

# FINDINGS AND DISCUSSION

## CHAPTER – IV

### FINDINGS AND DISCUSSIONS

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The findings of the present research are described and discussed in this chapter. The findings are analysed and presented in the form of tables and graphical representations. For the systematic presentation of the results, the chapter has been divided into the following sections:

**Section I:** Demographic Profile of the respondents

**Section II:** Extent of problems experienced by the respondents residing in small houses related to their existing furniture.

**Section III:** Proposed designs of multi-purpose furniture using a combination of interior materials, for small houses.

**Section IV:** A catalogue of proposed designs with detailed specifications, construction detail, and cost.

**Section V:** Intervention Program for the homeowners to enhance their knowledge regarding multi-purpose furniture, its use, and benefits in interiors of small houses

## Section I

### 4.1 Demographic Profile of the respondents

According to Dobosh (2018), Demography is the study of inhabitants. The word ‘Demography’ is a combination of two Greek words, ‘Demos’ meaning individuals and ‘Graphy’ meaning science. Through demographic study, we will understand the basic conditions of a people regarding; social, political, and economic aspects. Demographics are statistics that describe respondents and give a better understanding of their background characteristics. A demographic profile in a survey allows researchers to gain background information on their participants and provide context for the collected survey data, allowing researchers to describe their participants and analyze the data better (Dawson, 2019).

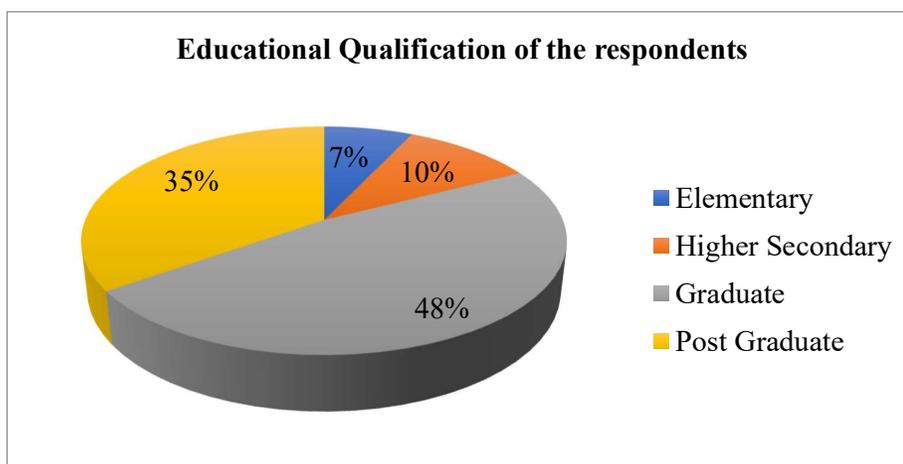
This section deals with demographic information of the respondents considered for the present study, which included parameters like; education qualification, occupation, type of family, number of family members, the composition of the family, family income, type of house, size of the house, duration of stay in the house, etc.

#### 4.1.1 Educational Qualification of the respondents:

The level of education of the respondents was assessed in this sub-section, namely elementary, higher secondary, graduate and post graduate.

**Table 5: Distribution of the respondents according to their Educational Qualification** *n=270*

Sr. No.	Educational Qualification	f	%
1.	Elementary	19	7.04
2.	Higher Secondary	28	10.37
3.	Graduate	129	<b>47.78</b>
4.	Postgraduate	94	34.81
<b>Total</b>		270	100



**Figure 1: Distribution of the respondents according to their Educational Qualifications**

Educational qualification of the respondents revealed that 47.78 per cent of the respondents were graduates, 34.81 per cent of the respondents were postgraduates 10.37 per cent of the respondents had completed higher secondary (up to 12<sup>th</sup> Standard) and 7.04 per cent of the respondents pursued elementary education (up to 10<sup>th</sup> Standard).

#### 4.1.2 Occupation of the respondents:

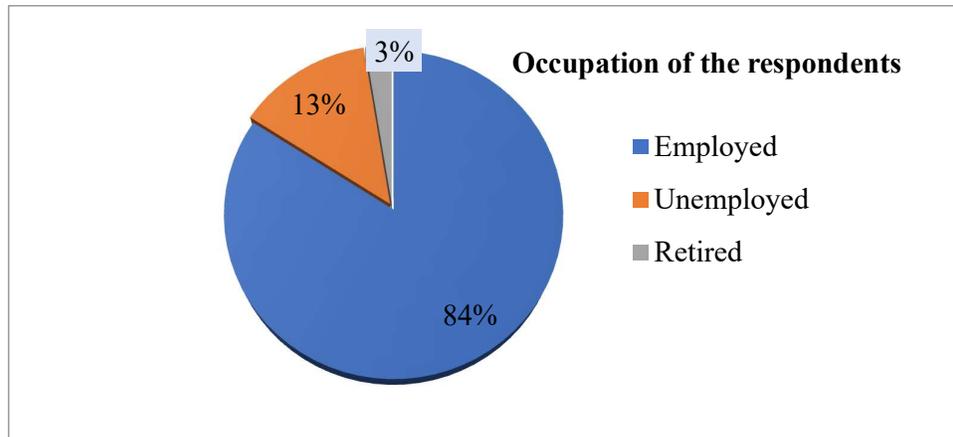
The occupation of the respondents was categorized into three subsections, namely employed, unemployed and retired.

**Table 6: Distribution of the respondents according to their Occupation**

*n=270*

Sr. No.	Occupation	f	%
1.	Employed*	227	84.07
2.	Unemployed	036	13.33
3.	Retired	007	02.59
<b>Total</b>		270	100

\*Employed from which Service(55.93 per cent) Business (31.5 per cent) and Self-employed (12.57 per cent)



**Figure 2: Distribution of the respondents according to their Occupation**

It was observed that 84.07 per cent of the respondents were employed, 13.33 per cent of the respondents were unemployed and 2.59 per cent of the respondents were retired.

#### 4.1.3 Type of Family

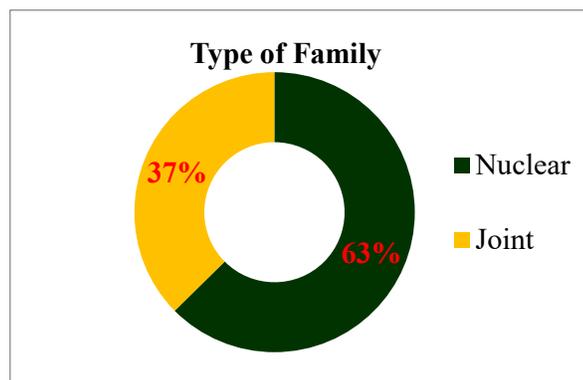
Type of Family was categorized as Nuclear and Joint.

**Table 7: Distribution of the respondents according to their Type of Family**

*n=270*

Sr. No.	Type of Family	f	%
1.	Nuclear	169	62.59
2.	Joint	101	37.41
<b>Total</b>		270	100.00

**Figure 3: Distribution of the respondents according to their type of family**



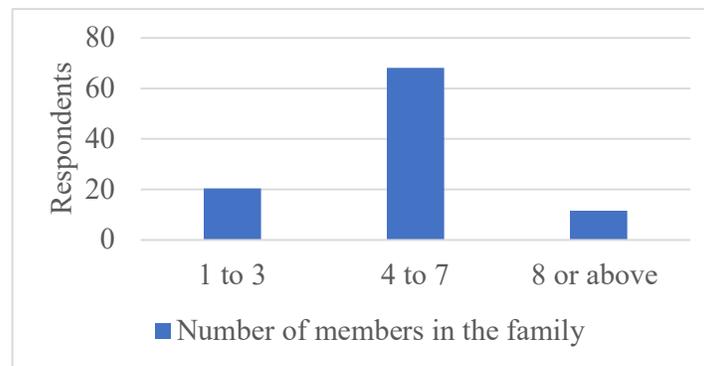
It was observed that 62.59 per cent of the respondents lived in nuclear families and the rest 37.41 per cent of the respondents lived in a joint family. 40.74 per cent) of the respondent’s families consisted of 3 elderly, 36.67 per cent of the respondent’s families had 3 adults and 42.59 per cent of the respondent’s families had 1 child.

#### 4.1.4 Number of Members in the Family

For the present study, the number of family members ranged from 1 to 8 or above.

**Table 8: Distribution of the respondents according to the number of members in the Family** *n=270*

Sr. No	Number of members in the family	f	%
1	1 to 3	55	20.37
2	4 to 7	184	<b>68.15</b>
3	8 or above	31	11.48
<b>Total</b>		270	100.00



**Figure 4: Distribution of the respondents according to the number of members in the Family**

The data collected, revealed that 68.15 per cent of the respondents had 4 to 7 members in the family, 20.37 per cent of the respondents had 1 to 3 members in the family and 11.48 of the respondents had 8 or above members in the family.

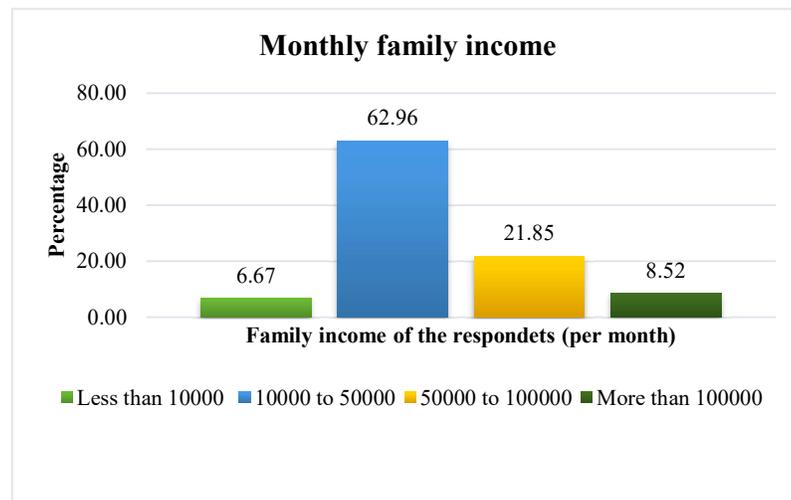
#### 4.1.5 Monthly Family Income

The monthly family income was categorized into 4 range with equal interval.

**Table 9: Distribution of the respondents according to their monthly family income**

in ₹ *n*=270

Sr. No.	Monthly Family Income (in ₹)	f	%
1.	Less than 10000	18.00	6.67
2.	10000 to 50000	170.00	<b>62.96</b>
3.	50000 to 100000	59.00	21.85
4.	More than 100000	23.00	8.52
<b>Total</b>		270	100



**Figure 5: Distribution of the respondents according to the monthly family income**

The findings of the study revealed that 62.96 per cent of the respondent's monthly income was between Rs. 10000 to 50000, 21.85 per cent of the respondent's income was ranging from Rs. 50000 to 100000, 8.52 per cent had more than Rs. 100000 and 6.67 per cent had less than Rs. 10000, family income per month.

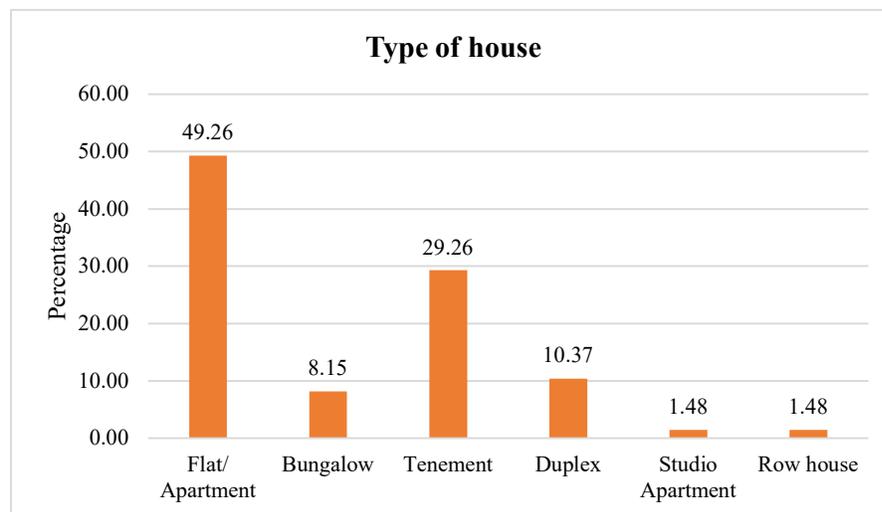
#### 4.1.6 Type of House

The respondents considered for the present study were dwelling in different kinds of houses namely flat/ apartment, bungalow, tenement, duplex, studio apartment and row house.

**Table 10: Distribution of the respondents according to their type of house**

*n=270*

Sr. No.	Type of House	f	%
1.	Flat/ Apartment	133	49.26
2.	Bungalow	22	8.15
3.	Tenement	79	29.26
4.	Duplex	28	10.37
5.	Studio Apartment	4	1.48
6.	Row house	4	1.48
<b>Total</b>		270	100



**Figure 6: Distribution of the respondents according to their type of house**

The findings of the study revealed that 49.26 per cent of the respondents were living in flats or apartment, 29.26 per cent of the respondents were living in tenement 10.37 per cent of the respondents lived in duplex, 8.15 per cent lived in bungalow, 1.48 per cent of the respondents lived in studio apartment and 1.48 per cent of the respondents resided in row house.

#### **4.1.7 Size of the house**

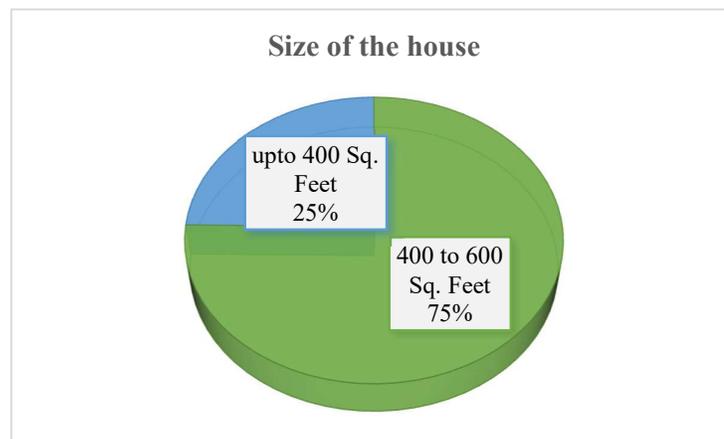
Size of the house in which respondents were living was purposively selected up to 600 sq. ft., and the respondents were divided into two categories, namely those having less

than 400 sq. ft. houses and those having between 400 sq. ft. to 600 sq. ft. area of the house.

**Table 11: Distribution of the respondents according to their size of the house**

*n=270*

Sr. No.	Size of House	f	%
1.	Up to 400 Sq. Ft.	67	24.81
2.	400 to 600 Sq. Ft.	203	<b>75.19</b>
<b>Total</b>		270	100



**Figure 7: Distribution of respondents according to their size of the house**

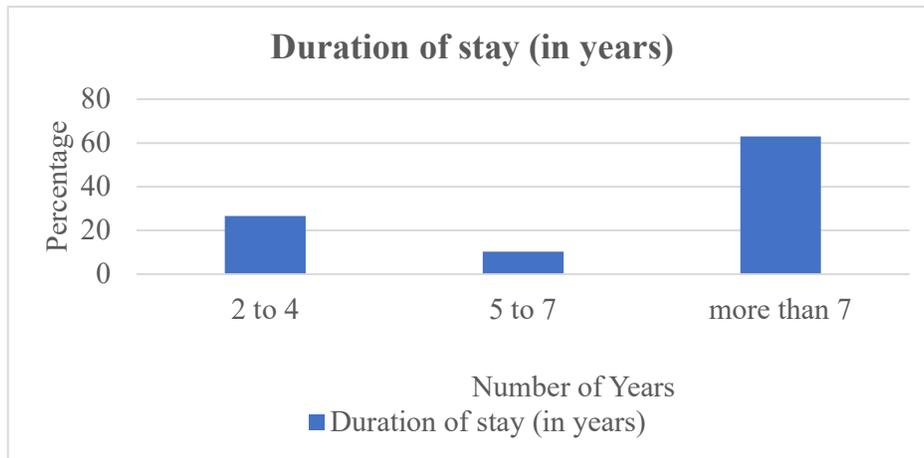
The data collected revealed that majority of the respondents 75.19 per cent were living in the house with the size of 400 sq. ft. to 600 sq. ft. and 24.81 per cent of the respondents were having a house size up to 400 sq. ft.

#### **4.1.9 Duration of Stay in the current House (in years)**

The duration of stay in the present house was considered for the present study. The data was distributed in three categories ranging from 2 years to more than 7 years.

**Table 12: Distribution of the respondents according to their duration of stay in the current house (in years) *n=270***

Sr. No.	Duration of stay in the current house (in years)	f	%
1.	2 to 4	72	26.67
2.	5 to 7	28	10.37
3.	more than 7	170	<b>62.96</b>
<b>Total</b>		270	100



**Figure 8: Distribution of the respondents according to their duration of stay in the current house (in years)**

The findings of the current study revealed that majority, 62.96 per cent of the respondents were living for more than seven years in the current house, 26.67 per cent of the respondents were residing for around 2 to 4 years in the current house, 10.37 per cent of the respondents resided in the residents for around 5 to 7 years in the current house.

## Section II

### 4.2. Extent of problems experienced by the respondents residing in small houses related to their existing furniture.

This section deals with the extent of problems experienced by the respondents related to their existing furniture in various areas of the residence namely, foyer, living room, kitchen, dining room, bedroom, bathroom, and other problems related to furniture. The respondents were asked to respond to a 2-point continuum scale in Experienced and not Experienced response structure. The scores of 2 through 1 were ascribed to each of the statements which depicted the extent of the problem experienced by the respondents. The possible range of score was divided into two categories having almost equal interval of number.

#### 4.2.1 Extent of problems experienced by the respondents residing in small houses related to furniture in foyer area.

Various parameters such as insufficient space for storing shoes, lack of space for existing shoe rack, insufficient space to store all pairs of shoes, the improper height of the shoe rack which made it inconvenient to sit and wear shoes, lack of space to create a seating arrangement in the foyer and lack of clearance space in the foyer; were the aspects related to the problems experienced by the respondents with respect to furniture in foyer area.

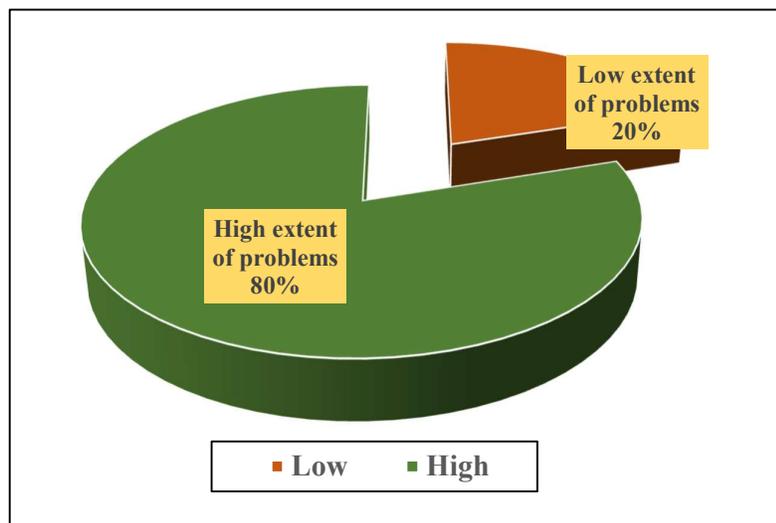
**Table 13: Distribution of respondents according to problems experienced by the respondents related to furniture in the foyer area**

Sr. No.	Problems experienced by the respondents related to furniture in the Foyer	Respondents ( <i>n</i> =270)				Weighted mean score (2-1)
		Experienced		Not Experienced		
		f	%	f	%	
1.	Insufficient space for storing shoes	234	86.67	36	13.33	1.87
2.	Small size of shoe rack	215	79.63	55	20.37	1.80
3.	Uncomfortable height of seating, to sit and wear shoes	198	73.33	72	26.67	1.73
4.	Lack of seating space in foyer	192	71.11	78	28.89	1.71
5.	Insufficient clearance space	165	61.11	105	38.89	1.61

The above table 18 revealed that 86.67 per cent of the respondents experienced problem related to insufficient space to store their shoes, 79.63 per cent of the respondents had a small size of shoe rack, 73.33 per cent of the respondents had uncomfortable seats and 71.11 per cent had lack of space in the foyer and 61.11 per cent of the respondents experienced problems of insufficient clearance in the foyer area.

**Table 14: The extent of problems experienced by the respondents related to their furniture in the foyer area**

Sr. No.	Extent of Problem	Range of Score	Distribution of the Respondents (n=270)	
			f	%
1	Low	5 – 7	54	20.00
2	High	8 – 10	216	<b>80.00</b>



**Figure 9: Extent of problems experienced by the respondents related to their furniture in the foyer area**

This section dealt with the extent of problems experienced by the respondents related to furniture in Foyer. The possible score ranged between 5 to 10, which was divided into 2 categories with almost equal interval. The range score 5 to 7 indicated low extent of problems experienced by the respondents and 8 to 10 indicated high extent of problem experienced by the respondents.

The data indicated that the majority (80 per cent) of the respondents were facing high extent of problems related to furniture in the foyer area and very few (20 per cent) of the respondents experienced a low extent of problems related to furniture in the foyer.

#### 4.2.2 Extent of problems experienced by the respondents residing in small houses related to furniture in the Living room:

Various parameters were considered to identify the problems in small space houses with respect to the living room namely difficulty to bring the furniture inside the house due to small entrance, scarcity of space to accommodate guests in the living room, lack of clearance space, lack of clearance space, no TV unit or existing TV unit, the distance between TV and seating arrangement was less, which leads to discomfort in watching TV, lack of enough space to open the cabinet doors, insufficient space to open the furniture drawers, lack of additional storage units in Living room, difficulty in using the centre table from sofa or another seating unit due to congested arrangement, height of Centre Table was very low and therefore not comfortable to use, the size of the Centre Table was small.

**Table 15: Distribution of respondents according to problems experienced by the respondents related to furniture in the Living room**

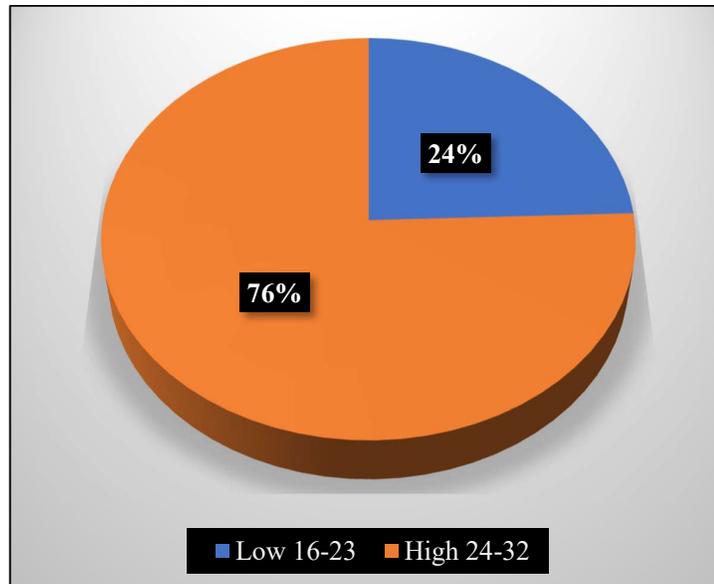
Sr. No.	Problems experienced by the respondents related to furniture in Living room	Respondents (n=270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	Lack of space to accommodate guests	174	64.44	96	35.56	1.64
2.	Compact furniture arrangement	165	64.44	105	38.89	1.61
3.	Lack of space for clearance and movement	163	60.37	107	39.63	1.60
4.	Inconvenience in cleaning the room due to improper furniture placement	166	61.48	104	38.52	1.61
5.	No space for TV unit	156	57.78	114	42.22	1.58
6.	Improper distance between TV and seating	147	54.44	123	45.56	1.54
7.	Insufficient space for storage near TV	221	81.85	49	18.15	1.82
8.	Improper clearance in front of storage cabinets	163	60.37	107	39.63	1.60
9.	Improper clearance in front of drawer unit	132	48.89	138	51.11	1.49

10.	Lack of additional storage units in Living room	186	<b>68.89</b>	84	31.11	1.69
11.	Height of Centre Table was low and therefore not comfortable to use	162	60	108	40.00	1.60
12.	Difficulty in using centre table from seating unit due to congested arrangement.	206	<b>76.3</b>	64	23.70	1.76
13.	Size of Centre Table was small, to accommodate necessary items.	145	53.7	125	46.30	1.54
14.	Size of Centre table is too big as compared to room size.	171	63.33	99	36.67	1.63
15.	No separate area for storing shoes.	182	<b>67.41</b>	88	32.59	1.67
16.	Lack of comfortable seating	157	58.15	112	41.48	1.58

The data in the above table (table 20) revealed that most of the problems experienced by the respondents in the living room was related to storage. 81.85 per cent of the respondents had experienced insufficient space for storage near TV (76.3 per cent), followed by the congested arrangement leading to difficulty in using centre table from seating unit, which was experienced by around 76.30 per cent of the respondents. There were 68.89 per cent of the respondents facing the problem of limited storage in living room and were willing to have more storage space, 67.41 per cent of the respondents had no separate area to store shoes, 64.44 per cent of the respondents had lack of space to accommodate guests and 64.44 per cent of the respondents experienced compact furniture arrangement.

**Table 16: Extent of problems experienced by the respondents related to their furniture in the living room.**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			f	%
1	Low	16-23	66	24.44
2	High	24-32	204	<b>75.56</b>



**Figure 10: Extent of problems experienced by the respondents related to their furniture in the living room**

This section dealt with the extent of problems experienced by the respondents related to furniture in living room. The possible score ranged between 16 to 32, which was divided into 2 categories with almost equal interval. Range score in 16 to 23, indicated low extent of problems experienced by the respondents and 24 to 32 indicated high extent of problem experienced by the respondents. The data revealed that 75.56 per cent of the respondents were facing high extent of problems related to furniture in the living room and 24.44 per cent of the respondents were facing low extent of problems related to furniture in the living room

#### **4.2.3 Problems experienced by the respondents residing in small houses with respect to furniture in Kitchen.**

The problems experienced by the respondents related to furniture in their kitchen were studied considering parameters such as; scarcity of space on the countertop for meal preparation, low height or too high height of the countertop for the homemaker to work comfortably, improper depth of the countertop, difficulty in cleaning countertop due to its poor quality, insufficient storage under the kitchen counter, no upper cabinets in the kitchen, lack of storage space in an upper cabinet for storing things, lack of clearance space, to move in the kitchen, lack of cross ventilation inside the kitchen, insufficient storage for storing utility things, poor quality material used in kitchen furniture, opening and taking out items from

refrigerator was difficult due to less space in front of the refrigerator, insufficient space for multiple workers to work together in the kitchen, placement of sink was improper, which creates difficulty during washing utensils, improper height and depth of the sink centre creating discomfort in washing utensils. The size of the sink was small, lack of space near the sink centre to store washed utensils, insufficient space for storing drinking water or storing earthen pot of drinking water (matla) near the sink, no space for water purifier near sink centre, no space for storing gas cylinder in kitchen, lack of pre-preparation space on the counter, lack of storage space for crockery in the kitchen, lack of space for storing extra grains in kitchen, no separate storeroom, insufficient storage space for storing spices, flour, and other cooking ingredients, lack of space to keep electrical appliances on the countertop, inadequate plug points for electrical appliances, improper height of the cooking counter hinders with visibility of food during cooking.

