1984 Boat Building Project Grand Turk

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Report to the Caribbean Research Foundation

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Grand Turk

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and

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CONTENTS

Introduction

This ethnographic documentation was a project of the Caribbean Research Foundation (CRF), a non-for-profit, dedicated to the conduct of and support for ethnographic and archaeological research in the Caribbean Basin. The CRF was active from the early 1980's to the early 1990's. Foundation projects included organizing, recording, and preserving the 19th and 20th century archives of the Government of Turks and Caicos Islands and two seasons of archaeological research on Middle Caicos at a Lucayan site, MC-12. Highlights of the Archives Project may be published in the near future. A detailed report of the MC-12 archaeological project has been filed with Department of Environment and Coastal Resources and the Turks and Caicos National Museum and a formal paper was presented at the International Association for Caribbean Archaeology (IACA) which will publish the paper.

Caribbean anthropological and archaeological research continues under sponsorship of the Anthropological Research Council (ARC), a non-profit successor to the CRF.

In the early 1980's Sullivan, an avid sailor, fisherman, and archaeologist who had spent considerable time in the islands, realized that the construction and use of the traditional plank sloop was rapidly disappearing and being replaced by fiberglass power boats. Thus, the knowledge of how to construct the sloops would also disappear. The CRF sponsored a project to document a detailed sloop construction. Sullivan and fellow CRF member Glen Freimuth were familiar with the people of Bambarra, Middle Caicos and enlisted Headley Forbes and Marcus Forbes to do the construction on Grand Turk with funding, materials and a support crew provided by the CRF.

Headley Forbes is enjoying retirement but Marcus Forbes is deceased.

The project report is presented as written and submitted to the CRF. There are sections which have no direct bearing on the construction of a traditional sloop but indirectly present the twists and turns of research and life in the islands, hence they are included.

Glen Freimuth, PhD
Shaun Sullivan, PhD

This work is dedicated to the indomitable Grete Seim whose foresight, funding and direction laid the ground work for prehistoric and historic research and preservation in the Turks and Caicos Islands.

Figure 1. Beached 30 foot salt lighter on Salt Cay.

Definition of the Native Sloop Project

For almost three hundred years, the inhabitants of the Turks and Caicos Islands have depended on small sloops for their commerce, fishing and transportation. These native boats have generally been small because of limitations imposed on them by the shallow waters surrounding the islands and the scarcity of suitable native wood. The largest of these sloops were approximately thirty feet overall and were used as lighters to haul local products principally salt, dried conch and sisal to ships anchored off shore (Figure 1). In addition these sloops were used for inter-island transportation. The farthest distance that they regularly traveled was to the Dominican Republic and Haiti. A small version of the boat, approximately sixteen feet, was used for fishing in the shallow banks off the Caicos Islands.

Changing commercial needs, modern transportation between the Islands by aircraft and more efficient fishing practices have made the native sloops obsolete. With this change the skills associated with construction and sailing such craft are now possessed by only a handful of men scattered throughout the Islands.

The purpose of this project was to record the construction techniques formerly used by constructing a sixteen foot version of the sloop using the same type of tools and materials that had been traditionally used. To accomplish this, an old time boat builder directed a volunteer team of assistants.

Associated with this project was an effort to record the oral history of the boat

builders and the people who sailed these sloops.

Preliminary Work

The Caribbean Research Foundation arranged with Hedley Forbes (Figure 2) of Bambarra in Middle Caicos to direct the construction of the sloop, a project that was expected to take about three weeks. Marcus Forbes, Hedley Forbes' brother agreed to cut the local timber in advance for use in fabricating the floors and frames of the boat and ship it to Grand Turk. For logistical reasons Grand Turk was selected as the site for the project. This was also the location of the Archives Project which was also being sponsored by the Foundation and would run concurrently with the sloop project. The Foundation arranged to ship the balance of the material, planking, sail cloth, hardware and keel to Grand Turk. This was in keeping with tradition as these items had always been imported from North America as they were not available locally.

A crew of six volunteers, Teri Quevreaux, Paul Chimenti, Paul Balbin, Jean De St. Croix and Leslie Milligan were recruited to assist Hedley Forbes with the project. Only one had previous boat building experience but they brought other skills to the project such as sketching and knowledge of the Islands. Three of the team had previously participated in other expeditions sponsored by the Caribbean Research Foundation.

Arrangements were made to house the team at North School on Grand Turk through Robert Hall, Minister of Health, Welfare, Education and Local Government. When Leslie Milligan arrived in advance of the main party, he found that cooking facilities were not available at this location as originally been anticipated. Mr. Hall made available an electric stove and refrigerator and arranged to have the necessary electric power brought into the school. Transportation from and to the airport for the main party was by police vehicles arranged by the Chief Secretary, Mr. Edward Brooks. In addition Mr. Brooks provided work parties composed of prisoners to assist with some of the heavy work such as moving the boat to storage.

Figure 2. Hedley Forbes fabricating a form with an axe.

The supplies for the boat shipped from Miami were received by Brian Riggs, now a resident in Grand Turk and a previous member of the Caribbean Research Foundation Expeditions.

Two problems immediately confronted the expedition. Communication by telephone to Middle Caicos had been out of service for several weeks so it was not possible to confirm when Hedley Forbes was going to arrive. In addition the timber that

Marcus Forbes was supposed to have cut and shipped was not on the island. A message was sent by a traveler to Middle Caicos but it failed to bring a response.

Through the cooperation of the Cable Wireless Company a message was put on the public radio that Milligan had chartered a plane and was flying to Conch Bar on Middle Caicos to pick up Hedley and the timber. Upon landing he was relieved to find Hedley and the timber waiting at the airstrip. The relief was short lived because he informed him that he had changed his mind about working on the boat project. However he would come for $800 as ownership of the boat was not sufficient compensation. After some negotiation a fee of $300 and return airfare was agreed upon. Hedley also presented a letter requesting an additional $300 for cutting the timber. It was Milligan's understanding that Marcus had already been paid a hundred dollars for cutting the timber so he told Hedley he would pass along Marcus' request to the Foundation.

The material and the reluctant boat builder were flown back to Grand Turk and work on the boat finally started on July 18, 1984.

Building the Boat

Our method of recording the details of constructing the sloop consisted of photographing the project, sketching some of the details and questioning Hedley during the construction about the techniques and methods used. A recorder, Jean De St. Croix, kept a log of his answers and comments. This is included as part of this report along with the sketches and photographs.

The tools used were the traditional ones that were used normally by Hedley. These consisted of a hatchet, hammer, auger, saw and a piece of stiff wire which he called "the pattern".

This latter device was used to determine the shape of the forms after the center form was set in place on the keel along with the stem, stern post and transom. Temporary rib bands were placed horizontally from stem to stern and the pattern was bent to fit the curvature at the location of each form.

The one tool not supplied by Hedley was an adz. This was used to shape the keel. This was not a departure from tradition as Hedley had used this in the past but did not own one. Fortunately one of our team members brought one with him.

The material used for the temporary rib bands and transom was pine purchased locally. The oak keel and mahogany planking was shipped from Miami. The stem, stern post and deadwood were made from Middle Caicos mahogany. The floors and forms were shaped from wood cut on Middle Caicos called locally, "locust". After questioning, it was determined that this was wild tamarind (*Tamarindus indica*).

In interviews with boat builders on Salt Cay, we were told these same woods were used by them when they constructed boats. In addition they used the same tools and the techniques as Hedley, whether it was a 16 foot or 30 foot boat.

One of the most difficult tasks for our team was sewing the sail. Although Hedley demonstrated the method using a sailor's palm, pushing the needle through the thick canvas was very difficult. We were eventually able to locate some beeswax

which had been traditionally used and this made the job a trifle easier.

Only one member of our team had sufficient skill with a hatchet to be really productive in shaping floors and forms. As this work made up the major portion of the task, the crew was limited in what they could do in assisting with the construction.

Hedley Forbes is a self-taught boat builder. He learned the techniques by observing a cousin, Cornelius Forbes, a ship's carpenter. As a youth he built model boats at his home on Middle Caicos. He built his first full-sized boat at the age of twenty-four in 1957. He said he had built twenty-eight boats ranging from eighteen to twenty-six feet in length. These boats were generally constructed for others. His own boat was used for fishing around the Caicos Islands. He never went far from shore or out into open water.

After two weeks of work on the project, Hedley announced that lobster season was starting and he had to leave. The boat had reached the stage of construction where planking was being installed on the forms. This left the boat with the remainder of the planking, deck, mast, rudder and sail to be completed. After Hedley's departure the team did what they could, principally working on the sail.

Prior to his departure, Hedley arranged for the boat and material to be stored at the home of a relative, Alseida Malcom who lived on Hospital Road, third house north of the Coalbrook Store. With the help of prison labor and a truck, the boat was moved to this location at the termination of the project. It was Hedley's intention to return to complete the boat after the lobster season ended. Although the plan was for the boat to be returned to Middle Caicos after completion, it is not known if this ever happened.

Oral History

Another goal of this project was to record on tape recorders the oral history of the men who built and sailed this type of boat. The project was handicapped by lack of people with this kind of experience on Grand Turk where the team was living. Most of the people with this background still living were in the Caicos Islands and on Salt Cay.

Milligan found two people on Grand Turk to interview. In addition with Jean De St. Croix he flew to Salt Cay where he interviewed three additional people. From these informants he learned that other potential informants could be found on South Caicos, Providenciales, and North Caicos but time did not permit visiting these locations.

One possible informant that could provide a wealth of information still lives on Providenciales, Mr. Gus Lightbourne, where he drives a taxi. His story is reported in part in the magazine *Turks and Caicos Current*, vol. 2/number 3. His boat and crew survived the 1945 hurricane when they were caught at sea. Fifty-two fishermen from Providenciales died during that storm. Lightbourne and his crew managed to survive eleven days lost at sea without food and water. His boat was the only one that stayed afloat in that hurricane. Later on, he became a successful boat builder using the local locust and mahogany timber.

Abstracts of the Interviews Conducted on Grand Turk and Salt Cay

J. N. Morgan, M.B.E. (Salt Cay)

Figure 3. James Morgan of Salt Cay.

Mr. Morgan has been the operator of a private salt production company on Salt Cay prior to the nationalization of the salt industry (Figure 3). He later directed the government's salt industry prior to its being phased out. In this capacity he oversaw the construction and operation of the thirty foot sloops used as salt lighters and for trading throughout the Turks and Caicos and with Haiti and the Dominican Republic. He also served in the legislative assembly and was the Deputy President of the assembly. Today he owns and operates the Mt. Pleasant Guest House on Salt Cay.

Captain Sam Seymour (Grand Turk)

Figure 4. Captain Sam Seymour of Grand Turk.

Seymour is one of three remaining pilots operating in the harbour at Grand Turk, although there is little call for his services these days (Figure 4). He recalled his early sailing days in the islands and his experiences during World War II when the islands were isolated by German submarines. His experiences also included service on large ships going to all parts of the world. He described how pilots worked in his early days when his father was a pilot and ships were still coming to Grand Turk for salt. Today he operates a soft drink stand.

Felix Lightbourne (Salt Cay)

Mr. Lightbourne was a carpenter employed by the salt industry on Salt Cay. His duties consisted of general carpentry as well as repairing the thirty-foot salt lighters. Mr. Lightbourne, a man in his early fifties, says that no boats have been built in over thirty years. The rotting salt lighters on the beach on Salt Cay are the ones he used to repair. Today he works as a handyman for descendants of one of the old salt families from Bermuda that still maintains the old family mansion on the island.

James Simmons (Grand Turk)

Figure 5. James Simmons

Mr. Simmons spent his youth on Salt Cay before moving to Grand Turk over thirty years ago (Figure 5). On Salt Cay, he was Captain of a salt lighter. Today he maintains his interest in boats by building model sailing boats and being an active participant in a group on Grand Turk that races their models. Today he is employed as a stockman and clerk in the Timco Grocery Store.

Doc Missick

Mr. Missick participated in one of the two interviews with Captain Seymour. He left the islands in his early teens for the United States where he became a citizen and had a military career. He describes an early sailing experience to West Caicos. Today he manages his brother's properties, one of which was the Evans Inn.

Hedley Forbes (Middle Caicos)

Hedley described his own background and how he learned the craft of boatbuilding. He also talked about how a new boat was launched at Bambarra and the festivities that were associated with it. Hedley today is primarily a carpenter but supplements his income with lobster fishing.

Recommendations

The extremely limited time period along with Hedley Forbes departure prevented seeing the project to a conclusion. It would be very interesting to see if the boat was completed. An observation of the sailing techniques used with this kind of a craft would be very informative.

As the oral history portion of this project barely skimmed the surface, visits should be made to the Caicos Islands while there are still informants left.

It would be interesting to learn about the ownership of the old sailing craft used for fishing, was it by nuclear or extended families. It would also be desirable to collect additional information on the use of the larger craft for inter-island commerce and the nature of the cargo.

Field Log of Notes, Observations and Sketches Including Comments by Hedley Forbes

Our boat is the Sunrise II. It will be 16 feet long, built under the eaves of the North Primary School on Grand Turk Island in the British West Indies. Documenting its construction is a group of volunteers of the Caribbean Research Foundation. To our knowledge this is the only boat built using the classic traditional methods in the Turks and Caicos Islands in 15 years. It is built without drawings or blueprints, or pictures hanging on the wall. It is all in Hedley's mind. He is building a boat. It is to be 16 feet long--if it turns out 16 feet 3 inches long, that's OK. It is unique, one of a kind, built without any standards other than the boat builder, using raw products of nature, doing his best with what he's got.

Woods

Woods in Sunrise II adhere as much as possible to the traditional. Normally the keel, side, and deck planking are of white pine. Sunrise II had to make do with a keel of oak and side and deck planking of mahogany, as no white pine was available, locally or in Miami. Stern and stern posts are of local mahogany (*Swietenia rnahagoni*). Timbers and Flooring are of Wild Tamarind (*Lysilorna Latisiliqua*), commonly referred to in the islands as "locust". A traditional rudder would be of Lignum Vitae (*Guaiacum sanctum*) strips bolted together. This wood is one of the world's heaviest (80 lbs per cubic foot) and strongest, but is now considered rare and is on the endangered species list. Rather than contribute to the depletion of a stand of half-champion lignum vitaes of Middle Caicos, Hedley uses pine; obtained in the local market.

The demise of white pine forests (*Pinus elliotti densa*) on Middle Caicos began in 1962, when hurricane Donna opened fissures in the dune line allowing the sea to intrude over the forest floor. Salt intrusion killed the pines. New pines are establishing, but are small and gnarled, as if they know they are no longer of consequence. It is doubtful if a mast could be fashioned from any of the pines now growing on Middle Caicos. The "locust" timber wood, mahogany stern & stern posts, and deadwood were hand hewn from branches, roots and trunks of trees growing on Middle Caicos by Marcus Forbes, younger brother of Hedley.

Tools

Saw, hatchet, plane, Stanley slide rule, square, hack saw, compass, "C" clamp, nails, ¼ inch diameter wire rod, pencil, chisel ½ inch, sliding bevel, 3 sizes of galvanized nails, hammer, chalk line (Figure 6).

Sharpening the Tools

It is traditional in boat building that, before and woodworking begins, all the tools be sharpened. Not singularly, as before using each one, but collectively as a project.

