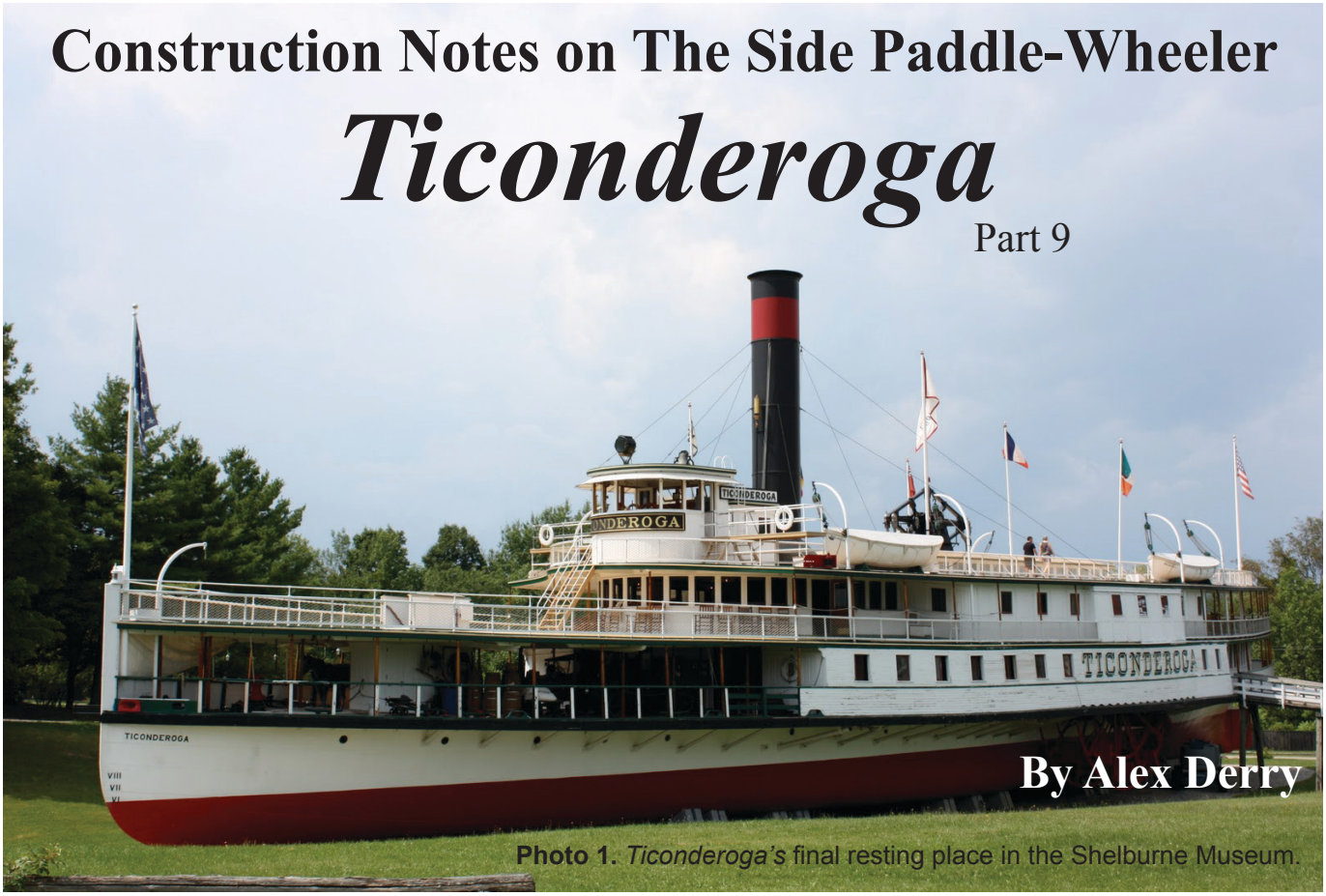
Construction Notes on The Side Paddle-Wheeler

Ticonderoga

Part 9



By Alex Derry

Photo 1. *Ticonderoga's* final resting place in the Shelburne Museum.

Welcome back to the ninth edition in the series. Last time I discussed the build of the second deck including the LED circuitry and the exterior of the living quarters including the companionway for the forward staircase from the first deck. **Photo 284**, which you have seen before, shows these structures resting on the deck but unattached. What I haven't discussed was the method used to mount the pillars found supporting the forward cargo deck and the aft salon. These pillars were milled from bamboo since the real pillars were wooden. As was mentioned previously, bamboo is the only parallel-grained wood like substance that could tolerate the milling process. In both, the forward and aft areas support beams included longitudinal ceiling beams that ran under the ceiling joists as is seen in **Photo 285**. Before the deck went on, the pillars were slid down through holes bored into the longitudinal support beams, adjusted for vertical and then glued in position. **Photo 286** shows the salon arrangement. The real difficulty in this strategy is finding the vertical alignment. Because the deck has a camber, it isn't possible to use a customized square as it was for the fore and aft plane. The only way to accomplish this was to use the existing vertical references found in the wood paneling backdrop.

Photo 284. The walls for the second deck are arranged in their places waiting to be fastened down.

This took time and effort, and I made a mental note not to repeat this strategy for the final pillar arrangement created by the third deck support aft. The results were satisfactory in both regions.