**Table 17: Distribution of respondents according to problems experienced by the respondents related to furniture in their Kitchen**

Sr. No.	Problems related to furniture in Kitchen	Respondents( <i>n</i> =270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	Insufficient space for meal preparation	170	62.96	100	37.04	1.63
2.	Height of the countertop was improper	157	58.15	113	41.85	1.58
3.	Uncomfortable depth of the countertop to work.	186	68.89	84	31.11	1.69
4.	Length of the countertop was inappropriate, which creates scarcity of space.	206	<b>76.30</b>	64	23.70	1.76
5.	Cleaning countertop was difficult due to poor quality of countertop.	120	44.44	150	55.56	1.44
6.	Insufficient storage under the kitchen counter.	232	<b>85.93</b>	38	14.07	1.86
7.	Unorganized upper cabinets in the kitchen.	206	76.30	64	23.70	1.76
8.	Lack of space in upper cabinet for storing things.	235	<b>87.04</b>	35	12.96	1.87

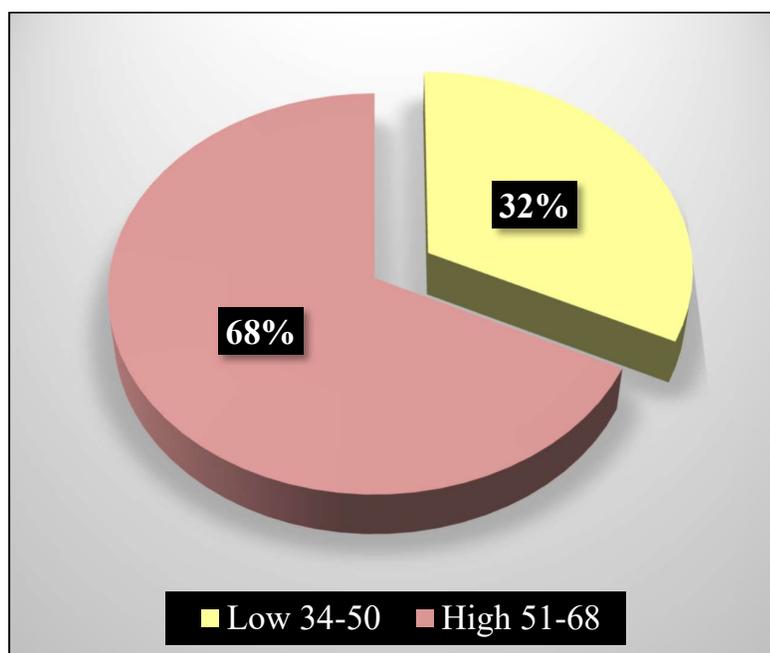
9.	Lack of clearance space, to move to-and-fro in kitchen	142	52.59	128	47.41	1.53
10.	Lack of cross ventilation inside the kitchen	157	58.15	113	41.85	1.58
11.	Lack of storage for storing utility things.	175	64.81	95	35.19	1.65
12.	Poor quality of material used in kitchen furniture	108	40.00	162	60.00	1.40
13.	Insufficient space to access the refrigerator	137	50.74	133	49.26	1.51
14.	Insufficient space for multiple workers to work together in the kitchen	223	<b>82.59</b>	47	17.41	1.83
15.	Placement of sink was not at a proper place, which created difficulty during washing utensils.	174	64.44	96	35.56	1.64
16.	Height of the sink centre was not comfortable to wash Utensils.	133	49.26	137	50.74	1.49
17.	Improper depth of the sink	174	64.44	96	35.56	1.64
18.	Size of the sink was small	140	51.85	130	48.15	1.52
19.	Lack of space near the sink centre to store washed utensils.	163	60.37	107	39.63	1.60
20.	No space for storing drinking water near sink.	135	50.00	135	50.00	1.50
21.	Insufficient storage near the sink center	148	54.81	122	45.19	1.55
22.	No space for garbage bin in kitchen	130	48.15	140	51.85	1.48
23.	No space for water purifier near sink centre.	176	65.19	94	34.81	1.65
24.	No space for storing gas cylinder in kitchen.	174	64.44	96	35.56	1.64
25.	Lack of pre-preparation space on counter	161	59.63	109	40.37	1.60
26.	Lack of storage space for crockery in the kitchen.	152	56.30	118	43.70	1.56
27.	No space for storing extra grains in kitchen	159	58.89	111	41.11	1.59
28.	No separate storeroom	172	63.70	98	36.30	1.64
29.	Lack of storage space for storing spices, flour, and other cooking ingredients.	149	55.19	121	44.81	1.55
30.	Lack of space to keep electrical appliances on countertop.	163	60.37	107	39.63	1.60
31.	Improper location of plug points	126	46.67	144	53.33	1.47
32.	Lack of organizers in cabinets for convenient storage	148	54.81	122	45.19	1.55

33.	Improper height of cooking counter while making food not visible during cooking.	109	40.37	161	59.63	1.40
34.	Lack of proper clearance due small size of kitchen	126	46.67	144	53.33	1.47

The data revealed that 85.56 per cent of respondents had insufficient storage under the kitchen counter and 87.04 per cent faced problems due to lack of space in upper cabinet for storing things. The data also showed that 82.59 per cent had insufficient space for multiple workers to work together in the kitchen and 76.30 per cent of the respondents had inappropriate length of the countertop which leads to scarcity of space. Lack of organized upper cabinets in the kitchen was also a problem faced by 76.30 per cent of the respondents.

**Table 18: Extent of problems experienced by the respondents related to their furniture in the kitchen**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			f	%
1	Low	34-50	87	32.22
2	High	51-68	183	67.78



**Figure 11: Extent of problems experienced by the respondents related to their furniture in the kitchen**

This section dealt with the extent of problems experienced by the respondents related to furniture in the kitchen. The possible score ranged between 34 to 68, which was divided into 2 categories with almost equal interval. The range score in 34 to 50 indicated low extent of problems experienced by the respondents and 51 to 68 indicated high extent of problem experienced by the respondents. The data revealed that 67.78 per cent of the respondents were facing high extent of problems related to furniture in the kitchen and 32.22 per cent of the respondents were facing low extent of problems related to furniture in the kitchen.

#### 4.2.4 Problems Experienced by the respondents residing in small houses with respect to Furniture in Dining Room

The problems experienced by the respondents concerning furniture in the dining room were studied considering insufficient space for furniture, dining room combined with the living room, or with the kitchen, the small size of the dining table for family members residing in the house, the uncomfortable height of the chair and table to sit and have a meal, lack of clearance space to pull out a chair and sit on the table, improper depth of the seat to sit, the uncomfortable backrest of the chair, lack of clearance space to move around the dining table while serving meals, no storage units in the dining area, lack of space in an existing storage unit, no space for decorative items in the dining room, no space for storing dining table accessories in the dining room.

**Table 19: Distribution of respondents according to problems experienced by the respondents related to furniture in the Dining room**

Sr. No.	Problems related to furniture in the Dining room	Respondents( <i>n</i> =270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	Dining area is combined with living room.	177	65.56	93	34.44	1.66
2.	Dining area is combined with kitchen.	132	48.89	138	51.11	1.49
3.	Clearance Space was less to pull out chair and sit on table.	131	48.52	139	51.48	1.49
4.	Design of chair was uncomfortable	104	38.52	166	61.48	1.39

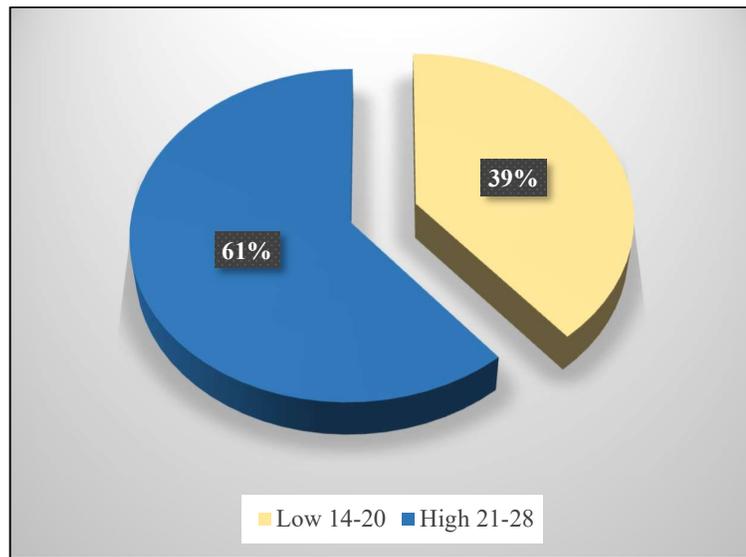
5.	Design of table was uncomfortable	112	41.48	158	58.52	1.41
6.	Size of Dining Table was too small	197	<b>72.96</b>	73	27.04	1.73
7.	Seat height is not convenient	126	46.67	144	53.33	1.47
8.	Backrest of chair was not comfortable while having meals.	130	48.15	140	51.85	1.48
9.	Clearance space around the dining table was too less.	214	<b>79.26</b>	56	20.74	1.79
10.	No storage units in dining area.	162	60.00	108	40.00	1.60
11.	Poor quality of material for the dining table	154	57.04	116	42.96	1.57
12.	Lack of space in existing dinning for extra guest	167	<b>61.85</b>	103	38.15	1.62
13.	Dining table also used for study purpose.	145	53.70	125	46.30	1.54
14.	Table and chairs occupy lot of floor space	161	59.63	109	40.37	1.60

The data revealed that 79.26 per cent of the respondents had too less clearance space around the dining table, which acted as a difficulty while serving meals, 72.96 per cent respondents had small size of dining table, 65.56 per cent of the respondents had their dining area combined with living room and 61.85 per cent of the respondents had lack of space for extra guests in dining area.

**Table 20: Extent of problems experienced by the respondents related to their furniture in dining room.**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			f	%
1	Low	14-20	105	38.89
2	High	21-28	165	61.11

This section dealt with the extent of problem experienced by the respondents related to furniture in dining room. The possible score ranged between 14 to 28, which was divided into 2 categories with almost equal interval. Range score in 14 to 20 indicated low extent of problems experienced by the respondents and 21 to 28 indicated high extent of problem experienced by the respondents. The data revealed that 61.11 per cent of the respondents were facing high extent of problems related to furniture in the dining room/dining area and 38.89 per cent of the respondents were facing low extent of problems related to furniture in the dining room/dining area.



**Figure 12: Extent of problems experienced by the respondents related to their furniture in dining room.**

#### **4.2.5 Problems experienced by the respondents residing in small houses with respect to Furniture in Bedroom.**

The problems experienced by the respondents related to furniture in the bedroom were studied considering aspects such as opening and the location of bed, inconvenience in opening and closing wardrobe and other storage units, no ledge or side table in bedroom, or improper height of existing side table, improper depth of side table to store things, lack of clearance space as furniture in the room was closely kept, too big or too small bed as compared to the room size, insufficient space to use the furniture conveniently (pulling out drawers, opening doors), lack of floor space due to more furniture, insufficient space to accommodate extra members (guest) in the bedroom, design of existing furniture was not comfortable to use, difficulty was experienced to bring the thing inside the bedroom due to small entrance, lack of additional storage unit or lofts for storing extra things in the Bedroom, lack of space for hanging clothes in the storage, no space for hanging used clothes so that they can be aired and made odour free, lack of space to store folded clothes in the wardrobe, lack of dressing unit or accessories storage, lack of separate storage for each family member, lack of space for accessories storage, improper depth of the wardrobe,

improper height or depth of the study table or chair (located in the bedroom), making it uncomfortable to sit and work for long hours, and the lofts in the bedroom were not having doors.

**Table 21: Distribution of respondents according to problems experienced by the respondents related to furniture in the Bedroom**

Sr. No.	Problems related to furniture in the Bedroom	Respondents( <i>n</i> =270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	Bedroom is shared space in living room	158	58.52	112	41.48	1.59
2.	Lack of clearance space due to more furniture items in small room	164	60.74	106	39.26	1.61
3.	Two bedrooms are interconnected	162	60.00	108	40.00	1.60
4.	Inconvenience in opening and closing wardrobe	136	50.37	134	49.63	1.50
5.	Difficulty in cleaning the room, due to furniture design.	141	52.22	129	47.78	1.52
6.	Lofts in the bedroom do not have doors.	150	55.56	120	44.44	1.56
7.	Bed is visible from common areas	140	51.85	130	48.15	1.52
8.	Size of the bed is too small	165	61.11	105	38.89	1.61
9.	Size of the bed is too big as compared to the room size.	164	60.74	106	39.26	1.61
10.	Lack of floor space due to more furniture	171	<b>63.33</b>	99	36.67	1.63
11.	Not enough space to use the furniture conveniently. (Pulling out drawers, opening doors)	149	55.19	121	44.81	1.55
12.	Design of existing furniture was not comfortable to use.	158	58.52	112	41.48	1.59
13.	No space to accommodate extra members in bedroom.	173	<b>64.07</b>	97	35.93	1.64
14.	Difficulty in moving furniture outside the bedroom due to small entrance.	170	<b>62.96</b>	100	37.04	1.63
15.	Lack of space for each member of the house in bedrooms	155	57.41	115	42.59	1.57
16.	Less space to store seasonal cloths	176	<b>65.19</b>	94	34.81	1.65
17.	Lack of clearance space in front of storage to access it.	153	56.67	117	43.33	1.57

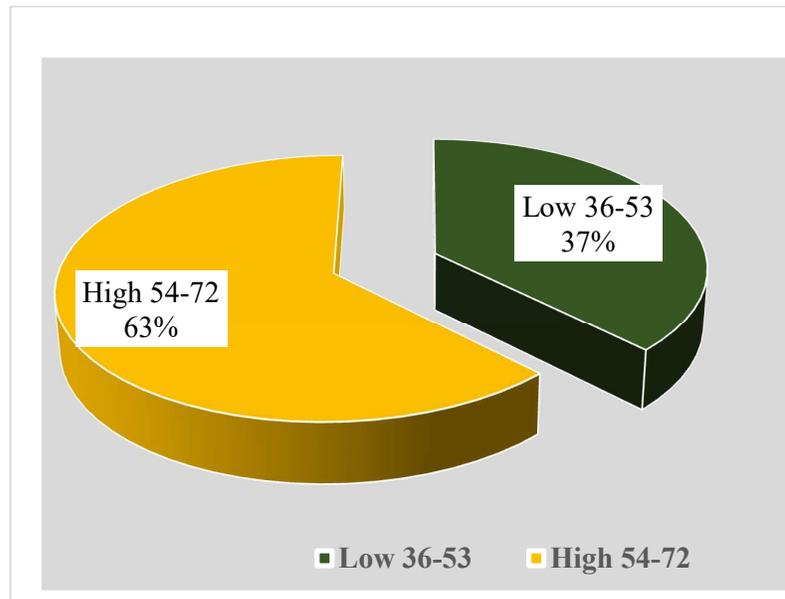
18.	Lack of space to store folded clothes in wardrobe.	157	58.15	113	41.85	1.58
19.	No lofts for storing extra things in the Bedroom.	132	48.89	138	51.11	1.49
20.	Less space for hanging clothes in the storage.	152	56.30	118	43.70	1.56
21.	No extra space for extra bedding	147	54.44	123	45.56	1.54
22.	No space to air used cloths.	128	47.41	142	52.59	1.47
23.	Lack of additional storage unit in the Bedroom.	211	<b>78.15</b>	59	21.85	1.78
24.	No dressing unit	149	55.19	121	44.81	1.55
25.	No accessories storage.	163	60.37	107	39.63	1.60
26.	No separate storage for each family member.	143	52.96	127	47.04	1.53
27.	Existing side table does not have storage	136	50.37	134	49.63	1.50
28.	Depth of the wardrobe was less to store big clothes.	120	44.44	150	55.56	1.44
29.	Study table was in the bedroom.	116	42.96	154	57.04	1.43
30.	Height of the study table was not comfortable to work.	131	48.52	139	51.48	1.49
31.	Depth of the study table was not comfortable to work.	115	42.59	155	57.41	1.43
32.	Height of the study chair was not comfortable to sit and work.	133	49.26	137	50.74	1.49
33.	Study chair was not comfortable to sit and work.	129	47.78	141	52.22	1.48
34.	No side table in Bedroom.	221	<b>81.85</b>	49	18.15	1.82
35.	Lack of space for locker	171	<b>63.33</b>	99	36.67	1.63
36.	No storage inside the bed	162	60.00	108	40.00	1.60

The data revealed that 81.85 per cent of the respondents experienced problems as they was no side table in the Bedroom, 78.15 per cent faced problems due to lack of space for additional storage unit in the Bedroom.

The data also revealed that 65.19 per cent had less space to store seasonal cloths whereas 64.07 per cent had no space to accommodate extra members in bedroom A similar percentage of respondents that is 63.33 per cent faced problems due to lack of floor space due to more furniture and lack of space for locker whereas 62.96 per cent of the respondents faced difficulty in moving furniture outside the bedroom due to small entrance.

**Table 22: Extent of problems experienced by the respondents related to their furniture in Bedroom**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			F	%
1	Low	36-53	101	37.41
2	High	54-72	169	62.59



**Figure 13 Extent of problems experienced by the respondents related to their furniture in bedroom**

This section dealt with the extent of problems experienced by the respondents related to furniture in bedroom. The possible score ranged between 36 to 72, which was divided into 2 categories with almost equal interval. Range score in 36 to 53 indicated low extent of problems experienced by the respondents and 54 to 72 indicated high extent of problem experienced by the respondents. The data revealed that 62.59 per cent of the respondents were facing high extent of problems related to furniture in the bedroom and 37.41 per cent of the respondents were facing low extent of problems related to furniture in the bedroom.

#### 4.2.6 Problems Experienced by the respondents residing in small houses with respect to Furniture in Bathroom

The problems experienced by the respondents related to furniture in the bathroom were studied considering difficulties such as the too-small size of the bathroom, lack of storage inside the bathroom, lack of space to store towels and clothes.

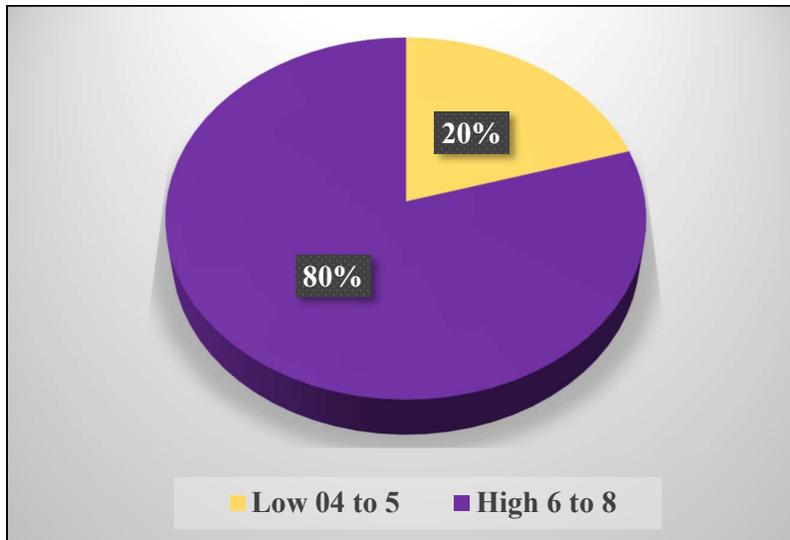
**Table 23: Distribution of respondents according to problems experienced by the respondents related to furniture in the Bathroom**

Sr. No.	Problems related to furniture in the Bathroom	Respondents( <i>n</i> =270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	No Dressing vanity inside the bathroom	198	73.33	72	26.67	1.73
2.	No storage inside the bathroom for daily cloths	221	81.85	49	18.15	1.82
3.	No space to store extra utility things (like soaps and shampoo)	171	63.33	99	36.67	1.63
4.	No space to hang and store extra towels.	145	53.70	125	46.30	1.54

It was observed that 81.85 per cent of the respondents had no storage inside the bathroom for daily cloths, 73.33 per cent of the respondents has no dressing vanity inside the bathroom, 63.33 per cent of the respondents had no space to store extra utility things (like soaps and shampoo) and other utility things.

**Table 24: Extent of problems experienced by the respondents related to their furniture in the bathroom.**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			f	%
1	Low	4-5	55	20.37
2	High	6-8	215	79.63



**Figure 14: Extent of problems experienced by the respondents related to their furniture in bathroom**

This section dealt with the extent of problems experienced by the respondents related to furniture in bathroom. The possible score ranged between 4 to 8, which was divided into 2 categories with almost equal interval. Range score in 4 to 5 indicated low extent of problems experienced by the respondents and 6 to 8 indicated high extent of problem experienced by the respondents. The data revealed that 79.63 per cent of the respondents were facing high extent of problems related to furniture in the bathroom and 20.37 per cent of the respondents were facing low extent of problems related to furniture in the bathroom.

#### **4.2.7 Other Problems experienced by the respondents residing in small houses with respect to Furniture.**

There were few other problems identified by the researcher, considering the overall house; which included lack of overall space in house, small room is size as compared to the family members residing in it, no separate space for washing clothes (chokadi/ washing machine), washing area was too small which creates difficulty during washing activity, lack of space for drying clothes, no space for storing gardening tools and equipment, no storage near wash area, no space for planting plants, no storage unit near wash basin, no space for placing swing/ outdoor furniture, insufficient space for storing electronic gadgets.

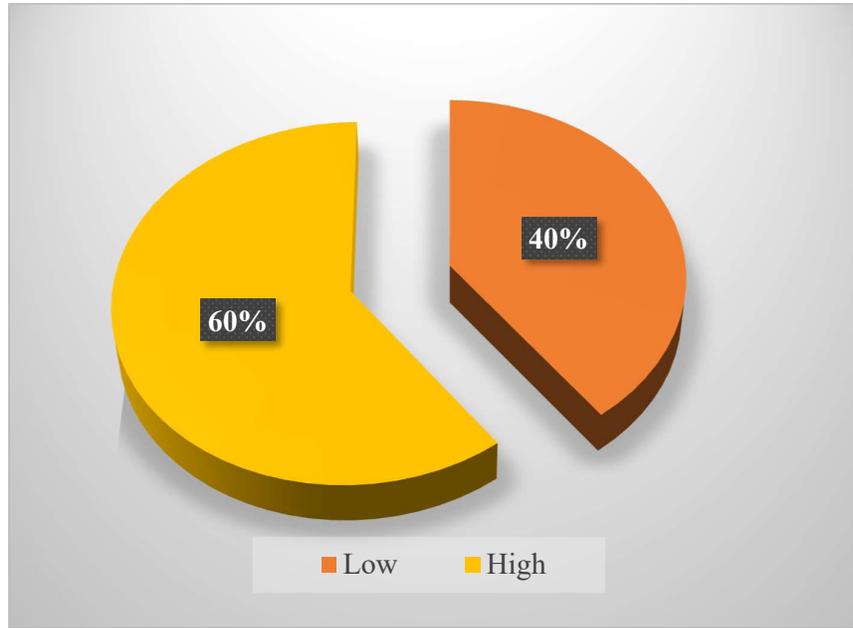
**Table 25: Distribution of respondents according to problems experienced by the respondents related to furniture in other areas**

Sr. No.	Problems related to furniture in other areas	Respondents( <i>n</i> =270)				Weighted mean score (2-1)
		Problems experienced by the respondents				
		Experienced		Not Experienced		
		f	%	f	%	
1.	Lack of overall space in House	175	64.81	95	35.19	1.65
2.	Small room size as compared to the family members residing in it.	163	60.37	107	39.63	1.60
3.	No separate space for washing clothes (chokadi/ washing machine)	124	45.93	146	54.07	1.46
4.	Washing area was too small which creates difficulty during washing activity	158	58.52	112	41.48	1.59
5.	Lack of space for drying clothes.	126	46.67	144	53.33	1.47
6.	No space for storing gardening tools and equipment.	157	58.15	113	41.85	1.58
7.	No storage near wash area	145	53.70	125	46.30	1.54
8.	No space for planting plants.	143	52.96	127	47.04	1.53
9.	No storage unit near wash basin.	158	58.52	112	41.48	1.59
10.	No space for placing swing/ outdoor furniture.	163	60.37	107	39.63	1.60
11.	Insufficient space for storing electronic gadgets.	170	62.96	100	37.04	1.63

According to above table, 64.81 per cent of the respondents faced problems due to lack of overall space in the house followed by 62.96 per cent of the respondents experiencing problems due to insufficient space for storing electronic gadgets. The data also revealed that an equal percentage of respondents that is 60.37 per cent experienced problems due to small room is size as compared to the family members residing in it and no space for placing swing/ outdoor furniture.

**Table 26: Extent of problems experienced by the respondents related to their furniture in other areas**

Sr. No.	Extent of Problem	Range of Score	Respondents ( <i>n</i> =270)	
			F	%
1	Low	11- 16	107	39.63
2	High	17 – 22	163	60.37



**Figure 15: Extent of other problems experienced by the respondents related to their furniture**

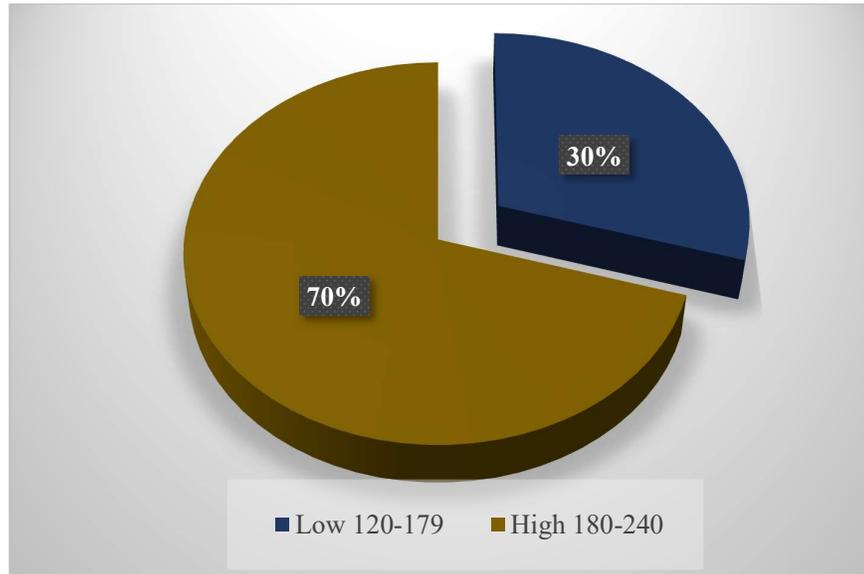
This section dealt with the extent of other problems experienced by the respondents related to their furniture. The possible score ranged from 11 to 22, divided into 2 categories with almost equal intervals. Range scores in 11 to 16 indicated a low extent of problems experienced by the respondents and 17 to 22 indicated a high extent of problems experienced by the respondents. The data depicted that 60.37 per cent of the respondents were facing high extent of other problems related to their furniture.

