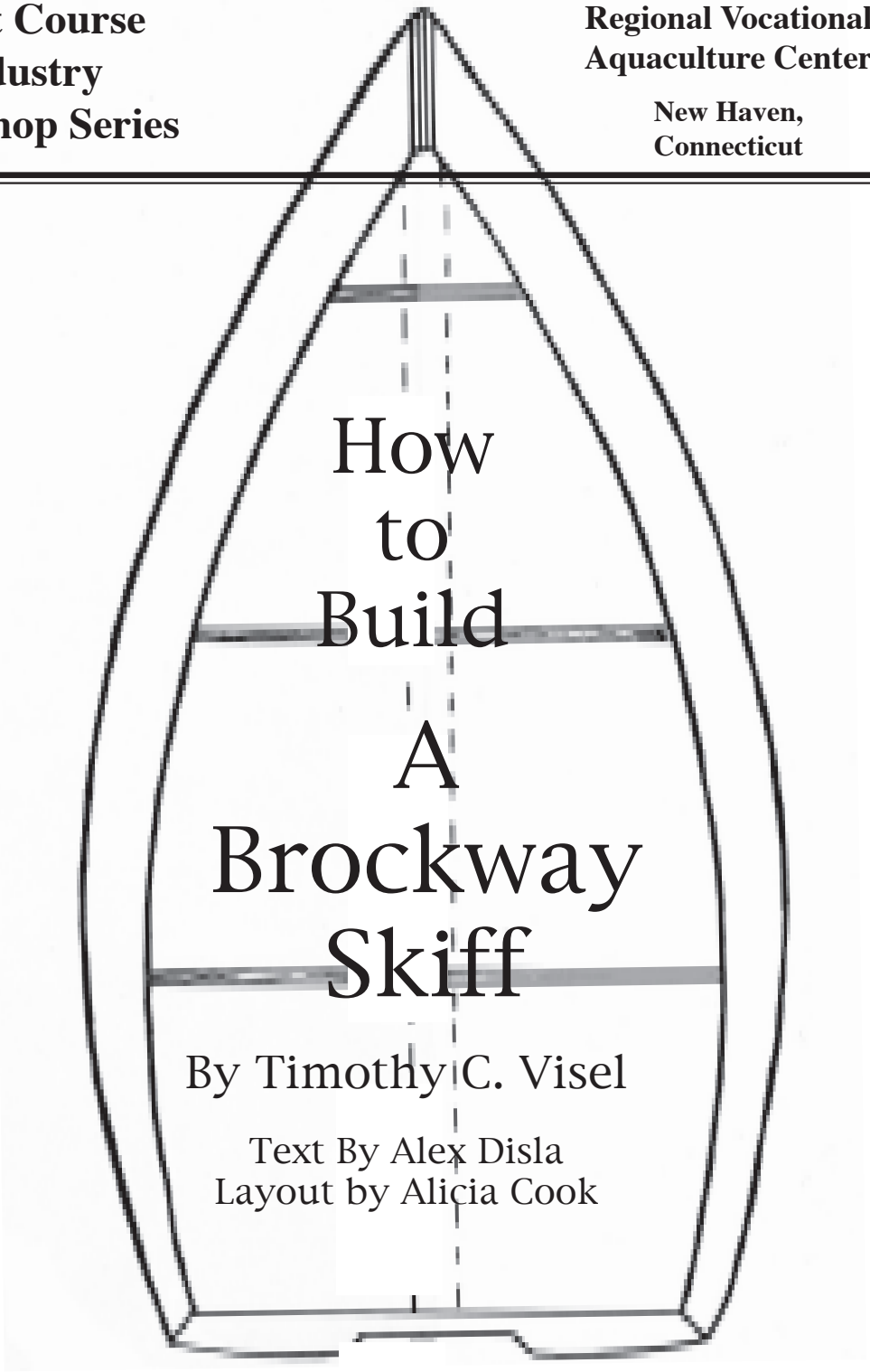
**The Sound School**
**Short Course**
**Industry**
**Workshop Series**

**The Sound School**
**Regional Vocational**
**Aquaculture Center**
**New Haven,**
**Connecticut**



# How to Build A Brockway Skiff

By Timothy C. Visel

Text By Alex Disla
Layout by Alicia Cook

Updatd July 2008 by Faiza Riaz, Sound School Communications Office

**Connecticut Regional Vocational Agriculture System Public High Schools of Choice Since 1955**

# Preface

Six years after Mr. Richard "Earle" Brockway passed away, the popularity and interest in his design continues to grow. Local to the Old Saybrook area, the design concept is being carried on commercially by Persson Boat Builders who builds a similar series. The River School, and later Maritime Educational Network conducted lectures on Brockway Boats in Old Saybrook just a couple of miles from Earle's boatyard. Brockway-style skiffs are also being build in several locations in Massachusetts, mostly on Cape Cod.

Here at The Sound School, we sponsor workshops for out-of-school youth and adults interested in boat building at the Maritime Education Network. The skiff used in the workshop series is the Brockway design. During last years' program, several workshop participants asked about other sizes (9, 12, 14) to be added to the 16. Although, I had owned all four size skiffs (there was also an 18 and a rare 20 skiff), I had plans only for the 9-foot dingy and 16-foot extra wide skiff. During the fall of 2000, I was asked if the boat building project could be expanded to include smaller skiffs suitable for Boy Scout projects, Sunday School projects, and technology classes at area high schools. In the following pages the 14-foot skiff is introduced. The 14-foot skiff is more suited for the above uses.

Several "Brockways" were constructed by attendees of last years' workshop, taught by Ned Costello of The Sound School, and their vessels helps keep the Brockway skiffs alive. The other plans included in this addendum follow the same basic construction procedures as the 16-foot guide used by Mr. Costello in 2001 and later by Mr. Bryan Amanta of Daniel Hand High School in 2002.

**Good Luck with the workshop series!**

Timothy C. Visel - Coordinator

An addendum to Plywood Work Boats for Small Scale Fisheries URI Kingston Rhode Island
First printing University of Rhode Island 1981 I.C.M.R.D. College of Resource Development
Reprinted Maritime Education Network 2001
Rewritten by Timothy C. Visel, Text by Alex Disla and Diagrams by Alicia Lynch for The Sound School Industry Workshop Series November 2001.

September 2002 - How to Build a 14-Foot Brockway Skiff Construction Guide

Reprints of the Brockway 16-foot skiff construction guide can be obtained from

Maritime Education Network,
203 Ferry Road, Old Saybrook, CT 06475
or
The Sound School - Alicia Cook, Vocational Agriculture Communications.
The Sound School Regional Vocational Aquaculture Center,
60 South Water Street, New Haven, CT 06519

# Introduction

The 14-foot skiff described here is built from construction-grade structural lumber, plywood, framing and trim. Earle Brockway maximized design to save materials -"no wood is scrape" he used to tell me - and strived that only "wood dust" was left after building one of his boats.

I have owned several Brockways, a 9-foot dingy (my first), two 12-foot skiffs and four 16-foot skiffs. I had one and had ridden in several 14-foot skiffs but they were a little too small for an oyster business and commercial fishing with my brother Raymond. I sold the 14-foot skiff only after a few weeks. Thirty years later, I was looking for a modest size family boat and, after looking at aluminum and fiberglass boats, I came to realize that a 14-foot Brockway was now the perfect fit. Unfortunately, my long time friend Richard Earle Brockway passed away in 1996. The source of "Brockways" was gone and soon I thought the legend of the Brockway skiffs would also be gone from the Connecticut coast. Then a fortunate event occurred. I was asked to contribute to a local shad exhibit. The plans for this 14-foot Brockway were taken from a skiff that was part of a shad fishing exhibit at the Deep River Historical Society from July to August 2001. I had been looking for an old 14-foot skiff to copy and this was it. I want to thank Jeff Hostetler and Edith Deforest of the Deep River Historical Society for providing the opportunity to take the plans. Every year it seems the number of Brockways grows less and less. Strong, sturdy and very functional, the plywood (AC) held the life span to about 10 to 15 years. 20 years was outstanding - a few even made it to 25. Time as they say is of the essence, but in the marine environment, plywood has a limited life-span. For the original purpose, as strong, durable, and low cost workboats, I believe there was none better. I guess that is why the interest in the Brockway design has not faded, but in fact is growing. Considering the number of Brockways constructed (it is in the thousands), as a vessel type, it is becoming the most widespread wood fishing vessel in recent history. Some feel because of its introduction overseas by Peace Corps volunteers in the mid 1980's, the construction style may surpass those designs spread throughout the world during the last two centuries.

# The 14-foot Skiff

**The Brockway 14**
**Coast Guard Capacity Information**
**Hull Number None - Built about 1975**
**Maximum H.P 15**
**Maximum Persons Lbs 500 Lbs**
**Maximum weight persons motor and gear 620 lbs**
**Builder Brockway Boatworks - Old Saybrook, CT (last constructed 1996)**

The original Brockway design has been modified over the years. The first Brockways were all planked vessels, but by the early 1950's, plywood sides were used with a planked bottom. A few years later, all plywood models were produced.

In 1976, the US. Coast Guard asked Mr. Brockway to include sealed floatation on all skiffs larger than 12 feet. They provide an extra margin of safety as the Brockway skiffs were often overpowered and overloaded. Although the 14' Coast Guard capacity plate lists a total of 620 pounds, I saw several 14-footers carry 15 bushels of oysters (about one-half ton) plus two people during the early 1980's. Most often the space under the rear seat was enclosed to hold a foam floatation or solid styrofoam block - Earle had designed the seat heights so the 6 gallon metal tanks prevalent during this time could fit underneath. As the foam compartments altered the seat design Earle installed frames instead of the usual middle seat. My feelings were the design changes were warranted for the extra safety and used both types. The larger skiffs had a bow compartment to hold the expanded foam. Others had specialized "side seats" incorporated into a frame. After this period, many commercial fisherman purchased these skiffs and tore the floatation compartments out. I believe the floatation provides an extra margin of safety. Some commercial fishing applications dictated that hauling be done at the rail so you had this conflict between safety and function.

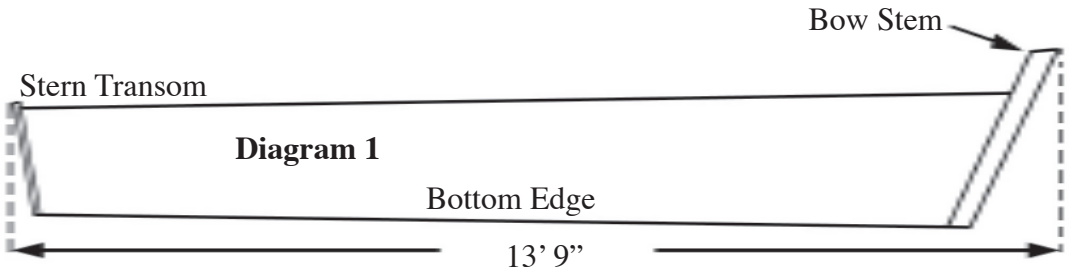
Having swamped the 16-foot skiff several times, they didn't sink. I never used anything over a 25 Hp engine. Several incidents of putting over 100 hp on a flat bottom 16-foot skiff prompted the Coast Guard regulations on capacity. It was speed that made these vessels unsafe and the "pounding" tended to loosen the joints creating leaks! They were never designed to be speed boats.

These plans are designed to be used with a previous guide on how to build a 16-foot "extra-wide" Brockway. Therefore several design features are not described in this plan. To completely understand the design, the 16-foot construction guide should be consulted.

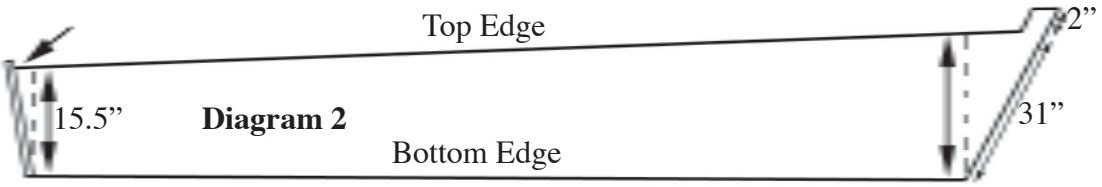
# Construction Guide

The sides are built from two 4x8 sheets of 1/2-inch plywood. AC plywood when cut produced a skiff measures 14' 1.5" at the top edge and 12' 7" at the bottom edge.

From Transom to Stem the skiff is 13' 9" inches overall.