The deck was then fastened in place. That sounded like it was a straightforward process, however, it was not! The difficulty was to fit the

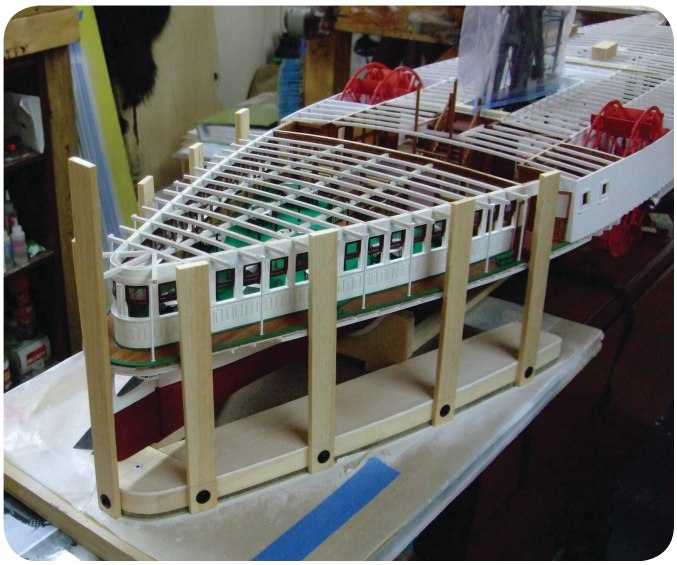


Photo 285. The support beams for the salon include the longitudinal ones, provided support for the ceiling joists.

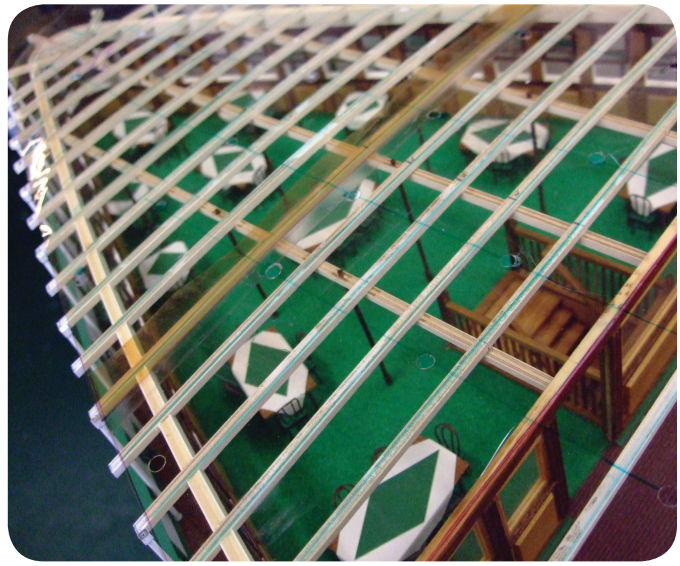


Photo 286. The pillars are slid down through holes drilled into the longitudinal beams, adjusted to the vertical axis and then glued in place.

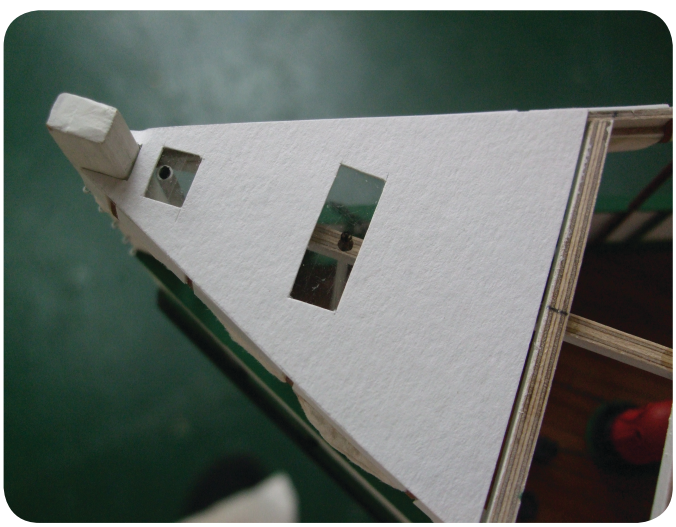


Photo 287. A paper jig was made for the forward area of the bow.

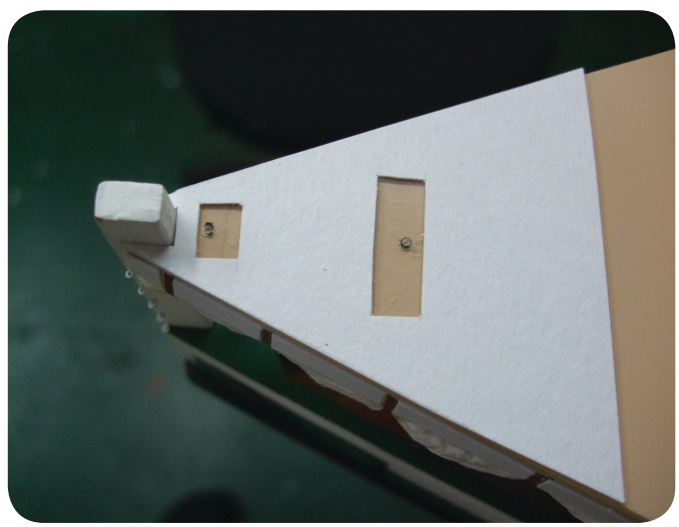


Photo 288. The deck was prepared to fit over the stem by using the jig to outline the area that needed to be removed to accept the stem.

