

Participant Handbook

Sector
Furniture and Fittings

Sub-Sector
Modular Furniture

Occupation
Production - Modular Furniture

Reference ID: **FFS/Q5102**, Version No. **1.0**
NSQF Level 3



**Cabinet Maker
Modular Kitchen**



Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FURNITURE & FITTINGS SKILLS COUNCIL

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: "**Cabinet Maker – Modular Kitchen**"
QP No. "**FFS/Q5102 NSQF Level 3**"

Date of Issuance: July 12th, 2017

Valid up to*: July 11th, 2020

*Valid up to the next review date of the Qualification Pack

Authorized Signatory
(Furniture & Fittings Skill Council)

Acknowledgements

Furniture and Fittings Skill Council (FFSC) would like to express its gratitude to all the individuals and institutions who contributed in different ways towards the preparation of this "Participant Handbook". Without their contribution it could not have been completed. Special thanks are extended to those who collaborated in the preparation of its different modules. Sincere appreciation is also extended to all who provided peer review for these modules.

The preparation of this handbook would not have been possible without the Furniture & Fittings Industry's support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the industry.

This participant handbook is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavors.

About this book

This Participant Handbook is designed for providing skill training and /or upgrading the knowledge level of the Trainees to take up the job of an “Cabinet Maker Modular Kitchen” in the Furniture and Fittings Sector.

This Participant Handbook is designed based on the Qualification Pack (QP) under the National Skill Qualification framework (NSQF) and it comprises of the following National Occupational Standards (NOS)/topics and additional topics.

- Introduction
- (FFS/N5102) Make modular kitchen
- (FFS/N8601) Ensure health and safety at workplace
- (FFS/N8501) Maintain work area, tools and machines
- (FFS/N8801) Work effectively with others
- Employability and Entrepreneurship Skills

Symbols Used



Key Learning
Outcomes



Activity



Summary



Tips



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1. Make Modular Kitchen



Unit 1.1 Basic Introduction to the Responsibilities of a Cabinet Maker

Unit 1.2 Make Modular Kitchen

Unit 1.3 Understand Kitchen Layout

Unit 1.4 Making of Furniture and Assembling of Parts

Unit 1.5 Different Types of Tools and Equipment and the Processes of Operating



Key Learning Outcomes

At the end of this module, you will be able to:

1. Evaluate the responsibilities of a cabinet maker
2. Practice making modular kitchen
3. Describe the kitchen layout in detail
4. Demonstrate making of furniture and assembling of parts
5. Identify different types of tools and equipment

Unit 1.1 Basic Introduction to the Responsibilities of a Cabinet Maker

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate the job responsibilities of a cabinet maker
2. List the job skills and personal attributes required

Among furniture makers, cabinet makers are wood workers with a specialty. These furniture makers construct and install cabinets in kitchens, bathrooms other locations of businesses and homes. Characteristic duties of cabinet makers involve designing customized cabinets, constructing cabinets, installing cabinetry, coordinating with clients and various other duties. As a modular kitchen cabinet maker, you have the responsibility of cutting and shaping wood, developing surfaces and fashioning a finished product.

This job role would require you to work with a vast range of tools like drum sanders, a saw table, dust extraction system etc. You would need to become familiar with a variety of hand tools like finish staplers, jigsaws, cordless drills and laminate trimmers. Cabinet makers also handle screws, nails, wood glue, dowels and other fasteners to construct finished furniture and cabinets.

Taking accurate measurements of the client's interior space proves a vital aspect of the job, whether you are constructing kitchen cabinets that effortlessly fit into the available space, or if you are constructing an item of furniture based on precise measurements. Another important aspect is creating drawings for the client that depict what the finished item will look like, as this enables the client to visualize and proceed with the project.

Job Responsibilities of a Cabinet Maker

- Make sure that all equipment necessary for your work has been cleaned and repaired, for example, skill saws, table saws, handsaws, sanding tools and all types of drilling equipment
- While carrying out measurements and markings you need to be precise, in order to ensure that resources are used efficiently and the projects remain within the budgetary restrictions
- Produce and assemble components of the cabinet, ensuring that every piece fits the specific dimensions mentioned by the client
- Confirm and double check all measurements and calculations to make sure that there is correct alignment in relation to hinges, doors, and side panels, etc. by using blueprints or design plans for reference
- Install the suitable hardware, for instance, handles and hinges, and replenish with replacement materials, when needed
- See that materials and grains are appropriately matched to create a uniform appearance for all the matching units
- Reinforce attachments and joints to optimize durability and sturdiness without causing a compromise to either functionality or aesthetic appeal
- Keep up a safe working environment by routinely cleaning and disposing of old materials, for instance screws and nails