<u>Saws</u>

The saw is placed firmly between two boards in a clamp or vise. Not having any vise, the boards can be held at each end by a helper. The teeth are filed with a 3-cornered saw sharpening file. Every second tooth leans to the left, every alternate tooth leans to the right. In sharpening every other tooth is filed on the push stroke, receiving the same number of file strokes with the same amount of pressure in order to keep the saw uniformly sharpened. At mid-point in sharpening, finishing every other tooth, the saw direction is reversed in the vise and teeth leaning in the opposite direction are sharpened in a similar manner. After sharpening, a light coating of motor oil should be applied to both sides of

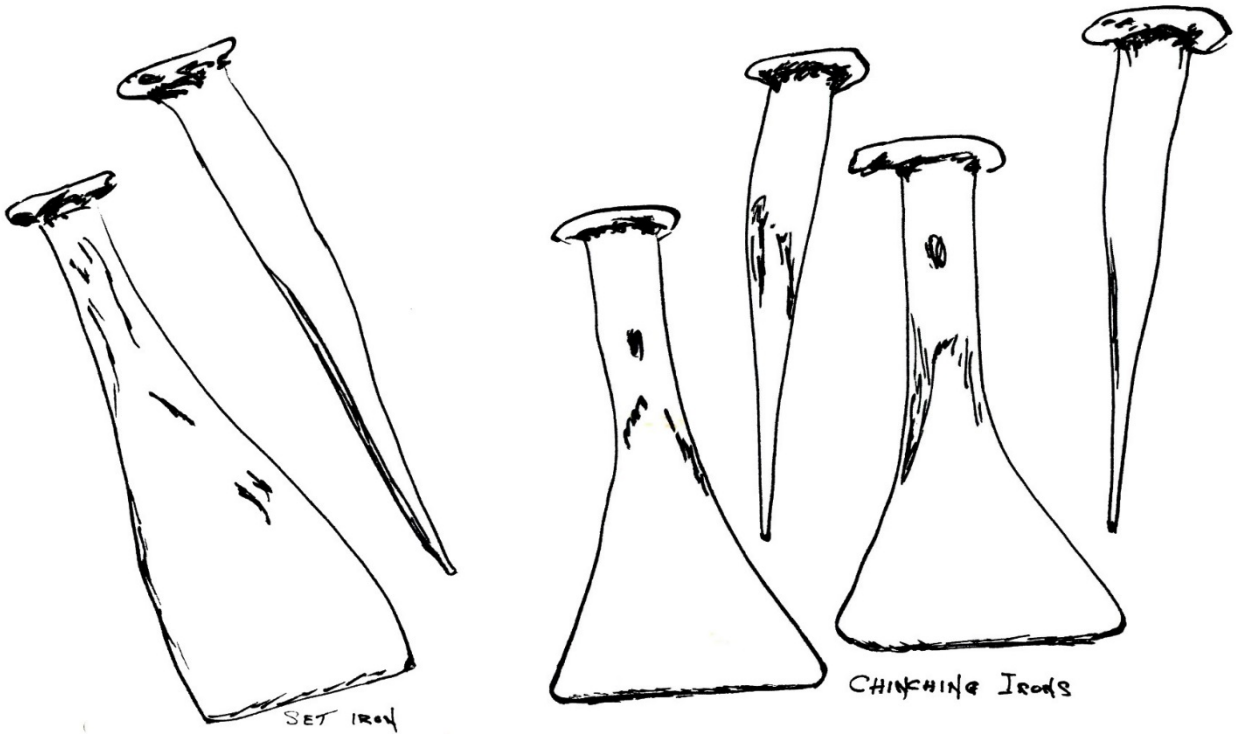


Figure 6. Examples of woodworking tools used (not to scale).

the saw to prevent rusting. Saw teeth are not allowed to touch metal.

Blades

Hatchet, plane, adz, chisel are all honed on an oiled whetstone. If no oil is available water can be used. The blade is stroked across the stone on one edge only, using an even stroke with even pressure. When the edge becomes thin enough, to curl backwards, the blade is turned over and lightly stroked across the stone just until the curl is removed. It is vital that the cutting edges of woodworking tools do not touch each other, other tools, or metal. Edges are made of highly tempered steel which, when honed to razor sharpness, are brittle. Any nick or blade damage hinders efficiency. Good woodworking tools are expensive and should last many years. When not in use, all blades are covered with cardboard or taped or wrapped in soft cloth.

The Boat

First the stem is squared up. The stem is the bow which cuts through the water and to which the side planking is attached. It begins as a four foot long mahogany beam, six inches square, hewn from a tree on Middle Caicos. It is thick, heavy, and irregular with traces of bark. With an ax, the leading edge is hewed down to ¾ inch across. Inside surface is worked down to 3 inches across and its depth is chopped away to 4 ½ inches (Figure 7). It is worked into a beautiful curve--the bow curve. Chop, measure, chop, measure, chop - - straight lines are pencil drawn, using a straight board for guidance. The bow curve is made by driving a nail into the top and bottom of the stem post. A pliable long, thin board is pressed at the center, using the nails as a stopper, until the desired curve is found (Figure 8). Not measured, just eyeballed. A line is drawn, the nails removed. Leading edge is planed to this line and the

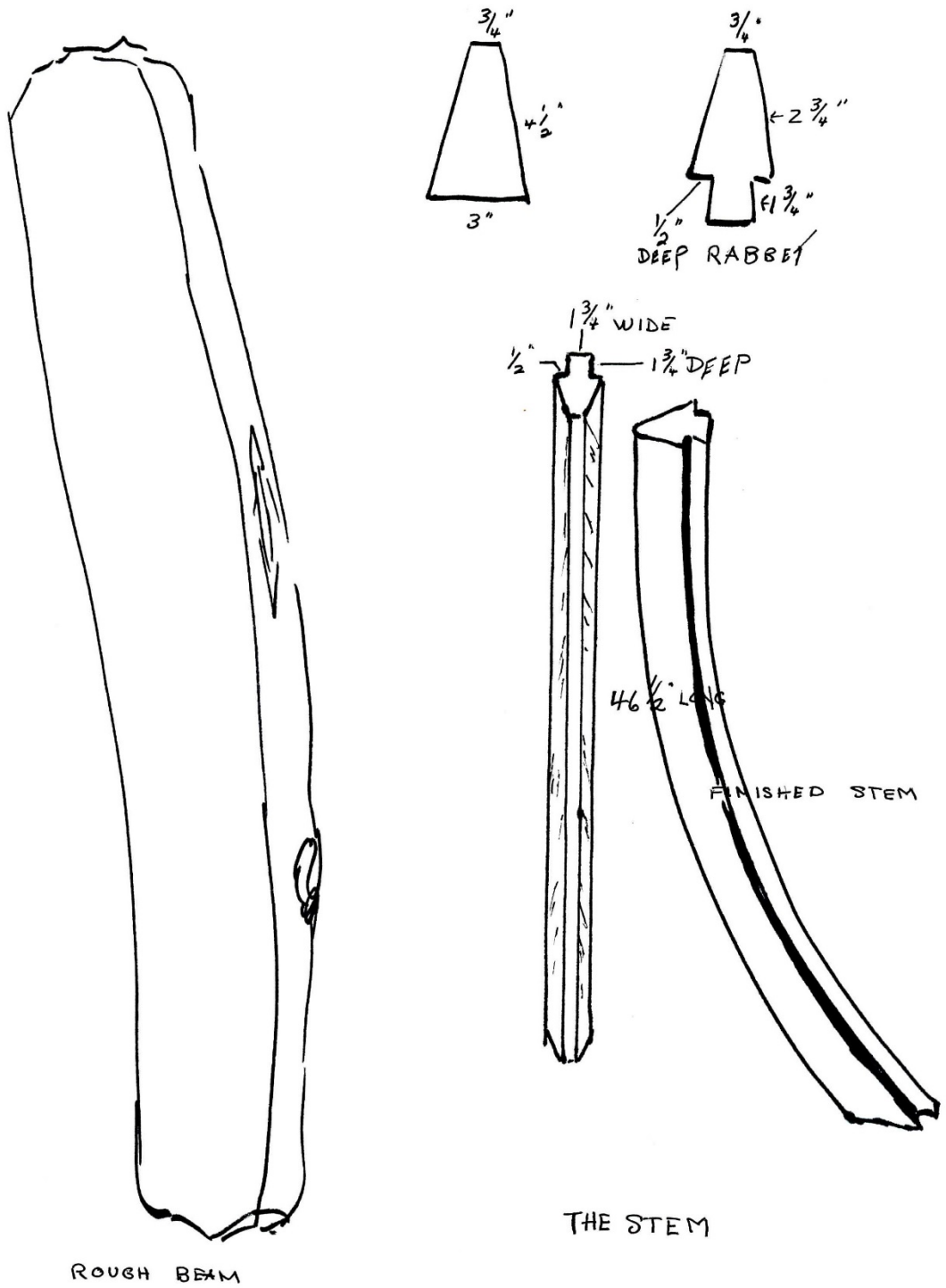


Figure 7. The stem.

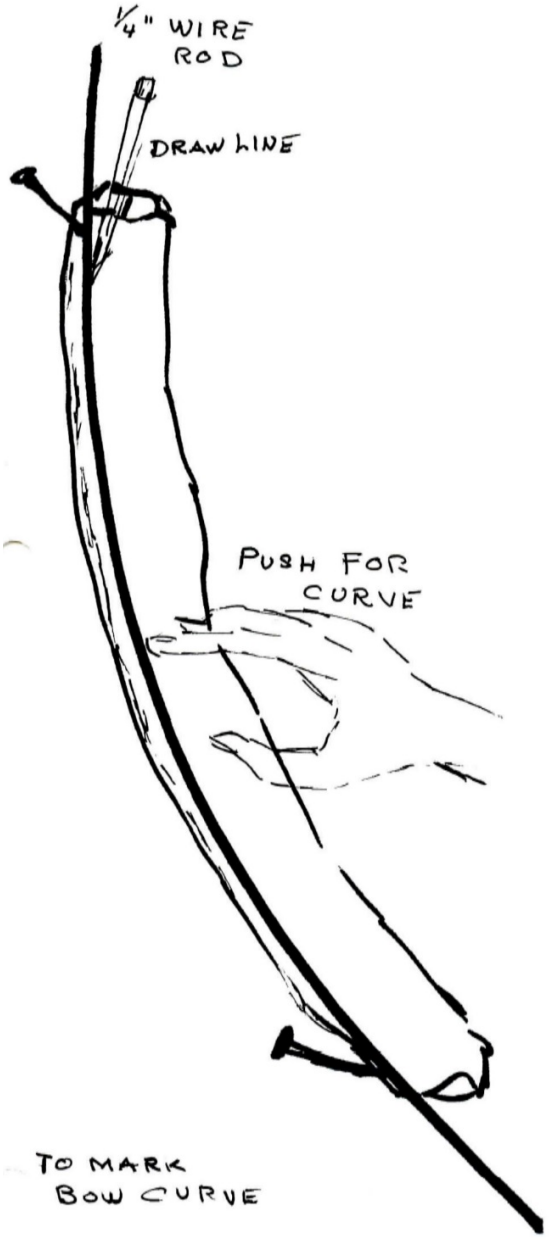


Figure 8. Marking the bow curve.

curve is made. The back is planed to follow this curve. A rabbet is cut into each of the trailing edges, into which the side planking will be inserted. The rabbet is ½ inch deep and 1¾ inches wide. (Figure 7) Line for the rabbet is made by holding a pencil 1¾ inches from the point and guiding it down the plank using the knuckle of the second finger. It is chiseled out with a ½ inch chisel hit by a carpenter's hammer.

The stern post is fashioned also from Middle Caicos mahogany. It does not have a curve. The inside, leading edge is straight, the trailing edge is cut away about half way up for placement of the transom later on. Excess wood from the original log is trimmed by hatchet, large, heavy strokes at first, becoming lighter and lighter. Final hatchet strokes are delicate, removing thin curling shavings and resulting in a very smooth finished product. The original 43 inches long log is trimmed down to 40 inches , 4½ inches from front to back and is 2 inches thick (Figures 9, 10, and 11). Length will be trimmed after the decking and transom are in place. The tiller will fit into a hole in the top of the stern post at an as yet undetermined height. The bottom is angled to rest of the keel--this angle sets the line of the stern and is cut only after great thought and visual judgement. The rudder will also be attached to the stern post.

Timbers

Ribs are referred to as “frames”, while supports for the ribs are called “flooring”. Wood to make these is called “timber”. Laying all around Hedley is a pile of precut tree branches, trunks, roots, combinations of part trunk/part root and part trunk/part branch. Cut on Middle Caicos by Hedley's brother Marcos, the aim was to get strength plus curve. Branch protrusions have already been removed and some bark, but the 50 pieces of raw timber make a twisted heap which surrounds Hedley. The two finest, longest are selected for the middle frame, which determines the width and depth of the hull. Timbers are all of wild tamarind, (*Lysiloma latisiliqua*) (not to be confused

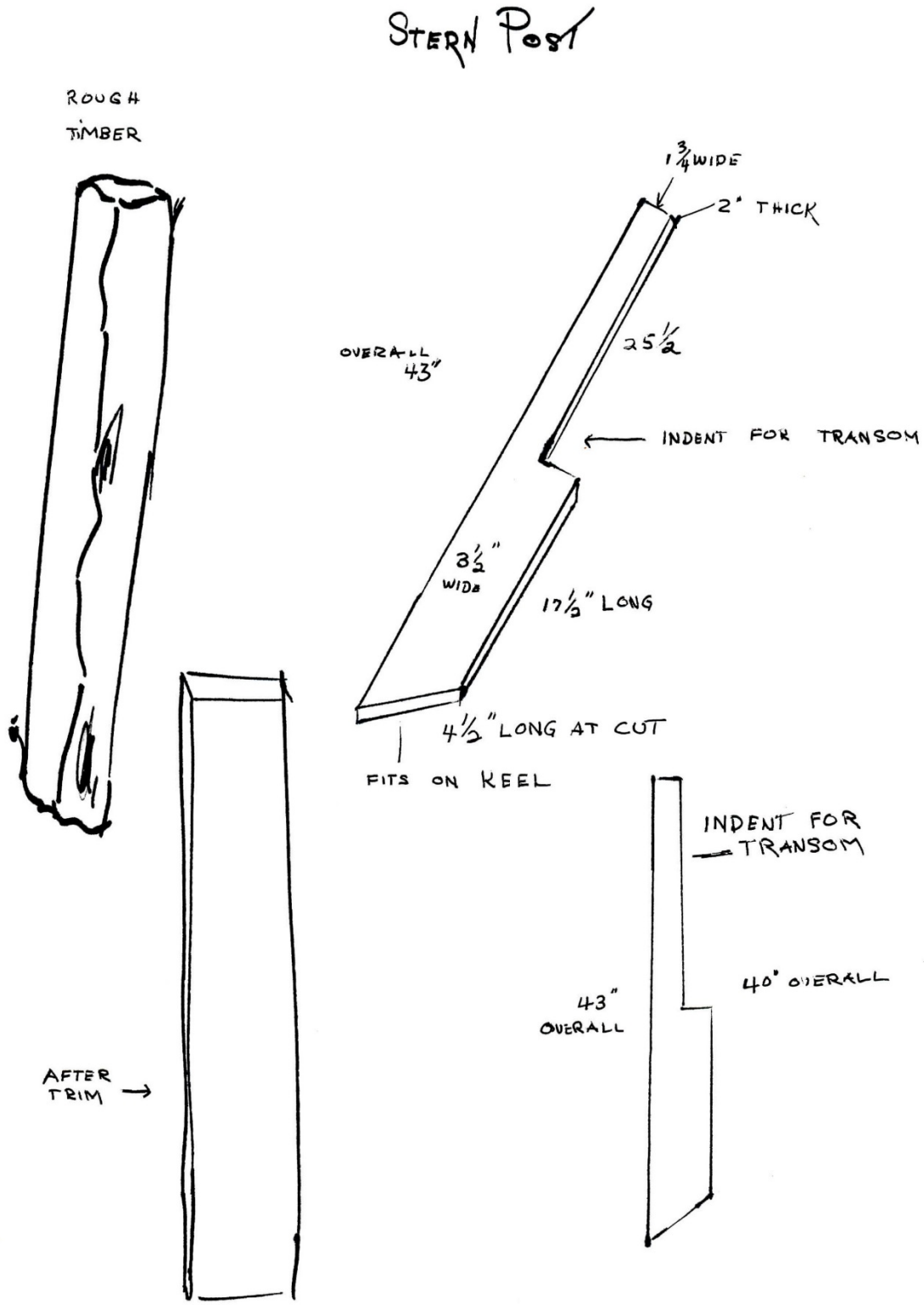


Figure 9. The stern post.

