

MECHANICAL BRANCH MODELS



GENERAL INSTRUCTIONS

FOR

Assembly and Finishing

**20,000 GALLON CAST IRON
WATER TANK AND STEEL
STAND KIT
(WITH ALKALINITY PLANT)**

**FROM 1st OCTOBER, 2017
(And Until Further Notice)**

PART II

Mechanical Branch Models take pride in the accuracy of their products. However, sometimes compromises have to be made to enable assembly. Parts are as thin as possible which means they are easily distorted and damaged. Always exercise care when handling and assembling parts.

It is recommended that soldering be used for assembly, unless otherwise noted. Drill holes prior to removing parts from the fret.

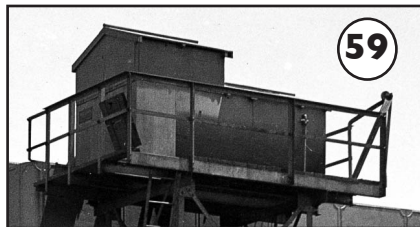
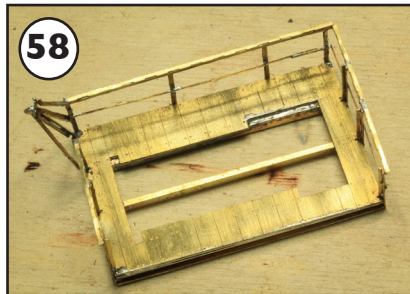
Remove etched parts from the fret only as they are required so that they can first be identified.

D4. Handrail Assembly

Handrails were provided for the protection of employees around three sides of the top platform. These were fabricated from steel bar and angle as in the drawing below.

Pay particular note of the orientation of the angles to ensure they are folded correctly before soldering. The jib is a complicated fabrication the best way to work it out is to carefully study the drawings and figures provided.

To simplify handling and assembly, the handrails have been designed to be formed up and aligned using dowel holes before soldering together as indicated.

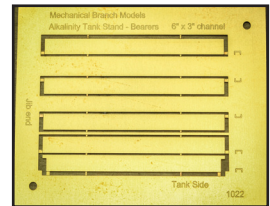


D4.1 Platform

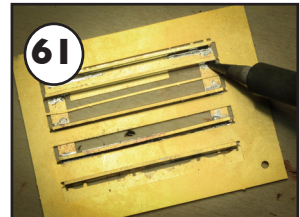
D4.1.1 The channel sections supporting the top platform are etched in the correct relationship to each other so that they can be folded up and soldered in place while still attached to the frame. This will ensure they are correctly positioned and parallel.

Fold along the fold lines to form the channels as shown in Figure 60

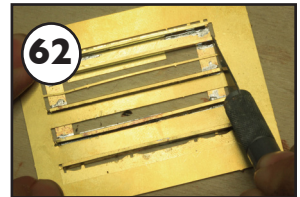
60



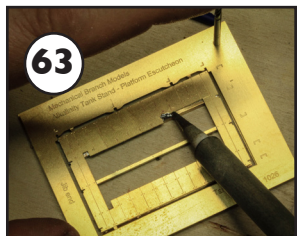
D4.1.2 Align the channels with the top platform etch and solder the flange of the channel to the platform. Figure 61.



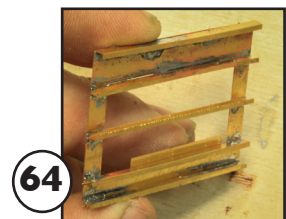
D4.1.3 Cut the channels from the frame. Figure 62.



D4.1.4 Turn the platform over to solder the platform escutcheon onto the platform. Solder the channels from the top for extra reinforcement.



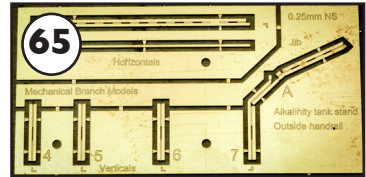
D4.1.5 The completed platform assembly. Figure 64.



