



Building Freedom for the Homebound

Building Basics ©

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Building Basics: How To's, tips, jigs and guidance for providing a safe, durable ramp

RAMP SURVEY AND DESIGN GUIDELINES

The focus of Ramp Survey and Design Guidelines will be to provide guidance for surveying, designing and ramp building based on ADA guidelines and years of field experience by several seasoned TRP team members. The processes presented are not comprehensive but intended to cover most of the questions that need to be asked and tasks to be completed through the survey and design as well as at least one way to approach the building and final assembly of modular ramps. The target audience is TRP surveyors and team leaders to assist with evaluating possible ramp locations, laying out a safe ramp, and collecting the needed database information.

Survey tools:

- Camera/Smartphone
- 25-foot or longer measuring tape
- Laser level and/or string and bubble level
- Survey checklist and paper for drawing the site and proposed ramp (an example survey form is available at the end of this document)
- Having a few scrap pieces of plywood, 2x4, 2x6, 5/4 board, etc. can be helpful in determining actual clearance under an open door over an existing porch. This will help define how to design any needed transition at the door.

Survey Process

1. If possible, contact client and arrange a time for the survey. Unscheduled visits can also be made, particularly if unable to make phone contact using referral information.
2. Take note of any issues locating the home and any identifying features to help the build team reach the correct site.
3. Discuss ramp need with client and any specific requests or concerns.
4. Critical questions for client:
 - a. Does client own home? If not, then owner/landlord must approve of the ramp design and installation.
 - b. Any HOA/community requirements, e.g., skirting, balusters, design approval.
 - c. Which door does the client want to use and where do they need the ramp to end, e.g., sidewalk, driveway? Try to accommodate the client's requests. However, don't hesitate to consider other doors or ending points in order to provide safe access.
 - d. What issues have they had getting into and out of the home? Pay particular attention to the threshold and ramp ending location (sidewalk, driveway, etc.).

- e. Best contact number for the build team to use when scheduling.
 - f. Location of power outlet
- 5. Evaluate the threshold, which may require a short, 4-foot or less mini-ramp to provide an accessible path through the door.
- 6. Find the best landing point to meet the client's needs, preferably onto a paved surface.
- 7. The length of the ramp is determined by the height from the ramp beginning point (e.g., door, porch) to the ending point. Using a string level or laser at the starting point, stand at the estimated ramp ending point and measure the vertical drop in inches from level. This will be the number of feet of ramp slope required. In some sloping yards it may be best to do a U-turn ramp that follows the ground slope down then returns to near the starting point.
- 8. Using standard 4'x8', 4'x4' and 5'x5' modules as much as possible, determine if there is at least one way to provide the needed slope in the space available.
 - a. Clearly explain any layout options to client and get their approval or refusal of the proposed ramp.
 - b. As the surveyor, you are authorized to refuse to build an unsafe ramp or if there is not a financial need.
- 9. General design requirements
 - a. Each inch of drop from porch to ground will require 1 foot of sloped ramp.
 - b. 5'x5' minimum flat area required at door and all 90-degree turns.
 - c. 30' maximum slope run before a flat turn or ending point or 4' flat rest area is required. For our modular design, that usually means no more than 3 standard modules or 24' before a turn or other flat resting area.
 - d. Ramp cannot extend over, or in any way block, a public sidewalk.
 - e. Ramp width can be reduced to a minimum of 36", if necessary, to work around obstacles.
- 10. Take pictures and measurements of the area where ramp will be built, taking care to note obstacles such as trees, sewer cleanouts, meters, faucets, etc.
- 11. Get agreement from client before planning for removal or repositioning of any movable obstacles or other items.
- 12. Other information needed:
 - a. Location of power source
 - b. Shade conditions at the site
 - c. Will any digging be required?

Declining a referral

While a difficult option, the surveyor and/or region coordinator may decline a referral for a variety of reasons including but not limited to the following:

- a. Client already has a ramp and/or handicap accessible path to the driveway, parking area or street
- b. The client only wants a ramp to access an area that does not facilitate getting to the driveway, parking area or street
- c. Client lives in an area not currently served by TRP
- d. Not enough room or other conditions that prevent building a safe ramp
- e. Client has no financial need
- f. Dangerous and/or unsanitary site conditions including excessive trash, animals, etc.
- g. Ramp installation will require knowledge and/or skills that are beyond what can be expected of volunteers. This can include extensive repairs to the existing structure before

ramp construction, any part of the ramp deck height more than 6 feet above ground level, unstable ground conditions, issues attaching to existing structure, etc.

h. Interior ramp

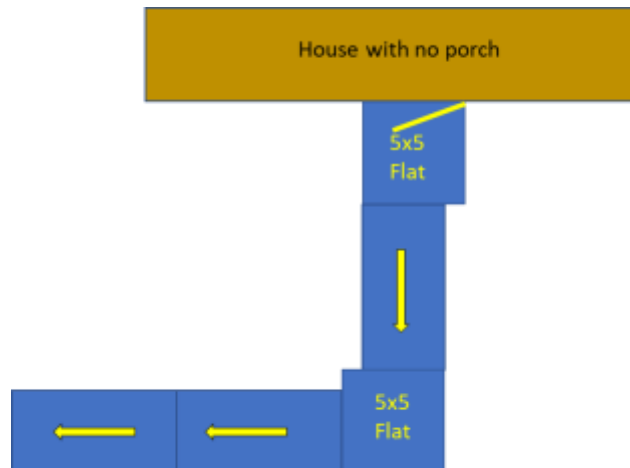
If the client refuses to approve the surveyor's proposed, safe- design, that situation should be reported as the client refusing the ramp

Ramp description examples:

From the survey notes and pictures, create a ramp survey description using these examples as a guide:

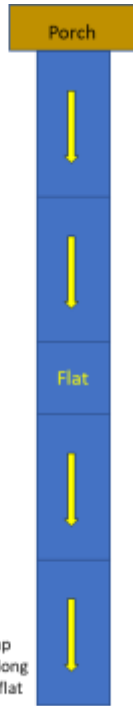
- Come off the existing porch, over the steps with a standard 4x8 sloping module, continuing with another standard 4x8 and complete the ramp with a starter module.
- Come off the porch, over the steps with a standard 4x8 module sloping down to turn left (facing the house) on a flat 5x5. Continue with a standard 4x8 and a starter to end at the driveway.
- Remove existing landing and steps. Install 5x5 flat at door. Continue toward back of home with a sloping standard 4x8 and 4x4 to a flat 4x8 U-turn. Continue toward the drive with a sloping 4x8, another 4x8, then a 4x4 flat resting point. Complete the ramp with a sloping 4x8 and standard starter.

Ramp Layout Examples

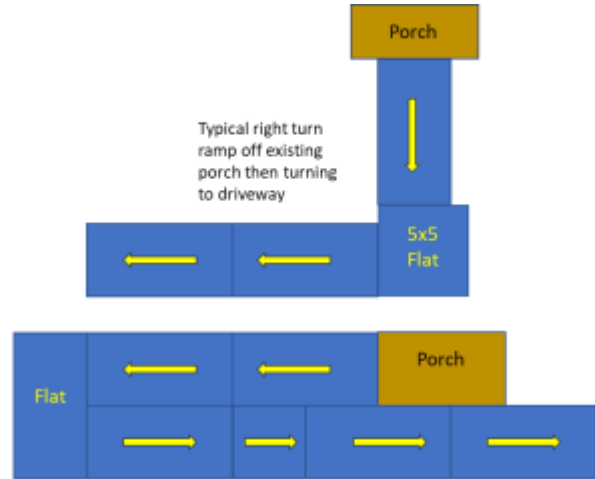




Standard ramp sloped down from a 24" high porch

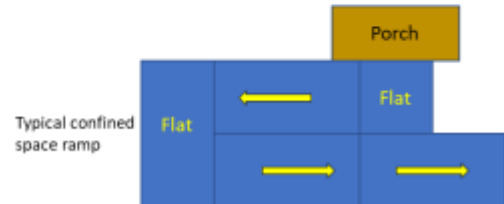


Standard ramp but over 30' long requires a 4' flat resting point



Typical right turn ramp off existing porch then turning to driveway

Typical mobile home u-turn ramp for a 44" high porch



Typical confined space ramp

BUILD PLANNING

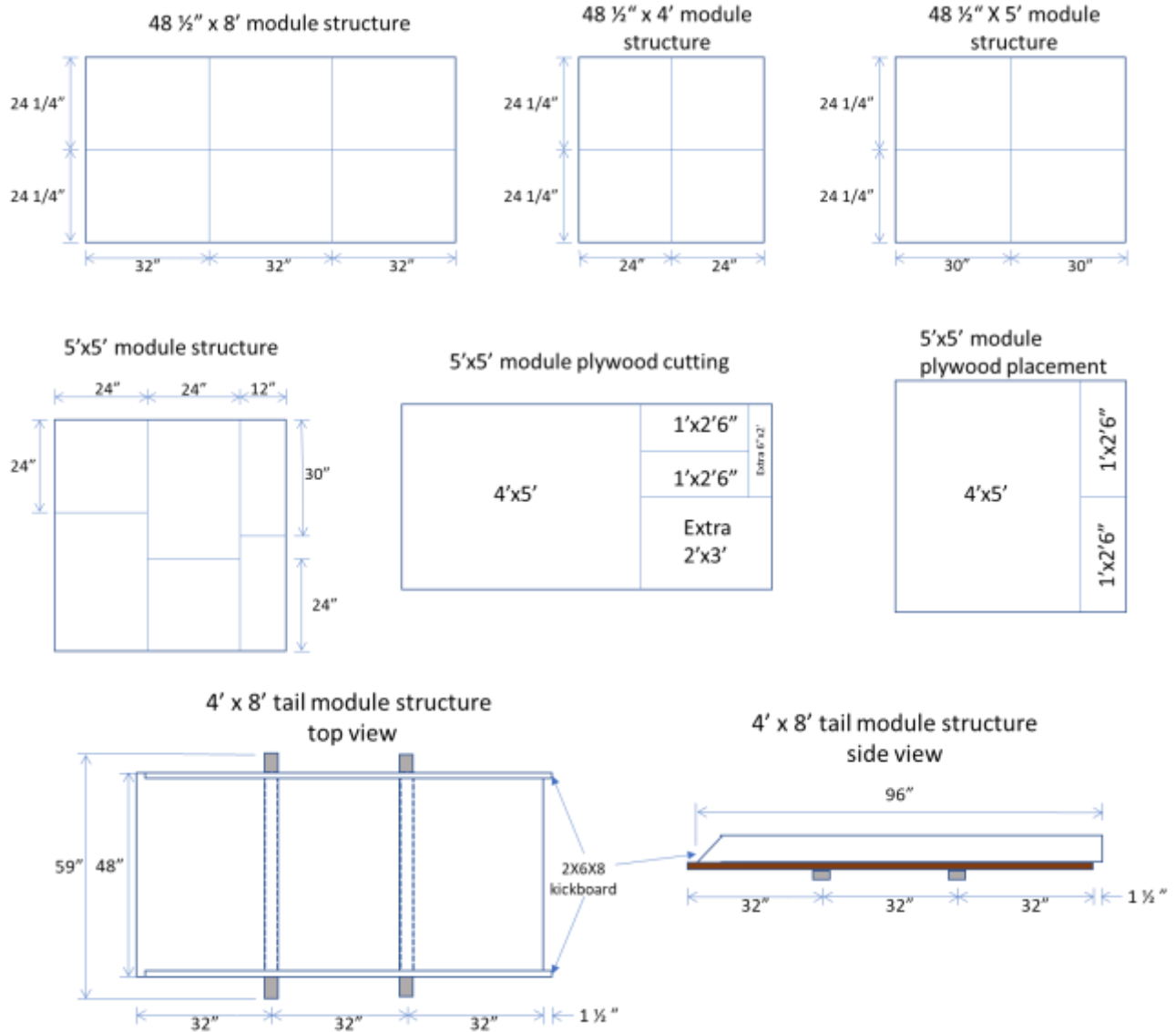
This section starts with a build planning overview and one version of module designs with diagrams and a list of the needed lumber. There are lots of steps needed to get prepared for a ramp build day, which may all be done by the team leader or distributed to a couple team members. The steps below are not comprehensive but do highlight the things to be considered.

