HOW TO

BUILD YOUR OWN CLIMBING WALL AT HOME

UNCARVED BLOCK EST. 1996
CLIMBING HOLDS

Building your own rock climbing wall at home is one of the most effective ways to improve both skill and strength. Allowing you to not only take on more challenging climbs sooner but also enjoying the thrill of rock climbing at any hour.

A purpose-built timber frame & plywood climbing wall can be as straight forward or as complex as you like. To build any wall, the steps will generally remain the same. This is a rough outline of where to start and things to keep in mind.

BUT PLEASE NOTE
THE FINEPRINT [IN GIANT FONT]

Due to the case by case nature of building your own wall, we have to let you know that this document is to be used as a guide only and Uncarved Block cannot be held liable for any damage or injury caused by, during or after the build. If you are uncomfortable with any of the steps, engineering specifications, tools used etc, we highly recommend engaging a professional. See the list at the end of this document for someone in your area.

The information in this document is provided as a rough guideline for building a climbing wall along with tips and recommendations only. None of the climbing wall designs in this document have been drawn, certified or provided by engineers or architects and they do not meet any known standards for climbing wall design & construction. Consult an engineer or builder prior to constructing your wall.
(Australian Standard 2316.1-2009 for commercial Climbing Walls)

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This document is broken down into 2x parts.

Firstly.....

To build a wall, we first need to wrap our heads around the process, what's required and the best workflow. The next few pages do just that.

Secondly.....

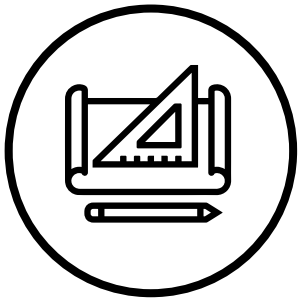
Lets build! In this step-by-step instruction guide we are going to make a simple frame and wall panel to use at home. This guide will show you all the elements required and rough costs so you know how to budget your build or go bigger if you want to dive into that shoebox under the bed.

Let's do it!

IT'S QUITE SIMPLE REALLY

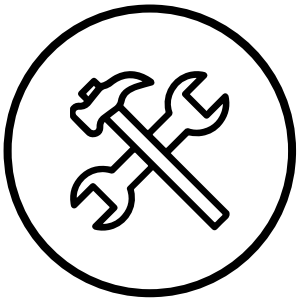
THREE KEY STEPS

DESIGN



GATHER

BUILD



FIRSTLY.....

LEARN.....

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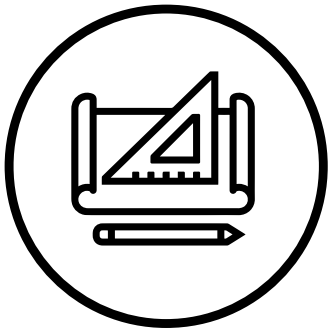


STEP 1.

DESIGN

The design of your climbing wall is going to be a product of many variables including, but not limited to:

- Your budget; do it yourself or pay someone else?
- Your level of building/carpentry skill and knowledge
- Space available, do you rent the space or own it?
- Primary user group
- Location: basement, shed, 2nd floor, what limitations?
- Goals for using the wall: is it for fun or some serious training?
- We are assuming your wall is not a commercial venture
- Browse youtube and google to see wall builds others have made. Ispiration can really help at this stage of your build.

For our particular build we are going to make a simple 1,200mmW x 2,400mmH plywood wall panel and frame. A great starting point and practice point for future bigger better wall builds.

STEP 2.

GATHER

Now you need to gather the materials needed to construct your wall. To build safely, you will require all the obvious carpenters tools (drill, drill bits, hammer etc) for construction. Depending on the complexity of your build, you may require some other specialised hardware. This list is by no means complete and will be different for everyones individual design, but it will give you a good idea of the tools to consider.