large deck onto the support structures in its correct position on the first try since the glue would contact the ceiling portion of the deck. Any shifting would then smear onto the ceiling's simulated tongue in groove, spoiling its texture and becoming a visual problem! It didn't help that the deck is sixty inches long and therefore hard to manage. What I needed was a system that would act as registers for the alignment. The foredeck offered the first register at the stem as the deck needed to be adjusted to allow it to fit over the stem. **Photos 287** and **288** show the paper jig that I used to mark the foredeck for cutting and the resultant fit. Also, the locations for the forward flagstaff and the anchor davit were set using the paper jig and drilled. The second register needed to be aft. **Photo 289** shows the deck in position over the salon area and the ceiling joists creating the support for the deck. By dry positioning the deck onto the model in its correct location I could mark off the ceiling joists for trimming. Once they were trimmed, they became a second reference to the proper location for the deck. I still hadn't totally solved the problem. My plan was to locate the deck at the bow first and then focus on the stern, however, due to the length of the deck I needed to brace the deck at intervals using 5 mm square wood stock that could be placed across the model. In this way, I could align the aft portion of the deck while it rested on these braces out of reach of the glue. Once aligned and secured,

I could begin removing each brace starting from the most forward allowing the deck to slowly sag onto its correct position. The next question was, what choice of glue would be best for this job? A long curing epoxy did the job nicely. I chose the locations for the braces during many rehearsals and marked them. This allowed me to avoid applying glue there. The epoxy is viscous which is a double-edged sword since it won't drip easily but it will offer some resistance to its application. As you have seen the deck rests on a web of joists forward and aft and amidships. These are narrow surfaces so care was needed to avoid any excess of glue, which might squeeze out during compression of the deck later. Also, the viscosity of the glue causes it to stick to the applicator, which can cause tendrils to form. These if you are not careful, can drape between beams to end up on the model below.

"D-Day" had arrived and after all the rehearsal and careful application of the epoxy the deck went down into position without a hitch. Weight was applied evenly to the deck surface while the cure of the glue was complete. Remember that the deck was painted at great effort so during this stage more care was needed to avoid any glue intrusion onto the upper surface of the deck and a barrier was applied to protect the paint from the weights. Before this last stage began one final check for the LED continuity was made before the deck was fastened!

Once the deck was in place the water boards needed to be attached along the edges of this deck. **Photo 290** shows the water boards in place along the edges of the deck up to the curved aft end of the deck. The white sheet of styrene has been tailored to fit the ends of the existing water boards on each side and to conform to the curve of the deck edge. The next step will be to mark the curved edge to create a curved water board with a consistent width throughout the curve. This takes patience and time to perfect. Laying the water boards fore and aft required that the surface of the deck be altered as the simulated canvasing is in the way of a proper adhesion. **Photo 291** shows the adjustments required. I used a # 11 scalpel with a new blade to score the deck so that the material could be removed without risking any blemish on the remaining deck. The material to be removed is reasonably soft since it is a talc filler and a small gaged styrene strip. Painted styrene strips were glued onto these edges carefully avoiding any glue contamination. The next task was to attach the walls of the various buildings to the deck. Each wall except that located outboard that house the Paddle-wheels, needed to be carefully located and base

Photo 289. The deck is resting on the ceiling joists after they were marked and cut back to align with the edge of the deck.

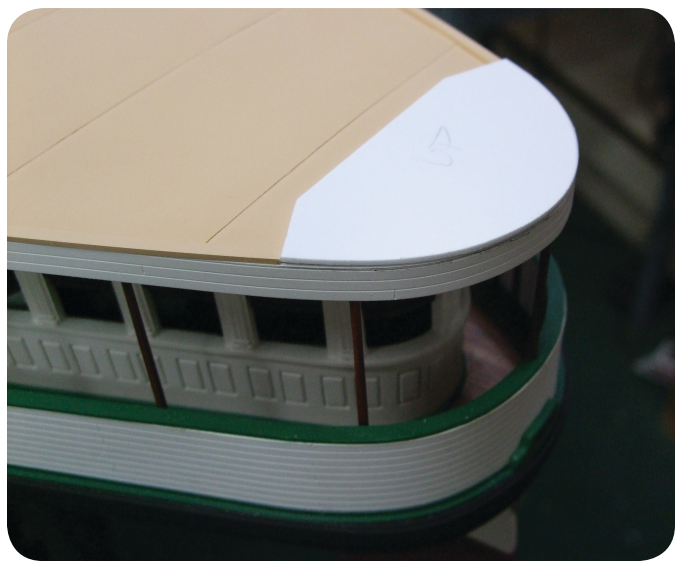


Photo 290. The water boards that run fore and aft have been put in place. The white styrene piece must be aligned against their butt ends and cut to form the curved water boards at this location.

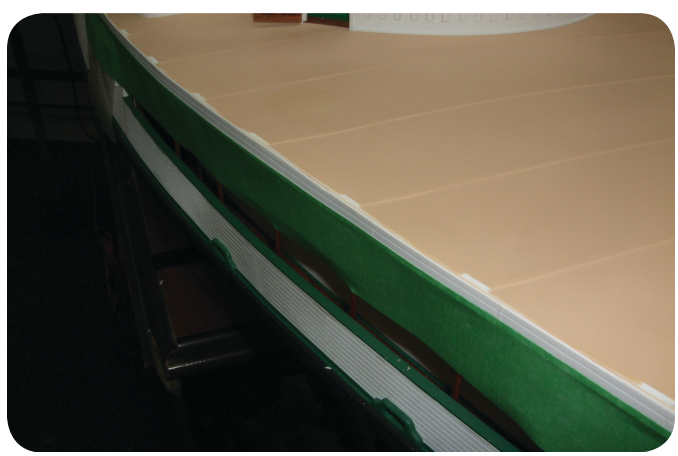


Photo 291. The simulated canvas deck must be carefully removed at the edges to accommodate the water boards.