- From the survey, determine the materials needed, paying special attention to modules that will be more than 30" above the ground, which will need concrete piers/Dek blocks and balusters.
- Plan and schedule pickup and/or delivery of the needed materials.
- Most ramps require one volunteer hour per constructed foot, e.g., a 40' ramp will require approximately 4 hours for a team of 10 to build. Removal of existing ramp, balusters, skirting and other complications will require additional time.
- Determine build date and notify recipient and volunteers. Communication should include:
 - Start and estimated end times.
 - Volunteer meeting location.
 - List what will be provided, e.g., which tools, water, first aid kit.
 - What volunteers should bring, e.g., tools, water, gloves, weather appropriate clothing.
- A sample worksite checklist is available at the end of this document in the Forms section

RAMP MODULE/FRAME STRUCTURE - PLYWOOD

The modules can be built either ahead of time, such as in a TRP warehouse, or at the build site. The module layouts and lumber needs shown below are intentionally designed to be 48½ inches wide to simplify installation of the plywood. Many warehouses and teams already have jigs to build modules that are 48" wide, which is also just fine.

Module/Frame Designs for Strength and Minimal Lumber Waste – Plywood Decking



- Build tail end module upside down.
- Start with a 4' long 2x6 header bolted or lag screwed to the end of the last standard module just like all other module connections.
- Cut two 96" 2x6's with 45-degree angle across the flat surface on one end for final module kickboards.
- Lay 4'x8' plywood sheet (good side down) on top of the long, pointed edge of the 2x6 kickboards with the square ends extending 1-1/2" past the end of the plywood.
- Align the kickboards along each edge of the plywood and screw through the plywood into the kickboard about every 18 inches.
- Cut two 2x4's 60" long and center them flat on the bottom of the tail end module at 32" from each end.

- Attach these support 2x4's with screws through plywood into kickboards from the underside.
- Cover the end of the module where the kickboards are angled with a $\frac{3}{4}$ " x 48" shelf standard to prevent delamination.
- Flip this module over and put a couple screws through plywood into each of the two support boards.

Lumber needed for the plywood decking modules assuming 8' stock unless otherwise noted:

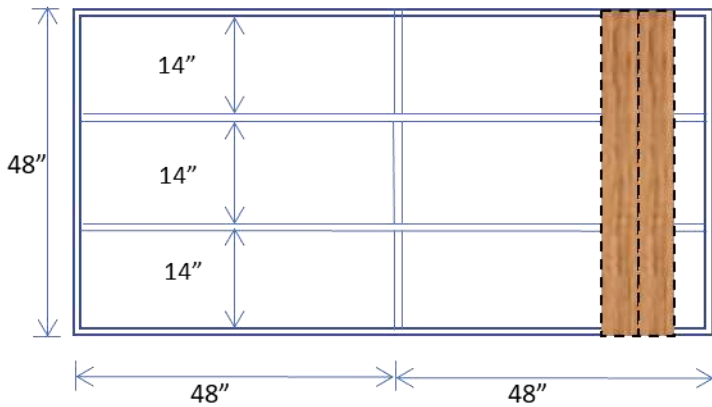
4x8 module consists of 2 pcs 45½", 2 pcs 96", 1 pc 93", 4 pcs 22"	Five 2x6x8 total
4x4 module consists of 2 pcs 48", 3 pc 45½", 2 pc 22"	Three 2x6x8 total
5x5 module consists of one 4x8 plywood, 2 pcs 60" from 10', 4 pcs 57" from 10', 2 pcs 22-1/8" from 8', 3 pcs 9¾"	3-2x6x10 and 1-2x6x8
4x5 module consists of 2 pcs 60" from 2x6x10, 1 pc 57" and 2 pcs 22" from 2x6x10, 2 pcs 45½" from 2x6x8	Two 2x6x10 and one 2x6x8 total
4x8 tail module consists of one 4x8 plywood, 2 pcs 2x4x60" from 2x4x10, 2 pcs 2x6x8'	One sheet 3/4x4x8 plywood One 2x4x10 Two 2x6x8

Additionally, every foot of length requires 0.75 2x4x8 and 0.375 2x4x10 for uprights kickboard and handrails when using two 2x4s for the handrail.

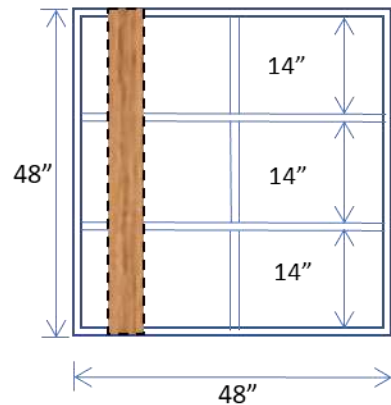
RAMP MODULE/FRAME STRUCTURE – 5/4 DECK BOARDS

The module layouts and lumber needs shown below are one approach to building the needed structure for using 5/4 x 6 deck boards. The main difference between plywood and deck board structure is that deck boards require more support as shown in the diagrams below. Some example planks are included on each diagram to show orientation of decking to the structure.

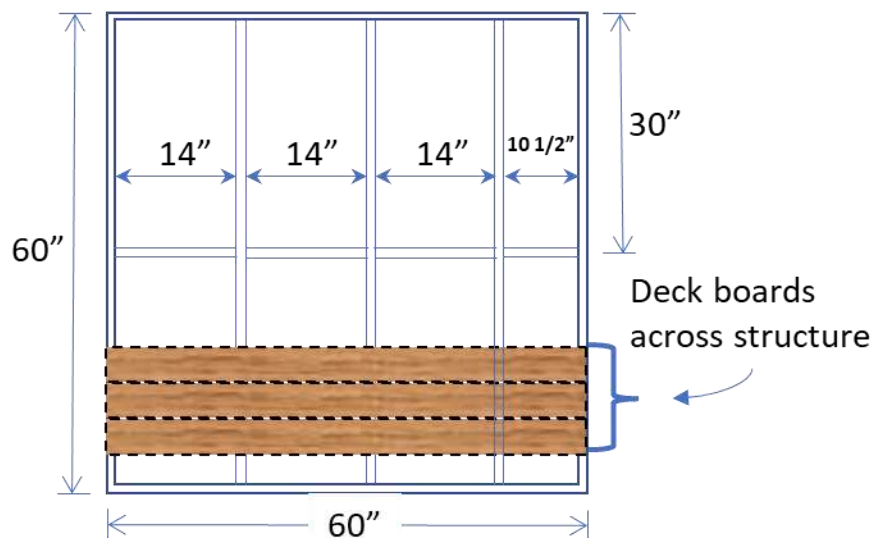
4'x8' structure for 5/4x6 deck

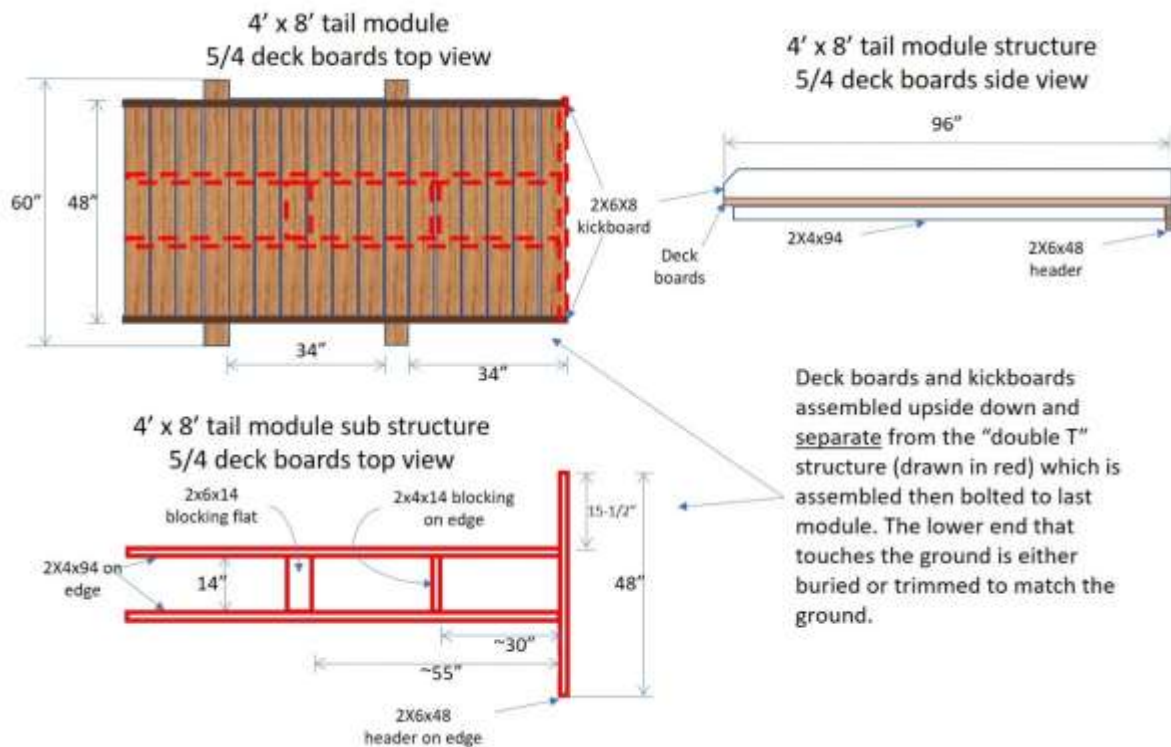


4'x4' structure for 5/4x6 deck



5'x5' module structure for 5/4x6 decking





Keeping the Ramp Square

When decking a ramp with planks, it is critical to make sure everything stays square. Using a jig to build the modules is very helpful and temporary boards screwed to the module while in the jig can hold it square while it is moved to the ramp for installation. To keep the decking square, after every 2 or 3 boards, measure the distance from each end of the leading edge of the deck board to the lower end of the current module. The distance should be the same on both ends. If the measurements are not the same, slight adjustments can be done when installing the next couple deck boards to get the decking back on track.

Lumber needed for the 5/4 board decking modules:

4x8 module consists of 2 pcs 45", 2 pcs 96", 2 pcs 93", 3 pcs 14"	Five and one half 2x6x8 total
4x4 module consists of 2 pcs 48", 5 pc 45", 3 pc 14"	Three and one half 2x6x8 total
5x5 module consists of 2 pcs 60" from 10', 5 pcs 57" from 10', 3 pcs 14" and 1 pc 10-1/2"	Four -2x6x10
4x5 module consists of 2 pcs 60" from 2x6x10, 2 pcs 57" from 2x6x10 and 3 pcs 14", 2 pcs 45" from 2x6x8	Two 2x6x10 Two 2x6x8 total
4x8 tail module consists of 2 pcs 5/4x6x60", 2 pcs 2x6x8', 2 pcs 2x4x94, 1 pc 2x6x48, 1 pc 2x4x14" and 1 pc 2x6x14	One 5/4x6x10 Two 2x4x8 plus 14" piece Three 2x6x8

Additionally, every foot of length requires 0.75 2x4x8 and 0.375 2x4x10 for uprights kickboard and handrails when using two 2x4s for the handrail.