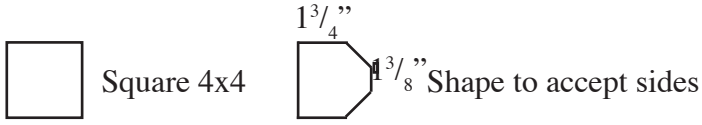



Plywood side top measures 14' 1.5 (true)
Plywood side boat measures 12' 7" (true)

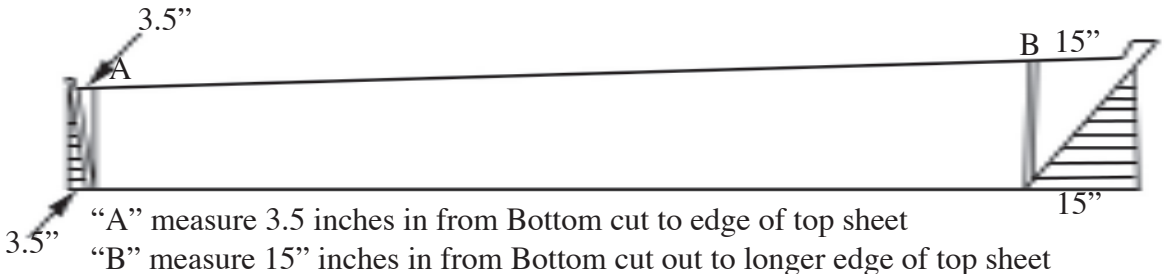


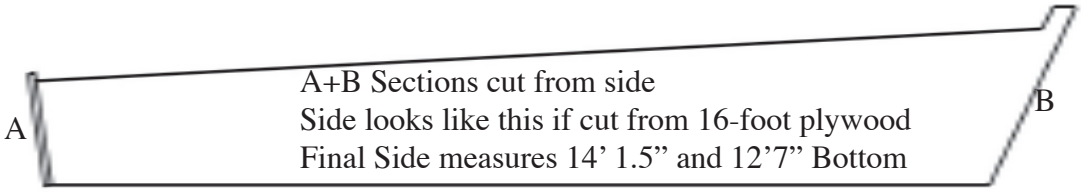

A= Sheet extends 3.5" beyond perpendicular line to transom
B= Sheet extends 15" beyond perpendicular line to stem.

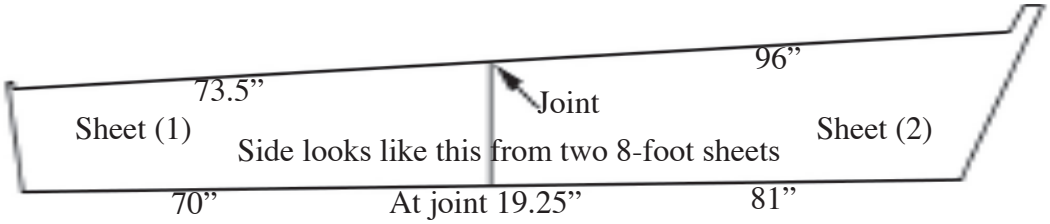
Stem details - Stem is 33" long extends 2" above sides cut to final length after sides on start with 40" piece cut same as details for 16-foot skiff.



Cut sides to make shape.




| | |
|---|---|
| 1) At 3.5 in on top sheet marked down | 15.5” from Top Edge |
| 2) At 2’ 3.5 | 16.5” from Top Edge |
| 3) At 4’ 3.5 | 18.5” from Top Edge |
| 4) At 6’ 3.5 | 19.5” from Top Edge |
| 5) At 8’ 3.5 | 20.5” from Top Edge |
| 6) At 10’ 3.5 | 22.5” from Top Edge |
| 7) At 12’ 3.5 | 23.5” from Top Edge |
| 8) At 12’ 10.5” | 24” from Top Edge |

Then cut 15” out and draw to 12’ 10’.5 mark or measure 15.5 down at station 1 and mark 24” down station 8 use chalk line. This should be a check as the line should be straight. Earle hated to waste wood so the cutting plan must have complemented another boat design, perhaps a 9-foot dingy. The plans had scrap but no doubt was utilized elsewhere. The sides he used was rarely built from one sheet although I did have a 16-foot Brockway skiff built from 16’ continuous sheet of mahogany plywood. Most often, Mr. Brockway would butt two plywood sheets together with a plywood splice. The splice was placed at the maximum width as the splice acted to flatten out the side. Earle would place the middle seat just before the splice later a frame would be placed here. I watched Earle place a piece of wood on the sides and jump up and down on it until the skiff reaches the proper shape. This is easier said then done. Of course, if you use or obtain 16’ panels, all this is not necessary. The Brockway boat was characteristically constructed from common construction lumber, thus the 4x8 plywood panels.

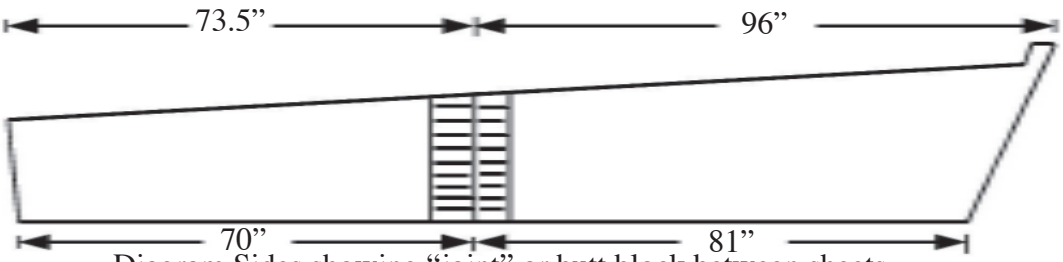
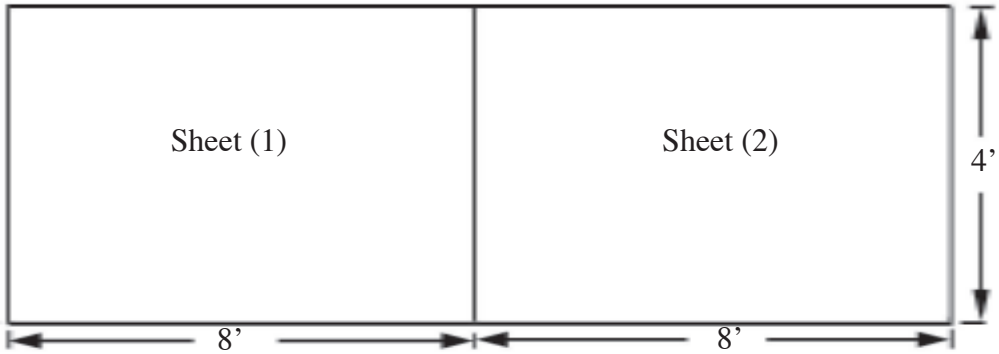
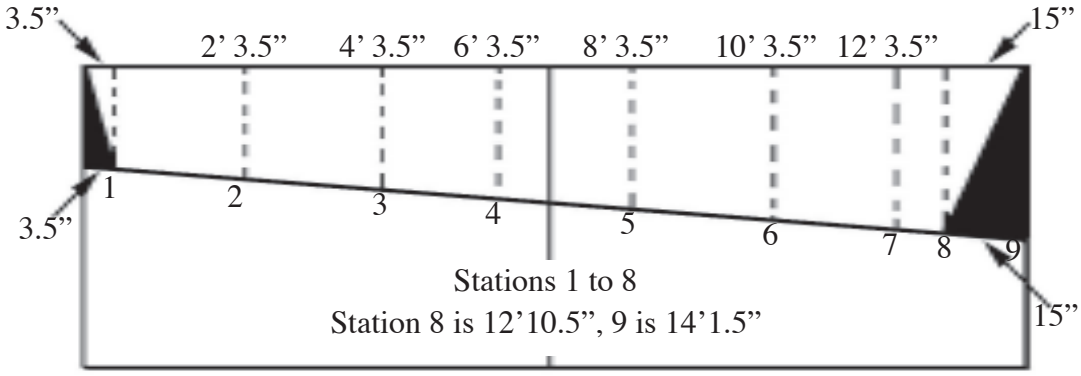


Diagram Sides showing “joint” or butt block between sheets

How To Cut Sides lay to sheets on flat surface 4x8 sheets
AC plywood (no large defects)



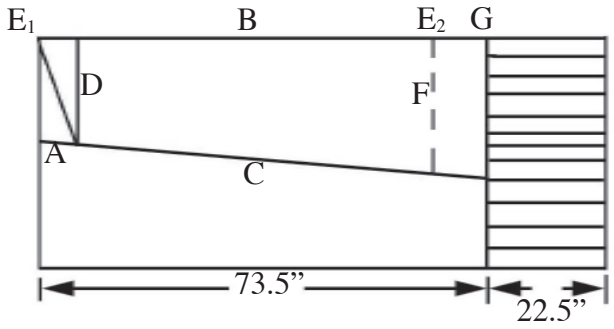
This creates a 16’x 8’ Panel from which two sides are cut ( measure depths from top straight edge)



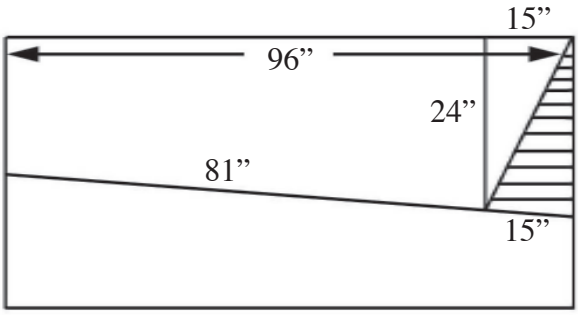

The sides can be cut by setting off stations (lofting) but the Brockways used straight edges so sides could be more easily. Station measurement can help in determining boat plans. Below is the steps to quickly cut out sides.

**Sheet #1**

A=3.5”
B=73.5”
C=70”
D=15.5”
E=51.5” ($E_1$to$E_2$)
F=18.5” Deep
G= At butt block joint
measure ≈19.25” Deep

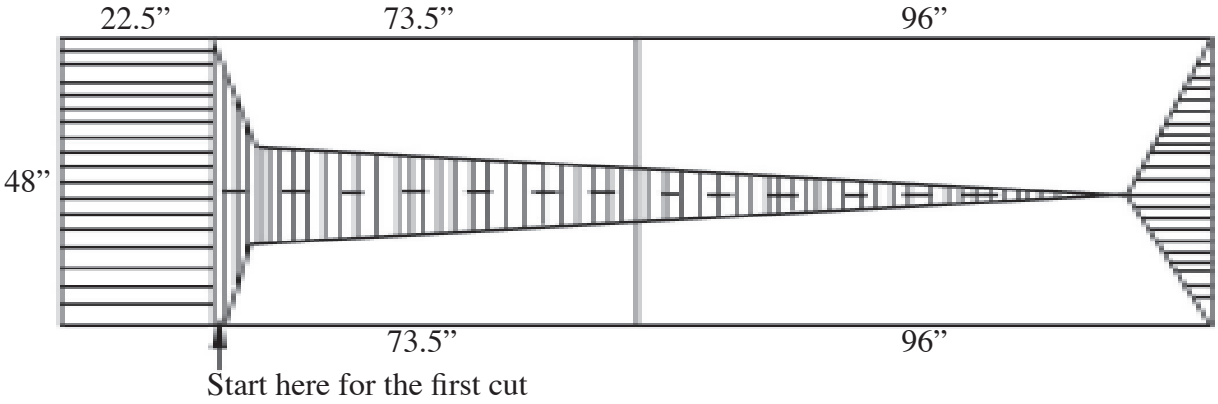



**Sheet #2**




**How to Cut Out Sides**

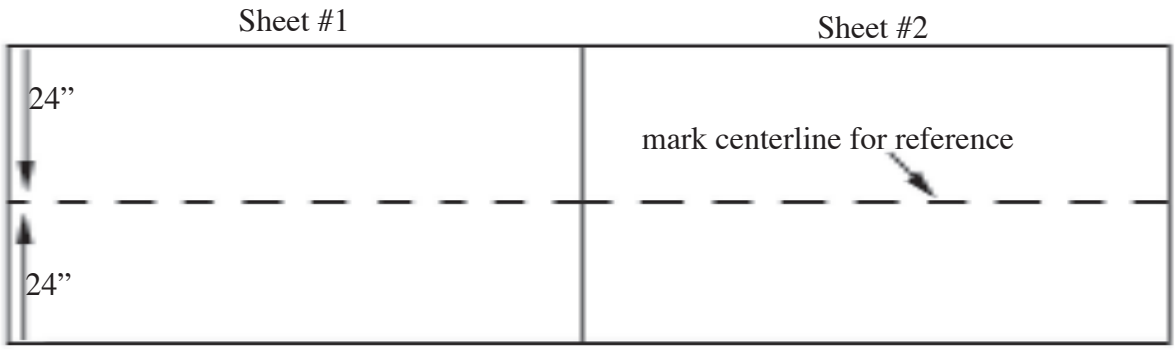
Layout of Both Plywood Panels showing cutting plans, location of all scrap (waste) of sheets 1&2. The 14’ Brockway skiff does not fully utilize the entire length, so when the two panels are flat, cut a piece 22.5” x 48” off. This will leave a rectangular piece to use elsewhere.