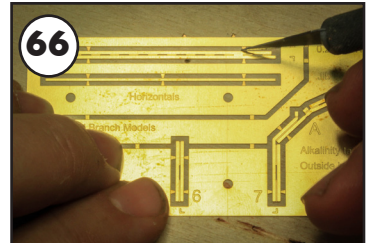
D4.2 Outside Handrail

Refer to Figure 57 for the orientation of the angles making up the handrails.

D4.2.1 Identify the etch for the outside handrail. Figure 65



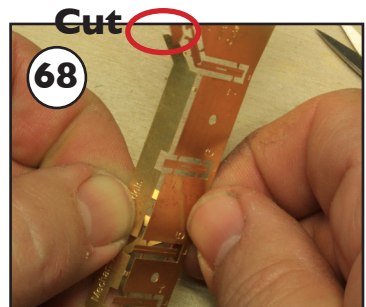
D4.2.2 Cut along the top of the top rail only. Figure 66



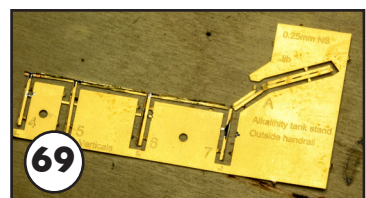
D4.2.3 Fold the top rail along the fold line. Figure 67



D4.2.4 Remove the frame for the horizontal rails. Cut as shown and fold the frame over. Figures 68 and 69



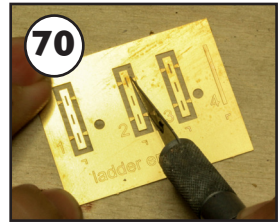
D4.2.5 Once you have a assembly like this, align the horizontals using the dowel holes in the frame and solder to the verticals. Remove from the frame. Figures 68 and 69



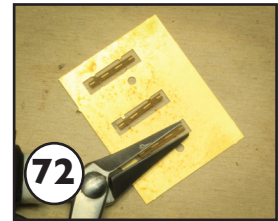
D4.2.6 Guided by Figure 57, fold up the jib.

D4.3 Ladder-end Handrail

D4.3.1 Identify the vertical angle iron etch and cut through the tabs on the right hand side only. (Figure 70)



D4.3.2 The right hand sides of the vertical angle-irons are folded back in to the plane of the etch, so that from above they look like Figure 71. Folding can be done with flat bladed pliers (Figure 72).



4 3 2 ⑦① 1

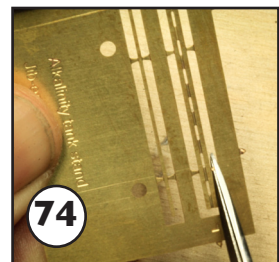
Ladder-end, top view



D4.3.3 Cut the tabs along the top of the railing and form the angle by folding the top half of the angle towards you. Figure 74.



D4.3.4. The frame of the horizontal railings is aligned with the vertical frame and the railings soldered to the verticals where they intersect. Figures 75 and 76.



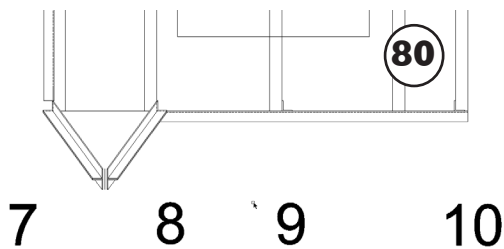
D4.3.5. Align the bottom of the vertical angles with the 'U' shaped openings in the platform and the supporting channels and solder in place. Refer to Figure xx for the **correct position**.



D4.4 Jib-end Handrail

D4.4.1 Assembly of the jib-end handrail is similar to the outside and ladder-end handrails. The jib is convoluted and is best illustrated by the Figure 57, 77-80.

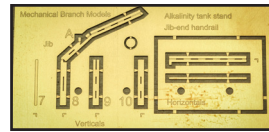
D4.4.2 The left sides of the vertical angle-irons are folded back in to the plane of the etch, so that from above they look like figure 80.



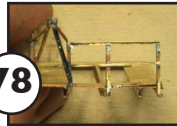
D4.4.3. The frame of the horizontal railings is aligned with the vertical frame and the railings soldered to the verticals where they intersect. **Support the etch frame of the verticals to protect the folds made in 4.4.2.**

D4.4.3. Align the bottom of the vertical angles with the 'L' shaped openings in the platform and the supporting channels and solder in place. Refer to Figure 99 for the **correct position**.