- Carpentry tools like saw, screw driver, hammer, drill with bits etc
- Structural plywood 1,200mm x 2,400mm x 17mm (minimum)
- Dimension lumber such as 4x2, 6x2 depending on your design
- Wood screws, metal screws as required
- 3/8” threaded t-nuts
- Primer and paint if you decide to paint and / or texture your wall
- Textured paint, or your own recipe
- 3/8” bolts
- Climbing holds
- Some friends to help

STEP 2 cont'd

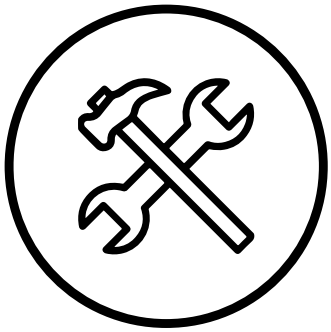
GATHER

For our basic plywood wall with timber framing, we will need the list of items below.

- **1x** sheet of structural plywood 1,200mm x 2,400mm x 17mm
  Cost - **$75**
- **3x** 4,500mm lengths of 90mm x 45mm treated framing timber
  Cost - **$27.14/length**
- **16x** 60mm x 60mm x 40mm x 2mm galvanised right angle reinforcing brackets
  Cost - **$10**
- **50x** 3/8" threaded t-nuts
  Cost - **$11**
- **64x** 10 gauge hex head timber screws
  Cost - **$18 (for 2x packs of 50x)**
- **17x** 14 gauge timber bugle batten screws
  Cost - **$15**
- **1x** Drill
- **1x** 12mm drill bit (to drill T-Nut holes)
- **1x** 3mm drill bit (to drill pilot holes for batten screws)
- **1x** 5/16" hex head socket
- **1x** 5mm hex driver bit
- **1x** Tin of paint to suit your style

On the assumption you have your own drill with required bits and a tub of paint from your last sunday project laying around, the total cost for this wall build will be around **$420.**

Top tip, shop around or hit the local tip shop to find some bargains!



STEP 3.

BUILD

Building the Frame.

Construct the frame that will be holding the plywood. For framing standards please consult an engineer.

In this build we will be making a very simple 1,200mmW x 2,400mmH vertical climbing wall showing the framing. Generally the spacing between the studs should be 600mm (to the centre of the stud)

The angle of the wall can be anything you like from vertical to steeper angles like 60 degrees past vertical and completely horizontal.

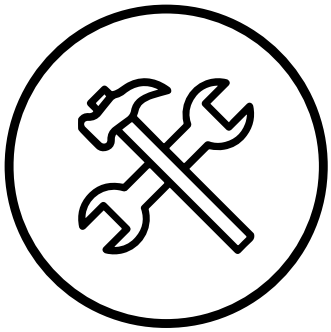
Steeper walls will require more framing that should be designed specifically to support the wall. Again consult an engineer.

Preparing the Plywood.

If you will be texturing or painting your wall, you can do this first and paint every sheet of plywood you think you will need. If you use 17mm plywood it is also possible to paint the wall as the last step. If you use a roller to paint the wall, it is unlikely you will get paint in the t-nut threads if you are careful. The t-nut is only 11mm in depth, which will leave you a buffer of about 5-6mm to the surface of the plywood.

The plywood in our build has been painted with a nice blue from an old job we did. Don’t pay extra for textured paint, make your own. Simply add some dry, fine beach sand to a latex paint in whatever colour you choose. A good ratio is for every 4L can of paint add 1-2kg of sand. Apply as normal with a roller.

Cheap Paint? If you are not too set on a particular colour for your wall, head to a hardware store and go to the paint section. Most will have



STEP 3 cont'd

BUILD

a an assortment of pre-tinted paint that customers have returned or changed their mind about. You can get a 4L tin of paint for 50-70% off!

Plywood Choice? We recommend to use a minimum thickness of 17mm plywood for your wall. Structural plywood is best and comes in sheets of 2,400mm x 1,200mm. Try to stick away from form ply as the holds can spin once mounted. Likewise, steer clear of non-structural ply as it will degrade too quickly and may cause failure.

TIP: design your wall to utilise full size sheets of plywood and save yourself lots of measuring and cutting!