Figure 10. Rough-hewing the stern post.

Figure 11. Refining the stern post.

with tamarind, (*Tamarindus indica*), which is referred to throughout the islands as “locust”. These chunks of wood average 4 inches thick and the curves are not uniform. The greater part of Hedley's time for the next 6 days will be spent hewing these timbers into shape with his hatchet, reducing them to 2 inch wide beautifully smooth boat frames (Figures 12, 13, and 14). Tools are the hatchet and finally the plane. Curve of the frames give the side planking its shape--another careful decision. A ¼ inch diameter wire rod is used as the mold (Figure 12 and 15). It is cut with the hacksaw to a 5 foot length. A graceful curve is bent into it altered slightly, observed, altered, observed, until at last it meets Hedley's approval. A timber curve must meet the curve of this mold before being selected. Frames are made set by set of two each, being equal and opposite. For each new set of frames the mold is adjusted, to a tight V at the bow and more L shaped at the stern. Finished frames are not square, but slightly rhomboid in shape.

More frames are shaped, each with a different curve, determined by bending the mold wire (rod) inside the ribbands (Figure 15). As a frame is fashioned from the rough timbers and meets with Hedley's approval, an equal and opposite Frame is fashioned. Each frame is 2 inches wide--which is eyeballed out when the timbers are trimmed. Framing from the left will not fit to the right as the bevel is backwards due to the curve. It must be planed and fit, over and over. The bevel gives a perfect fit for the side planking and adds strength (Figure 16)

Throughout the boat building process the tools are elegantly cared for--always laid down on the side, the edges never put against metal or the concrete. Edges are kept sharpened on the "oilstone". Occasionally Hedley puts down a tool and digresses: "From Bambarra to Conch Bar (two towns in Middle Caicos, one at the east and one at the west end of the island) in my companion (my age group) time I am the best with boats and the best with houses in Bambarra. In Lorimers Boy Hall is the best contractor and he is also good with boats. In Conch Bar there are no men with this talent. They can build for their own needs but not more. I build all my boats in my yard. When finished we get all the men who all stand around it and lift up a part. We put it on a roller and drag it to the beach. But now we have some trucks on Middle Caicos so we can put it on a truck and drive it to the beach."

Then a floor timber is made to suit that particular frame (Figure 17). The skeleton is growing. Four frames are installed. They are braced at the top with a scrap board longer than the width of the boat and nailed across at the top ribband (Figures 18 and 19).

<u>The Transom</u>

The transom is fashioned from a pressure treated pine plank 12 feet long, 2 inches thick, and 6 inches wide (Figures 20 through 22). Thickness is not altered. It is cut into 3 lengths of 3 feet x 5 inches plus the leftover piece and held together edge to edge with temporary bracing of 1 inch x 6 inch boards nailed to the outside. Once again the ¼ inch thick wire rod is used for a mold. It is bent into a beautiful curve--the outside future shape of the transom. This curve is traced on to one side of the transom,

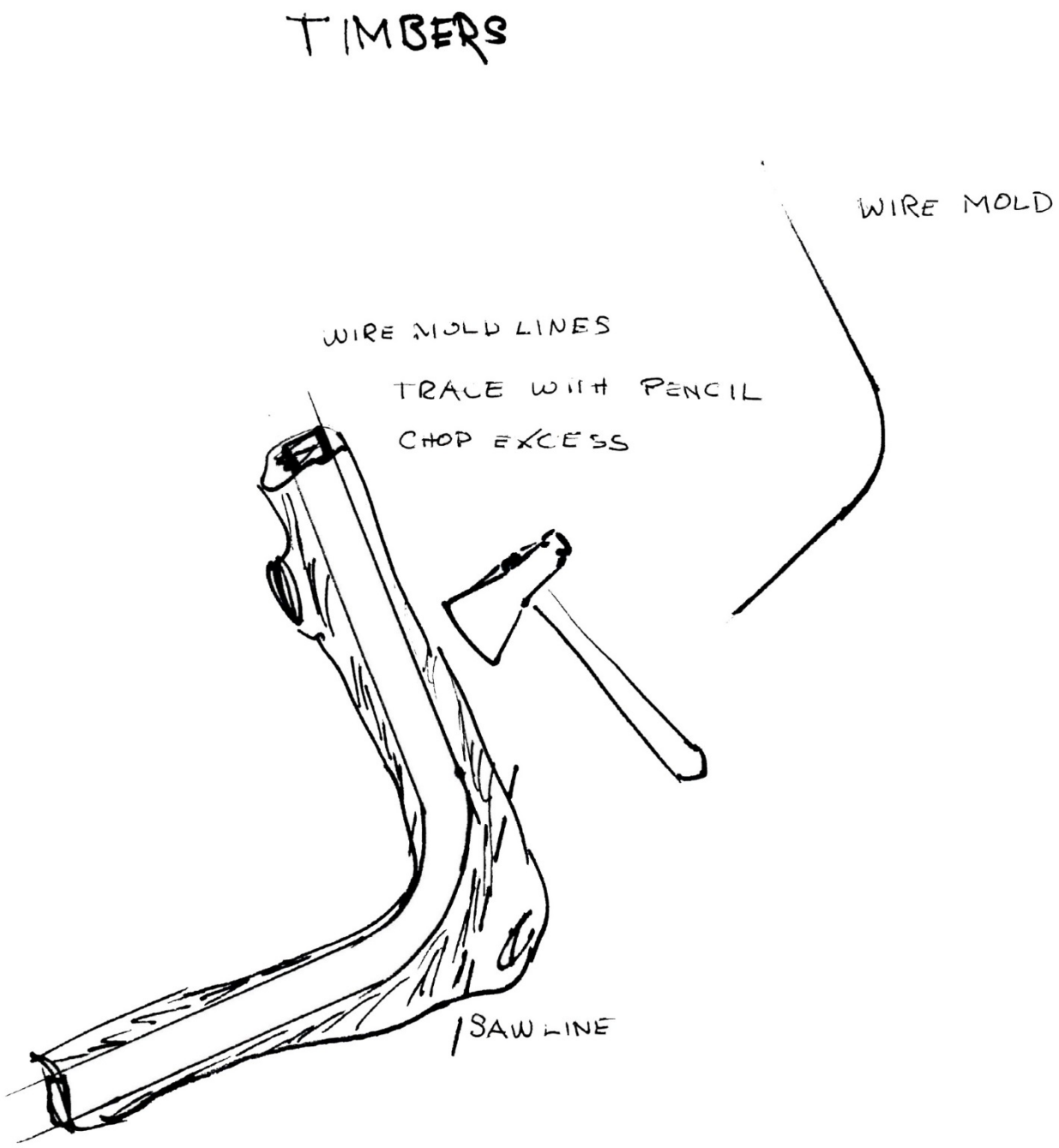


Figure 12. Selection of timbers for frames.

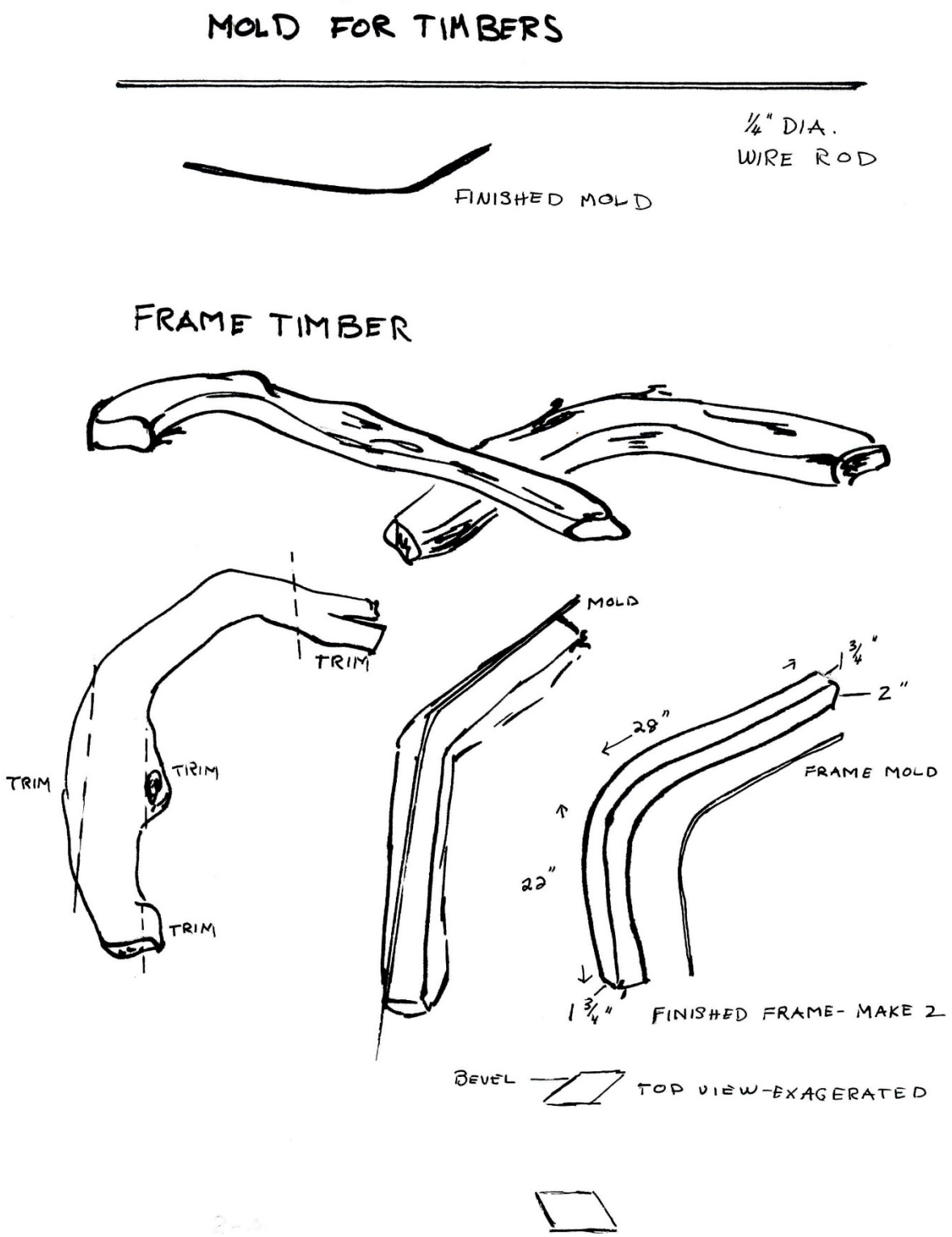


Figure 13. Mold for timbers.

Figure 14. Creating a form.

Figure 15. Using the wire mold.

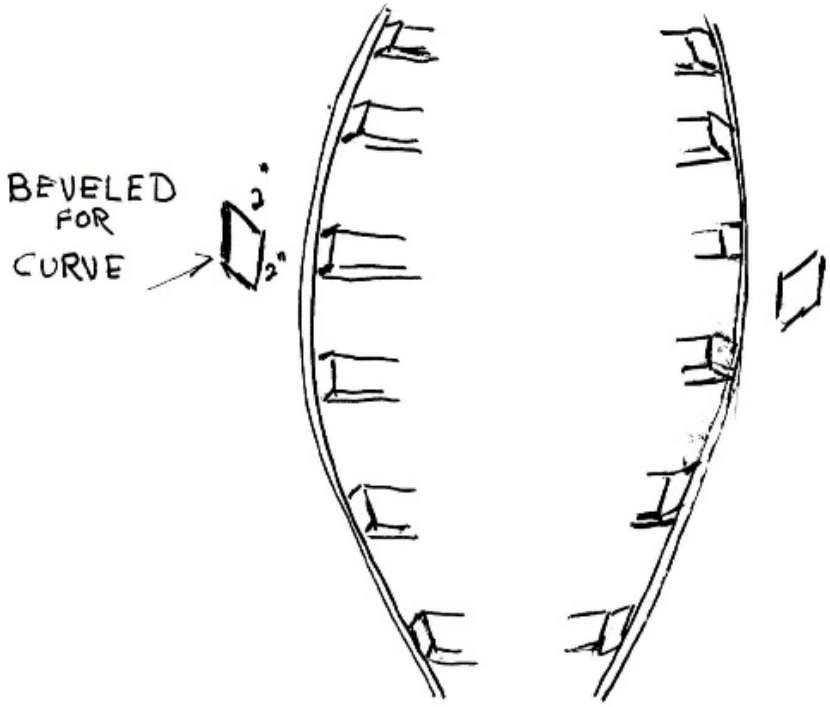


Figure 16. Sketch illustrating the bevel.

Figure 17. A floor timber in place.

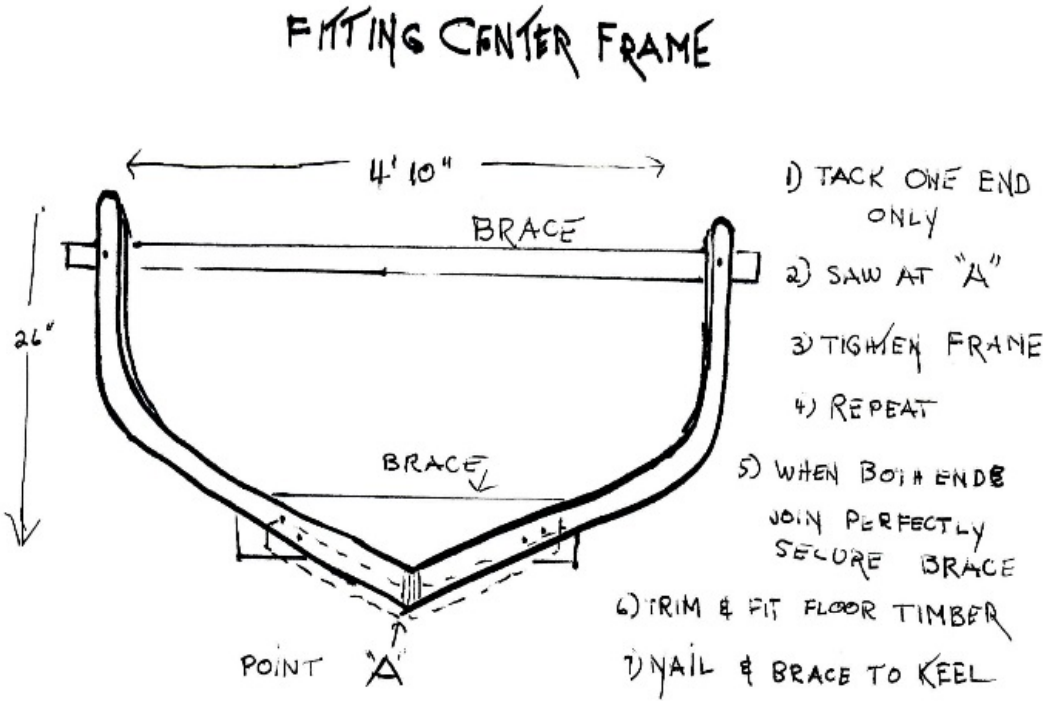


Figure 18. Fitting the center frame.