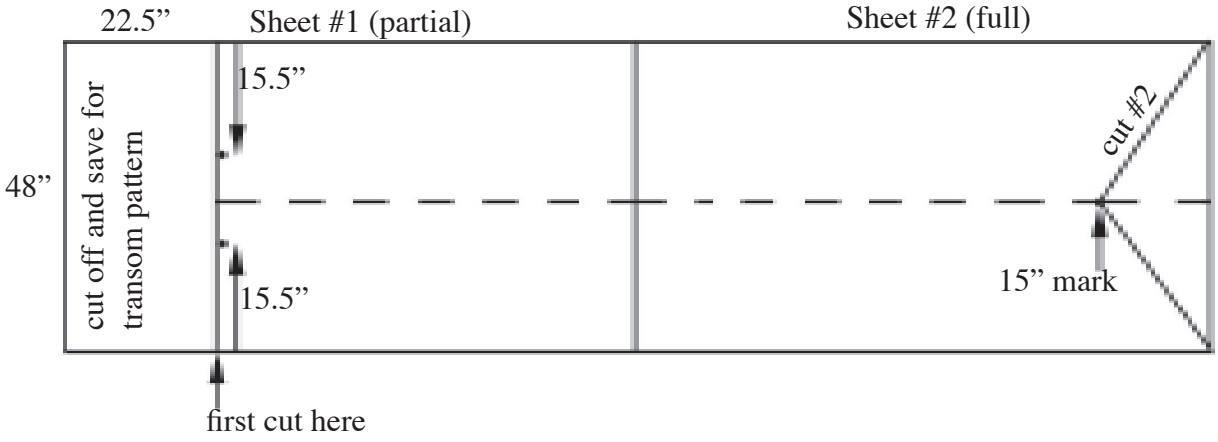
Two people - one measuring and marking, one checking and cutting should be able to cut sides out in 15 minutes.

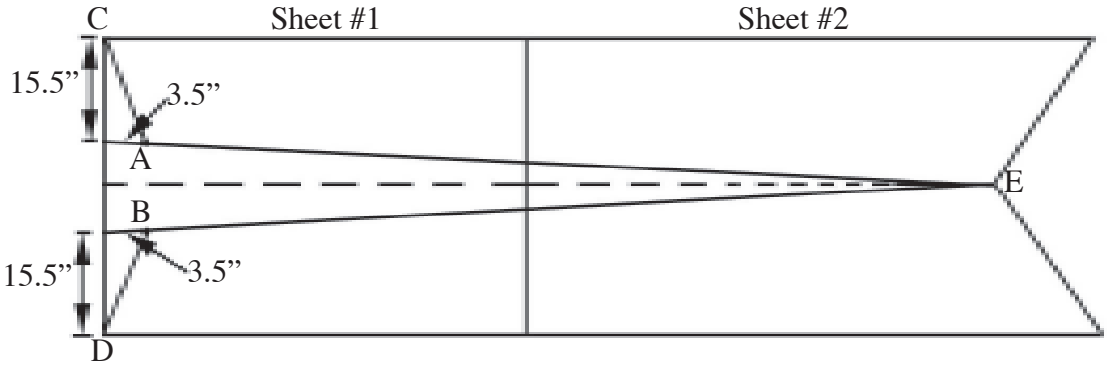
Place two sheets of 1/2 inch plywood end to end to form 4x16 panel.

1) Take a metal straight edge or builders chalk line and mark at 24" center line.



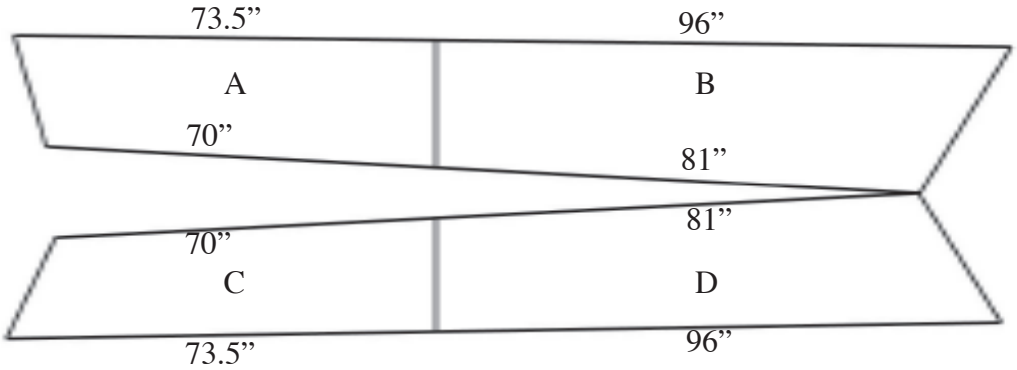

2) Cut out piece of 22.5" x 48," measure in 15" on full sheet 2 draw to corners from center line. Make second cut, measure down 15.5" on part sheet from each edge. Draw two lines as shown.





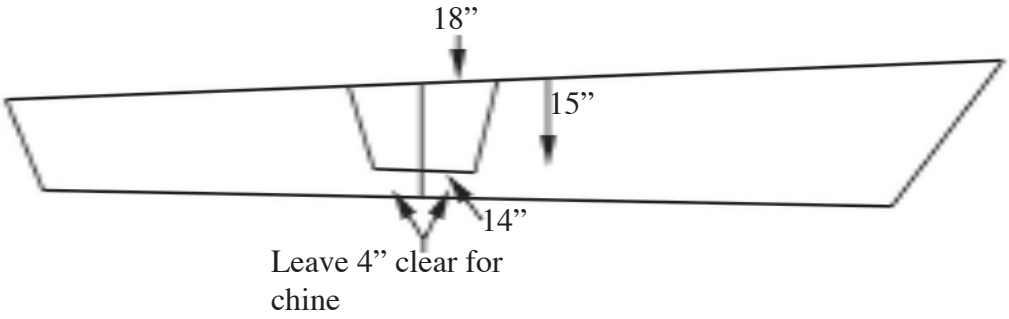

3) Measure 3.5” on 96” each transom side. Shown as “A” mark “B” mark.

4) Cut out sides - center waste becomes plywood butt blocks and seat supports. (Earle never wasted anything) cut D to B to E, then C to A to E.



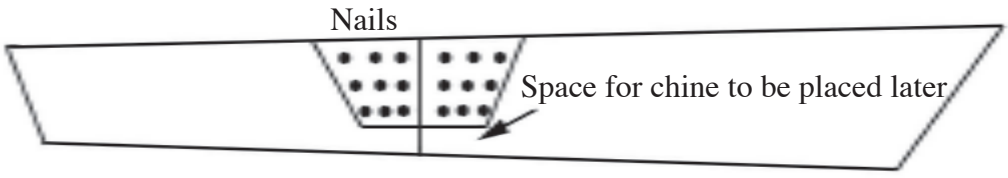

5) It is important to check final measurements and mark each side. A+C should be identical, B+D the same if one side is slightly smaller (however no two Brockways were precisely the same) lay the smaller side on top of larger trace line, cut to exact shape. Slight differences will not impact skiffs construction.

Sides can now be spliced - with a piece of 1/2 plywood - butt block does not extend the full width but 4 inches short of bottom side edge top piece is 18 tapered to 14." The four inches is where the chine will be placed. Earle would cut these pieces from leftover scrap produced from cutting the sides.




Plywood splice measures 18" x 15" deep x 14" (use 1/2 plywood). Note= if you plan to place an interior rail a 1x3 pine stock will work - then modify splice for 12" deep - leave top 3" clear. As this will further reduce the splice area. Widen the splice top from 18" to 22."

Glue and nail butt blocks using 7/8" inch roof nails. 20 to 30 nails each splice - glue should be epoxy resin (splice goes on the inside). The "A" side contacts the water the splice should be on the "C" side which should be the vessel interior.



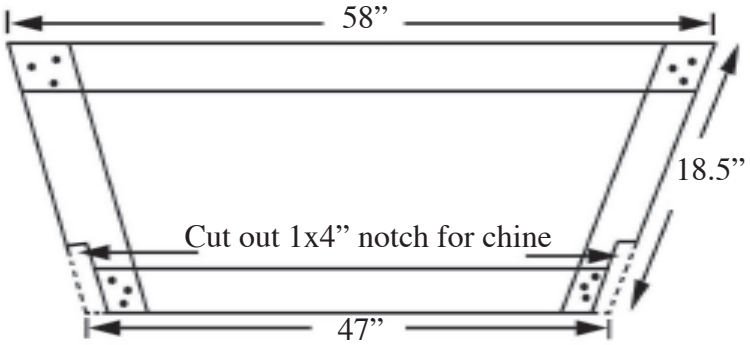

Place splice on side trace out lines, apply generous coating of epoxy resin within traced lines - (coat splice piece with resin). Place on side - match traced lines nail at four corners making certain that the splice does not slip out of position. Finishing the nailing process.

**Mold**

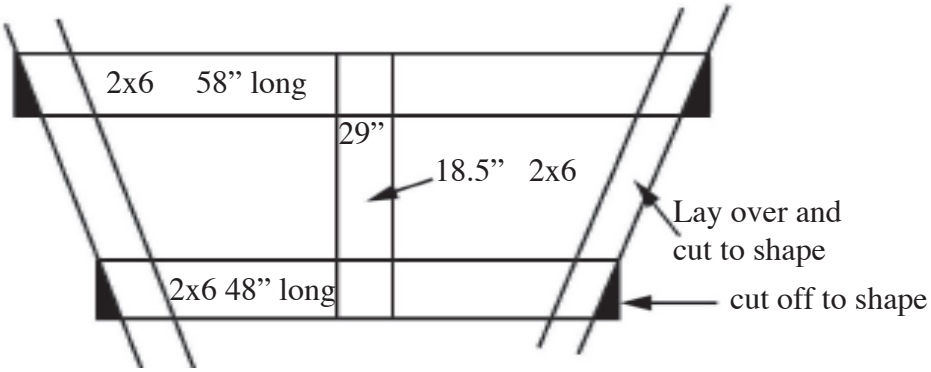
Most hulls are built with a mold to help maintain the shape. Earle didn't use a mold but used temporary braces which he placed at strategic positions. This seemed to me to be the product of decades of experience so I suggest (strongly) the construction of a temporary mold (as shown in the 16 construction guide).

The force at which he pushed these braces in took courage as well as skill. I still have mental images of Earle jumping on these! Anyway the mold although temporary is completely reusable, so it can be loaned out to someone or reused many times.

**Mold Design**




The mold measures 58” top, 47” bottom by 18.5” high use 2x6 material - see quick method below.



**Mold Construction Details**

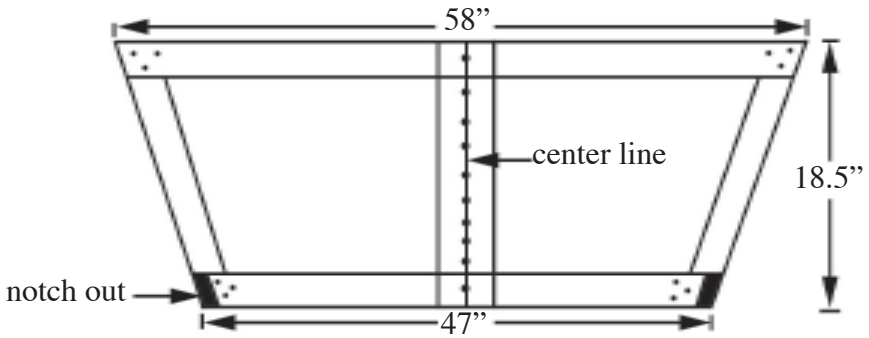
1) Cut two pieces of 2x6 spruce or fir, one 58 long on 48' long, mark centers of length.

2) Place 18.5 pieces of 2x6 at centers and using a builders framing square fasten to mark an "H." Check to see if square.

3) Long two pieces of 2x6 about 25" long placing each edge as shown, mark with pencil and cut four triangular pieces out.

4) Fasten the 2x6 sides to the original H, cut them to length, use 2.5 drywall screws or similar to fasten.

