# Florida Stretchers

Adjustable stretcher system
using locally available aluminum,
wood, and hardware.
floridastretchers.org

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**Adjustable stretcher system using locally available aluminum, wood, and hardware.**

System Design and Presentation
Marc Bridger

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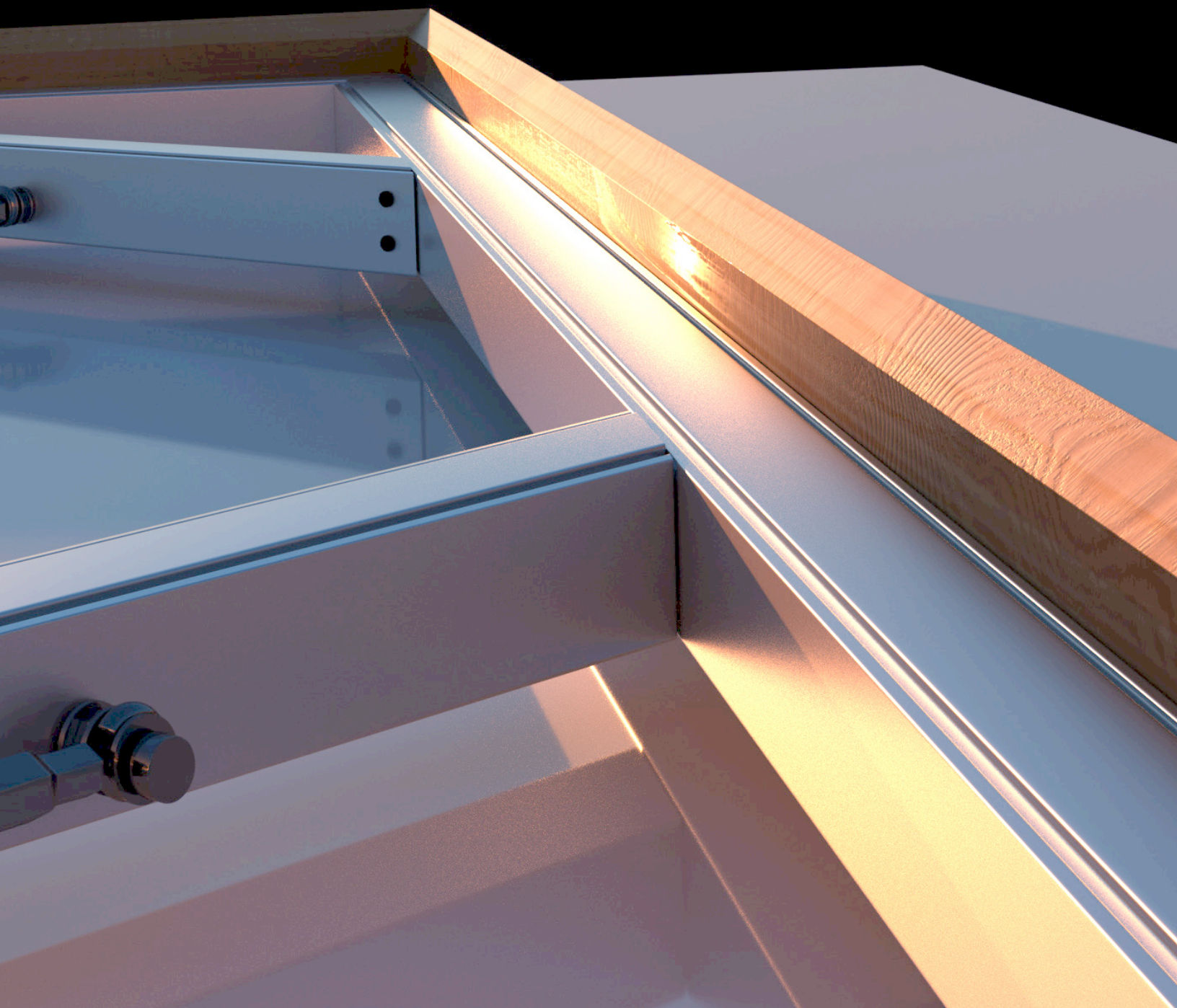
August 21, 2019



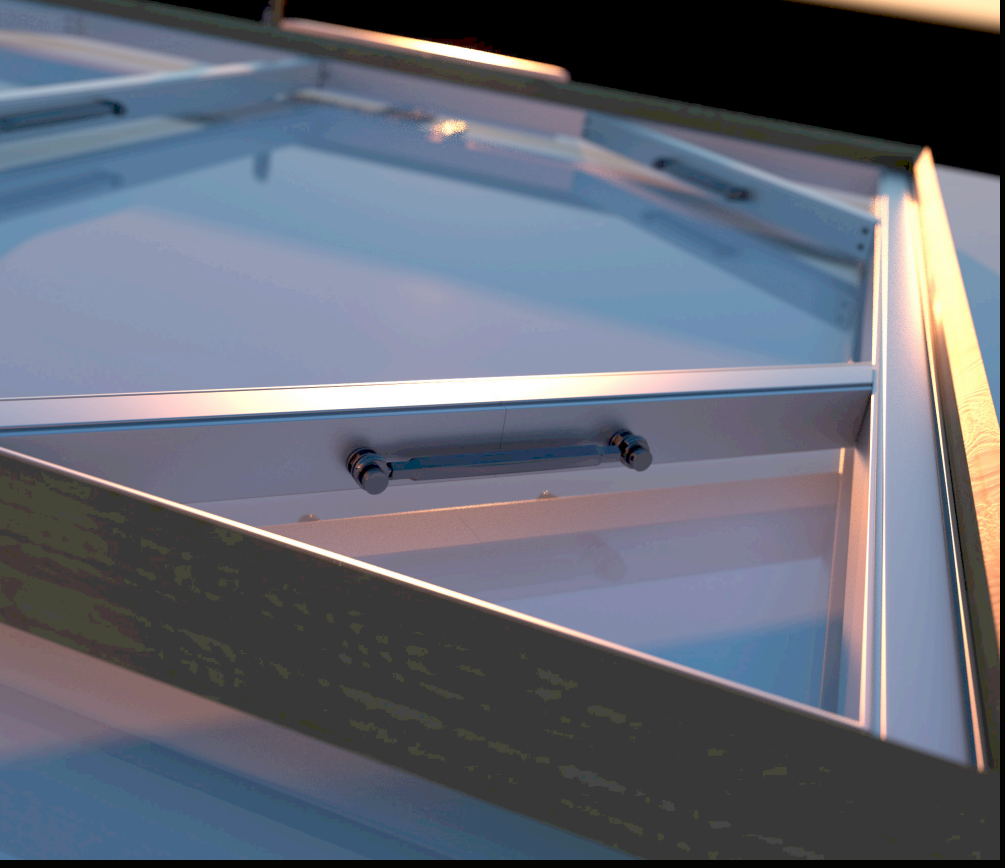
# Florida Stretchers

Please visit Floridastretchers.org
for a helpful video series that
accompanies this written guide

Florida Stretchers

# Part I

## Purpose & Intent
## How Florida Stretchers Work



## Introduction

My name is Marc Bridger and I am visual artist. The purpose of this PDF is to consolidate and document a stretcher-bar system I developed for personal use in preparation for a winter 2019 MFA studio. At that time, I documented the system and attached it as an ancillary notation in a communication with Professor Steve Knudsen. Through Steve's valued encouragement, I am now producing documentation and a video supplement for students and art professionals. Together, Floridastretchers.org, this PDF Guide, and the associated videos present a system to art professionals that may be customized and I am delighted to pass it on to you and the larger art community to alter for your personal needs.

## Intent and Disclaimer

While I will attempt to document all steps, measurements, and caveats; please understand the intent of the system and subsequent documentation is to provide an alternative to commercial offerings. I do not have a background in carpentry, construction, or a field where a system design such as this would benefit that experience. Thus, it may have glaring design issues when examined through the lens of a professional with those skill-sets. Its original intent was for personal use. Certainly, it has many of my ideas. Nevertheless, it is very much an artist's amalgamated interpretation of existing notions manifested into necessitation due to financial constraints and design affinities.

Commercial Alternative
BEST Pro-Bar System

## Goals

The following concerns were catalysts for the inception of the design that led to Florida Stretchers:

- I needed an alternative to expensive commercial aluminum stretcher-bar systems that in large sizes incur exorbitant freight fees.
- To address fluctuations in surface stress related to maturation and environmental conditions, the system must empower conservationists with methods of intervention well into posterity.
- Framing that provides a deep and substantial appearance for the final stretched substrate in contrast to BEST and similar systems that can be flimsy and minimal. In addition, the system should accommodate shallow depth preferences.
- Must incorporate off-the-shelf hardware and materials from local stores to eliminate special-order and freight concerns.


3” x 2” Also Available

Enclosure Aluminum at Home Depot

Locating an ordinary and local extruded aluminum resource provided a challenge. However, the common screen enclosures attached to homes at the rear lanai and pool areas in Floridian homes provided an answer. The standard extruded aluminum available off the shelf is 2-inches square and is readily available at Lowe’s and Home Depot. A 3”x2” version is also commonly available for those that may need something uncommonly substantial. After prototyping a few ideas, I settled on screen-enclosure aluminum using its inner-channel to create an ***internal sliding coupler*** that is an integral component. And, that is the origin of the system’s moniker.

## Cost and Commercial Comparisons

Aside the following rough comparison, cost is not addressed in this document. In the Fall of 2018, a single commercial aluminum stretcher measuring 129” x 80” was going to cost roughly $300. In addition, freight fees of $250 to $300 would be levied when estimating the options from three different online retailers (Blick, Jerry’s, etc.). Thus, the rough budget for comparison in the first attempt was $500. The initial unit incurred more waste due to trial-and-error when prototyping. However, the final material costs were roughly $400. This can be reduced easily with cheaper lumber, mending plates from online resources, and other frugal strategies.

### Choosing Between Commercial & Florida Stretchers

Florida Stretchers can be a time-consuming endeavor. If cost is the only consideration this system may not be a beneficial option. Along with adjustability a primary consideration is the ratio of light-weight framework to strength in supporting a substantial exterior wood frame. Because of warping wood and strength issues, stretcher lumber is typically laminated beyond 7 or 8 feet and this causes it to become very heavy and expensive. Like heavier wood alternatives, Florida Stretchers provides advantages for producing substantial frameworks that protrude from the wall yielding a decisive presence.

First Florida Stretcher result | Fall 2018 | 129” x 80” x 3½” Deep

Florida Stretchers | 129” x 80” x 3½”

## Adjustment

Tension adjustments become necessary with age, while changes in temperature and humidity can cause a canvas or linen to sag. When creating the first prototype stretcher, it was winter in Florida. The temperatures were ranging from 40° in the morning to 85° in the afternoon. After five coats of gesso coupled with the humidity and temperature shifts, the canvas sagged tremendously. Ordinarily this would have been an enormous issue due to the severity of the sag. However, the adjustable joints quickly remedied the situation and proved the system’s flexibility. Included here are some comparison images of the sag encountered:

## Sag

Canvas nearly touching the center support.

## After Adjustment

Corner braces and center expanded to eliminate nearly 1½” of sag in canvas. The visible gap between alumi-num supports is intended. The internal-sliding-coupler maintains the connection between the two support segments (explained in a later section).

