

# BUILDING YOUR FRAME

This Section is how to build your frame for your M2. It is split into six main sections: Building the wasteboard, building the top beam, leveling your frame and attaching your material, mounting the chains, mounting your M2, and connecting your DUE board.

**Drew's Note:** We recommend reading this entire section before beginning.



### BUILDING YOUR FRAME PART 1: WASTEBOARD (BAG D)

The next step to starting your M2 CNC adventure is to build the frame that will hold your material and the M2 while it cuts. The M2 mounts for your frame are included, but you will need to purchase the following from a local hardware store to build the standard 4x8' frame. If you already have a Maslow frame, you're good to go!

**Drew's Note:** The four most important things to keep in mind when building the frame are:

1. The bottom of your wasteboard should be 12" from the bottom of your legs.
2. The wasteboard should be clamped or screwed onto the stud mounts, to maintain a 15 degree angle.
3. The target distance of the motor offset (from where the chain leaves the motor sprockets to the top of the wasteboard) should be at least 18" for a 4'x8' frame.
4. Your top beam and wasteboard must be level and equal distance from eachother.

#### Wood needed:

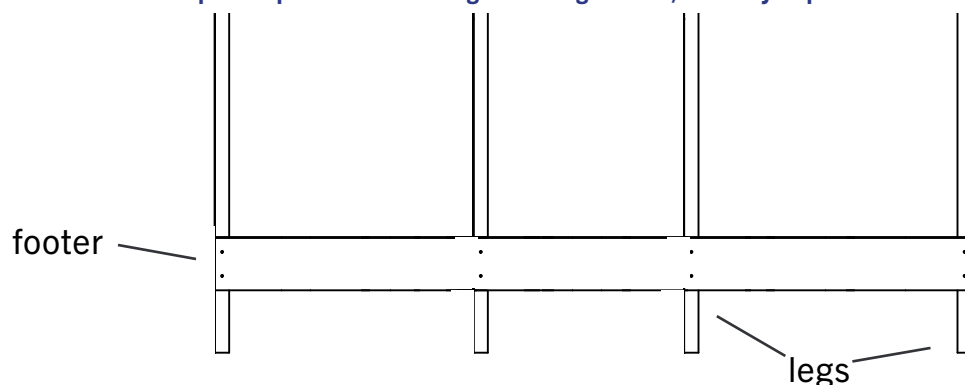
| Item                      | Quantity | Use                    |
|---------------------------|----------|------------------------|
| 2"x4"x8' Board            | 3        | Frame Legs and Support |
| 2"x4"x10' Board           | 1        | Top Beam               |
| 1"x6"x8' Board            | 1        | Footer                 |
| 4'x8'x3/4" Plywood or MDF | 1        | Wasteboard             |

The Frame has 2 main parts: The top beam that holds the motors, and the wasteboard that you clamp or screw the material that you are cutting to.

**Drew's Note:** The size of material the M2 can cut is only limited by the chain length. These instructions are based on the chain included with your M2 and will walk you through how to set up your kit to cut material almost to the edge of the 4x8' space. These instructions are based on attaching the Top Beam to a wall. If you are intersted in a different frame size or design, check out our [M2 Resources page](#) or the [Owners group on Facebook](#) for help!

1. To build the wasteboard, cut the (2) 2" x 4" x 8' boards in half to make the four legs.
2. Line all four boards up and measure up 12" from bottom. Use a speed square to draw a line.
3. Place the 1" x 6" x 8' footer board across the legs, underneath the 12" line. Arrange the legs with one on each end and two spaced out in the middle. Attach the footer to the four legs with D1 screws underneath line. This will ensure your wasteboard is 12" from the ground.