RAMP BUILD DAY

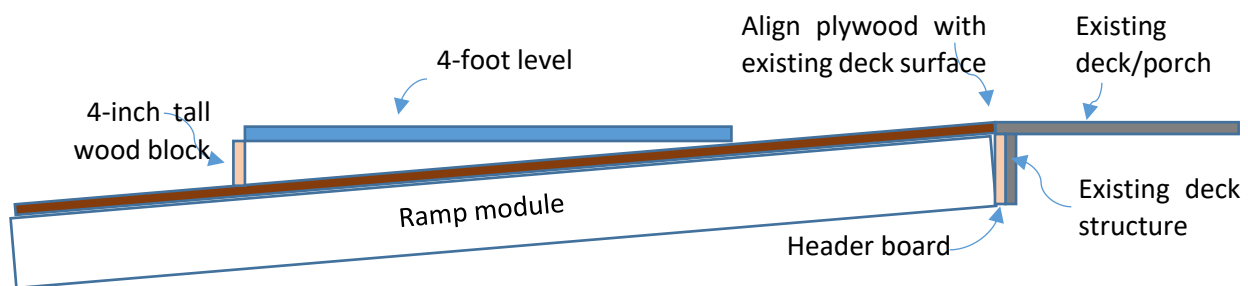
Declining ramp build or last-minute client requested alterations:

The team leader has the option to decline building the ramp when arriving on site at their discretion. For example, if they find the ramp cannot be built safely as designed, the site conditions will not be safe for the volunteers or there are obstacles such as unmovable vehicles that are blocking the ramp path. The team leader also can decline any client requests made on-site for unplanned changes that would make the ramp unsafe or too challenging to build with the assembled volunteer team and materials available.

Setting the slope and adapting to existing structures:

A maximum 5-degree slope (more accurately 4.76 degrees) which is 1" drop per 1' of ramp length is critical and can be confirmed during the build using a 4" block of wood and a 4' level as shown in the diagram below. However, there may be cases where the slope is less than this, generally due to sloping ground and/or a defined ending point, such as a driveway, causing the ramp to be a little longer with a gentler slope. In these cases, a string from the top of the last flat module down to the planned ending point of the ramp on the ground can be used to set the slope as each module is added.

Also shown in the diagram below, before attaching the first module, determine if a header board is required. A header board can be used to provide a solid mounting location for the first module and/or fill any gap between existing structure and the edge of a porch.



First module

- Align the first module height using a small piece of plywood on top to ensure the finished height of the ramp will be level with the existing porch or door threshold
- Attach the module to the house or existing porch using concrete anchors or 3/8" carriage bolts or 5/16" lag screws long enough to get to solid connection to the existing structure
- Use a module installation jig or scrap piece of lumber temporarily attached to the lower end of the module to support it until the 4x4 corner supports are in place
- Place 4x4 posts in the outer/lower end corners of 1st module flush with the top of the module and standing on a concrete or wood block unless the top surface of module is over 30" from the ground then Dek blocks or concrete piers should be used. Use 4 screws on both faces of the corner to connect the module to the post. If a solid attachment to the existing structure is not possible, then also install 4x4 posts on the end connected to the house/porch. If higher than 30", cross bracing should be placed on top of the blocks and screwed to the 4x4s to ensure ramp stability. Diagonal bracing may also be needed for higher ramps.

Next module(s)

- Align top surface of next module with top of the previous module
- Temporarily attach to the previous module with 2 or 3 screws
 - Avoid putting the screws in a line to minimize the chances of splitting the wood
 - Align screws vertically, roughly in the middle of the 2x6 at least 2" from the edge of the board.
 - If one module is flat and the other module sloping, then carefully tighten the screws to make sure the slope is maintained. There will be a gap along the top or bottom joint edge unless the sloping module was built with a 5-degree angle to match up against the flat module.
- Use a support jig or a piece of scrap lumber temporarily attached to the outer end of the module as a leg to support the end until the 4x4 corner supports are in place
- Set correct slope of 5 degrees (1" drop per 1' of ramp length) with level and jig or similar method then:
 - Join modules with 2 carriage bolts minimum 3/8"x4" with washers and nuts approximately 1 ft in from outer edges of the ramp.
OR
 - Join modules with two 5/16"x4" minimum lag screws or equivalent structural screws. It is best if the screws go into the 4x4 posts in the lower end corners of the previous module to maximize support.
- Place 4x4 posts on lower end, inside corners of the module flush or slightly below the top of the module and standing on a concrete or wood block. If top surface of module is over 30" from the ground then Dek blocks or concrete pier blocks should be used along with cross bracing to ensure ramp stability. Cutting the bottom end at a 5-degree angle will maximize support on the block. Use 4 screws on both faces of the corner to connect the module to the post.

Repeat these steps for all except the last module that will touch the ground.

Plywood decking

- Mark top surface of plywood with location of center, lengthwise, structural support. A chalk line works well for this line to show where screws can be placed later.
- Align and center the plywood on the module structure at the top of the module flush with the previous module, existing porch or house then screw down one top corner
- Square up module and plywood keeping plywood as centered as possible along the sides of the module structure
- Place screws around all edges
 - 6" apart where plywood sheets meet
 - 12" apart along other edges

Place screws 12" apart down the lengthwise center structural support previously marked on the plywood

Plank decking

- Keep boards square by frequently measuring from both ends of plank down to lower end of module. Both measurements should be the same. Adjust board position as needed to maintain square

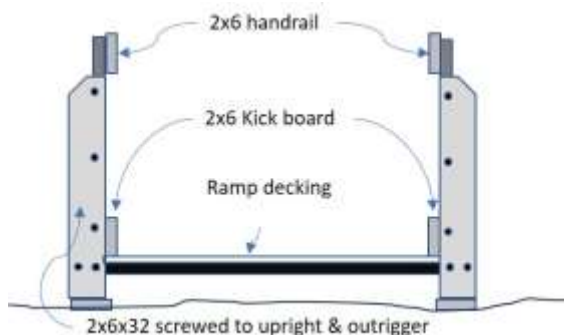
- Drive 2 screws through plank into each module structure board
- There will be points in the installation where a plank may need to be ripped to match the space available so make sure a circular saw or table saw is available on site.

Final module (Common names are starter, end, tail, landing, inverted...)

- As shown on the diagram on the following page
 - Plywood
 - Cut a 2x6 48" long (or the width of the ramp) and bolt or lag screw it on the end of the 2nd to last module, flush with the top of the module 2x6 structure
 - Place the pre-built module against the board with its 2x6 kick boards on top of the plywood extending over that last module with the plywood edges flush against each other.
 - Put screws along plywood joint about 6" apart
 - Planks
 - Build "Double-T" structure shown in the module diagrams for plank construction
 - When landing on concrete or other hard surface, cut 94" 2x4 runners at an angle to allow end of ramp to lay flush on the ground
 - For softer surfaces, dig trenches for each 2x4 runner to be buried allowing end of ramp to lay flush on the ground



- Lay deck board and kickboard part of this module on top of the "Double-T" and attach across the top to the header board and down the middle to both 2x4 runners
- Cut 4 uprights. For the designs used in this documentation, the uprights are 34-1/2" for plywood decking and 33-3/4" for planks with parallel 5-degree angles on both ends and install on top of each support board.
- Put screws through kickboard into uprights
- Strengthen uprights with buttresses 2x6x18 (or up to 32" long) attached to upright, kickboard and the outrigger board



- Add a metal transition plate, if the ramp ends on a hard surface

Uprights

- Dimensions
 - 40" long 2x4 with 5-degree angle when installed plumb on sloping module or 90-degree cut for flat modules or perpendicular to surface of sloping modules
 - Recommend using 10' lumber to get three 40" pieces with little waste
- Center to center spacing of uprights on side of modules
 - 32" on 8' modules
 - 24" on 4' modules
 - 30" on 5' modules
- Attachment
 - Install uprights either (height of finished handrail must be 34" - 38" above deck surface)
 - Perpendicular and flush with bottom of 2x6 module using a square
 - OR
 - Aligned with bottom of 2x6 module and vertical using a level
 - Screw pattern
 - Use 3 screws in a triangle pattern
 - OR
 - 4 screws in a diamond pattern
 - OR
 - 2 screws plus a 4-1/2" construction screw through side of module and into end of internal cross-member
 - OR
 - 2 screws plus a 5/16"x4" (minimum) lag with washer through side of module and into end of internal cross-member
 - Continue down ramp on both sides

Wheel stop (Kickboard)

- Position kickboards 3/4" to 3-1/2" above the plywood deck using scrap plywood or 2x4 flat or on edge for spacing. Note the 3-1/2" spacing from a 2x4 scrap on edge leaves room for a paint roller and minimizes leaves and other debris from collecting on the ramp.
- Put 2 screws through kickboard into each upright

Handrail

- Install 2x6 on edge raised 1-1/2" above the top of the uprights and parallel with the ramp deck
- Make with as few joints as possible for strength and to provide a better surface for the client
- When going from a sloped to flat section of the ramp use 5 degree rather than 90 degree cuts to minimize gaps in the handrail at these points.

Child Safety Balusters (if required)

Additional uprights (balusters) are required if top surface of module is over 30" above the ground. These balusters must be no more than 4" apart so use a short scrap of 2x4 to quickly space and install these uprights attaching them to the kickboard and handrail support. Balusters can be cut from 2x4 or 2x2 lumber and are attached from the kick board up to the handrail.

Completing the ramp

- Install the TRP nameplate preferably in a location where it is visible from the street and/or during regular ramp use if in a more remote location.



- Sand rough edges where needed, particularly on handrails
- Check for sufficient screws especially down the center of each module which is often missed during construction
- Clean up site, dispose of trash and locate all tools making sure that personal tools are reunited with their owner

Ramp documentation

- Send in the ramp completion report per the established process for the region. An example is in the Reports and Documentation section of this document.
- Fill out and leave client report with the client. Specifically mention the need for waiting 60 days before any paint or sealer is applied. An example is in the Reports and Documentation section of this document.

Ramp designed to accommodate required slope and work around existing structures or other obstacles



2x6 handrail on edge provides continuous 1 ½" gripping surface



5x5 module at 90 degree turns to provide sufficient maneuvering room

2x6 buttresses to strengthen handrail on last module

Additional balusters for child safety where ramp deck is more than 30" above the ground

SPECIAL DESIGN CONSIDERATIONS

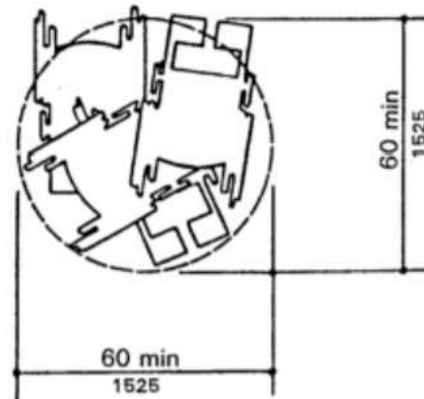
The 5x5 Module

Is building and installing a 5x5 module worth the extra trouble and lumber? Lumber and plywood are readily available and fairly easily used when modules are 4' wide and either 4' or 8' long, allowing for minimal cutting, minimal waste and minimal cost. The 5x5 requires extra thought when cutting the lumber, assembling the module and including it in a ramp from attaching the next module to installing the

handrails with the extra one-foot corner. So, why are they included in ADA specifications, Texas Accessibility Standards and our ramp build guidelines?

The reason is to provide the necessary clearances for easily maneuvering a wheelchair as shown below in a diagram from the Texas Accessibility Standards.

https://www.tdlr.texas.gov/ab/tas/tassection04_02_to04_09.pdf



This need is especially important at doors and at 90-degree turns to allow the wheelchair operator to focus on the door, or direction change, without worrying about rolling down the ramp.