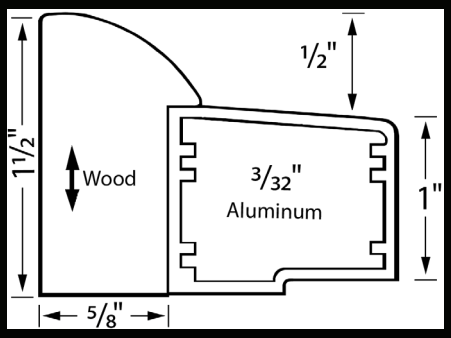
# Commercial Systems Comparison

Like other commercial alternatives, wood is wrapped around Florida Stretchers' aluminum frame. This permits the framing to have depth, provides a location for stapling, and yields a malleable material for creating a 45° bevel that distances the canvas from the underlying framework. Consider the commercial alternative of Jack Richeson's BEST Pro-Bar System which has a 1½" wood casing around a 1" aluminum frame. By comparison, Florida Stretchers use 2-inches of extruded aluminum while the wood depth can vary depending on your needs. My initial Florida Stretcher and the two frames I will be constructing for this documentation use 1"x4" select pine boards (which actually measures 3½" and have a depth of 3/4"). The BEST Pro-Bar solution connects its joints two ways. First, the corners attach via thin metal corner connectors that slide into a channel. Second, the center all-wood supports connect and are supported by plastic hardware. Images provided here of BEST's system were taken from product literature on the Blick website.

Richeson's BEST Pro-Bar Model

BEST Pro-Bar Corner Connectors

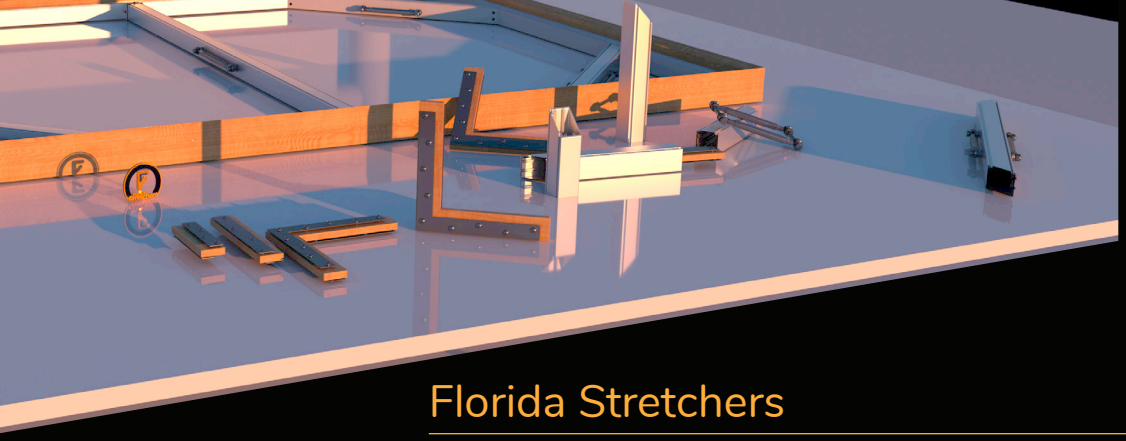
BEST Corners are adjustable with these turnbuckle-like connections




BEST uses a 1½" wood and 1" of aluminum.


BEST Pro-Bar ***Plastic*** Horizontal & Vertical Adjustment

All images on this page are come from Dick Blick's BEST Pro Bar system and can be viewed at this URL:
https://www.dickblick.com/products/best-pro-bar-system/



# Florida Stretchers

Part I is an introductory section providing a broad overview while Part II will present descriptions, hardware, measurements, tool considerations, and other necessary information to help create Florida Stretchers.

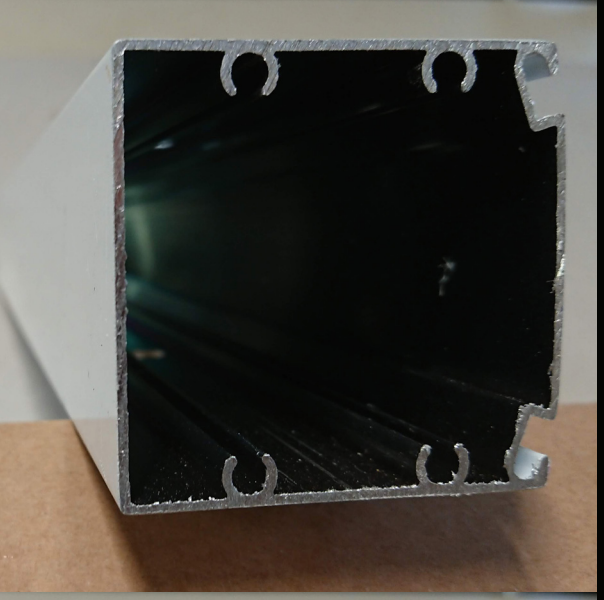
## How it Works

ScreenTight branded extruded screen enclosure aluminum was used for these projects. It is 2-inches square and readily available at Home Depot. Other square extruded aluminum would work; however, the measurements in this document would not be applicable. Nevertheless, the ***sliding couplers*** constructed to make flexible joints can be tailored to any type of aluminum you choose as long as it's hollow.

Florida Stretchers depend on a constructed hardware component referred to as an ***internal sliding coupler.*** It is an integral component to the system assembly. Using an L-shaped 90° corner version of the ***sliding coupler*** permits connection of the four outer edges which "float" and slide into one another, eliminating the need for screws or nails while simultaneously permitting flexibility and adjustability. Thus, the outer edges connect, but are not permanently fixed into position or to each other. Each corner has a 45° diagonal aluminum brace. The diagonal and center braces are constructed of two equal lengths of aluminum. Connecting the pieces requires a ***straight sliding coupler*** and two turnbuckles. The aluminum segments, sliding coupler, and turnbuckle work together and constitute a single brace. Expanding the turnbuckles permits the two pieces of aluminum to separate in conjunction with the inner ***sliding coupler,*** which retains a firm connection between the two segments. Together, these elements permit expansion or contraction yielding a flexible joint.


ScreenTight
SKU#631-204
Home Depot

Sliding Couplers
Left is a Corner Coupler | Right is a straight coupler used in diagonal supports and the center brace




Overlay with ScreenTight Aluminum (SKU#631-204)

Sliding-Coupler
Straight Version

All joints must be able to contract or expand and cannot be permanently fixed as it would defeat the necessary adjustability. These concepts will become more apparent through the following descriptions, images, and the accompanying video.

## Sliding Coupler and Aluminum Channels

Sliding couplers slide along the inner channels of the extruded aluminum. Notice the circular channels inside this ScreenTight branded 2” extruded aluminum (left). The sliding couplers use metal mending plates attached to wood that slide into the circular channel. Also, the center part of the aluminum tube between the two circular channels becomes a channel for the wood portion of the sliding coupler (see images on left). If extruded aluminum is used without these channels, then adjusting the coupler design would be necessary. The metal mending plates could be eliminated or simply used to reinforce the wood. Most of the sliding action depends on a snug wood portion. It is more important that the wood be cut as exact as possible so that it is snug and does not have a gap. However, it should not be so tight as to prevent the two aluminum segments from contracting

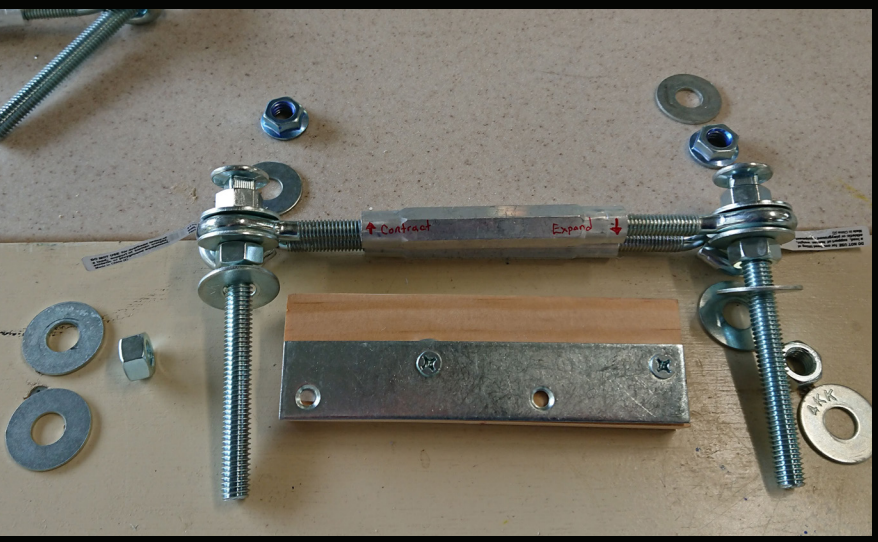
**Corner-Sliding-Coupler** (L-Shaped)
The four corner are not permanently fixed to one another. Instead each of the four sides fits together through an L-shaped corner sliding coupler.

Exterior wood strips surround the aluminum providing depth, additional structure, and a method of attaching the canvas. The wood is cut to 45° on a table saw as depicted in this image. However, for those without a table-saw corner-round could be affixed to the flat edge and would serve the same purpose (preventing the canvas from touching the 3/4” of wood).

or expanding (separating). There should be no movement or play perpendicular to the coupler. In other words, if expanded slightly, the two aluminum segments must remain a rigid unit with the coupler in place. If you can rock them back and forth and the coupler allows a flexing of the two segments, then consider a tighter wood segment.

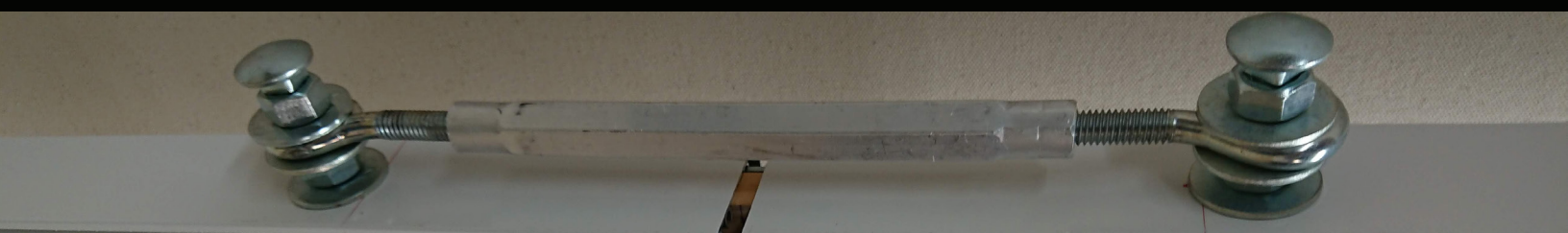
## Adjustment Hardware

To be adjustable, the corners and joints cannot use screws or hardware to permanently bond segments, as these areas need to remain flexible. Heavy-duty sliding couplers in corners and braces provide sturdy internal support, while flexibly mending the two aluminum segments together. The turnbuckles work together with the coupler to strengthen the flexible joint on the exterior, while providing adjustment hardware to expand and contract the pieces.

