Scratchbuilding Single Sheathed Car Sides

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Hindsight 20/20 3.0
26 September 2020

This will be posted to prototopics.blogspot.com

Scratchbuilding Single Sheathed Car Sides
Thank you

- Lloyd Keyser
- Martin Lofton
- Richard Hendrickson
- Frank Hodina
- Aaron Gjermundson
- Bill Welch
- Ron de Pierre
- Jon Cagle
- Tom Madden
- Charles Dean
- Ed Rethwisch
- Bob Hundman
- Ryan Mendell

Scratchbuilding Single Sheathed Car Sides

What are your goals and “perspective”?

- Contest model
- Pattern for personal use
- Sales
- Layout model

Scratchbuilding Single Sheathed Car Sides

This presentation focuses on “old school” techniques. There are now many areas where 3D solid modeling on a computer is easier and frequently superior for scratchbuilding. I fully embrace those tools. However, I understand that they come with a learning curve and costs that may be more expensive in time and money than just sitting down and making it from scratch. To summarize, I understand that technology has changed and there are other (and in many instances, better) ways to do things.

Make one, not two!

It can be incredibly difficult, if not impossible, to make two identical sides or ends. Focus your efforts on making one perfect part and copy it yourself or have it duplicated for you

Don’t reinvent the wheel

If you can modify a commercially available part, then there is likely no need to scratchbuild it. Focus your efforts on the things where you can create something new. In this vein, many details can be harvested from other sources and repurposed. In some instances, they may not even be the same type of detail. However, in many instances, we are *simulating* the prototype, not duplicating it exactly

Don’t let perfect be the enemy of good

Don’t obsess over very minor imperfections*. Clean them up as you’re able and move on, particularly if the end product is for you and maybe friends. Paint and weathering can hide a lot of sins.

*the exceptions are things that are supposed to be straight, aligned, etc., but are not. The human eye is amazing at detecting even the slightest such differences and people will notice those flaws. As such, use good tools for ensuring that things are square and in alignment.

Don’t overthink things!

Many people get lost in the “analysis — paralysis” trap, thinking that if they only had a better tool, technique, material, etc., then the pattern would practically make itself. I have been there and the only result is no result. Some of my best modeling has been when I have had an obstacle without knowing how I’d overcome it and I just sat down and got the job done.

If you need inspiration for overcoming “analysis — paralysis” refer to “The Waiting Place” section of *Oh, The Places You’ll Go!* by Dr. Seuss

Just get started

You likely already possess most of the necessary skills. Start with something modest and spread your wings from there. Once you familiarize yourself with the materials and techniques, your imagination will take over and you will start to envision how to make things.

Additionally, any project can appear daunting when viewed in total. However, when things are broken into individual tasks, they are usually far simpler than envisioned.

Modify an existing model with a couple scratchbuilt details and go from there…

References

Since you will not be starting out of thin air, what do you need as your reference?

I have made patterns using engineering drawings/ blueprints, diagram sheets, field notes, and photos. Obviously, the more info you have at your disposal, the better. That said, if your goal is simply to have a string of cars for your layout, then photos and some basic dimensions from an *Official Railway Equipment Register* may provide all you need to get started.

References

While this presentation is intended to help with gaining a basic understanding, I highly recommend consulting others' work to provide a foundation of thought. Good sources include the various scratchbuilding articles by Bob Hundman in *Mainline Modeler* (*MM*), the kitbashing articles by Mark Feddersen and John Munson in *MM* and by Richard Hendrickson in numerous publications, my material in *RMC* and the work of many in *Prototype Railroad Modeling*. A heavy kitbash can be more instructive than scratchbuilding.

References

- Drawings/Blueprints - archives and historical societies may have these, as well as many produced in publications, both model periodicals as well as industry publications (*Car Builder's Cyclopedia*, *Railway Age*, *Railway Mechanical Engineer*, etc.)
- Diagram sheets - historical societies as well as some private sellers offer reprints
- Field notes - cars still exist and can be photographed and measured
- Photos - photos combined with some key dimensions can be enough to make a model

Materials

I prefer to use styrene as my primary material and augment it with shim stock vinyl and brass, as needed. That said, if you are more comfortable with wood, brass or some other material as your primary medium, then go with what works for you.

In general…

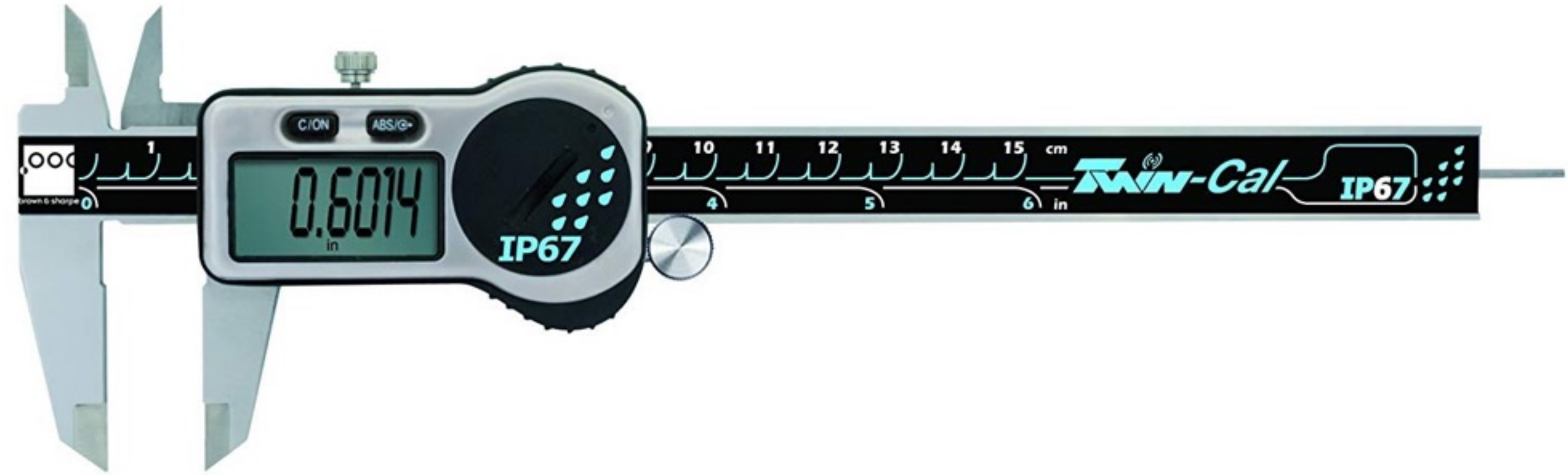
- What follows is not meant to be a thoroughly expansive treatise; it is a compilation of my thoughts on making freight cars and is more a work-in-progress
- There are many types of projects I haven't tried and materials and techniques I haven't used. Your efforts and experiences will differ. Do what works for you!

- Start small
- Develop your skills
- Move on to more difficult projects

Stuff to help…

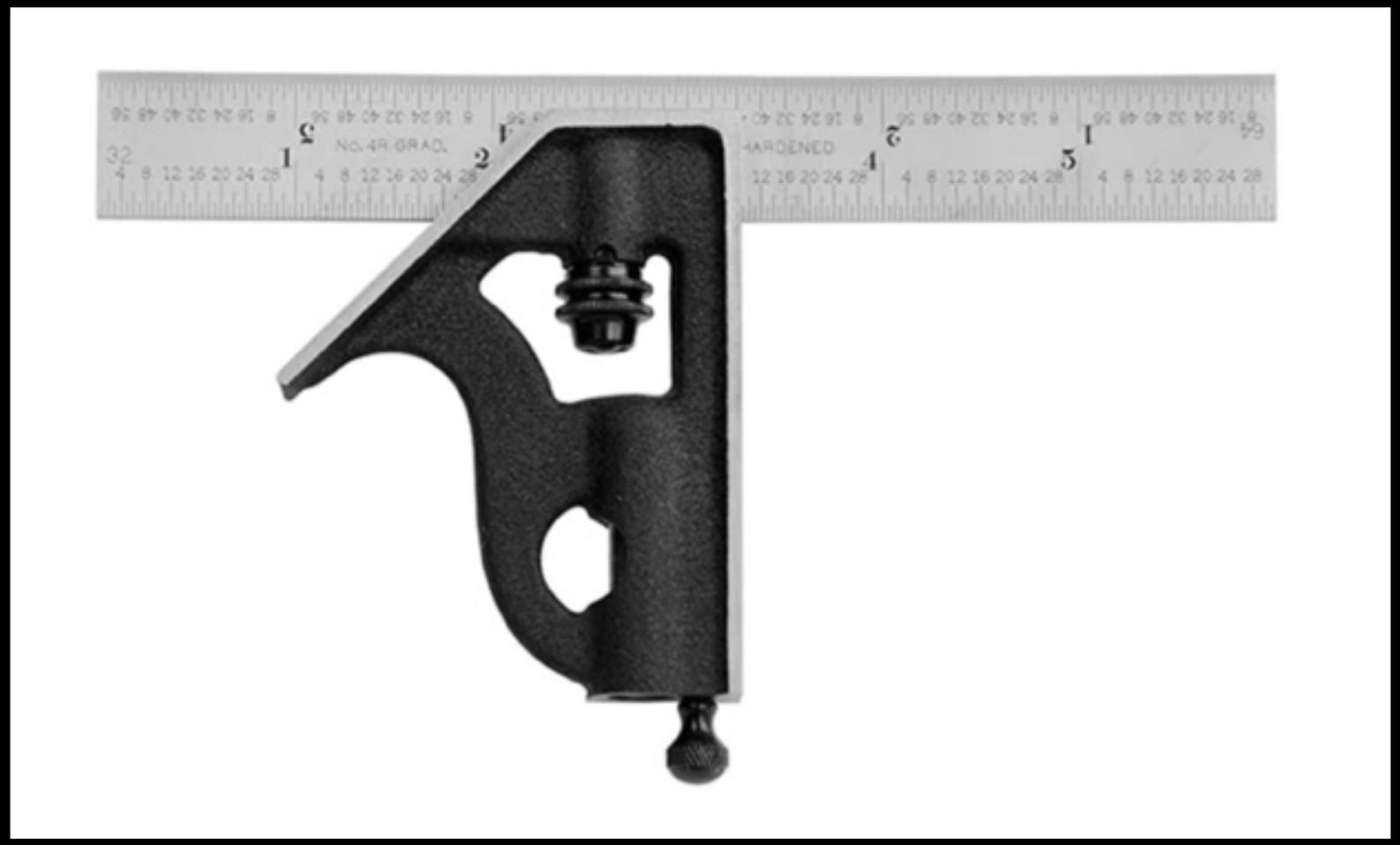
- Tools (following pages)
- Adhesives
  - MEK (or your favorite solvent cement)
  - Barge Cement or Goo thinned with MEK for joining dissimilar materials
- Future floor wax — can be used as a simple adhesive and to seal details for casting
- The usual
  - Files
  - Drills
  - Very, very fine brushes
  - Cutting tools, e.g., the ubiquitous no. 11 blade

