

OLD BUCKENHAM MILL, NORFOLK.

Specification for making a new set of sails, stocks and clamps etc.

Scope of the work.

The work consists of removing the existing stocks and clamps, retaining the ironwork for re-use. Making new sails, stocks and clamps to the design shown in the drawings, treating and painting as specified. Refurbishing the striking gear as found necessary. Putting up the new sails etc., adjusting and balancing to good order.

Dismantling.

Carefully take down the existing stocks and clamps. Keep the striking gear in a safe place for re-use, and report any defects discovered. Note that the former bolts used to attach the sails to the stocks, and the fastenings for the clamps are to be discarded and new fastenings made as shown on the drawing.

Allow for disposing of the stocks and clamps in an environmentally correct way.

Canister.

Clean rust from the inside of the canister by chipping and wire-brushing until all the crusts have been removed. Prime the clean surface with a red lead and linseed oil primer, applying two coats. Clean and spot-prime the outside of the canister as found necessary. Apply two coats of white Holkham Paint to the inside of the canister, and two coats of oil-based black enamel (e.g. Japlac, but not Hammerite) to the outside surfaces.

Front Striking Gear.

Allow for blast cleaning the components, namely the cross (spider), rein irons, standards, triangles etc. The rein irons, and standards are to be hot-dip or spin galvanized, any threads to be cleaned or supplied with oversize nuts. The cross and triangles are to be primed with red lead primer type B, and finished with two coats of black enamel paint. The bolts, nuts and washers used as pivots or fastenings are to be galvanized or of stainless steel..

Stocks.

Two new stocks are to be made from glulam beams constructed using Siberian Larch laminates fastened with Melamine glue. Ends of laminates are to be finger-jointed and glued. The surfaces of the stocks are to be planed smooth.

The stocks are to be 60 feet from end to end, 13"x 12" at the centre, tapering to 7"x 7" at the tips. The centre 29" of each stock is to be shaped to fit the width of the canister, with a "jog" or shoulder to abut the canister on one side. From the canister area outwards, the width is to taper to 11 ½" wide at the ends of the clamps. The

main tapers of the stocks are to commence at the ends of the clamps, reducing them to 7"x 7" at the tips..

The bolt holes for fastening the whips are to be bored slightly oversize at 26mm. The hole for the striking rod is to be bored 2" in diameter.

After all shaping, the stocks are to be brush flooded with solvent wood preservative on the top face, turning after an hour to treat each face separately. All bored holes are to be stopped up with a plug underneath, filled with wood preservative and left to soak for an hour. When the wood preserver has dried, the stocks need to be treated with raw linseed oil, including the bolt holes.

Finally, the stocks are to be primed and painted with white Holkham linseed oil paint, 3 coats in all. Note that a 20% of zinc oxide needs to be added to the basic paint for all the white paint used.

Clamps.

Four new clamps are to be made from laminated Siberian larch as for the stocks. The new clamps are longer than the existing clamps, being 30 feet long and equivalent to the length of the last working clamps. The clamps are 11"x 7" and to be housed out by 1" to fit over the canister. They are to be chamfered at the weather angles to fit behind the sail frames, and the ends are to be half-rounded, all as shown in the drawing. The clamps may need to be housed out further, front or rear, to avoid the adjacent canister box. Any such housing necessary should be considered and allowed for.

Each pair of clamps is to be fastened with 4 U-bolts and 2 shackles, but no through bolts. The existing U-bolts are to be modified to fit in a new mid-position between the inner shackle and end u-bolt by cutting and welding. A new set of four U-bolts is to be made up to fit the ends of the clamps as shown on the drawing. A set of four shackles is to be made as shown on the drawing to fit in a convenient place near the triangles. All the components of the fastenings are to be blast cleaned if necessary, and spin galvanized. Over sized nuts will be necessary to fit the galvanized threads.

The clamps are to be preservative treated, oiled and painted as for the stocks.

When fitted, the tips of the clamps are to be strained into tight contact with the stocks using the outer U-bolts. There will be gaps between the stocks and clamps at the middle U-bolts and shackles which must be filled with packings 3" wide and of suitable thickness, made from painted hardwood held in place by tightening the U-bolts.

Sails.

Four new sails are to be made as shown in the drawing.

Whips.

The whips are to be made from 7"x 7" laminated Siberian larch timbers as detailed for the stocks. These are to be chamfered and cleanly mortised right through at the weather angles shown to accept the eleven sail bars. The ends are to be rounded or chamfered as shown, and the bolt holes bored slightly oversize at 26mm. The whips are then to be dip-treated with solvent wood preservative, and allowed to soak for 5 hours. After drying, the mortises and bolt holes must be treated with raw linseed oil.

Sail Framing.

The sail framing is to be made from selected "Unsorted Redwood" chosen for lack of knots and other defects. The timber is to be planed all round to the sizes shown in the drawing, and pressure-treated to PT3 specification with Tanalith E or equivalent process. The components will then need to be allowed to dry out with 1" sticks between until the moisture content has reduced to an "outdoors" level. As an alternative to this, the components, once fully shaped and bored, may be dip-treated with a solvent wood preservative as for the whips.

The sail bars may be reduced a little to allow for sliding through the mortises, but must be a very tight fit both ways at their final position. The bars and mortises must be well painted before finally driving the bars home.

The hemlaths and uplongs must be housed by ¼" to fit under the sail bars. The joints must be well painted before bolting up with the galvanized (not zinc-plated) carriage bolts, nuts and washers. The excess may now be sawn from the ends of the sail bars, and the corners chamfered.

The wind boards may be shaped and fitted at this stage, and drilled for the screws, but not yet fastened in place. They will need relieving with a gouge to fit over the heads of the carriage bolts.

The completed sail frames and boards may now be linseed oiled, primed and painted three coats of Holkham paint. The bolt holes should be painted by plugging and filling or by using a large bottle brush.

Pre-assembly at ground level.

Ideally, the stocks, clamps and sails should be assembled on the ground to check for fit, and to gauge for the backstays. The sail bolts should have no more than 1" of thread beyond the nuts. The backstays need to be jointed, treated, oiled and painted as for the other sails timber.

The striking gear should also be checked for fit, and any necessary adjustments made..

Canister wedges.

Each stock is to be secured in the canister by four sets of painted folding wedges placed at the front, in exactly the same way as the existing. The wedges should be

made from a durable hardwood such as Greenheart or Balau, but this must be obtained from a bona fide renewable source. When the stocks are up, the wedges should be driven tightly, trimmed if necessary, and secured by the galvanized angle plates with stainless steel studs through the canister to the opposite set of wedges.

Raising the sails.

A crane of suitable capacity should be used to lift the components of the sails into position on the mill. A hydraulic platform will also be needed for access to fastenings etc.

The stocks should be raised and wedged in the canister.

The clamps should then be raised. The first clamp of each pair will need to be secured temporarily by a strap, as no through bolts are proposed. Once the second clamp is raised, the U-bolts can be fitted and tightened up.

The four sails can be raised in turn to the bottom position. The crane can be used to turn each sail to the top so that the opposite sail can be attached. The backstays can then be fastened in place, and the striking gear connected up.

Completing the Work.

The striking gear must be adjusted and lubricated. If there is an imbalance in the sails, suitable, neat, lead weights should be fastened securely to the tips of the appropriate sails so that the mill is balanced and turns easily.

Any damage to paintwork etc. caused when installing the sails must be repaired and the mill and its surroundings left clean and tidy.

End of Specification