Figure 19. Center form with temporary ribbands

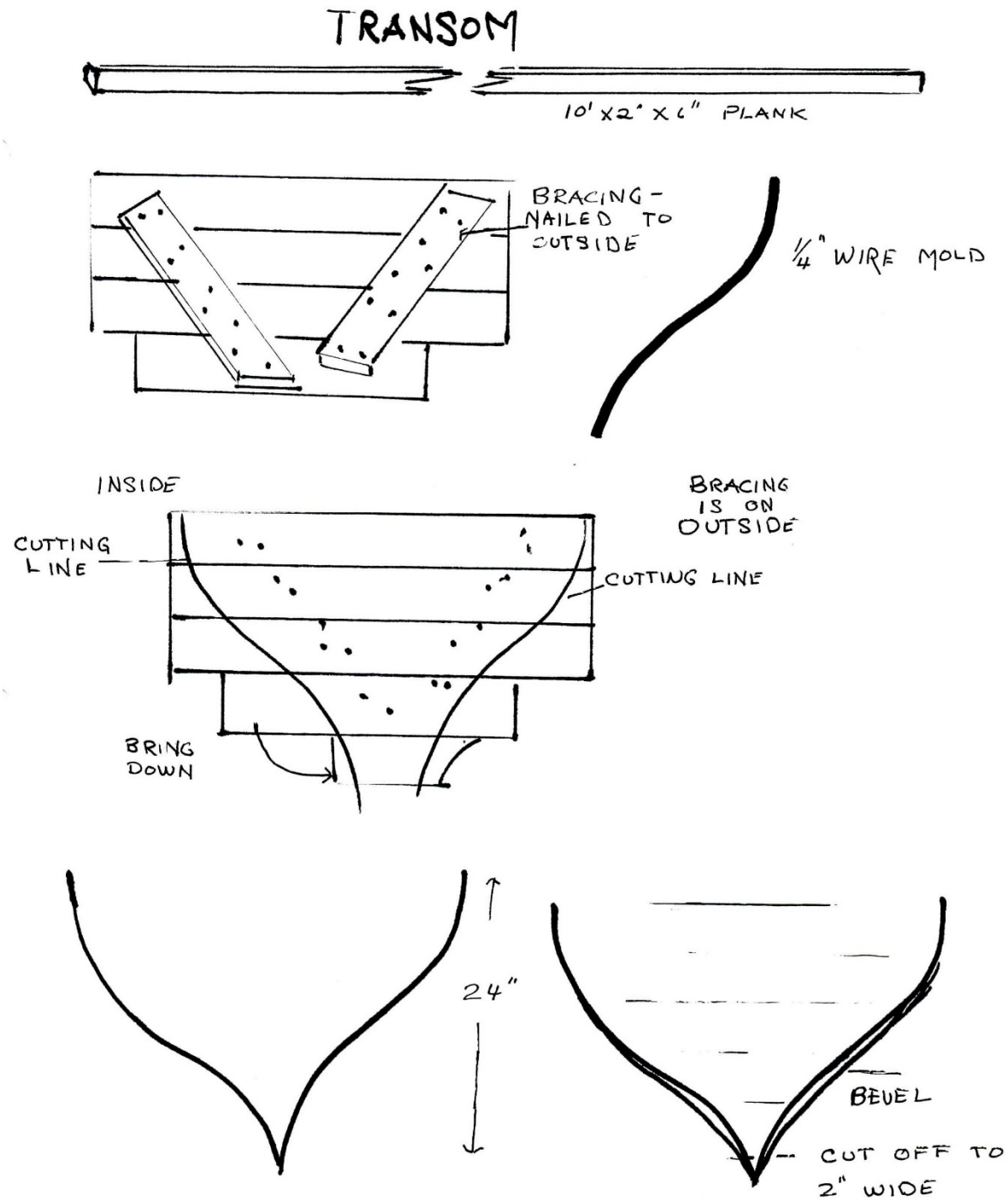


Figure 20. Transom plan

Figure 21. Finished transom.

Figure 22. Transom in place.

turned over, and traced onto the other side. Excess wood is sawed and axed away. A short piece of sawed off 2 inch x 6 inch is then used for the very bottom piece. The bracing stays on until side planking is nailed onto the frame. The transom is then beveled to accommodate the curve of the side planking. The V at the bottom is most heavily beveled. This is done with an ax on the curve and a saw on the straight parts. Final few strokes are done with a carpenter's rasp. Angle of bevel is checked and corrected with a sliding bevel, both port and starboard bevels being equal and opposite.

The centerline from top to bottom is drawn and the stern post is nailed to the outside of the transom along this line. To make all nail heads lie flush, the head of a large nail is hammered sideways into the mark, turned and hammered several times. This roughed-up spot easily compresses when the nail head is hammered down hard. A few high spots on the inside of the transom are planned down.

The Keel

Sunrise II will have a keel of oak--the first oak keel Hedley has ever made. White pine, formerly available on Middle Caicos and virtually worm resistant, has always been used for the keel. Original oak beam was 10 feet x 2¼ inches x 6 inches. This was hewed with the ax, chipped with an adze, and finished with a plane to a size of 5 inches top to bottom, 2 inch width at the top and remaining this wide downward for 3¼ inches when the tapering begins for the base-which will not be covered by side planking and which will cut through the water (Figures 23 through 25). This bottom part of the keel is beveled to one inch width at the bottom. On arrival the keel beam was warped--a problem Hedley handles without surprise and with ease. Both left end and right end were high on top, while the bottom was low in the middle. Before any measurements were made on the plank it was made true and straight. Keel sides were planed. The plane was adjusted to the oak, having been set too course, or "rank", by moving the blade slightly into the plane bottom edge. A chalk line is snapped onto both top and bottom edges, a pencil line drawn along the chalk line and the hewing begins. Length of keel determines how far apart the frames will sit. The distance is normally 9 inches center to center. Hedley decides the frames will sit 12 inches apart center to center and the finished keel is marked off accordingly. An entire day is spent on the keel. We all take a turn hatcheting away but, as usual, in the end we stand transfixed as Hedley shaves the bottom-most bevel with gentle ax strokes

The beveled keel is quite special, and only the second of the 28 boats Hedley has built to have it done. Hedley built his first in 1957 at the age of 24. He has overhauled 8 more--which is called "repairing". If a boat is "overhauled" the registration must be modified, if only "repaired" the same registration holds. Island boats are seldom "over- hauled". Hedley had no trade when he built his first boat, but figured it out for himself by looking at other boats. His grandfather was a carpenter and a boat builder and Hedley comes by this gift naturally. When a boy he would stop and watch all construction sites and learn by watching. "When I was young all the boys went to the sea, we all sailed our boats. That's what boys did. We never went from one island to another island except by sail. Now the young boys go to another island only by airplane. Boys today don't want to work outside, they want to be in air conditioning,

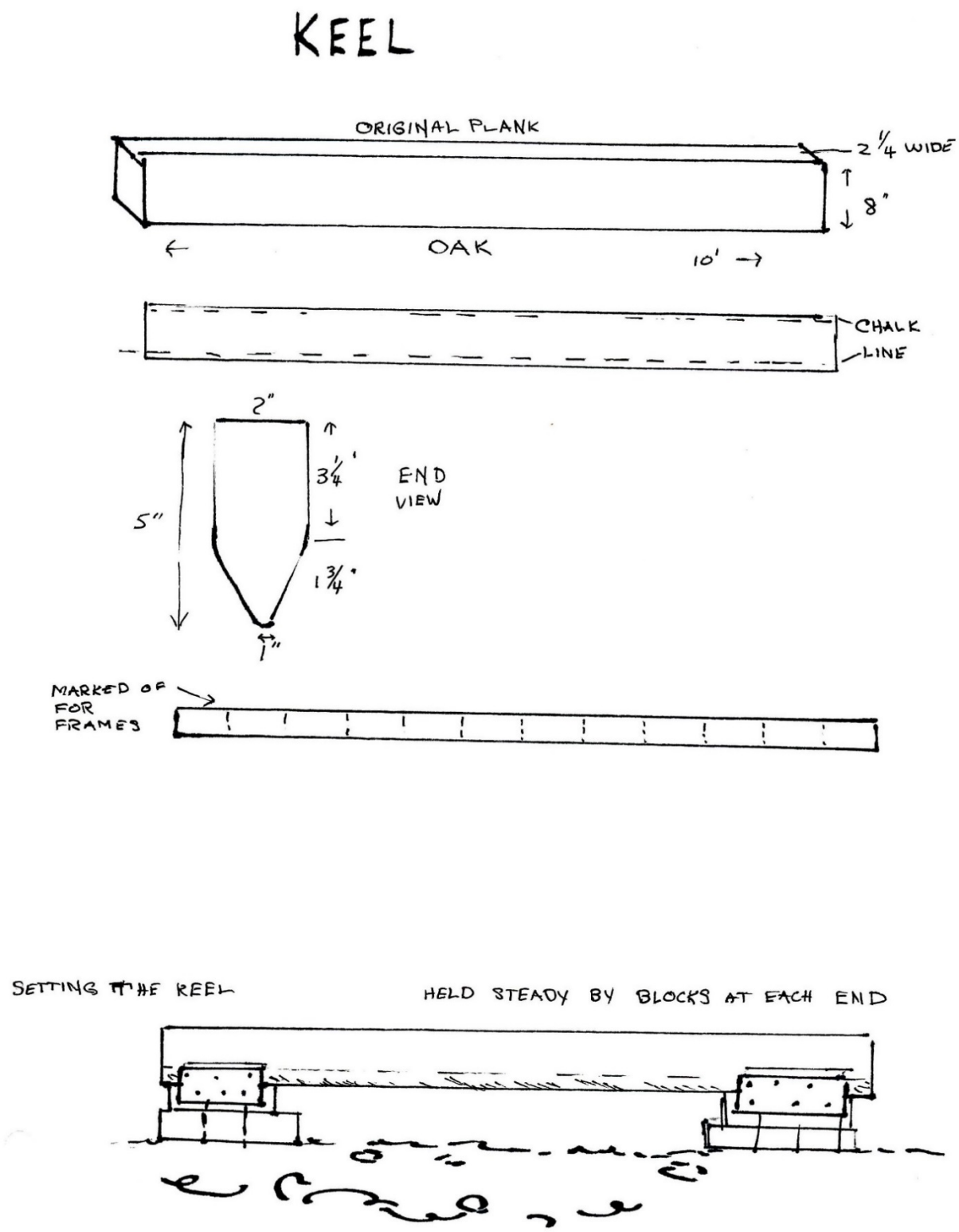


Figure 23. Plan for the keel.

Figure 24. Beginning the keel.

Figure 25. Finishing the keel.

but don't get the degree of education to equip them for indoor work."

The finished keel is set out on even ground and is rested on blocks of wood, with side blocks along the port and starboard sides to hold it even. It is ready for placement of the stern, stern post and the frames.

The stem is now prepared for placement on the keel. Cutting it with the proper angle is important as it sets the profile of the bow. Fitting the stem to the keel is called “shoefooting” (Figures 26 and 27). A right angle is notched into the stem. This fits over the leading edge of the keel. Hedley didn't like the first profile so the notch was altered, but remains a right angle. The original cut gave a top boat measurement of 16 feet 2 inches. The altered cut gave a top measurement of 16 feet. The stern post with transom is now fitted to the keel. The original bottom cut gives a beautiful stern line and remains as cut. Like the stem, the stern post is fitted, nailed to the keel and braced. There is no wood for bracing material. Mountain Paul rides the bike to Cockburn Town and returns with a 2 inch x 4 inch x 6 foot plank, all that was available. The center frame is the first frame to be placed onto the keel (Figure 18). But it is not attached at all to the keel but rather, to the flooring timber which is nailed to the keel (Figure 28). If timbers for the framing are long enough, the framing will meet at the center of the keel top. If framing timbers are too short, as many are, they will not meet at the center bottom. The gap is made up by the floor timbers (Figure 17). Frame and floor timbers are held in place with a "C" clamp while being fastened to the keel (Figure 29).

Next, ribbands are nailed from stem to stern (Figure 30). Ribbands give a view of the natural side lines of the boat, maintain the spacing and alignment of the frames and are an important guide in bracing the planking. They are removed one by one as the planking is placed on the sides. Hedley learned about ribbands from watching: "When you learn something in school, you do as taught. When you learn by yourself you keep an open mind--always ready to learn more and improve. Then if something doesn't look right you are more able to study it and change it for improvement." Three ribbands are put on each side of the boat. Ribbands were ripped out of a piece of floor molding. More ribbands were made from a 1 inch x 6 inch x 12 foot plank. We all take a turn at ripping up the boards into ribband strips, which were marked by snapping a chalk string onto the boards. To the inexperienced arm this is grueling work and we all give up, willingly returning the saw to Hedley, whose powerful arms effortlessly guide the saw through the plank, reducing it to six even strips.

Hedley's saw is a ripsaw of medium quality, Disston Model D23 having 7 teeth per inch. Other tools are also basic: a hatchet, a carpenter's hammer, a two-foot carpenter's level of aluminum, a 12 foot Craftsman tape measure, a trisquare and a carpenter's framing square. There is a sliding bevel of average size and a 1½ inch chisel and a rasp. Hedley uses no sandpaper. For smoothing out edges and curves, particularly inside curves where the plane won't reach he uses the edge of a broken bottle--and glass is everywhere, no need to carry it in his tool kit.

More ribbands are added. More supports and jockeyed into position. The skeleton is firmly in place at all times. The top center is marked by a string running from stem to stern (Figure 31). The string is tied to

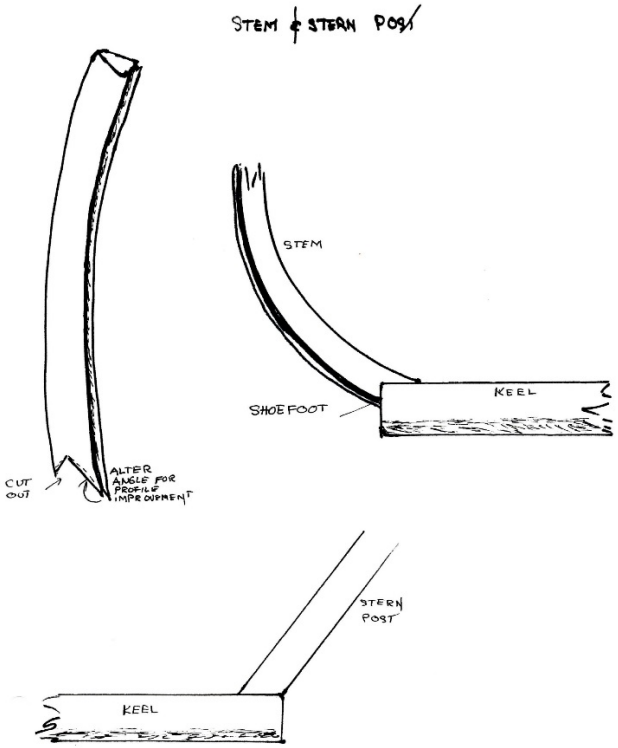


Figure 26. Shoefooting.

