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PLANNING AND DESIGNING OF COMMERCIAL BUILDING USING SKETCHUP SOFTWARE

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ABSTRACT

The report outlines the design plan for a multi-store building featuring a vegetable market, shops, and a marriage hall. We carefully considered how people will use the space, placing the market on the ground floor for easy access and shops on higher floors for visibility. The marriage hall is positioned for privacy and nice views, possibly on the top floor. Green elements like plants and natural light are incorporated for a pleasant environment. Features like escalators, elevators, and parking are included for convenience. Using SketchUp software, we created a 3D model to visualize the design. Overall, the report explains our thoughtful approach to meeting various needs while ensuring practicality and attractiveness in the building design. The report explains in detail how we planned a multi-level building with a vegetable market, shops, and a marriage hall. It looks at where each part should go to make it easy for people to use. We also talk about adding things like plants and sunlight to make the place look nice and eco-friendly. In addition, we made sure there are facilities like elevators and parking spots to make it convenient. Using SketchUp software, we created a 3D model to see how everything fits together. In summary, the report shows how we thought carefully about making the building useful, attractive, and easy to use for everyone. Furthermore, we talked about how we made sure everyone, including those with mobility challenges, can easily access the building using ramps and elevators. We also thought about how to make the shops and vegetable market attractive to customers. By considering all these things, we wanted to create a place where everyone feels welcome and part of the community. With careful planning, we believe our building will be a valuable addition to the area, serving the needs of everyone who uses it.

Keywords: Vegetable Market, Shops, Marriage Hall, Sketchup Software, 3D Model, Area Calculations And Specification.

I. INTRODUCTION

Welcome to our project introduction! We're excited to share our plans for a multi-store building that will benefit our community. Our goal is to create a space that works well, looks nice, and helps the environment. In this introduction, we'll give you an overview of how we came up with our design, including things like how we organized the layout, made sure it's easy for everyone to use, and thought about being eco-friendly. We'll also show you a 3D model we made using SketchUp software to give you a clear idea of what our building will look like. This report is all about explaining why we made the choices we did and how our project will make a positive impact on our community. Welcome to our project introduction! We're excited to share our plans for a multi-store building that will benefit our community. Our goal is to create a space that works well, looks nice, and helps the environment. In this introduction, we'll give you an overview of how we came up with our design, including things like how we organized the layout, made sure it's easy for everyone to use, and thought about being eco-friendly. We'll also show you a 3D model we made using SketchUp software to give you a clear idea of what our building will look like. This report is all about explaining why we made the choices we did and how our project will make a positive impact on our community. We'll also talk about how we asked people in the community for their thoughts on our design. By getting their input, we want to make sure our building meets their needs and makes them proud. We'll mention some of the things they liked and how we're including those

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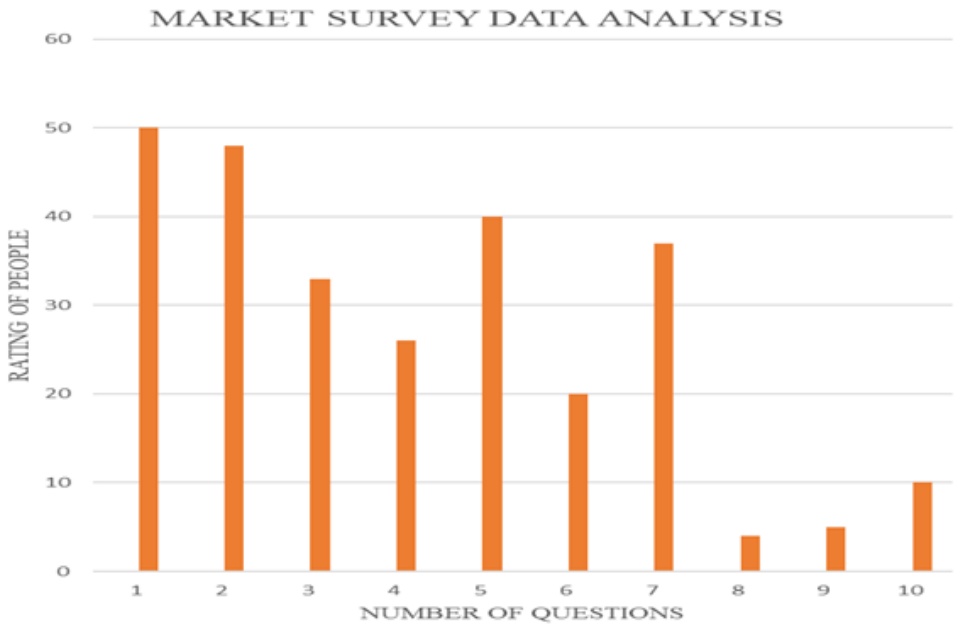
in our design. Our aim is to make a building that not only works well but also makes the community happy and strong.