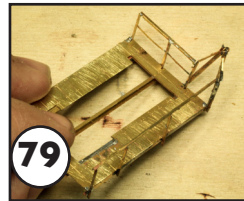
77



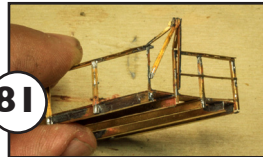
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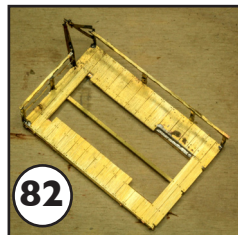
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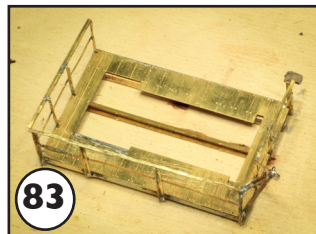
81



82

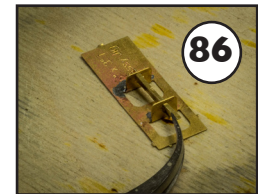
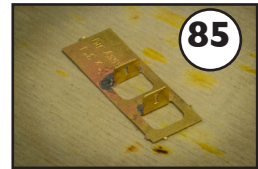
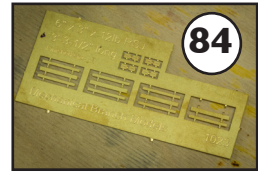


83



D4.5 Assemble platform onto stand

D4.5.1 Assemble the four short 6" x 3" columns (Part no. 1023) using the jig provided (Figure 85). Assembly is the same principle as the longer joists, but more care is required due to their short length. Assembly is shown in Figures 85-89.



D4.5.2 There are eight plates that are soldered to the ends of these columns. It is recommended to join the columns to the plates while they are still attached to fret.

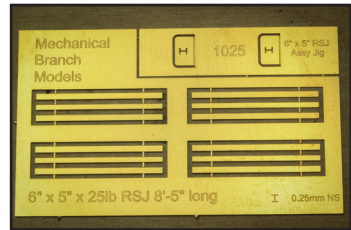


D4.5.3 Attach the columns to the 8"x6" joists as shown in Figures 93 and 101.



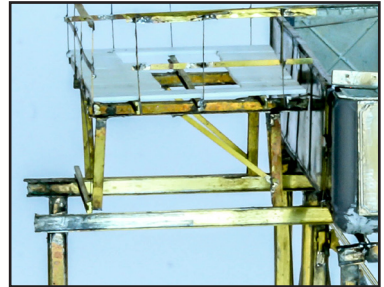
D4.5.4 Assemble two of the 8'-5" long 6" x 5" beams. These sit atop the four short 6" x 3" columns.

92



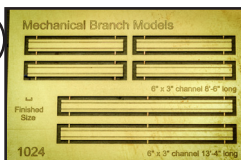
D4.5.5 Place the platform assembly on to the stand in the position shown in Figure 101.

93



D4.5.6 There are two 3" x 3" angles which brace the top platform. These are cut from styrene angle and superglued into place. See Figures 93, 95 and 101 for details.

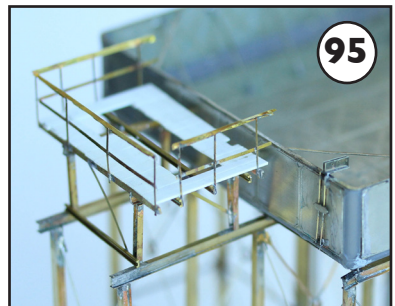
94



the 6"x3" x 8'6" channels are for bracing. Only 1 is required.

the 6"x3" x 13'4" channels are spares for the top platform.