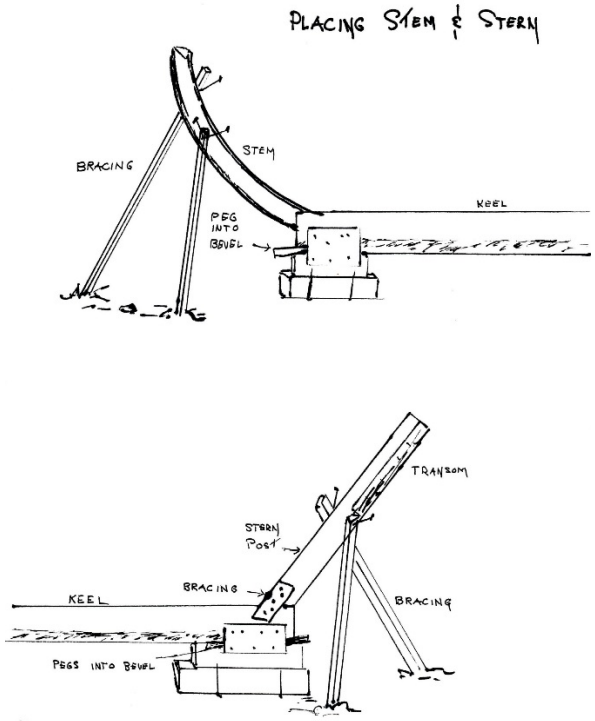


Figure 27. Placing the stem and stern posts.

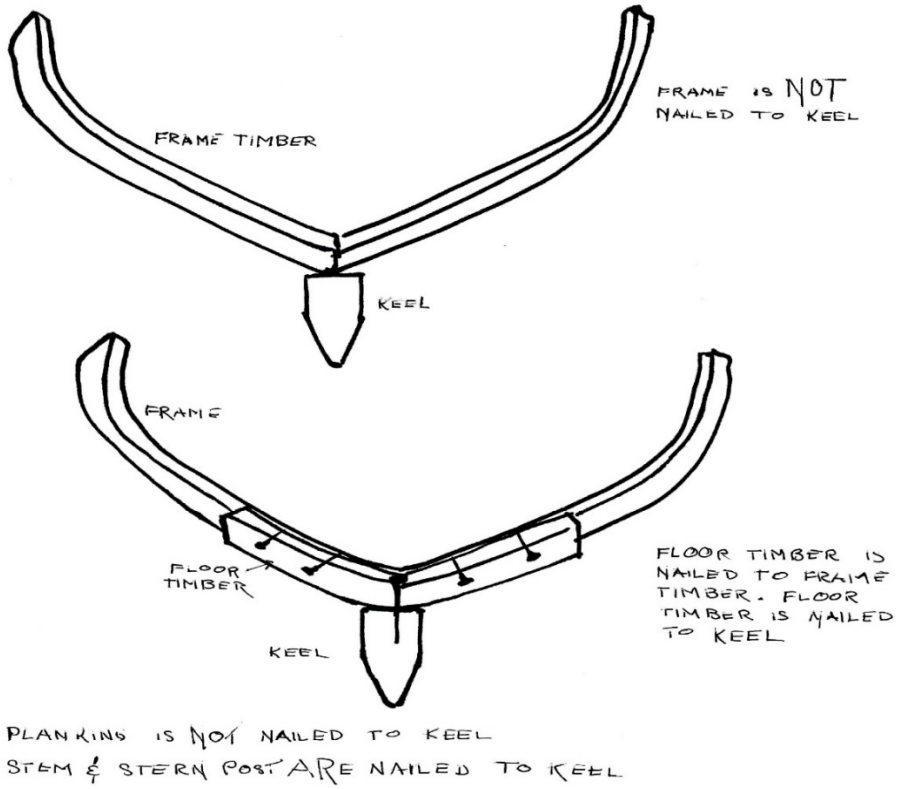


Figure 28. Attaching the frame to the keel.

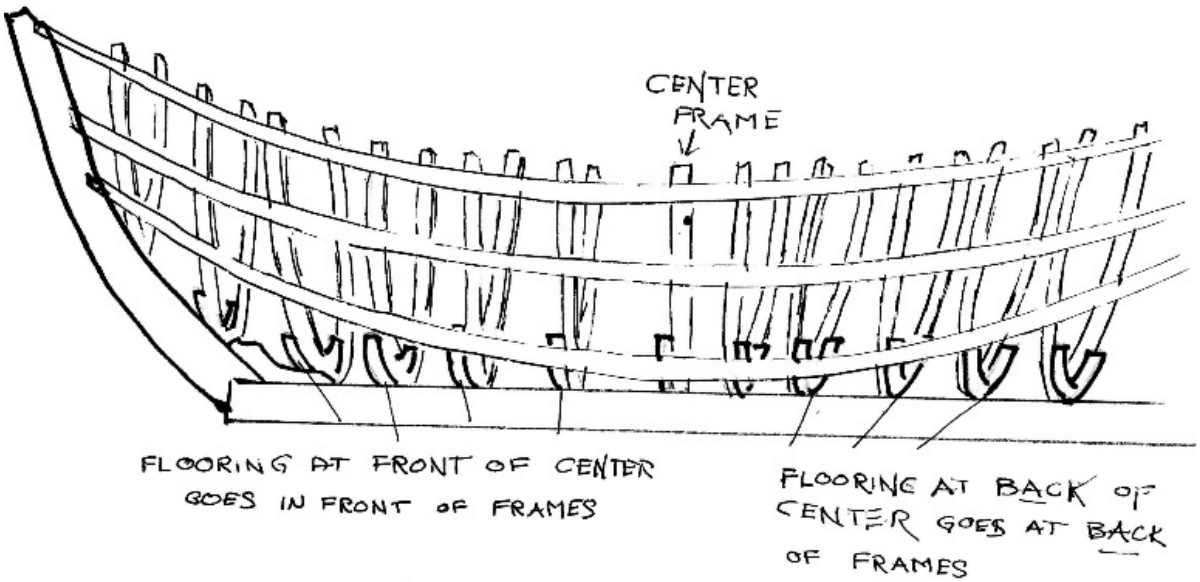


Figure 29. Securing the frames using flooring wood.

Figure 30. Ribbands in place.

Figure 31. String marking the boat's centerline.

a nail placed in the top center of the stem and a nail in the top center of the stern post. Width measurements port and starboard must match on each subsequent frame when installed. Dimensions are now: stem to stern on deck = 199 inches; width (broadest part outside measurement) = 59½ inches; transom (top to keel) = 39 inches.

Sunrise II now has shape, graceful form and is pleasing to the eye. People begin coming by to look at her--a young man who says his granddaddy also built boats. Two boys and a horse, other boys with two donkeys, an anxious man who carries carpenters tools in his arm, the head mistress of the North Primary School. Each day brings further progress and other islanders. Sunrise II makes everyone smile.

Deadwood

Deadwood is for strength and is used at critical joinings and is of "locust" (Figure 32). Hedley's timbers were cut in the brush by Marcus, Hedley's brother, and were left very large including much bark and knots. Had Hedley done the cutting, more obvious waste would have been removed at the tree site.

Walking through the brush looking for suitable timbers is called "rambling". There are no roads through the brush on Middle Caicos so one "rambles"--climbs the taller trees to locate other desired ones and crouches down to look under the lowest branches through the brush to locate a fat trunk.

"Older trees are usually tougher than young ones--just like man. Some men are old and tough, some are old and softer, but mostly young ones are softer. When I get a frame coming out of an old tree I chops and chops, but if that frame is coming out of a

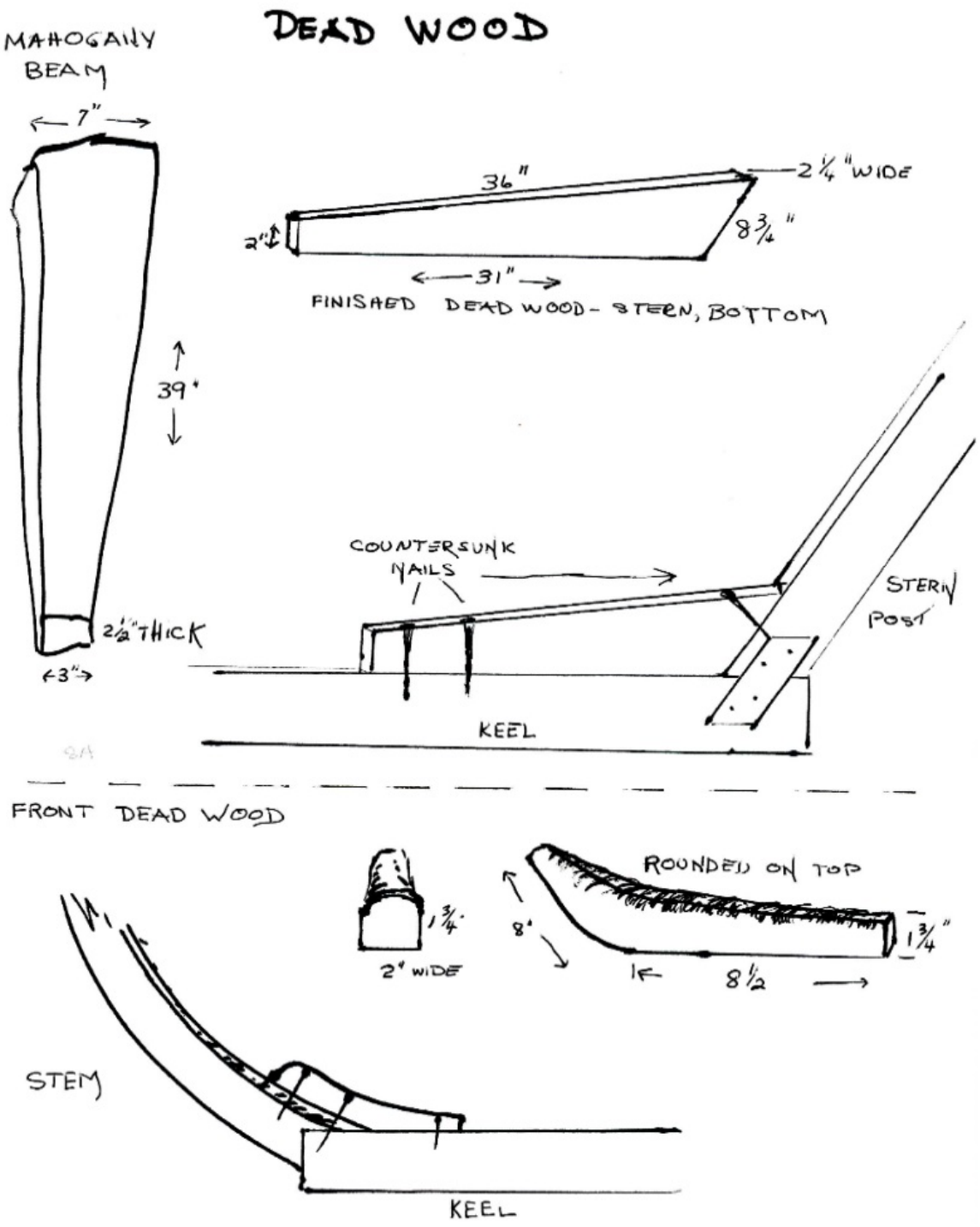


Figure 32. Deadwood.

young tree it shapes up right away. When I look at a tree in my mind I see timbers."

The stern deadwood is wedge shaped, hewn by ax hatched from a heavy chunk of mahogany. It is 31 inches long at the bottom, 36 inches at the top. The back end, which must perfectly meet the angle of the stern post, is 8¾ inches high. It narrows to the front to 2 inches. With brace and bit holes are drilled through it and into the keel and stern post. All nails used are galvanized. The deadwood is fastened with huge spikes, counter sunk at the top, 2 spikes into the keel, and two spikes into the stern post.

Front deadwood reinforces the stem connection to the keel (Figure 33). The angle of the leading edge must match perfectly with the angle of the Stem where it meets the keel. One large spike is driven through a drilled hole through the deadwood and into the keel. Two nails are set into the stem. Top stern deadwood is of pine, whittled with the hatchet from a 4 inches x 8 inches by 4 foot chuck of wood bought at the local market. It was sawed, chopped and planed down to size very quickly (Figures 34 and 35). Four holes were drilled through it from top to bottom for spikes. Top stern deadwood abuts the stern post and rests on top of the bottom stern deadwood. After drilling a few holes Hedley produces a spice jar filled with lube oil. A hot drill expands, becomes tight in the hole, has more strain and may break. Oiling the bit prevents this.

Sunrise II has 12 frames in place and seven floor timbers. There will be 14 sets after completion. Four frames do not meet at the Keel, but are nonetheless held securely in position by the floor timbers. This is acceptable to Hedley. Four other frames are too short at the top and will have to be joined to extension pieces of frame material in order to reach the top line of the hull. This is normal in hand made boats of this type.

The Sail

The sail is normally laid out of doors in a reasonably flat surface. However, as we have a large schoolroom with a concrete floor we will do it inside. Three boards 18 feet long and 3 inches wide are set on the floor in a triangle. One edge is extended to 19 feet 3 inches. Lots of math, not all of it explainable, is being done in Hedley's head. The mast will be 19 feet, the bottom of which will sit in the bowels of the boat, above the keel. So the sail will be 17 feet 5 inches high (Figure 36). The mystery of this determination is in Hedley's head.

Our sail fabric is Number 10 canvas and is in a continuous strip 36 inches wide. Hedley figures that our 5-breadth sail will have 20 2/3 linear yards of canvas, which might not be enough. Beginning with the "after leach" (trailing edge section) the sail canvas is laid on the floor along the longest plank. The edge is cut off along the boards at each end, one end will be the boom edge, the other will be the top of the mast point, or "luff edge". A second breadth is put down, overlapping the first by 1 inch and cut at the ends at the boards Then a 3rd, 4th, and 5th breadth.

Two days later, Hedley decides we do not have enough sail and adds another breadth at the after leach edge. Where the overlap edge occurs, a 1 inch seam line is snapped onto the bottom laying breadth which is the sewing line. The sail is sewn with #7 polyester thread (Figures 37 and 38). The needles are large and varied upholsterer's equipment—triangular at the tip, flat at the tip and curved at the tip. A

Figure 33. Stem deadwood.

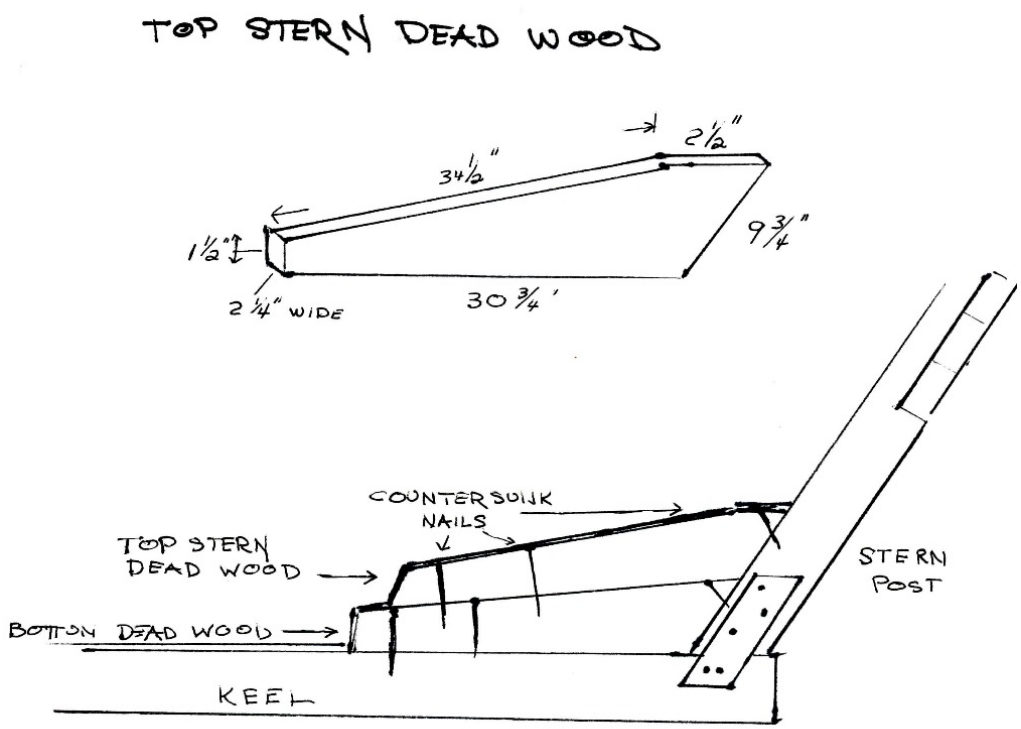


Figure 34. Top stern deadwood.