We'll also cover things like when we'll build the project, how much it will cost, and any problems we might face along the way. We'll explain how we're planning to deal with these challenges to make sure the project goes smoothly. Plus, we'll mention if there's a chance to work with local businesses or groups to make the project even better. By sharing all this information, we want to show that we've thought about everything and are ready to make our project a success for the community. We'll also cover things like when we'll build the project, how much it will cost, and any problems we might face along the way. We'll explain how we're planning to deal with these challenges to make sure the project goes smoothly. Plus, we'll mention if there's a chance to work with local businesses or groups to make the project even better. By sharing all this information, we want to show that we've thought about everything and are ready to make our project a success for the community.

II. METHODOLOGY

1. MARKET SURVEY AND DATA ANALYSIS

We visited the market to talk to the business owners and learn about the issues they face. We asked them questions about their problems and listened carefully to what they had to say. By talking to them, we gathered important information that will help us understand the challenges they experience in running their businesses. This information will guide us in finding solutions to improve the market for everyone involved. During visit to the market for this project, We met with local businessmen to learn about the problems with the old building. They told us about issues like not enough space to display products, difficulties for customers to get around, and outdated facilities. Seeing these problems firsthand helped me understand what the businesses need. This information will be really helpful in making sure our new building design meets their needs and makes things better for them.



Graph 1:

(Bar graph of market survey analysis)

Sr.No	Problem in market	Sr.No	Problem in market
1	Problem of spacing	6	Requirement of space for displaying product
2	Requirement of shops	7	Loading unloading
3	Storage problems	8	Natural ventilation
4	Passage requirement	9	Parking requirement

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5	Requirement of ota	10	Number of vehicles required

SR. NO	QUESTIONS OR PROBLEMS OBSERVED IN THE VEGITABLE MARKET	MARKING
1.	Problems regarding to the spacing in the vegetable market.	✓
2.	Requirements of shops	✓
3.	What types of problems are arise while storage	✓
4.	Passages requirement	✓
5.	Ota is required or not	
6.	What are your space requirement for displaying your products	
7.	Do you need storage space for inventory?	✓
8.	How important is natural lighting for your shops?	✓
9.	How important is accessibility and parking for your customers?	
10.	Do you need parking spaces for you and your customers necessary?	