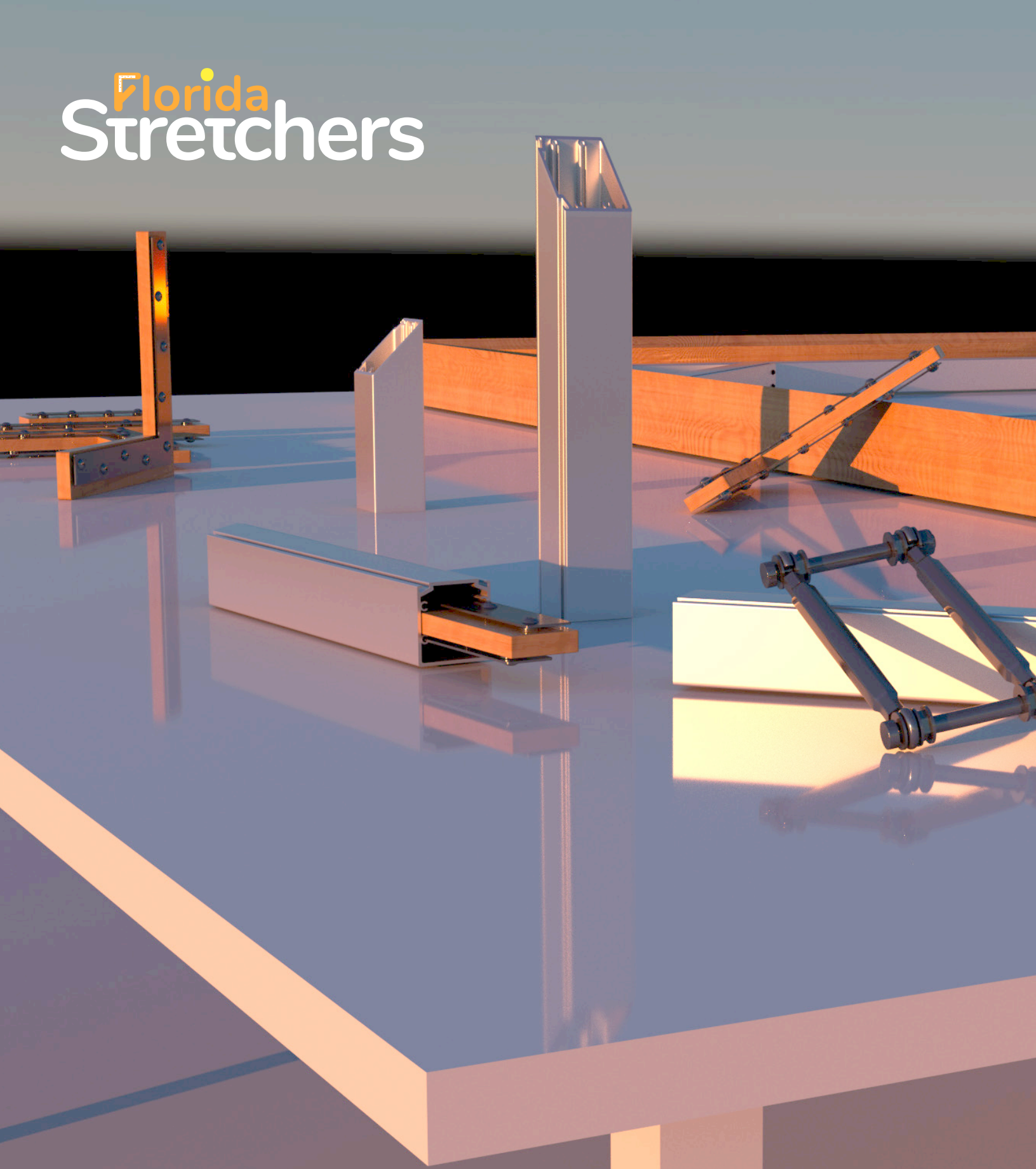



## Flexible Joint Construction

Heavy bolts serve two functions: 1) anchors for the turnbuckles, and 2) stoppers to prevent the inner sliding-coupler from moving further into the tube. While these turnbuckles are far heavier-duty than necessary, they're readily available at all local hardware stores in these 3/8" x 10" and 3/8" x 16" (center support) sizes. Thus, similarly oversized carriage bolts are used to correspond to the turnbuckle eye-loop hole. Cutting your own threaded bars is an alternative to the carriage bolts as are various other forms and sizes of turnbuckles. These types of joints are used in five locations. The shorter 3/8-10" turnbuckles are used at each 45° diagonal brace, while the longer 3/8-16" turnbuckle and joint is located on the center support.

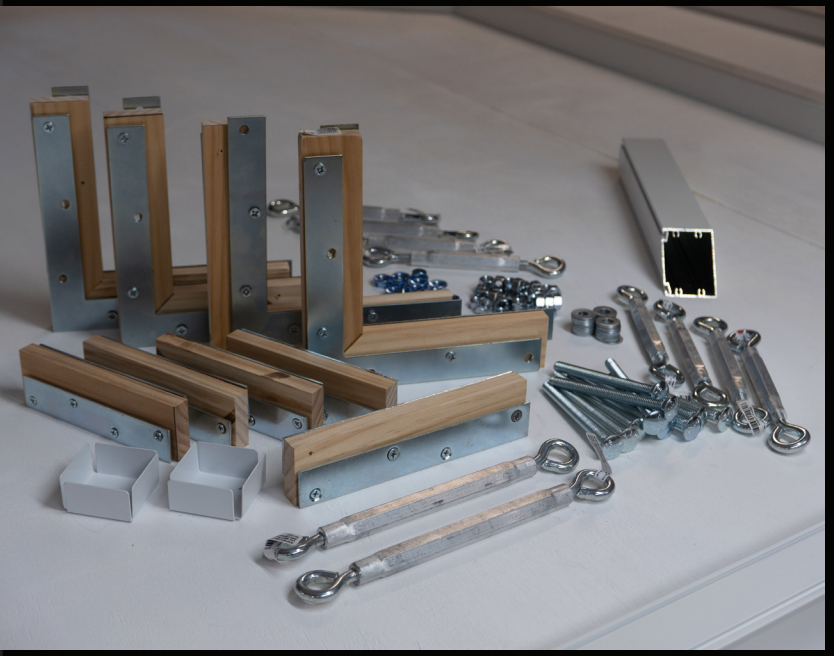


Florida Stretchers



# Part II

## Construction | Parts, Measurements, Plans, and Calculations






# Introduction

Presented in this part is the construction of a Florida Stretcher measuring 80” x 110” using ScreenTight (SKU#631-204) extruded aluminum.

## Materials and Hardware

Except for screws attaching the wood casing to the aluminum and the self-taping screws for the braces, all hardware necessary for Florida Stretchers are presented in the adjacent images. Quantity and sizes are presented in the below table. To save substantial costs, washers, carriage bolts, and nuts are best purchased by weight (at stores like Rural King, or a similar retailer). Mending plates and corner braces are found cheaper online as Home Depot and Lowes price gouge these parts heavily.

| Item | Size | Qty | Sku/Brand Location | Purpose |
|---|---|---|---|---|
| Corner Braces (L-Shape) | 8” or 6” | 8 | Everbilt HomeDepot | Corner Sliding Coupler |
| Mending Plates (Corner Braces) | 6” | 8 | Everbilt HomeDepot | Sliding Coupler (Braces) |
| Mending Plate (or 2 additionalcal 6”) | 8” | 2 | Everbilt HomeDepot | Sliding Coupler (Center ) |
| Washers (Spacers) | Small | 144+ | Any Small Washer | Sliding Couplers |
| Wood Screws | #8 x 3/4” | 72+ | Everbilt HomeDepot | Sliding Couplers |
| Select Pine (roughly 12-foot) | 1” x 3” x 12’? | 1 | Daymark | Sliding Couplers |
| Select Pine - Height of Canvas | 1” x 4” x 8’ | 2 | Daymark | Wood Casing |
| Select Pine - Width of Canvas | 1” x 4” x 10’ | 2 | Daymark | Wood Casing |
| Screen Enclosure Aluminum 2” | 2” x 2” x 10’ | 6? | ScreenTight | Framing |
| Turnbuckle | 3/8” x 10” | 8 | Lowes | Corner Braces |
| Turnbuckle | 3/8” x 16” | 2 | Lowes | Center Support |
| Carriage Bolts | 3/8” x 4½” | 10 | Rural King | Turnbuckles |
| Washers | 5/16” | 60~ | Rural King | Bolts/Turnbuckles |
| Nuts | 3/8” | 60~ | Rural King | Bolts/Turnbuckles |
| Clip U-Fastener SKU332-103 | P#WCCUF | 4 | ScreenTitght HDepot | Center Support |
| Teks Hex Self-Drill Roofing w/washer | #12 x 3” | 8 | SKU #571326 | Corner Braces |
| Teks Hex Self-Drill Roofing w/washer | #12 x 1½” | 4 | SKU #634517 | Corner Braces |
| Teks Hex Self-Drill Roofing w/washer | #12 x ¾” | 20 | SKU #184165 | Center Brace |
| Spax Wood/Metal Screws | #8 1½” | 50 | Spax HomeDepot | Wood Casing to Alum |

■ Lumber width will vary depending on personal preferences. If using 2” ScreenTight aluminum, use a minimum of 2” (actual) wood with quarter round or 2¾” wood beveled to 45° to ensure canvas does not hit aluminum.

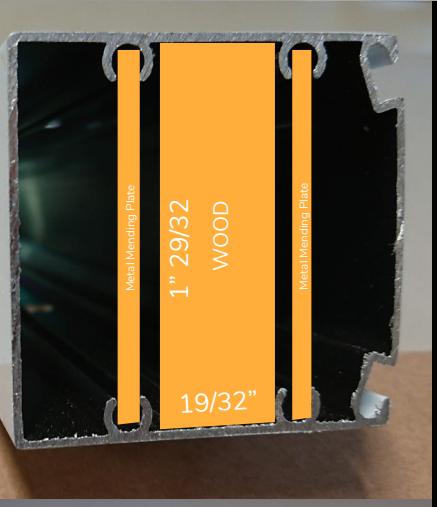
## Plan

A plan helps determine the necessary aluminum and lumber. The plan on the following page illustrates sliding-coupler placement. Sliding coupler's articulation, placement, assembly, and use are best illustrated with the new Online video segments and it's highly recommended that resource be referenced in addition to this guide.

## Sliding Couplers

Four (4) L-shaped corner sliding couplers, four (4) straight corner brace couplers, and a (1) single center coupler are necessary. Sliding couplers are constructed of mending plates, screws, small washers (optional), and wood. The washers separate the metal plate from the wood so that it is easier to slide into the circular channel of the aluminum tube. The wood needs cut to its final dimensions on a table saw. Most other cuts for a Florida Stretcher can be performed on a miter saw.

In addition to the main stretcher, an additional demo model was built. The main canvas sliding couplers use 8" L-shaped corner brackets, while the demo employs 6" corner brackets. Either will suffice. However, both use 8" strips of sliding-coupler wood cut at 45° and connected with a screw. Refer to the images and video demonstration for a complete walk-through of creation and assembly.




| Sliding Coupler | Wood |
|---|---|
| Height | 1" 29/32nds |
| Width | 19/32nds |
| Length | 8" L-Corners & Center<br>6" for diagonal corner braces |