Figure 35. Bottom stern deadwood in place.

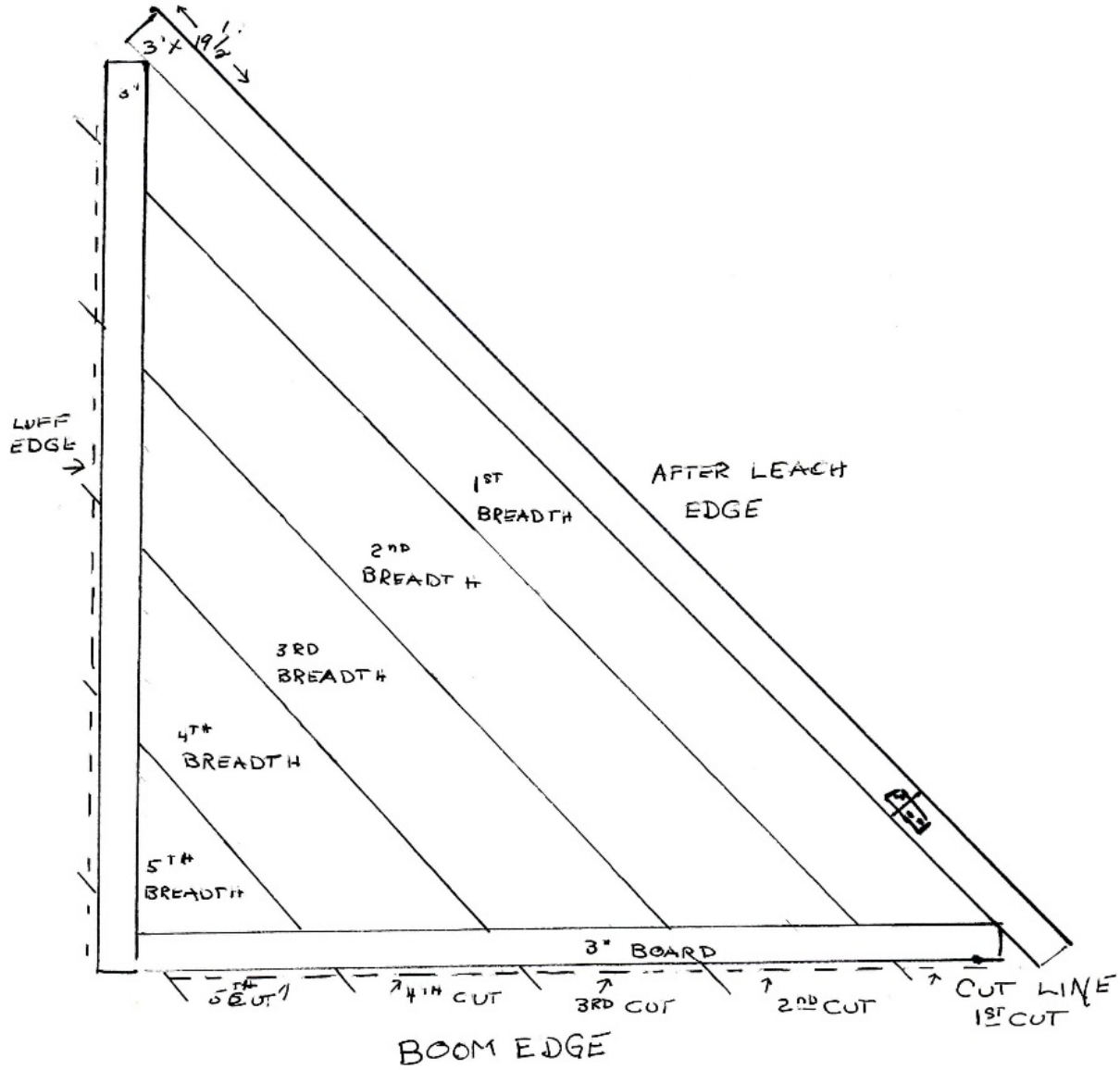


Figure 36. Cutting a five breadth sail.

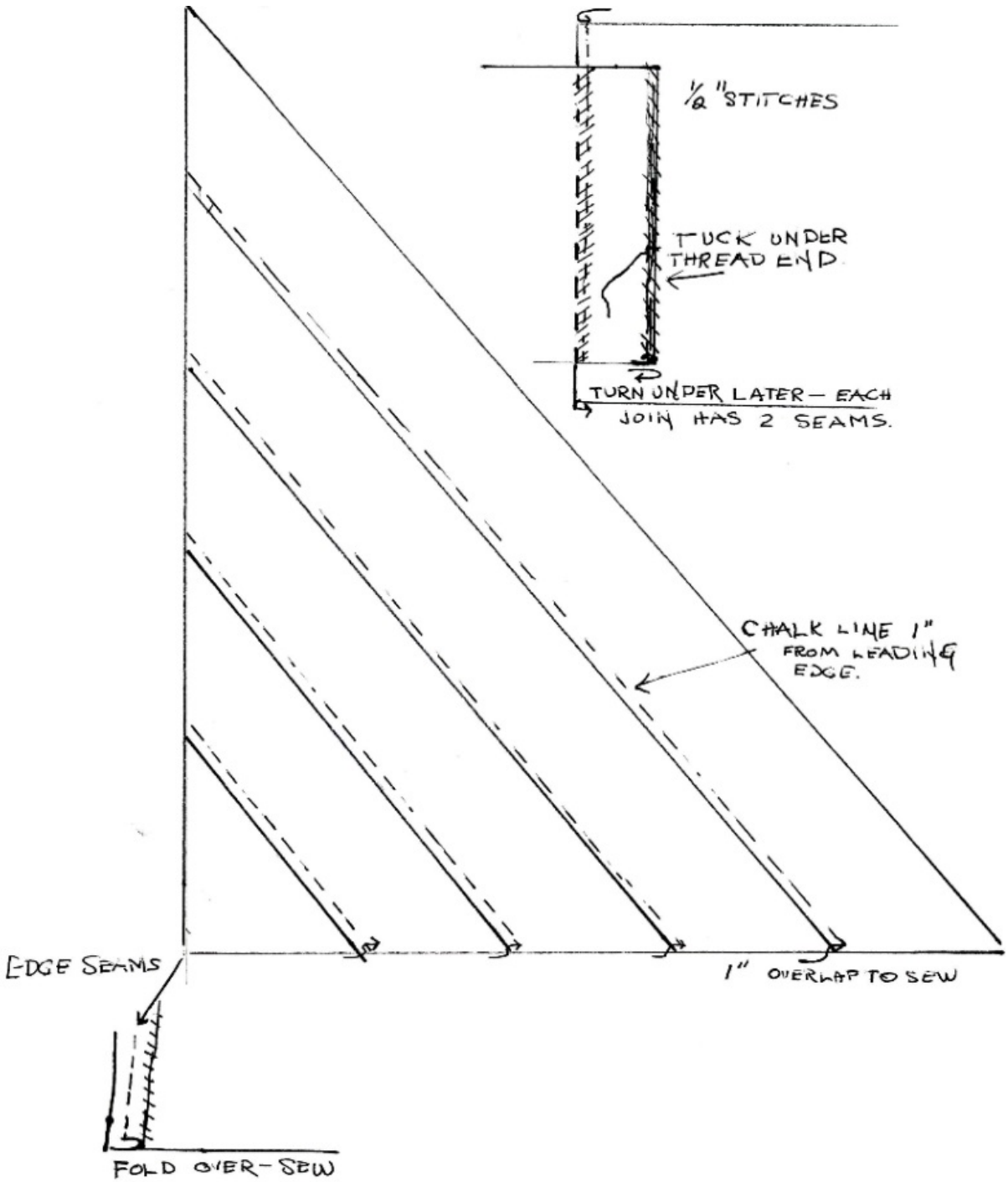


Figure 37. Sewing plan.

Figure 38. Sewing the sail.

successful needle must be wide enough at the tip to make a hole big enough to allow the needle eyes plus two strands of heavy thread to pass through it. A leather harness called a "palm" (Figure 39) is used at first to push the needle through--later we discover a formula--the sails are taken off the floor and draped over all the school desks. The sewer on the east side pushes the needle point through the canvas and the helper sitting on the west, pulls the needle through with pliers--such is the difficulty of this process to the untrained hand. Stitching and joining thread sections is explained by Hedley. A straight stitch of ½ inch length is used beginning at the seam edge of the top canvas which is lined up with the blue chalk line of the under canvas. Knots are not used at end of threads. Rather, the thread end is folded back inside the two fabric layers and the new thread begins 1 stitch back, holding it firmly in place.

When all seams are sewed, the sail is turned over and sewn on the other side in the same manner. There must be no loose edges for the wind to catch in. Stitches must be tight enough to do this, not tight enough to buckle the fabric. By the second day we are all cut and bleeding from puncture holes. "If a wide canvas is available it is better. But if not, we can use narrow strips. Its OK--seams are not necessary for strength." We can sew 3 feet per hour. Hedley can sew 3 feet in minutes. We are convinced that sewing sails is man's work.

When sewing the breadths is finished, the outside edge is trimmed and folded under and seamed in a similar manner. When this is completed a ½ inch rope must be sewed around the periphery of the sail, to help it set in the wind. Felix Lightbourne on Salt Cay also sews his sails the same way, using a 3 inch needle and cotton twine rubbed with beeswax for protection and for easier sewing.

The Side Planking Goes On

From stem to stern post the frames are marked along the top of the top ribband. This will be the line of the top plank. Both port and starboard sides are marked. Top ribband, each side is removed. Somehow, by some combination of mental math and instinct, Hedley decides the top plank will be 4 inch at the bow, 4¾ inches at the center and 3½ inches at the stern.

The mahogany plank is marked using Hedley's native method. The plank is put on the concrete sidewalk. Seven nails are driven into it marking a curve (Figure 40). Another plank is laid on edge along this curve and the curve line is drawn against the plank. Nails removed and put into the other edge of the plank to mark the other curve. The second plank is again laid against the nails, the second curve is drawn, nails and marking plank removed and unwanted wood is scribed out--removed with hatchet and plane. Bevel on edges is planed on with long smooth strokes. Bevel is measured with a sliding bevel. The top side plank nailed onto the frames at the marked line: top bevel results in a flat surface. The plank overshoots the stern by two inches. This is OK. The top two planks on each side have the same measurement. Bevel on top of the second plank is the opposite of the bottom of the first plank, resulting in a perfect fit (Figure 41).

The third plank down has a different measurement--it is scribed down to 3 inches at the bow, 4½ inches at center and 3 inches at the stern. As each plank goes on the ribband it replaces is removed, now becoming scrap. Now planking shifts to the bottom plank, at the keel. However before the

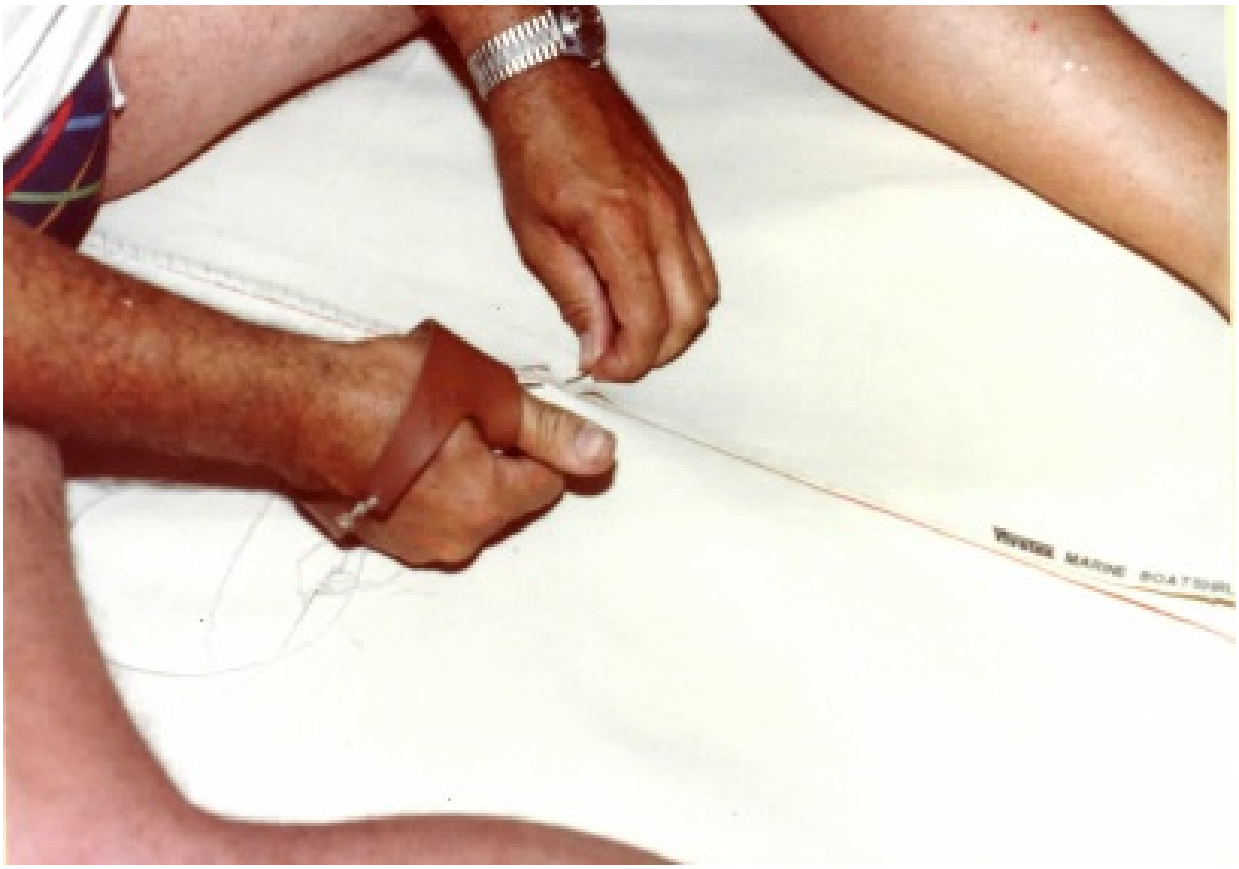


Figure 39. A sailor's palm in the right hand.