2. PLANNING AND DESIGNING OF THE NEW MARKET BUILDING

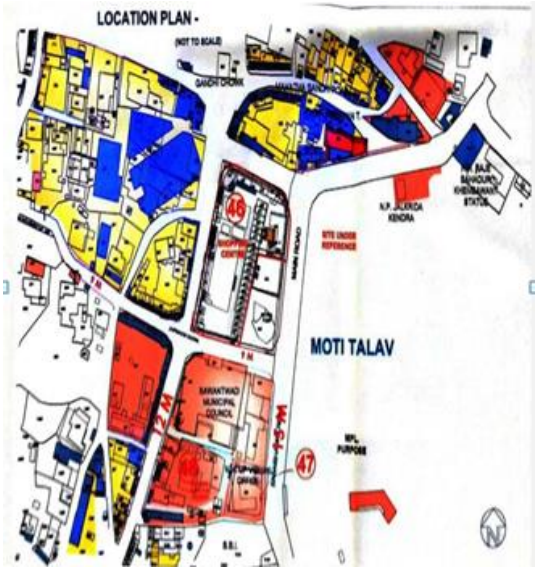

Fig 1: Location plan of the market building

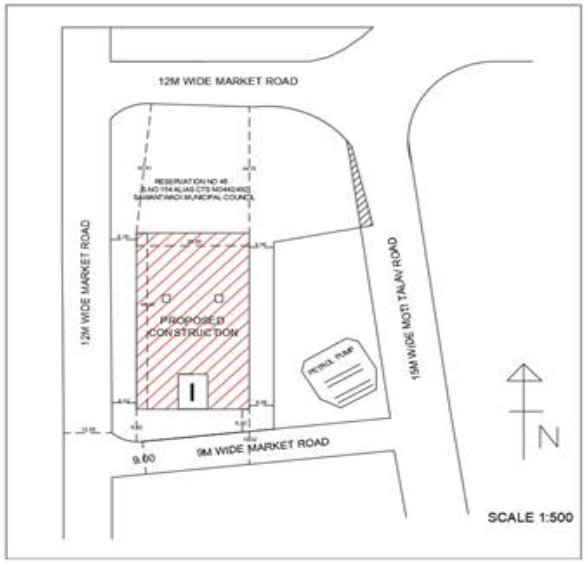

Fig 2: Site plan of the market building

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Area statement and FSI calculation

Sr. No	Discription	Area
1	Lower ground floor	1248.46 Sq.m
2	Upper ground floor	1248.46 Sq.m
3	First floor	1654.60 Sq.m
4	Second floor	1446.77 Sq.m
5	Third floor	1446.77 Sq.m
6	Fourth floor	1654.60 Sq.m
8	Plot area	4400.00 Sq.m