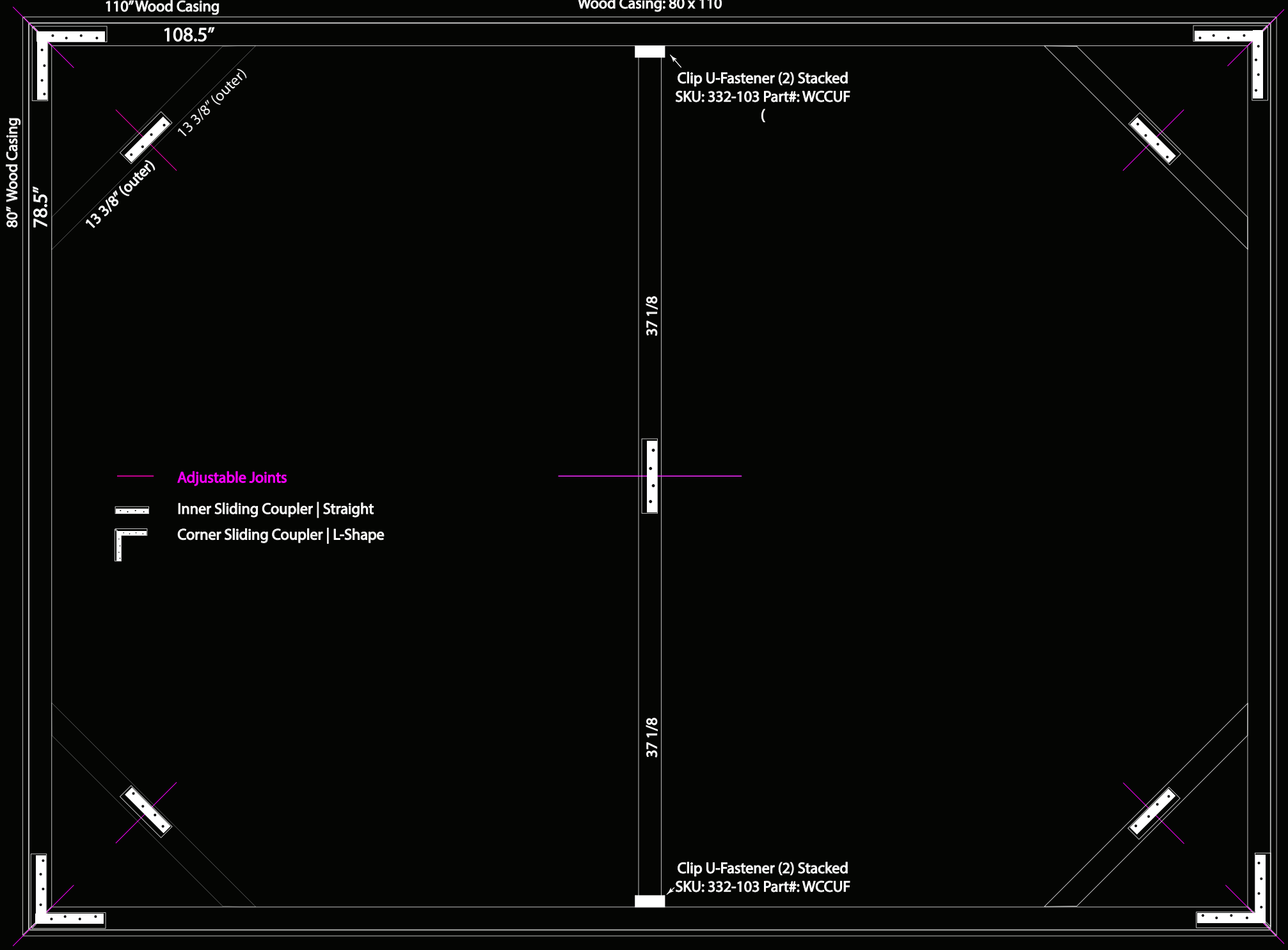
The diagram on the left and its corresponding table present the internal measurements of the ScreenTight extruded aluminum. These measurements will help you when cutting the wood down for the sliding couplers.

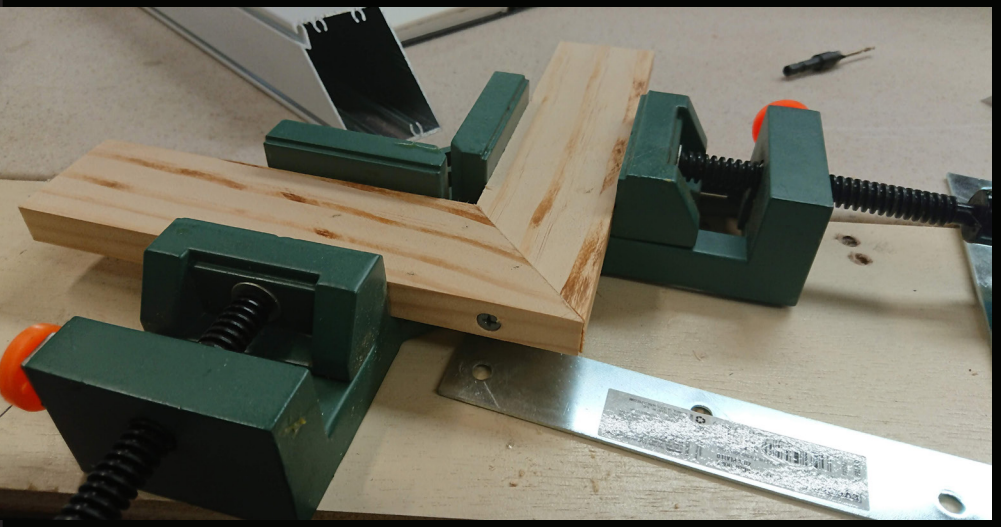
## Assembly

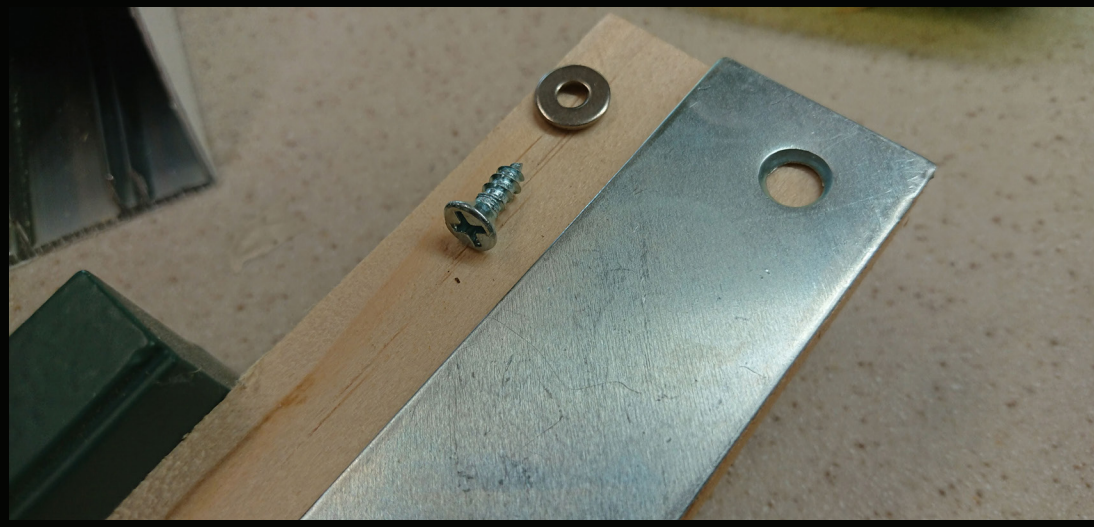

The L-shaped corner sliding couplers and the straight sliding couplers have a simple construction once the wood is cut to proper dimension. After cutting two 8" strips of sliding-coupler wood at 45° on one end, align them in a corner clamp. With a countersink bit drill a hole and insert a 1½" wood screw. Align one L-shaped corner bracket (see material list) to the L-shaped sliding coupler wood you just created in the clamp. Use a punch or drill pilot holes to ensure precise placement of the screw. Next, remove metal bracket and place two small washers as spacers between wood and metal for each hole. Affix metal bracket to wood with #8 ¾" wood screws. The second metal bracket is off-set and placed on the opposite side of the wood. Do not over-tighten—brackets should be slightly loose. See images on following pages and the video for a demonstration.

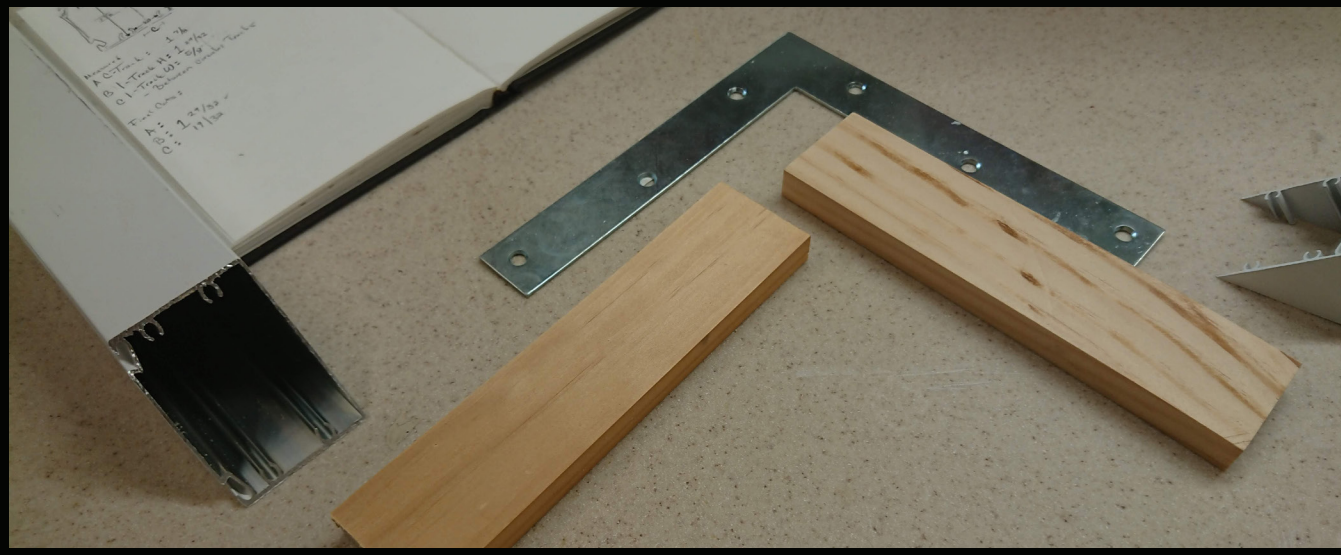
Corner Clamp with Quick Release
Under $10 at Harbor Freight

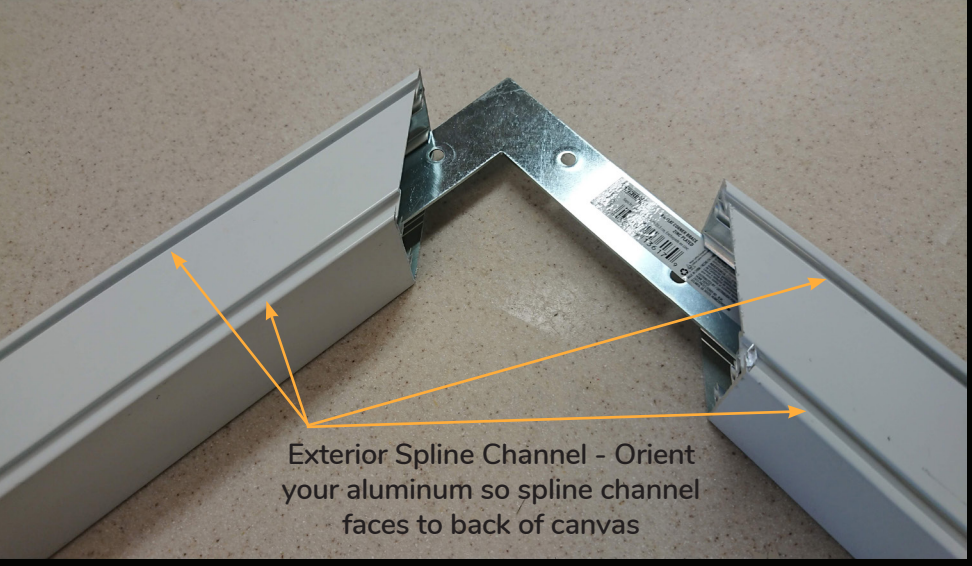
√3
1 : 1.73
Aluminum: 78.5 x 108.5
Wood Casing: 80 x 110





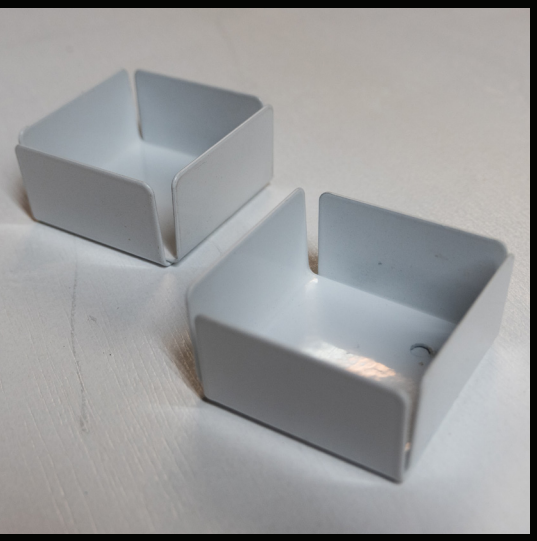







## Aluminum Cuts

The channels on the exterior of the ScreenTight extruded aluminum are intended for rubber splines that hold the screen. Place these channels inward toward the canvas (hidden when looking from the back). Once cuts and construction begin, the front of the canvas will be facing toward you for most of the assembly. Keeping these channels facing the front of the canvas provides a visual alert to proper orientation. Alternatively, they could face the back but consistency is key. They cannot be placed 90° of this orientation since the inner channels would be aligned ***incorrectly***. The channels inside the tubes ***must*** be located on the top and bottom of the tubes in order for the corner sliding couplers to work properly. Once a cut is made all subsequent cuts become relative. Therefore, it's important to orient the aluminum properly and note the desired orientation. Use a proper miter blade to ensure clean cuts (96-tooth for 12").