Calipers



- Don’t get the least expensive; stainless jaws a must
- Measuring to 0.0001"
- Indispensable for laying out, locating, and spacing details such as structural members

Squares



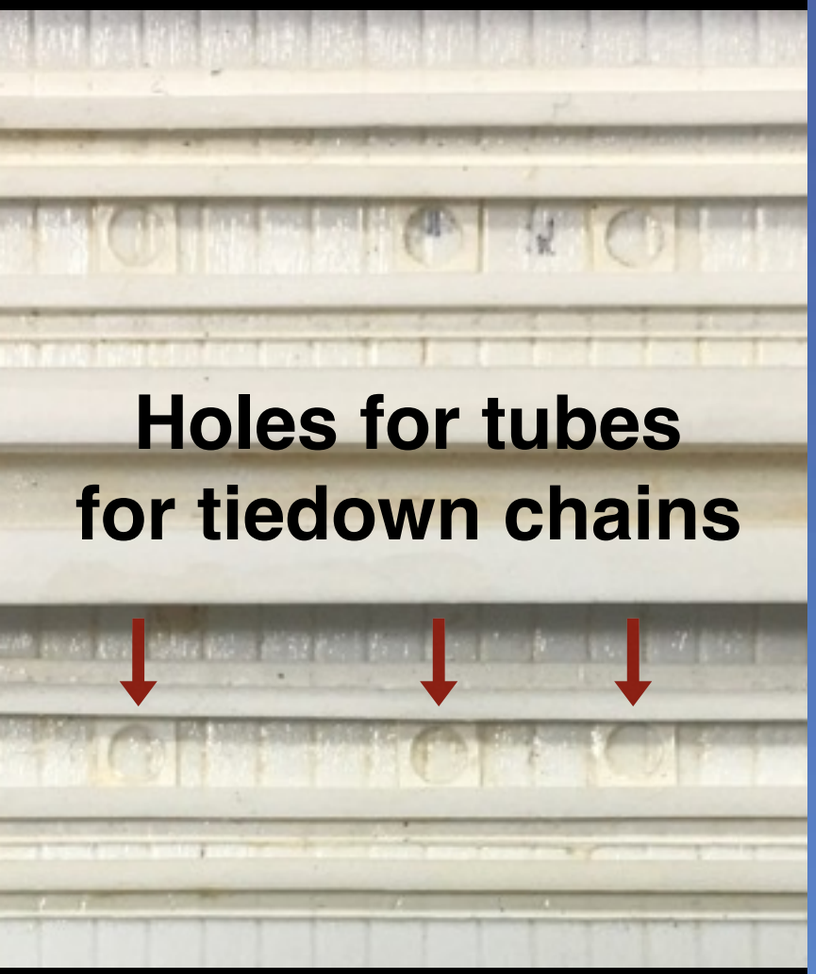
- Don’t go cheap
- Starrett and Brown & Sharpe are excellent
- Indispensable for squaring components when pattern making

The Chopper Northwest Short Line

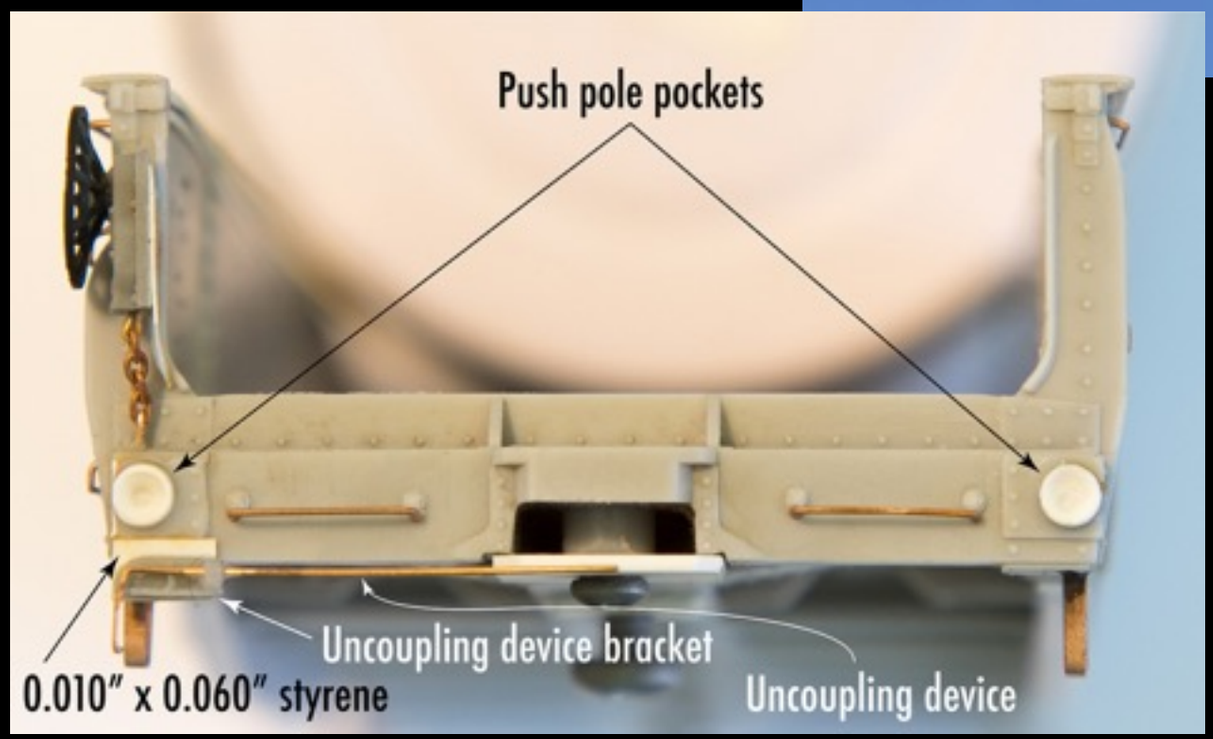
- Easily create pieces of the same length

The True Sander Northwest Short Line

- To square edges either just for straightness or to improve assembly (good to make sure sides in “flat” resin kits are square and of the same length)



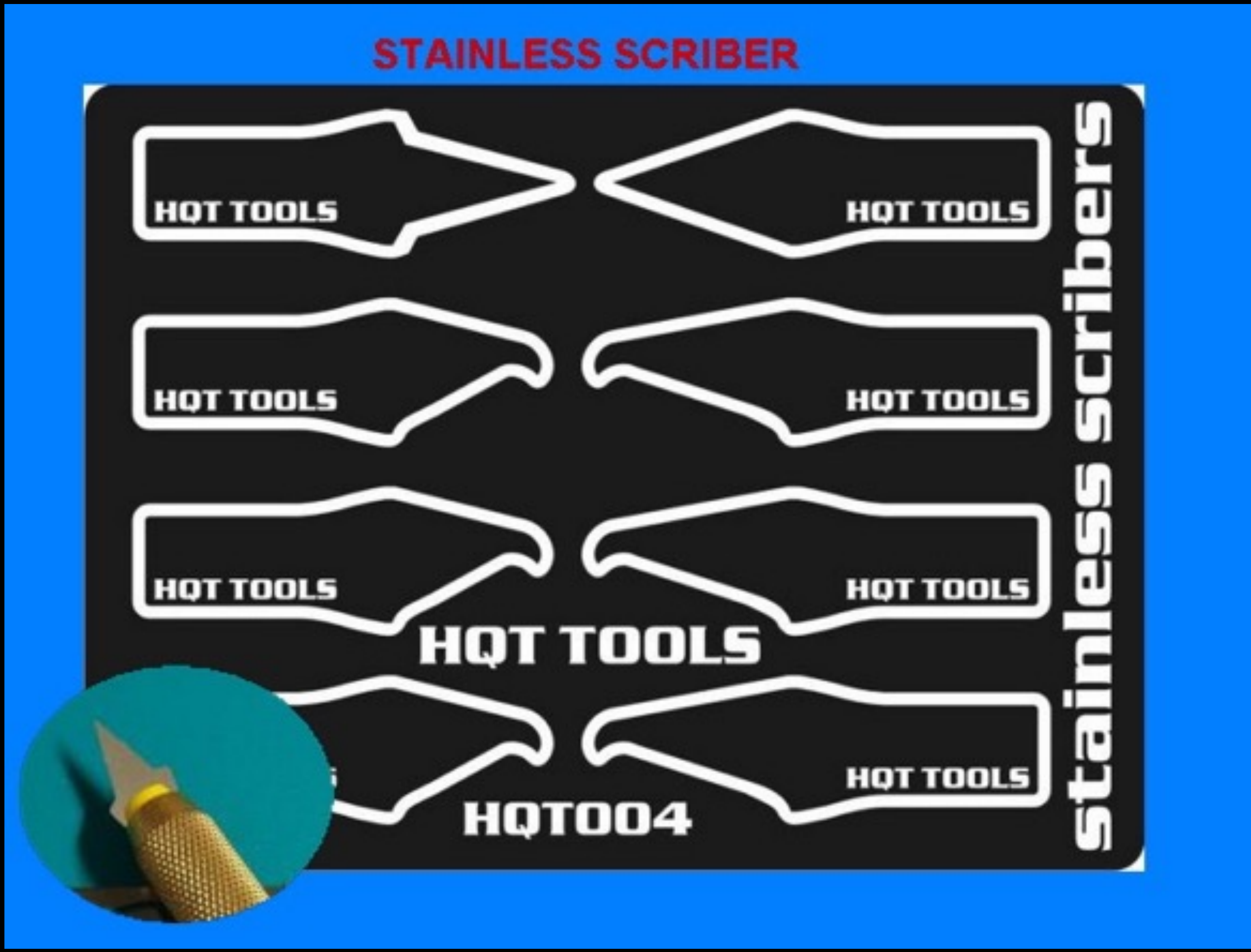
RP Toolz punch and die



- Round shapes are common
- Can be used for push pole pockets or other applications