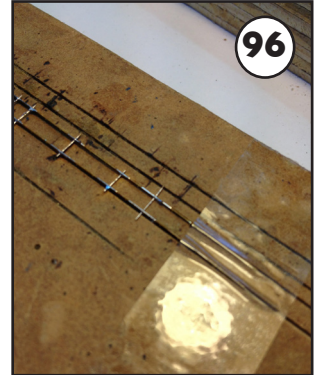
95



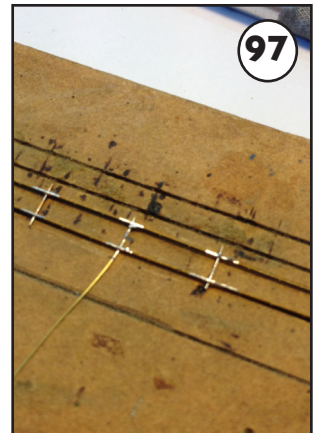
D5. Treatment Plant Stand – Finishing

D5.1 Assemble ladders

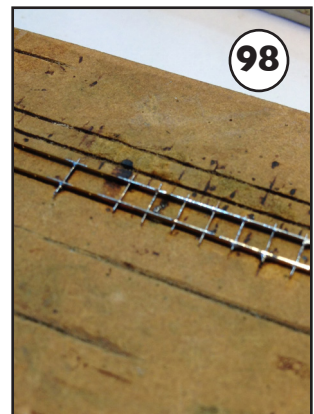
D5.1.1 Fabricate the ladder. It is recommended to use a small length of 12mm MDF with shallow parallel grooves cut into it with a razor saw. These grooves are 13.5" (4.4mm) apart which is the separation between the ladder stiles (note that this is wider than a standard signal ladder).



D5.1.2 Tape down the ends of the ladder stiles and pass some 0.18mm brass wire through opposing holes, at the top and bottom ends of the ladder and one or two at the middle. Check that the rungs are square to the stiles before adding the remaining rungs. Overheating the brass will cause distortion.



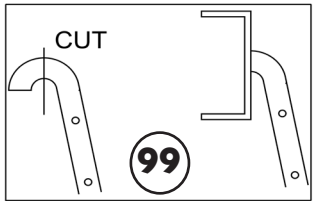
D5.1.3 Ensure that the solder joints are sound before trimming the excess wire either side of the stiles. Solder wick is useful for removing excess solder. Carefully file the stiles to remove excess wire and solder.



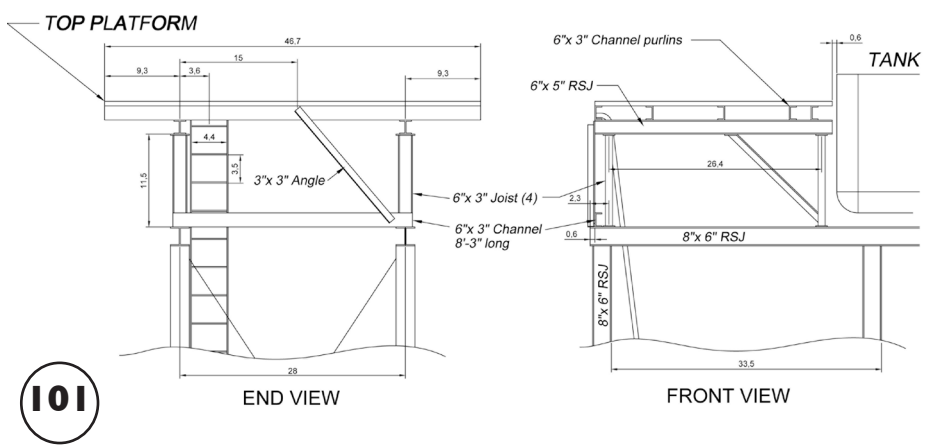
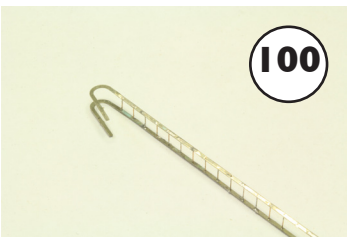
D5.2 Install ladders

Two types of ladder are supplied - the lower ladder with a larger stile at the top to assist in climbing on to the centre landing, and a ladder with a shorter stile which joins below the door flap in the top platform. This ladder can also be used for tanks where there is no alkalinity plant and the ladder reaches from the top of the tank to the ground.