5) Notch bottom corners of mold to accept 1"x4" pine trim as chine (actual 3/4" x 3.5")



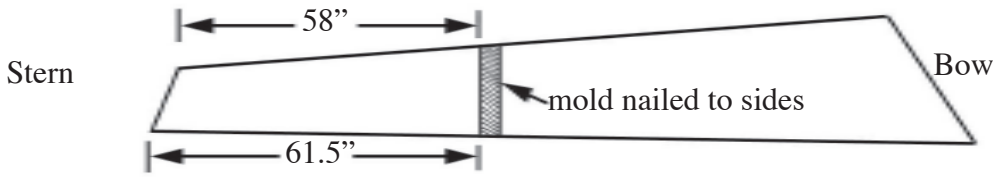

**Mold Placement**

Place stem and side sections to be built bottom up allow excess stem above and below sheets. Attach the bow sections to the 4"x4" trimmed stem with epoxy resin - nail using a 2.5" to 3" galvanized common nails every 2", about 60 nails total. Let dry. Rig a Spanish windlass (see 16' guide section) using a 5/16 or larger dacron or poly blend loop of rope around the sides. Place a piece of scrap lumber between the loop hold ropes together and twist. Be careful! The spring tension created here is tremendous! As the sides slowly come together, place the mold into the skiff as follows.

1) At transom end - measure 61.5 inches on each top plywood edge. (The vessel reaches maximum width here of 60.5" across) mark with pencil or chalk.

2) Measure 58" on each bottom plywood edge and mark with pencil or chalk.

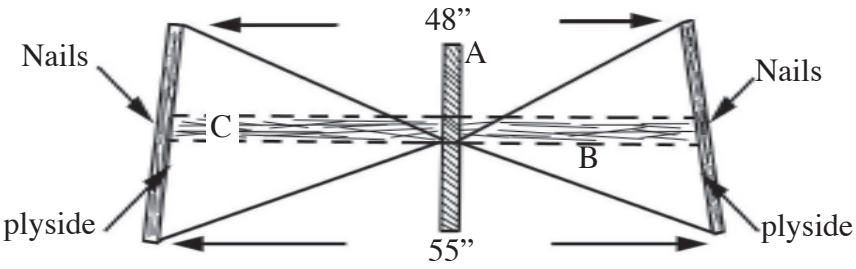
3) Place mold inside skiff and nail into place at marks, do not nail all the way on this mold is eventually removed. Place mold as shown in diagram.




Continue to draw Spanish windlass until sides come to be about 48" apart. Secure windlass by tacking scrap lumber to hold sides. **DO NOT RELEASE THE WINDLASS**. Now its time to build the transom. The sides will begin to accept a "set" - it is okay to leave for several days if in proper shape.

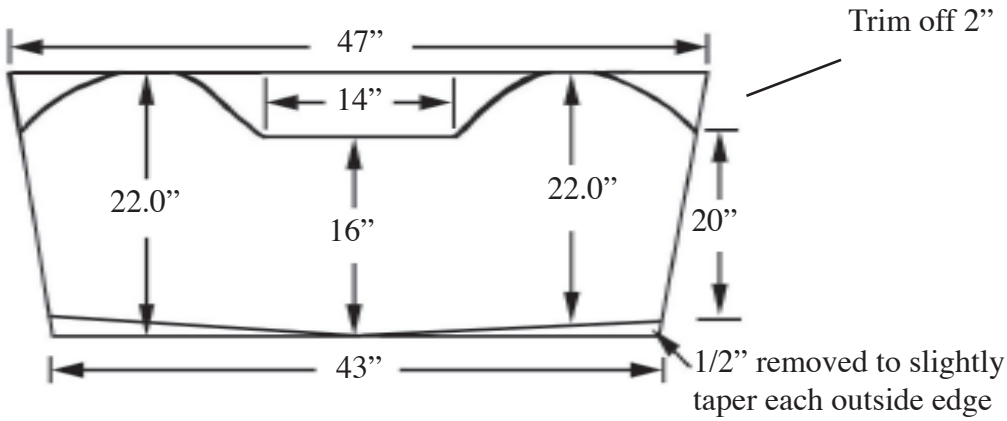
Transom Details - two pieces 3/4 AC plywood glued to create a 1.5" thick transom.

**The Spanish Windlass**




A= Wood lever 20"
B= Continuous rope loop
C= 2x4 wood brace
Note: Rotating the lever will shorten the rope length pulling the sides together. Use caution, the force can be significant.

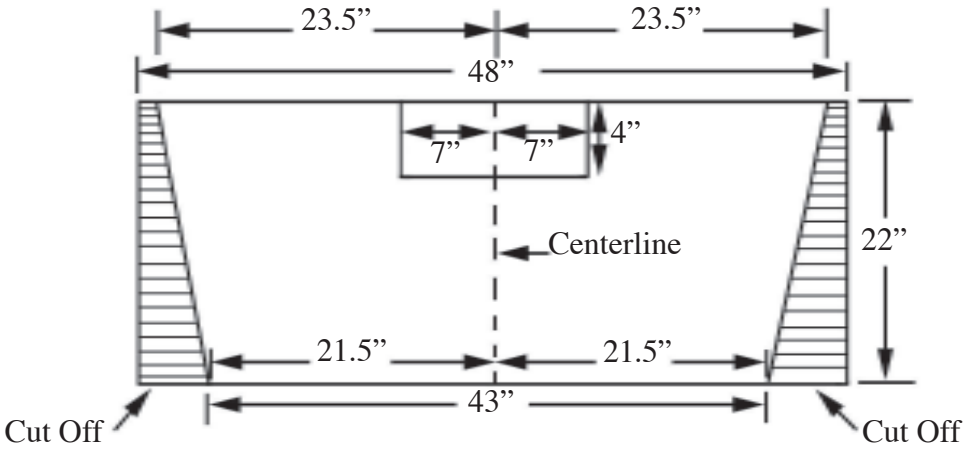
You might want to practice making the transom on the 1/2 scrap piece 22.5" x 48" cut off from producing the two sides. Everything described here can be done on the 1/2" plywood cut out scrap.




Two pieces 48” wide by at least 22’ high will be enough rough material. See bottom panel diagram to save material.

**How to Start**

I start by just cutting two pieces of 3/4 AC 48” x 24”



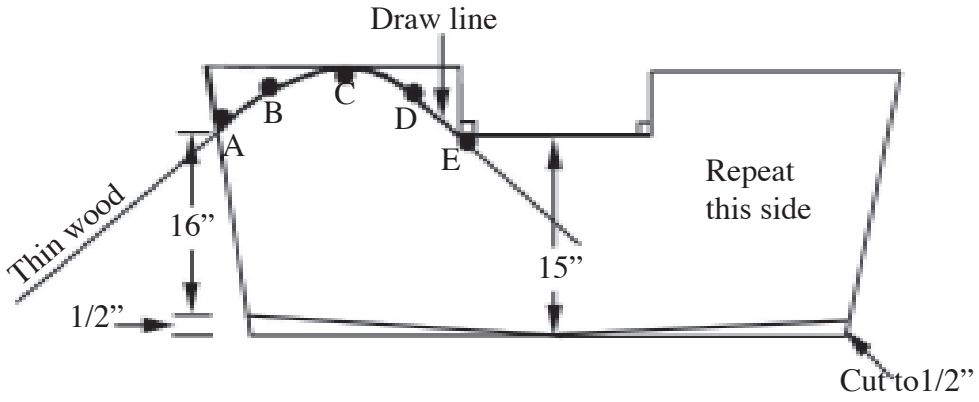

Mark center line vertically, measure over half of 47 and 43 on top, bottom edges, cut off scrap. Then measure down 3” and cut 7” out from center as shown. That 14”x3” cut out becomes the outboard seat. Measure 21.5 from center for bottom dimension “43” 2.5” cut off from each side.

Now comes the art. I’m convinced that Earle kept pattern sheets to draw the shapes. I can’t imagine him taking the time to try to fair off the transom sides. Basically, take a plastic strip or other flexible wood strip and draw the transom finish lines.

Take the 18.5” x 47” final piece and lay out flat.

1) Drive 2 nails at A” 16” C 18.5” E 15.” Place flexible curves and mark lines - cut out using a jig or saber saw. (scroll saw?) When the lines are acceptable. I have found that thin straps of wood - (door stop material will work) but don’t cut short, leave long overhangs set transom on table if necessary. Place strip between the nails, trace along curve.

Remember no two transoms are exactly alike, you can choose your own curve or no curve!



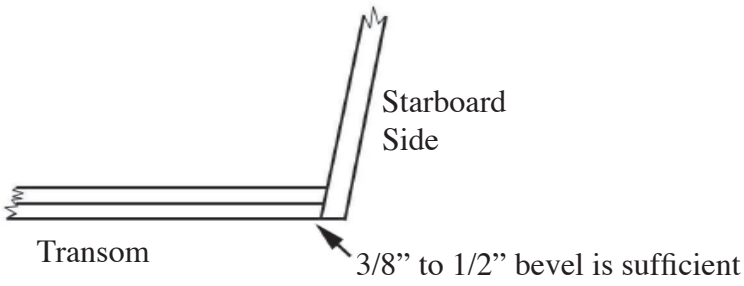

2) The transom has a slight bottom taper about 1/2” so the original maximum height is reduced to 18” at “C” often final cut from each side.

Using this sheet as a pattern, trace out a second sheet (if you plan to make more 14” skiffs, trace out two additional pieces and save this one as the pattern.)

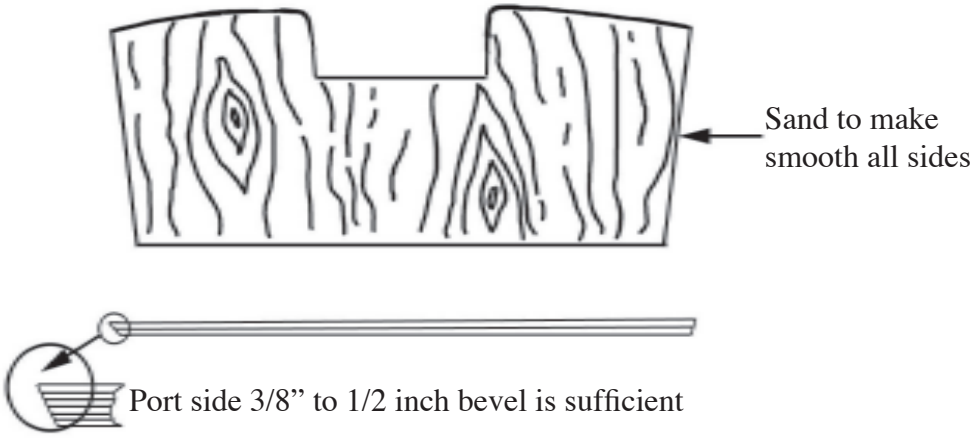
3) Once the second sheet is cut out, lay both on working surface. Cover each with a thin coat of epoxy resin over lap each other nail together with 1 1/4” roof nails to complete the transom.

4) After the glue has cured, it is ready to be beveled to accept the sides. As the pieces were cut flat (no angle), it will be difficult to attach the sides without distorting the 1/2” plywood sides. The bevel however small, is important for creating proper curvature.

**View of Transom Bevel from Above**




Once the bevel is finished (a skill saw is fine for this process). Plane or power sand all other sides to make “even.”



**Attaching the Transom**

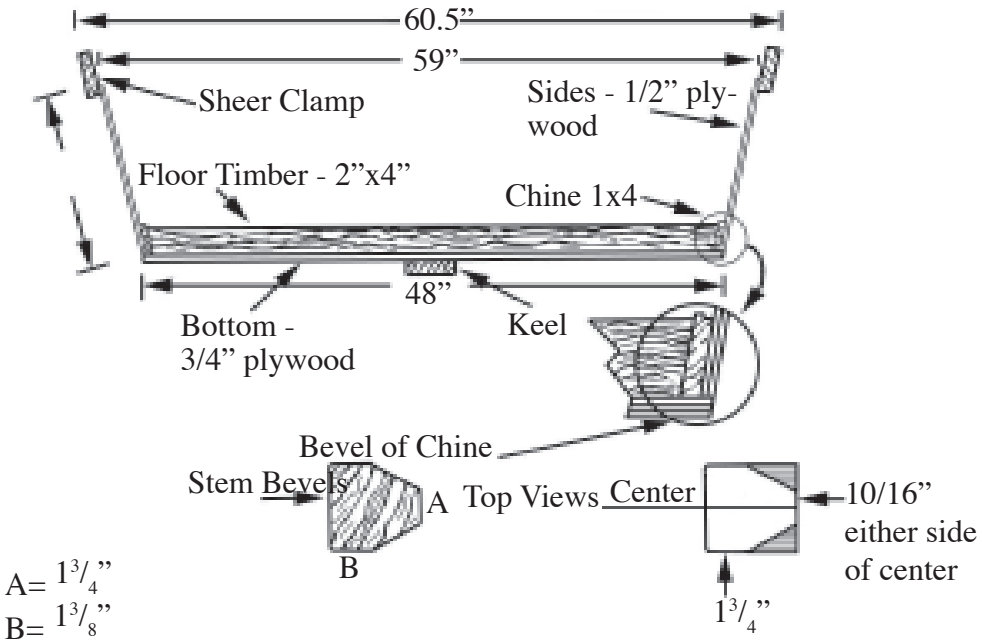
Reattach the Spanish windlass tighten to take the stain off the temporary brace (the scrap 2x4 put in to hold the sides.) Keeping the pressure on the windlass, remove brace and place the transom in place. Drive two common galvanized nails on each side. Draw the windlass so that the transom is tight in place – nail the transom in place, but do not nail all the way, using the side as a guide, adjust so the transom is even. It is important that the inside edge of the transom meet the plywood sides. Because of the angle of attachment, the outside edge of the transom will be above the sides, that's fine as this as well as the extra material of the stem will be removed to form a flat surface for the 3/4" plywood bottom. Taking a crayon or pencil, make a mark on edge side. This will help you align the pieces when the glue is on them for final nailing. Loosen the windlass slightly and remove the nails and transom. Then with the properly prepared resin glue, coat the sides within lines and transom edge. Replace and then nail with 12 galvanized 2.5" #8 common nails each side.