**Table 27: Overall Extent of problems experienced by the respondents related to their furniture**

Sr. No.	Extent of Problem	Range of Score	Distribution of the Respondents (n=270)	
			f	%
1	Low	120-179	80	29.63
2	High	180-240	190	70.37

This section dealt with the overall extent of problems experienced by the respondents related to the furniture in whole house. The possible score ranged between 120 to 240, which was divided into 2 categories with almost equal interval. Range score in 120 to

179 indicated low extent of problems experienced by the respondents and 180 to 240 indicated high extent of problem experienced by the respondents. The data revealed that 70.37 per cent of the respondents were facing high extent of problems related to furniture in whole house and 29.63 per cent of the respondents were facing low extent of overall problems related to furniture.



**Figure 16: Overall extent of problems experienced by the respondents related to furniture in whole house**



### Section III

#### 4.3. Proposed designs of multi-purpose furniture using a combination of interior materials, for small houses.

To overcome the space crunch issue, the researcher developed new designs of multi-purpose furniture using a combination of Interior materials, for each area of the house; namely the foyer, living room, kitchen, bedroom, dining room, bathroom, and other areas. The furniture was designed keeping in mind the scarcity of space, for optimum utilization of available space, for which the researcher came up with innovative multipurpose designs for various areas of the residential unit, especially for small houses.

While designing furniture it is necessary to keep in mind factors such as strength, durability, wear and tear, resistance, life of a furniture unit, and maintenance, along with the consideration of its price. There is also a need to select, the proper material for each furniture item, according to the room in which it is to be placed and according to the people by whom it is to be used. The prices suggested in the catalogue were according to the market research done by the researcher during the duration of the research and may vary with changes in the price and brand of the material and expertise of the labour used. The Multipurpose furniture was conceptualized, sketched, and then designed with the help of AutoCAD 2022 and SketchUp 2022, design software.

**Table 28: Proposed Multi-purpose Furniture designs.**

<b>Furniture for Foyer and Living room</b>	
1)	Utility storage with shoe rack and pull-out seating bench
2)	Three-seater sofa with shoe rack and utility storage
<b>Furniture for Kitchen and Dining room</b>	
3)	Three-seater sofa cum bed with foldable Four-seater dining (One table and Four chairs)
4)	Portable pre-preparation center with extendable dining table, chairs, and storage
<b>Furniture for Bedroom, Bathroom, and other areas</b>	
5)	Study unit with dressing and storage
6)	Wardrobe with foldable iron board and study area and chair
7)	Extendable Bed, storage, and folding seating
8)	Folding office and Dressing
9)	Centre Table, Storage, Chair, and bed

## **Furniture proposed for various areas:**

### **4.3.1 Utility storage with shoe rack and pull-out seating bench**

The unit was designed keeping in mind the problems issues experienced by the respondents related to furniture in foyer. Some of the respondents had electrical meters visible which was making the entrance of the house unattractive, so this unit was designed to conceal the electrical meter as a part of the unit and beautify the area along with storage and drawers.

The shoe rack was designed to the vision to and availing maximum clearance space. This multipurpose furniture was designed with the concept of pull-out furniture. The design of the furniture helps the user utilize the space to hide the electrical meter, MCBs, and EELCBs behind the shutter, the top drawers can be used to store things of first use like keys, watches, wallets, purses, bills, and other important things, one can also add a lock to the drawer if needed. The shoe rack was designed to get maximum space to store daily wear, occasional and seasonal wear shoes. This shoe rack was designed to accommodate a minimum of 16 pairs of shoes. There are two drawers underneath the shoe rack which could be used to store newspapers and magazines and the bottom drawers can also be used to store laptop bags and ladies' purses. This storage unit and shoe rack occupy 3'11" X 10-1/2" X 4'2" of space. The sizes can be modified according to the availability of the space and utility, as this unit can be used as half with 2'-0" in length and less height if needed. The seating height for the pull-out bench is 1'7".

For the proposed furniture, extensive market research helped the researcher to come up with various material options. A variety of base materials with suitable finishing materials can be used for constructing this furniture. Various base materials like real wood, plywood, and MDF with a combination of finishing materials like, laminate, veneer, and polyurethane Polish can be used. Accessories to highlight the furniture can be designed using different metals.

**Table 29: Materials options for utility storage with shoe rack and pull-out bench**

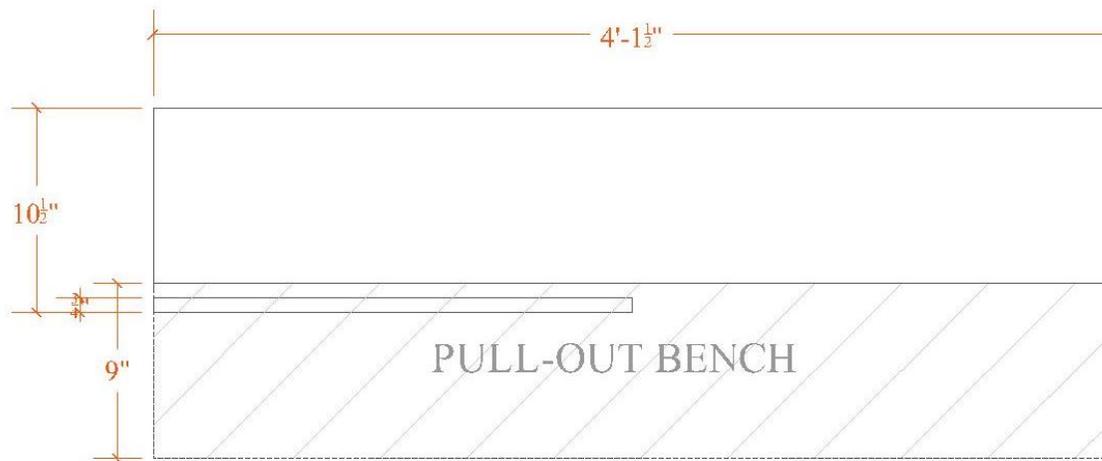
Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam, and Fabric	Stainless Steel	Any other metal
<b>Drawers</b>	•	•	•	•			
<b>Shutters</b>	•	•	•	•			
<b>Shelves</b>	•	•	•	•			
<b>Pull out the bench seat</b>	•	•	•	•	•		
<b>Handle</b>						•	•
<b>Drawer Channel</b>						•	•

Parts of the utility storage with shoe rack and pull-out bench are discussed below:

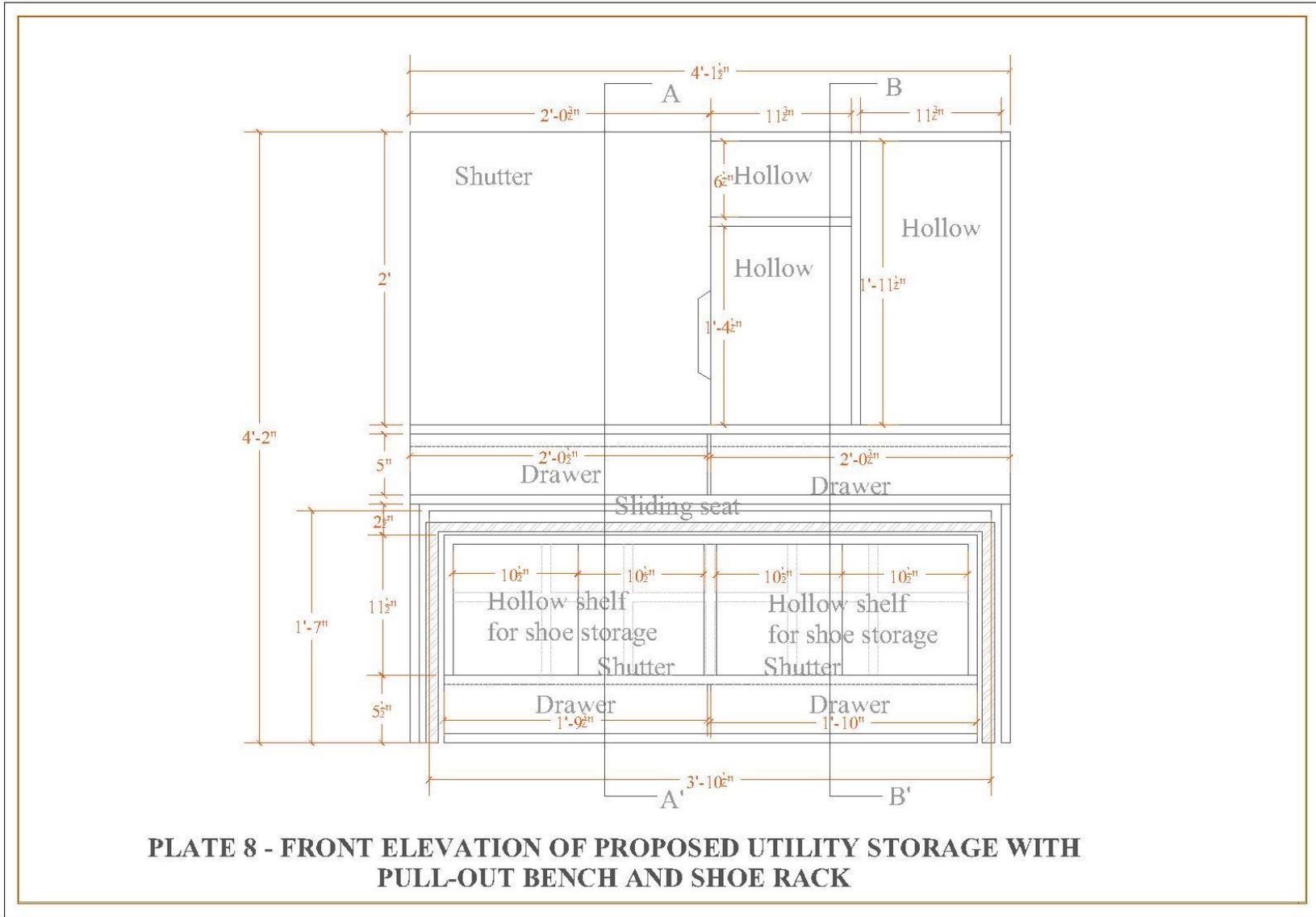
1. **Drawers, shutters, shelves, and Pull-Out bench:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Pull-out Bench Seat:** Ply, Foam, and Fabric (Foam of different densities can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, channels with reasonable strength of stainless steel or any other metal could be used.

As the proposed piece of furniture was designed for the foyer area, the design suggested by the researcher is sleeker with concealed handles and edges that could be chamfered. the colour options can be selected by the end user according to the theme of their house.

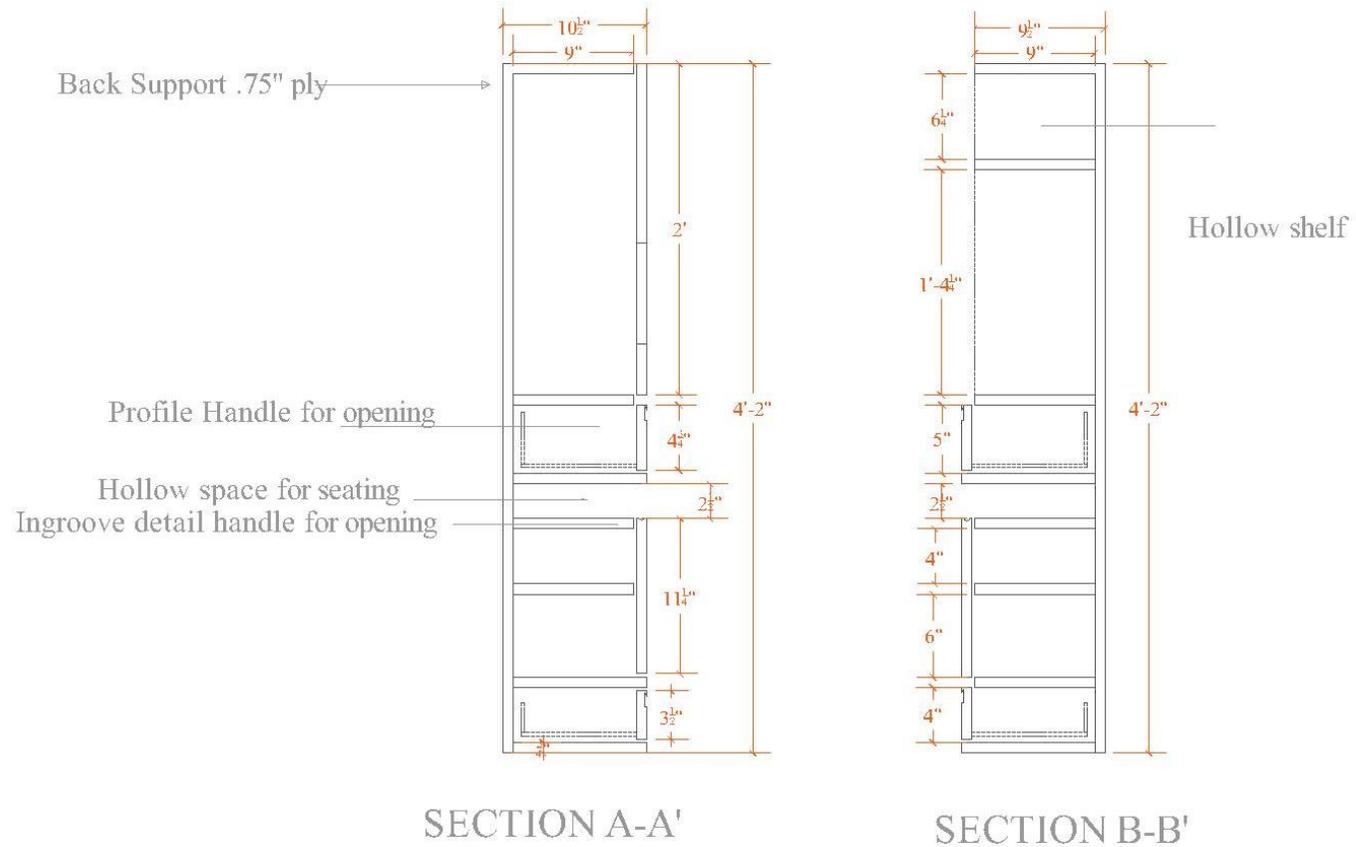
**Price for this unit:** Price would range from Rs. 5000 to Rs. 12000 depending on the material chosen and its brand selected for construction.



**PLATE 7 - PLAN OF PROPOSED UTILITY STORAGE WITH PULL-OUT BENCH AND SHOE RACK**



**PLATE 8 - FRONT ELEVATION OF PROPOSED UTILITY STORAGE WITH PULL-OUT BENCH AND SHOE RACK**



**PLATE 9 - SECTIONS OF PROPOSED UTILITY STORAGE WITH PULL-OUT BENCH AND SHOE RACK**



**Plate 10: 3D view of proposed Utility storage with shoe rack and pull-out seating bench**



**Plate 11: 3D view of proposed Utility storage with shoe rack and pull-out seating bench (Plywood and Veneer finish) (open)**



**Plate 12: 3D view of proposed utility storage with shoe rack  
(Plywood and Veneer finish) (closed)**

#### **4.3.2 Three-seater sofa with shoe rack and utility storage**

This unit is designed keeping in mind the major problems experienced by the respondents, who were not having a separate foyer area, or a separate designated space to store shoes. The proposed multipurpose furniture is designed with a concept of openable furniture, using different kinds of shutters, and opening styles. The three-seater sofa provides sitting space fulfilling the major function of the furniture but along with that, it provides storage space underneath the seat. The space below the seat is divided into two sections, namely front side, and backside. The researcher has incorporated shutters for storing newspapers, purses, and other day-to-day items, while the back side of the sofa has drawers to store extra seasonal things, which can be accessed by pulling the sofa out. One can also skip this division of space and can use the underside of the seat as full storage. Alongside, the sofa is also designed with hand rest, with a hidden shoe rack in it. This shoe rack is designed to store shoes for daily use. This shoe rack has a vertical storage space with a capacity of around 8-10 pairs on one side and 8-10 pairs on another side.

This unit occupies 5'0" X 2'6" X 2'5" of floor space. The sizes can be modified according to the availability of the space and utility, as this unit can be used as a single chair with around 2'-0" in length, or by designing a shoe rack on either side of the hand rest. The underneath storage can also be designed according to the utility and need of the user. This furniture can be designed using different combinations of materials.

For the proposed furniture, thorough market research assisted the researcher in coming up with a range of material possibilities. A variety of base materials with suitable finishing materials can be used for constructing this furniture. Various base materials like real wood, plywood, and MDF with a combination of finish materials like, laminate, veneer, and polyurethane Polish can be used. Hardware designed using different metals can be incorporated. The design suggested by the researcher is sleeker with concealed handles and chamfered edges along with colour options that can be selected by the end user according to the theme of their own house.

Parts of the Three-seater sofa with shoe rack and utility storage furniture are discussed below:

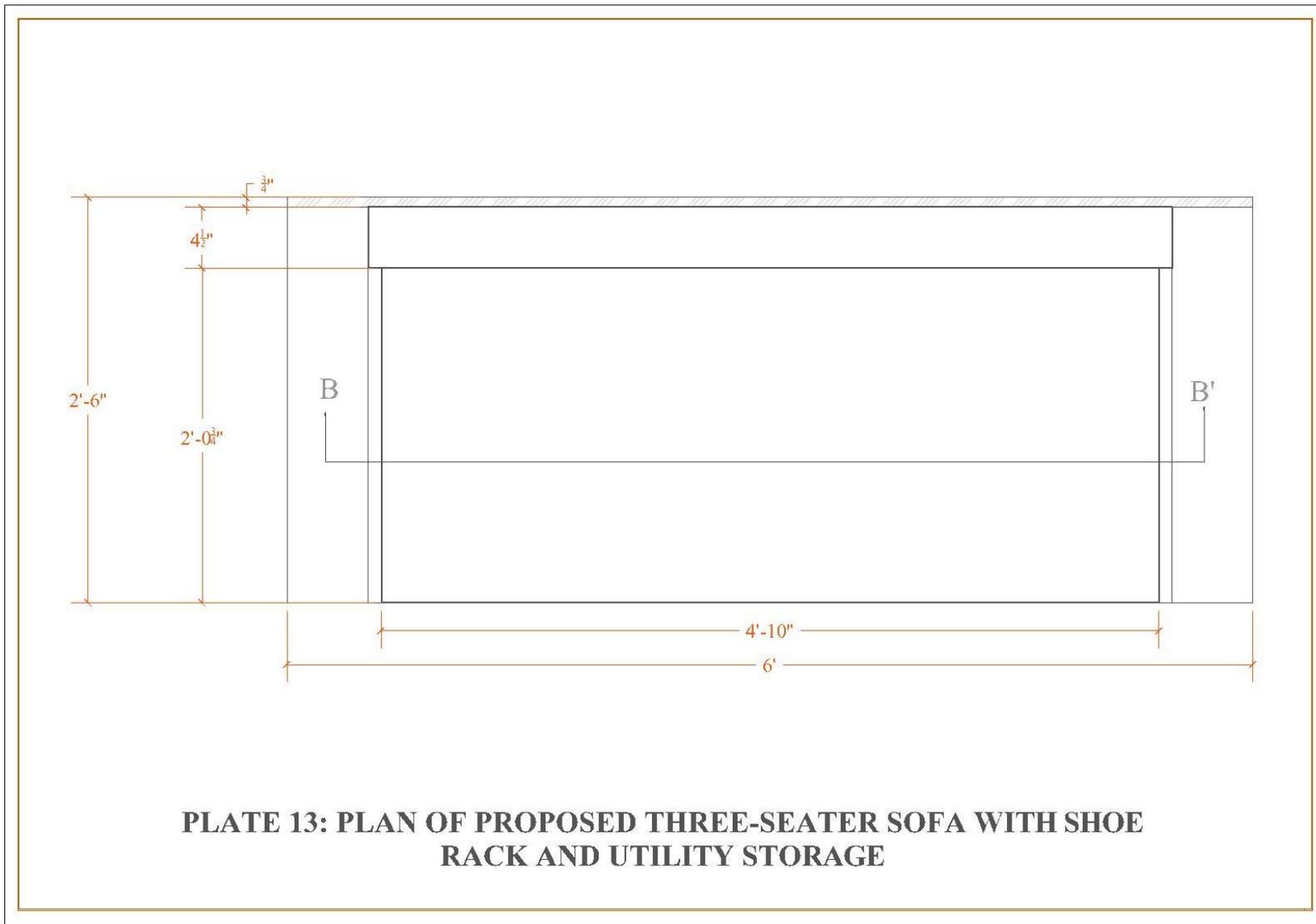
1. **Drawers, shutters, shoe rack shutters, sofa base:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Sofa seat, Backrest:** Ply, Foam, and Fabric (Foam of different densities can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, channels with reasonable strength of stainless steel or any other metal could be used.

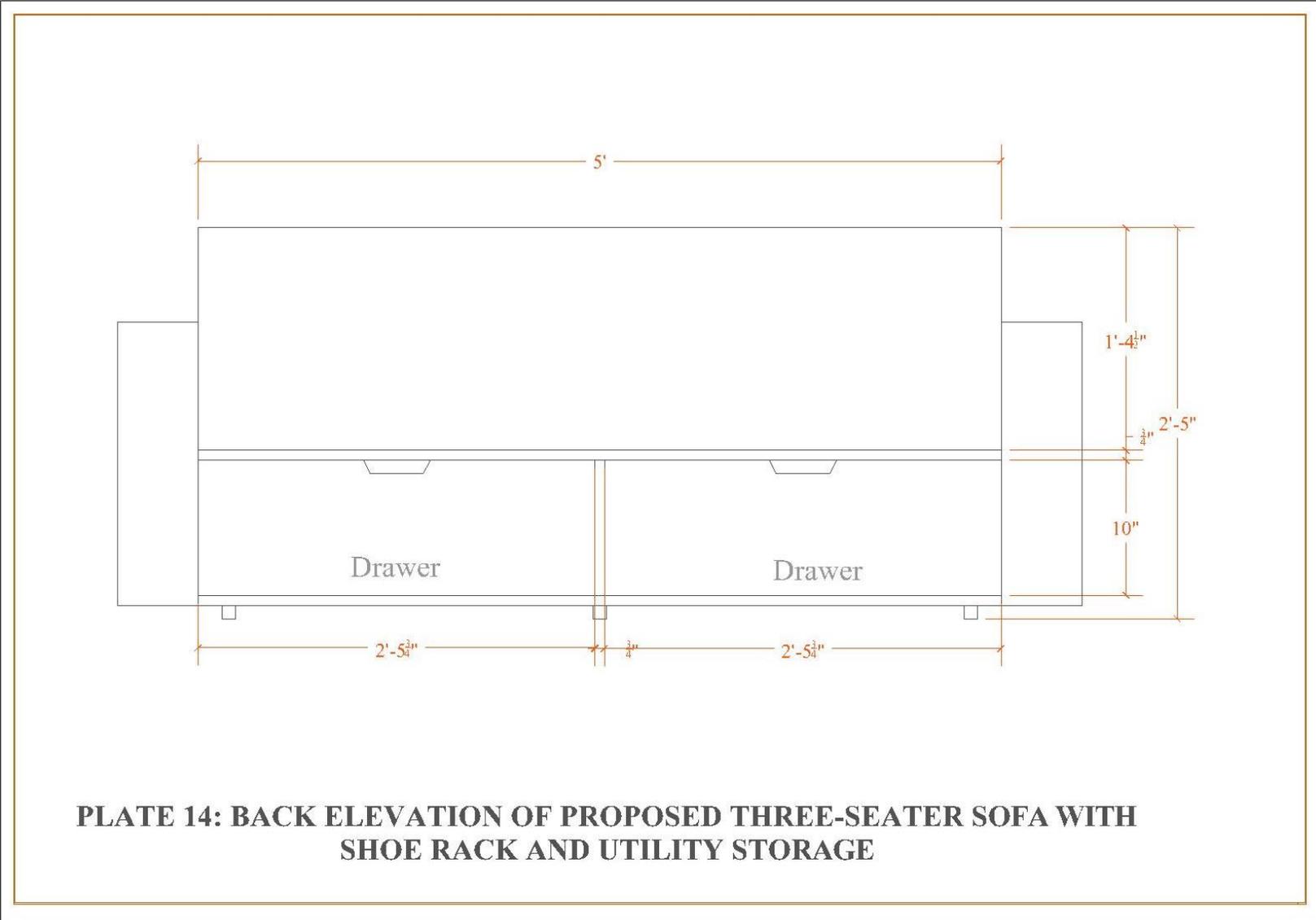
**Price for this unit:** Price would range from Rs. 8000 to Rs. 30000 depending on the material chosen and its brand selected for construction.