Ladders are arranged as shown in Figure 126. The top ladder is trimmed and attached to one of the beams under the top platform as shown in Figure 99.



The bottom ladder (figure 100) is fed through the centre platform and attached as shown in Figure 126.



Part E: Water Treatment Tank and Piping

E1. Chemical Tank and piping

Part identification

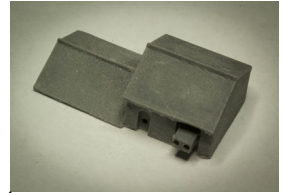
102



Equilibrium valve



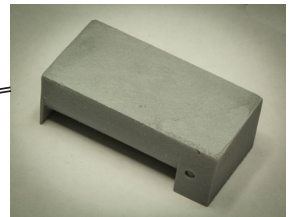
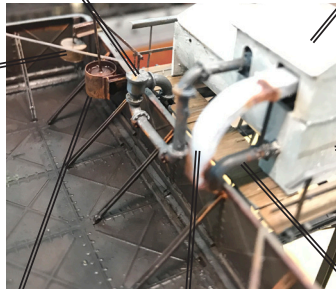
Flanged pipe assembly



Chemical tank cover



Level indicator float



Chemical tank



Tank and valve float

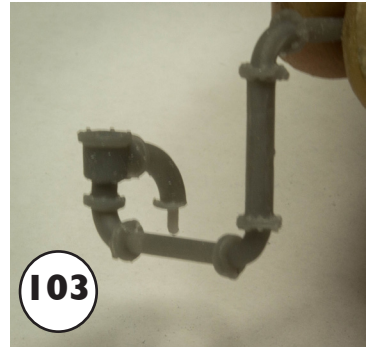


Outlet Chute

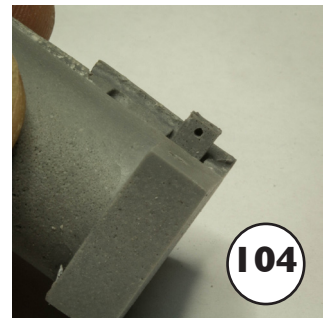


Outlet from Chemical Tank

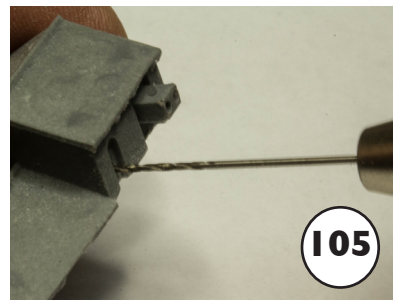
E1.1 Glue the equilibrium valve to the pipe assembly as shown in Figure 103.



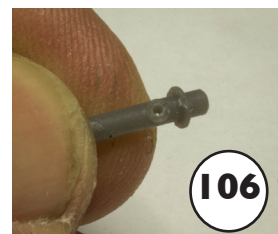
E1.2 Drill a diameter 0.8mm hole under the outlet chute of the chemical plant cover as shown.



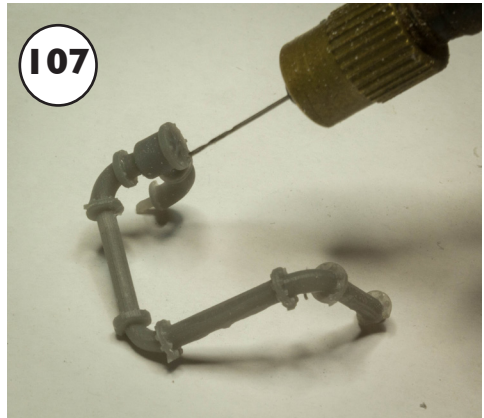
E1.3 Drill out the hole for the piping assembly in to chemical plant cover using a diameter 0.8mm drill as shown. This only needs to be 1.5mm deep.