Scribers

- Used for panel lines, sometimes wood joints, as guides for straight lines to glue material, etc.
- Don’t necessarily have to be called scribers. Can be blades, dental picks, etc. Use what works for you.



Single Sheathed Cars

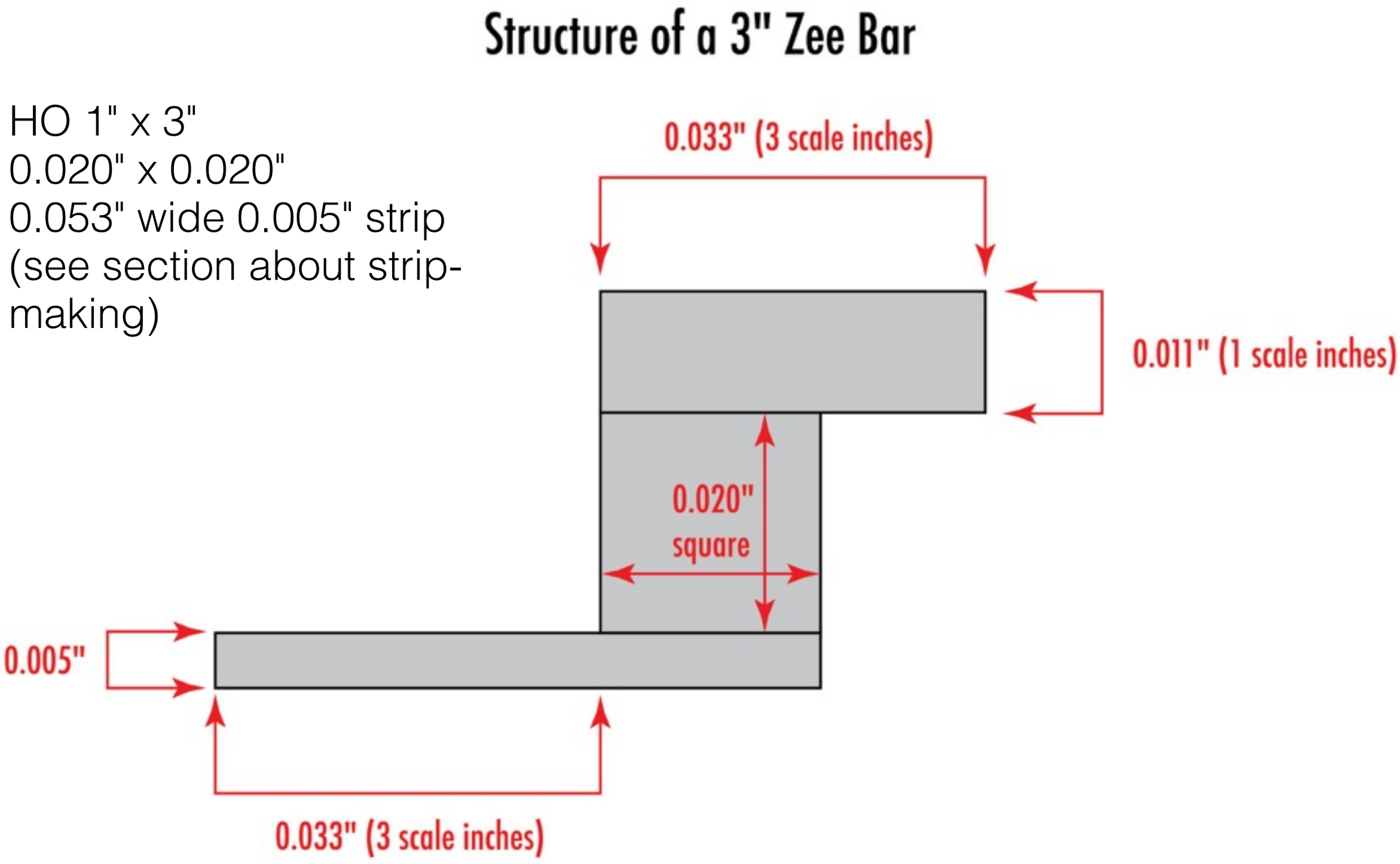
- Most boards in single sheathed cars are 5¼" wide, although 5⅛" is a common dimension as well as 3¼".
- Fortunately, 5¼" wide = ~0.060" ; that is what we will cover herein
- I start with the thickest styrene sheet I can use, ⅛"
- Ensure that the edge is perfectly straight
- Side sills are typically 9" channel sections, or 0.100" in HO
- I use 0.040" x 0.100" for the side sills and 0.040" x 0.060" for the sheathing boards
- Lay out the side sill keeping it straight relative to the edge of the styrene
- Then lay in the number of side sheathing boards needed
- A narrower width board is common adjacent to the side plate (at top); the side plate overlays boards that are narrower, meaning that the face of the side plate is usually flush with the face of the sheathing boards. The narrow upper side sheathing board and/or the side plate may need to be slightly “shorter” or “taller” (width) relative to the prototype to ensure that the overall car side height is as close as possible to the prototype

Single Sheathed Cars

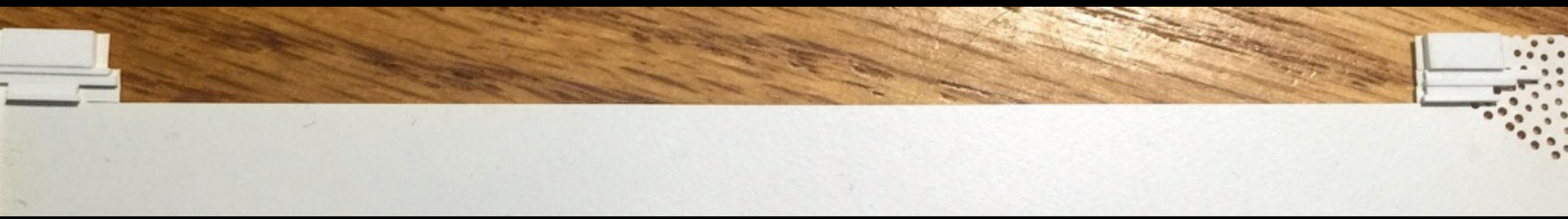
Scribed styrene vs. the prototype

Single Sheathed Cars

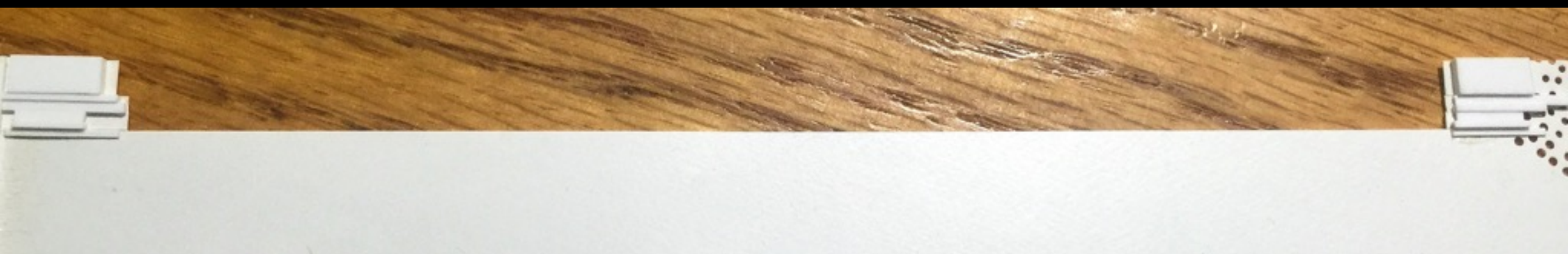
- HO 1" x 3"
- 0.020" x 0.020"
- 0.053" wide 0.005" strip (see section about strip-making)