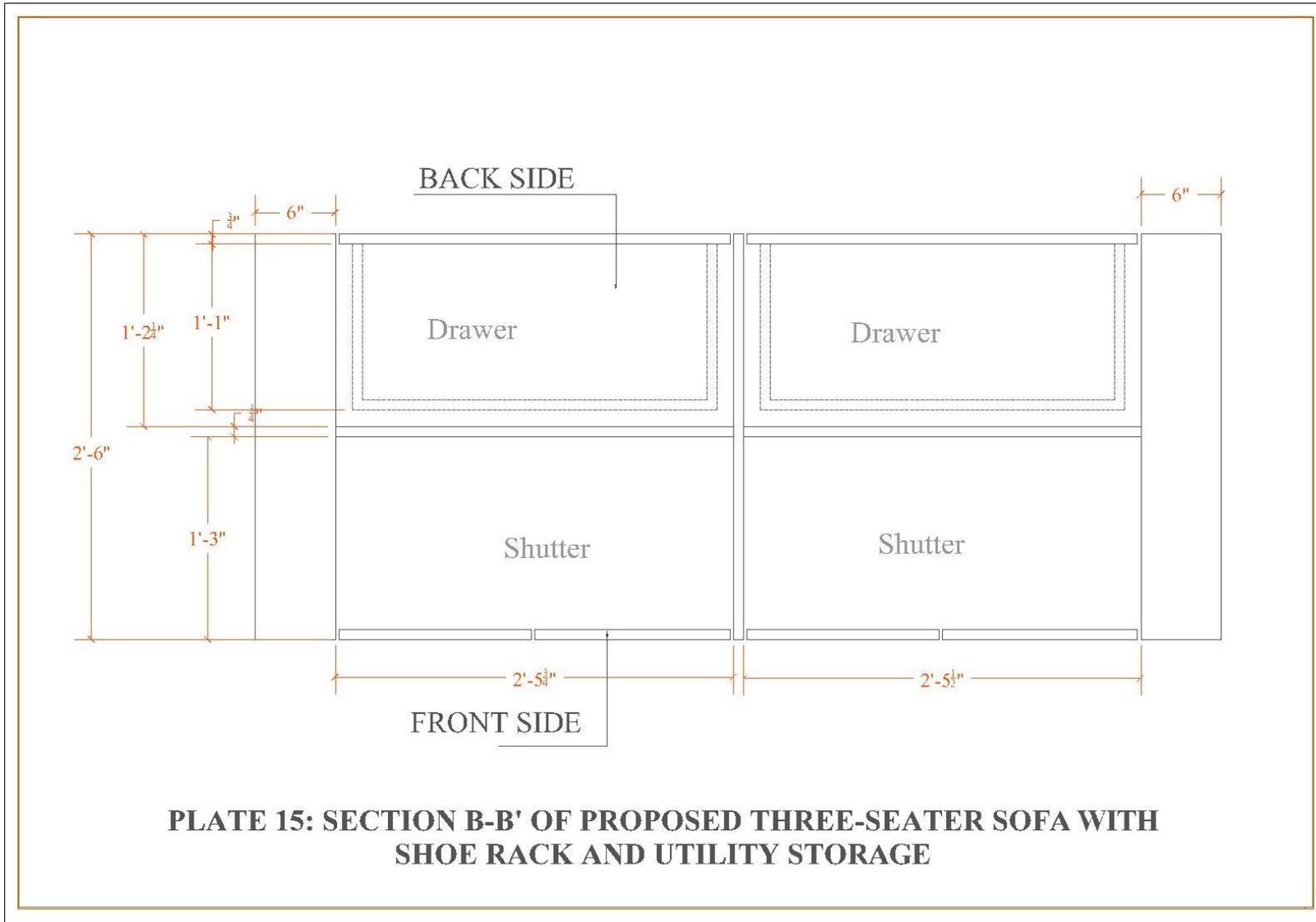
(Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with changes in the price of the material used. The price would also depend on the brand of products and raw materials used, and the craftsmanship cost will vary according to the expertise of the craftsman)

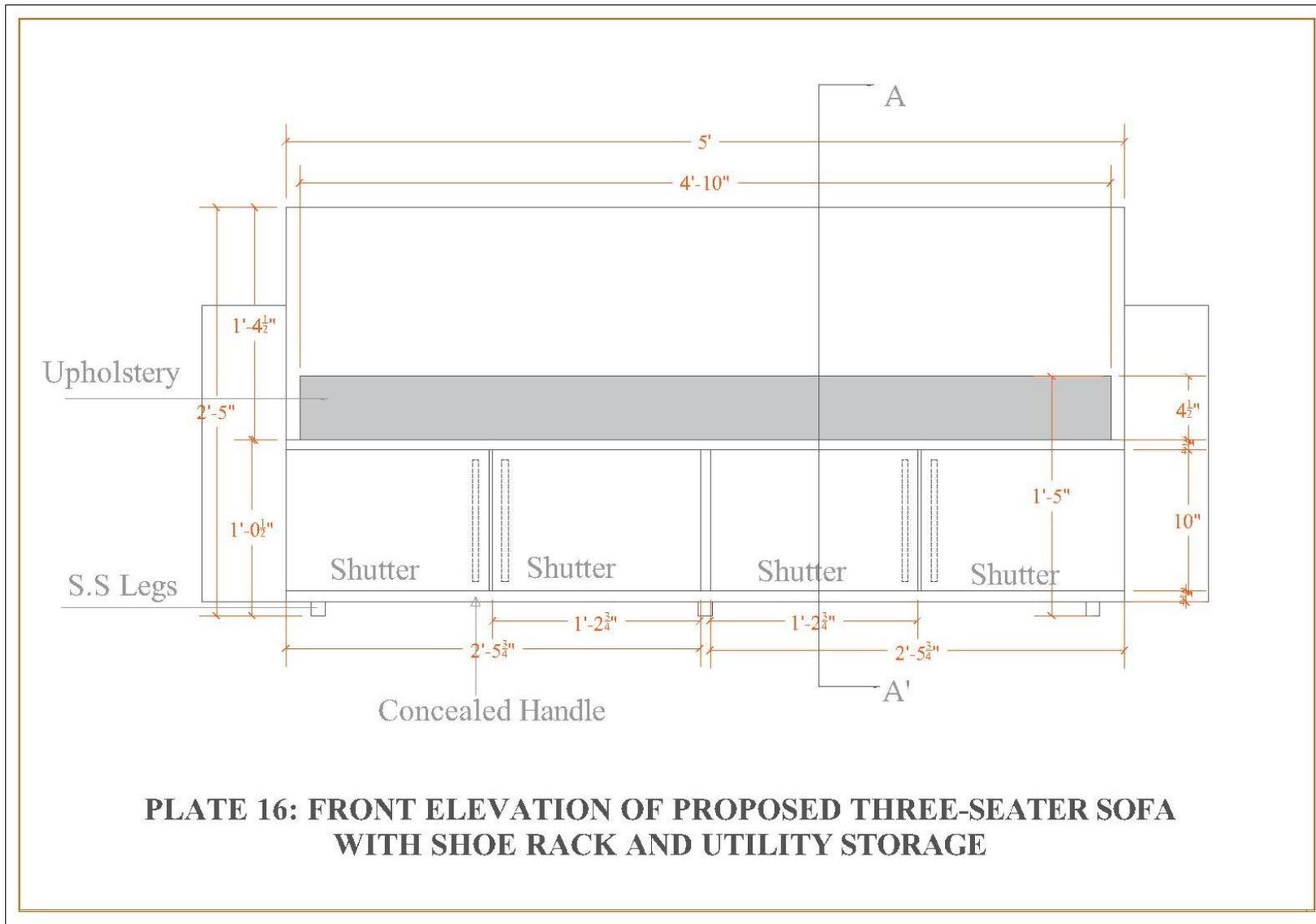
**Table 30: Materials options for Three-seater sofa with shoe rack and utility storage**

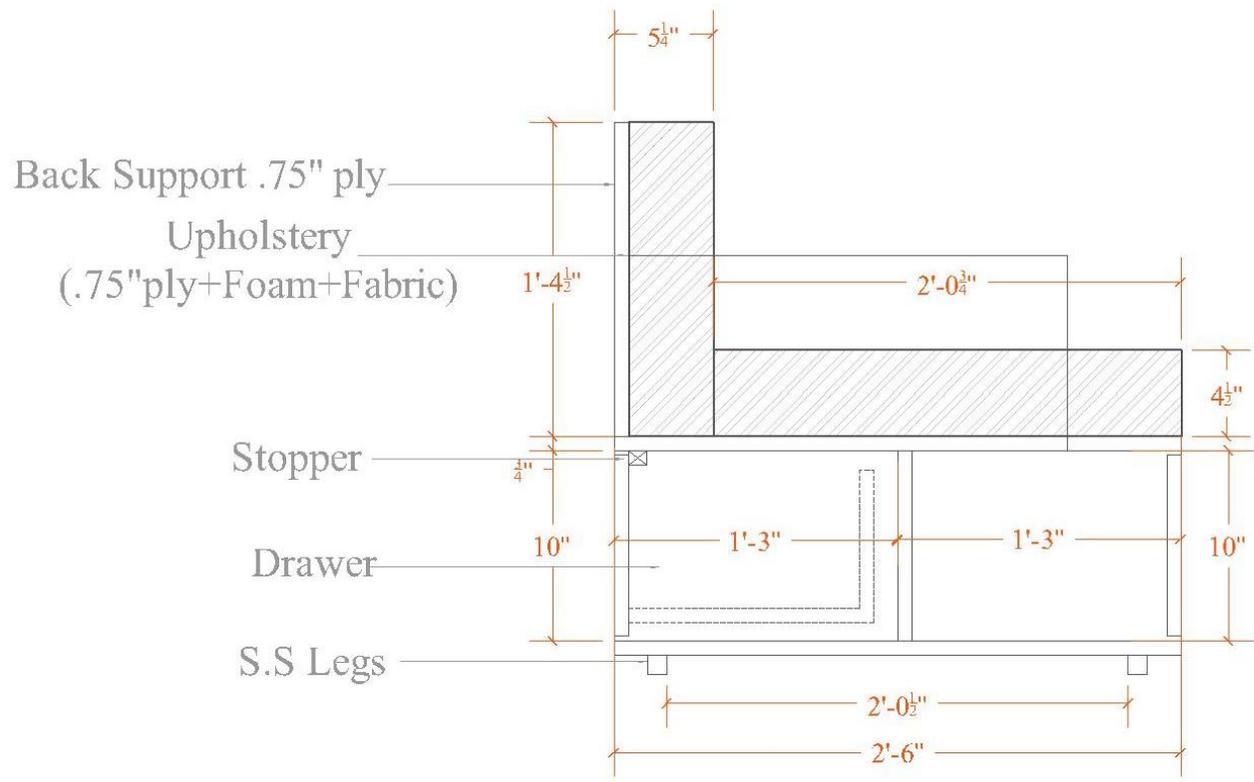
Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam, and Fabric	Stainless Steel	Any other metal
Drawers	•	•	•	•			
Shutters	•	•	•	•			
Shoe rack doors	•	•	•	•			
Hardware (Handles and Channels)						•	•
Drawer and shoe rack Channel						•	•



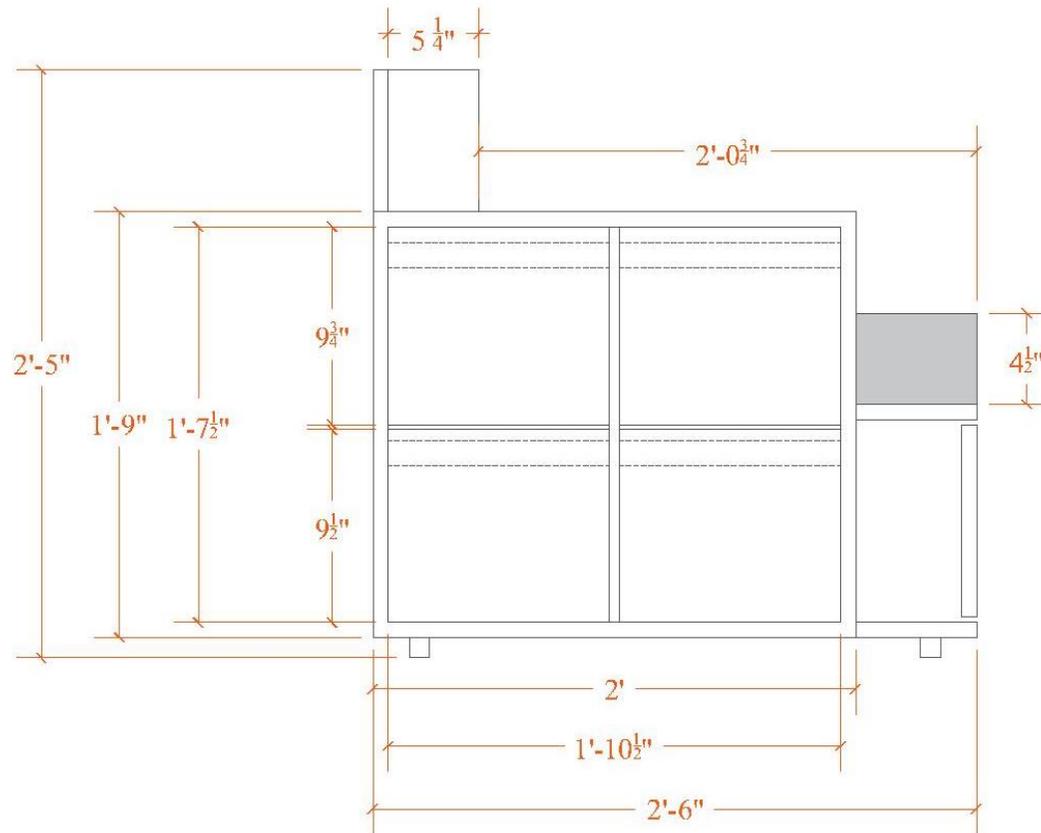




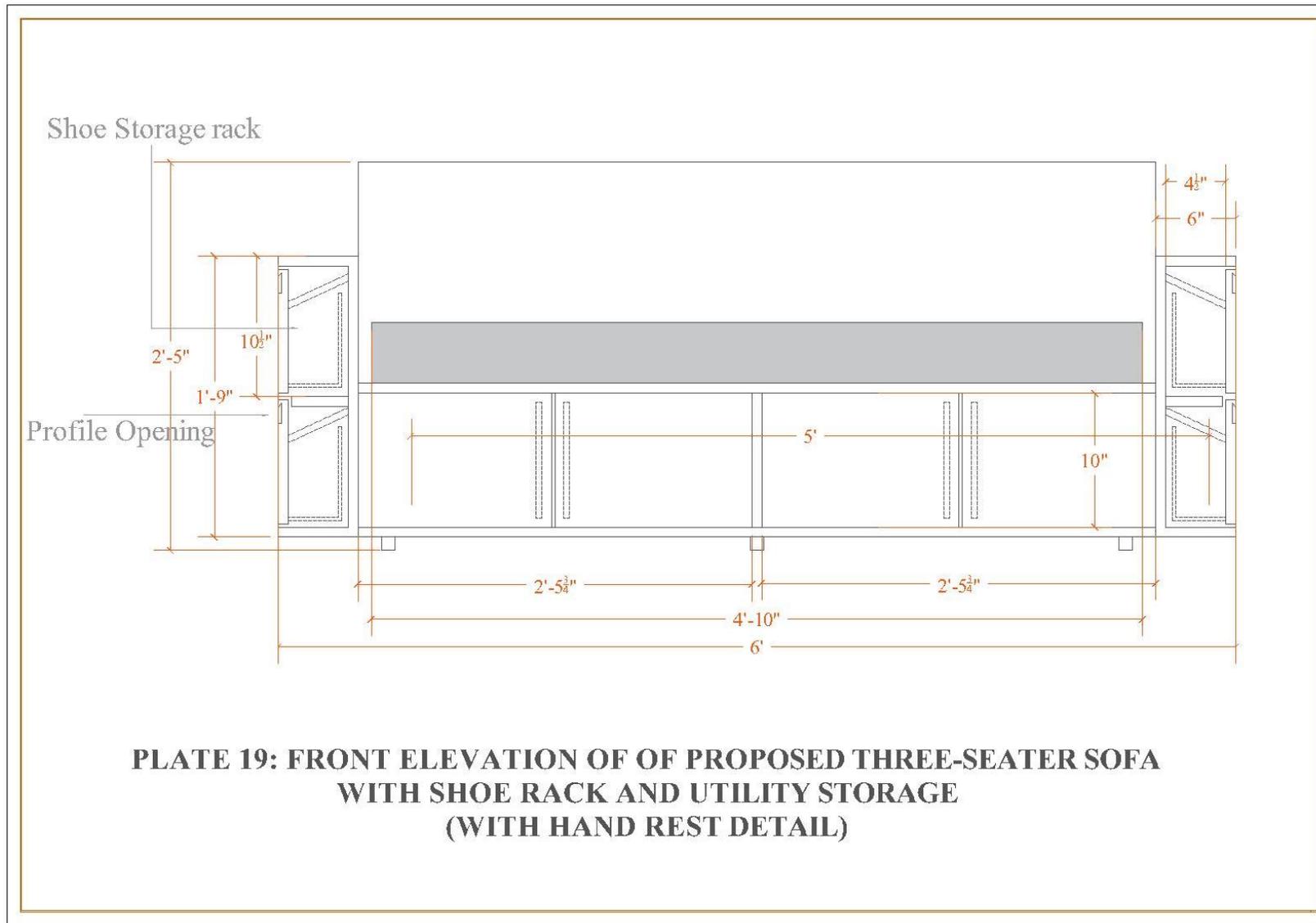




**PLATE 17: SECTION DETAIL (A-A') OF PROPOSED THREE-SEATER SOFA WITH SHOE RACK AND UTILITY STORAGE**



**PLATE 18: SIDE ELEVATION OF PROPOSED THREE-SEATER SOFA WITH SHOE RACK AND UTILITY STORAGE**





**Plate 20: 3D view of proposed three-seater sofa with shoe rack and utility storage (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer)  
(with shoe rack un hand rest)**



**Plate 21: 3D view of proposed three-seater sofa with shoe rack and utility storage (Plywood and Veneer) (with shoe rack and hand rest)**



**Plate 22: 3D view of proposed three-seater sofa with shoe rack and utility storage (Plywood and Veneer)**



**Plate 23: 3D view of proposed three-seater sofa with shoe rack and utility storage (Plywood and Veneer)**

### **4.3.3 Three-seater sofa cum bed with a foldable four-seater dining**

This piece of furniture is designed keeping in mind the requirements of the small space houses. This sofa cum bed serves the purpose of three individual furniture items at the same time, namely a three-seater sofa, bed, and four-seater dining table. The three-seater sofa can be converted into a bed. The shutters below the seat of the sofa are designed to store a dining table along with four chairs. There is a hidden dining table which can serve four people at a time, saving a lot of floor space as it can be easily folded and kept inside whenever not in use. The sofa-cum-bed is designed with a continuous mattress which is in three parts (two parts are in seating and one part in the back rest, folded in such a way that it can serve the purpose of the seat as well as a backrest and can be pulled and laid down whenever the furniture is used as a bed. This piece of furniture occupies 5'0" X 2'7" floor space.

Space-saving furniture can be used in a living room or a bedroom or other areas of the residence. The researcher designed lightweight dining tables and chairs so that they can be easily carried to different rooms wherever required. The material chosen for this furniture unit could be plywood, MDF, or real wood. Finishes such as laminate, veneer, and polyurethane polish can be used. Hardware can be designed using different metals. The design suggested by the researcher is sleek with concealed handles and chamfered edges and the colour options can be selected by the end user according to the theme of their own house.

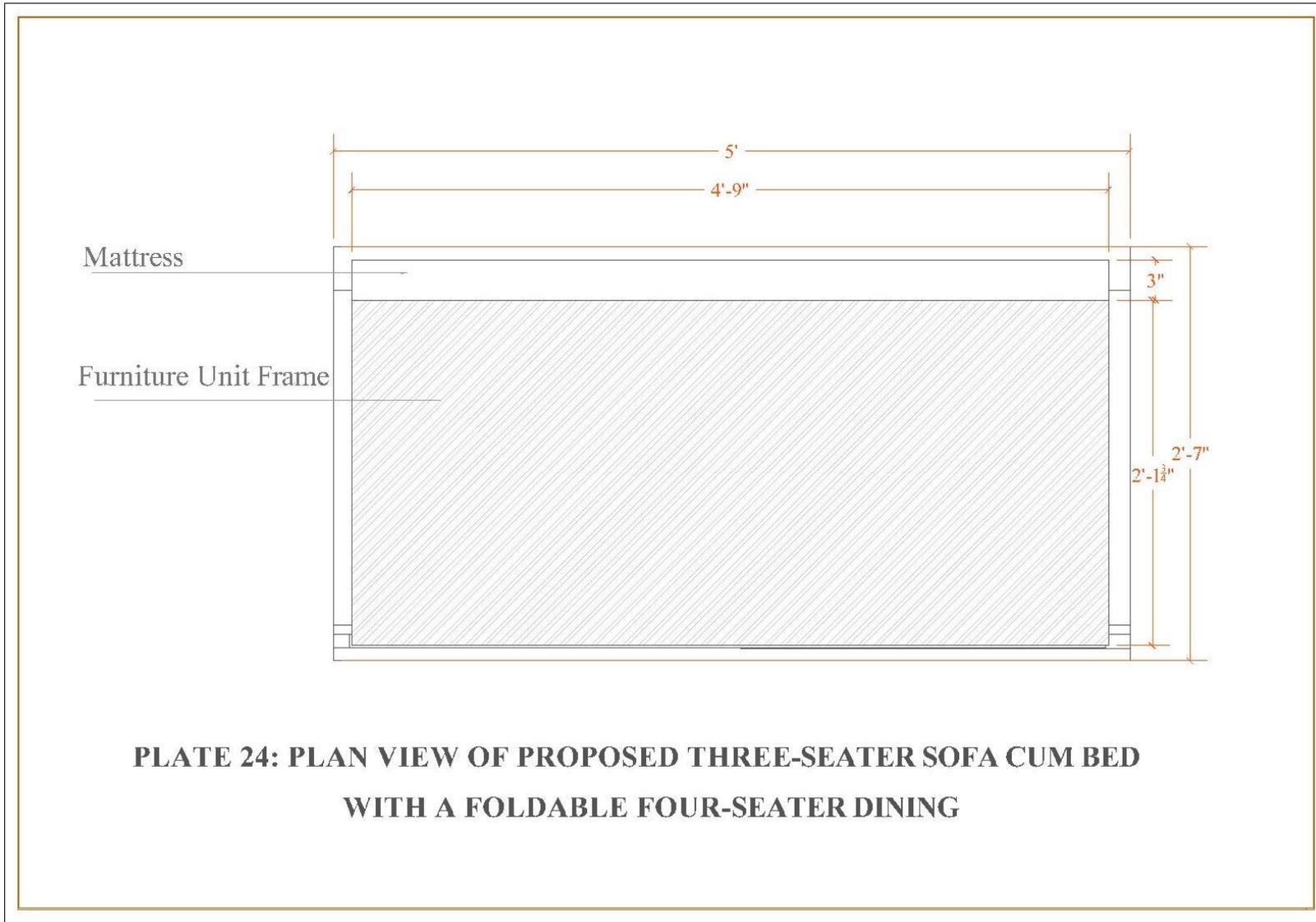
Parts of the three-seater sofa cum bed with foldable four-seater dining are discussed below:

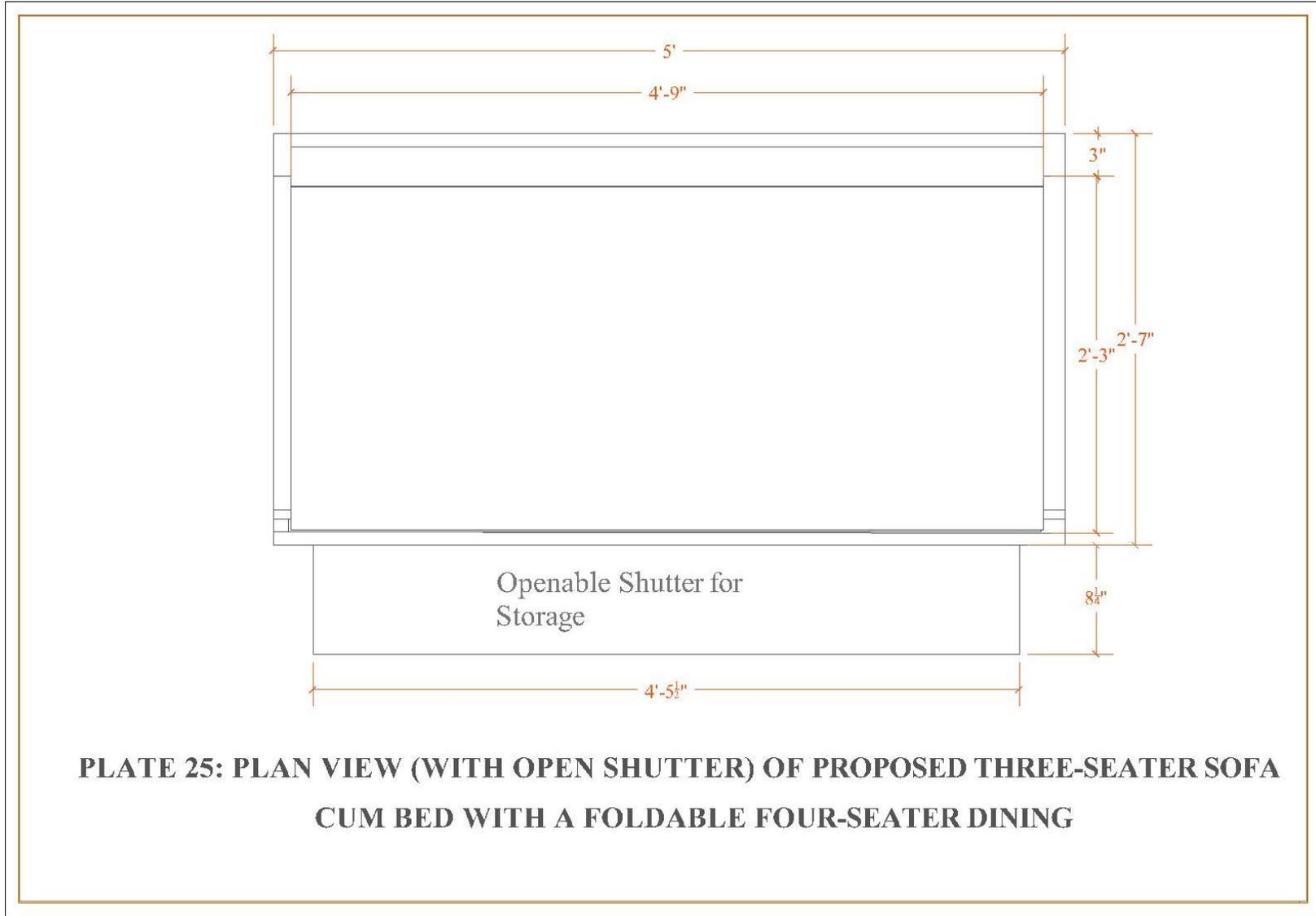
1. **Sofa and Shutters:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Sofa seat, Backrest, and mattress:** Ply, Foam, and Fabric (Foam of different densities can be used and tightly woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, channels with reasonable strength of stainless steel or any other metal could be used.
4. **Table and Chairs:** Stainless steel/ any other metal handles can be used.

**Price for this unit:** Price would range from Rs. 8000 to Rs. 30000 depending on the material chosen and its brand selected for construction.