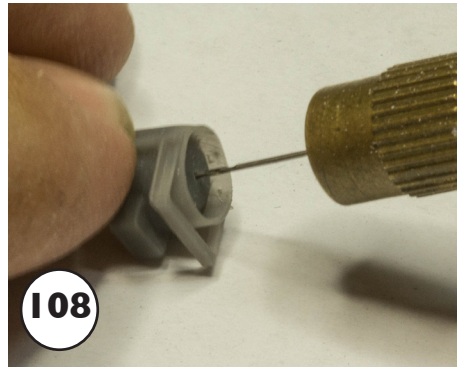
E1.4 Drill out the hole in the top of the Outlet from Chemical Tank pipe using a 0.8mm diameter drill, 1.5mm deep, as shown in Figure 106.



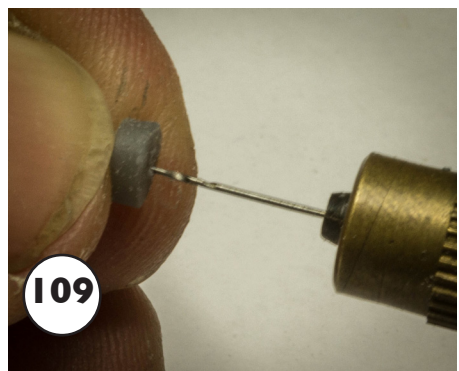
E1.5 Drill a 0.4mm dia hole in the top of the centre of the Equilibrium Valve 2mm deep, as shown in Figure 107.



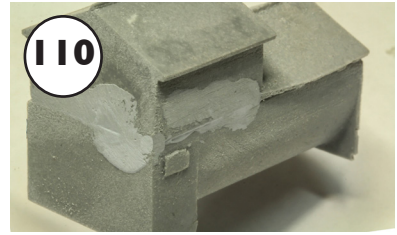
E1.5 Drill a 0.4mm dia hole in the top of the centre of the Equilibrium Valve 2mm deep, as shown in Figure 108.



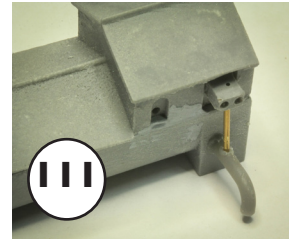
E1.5 Drill a 0.4mm dia hole in the top of the centre of the Equilibrium Valve 2mm deep, as shown in Figure 109.



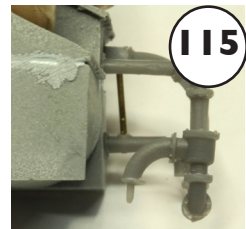
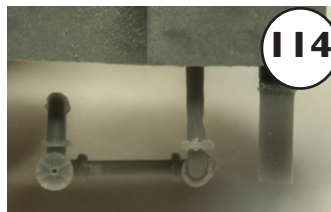
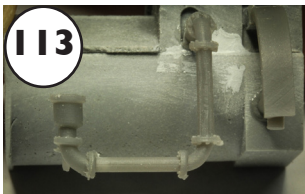
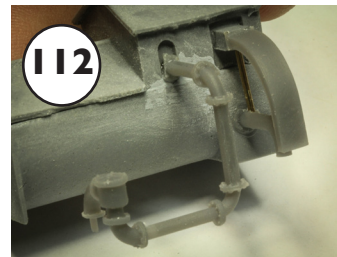
E2.2 Glue the chemical tank cover to the chemical tank. Ensure they are accurately aligned. Fill in the gap between the two parts with putty and sand smooth. Figure 110.



E2.2 Glue the tank outlet pipe into position as shown in Figure 111. Cut a piece of 0.8mm wire 0.9mm long and fit between the holes in the outlet pipe and the outlet chute in the chemical tank cover.



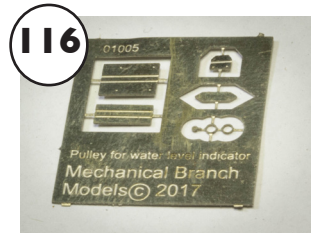
E2.2 Glue the pipe assembly and outlet chute into place as shown in Figure 112. Ensure the pipe assembly is square and level as shown in Figures 113-115.



E2. Water level indicator

E2.1 Assemble pulley assembly and water level indicator

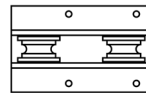
E2.1.1 The etch (figure 116) comprises a flat base, a second, narrower rectangle which is folded into a “U”, and indicating plate and a slider.



