**1.0 SUMMARY DESCRIPTION OF WORKS**

The Horniman Museum wishes to appoint a suitably qualified contractor to carry out redecoration and local repair of timber windows an doors predominantly located on the building’s east elevation, located above a service alley running along the eastern boundary of the site. There are also a number of windows and doors also included in this scope beyond the east elevation which are illustrated in the tender drawings and schedules.

The scope will included repair and redecoration of:

* Painted timber sash windows on the south elevation at ground, first and second floor
* Painted timber doorsets at ground level and leading onto the south flat roof area at second floor level
* Painted, circular windows on the clock tower
* Stained timber storm doors at the foot of the clock tower
* Timber, louvre-faced cupula vents on the North Hall barrel vault roof
* Provision of 5 No. new, internal insect screens
* Local repointing and brickwork repairs on the east elevation
* Redecoration and local refurbishment of rainwater goods on the east elevation

The location and quantities of each item are identified in the drawings and schedules included within the tender documents.

The Horniman is a Grade II\* listed building and the repair and redecoration methods should comply, where relevant, with Historic England’s document *Traditional Windows, Their Care, Repair and Upgrading*. A copy of this document is appended to this specification and the redecoration and specifications included in this document are informed by this document, where relevant. Repairs to brickwork should comply, where relevant to Historic England’s document *Repointing Brick and Stone Walls – Guidelines For Best Practice*. A copy of this document is appended to this specification.

At this stage it has not been possible to identify all timber repair requirements due to pre-contract access restrictions and existing paintwork potentially concealing larger areas of decayed timber. Where timber repairs are required but that are not identified in this specification, the Historic England document noted above should be used as the primary repair source document and detailed repair methods should be agreed with the architect prior to carrying out the works. The architect will be available to carry out further condition assessments alongside the contractor, once scaffolds are erected and decorative finishes have been stripped back.

**2. PREPARATION OF SURFACES AND DAMAGED GLAZING PRIOR TO REPAIR AND REDECORATION**

Works are generally to comply with BS8000 Part 12 Section 2.

**2.1 Previously painted timber framed windows, frames and external doors:**

2.1.1 Remove all loose or flaking paint by scraping, sanding and/or chemical strippers. **Burning is not to be used**.

2.1.2 Loose, cracked and perished putty to the full length of the affected rebate is to be carefully removed.Care should be taken not to damage glazing when removing old putty. Where necessary old putty can be softened by applying solvent (non-caustic) paint strippers applied in accordance with manufacturer’s instructions and covered with polyethylene film to prevent drying out. A dwell time of up to 24 hours may be needed to soften putty sufficiently to enable it to be removed by careful scraping. Further applications may be required to treat the full thickness of putty.

2.1.3 Cut away defective mastic pointing to all brick reveals etc, clean joint recesses, remove dust and seal joint surfaces as recommended by the sealant manufacturer. Fill cracks and areas open grain, rub down, prime rebates, apply knotting and patch prime bare timber surfaces. (see Section 3 of this document where more significant timber repair works are required prior to redecoration)

2.1.4 Remove any areas of repair filler that is no longer sound, is extensively cracked or where adjacent timberwork has rotted (see section 3 for replacement filler repairs)

2.1.4 Glazing rebates should be primed before applying putty to the appropriate thickness and angle to match the existing window profile. Where metal fixing sprigs or pins are necessary, these should be fixed with a small gap between sprig and glass to avoid fracturing the glass. Putty thinned with raw linseed oil or natural turpentine can be used to seal minor cracks in old putty, where it is generally sound.

2.15 A high quality, traditional linseed-based putty should be used, manufactured to BS544 and applied in accordance with the manufacturer’s recommendations.

Application temperature should be between +5 and +30 degrees centigrade.

Paint (see section 4 for paint specification) should be applied after the putty has sufficiently skinned and firmed up to accept the paint finish. The curing time is dependent on atmospheric conditions but is typically between 2 and 3 weeks and is important to prevent early shrinkage post-decoration that can blister paint finishes. Both undercoat and top coats must be applied within 4 weeks of the putty being installed to prevent it over-drying and cracking prior to decoration.