Two stacks of two Clip-U Fasteners. Four clips = 1/4" deduction from total center support length (or 1/8" from

## Primary Stretcher Frame Cuts

Cut each end of the stretcher support at 45° with a miter saw. Each 45° end will be opposite the other, mimicking a picture frame. For example, the left will have this angle: \ While the right will have this angle: / These cuts are demonstrated in the video and plan presented earlier.

## Center Support Creation

If ScreenTight extruded aluminum is used, the following measurements become useful for creating the center support. The center support starting length can be obtained after cutting the left and right supports. Since the ends of these supports are cut at 45°, the inner length will be approximately 4" less than the outer length of 78.5". While this can be calculated, I typically obtain an inner measurement from the cut support rather than going strictly by a measured length. Nevertheless, the center length can be calculated by subtracting 4" from a side support length. The outer side length for the Florida Stretcher Demo Model is 78½". Adding the top and bottom aluminum supports at 2" each equates to 4" that must be subtracted from 78½", arriving at our center support length: 78.5" - 4" = 74½". However, this length needs divided as the center brace is created using two equal segments. Thus, the measurement is 37¼" per segment. Yet, another deduction needs made for the two Clip-U Fasteners that are placed on each end (see plan presented earlier). In the left photo, there are two (2) stacks of two (2) ScreenTight Clip-U Fasteners. A digital caliper measurement yields

| Hardware | | | Measurement |
|---|---|---|---|
| ScreenTight | Clip U-Fastener SKU332-103 | Part#WCCUF | 1/8" (per stack of 2) |

7/64th of an inch (per stack of two). However, sometimes the caliper read 1/8". Therefore, I used 1/8" per stack of two.

Finally, when the center brace is socketed into the Clip-U fasteners they do not sit flush. There is a gap of approximately 1/8" as depicted in the adjacent images and this must be accounted for in the final segment lengths. Thus, a final adjusted measurement for each segment was 37" (74" total—with 1/4" reduced for clips and another 1/4" reduced for the clip gaps). This is noticeable in the video supplement as well.

Remember: when trying to ascertain a final center support measurement it is better for the segments to be a little short than too long since they can be easily expanded with the turnbuckles which lengthen (stretch) the support.

## Corner Braces

Corner brace length will vary depending on the size of the stretcher you create. The stretcher's aluminum dimensions documented here are 78½" x 108½" (or, 80" x 110" final measurement when wood casing is added). Place the corners well away from the center support as their main function is to 1) support the corners and 2) provide an adjustment location for expanding/contracting the primary corners of the stretcher frame. For this project, the two segments measured 13 3/8" each. If creating shorter segments, please be sure to use least 9½" per segment, as anything shorter creates issues for accessing the turnbuckles that will be added in a later step.

## Cutting Safety Tips and Aluminum

When cutting the aluminum, it will discharge thousands of sharp flakes. Ensure footwear is fully covering toes and other areas.

When cutting with the miter saw, I experienced the blade catching the aluminum on occasion which can cause bends in the aluminum and unsafe conditions. This happens when the blade is raised back into its normal resting position. One way I avoided these situations was to stop raising the blade back into its upper-resting position until the blade stopped spinning. Therefore, to make a cut, press downward on the blade, cutting the piece. But, keep the blade depressed and let off the power trigger to permit the blade to stop spinning before returning it to its default resting position. This mostly eliminated blade-catch issues and bends.

# Wood Casing

Even select pine is often warped and is difficult to obtain in very straight segments. Unless a planer and jointer are accessible, consider applying the wood casing in segments. This will help alleviate conditions where the wood is torquing and slightly twisting the aluminum. During the construction of one Florida Stretcher where I

Inner-wood length of 45° bevel should match the aluminum length. It will be approximately 3/4” less than the outer length.

employed segments, I cut them at 45°, as this permitted the best join with the least amount of gap to fill.

## Beveling on Table Saw

The right image illustrates that the long side of the lumber is beveled to 45° to offset and prevent the canvas from touching a wood ledge (3/4”) and the center support. Alternatively, add quarter-round to the edge.

## Cutting Wood

At this point all aluminum cuts should be complete. To get the wood measured properly for a miter cut, measure the length of aluminum that the wood will wrap. This will become the inner-length of the wood. For example, the primary stretcher sides for this project measure 78½”. The inner-length of the wood will be this same length: 78½”; the wood’s outer length will be 3/4” longer on each end due to the 45° bevels resulting in a final length of 80”. It’s recommended to always precisely measure the cut aluminum piece and match this measurement for the inner-wood length being cut rather than relying on measurements entirely; as, sometimes the actual cuts have minute differences than calculations. Using the cut-measurement of the aluminum will ensure the wood-aluminum segments fit together as cleanly as depicted in the left image.

Optionally fill wood holes and joints where wood segments meet, then sand.

## Affixing Wood

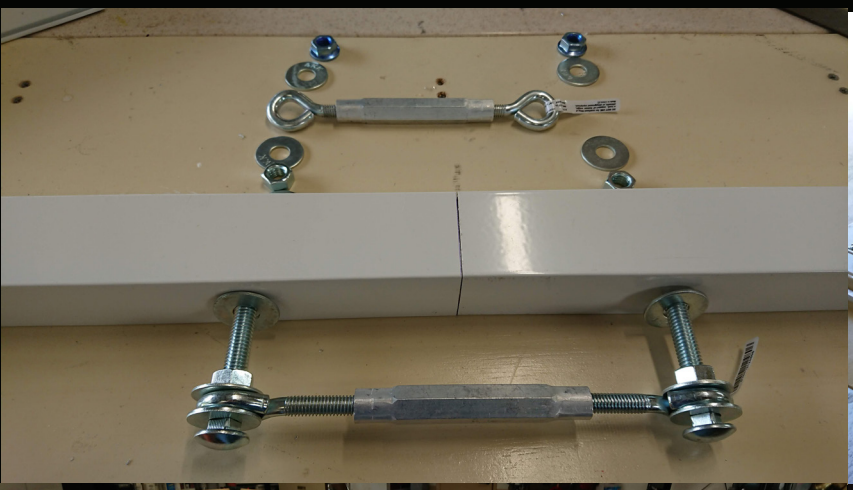
With the framing placed on a flat and level surface, affix the wood pieces to the aluminum. Drill a counter-sink hole through the wood into the aluminum approximately ½” up from the bottom edge. Cobalt-tipped drill bits help, but are not mandatory. Use the Spax #8 1½” screws suggested in the materials table earlier in this section. Do not place any screws within 11” of the corners. They will penetrate the inner channels and prevent the sliding-couplers from functioning.

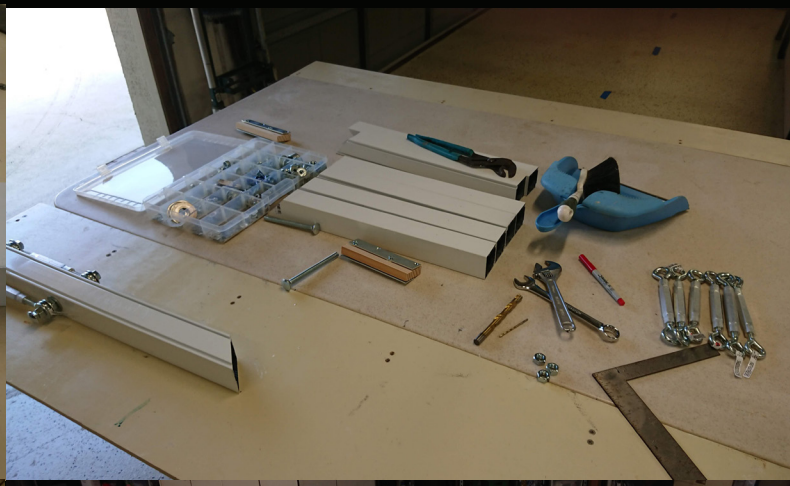
Optionally, fill counter-sink holes with wood-filler in addition to filling where wood segments are joined (if using segments rather than single-lengths of lumber). Af-

terward, the entire side is sanded smooth to prevent any aberrations in the canvas upon stretching.

## Creating and Assembling the Adjustable Joints

The corners are only connected by the L-shaped sliding-couplers. The corner sliding-couplers allow the corners to separate via the expansion or contraction at the center and corner turnbuckle locations.  The center support permits the top and bottom to be adjusted independently, but in conjunction with the corner braces.





## Corner Braces

The corner braces use 3/8-10” turnbuckles and a 6” straight sliding-coupler. On the side of the support, measure over 1” from the side to find the center (middle of 2” aluminum segment). Then, measure up from the edge of the segment 3¾-inches Repeat this on the other side. Drill a pilot hole at your marked locations then complete the hole with a quality 3/8” bit. Repeat this procedure for both segments of the brace. Once the holes are complete, temporarily place carriage bolts into the holes to act as stoppers. Then, partially insert a 6” sliding coupler 3” into one segment. Attach the other corner brace segment. Now, remove the carriage bolts and partially assemble them with the following:

Head of carriage bolt; washer; turnbuckle, washer; nut, washer [alum segment]