E2.1.2 Assembly of the pulley assembly is shown in Figure 117.



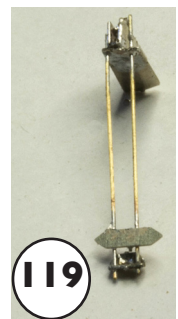
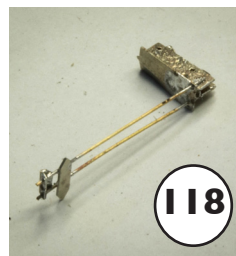
Drill out the four holes in the base and the two holes in the slider, to fit 0.3mm wire.



Fold up the channel and solder to the base.

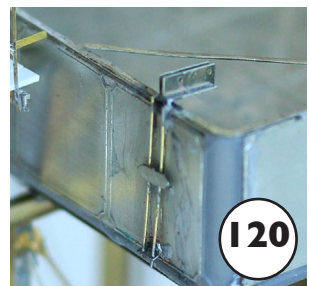
Fitting pulleys is an optional detail.

E2.1.3 Fold the slider into an “L” shape. Cut two 15mm lengths of 0.3mm wire and solder into the holes in the pulley base and slider as shown in Figures 118 and 119.

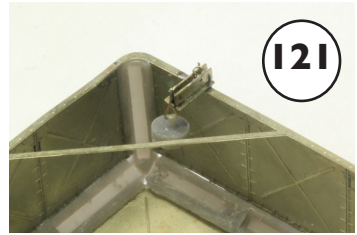


E2.1.4 Solder the pulley assembly to the top edge of the tank as shown in Figure 120.

A full tank would be indicated by the indicator plate at the bottom of the tank. Figure 120 shows a tank approximately half full.



E2.1.5 Cut a length of 0.15 wire to the float so that it will sit at the desired water level in the tank. Glue the wire to the float. Glue or solder the wire to the pulley assembly. This is shown in Figure 121.



E3.1. Fit the main 9" outlet pipe fitting to the hole in the floor of the tank and glue in place. Attach the two lengths of 9" pipe to the fitting under the tank. Additional lengths of pipe and valves are available separately.



Typical attachment of water outlet pipe to the underside of the tank.

6. Painting and weathering

6.1. Ensure the tank is clean, free of loose material, grease and flux. Paint with a self etch primer.

6.2. The tank and steelwork were painted a mid grey. Refer to photographs to match the colour. Successful results have been obtained with Vallejo Model Air Acrylics, where Deep Sea Grey was used. Building up colour with several coats is more effective than one or two heavy coats.

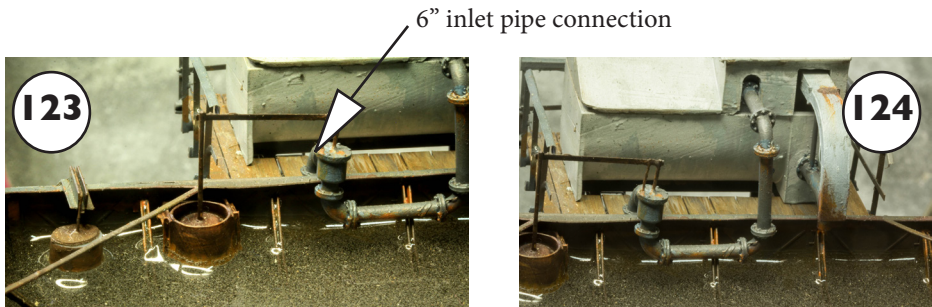
6.3. The alkalinity plant is best painted prior to attachment to the tankstand. The cover was timber or possibly asbestos cement (fibro) and so was a pale blue/grey colour. In some photos it appears that it was painted silver, so there may have been differences at different locations.

6.4. Photographs from the 1940s and 50s show that tanks were often well maintained, however at that point many were less than ten years old. As would be expected with an outdoor structure holding untreated water, tanks became rusty and stained with salts. The cast iron panels were sealed to each other with a compound containing iron filings so that any leak would cause the formation of the oxide and seal up the leak. Therefore, rust and salt stains often formed along the joints between panels.