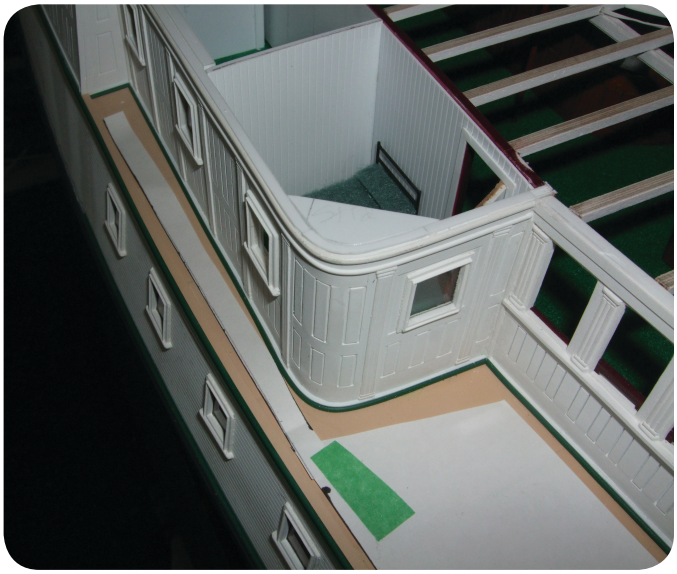


Photo 292. A composite baseboard trim was added to finish the walls and to add attachment surface area.

Photo 293. The long paneled walls are in place.

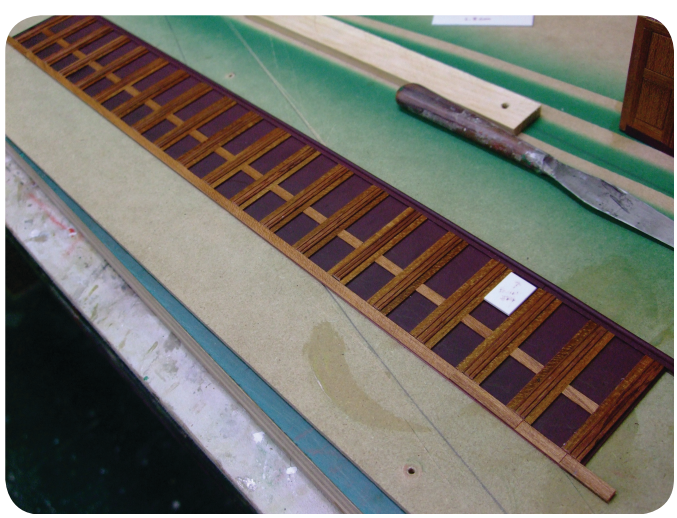


Photo 294. The wall partially paneled. The white jig was used to standardize the distance between the vertical frames.

trim added. **Photo 292** shows a section of the walls that have been finished. The base trim was made from a combination of two styrene pieces. The one closest to the wall was a square shape which, was wide enough to match the depth of the pillar façade on the wall and then a quarter round of the same dimension painted green added as is seen in the photo.

Photo 293 shows the completed interior of the second deck. I want to share some of the discoveries that I made during the build of this section of the model. Starting with the four doors that provide access to the outside, these were built in the style discussed earlier in the series. It is important to model the methods used to secure these doors in an open position. I used two methods wedges and tethering. The doors are open as they would be in the summer to promote air movement. Open doors give the viewer access to the interior. The first thing that I did on the interior was to build up the two walls that run fore and aft as is seen in **Photo 293**. These are large sections that demanded patience and precision. The wall enclosed various rooms and the paddle-wheel compartments. I chose to model the four staterooms at the four corners so doorways needed to be included. **Photo 294** shows the full wall. The white rectangle is a jig used to set the vertical panel frames at uniform spacings. The wall was built up on styrene backings since the interior walls of the four staterooms would require a tongue in groove design. The side for the wood application was plain and painted maroon to provide colour contrast. This is one of my discoveries that made a huge improvement in my efforts to model all wood raised paneling. **Photo 295** shows a more detailed image of the wall. I created fluted pillar facades which formed the centre of the vertical frame of the paneling. The jig shown here was used to set the height of the horizontal framing. **Photo 296** shows a portion of the finished wall including a door opening. You will notice that the panels are carefully fitted so that there is a small amount of space on all sides within the framing. The maroon backdrop highlights the edge of the panel and so gives it depth. At first when I tried this with perfectly fitted pieces one could not distinguish the panels as it all blended into each other. **Photo 297** shows the four doors for the staterooms. Once again the maroon makes the difference.

Photo 298 shows one of the long walls in place along with two other enclosures. In both of these cases, the enclosure walls are laminates. The inner walls are tongue in groove styrene while the exterior is a variety of wood layers. The rectangular

Photo 295. The white jig shown here sets the height of the horizontal Frames. Note the pillar facades that are found centrally in the frame.

Photo 298. Two new structures have appeared. Note the feed wires for deck three will pass through the space enclosed by the rectangular structure.