Many will claim the 5x5 requirement only applies for commercial ramps, not residential. When looking at the ADA rules for ramps, the focus is clearly on commercial installations, so it is important to understand the “why” behind the rules and factor in what can be done to meet the spirit of the rules using readily available dimensioned lumber. The “why” on 5x5 porches is for a safe flat area to operate the door. For 90-degree turns, the “why” is to provide enough turning radius as shown above and for when a wheelchair is being pushed or for an ambulance gurney. These needs are not different between commercial and residential applications and, while they are more challenging, a 5x5 can be built with readily available lumber with minimal waste using a combination of 8-foot and 10-foot 2x4’s and 2x6’s. As an alternative to not deal with plywood pieces and scraps, the rest of the ramp can be decked with plywood and just the 5x5 modules can be decked with planks assuming the modules are designed and built accordingly.

Are there cases where a smaller flat porch can work? Yes, one possibility is when the door opens inward, but it wouldn't be a mistake to use a 5x5 even in that situation. Since we are building residential ramps, can we get away with 4x4 turns? Probably, but is that the best thing for the client when it comes to maneuvering a wheelchair on the ramp? While there are parts of the ADA rules that really don't apply to residential, specific ramp requirements like the slope, resting flats and turning radius allowances all have

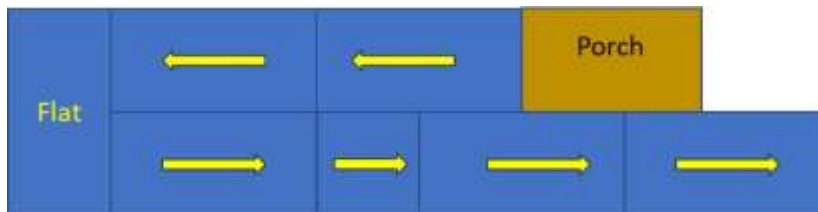
a universal “why” that is based on a person in a wheelchair or EMTs with a gurney trying to get up and down the ramp.

At the same time, the cost for a 5x5 module is about 1.5 times that of a 4x4 module which also affects the decision on following ADA to help as many clients as possible while also doing what is best for each specific situation. Guidelines work for the “ideal” cases, but there will be situations that necessitate judgment to balance the guidelines against the need to provide a safe, functional ramp for a homebound client.

Switchback Ramp Design

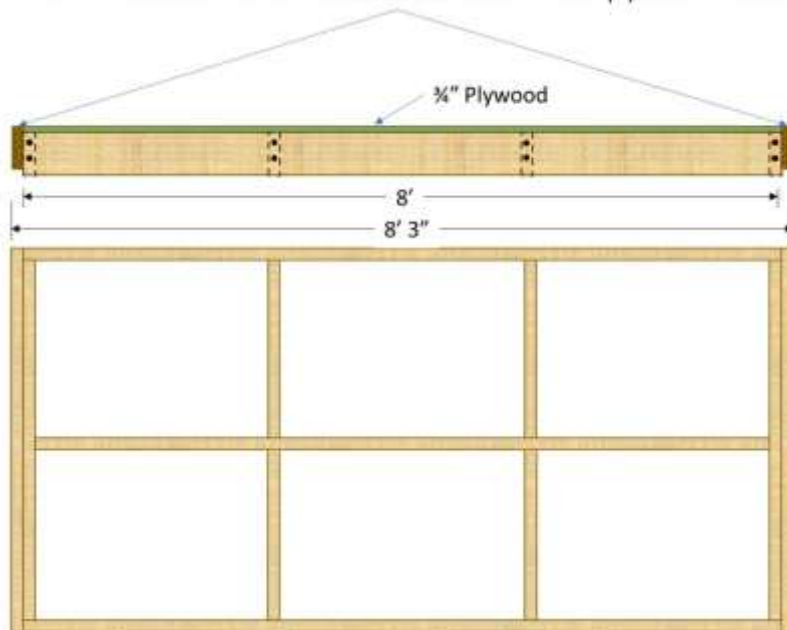
There are a few things to be considered when building switchback (or U-turn ramps) to make sure everything fits and material is used efficiently. The use of 48 ½” wide modules also require a change to the way many of us were taught using 48” wide modules. As discussed at the conference, some TRP teams build 5’x8’ or 5’x10’ modules for the U-turn to meet local regulations and/or to align with the ADA guideline of a 5’ flat area in the direction of travel on the ramp. Since most teams use a standard 4”x8’ module, the following will focus on that option.

Switchback ramps are frequently needed to provide the necessary length in tight spaces and/or deal with sloping ground.

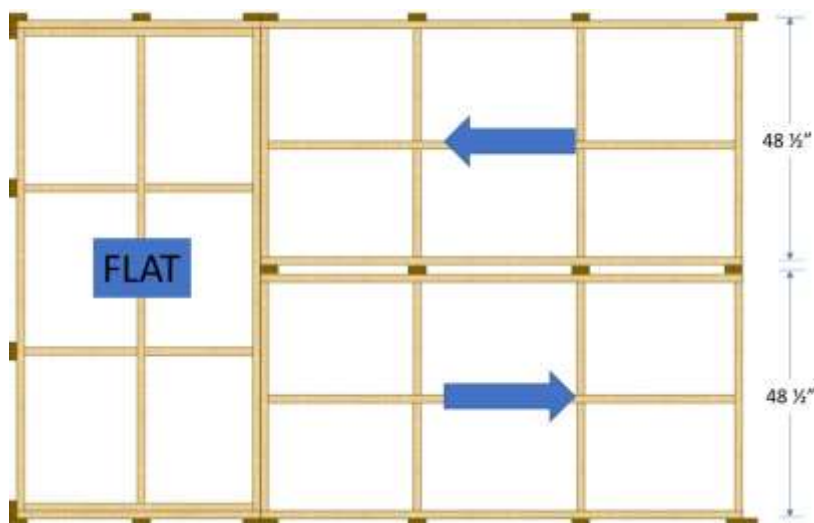


A standard module can be used for the flat, but will need some additional length to provide room for uprights down the center of the “U” and if the sloping modules are built 48 ½” wide the U-turn module must accommodate that additional width. This is easily done by adding 48 ½” long 2x6 pieces on each end of the flat module which are shifted up to match the thickness of the plywood as shown in the following diagram:

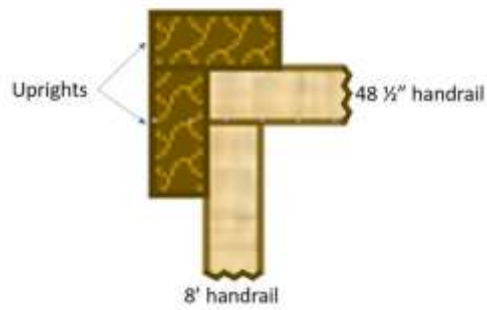
2"x6"x48-½" installed ¾" above module on both ends to match plywood thickness



This addition makes the module 8' 3" long which then allows room for the center handrail between the sloping modules.



Another consideration for the uprights is arrangement used for the outside corners of the flat module. The "top view" diagram below shows one option for arranging the two upright boards which allows for enough room to place screws and use an 8' board for the long side handrail.



Another option on the corners (and anywhere two modules are joined) is to use 2x6 uprights which allows more flexibility and surface area for attaching kickboards and handrail boards.

There are many possible solutions to the design challenges faced when installing ramps so the above is just one option for how to start with standard modules, add a couple 2x6 pieces and successfully construct a switchback ramp without extreme design changes or a lot of extra lumber.

“Tall” Ramp Requirements

A “tall” ramp is when the top surface of the decking is 30 inches or more above the ground. This situation requires additional structural support as well as child safety balusters. Note that while this is normally the top end of the ramp, it can also extend several modules down and often with u-turn ramps when the ground is falling away from the home as shown in the picture below.



At a minimum, taller legs should be connected by a board laid flat across the blocks but angled bracing is better, particularly on 4x4 or 5x5 modules installed at the door.



The spacing requirement for the child safety balusters is a maximum of 4 inches. Using a 2x4 scrap around 20 inches long is an easy way to quickly space each baluster for installation. Note that pre-drilling is often needed to avoid splitting the baluster if using 2x2 lumber. If a table saw is available, it can be less expensive to rip 2x4 lumber in half.



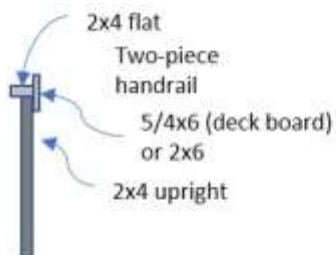
HANDRAIL DESIGNS

There are many different approaches to handrails with differing construction complexities and material costs. All diagrams below are a cross-section of the handrail taken at one of our standard 2x4 uprights.



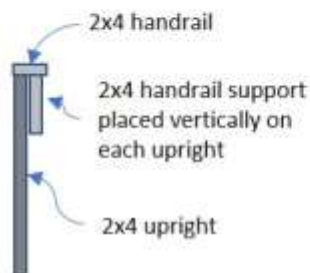
Pros: Solid design that minimizes damage caused by drying and warping of lumber

Cons: Wide top surface doesn't really meet ADA guidelines and the 2 board design does require installation time and material expense.



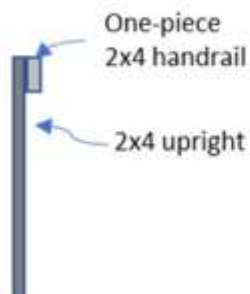
Pros: Solid design that minimizes damage caused by drying and warping of lumber and also provides a continuous 1" or 1-1/2" gripping surface.

Cons: 2 board design does require installation time and material expense.



Pros: Inexpensive and easy to install

Cons: Wide top surface doesn't really meet ADA guidelines and all handrail screws are driven into end-grain which is susceptible to early failure as the lumber dries and warps.



Pros: Inexpensive and easy to install and provides a 1-1/2" gripping surface between the uprights.

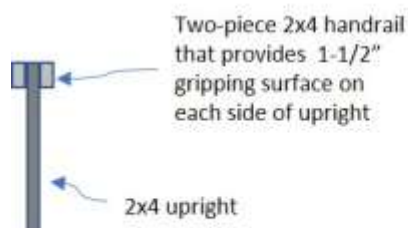
Cons: Minimal structure makes handrail boards susceptible to early failure as the lumber dries and warps.





Pros: More expensive than using a 2x4 but slightly stronger. Still relatively easy to install design that provides a continuous 1-1/2" gripping surface.

Cons: Susceptible to early failure as the handrail lumber dries and warps.



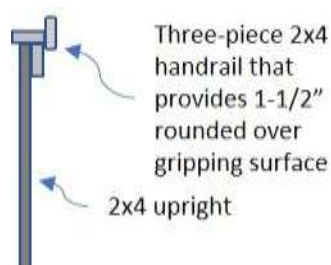
Pros: Relatively easy to install and provides a 1-1/2" gripping surface between the uprights.

Cons: Exposes upright end-grain to sun and rain. Warping of the 2 handrail boards over time



Pros: Provides a near continuous 1-1/2" wide gripping surface

Cons: Narrow overlap of the stacked boards could become unstable and susceptible to warping of the handrail boards over time



Pros: Provides a near continuous 1-1/2" wide rounded edge gripping surface with most of the end grain protected from weather.

Cons: Narrow overlap of the rounded off board could become unstable over time



There are many options being used for handrail, each with pros and cons. There is no right or wrong option which allows each region and/or team to figure out what works best for them and their clients.