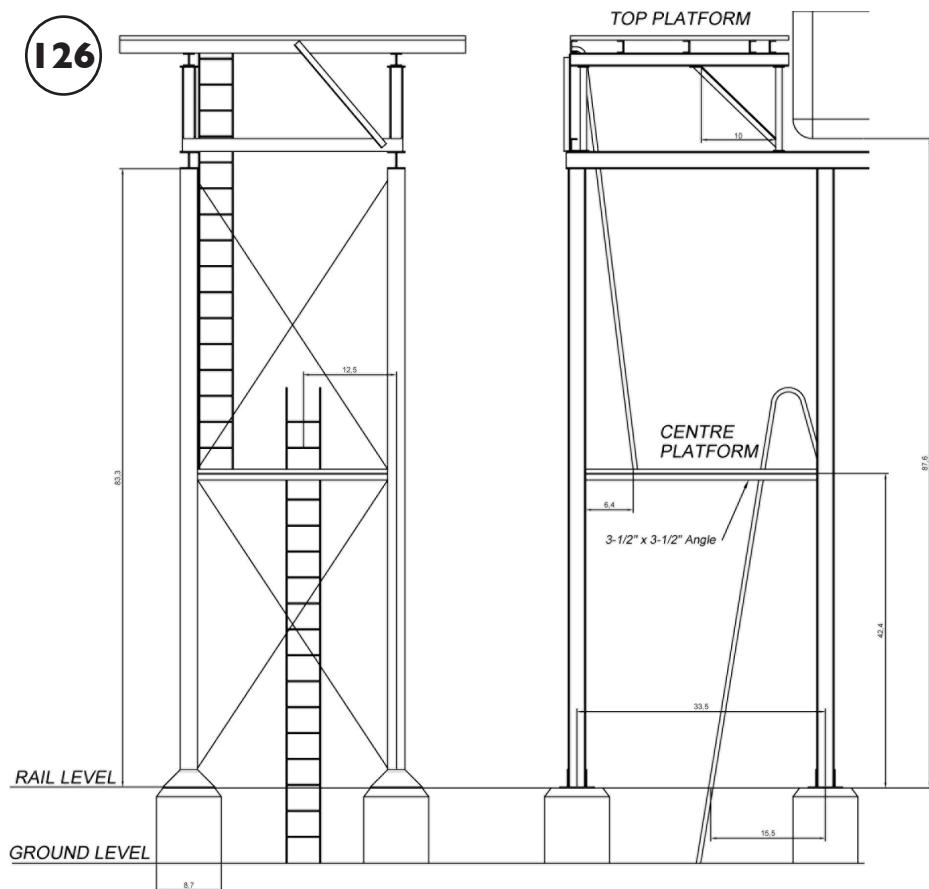
7. Final Assembly

7.1. After painting, paint and attach the concrete footings. Two sizes of footing were used, the larger on the four innermost columns.

7.2 Attach the Alkalinity Plant tank assembly to the top platform. Insert the plungers into the equilibrium valve and float (using 0.3mm wire). Attach the float assembly to the tank in the position shown in Figure 123. Solder a length of flat brass bar 0.6mm wide between the plungers.



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7.3 This tank was supplied by a 6" inlet pipe which connected to the fitting at the side of the equilibrium valve (shown in Figure 123 and 125). A manual valve was usually installed inline near or below ground level so that the supply could be cut off if necessary. You may have to relieve the centre platform to provide clearance around the inlet pipe.

7.4 Representing water in the tank

Prepare the inside of the tank by painting a mid-brown (see figure 102), with highlights to represent rust and silty water. Tide lines are common around the inside of the sides of the tank. If desired the tank can be filled with a clear resin. I recommend Barnes Products EpoxyGlass ultra-clear resin. This product can be tinted if required. Ensure any holes or gaps in the tank are filled before pouring in the resin.



Method of fixing inlet pipe to bracing.



2-tier tank at Orange showing the 6" inlet pipe and indicator (note that this is a different style of pulley assembly)