Drilling Holes in the Plywood for T-nuts.

Now that the frame is ready you need to drill holes in the plywood and insert the t-nuts which will allow you to attach the holds to your wall. In our build using only one sheet of ply we will mark up and drill the panel in one go. If your wall is going to be bigger using multiple sheets, stack them together and raised off the floor with saw horses or similar. Drill according to the spacing of the framing for the wall they are going on. Drilling multiple sheets at a time saves time and you lots of drilling.

TIP: Use a drill bit that is closest to the diameter of the t-nuts, without being exactly the same size to make hammering them in harder. Having a better fit will help to ensure the t-nuts go in straight. For all the t-nuts we carry, the best size drill bit is 12mm or 7/16”

TIP: If your wall has uniform framing, mark the studs on one sheet of plywood, then place this sheet on top of your other sheets of plywood and drill as many sheets as your drill bit will accomodate at once and save yourself a lot of drilling.

TIP: When drilling the holes for the t-nuts through multiple sheets, it is very important to keep the drill bit perpendicular to the plywood.

STEP 3 cont'd

BUILD

TIP: placement of the holes for the t-nuts can be random or in a grid, (just not where your studs will be) a good ratio is 50-100 t-nuts per full sheet of plywood.

Adding T-nuts to the Plywood.

The holes are drilled, now it is time to hammer in the t-nuts.

TIP: if you can, lay the plywood flat on the floor, concrete is the best, get some ear plugs, and hammer away.

TIP: Try hard to hammer the t-nuts in straight, as this will reduce cross threading later when you attach holds.

TIP: This is a job for your mates!

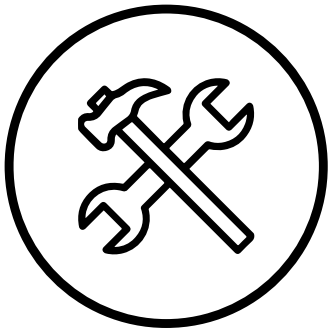
TIP: Hammer the t-nuts in until they are flush with the plywood.

TIP: Make sure you get the t-nuts flush with the plywood. Yes, attaching a hold and tightening it will pull the t-nut flush to the plywood, but it places a lot of stress on the t-nut where the threaded sleeve joins the base and weakens it enough for it to fail, especially zinc plated t-nuts.

TIP: Over-tightening holds pulls on the t-nut threaded sleeve, and weakens it where it joins the base of the t-nut.

Attaching the Plywood to the Frame.

Using at least 10 gauge wood-screws that are twice the thickness of your plywood or more, attach your plywood to your frame from the bottom up. Screw density should be approximately every 20 cm or more along the outside edge of the plywood and along any internal studs.



STEP 3 cont'd

BUILD

Add Climbing Holds to your Wall.

Second to last step is to attach your climbing holds to the wall. The majority of climbing holds will be attached to your wall using bolts with a 3/8" thread, that come in a variety of lenghts and made of a variety of metals. You will need an Allen key to tighten the holds or a special tool designed specifically for this purpose.

Some holds are attached with only screws and are called, obviously, screw-on holds and all you will need is some screws and the appropriate screwdriver.

There is no proper orienation for a climbing hold. However different orientation will make most holds either more positve and easier to hold onto, or harder. Thus you can change a wall simply by changing the orientation of the hold. Since you went to the trouble of hammering in about 80 t-nuts per sheet of plywood, you can also change your wall by moving the holds around.

TIP: Do not over-tighten holds. It will weaken the t-nut, and it could potentially fail.

YOU DID IT...

NICE WORK!

So now your wall looks like a climbing wall!

Good work on a job well done. You've now made your wall in three simple steps.....but.....

OK, WE LIED, THERE'S

A COUPLE MORE STEPS

DESIGN GATHER BUILD

STEP 4.

PADDING

No bum is safe.

Now that you have a climbing wall you are going to need a soft surface to land on. There are many ways to accomplish this and again depends on your budget. Contact a local upholsterer and make a deal to take all their off cuts for a couple months, as they have to pay the local landfill to dispose of it. That is of course if they actually throw away their offcuts, as foam is very, very expensive.