When both sides are nailed and the glue is still wet, take a ballpeen hammer and with the ball end set each nail at least 1/4" inch deep. Fill each nail head with resin glue; this will keep the water from making direct contact with the metal nail. Doing this procedure throughout the construction process will add about 5 years to the vessel life, (15 years) instead of flush nailing with no sealer (other than paint) instead of 10 years with AC plywood. Remember: AC plywood is not designed for marine construction and has a limited life span. Defects (not severe) can be repaired with marine resin (see page 24 for details).

With good maintenance, a plywood skiff built with AC can last up to 20 years. Marine plywood however is much more expensive but could last 20 to 40 years. Most Brockways were used for recreational and commercial fishing and were subjected to hard continuous use. Any time the plywood surface is broken allowing water to saturate the plywood it is harmful to the skiff. Since this was constant with commercial fishing, after 10 years of hard use "just get another one from Earle" was word along the waterfront.

**Skiff Widths and Details for Bottom Plywood and Seat Placement**

This 14-foot skiff bottom is built from 3/4" AC plywood – "A" side faces water. The next step before the bottom is to install the chines 1x4 pine Flat stock often used in trim. It should be #2 with small knots and no obvious splits. Skiff should be placed with the bottom opening up.



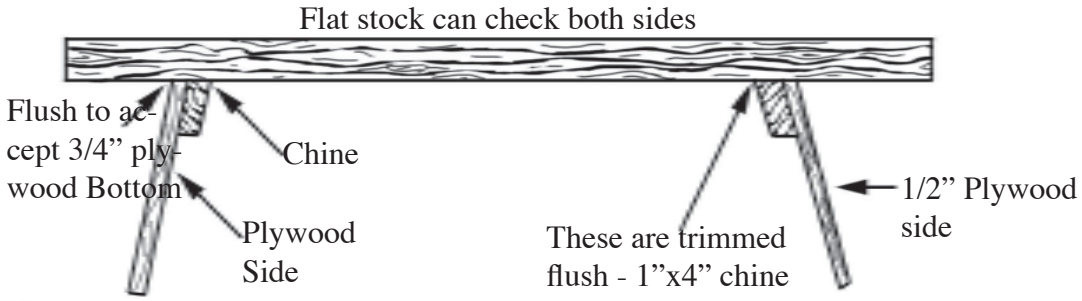

Take 2 lengths 16' of 1"x4" and place on outside of skiff sides with 4 to 8 clamps. Mark lengths of pine lengths to fit inside of skiff. Then, once cut to length, place on inside being careful to place into mold "slot". As with the transom and stem chine should be slightly above pine side, as it also will be trimmed for the plywood bottom panels.

**Attaching the Chines**

Allowing the chines to be in the mold and along sides 24 hours will help in the final process. Longer is better as the wood will begin to accept the "set" or "take" the skiff's curvature. Before the gluing process begins, cut 4 to 5 temporary braces – scrap 2 x 4's work great. These will be placed while the chines dry. They help to keep the skiffs shape. To ensure the proper shape, set up a center line string (#21 nylon twine is sufficient) from the middle of the stem to the middle of the stem to the center of the transom. Distance from the center to the sides should be equal, but it is possible to adjust with braces, wedging tight to adjust the sides' shape. To check the skiff's final shape, take a sight along the centerline. Remove one chine at a time cover with resin and nail with 1-inch roofing nails (60 to 80 nails each chine). Remember: keep the chine slightly above the plywood side. This material will then be trimmed to accept the plywood bottom. While nailing the chine, use the wood clamps – don't expect the roofing nails to close gaps between the plywood and chine. The glue surfaces should be tight before nailing. The more clamps the better! Tool rental stores could be help here. (I have used as many as ten wood clamps per side.)

**Preparing for the Bottom Panels.**

When the chines are dry, place two pieces of wood 2' apart on the sides. These must be flush before the bottom is attached. Reviewing what was covered before expect to trim the chines, transom, and stem. All surfaces should be smooth and flush - a flat stock across the vessel will show "high" spots that need to be planned or if you are careful, use a belt sander (small sizes). You are finished when you can move that piece of flat stock from stem to transform with no space larger than 1/8" less is better. That space will be closed during the application of the marine resin and nailing process. (Earle used to trim the chines with a hatchet - not recommended - a belt sander is better, but don't overdo it!)



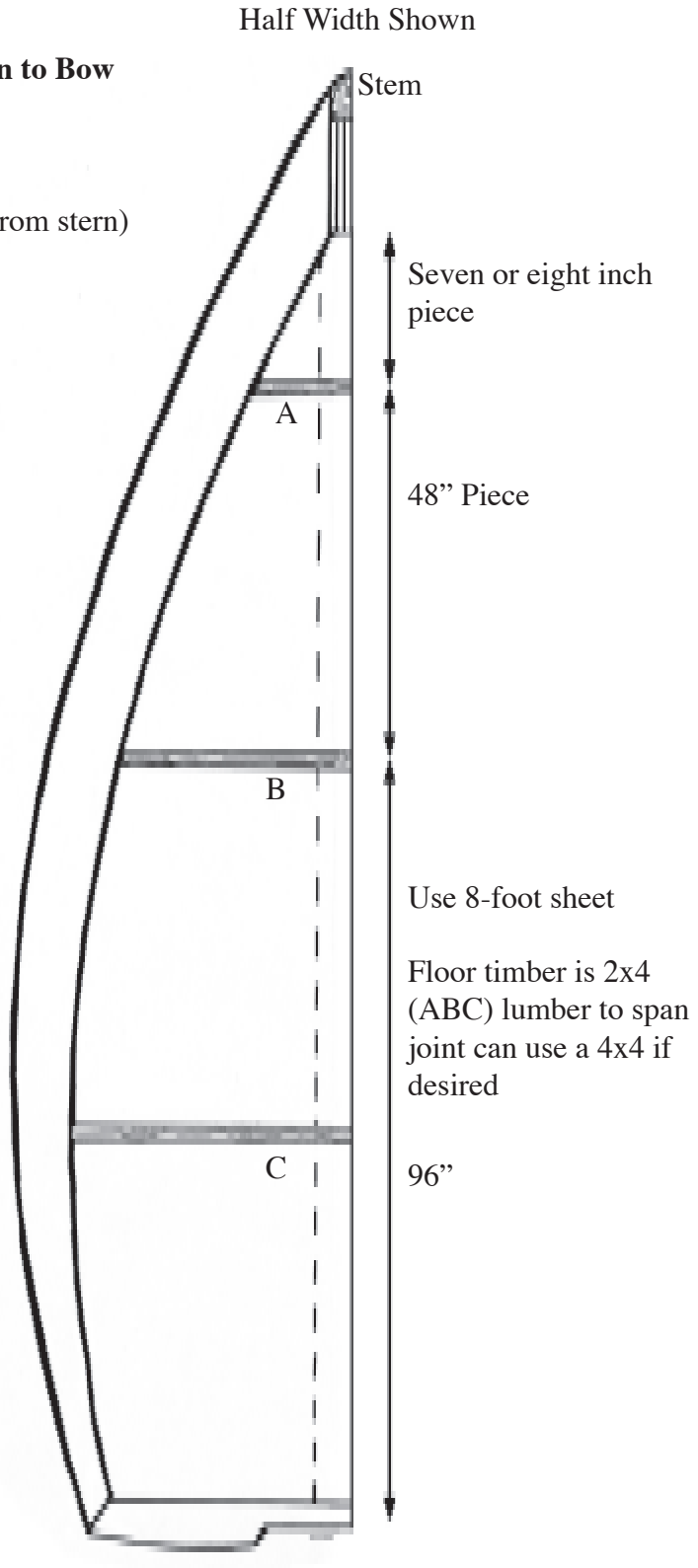
**Checking the Skiff's Shape from Stern to Bow**

| | Rail to Rail **Station** | **Width** (measure from stern) |
|---|---|---|
| 1 | 5” | 50.5” |
| 2 | 2’5” | 56.5” |
| 3 | 4’5” | 60.5” |
| 4 | 6’5” | 59” |
| 5 | 8’5” | 53” |
| 6 | 10’5” | 40.5” |
| 7 | 12’5” | 22.5” |
| 8 | 12’10” | 18.5” |
| 9 | At Stem 5” | 5” |

Example: 5” from transom, the vessel is 50.5 inches wide rail to rail.
or
6’5” from Transom the width rail to rail is 59”

Maximum rail to rail is 60.5 inches

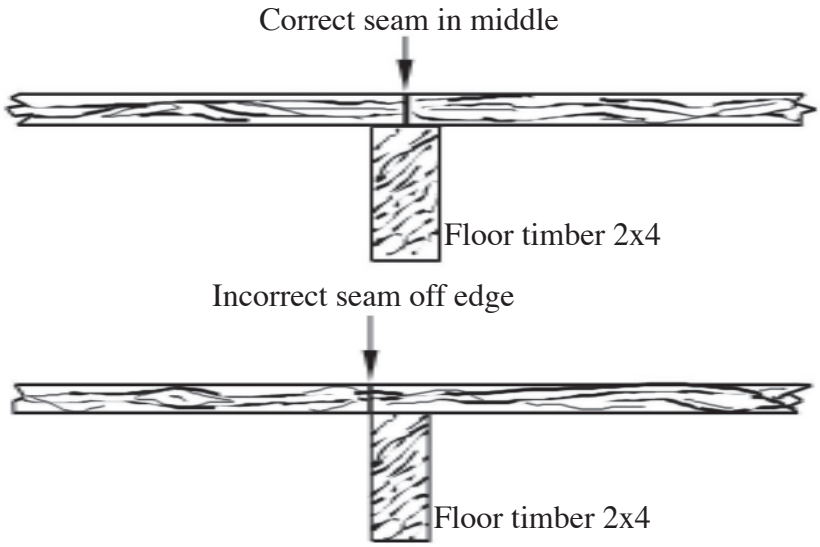
Maximum on Bottom is 48” (inches wide)



Earle Brockway would have been amused to see how much time I spent on the shape of the skiff. He could just look at the sides and with a pound here and hammer hit there, he'd configure the shape by eye. That takes years of practice! Adjusting the shape so it is equal to the centering string can be a somewhat frustrating process. Remember the measurements I provide are only a guide – each skiff is a little different – the next one may have a more tapered bow, flatter section at the stern, etc. I do know one thing, the sides at the splice can be a challenge because you are bending 1" of plywood instead of a 1/2" sheet. You may need to spend some time and an extra brace here to get that doubled area to shape up. Don't be timid; it will take some bending and pounding to get the skiffs shape.

One thing I see in the homemade Brockway skiffs is a flat section at the splice. The vessel's shape bottom up should be like that as shown on page 20. The dotted double line down the middle represents the 2x4 keel, which is bolted on last. The 3 cross pieces represent the floor timbers, two of which also function as "seams" for the 3/4" plywood joint. When the skiff is bottom up and all surfaces prepared to accept the bottom, Earle would gather up some nails and would place the first sheet on the transom. Taking a few nails he'd tack the sheet along the transom and walk forward to bend the 3/4 ply, tack nailing every so often.