Paint should extend c5mm beyond the putty onto the glass around the pane edges to form a full weather seal between glazing and putty.

2.16 Cracked and broken panes of glass are to be carefully removed and replaced within existing frames using float glass manufactured to BS952. Glass thickness to match existing.

2.17 Existing draught excluder strips rebated into sash window frames installed c10 years ago are to be retained and not over-decorated so they remain functional. Where strips are damaged or missing, these should be replaced with a similar strip suitable for insertion into the existing rebates.

**2.2 Previously stained timber doors and window frames:**

2.2.1 Brush down to remove surface dirt and dust. Carefully remove all loose or flaking stain / timber sealant. Prepare surfaces for redecoration by careful rubbing down using fine-grain abrasive paper, prior to the application of new timber sealant to match the existing finish.

2.2.2 Sealants/timber stains (refer to Section 4 for sealant specification) are to be selected to create a suitable visual match to the existing finish. Following sanding down, a trial area in a less visible location should be identified in liaison with the architect, to trial the proposed sealant / stain to achieve a suitable match with the existing finish and to ensure that areas of existing sealant, where not fully removed, do not create an uneven appearance in terms of colour or texture.

2.2.3 All decorated timberwork should be fully functional post-decoration with sashes and hinged windows that open and close freely. Any exterior paintwork or timber sealant drips on ironmongery should be carefully removed without damage to the surface of metalwork.

**2.3 Gutters, drainage and rainwater pipes, metal fittings:**

Clean out gutters and re-caulk open, failing joints. Lightly rub down with abrasive paper, wash and rinse with clean water, allow to dry. Prime bear metal to paint manufacturer’s recommendations (see Section 4 for paint specifications).

**3.0 REPAIRS TO DEGRADED TIMBER WINDOW FRAMES, SILLS AND DOORS**

3.1.1 The extent of timber repairs is to be assessed and agreed with the architect and contract administrator following removal of existing paintwork and timber sealant. For pricing purposes, please refer to the tender preambles.

3.1.2 Smaller areas of decayed timber, of less than 50mm in diameter should be repaired using two-pack epoxy resin filler or polyester resin. The worst areas of decay should be cut away and weakened areas adjacent to cut away timber should be strengthened with a resin consolidant prior to the application of filler.

3.1.3 In several places the existing timber window frames and sills have previously been patch repaired using fillers. In some areas these are unlikely to be suitable for further patch repair. There are also areas of timber decay which are too large for patch repair and where wider replacement of the timber is now necessary to provide a suitably durable base for redecoration. In these instances, repairs using spliced-in new timber will be necessary.

3.1.4 Spliced repairs should be made by cutting out rotten wood and splicing or scarfing-in timber inserts which are shaped to obtain the maximum strength and to match the existing profiles. The new timber should always be worked to the line of the existing and should follow any existing deformations in the line of the window. Excessive trimming of the existing timber should be avoided. Spliced repairs should be designed so that water is directed towards the outer face of the timber and cannot lie on or enter the repair joint. Inserts should be made from good-quality wood similar in species and moisture content to the parent timber. They should be fitted with the grain orientated to match the existing. This reduces the risk of the insert and the parent timber moving at different rates during damp and dry conditions, which could in turn cause the repaired joint to fail by splitting. Just as for any other joinery work, timber with defects such as shakes, resin pockets, knots or sapwood should be avoided for use in repairs. Modern softwood has poor resistance to decay and should be double-vacuum impregnated with preservative by the supplier.

3.1.5 Where sill replacement is considered necessary, sill timbers should be removed from the entire front face of the window and jointed and sealed beneath the sash.

3.1.6 Contractors should refer to Historic England’s window repair document noted in Section 1 above for guidance on repair methods, which provides informative drawings illustrating how decayed window timbers should be pieced-in.

**4. SPECIFICATION FOR PAINTS, SEALANTS, FILLERS AND PRESERVATIVES**

**4.1 Paint for timber windows, frames and doors** should be one of the following. No alternatives will be considered after receipt of tender.

The works shall comply with BS 8000: Part 12, BS 6150

ICI Dulux Weathershield Exterior Gloss Paint System. Colour - Brilliant White, comprising Wethershield preservative primer, weathershield exterior flexible undercoat and weathershield exterior high gloss finish.

