Experimental Archaeology – Volunteer Project

PRESERVATION OF BRONZE AGE TRACKWAY TIMBERS IN SUCROSE SOLUTION.

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1. ABSTRACT

Five Bronze Age oak timbers dating from 1000BC were discovered on the low tide foreshore at West Mersea in Essex in 2016. They were thought to have been part of a 2m wide trackway. Three of these timbers were professionally preserved at a facility in Portsmouth with the remaining two poorer and unwanted samples being used by CITiZAN volunteers to attempt the low cost "sucrose" method of preservation under guidance from CITiZAN staff.

Sucrose crystals can restore the internal structure of ancient water-logged timber at low cost as opposed to the expensive Polyethylene Glycol (PEG) method.

The timbers were thoroughly cleaned in fresh water and then immersed in incrementally higher concentrations of a sucrose solution starting at 4% and reaching a maximum of 70% over a period of 4 months from August to December 2018.

One small portion of timber was immersed and soaked in paraffin over the same time period, as a trial alternative to sucrose solution. Paraffin is a liquid wax and had been used by shipwrights on Mersea to restore old clinker built wooden dinghies, the concept being that paraffin wax may be a viable alternative to sugar crystals in preserving the internal structure of ancient water-logged timbers.

The timbers were then very slowly dried in an unheated barn over a period of 18 months from December 2018 to June 2020.

During this period they were regularly monitored and measured for weight, density and volume to ascertain the effectiveness of the sucrose method.

The volume calculations were approximate as the timbers were not of uniform shape.

Total initial volume in August 2018 was 0.2947m3 reducing to 0.2107m3 by June 2020, a reduction of 29%.

Total initial weight in August 2018 was 30.19kg reducing to 13.39kg by June 2020 a reduction of 55%. (NB allowance must be made for loss of weight from water during the drying process. The specific gravity of seasoned oak which contains 20% moisture content, is 0.67 kg/m3 i.e. of the 55% reduction in weight, 33% is moisture loss.)

The total cost of the sugar crystals and chemicals required for the experiment was £76.00 at 2018 price base.

2. LOCATION OF TIMBER TRACKWAY

Fig. 1 Location of timber trackway

3. BACKGROUND

Five ancient oak trackway timbers were discovered by West Mersea oysterman Daniel French in October 2016 and reported by him to the CITiZAN project team in London.

Following subsequent visits by CITiZAN and ancient timber experts, and with the consent of Heritage England, in November 2016 the CITiZAN team, assisted by local volunteers, lifted the timbers and transported them back by boat to Mersea Harbour where they were loaded onto a truck for transport to MOLA in London.

In December 2016 the timbers were cleaned, recorded and packaged at MOLA for further transport to Portsmouth for preservation and dating by dendrochronology and carbon dating. Dating was determined at approximately 1000BC. Only the 3 main larger timbers received the full preservation by Polyethylene Glycol (PEG) method, with the remaining 2 retained in the moisture containing wrapping and kept in a refrigerator for preservation.

Fig. 2 The timbers are lifted by CITiZAN for transport by boat to Mersea Harbour.

Fig. 3 CITiZAN volunteers including Mersea oystermen assist archaeologist Lara Band with timber walkway inspection and cleaning at MOLA in London.

Fig. 4 Volunteers and professional archaeologists clean the timbers at MOLA.

Fig. 5 Replica of a Bronze Age axe that would have been used to make the holes.

Fig. 6 The timbers wrapped for transport to Portsmouth.

On 21 August 2018 the two remaining untreated timbers were transported from Portsmouth to Great Wigborough in Essex where CITiZAN volunteers were to attempt the preservation using the “sucrose method”.

