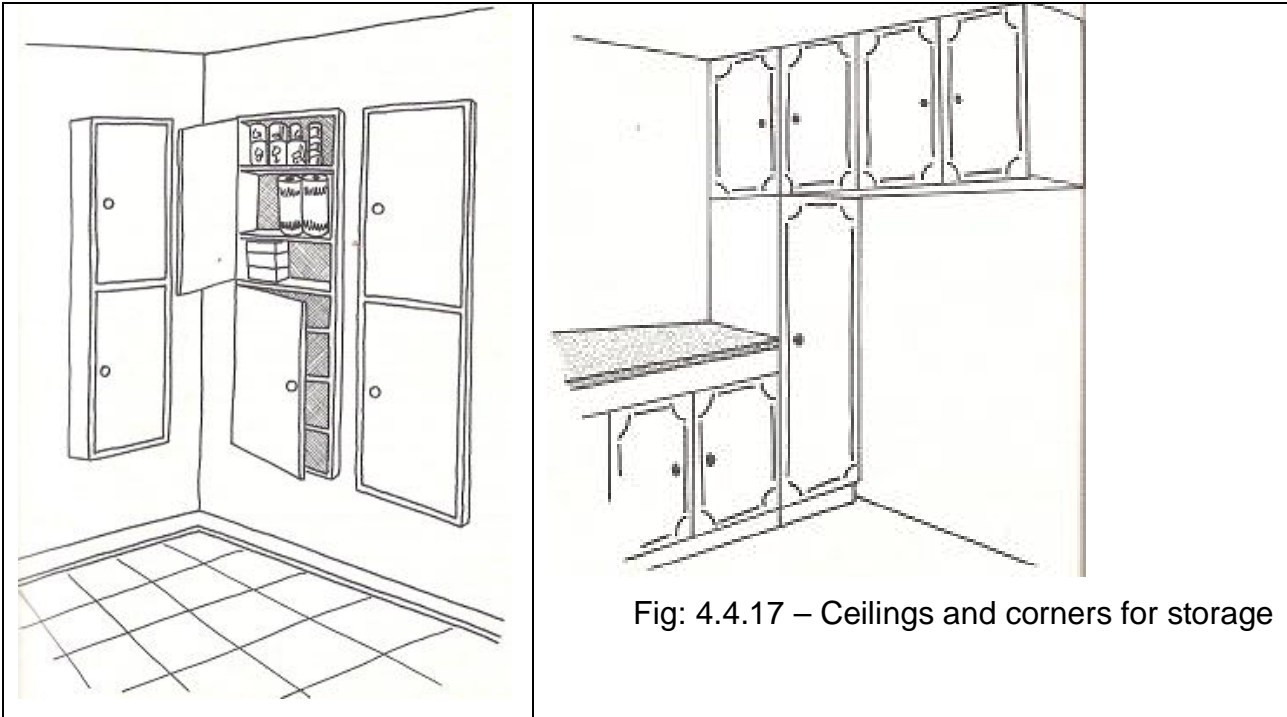


Fig: 4.4.17 – Ceilings and corners for storage



Fig: 4.4.18 – Cabinets make Storage

Shallow Vertical

4. Ceilings and/or the Corners

Look for places where one can work with cabinets towards ceiling do that in the kitchen. It will be more difficult, because most of the corners will be used in the typical kitchen, but remember that such cabinet comes in different dimensions or one can have a carpenter custom-build some for the space one has as referred to Fig: 4.4.17.

5. Shallow Cabinets for Vertical Storage

The standard depth of a kitchen base cabinet is 24 inches, but the builder has built the cabinetry in many small kitchens on site, so one can not count on that sizing. But look at space critically. There can be a possibility to afford “borrow” six or eight inches along the back for some valuable storage space. Chances are, one can work only in the front area of countertops, possibly the first 12 or 15 inches, and some of the counter space farthest from the one that is wasted as illustrated in Fig: 4.4.18.

So make, or have made, a shallow cabinet to go along the wall, protruding only six or eight inches. It can go as high as space allows. It will be deep enough for, perhaps, only one can or one or two glasses, but might solve all space need for all canned goods storage that way, or glassware and liquors. These small kitchens usually do not have doors. They usually have only an opening. But door or opening, there usually is a place where one can install a shelf above, and it can hold some of larger dishes and pans that one does not use every day. As illustrated in Fig: 4.4.19, open shelves were provided for storage above doorway.

6. Movable shelf

These shelves are not uncommon and are used as base or wall cabinets. One can buy a set of revolving shelves, mount them between two plastic-laminated circles, and add three braces from top to bottom, add castors on the bottom, and have a moving table that will give extra counter space when needed and also store all of the canned goods likely to have as identified in Fig: 4.4.20.

Fig: 4.4.19 – Shelf over the Entryway

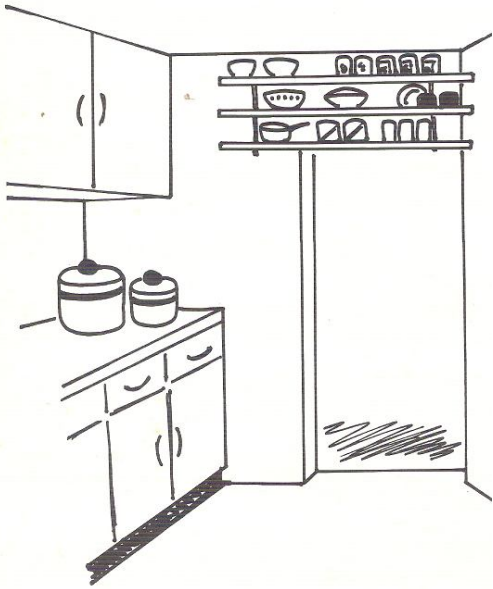


Fig: 4.4.20 – Movable shelf

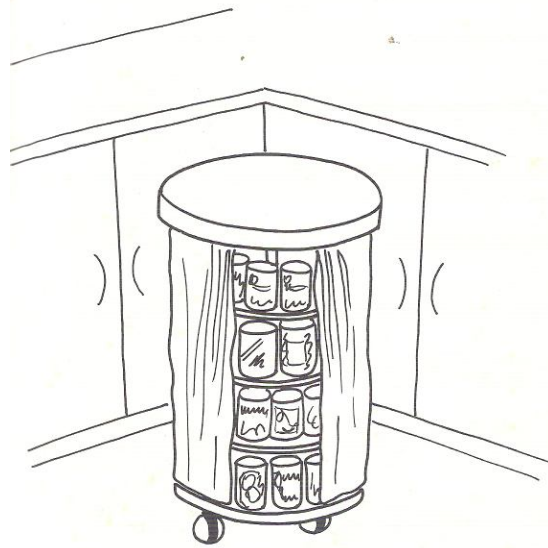


Fig: 4.4.22 – Shallow shelves above wall cabinets

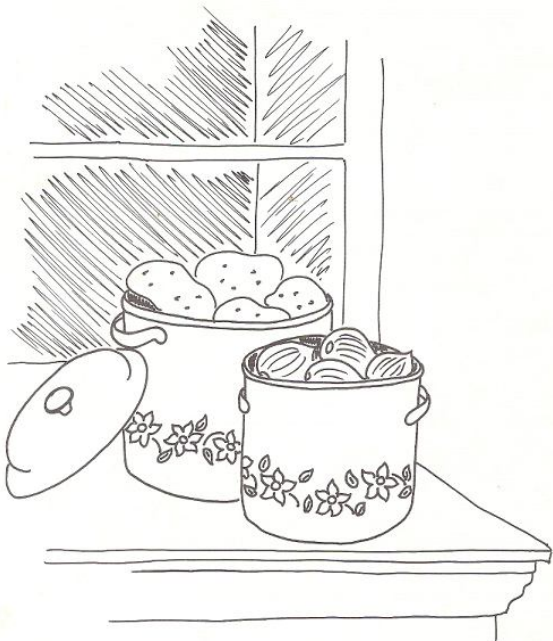
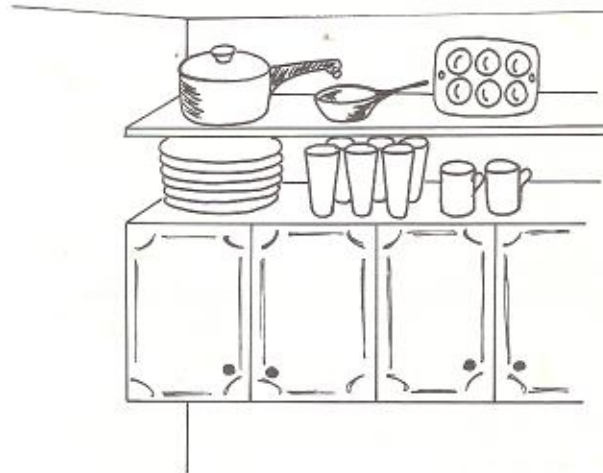


Fig: 4.4.21 – Pots as storage source

7. Shelf over the Entryway

An alternative is to buy a kitchen cabinet and mount the hardware in it. Add the casters and the top. Either way one can get a double-duty top and cabinet. Or, if sturdy enough, use the movable shelf as a stool.

8. Storage in the Pot

There are big pots in any kitchen that spend most of their time unused and empty, and they often are not very sightly. Throw away the old pots and buy the most decorative ones one can find and can afford. Then leave them out where they can be seen, where they are part of the decor, on tables or placed attractively on the floor. Then use them to store things—potatoes or onions, dishes, whatever—and have solved two problems: Where to store the pots, and whereto store the things and one now can put in them as observed in Fig: 4.4.21.

9. Shallow Shelves above Wall Cabinets

If small kitchen has factory-built cabinets, there probably will be 12 inches of space between the tops of the wall cabinets and the ceiling. This is not good space. It is too hard to reach. Still, there are things one does not use more than once or twice a year, and any gain in space is worth a couple of trips a year up the stepladder.

The trick up there is to use shallow shelves, only 6 or 8 inches deep, rather than trying to add a shelf as deep as 12-inch wall cabinet as shown in Fig: 4.4.22. The deeper it is the more inaccessible it is, and it's already bad enough to be using space so high up.

10. Can Storage at Doorway

If one is three feet wide, this will not work. But if girth is normal, one can afford to lose up to 6 inches on either side, within the entryway to small kitchen. The suggestion is to make two tall cabinets, each only 6 inches square, to fit from floor to top of doorway, one on either side. These will have shelves just high enough to hold one large can of vegetables, etc. Thus one will have a line of cans on either side, but obscured by the cabinet. These cabinets could be 3-sided, with the open side in the kitchen as shown in Fig: 4.4.23. But it would be classier to

Fig: 4.4.23 – Can storage at doorway

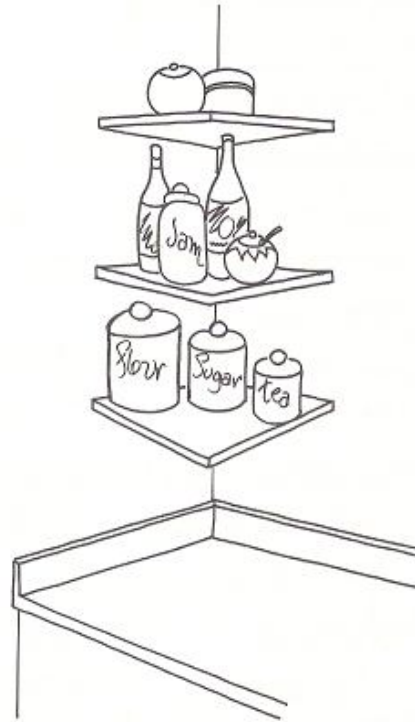
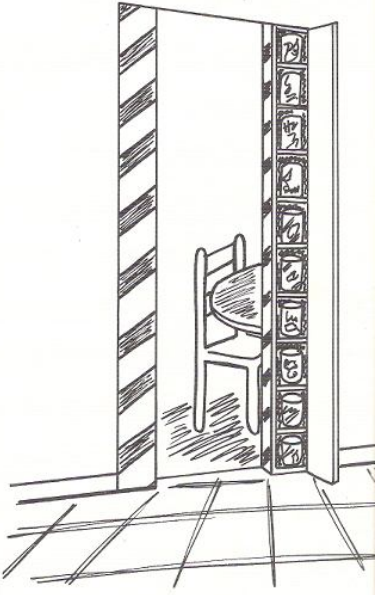


Fig: 4.4.24 – Spot storage

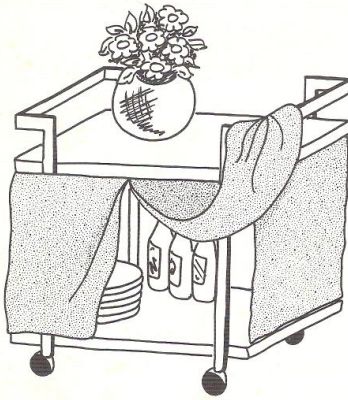


Fig: 4.4.25 –

Mobile Cart



Fig: 4.4.26 – Elevated Dishwasher

make them four-sided, with four doors (two on each side; one long door would warp) and then decorate them.

11. Scones, Shelves for Spot Storage

Scones to fit in corners or on walls are available as shown in Fig: 2.24. These can be spotted anywhere there is a blank space on a wall, and used for spot storage of a coffee pot, a tea pot or any other. One could use these even to put everyday plates on display. If they are not decorative enough, get new ones that are. They do not need to be expensive, just attractive.

12. Mobile Cart

Wheeled teacarts are widely available. One of these can be help in kitchen, stocked with drinks or dishes. It can be wheeled into the kitchen when needed there, and then wheeled outside into the living area to sit in a corner or along a wall as seen in Fig: 4.4.25. The key factor here is its mobility. If not, plann it and move it according to plan, it is just another thing in the way. One must be able to move it into the kitchen when there is a need of the extra space to put things down on, or to use the things stored underneath. And then one has to get it out of there

13. Storage with Elevated Dishwasher

If there is sufficient countertop space in the kitchen but lack storage space, consider elevating the dishwasher. As illustrated in Fig: 4.4.26, the photo shows how one can gain two bins below plus the storage space above, decorating the front of the built-in dishwasher to match the cabinetry. This position for the dishwasher also makes it much easier on the back. On the other side of the sink there can be a roll out "garage" cart for small appliances, and a pullout unit that brings dishes out. The upper unit makes regular drawer-slide hardware, but mounted top and bottom to make this, in effect, a vertical drawer.

Fig: 4.4.27 – Storage for Toilet Toppers

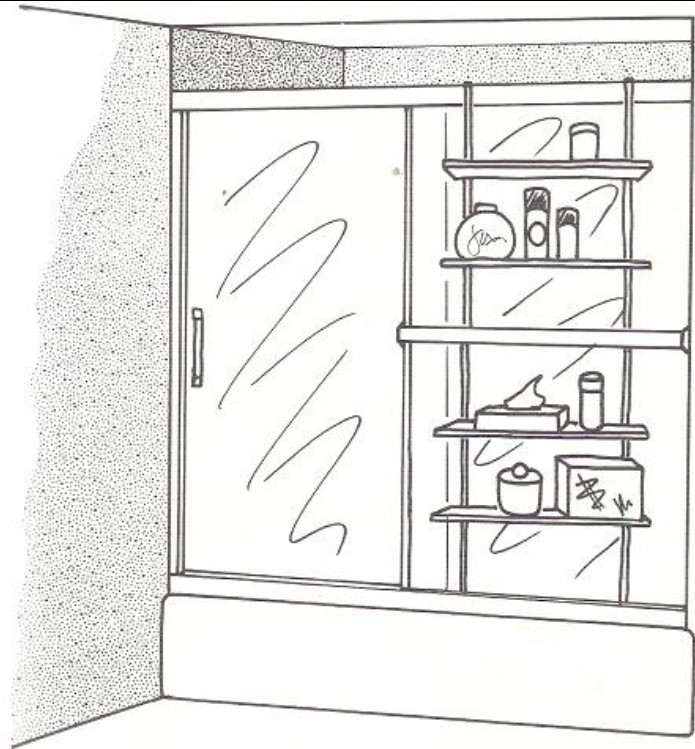
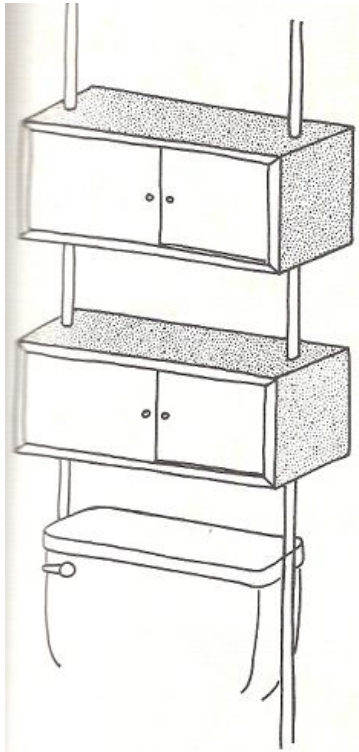


Fig: 4.4.28 – Shallow shelves outside tub glass door

III. Tiniest Bathroom

The bathroom is the ultimate challenge, whether it is in the apartment or, very often, in houses built on an otherwise generous scale. Both builders and architects tend to think of bathrooms simply as places to crowd in three fixtures, and they often take little notice of ordinary needs for storage and places to put the miscellaneous items that any person wants in the bathroom.