HANDRAIL TERMINATION

Most ramp construction standards say to extend handrails a minimum of 12 inches beyond the end of the ramp and then recommend curving it down and back to the last upright. Our ramp design and materials used don't allow us to meet these criteria, so we must get as close to the spirit as possible. This means extending the handrail as close to the end of the ramp as possible while still supporting the user and not "sharpening" it to a point, which could be dangerous for someone entering the ramp.

Most of the pictures collected for this article are good, but there are a couple examples that don't extend far enough, which can create a trip hazard. A couple also look like they might be unstable in use, which is not good for a handrail.

First, the two below are rounded off, but they don't extend very far past the last uprights, which can leave an unprotected tripping hazard due to the wheel stop board.



At the other extreme are a couple that appear to protect the end of the ramp but extend so far, they may be unstable in use.



Finally, the examples below show a relatively good balance of the competing objectives.



HANDRAIL BUTTRESSES

A “buttress” is a support structure generally used to support and strengthen a wall but in ramp building, buttresses support and strengthen handrails. Several approaches have been used in TRP’s history but the latest design is a solid solution that also allows for some flexibility and variations.



There are many possible variations of this simple buttress. Some use the historical TRP design 2x4 cross members under the final module then attach the 2x6 either on top of, or on the edge of the 2x4 sticking out from the ramp. Attachment includes screws through the kickboard and upright as well as into the cross-member that goes under the ramp.

Tom Canfield is using a pair of 2x6x8s and cutting them at 60 inches for the cross-member board under the ramp module then cutting the 36-inch extra piece into two 18 inch pieces with an 45 degree angle cut on one end for appearance:



One advantage of attaching the buttress to the edge of the cross-member, as shown in Tom's pictures and the picture below, is the ability to adjust the position of the buttress down to a block or to the ground to support both the handrail and to reduce flexing of the starter/tail/end module.



The Washington County team which is led by Butch Meier doubles up the support on the last upright as shown in the picture below:



The 2x6 buttress can be efficiently cut from the 2x6 cross-member or from whatever 2x6 “scrap” pieces are left at the end of the ramp build and then can be attached to the edge or face of the cross-member and positioned either above or on the ground. The strength and flexibility of this approach is going to be hard to beat.

THRESHOLD TRANSITION SOLUTIONS

Thresholds that drop a few inches to a porch or deck are obvious problems but even those with a bump just $\frac{3}{4}$ ” – 1” high can be a challenge for wheelchair users. The height is a big factor in determining the solution along with whether the door opens outward.

When there is a drop of multiple inches at the door, measure the drop and look at the door. If the drop is more than 2 inches and the door opens out, it is best to install a 5x5, or larger, flat at the door in addition to a short ramp. The flat area will improve safety and mobility better than creating a situation where the wheelchair must be on a slope when the user is opening the door. When porch space is very limited, some, or all, of the area may need to be covered by a flat which is installed where the plywood surface will be at threshold height then the main ramp can be started at this higher level.



A drop at the door of only 1 or 2 inches can be managed with a short piece of plywood that maintains the ramp slope of 1” drop for every foot of distance. The upper edge of the plywood will need to be supported by an appropriate thickness board and attached to the home. The lower end should have a metal transition plate or a beveled edge to provide a smoother transition. The transition plate is the best choice if the plywood is exposed to the elements as beveled plywood will not weather well.



For $\frac{3}{4}$ " – 1" bumps, a metal transition plate or a beveled board (5/4 x 6 or 1 x 6) can be used. These options can be cut to length based on the door width and custom cut around any frame or other obstructions around the door. These small transition solutions can be used both outside and inside (as shown in the picture below) to provide an easy path from the home all the way to the end of the new ramp. Interior threshold transitions can be held in place with double sided mounting tape



Summary

While the tendency will be to focus on the needs for a "big" ramp, surveyors and builders also need to be aware of seemingly small obstacles such as the threshold and help provide solutions for these cases. Often, scrap lumber and plywood are all that is needed to construct a short and safe door threshold transition.

There are also tools that can be helpful, but not necessary, on a build site such as the power hand-held planer.

The 2x6 buttress can be efficiently cut from the 2x6 cross-member or from whatever 2x6 "scrap" pieces are left at the end of the ramp build and then can be attached to the edge or face of the cross-member and positioned either above or on the ground. The strength and flexibility of this approach is going to be hard to beat.

WORKSITE TOOLS

There is a minimum set of tools needed to build a ramp but there is also the “might need it” list of tools and other supplies and the “nice if funds and space allow” list which we generally have to figure out on our own after building many ramps.

The “minimum” tool set:

- Miter saw (technically not necessary but so much better, faster and safer than a circular or reciprocating saw for cutting lumber to length)
- Extension cord with built in 15amp electrical breaker (better to trip the breaker on the cord than to deal with the client’s breaker box)
- Battery powered drill/drivers (with appropriate bits for your box of screws)
- Measuring tape
- Pencils
- Levels
- Speed squares
- Hammers
- Circular saw (battery, corded or both)
- Wrenches and/or sockets for lags and/or carriage bolts
- Camera or phone (yes, it’s not absolutely necessary for building the ramp but pictures are very important for reporting, recruiting and fundraising)

The “might need it” tool list

- Chisel
- Shims (found in the door department of your big box or local home improvement store)
- Phillips, slotted, square and T-25 bits to cover most situations
- Extra extension cord(s)
- Reciprocating saw with metal and wood cutting blades of various lengths
- Belt or other handheld sander with extra sandpaper
- Coarse file or rasp
- Clamps
- Big Sharpie for marking treated lumber to be easily seen
- Pliers
- Adjustable wrench
- Phillips and slotted screwdrivers
- Pry bar
- Chalk line
- SDS Hammer drill with masonry bits appropriate for the screws or anchors you will be using
- Drill bits in a variety of sizes

Tools that are “Nice to have” if space and funds allow

- Battery powered planer (it is surprising how valuable this tool can be on a ramp build)
- Light socket to outlet adapter

- Generator (in some specific cases this may be a necessity which was hopefully identified in advance by the surveyor)
- Metal plates and/or beveled lumber and/or rubber transition ramps in a couple thicknesses and at least 36" long to deal with threshold issues not identified by the surveyor
- Angle grinder with cutoff and grinding wheel
- Jig saw

One option for the “sometimes or rarely needed” type tools is to know which ones can be borrowed from your team members based on survey information such as the need for a generator or the need to drill into concrete.

Power Hand-held Planers

While the beveled edge on plywood or a board can be created with a table saw, another method is to use a power hand-held planer which is more portable and has other uses at a ramp build site such as chamfering handrail corners:



The collection of pictures below shows several controlled passes of a planer along one edge of a board can be used to create the beveled edge. Note this does not need to be a “sharpened” edge, just sloped from the full thickness down to about 1/8”. The same process can be used on a piece of plywood, which is much easier with a hand-held planer than with a table saw.



From making transition boards and improving handrails to adjusting “less than straight” lumber when joining modules together, a power hand-held planer can be a helpful tool in the ramp building tool box.

RAMP DECKING OPTIONS

The standard TRP design uses plywood but 5/4x6 or 2x6 planks are also decking options, if the module structure is changed to safely support each type of lumber. All are acceptable materials but each one has pros and cons as a ramp deck solution.



Ramp deck material selection

Historically, and for good reasons, TRP has used treated $\frac{3}{4}$ " plywood for the ramp deck. This is an effective solution that is easy for our volunteer groups to install and is the least expensive option when compared to 5/4" or 2" planks. The TRP "inverted module" that touches the ground is a very creative design that is made possible by use of a sheet of plywood. However, plywood is slippery when wet even with anti-slip paint and generally has a shorter expected lifespan than planks, particularly when placed close to the ground. Overall plywood is a good solution, but it's not perfect.

5/4 Deck boards

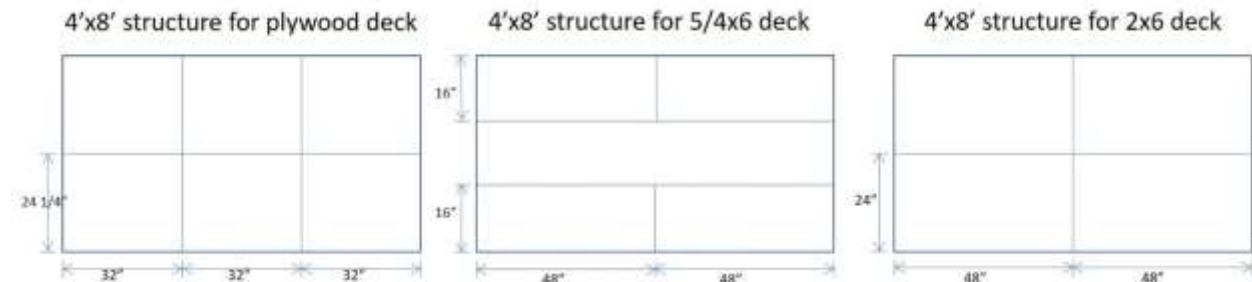
5/4" deck boards are a commonly used deck building material and a ramp is a deck, installed on a slope. The boards are roughly 1" thick with rounded edges that look good when installed and shed water very well to provide better wet weather traction. Other groups that have been building ramps for as long as TRP has, have used deck boards very successfully. A big positive is no need to return and paint the deck. The downsides are cost, slightly more time-consuming installation and a more complicated final module where the thicker material is transitioned down to the ground.

2x6 boards

2x6 lumber is already familiar to TRP teams and primarily differs from 5/4 boards in thickness (1.5" vs 1") and the lack of rounded edges. In general, 2x6 decking should last longer than either 5/4 boards or plywood and falls between them in "per foot" ramp cost due to requiring a little less structure than the thinner 5/4 planks. However, the additional $\frac{1}{2}$ " thickness further complicates a smooth transition to the ground at the end of the decking.

Module structure differences based on decking selection

Using the standard 4x8 module as an example, the different decking options require different structures as the thicker 2x6 decking needs less support than the thinner 5/4 boards or plywood. While not the only solutions, the following diagrams show the basic 2x6 structure needed to support the various decking options. Dimensions below are based on a 48 1/2" wide module for plywood and 48" for the two plank options. There are good reasons to use an even narrower structure such as 45" for 48" planks with overhang which will further extend the deck life but this complicates the installation of handrails.

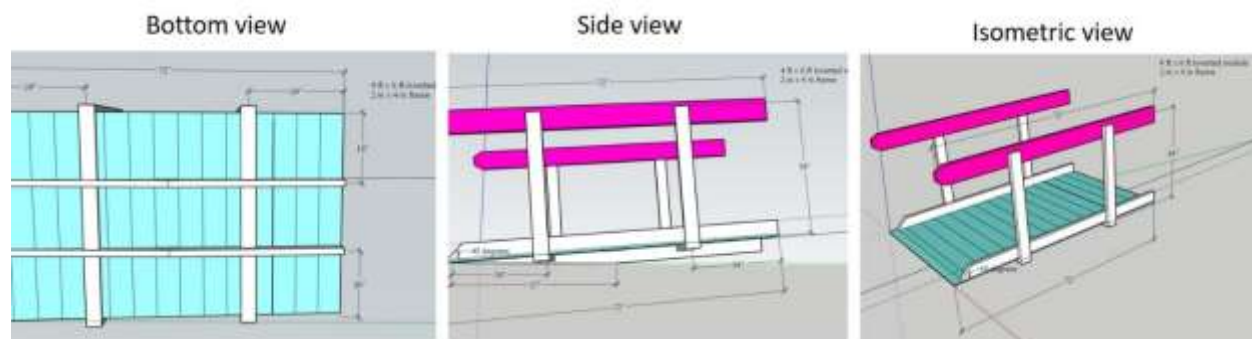


Assuming these structures and current lumber prices, a complete 4x8 ramp module using 5/4 decking will cost about 20% more than one using plywood. A complete 4x8 module with 2x6 decking will cost about 15% more than plywood.