Unit 1.2 Make Modular Kitchen

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate the preparatory activities for cabinet making
2. Create records of architectural features present in the room
3. Evaluate the requirements of the client from supervisor

Preparatory activities for cabinet making

Take Measurements for Making Layout and Designs

1. Ensure that the measurements are accurate. Tools you would need include a straight edge graph paper and tape measure.
2. Take measurements clockwise. Make records of the overall length of each wall, working to your right around the room. Get walls, doors and windows labeled with numbers.
3. Confirm the width and height. Carry out horizontal measurements of walls at 36-inch height. Make a record of the vertical measurements floor to windowsill, beginning from the windowsill right up to top of window, and then proceed from the top of the window to the ceiling, after that from floor to ceiling.
4. Figure out the center. Designate the centerline of all permanent features in all measurements including windows, doors, oven, cooking range, sinks, walls, closets, outlets and ducts.
5. Consider the trim. While taking measurements of the doors and windows, take the casing into consideration as part of the door or window.

Doors and windows

- Take measurements the size of windows and doors, as well as the distance and height of each from the floor, ceiling, and edges.
- In case you intend on placing a cabinet under the window, bear in mind that the minimum distance between the window frame and the floor needs to be 90 cm, and preferably 105 cm.

Walls and floors

- Take measurements from the floor to the ceiling.
- Take the distance between walls.
- Measure from the corners to the doors.
- You would also need to make a record of any features that protrude into the room, for instance, as ventilation, radiators, special angles, pipes and any other major architectural features.

Sockets, switches, water connections

- After this, record the location of existing electrical water, switches, sockets, and gas connections.
- Bear in mind that these can be shuffled around to suit your new kitchen.
- Record the estimated position of the area where you would prefer these new switches, connections and outlets to be positioned.

Take records of architectural features present in the room or planned to be installed in the room in near future

- Before the construction process starts, the cabinet maker needs to make a record of the already existing architectural features present in the room.
- Included among these features are items like pipes special angles, chimney, ventilation window, exhaust etc.

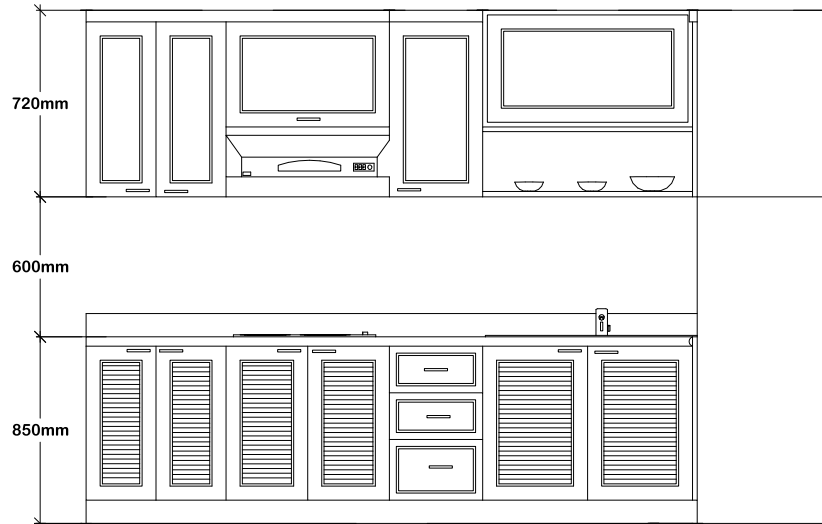


Fig. 1.2.1: Sketch diagram of elevation

- Create a sketch of the room and making note of all the architectural features present.
- You would need to maintain a log book to record the features present in the room.
- In the log book make a note of the following parameters:

Log Book	
Features	Parameters
Elevation of the room	21' 6" breadth x 23' height
Height and breadth of window	24'
Height and breadth of door	6' height x 2' breadth
Position of the chimney	Above the island
Elevation and number of sinks	36' elevation, 2 sinks

Table. 1.2.1: Log Book

Understand the requirements of the client from supervisor

A cabinet maker must understand the client's requirements thoroughly and have appropriate and correct understanding of the work task, in terms of:

- Objectives of the task/ assignment
- Specifications as per the Blueprint and AutoCAD drawings
- Phase-wise feedback on the task provided by the client
- TAT adherence, in terms of phase-wise and final delivery of the finished products
- Understanding the brief from the customer thoroughly in order to accommodate the specifications of the client regarding the aesthetic aspects of the cabinets being constructed.
- Discussing the projects at hand with the client/supervisor and drawing up detailed specifications as per their requests.
- Visualizing and interpreting the clients' wishes when it comes to style, color, kind of raw material requested etc., giving advice and making recommendations or providing options which meet/improve their original design.
- Working with the sole aim of putting in one's best efforts to abide by all client requirements, thus, in turn, completely satisfying the client and earning appreciations
- Ensuring that there is no communication gap between the modular kitchen cabinet maker and the client in understanding requirements and specifications, by providing the client with daily or weekly (as prescribed by the organization) updates on the different phases of the assignment

Assist in deciding the design shape of kitchen and size of kitchen cabinets with consultation of supervisor and or client

Above design or style desired by the client, it is essential to define a module so as to optimize performance and minimize the manufacturing costs of the different pieces. This way, measurements of all the components of a kitchen are set before defining the space that will house them.

Workspaces and Flow

- Several studies served to define five general areas in a kitchen:
- Storage area: utensils, appliances, cookware
- Cooking area: oven and stove
- Pantry area: canned goods, refrigerator, food storage space
- Sink area: cleaning area, cleaning supplies area
- Preparation area: preferably a sizeable counter space to carry out cooking prep

A kitchen's overall layout is the shape that is created by the positioning of the major appliances storage areas and countertop. This is what forms the floor plan and creates the kitchen's work triangle (the shape of figure that one follows while moving around the kitchen from the sink, to the refrigerator, to the oven/cooking range to prepare a meal).

Five different layouts are recognized in contemporary kitchens—the L, G, U, galley and single. Despite the fact that particular floor plans create a more efficient, spacious kitchen.

L-Shaped Kitchen



Fig. 1.2.2: L-shaped Kitchen

- L-shaped kitchens are the type of design that very popular among clients.
- This design is characterized by two counters joined together which then create a right angle in a corner of the kitchen.
- L-shaped layouts have the benefit of providing great traffic or work flow through the kitchen.
- This enables multiple people to work together while still allowing the space for others to walk through the kitchen without hampering any work.
- An L-shaped layout has two walls along which you can install cabinets and shelves both above and below the countertop, without requiring any additional floor space.
- In an L-shaped kitchen the third side can be used to accommodate wall niches for the gadgets like refrigerator, oven, microwave etc. and built-in cabinets.
- Preferably you would need to exploit corner storage space in an L-shaped layout.
- A carousel cabinet can also be installed which can hold several of items.

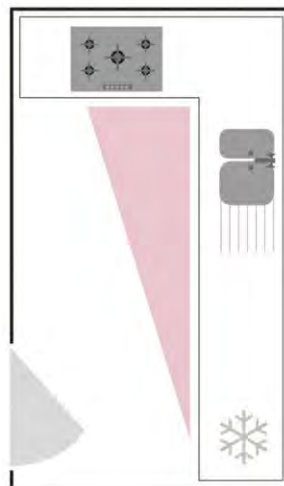


Fig. 1.2.3: Layout Plan of L-shaped Kitchen



Fig. 1.2.4: U-Shaped Kitchen

Often referred to as 'horseshoe' designs, U-shaped layouts are characterized by three walls or sections of countertop that create a semi-circle, or 'U' layout. These designs work best in big kitchen spaces that can have enough room to accommodate three countertop sections. This layout is another design that works well with a kitchen island to allow for more storage and prep space.

These layouts comprise of workspace on three adjoining walls of cabinetry. It has one open end for access. When working with kitchens that have U-shaped layouts you get the chance for symmetry within a design

The lengths of the cabinetry on a U-shaped layout can vary or be roughly the same. Both these instances allow for flexibility within the design.

