

Building with 5/4 Deck Boards

Washington County

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In July of 2023 Washington County converted from building ramps with plywood to 5/4-inch deck boards. Below are a few modifications we have made since that time.

Structural & Design Changes

Only one structural change is needed.

- 5/4 deck boards need supports at 16" centers. All module frames will need two center supports at 16" centers instead of just the one at 2' centers when using plywood.



It is key that all module frames are square and stay that way until installed.

- The best way to have a perfectly square frame is to have a Table Jig to build your modules. We build all our modules on site. Our Table consists of a 4' X 8' piece of plywood on sawhorses. Our Jig consists of three narrow pieces of plywood with small pieces attached to the bottom and top. On the bottom or pieces that rest against the plywood to hold them in place then screwed down, so they don't move.

On top, the small pieces hold the frame pieces in the right place so the frame can be secured. One picture shows the bottom of the Jig and the other shows the Jig flipped over and secured to the plywood. You will see two are longer, that is for building a 5X5 module.



- Once the frame is screwed together, and before removing it from the jig, screw two or three 4' deck boards to the top of the frame. This will hold the frame square till it is attached and set in place. (We hang the plank over the high side of the frame about an 1" so when mounting it you can rest it on the existing frame till it gets secured.



Different Ways to Build End Piece and Bottom Support

Our first design for the bottom support I refer to as a Double T. This design is for an end piece that terminates on the ground/dirt.

- The double T consisted of 4 pc.
 - Two 2X6 cut 94"
 - One piece cut 48"

- One cut 14 1/8"



The two 94" pieces are secured to the 48" piece at 16" & 32" centers. The 14 1/8" piece is secured in-between the two 94" in the center of the Double T. Its sole purpose is to hold the frame square as shown in picture above.

On the bottom of this design, we secured a 2X4X5' to help support the last upright 24" from the bottom. This requires measuring from the bottom of the Double T 26" & 30" on top side of each 94" pieces and then measure down 1 5/8" once cutting out a slot which a 2X4 under the end piece will fall in.

To install the Double T requires digging out the dirt at the end of the Double T until the end top side is flush with the ground, and secure the other end to the last module.





The 2nd design was a minor change, an idea that Bryan/College Station came up with. WE ARE NOW USING THIS EASIER DESIGN. They felt it was a lot of trouble notching out the Double T for the 5' 2X4 to fit in. Their idea was to just install on the end piece one longer deck board two feet from the end, which would accomplish the same thing the 5' 2X4 would do to hold up and brace the last upright. Works very well.



The 3rd change came about because of a concern that burying part of the Double T in the ground will cause it to rot out quicker.

- We have begun to purchase a couple of Composite deck boards and cut 3 of them 4' long. We then lay one at the end piece will terminate. The end piece will sit on top of this composite board. The other two 4' composite boards put on the ground so the Double T runners sit on them instead of the dirt. The problem with this is you need to dig out 1" of dirt under these deck boards so that their tops are flush with the ground and the end piece is at ground level.
- Once you have the three composite boards lowered in the ground and in the correct location, then you take the Double T and set it on Top of the last module as close to the edge as possible. The other ends on the composite deck boards buried in the ground. Then we take a short 2X6 or deck board and start at the very end to scribe a line by lying the edge of this short piece on the composite, up against the Double T and marking a line.



We then cut along this line, removing the excess. If done correctly, after you cut the bottom part of the Double T, you should be able to secure it to the last module and the cut edge should sit perfect on the composite boards allowing the end piece to be placed on it.





Building the End Piece

Here are some examples of building the end piece using 5/4 deck boards.

- The end piece is built basically the same as with plywood except there are no added braces under it. The Double T is the support for the end piece.
- We cut two 8' 2X6 pieces. At one end of each we cut a 45 degree angle so it is not a sharp corner to trip on at the end.
- Put the two 2X6 on your Jig with the 45-degree edge cuts facing down. Then start installing deck boards on the end with the 45-degree edge cuts. Starting with one composite board then three wood deck boards. For the fourth deck board use a 5' piece that will hang over about 6" on each side. The final upright will be attached to this. Then attach the rest of the 4' deck boards till you reach the end. Usually, you end up a few inches short of the end. If the end piece is attaching to the ramp, just install a full piece that hangs over. Once you flip it over this piece can be secured to the existing ramp. NOTE: if the end piece is coming off a landing, you would have to rip the last deck board to size.
- If the ramp is going to the ground, we usually bring a bucket of base material or ground up asphalt to put at the end to make a nice transition.



We are considering making another change to the end piece supports (double T) to have less digging and longer lasting. Note: for ramps ending in dirt only.

Thought is to build it out of 2X2X3/16 Angle Iron.

- This will cut down on digging. If the ground is soft enough, the narrow frame of 3/16 iron can be pressed or hammered in the ground at the end.
- Right now, we are looking at two different designs. Both designs for a metal frame will require adding a 4' 2X6 attached to the last module with 3/16" cut out of the top so the 18" metal frame can sit on top and be flush with the rest of the ramp. That 18" metal piece will also need to have some pre-drilled holes to mount it to the wood frame.
- The first design involves building a metal frame taking the place of the Double T. This frame consists of 4 pieces welded together. Two 89" one 4' and one 18". The 18" piece needs to be 1.5"X2.



