

# Construction

*Making Something Real.*

# You'll build a lot of stuff

Over the course of a carpenter's career, they'll build a huge number of strange and unique things. So many types of things that going over all of them would be lunacy.

However, a lot of them are just variations on a few different things, and for the things that aren't, a good carpenter can bring some logic and experience to the table to figure out how best to build something.

Most of what you build will be different **flats** and **platforms**, just with different flavors and dimensions.

To start, let's look at a flat. How it's built and the principles of woodworking.

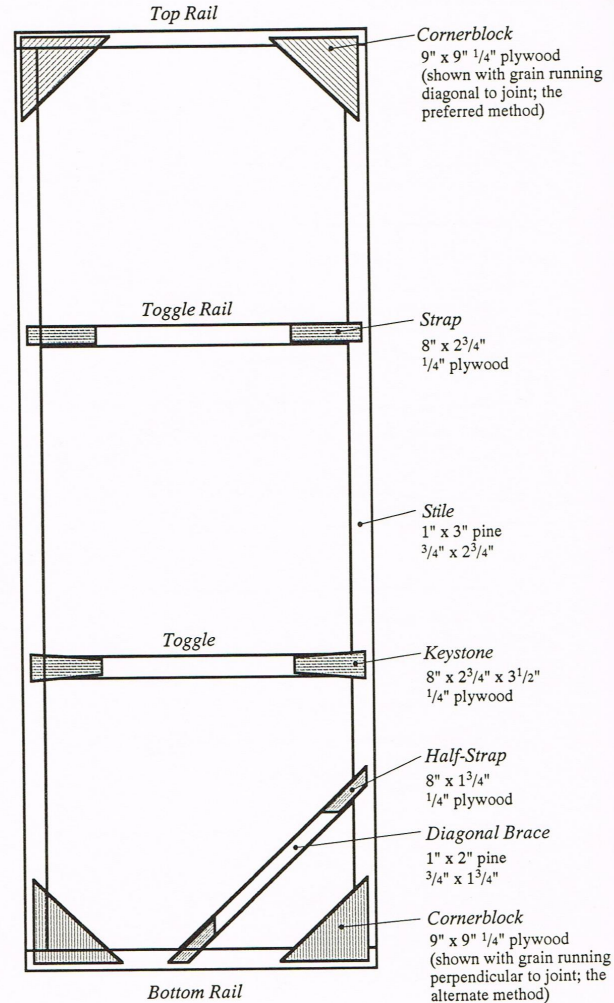
# Flat Types

- **Hollywood Flat:** silly. Identifiable by the 1"x3" being "on end." Almost always a hard cover flat.
- **Broadway Flat:** A flat with the 1"x3" flat.
- **Hard Cover Flat:** A flat with some kind of hard material on the face like wood (Luon in our case) metal or plastic.
- **Soft Cover Flat:** A flat with a soft material on the face like canvas or muslin.

# Broadway Flats

- Attached with cornerblocks and straps.
- Everything is attached with glue and staples
- Lighter, smaller, easier to fly.
- Difficult to make complex structures of.

## PARTS OF A FLAT



# Working with Wood

In theatre, we mostly use wood to construct our sets. There are many different **types of wood** as well as strange industry quirks such as **nominal vs. actual** lumber dimensions.

# LUMBER IS A JERK

## Nominal Vs. Actual Lumber Dimensions:

(this is like, **super important** to know)

Nominal is on the left, it's what we call the wood. On the right is the actual dimensions of that wood if you were to measure it yourself.

1" x 3" =  $\frac{3}{4}$ " x  $2\frac{1}{2}$ "

1" x 6" =  $\frac{3}{4}$ " x  $5\frac{1}{4}$ "

2" x 4" =  $1\frac{1}{2}$ " x  $3\frac{1}{2}$ "

2" x 8" =  $1\frac{1}{2}$ " x  $7\frac{1}{4}$ "

4" x 4" =  $3\frac{1}{2}$ " x  $3\frac{1}{2}$ "

### Why? Why would any decent person do this?

- Way Easier to say
- The wood is roughly these dimensions in the lumber mill, but shaving off the rough bits and making it shop ready loses a small amount, giving us the actual measurement.



# Types of Lumber

Does it get any more exciting? No. No it does not.

- **Sticks:** Sticks are any long, continuous piece of lumber. Made from the same tree, grain all going the same way. These are things like 1"x3" or 2"x4".
- **Sheets:** These are large, well, sheets of wood. Usually make from several pieces of wood glued together. In this category we have plywood and MDF.

# Types of Wood!

**PINE!** YEAH! We use Pine for almost all of our stick lumber. It's strong enough and cheap! Yay! For artisan projects, one might use things like maple, poplar and mahogany, but usually we'll just use pine and paint it to look like those.

Most plywood is made of pine, but for thin stuff, we use Luan, which comes from a filipino *shorea* tree. It's relatively cheap, takes paint well and is pretty bendy. Luan is awesome.