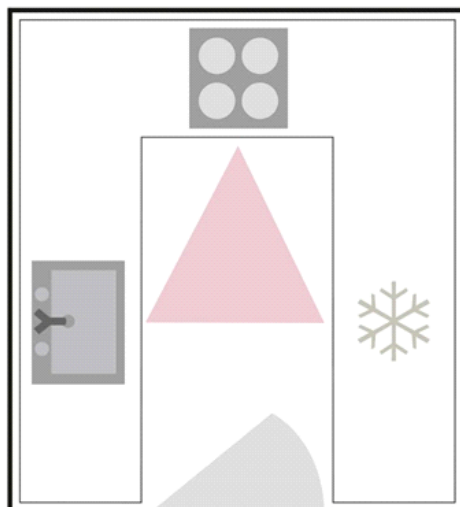


Fig. 1.2.5: Layout Plan of U-Shaped Kitchen

Straight Line Kitchen



Fig. 1.2.6: Straight Line Kitchen

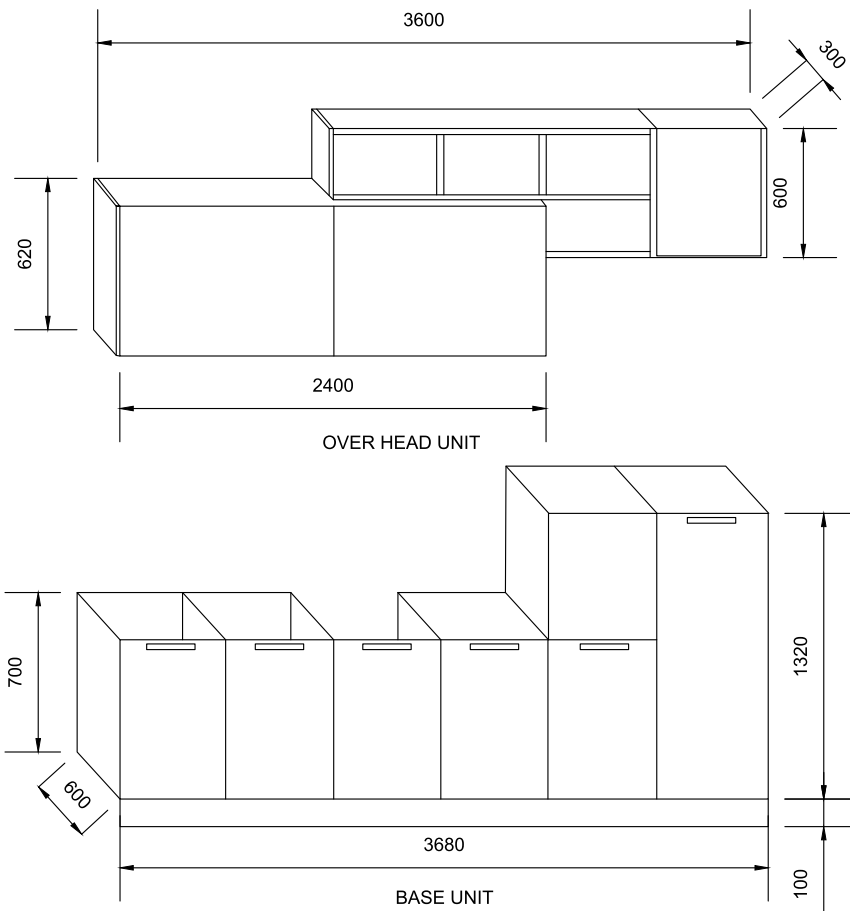


Fig. 1.2.7: Layout Plan of Straight Line Kitchen

- Kitchens in which all appliances, cabinets, and countertops are positioned along one wall is known as a straight line kitchen or a one-wall layout.
- This design allows for unhampered traffic flow.
- The work flow or triangle in this kitchen layout is not so much a triangle but rather a walk, with all the three main areas running along one side of the wall.
- Since there are no obstructions within the kitchen space, it allows for maximum openness.
- Among the various designs this is one of the easiest kitchens to design, plan, and execute.
- The entire kitchen is sectioned into three compositions which involve base cabinet, wall cabinet, and open shelves, installed in a convenient manner.

Kitchen with an Island



Fig. 1.2.8: Kitchen with an Island

Perhaps the most popular kitchen element in these years is an island that is positioned in the center of a room, with worktops on the surrounding walls. The setup gives it the appearance of an isolated island. With enough space, the element of the 'island' unit delivers a versatile space that gives homeowners the chance to easily cook, prep, eat and entertain within that space. It has the ability of acting as a 'bridge', cutting down on leg work between workstations.