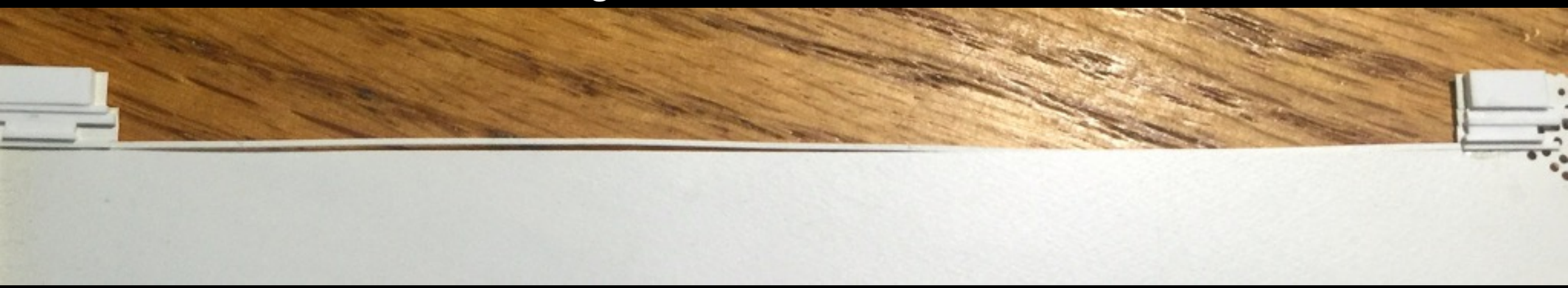
Single Sheathed Cars — Making Strip



- I use the same piece of 0.005" styrene to make strips. Other thicknesses can be used, as well. Add pieces to create the necessary width

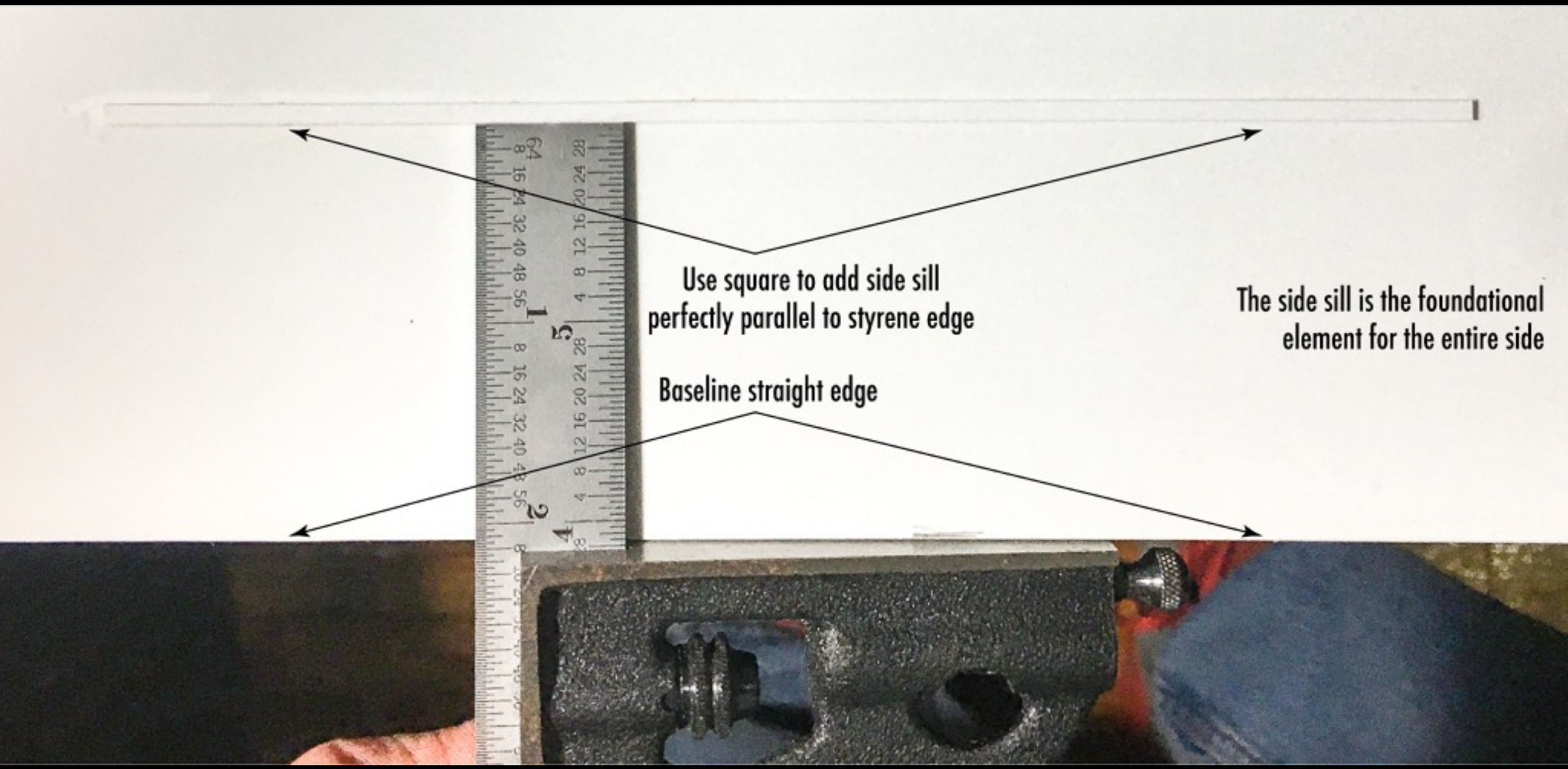


- Add pieces to create the necessary width, e.g. scale 3" (0.033") + 0.020” = 0.055" for a zee bar for a single sheathed car with a 3" zee structural member



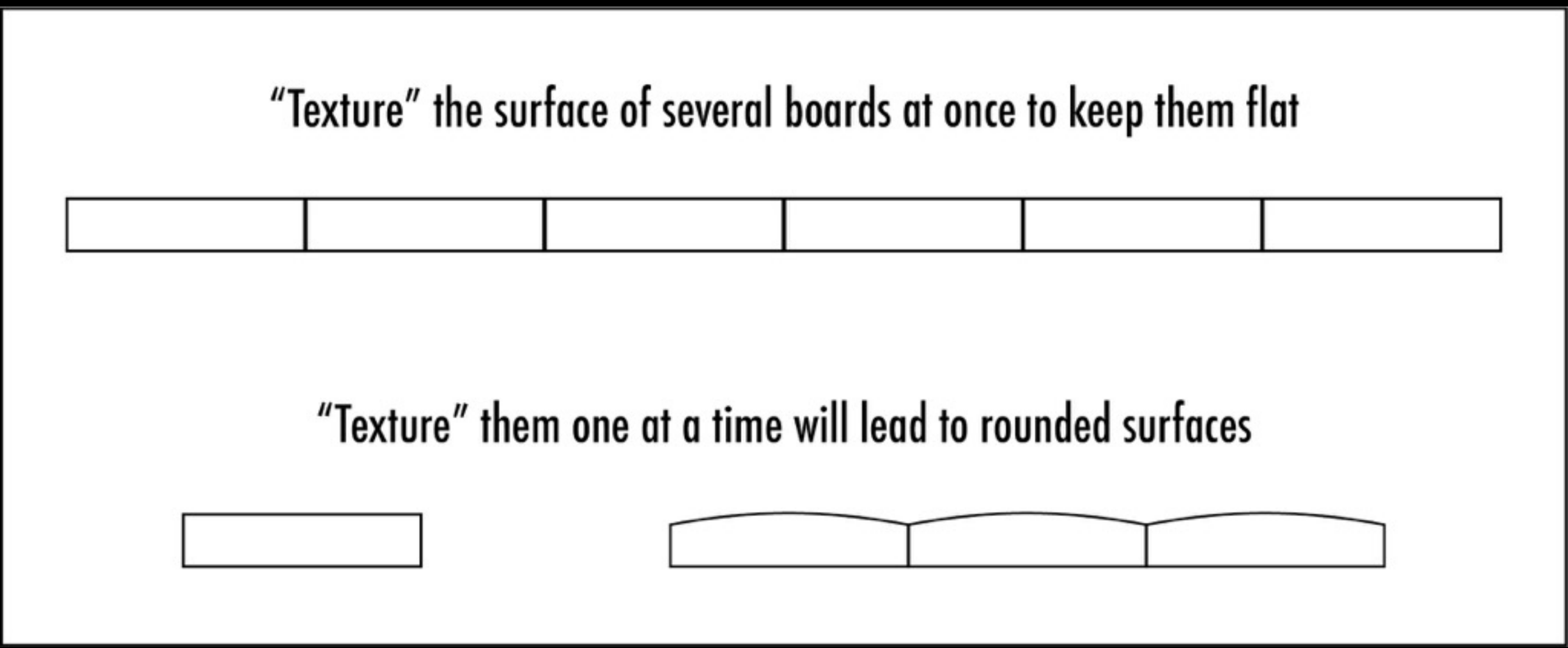
- Abut the pieces with a steel straight edge and trim along the edge to create the strip. In this photo the strip is visible after trimming, still attached at the ends.