Once you have ample amount of offcuts, cover the lot in low pile or thin industrial type carpet that you can also easily recover from the tip for next to nothing. To prevent the carpet from moving all over the place screw it to the very bottom of your wall. Padding will not be required within about 30-40 cm of the base of your wall.

If you need thicker padding, old mattresses work great. Once you get a couple layers of mattresses piled offset like bricks, apply some of the foam offcuts on top, then the carpet and your good to go. If your wall is not too big you can also use a bouldering pad for softening landings.

STEP 5.

CLIMB!

You've Done it!

Now, you are ready to climb.

Some accessories you may want to consider are chalk and a chalk bag to help keep your hands dry, some route/problem marking tape to create some boulder problems.

8b Plus Chalkbag

Chalk

Metolius Climbing Tape

For our full range, head over to

uncarvedblock.com.au

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SECONDLY.....
BUILD.....

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STEP 1.

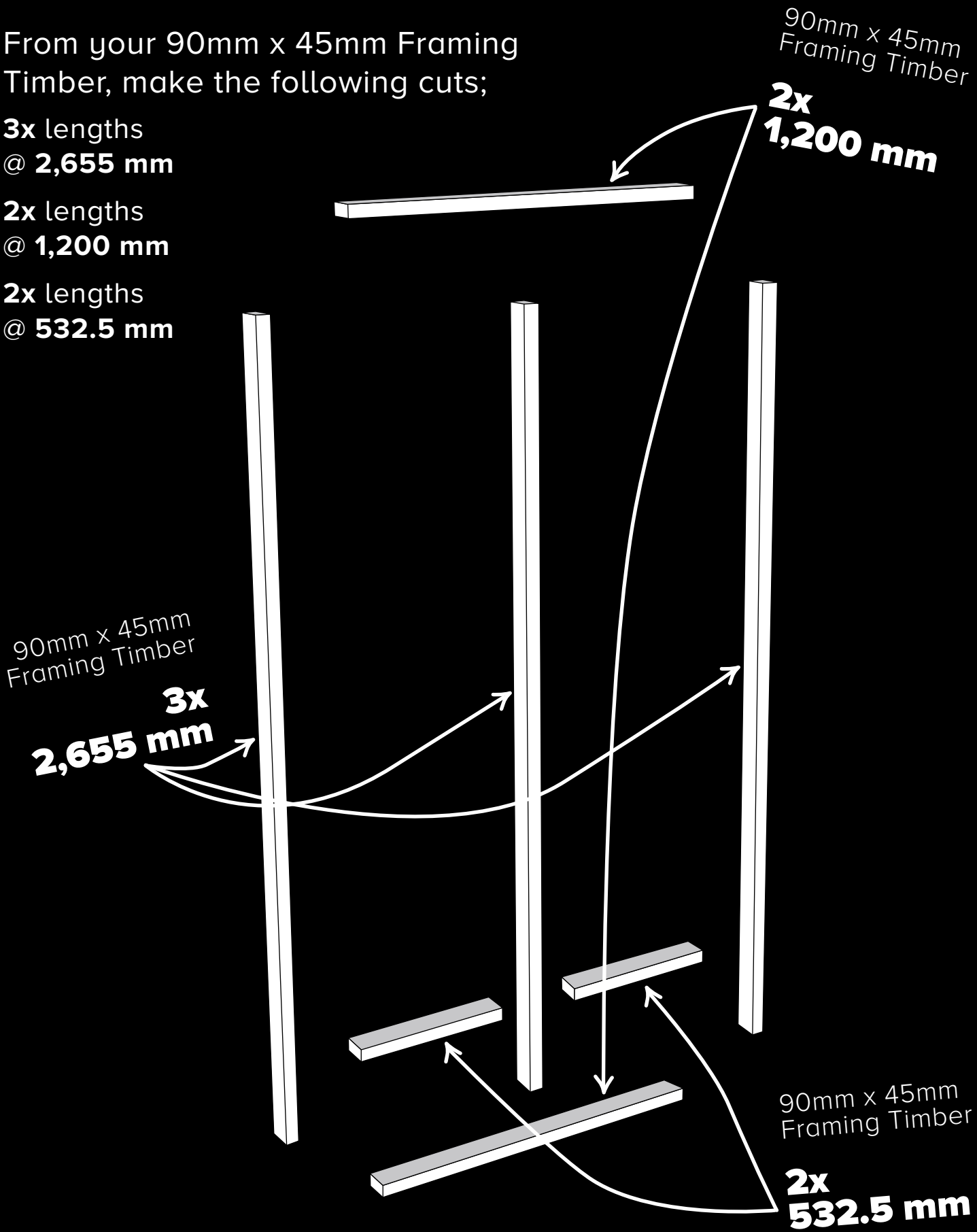
CUTS

From your 90mm x 45mm Framing Timber, make the following cuts;

3x lengths
@ **2,655 mm**

2x lengths
@ **1,200 mm**

2x lengths
@ **532.5 mm**



STEP 2.