4. METHODOLOGY

SUCROSE METHOD

The sucrose (sugar) method of conserving waterlogged wood was developed as an alternative to more expensive methods (Parrent 1983, 1985). The procedure is identical to that described for PEG, except that sucrose is used. Wood to be conserved should be carefully cleaned by rinsing in baths of fresh water to remove all ingrained dirt and to remove the bulk of any soluble salts that are present. Once the wood is cleaned, the following procedure is recommended:

1. Prepare a solution with a sufficiently low sucrose (1-5 percent) concentration to prevent the dehydration of well-preserved wood or regions of sound wood within an otherwise deteriorated piece. This necessitates the thorough examination of the wood to be treated in order to determine its state of preservation before treatment begins. With highly degraded wood, it is possible to start with a higher concentration of sucrose; however, if in doubt, start with a 1 percent weight/volume solution. Commence a program of weighing a representative sample of wood in treatment to determine when the wood has reached equilibrium with its solution. Once saturation with a given x percent solution is achieved, increase the sugar concentration by 1-10 percent.
2. Select an antimicrobial agent, such as Dowicide A, and add it to the first mixture of sucrose and water when it is initially prepared. This allows for the complete penetration and protection of the wood by the antimicrobial agent.
3. The incremental percentages of increase can be higher and more closely spaced if the wood is highly degraded. It is best to start with a low percentage increase, e.g., 1-5 percent, until a concentration of 50 percent is reached. Then the solution can be increased in 10-percent increments. Again, if in doubt, the same incremental increases used at the start of the treatment can be used throughout the treatment. The treatment continues until sucrose concentration reaches 70 percent, and the wood has equalized at this concentration.
4. If necessary, select an additive that will discourage insect and rodent attacks on the treated wood. There are many pesticides that will work, and selection depends on local availability. For thorough protection of wood, add the insecticide to the initial solution. If the wood is kept in a museum environment, problems with insects and rodents should be minimal and probably would be controlled by alternative means.
5. When the wood has reached an equilibrium with the highest solution desired, air dry it slowly under conditions of controlled high humidity. Humidity can be lowered slowly as the wood dries. Submitting the wood too quickly to conditions of low humidity will damage it. Slow, controlled drying and adjustment to the prevailing atmospheric conditions, as is the case in all the wood treatments described here, will maximize the success of the overall treatment.
6. Store the wood under conditions of less than 70 percent humidity if possible. The wood should not be subjected to humidity over 80 percent because of the possibility of condensation forming on the wood; this could leach out the sugar.

If sugar is selected as the treating medium, refined white sugar (pure sucrose) should be used. The brown- colored, coarse-grained unrefined sugar (Type A sugar) should be avoided, as it is much more hygroscopic than the white. Each time the relative humidity rises, the surfaces of wood treated in unrefined sugar will become

wet. This hygroscopicity is analogous to that encountered when using the medium molecular weight PEGs. The Type A sugar-treated wood, however, remains dimensionally stable.

Maintaining artifacts treated by sugar in a controlled atmosphere will ensure the continued success of the conservation procedure. Artifacts conserved with this method require no more or no less care than those treated with other preservatives. This method constitutes an acceptable means of conserving waterlogged wood and is the least expensive of the methods currently available. Sucrose-treated wood, however, has a dull muted color, and small hair line cracks will frequently form on the surfaces. The treatment will produce dimensionally stable wood and is a viable alternative when the overall cost is a major consideration. The required equipment is the same as discussed above for PEG treatments.

5. METHOD APPLICATION PREPARATION

5.1 Pre-application requirements

On 22 August 2018 the timbers were unpacked at Great Wigborough by CITiZAN volunteers and then measured, weighed and photographed.

The labels on the packaging were:
For timber 1: T4 EX-CC 1317. This timber was in 2 sections having been cut for dendrology dating. Both sections were of a length that would fit into the bath in which the sucrose preservation would be attempted.

For timber 2: T5 EX-CC 1317. This timber had been cut at one end for dendrochronology dating. The remaining length was too long to fit into the bath so was sawn into 2 sections.

Fig. 7 Timbers at Great Wigborough in their packaging.

Fig. 8 Unpacked timbers at Great Wigborough.