While the cost is higher, another pro for using planks is when “non-standard” modules like 5x5, 5x10 or short modules like 4x2 are needed in a ramp. Planks easily adapt to sizes other than 4x8 with little or no waste unlike plywood where odd size, “difficult to use and/or store” pieces can be generated. In addition, the larger flat surface of a 5x5 or 4x8 U-turn module will drain water much better when decked with 5/4x6 or 2x6 boards which will significantly improve the safety and expected lifespan of the ramp.

Transition to the ground with the different decking options

The final transition to the ground can be challenging with anything but plywood due to the lumber thickness. One example of handling this is shown below, with thanks to our friends in the New Mexico Ramp Project for documenting this approach:



This design primarily uses 2x4s and requires ripping two of them at an angle to lay flat on the ground to support this last module. Others will bury the structure in the ground allowing the whole 2x4 or 2x6 to support the planks and hold the screws.

For plywood decking, the TRP “inverted module” is a very good solution particularly with the addition of the metal plate used by many of our regions to remove the $\frac{3}{4}$ ” plywood edge obstacle at the end of the ramp.

A combination can also be used where most of the ramp uses planks but the last few feet is an inverted plywood module to make the final transition to the ground.

Unfortunately, no matter the design, any lumber close to, or contacting, the ground will deteriorate faster than the rest of the ramp.

Summary of decking options

It is hard to argue with the use of plywood due to the ease of installation and the cost, but the need to add anti-slip paint a couple months after completing the ramp is a challenge. In addition, plywood in general will not last as long as planks and currently available plywood really doesn’t have a “built to last” look as many sheets have open knots in the surface that are going to hold water and accelerate the deterioration process even if painted. If the cost (dollars and volunteer time) of replacing the decking every few years is included on more ramps than in the past, the use of planks becomes more attractive and they eliminate the need to paint the deck also saving volunteer hours. There may be some value in assessing the needed life of each ramp as part of the survey process to facilitate the selective use of planks. It is also possible that specific teams/regions may decide which decking option is best for their clients, build teams and budget to standardize on a survey and build process based on just one decking solution.

JIGS AND MARKINGS

Simple and Cheap Surveyor Jig



Carrying along 3 scraps of lumber when doing surveys can help the build team leader be properly prepared for unique situations and door threshold transition. The pictured scraps are: a short 2x6, a short 5/4 deck board and small piece of plywood. The longest one in this picture is about 15” so these are scraps that can be found when cleaning up after most any ramp build.

The reason to carry these is to better determine specifics like module adjustments needed to clear existing steps or find the right threshold ramp solution particularly in cases where a door will have to clear the completed transition ramp. Of course, a measuring tape can be used to check door clearance but on the build day there can be unexpected clearance issues that could be caught during the survey. These short boards provide a way to quickly evaluate options with readily available lumber thicknesses either individually or in combination i.e., laying the deck board or 2x6 down first then placing the plywood scrap on top to determine which board or combination most closely matches the threshold height while still allowing the door to swing freely. The small pieces are easily carried and can be moved to different positions on an existing porch or deck if there is concern about the clearance varying across the door swing.



There is nothing fancy about these jigs but they can provide a quick “go/no-go” check on which lumber to use for the proposed threshold ramp design.

Module Assembly Jigs

While most beneficial for regions and/or teams that build a lot of ramps every year and pre-build the modules, even if a team only builds a few ramps each year, a module assembly jig can be very helpful and it’s relatively easy to build one.

The primary objective for the jig is to hold the cut lumber pieces on edge and in the correct orientation to each other. In addition, the jig can provide a work surface that holds screws, drills, mallets and any other items needed. There are a few designs in use from simple and flexible, using a sheet of plywood with short blocks around the edge to hold the module’s perimeter boards in place, to more complex approaches that also support the interior module structure during assembly.

The simple and flexible design is basically a sheet of plywood on a bench or other support structure with short blocks added around the edge (as shown in the first picture) to support the perimeter module pieces until they can be screwed together.



The interior area of this jig is left completely open which allows for custom module lengths and easy changes to the module structure as new approaches are identified or custom needs arise. Standard locations for the interior boards can be marked directly on the plywood to speed assembly. Note that this design even allows for building modules with the lumber “flat” to create a 1 ½” thick module as opposed to “on edge” for a standard 5 ½” thick module. On the con side, it can be challenging to have screws rolling around on this surface when getting the boards positioned and having the module being assembled directly on a flat surface leaves little working room for the drill handle and battery when attaching the interior joints.

A variation of this design includes blocks for all of the module structure components with the one shown below being setup for standard 4x8 and 4x4 modules.



Now, just like the “inverted module” at the end of a TRP ramp, another jig design puts the jig on top of the plywood as shown in the following pictures.



One of these jigs can start with a module that has already been built however, it is best to use untreated 2x4 or 2x6 lumber to minimize shrinkage of the jig. This jig “module” is then attached to plywood and the short support blocks added as needed where two pieces of a module will be joined. This design is not as flexible as the open plywood jig but it does allow more working room for drills or other tools and screws can be scattered in the open areas for easy use without interfering with the module assembly process. There can be blocks correctly positioned for several different module sizes, i.e., 4x8, 4x4, 4x2, etc. but it won’t be as flexible as the first jig design described in this article and won’t easily accommodate laying the lumber flat for a thinner module.

Some items which apply to all jig designs:

- The base can be custom built or the jig can be set on top of sawhorses or a table
- The blocks only need to be about 1 ½” high to support a module while it is being built
- The blocks should be about 1/8” thinner, above the jig, on the surface that will support the module being assembled to allow for some variation in the treated lumber straightness and thickness. Without this relief, the assembled module will often be too tight in the jig.



- No matter which jig design is used, it is helpful to have cutouts in the jig to allow for easier removal of an assembled module



- The number of support blocks and their surface area should be minimized which, along with the 1/8” relief, will reduce the chances of a newly assembled module getting stuck in the jig. In any case, it is a good idea to have a pry bar handy when using a jig to build modules.

Creating and Marking a Module's "Good Side"

Whether you are assembling several modules using a jig in a TRP warehouse or building them on the ground at a client's home, it is important to pay attention and intentionally create a "good side" on each module. For example, the following picture is an example of the "good side" where the structure boards will all contact the plywood on a smooth, solid surface.



Now, the other side of this joint looks like this:



It is surprising how different our "dimensional lumber" can be, particularly after it has been treated for ground contact. During module assembly, the builders should select a side and try to make all joints on

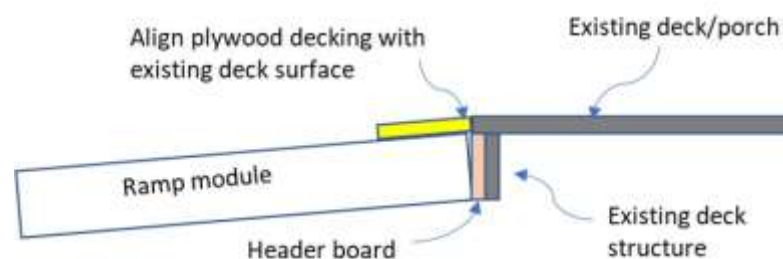
the selected side of each module flush and not worry about the other side. The next, very important step, is communicating this to the ramp build team by marking the “good side” which is easily done with a big Sharpie on the inside surfaces where it will be visible from either edge by those carrying the module into its final position on the ramp.



While it is most important to create the “good side”, marking it makes the ramp build task much easier. This can even apply when building modules on-site, as any given module may not be immediately installed.

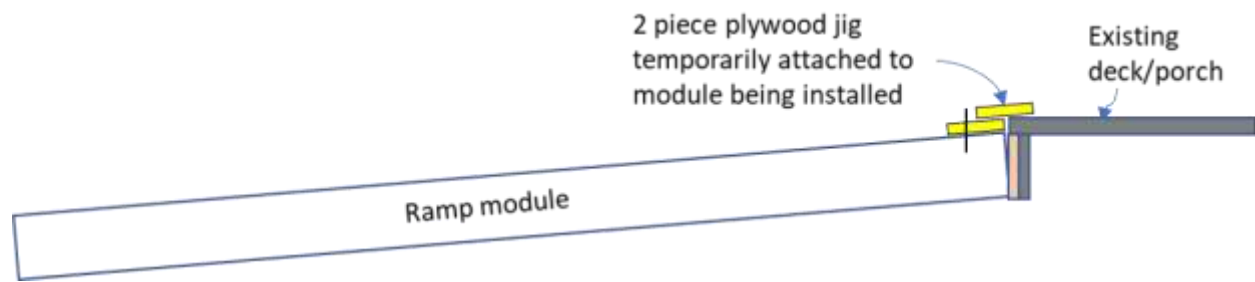
Module Installation Jigs

When installing the first module, it is extremely helpful to have a small plywood scrap available. This is so the finished ramp surface with plywood decking will align with the existing porch, deck or doorway, as shown in the diagram below. Also pictured is the scrap I use, which is about 4” wide and 18” long.

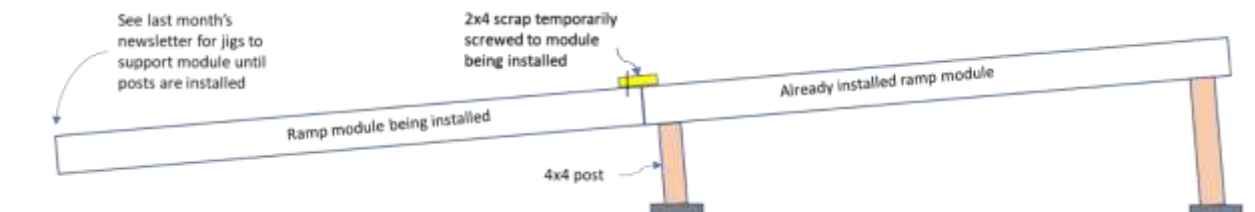


To improve on this simple jig, 2 pieces of scrap plywood can be bolted, screwed and/or glued together overlapping 1/2 of their length. This jig is then temporarily attached on the top edge of the module with

one jig on each top corner on the upper end of the module as shown from a side view in the diagram below.

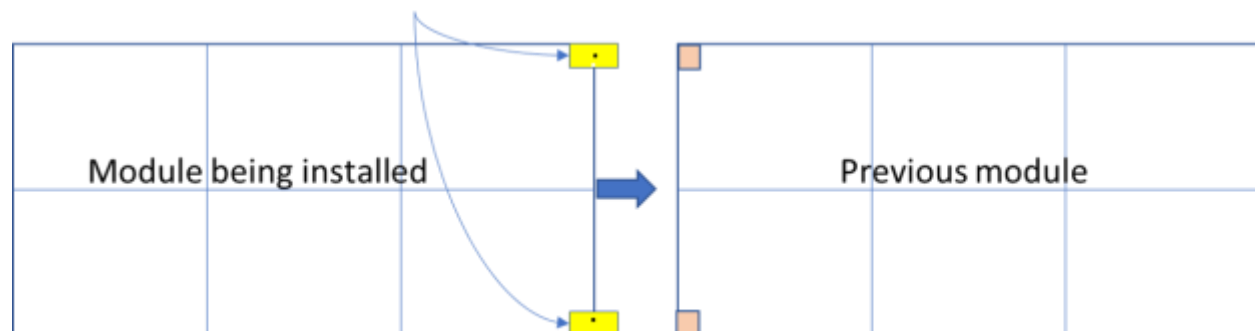


For the remaining modules, a couple scrap 2x4 pieces roughly 6"-8" long serve a similar purpose after being temporarily attached such that they are sticking out about ½ their length beyond the upper end of the module being installed. The first diagram below shows a side view of this simple and easy to make jig.