Single Sheathed Cars
The “Foundation”



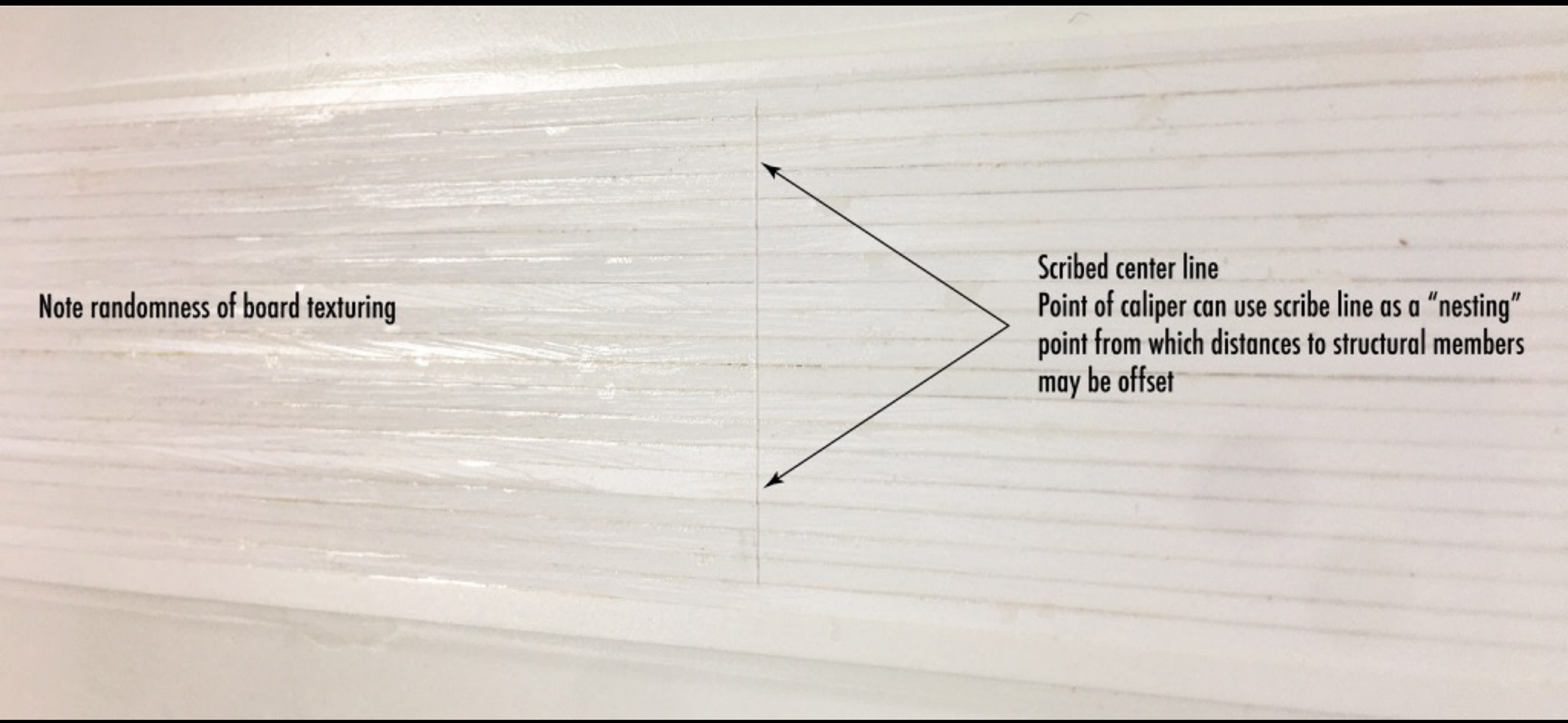
Use a rigid backing sheet. I build all my patterns on ⅛" styrene

Single Sheathed Cars
Texturing Sheathing Boards with Sandpaper



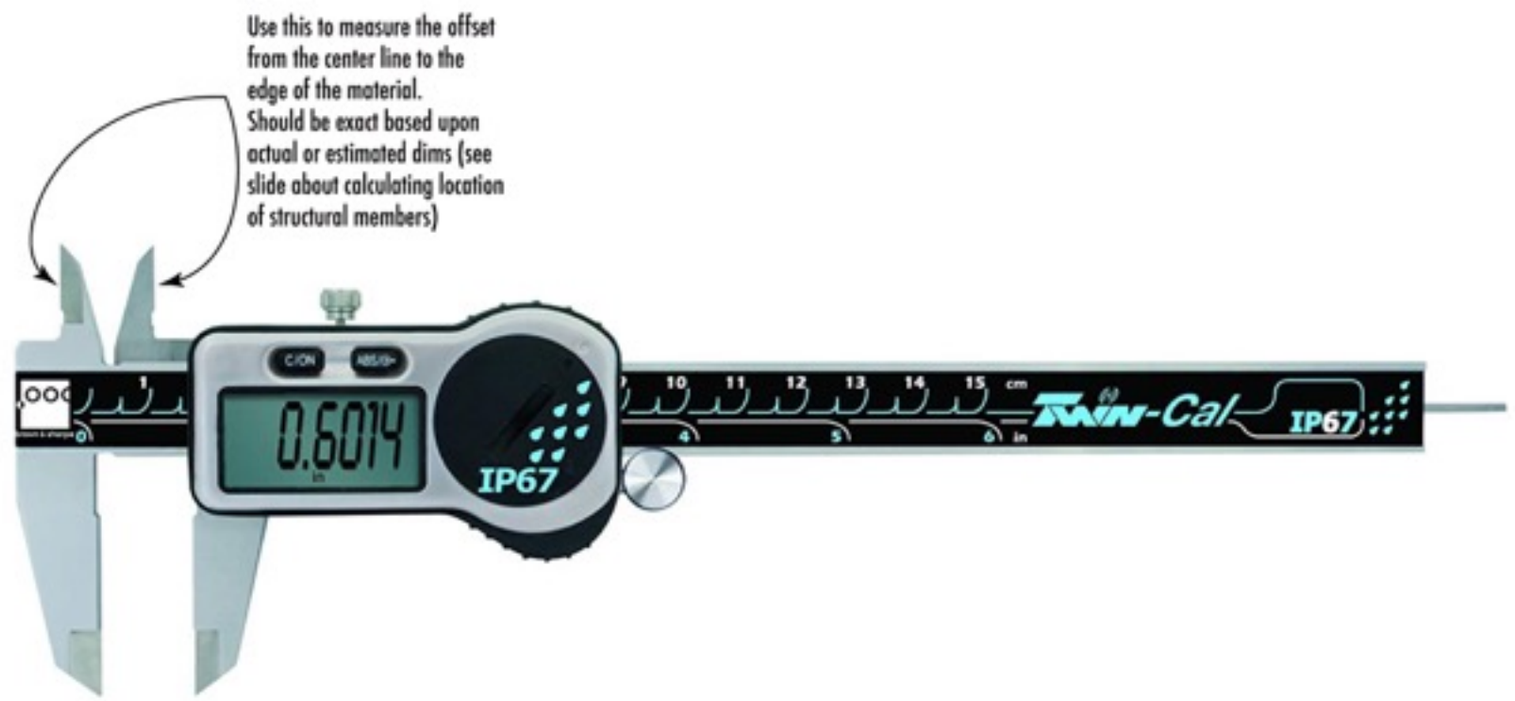
- If you sand the surface of the boards to create surface texture, do them in groups laid out touching at the edges and drag sandpaper across all at once. When done, you can drop them like pickup sticks and select at random as you add to the side

Single Sheathed Cars



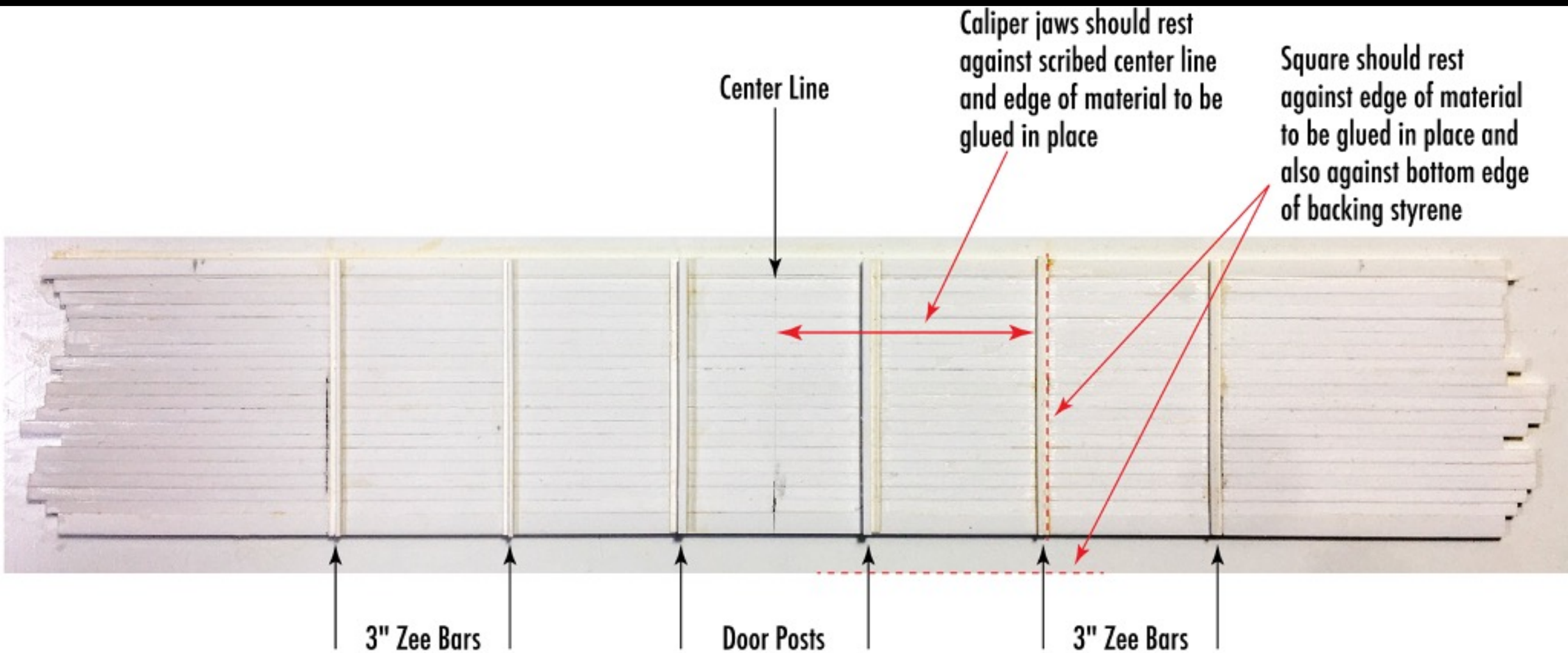
Use a rigid backing sheet. I build all my patterns on ⅛" styrene