Total buit up area = LGF+UGF+FF+SF+TF+FF

= 1248.46+1248.46+1654.60+1446.77+1446.77+1654.60

= **8699.66 Sq.m**

$$FSI = \frac{TOTAL\ BUILT\ UP\ AREA}{PLOT\ AREA}$$

$$FSI = \frac{8699.66}{4400.00}$$

FSI = 1.97 < 2.00

HENCE PERMISSIABLE

3. DIFFERENT FLOOR PLANS WITH THERE 3D VIEW

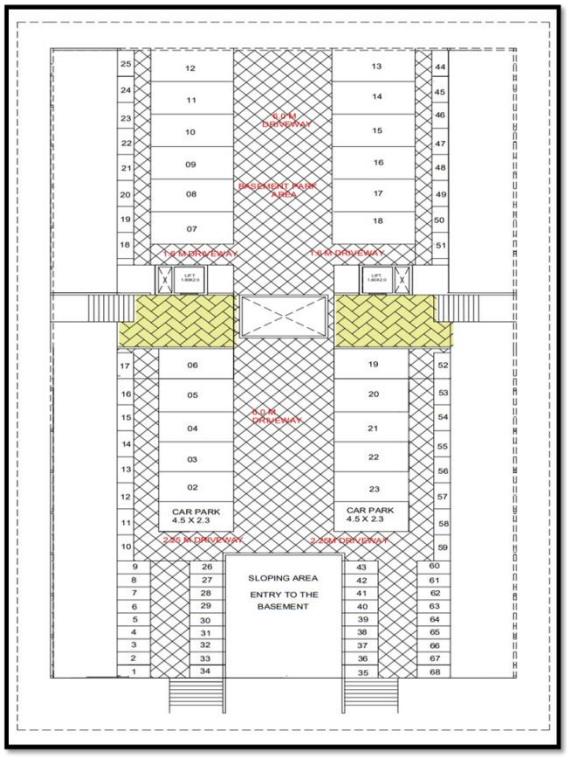

Fig 3: Developed plan of basement

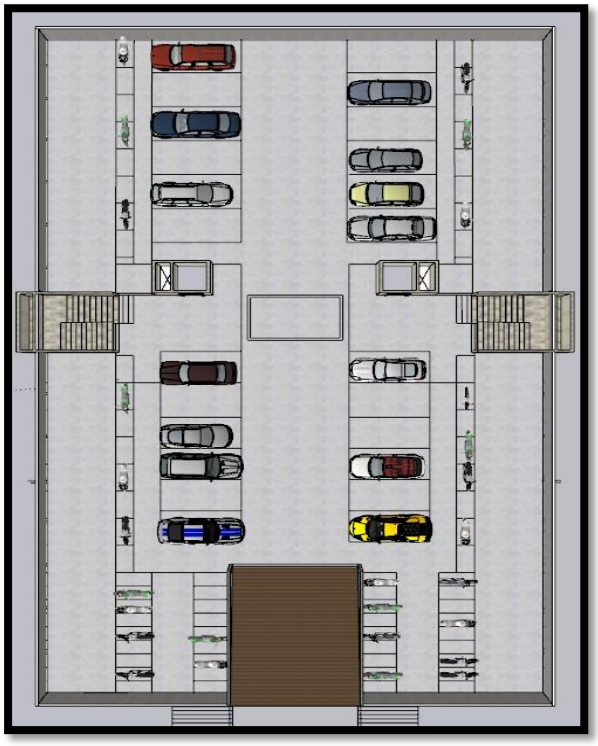

Fig 4: 3D view of basement

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Fig 5: Developed plan of lower and upper GF