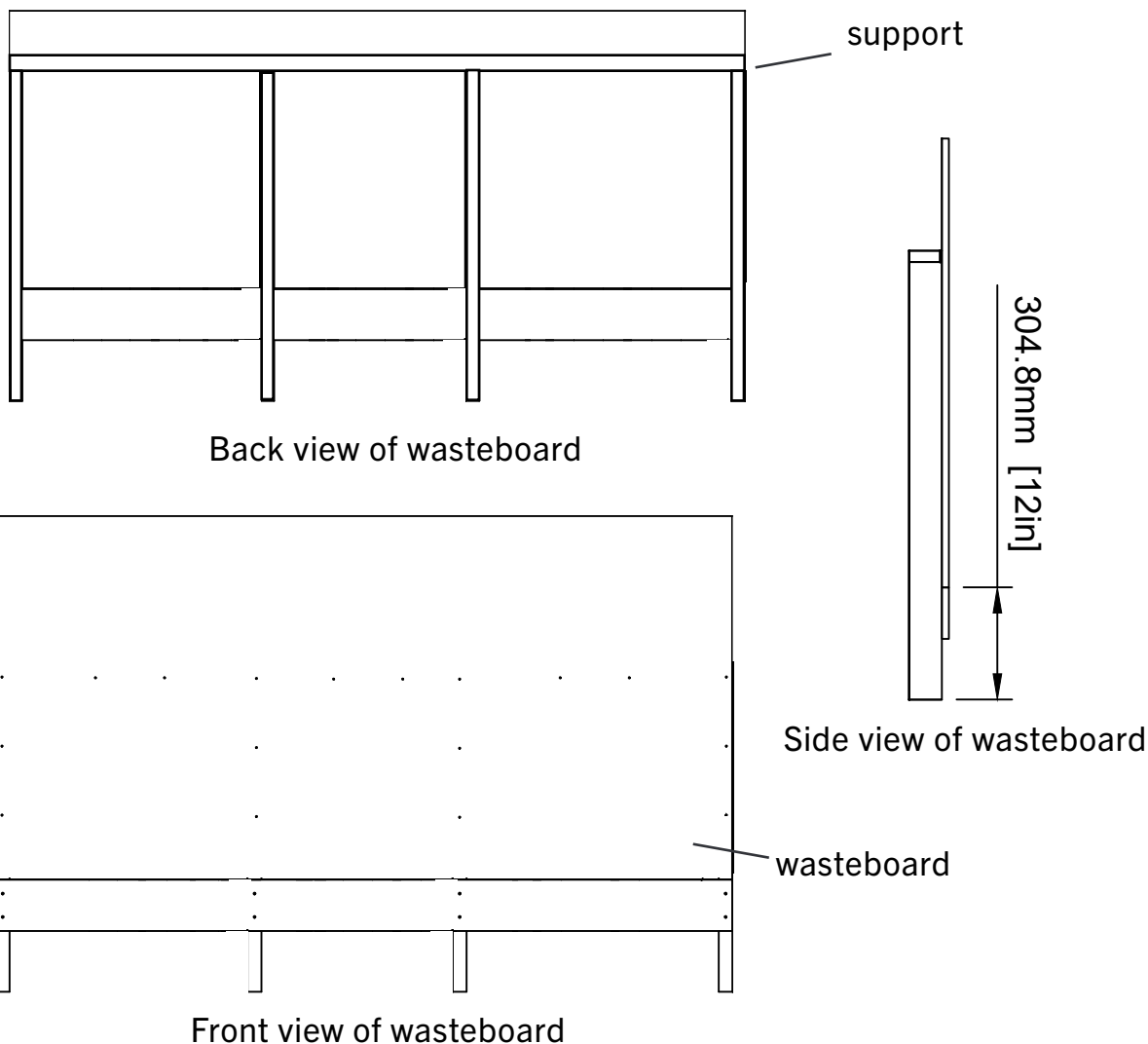
**Drew's Note:** Use a speed square to attach legs in straight lines, it's very important that this is square!



## BUILDING YOUR FRAME PART 1: BUILDING THE WASTEBOARD (BAG D)

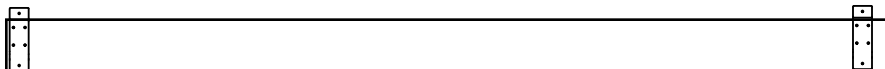
4. Set the 4'x8' Wasteboard on the footer. Attach to legs with D2 screws. This will help to flatten your wasteboard for smother cuts.

5. Place last 2" x 4" x 8' support board across the top of the legs. Attach with D2 screws to top of legs. Screw wasteboard into support, to help keep your wasteboard flat.



6. Two of the stud mounts will hold your wasteboard at the top corners, so it rests at a 15 degree angle when you're cutting (with the largest end closest to the ground). Find two studs in your wall that are 8' apart and mark them. Then, lean the wasteboard against the wall and align one of the studs close to the edge. Hold the stud mount between the wall and the leaning wasteboard and mark the top hole of the stud mount. Attach it to the stud in the wall using D2 screws.

**Drew's Note:** The bottom of the stud mounts will be about 53" from the ground. This is an x-ray example of the wasteboard with the mounts attached to the studs, they might not be right on the edge.



## BUILDING YOUR FRAME PART 2: BUILDING THE TOP BEAM AND ADDING THE X/Y MOTORS (BAG D, BAG E)

1. Measure the distance from the ground to the bottom of the stud mount. Attach the other wasteboard stud mount to the stud on the opposite side at the exact same height.



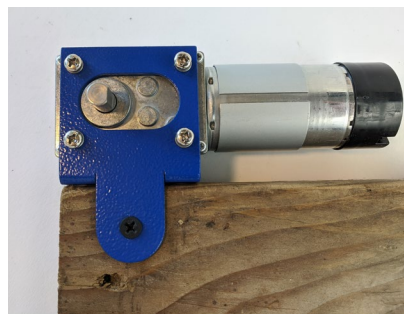
2. Lean your wasteboard against the stud mounts and arrange it until it is level across the top. Clamp the wasteboard to the stud mounts and mark 10" up from the top of your wasteboard on the wall above each stud mount. This will be where the bottom of the top beam stud mounts will attach to the wall and ensure the required 18" distance between your wasteboard top edge and the top of the to be installed motor sprockets.