The final diagram below shows a top view for where the 2x4 scraps are temporarily installed on the upper end of the module. Deck screws or clamps provide the temporary attachment of the jigs. The location is the same for the 2-piece plywood jigs used on the first module.

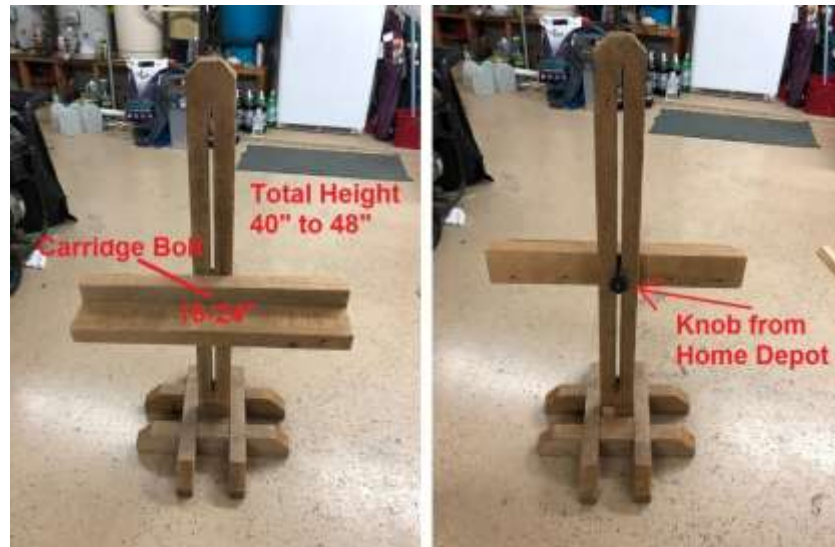
Scrap 2x4s temporarily attached to top edge of module being installed to hold it flush with the top of the lower end of previous module until they are bolted together



These jigs do the work of a couple people by holding the module at the right height, without any wiggling, until it can be attached to the porch or previous module. After getting the module attached, simply remove the jig for use on the next module and next ramp. It's hard to beat a simple, helpful jig that can be made from scraps that would normally be thrown away. After your next ramp build pick up a few of the scraps and build these jigs. Don't forget to paint them yellow or otherwise mark them so they don't get thrown away.

MODULE INSTALLATION JIGS

Two variations of a jig to support the lower end of a module during installation have been developed in two different areas of the state. The first one was created by Luke Crain and submitted by Richard Riehm, who leads our Parker County crew. The jig has a slotted vertical support and a simple tightening knob on the back that will hold its ~2' wide horizontal support bar in position while the module is attached on the upper end and the 4x4 posts are installed.



From the Longview region, Herman Word has created a similar jig using a long bar quick clamp, which is supported by a 2x4 base. Running the length of the base is a hidden rod that passes through a hole near the end of the clamp's bar. This simple jig will support the lower end of the module, and the squeeze clamp allows for quick adjustments to the height during installation. Herman says it looks unstable but is very strong and will rock back and forth as needed, without falling over, while the module is installed.

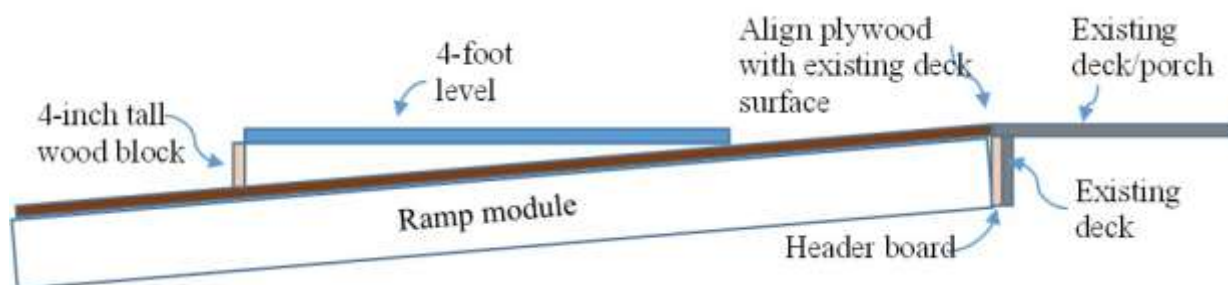


The right-hand 2 pictures above, are a design from Jerry Halpain in East Texas Jacksonville, using a scrap of wood, a piece of pipe, wall flange and the sliding ½ of a pipe clamp.

These jigs are especially valuable when you have a small team as they provide the “extra hand” needed to hold up the module so the rest of the crew can focus on getting it aligned and attached.

SLOPE JIGS

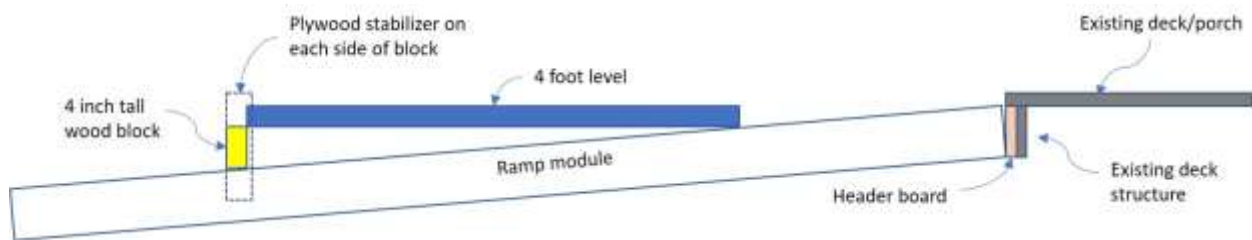
Once the module is aligned with the previous module or an existing porch, a 4” tall wood block and 4’ level provide a quick reference to get the slope of the ramp correct, as shown below, along with a picture of a block used for setting the slope.



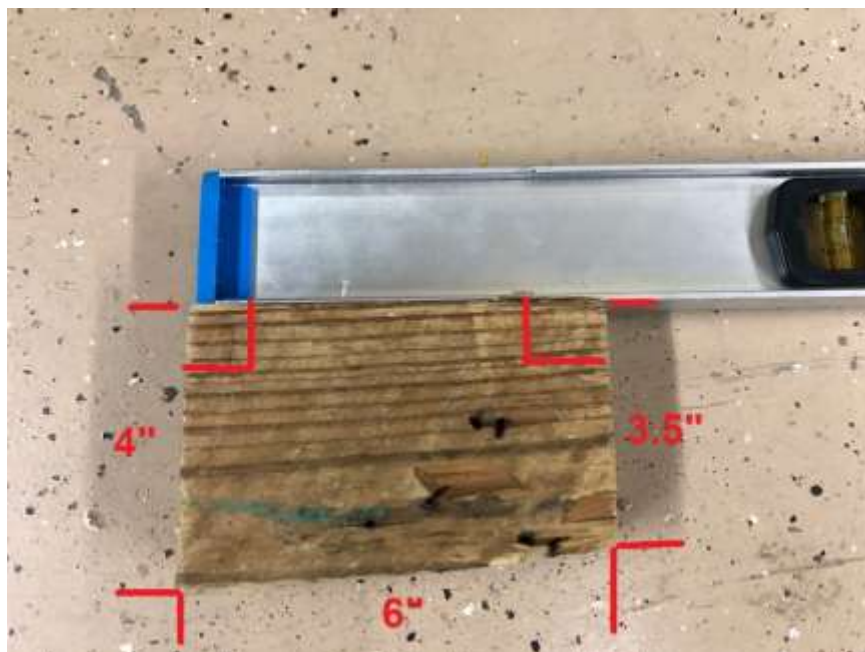
Everything can be improved, and that includes the above slope setting using a level and 4” block which in many cases will fall off the module during use. Randy Kerkman, the Austin Central regional coordinator, has an improved version that solves this problem, which he got from a former Austin team leader and warehouse manager. The addition of a 4” x 10” piece of plywood on either side of the block, as shown in the picture below, will hold it and the 4’ level in place while the module is aligned and attached.



Side View of jig holder



If losing the 4" block is a problem, below are two ways to keep contain the block. The first is another creation from Luke Crain in Parker County, built from a 6" long scrap of 2x6 which is cut 4" wide on one end and 3½" wide on the other end, then screwed onto a 4' level ready for getting the slope correct during module installations.



Jerry Gritter in the Bryan-College Station region had the same frustration, and his solution was to simply tie the block to the level as shown below.



Another option is the “Stanley 48 in. Non-Magnetic 180 Aluminum I-Beam Level” which includes a 180-degree rotating vial on one end that can be set to indicate the correct ramp slope. This level tends to be priced at the lower end of the range for 48” levels.



The rotating vial can be set to any angle but for ramp slope it needs to be 5 degrees.



To accurately set the dial, begin by using the center vial on the level and adding shims as needed to make



sure you have a level reference surface. Then put a 4" block under the end with the rotating vial and adjust until it shows level, when on the 4" block as shown below, making sure to include any needed shims from the previous step used to establish a level surface:



After the vial is in the correct position, hot glue and/or clear tape can be used to hold it in place for use in establishing the ramp slope.

In use on a sloped section of the ramp, the lower end of the section is raised or lowered until this adjustable vial shows level. For flat sections of the ramp, the same level can be used as the center vial on the level can still be used to correctly set flat (non-sloped) sections of the ramp.

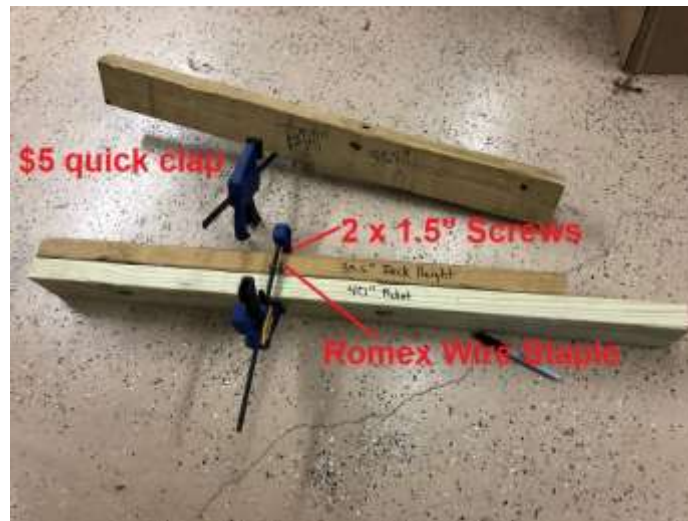


Jigs for Installing Uprights

Gary Poe is a team leader in Scurry County in our Abilene region. The team there has created a jig for installing uprights that has proven to be very useful and time-saving. As shown in the pictures below, the prototypes were built out of some scrap C Perlin and angle iron, but square tubing, etc., could also be used. The first picture shows the jig being used by one team member to install an upright.



Another solution to make sure the uprights are at a consistent height is this item from Luke Crain (Parker County). A quick clamp is attached to a 2x4x33½" board, then a new upright can be aligned on one end, clamped in place, and the shorter board is set on the ramp deck to hold the new upright at the correct height for installation.



Other tips

Paint all jigs a bright color such as yellow

First tip is to note the color of the jigs pictured above, and you might remember the color of the upright installation jigs featured in the October 2021 newsletter. Yellow! Painting jigs like the 4" slope blocks and plywood pieces for installing the first module can help make them identifiable and keep them from getting thrown away at the end of each build. Yellow makes jigs and tools very visible on grass, concrete, dirt or the many other surfaces we find ourselves working around.