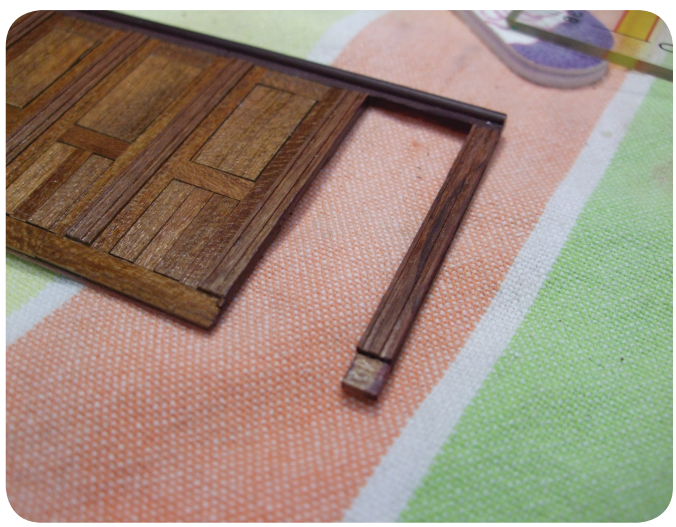


Photo 296. The paneling is finished. Note the effect that the maroon highlighted spaces create.

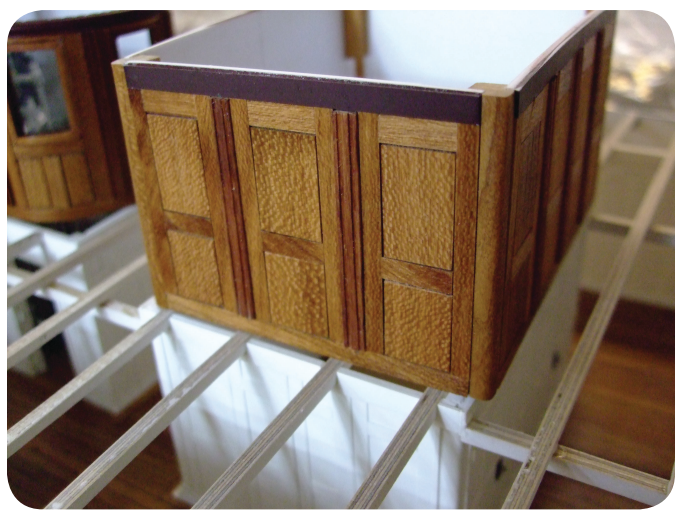


Photo 299. This image shows the arrangement of the enclosures that would allow the stack to pass through.

Photo 297. The finished door for the four staterooms.

enclosure is for the machinery that moves up from the boiler rooms below such as the smokestack. It also housed storage areas, and so had access doors. **Photo 299** shows you this room as it would be positioned on the structure below. You will note that another rectangular room is found below and below that would be the boiler rooms. From this image, one can see that the corners of this room are rounded. To solve the technical complexities of this build I used a rectangular piece of black cherry wood, rounded on one corner and milled the slots for the walls. The hardware for the four doors hasn't been added as of yet. In **Photo 298** you will have noticed that the feed wires for the lighting is present. They will provide for the circuitry in the third deck. The enclosure for the engine was more complicated as it had a rounded end with windows and at the other end the mirrored backdrop for the first landing of the grand staircase. In **Photo 298** you can see that a curious passenger could peer

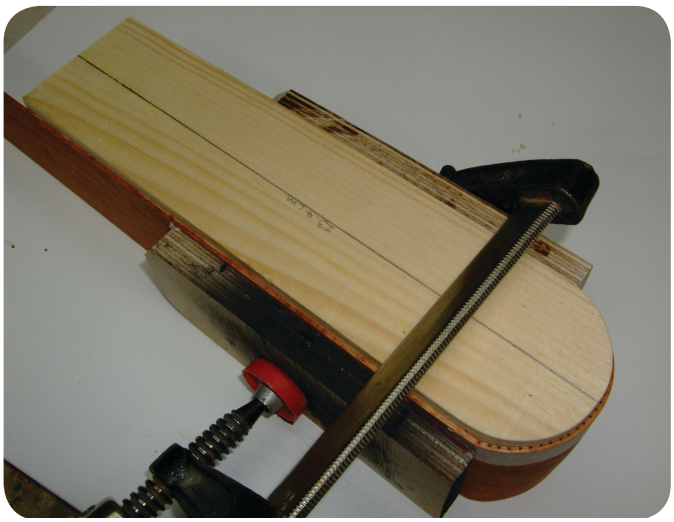


Photo 300. The jig for the engine room enclosure being used to hold the basswood while it dries.

through the windows into that space to see the engine fluidly moving through its paces.

The build of the engine enclosure required another jig. I built it up from clear pine. **Photo 300** shows the jig and a basswood first layer of the lamination. Note that the basswood has been relief cut to allow it to easily conform to the demands of the curve. It has been soaked and then clamped. The three observation windows were cut once the basswood had conformed to the curve as is shown in **Photo 301**. The build-up of the paneling is shown in **Photos 301 – 305**. The wood was treated with a blend of oil-based stains by Minwax which as you see in the images gives the wood a rich semi-gloss texture. I have since discovered that Varathane has a stain that is water based called Toscan which gives the same color however it