Single Sheathed Cars

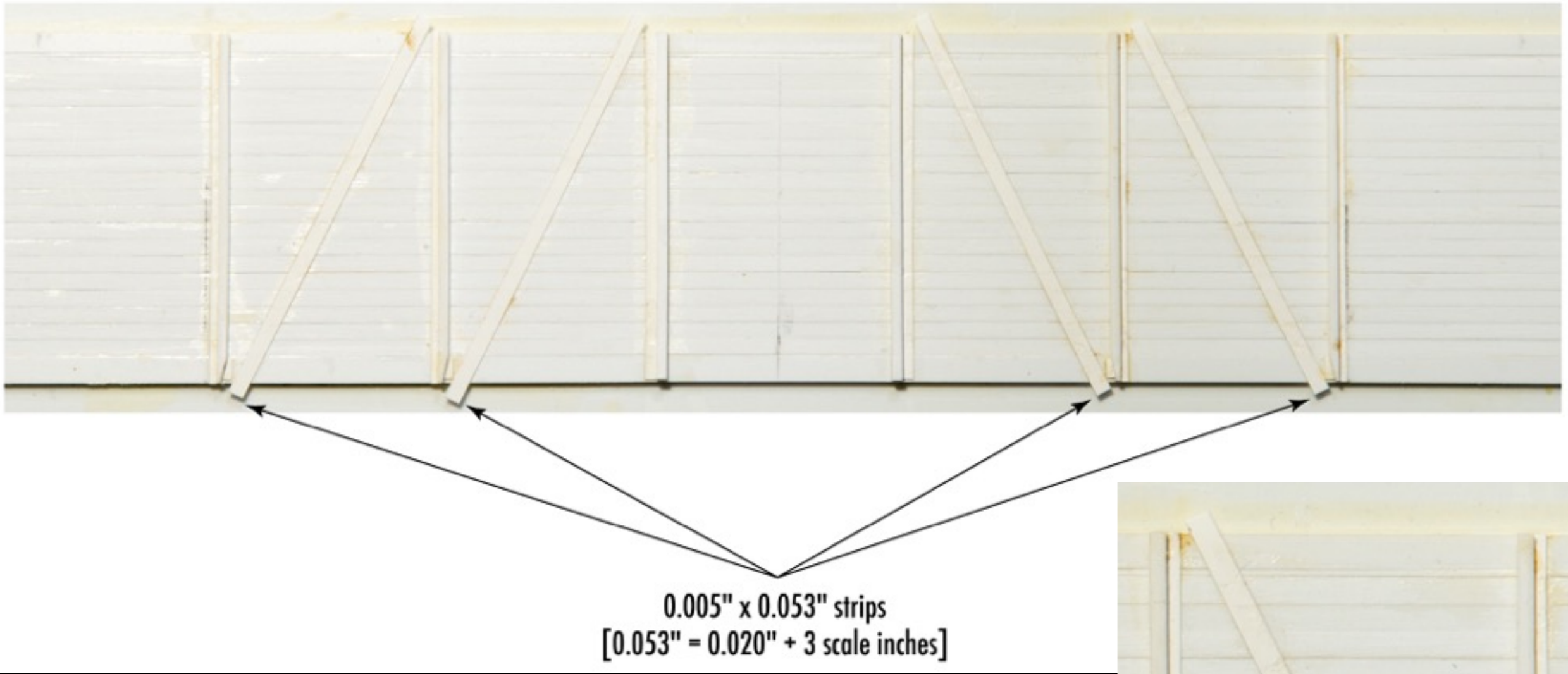


Single Sheathed Cars

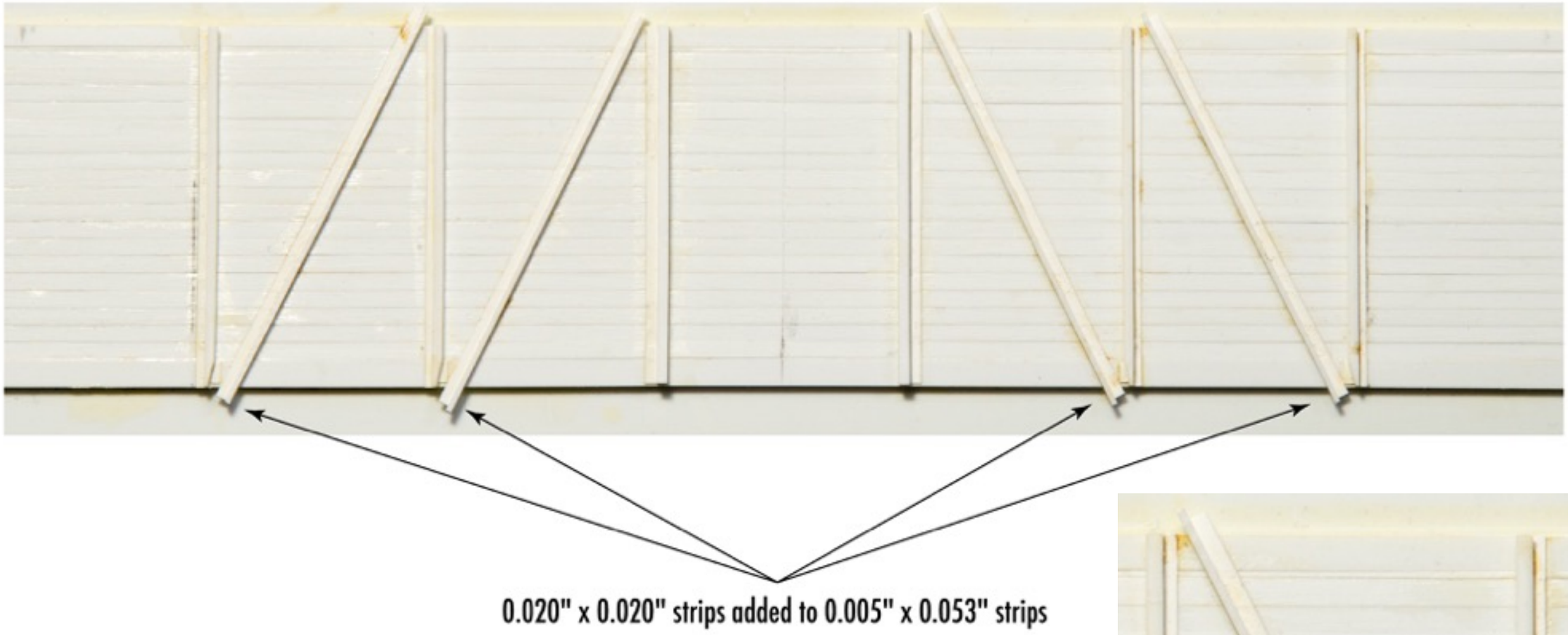
Single Sheathed Cars



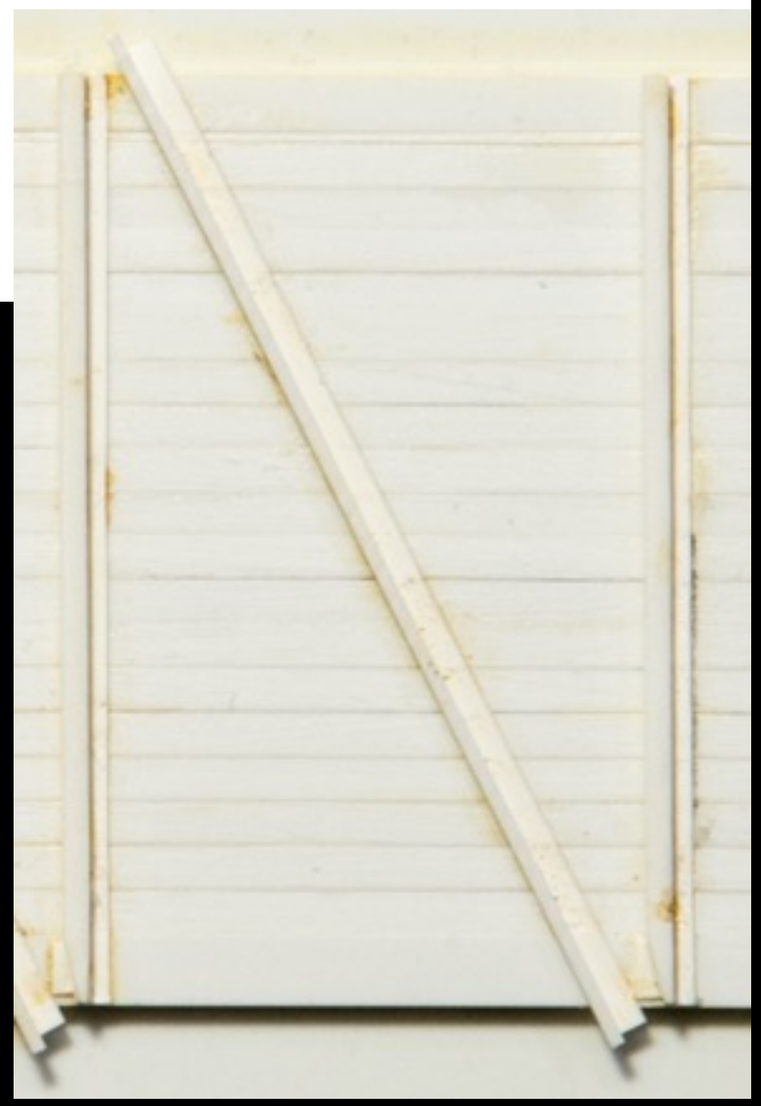
- I generally add the 0.005" strip (0.033" + 0.020" for a 3" zee bar) to the side first and then add the 0.020" x 0.020" followed by the 1" x 3", although you can also add an “assembled” zee straight to the side if that works for you