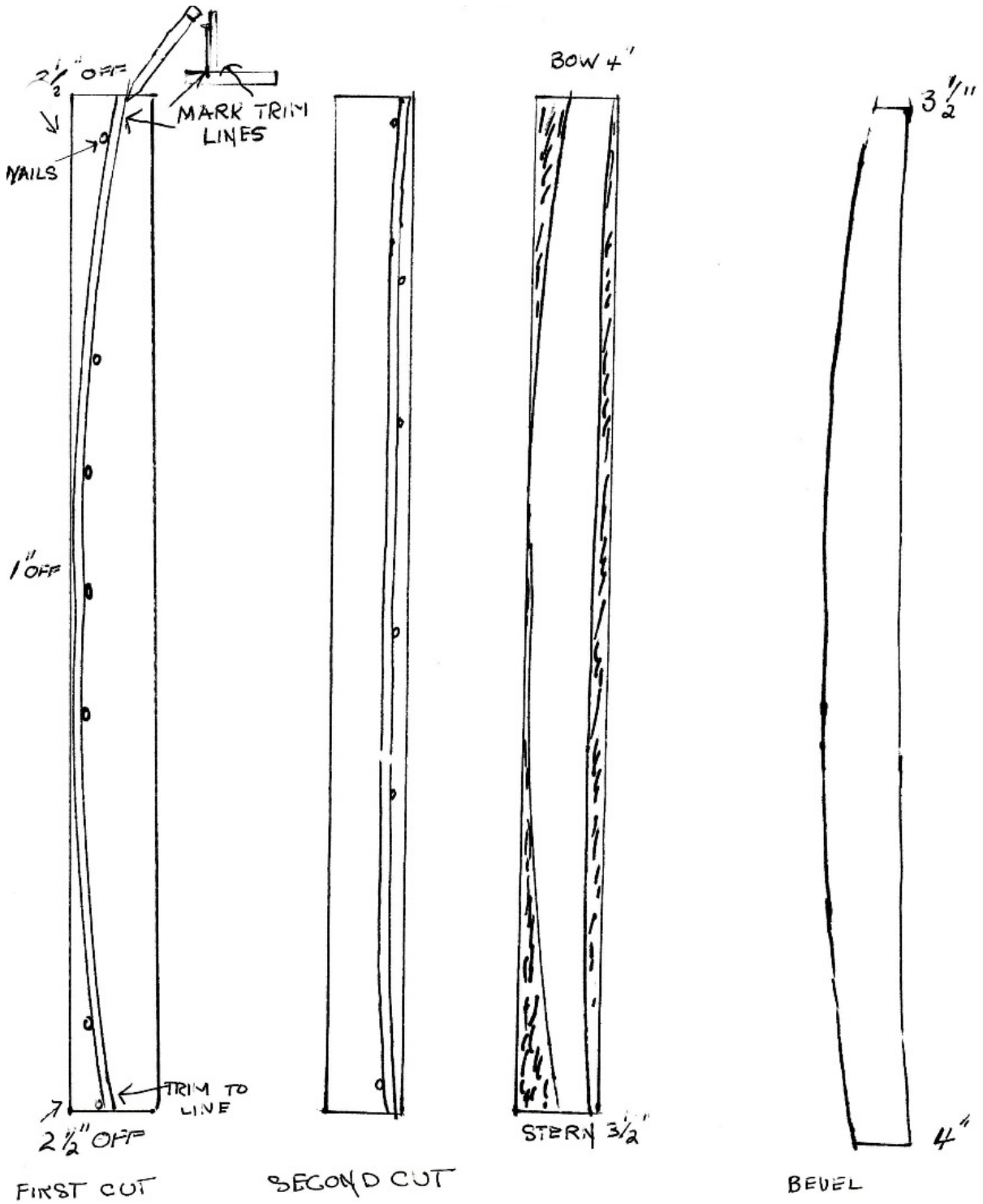


Figure 40. Plan for cutting side planking.

Figure 41. Side planking.

bottom planking is secured water pins must be placed at all the joints of the deadwood with other wood to stop any possible leaking (Figure 42). Water Pins on Sunrise II are one inch pine dowels. A l inch hole is augured laterally at the juncture of the stem, keel and front deadwood. The pine dowel is hammered though the hole and trimmed for a smooth edge. Any water leaking at a water pinned seam will cause the water pin to expand, thus, become self-sealing. Four, 1 inch waterpins are used at the stern: 1 on the bottom deadwood, one on the top deadwood, center, 1 where bottom and top deadwood meet the stern post and one half way up the top stern deadwood. They are all lateral. Another rabbet is cut into the stern on a line where it is determined the bottom side planking should fit for best appearance and seaworthiness. This rabbet is just about a "V" shape, 1 ¼ inches wide, and goes about 1½ inches into the keel. If no one inch plane dowel is available, a water pin should be whittled.

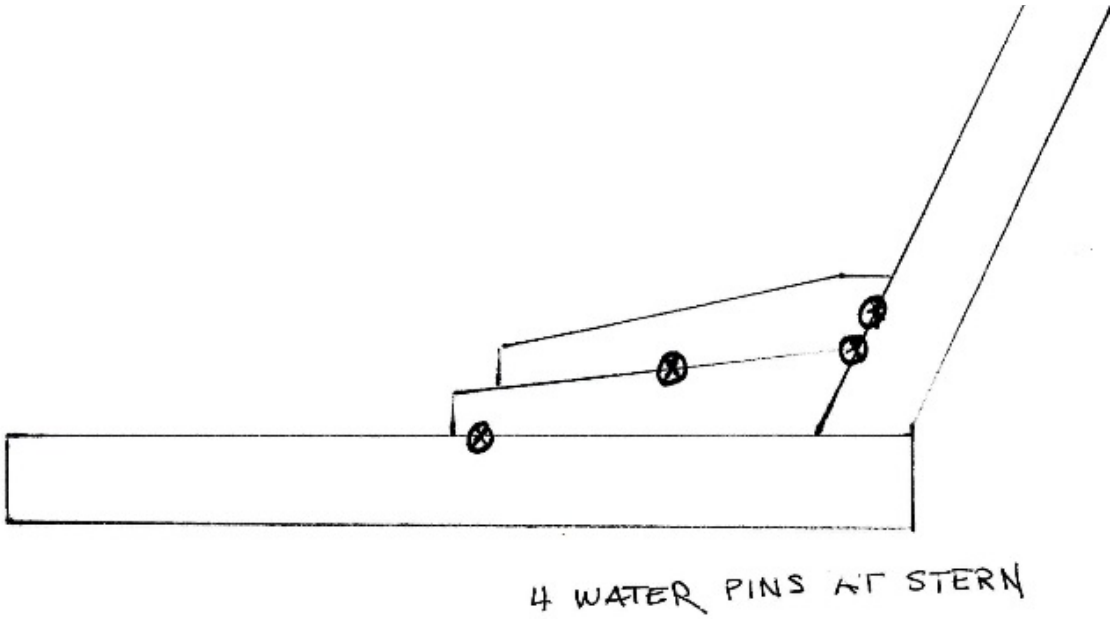
The bottom of the bottom plank is beveled to fit on top of the keel, stern end fits into the rabbet made at stern deadwood. It must be cut exactly. Bottom plank is 3½ inches at the bow, 4 inches at the stern and the center is left almost 6 inches, perhaps 5¼ inches. Balance of planking is put on working upwards. Planking can be held with "C" clamps to tile frames. The last plank to be installed is half way up the side and is called the "set" plank. It cannot be held by "C" clamps and must fit right into the space left for it. Very little trimming should have to be done on this plank. It has to pop right into the last narrow slot.

At this point a breast hook is made for the bow (Figure 43). It is of wild tamarind "locust" and inserts even with the top of the side planking, between the port and starboard planking and flush against the back of the stem. It is 2½ inches thick. Arrangements are made to fit the decking, which will be l inch thick mahogany planks, like the sides. A 1 inch x 2 inch strip of pine is nailed to the frames 1¾ inches below, the top of which is 1¾ inches below the trimmed off frames and the top of the top side plank.

Beginning half way between the transom and the last frame a 2 inches x 4 inches is nailed across. Another is nailed across between the last and next to last frames, and another between the second and third frames from the stern. Four 2 x 4s are nailed across the front portion of the hull, resting on and nailed to the l inch x 2 inches support. The center opening is narrowed with two 2 x 4s running from fore to aft on either side of the boat from the last of the front set to the first of the stern ones. These supports hold the deck planking (Figure 44). The first deck plank to go on is the middle one for the foredeck. Second one goes to the right of it and the 3rd one is equal and opposite this and goes on the other side. Planking continues outward until even with the side 2 x 4s, where they are continued all the way to the stern of the boat (Figures 44 and 45). The outer planks become the "side deck" stern decking is worked inward. A trim called a waist is put around the edges of the deck.

To hold the boom a block is attached to the stern post. Another block is attached to the boom. The main sheet (rope) is fastened to the mast blocks. The boom is held to the mast by a V shaped piece of wood, on the boom end which fits under a block of wood on the mast.

The rudder is made of 2 each 2 inch x 10 inch planks laid edge to edge (Figure 46).



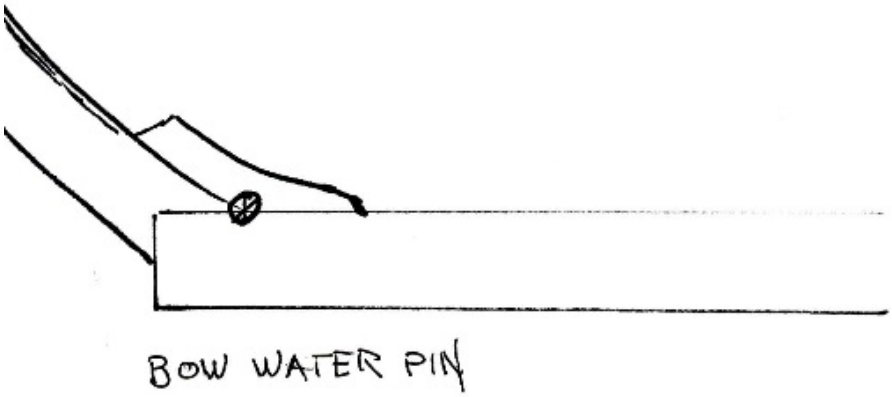


Figure 42. Water pins.

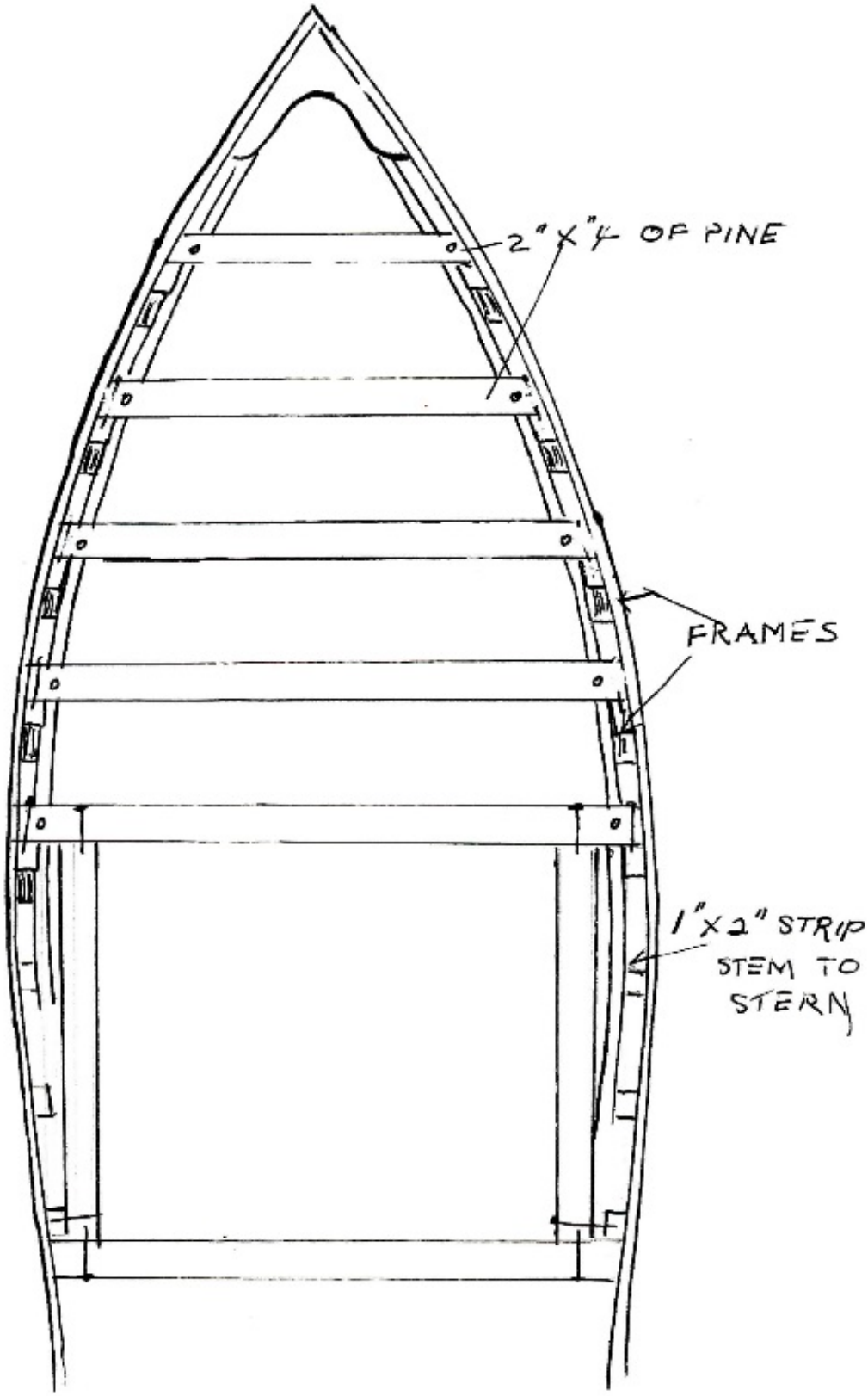


Figure 43. Framing for planking.