5.2 Initial Weights and Dimensions

Immediately after removing the packaging the timber sections were measured. The timbers were weighed in kg on 20 September 2018 using a set of *Freetoo* digital scales (used for weighing travel luggage) to two decimal places.

Fig. 9 T4 section A - Length 1065mm, width (average) 180mm, thickness 60mm. Weight 11.35kg on 20/9/18.

Fig. 10 T4 section A – end detail

Fig. 11 T4 section B - Length 890mm, width (average) 150mm, thickness 54mm. Weight 8.95kg on 20/9/18.

Fig. 12 T4 section B – post hole detail

Fig. 13 T5 section A - Length 1240mm, width (average) 105mm, thickness 46mm. Weight 5.92kg on 20/9/18.

Fig. 14 T5 section B - Length 680mm, width (average) 105mm, thickness 40mm. Weight 2.61kg on 20/9/18.

Fig. 15 T5 section C (to be immersed in paraffin) -Length 370mm, width (average) 130mm, thickness 40mm.
Weight 1.36kg.

6. METHOD APPLICATION

It had been decided that the sucrose solution would be increased by 5% (5kg). The sucrose was added every 10 days until 50% sucrose concentration was reached, then increased by 10% every 10 days until 70% was reached. The added sucrose was mixed with 100lt of water measured into a bath (10lt per occasion), the water then heated, sugar added and the cooling fully dissolved solution poured back into the bath. After a final period of 130 days in the incrementally increased sucrose solution the timbers would be removed for the gradual and controlled drying process.

T5 Section C was placed in a covered container, and immersed in paraffin and left to soak in a cool corner of an outside barn. This alternative “control” was to test a local shipwrights method of preserving old timbers in wooden boats by painting liberally with paraffin. The thinking was that as paraffin is a liquid wax, soaking for a long period and then drying very slowly, may leave residue wax in deteriorated timber cells replacing the lost structure.

NB Initial attempts to use the Stihl wood moisture meter during the soaking and drying process failed because the moisture content was too high for the meter to read and later the sucrose content appeared to result in false readings.

7. IMMERSION IN SUCROSE SOLUTION & OBSERVATION CHRONOLOGY

On 22 August 2018. To a conventional bathroom bath was measured 100lt of cold tap water. To the water was added and mixed 500ml of *Hibiscrub* biocide (4/0 w/v cutaneous solution chlorhexidine gluconate 40mg/ml).

4kg of granulated white sugar (Tate and Lyle) were dissolved in heated water taken from the 100lt in the bath, and added back to the 100lt to form a 4% concentration to create the initial sucrose solution for the timbers.

The timber sections apart from T5 section C were placed in the sucrose solution and the bath covered with a sheet of plywood to prevent light penetration. **It should be noted that the bath was in an outdoor brick building and subject to temperatures and atmosphere that were not controlled.**

Fig. 16 The timbers (apart from T5 section C) in the initial sucrose solution. The "pink" water colour is from the Hibiscrub biocide. 22/8/18

Fig. 17 The bath was covered in a sheet of plywood to prevent daylight. 22/8/18

30 August 5kg sugar/sucrose added (first removing and heating a small quantity 10lt, of water from the 100lt in the bath to dissolve the sugar in – this method to be used on all sugar/sucrose additions). Now 9% concentration.

Fig. 18 Timbers 30 August 2018

10 September. Added 5kg sugar/sucrose as above method. Now 14% concentration. Brown “viscous” sludge on top of planks, but not on bottom. Slight foam on top of water. Water clear(ish) over top of planks, cloudier around the sides. Planks turned.

15 September. Inspected and decided the mixture was starting to ferment. Read further information from St. Augustine Lighthouse Maritime Archaeology http://www.staugustinelighthouse.org/LAMP/Conservation/sucrose-treatment better article than one used above. Decided to remove timbers from bath and thoroughly clean with hose and soft brush. Emptied all bathwater and cleaned bath. Re-filled bath with fresh 100lt 15% sugar/sucrose solution to which was added 0.50lt of *Roundup Pro Vantage* as a biotic to prevent floral growth. *Roundup PV* contains 48g/lt glyphosphate, 588g/lt potassium salt of glyphosphate.