This design the end piece will cover the entire frame and at the end, the last plank

will be an inch high so will need some base material or ground asphalt placed in front to make a smooth transition.

- The second design is basically the same except the 4' metal piece instead of being flush with the rest of the metal frame, we weld the 4' angle iron 1" higher than the other angle frame.



This design the two angle iron runners are longer at 93". This one makes a smoother transition at the end. In pictures above, once you set the frame on top of the last module then stand on the frame at the lower end and what works best is take a 4X4 and use it to drop it on the angle frame driving it into the ground. The first angle iron lip to touch the ground on this design are the ends of the center runners. Next step is to take a small flat crowbar and start removing dirt under the lip about a foot back or so from the end on each runner. This will give it a gap so you now can lower the frame another inch so the 4' frame can lower till that lip is firmly on the ground. This will leave the two long center runners a little below the ground level at the end so you will need to shovel a little dirt out at the end so the end piece when put in place will set on the frame runners and flush with the end 4' metal angle. This makes a very smooth transition leaving the last angle iron exposed. On this design there needs to be one other change to your end piece. When you build this end piece, start screwing the first deck board NOT on the end but drop back 1" leaving the 2X6 you are screwing to stick out an inch. The reason for this is so once you set the end piece in place on the metal frame the deck boards are flush with the last angle and the 2X6 frame ends set on top of the last angle for support.

- The design using metal frames will need special screws to secure the end piece to the two center metal supports. You can purchase self-tapping screws but then you have to use a drill bit to pre-drill through the board and metal. Suggest finding a 12X2-1/2" reamer tek wood to metal screw. They are more expensive, but they will drill through the wood and metal then self-tap all in one. And the head uses a star 25. Item # 712038322381 from Jake Sales.com. is one location where I found these screws.

Ramps that end on concrete.

- If your ramp will end on concrete the Double T is done the same way as the one that ends in dirt by setting it on the last module and the lower end now scribing it to the concrete. One difference is you cannot use screws on the last few deck boards because the screws will hit the concrete and push the ramp up. We have been putting caulk on the first foot or so before setting the end piece on it.
- Building the end piece with this design the first deck board will need to be cut down. To keep from having a 1" deck board at the end to trip on, we cut that first deck board on a table saw. Just set your table saw fence at what you feel comfortable with like maybe 3/8" from the blade then tilt the blade till the top of the blade is 1" from the fence. Once you finish ripping it down save the fall off. Take the fall off and cut two pieces of it at 1 1/5". Glue the two small pieces you cut off the fall off on each end of the plank you ripped down. This gives it a full 1" at the ends making it easier to screw it on the 2X6 end piece. This is the easiest way to finish on concrete walks that may not be level.





- For better looking transition, although it takes more time, rip the first two planks down where this rip edge faces down instead of up. NOTE: We usually only do this on porches that need a small ramp like two or three feet to get over a threshold, Or doorways inside a garage where the floors we end on are flat and level. In this case you set the angle on the table saw to 5 degrees. The trick is getting the right distance from the blade to the fence so after your first pass through the saw, when you flip it over to finish cutting the opposite end, the cuts line up, so you have two pieces exactly the same size. On my saw I think I set it at 7/32. But if you get two exact cuts the second one can be used on the next ramp. For the 2nd plank set your fence set at $\frac{3}{4}$ ". This will give you the first two planks for your end piece that the cut edge will set on the concrete.
- If you prefer this cut "ripping down two planks" on a full ramp using the Double T then you will have to cut your Double T boards 10 to 11" shorter before you scribe it and cut it because it will need to end up under the third plank from end.



Other small notes

- On our modules for the ramp or slope we cut a 5-degree shim out of a 4X4 and attach to the lower end of the module where the 4X4 post will be mounted, to help it look more plum.
- Where a level module meets a module that slopes, we also put two small shims to keep someone installing bolts and tighten them too much causing them to pick up or close the gap.
- When you must double back on your ramp and have a 4X8 landing or 5/10 we will run the center supports at 16" centers the short way so the planks all match and you have 8' or 10' planks on the landing instead of 4'.



Conclusion

This is just to show you how ramp construction in Washington County has evolved by making the change to using deck boards. It is up to you to see what works best for you or your area and the codes you must deal with. I believe the codes in Austin do not allow wood to touch the ground so maybe the way we place a composite deck board on the ground first then setting our Double T frame on it is a good approach for you. I know the metal double T frame should help with that. I know the TRP is all about building a ramp with lumber so the metal frame at the end might be an issue. We have someone that can weld the small frame. If you like to use metal and do not have someone who can do the welding for you, some high schools have programs to teach welding and may love to have a project for their kids to work on.

I hope this helps other TRP groups in making the transition to building using deck boards. If you have any questions, you can either call me at 979-203-4059 or email me at robertmeier218@gmail.com