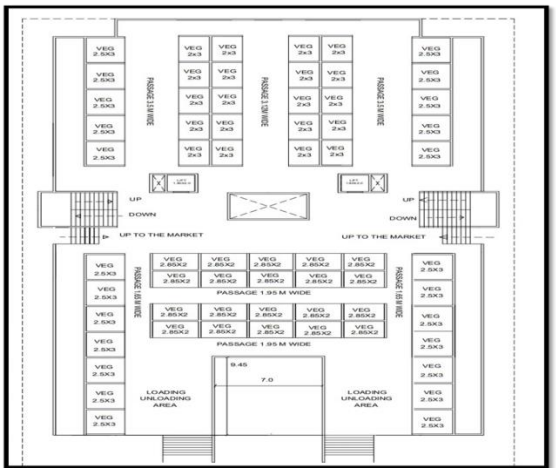

Fig 6: 3D view of lower and upper GF

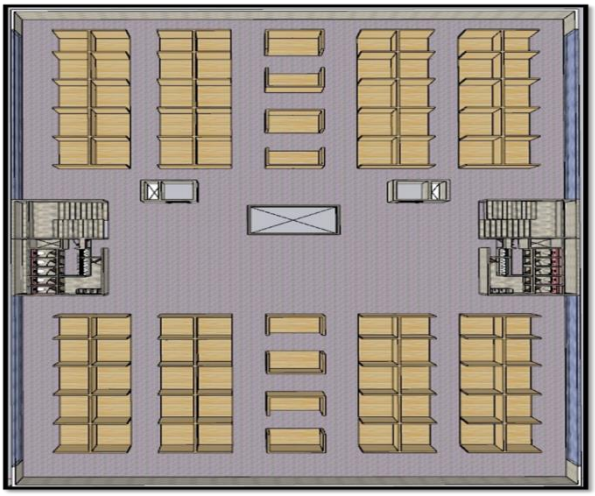

Fig 7: Developed plan of first floor

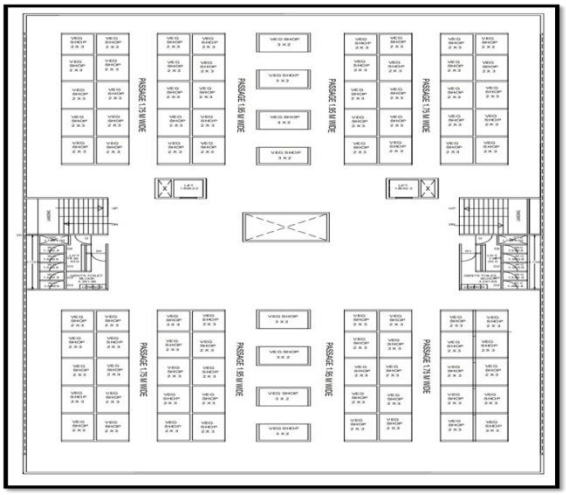

Fig 8: 3D view of first floor

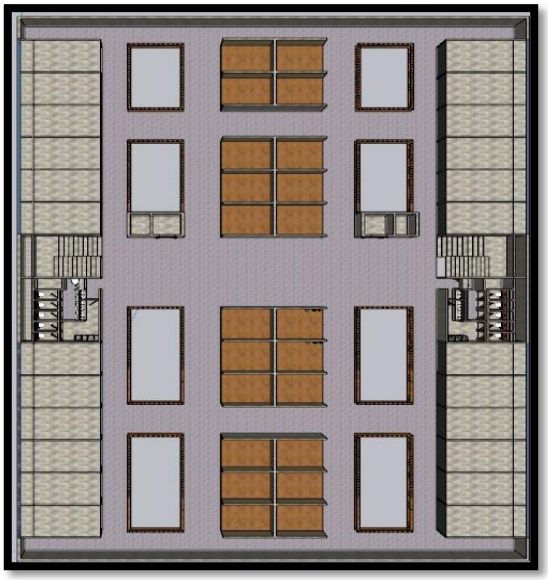

Fig 9: Developed plan of 2nd and 3rd floor

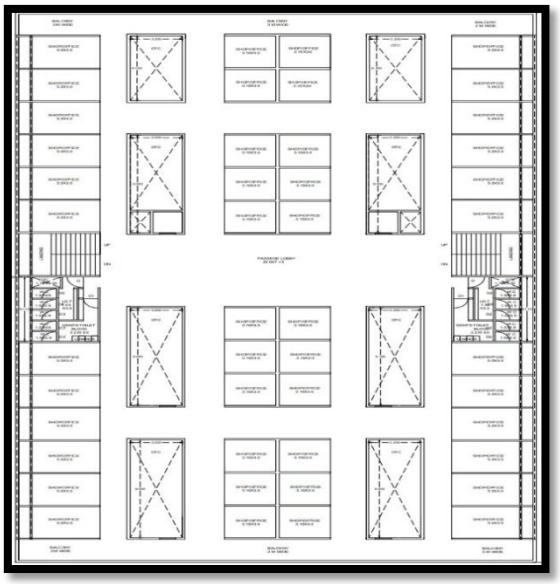

Fig 10: 3D view of 2nd and 3rd floor

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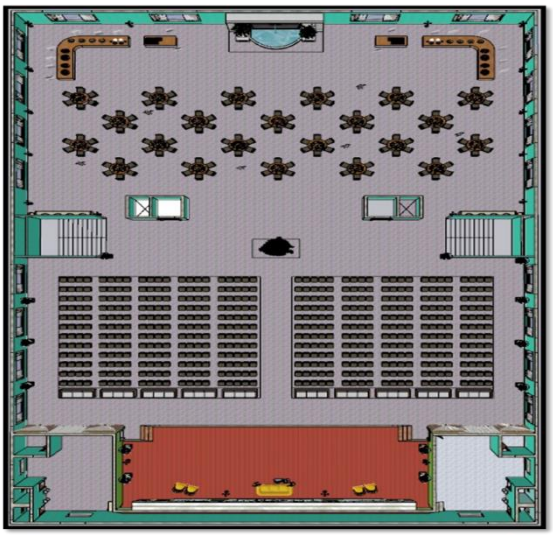