Fig. 19 Froth in the bath – fermentation? 15/9/18

Fig. 20 “Sludge” on the top of the planks. 15/9/18

Fig. 21 New 15% sucrose solution and Roundup PV 100lt total. 15/9/18

20 September 2018. Added 6kg sugar/sucrose solution. Now 20% concentration. Observed lines of slight “froth” reflecting the outlines of the submerged timber.

2 October 2018. Removed 10 litres of water (to avoid heating this water and potentially releasing *Roundup* gas). Added 5kg sugar/sucrose solution. Now 25% concentration. Observation “froth” on perfect outline of bubbles reflecting wood shapes including hole at one end of the timbers.

Fig. 22 Timbers 2 October 2018

10 October – as above +5% now 30%. It should be noted that the bath/timber/sucrose does give off a slightly damp, sweet, musty smell. Do not know what this is.

Fig. 23 Timbers 10 October 2018.

21 October – as above +5% now 35%. Same outline of “froth” on bath water surface marking shapes of timbers.

30 October – as above +5% now 40%. Ditto on surface froth.

Fig. 24 30 0ctober 2018

9 November – as above +5% now 45%. “fermenting” has stopped.

22 November – as above +5% now 50%. NB future + 10% for 2 occasions to final 70%. Wood showing signs of “floating” – acquiring specific gravity (SG) of sucrose liquid in bath?

30 November – removed 10 litres of water and added +10% (10kg) of sugar. Now at 60%. Wood “floating” and one plank held under by placing ceramic bowl weight. Water now very dark- almost black. Gassy smell less. Less froth outline (Fig. 25 below).

11 December – as above now final 70%. Planks floating and held under water by placing 2 heavy ceramic bowls on top.

It was decided that as the sucrose liquid is now quite thick and syrup like, to leave the timbers in the solution until after Christmas to ensure complete take up of the 70% before removing them to start the slow drying process.

Fig. 25 28/12/18 solution black – no bubbles or froth

8. THE DRYING PROCESS AND OBSERVATION CHRONOLOGY

Timbers were removed from sucrose solution on 28 December 2018 to commence slow drying process in a barn.

They were first gently washed with a hose, left to drain for 15 minutes then weighed. The timber placed in the paraffin was also removed from its liquid to start drying.

Fig. 26 The piece of timber (1) from the experimental paraffin immersion & Fig. 27 timbers (2, 3, 4, 5) after removing from the sucrose solution

The timbers were placed on 2 wooden ladders in the barn to ensure adequate support and good air circulation around them. The ladders were placed on a polythene sheet that could be placed over them if thought to be drying too quickly.

Testing of weight and moisture content was undertaken every 2 weeks for the next 3 months (test results dependent this could be extended).

Fig. 28 Timbers placed on old wooden ladders to dry 28/12/18

9. MEASUREMENTS

NB all measurements relate to the paraffin timber as 1, then the timbers as above left to right – 2 (timber T5 B), 3 (timber T4 B), 4 (timber T5 A), 5 (timber T4 A).

NB – On 28/12/18 assume totally saturated with the 70% sucrose solution.

NB – On 4/1/19. Timber 1 (paraffin) showing signs of surface cracking with the grain and a whitish “bloom” which may be salt drying or fungus growth, but thought too cold for fungus.

NB – On 10/2/19 wood observed to have mould growth in spots, so uncovered polythene sheeting to allow to “air”. Also some surface flaking.

NB 19/2/19 - Timbers 4 & 5 both have slight greenish mould, looks like mould sometimes found on jam? As only minor patches, decided to leave and not treat. Mould brushes off very easily. Timbers 5 & 3 both look “sticky” with small flakes of outer wood falling off – not major.