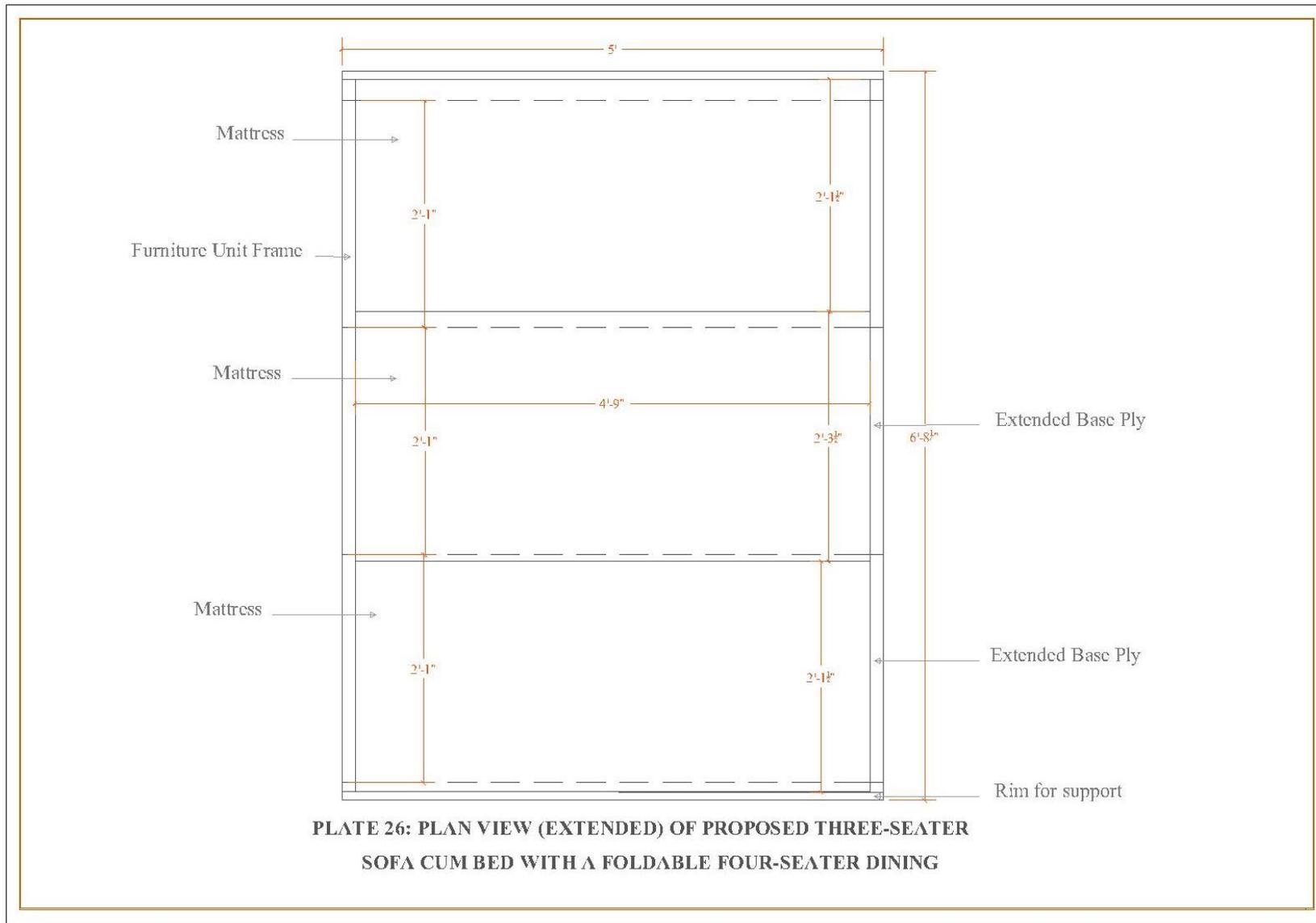
**Table 31: Materials options for three-seater sofa cum bed with foldable four-seater dining.**

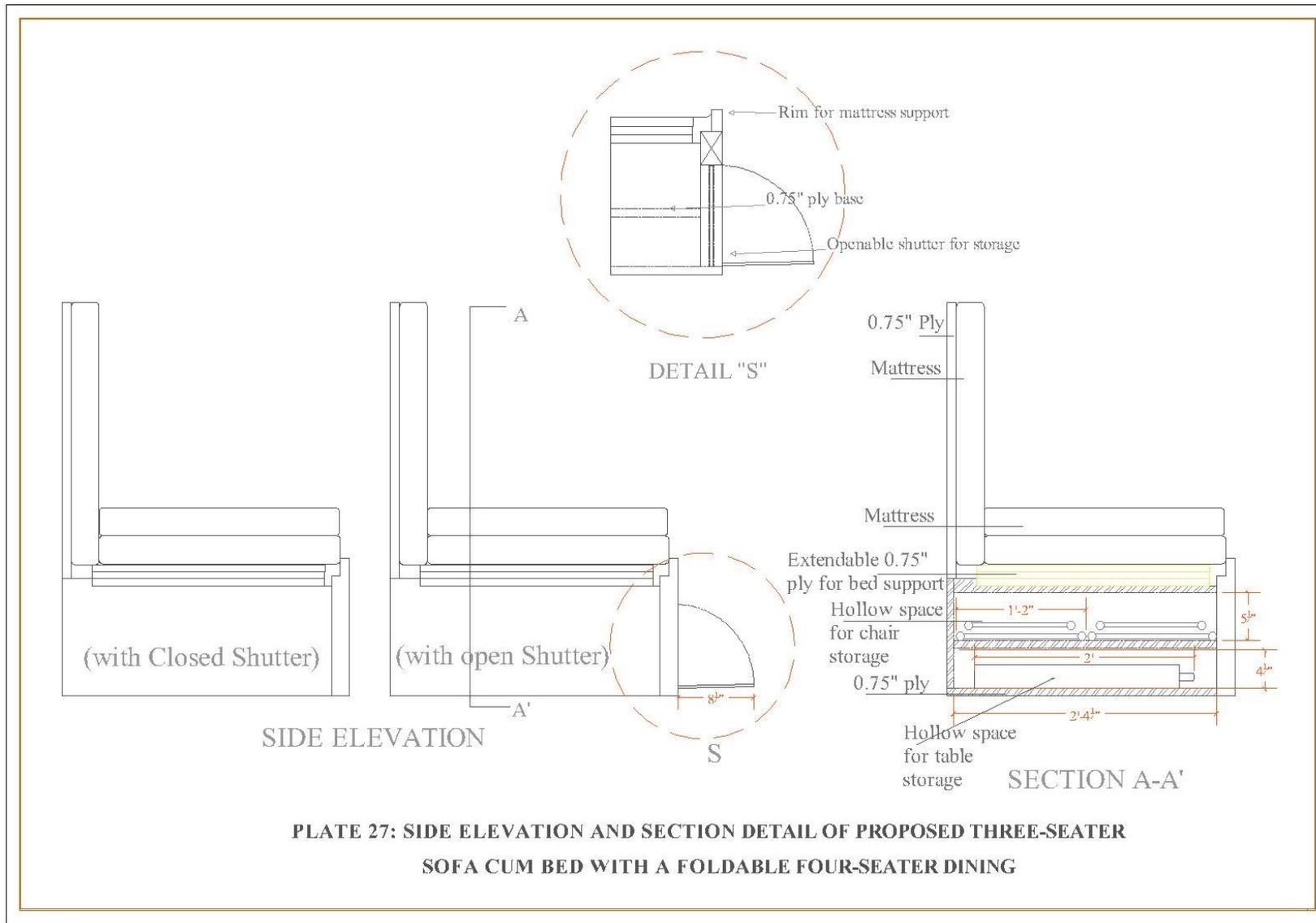
Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam, and Fabric	Stainless Steel	Any other metal
<b>Sofa and Shutters</b>	•	•	•	•			
<b>Sofa seat, Backrest, and mattress:</b>	•	•	•	•	•		
<b>Hardware (Handles and Channels)</b>						•	•
<b>Table and Chairs</b>						•	•

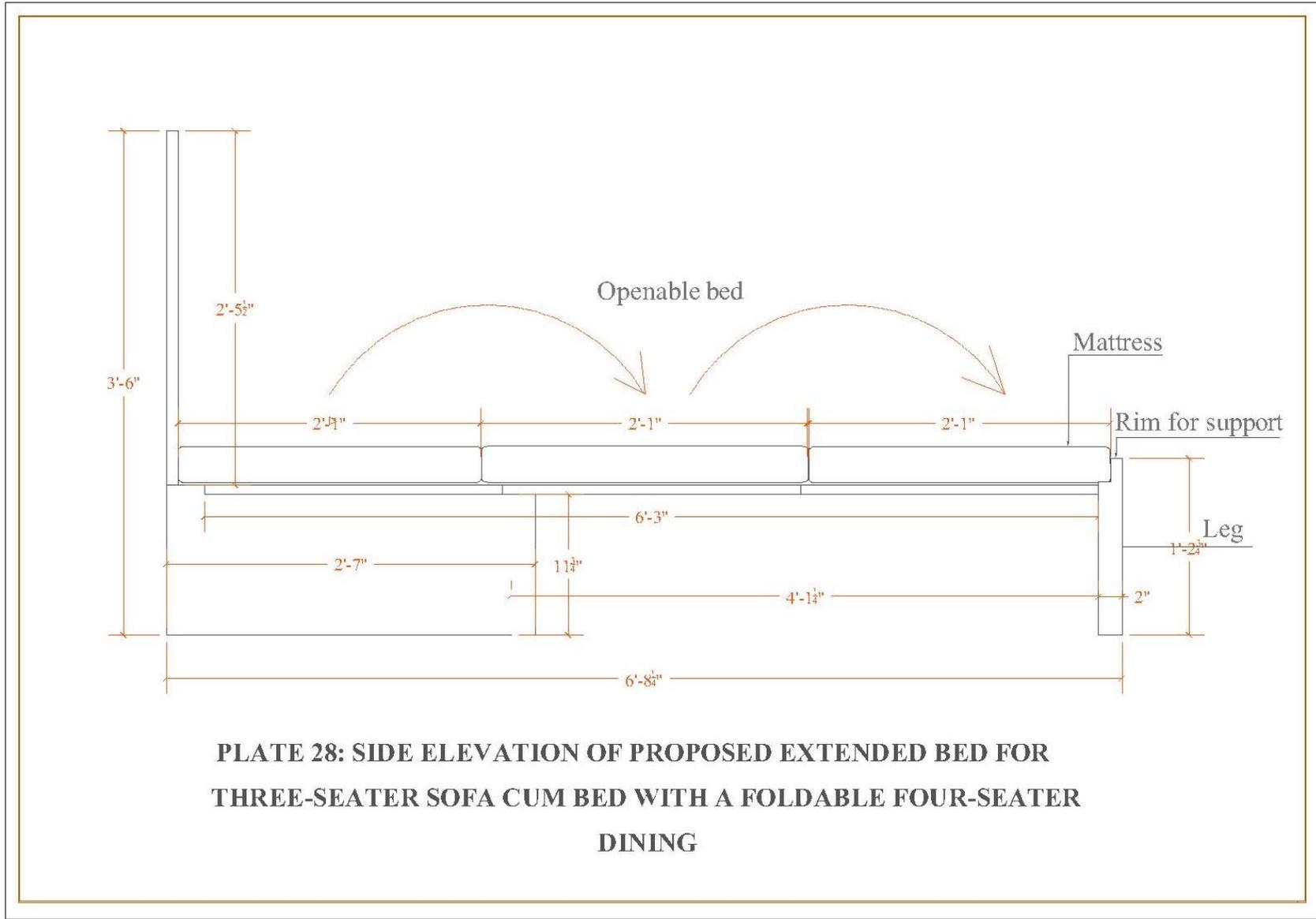




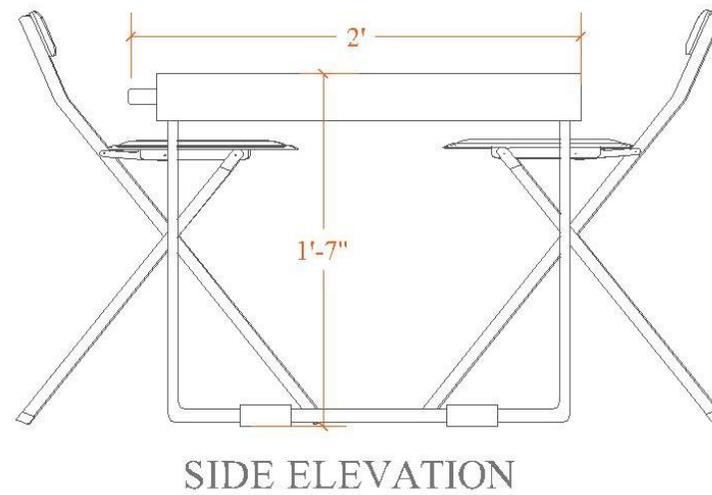
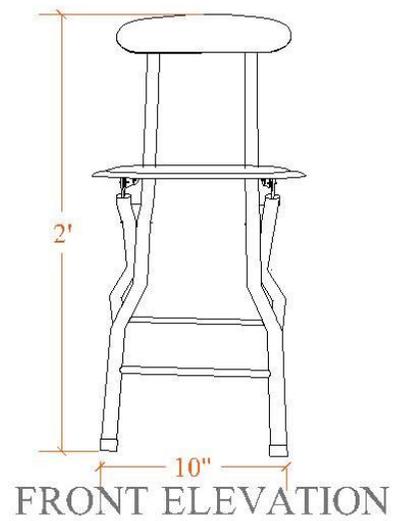
**PLATE 25: PLAN VIEW (WITH OPEN SHUTTER) OF PROPOSED THREE-SEATER SOFA CUM BED WITH A FOLDABLE FOUR-SEATER DINING**







**PLATE 28: SIDE ELEVATION OF PROPOSED EXTENDED BED FOR THREE-SEATER SOFA CUM BED WITH A FOLDABLE FOUR-SEATER DINING**



**PLATE 29: CHAIR DETAIL OF PROPOSED CHAIR FOR FOLDABLE  
FOUR-SEATER DINING**



**Plate 30: 3D view of proposed Three-seater sofa cum bed with a foldable four-seater Dining (when used as a sofa)**



**Plate 31: 3D view of proposed Three-seater sofa cum bed with a foldable four-seater dining (while using dining)**



**Plate 32: 3D view of proposed Three-seater sofa cum bed with a foldable four-seater dining (while using as a bed)**

#### **4.3.4 Portable pre-preparation center with extendable dining table, chairs, and storage**

This piece of furniture showcases characters of four types of furniture namely, the pre-preparation centre of dining table, chair, and storage. This unit is designed especially for houses in which they have a scarcity of space the in kitchen, the countertop is small, don't a separate dining area.

This piece of furniture occupies around 3'-4" X 2'-0", this piece of furniture can be created in various, and sizes can be modified according to the availability of the space and utility and according to the number of users. The underneath storage can also be designed according to the utility and need of the user. This furniture can be designed using different combinations. Extensive market research helped the researcher to come up with various material options for the proposed furniture, the material for this furniture could be plywood, MDF, or real wood; and finishes such as laminate, veneer, and polyurethane polish can be used. Hardware can be designed using different metals. The design suggested by the researcher is sleeker with concealed handles and chamfered edges. the colour options can be selected by the end user according to the theme of their own house.

Following are the parts of the Portable pre preparation center with an extendable dining table, chairs, and storage.

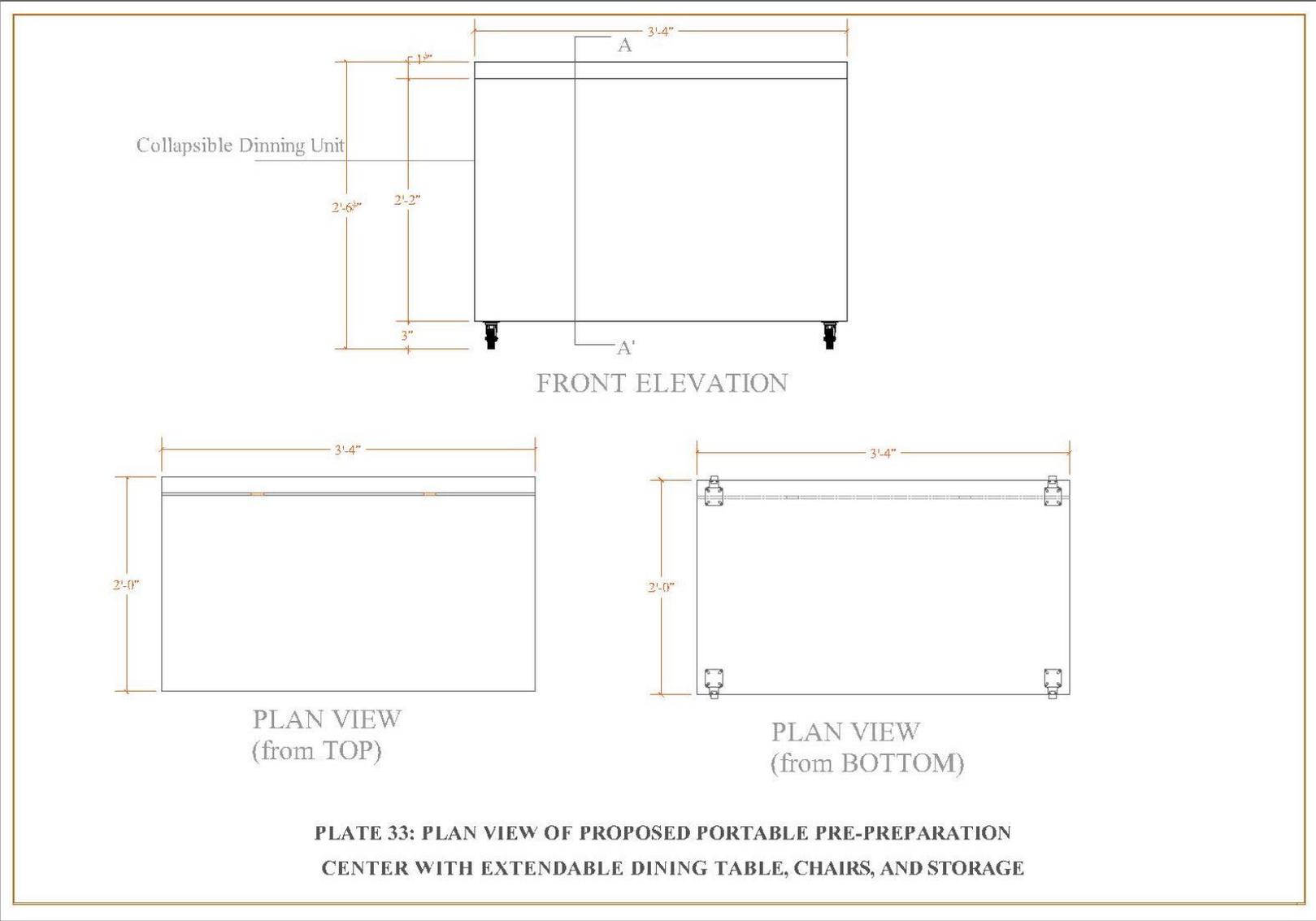
- 1. Pre-preparation center, extendable dining table:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
- 2. Chair seat and Backrest:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish. If needed it could be upholstered; using a combination of ply, foam, and fabric (Foam of different densities can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used).

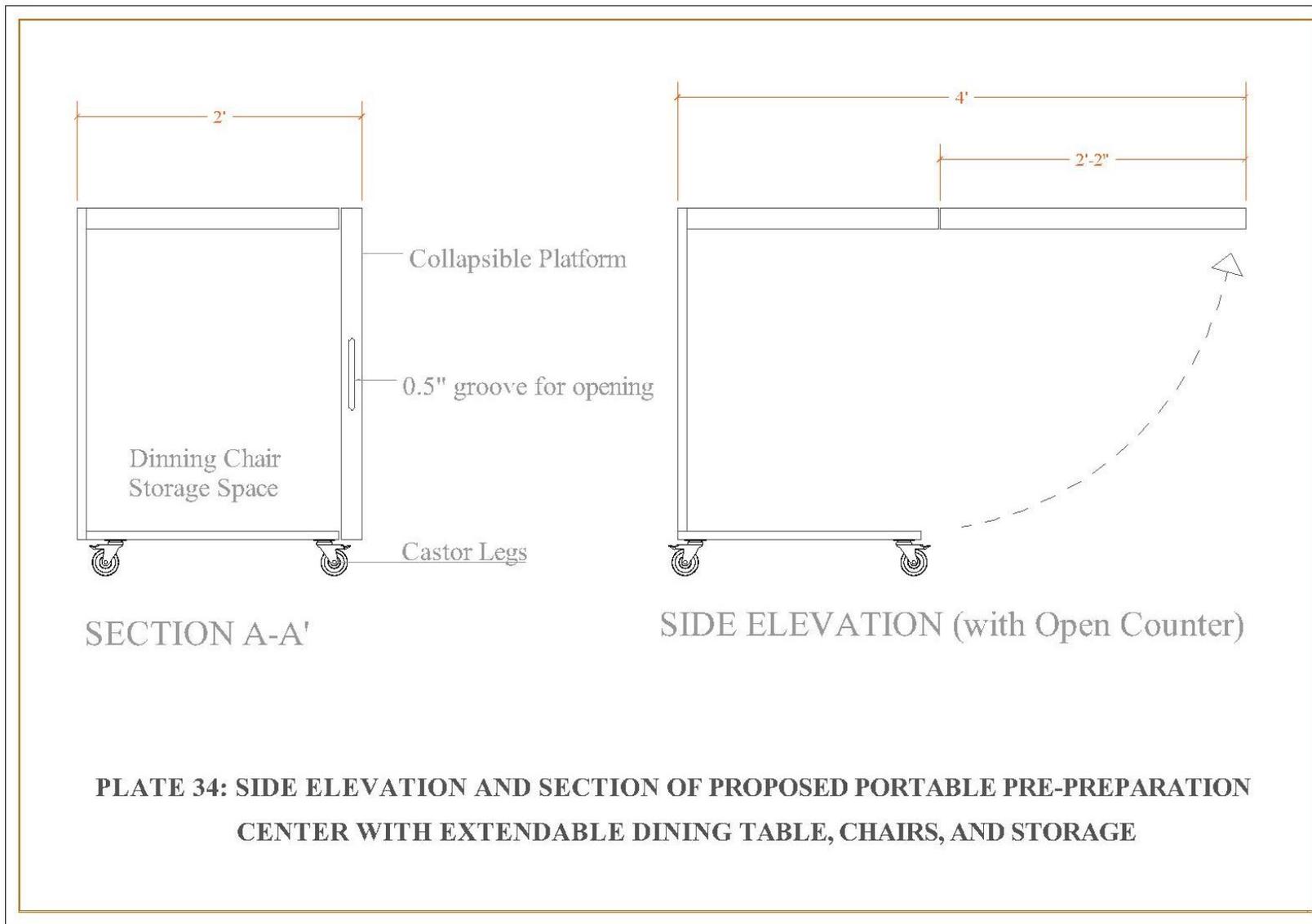
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal can be used. Also, channels with reasonable strength of stainless steel or any other metal could be used.
4. **Countertop:** Natural or Artificial Stone could be used. Stone might make the piece of furniture heavy. And so, if light furniture is preferred one can use Laminate.

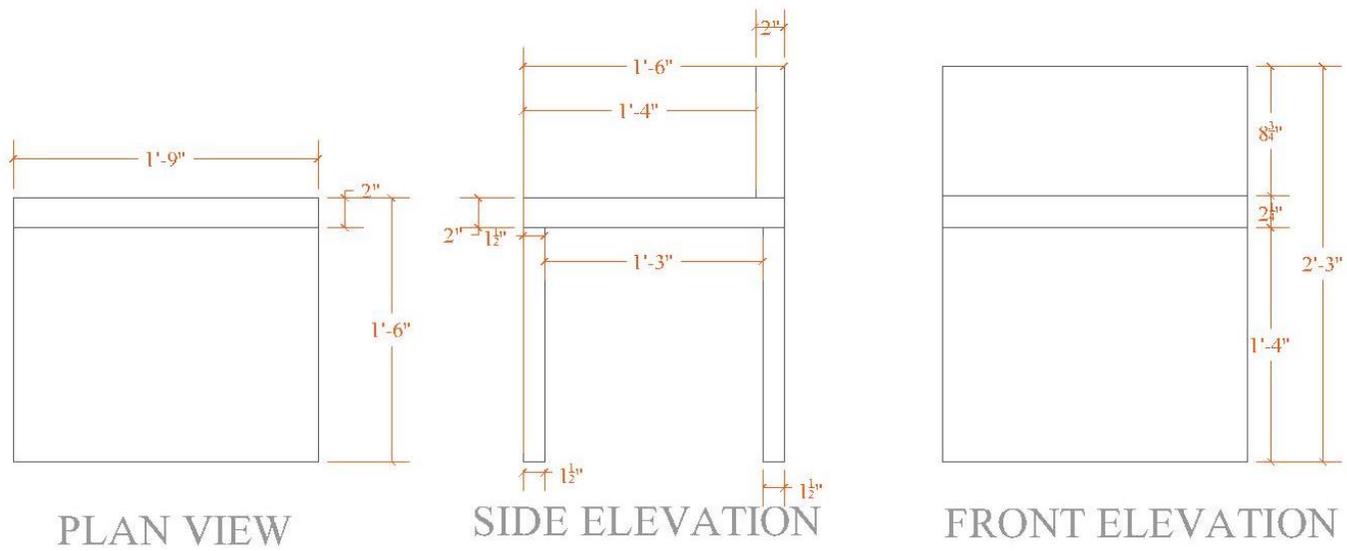
**Price for this unit:** Price would range from Rs. 6500 to Rs. 25000 depending on the material chosen and the brand of the product selected for construction. (Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with the passing of time. The price would also depend on the brand on products and the raw materials used, and the labour cost will vary according to the expertise of the labour)

**Table 32: Materials options for the portable pre preparation centre with extendable dining table, chairs, and storage**

Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam and Fabric	Stainless Steel	Any other metal
Pre-preparation centre, extendable dining table	•	•	•	•			
Chair seat and Backrest	•	•	•	•			
Countertop	•						
Hardware (Handles and Channels)						•	•







**PLATE 35: CHAIR DETAIL FOR PROPOSED PORTABLE PRE-PREPARATION CENTER WITH EXTENDABLE DINING TABLE, CHAIRS, AND STORAGE**



**Plate 36: 3D view of proposed Portable pre-preparation centre with extendable dining table, chairs, and storage (ledge to open as a dinning)**



**Plate 37: 3D view of proposed Portable pre-preparation centre with extendable dining table, chairs, and storage (extended dinning)**



**Plate 38: 3D view of proposed Portable pre-preparation centre with extendable dining table, chairs, and storage (Pre-preparation counter)**

#### **4.3.5 Study unit with dressing and storage**

This piece of furniture is specially designed to serve multiple purposes, namely, storage, study, dressing, and a side table for the bed. This unit occupies around 1'-10" X 1'-5" of the floor space. The height could be designed in 2'-0" or 2'-6". The number of drawers would vary according to the height desired by the user. The sizes can be modified according to the availability of the space and utility, as this unit can also be designed in a large width. This furniture can be designed using different combinations of materials. The market analysis helped the researcher to come up with various material options for the proposed furniture, the material for this furniture could be plywood, MDF, or real wood; and finishes such as laminate, veneer, and polyurethane polish can be used. Hardware can be designed using different metals. The design suggested by the researcher with concealed handles or push-to-open hinges and chamfered edges, and the colour options can be selected by the end user according to the theme of their own house. This multipurpose furniture can be used as a side table, during nighttime. Once opened from top, it can be used as a dressing table, as it has an openable mirror. The ledge on the side can be lifted and used as a workstation to work on laptop.