3. Measure and mark the exact middle of the 10' top beam. Repeat on your wasteboard. Then measure how far the wasteboard stud mounts are from its center. Mark the equal distance on your top beam, to ensure your top beam will be centered with your wasteboard. Attach the stud mounts to the 10' top beam with D1 screws and a speed square. Ensure that they are the same distance up from the bottom of your beam, and the larger end is placed to be closest to the ground. Pilot holes that are 0.5" from the bottom edge can help.

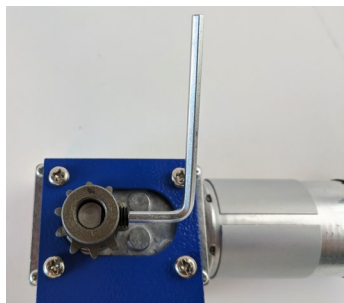
4. Attach the motor mounts on each edge of the top beam, flush with the ends. Use one D1 screw on front and four on top.



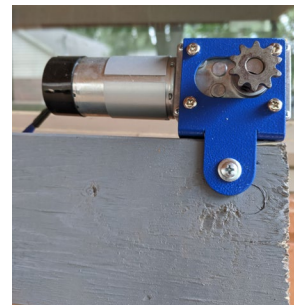
5. Place motor in left bracket, with cylindrical end toward center. Slide lock E4 washers over E3 screws and fasten screws through the front of the motor with a Phillips Screwdriver.



6. Attach E1 motor sprocket by inserting the E2 grub screw into the gear hole, aligning with the flat side of the motor shaft, and tightening with E5 Allen wrench to prevent slipping.

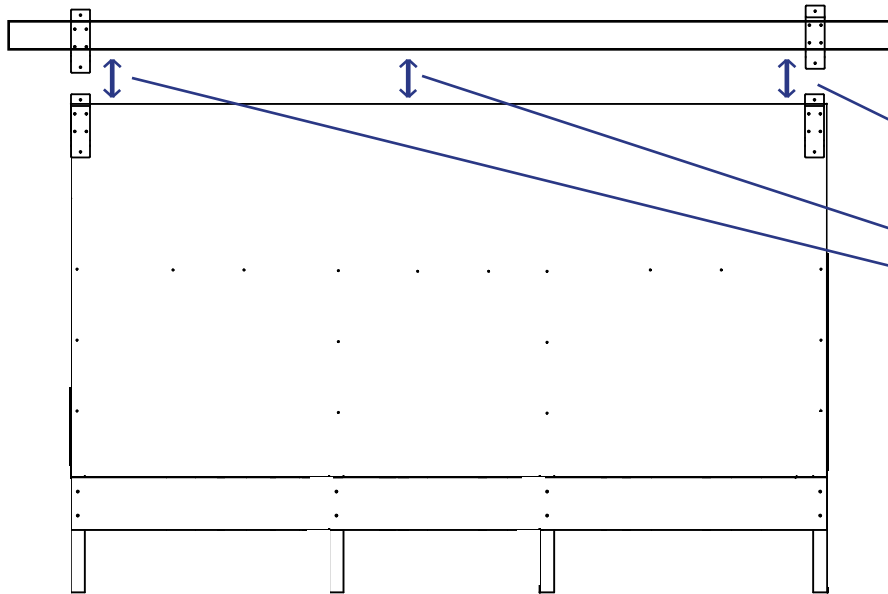


7. Repeat steps 5 and 6 to mount the motor on right side.



## BUILDING YOUR FRAME PART 3: LEVELING YOUR FRAME AND ATTACHING YOUR MATERIAL

1. Mount the top beam to the wall using your guide marks from Step Two and ensure that it is level. To mount, line up the bottom of the stud mounts with the wall marks you made. Only screw one D2 screw into the top of one side. Level your top beam by holding the other side against the wall, using your 10" mark as a guide. Hold a level against the top edge, and screw in the top of other side when it's level. Screw in the bottom of the stud mounts.



**Drew's Note:** Double check that the top beam and wasteboard are level with each other, the same distance apart, and the centers are aligned! Even a tiny difference will throw off your calibration.

2. The material you are cutting will need to be clamped to the wasteboard stud mounts or screwed into the wasteboard. We recommend both clamping at the top and screwing in at the bottom to prevent warping.

If you want to screw your wasteboard to the wall and not use clamps, mark on your level wasteboard where it rests on the stud mounts. Remove the wasteboard stud mounts from the wall, and attach using those guide marks. Reattach to the wall into the same top holes you measured in the last section. Double check that your wasteboard is level, and adjust as needed.

**Drew's Note:** Always clamp or screw the material you're cutting to the Wasteboard Stud Mounts so it doesn't move.