Fig. 29 19/12/19 Mould spots, sticky excretion and some surface flaking

February 10/02/19 – wood observed to have mould growth in spots, so uncovered with polythene sheeting to allow to “air”. Also appears to be shedding small loose bits of timber.

March 6 2019 – mould growth very slight and patchy. Rubs off easily and appears to be growing on surface sucrose. Small black “bumps/bubbles” on some of the surfaces (minority) appear to be softish sucrose coming out of the wood. Stihl wood moisture reading still not working on timbers, but does on control piece of adjacent oak timber kept in the drying barn, possible evidence that the internal sucrose prevents the Stihl from working/taking reading.


Fig. 30 6/3/19 timbers looking drier and feel firm – look good and stable, little mould evidence and Fig. 31 Timber 1 treated with paraffin showing signs of drying too quickly with cracks appearing. Can say with some confidence does not work compared to sucrose method.

March 23 2019 – no mould growth. Timbers look “dryer”. Timber 5 still “sticky” on one side. All timbers feel firm.

27 May 2019– all timbers appear “stable” and quite firm to the touch. No mould, no smell. Attempts to take moisture content reading with Stihl wood moisture reader again failed – NB Timber 1 (off cut treated with paraffin) appears stable and quite firm.

30 June 2019
All timbers looking good, feel very firm apart from some surface “flaky” bits. No smell.


Fig 32 30/6/19 *Fig 33* 30/6/19

Fig. 34 21/7/19

Fig. 35 21/7/19

Fig. 36 29/8/19

Fig. 37 29/8/19

Fig. 38 21/10/19

Fig. 39 21/10/19

7 Feb 2020 **(NB – Covid 19 prevents regular future visits.)**

Timbers moved from barn to secure brick annex as numerous mice droppings seen, an indicator that the rodents had found the sugar attractive. Timbers now very dry to feel (no sticky outer surface) and very firm, hard touch and feel to the timbers indicating a stability being reached.

Fig. 40 7/2/20 NB timbers moved to brick annex

7 June 2020

It was felt the timbers had fully dried and were measured and weighed for last time. All look stable, non-sticky and wood texture firm. NB timber 1 (paraffin experiment) not as firm on the surface.

Fig. 41 7/6/20 timber 1 (paraffin)

Fig. 42 7/6/20 timber 2 & 3

Fig. 43 7/6/20 timber 4 & 5

10. MEASUREMENT RESULTS

TABLE 1 DRYING WEIGHTS IN KG - NB all timbers turned each time so resting on alternate flat surfaces to prevent timbers warping in drying process.

Date	1	2	3	4	5
20/9/18 as arrived at Wigborough before sucrose immersion	*1.36 NB this piece in paraffin and only timber to gain*	*2.61*	*8.95*	*5.92*	*11.35*
28/12/18 as removed from sucrose soaking	1.77 (+30%)	2.30(-12%)	8.88(-1%)	5.86(-1%)	11.30(n/a)
4/1/19	1.45 (18%)	2.14 (7%)	8.54 (4%)	5.70 (3%)	10.87 (4%)
27/1/19	1.26 (13%)	2.01 (6%)	8.30 (3%)	5.02 (12%)	10.84 (0%)
19/2/19	1.17 (7%)	1.66 (17%)	7.54 (9%)	4.51 (10%)	9.81 (9%)
6/3/19	0.94 (20%)	1.59 (4%)	7.19 (5%)	4.38 (3%)	9.06 (8%)
23/3/19	0.87 (7%)	1.47 (8%)	6.95 (3%)	4.17 (5%)	8.77 (3%)
24/4/19	0.69 (21%)	1.21 (18%)	6.07 (13%)	3.69 (12%)	7.74 (12%)
27/5/19	0.63 (9%)	1.21 (0%)	5.40 (11%)	3.30 (11%)	7.15 (8%)
30/6/19	0.63 (0%)	1.20 (0%)	5.01 (7%)	3.24 (2%)	6.45 (10%)
21/7/19	0.63 (0%)	1.18 (1%)	4.89 (2%)	3.15 (3%)	6.35 (1%)
29/8/19	0.62 (0%)	1.17 (0%)	4.64 (5%)	3.10 (1%)	6.05 (5%)
21/10/19	0.64 (0%)	1.06 (9%)	4.42 (5%)	2.98 (4%)	5.78 (4%)
7/2/20	0.71 **+10%**	0.93 (12%)	3.93 (11%)	2.93 (2%)	5.43 (6%)
7/6/20	0.67 (5%)	0.92 (0%)	3.89 (1%)	2.70 (7%)	5.21 (4%)