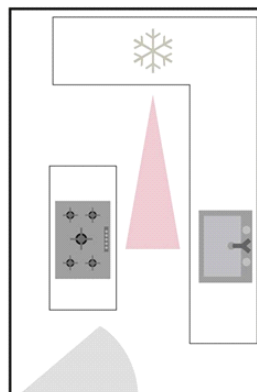


Fig. 1.2.9: Layout Plan of an Island Kitchen

Discuss with supervisor and or of client regarding placement cabinet systems, division of work zones (cooking, washing, storage etc), shifting of existing electrical outlets, switches, and water and gas connections if necessary

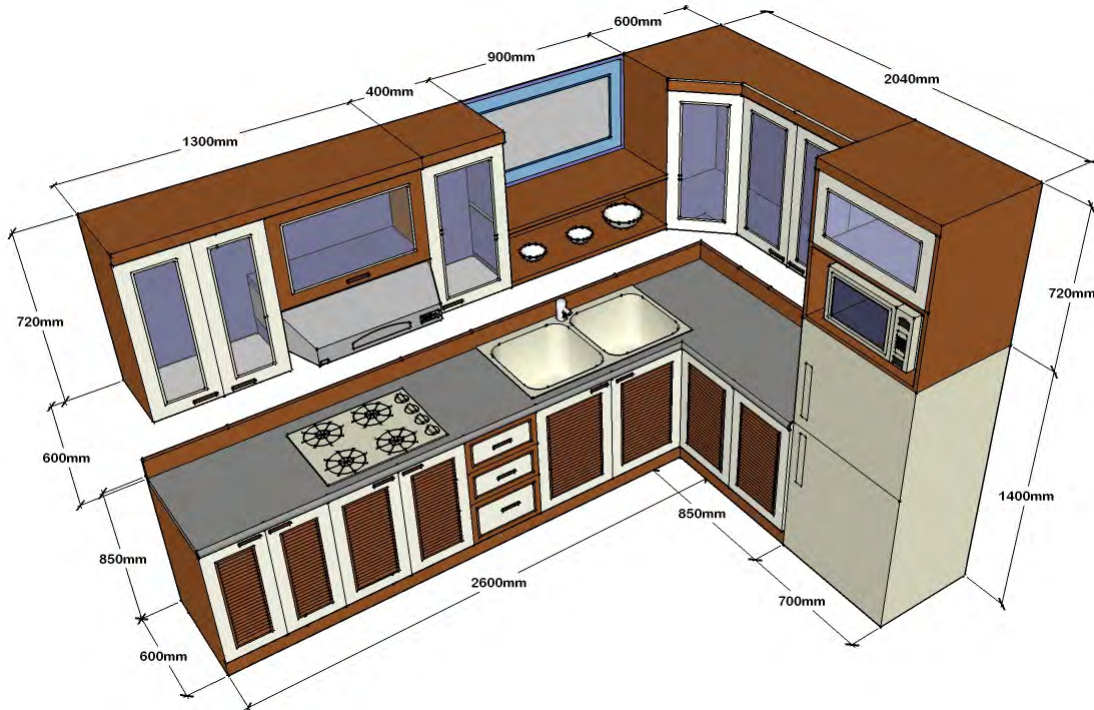


Fig. 1.2.10: Layout Plan of Kitchen Work zones

While making decisions regarding where to place appliances and cabinets in relation to each other, it can prove useful to think in terms of work zones. With this in mind you will focus on function rather than objects to fit in. The consequence would be an everyday-friendly and efficient kitchen.

The three main zones are, in relevance to the working triangle, are: **storage** (fridge/freezer and dry storage), **washing** (sink, dishwasher) and **cooking** (cooking hob, oven, chimney, microwave). Placing them well is crucial to achieving an ergonomic work triangle, with a natural workflow and everything within reach.

The following are basic tips to bear in mind when planning your work zones:

Cooking zone:

Steer clear of crossing the kitchen with hot and heavy pans and pots. Consider positioning the oven and hob in proximity to the worktops and sink.

Washing zone:

The sink can be considered as a vital area in the kitchen. Arrange to have the fridge near at hand which would allow for easy food prep. The proximity to the hob would make it simpler to do tasks like draining pasta and washing vegetables etc.

Storage zone:

In terms of storing items, there should be enough storage for all the food - both in the fridge and for dry goods. Positioning a worktop next to the fridge and high cabinets allows you to unpack shopping bags easily.

Placement cabinet systems

As regards cabinet sizing, a host of factors come into play, as you would need to design the kitchen efficiently in terms of the space.