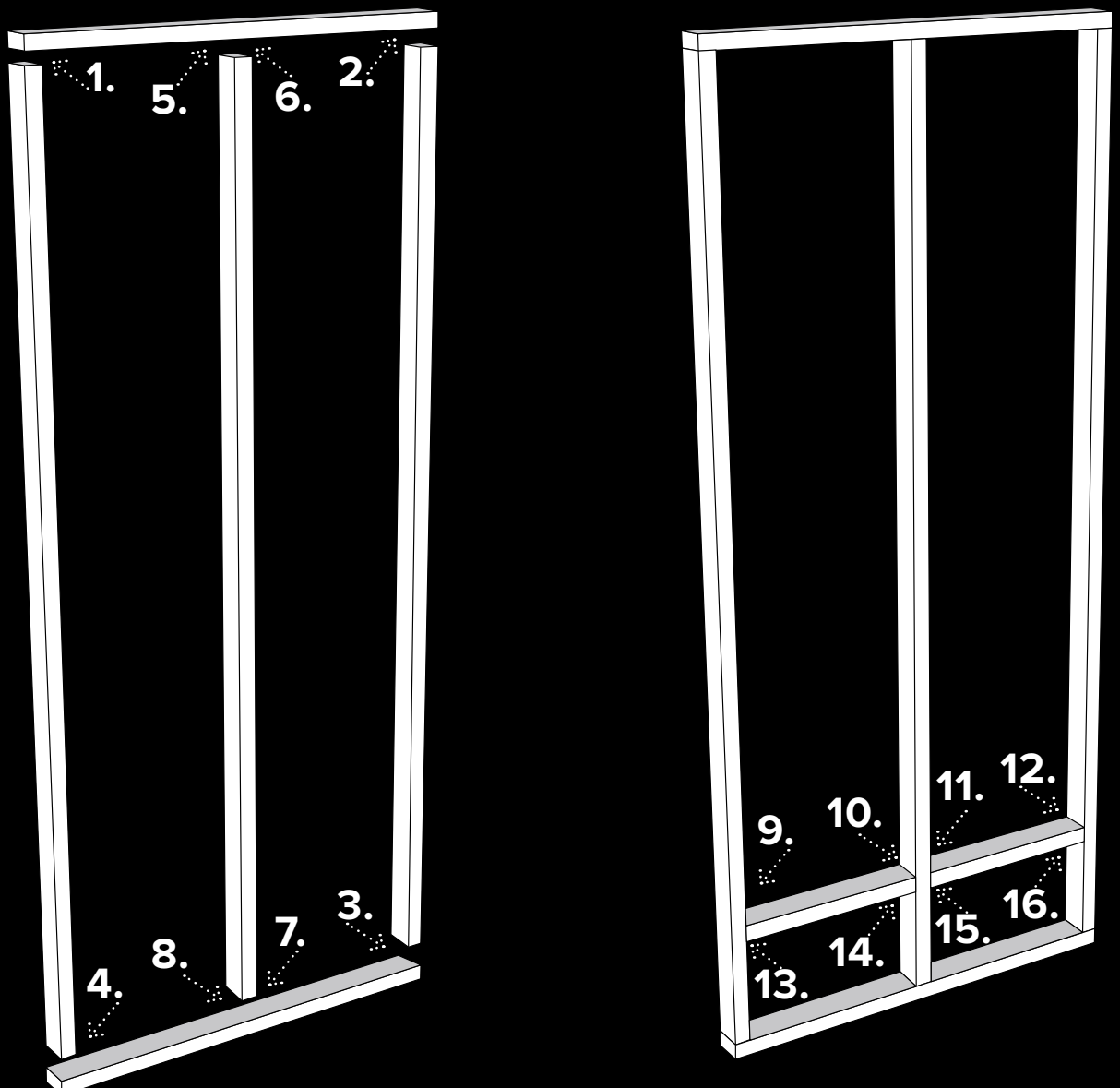
A GOOD SCREW

Now it’s time to put the frame together.

Grab yourself **16x** 90° bracing plates. We’ve used 60x60x40x2mm braces.

Screw the framing together using 10 gauge hex head wood screws. We find it easiest to start in the top corner, work your way around the outer corners, then do the middle to finish off.

Make a mark 345mm up from the bottom, insert the smaller timbers and align the bottom at your mark, then fix off the same way as the other corners.



STEP 3.

PLY PANEL PREP

Now is the time to paint or texture your wall.

For our wall we are going to use some old paint we had laying around from a previous job. This can save you money provided you are ok with what you have laying around.