Fig 11: Developed plan of marriage hall

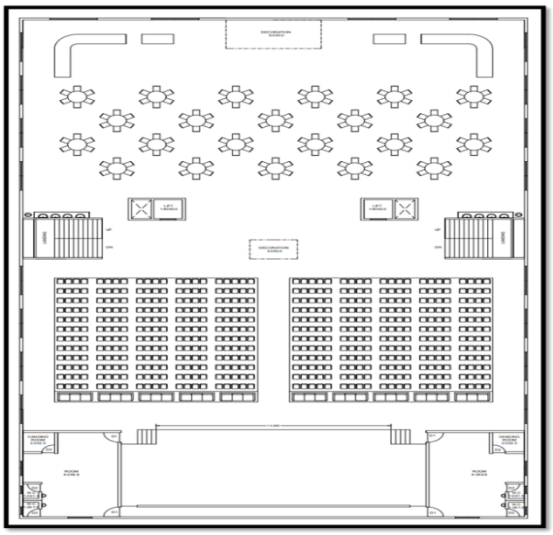

Fig 12: 3D view of marriage hall

4. DETAILS OF EACH FLOOR WITH DIFFERENT UNITS

Sr. No	Description of the floors with units	Size	No
1	**Basement plan details**		
	Car parking	4.5X2.5M 5.0X2.5M	12 12
	Two wheeler parking	2X1M	68
	Drive way	6M	1
	Lift size	1.8 X 2.0 M	2
	Duct	5.0 X 3.0 M	2
	Built up area	984.27 SQ.M	1
2	**Lower and upper ground floor**		
	Vegetable shops	2.5 x 3 m 2 x 3 m	48 80
	Passages	3.5 m width 1.65 m width 1.95 m width	6 4 4
	Lift	1.8 x 2.0 m	4
	Duct	5.0 x 3.0 m	2
	Partition wall between shops	0.15 m	104
	Built up area	1248.46 sq m	2
	Loft on the shop	1m height	128
3	**First floor**		

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	Vegetable shops	2 x 3	83
	Passages	1.75 m width 1.95 m width	4 4
	Lift	1.8 x 2.0 m	2
	Duct	5.0 x 3.0 m	2
	Partition wall between shops	0.15 m	104
	Built up area	1654.6 Sq. M	1
	Loft on the shop	1m height	83
4	**Second and third floor**		
	Shops / offices	5.0 X 3.0m 3.15 X 3.0m	48 44
	Passages	3.0m width 1.85m width	4 32
	OTS (Open to Sky)	3.20 X 9.30m 3.20 x 8.15m	12 4
	Passage lobby	20.0 x 7.15m	2
	Built up area	1446.77 Sq.m	2
5	**Marriage hall**		
	Chairs arrangement	0.52 x 0.43 x 0.9m	504
	Sofa arrangement	2.20 x 0.86 x 0.84m	10
	Passage width	2.00 m wide 0.57 m wide	3
	Stage	19.20 x 7.60 x 1m	1
	Changing room	6 x 8.8m	2
	Lift	1.8 x 2.0 m	4
	Catering arrangement		
	Chairs arrangement	0.52 x 0.43 x 0.9m	504
	Sofa arrangement	2.20 x 0.86 x 0.84m	10
	Passage width	2.00 m wide 0.57 m wide	3
	Total built up of hall and catering	1654.6Sq.m	1

5. PROVISION OF LOFT

Specifications for the provision of the loft as per UDCPR - 2020

1. The clear headroom under the loft not less than 2.1m
2. Loft in commercial areas and industrial building shall be located 2m away from the entrance

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3. Loft shall not interfere with the ventilation of the room
4. The maximum height of the loft shall be 1.5m

Details of loft provided in the market building

1. Height of the loft is 1 m above the shop
2. Clear head room under the loft is 2.5m
3. Size of the lofts are (2.5 x 3) and (2 x 3)
4. No of lofts is equal to the No of shops