Here, one can borrow some of them from the kitchen or other areas in the home. It does not matter. The point is, we are looking for unused space that is out of the way in an effort to create storage space.

1. Stores for Toilet-Toppers

There are many specialty manufacturers of small storage systems to fit over the water closet behind the toilet. In many apartments the toilet is plumbed into a continuous water-feed system, but in most there is a "water closet"—a tank behind and above the toilet as referred in Fig: 4.4.27. Above that, there usually is nothing but empty, wasted space. So look first for these store-bought systems. Most sit on the floor, and many have spring-mounted tops that wedge against the ceiling, with shelves between closet and ceiling. Others have shelves with sliding doors to hide the articles to store.

2. Shallow Shelves on Outside of Tub Glass Doors

This will not be easy because one will have to do it all yourself. But it helps where storage is minimal. One could hang two decorative cords from the top nail and knot them at even intervals on either side to hold glass or wood shelves. And it gains storage space for light articles as shown in Fig: 4.4.28.

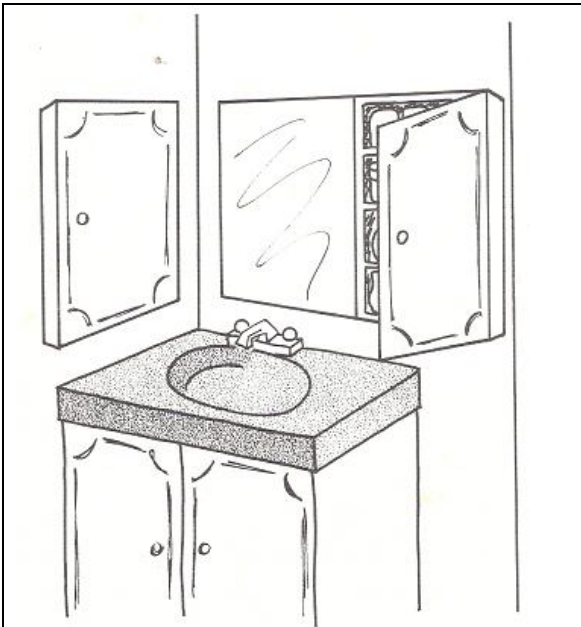


Fig: 4.4.29 – Shallow cabinets on walls

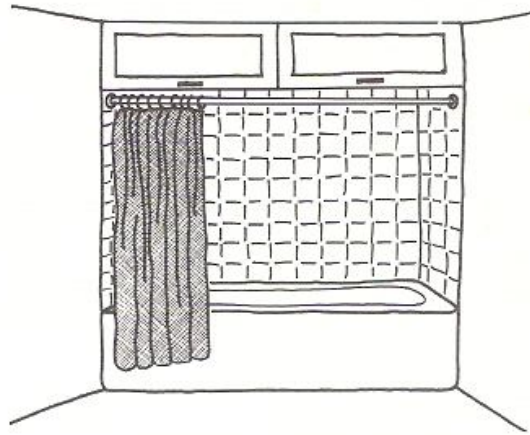


Fig: 4.4.30 – Space above Tub

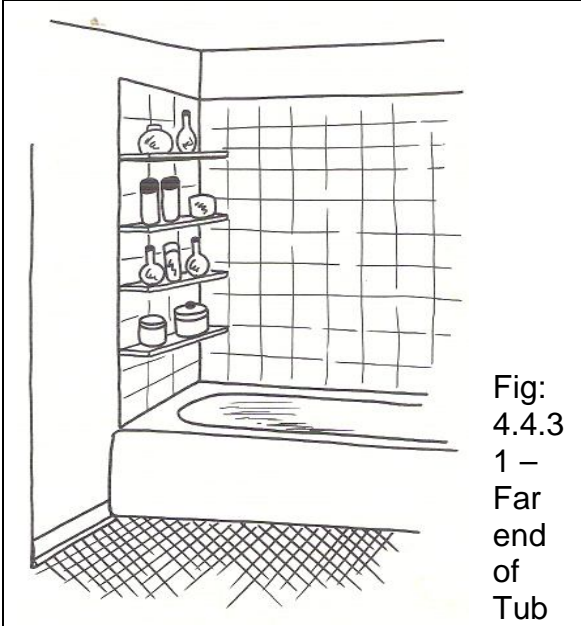


Fig:
4.4.3
1 –
Far
end
of
Tub

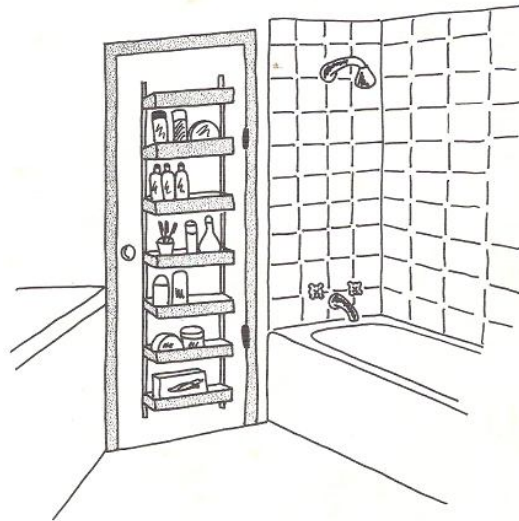


Fig: 4.4.32 – Pantry on door

3. Shallow Cabinets on Walls

As referred in Fig: 4.4.29, the recessed cabinets used in other parts of this apartment come in three sizes, including a size for bathrooms. One may prefer to buy regular medicine cabinets that affix on the walls rather than recessing between the studs. Either way, cabinets can be used here. Get the landlord's permission to recess, but one can put up the on-wall cabinets oneself. Somewhere in the bathroom there will be space for one or more of these.

4. Space above the Tub

Many bathrooms have tub alcoves with the upper 12 to 14 inches furred down and nothing behind but empty space. In many cases this space can be used. First neatly cut a hole in one end, so one can look in and see if the space is clear. If it is, cut out larger holes for standard cabinet doors that will fit, hang them downward with hinges at the top and create storage for towels and washcloths. The illustration shown besides as Fig: 4.4.30 describes storage cabinet over tub. If one finds this space is not usable after cutting peep hole, replace the piece one cuts out after packing it with any usable plastic, sand it off after it dries and then tape it and paint over it. But chances are that one will find good usable space there.

5. Far end of the Tub

The wall at either end of the tub is usable. Shelving can be installed at either or both ends for lotions, shampoos, soaps and the various other things one wants. The Fig: 4.4.31 illustrates open shelves placed on either ends of bath tub.

6. Pantry on the Door

These recessed cabinets mentioned do not have to go in the kitchen or in the wall. In a bathroom door there can be a 4 inches that a kitchen-type pantry adds to its thickness as seen in Fig: 4.4.32. So get the full-size unit and put it on the door for myriad items to store. And in apartment, one might even put some of the canned goods there. This, incidentally, can go on either side of the door because one can decorate the face in any way chosen, and one can gain the most space by putting it on the outside of the bathroom door



Fig: 4.4.33 – Shelving system

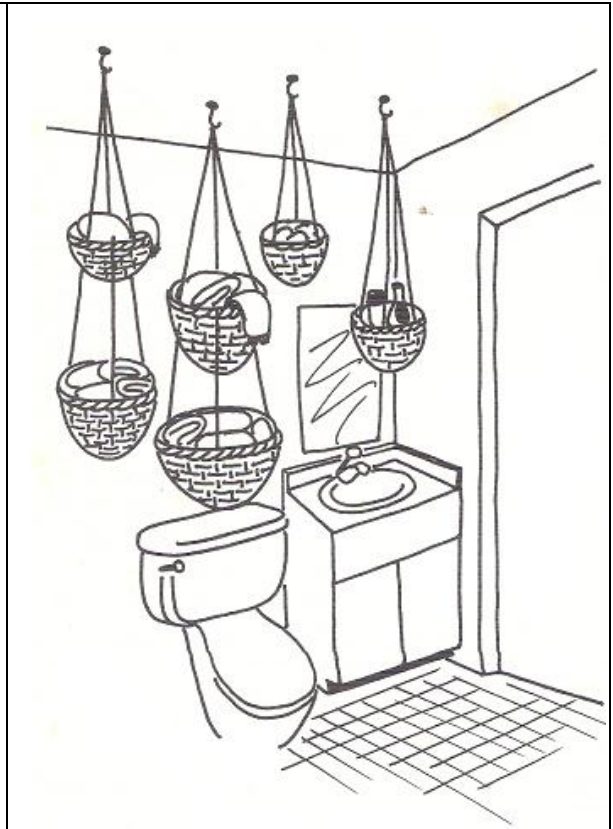


Fig: 4.4.34 – Hanging Baskets

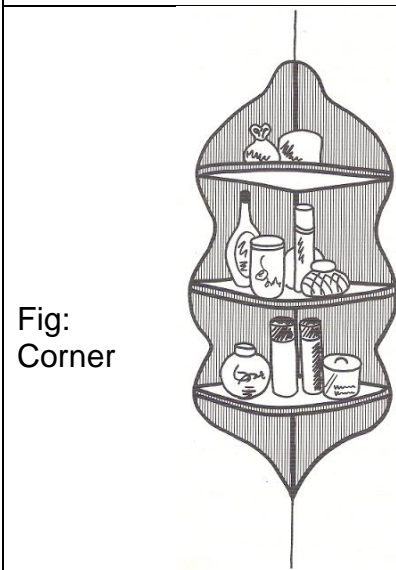


Fig:
Corner

4.4.35 –
spaces

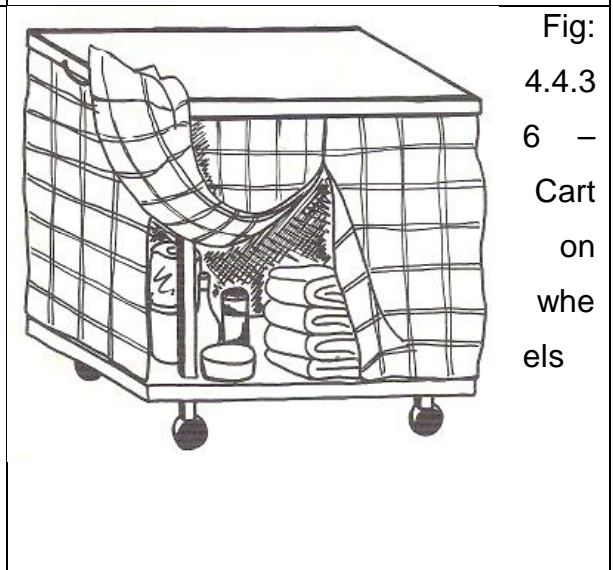


Fig:
4.4.3
6 –
Cart
on
whe
els

7. A Shelving System on the Inside

A pantry on the outside of the bathroom door leaves a few inches of clearance on the inside. It could take either another pantry unit, or a shelving system as in Fig: 4.4.33, which is available with brackets and shallow shelves at neighborhood home center. Or make a new one. One can buy ordinary wall brackets in various sizes to hold as many shelves as required.

8. Baskets from the Ceiling

There is a lot of space between the floor and the ceiling above the area where it hits heads that is not used. And one can buy an unending variety of hanging baskets to hold soaps, washcloths, shampoos, towels or anything else that have to have in the bathroom as illustrated in Fig: 4.4.34. One good place is right over the toilet, because nobody ever stands fully upright there. Otherwise one will want to be sure the baskets are high enough so the user would not bump into them.

9. Corner Spaces

On the market there are many small corner shelves or sconces, some with two or three. These are great for relatively small corner spaces where one normally might not think of putting things. Look around the bathroom and one will see such spaces and store things as seen in Fig: 4.4.35.

10. Wheel-Around Cart

When there is no space inside the bathroom, the wheel-around cart suggested for the kitchen as illustrated in Fig: 4.4.36 can be used. One can buy these or have them made, and can hide their contents with skirts of drapery fabric. Properly decorated, such a cart can sit outside the bathroom in the only room one have to live in, and be wheeled inside when needed.

11. Shelves under the Lavatory

Many small apartments (and many larger ones) do not have storage vanity cabinets under the lavatory in the bathroom. In such cases, have carpenter build some shelves that fit around the plumbing and then fit a skirt around it all to hide the things stored there.

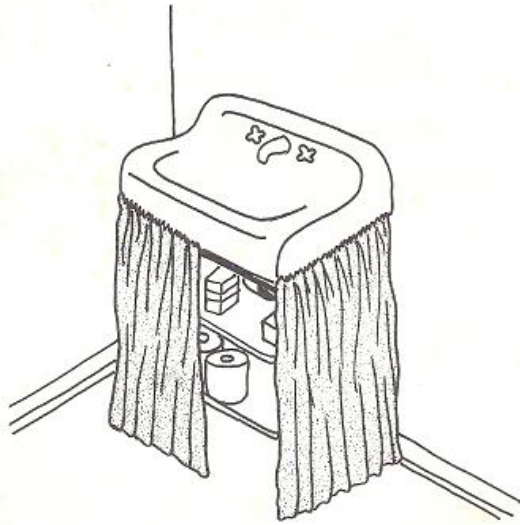


Fig: 4.4.37 – Shelving system under lavatory

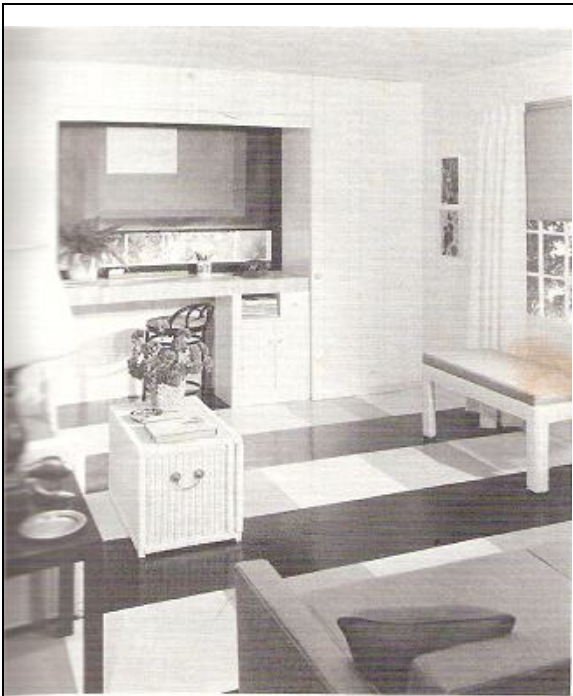


Fig: 4.4.38(a) –Den, Guest Room



Fig: 4.4.38(b) – After expansion

There are many ways to install the skirt: one is to use a U-shaped metal molding with a 2-sided tape one side to stick to the lavatory then one can use simple metal or plastic hooks to slide in the U. Another way is to stick the skirt directly to the lavatory with openings at each front corner for easy access. One will be able to get at least two shelves under there for a lot of extra storage as referred In Fig: 4.4.37.

IV. Products

1. Den, Guest Room and Hobbyist's Hideaway

An architect, Edmund Motyka, ASID, designed a room, as illustrated in Fig: 4.4.38(a) and 4.4.38(b), to hold and hide anything a homemaker might want. Cabinets were built out from the window wall. The table at the window serves as a work bench, and actually was used to make the cabinetry in the room. Shallow cabinets along the ceiling hold lumber in various sizes and lengths. Cabinetry at left opens to reveal various tools hung on pegboard, and power tools, with paints and other handyman materials in cabinet at right. A white shade covering the far window is painted in geometries to add to the room decor, and the two lower units on either side are on castors to pull out and serve as horses for extra-length lumber. And, of course, there's a vacuum hidden in one of the roll-out units for cleaning up after the work is done when the room reverts to guest-room status.

2. Sewing Room behind the Shades

This entire sewing room disappears behind fiberglass shades mounted in a simple strutted framework, as seen in Fig: 4.4.39. Even the sewing machine slides into the space beside it. The shades are decorated with illustrations that serve as an index to what is hidden behind. The room is by Shirley Regendahl, interior designer, and the illustrations are adapted from her book "The Golden Hands Complete Book of Dressmaking."



Fig: 4.4.39 - sewing room behind shades



Fig: 4.4.40 - Shelves

Fig: 4.4.41 – Bar for a Wall recess



Fig: 4.4.42 – Pullman kitchen



3. Shelves

These shelf units, shown in Fig: 4.4.40, are made of steel rods with vinyl coverings so they stay clean, need no finishing, and never have a warping problem. They are made in depths of 9, 12, 16 and 20 inches, and can be ordered in lengths up to 10 feet. The back clips come attached and are self-locking. These are good for residential use in 9-inch and 12-inch depths. The deeper units are usually used for hospital or commercial applications.

4. Watch Local Ads for Storage Ideas

Local newspapers often carry products that might be made locally and are not generally available. Newspaper includes a wealth of storage ideas: the bunk beds, under-bunk storage, and extra storage at the end of the upper unit and the cabinet at the end.