To spice it up a bit, feel free to paint a pattern, logo or let the kids go nuts with some creative “artwork” to give your wall a unique vibe. See if you can paint a rock texture... go on, dare ya’

At this point as noted in the earlier guide, you can use some sand or textured paint to get a more real life texture to your wall.

Make sure you paint both sides of your panel and all edges if you will be using your wall outdoors. This will help with the longevity of your materials and reduce the risk of any part failing down the track.

Go on,
Get creative!
Post your wall
design on instagramand
#uncarvedblockDIY

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STEP 4.

GRAB A TAPE

Tape measure time!

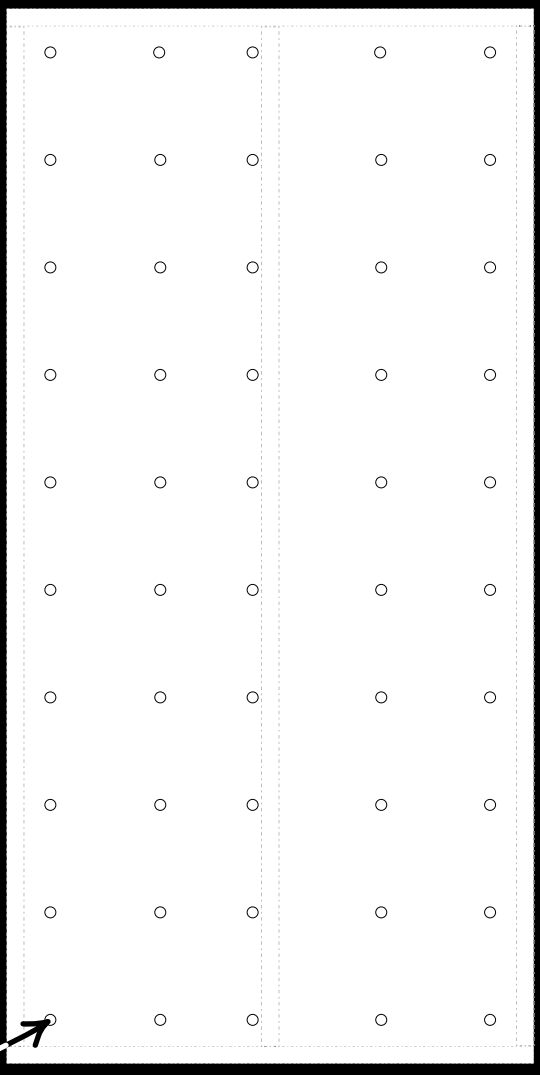
Throw your piece of ply in a comfortable spot, on trestles if you have them, or just straight on the ground if it's easier.