Methods of preparation and application as per manufacturer’s recommendations.

Manufacturer: ICI paints, Wrexham Road, Slough, Berks SL2 5DS.

Or,

Jonhstone’s Flexible Exterior High Gloss System, Colour Brilliant White, comprising, Stormshield flexible externior primer / undercoat and Stormshield Exterior High Gloss.

Methods of preparation and application as per manufacturer’s recommendations.

Manufacturer: Johstone’s Paints, Stonebridge House, Edge Lane, Droylsden, Manchester M4 3BX.

**4.2 Paint for gutters, downpipes, drainage goods and external metalwork**

ICI Dulux Weathershield (as above), black, high gloss finish.

Methods of preparation and application as per manufacturer’s recommendations.

Johnstone’s Paints Flexible Exterior High Gloss (as above), black, high gloss finish.

**4.3 Traditional Linseed Putty**

Arbo Linseed Oil Putty, or similar approved, manufactured to BS544.

**4.3 Filler for timber windows, doors and frames**

2 Pack epoxy resin filler for exterior timber. Apply preservative consolidation treatment for adjacent areas of decayed timber, to manufacturer’s recommendation.

**4.4 Mastic Sealant for Windows, Doors and Frames**

Mastic acrylic sealant to be Arobcrylic or similar approved, gun applied sealant.

**4.5 Chemical Paint Stripper**

Nitromors or similar approved water rinseable stripper.

**4.6 Replacement Glass**

Glass to be 4mm clear float glass (or to match existing pane thickness) manufactured to BS952.

**4.6 Preservative Stain**

Soligum, Cuprinol or similar approved to match colour and finish of existing stained timberwork.

**5.0 REPLACEMENT JOINERY FOR DORMER VENTS, NORTH HALL ROOF.**

There are three ventilation ‘dormers’ set within the north hall roof, comprising timber frames with pairs of timber louvre doors, side hinged which swing outward to allow access to extract fans located within the roof void. Each cupola has paired lovred doors facing both east and west (4 individual louvre doors per cupola). These are an important visual characteristic of the north hall roof and therefore of specific significance in historic building terms.

From initial inspection, the west facing louvres are in a repairable condition and the Contractor should assume that these need to be prepared with local resin repairs carried out where necessary (see Section 3 above), prior to redecoration. If more substantive timber repair is considered necessary on closer inspection / removal of existing paintwork, this should be reviewed with the architect to agree the scope, extent and cost prior to undertaking the works.

The east facing louvre panels are in an advanced state of decay and are likely to require full replacement, as follows:

5.1. Carefully number and remove all paired doors. Take off-site to a suitable workshop environment.

**Take detailed measurements of each individual louvre door pair and produce fabrication shop drawings for architect’s approval for like-for like replacement.**

Given the age of these original door pairs it is possible that the frame sizes differ and it should not be assumed that all are identical. It is therefore important that each door pair is measured individually and in detail, to ensure a correct fit when these are reinstated.

5.2 Timber louvre and fame profiles are to match the existing as closely as possible. New panels are to be constructed using high grade timber, free of splits and large knots. Panels should be made available for architect’s inspection and approval prior to redecoration. Timber is to be treated with a suitable preservative to prolong the life of the timber and to discourage rot, then primed and coated using Brilliant White High Gloss Dulux Weathershield High Gloss or Jonhstone’s Flexible Exterior High Gloss System, to the paint manufacturer’s recommendations. Hinges and catches to match existing are to be provided and fully decorated.

5.3 The existing timber frames and sills to these dormer vents are to be retained, prepared and redecorated. If required, repairs to frame timberwork should be in line with the timber epair specifications set out previously in this document. The frames should be prepared and redecorated as set out previously in this document.

5.4 The replacement louvre panels are to be reinstated within the prepared and redecorated frames, with frames and ironmongery eased post-decoration / installation to ensure they open and close freely.

**6.0 Local roof repairs to small bay extension to aquarium**

The small extension of the Aquarium at ground floor level that extends into the side alleyway requires re-roofing in traditional roofing felt with flashings to form a weatherproof seal with adjacent brickwork. The plywood soffit also requires replacement with new WBP plywood with a clear timber sealant.