Following are the parts of the study unit with dressing and storage.

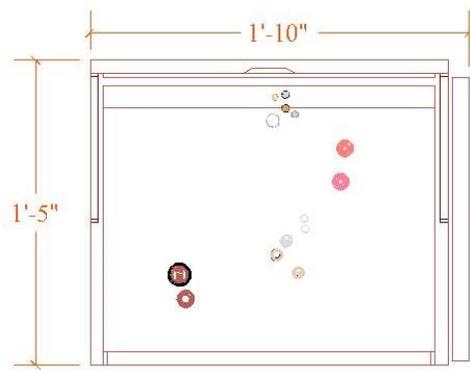
1. **Side table, drawers, removable seat:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, the channels with reasonable strength of stainless steel or any other metal could be used.
3. **Mirror and frame:** Mirror with frame can be used for dressing, frame could be of the same base material as of the table.

**Price for this unit:** Price would range from Rs. 7000 to Rs. 28000 depending on the material chosen and the brand of product selected for construction. (Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with passing of time. The price would

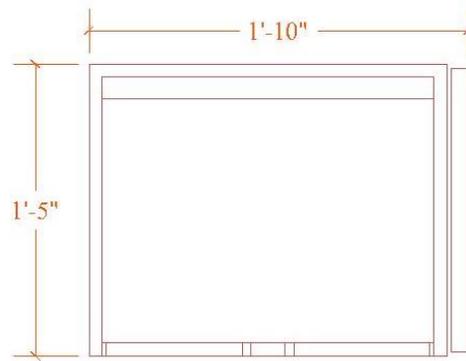
also depend on the brand on products and raw materials used, and the labour cost will vary according to the expertise of the labour)

**Table 33: Materials options for study unit with dressing and storage**

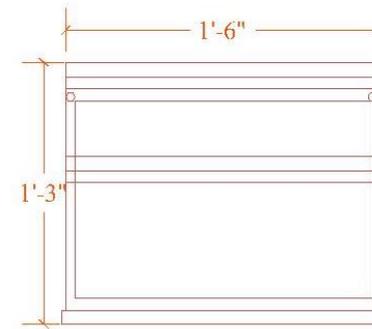
Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam, and Fabric	Stainless Steel	Any other metal
Side table, drawers, removable seat	•	•	•	•			
Hardware (Handles and Channels)						•	•
Mirror and Frame				•		•	•



PLAN VIEW  
(Open Dressing)

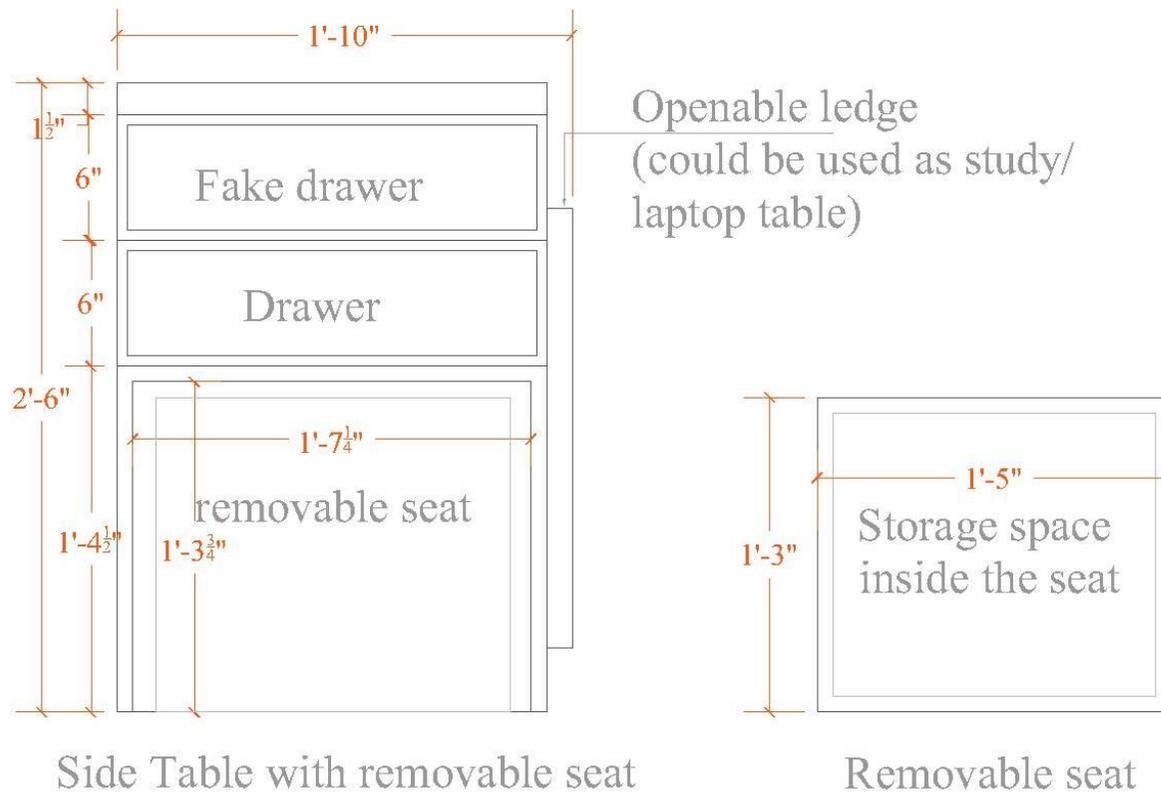


PLAN VIEW  
(Closed unit)

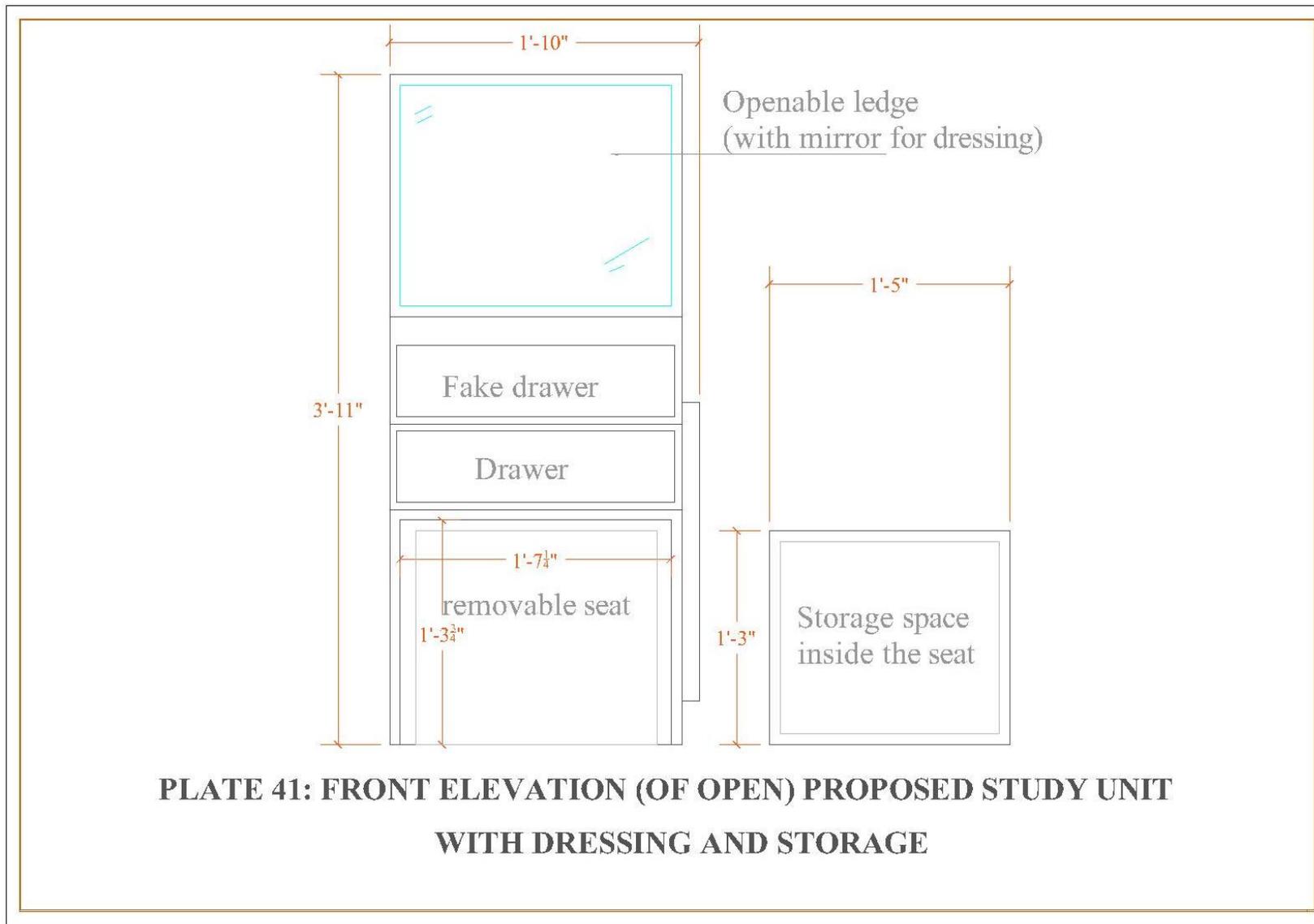


PLAN VIEW  
(Seat)

**PLATE 39: PLAN VIEW OF PROPOSED STUDY UNIT WITH DRESSING  
AND STORAGE**



**PLATE 40: FRONT ELEVATION FOR PROPOSED  
STUDY UNIT WITH DRESSING AND STORAGE**





**Plate 42: 3D view of proposed Study unit with dressing and storage  
(with dressing and openable seat)**



**Plate 43: 3D view of proposed Study unit with dressing and storage  
(with dressing and seat for seating)**



**Plate 44: 3D view of proposed Study unit with dressing and storage  
(With seat inside)**



**Plate 45: 3D view of proposed Study unit with dressing and storage  
(openable ledge used as workstation)**

#### **4.3.6 Wardrobe with slide-out iron board and study area and chair**

This piece of furniture is specially designed to serve multiple purposes, namely, storage, study, dressing and ironing. The top part is the wardrobe to store big cloths, hanging can be designed in that part. And the bottom part has slide-out panels which can serve as study and iron board as per the need. Along with that there are two hidden chairs which can be pulled out when ever needed and slide in when not in use. The space beneath the chair is also designed as an open box from the top which can be used as a storage for storing kids toys or purses or bags or any other extra items.

This unit occupies around 3'3" X 2'1" of the floor space. The height can be designed according to the availability of vertical space and can range from as small as 5'0" to as large as 7'0" or even more if required.

The sizes can be modified according to the availability of the space and utility, as this unit can also be designed with single chair. The underneath storage can also be designed according to the utility and need of the user.

This furniture can be designed using different combinations of materials. An extensive market research helped the researcher to come up with various material options for the proposed furniture, the material for this furniture could be plywood, MDF or real wood; and finishes such as laminate, veneer, polyurethane Polish can be used. Hardware can be designed using different metals. The design suggested by the researcher is with concealed handles or push to open hinges and chamfered edges and the colour options can be selected by the end user according to the theme of their own house.

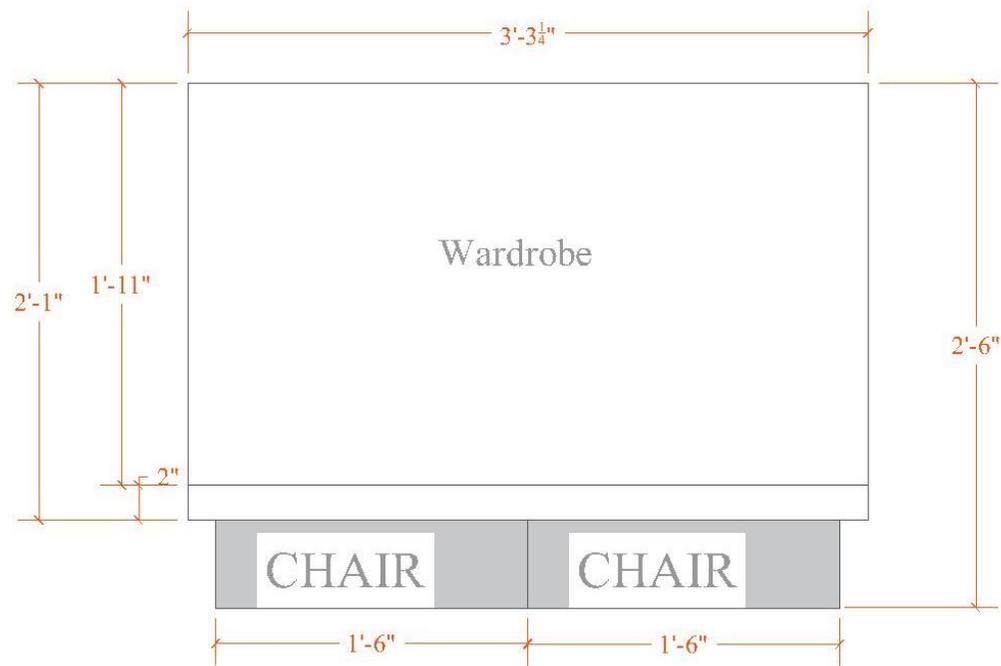
Following are the parts wardrobe with slide-out iron board and study area and chair.

1. **Wardrobe, storage boxes and slide-out study:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Chair and slide-out iron board:** Ply, Foam and Fabric (Foam of different density can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, the channels with reasonable strength of stainless steel or any other metal could be used.
4. **Mirror and frame:** Mirror with or without frame can be used for dressing.

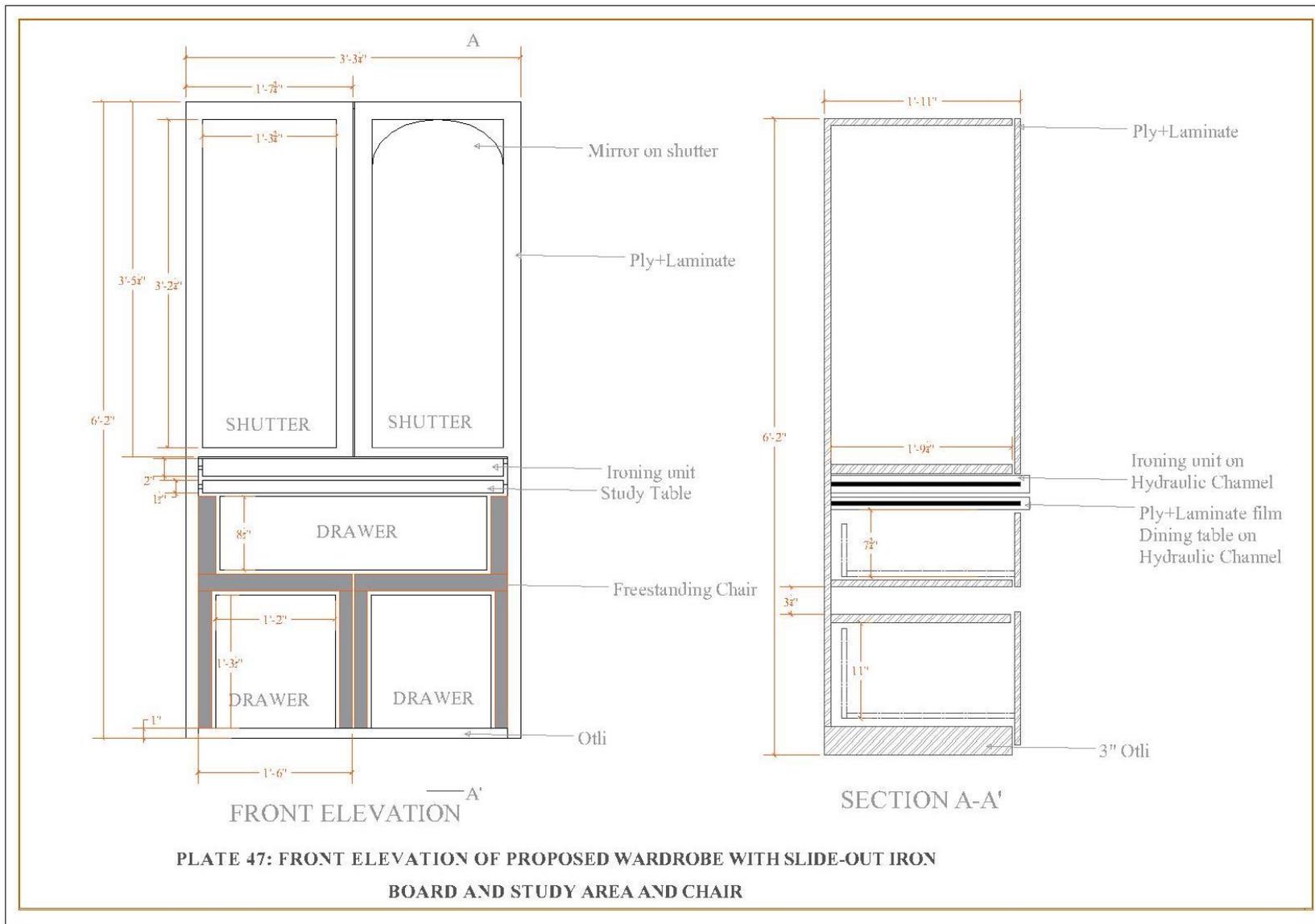
**Price for this unit:** Price would range from Rs. 8000 to Rs. 30000 depending on the material chosen and the brand of product selected for construction. (Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with passing of time. The price would also depend on the brand on products and raw materials used, and the labour cost will vary according to the expertise of the labour)

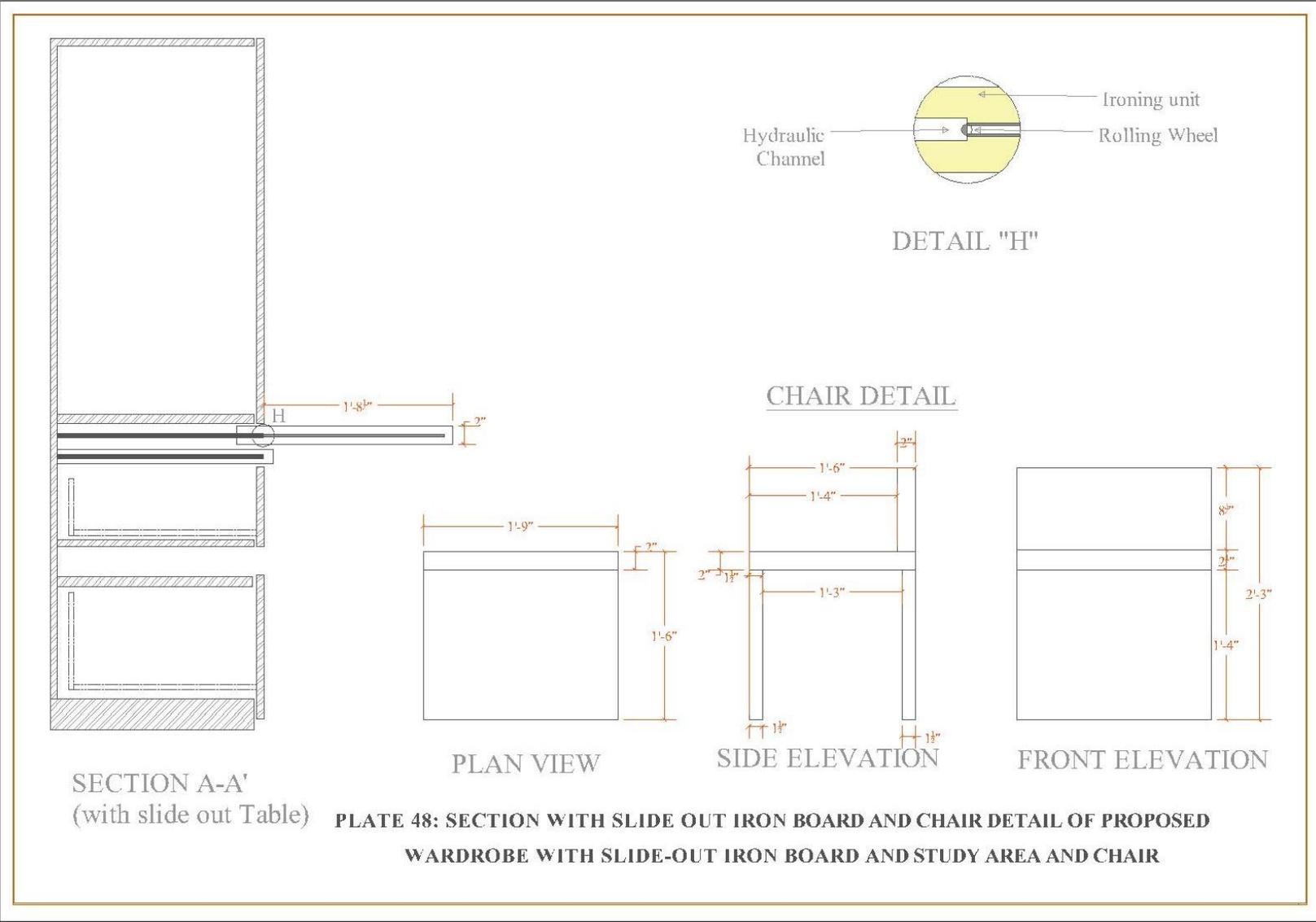
**Table 34: Materials options for wardrobe with slide-out iron board and study area and chair**

Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam and Fabric	Stainless Steel	Any other metal
Wardrobe, storage boxes and slide-out study	•	•	•	•			
Chair and slide-out iron board	•	•	•	•	•		
Hardware (Handles and Channels)						•	•
Mirror and Frame				•		•	•



**PLATE 46: PLAN VIEW OF PROPOSED WARDROBE WITH SLIDE-OUT IRON BOARD AND STUDY AREA AND CHAIR**





**PLATE 48: SECTION WITH SLIDE OUT IRON BOARD AND CHAIR DETAIL OF PROPOSED WARDROBE WITH SLIDE-OUT IRON BOARD AND STUDY AREA AND CHAIR**



**Plate 49: 3D view of proposed Wardrobe with slide-out iron board and study area and chair (openable ledge and pull out chairs)**



**Plate 50: 3D view of proposed Wardrobe with slide-out iron board and study area and chair (as a wardrobe and mirror for dressing)**



**Plate 51: 3D view of proposed Wardrobe with slide-out iron board and study area and chair (storage drawer and storage bins underneath the chair)**



**Plate 52: 3D view of proposed Wardrobe with slide-out iron board and study area and chair (slide-out iron board)**

#### **4.3.7 Extendable Bed, storage, and folding seating**

This space-saving furniture can be used in any bedroom. This bed has a sliding box extendable from the underside of the bed, with a removable bed back, which can be used as a seating couch during the daytime in any corner of the house. Apart from that there is also an extendable board designed to keep alarm clocks, mobiles, lamps, or any other items during nighttime.

This bed occupies 3'-3" X 6'-6" of floor space and can be designed in various sizes and materials according to the availability of the space. There is a storage box designed underneath the extended bed to store useful things.

The material chosen for this furniture unit can be plywood, MDF, or natural wood; along with finishes such as laminate, veneer, and polyurethane polish. Hardware can be designed using different metals. The design suggested by the researcher is sleek with concealed handles and chamfered edges and the color options can be selected by the end user according to the theme of their own house.

Parts of the extendable bed, storage, and folding seating are described below:

1. **Bed, Bed back and storage box underneath the bed:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Bed-back:** Ply, Foam, and Fabric (Foam of different density can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, the channels with reasonable strength of stainless steel or any other metal could be used.

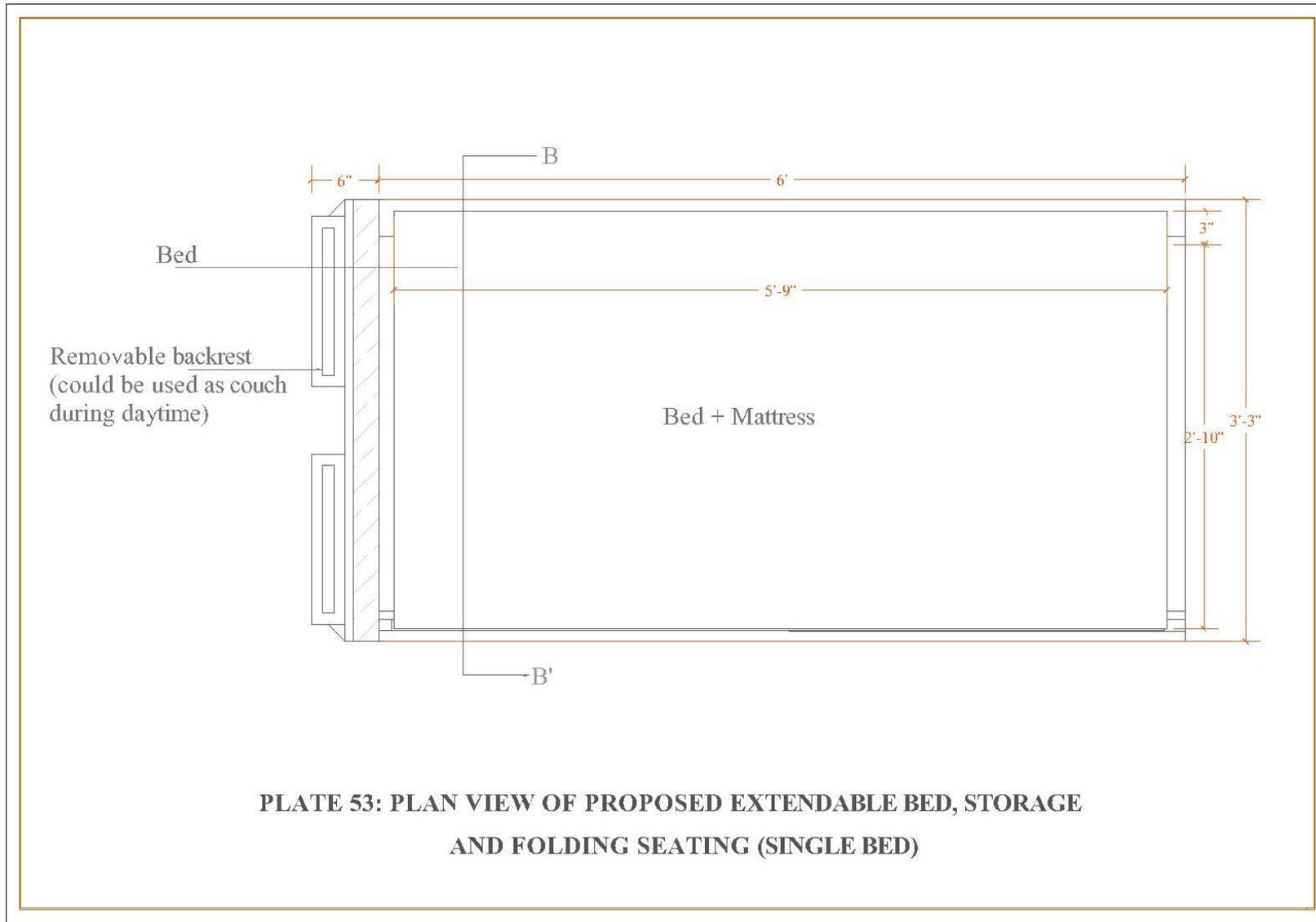
**Price for this unit:** Price would range from Rs. 13000 to Rs. 35000 depending on the material chosen and the brand of product selected for construction.