Building the Structural Members



0.020" x 0.020" strips added to 0.005" x 0.053" strips



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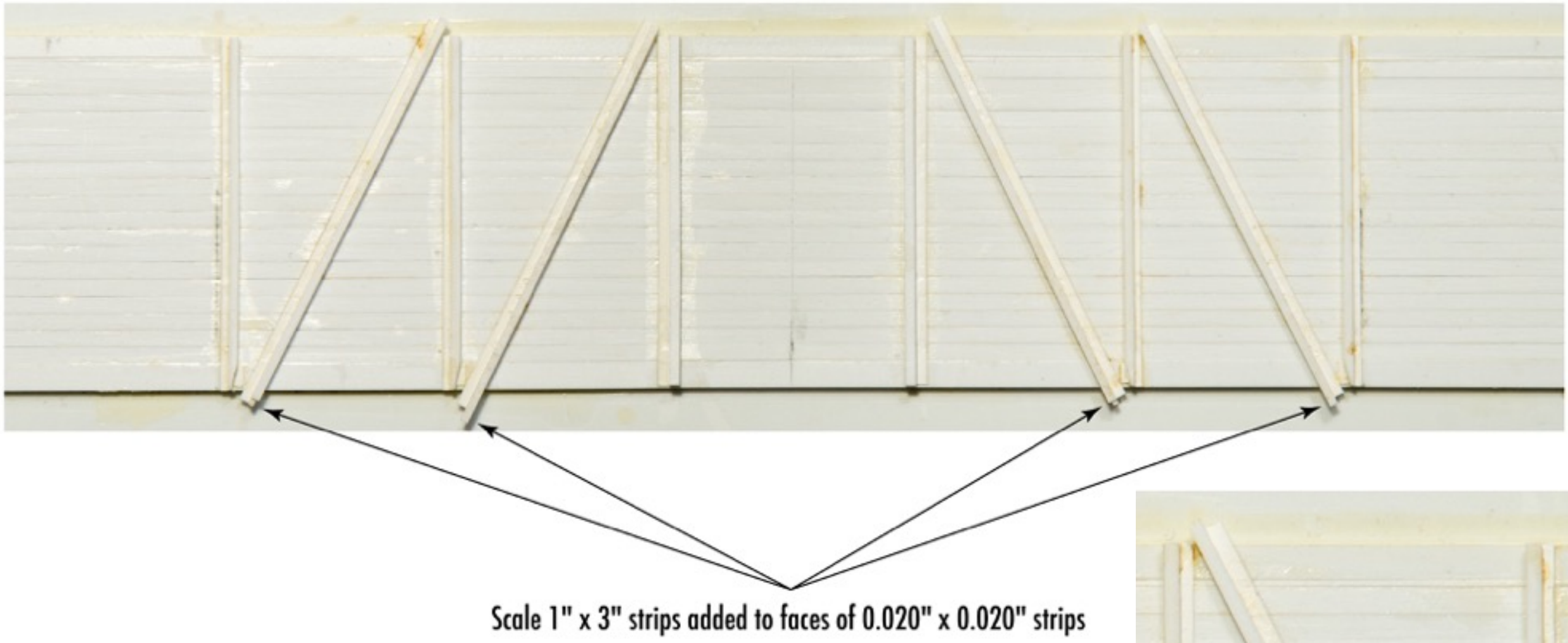
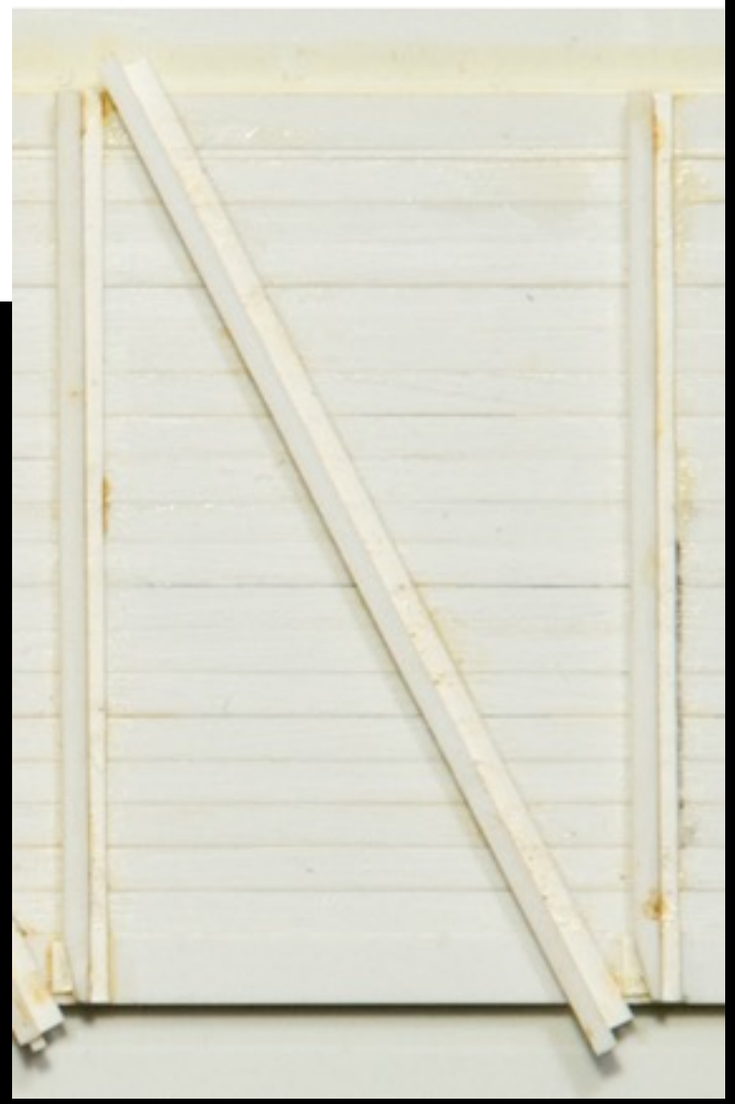