We will now mark out the holes to be drilled for the T-Nuts. Start at the bottom left of your panel and mark up and in 100mm, pencil a spot here. Still at 100mm up make marks at 300mm, 560mm, 850mm and 1100mm across the panel.

Now we need to do the same at the top. Start at the top left of your panel and mark down and in 100mm, pencil a spot here. Now mark a spot at 300mm, 560mm, 850mm and 1100mm across the panel.

Draw a straight line from the spot at the top to the bottom at each measument across.

Now starting on the far left line, mark a spot every 245mm down from the top spot until you reach the bottom. Continue this process along each vertical line.



NOTE: The mark at 560mm is not centred so the bolt in the t-nut isn't pushing into the frame behind when fixing.

STEP 5.

BZZZZZZZZZ

Grab your drill, and stretch your arms, this might tire you out.

Using a 12mm timber drill bit, drill a hole on each spot across the panel, yup there's 50 to get done, so get to it! Make sure you drill down nice and straight, if you go at an angle you may have issues down the track with cross threading or risk of T-Nut failure.

STEP 6.

BANG! BANG! BANG!

Alrighty, well, we're not going to lie, this is the s$%t bit.

Firstly make sure you lay your panel with the face down, you know, the side you made look so pretty earlier. If you're worried you may damage your finest artwork, just lay the sheet on the grass in your yard, or use a towel to lay under as required.

Grab some earmuffs, a hammer and start hitting in those T-Nuts.

Place the T-Nut into the hole and give it a gentle tap to seat it.... then swing away.

Continue this process to fix all 50x T-Nuts into their holes. Make sure you are hammering the T-Nut flush with the ply.

We find this process a lot easier if you have a nice flat hard area like a carport or concrete slab.... in the shade if possible, you're going to get sweaty.

NOW YOU HAVE A FRAME AND A WALL PANEL

WELL DONE!

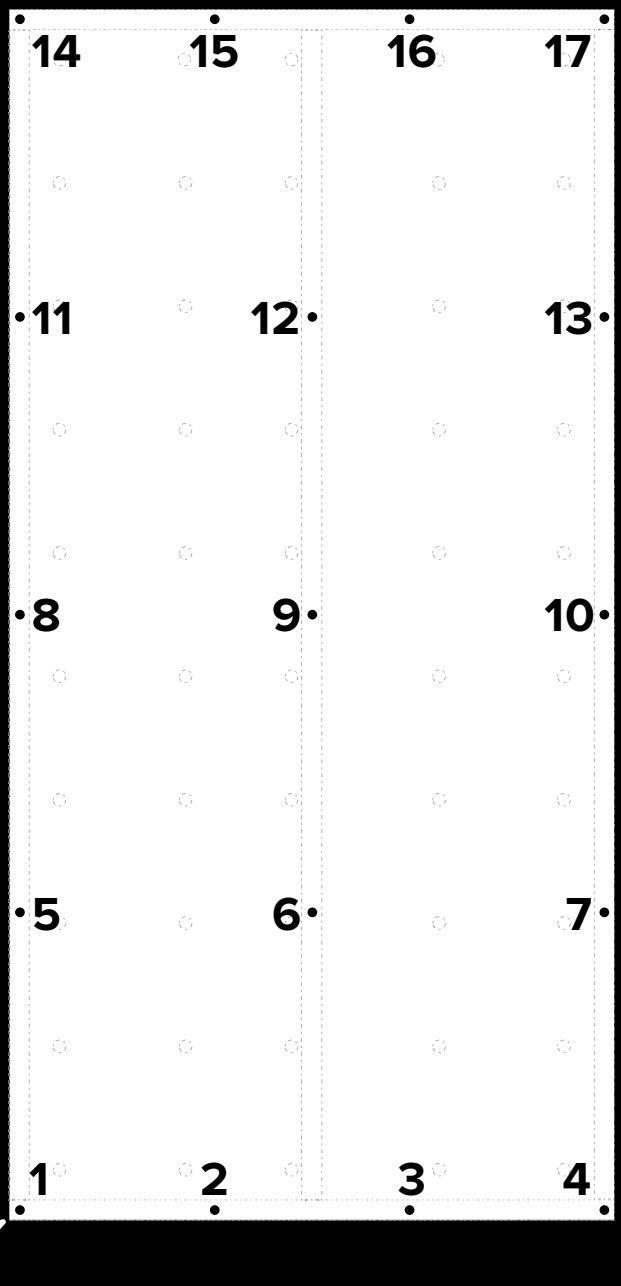
STEP 7.