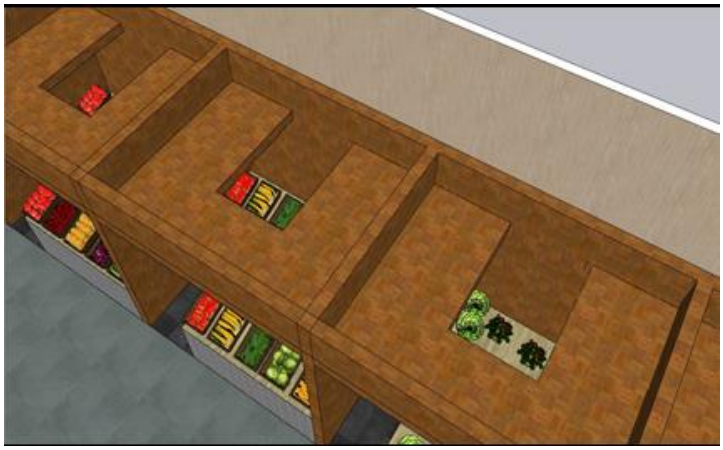

Fig 13: 3D view of loft provided on the shops

6. 3D MODELLING OF MARKET BUILDING

Fig 14: 3D view of market building from 9m wide road side

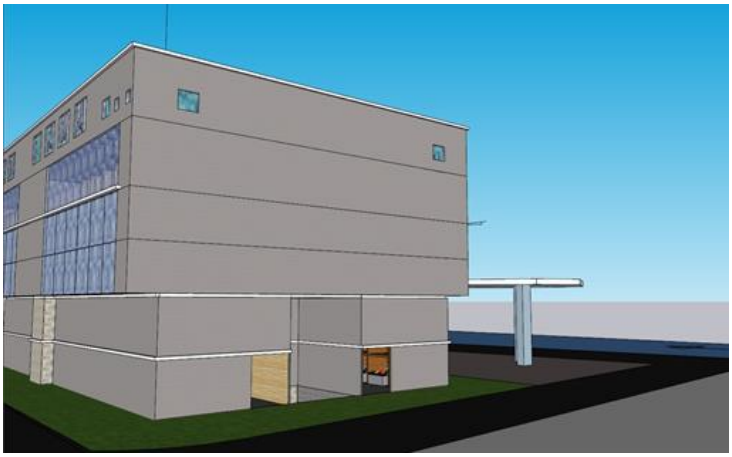

Fig 15: front view of market building

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III. RESULTS AND APPLICATION

Sr.no	Problem in vegetable market	No	Percentage
1	Problem of spacing	50	100
2	Requirement of shops	48	96
3	Storage problems	33	66
4	Passage requirement	26	52
5	Requirement of ota	40	80
6	Requirement of space for displaying product	20	40
7	Loading unloading	37	74
8	Natural ventilation	4	8
9	Parking requirement	5	10
10	Number of vehicles required	10	20

1. Detailed Building Plan:

Your project will create a detailed plan for a multi-story building. It will show how each part of the building, like the vegetable market, shops, and marriage hall, will look in 3D.

2. Better Use of Space:

By using SketchUp, you can plan the building's layout so that every space is used well. This means making sure each area is useful and easy to use.

3. Easy Movement Inside:

Your design will make it easy for people to move around inside the building. This includes having clear paths for walking and driving.

4. Happy Visitors:

Your design will focus on making sure people enjoy using the building. This means making it comfortable and easy to use for everyone.

5. Helping the Environment:

You can design the building to be good for the environment. This might include using natural light, saving energy, and making green areas.

6. Supporting Local Businesses:

Your project can help local businesses by giving them a place to work and sell things. This can help the local economy and bring people together.

7. Showing Ideas Clearly:

The 3D models you create will help people understand your ideas. This includes clients, investors, and people in the community.

8. Checking if the Plan Makes Sense:

You can use your project to see if building the plan is a good idea. This means looking at things like cost, demand, rules, and how much money it might make.

IV. CONCLUSION

1. From the survey did in the old municipal vegetable market building to identify the problems of the shopkeepers we gets the following problems which are mostly occurred

- Problem of storage hence required store rooms
- Place is congested hence required more passages
- Due to the large requirement needs big shops
- Required loading and unloading places

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2. By analysing the data collected from the market visit we design a new market building which consists following floors ;

- Lower ground floor - 1248.46 Sq.m
- Upper ground floor - 1248.46 Sq.m
- First floor - 1654.60 Sq.m
- Second floor - 1446.77 Sq.m
- Third floor - 1446.77 Sq.m

We tried to solve the maximum problems of shopkeepers which are identified in the market survey in our project.

3. We suggested the multipurpose hall which can be used for different types of events like marriage, cultural event, gatherings assembly, meetings etc. This hall also adds extra revenue in the municipal corporation.
4. We give the 3d visualization of our building to the public by using Sketch up software. It is software which have ability to generate a 3d view of building before the construction.

For designing of our building we use following tools;

Push and pull, orbit, select, eraser, line, rectangle tool, circle, arc, 2 points arc, look around, move, copy, rotate, scale, offset, temp measure tool, dimensions, pie, walk, look around, import and export.

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