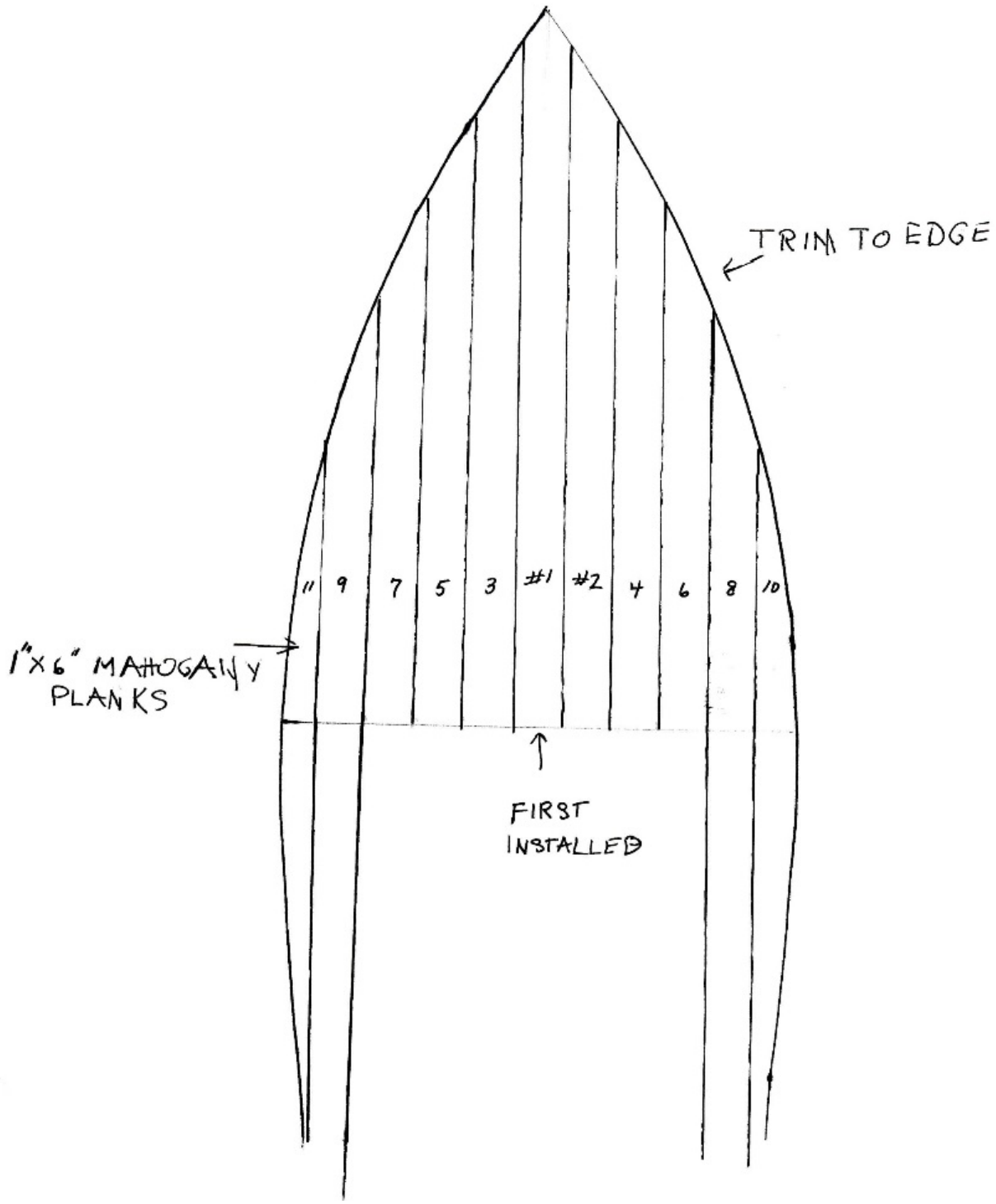


Figure 44. Deck planking.

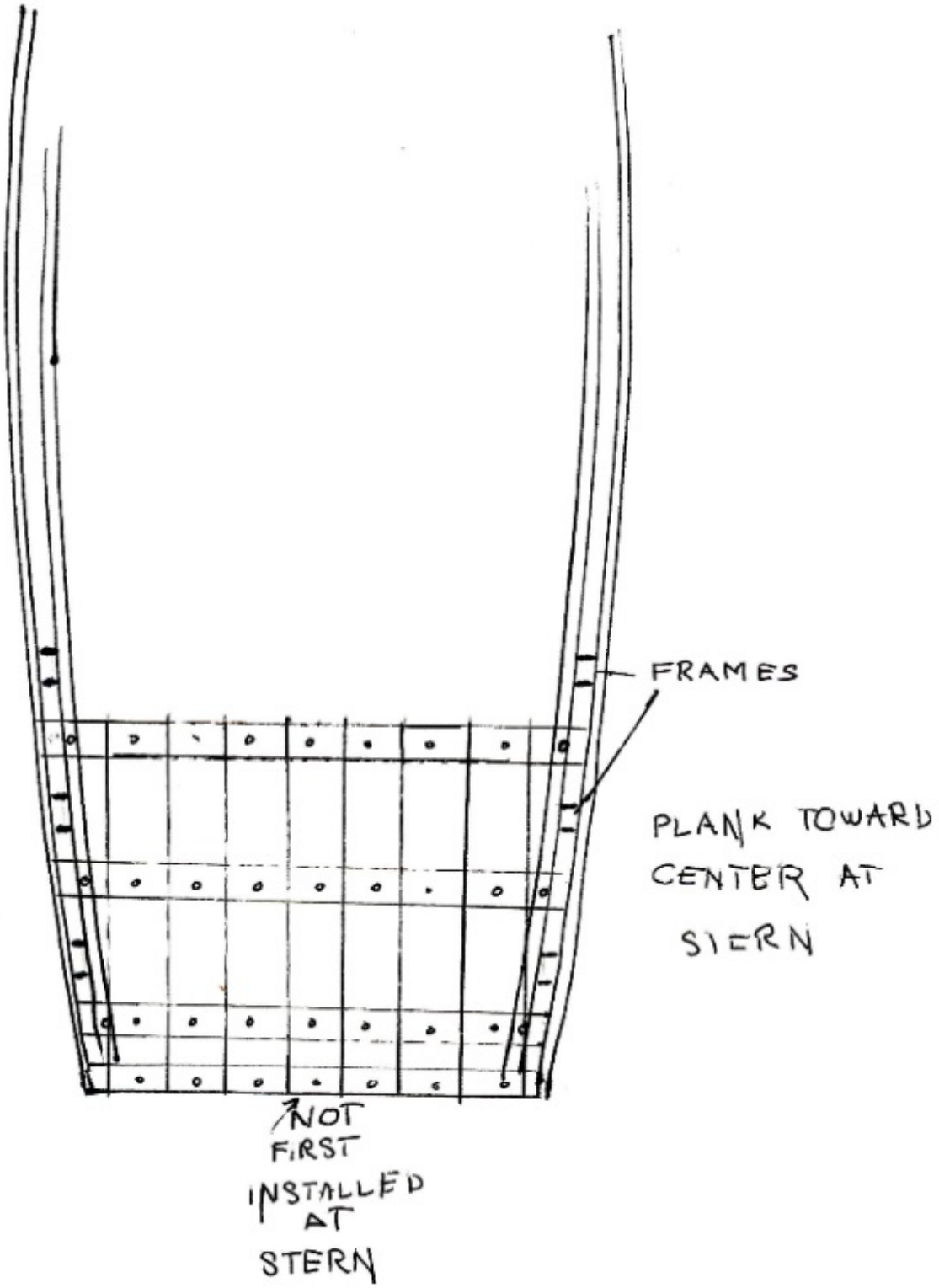


Figure 45. Stern planking.

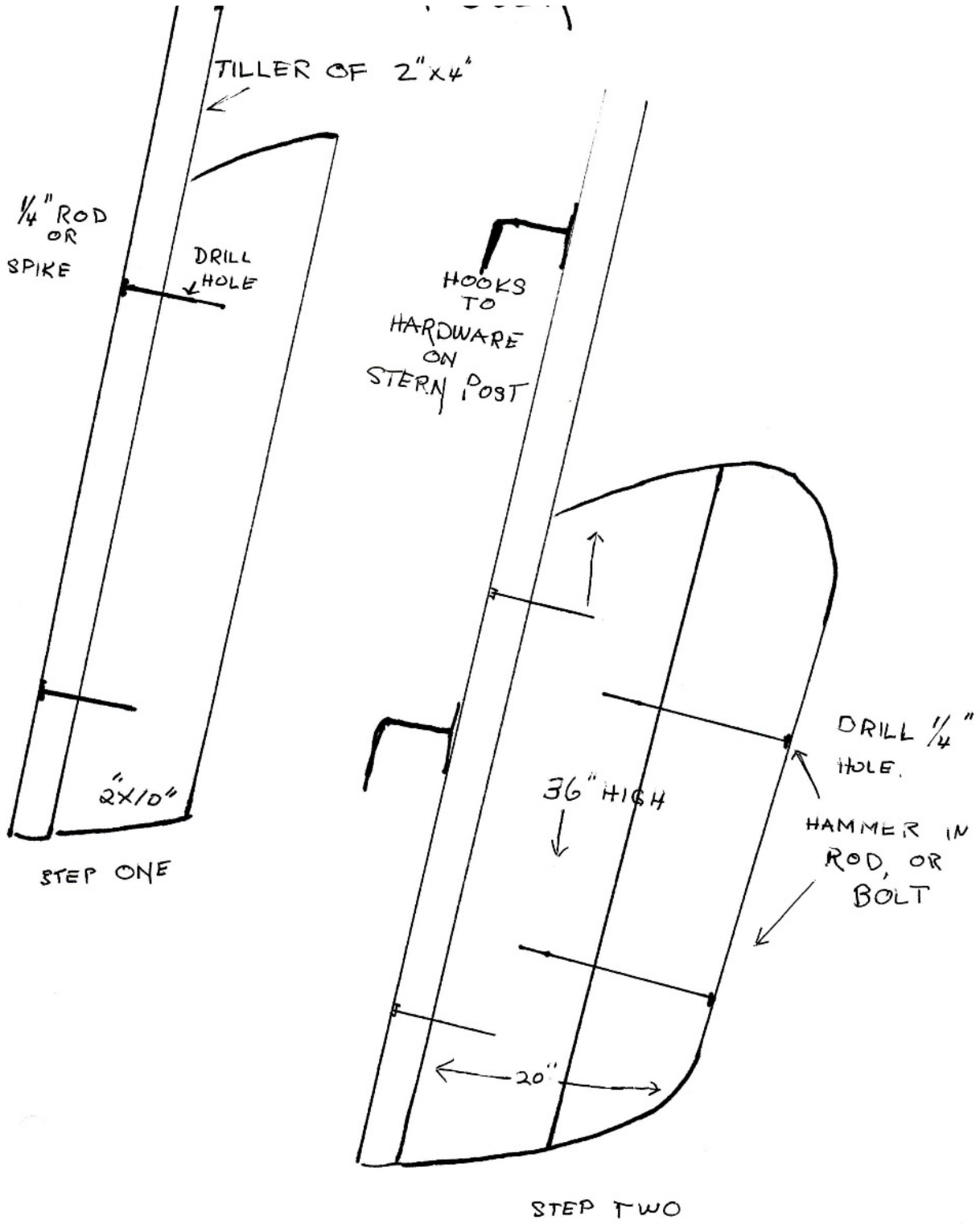


Figure 46. Rudder.

Two, long ½ inch holes are drilled through the first plank and through the tiller. A long nail or sawed off rod is hammered through each tiller hole fastening it to the rudder plank. The back half of the rudder is drilled in a similar way, with the holes extending into the plank that is attached to the tiller. The second rudder plank is then attached using nails or long rods. The rudder should be 36 inches high and 20 inches front to back. It should be planed down to exposed suitable thickness and rounded off at exposed edges. The tiller continues up six inches over the stern post. Hooks are put on the tiller, Eyes are put on the back of the stern post and the rudder hooks put through the eyes, and held with pins. Tiller handle is fashioned and inserted through a hold cut into the tiller and protruding out the back, where a pin is inserted through to hold. In years gone by, rudders were made of lignum vitae, but this wood is no longer available as all the trees have been cut down.

Mast for Sunrise II will be 19 feet tall (Figure 47). Up until Donna in 1962, young pines from Middle Caicos were used for masts. Salt intrusion killed these trees and today, although young pines are again growing, they are not straight and are unsuitable for masts. The mast begins at 3½ inches diameter and tapers to 2½ inches at the top. The bottom of the mast is squared off to about·2 inches on each side. A block of wood, called a "mast step",--made from a 2 x 4 inches or 2 x 6 inches is indented--a square the exact size as the mast base--is chiseled out for a depth of 1/2 inch. This block is nailed onto the keel at the bottom of the boat. A hole is cut in the deck the exact size as the mast at that distance from its base. This hole is reinforced with a wood trim under the deck. The mast goes in front of the fifth frame. Near the top of the mast three wooden cleats are installed. These are wooden nobs, 1 inch wide by 3 inches long, which keep the three shroud lines from slipping down the mast. Shroud lines are permanently looped, then slid down over the mast and fastened at the port and starboard deck edge and the bow. Shroud bottoms are fastened to ropes, which are tied onto rings--one at the top of the Stem post, and one on each side rail 1 foot behind the mast.

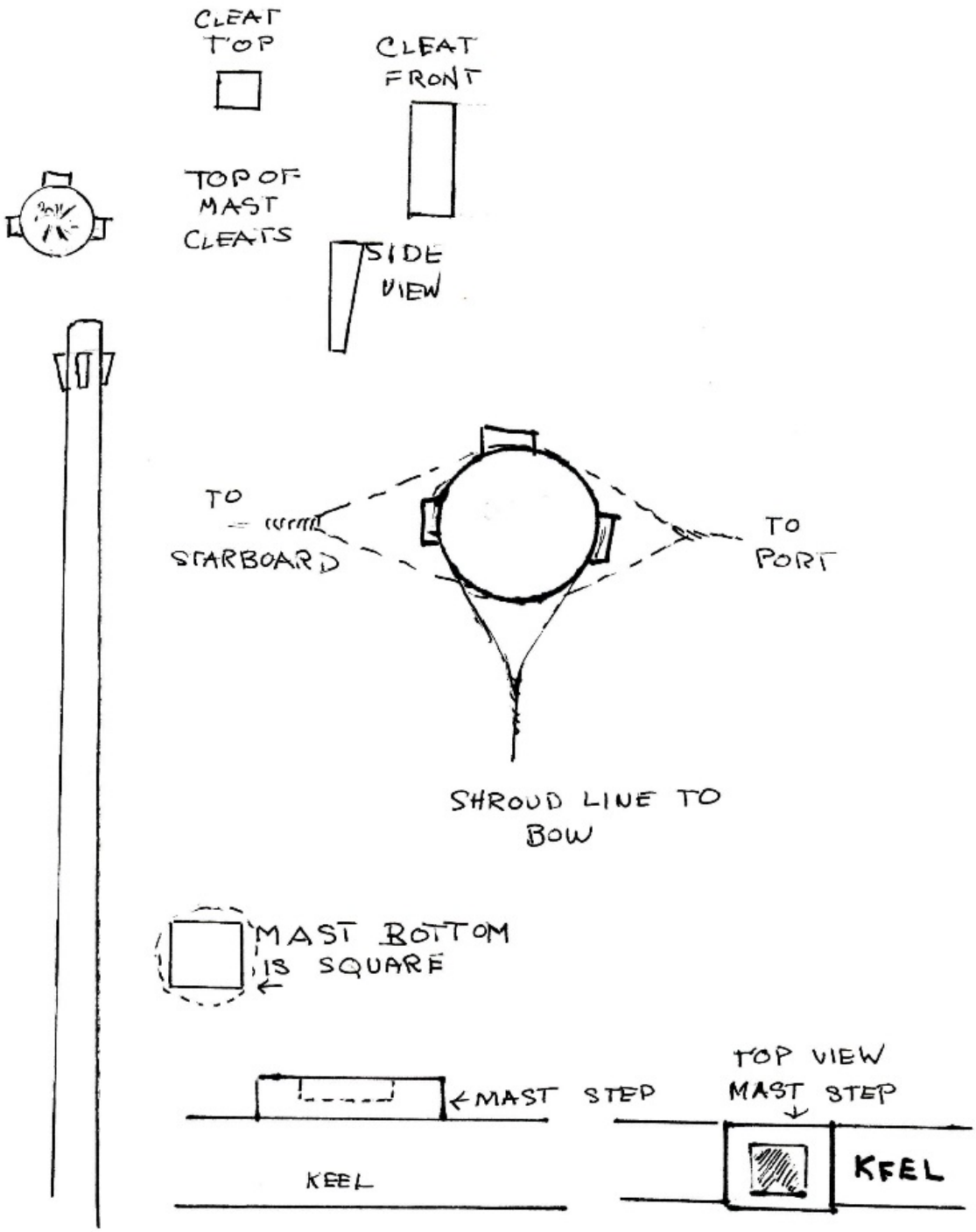


Figure 47. Mast.