Base Cabinet Sizes

This type of cabinetry serves as the foundation or base for countertops and other surfaces. It is positioned at floor level and often comes with one drawer and a series of shelves or a set of drawers stacked one on top of the other, as per the needs and preferences of the client. As base cabinets are installed on at floor level, they tend to carry a lot of weight, with sinks and counters installed on top of them.

The measurement of standard base cabinets is 34.5" H and 36" H from the floor to the top of the countertop when a countertop is installed.

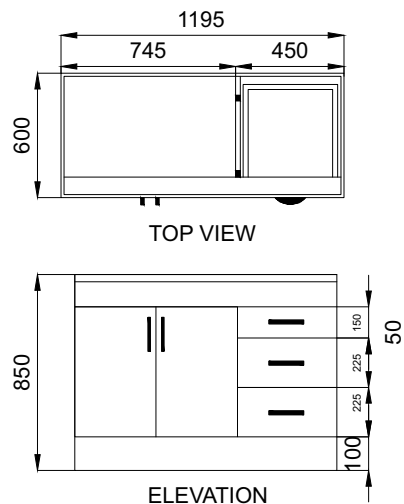


Fig.1.2.11: Base kitchen cabinet dimensions

Wall Cabinet Sizes

Wall cabinets have a design that allows it to function as both storage of kitchen supplies and food items. In comparison to base cabinets, wall cabinets give a lot more variety in sizing. Picking the optimal height for the wall cabinets is contingent on the height of the kitchen ceiling and client preferences.

Generally, wall cabinets are available in 30", 36" and 42" in height. Most commonly tall pantries are 24" deep, but 12" deep alternatives are also available for smaller spaces.

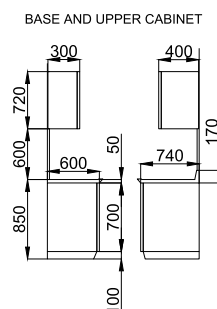


Fig. 1.2.12: Wall kitchen cabinet dimensions

Unit 1.3 Understand Kitchen Layout

Unit Objectives

At the end of this unit, you will be able to:

1. Identify different kitchen layouts
2. Analyze and study the drawing (2d/3d) and designs
3. Arrange materials and fittings hardware

Study the design & drawing (2D/3D) prepared by supervisor to further understand the requirement and specifications for the work to be done

The job of a Cabinet Maker is practically impossible without the skills of reading, studying and interpreting work orders, technical drawings and blueprints.

Ability to Interpret Work Specifications Accurately

- Work Order is a task, job or assignment, which can be assigned to a person for completion.
- A work order may be issued from the client's end or circulated internally within the organization.
- Work Orders comprise details and specifications of a certain job per work-piece.
- It explains the client's expectations about the assignment.
- The essential components of Work Orders are:
 - Instructions and Guidelines
 - Cost Estimates
 - Forms and Annexures
 - Date and time to execute the work order
 - Information about the location and entities to execute the work order
 - The person to whom the work order is assigned
- Job Orders are the work orders circulated internally within the organization.
- Job Orders are the work orders circulated internally within the organization.
- A Job Order is prepared during the initial stages of an assignment / project and is connected with the final Bill of Materials.
- The essential components of a Job Order are:
 - Quantity of the product to be manufactured, assembled, installed or repaired
 - Quantity of the raw material to be used, along with its Price per unit and the number of units required
 - The types of labour needed (casual or skilled), rate per hour or per unit and amount required
 - Machine utilization of each machine involved in carrying out the assignment, the rate and the amount

Study the drawing (2D/3D) and designs and understand the requirement Blueprint and its Parts

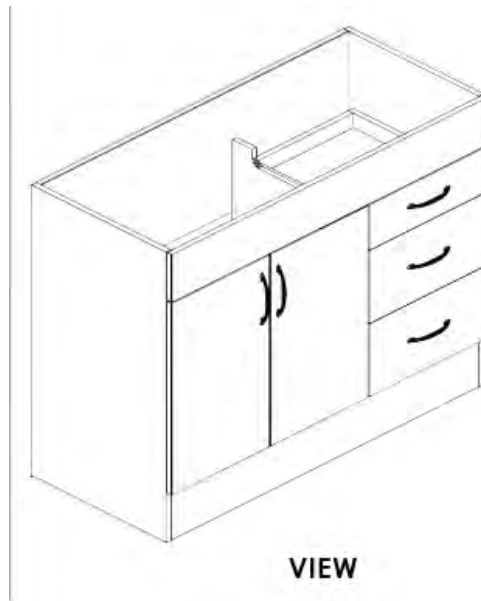


Fig. 1.3.1: Blueprint design of a cabinet

- The requisite for reading a Blueprint is interpreting 1st and 3rd angle drawings.
- A Blueprint is a 2D (two dimensional) miniature / replica of the actual work piece, prepared by scaling down the actual measurement with the product to be developed.
- It comprises the required technical specifications as well as the techniques of preparation.
- The essential parts of a Blueprint are:

Elevation View

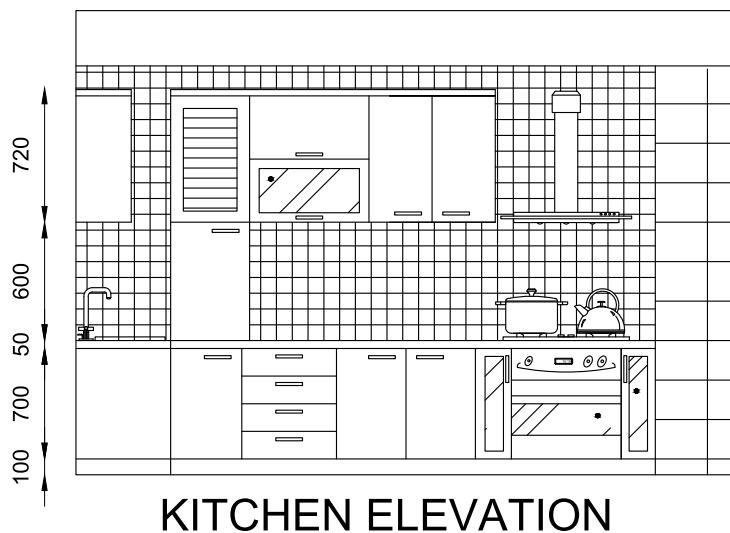


Fig. 1.3.2: Elevation sketch of kitchen

- Vertical display of one side of the project, from north, south, east or west
- Gives an idea about how the complete structure will look after installation
- Helps in determining the height dimensions

Plan View

- Horizontal display of the proposed job looking down from above
- This view is usually on a horizontal plane 30 inches (75 centimeters) above the floor
- Helps in determining the length and width dimensions

Section View

- A cut-through display, showing how an object will be built

Steps in Reading a Blueprint

- **Determining the view**
 - The Elevation view must be studied and understood first. This is a representation of the expected outcome of the project. This view indicates the height dimensions of the work piece.
 - The Plan view comes next, which indicates the length and width dimensions of the work piece.
 - The Section view must be read at the last, to get a clear idea about the sequence of the parts to be built, in order to obtain the final product.
- **Understand the scale and determine the actual dimensions**
 - The measurement scale is always exactly proportionate with the final product.
 - This proportion is usually 1:2 ratio.
 - The Engineering Scale is used, which incorporates a ratio, where one has to follow multiples of 10.

- **Reading the Title Block**

This indicates the context in which the drawing must be perceived. The Title block provides information about the following:

- General tolerances
 - Projection details for the item . component to be manufactured
 - Scale used in the drawing
 - Status of the drawing (Preliminary, Approved, etc.)
 - Name of the component or assembly
 - Contact details of the drawing owner
 - Mass
 - Units used in the drawing
 - Sheet number and number of sheets
- **Reading the Notes**
 - The notes should lie outside the Title Block.
 - The information provided by the notes are preferred to that provided by the Title Block and hence, the Notes supersede the Title Block information.
 - In case of conflicts, the Notes are considered correct over the Title Block.

- **Reading the Work Order or the Bill of Materials**
 - The work order provides the requisite details of the assignment and the requirements of the final product.
 - The bill of materials is a list of the components and the corresponding quantities that make up the general assembly of the item being manufactured.
 - The BOM is usually tabulated on the first page of the Blueprint / Drawing.