He would mark the edge of the sheet with a pencil, forming the centerline for the 2nd floor timber (spaced 4' apart). Place the second sheet next to the first – tacking along the chines – marking the location of next floor timber. When that was done – Earle would draw a line leaving 1/2" to 5/8" extra on all edges – this was the line to cut out for the skiff. Once marked, he would pull off the sheets and install the floor timbers. 2x4 lumber works well but remember the marks. You must center this on the plywood seam leaving only 3/4" on each in which to nail. Many people like a little extra width – 4x4 is okay. It adds weight to the skiff, but does give you a little extra nailing room. As with the chines, stem, and transom, it needs to be flush with all surfaces before nailing the bottom.

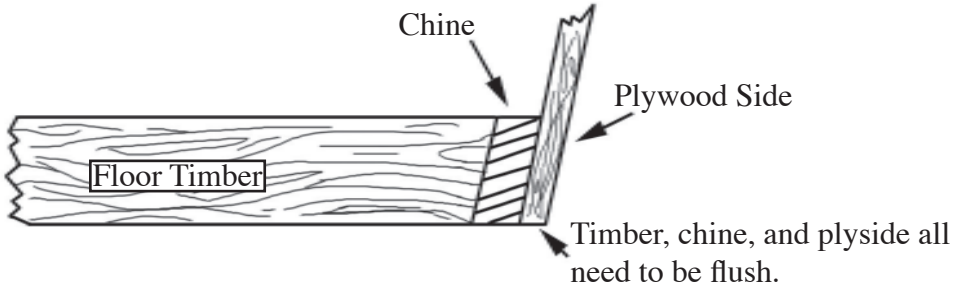


**About the Plywood Bottom Panels.**

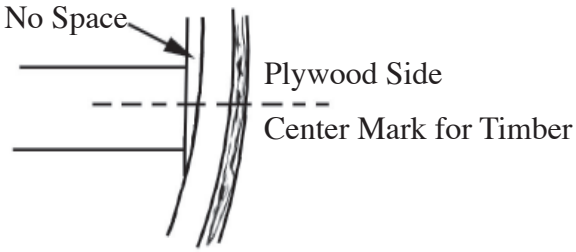
It will take two 4x8 panels of 3/4 AC plywood for the bottom. The large sheet from the transom is mostly used, but the middle piece is a 4x4 piece. The two transom pieces can be cut from the other half. The very small bow piece can be cut from scrap. In this way, only two sheets need to be purchased. Remember: Earle was very cost-conscious about materials, so plans reflect the "most" for the "least".

**Installing the Floor Timbers.**

For an experienced boat builder, shaping a piece of square stock with each end having a taper and angle cut is easy. For others, and I include myself in this category, trial and error seems to rule the day. (Take away the flair and curve and it is easy!)




Each floor timber must fit tight against the chines and at the mark. A quick review will show that top of the floor timber is longer than the bottom. This dimension can be measured - write the top and bottom measurements to the floor timber center mark. But that's the distance only at the center mark! The curvature of the skiff that will be at one edge of the floor timber (toward the bow) will be less and it will be more toward the stern. Not allowing from this difference will create a space – which will weaken the floor timber.



**Method #1**

After about a dozen wasted 2x4's (one side would be perfect the other one inch short, etc.), I came up with a method which may save you some time. It's a little embarrassing to describe, but woodworking is not a skill I can brag about. I take a piece of 1x4 pine square stock and nail it to the sides centering the floor timber marks. Then, taking a 2x4 that is about 1' short on each side, screw the 2x4 to the pine stock, again centering for the proper position. I cut four strips of 1/4" luan plywood 3.5"x2' and place them against the chine, using a jig saw and a pencil, I trace a line, following the chine on the trimming until it is a very close fit. Then I screw it into the 2x4. After all four pieces are fixed to the 2x4, I remove it and that is the pattern I use. This sounds a little time consuming, and it is. Only after hours of frustration, does it become a way out. As I said before, Earle would find all of this very humorous; he would examine the opening, take a rough measurement, set the angel on his skill saw, and with two quick cuts, produce the floor timber.

**Method #2**

This came up a couple of times. Place the floor timbers first and then make the plywood fit them. I guess whatever works, but I could quickly see buying an additional sheet of 3/4 plywood. Again it might be worth it. (I think it is.)

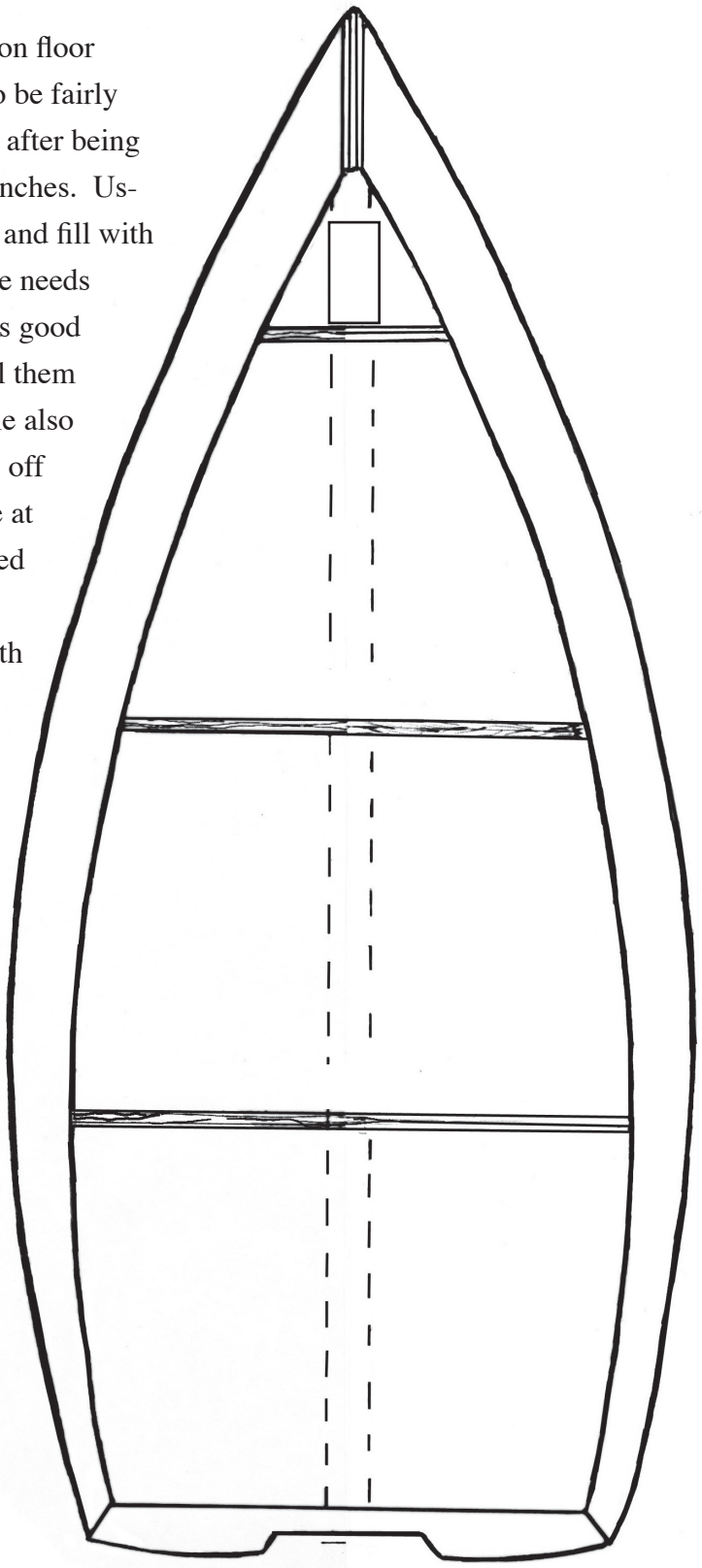
**Method #3**

Invite over a friend who is a skilled carpenter. Once all the floor timbers are in and flush with the chine, bow and transom, make a 1/2" x 1/2" notch at the chine. This will allow water to drain along the floor one section to another.

**Attaching the Plywood Panels**


Cut out the bottom plywood sections and place them on skiff to check dimensions. If proper, apply generous amounts of marine resin to transom, and chines to first floor timber. Once the glue is applied, place the sheet and quickly nail it into the transom – place stones, weights etc., on plywood to make it conform to the sides. I like to stand on the sheet and with a ballpeen hammer and a bag of 8-penny nails. Start at the transom and work out to each chine floor timber #1 alternating each chine quickly and finish on floor timber #2. Repeat with second section. And

using a piece of scrap, the bow section on floor timber #3. The nailing process needs to be fairly rapid as the glue bond should cure only after being nailed with nails placed every 2.5 to 3 inches. Using a ballpeen hammer, recess the nails and fill with resin. Don't be surprised if the nail hole needs to be filled several times; actually that is good as it seals the exposed plys. I like to fill them flush with the rest of the plywood. Earle also cautioned me against cutting the excess off the 3/4" sheet bottom. He liked to leave at least 1/2" extra to be rounded off – called it a built-in "fender". This edge can be rounded with sandpaper and painted with resin. On one of the skiffs I prepared this way, after ten years, the nails were rusted almost to the breaking point, but the knots on the plywood painted with resin were as good as new. Serious flaws in the plywood can be fixed with ply slivers or sections of ply similar to patches in high-grade marine plywood. This sounds like trying to turn an AC panel into something better and it is. The 16-foot skiff guide has an entire section on repairing and stabilizing knots, edges, etc.



**Can You Fiberglass a Brockway?**

Yes, and I have seen it done. One word of caution however, when glassing and applying the resin, the cure can be "uneven". In areas that the glue didn't penetrate, it tends to crack, letting water in between the cloth and the plywood. I have seen Brockways rot out faster because they were fiberglassed, had a crack, and had water trapped between the outside fiberglass coating and the plywood. Sometimes water could go to two or three feet from the crack making repairs difficult. More than once, I had to remove the cloth altogether to find out what was causing the damage. However applying a 4" band of fiberglass tape at the outside chine edge did seem to help, which was done on a lot of Brockways.

**Finishing the Skiff**

Three major procedures need to be finished: top rails (sheer clamps), the keel, and the three seats (thwarts). Since the vessel is still upside down, lets go to the keel first. Earle used a 2x4 or 2x6 piece of Doug Fir structural lumber. He would put out several long pieces, in good shape, free of any serious knots which may crack or break, wedging one end on a rock or barrel, placing stones on the other end to bend it in the open air. Getting the proper set could take weeks or months to obtain, especially for chines, rails and heavy keels. A long 2x4 can be made usable in two to three days – the bend needed for the keel is less and the many fasteners assist with this process. For this skiff, an 18-foot green Douglas Fir #2 2x4 is sufficient. Avoid lumber with serious cracks or large knots in the middle. It has been my experience that these will break about half-way through the process so its just not worth it. Pick out a good one! Using a similar method as Earle (although ancient) is effective. I used a 125-pound mushroom anchor over a barrel to bend a 20-foot 2x4 staked to the ground. Green lumber has more moisture and bends more easily. Avoid dried out lumber - it cracks.

Probably the most common memory of owning a Brockway is the not so pleasant memory of roofing tar and lots of it. Earle was extremely generous in its use, usually applying it with a stick ("Sticks are cheap!" He would tell me). Anyway, a common phrase about building a Brockway was two days to paint it, two weeks to remove the tar before you could paint. It wouldn't take two weeks, but it was quite a process. Even years later, on a hot day the tar would ooze out. Earle used the tar to seal joints and keep water out. At times, it seemed as though the entire boat was covered by tar. (Those of you who owned one will know what I mean.) I don't use tar ex-

cept for attaching the keel and here it makes sense. If you used the skiffs from the shore the keel takes a lot of abuse. (Sand, rocks, gravel, etc.) It was common to rub off the copper bottom paint allowing the marine borers (ship worms) in the keel. Once in, it is only a matter of time before the keel needs to be replaced. If the keel was glued to the bottom, it would take many hours to chisel the keel off. Instead (in this case, I agree with Mr. Brockway), put a generous coating of tar (can be the tube form) on the 2x4 and on the skiff's center. Nail two 12-penny on each floor timber and use a series of 1/2" galvanized carriage bolts between the floor timbers (washer and nut on the floor) to fasten the keel to the skiff. Start at the transom, end at the bow, carefully cutting off the excess from the bow leaving a little excess smooth to shape. If the keel needs to be replaced, remove all bolts and pull out the nails from the transom and floor timbers. Clean off any old tar and re-coat with new tar. Install the new keel. I once replaced the keel on a 14–foot skiff in less than two hours. It would have taken much longer if the keel had been glued on.