5. Bar for a Wall Recess

This redwood bar can be adapted to any wall recess, with fluorescent lighting above the acrylic panel, and glassware storage at sides. A window shade could be added at the front to hide it completely, if desired, as observed in Fig: 4.4.41.

6. Pullman Kitchen

The vinyl floor pattern resembles the leaded glass furnished motif for this kitchen designed, as illustrated in Fig: 4.4.42. It can be a compact kitchen in a tiny apartment or an entertainment area in a family room. Either way it is highly cleanable. The shelves are fully adjustable in the glassware section (which could be canned goods or anything else) and the flooring is repeated behind the shelves above the stainless steel countertop. The wine closet door is covered with silver and white reflective wallpaper which matches the folding door visible at right. The folding door closes the area off entirely.

7. Bathroom Space-Saver

Fig: 4.4.43 – Bathroom space saver



Fig: 4.4.44 – kitchen cabinets in nursery



Fig: 4.4.45 – Added storage on countertop



Fig: 4.4.46 – Division using shelves

One can create valuable storage space in the area over toilet and water closet with items like in Fig: 4.4.43.

8. Kitchen cabinet in nursery

This is a kitchen cabinet, called chalet, by AristOKraft (the brand name of united cabinet). Chalet features white wicker styled panel inserts in the doors which can be removed painted or covered with fabric or wall covering, as it is here, to make it to blend with the surroundings as illustrated in Fig: 4.4.44.

9. Added Storage on Countertop

If there is ample counter space in the kitchen, and if one tends to use the front foot and not the back foot of counter, here is a good idea for gaining extra cabinet storage space. As seen in Fig: 4.4.45, the wall cabinets sitting on the counter are 12 inches deep, leaving 13 inches of space in front of them. At left is a standard 84-inch utility cabinet (which could take pantry shelves), and the sit-on cabinets are 18 inches and 30 inches respectively, stacked to achieve the standard 84 inch height in the kitchen.

10. Division Using Shelving, not a Wall

A wall is a wall, but if the objective is to make a divider between kitchen and living area, create storage space with shelving, as seen in Fig: 4.4.46. In this design, one-base cabinet turns the corner and shelves are used above it and extending out for the divider, all matching the cabinets.

11. Storage to Cabinet Doors

As mentioned earlier, a basket is an invaluable source of small organizers that extend the use of cabinets in kitchen or bath. Here are a couple of examples, one for a kitchen cabinet door to hold lids and small bake ware, and another to hold cleaning materials for kitchen or bath as seen in Fig: 4.4.47 (a) and Fig: 4.4.47(b).

12. Storage "Boxes"

The seating cubes covered in shag are storage places. The shining end tables (or coffee tables) also encase storage space, as do the table at the rear. This room, seen in Fig: 4.4.48 is practically all storage space, and none of it shows.



Fig: 4.4.47(a) – Storage to cabinet doors



Fig: 4.4.47(b) – Storage to cabinet doors



Fig: 4.4.48 – Storage boxes



Old Army Footlocker

Fig:
4.4.
49 -

13. Old Army Footlocker

These storage boxes at the foot of the beds are not old army footlockers, but the concept is the same in this do-it-yourself project; moreover, it provides good storage that is well coordinated into the room. Vinyl wall covering was used up the wall behind the beds in this guest room, and then duplicated on the storage boxes, observed in Fig: 4.4.49.

13. Under-bed Space

This room is for a young boy old enough to use a typewriting but young enough to still like stuffed toys. So a desk was built in drawer space, with added space at the head of bed, and with big drawer space pulling out draw under the bed as shown in Fig: 4.4.50.

14. Dishwasher in small kitchen

Many kitchens are too small for built dishwashers, but do not want to wheel a dishwasher out to sit in the living or dining room. So an island can be made for it that also will give extra storage and countertop space as shown in Fig: 4.4.51. One can keep dishes behind those cabinet doors which open from either side of the unit, and on that one can use standard laminated plastic. The whole island does not have to be portable, but placed where there is space, and the dishwasher may be moved in and out as needed.

16. Making a Dishwasher Peninsula, with Serving Cart

Another good idea for a dishwasher when it is not provided in the kitchen is to sacrifice one base cabinet to build a peninsula that does four jobs: it contains a built in dishwasher near the sink; it serves as a divider between kitchen and dining room; it holds a portable dish storage unit that can be rolled from storage to the table; and it provides extra countertop work space as illustrated in Fig: 4.4.52 (a) and Fig: 4.4.52(b).

17. Hutch Hiding the Dishwasher

The dishwasher garage also can be a decorative piece fit in with the room decor and without extra utilitarian functions. The suggestion is an antiqued placed in a traditional room, with shelf space above for serving dishes or display pieces as seen in Fig: 4.4.52(c) and (d). But open the lower doors and there is the

Fig: 4.4.50 – under- space bed



Fig: 4.4.51 – Dishwasher placement

Fig: 4.4.52 - Peninsula with dishwasher



(a)



(b)

portable dishwasher. Wheel it to the table for unloading, then to the sink for washing, and store the dishes in it.

18. Another Dishwasher "Garage" Using Two Separate Units

As illustrated in Fig: 4.4.53 (a), (b) , the "garage" houses has portable dishwasher when there is no room in the kitchen, and the dishwasher itself has 3 butcher block top which is exposed when the top of the garage is opened. The companion unit can be a bar or serve any other purpose.

19. Bunk Beds

Bunk beds are a familiar space-saver when there are two sleepers in a single room. These fold out of the way when not in use to afford more usable space in the room for living activities as illustrated in Fig" 4.4.54. If the user does not want the beds to show, they can be hidden with draperies suspended from a draw rod above, or a cabinet can be built around them with common wall panels.

20. Storage Ideas Usable Anywhere

Storage ideas are plentiful, but not overpowering in the family room. Most obvious is the room divider built with two series of Plywood cabinets covered with plastic laminate for easy cleaning with open shelves between. Holes in the doors and drawers create an interesting effect and serve as substitutes for pulls and knobs for opening. The two series of six cantered holes on either side are in drawers. The four cubes in the centre of the room all provide lift-top storage, as the bases of the bench seat and the dining table. Prefinished wood paneling is used on the walls. Such an example is shown pictorially in Fig: 4.4.55.

21. A Living Room into a Bedroom

This is another idea room with the entire interior constructed of prefinished wall paneling. The living room utilizes a sofa bed, framed by paneling which includes storage cabinets constructed above and so lighting mounted inside to shine down on either sofa or bed. The interior of the two visible walls has been "moved in" about 10 inches, creating storage space between the original wall and the new wall. Thus find drawers under the windows, and doors beside the windows giving access to tall vertical storage as in Fig: 4.4.56.

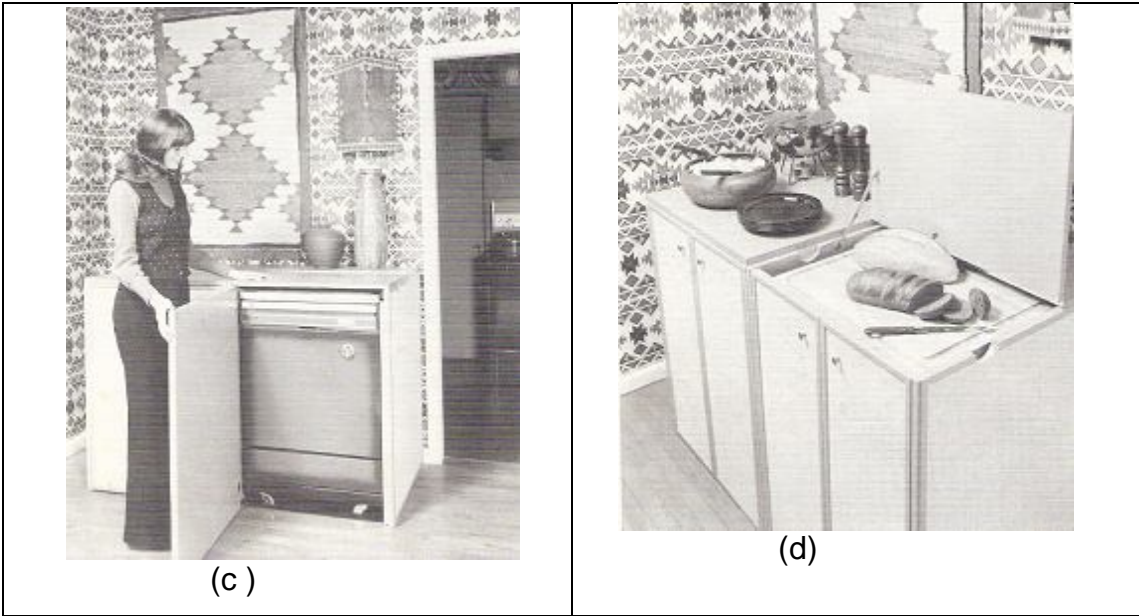
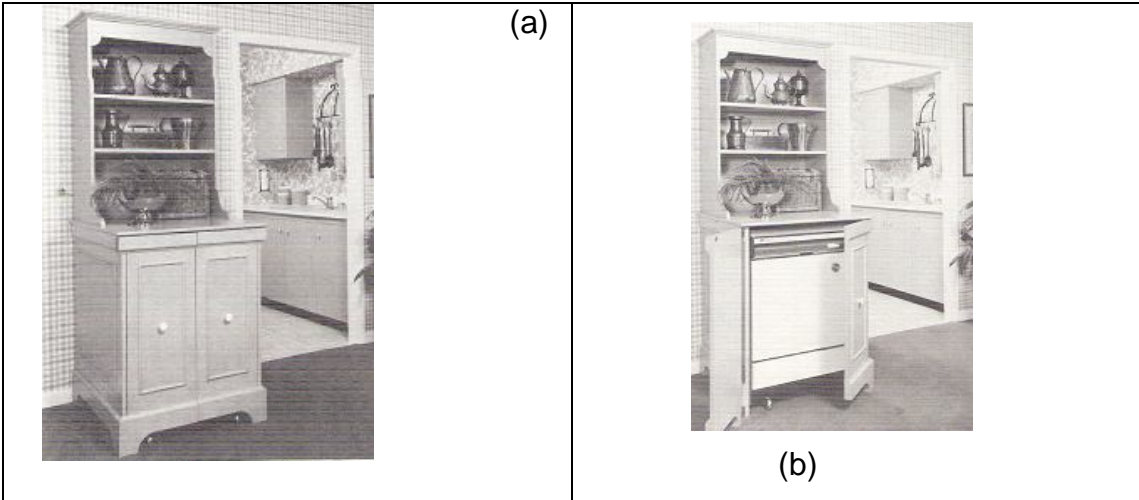


Fig: 4.4.53 - Dishwasher garage



22. Buying a System and Stacking It

There are several companies now making wall systems, and several more systems are being import. Combinations are most endless, and the good thing about most of these systems is that they are free-standing—they do not have to be built in. One can take them apart and moved as seen in Fig: 4.4.57. The colour of neutral white goes with any décor, or one can paint it or use a wall covering.

23. Another system remakes a bedroom

This inner wall system is shown in a bedroom, and it surely adds as much storage space as anyone would need. The entire wall is moved inward by the depth of the cabinets, and notice the tall vertical door added in the left of the doorway with the key in it to provide a little extra security for coat, shown in Fig: 4.4.58. While such installations cut the size, they often gain space because they obviate the need for chests, bureaus, dressing tables and the like.

24. Put More Storage in Bathroom

A study on bathroom with a thoughtful and creative eye to find ways to use cabinets must be done, but the ways are usually there. In the bathroom, the space that was wasted under the sink and on either side becomes solid storage with the addition of a full-size vanity cabinet; matching wall cabinets are added above. Note the make-up is added in panels on either side of the mirror to hide 12-inch depth of the wall cabinets as in Fig: 4.4.59.

25. Unlimited Versatility with Kitchen Cabinets

They may be called kitchen cabinets, but the furniture and they go well in any room of the home these photos indicated in fig: 4.4.60. The photo show basically styling for living room, a bar in the reception room for gaining storage in room in a very decorative way

26. Minimizing Confusion in the Cabinets

This feature, as shown in Fig: 4.4.61 is the use of organizers inside the cabinets. This wall cabinet has spice racks built in with lazy Susan shelves at left, transparent canisters, at right and below, a shelf for taller bottles above.



Fig: 4.4.54 – Bunk beds



Fig:
4.4.
56

– living room to a bedroom



Fig: 4.4.57 – living room with loose furniture



27. Modules in the Bathroom

The units in these two bathrooms are modular, as seen in Fig: 4.4.62, so one can add or subtract depending on the space available. The light shaded one shows maximum use of space on a larger bathroom wall, with a large mirror behind crossed by a group of shallow drawers for make-up items. The dark shaded units show adaptability for a smaller bathroom.

30. A vanity into a corner

Many bathrooms have minimal space, and a regular square vanity cabinet, as in Fig: 4.4.63 here would bump hips whenever a person tried to turn the corner. Using one of the standard corner wall cabinets (the C3000), adding a toe space, and then adding standard 9-inch doors on the sides to finish it off.

31. Study converts to a Guest Room

Guest rooms are usually empty most of the time; therefore a wiser choice is a dual purpose room. Here is a home office that converts quickly into a guest bedroom when needed, as illustrated in Fig: 4.4.64 (a) and (b). The back of the built-in sofa lifts up and the upper unit of a bunk-bed secured with spring and fastened to the walls.

32. Defining a Closet's Function

Most closets are empty spaces with a hanging pole, and they promote haphazard storage. Plan what one wants the closet for—it might not be clothing at all—then organize it by building the functions in with plywood. Here is a suggestion for a closet made over, but it could also be erected against a basement wall. Cut slots, circles or notches to hold shelves or to open doors, eliminating hardware expense. Castors may be used on the lower drawers because they are big and could be heavy when loaded, decorative mouldings used to adorn the doors. The options can be seen in the Fig: 4.4.65 (a) and (b).



Fig: 4.4.58 – Bedroom



Fig: 4.4.59 – Bathroom

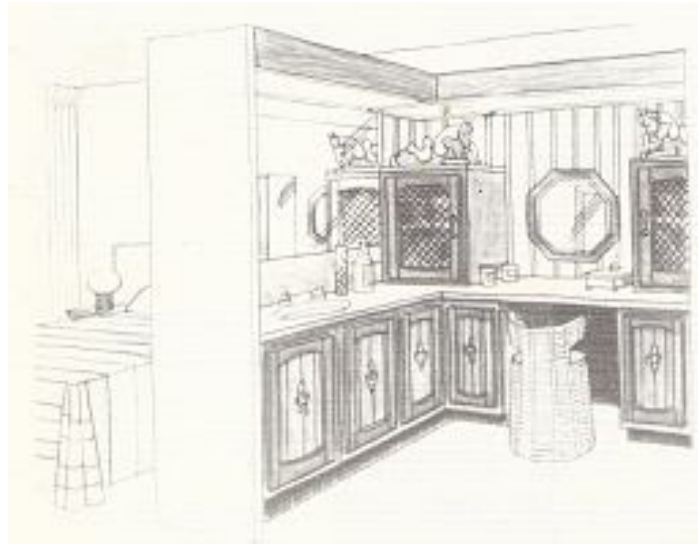


Fig: 4.4.60 – Living / Kitchen



Fig: 4.4.61 – Use of organisers in kitchen



Fig: 4.4.62 – Modules in Bathroom



Fig: 4.4.63 – Vanity corner

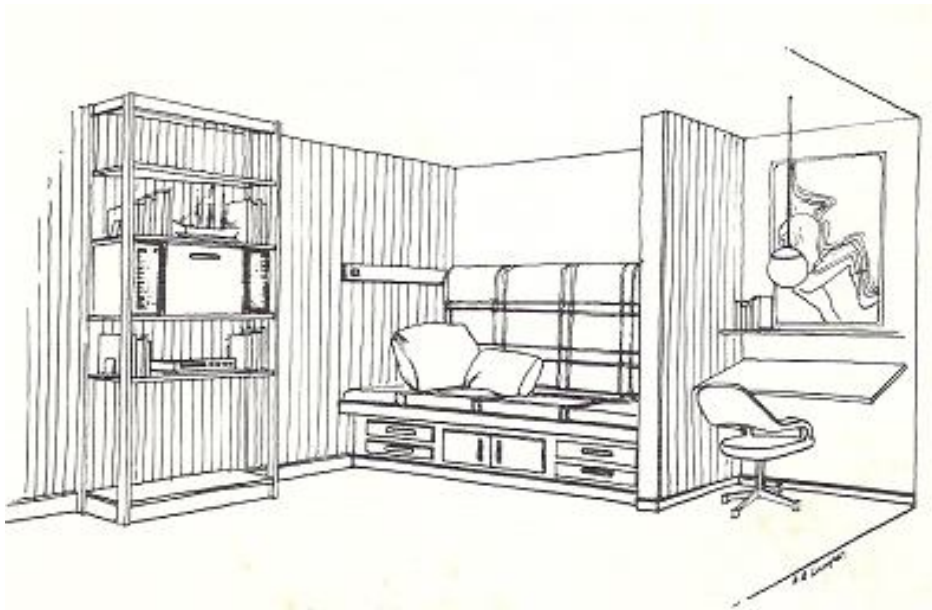


Fig: 4.4.64 (a) – Study room to Guest room

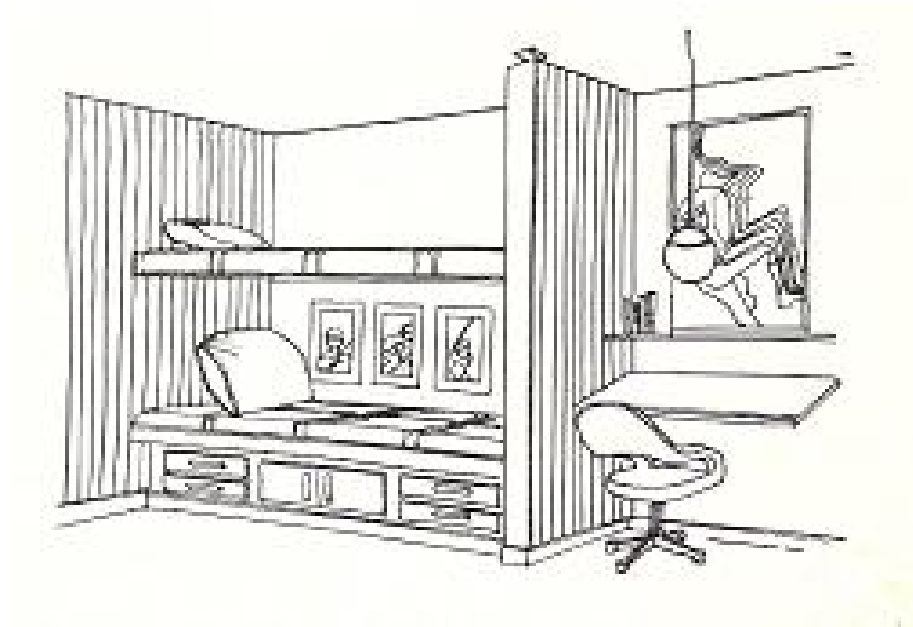


Fig: 4.4.64 (b) – Study room to Guest room



Fig: 4.4.65– Book - Staircase



Fig: 4.4.66 – Book - Staircase



Fig: 4.4.67 – Tank less toilet



Fig: 4.4.68 – Sofa to bunk bed

33. Book-Staircase

As seen in Fig: 4.4.65 and Fig : 4.4.66, the creative design project by Levitate Architects, the staircase bookshelves it is a solution for space saving if one has a huge books collection, and this belongs to a rental apartment. This can become an amazing book-lined staircase.