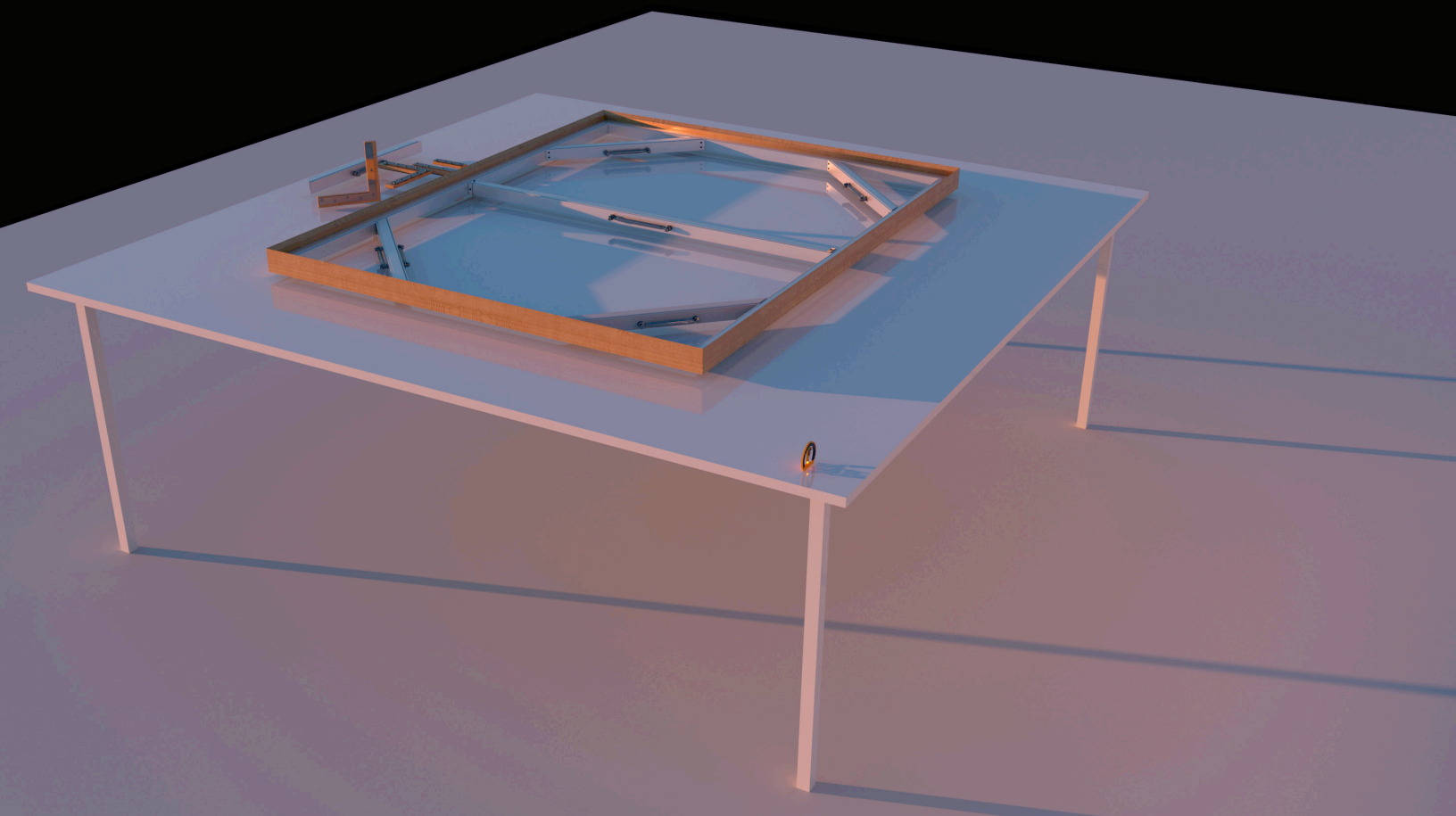
Insert through the aluminum segments. Then begin assembling the other side of the carriage bolt:
[aluminum segment] washer; nut; washer; turnbuckle; washer; nut*

*Alternatively add a lock washer or a locking nut.

The adjustable corner brace is not completely assembled. Adjust the turnbuckles so that they bring the two segments together tightly in preparation for mounting these braces to the main aluminum frame.

## Center Support

Repeat the steps above for Corner Braces changing the 3¾” measurement for the hole location to 4¾” since the center straight sliding-coupler is 8” in length. Repeat all other steps to assemble the center support.



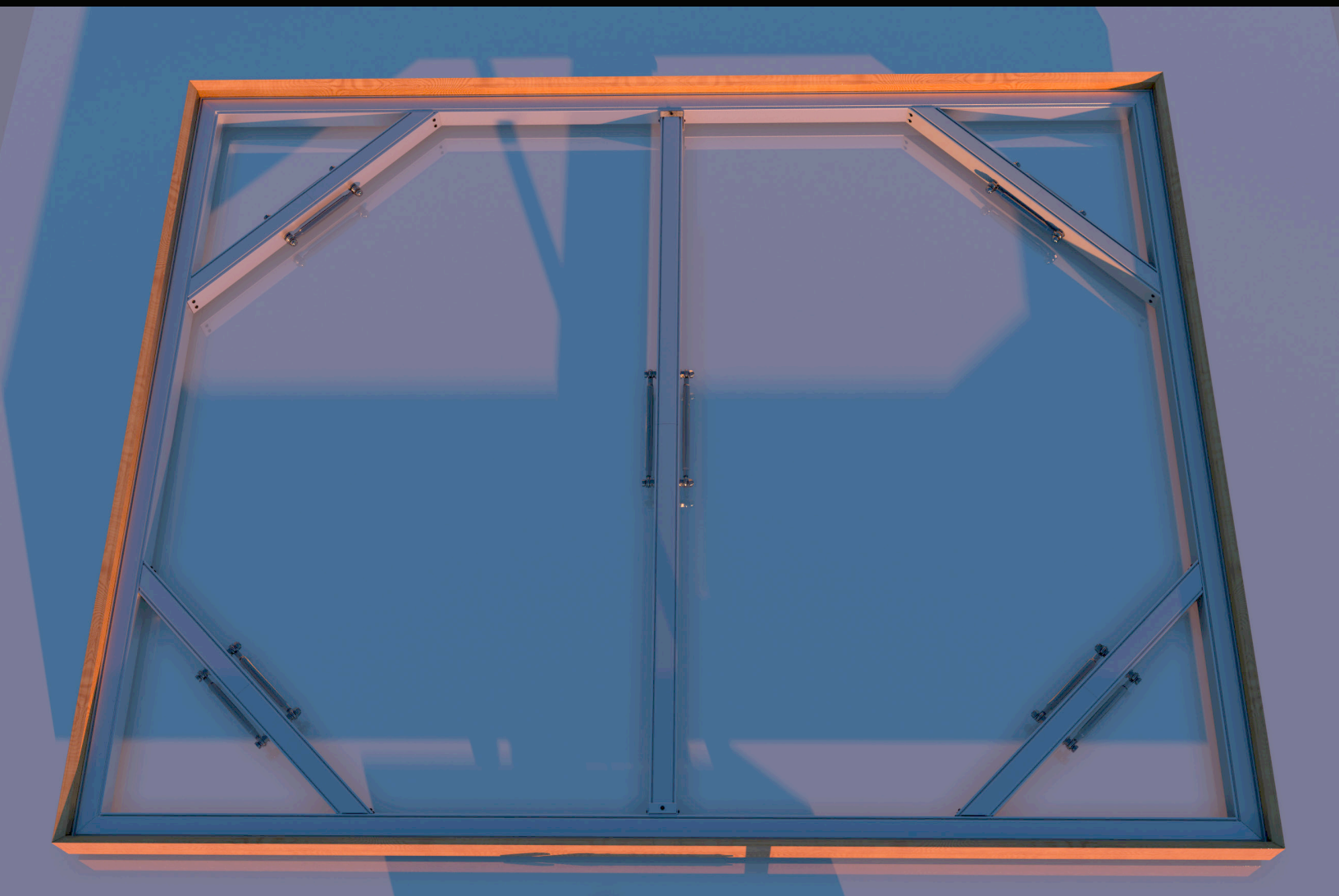
# Florida Stretcher Assembly

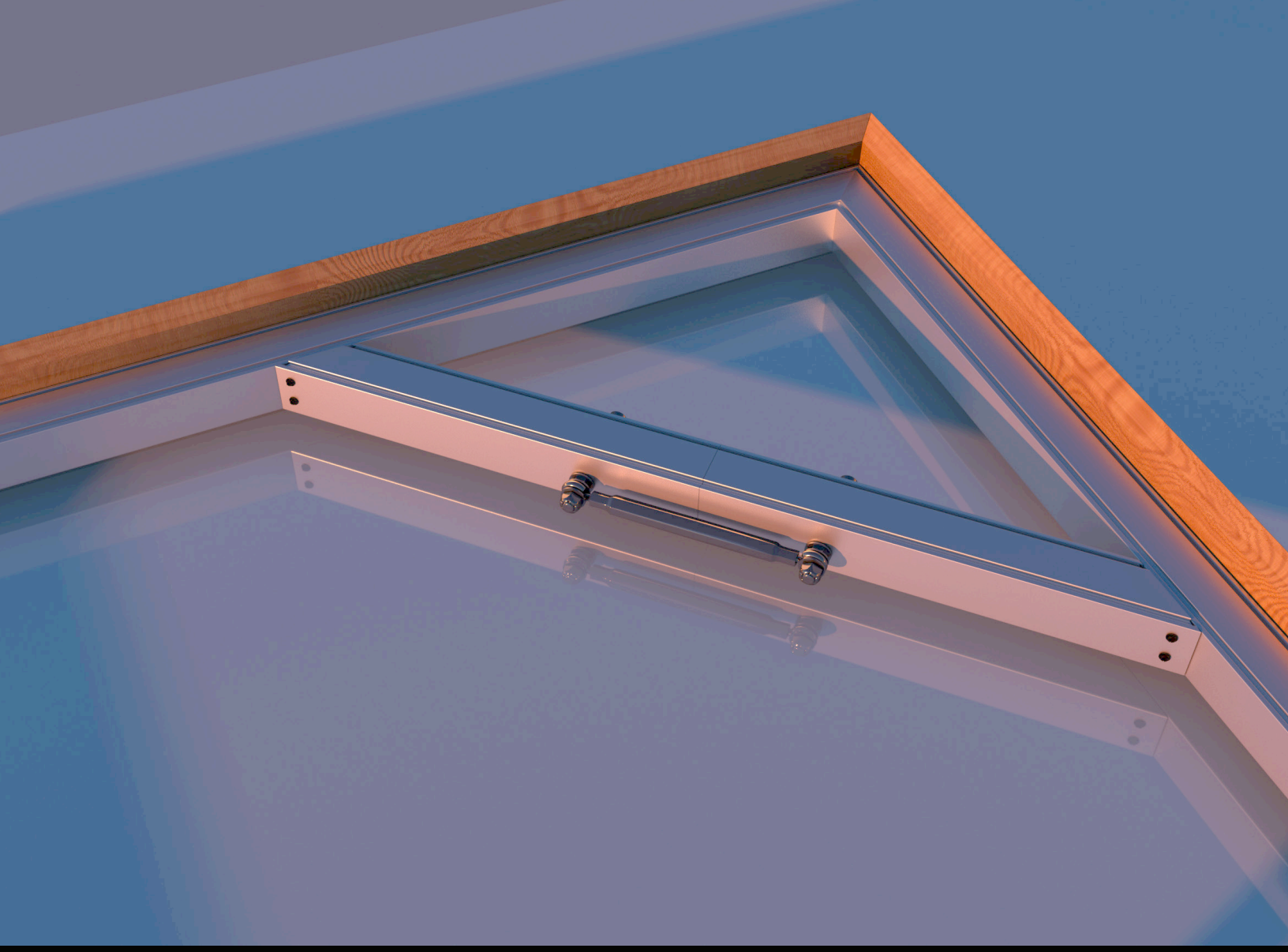
This section is well documented in the video supplement. Please refer to that resource. The center and corner braces should be fully assembled as outlined in the previous section. Insert the corner-sliding-couplers into the Top and Bottom segments (the segments perpendicular to the center brace). The top should have two corner sliding couplers. Attach the sides to the top and this will result in a U shape, leaving one of the perpendicular lengths (bottom) off while the center is added.

## Center Support Assembly

Measure and mark the exact center location of the two long supports where the center brace will mount (perpendicular). Once the center is marked, with Teks #12 x ¾" self-drilling roofing screws (with washer), attach a stack of two Clip U-Fasteners (see material list at beginning of section). Then, attach the other stack of two to the adjacent segment where the other end of the center brace will be mounted. Once the Clip U-Fasteners are mounted, place the center support in its proper location, socketing it into the Clip-U-Fasteners, and then slide the adjacent primary stretcher segment into place

Alternatively, fix these pieces together with corner clamps as depicted in the video and images. The main stretcher frame is now complete and ready to receive the final corner brace segments.