ADD REMOVED

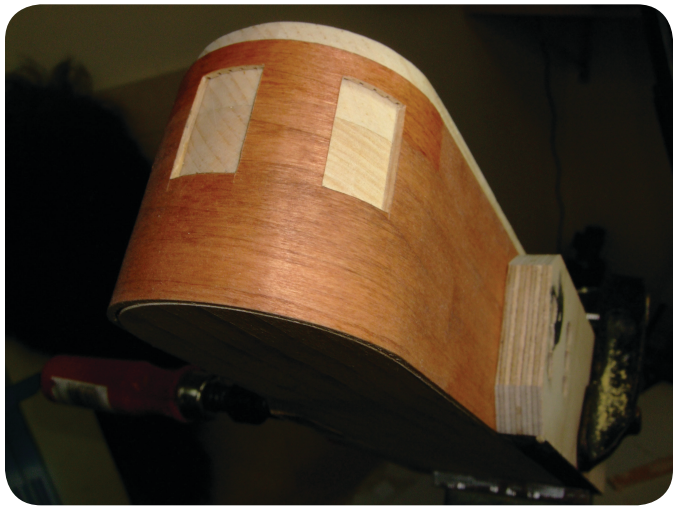


Photo 301 to 305. The steps in paneling. Note in the photo above the window frame has been added.

needs to be treated with a varnish to achieve the same texture. Their varnishes are offered in oil base or water base. The water base dries quickly which was both an advantage and a disadvantage depending on the job application. The opposite end of this structure was flat and required a peeked façade. **Photo 306** shows this structure in progress.

I chose to design into the wall a slot to accept a real mirrored surface as is seen in **Photo 307**. **Photo 308** shows there is some work yet to be done to finish off the upper portion of the grand staircase such as the railings and newel posts.

Photo 309 shows that the observer would have a clear view of the engine. I wanted to illuminate the space below where the engine control room was since a keen observer would be able to see into this space. Three LEDs were built into the rounded end of the building that overlooks the control room. **Photo 310** and **311** shows their arrangement. Note that power for these will come from a feed that drops down from the third deck. Illumination also was placed at the other end of the lower engine room. **Photo 312** shows the circuitry which received its feed from the second deck.

Photo 313 shows the third structure found on the second deck. This will be placed under the future location of the wheelhouse. Its function was to provide a conduit in which the gear such as steering and telegraph cables, would pass. Another detail

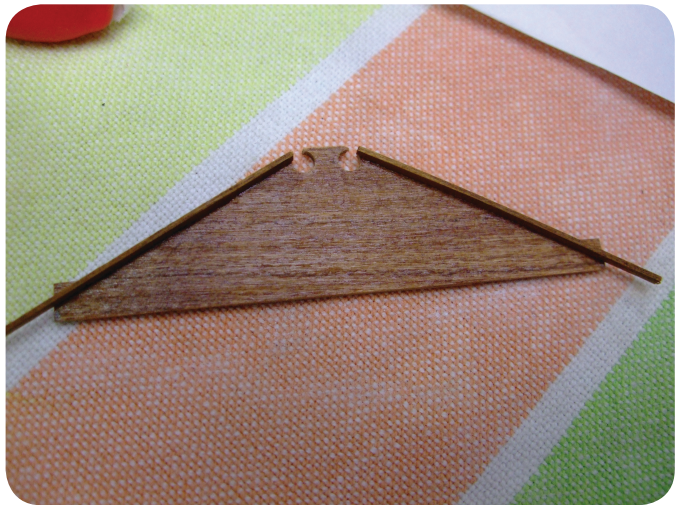


Photo 306. The peeked façade in progress.

Photo 307. The enclosure in place at the first landing of he grand staircase. A real mirror has been included.

Photo 308. The railings and newel posts for the staircase have yet to be finished.

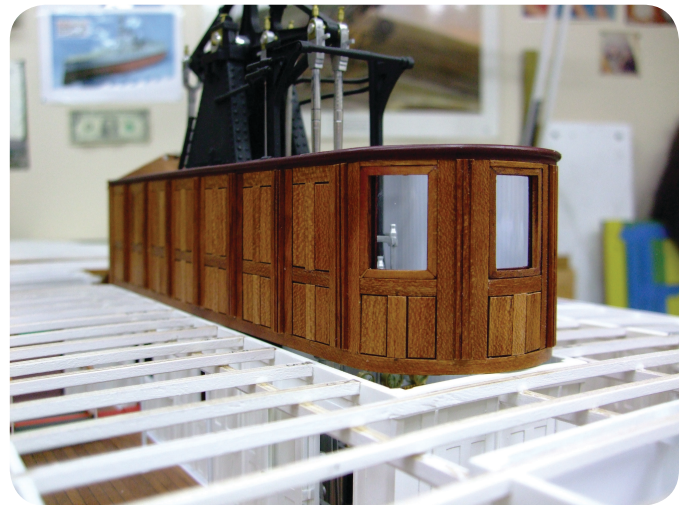
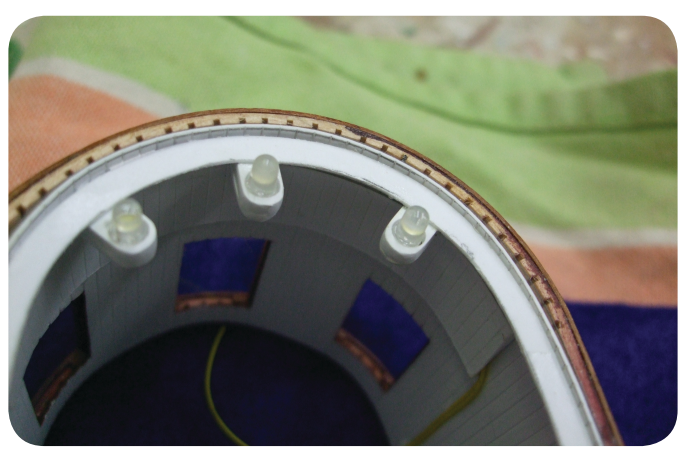


Photo 309. One can imagine the view that a curious observer would have while looking through the windows.