34. Tank less Toilets

With living space in homes often limited, space-saving tank less toilets are another new trend in the bathroom market. The toilet bowl itself has also been made more compact in these toilets, as seen in Fig: 4.4.67. The models' features include especially quiet flushing and refilling, as well as energy conservation by way of automatic control of the heated toilet. In such ways, toilet manufacturers are going all out in their use of cutting-edge technology to provide a more comfortable and eco-friendly experience for users.

35. Sofas to bunk bed

Convertible sofas transform into a double bed and even easy chairs that convert to single beds. But also a couch can become bunk beds, as seen in Fig 4.4.68, can save space. The cover is fully removable for easy cleaning and there is an integrated ladder.

36. Loft bed

The bed seen in Fig: 4.4.69 is used in childrens' bedroom and saves space as it is multipurpose furniture. This unit comprises of wardrobe, display unit, bed and study unit. The design also leaves some place for children to play with toys.



Fig: 4.4.69 – Loft bed

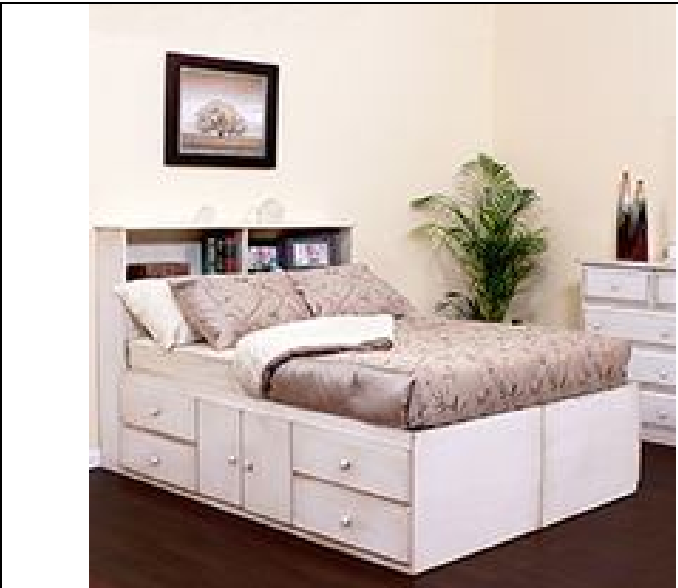


Fig: 4.4.70 – Platform bed



Fig: 4.4.71 – Space saving Bed cum Display unit



Fig: 4.4.72 – Corner table

37. Platform bed

Platform beds have storage underneath, as seen in Fig: 4.4. 70, either in the form of drawers or lift up storage. These models are in the market since 1969. As per the requirement of space, these models can be placed in the bedroom.

38. Space saving flip top bed

The model shown in Fig: 4.4.71 which flips a bed from wall and when not flipped would give space for storage and display.

39. Corner tables

In an apartment with a not-so-spacious bedroom, it is clear that desk is huge in the room. To put storage, space-saving table that could go against the wall can be placed in L-shape, as illustrated in Fig: 4.4.72. This table could serve as a nightstand and a desk that is just wide enough to fit laptop.

40. Oval platform in kitchen

This figure illustrates a oval cutting tray placed on the platform of kitchen that forms a no hindrance to stack things and at the same time saves space taken to stack another cutting tray as in Fig 4.4.73.

41. Cocktail table

This handy and stylish set provides a cocktail table and two ottomans all in one space-saving package. Simple lines and the warm tones of dark cherry finished wood and peat micro fiber add up to a sophisticated looking ensemble. Illustration given in Fig 4.4.74



Fig 4.4.73 - Oval platform in kitchen



Fig 4.4.74 – Cocktail table



Fig 4.4.75 – living room to bedroom



Fig 4.4.76 - Ledges

42. Living room to bedroom

The figure 4.4.75 illustrated above makes a double bed in a bedroom by transforming a sofa to bed which also camouflages the display unit behind when closed.

43. Ledges

As a space-saving strategy turned into a centerpiece of interior design, from virtually any perspective the result is remarkably attractive and a good reminder that a lack of space can be a great design

opportunity. As seen in the Fig 4.4.76, the ledges can be placed anywhere in the interiors that can hold anything, if placed safely and strongly.

44. Storage cabinet

When it comes to innovation and really cool convenient space saving furniture accessories, the cabinet by designer Andree Putman definitely makes the best use of a small space. A fold up style design allows concealing valuables when not in use, and the wheels allow moving the cabinet away to the closet or another out of the way. This storage cabinet sports a multitude of various sized drawers, hanger, trays, and cabinets as in Fig 4.4.77.

45. Book shelf

Available in multiple sizes, book shelf also functions as a room divider as shown in Fig 4.4.78.



4.4.77 – storage cabinet



Fig 4.4.78 – book shelf



Fig 4.4.79 - desk



Fig 4.4.80 – shelf

46. Desk

The desk illustrated in Fig 4.4.79, is super-sturdy and attractive and it is big enough to act as a small dining table, too.

47. Shelf

These leaning bookshelves have risen in popularity lately which is very sleek in design and occupy as less space as possible as illustrated in Fig 4.4.80.

48. Book towers

The book towers, as in fig 4.4.81, are a sturdy, space-saving alternative to traditional bookshelves that often fit in places where other furniture will not.

49. Multimedia cabinet

An Affordable Multimedia Cabinet with Versatile, Timeless Style because of this glass-door media storage unit, decorators no longer have to wonder how to incorporate large media collections into an attractive room design. It is durably constructed of solid hardwood and hardwood veneer, bringing a touch of elegance to media storage. The space-saving sliding doors feature glass panels that simultaneously display and protect CDs, DVDs, videos and books. Brighten your home with striking glass-door media storage. With seven adjustable shelves and a total capacity of 520 CDs, this multimedia cabinet is supremely functional, but do not overlook the beauty of its design as in Fig 4.4.82.



Fig 4.4.81 – book towers

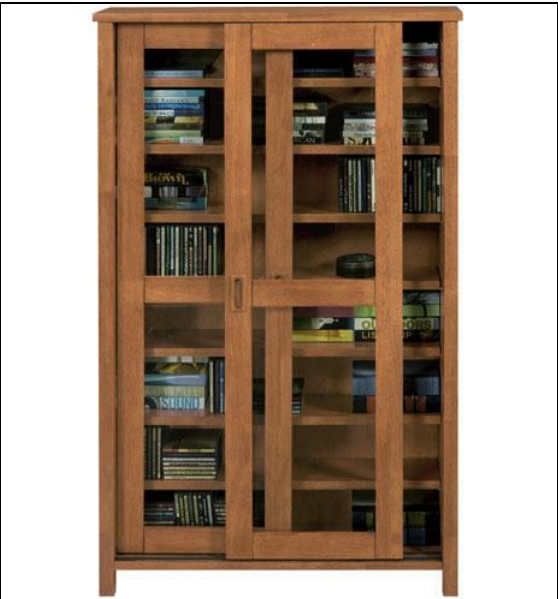


Fig 4.4.82 – multimedia cabinet



Fig 4.4.83 – dining table



50. Dining table

For expensive and limited living space comes the necessity of efficiently utilizing this limited space comes a cool dining table in a cube design. The dining set is cleverly designed such that it is an unassuming little cube when not in use. Whenever to use it, simply pull the chairs away and have a table with seats for four people. When closed, as in fig 4.4.83, it does not look so pretty, looks like a cube of wood, like a table cover on top.

51. Bed solutions

A. The hottest trend in design these days is multi-functional furniture that saves space by replacing multiple pieces with one as space saving beds (2004). These days, modular (pre-produced, uniform shapes, sizes and designs) furniture ranges provide different combinations of sleeping, storage and working areas for people of different ages and needs as in Fig 4.4.84 A. Each piece (for example, a cupboard or a set of shelves) is sold separately. Partial self assembly is usually required.

B. Private Cloud illustrated in Fig 4.4.85 C, looks like a giant rocking chair, or to be more exact like a rocking bed. It is not a normal bed, is something that wants to revolutionize every bedroom. The bed requires a little more space than a “normal” bed.

C. The unusual bed has a cool and unusual shape. The shape is inspired by a molecular structure; the basic form for all objects is the universe. It is made of 120 sofa balls covered with elastic fabric as seen in Fig 4.4.86 C. Because of the structure and feel, allows creating multiple forms.



Fig 4.4.84 – Bed A



Fig 4.4.85 – Bed B



Fig 4.4.86 – Bed C



Fig 4.4.87 – Bed D

D. Designed by the studio of invention, the bed that falls from the ceiling is an innovation that will save 4 m² in apartment and for someone who lives in a small space... 4 m² of space is pure gold. By day, the bed is stored on the ceiling; the under-surface becomes ceiling with the possibility of integrating lighting. At night, the bed can come down in the manner of an elevator and stops at the height previously requested, thus avoiding moving furniture that would have been placed underneath it. Now besides being functional, this bed has a clean design that is discreet and elegant as in Fig 4.4.87 D.

E. A bookcase that transforms into a bed is illustrated in Fig 4.4.88. The bookcase -bed combination works together to help maximize space and give walls a little extra colour as in figure 4.4.88 E mattress stands upright in four bits and forms the bulk of the bookcase. These surround five storage shelves which are suspended in mid-air by a wall mounted frame. The mattress sections are placed on the floor and slot together to form the bed with two parts for a single, or all four to make a double.

F. Hi-Can is a “High Fidelity Canopy” designed by Italian designer Edoardo Carlino. The Hi-Can, illustrated in Fig 4.4.89 high fidelity canopy features beautifully designed equipment that allows surfing the web, watching movies, playing games, and listening to music all from the comfort of bed. This bed provides a lot of technology at fingertips, and is a perfect tool that aims to make life more sedentary.

G. Scoop (fig 4.4.90) is a sophisticated and innovative answer to the demand for combining the sofa function with the bed function. The two semi-circular sides of the bed can be separated resulting two new pieces of furniture. This bed is a great way to surprise guests, and also can be proud to have a stylish contemporary bed and two sofas in the same time.

H. This sofa bed is called “*Book*” and is designed by the Italian designers as shown in Fig 4.4.91. Ideal boundary between day and night, Books has a dual function that makes it particularly suitable for small spaces.



Fig 4.4.88 – Bed E



Fig 4.4.89 – Bed F



Fig 4.4.90 – Bed G



Fig 4.4.91 – Bed H



Fig 4.4.90 – Bed G

By day sofa is a modern, linear and elegant, and by the night turns with a simple gesture in a comfortable bed rest with a plan staves. The sofa is not too beautiful at a first glance, but when we think that is a piece of furniture that can also become a bed.

I. The Fluttua bed from Lago has the appearance that it is floating. To give the bed its floating appearance, the frame was attached to the wall and supports a single post under the centre. This bed can have a strong impact on visitors, and they will be quite impressed.

J. The computer bed is a normal bed which makes an intelligent use of the space below the bed. The gas pistons enable the bed to double up as a computer table.

K. As seen in the illustration Fig 4.4.94, this is not just a very comfortable bed, but also has some technology incorporated. The bed features a home cinema rack fitted between the two headboard bolsters that offers enough space for items such as a DVD player and games consoles. As soon as the film is over, a button on the remote control and the screen disappears inside the foot section

L. A bed suspended on a rope is illustrated in Fig 4.4.95. Teak platforms suspended from heavy-gauge rope take centre stage, while a punchy orange-striped fabric on the wall and Roman shade create a seamless backdrop. The visual effect of these suspended beds is just awesome, but these are not recommending to someone who is sleeping like a rabbit and wakes up at the slightest sound.

M. Zoom-Room, far from being simply “a bed” or traditional “wall bed”, is a design solution that allows thinking of the rooms in home in a completely different way. This bed will appear if one just presses a button on the wireless remote control. When the button is pressed that sends the premium latex mattress as well as German-designed slatted frame gliding



Fig 4.4.92– Bed I



Fig 4.4.93– Bed J



Fig : 4.4.94



Fig 4.4.95– Bed L



Fig 4.4.96– Bed M

down a vertical track and into space. The bed measures a mere 24" deep, making it pretty much undetectable to the untrained eye as in Fig 4.4.96.

N. The incredible bookcase completely surrounds this bed, making look like an igloo made of books. The final results looks good, but unfortunately is not too practical, and takes a lot of space, but little kids will love this project.

O. A flat TV panel is hidden under the bed and slides out to position itself for the optimum viewing while in bed.

Based on the above suggestions and ideas, the model apartment was designed so as to enable the homemaker to guide herself before thinking about treating interior spaces to be more spacious within the available. The two bedroom apartment design chosen was an upcoming project at Miyapur, Hyderabad. The plan was borrowed from the builder and was shown to two famous Architects so that the plan can be evaluated for structural design features which contribute to saving space. Later, after architects' suggestions, few structural changes were done and further interior design solutions were worked on by the investigator. The renovated plan is shown in Fig 4.4.99.



Fig 4.4.97– Bed N



Fig 4.4.98– Bed O

Significant findings of Interior space management strategies

- Most of the respondents (68%) are young and could be conscious of space management in their homes
- Majority (24%) families are employees of private organisations and draw an income of rupees 50000/month
- Revealing that most of the families could afford large living spaces
- Bean bags of medium size made in black leather were found in 1 households
- As high as 48% of households used emulsion paint with rough finish
- It was observed that 34% household had cream wall, 20% had white walls
- As high as 32 numbers of households used marble and white flooring making it more appropriate to create illusion of space though difficult to maintain. Another 24% used tile and white flooring
- Majority (32%) of households used combination of different colours for curtains resulting in homemakers' choice to match with a theme.
- It is observed that 34 number of households used CFL with white light, creating more cooling effect due to its properties
- 4% of households had medium sized inbuilt cupboards made of brown wood, 4% of households had flexible furniture of large size in wood, 6 % of houses had large sized built-in cupboard with open shelves, 4% had foldable chairs made of white plastic, 4% had foldable chairs made of black plastic, 2 % of households had inbuilt crockery units with open shelves, 10% had crockery unit framed with brown and black wood. Some households also had round dining table made of glass and they form 4%. 2 households had L shape sofa. Only one home positioned wooden collapsible partition. Centre table with stools and center table with storage, made of wood and glass were found in 42% of households.
- In smaller living / dining rooms, kitchens and bedrooms the inhabitants adopted flexible / built-in / collapsible / dual purpose furniture so that their needs can be fulfilled in the available space.