# Types of wood Continued!

**MDF** or **MULTI DENSITY FIBER-BOARD** is basically glue and sawdust squeezed together. It's not strong, but it has no grain, so it can be neatly cut and sculpted into shapes and things. Sanding makes a LOT LOT LOT of dust, so wear masks while using doing that. Very useful for props!



# Finishing Touches!

## SANDING!

- Sandpaper comes in “grits”
- High number grit is smoother
- Start with low (60) work your way up.
- Also applies to powered sanders
- Doing this makes for very smooth wood.

## Routing!

- Can be used to make pretty moulding
- Also used to *flush cut* things like overhanging plywood.



# More Wood:

Masonite:

Bendy Board:

# Actually Building Something

*And the principles behind it.*

# Construction

- Will this actually work?
- Where is the weight?
- What are the weak points?
- How do we strengthen weak points?

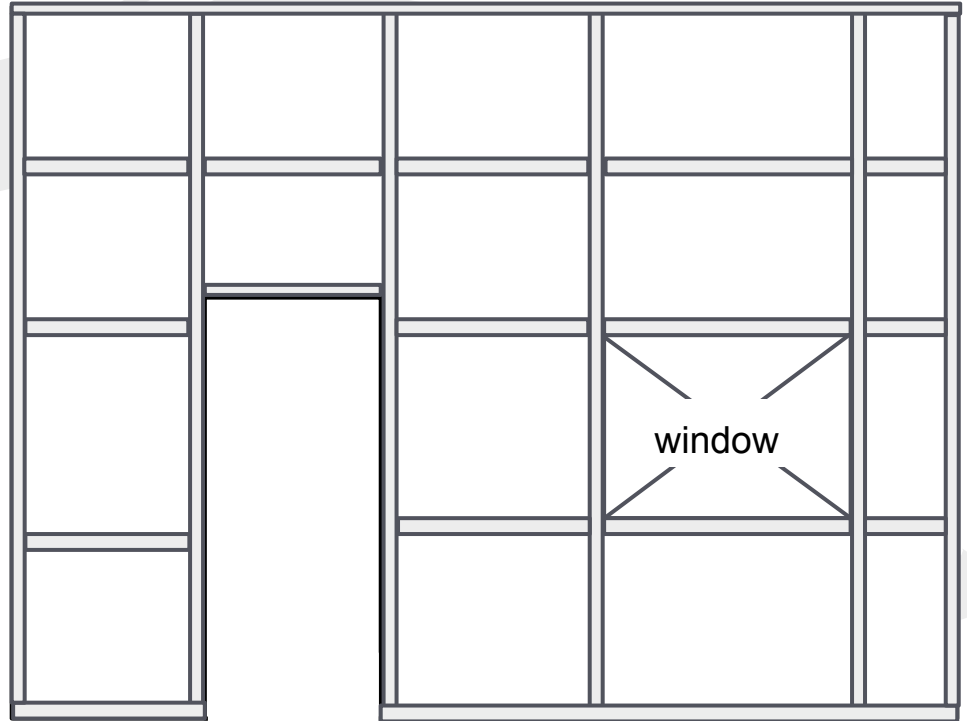
When making anything, you must consider its ability to not completely collapse, killing anyone on or near the object. This is primarily done by making sure your set piece is **supported** and that forces acting on the piece are accounted for.

Drafting and figuring out how a thing is made falls onto the **Designer** and the **Technical Director**. Often, you the carpenter will be given a drafting and told to build it.

# Construction

Here is a typical wall made, a giant hollywood flat. Gravity, wind and errant actors will try to knock this down, so we have tall, vertical supports to fight against that.

- Support at least every two feet
- Support all around doors and windows
- Utilize as many long pieces as possible
  - stronger
  - less work



# CUT LIST

A cut List is a list of all the lumber you're going to need at what size.

This is figured out by looking at a drafting of a set piece and looking at each piece of wood that we're going to need to make it. Let's look at a typical hollywood flat that is two feet wide and four feet tall.

So this 2' x 4' flat is made of 6 pieces of wood. To find this, we use the given measurements and account for things like the **width of lumber**. The middle piece (toggle) won't be 2 feet wide because the two vertical pieces already make up some of that width (1 ½" of it).

So to make it really 2 feet wide, the toggle has the width of the verticals taken from it, making it 1' 10 ½"

1" x 3" cuts

2 @ 2'

2 @ 3' 10 ½"

1 @ 1' 10 ½"

¼" Luan Cuts

1 @ 2' x 4'



# Measure Twice...

With your drafting and your cut list, you are ready to create your thing.

- Cut stuff
- Lay it out
- Assemble pieces



# Finishing Touches

Once your set piece is built, there are some final touches to make it truly finished:

- **Leveling:** Making sure your piece sits flat
- **Connecting:** Attaching a piece to another piece. Screws for light use, bolts for heavy use. Coffin locks and others for attaching and unattaching.
- **Detail pieces:** Such as molding.
- **Spackling and Sanding:** To get it ready for paint.