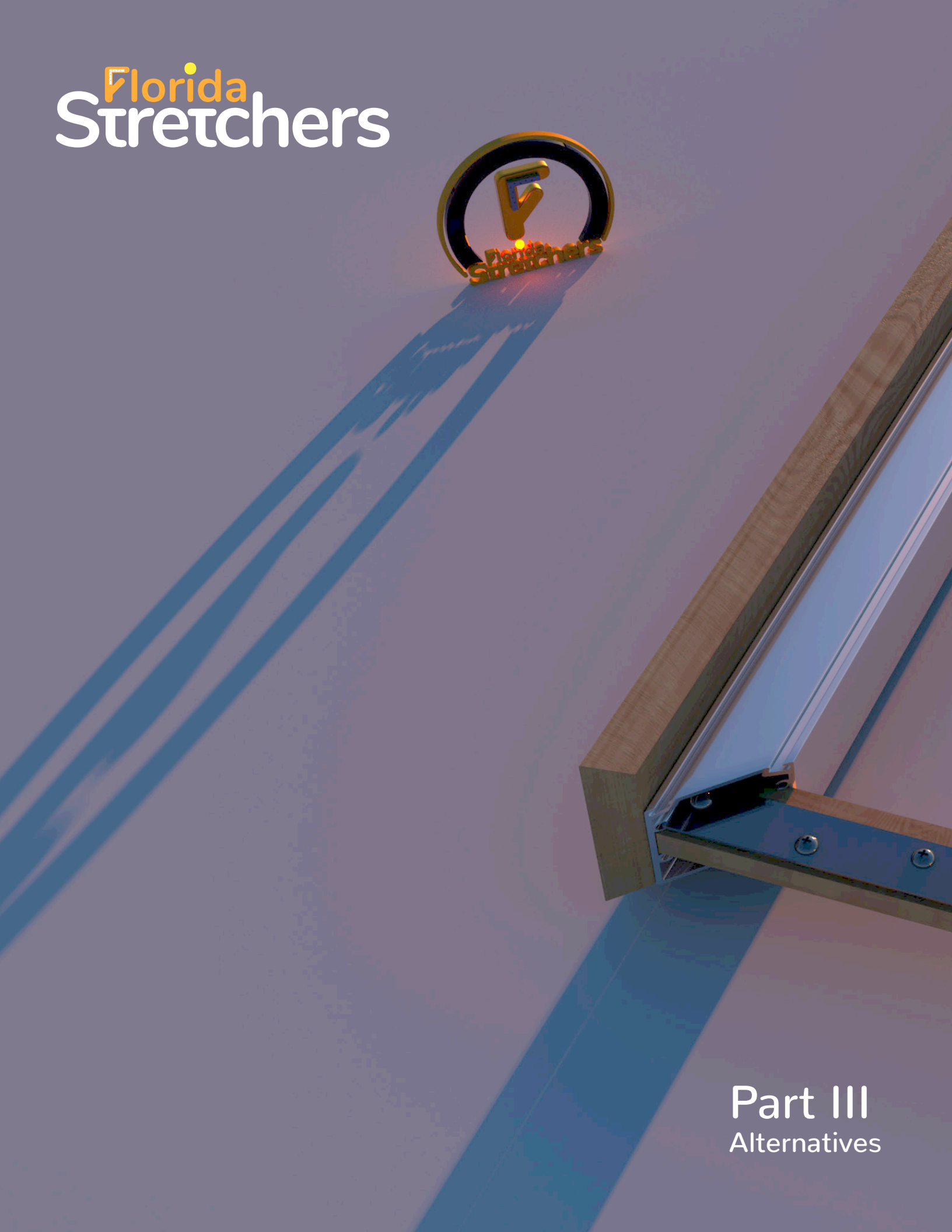
## Corner Brace Segments

At each corner, install the corner braces using the Teks Hex Self-Drill Roofing w/washer screws both 1½ and 3½ inch versions. Please refer to the video for how to sweep the drill at an angle after the first hole is made in the brace to penetrate the second piece of aluminum which can be problematic due to the slick white finish on the ScreenTight segments. The corner braces are already cut at 45° on each end and merely slide into each corner easily for fit. The only challenge is the drilling portion as outlined in the video.

## Complete

Once the corner braces are installed the Florida Stretcher is now complete and it can receive linen, canvas, or any other substrate you have decided to attach.

Florida Stretchers



# Part III
## Alternatives

Reductive Stretcher: Adding a corner brace in the highlighted location enables this design to adjustably function identically to the larger design with four braces.

## Reductive Brace Design | Alternative

A “Demo” unit was constructed in tandem with the Florida Stretcher that is documented here and in the videos. I wanted the size to be reduced considerably to simplify disassembly for quickly demonstrating de-construction and to reveal inner parts. Therefore, I used the design presented in the adjacent figure. The corner brace extends well below the center of the vertical support. Adding the additional highlighted corner brace to the opposite side reveals an interesting alternative. All sides become flexible and adjustable—even with the absence of the two adjustable braces in the normal design. From an adjustability perspective, this configuration permits all four corners to be expanded and contracted, thus functioning identically to a stretcher with two additional braces. This reduced configuration would yield a sturdy design for smaller frameworks while eliminating two braces and their associated hardware. This reduced configuration may be applicable in large frameworks as well, as long as the brace elimination does not compromise structural integrity and the corners are sufficiently supported by the aluminum and adjacent braces.

Reductive Stretcher: Photoshop mock-up using demo images to illustrate and place lower right brace into perceived position.

## Extended Lengths Beyond 10-feet

The ScreenTight extruded aluminum used for the projects within this document are 10-foot in length. The first Florida Stretcher I created went beyond 10’ (120”) and had a final length of 129-inches. I came up with my own solution which I will present here for consideration.

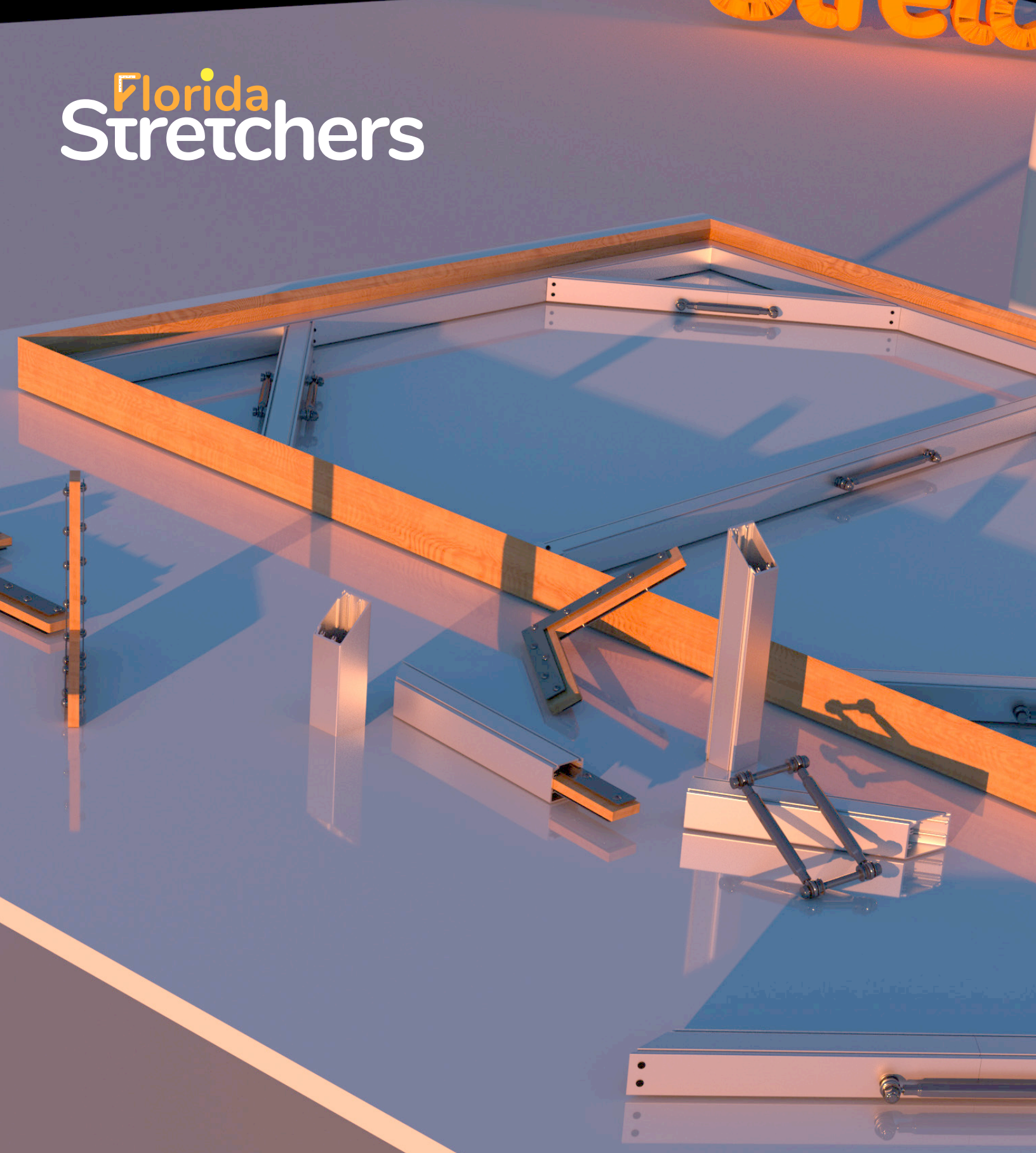
First, using the concept of the sliding coupler I merely appended 3.5” extensions onto the ends of a 10’ length. However, I did cut the standard 10’ ends at 45°. These 3.5-inch extensions along with the 10-foot length were attached to the corner

sliding coupler. When attaching the piece to the wood casing, great care must be made to ensure the screws penetrate well below the inner-channels where the metal and wood slide. It's important these channels do not become bent or receive pressure from the penetrating screw. The corner sliding coupler passes through this small extension well into the main 10-foot length. Therefore, the wood casing and coupler provided adequate structural strength to compensate for the break in the aluminum. For longer extensions a few options emerge as solutions: a longer corner sliding brace, a wood mending piece affixed permanently, or a combination.

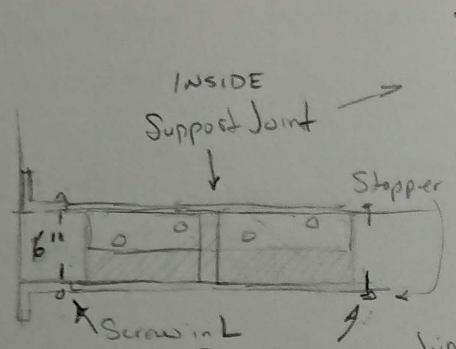
Aluminum can be extended beyond sock lengths using the inner-channels with wood couplers.

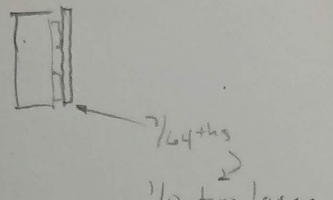
Alternatively, I believe that in addition to the wood casing long extensions of aluminum could be concatenated using internal couplers to bridge the two pieces. These would not need to slide; instead, they would bridge aluminum segments together. These coupling bridges should be extended as long as possible to buttress the division. Images of the two 3.5-inch extensions I used are presented here for examination. The two units produced for this document and video series did not have extensions and remain under 10-feet.