- The results show that in majority of households' (60%) kitchen was medium in size, 24 households (48%) was small in size and 10 household (20%) had large size room dimension. Large sized kitchen is least found from sample.
- In large sized kitchen with u shape platform, large RCC white racks were found in 4 households, large wooden white and brown racks were found in 2 households. In large sized kitchen with l shape platform, medium sized wooden brown racks were found in 8% of households.
- As high as 56% of households used emulsion paint with tiles, 36% used emulsion paint with rough finish and 4% used emulsion paint with smooth finish in their kitchen.
- It was observed that 44% household had white wall, 32% had cream walls.
- In large kitchens, 10 households had inbuilt crockery units along with overhead storage, covered with wood and glass.
- In medium size kitchens, majority of shelves are open. 2 households had open shelves for crockery. 2 households had tall unit with draw baskets made in wood. 8 households had corner units done in wood. In small kitchens, 16% of households had inbuilt crockery unit, (with open shelves) 12% of households had open overhead storage units. 8 households had draw baskets in small kitchens.
- Four households (8%) bedroom 1 was large in size, 44 households (88%) were medium in size and 2 household (4%) had small room size. Due to space constraint, the results show that majority of households had medium sized bedrooms.
- In large sized bedroom 2, in-built wardrobe with open shelves were found in 4 households, in-built wardrobes with wooden frames in black and red were found in 4 and 2 households respectively.
- Dresser cum luggage rack made of wood was found in 2 households. Godrej wardrobes made of blue plastic were found in 4 households and brown iron Godrej wardrobes were found in 4 household. In medium sized bedroom 2, in-built wardrobe cum TV unit was found in 2

households which were made of wood and glass. Stackable chairs made of white plastic were found in 2 households. Wardrobe cum dresser made of wood in red and glass were found in 2 households. 4 households had sofa cum bed made of wood. Flip top dining table was found in 2 households which were made of wood and glass. In small sized bedroom 2, 6 households had built-in cupboards.

- As high as 24 household (48%) bathrooms were large in size, 18 households (36%) were medium in size and 8 household (16%) had small size.
- All the bathrooms of households were tiled in light colours enabling reflection of light and maintenance free. As high as 56% of households used tiles with pink, 34% used tiles with blue and as low as 10% of households used tiles with brown in their bathroom.
- It shows that 43(86%) number of households used tile and white flooring, 2% used tile and grey flooring, 10% of households used tile in yellow

Designs evolved for model apartment

1. Floor plan of two bedroom apartment



Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

2. Foyer – perspective



Space saving strategies

- Built in shoe rack with picture paint on wall

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

3. Living room – perspective 1 (a)



Space saving strategies

- Sleek entertainment unit
- Sofa cum bed (3seater sofa)
- Glass + steel centre and side tables

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

4. Living room – perspective 1 (b)



Space saving strategies

- Sofa cum bed
- Flexible furniture (centre tables and side tables)
- No curtains added to French door to make it look like a picture window
- Analogous colour scheme

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling in white in colour.

5. Dining area – wall perspective with open dining table



Space saving strategies

- Flip down dining table
- Suspended crockery unit with minimum depth
- Sleek chairs for illusion of space
- Monochromatic colour scheme

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling in white in colour.

6. Dining area – wall perspective with closed dining table



Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling in white in colour.

7. Kitchen – perspective



Space saving strategies

- Modular storage system for organised working pattern
- Open shelves for extra storage upon refrigerator
- Continuous uninterrupted platform
- Loft storage
- Corner space used by placing corner carousel
- Neutral colour scheme

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling in white in colour.

8. Bedroom 1 – perspective 1



Space saving strategies

- Bed with storage
- Suspended night stand
- Built-in wardrobe / dresser / study table
- Loft (also extended)
- More circulation space
- Curtain colour same as wall colour to continue the spaciousness of wall area

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

9. Bedroom 1 – perspective 2



Space saving strategies

- Extra open shelves for storage near bathroom entry
- Less occupancy on floor for relieving the space from heaviness
- One wall storage with less storage capacity towards floor for continuation of space on floor

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

10. Bedroom 2 – perspective 1



Space saving strategies

- Wardrobe with loft for more storage capacity.
- Two bunk beds for two boys with study table underneath along with a chair and storage.
- A common rack to place stationery and hobbies.
- Contrasting colour scheme
- Furniture arrangement to leave more space for their play.

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

11. Bedroom 2 – perspective 2



Space saving strategies

- Furniture arrangement to leave more space for their play.
- Pin-up board to mount hobbies
- Curtain colour same as wall colour to continue the spaciousness of wall area
- Wall bracket lighting to highlight wall area

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

12. Toilet – perspective 1



Space saving strategies

- Shelf for storage above washbasin
- Built-in rack near tub
- Grab bar for easy accessibility
- Similar wall finish to continue wall area

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

13. Toilet – perspective 2



Space saving strategies

- Open shelf for more storage
- Storage cabinet onto recessed wall for extra storage
- Similar wall finish to continue wall area
- Less occupancy onto floor to space illusion

Note: the rendered images are not reflecting the actual colours due to technical reasons. All wall colours are in light tints and ceiling is white in colour.

The model developed should cadre to middle income group. Hence the estimation was worked out for homemakers as in TABLE 4.4.1.

S. No.	Item	Quantity	Unit price	Net price
1.	FOYER			
A	FURNITURE			
I	Shoe rack	5'8" X 2'6"	600	8625
B	ACCESSORIES			
I	Painting	3 No.	1200	3600
C	LIGHTING			
I	CFL	4 Nos.	475	1900
li	Spot lights	3 Nos.	375	1125
D	COLOURING			
I	Wall and ceiling colour	200	5	1000
2.	LIVING ROOM			
A	FURNITURE			
I	Entertainment unit	6' X 6'6"	600	23400
li	Sofa set (3+1+1)	1 Set	45000	45000
iii	Centre table and side table set	1 set	12000	12000
B	ACCESSORIES			
i	Rug	1 No.	4500	4500
C	LIGHTING			
I	CFL	4 Nos.	475	950
li	Wall brackets	2 Nos.	600	1200
D	COLOURING			
I	Wall and ceiling colour	600	5	3000
3.	DINING ROOM			
A	FURNITURE			
I	Flip down dining table	1 No.	18000	18000
li	Dining chairs	4 Nos.	3500	14000
iii	Crockery unit	3'8" X 2'	600	4500
B	LIGHTING			

i	CFL	2 Nos.	475	950
D	COLOURING			
i	Wall and ceiling colour	200	5	1000
4.	KITCHEN			
A	FURNITURE			
I	Platform storage	21' X 2'6"	650	34125
li	Overhead storage	21' X 2'6"	600	31500
iii	Baskets and fixtures	1 set	20000	20000
B	ACCESSORIES			
i	Utensil rack	1 No.	2400	2400
C	LIGHTING			
i	CFL	2 Nos.	475	950
D	COLOURING			
i	Wall and ceiling colour	350	5	1750
5.	BEDROOM 1			
A	FURNITURE			
I	Cot with storage	1 No.	28000	28000
li	Suspended night stand	2 Nos.	1800	3600
lii	Built in wardrobe / study / dresser	12' X 10'	650	78000
iv	Chair	1 No.	3000	3000
B	ACCESSORIES			
i	Curtain	1piece	3400	3400
C	LIGHTING			
i	CFL	5 Nos.	475	2375
ii	Wall brackets	3 Nos.	375	1125
D	COLOURING			
i	Wall and ceiling colour	600	5	3000
6.	BEDROOM 2			
A	FURNITURE			
i	Bunk beds / study table	2 Nos.	17500	35000
li	Chairs	2 Nos.	3000	6000

lii	Storage rack	3' X 6'	600	10800
lv	Walk in wardrobe	8'7" X 10'	600	52500
B	LIGHTING			
i	CFL	6 Nos.	475	2850
ii	Wall brackets	3 Nos.	375	1125
C	COLOURING			
i	Wall and ceiling colour	600	5	3000
7.	TOILET			
A	FURNITURE			
i	Storage unit 1	1 No.	5000	5000
ii	Storage unit 2	1 No.	3500	3500
iii	Storage unit 3	1 No.	2000	2000
B	BATHROOM FIXTURES			
I	Bath tub	1 No.	12000	12000
ii	Pedestal wash basin	1 No.	5000	5000
iii	W.C.	1 No.	8000	8000
iv	Shower head	1 No.	3500	3500
C	LIGHTING			
i	CFL	4 Nos.	475	1900
D	COLOURING			
i	Wall and ceiling colour	330	5	1650
Approximate grand total				511800

The costs mentioned for all the above elements of interiors of two bedroom apartments are given as per the prevailing rates and specific choices, totalling to an amount of Rs.5, 11,800, rounded off as Rs.5,12,000. Changes in the items specified while retaining the theme can influence the cost.

CHAPTER V

DISCUSSION

The findings of the research study have been discussed and interpreted under the following heads

- 5.1. Standard dimensions of interior spaces
- 5.2. Existing space saving furniture designs
- 5.3. Interior space management strategies
- 5.4. Strategies for space conservation in a two bedroom apartment model design

5.1. Standard dimensions of interior spaces

The organization and character of individual dwelling units cannot be expressed by simple numerical standards. Functional organization, privacy, visual appearance, etc., are issues which must be dealt with consciously and rationally if desirable housing is to be achieved. Therefore the following guidelines and performance criteria were set forth to assist the investigator in preparation of plans.

Typical room sizes in feet

	Small	Average	Large
Basic Rooms			
Living room	12x18	16x20	22x28
Dining room	10x12	12x15	15x18
Kitchen	5x10	10x16	12x20
Utility room	6x7	6x10	8x12
Bedroom	10x10	12x12	14x16
Bathroom	5x7	7x9	9x12
Additional Rooms/Areas			
Halls	3' wide	6' wide	9' wide
Area	10x20	20X20	22x25
Storage wail	6' deep	12'deep	18" deep

Den	8x10	10x12	12-16
Family room	12X15	15x19	15x22
Wardrobe closet	2x6	2x8	2x15
One-rod walk-in closet	4X3	6x6	4x8
Two-way walk-in Closet	6x4	6x6	6x8
Porch	6x6	8x12	12x20
Entry	6x6	8x10	8x15
One-Car Garage	11x19	13x25	16x25
Two-car garage	20x20	21x22	25x25

For a living room, the furniture required is

- One couch, 3 ft 0 in by 6ft 10 in
- Two easy chairs, 2 ft 6 in by 3 ft 0 in
- One desk, 1 ft 8 in by 3 ft 6 in
- One desk chair, 1 ft 6 in by 1 ft 6 in
- One television set, 1 ft 4 in by 2 ft 8 in
- One table, 1 ft 6 in by 2 ft 6 in

Sizes of living room furniture

Sofas	2 ft 6 in to 3 ft 6 in deep by 6 to 7 ft long	Governor Winthrop	2 ft by 3 to 3 ft 8 in	Tables, circular	
Love seats	2 ft 6 in to 3 ft deep by 3 ft 6 in to 4 ft 6 in long	Secretary	1 ft 6 in to 2 ft deep by 3 10 4 ft long	Lamp	2 ft diameter
Chairs		Highboy, lowboy	1 ft 6 in to 2 ft deep by 2 ft 6 in to 3 ft 6 in long	Coffee table	3 ft diameter
Club	2 ft 9 in by 3 ft 6 in	Tables, rectangular End	1 ft 6 in to 2 ft deep by 2 ft 6 in to 3 ft 6 in long		
Wing	2 ft 6 in by 2 ft 9 in	Coffee table	2 ft 3 in by 1 ft or 1 ft 8	Drum	3 ft diameter
Bridge	1 ft 6 in by 1 ft 6 in	Bridge	2ft 6in by 2ft 6in	Piecrust	3 ft diameter
Desks		Console	1 ft 6 in by 3 ft	Pianos	
Flat top table	2 ft to 2 ft 6 in deep by 4 to 5 ft long			Grand	4 ft 10 in to 5 ft wide by 5 to 9ft long
				Upright	2 by 5ft

For Dining areas, the principal factors to be considered in planning are as follows

- Number of persons to be seated
- Space used at the table
- Space for chairs and for passage behind them
- Seating arrangement
- Size and type of furniture

- Storage space for linen, silver, glassware, chinaware, etc.

Primary and secondary activities that usually take place in dining rooms or spaces are setting the table, serving food, eating, cleaning up after meals, storing dishes, children's play, reading, writing, studying and homework, entertainment, board games, pattern cutting and sewing, watching television, ironing clothes, etc. Dining areas must accommodate furniture either portable or built-in for eating, sitting, serving and possible storage. Equipment for these dining functions may also be adopted to meet other possible requirements for this space as studying, game – playing, etc. If no one is to be seated at either end of the table, the length may be reduced by 2 ft. (21 sq.ft) recommended space for dining area is as follows

Persons	W X L in Ft	=area in Sq. ft.
4	10.5 X 12	126
6	10.5 X 14	147
8	10.5 X 16	168
10	10.5 X 18	189
12	10.5 X 20	210

Furniture measurements of dining area in accordance with occupancy are

- 1 or 2 persons 2 ft 6 in by 2 ft 6 in
- 4 persons 2 ft 6 in by 3 ft 2 in
- 6 persons 3 ft 4 in by 4 ft 0 in or 4 ft 0 in round
- 8 persons 3 ft 4 in by 6 ft 0 in or 4 ft 0 in by 4 ft in
- 10 persons 3 ft 4 in by 8 ft 0 in or 4 ft 0 in by 6 ft 0 in
- 12 persons 4 ft 0 in by 8 ft 0 in
- Dining chairs 1 ft 6 in by 1 ft 6 in

- Buffet or storage unit 1 ft 6 in by 3 ft 6 in

For Combined living-dining spaces, several compatible living functions can be combined advantageously in a single room. Some of the benefits of such arrangements are that less space is used but it is used more intensively, its functions can be changed making it more flexible and serviceable space, it is adaptable to varied furniture arrangements, while visually It can be made more interesting and seem more generous than if the functions were dispersed into separate rooms. For adjacent spaces to be considered a combined room, the clear opening between them should permit common use of the spaces. This usually necessitates an opening of at least 8 ft.

A combination dining area – kitchen is preferred by some occupants of small houses and apartments. This arrangement minimizes housekeeping chores and provides space which can be used as the family's day-to-day meeting place. One of the primary functions of the kitchen has been to provide a place for informal or family eating. This is different than guest or formal dining in a separate dining room or area. The informal dining generally consists of breakfast, lunch, snacks or just serving coffee to a neighbour. This eating area should be clearly defined as a separate functional area. A frequent and desirable arrangement is the combined kitchen-dining area.

The kitchen is not a specialised work room for it has many uses. It is used for preparation of meals, food preservation, storage of food and utensils, and also in many cases for eating, laundering, entertaining and child care. In it a woman uses her own labour and also makes full use of electric power, tap water and manufactured or bottled gas. She uses refrigerators, stoves, dishwashers, mixers and toasters, and garbage disposal units as well as various kinds of storage compartments and work surfaces. Since more time and effort are frequently spent in the kitchen than in any other area of the house, careful planning is especially

important. This requires careful selection of appliances and storage units and convenient arrangement of the area.

The primary and secondary activities that usually take place in bedrooms are, sleeping, dressing / undressing, storing clothes, personal care, reading, writing, studying, working, watching television, listening to music, childrens' play, caring for infants, knitting, mending and sewing, ironing, telephoning, drawing and painting, sitting and entertaining, doing exercise, resting, hobbies and crafts, keeping pets, storing bulky items and seasonal clothes. There are minimum requirements for furniture and space if occupants are to be able to carry out their normal bedroom activities. Two basic bedroom types have been identified.

1. The single occupancy bedroom which will accommodate one single bed

2. The double occupancy bedroom, which will accommodate one double bed or two single beds.

Clearances should be provided in front of and around furniture in bedrooms so that primary activities can take place efficiently and in comfort. In some cases greater clearances are required to satisfy the needs of elderly people and wheelchair users and invalids. The location of doors and windows should permit alternate furniture arrangements. The least used side of a single bed or twin bed can be placed against the wall except in bedrooms for the elderly. Where at least two other sleeping spaces are provided, a dormitory is sometimes preferred by larger families.

Combined living- sleeping areas must have a bed alcove with natural light and ventilation and which can be screened from the living area is desirable in a zero bedroom living room unit. In housing for the elderly and handicapped, the units suitable for wheelchair users often can be placed advantageously on the ground floor. Omission of an easy chair is acceptable to give more space for occupant's wheelchair.

Single occupancy bedroom with another space	5 sq. m	Adults
Single occupancy bedroom	8.5 sq.m	Elderly, adults, teenagers, pre-adolescent child
Double occupancy bedroom	14.7 sq. m	Adults, school age children of same sex, children of different sexes who are less than 9 years old, preschoolers

Essential furniture and circulation for a bedroom is as follows

- Two twin beds, 3ft 3 in by 6ft 10 in
- One dresser, 1 ft 6 in by 4ft 4 in
- One chair, 1 ft 6 in by 1 ft 6 in
- One crib, 2 ft 6 in by 4 ft 6 in
- One table, 1 ft 6 in by 2 ft 6 in for sewing or other work
- A secondary double-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture
 - Two twin beds, 3ft 3 in by 6ft 10 in,
 - one double bed, 4 ft 6 in by 6 ft 10 in
 - One or two dressers, 1 ft 6 in by 3 ft 6 in
 - One chair, 1 ft 6 in by 1 ft 6 in
 - One desk, 1 ft 8 in or 3 ft 6 in, or storage chest for toys

A secondary single-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture

- One twin bed, 3 ft 3 in by 6 ft 10 in
- One dresser, 1 ft 6 in by 3 ft 6 in
- One chair, 1 ft 6 in by 1 ft 6 in
- One desk, 1 ft 8 in by 3ft 6 in

The recommended room sizes for bedrooms are as follows

- Parents Bed room - This bed room has an approximate size of 10ft 6 in by 11ft (115.5 sq ft) the size of this bed room will only just permit the use of twin beds if placed together.
- One person bed room - The bed room has an approximate size of 9 ft 3 in by 9 ft 6 in (87.9 sq ft).
- Two person bed rooms - This bed room has an approximate size of 10ft 6 in by 14 ft 6in (152.2 sq ft).