TABLE 2 DRYING DIMENSIONS in mm

Timber	Length	Width	Thickness	Volume	% change
T1 Sep 18	370	130	40	0.1924	
T1 May 19	360	125	33	0.1485	-23%
T1 June 20	360	123	32	0.1416	-4%
T2 Sep 18	680	105	40	0.2856	
T2 May19	665	92	35	0.2141	-25%
T2 June 20	660	90	33	0.1960	-8%
T3 Sep 18	890	150	54	0.7209	
T3 May 19	880	145	48	0.6125	-15%
T3 June 20	870	135	47	0.5520	-10%
T4 Sep 18	1240	105	46	0.5989	
T4 May 19	1220	100	40	0.4880	-19%
T4 June 20	1210	95	40	0.4598	-6%
T5 Sep 18	1065	180	60	1.1491	
T5 May 19	1040	160	50	0.8320	-27%
T5 June 20	1040	155	47	0.7576	-9%

As all timbers have shrunk in the drying process, they were all re-measured to compare with dimensions taken on 20/9/18. NB the widths and thickness varies considerably on each timber, so an “average by eye” was taken as a cross section to measure. Measuring length was accurate ie to extreme ends of each timber. All dimension in mm.

11. SUMMARY

Weight loss from September 18 as arrived in Wigborough (prior to sucrose immersion treatment) to June 20, a period of 22 months:

Date	**1***	2	3	4	5
20/9/18	*1.36*	*2.61*	*8.95*	*5.92*	*11.35*
7/6/20	0.67 (50%)	0.92 (65%)	3.89 (56%)	2.70 (54%)	5.21 (54%)

- **NB this piece in paraffin.**

Volume loss from September 18 to June 20 :

Timber	Length	Width	Thickness	Volume	% change
***T1** Sep 18	370	130	40	0.1924	
T1 June 20	360	123	32	0.1416	-26%
T2 Sep 18	680	105	40	0.2856	
T2 June 20	660	90	33	0.1960	-31%
T3 Sep 18	890	150	54	0.7209	
T3 June 20	870	135	47	0.5520	-23%
T4 Sep 18	1240	105	46	0.5989	
T4 June 20	1210	95	40	0.4598	-23%
T5 Sep 18	1065	180	60	1.1491	
T5 June 20	1040	155	47	0.7576	-34%

NB T1 in paraffin.

1. **Total initial volume of all timbers in August 2018 was 0.2947m3 reducing to 0.2107m3 by June 2020, a reduction of 29%.** The volume calculations were approximate as the timbers were not of uniform shape.

2. **Total initial weight of all timbers in August 2018 was 30.19kg reducing to 13.39kg by June 2020 a reduction of 55%.** (*NB allowance must be made for loss of weight from water during the drying process. The specific gravity of seasoned oak, which contains 20% moisture content, is 0.66 kg/m3 i.e. of the 55% reduction in weight, 33% is moisture loss.)* **The timbers after sucrose treatment have an average specific gravity of 0.63kg per m3.**

3. **The total cost of the sugar crystals and chemicals required for the experiment was £76.00 at 2018 price base.** No comparison cost of treatment by the Polyethylene Glycol (PEG) method is available.