Photo 310 (above) & 311 (below). The arrangement of the LEDs that will illuminate the control room for the engine.



that needed to be attended to was the completion of the railings surrounding the entrance of the grand staircase as is seem in **Photo 314**. I built a jig that helped me to set the spindles into the base frame by holding them in place while others were put in place. The jig shown in **Photo 315** also provided a guide for the height of the spindles. The finished structure is shown in **Photo 316**. Newel posts and short banisters have been added to the second deck to help tie into the banisters leading down the staircase.

Once these details were completed my attention turned to the development of the longitudinal support beams and the placement of the ceiling joists. This was a complex process that was also contingent on the placement of the turtle deck. **Photo 317** shows the unfinished turtle deck resting on the longitudinal support beams. The first step was to arrange the longitudinal beams. I built four jigs that served to hold the beams in place so that I could adjust their positions while fitting the base frame of the turtle deck. **Photo 316** shows these in place. The jig needed to be built to compensate for the camber of the deck, provide a consistent height and needed to be free standing. **Photo 318** provides a better view of the jig. As is shown in **Photo 319**, the difficulty here was adjusting the length of these beams so that once fitted against the interior wall of the enclosure, its position was centered within the space plus the width provided would support the sides of the turtle deck. The turtle deck was built up on a jig shown in **Photo 320**. The base frame was built up from laminations at the rounded ends and straight plywood pieces. Also, I needed to enlarge this frame by the width of the wall of this structure. The completed frame is shown in **Photo 321**. Before the 2 primary longitudinal beams were fitted and fastened holes were drilled to accept the pillars needed. **Photo 322** shows the pillars installed and the addition of the central longitudinal beam which is fitted between the two main structures. Notice that the base frame rests on the full width of the longitudinal beam. I needed to attach to the outboard side of these beams a angle iron so that there was an extension offered for the ceiling joist support. The angle iron is shown in **Photo 323**. In this photo one can see the joinery for the joists as they align to the curvature of the turtle deck. Finally, **Photo 324** gives an opportunity to see the joinery of the joists to the outside paneled wall. The actual beam joist would have passed through this wall to end at the exterior wall however, I chose not to model this detail. One more mention regarding the turtle deck arrangement. **Photo 323** shows the wiring passing from the turtle deck into the machinery enclosure.

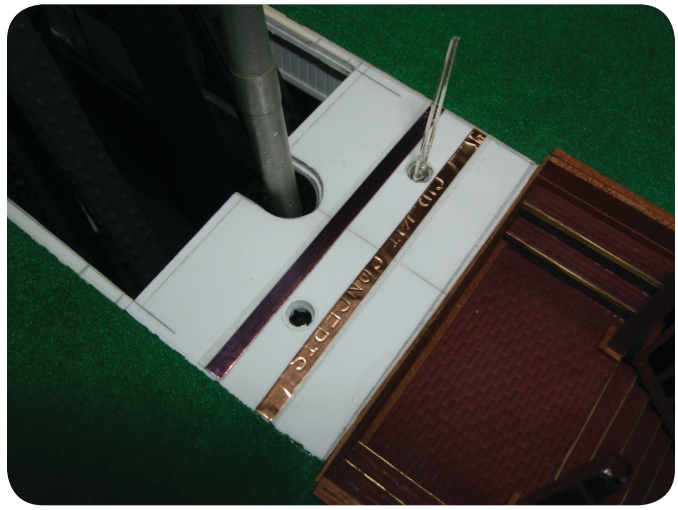


Photo 312. The circuitry for the LEDs that will illuminate the opposite end of the engine room.

Photo 313. The third structure found on this deck served as a conduit for the gear that passed down from the wheelhouse on its way to the machinery.

Photo 314. The unfinished edge of the grand staircase.

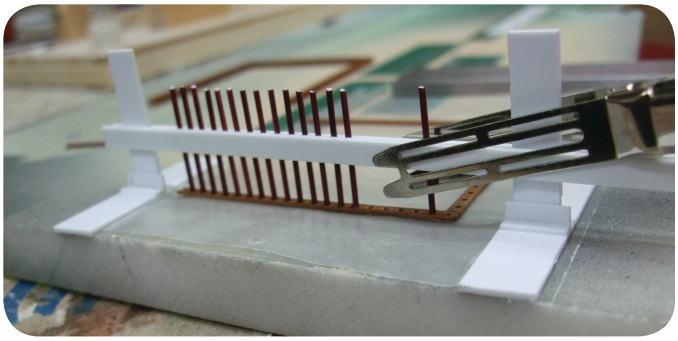


Photo 315. The jig held the spindles vertical for gluing and guided their trimmed height.

Photo 316. The finished structure included newel posts and banisters that connected to the existing banisters on the stairs.

Photo 317. The unfinished turtle deck rests on the longitudinal support beams.

Photo 318. A closer look at the beam jig that needed to be self-standing and conform to the camber of the deck.

Photo 319. Determining the correct length of these beams proved difficult as they needed to be located relative to the center of the space and match the width of the turtle deck.