5.2. Existing space saving furniture designs

Furniture showrooms have presented several features in furniture for every room enabling the homemaker to make her choice in accordance with the space available. Also the price range is so varied that homemaker can make her choice.

The wide variety of space saving furniture available for living room are sofa cum bed, L shape sofa, split sofa, bunk bed, bean bags, expandable Diwan, resin chairs, flexible center table, center table with stools, center table with double tops, shelf table, nest of tables, corner or end tables, center table with storage, entertainment units, display / shoe rack, shoe cabinets, folding chairs, inflatable sofas, love seat, sleeper sofa and Diwan.

Cot with box storage, foldable bed, wardrobe with sliding doors, dresser with stools, TV unit, ottomans and night stands form bedroom furniture that save space with more storage capacity.

Space saving furniture for dining rooms was dining table set, round dining table, dining table with double tops, chest of draws and corner curio units.

Childrens' bedroom solutions had bed, wardrobe, study table and dresser, bed with side storage, children bedroom unit, flat boy, 2 way book shelf for book storage form space saving furniture for other rooms with less space.

Tall unit, foldable seats, wooden seat, wash with storage area, wooden partition, study tables, computer tables, bar / partition units, CD rack, shoe cabinet / seat, flexible furniture and kitchen unit solutions are other types of furniture existing. All these units save space and also the material with which they are made can be chosen to suit the ambience as required by homemaker. They can also be duplicated to size required by a carpenter. The showrooms provide services to customize furniture as required by homemaker. The material used for its construction can also be chosen for convenience.

5.3. Interior space management strategies

5.3.1 General profile

5.3.1.1 (A) – Age of respondents

Majority of respondents (68%) are in the age group of 30 to 40 years and 4% of respondents fall under age group of 40 to 50 years. Another 12 % of respondents fall in elderly age group. This reveals that most of the respondents are young and could be conscious of space management in their homes.

5.3.1.1 (B) – Number of children

The results reveal that, a majority of families (46%) have two children and there were families (10%) having no children representing new family set up. All the households were owned by the homemakers and all are nuclear families.

5.3.1.1 (c) – Socio economic status respondents

The collected data reveals that majority (24%) families are employees of private organisations and draw an income of rupees 50000/month. While another 2% of respondents belonged to middle income group, working in a government organization. Respondents earning up to 20000 are 10%, up to 30000 are 8%, up to 40000 are 14%, 60000 are 4%, 70000 are 8%, 1 lakh are 6%, 1,20,000 are 4%

and income up to 2 lakh are 10%. The remaining respondents are business professionals, employees at MNCs and other private organizations, thus making it clear that there is variation in the income levels of respondents and since most of them belong to the upper middle income group, can adopt for comfortable space.

Interior profile

5.3.2.1.1 – Living / dining room area specifications

As stated in the results, majority of living / dining rooms (64%) were large in size, 17% were medium in size and just one household had small living / dining room revealing that most of the families could afford large living spaces.

5.3.2.1.2 – Living / dining room furniture

It was observed that a variety of furniture was used in living / dining room. Sofa sets having brown and yellow fabrics were found in 5 households having large living / dining rooms. Medium size sofa sets made in orange and brown fabric were found in 4% households each. Small sofa sets made in red fabric formed 2% of total households. Large black wooden sofa set were about 10%, and medium brown wooden sofa sets were 8%. There was one household with large yellow Diwan and two households with medium sized brown wooden Diwan. Medium sized furnished Diwan in white was found in 3 households. Bean bags with brown leather were seen in 2 household. This represents use of wide variety of furniture types with different colours, size and material, mainly in neutrals and yellow for furnishings.

In a medium sized living / dining room, large Diwan with brown wood was found 2 times, large sofa set made in brown wooden polish was found in 1 household, medium sized Diwan with center table was seen in 3 households, medium Diwan made out of brown wood was encountered in 2 households, sofa set of large size made in wood and fabric were seen in 2 households, bean bags of medium size made in black leather were found in 1 households, another 4% of households

had combination furniture like sofa set and Diwan, sofa set and bean bags, Diwan and center tables. These figures represent that as the size gets decreased, furniture of split sets and smaller sizes were used. The colours used were not representing much of variation from that of large size rooms.

A 2 bedroom flat generally has a small living / dining room, a Diwan was placed which is of medium size and is made of brown polished wood, which would act as a formal cum an informal seating space.

5.3.2.1.3 –Living / dining room wall type and finish

As high as 48% of households used emulsion paint with rough finish and as less as 2% of households used texture/royal emulsion paint with smooth/lappam finish. Another 26% used lappam, 14% used emulsion paint with smooth finish, and 10% used texture paint with rough finish. This result revealed that homes with emulsion paints are easy to maintain and they formed the highest percentage of sample and a rough finish produced less glare within.

5.3.2.1.4 –Living / dining room wall colour

From results, it was observed that 34% household had cream wall, 20% had white walls, 16% each had peach and pink walls, 12% had green walls and 2% households only has blue walls for living / dining room which represented recommended colours for interiors of living / dining room. Since all colours are pale, they reflect more of light making the interiors look more spacious. The results reveal a good amount of colours for making interiors look cool and spacious.

5.3.2.1.5 –Living / dining room floor type and colour

As high as 32 numbers of households used marble and white flooring making it more appropriate to create illusion of space though difficult to maintain. Another 24% used tile and white flooring, 2% of households used tile and black, and 2% of households used marble and green flooring.



Living / dining room space saver – built-in storage / display unit

5.3.2.1.6 –Living / dining room curtain colour

Majority (32%) of households used combination of different colours for curtains resulting in homemakers' choice to match with a theme. Yellow curtains were used in 4 households, 12% used peach curtains, 14% used green curtains, 8 % used pink and as less as 4 % used blue curtains in their living / dining room. Though all households had pale curtain colours, there were splashes of dark colours creating emphasis in interior spaces.

A general homemakers' practice of matching the wall color with the curtains can be observed in the survey, and in order to bring in pattern to break the paleness of the walls patterns are a choice for curtains.

5.3.2.1.7 – Living / dining room lighting type and colour

It was observed that 34 number of households used CFL with white light, creating more cooling effect due to its properties. Whereas just one household used a chandelier, which had warm effect in view of a number of incandescent bulbs. Few household (10) used focus lights emitting a yellow tinge and very few households (5) used CFL with a yellow tinge.

5.3.2.1.8 –Living / dining room Space savers'

As in results, there were many variations in using space saving features in large living / dining room. 4% of households had medium sized inbuilt cupboards made of brown wood, 4% of households had flexible furniture of large size in wood, 6 % of houses had large sized inbuilt cupboard with open shelves, 4% had foldable chairs made of white plastic, 4% had foldable chairs made of black plastic, 2 % of households had inbuilt crockery units with open shelves, 10% had crockery unit framed with brown and black wood. Some households also had round dining table made of glass and they form 4%. 2 households had L shape sofa. Only one home positioned wooden collapsible partition. Centre table with stools and center table with storage, made of wood and glass were found in 42% of households.



Living / dining room space saver – built-in crockery unit

In a medium sized living / dining room, the space savers used were wrought iron foldable chairs made in black and were found in 2 households. 2 households had medium sized foldable chairs in white. Other 13 households had medium sized glass coffee tables.

In a small sized living / dining room, one household had stackable chairs made in white plastic. This states that small sized rooms were used better by using flexible furniture which in turn leaves floor space when there is less number of occupants.

Due to the mismatch in the proportion to the space available to the demand, builders have opted for vertical construction in the restricted and limited space available in and around the cities, which in turn resulted in smaller living / dining rooms and bedrooms, hence forcing the inhabitants to adopt flexible / built-in / collapsible / dual purpose furniture so that their needs can be fulfilled in the available space.

5.3.2.2.1 – Kitchen area specification

The results show that majority of households' (60%) kitchen were medium in size, 24 households (48%) were small in size and 10 household (20%) had large size room dimension. These figures show that the area dedicated to kitchen in apartments is not too liberal. Large sized kitchen is least found from sample.

5.3.2.2.2 – Kitchen furniture

As seen in results, in large sized kitchen with u shape platform, large RCC white racks were found in 4 households, large wooden white and brown racks were found in 2 households. In large sized kitchen with l shape platform, medium sized wooden brown racks were found in 8% of households.

In medium sized kitchen with u shape platform, medium sized RCC racks were found in 3 households and brown wooden racks of medium size were found in 2 households. In medium sized l shape platform, white and blue wooden racks, medium in size were found in 3



Kitchen furniture – wooden shutters for storage under platform

households, open racks of large sizes were found in 2 households. In double wall platform, large brown wooden racks were seen in one home and medium sized brown wooden racks were found in 4% of households. Single wall kitchen platforms had large wooden black racks and medium wooden white and pink coloured racks; each in a household.

In small sized kitchen, L shape platform in RCC were found 12 households. Single wall platform were medium sized again in RCC found in 4 households, and wooden in white and green in another 2 households. U shape platforms were all wooden racks found in various colours in about 8 households.

These figures may represent the homemakers' interest to make their kitchens more organised. Majority of kitchens had wooden racks by using baskets making storage system more feasible for organizing items in kitchen. Even the corner space was used judiciously with storage facilities.

With the changing lifestyles the cooking habits and the time spend in the kitchen have proportionately reduced hence giving way to the development of modular pattern of designing in the kitchen. Modular kitchen are not only easy to maintain but help the homemaker to be well-organized in the available space. Every-inch of the available space in the kitchen can be turned into a utility space through modular designs.

5.3.2.2.3 – Kitchen wall type and finish

As high as 56% of households used emulsion paint with tiles, 36% used emulsion paint with rough finish and 4% used emulsion paint with smooth finish in their kitchen. Majority of households had tiled walls as back splash making it easier for homemakers to maintain interiors of kitchen from oily soot, usually encountered in kitchens.

5.3.2.2.4 – Kitchen wall colour

It was observed that 44% household had white wall, 32% had cream walls, 20% had peach walls and 2% had green walls for kitchen



Kitchen space saver – built-in storage unit for extra storage near counter

representing light coloured walls reflecting more light making the area more spacious visually.

5.3.2.2.5 – Kitchen floor type and colour

From results, as high as 28 numbers of households used tile and white flooring, 42% used marble and white flooring, 2% each of households used tile and black and tile and black flooring. Very less number of households used dark flooring. The use of pale colors makes the room look spacious and especially in kitchen the need for virtual spacious is essential due to the type of work and for the time spend on it. Black flooring is generally preferred for easy maintenance.

5.3.2.2.6 – Kitchen lighting type and colour

It was observed that 48 number of households used CFL with white light, whereas just 2 households used CFL with yellow tube. Due to choice of the tube colour, majority of kitchens look more spacious and gives a brighter environment for task completion.

5.3.2.2.7 – Kitchen Space savers'

Majority of households have built-in cupboards and crockery units which save most of the space available. In large kitchens, 10 households had inbuilt crockery units along with overhead storage, covered with wood and glass. In medium size kitchens, majority of shelves are open. 2 households had open shelves for crockery. 2 households had tall unit with draw baskets made in wood. 8 households had corner units done in wood. In small kitchens, 16% of households had inbuilt crockery unit, (with open shelves) 12% of households had open overhead storage units. 8 households had draw baskets in small kitchens. The conventional practice of storage in the kitchen is still persistent since its easy to maintain and easy to function. It also does not take much time in the construction of it, generally done during the building construction saving the time of the inhabitants.



Kitchen space saver – loft storage

5.3.2.3.1 – Bedroom 1 area specification

The results show that in 4 households (8%) bedroom 1 was large in size, 44 households (88%) were medium in size and 2 household (4%) had small room size. Due to space constraint, the results show that majority of households had medium sized bedrooms.

5.3.2.3.2 – Bedroom 1 furniture

The results depict that in large bedroom 1, double cot made of teak wood of medium size was seen in 2 households. In another 2 households, double cot, dresser, wardrobe and study table as a set was found. In medium sized bedroom 1, double cot and a dresser large of wood was seen in 8% of households, just the double cot made of wood was found in 36% of households. Wrought iron double cot of black and brown colour is found in 3 and 2 households respectively. 2 single cots made of wood are found in 13 households alone. King size bed, dresser and a wardrobe made in wood and large in size are found in 2 households. In small bedrooms, double cot alone, made in wood was found in 2 households. As already stated in results, various types of space savers are used representing awareness of homemakers towards treating space available in judicious way at least in bedrooms as this area needs personal theme and at the same time creating space for relaxing and spending personal time.

5.3.2.3.3 – Bedroom 1 wall type and finish

As high as 40% of households used emulsion paint with smooth finish, 36% used emulsion paint with rough finish and 12% used lappam with smooth finish in their bedroom 1 creating illusion of space where emulsion paint was used with smooth finish. The smoothness reflects more amount of light in turn creating more space to work with.

5.3.2.3.4 – Bedroom 1 wall colour

It was seen that 16 (32%) households used blue wall, 14 (28%) had yellow walls, 8 (16%) had pink walls, 6 (12%) had green for walls, 4 (8%) had orange and 2 (4%) had more than one for bedroom 2 walls.

Blue being cool as stated in theory, creates cool effect leading the occupant to relax feel comfortable while resting in the bedroom.

5.3.2.3.5 – Bedroom 1 floor type and colour

32(64%) number of households used marble and white flooring, 32% used white tile flooring, 4% of households used black tile. These figures evidently reveal that use of light coloured tiles for floor is popular as it gives an impression of light and spaciousness.

5.3.2.3.6 – Bedroom 1 curtain colour

From results, green and brown curtains were used in households of 7 each which is least percentage. 12% of households used blue and pink curtains in each. Combination of colours for curtains was used in more number of households (40%) which forms the majority of households. Yellow and orange curtains were found in 4 households each. The choice of curtain color falls in line with the choice of wall colour. It can be so observed that a continuity of the color through-out can be maintained with the same color of wall and curtain.

5.3.2.3.7 – Bedroom 1 lighting type and colour

It was observed that majority (45) number of households used CFL with white light, and just 2 households used CFL with yellow tube. There were 3 households having a chandelier with yellow illumination.

5.3.2.3.8 – Bedroom 1 Space savers'

As in results, in large bedroom, inbuilt wardrobes were found in 2 households which are made of black wood. In medium size bedrooms, large open inbuilt wardrobes were found in 8 households, medium open inbuilt wardrobes were found in 8% of households, brown plastic medium sized inbuilt wardrobe in 3 households. In other households, inbuilt units were seen made in wood and glass. Use of glass in majority of households lead to creation of illusion of space as glass not only reflects light but also creates transparency between areas. Also inbuilt

cupboards save lot of space which leaves space utilisation for openings only.

5.3.2.4.1 – Bedroom 2 area specification

Results show that 20 household (40%) of bedroom 2 were large in size, as high as 24 households (48%) were medium in size and as least as 6 household (12%) had small size.

5.3.2.4.2 – Bedroom 2 furniture

In large sized bedroom 2, double cot and dresser of medium size made of orange wood was found in 2 households, wrought iron double cot of medium size made in black was found in 4 households. Two single cots of small size made of brown wood were found in 4 other households. Single cot and a wardrobe made of brown wood were found in 2 households. Two single cots made of black wrought iron were found in 4 households. Single cot made of black wrought iron was found in 4 other households. In medium sized bedroom 2, single cot made of brown wood was found in 2 households, mattress and wardrobe made of white fabric and black wood was found in 2 households, accent chairs and centre table made of fabric and wood were found in 2 households, study table made of wood in 4 households, in-built wardrobe in 4 households, double cot with underneath storage made of black wood was found in 2 households, double cot and study table made of wood in brown were found in 2 households, 2 single cots made of wood both large and small were found in 2 households respectively. In small sized bedroom 2, single cot of medium sized made of brown wood was found in 2 households, single cot with side tables made of wrought iron in black was found in 2 households, and cot under cot made of wood in brown was found in 2 households. Varied furniture types that save space were observed in households that save space at various parts of bedroom. Lofts became a common feature in bedrooms which accommodates seldom used items, decreasing large amount of items' show away from vision.

5.3.2.4.3 – Bedroom 2 wall type and finish

As high as 40% of households used emulsion paint with smooth finish, and as less as 12% of bedrooms had lappam with smooth finish for walls in their bedroom 2.