Scale 1" x 3" strips added to faces of 0.020" x 0.020" strips

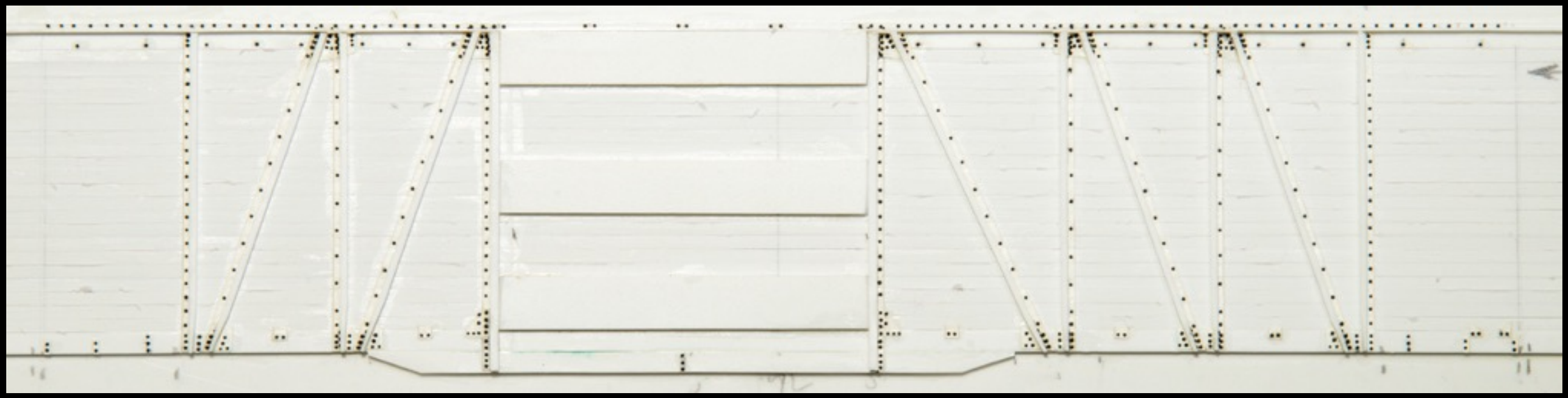


Building the Structural Members

Bottom of 1" x 3" strips trimmed to shape
Upper end of strips trimmed, as well

Building the Structural Members

Detailing

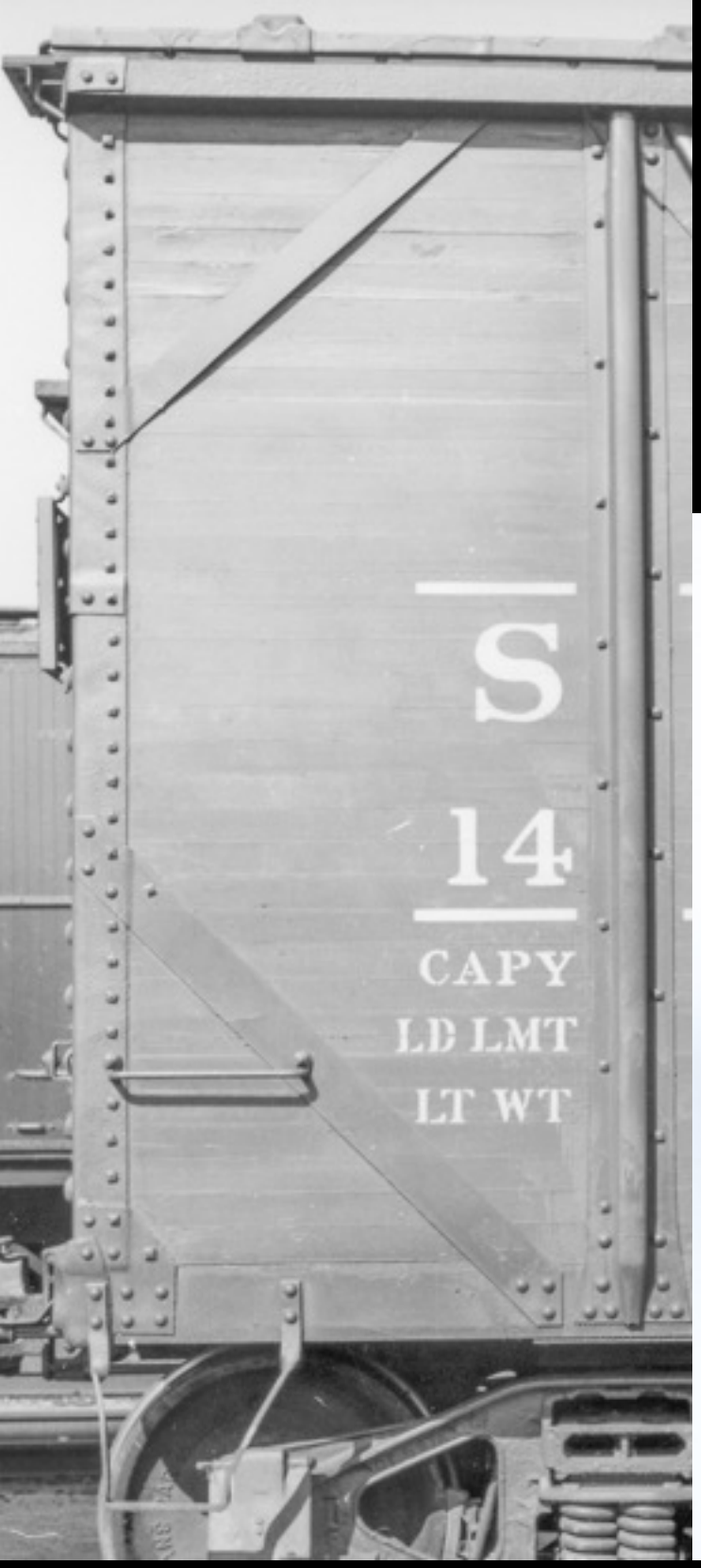


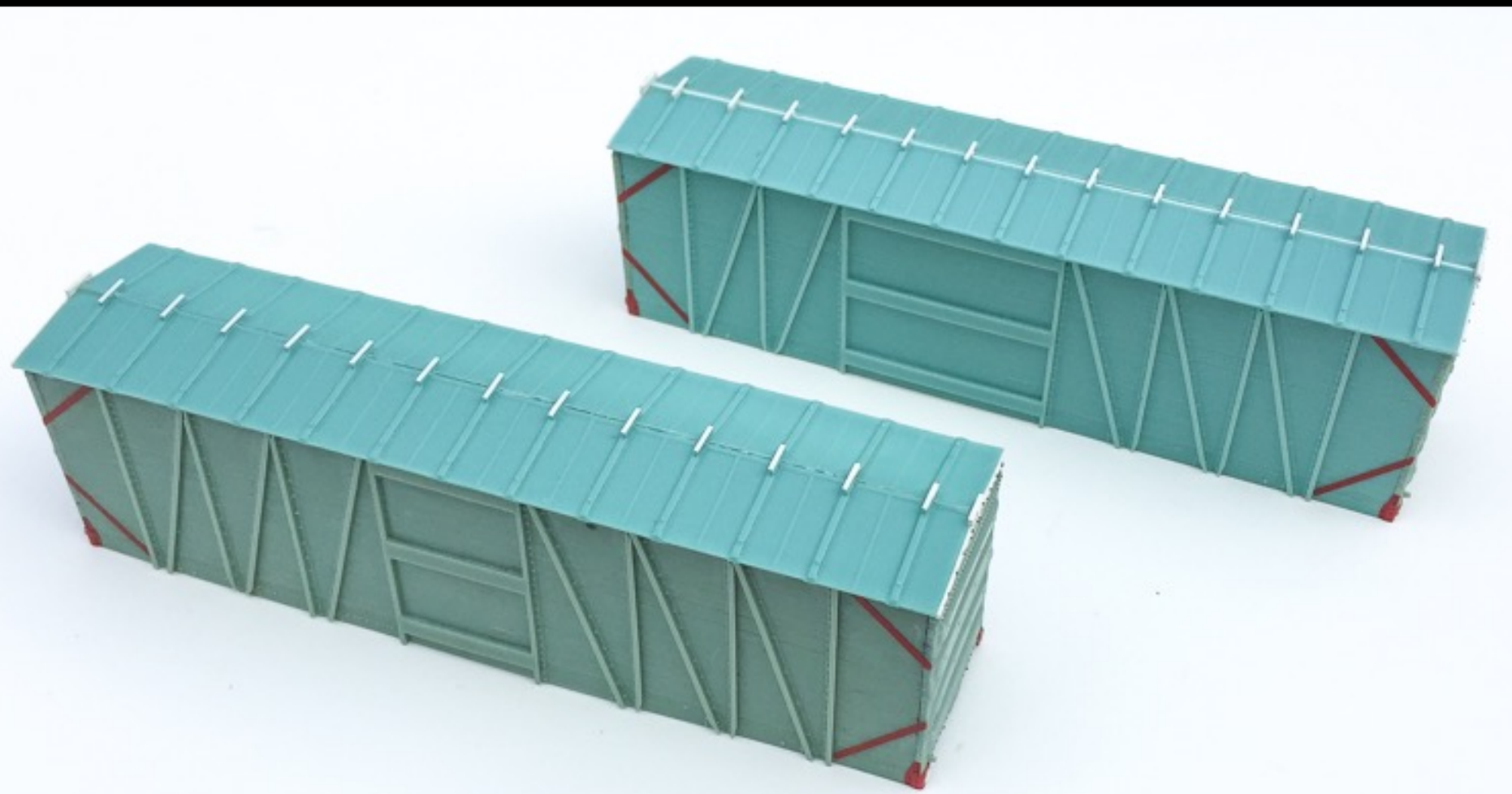
- Carriage Bolts
- Rivets
- Plates/Fixtures/Angles
- Grain Bulge Plates
- Door Opening Filler
- Sill Step Detail
- Ladder and/or Grab Fixtures

Single Sheathed Cars

- The narrow width boards on this car (3¼") were simulated using 0.005" styrene cut to width and then glued to a “sub”side. The overall result was effective

Single Sheathed Cars



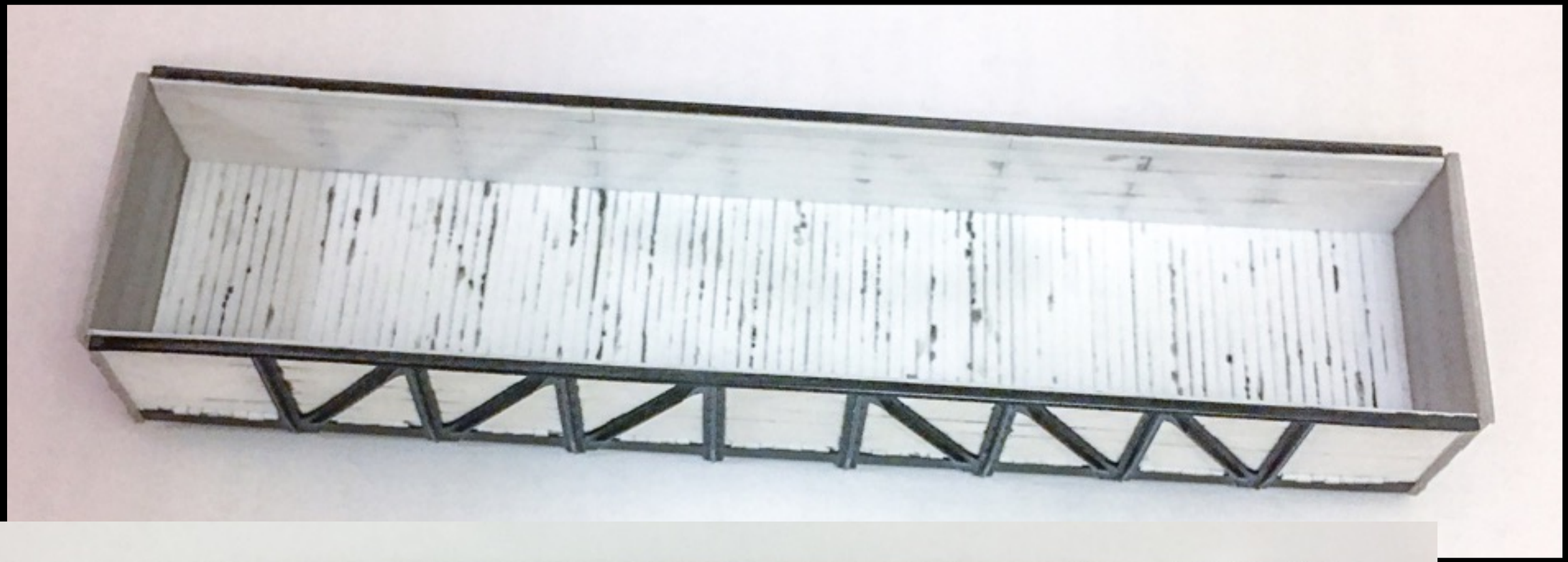


- Some details, such as corner straps and wraparounds, as well as end eaves, are best added after the body is assembled for a better fit or to create a continuous piece, not possible if added to the side and end corner as separate details

“Double-sided” Single Sheathed Cars

The strips will “curl” as they are glued together. There are two solutions:

- Create a thin “veneer” of sheathing boards to be copy-cast or
- Use a rigid-enough structural lattice to resist curling (below)



“Double-sided” Single Sheathed Cars: SP Hog Fuel Cars

- SP rebuilt many groups of single sheathed cars into hog fuel (chips) cars with hinged doors and open tops (see *Southern Pacific Freight Cars, Volume 3* by Thompson, Signature Press.) A-50-6, below, was one of the types of cars so rebuilt
- Create 0.010" thick side sheathing boards to be copy-cast
- Glue them back-to-back and add structural members, details, etc., etc.

Resources

- Rivets — Archer - http://www.archertransfers.com
- Tools — UMM-USA - http://umm-usa.com/onlinestore/index.php

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