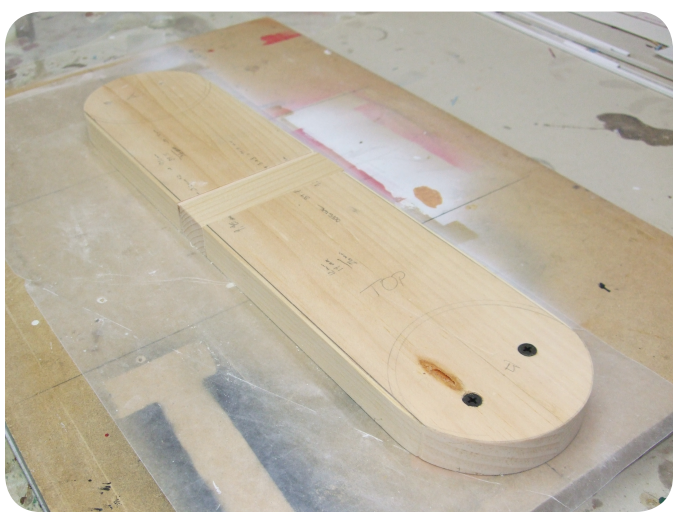


Photo 320. A jig was built onto which laminates could be built up for the turtle deck.

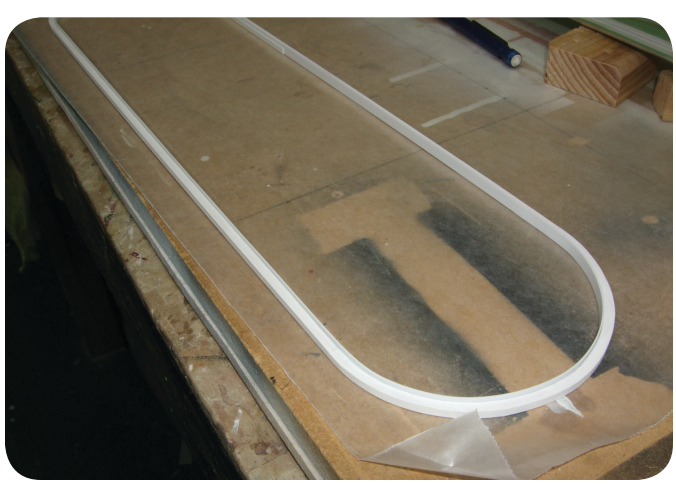


Photo 321. The finished base frame for the turtle deck.

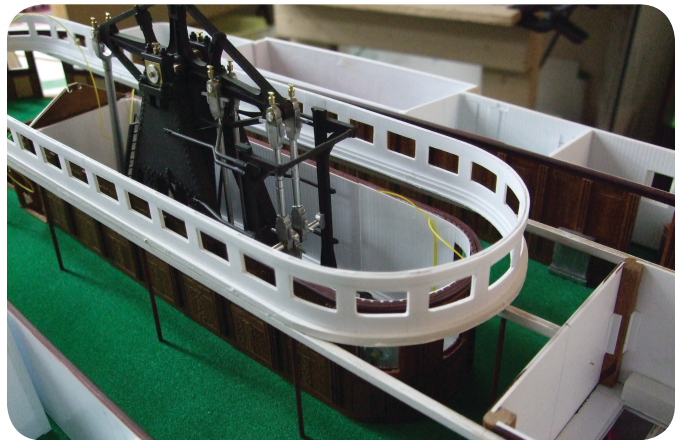


Photo 322. The center longitudinal beam has been attached.

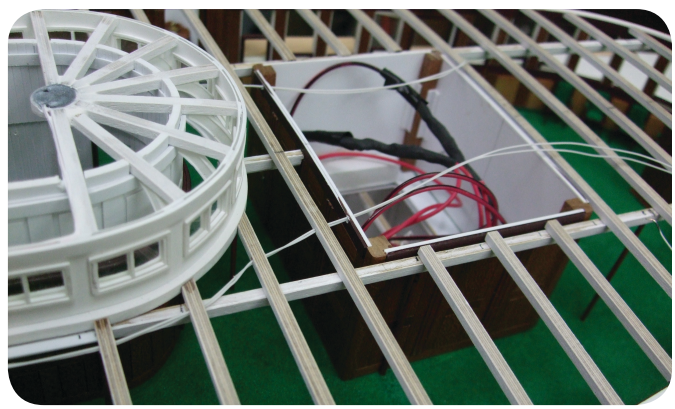


Photo 323. Angle irons have been added to the longitudinal beam to provide a surface on which the joists can rest.

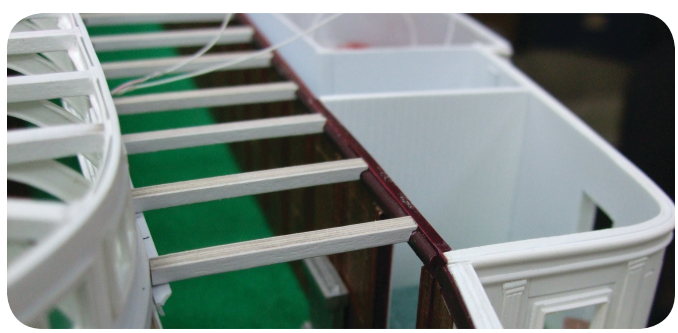


Photo 324. The joinery for the ceiling joists.

These wires will be joined into the feed coming from the next deck to be applied to allow their illumination.

Next time I will continue with a more detailed discussion about the build of the turtle deck and then the next deck. Fitting this deck was another challenge! Following that discussions will include the wheelhouse, lifeboats and their gear plus the remaining upper deck structures. We are approaching the final steps in this project. In the meantime enjoy your projects.