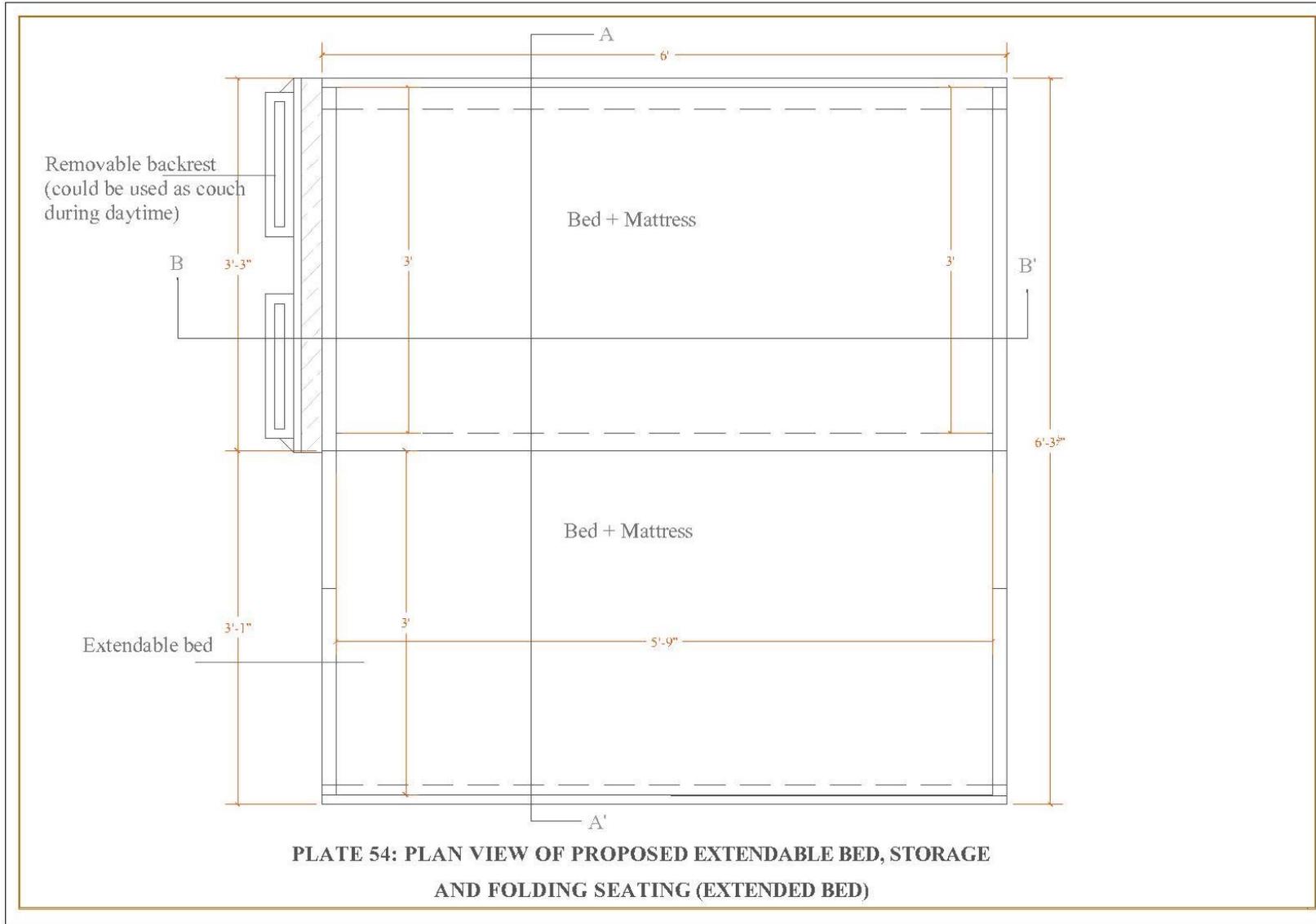
(Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with passing of time. The price

would also depend on the brand on products and raw materials used, and the labour cost will vary according to the expertise of the labour)

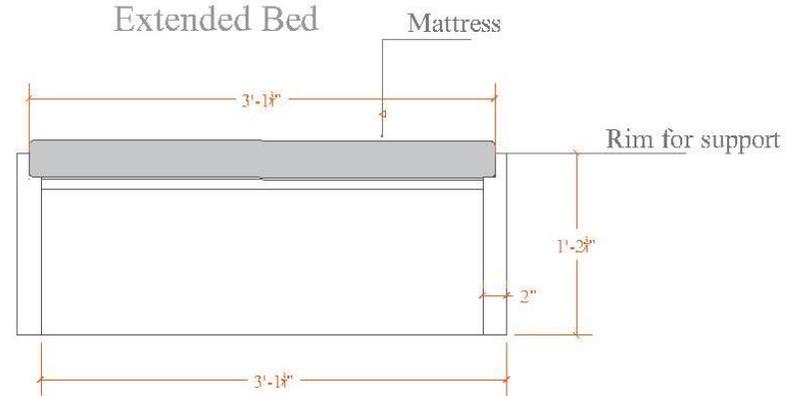
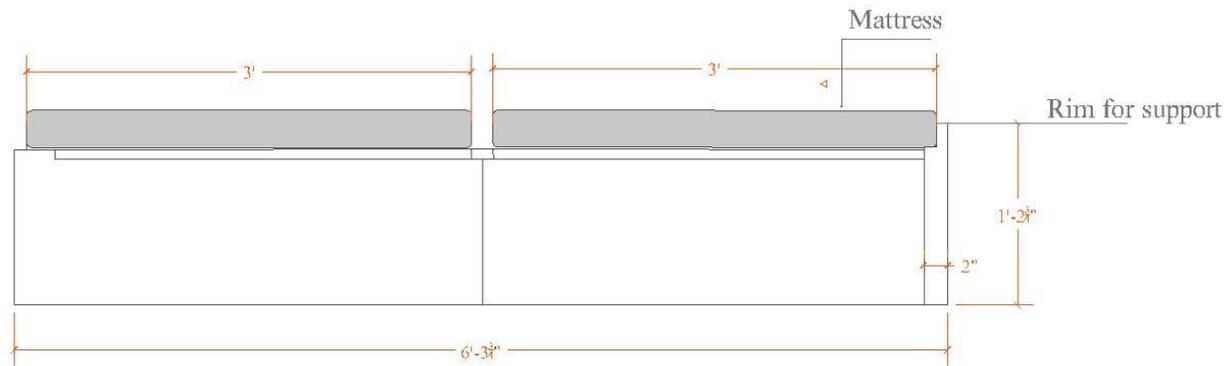
**Table 35: Materials options for the extendable bed, storage and folding seating**

Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam and Fabric	Stainless Steel	Any other metal
Bed, Bed back and storage box underneath the bed	•	•	•	•			
Bed back	•	•	•	•	•		
Hardware (Handles and Channels)						•	•

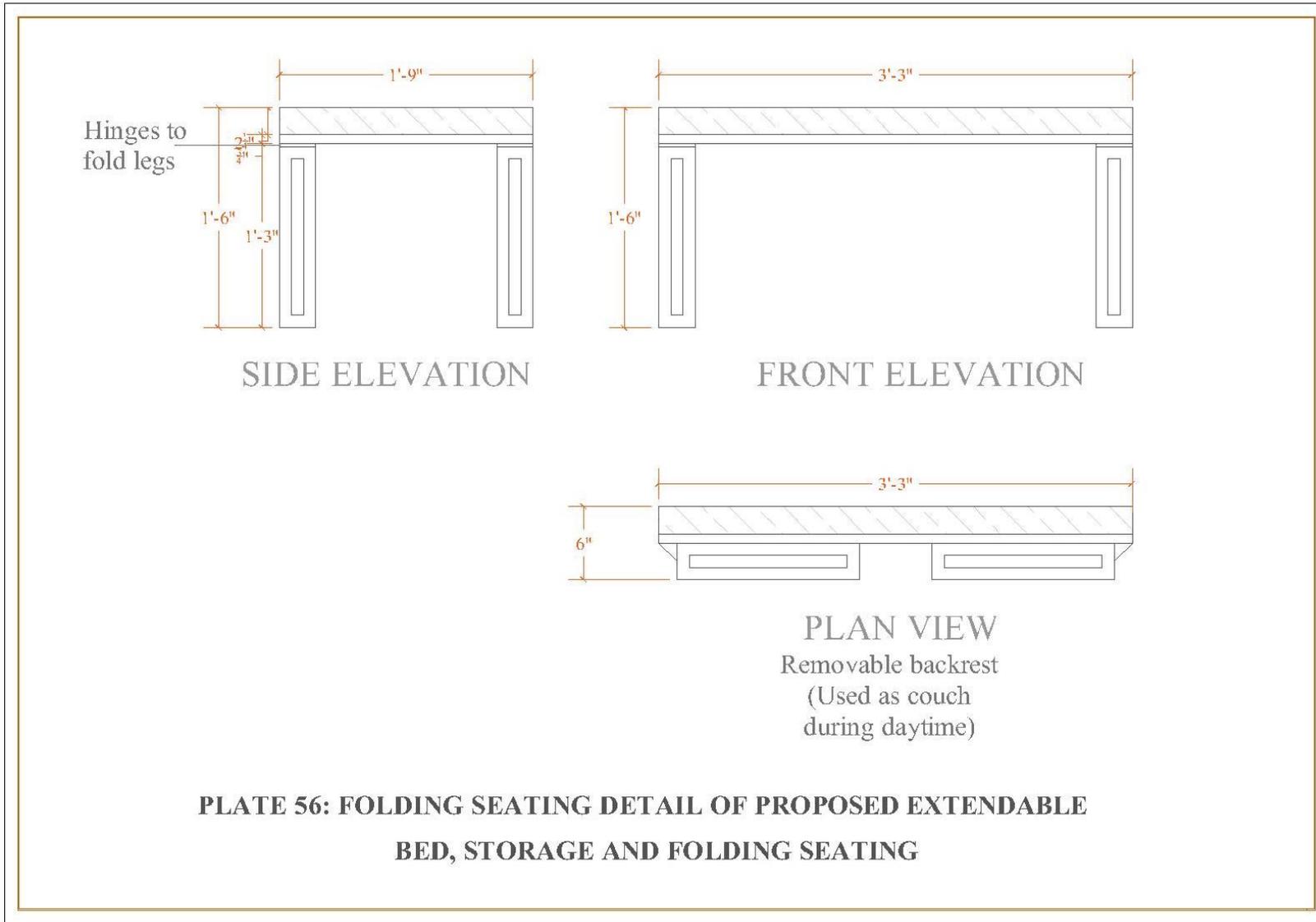


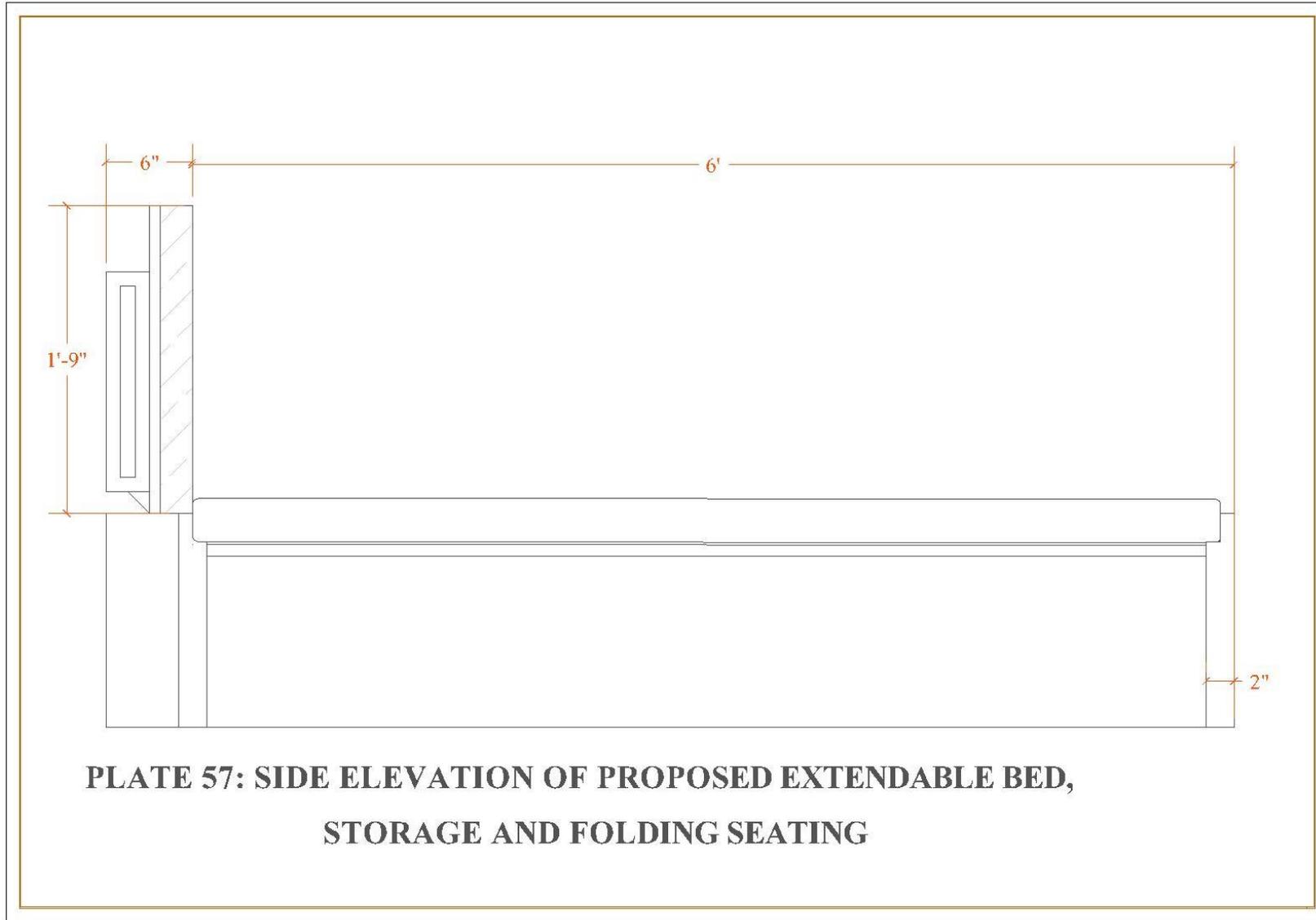


**PLATE 54: PLAN VIEW OF PROPOSED EXTENDABLE BED, STORAGE AND FOLDING SEATING (EXTENDED BED)**



**PLATE 55: SECTIONAL DETAIL OF PROPOSED EXTENDABLE BED,  
STORAGE AND FOLDING SEATING**





**PLATE 57: SIDE ELEVATION OF PROPOSED EXTENDABLE BED,  
STORAGE AND FOLDING SEATING**



**Plate 58: 3D view of proposed Extendable Bed, storage, and folding seating  
(Slide out bed)**



**Plate 59: 3D view of proposed Extendable Bed, storage, and folding seating (Foldable seating)**



**Plate 60: 3D view of proposed Extendable Bed, storage, and folding seating (openable storage bed)**

#### **4.3.8 Folding office and Dressing**

This furniture is designed especially for people who do not have a separate study room or office space in the house. This piece of furniture can be accommodated in as small as 2'-6" X 5'-0" of a space, and can accommodate 2 chairs, 2 work desks, 1 bulletin board, 3 open shelves for storage, 1 small storage cabinet behind the door, and 2 drawers; on one side and dressing unit with mirror and slide out drawer on the other side. The height can be designed according to the availability of vertical space and can range from as small as 5'0" to as large as 7'0" or even more if required.

This piece of furniture is designed on castors so that it can be rotated when not in use and displayed as a regular dressing cabinet/ wardrobe. The sizes can be modified according to the availability of the space and utility, as this unit can also be designed with a single chair. The underneath storage can also be designed according to the utility and need of the user. This furniture can be designed using different combinations of materials as per user's requirements.

An extensive market research helped the researcher to come up with various material options for the proposed furniture, the material for this furniture could be plywood, MDF or natural wood; and finishes such as laminate, veneer, polyurethane Polish can be used. Hardware can be designed using different metals. The design suggested by the researcher is with concealed handles or push to open hinges and chamfered edges and the colour options can be selected by the end user according to the theme of their own house.

Parts of folding office and dressing are discussed below:

1. **Dressing, folding office, cabinets shelves and drawer:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Chair:** Ply, Foam and Fabric (Foam of different density can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, the channels with reasonable strength of stainless steel or any other metal could be used.

4. **Mirror and frame:** Mirror with or without frame can be used for dressing.

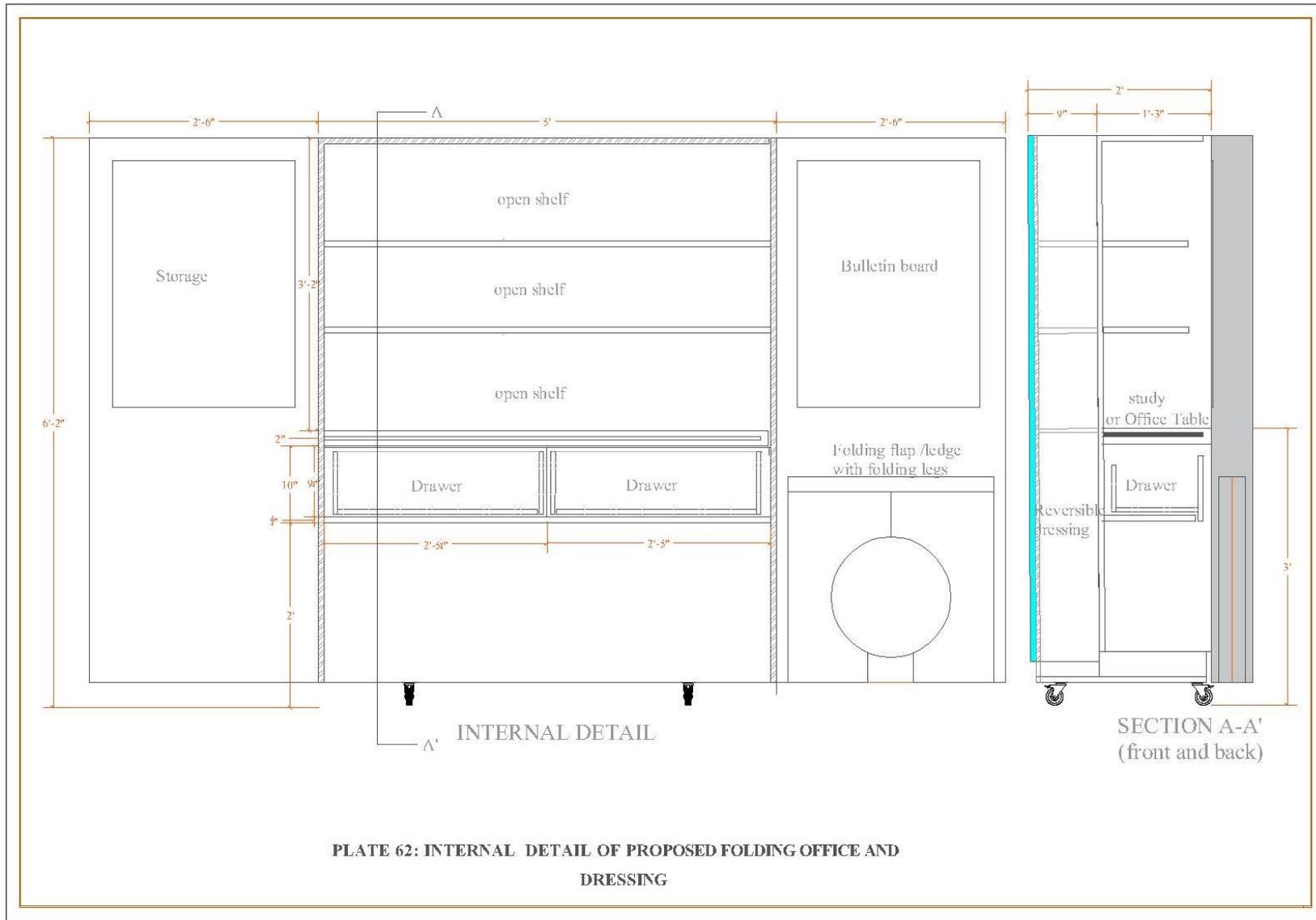
**Price for this unit:** Price would range from Rs. 10000 to Rs. 40000 depending on the material chosen and the brand of product selected for construction.

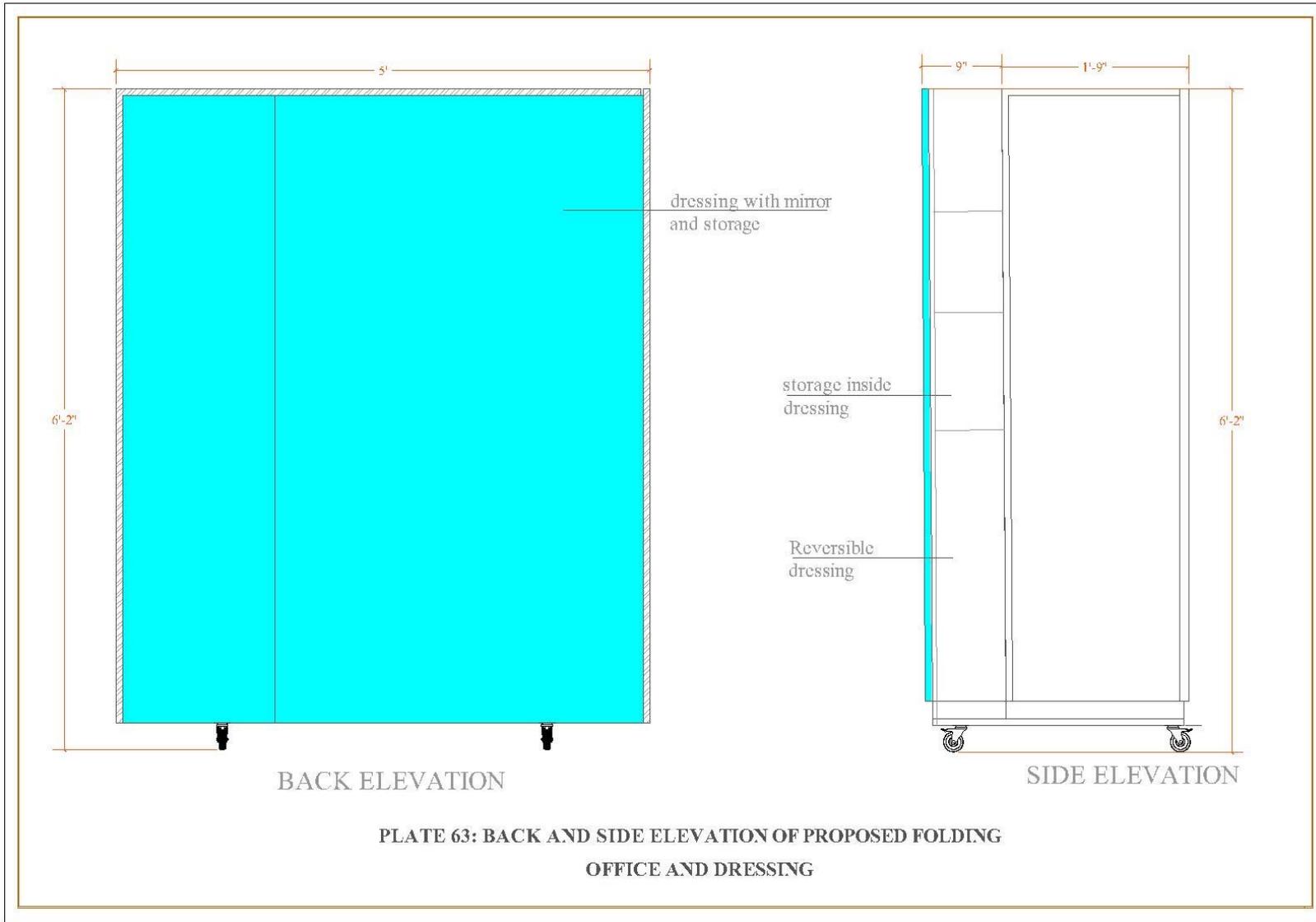
(Note: These prices are according to the market research done by the researcher during the duration of the research and may vary with passing of time. The price would also depend on the brand on products and raw materials used, and the labour cost will vary according to the expertise of the labour)

**Table 36: Materials options for folding office and dressing**

Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam and Fabric	Stainless Steel	Any other metal
Dressing, folding office, cabinets shelves and drawer	•	•	•	•			
Chair	•	•	•	•	•		
Hardware (Handles and Channels)						•	•
Mirror and Frame				•		•	•

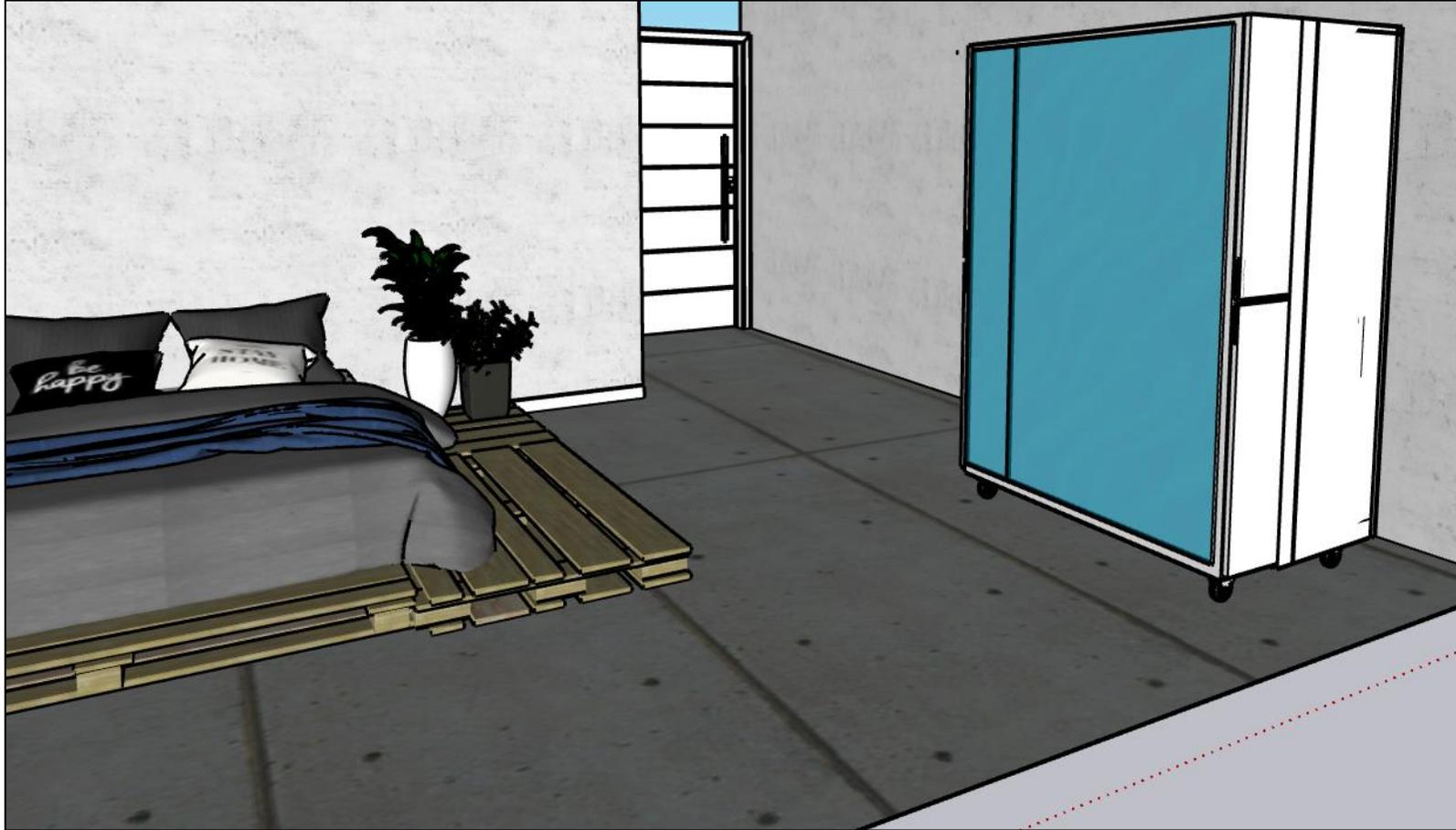








**Plate 64: 3D view of proposed Folding office and Dressing (Open)**



**Plate 65: 3D view of proposed Folding office and Dressing (closed)**

#### **4.3.9 Centre table, storage drawer, chair and bed**

The proposed furniture serves the purpose of sofa chair which can be extended to bed and folded and used as centre table. There is also a sleek drawer designed underneath to store beddings for guests. This furniture occupies 2'-7 ½" X 3'-0" floor space. This extendable bed can be used for guests as well as for children. The folding feature of turning it into a centre table makes it space saving and can be stored in some other room and used whenever needed. An extensive market research helped the researcher to come up with various material options for the proposed furniture, the material for this furniture can be plywood, MDF or natural wood; and finishes such as laminate, veneer, polyurethane Polish can be used. Hardware can be designed using different metals. The design suggested by the researcher is sleeker with concealed handles and chamfered edges. The colour options can be selected by the end user according to the theme of their own house.