**The Seats**

The seats on this 14-foot Brockway were from two types of building materials, the rear seat x 2x12 D fir framing or structural lumber the middle and bow seats from stair tread material. Earle didn't go to the lumberyard that much. Local contractors who had surplus materials would sell them to Earle. Someone most likely had some extra stair treads and that's how they ended up in the skiff. I suggest putting the transom & bow seats in first then removing the mold and installing the middle sheet. Some construction notes:

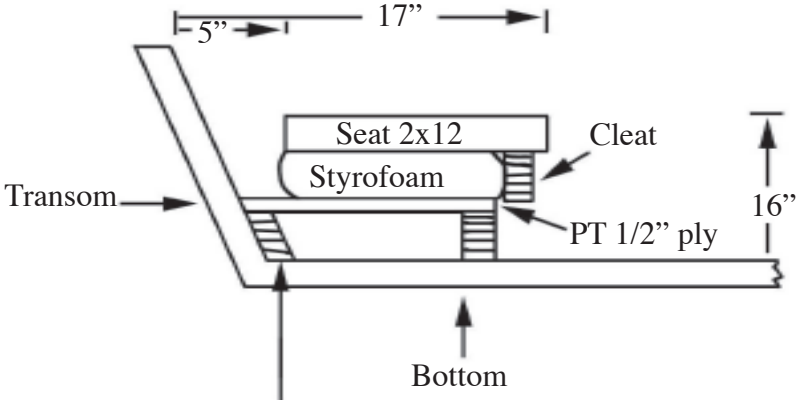
> This 14-foot skiff was old – no enclosed spaces with foam floatation. I support the floatation, but not in sealed compartments. Rarely have I seen these completely waterproof. They leak, allowing water and moisture to rot the wood. Instead, I like enclosed floatation but not sealed allowing the compartment to dry out. Often I put in a floor timber at the transom. It is optional, but builds a very strong transom and assists with the floatation compartment. To provide floatation, I use a 12"x10" styrofoam log in two sections between the center seat support. To allow this area to dry, I build two sections of a false floor – 1/2" pressure treated plywood with 1/2" diameter holes on two pieces of pressure treated 2x4. A piece of 2x6 is used as a cleat to hold the styrofoam log in place. The pressure treated plywood is attached to the floor timber with 1/4 bolts. The cleats are also attached with 1/4" bolts. The space between the seat and transom allow the false floor to be removed. This provides two pieces about 22" wide on each side of the rear seat support. The concept is to allow for quick removal and allow water to exit quickly from this area. The area under the seat should be cleaned, dried and painted every year.

**Seat Details**

**Center seat:**
5” below sides and is placed at center of mold; has center support.

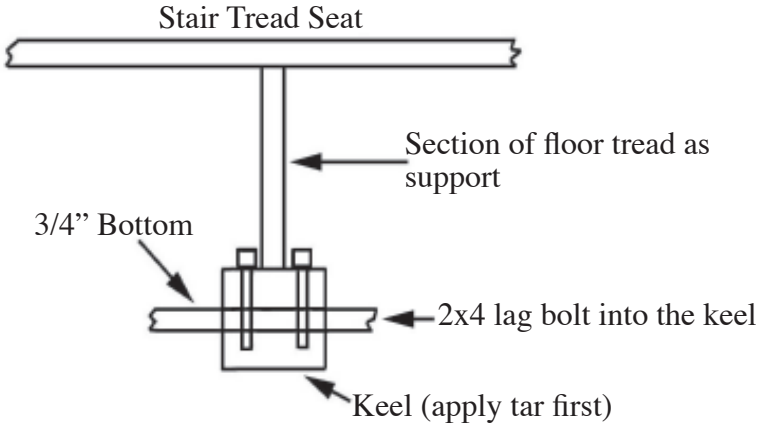
**Rear seat**:
Slanted toward the transom to shed water; has a center support which is fastened to transom.

**Bow seat:**
8” below sides centerline is 49” from stem. Seat consists of two pieces of 1.5x11.5” stair treads flat edge to flat edge. Attach section of styrofoam log under seat – can use straps or box in to enclose.

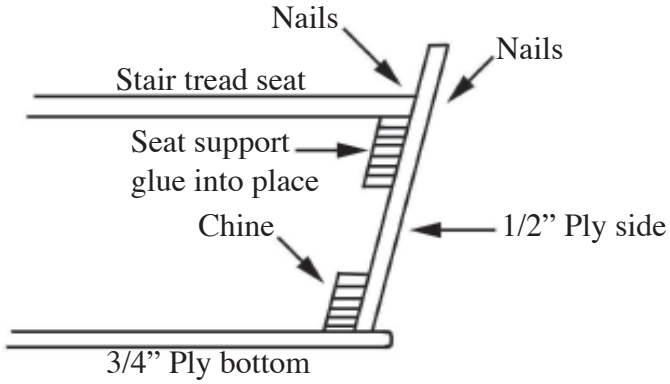


Additional floor timber at transom for extra strength (optional)

**General:**
All seats use a center support. A section of 2x4 is bolted to the keel through bottom support and is attached to it and the seat. All seats supported by 1x4 pine stock glued and nailed to the sides. The seats rest on these scraps and nail to it. All edges are nailed through the 1/2” plywood sides. Edge nailing the seat is not enough but use the scraps of wood and also nail from the side into the seat.

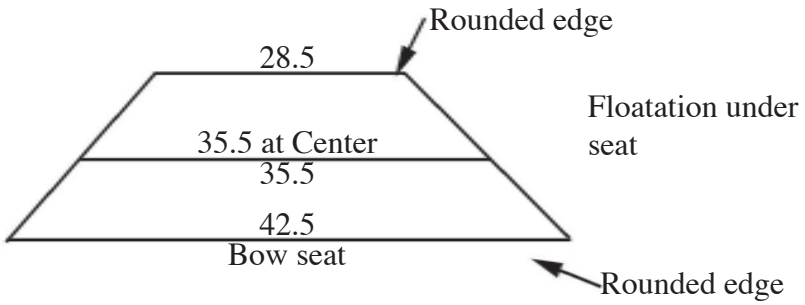


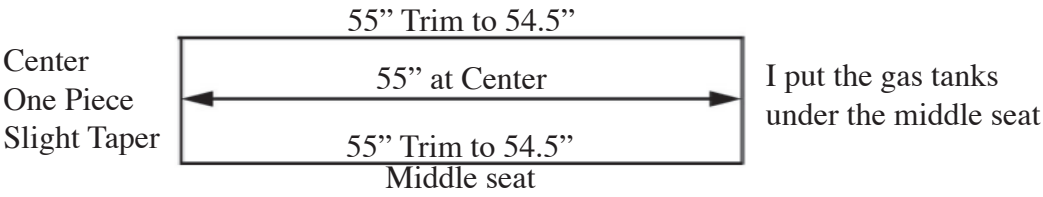
All seats are supported by 1x4 pine stock glued and nailed to the sides. The seats rest on these scraps and nail to it. All also edge nailed through the 1/2" plywood sides. Edge nailing the seat is not enough, but use the scraps of wood and also nail from the side into the seat. (see diagram below)

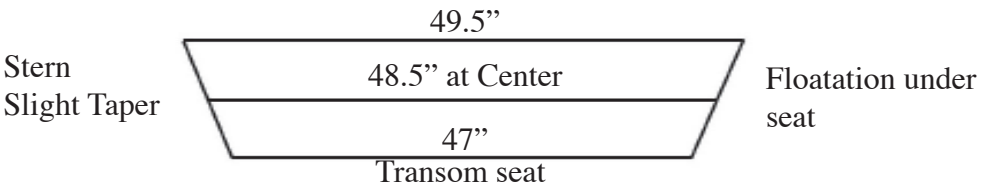



**Seat Dimensions**

remember: every skiff is different, so treat these measurements as approximations



**Attaching the Rails**

The final step before paint preparation is attaching the rails. Most skiffs had a 1x4 pine rail on the outside plywood edge. With the temporary braces intact and the skiffs' shape stable, take a 16-foot #2 pine – again free of splits or large knots. Bend the stock along the rail with clamps similar to the chine procedures. Bend the entire length; you might want to do the other side and let them sit for a couple of days. If you do this, it will make the nailing process with 1-inch roofing nails and marine resin easier. To fasten, coat the entire nail and plywood side where it will be placed with resin glue. Clamp into position and quickly nail, establishing a pattern two rows about every two to three inches. Use larger nails into the stem and transom. Complete the other side. No spaces should be observed between the pine rail and plywood. If a space is seen, quickly put a clamp on that spot. After the rail is dry, remove clamps. Sometimes Earle would put in an interior rail – this would requires a top splice 3.5" below ply side (mentioned earlier). It produces a really strong rail 3/4-pine 1/2 ply, 3/4 pine "sandwich". To finish the rail, I take 3" plastic narrow wall pipe (stelpath) and cut down the entire length with a hack saw. Opening the cut, I slip it over the entire length; small bronze nails nailed to the rail would keep the pipe in place. This produces a good "rub rail" for hauling lobster pots or seed oyster dredges. Without it, the soft pine (the rails) would be torn up in a matter of days.

**Final Details**

Once the skiff is constructed, do take the time to inspect the plywood sides. Any defects, holes, loose knots should be repaired with ply patches and marine resin. A few hours of plywood repairs can add years of usable life the skiff. A marine enamel paint on all surfaces (primer plus two additional coats) will seal and protect the skiff. Antifouling paint on the bottom protects the skiff from growth and marine worms.
Remember safety comes first! Follow all safety tool and equipment procedures. Make certain that the vessel follows all State and Coast Guard Regulations for safe operation.
I hope that this workshop was interesting to you. We welcome comments about this workshop or any other Short Course Industry Workshop, please mail comments to :

Adult Education program,
Vocational Agriculture Dept.
The Sound School
60 South Water Street
New Haven, CT 06519

**Additionss/Corrections to th 14-Foot Brockway Construction Guide**

Timothy C. Visel, May 2008
The Sound School Adult Education & Outreach Program

**Buiding a 14-Foot Brockway by Tim and Willard Visel**

In 2005, I started to build a 14-foot Brockway with my son, Willard. We cut out the sides from two sheets of ½" plywood, trimmed a 4 X 4 to make the stem piece and Willard glued the two sides to it. That's as far as we got, it just wasn't going together fast enough for us. We put the sides and stem assembly aside in the yard, and there it sat for three years.

In the meantime, we purchased a 12-foot aluminum lake skiff, a light, but serviceable fishing platform, easy to trailer and launch. One afternoon, we had two large bluefish hooked and saw the look of amazement of surrounding boaters staring at us as we turned to see our metal craft heading toward six foot waves before a reef. We got out of harm's way by an instant and boated both blues. But, the look of six-foot waves against our 14-inch high transom left, as they say, a lifelong memory. We started discussing a larger boat later that day. That fall, we spent looking at boats, either the sides were too low (we like to stand while casting) or the boat was just too heavy – several hundred pounds. We also looked at outboard requirements and of course fuel costs. We wanted something that gave us a more stable platform, a hull with not a lot of resistance for power/fuel economy, with good high sides. After a fall and winter spent looking, we came to the conclusion: finish the Brockway. It had all the design features we desired, a stable platform, high sides for the often unpredictable Long Island Sound, something that was easily powered, with a modest outboard and not that heavy. Later that fall, we moved the stem and side assembly back on to our outside wood deck. During the time, we glued and nailed the sides; the plywood had "set," so trying to get the sides upright took two months of pressure, but slowly, we were able to get them back to the shape we needed. Mr. Brockway built his boats outside, so the flat deck became our working area.

We built the mold shown on page 13 and placed it in the appropriate position, the excess stem we placed over the deck in a hole. To maintain the shape, we attached a series of 2 X 4 stations to the deck with screws on which to place blocks to hold the skiff in position. The mold was attached to the 2 x 4 below it, and the sides nailed to the mold. This created a fixed frame to lock the skiff into position. We had a problem with this method when we attached the transom. We had to release the sides to lift them both up. I then realized why Earle Brockway would pound the stem into the ground and set the transom with iron stakes. He could lift the skiff at any time, no adjustments necessary.

The Spanish windlass shown on page 14 was a challenge, no matter how we tried; we couldn't get the sides to the mold. I feel the 3-year delay had something to do with it

The sides had been apart and the wood had dried. As we pulled the sides, we just couldn't get them to the 47 wide bottom of the mold so our skiff is 51 wide at that part we widened the mold bottom 4 inches and keep the top width the same. This created a wide version of the 14-foot model. I realize why Earle wanted 47 at this width, ½ left for each plywood edge, which he felt, was important but also for economy of materials which Mr. Brockway turned into a science. But the change in width meant extra plywood would be needed for the bottom – Earl would have used a long whole sheet, staying within the standard 48 width, but we used two cross sheets which dictated of course, the placement of our floor timbers four feet apart. This required three sheets of bottom plywood, instead of two. We put a rear seat next to the transom, the middle seat, just forward of the first frame set and a double seat, (square edge to square edge) just forward of the second set of frames.