Florida Stretchers



# Part IV
## Appendix



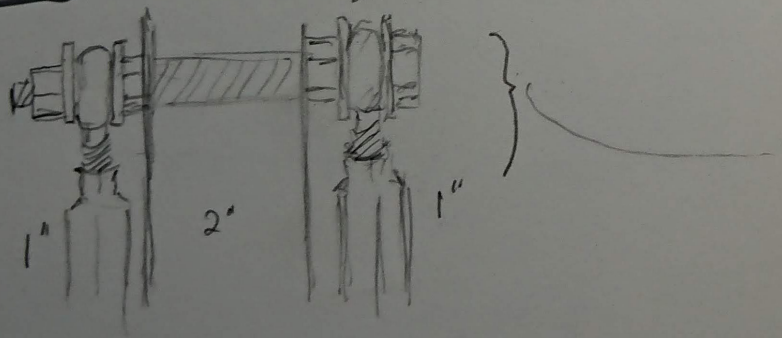

Return (2) 2x2 x6

Aluminum
1 10x2x2
4 E Brackets

2 ea = 8x8" Mending Bars
2 ea = 8 Turnbuckles
4 ea = 16 4½" (?) 5/8 Bolts
(3) 6 ea = 24 Nuts
(4) 8 ea = 32 Washers
2 ea = 8 Lock Washer

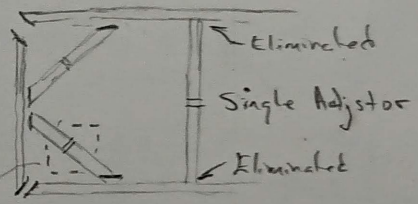
Each Side or 3 Nut & Bolt head

2 nuts
2 washer

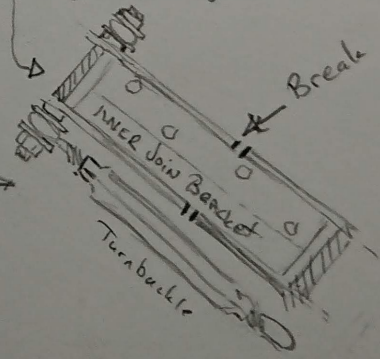


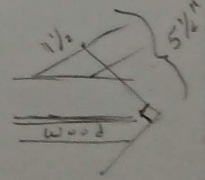

Corners & Support

- Changing from Bracket + Turnbuckle to 45° Supports from Center of H to Width (Long). And, cutting these in Center while locating a turnbuckle and Inner Join Bracket. This yields better Corner and Height Support while combining the adjuster into the Support. Also: Eliminates need for two (2) Adjustment Breaks in Center Support. Only need 1




(8) 10" Turnbuckles - 2 / Adjuster
(2) X-Long @ Center

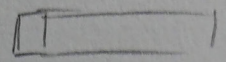



Cut my own Bolts? Thread Rod

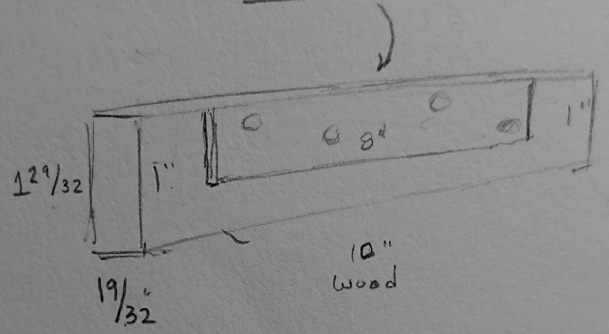
Center Support :

(2) 37 1/4"

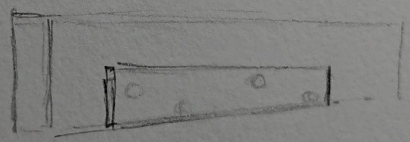


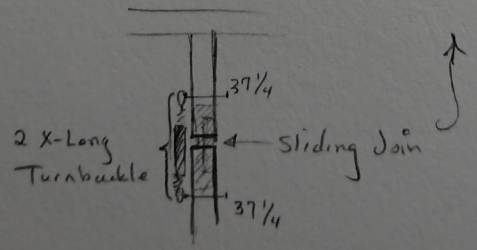
INNER JOIN Support

10" Wood, 8" Braces @ Center



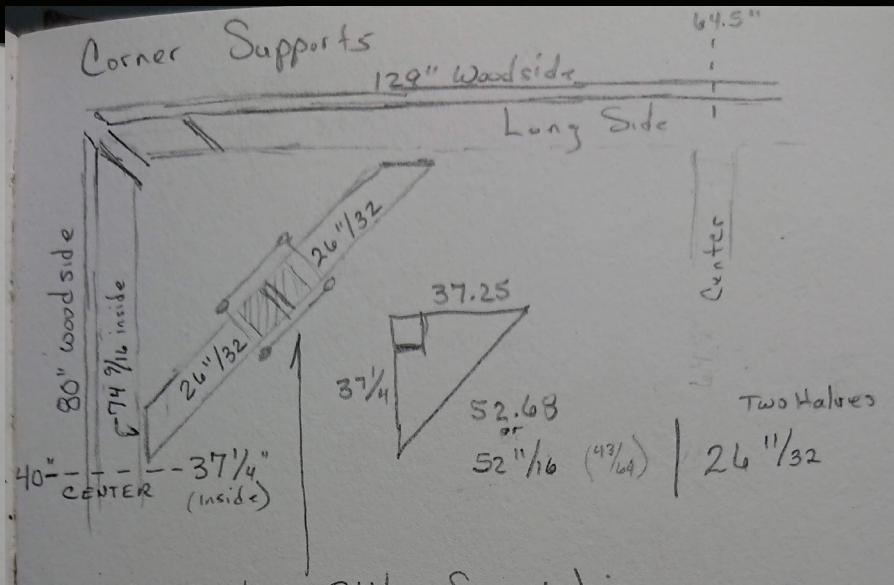

2nd 8" Brace on Bottom



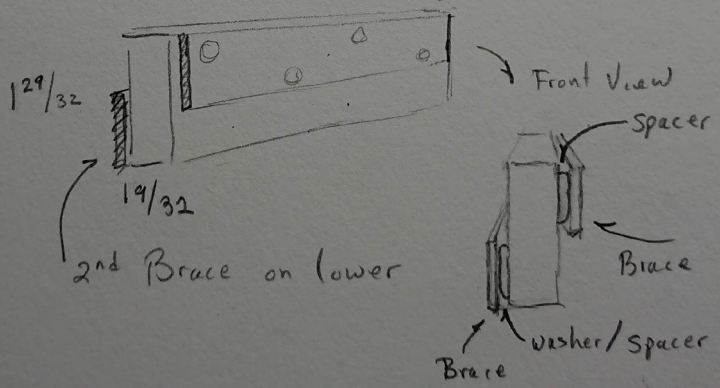

SEE Photos & Measurements

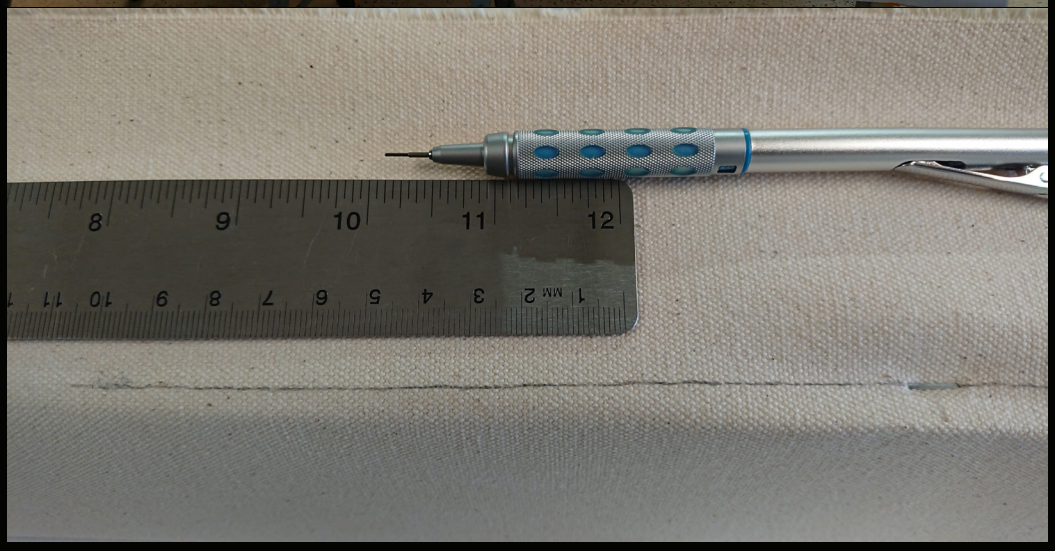
Corner Supports

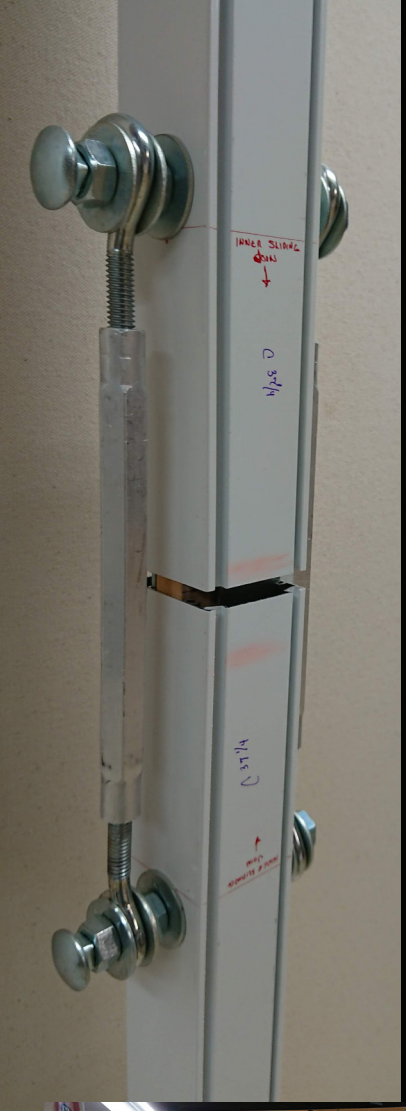



Inner Sliding Support Join

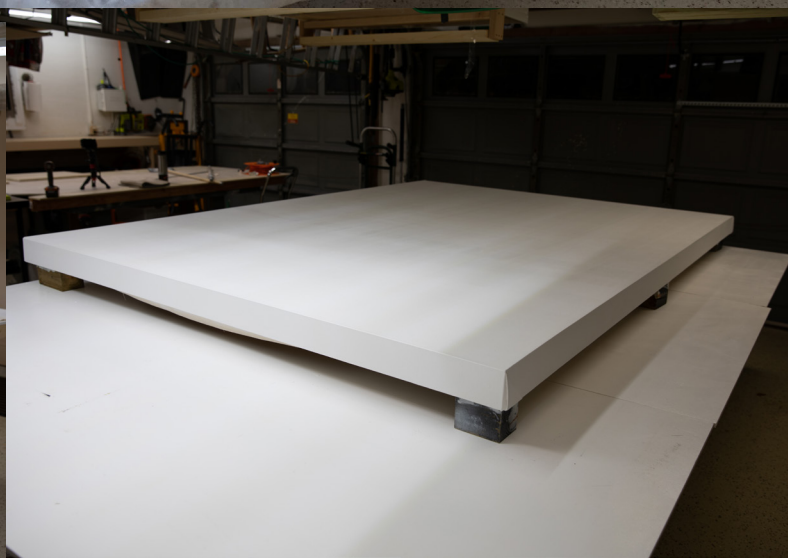
6" Wood + (2) 6" Braces




8
9
10
11
12


INNER SLIDE


JERRY'S
World's Greatest
GESSO




RIDGID


Florida
Stretch