Materials are to be selected to match existing, with installation to manufacturer’s details. Proposed products for roofing felt and flashings are to be put forward by the contractor for approval by the architect.

**7.0 Insect screen installation**

There are 5 windows on the 5th floor which require new insect screens to be installed internally. These are in the Collections Care part of the Museum which contains environmentally sensitive material. Minimizing the risk of dust contamination is critical and the Museum team will expect the contractor to liaise directly with them to agree a suitable method of working which does not put the collections at risk. This is likely to require temporary protection using polythene sheeting and the Contractor should allow a provisional sum for these protective works.

The works are to include:

* Relocation of the existing blinds to the inside face of the reveal to allow these to be operational in front of the insect screens.
* Insect screens to be fabricated in two sections with a sliding track (sliding horizontally) to allow access to window opening mechanisms by sliding one panel in front of another.
* Tracks should have brush seals to maintain an insect-resistant seal.
* Screen tracks are to be of white aluminium with a white mastic seal between the frame and window reveals to maintain and insect-resistant seal.

The Contractor will be requested to put forward a suitable screen product for approval by the Museum.

**7.0 Brickwork repointing and cleaning of surface staining.**

There are some areas of brickwork which have been repointed using a cement based mortar, however given the age of the building and on inspection of older areas of pointing, the original brickwork used lime based mortar. The use of cement based mortars, which are significantly harder and less permeable, will, over time, cause damage to the brickwork and repointing in this works package should use Natural Hydrated Lime Mortar.

In general, the Contractor should refer to Historic England’s document ‘Repointing Brick and Stone Walls, Guidelines for Best Practice’ for further information on suitable repointing works for this Grade II\* listed building. A soft copy of this document is provided within the tender information.

**Preparation:**

Once areas of defective pointing have been identified they should be carefully raked out manually using hooked tools or masonry chisels to a depth of at least twice the height of the joint. It is important that mortar is removed from the top and bottom of the joints leaving a square-cut joint. Dust and debris must be removed from the joints using brushes or even a vacuum cleaner and thoroughly rinsed with water so that no loose dry material is left. The masonry must be thoroughly dampened with a hosepipe with a spray nozzle or a pump-action water sprayer, before placing the mortar. This is to reduce suction, improve adhesion of the mortar and prevent the mortar from drying too quickly.

**Repointing:**

Once preparation work has been completed then filling the joints can start. Repointing with lime mortars should generally be carried out by an experienced contractor using Natural hydraulic lime (NHL) mortar. Contact with any form of lime can cause severe irritation to skin and eyes and appropriate protective measures should be employed.

Once the repointing is underway it is important to protect it from wind, rain and strong sunlight, to avoid damage or rapid drying. Particular care is required to avoid damage from frost when pointing has to be carried out in cold weather. Surfaces should be protected with ventilated covers (multiple layers of hessian, thick blankets or carpet underlay are often used) and regular mist spraying may be needed to maintain damp conditions as the mortar starts to set. Additional plastic sheeting or tarpaulins draped in front of the hessian covers may also be needed if it is very windy or there is driving rain.

**Finishing:**

The mortar is ready for finishing when it is still damp but has a semi-hard leathery consistency so that it can be marked with a thumbnail, but a thumb pressed into the surface leaves barely any impression. The finish of jointing should match the detail of historic areas of pointing.

**Brickwork piecing-in**

There are small areas where bricks have become lose or been removed entirely. Where new bricks need to be re-installed, a hand-thrown yellow-gold brick to match the appearance of the original brickwork should be used. A sample of the proposed brick should be submitted by the Contractor for inspection and approval of the architect, prior to carrying out the works.

**Cleaning of brickwork staining**

There are areas of brickwork staining, primarily adjacent to rainwater / drainage pipes, that require cleaning. This should be carried out in accordance with BS 8221–1:2000 Code of practice for cleaning and surface repair of buildings.

Low pressure water jet (17 bar or less) should be used, along with a nylon-bristle brush, to avoid damaging the surface of the historic brickwork. Chemical and abrasive cleaning techniques are not to be used.