Follow a string for the slope

Another tip related to the ramp slope is to use a string from the final flat surface (porch or ramp turn module) down to the final ramp destination point, held in place with a screw into the ground or a block of some kind. The top surface of each module is aligned with the string instead of using the 4" block on each module. If the survey and design were done correctly, this slope will be correct and this will minimize changes in slope when the last module is installed.

Glue on the shelf standard

Gary Poe of Abilene Scurry County submitted this suggestion. When attaching the ¾" x48" shelf standard (see June 2021 newsletter), he recommends using Gorilla Glue (water-activated) in between the shelf standard and the edge of the plywood. This strengthens the joint and helps seal the plywood edge. In addition to the glue, they use No. 8 x 2.5" deck screws. The glue foams up and seals very well.

Pre-paint the plywood decking

Our last tip comes from Greg Silkenon of Elgin in Bastrop County. Greg found it hard to get a small crew to travel back out to ramp sites 15 to 20 miles away for the final painting step, so he changed the process. Now they pre-paint the plywood. Their new process is to order the plywood 3 to 4 weeks before they plan to build a ramp. The plywood is stored in a garage stacked on edge, with short 2x4 block spacers to allow air flow between the sheets. This allows the plywood to dry out. Then two or three volunteers drop by the garage when the wood is dry and paint it, laying it on saw horses and using paint rollers.

There is at least one other team in East Texas that also pre-paints the plywood. Greg's team has found this process a great way to leave the recipient with a completed ramp on build day. Below is a picture of one of the ramps built by Greg's team. Thanks to Greg for taking the time to make this suggestion which may help other teams in the state.



Carpenter pencil tip

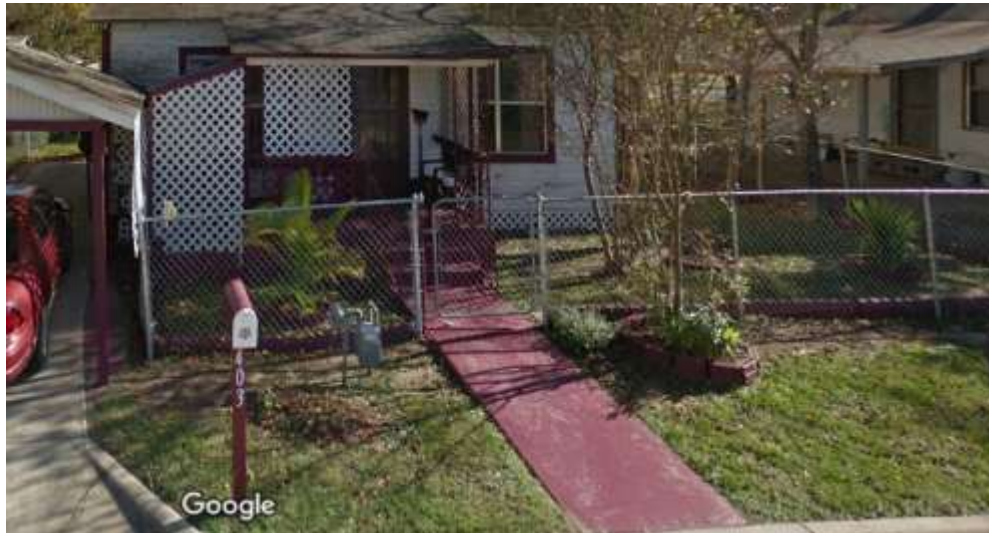
Sharpen both ends of your carpenter pencils so it is useful no matter which way it comes out of your tool bag and if the lead breaks while in use, you can just flip it around and keep on marking.



ELECTRONIC RESOURCES AND TIGHT SPACE RAMP DESIGN

The pros and cons of some electronic resources and understanding the absolute minimum ramp requirements are the subject of this month's article.

When possible, the first "visit" to a referral may be possible using Google Street View such as the picture below.



This capability can provide a rough idea of the ramp need and can help find the house when you actually do the in-person survey. A quick look at the example image above says "...there isn't enough room for a ramp at that house..." because a step riser is around 6 inches which means there has to be room for roughly 18' of slope which isn't obviously available in this view.

In some cases, the satellite view can also be helpful but, as shown below, trees are often an issue and you can't see near the detail available in the street view.

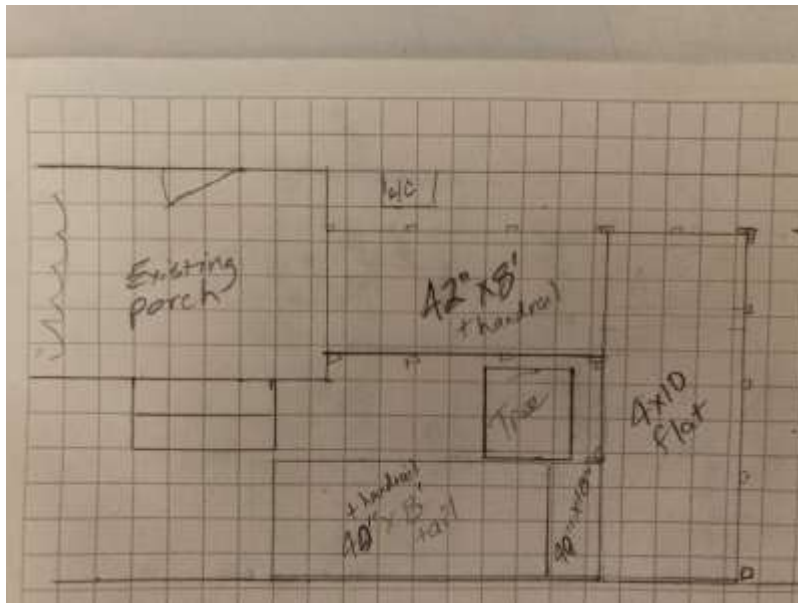


In addition, some of these online images are starting to get old so "what you see, may not be what you get" when you visit the site as shown in this recent picture.



The street has apparently been replaced which included a curb cut and new sidewalk up to the gate and a window a/c unit has been added which further constrains the available room for a ramp.

In the end, a ramp did fit, but it required careful consideration of the minimum 36" inside width to allow room for a wheelchair so the section between the fence and the tree is only 40" wide which leaves 37" inside width. The section between the house and the tree was narrowed to 42" to clear the window a/c unit.





During the survey visit, the client's wife revealed that, in addition to our client needing the ramp, their daughter is wheelchair bound and they would lay boards on the steps for her visits to the home.

The moral of the story is that some electronic resources are amazing and helpful for the survey process, but to do it right, it is important to visit the site, take measurements, take lots of pictures, and hopefully visit with the client. This ramp took a little more time to design and build to meet all the needs and minimum requirements, but will serve several others in addition to the client.

BUILD INSPECTION

As a ramp is being built, there are many checks that need to be done along the way. In most cases, little problems are easier to fix early in the build and get harder as more components are added so it is best to be constantly on the lookout for issues.

An easily found concern are screws that completely missed the mark or maybe were driven in too far causing them to stick out where they can catch on fingers or clothing.



Another potential issue is screws that are in a line with the grain that will likely lead to splitting the board.



Wide or uneven joints, particularly on the handrails, need to be minimized. Inevitably, they will happen so it is important to catch them as early as possible to allow for correction but they can often be fixed by using a planer, rasp or sander. In the case shown below, one of the handrail supports was installed too high so with that corrected, the gap was fixed when the handrail was reinstalled.



It is also important to make sure that all needed screws are there such as down the centerline of the modules to hold down the center of the plywood.



Summary

It is critical that we provide safe, durable ramps to our clients which requires the surveyors and team leaders to recognize the need for additional structure and child safety balusters on some ramps. In addition, all ramps are improved when the team leader and all build team members watch for and correct any potential weak spots, handrail splinters or screws that have missed their mark during installation.

FORMS AND DOCUMENTATION

Survey Information Form

Date: _____

REFERRAL FROM: SW Name: _____

MAPSCO: _____

Agency: _____

Client name: _____

Address: _____

Other Contact Info & Description:

Phone: _____

Ethnicity: A-A CAU HIS ASIAN Other _____

Veteran? YES NO AGE _____

Ramp Location: Front Back Garage Other _____

Threshold ramp: _____

Starting point: _____

Took pictures? YES____ NO__

Elevation: _____

Shade Factor: _____

Electric Outlet Location: _____ Porch made from: Concrete Wood

Description of ramp: _____



TEXAS RAMP PROJECT

Things to Know About Your New Ramp

We expect that you will find your new ramp to be very useful. Here are some things that you should know about your new ramp:

- It is constructed from pressure-treated wood. This minimizes the potential problems of wood rot and termite damage.
- You may decide to paint or stain the wood for appearance' sake. We recommend waiting two months so that the wood will be completely dry. A textured surface will help to reduce any slipperiness.
- If you find any structural or safety problems with the ramp, please contact us.
- The ramp was built entirely by volunteers. No one is financially compensated in any way. Volunteers provide their own tools and transportation.
- The cost of lumber and hardware is covered by donations from churches, corporations, schools, other organizations and individuals.
- We construct hundreds of ramps each year and the needs continue to grow.
- The cost of materials for your ramp is \$_____.

The volunteers and organizations that provide support appreciate thank you notes. Any financial contribution that you or your friends can make is also appreciated but not required. 100% of your donation will be used to purchase lumber for future ramps; donations are tax-deductible and should be sent to:

**Texas Ramp Project
PO Box 832065
Richardson, TX 75083-2065**

Further information about our organization can be found on the internet at:

www.TexasRamps.org

Phone contact: (214) 558-0339

Email contact: info@texasramps.org



P.O. Box 832065, Richardson, TX 75083-2065
Phone: 214-558-0339 • info@texasramps.org • www.texasramps.org

Ramp Completion Report

1. Name of Client _____
2. Address _____
3. City/Zip _____
4. Length of ramp including all flat areas _____
5. # of volunteers on site _____
6. # of man hours to build* _____
*(i.e., 4 volunteers on site for 5 hours = 20 volunteer-hours)
7. Source of volunteers _____
8. Team Leader _____
9. Date built _____
10. Does client own home Yes ____ No ____
11. Has referral source been notified _____
12. Funding Source for ramp materials (if known) _____

When completed, send the form to garygatzlaff@texasramps.org

Feel free to attach pictures so they can be added to each client's build data.

Media Consent, Waiver and Release
Texas Ramp Project

Photographs, Videos and Recordings

On behalf of myself and of the below-named individual, I hereby grant permission to Texas Ramp Project (TRP) to take photographs, videos, and audio recordings or any other media platforms of the below-named individual on the date and at the location listed below.

First and Last Name (Printed) Minor? Y or N

Location _____
Date taken

I grant to TRP my irrevocable consent and a non-exclusive, sub-licensable and assignable license to use, publish, post, and display the above-named individual's name, likeness, photograph and voice, in whole or in part, regardless of whether altered, distorted, or used alone or with other material, for promotional, advertising, trade, and publicity purposes in any medium now known or later discovered, worldwide and in perpetuity, without review or approval, and without further notice, payment, or consideration of any kind.

Waiver, Indemnity and Release

On behalf of myself and of the above-named individual, I hereby release, and agree to defend, indemnify and hold harmless TRP from and against any claims, damages, causes of action, or liability arising from or related to TRP's use of the photos, videos, or audio recordings of the above-named individual, including but not limited to claims of misappropriation, defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished photo, video, or audio recording, its publication or distribution.

I have read this document before signing below, and I fully understand the contents, meaning and impact of this consent, waiver, indemnity and release. This consent, waiver, indemnity and release is binding on me, my heirs, executors, administrators and assigns.

Signature _____
Date