5.3.2.4.4 – Bedroom 2 wall colour

It was seen that majority of (32%) households used blue wall, 14 (28%) had yellow walls, 8 (16%) had pink walls, 6 (12%) had green for walls, 4 (8%) had orange and as less as 2 (4%) had more than one for bedroom 2 walls. Unlike bedroom 1, colours for walls were used intensively. The use of pinks, blues in the bedrooms is to bring in brightness, coolness. Use of yellow, orange brings in shine, charm into the room. The present trend of use of dual wall color is to bring a taste of aesthetics into the room, either by contrasting or complimenting colours.

5.3.2.4.5 – Bedroom 2 floor type and colour

32(64%) number of households used marble and white flooring, 32% used tile and white flooring, 4% of households used black tile.

5.3.2.4.6 – Bedroom 2 curtain colour

40 % of households were using combination of colours onto curtains, 14% each with green and brown, 12 % each with blue and pink curtains, 4% each with yellow and orange curtains in bedroom 2.

Curtains are generally considered to be the monotonous breakers-the continuous wall color is generally broken by the use of patterned dual colored curtains. This is mainly done to bring in brightness, liveliness in the rooms.

5.3.2.4.7 – Bedroom 2 lighting type and colour

It was observed that 45 number of households used CFL with white light, whereas just 2 households used CFL with yellow. There were 2 households having focus lights with yellow and one bedroom had a chandelier with yellow illumination. Bedrooms used variety of artificial



Bedroom 2 furniture – flexible book rack

lighting and their usage is occasional unless it is ambient lighting. The use of CFL either white / yellow light enables more efficient task performance in the rooms-like in for dressing/studying-since majority of the bedrooms in the survey reveal to act as a dual purpose room –for studying as well as dressing rooms. The use of focus lighting is only to create a lighter environment in the rooms.

5.3.2.4.8 – Bedroom 2 Space savers’

In large sized bedroom 2, in-built wardrobe with open shelves were found in 4 households, in-built wardrobes with wooden frames in black and red were found in 4 and 2 households respectively.

Dresser cum luggage rack made of wood was found in 2 households. Godrej wardrobes made of blue plastic were found in 4 households and brown iron Godrej wardrobes were found in 4 household. In medium sized bedroom 2, in-built wardrobe cum TV unit was found in 2 households which were made of wood and glass. Stackable chairs made of white plastic were found in 2 households. Wardrobe cum dresser made of wood in red and glass were found in 2 households. 4 households had sofa cum bed made of wood. Flip top dining table was found in 2 households which were made of wood and glass. In small sized bedroom 2, 6 households had in-built cupboards.

The in-built cupboards are a common scenario due to the space restriction and also because it saves time of the in-habitants for the construction, these are generally constructed along with the construction of the building. The use of ready-made furniture makes it even easier to maintenance and since these products come in standard sizes they can be accommodated in small rooms to the larger rooms. the other types of furniture like the collapsible/flip-over are mainly used so the available space can be used for dual purpose./multi-tasking.

5.3.2.5.1 – Bathroom area specification

As high as 24 household (48%) of bathroom were large in size, 18 households (36%) were medium in size and 8 household (16%) had small size. Due to the space constraint the space allocated for the

bathrooms is minimum and other spaces like kitchen ,bathroom, living rooms are given preference since the time spend in these rooms is proportionately more than bathrooms.

5.3.2.5.2 – Bathroom wall type and colour

From results, it is observed that all the bathrooms of households were tiled in light colours enabling reflection of light and maintenance free. As high as 56% of households used tiles with pink, 34% used tiles with blue and as low as 10% of households used tiles with brown in their bathroom.

5.3.2.5.3 – Bathroom floor type and colour

It shows that 43(86%) number of households used tile and white flooring, 2% used tile and grey flooring, 10% of households used tile and yellow All bathrooms had light coloured tiles for their floor. the use of vitrified tiles in the bathrooms eases the maintenance of them. Tiles in white/yellow/or pastels are generally used so that the bathrooms can be made spacious virtually.

5.3.2.5.4 – Bathroom lighting type and colour

It is observed that 28 number of households used CFL with white light, whereas just 22 households used CFL with yellow tube. White / yellow CFL is mostly preferred for the places where utility is given more importance like studying corner, kitchen, bathrooms, dressing rooms because the characteristic of the lighting allows for a comfortable tasking performance without stress on the human eyes.

5.4 Strategies for space conservation in a two bedroom apartment model design

Foyer

A shoe cabinet with platform was provided for quick storage of entrance utilities. The colour of wall used is yellow to have a cheerful entry into the house. Since the area is really narrow, the recessed space available from pillar was utilised to place this shoe cabinet. The opposite wall was emphasised by placing a painting with spot light.

Living room

In the area available for living room, the colour scheme planned is monochromatic colour scheme and the base colour is green which represents nature and cool effect. Since the room has a French door which brings outside environment inside, green colour is suggested so as to counter the sunlight warmth during day time and at the same time bring nature effect during nights. All the lighting fixtures are placed onto ceiling to enlighten the height of room rather than placing them on to walls and floors which would cut the flow of space. An entertainment unit suitable to place plasma TV was placed onto the wall adjacent to French door which is sleek in nature. This unit can accommodate items supporting plasma unit and also for display of possessions. Due to its design, the circulation space between seats and the unit is maximised. The seats proposed is a sofa set of 3+1+1. The three seater can be converted to a bed during nights to accommodate more than one person in case of any visitor. Glass side tables and centre tables are also placed which has storage provision underneath. Due to the material used for construction, glass, enables the space to flow from floor to eye.

Dining room

Since the plan is open plan from living to dining and then to kitchen, it was thought to provide a flip top dining table with its chairs placed against the wall. The dining table itself acts as a space saver as it can be hooked to wall when not in use and can be lifted up to accommodate people for eating activities. The chairs were designed in such a way they are sleek and enough to accommodate a average sized person. As in the plan, placement of entertainment unit is done in such a way that maximum number of people working at dining area can also watch TV. No permanent partition is planned to separate the areas from living and dining activities. The base of designing a model apartment is to use the space judiciously and to create illusion of space. An open plan is one such strategy to achieve the above specified goal.

Kitchen

The kitchen was planned with modular design where in baskets were arranged according to space available. L-shape kitchen platform was designed to accommodate the activities. Refrigerator was placed against the pillar. Overhead storage was also placed to increase the storage capacity. The colour scheme proposed was monochromatic neutral colour scheme. The corner space was also utilised by placing a corner carousel.

Bedroom 1

Built in wardrobe cum study table was accommodated to one wall which occupies the major ambience of space. Bed was designed with storage underneath and a side night stand was placed which is suspended on both sides. Suspended furniture adds up space as they reduce the illusion of heaviness. This creates space and illusion at the same time. The wardrobe was also provided with loft to store seldom used items. Study table was designed with minimalist approach where the space underneath was left empty for knee. Minimum storage space

was provided for study table. Space was left next to study table for free movement of door leading to balcony. A small mirror with a suspended draw was placed in between wardrobe and study table. The circulation was taken in to consideration before furniture was proposed to place. Monochromatic colour scheme in green was proposed for this bedroom for the space to look cool and relaxing.

Bedroom 2

The space next to door was thought of to place wardrobe. Wardrobe was proposed along with loft for more storage capacity. Two bunk beds for two boys with study table underneath were designed along with a chair and storage. A common rack was placed in between bunk beds to accommodate their hobbies. A triad colour scheme was proposed in this room to suit the age group of occupants. This kind of arrangement in the room was to leave more space for their play also. Curtains were selected and placed against windows with same colour as on walls as it continues wall space leading to space expansion visually.

Bathroom

Bathroom was planned with bath tub, wash basin, western commode and storage units. Except for bath tub, all other fixtures were placed onto wall for creating continuation of space which led to illusion of space. The storage unit provided on top of wash basin holds frequently used items and is suspended on to wall. Mirror was provided onto its shutter which adds space visually. Two other storage cabinets were provided onto other two walls. Built-in soap holder is provided along with a grab bar near bath tub.

Cost estimation of the model apartment was also done so as to enable the homemaker to plan for finances and selection of elements to treat space available with them.

The estimation was also worked out item wise (which can be changed according to the requirement and budget allocated to these items) to create visual impact on space by treating them with judicious space management strategies.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Attitude is all that matters in life. When it comes to living, no place is perfect and no pay scale is enough to meet needs and satisfy wants. One can only be as happy and satisfied as one wants to be. Whether one lives in a big house or a small apartment, without a systematic approach to living, one cannot create the desired harmony and comfort. By sharpening abilities and using them to bring imagination into reality is what is required. Live with style, but live simple.

The common complaint from people today, especially those living in apartments or small houses is not having enough space for comfortable living. Therefore there was a felt need to explore and frame ideas that would help in managing space more conveniently, making room for more belongings in future and having an organized living area around. One can increase the physical space that is available by clever and imaginative furnishing and the virtual space by brilliantly playing with colours and lights.

Keeping in view the requirement of homemakers, the present study was designed with the following objectives

General objective

To evolve judicious space management strategies / modules / framework for effective implementation.

Specific objectives

- To examine the standard dimensions for residential interior spaces.
- To explore the availability of types of furniture and space modifiers for interiors.
- To assess the existing interior space management techniques.
- To design modules in AutoCAD for residential interiors, with judicious space management strategies.

The results of the present study have been summarized below

1. The typical room sizes set as standard dimensions are

Typical room sizes in feet			
	Small	Average	Large
Basic Rooms			
Living room	12x18	16x20	22x28
Dining room	10x12	12x15	15x18
Kitchen	5x10	10x16	12x20
Utility room	6x7	6x10	8x12
Bedroom	10x10	12x12	14x16
Bathroom	5x7	7x9	9x12
Additional Rooms/Areas			
Halls	3' wide	6' wide	9' wide
Area	10x20	20X20	22x25
Storage wall	6' deep	12'deep	18" deep
Den	8x10	10x12	12-16
Family room	12X15	15x19	15x22
Wardrobe closet	2x6	2x8	2x15
One-rod walk-in closet	4X3	6x6	4x8
Two-way walk-in Closet	6x4	6x6	6x8
Porch	6x6	8x12	12x20
Entry	6x6	8x10	8x15
One-Car Garage	11x19	13x25	16x25
Two-car garage	20x20	21x22	25x25

2. The typical furniture dimensions used in living room are -

- One couch, 3 ft 0 in by 6ft 10 in
- Two easy chairs, 2 ft 6 in by 3 ft 0 in
- One desk, 1 ft 8 in by 3 ft 6 in
- One desk chair, 1 ft 6 in by 1 ft 6 in
- One television set, 1 ft 4 in by 2 ft 8 in
- One table, 1 ft 6 in by 2 ft 6 in

3. The typical furniture dimensions used in dining room in accordance with occupancy are –
 - 1 or 2 persons 2 ft 6 in by 2 ft 6 in
 - 4 persons 2 ft 6 in by 3 ft 2 in
 - 6 persons 3 ft 4 in by 4 ft 0 in or 4 ft 0 in round
 - 8 persons 3 ft 4 in by 6 ft 0 in or 4 ft 0 in by 4 ft in
 - 10 persons 3 ft 4 in by 8 ft 0 in or 4 ft 0 in by 6 ft 0 in
 - 12 persons 4 ft 0 in by 8 ft 0 in
 - Dining chairs 1 ft 6 in by 1 ft 6 in
 - Buffet or storage unit 1 ft 6 in by 3 ft 6 in
4. The typical furniture dimensions used in bedroom are –
 - Two twin beds, 3ft 3 in by 6ft 10 in
 - One dresser, 1 ft 6 in by 4ft 4 in
 - One chair, 1 ft 6 in by 1 ft 6 in
 - One crib, 2 ft 6 in by 4 ft 6 in
 - One table, 1 ft 6 in by 2 ft 6 in for sewing or other work

A secondary double-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture

 - Two twin beds, 3ft 3 in by 6ft 10 in,
 - one double bed, 4 ft 6 in by 6 ft 10 in
 - One or two dressers, 1 ft 6 in by 3 ft 6 in
 - One chair, 1 ft 6 in by 1 ft 6 in
 - One desk, 1 ft 8 in or 3 ft 6 in, or storage chest for toys

A secondary single-occupancy bedroom should have space to facilitate circulation and accommodate the following sized furniture

 - One twin bed, 3 ft 3 in by 6 ft 10 in
 - One dresser, 1 ft 6 in by 3 ft 6 in
 - One chair, 1 ft 6 in by 1 ft 6 in
 - One desk, 1 ft 8 in by 3ft 6 in
5. Other space saving measurements of furniture are –
 - A normal table is usually 2 feet (60 cm) in depth. But a depth of 1.5 feet (45 cm) is also adequate for Asian heights unless the user is very tall.

- Create an extra work table by hinging a table top to the wall so it folds down when not in use. A table that does not have legs saves on floor space too.
 - Traditional TVs need table depth of 2 feet (60 cm).
 - Plasma and LCD screens need counter depths of just 1.1 feet (35 cm) to 1.3 feet (40 cm).
 - A bedroom needs to be at least 19.7 feet (6 m) x 9.8 feet (3 m) to comfortably accommodate a walk-in wardrobe.
 - The wardrobe (for 1-2 persons) should measure at least 6.6 feet (2 m) x 4.9 feet (1 m).
 - The standard wardrobe depth is 2 feet (60 cm). But going with boutique-style clothes rails and open shelving - no bulky wardrobe backs, doors and sides – requires just 1.5 feet (45 cm), a hefty space saving of just 0.5 feet (15 cm).
 - Position wardrobe drawers closer to the floor to increase the sense of space, and also for the 'boutique feel'.
 - Keep partitions thin, that is, 1.6 to 2 inches (4 to 5 cm).
 - Storage, for example a mirrored cabinet about the vanity, should not be more than 20 cm in depth.
 - Cabinets or shelving directly above the toilet should be hung 1.5 – 2 feet (45 – 60 cm) above the cistern, so that one does not knock their head when getting up.
 - Normal shoe cabinets need a depth of 1.1 feet (35 cm). Slant the shelves so they fit into a 0.82 feet (25 cm) depth.
6. All of the stores were conscious about the requirement of homemakers and space constraint in present scenario. Hence they were concentrating on manufacturing furniture designs that save space. Furniture designs were given to all the rooms and were also trendy to suit the present fashion. The materials used for construction were also easy to maintain by the homemaker. The range of cost for all the furniture pieces was affordable by middle income group families also.

The living room furniture available are Sofa cum bed, Sofa set (3+2+Couch), Sectional sofa, Sofa cum bed, Bunk Bed, Bean

Bags, Expandable Diwan, Resin chairs, Flexible Centre table, Centre Table with Stools, Centre Table, Shelf Table, Nest of tables, Corner/ End Tables, Centre Table with Storage, Entertainment Unit, Display / shoe rack, Shoe Cabinet, Folding chairs, Inflatable sofas, Love seat, Sleeper sofa and Divan. The cost of each piece varies depending up on the material used and size. In general, the price ranges from Rs.3, 000 to Rs. 50,000 and are available commonly in all furniture showrooms.

The furniture available for bedrooms are Cot with box Storage, Foldable Bed, Wardrobe with Sliding Doors, Dresser with Stool,) TV unit, Ottoman and Night stand. For small furniture units, the price ranged from Rs.3, 000 to Rs.15, 000 and for cots and wardrobes, the cost was ranging from Rs.25, 000 to Rs.65, 000. The price range depends on material used for construction.

Dining room furniture observed are Dining table set, Drop-leaf Dining Table, Dining table with double top, Round Dining Table, Chest of draws and Corner Curio cabinets. The price ranged form Rs.20, 000 to Rs.45, 000.

Furniture for childrens' bedroom was available in wide variety. The colours used suit to theme. They are Childrens' Bedroom Solution, Bed with Side Storage, Flat boy and 2 way book shelves. Since these units come in a set of bed, wardrobe, study table and dresser, the price ranged from Rs.1, 20,000 to Rs.2, 50,000.

For other interior spaces, the space savers available are Tall Unit, Foldable Seat, Wooden seat, Wash with Storage, Wooden Partition, Study Tables, Computer Tables, Bar unit / Partition, CD Rack, Shoe cabinet / seat and Mobile furniture that cost from Rs.3,500 to Rs.15,000.

For kitchens, modular systems for storage and draw baskets are available which has a wide price range. A basket can cost from Rs.1, 000 to Rs.12, 000. This depends on the company and warranty period offered on it.

With regard to the interviews of 50 numbers of families, it was observed that

7. Majority of the respondents (68%) were young couple who were conscious about the space management techniques for their homes. And a small percentage of respondents (12%) were elderly couple.
8. majority of households (46%) had two children in their family and form nuclear family structure
9. All the respondents owned two bedroom apartments.
10. Most of the respondents were stable with their financial position hence enabling them to treat their spaces with various space saving strategies.
11. Majority of households (64%) had large living / dining rooms (300 sft. to 225 sft.), which represents the economic status of homemakers to afford large spaces, and mainly living / dining room as this is the room where major of the activities take place. Only one household had a small living / dining room (180 sft. to 120 sft.) indicating the consciousness of majority of homemakers in choosing spaces for their activities.
12. Almost all the households had wooden sofa and Diwan with centre tables which clearly reveal that the homemakers are aware of the present trend in arranging space with furniture element in large, medium and small sized living / dining room.
13. Two households were observed to have bean bags as seats or furniture element in their living / dining room which represents homemakers' enthusiasm to use modern styles.
14. A wide variety of materials were used for construction of furniture like wood, glass, fabric and leather depending up on the furniture design in large, medium and small sized rooms.
15. As high as 48% of households used emulsion paint with rough finish which shows that the homemakers are conscious about avoiding glare in interiors. This feature also contributes to easy maintenance of walls. As less as 2% of households used texture paint with smooth finish. This reflects the homemakers' choice for new material to be used in interiors.
16. As seen in the results, the wall colours chosen for living / dining room by the homemakers were very wide in range and this explains that homemakers are aware of the choice of colours for making interiors

look cool and spacious as all the colours on walls were light in colour and 50% of households used cool colours while the remaining percentage of households had warm colours on walls.