4. **The timbers (apart from T1 the paraffin trial timber) after full treatment and drying are firm and solid to the touch and appear relatively strong.** There is no indication of residual stickiness from the sucrose. There has been considerable shrinkage, which is noticeable around the post hole Bronze Age axe head cut.

5. **Timber T1 that was immersed in paraffin rather than the sucrose solution has deformed and the surface texture does not have the same hardness as the other timbers.** It also is lacking in strength and appears brittle and fragile.

Fig. 44 Left image after removal from sucrose treatment 28/12/18
Right after drying out in barn and removal to brick annex on 7/2/20

12. CONCLUSIONS

- The sucrose preservation method experiment demonstrated that low archaeological value water saturated timbers can be preserved but with some deformity by shrinkage of the original shapes taking place.
- Costs are very low if, under professional guidance, volunteers are used.
- The use of paraffin (a liquid wax) may work on dry timbers, but not on already water- logged samples.
- An outdoor or “remote from a main living dwelling” facility e.g. garden shed for sample immersion over a long period and long term drying is essential.
- Such volunteer led experiments are a great use of the CITiZAN public education objective.
- *It should be remembered that the timbers used in this experiment were going to be dumped i.e. there was no loss to the archaeological record or feature involved.*

13. DISCUSSION

- Would longer soaking in fresh water or a salt/fresh brackish mix prior to sucrose immersion have prevented some of the timber distortions? The timbers had been in saline conditions for some 3000 years, so would the dissolving of residual marine salts have been beneficial?
- Would longer immersion times than that recommended in professional methodology (Section 4) been beneficial? The fact that the immersion took place from Autumn into Winter, air temperatures and hence water temperatures may have prevented full take up of the sucrose solution?
- Would the final treatment of an appropriate natural oil application to the surface only of the timbers be beneficial? During research by the volunteers for this experiment, it was noted that under certain circumstances and depending on where the timbers were finally displayed or stored, insects and rodents and in particular ants and mice, were attracted to residual surface sugars that may appear.
- To answer this question sample timber T2 (the poorest sample) was selected for oil treatment.
- Oil types researched for use were Linseed, Danish, Mineral, Osmo, Pure Tung oil and Tung oil with white spirit dilution.
- Two types of oil were selected as being most appropriate, pure Tung Oil with 20% white spirit dilution and Osmo POLYX high solid oil. The former is a very light natural product that is applied by soft cloth and the latter a more viscous natural product with a liquid wax content applied by brush (see Fig 45 below).
- The paraffin sample T1 was also treated with the Osmo product, as paraffin too is a liquid wax (see fig. 45 below).
- The initial results demonstrate that the pure Tung Oil with 20% white spirit produces a better finish than the Osmo oil, giving a delicate natural appearance that has enhanced the timbers visual and textural look.
- The concern was that the oil would detrimentally impact on the internal sugar cells that have formed in the timbers and weaken that artificial structure. Visual and surface hardness testing over 7 days has demonstrated that such a fine layer of pure Tung Oil with 20% white spirit has not affected the timber integrity.
- All 3 remaining timbers now (14 June 2020) cleaned with a soft bristle “shower type” hand brush, followed by comprehensive clean with medium bristle tooth brush and then 1 coat only of the pure Tung Oil and white spirit mix applied with a soft paint brush as opposed to cotton cloth as the timber surface to rough and irregular (see Fig. 47 below).


Fig. 45 Sample T2 on left with top half treated with pure Tung Oil and bottom half with Osmo POLYX. Sample T1 on right treated with Osmo POLYX only and

Fig. 46 Timbers prior to brush cleaning and Tung oil application

Fig. 47 The timbers (L to R 1, 2, 3, 4, 5) with final treatment of pure Tung Oil and 20% white spirit to assist with sealing any sucrose residue from attracting insects or rodents. Scale T 4 1.20m long. 17/6/20

14 ACKNOWLEDGEMENTS

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