PANEL TO FRAME

After you recharge your drill battery from the previous step, grab a 3mm drill bit, the 5mm Hex driver bit and your batten screws.

Lay your frame down on the ground (or work area of choice) and lay the now prepped plywood panel on top aligning the corners to ensure it is all square. Make sure you have the back of your panel on the frame, do this by making sure the T-Nuts are not visible on the face of your ply.

Starting from the bottom left corner, drill a pilot hole using the 3mm drill bit, then screw in a batten screw. Continue this along the bottom and then work your way up the panel as shown here.



STEP 8.

GRAB A HOLD

Nice work on making your wall. Now it's time to add some holds so you can get climbing. Just a reminder, most holds don't have an official top and bottom, installing them how you see fit can make them easier or harder to use, have a play around and see what you like most.

We highly recommend grabbing an ***Uncarved Block Ergo Wrench***, they make life easy installing your holds and will help you to not overtighten the bolts in your wall. Remember, over tightening your bolts can increase the risk of failure or breaking the T-Nut.

As this is just a simple single panel build we can't really create "lines" but if you have multiple panels beside or above eachother, get creative and make multiple lines for the whole family to enjoy in various degrees of difficulty.

For the full range of climbing holds and all the equipment you will need to get climbing at home, head on over to **www.uncarvedblock.com.au**

Have fun and as always, climb on!

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CLIMBING HOLDS

GOT STUCK OR NEED A HAND?

HELP IS ONLY A CALL AWAY

Australia Wide

Highgate Group

Email: admin@highgategroup.com.au
Tel: 02 9999 0055
Available Australia wide. Located in Warriewood.

Discovery Climbing

Email: Info@discoveryclimbing.com.au
Tel: 0455 158 223
Available Australia wide. Located in Brisbane

Summit Climbing Walls

Email: contact@summitwalls.com.au
Tel: 08 9249 2097
Available Australia wide. Located in Malaga

Project Climbing

Email: info@projectclimbing.com.au
Tel: 0429 221 129
Available Australia wide. Located in Melbourne.

Stax Climbing

Email: jacob@staxclimbing.com.au
Tel: 0452 355 771
Available Australia wide. Located in WA.

New South Wales

Constructive Access Solutions P/L

Email: james@constructiveaccess.com.au
Tel: 0474 150 260
Available to work in and out of the Sydney metropolitan area. For works outside of the Sydney metro, accommodation and transport costs would apply. Feel free to contact me for more information.

Queensland

Awesome Woodys

Email: info@awesomewoodys.com
Tel: 0449 555 614
Available to work in and out of the Brisbane metropolitan area. Feel free to contact me for more information.

Ryan Miller

Email: ryan_miller87@live.com.au
Tel: 0405 566 301
Available to work in Northern Queensland.

Victoria

Aventure Developments

Email: info@adventuredevelopments.com
Tel: 0488 662 734 Website

Western Australia

Otech Consultants

Email: info@otech.net.au
Tel: 08 9386 6624
Otech Consultants can manage all your climbing wall, bouldering wall or traverse wall requirements. Managing installations Western Australia wide.

Stax Climbing

Email: jacob@staxclimbing.com.au
Tel: 0452 355 771
Available to work Australia wide. Located in Western Australia.