17. In case of floor type and colour, as high as 64% of households had marble and white flooring revealing the fact that the builders and homemakers have a taste for selection of colour and material for flooring. Marble floors in white are easy to identify stains. They create an illusion of space as white is a neutral and has cooling effect on interiors. As low as 4% of total sample used dark coloured flooring making the area look much smaller than existing.
18. Majority of households (32%) used curtains which have splashes of colours. This shows that homemakers are aware of ways to create interest in interiors by adding colours through curtains. This also emphasises on intellectual selection of homemaker to make the curtains match any theme planned for interiors.
19. As high as 68% households used CFL with white tinge creating cool effect in interiors. As less as 10% of households used CFL with yellow tinge making the interiors warmer.
20. All households were planned with space savers like built-in cupboards, flexible furniture like stackable chairs, collapsible partition (2%) and multi purpose furniture like sofa cum bed, L shape sofa and glass centre tables that contribute to creation of illusion of space. This reveals that the homemakers are conscious about space planning right from construction stage as built-in cupboards have to be planned before completing of structure. They are also aware of choice of design for furniture by placing multi purpose furniture wherever possible.
21. Among the sample, as less as 20 % of households had large kitchens (63 sft.), 48% had small kitchens (35 sft.). This led to compromise on space planning for kitchen. However, irrespective of size, most of the kitchens had built-in features, allowing for adequate space for movement.
22. In all three sizes of kitchen, built-in storage is the common feature observed. This explains that this feature enables the homemaker use the space for multipurpose.

23. Majority of kitchens (38%) had U shape platform leaving the corners for storage.
24. As high as 56% of households had back splash with tiles for kitchen walls, which enabled the user to maintain the walls clean without oil or food stains.
25. Majority of kitchens (44%) had white walls conveying that the homemakers are aware of treating small kitchens with cool and neutral colours to create space illusion.
26. Twenty eight households had white tile flooring for kitchens which reveal that this combination of floor type and colour created illusion of space in small kitchens.
27. As high as 96% households used CFL with white tinge in kitchens and as low as 4% households used CFL with yellow tinge. Even light colours also play an important role in creating ambience and hence are the choices made by homemakers.
28. Built-in cupboards are common space savers found in all rooms of two bedroom apartments making it more revealing about the awareness of space utilisation by homemakers and space planners / architects. All kitchens had built-in crockery unit in three sizes of kitchens. Twelve percent of households worked out for overhead storage units for increasing storage capacity of kitchen.
29. Due to economic constraints, 88% households had a medium sized bedroom 1 (180 sft.). This clearly shows that in India, living / dining room is given more importance space wise than for kitchens, bedrooms and bathrooms. This could be because of impact of cultural background to perform activities together as a family in common activity areas.
30. Bedroom 1 being treated as master bedroom; double cots were placed in majority of households (62%). A few of bedroom 1 (4%) had all cot, dresser and study table which are medium in size. Wrought iron for cots was used in 16% of households, wood for 84% of households. All furniture in bedroom 1 was painted in dark colour. But no furniture was found heavy for bedroom 1 due to its colour.
31. As high as 40% of households had emulsion paint with smooth finish for walls of bedroom 1 and bedroom 2 and as less as 12% of

households had lappam with smooth finish for walls of bedroom 1 and bedroom 2. Also a good 36% used emulsion paint with rough finish.

32. A wide range of colours were used for walls of bedroom 1, 32% with light blue, 28% with cream, 16% with light pink, 12% with light green, 8% with peach, and as less as 4% of bedroom 1 had more than one colour for walls of bedroom 1. Similar findings were observed for bedroom 2.
33. It was evidently revealing that light coloured floor tiles are popular for bedroom1 in households of 64% among sample. A very few percentage of households (4%) used black tile flooring which seemed to create a closed-in and less spacious look.
34. As high as 90% households used CFL with white tinge in bedroom 1 and bedroom 2 and as low as 4% households used CFL with yellow tinge. A few number of households (6%) had a chandelier with yellow tinge, being the personal choice of homemakers.
35. Glass and mirror along with built – in cupboards are the major space savers seen in households that create space. Loft storage has also become a prominent feature in bedrooms. 94% of households have these features where as the other 6% had less number of space savers making the space look small and heavy.
36. As bedroom1, bedroom 2 was also given almost the same area in two bedroom apartments. Among these, 40% had large bedroom 2 (180 sft.), 48% had medium size (150 sft.) and 12% had small size bedroom 2 (120 sft.).
37. Since bedroom 2 is treated either as childrens' bedroom or guest bedroom, proper furniture is not planned in majority of households. Wide variety of furniture types were seen in bedroom 2 depending upon the requirement of homemakers. Only 8% of households had upholstered furniture, 40% had wrought iron furniture and the remaining majority of households had wooden furniture. This room usually becomes a store room when not in use. But if children are using it, space savers like bunk beds were seen in 1 household.
38. Majority of households (48%) had large sized bathroom (35 sft.), and as less as 16% had small bathroom (20 sft.). A large number of households (36%) had medium sized bathroom (24 sft.).

39. As high as 56% of households had tiles in pink for walls of bathroom, and a very low percentage of households (5%) had brown tiles for walls.
40. Though white (86%), grey (4%) and cream (10%) were used for flooring for bathrooms, all colours were used in their tints which reveals that space illusion is significant.
41. Use of warm lights was observed more in bathrooms than any other room. 44% of households used CFL with yellow tinge and 56% used CFL with white.
42. For designing a model apartment, the space saving strategies were explored as Sofa for Triple Duty, Added Storage, Corner with a Cabinet, Two Corners and a Ceiling, Adding a Box Beneath, Storage boxes, Pull-up Drawers behind the Sofa, Sofa beds and Murphy Beds, Chair-beds, Conversation Pit, Space between the Studs, Storage/Dining Table, In-Cabinet Space, Filling the Empty Spaces, Pantry Cabinets, Ceilings and/or the Corners, Shallow Cabinets for Vertical Storage, Movable shelf, Shelf over the Entryway, Storage in the Pot, Shallow Shelves above Wall Cabinets, Can Storage at Doorway, Mobile Cart, Storage with Elevated Dishwasher, Stores for Toilet-Toppers, Shallow Shelves on Outside of Tub Glass Doors, Space above the Tub, Far end of the Tub, . Pantry on the Door, A Shelving System on the Inside, Baskets from the Ceiling, Corner Spaces, Wheel-Around Cart, Shelves under the Lavatory and other furniture products that save space. Ideas were taken from these and a model apartment of two bedrooms was designed.

The foyer had a built-in storage for shoes and other accessories that saves movement space in that narrow area.

Living room was provided with sleek entertainment unit, multi-purpose sofa cum bed, glass centre and side tables. Lights are placed onto walls and monochromatic colour scheme is planned for wall colours.

For dining room, it was thought to provide a flip top dining table with its chairs placed against the wall. The dining table itself acts as a space saver as it can be hooked to wall when not in use and can be lifted up when to accommodate people for eating

activities. The chairs are designed in such a way they are sleek and enough to accommodate a average sized person. A cabinet was provided to store crockery.

The kitchen was planned with modular design where in baskets were arranged according to space available. Overhead storage was also placed to increase the storage capacity. The colour scheme proposed was monochromatic neutral colour scheme. The corner space was also utilised by placing a corner carousel.

Built in wardrobe cum study table was accommodated to one wall which occupies the major ambience of space for bedroom 1. Bed was designed with storage underneath and a side night stand was placed which is suspended on both sides. The wardrobe was also provided with loft to store seldom used items. Monochromatic colour scheme in blue was proposed for this bedroom for the space to look cool and relaxing.

Wardrobe was proposed along with loft for more storage capacity. Two bunk beds for two boys with study table underneath were designed along with a chair and storage. A triad colour scheme was proposed in this room to suit the age group of occupants. This kind of arrangement in the room was to leave more space for their play also.

Bathroom was planned with all fixtures placed onto wall except for bath tub that is placed on floor to create continuation of floor area. Built-in and extra storage units were placed to more storage capacity.

From the above findings, it can be concluded that, the space saving strategies are adopted by homemakers as there is availability of wide range of products that save space. Also because of economic reasons, homemakers compromised to get satisfied with the available space which provokes then to find ways to save space. Varied ways of obtaining information on space saving techniques have helped the homemakers, space planners, furniture designers and architects to look into space as an important factor and treat them accordingly depending up on the requirements of occupants.

Implications of the study

The findings of the study are assumed to be beneficial from the view point of homemakers, furniture designers and manufacturers, architects and interior designers, lighting specialists, colour experts and accessory designers.

- The study investigates the impact of space constraints in designing residential interiors, furniture styling and availability in market, homemakers' choice on treating space and other space saving techniques.
- The study also serves an eye opener to homemakers with respect to the existing trends in furniture styling, arrangement and other elements like lighting, colour, accessories that create illusion of space.
- The study offers substantial information to designers, homemakers and architects on standard dimensions of interior spaces, furniture and characteristics of interior spaces.
- The study enlightens the existing trends practised by homemakers to treat space, which forms the basis, to take up research.
- The study also suggests a module of two bedroom flat with space saving strategies which might form guidelines to homemakers / designers / architects to treat the available space in a judicious manner using all interior elements.
- The results of the study would provoke furniture stylists, colour and lighting specialists to come up with modern yet simple and economic space saving designs in products.

Recommendations for further research

- A study on judicious space saving strategies in commercial interior spaces may form a counterpart of the present study.
- A comparative study on economic conditions influencing the homemakers in treating the available space in interiors may be studied.

- A detailed study on awareness of homemakers on various ways in treating space to make interiors look more spacious can be attempted.
- The role of various factors that influence the homemaker in decision making for treating the available space can be explored.
- The role of various factors that influence the designers in designing a product / furniture may be studied.
- Designing furniture for all the rooms of a dwelling unit that can be multipurpose can form an action-oriented research.
- Impact of colour on space can be keenly studied.
- Lighting needs and their influence on creating an illusion of space can be explored.
- Role of building materials and finishes to create an illusion of space may be taken up.
- Space saving strategies in multipurpose rooms in rural areas may serve as a contrast study.

BIBLIOGRAPHY

- “Ease away stress”, [Saturday 3, November 2007], Times of India, Times Property, Page 2.
- “Flavours in coffee tables”, [Saturday 8, December, 2007], Times of India, Times Property, Page 2.
- “Making the most of a portico”, [Sunday 29, September, 2007], Times of India, Times Property, Page 2
- “Utilization of a balcony space”. [Saturday 15, September 2007], Times of India, Times Property, Page 2
- Brager, G., J. Heerwagen, F. Bauman, C. Huizenga, K. Powell, A. Ruland, and E. Ring, [2000]. “Team Spaces and Collaboration: Links to the Physical Environment.” Internal Report, April, [http://www. Center for the Built Environment, The Impact of Team Space Design on Collaboration.htm](http://www.CenterfortheBuiltEnvironment/TheImpactofTeamSpaceDesignonCollaboration.htm)
- Chandaraju Aruna, [Sunday 11, November, 2007], Times of India, Times Property, Page 2, Unfurl those curtains, “Personalize your home with art and accessories”
- Fatehi Moayyed, [Saturday 3, and November 2007], Lasting impressions, Times of India, Times Property, Page 2.
- [http:// www. Beds the Most Extreme Modern Beds for your Bedroom.htm](http://www.Beds.theMostExtremeModernBedsforyourBedroom.htm)
- <http://about.pricegrabber.com>.
- <http://bus060828.html>.
- <http://coasters.PebbleZ.com>
- http://en.wikipedia.org/wiki/World_population.
- http://EzineArticles.com/?expert=Shrinivas_Vaidya.
- <http://hyderabad.clickindia.com/areas/around.html>.
- <http://ioc3.unesco.org/indotsunami/images/hyderabad-map-city.gif>.
- <http://myinteriordecorator.com>
- [http://www. Bathroom Lighting Tips, Guide to Lighting for the Bathroom.htm](http://www.BathroomLightingTips,GuidetoLightingfortheBathroom.htm).
- [http://www. Bedroom Decorating Tips, Bedroom Decor Guide Bedroom Interior Decoration Tips.htm](http://www.BedroomDecoratingTips,BedroomDecorGuideBedroomInteriorDecorationTips.htm).

- <http://www.Choosing a Door for Your Home, Tips on Types of Interior Door.htm>.
- <http://www.Contemporary Kitchen Interior Design Tips Guide on Creating a Dream Kitchen.htm>.
- http://www.Amazing Staircase Design for Space Saving Solution _ Home Trends _ Decoration _ Gardening.htm.
- <http://www.amazon.co.uk/Beginners-Guide-Colour-Psychology/dp/0954065700>
- <http://www.bathroom-furniture-guide.com/images/bathroom-furniture/casestudy>
- <http://www.bedroom-design-and-decorating-ideas.com/>
- <http://www.better-life-thru-interior-decorating.html>.
- <http://www.diyhomedecorating.com>.
- <http://www.Hyderabad Population, Population of Hyderabad.mht>.
- <http://www.Hyderabad, India - Wikipedia, the free encyclopedia.mht>.
- http://www.indianchild.com/population_of_india.htm.
- <http://www.maps-india.com/andhra-pradesh/ap-map/hyderabad-map.gif>
- http://www.nagarjunafertilizers.com/images/zonal_off_netwrk_ap.jpg
- <http://www.platformbeds.com>, “Changing your home bedroom design with new trends in platform beds”.
- <http://www.Select mat colors that enhance both the art and color scheme.com>
- <http://www.unique-home-decor-ideas.com/bedroom-tips.html>.
- <http://www.waysoftreatingthespace.com>.
- Jeff, “Space Saving Decorating Ideas for a Studio Apartment”, <http://www.studioapartment.com>.
- Minimalist Design for living spaces, [Saturday 8, December, 2007], Times of India, Times Property, Page 2
- Murphy Kate, The McGraw-Hill Companies Inc. [1998, Oct. 1], Build your dream workspace, <http://www.10-12-98 BUILD YOUR DREAM WORKSPACE.htm>
- Nandita and Jeanne Roby [1998], Planning small spaces, Small spaces, Inside outside, November

- Norberg-Schulz, C. [1971]. Existence, Space and Architecture. New York: Praeger.
- Norberg-Schulz, C. [1980]. Genius Loci: Towards a Phenomenology of Architecture. New York: Rizzoli.
- Onathan D. Sime, [1986], creating places or designing spaces? Journal of Environmental Psychology, chapter 6, page - 49-63
- Patrick J Galvin [1976] ,”Successful space saving at home” ,page 6-57.
- Prasad Joshi and R. Sadananda, Towards a Knowledge-Based Approach to Space Planning in Industry, *Computers in Industry* 13 [1989] 141-154
- Shimmer effect, [Sunday 29, September, 2007], Times of India, Times Property, Page 2
- Storage Chests, [Saturday 8, December, 2007], Times of India, Times Property, Page 2.
- Terence Conran, [1995], Past and Present, The Essential House Book, Chapter 1.
- Vaidya Shrinivas, [2005], “Space Saving Kid Furniture for Creating a Stimulating Bedroom”, the webmaster of Bedroom designs and decorating ideas.com, “How Do Home Furnishing Experts Study an Interior Space?”
- Van de Ven, C. [1978] Space in Architecture. Amsterdam: Van Goraum Assen
- Venturi, R. [1966], Complexity and Contradiction in Architecture. New York: New York Museum of Art.
- www.apartmenttherapy.com.
- www.google.com
- www.myinteriordecorator.com.
- www.torlys.com
- Yvonne Y.F. Chan[†] and George K Stylios, 2000, Engineering the design attributes of woven interior textiles using shape memory polymer, Heriot-Watt University, Ri-Flex department.

SPECIFIC INFORMATION ON INTERIORS:							
Room:							
FURNITURE							
Area	Type	Material	Size	Colour	Space Management Strategies		Interviewer's Observations
Size							
Walls, Floors & Ceiling							
Wall Finish	Wall color	Floor Type	Floor Colour	Ceiling Type	Ceiling Colour	Space Management Strategies	Interviewer's Observations
SOFT FURNISHING							
Wall	Color	Floor	Colour	Curtains	Colour	Space Management Strategies	Interviewer's Observations
LIGHTING							
Type	Nos.	Watts	Colour	Space Management Strategies		Interviewer's Observations	
SPACE SAVERS							
Type	Material	Size	Colour	Space Management Strategies		Interviewer's Observations	