**Bottom and Transom Changes**

Instead of the usual ¾" sub-floor plywood which Earl used, we purchased a better quality 5/8 inch plywood for the bottom (3 sheets 4x8). The transom was two pieces of ¾ marine plywood laminated together for the full 1.5" width. The chine was strengthened (Willard's suggestion) with an identical piece of ½" pine on the outside edge. He was concerned that the ½ plywood and ¾ chine wasn't "beefy" enough. When sanded smooth, that provided a bottom-nailing surface of 2".

I had seen this done before, so it was within the Brockway style. It did strengthen this area substantially. We discovered a major mistake in the transom plans. The plywood sides were about 15 inches high which Earl lapped a 2 x 6 over 2 inches of each side, making the actual height of the transom or side 18.5 inches. We increased that to 20 inches by using a 2 x 10 x ¾" pine plank, followed a second 2 x 5 x ¾" pine over that (which formed the finished rails). This is also an additional piece of wood that strengthened the top rail area. (The higher than normal sides was still a carryover from our 6-foot wave encounter). The original plans showed the trimmed or rounded transom at 16" high, but when you go to attach the rail, there is no wood to nail to—obviously a mistake -- that 16 should be 18.5, which we increased to 20. To have a 20 side and some "tumble home" in the transom, the material needs to be at least 22" high. (Round off the 22" to 20".) In addition, we added a side 2 x 4 at each transom edge to provide extra strength, so when the sides were nailed, we had a 3" nailing surface.

**Supplies and Materials**:

We used Marine polyester resin for all gluing – chines, nails, thwart supports, etc. (2 gallons). (Do not glue frames or keel.) We applied thin coats between clean wood surfaces, used galvanized carriage bolts to attach thwart supports, galvanized hardware for ground tackle- rings, cleats, etc. To attach the chines, and rails, we used a mixture of roofing nails and coated deck screws. Mr. Brockway didn't use screws, just nails, but we used a mix.

The keel and frames are bolted with tar, not resin; Earle insisted that this was a better practice – keels often rub the beach and the copper bottom paint easily scrapped off. On two occasions, I "lost" the keel on our 16-foot skiffs to marine wood borers (worms). To remove the keel was a much easier task with tar – remove the bolts, and pull out the stem and transom nails. If it had been glued, I could see hours, if we had to use the wood chisel.

**The Seats**

We again used the traditional Brockway seat material, standard stair thread 11.25" wide by 1 1/8" thick, bull nose on one edge. I discovered this by mistake thinking that Earl had taken the time to smooth one edge – he didn't. The material just came that way. We purchased two 12-foot lengths and had about 4 left over.

**General Comments**

We used a lot of marine resin to repair defects in the plywood: cracks, voids (which were fixed with plywood slivers); loose knots. We filled them with the two part resin and sanded the plywood smooth. All cut plywood edges were also sealed, which again Mr. Brockway felt was very important, especially the ½" extra on the bottom. He saw people cut this edge off flush with the sides, which Earl felt was a mistake. The ½" rounded edge was a built-in "bumper" in case of hits, which in our lobster operation, were frequent. We never had an edge go bad, however. So, resist the temptation. We always kept this rounded edge in good condition.

True to Brockway style, we didn't glue the frames to the floor timbers, but used roofing tar – (caulk gun tubes). Be careful – a little bit goes a long way as anyone who owned a Brockway can "attest." The saying used to "two weeks to clean off the tar and two days to paint." The tar Mr. Brockway felt was a "shock absorber," with the frames. If a huge hit occurred, the frames would move instead of splintering or crushing. I did see this happen and an oyster scow took a direct hit and the frames did move and not completely break. He felt that if they had been glued, the plywood sides would have splintered, the hit boat didn't sink, but the frames had all split, so in a few hours after the new frames were installed, the scow was as good as new.

One thing we learned, is that a belt sander was indispensable; we did a lot of sanding (Willard, mostly), shaping and just grinding. A small belt sander is a must! We had a small saber saw, power miter saw, electric drill and skill saw to round out the electric tools. A dozen C clamps, metal --were a huge help with all gluing, chine, rails, supports and transom. (It is interesting to note that Earl was slow to accept electric tools, but eventually bought a drill and skill saw. Before 1971, it was mostly by hand.

We finished off the skiff with good quality oil base paint. The bottom got two coats of copper based paint.

Good luck and great fishing!

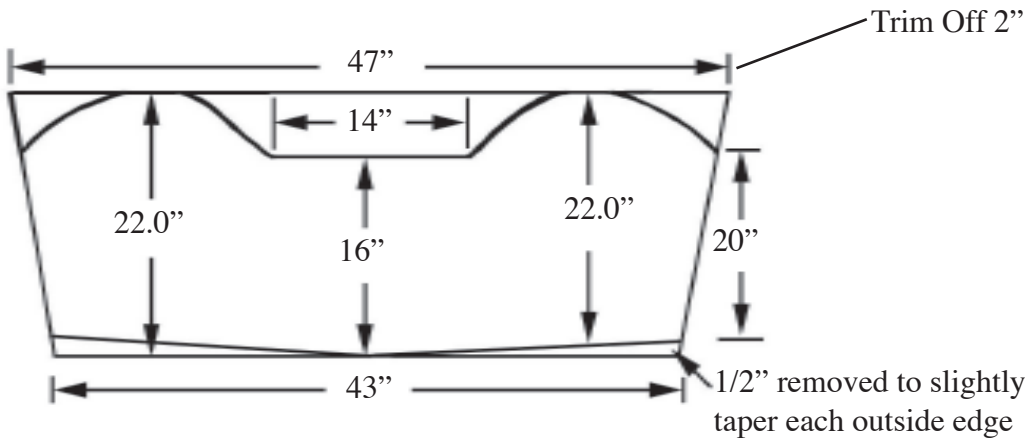
Copies of the 14-foot Guide and the original 16-foot Brockway Skiff plans are available from:

Susan Weber
Adult Education and Outreach Coordinator
The Sound School Regional Vocational Aquaculture Center
60 So. Water Street, New Haven, CT 06519

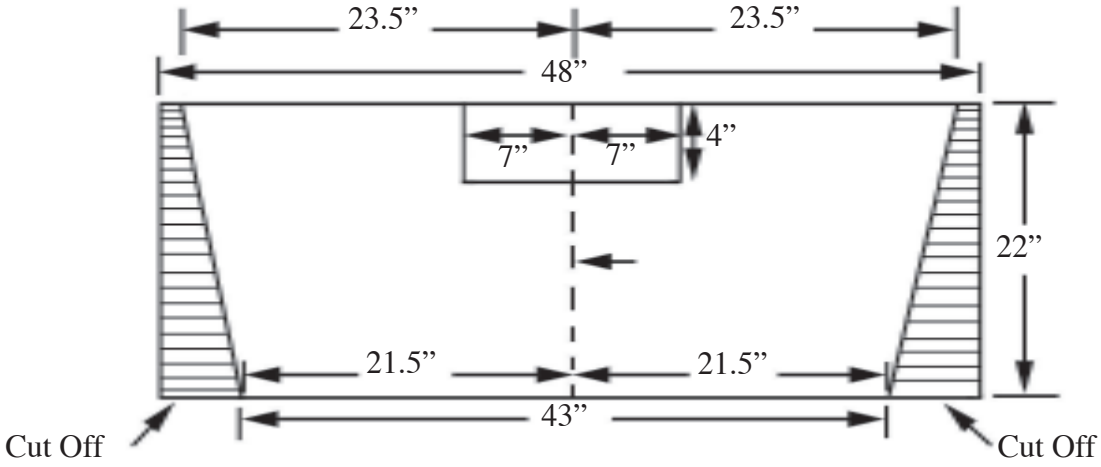
Phone: 203 946 6875
Fax: 203 946 6156
Email: susan.weber@new-haven.k12.ct.us

Note: Our school website: www.soundschool.com has Brockway plans that can be downloaded on your computer. Coming soon are a PowerPoint of pictures of actual construction of a Brockway boat.

**Corrected Page 15; July 2008**




Two pieces 48” wide by at least 22’ high will be enough rough material. See bottom panel diagram to save material.




**How to Start**

I start by just cutting two pieces of 3/4 AC 48” x 24”
Mark center line vertically, measure over half of 47 and 43 on top, bottom edges, cut off scrap. Then measure down 3” and cut 7” out from center as shown. That 14”x3” cut out becomes the outboard seat. Measure 21.5 from center for bottom dimension “43” 2.5” cut off from each side.

Now comes the art. I’m convinced that Earle kept pattern sheets to draw the shapes. I can’t imagine him taking the time to try to fair off the transom sides. Basically, take a plastic strip or other flexible wood strip and draw the transom finish lines.

National Fisherman
P O Box 7438
Portland, ME 04112-7438
Fax letters to (207) 842-5603
Email: nationalfisherman@divcom.com

"Mail Buoy"

Brockway Tradition is Timeless

It was terrific to see Michael Crowley's story about Brockway-style skiffs. (NF, Sept 07, pg. 38). I always enjoy reading about or seeing Brockway skiffs from Southern Maine to the Chesapeake Bay. It's been over a decade since the flat irons and hammers fell silent at the former Brockway Boat Works, located in Floral Park, Old Saybrook, Connecticut, but interest in Earl Brockway's family's design and construction techniques continues to grow. I was fortunate to spend a lot of time with Earl Brockway, the last of five generations of Connecticut River Brockway boat builders. Visitors to the lower Connecticut River will find "Brockway's Reach," "Brockway's Island" and "Brockway Ferry Road" -- all referencing the maritime impact of his family. What isn't so well known is Mr. Brockway's generosity and interest in small boat fishermen regionally and internationally.

According to Earl, the Brockway skiff and scow evolved from the 1920's Connecticut River turtle, duck and shad fisheries. Many of these uses included duck/waterfowl hunting in the winter, so desirable features included stability, ease of maneuverability and shallow drafts. The first Brockway skiffs were of traditional design-planked construction, hard chine not unlike the small work skiffs of Niantic Bay and Noank, CT. Originally, a boat for bay and river, the family began experimenting with plywood in the 1940's, first replacing the bottom and later, the sides. The first all plywood versions which included the transom assembly, came out in the 1950's. What was amazing to Earl is that customers wanted higher sides for the skiffs and so they became prevalent outside rivers and bays. After a "high-sided" version was added, the skiffs' popularity soared. Scow boats continued in the traditional lower profiles and were used for oystering, lobstering and of course, shad fishing. They were known for their strength, durability, holding capacity, ease of repair and maintenance. Fishermen loved the lower initial cost, (they came "unfinished"), and you had to provide your own painting and remove the extra tar.

In 1972, I purchased my first Brockway with my brother Raymond. We used them for many inshore fisheries, and soon realized why "Earl couldn't make enough of them;" although they were slower, the boat was tough, could take a lot of punishment from the gear and was a good sea boat, and most importantly, reliable.

We would own several over the years. In 1981, when an international request was issued for a small, simply constructed, strong plywood workboat, as part of the United Nations' response to floods in Asia, we submitted the Brockway design. A year later, the construction manual plywood workboats for small-scale fisheries and photographs by Raymond appeared a year later. The manual was designed for disaster relief, Peace Corps and US A.I.D. fisheries extension efforts. The "Brockway" design would soon become available worldwide. In fact, my own son even saw one on a trip to Fiji in 2005! Earl didn't want or expect anything for the design – his simple response was "Commercial Fishermen need help once in a while," followed by, "I hope they will come and visit me someday." And, some did. A few years before Earl passed away, a visitor from Haiti came to see him with photographs, and on the Haitian beach were several "Brockway's." He wanted to visit the man who had helped his village.

That was the type of man that Mr. Brockway was – very unassuming in character and always amazed at the popularity of his boats. The 16' "extra –wide skiff plans" went into extra printings. The Brockway style skiff will most likely be one of the most popular and easily recognizable inshore fishing boats of New England. It was great to see that popularity continued and to read about the legacy of Earl Brockway.

Timothy C. Visel
Aquaculture Coordinator
The Sound School Regional Vocational Aquaculture Center
17 Sea Street
New Haven, CT 06519

Phone: 203 946 7106

= = = = = = = =

Brockway Plans for 14' skiff and for 16' skiff are available for free!
Contact:
Susan Weber
The Sound School Aquaculture Center
17 Sea Street
New Haven, CT 06519

Susan.Weber@new-haven.k12.ct.us

203 946 6875 (phone)
203-946-6156 (fax)

Donation for postage is appreciated.