- **Understanding the differences between the various Lines and interpreting them**
 - **Visible lines** indicate an edge is visible in the relevant view
 - **Hidden lines** indicate the edge is behind a face
 - **Phantom lines** indicate edges of structure that are relevant but not included in the drawing
 - **Phantom lines** could also mean a tangent line (where a curve starts or ends)
 - **Centre lines** indicate the geometric center of the assembly

- **Understand and interpret the projections, sections and details**
 - View the drawing itself, regardless of the dimensions, trying to visualise how and what the assembly looks like in 3D.
 - Use the sections and details as a start point and you will soon realise that the details and sections have been created to highlight important components or features.
- With the aid of the BOM / Work Order, find out the components in the drawing in order to understand the role each component plays.
- Find out the notes that have arrows pointing towards the assembly. These information are extremely vital to the assembly and its functionality.
- Use the dimensions in the drawing to comprehend the size of the component / Assembly / Final product.

- **Understanding Allowances from the Blueprint**
 - Allowance is the minimum clearance (positive allowance), or maximum interference (negative allowance) between parts of an Assembly.
 - While preparing Blueprints and technical drawings, high degree of diligence is implemented to incorporate Allowances, thus ensuring "Zero Wastage".
 - This helps in reducing the Cost of Production per unit and increasing the productivity of the assignment.

Assist in listing out required raw material, furniture, hardware to meet quality standards

Raw materials required for modular kitchen cabinets

Some of the raw materials involved in constructing modular kitchen cabinets are listed below:

Solid Wood:

Solid wood refers to the timbre that is used to build structures.

- Timbre is the raw materials that are seasoned to produce workable wood.
- Timbre or the log of the tree is the first material that is processed to produce beams.

- Generally, the logs are cut horizontally to make beams.
- Beams are then sent to designated places for seasoning.

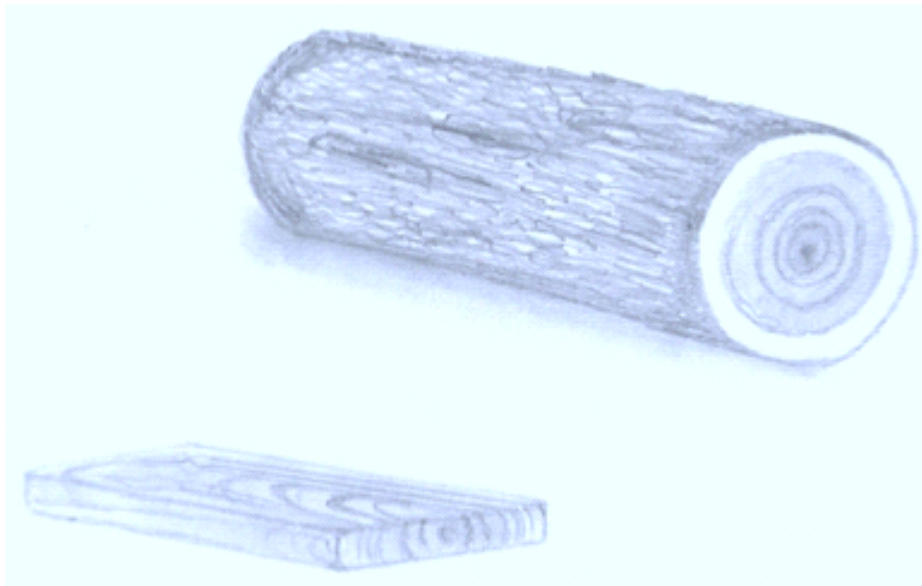


Fig. 1.3.3: Log and Beam

Engineered Wood:

Engineered wood is commonly known as composite wood.

- This is a type of wood which incorporates various chemicals, fibres, sawdust and adhesive to prepare desired type from the solid wood.
- In other words, solid wood is further processed to engineered wood.
- There are many types of engineered wood available in the market.

Some of the most important types of engineered wood are –

- a) Plywood
- b) High Density Fibre (HDF)
- c) Medium Density Fibre (MDF)
- d) Veneer
- e) Laminates
- f) Block-board



Fig. 1.3.4: Sample of engineered wood

Plywood

Plywood is a form of engineered wood where thin slices or layers of wood are glued together to form a sheet.



Fig. 1.3.5: Plywood

Plywood is used to build interior walls, ceilings, doors and cupboards in structural construction. Furniture pieces like wardrobes, side boards of cabinets, drawer bottoms can be made. Apart from these plywood is used in decorating railway coaches and trams etc.

High Density Fibre (HDF)

HDF, also known as Hardboard, is made up of highly-compressed wood fibres. The higher magnitude of compression makes hardboard denser and harder.

Medium Density Fibre (MDF)

- MDF is another form of engineered wood, which is denser than plywood.
- MDF is produced by gluing residuals of softwood or hardwood with binders like resin or wax.