The sizes can be modified according to the availability of the space and utility, as this unit can also be designed with three-seater sofa. The underneath storage can also be designed according to the utility and need of the user. This furniture can be designed using different combinations of materials.

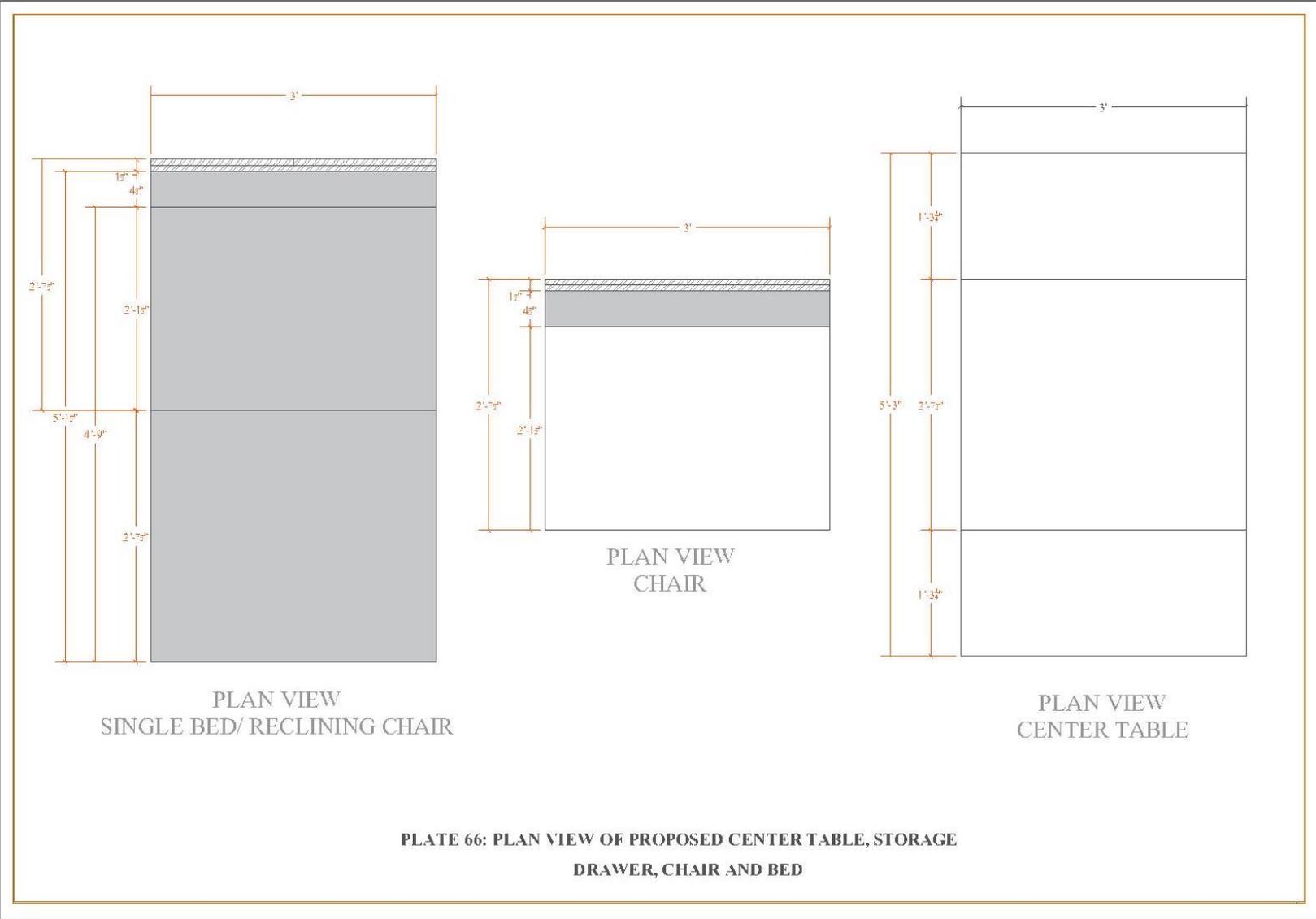
Parts wardrobe with slide-out iron board and study area and chair are discussed below:

1. **Chair frame and drawer:** The base material can be constructed using Plywood Laminate/Veneer/ MDF with PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer finish and can also be constructed using Real wood with painted/ stained finish.
2. **Chair and extended bed mattress:** Ply, Foam and Fabric (Foam of different density can be used and closely woven fabric with high resistance to wear and tear such as leather/velvet/jute/cotton or polyester can be used)
3. **Hardware (Handles and Channels):** Stainless steel/ any other metal handles can be used. Also, the channels with reasonable strength of stainless steel or any other metal could be used.

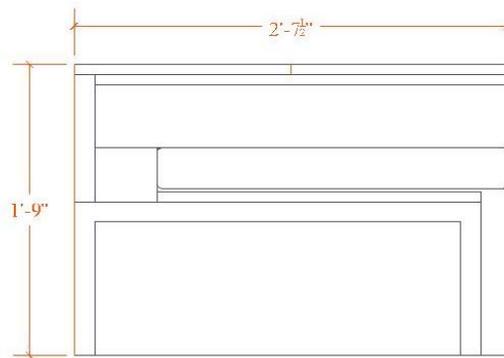
**Price for this unit:** Price would range from Rs. 6000 to Rs. 20000 depending on the material chosen and the brand of product selected for construction.

**Table 37: Materials options for centre table, storage drawer, chair and bed**

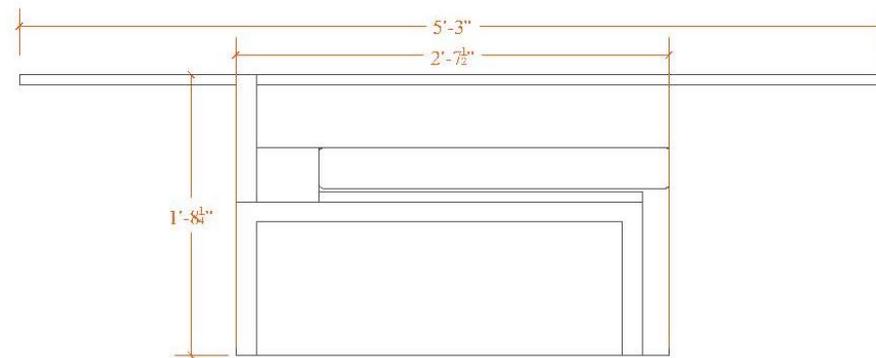
Parts of Furniture	Material						
	Plywood and Laminate	Plywood and Veneer	MDF and PU (Polyurethane polish)/ Nitro Cellulose (NC) Lacquer	Real Wood finished with paint/stain	Plywood, Foam and Fabric	Stainless Steel	Any other metal
Chair frame and drawer	•	•	•	•			
Chair and extended bed mattress	•	•	•	•	•		
Hardware (Handles and Channels)						•	•



**PLATE 66: PLAN VIEW OF PROPOSED CENTER TABLE, STORAGE  
DRAWER, CHAIR AND BED**

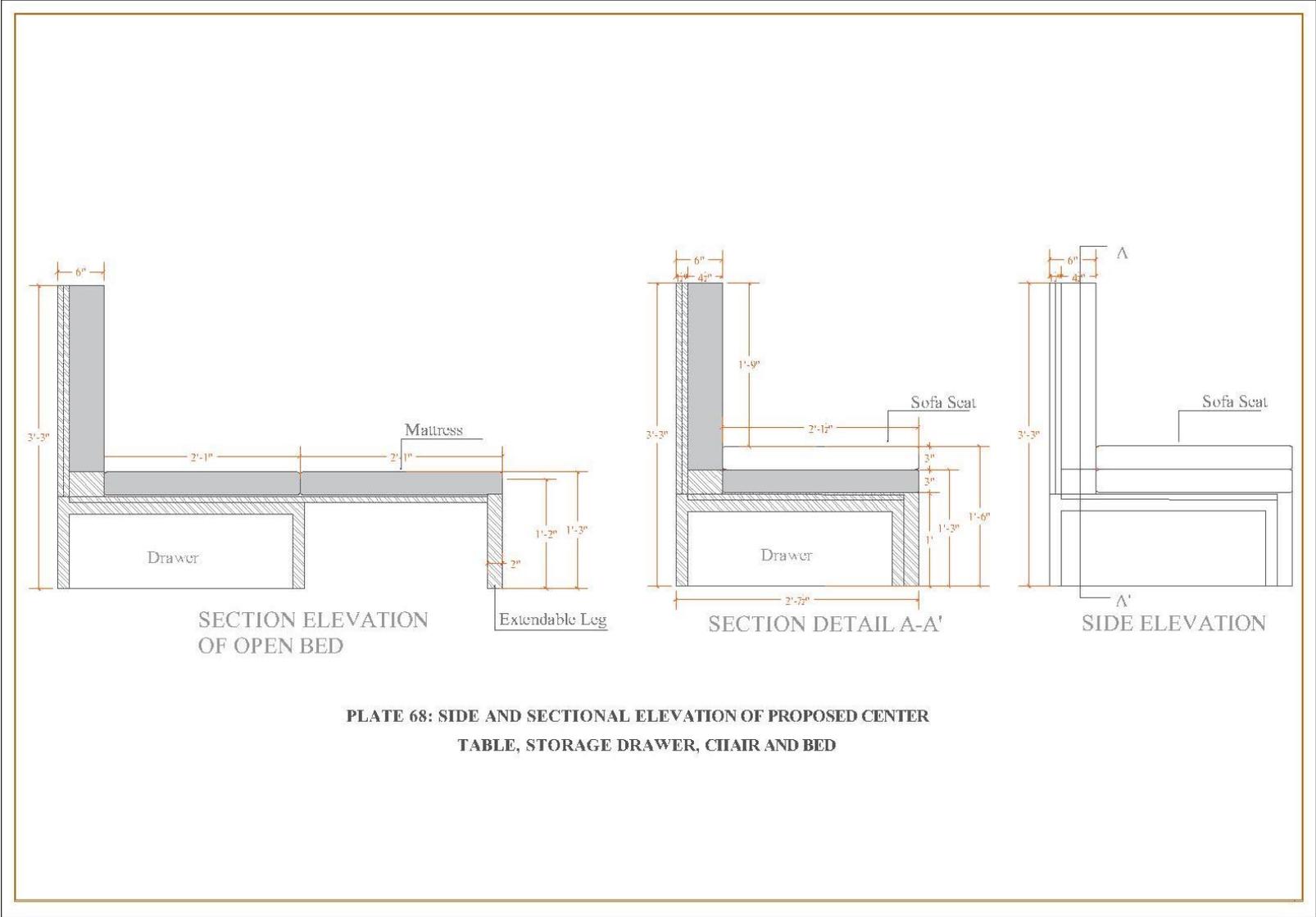


FRONT ELEVATION  
CLOSED UNIT



FRONT ELEVATION  
CENTER TABLE

**PLATE 67: FRONT ELEVATION OF PROPOSED CENTER TABLE,  
STORAGE DRAWER, CHAIR AND BED**



**PLATE 68: SIDE AND SECTIONAL ELEVATION OF PROPOSED CENTER TABLE, STORAGE DRAWER, CHAIR AND BED**



**Plate 69: 3D view of proposed Centre table, storage drawer, chair and bed**



**Plate 70: 3D view of proposed Centre table, storage drawer, chair and bed**

## Section IV

### 4.4. A catalogue of proposed designs with detailed specification, construction detail and cost.

A catalogue of the proposed multipurpose furniture designs was prepared by the researcher applicable in various small space houses. The catalogue included details of furniture proposed for various spaces, namely foyer, living room, kitchen, dining room, bedroom, bathroom, and other areas of the house. It consisted of the Furniture for Foyer and Living room which included Utility storage with a shoe rack and pull-out seating bench, a Three-seater sofa with a shoe rack, and utility storage. Furniture for the Kitchen and Dining room consisted of a Three-seater sofa cum bed with foldable Four-seater dining (One table and Four chairs), a Portable pre-preparation centre with an extendable dining table, chairs, and storage. Furniture for Bedroom, Bathroom, and other areas consisted of a Study unit with dressing and storage, Wardrobe with foldable iron board and study area and chair, Extendable Bed, storage, and folding seating, Folding office and Dressing and Centre Table, storage Chair and bed. The material specifications along with its price was included in the catalogue. Various parts of the designed furniture along with the material options were specified and described in the catalogue and details of each proposed designs were discussed in section III of the findings, which consisted of all the AutoCAD drawings with detailed specifications and dimension.

The catalogue also included material options applicable to various budget groups. The catalogue can be used as a ready reference book by the small space owners, to design their small houses in a smart and effective manner. This can help them organize their home by designing multipurpose furniture in a cost-effective manner. Multipurpose furniture is also known as space saving furniture, foldable furniture and transformable furniture. Space-saving furniture helps an individual to achieve multiple goals through one piece of furniture. It saves resources like labour engaged in constructing multiple pieces of furniture, the material cost involved in purchasing raw materials for building a piece of furniture and saves time in the construction of the furniture. Multipurpose furniture occupies less floor space in comparison with individual furniture items. Researcher designed multipurpose furniture for small space houses with different material options, with different price range for all the areas of the residential unit. The Multipurpose furniture was conceptualized,

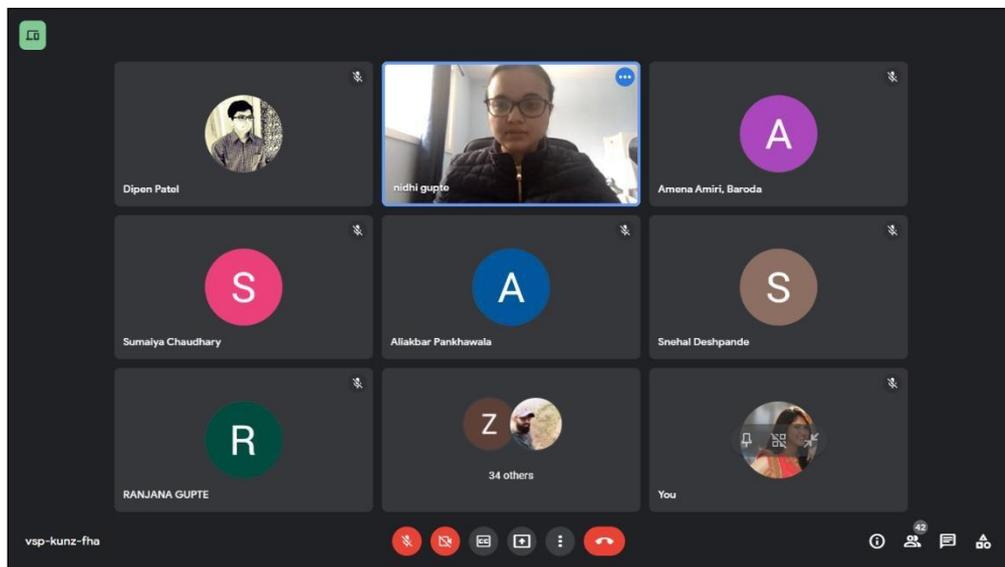
sketched, and then designed with the help of AutoCAD 2022 and Google 3D SketchUp. The catalogue of proposed designs of multipurpose furniture was designed by the researcher which could be used as a ready reference by the residents of small houses to help solve their furniture-related problems. This catalogue contains 9 major furniture pieces, consisting of 30 sub pieces of furniture. Each furniture was designed keeping in mind small houses with the suggestions of variety of furniture material options.

## Section V

### 4.5. Intervention Program for homeowners to enhance knowledge regarding multi-purpose furniture, its use and benefits in interiors of small houses.

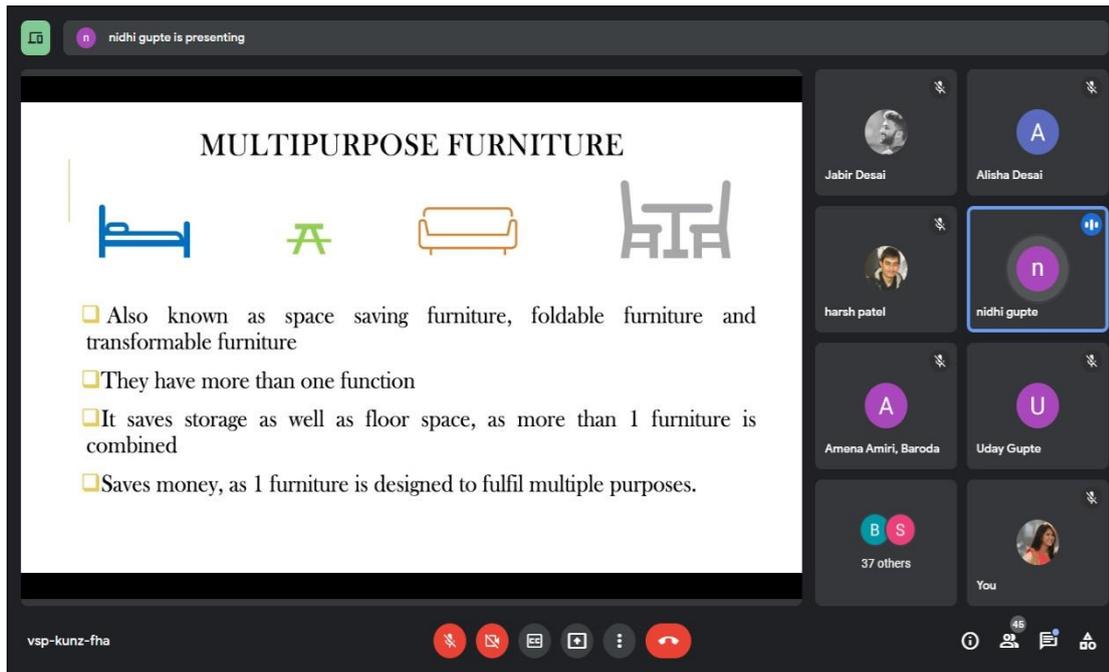
An intervention program was conducted for the residents of the small space houses along with the respondents of the study. The aim of the intervention program was to focus on enhancing the knowledge of the residents of small spaces regarding the use of multipurpose furniture.

The major focus of the intervention program was to discuss the various design options of space saving, multipurpose furniture proposed by the researcher.



**Plate 71: Intervention Program conducted by the researcher**

The intervention program was conducted according to the availability of the respondents and time preferred. The sessions were planned, and respondents were divided in 6 groups. The beneficiaries ranged from around 45-84 for various sessions. Apart from the respondents of the study, the intervention program was also attended by some interior designers, architects, and aspiring designers.

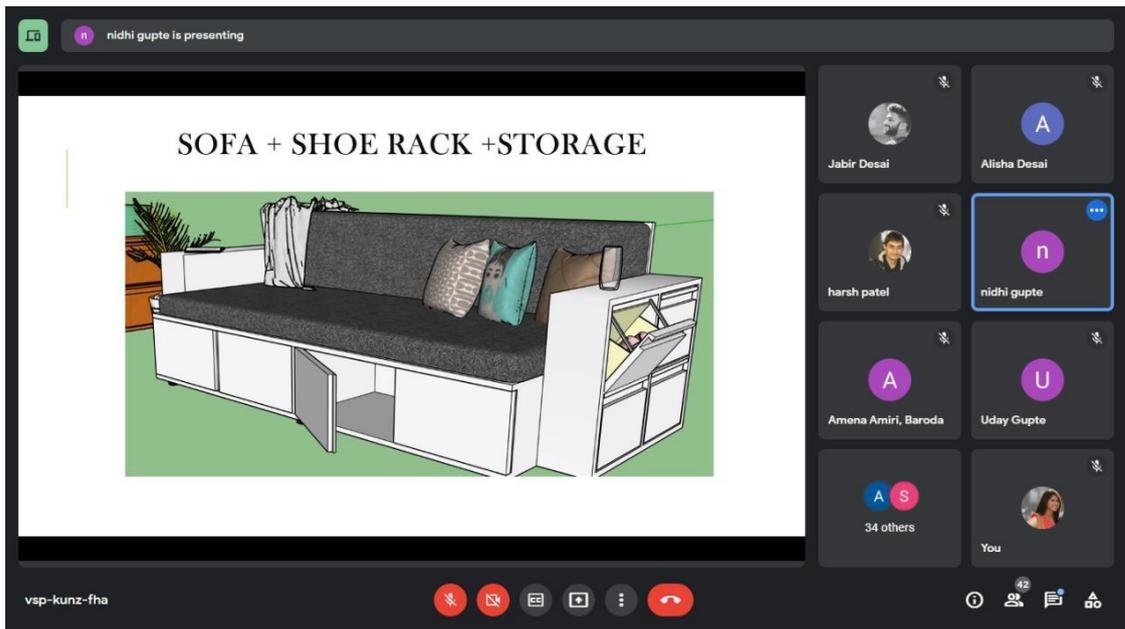


**Plate 72: Researcher explaining the benefits of multipurpose furniture during Intervention Program**

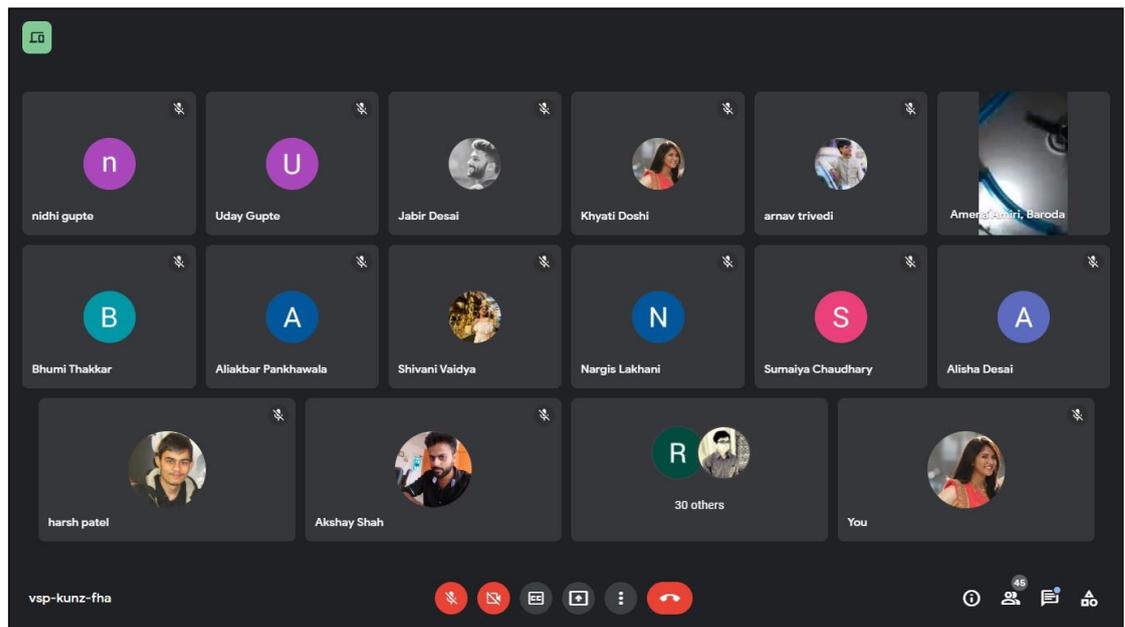
An intervention program was delivered in a Hindi, Gujarati, and English language for better understanding, according to the preference of the audience. Minute attention was given to explain each design to the respondents and feedback was also taken from the respondents in terms of look and functionality of the design.

The Intervention program highlighted, the importance of Multipurpose furniture especially in small spaces. An interactive session was conducted to identify the knowledge of beneficiaries, and as most of the respondents were not much familiar with the concept of multipurpose furniture, a brief explanation was given by the researcher to enhance the knowledge of the respondents.

The proposed multipurpose designs were discussed in detail with the respondents and question answer session was conducted at the end of the program. An overwhelming response was availed and many of the respondents were looking forward for implementing the furniture designs in their home in near future. Researcher shared the catalogue with the beneficiaries, which they could use as a ready reference to construct proposed multipurpose furniture for their house.



**Plate 73: Researcher explaining the design of furniture**



**Plate 74: Feedback session during the Intervention Program**