



Gujarat University

TECHNICAL SPECIFICATIONS

INTERIOR WORK

Tender No: GU/ESTATE/ZOO/2018-19/01

**Tender Document
For
Construction of Department of Zoology at
Gujarat University**

M-1: TEAK WOOD

The teakwood shall be of good quality as required for the item to be executed. When the kind of Wood is not specifically specified, Indian teakwood as approved by the Architect/Engineer-In-charge shall be used.

Teak wood shall be generally be free from large, loose, dead or clustered knots, flows. Shakes, Warps, twists, bends or any other defects. The teakwood shall generally be uniform in substance and having straight fiber as far as possible. It shall be free from rot, decay, harmful fungi and other damage of harmful nature which will affect the strength, durability or its usefulness for the purpose for which it is required. The color of the teakwood shall be uniform. Any effort like pointing, using any adhesive or reasons materials made to hide the defects shall render the pieces liable to be rejected by the Architect. The teak wood shall be dry and kiln seasoned. Green and wet timber shall be rejected.

All scaffoldings, planks, etc. shall be sown in straight lines and planed in the direction of the grains in uniform thickness to the size specified. Under no circumstances roughly worked or pieces damaged while being sawed or planed shall be accepted. The tolerance for the dimensions shall be allowed at the ratio 1.50 mm. per face to be planed.

Teak wood brought from the timber mart/ prepared at site shall be stored as per category size on

Successive cross layers as directed by the Engineer-in-charge. In no case the stacking shall be done so as to result in bending of teak wood members. The bottom most members shall not be directly be rested on ground but kept raised from floor in leveled manner so as not to be affected by moisture and insects. In case if the prepared teak wood members are to be stored for a period of more than 10 days the same shall be applied with approved quality anti termite liquid. The prepared timber shall be stored in shade in dry condition. Under no circumstance the prepared timber shall be tied with rope or hemp string to avoid rope burns. The area where such prepared fiber is stored shall be adequately being protected against fire hazards.

M-2: PLYWOOD

The plywood to be used shall be of approved make as shown in the appendix.
PLYWOOD OF ALL

THICKNESS SHNL BE OF BOILING WATERPROOF TYPE ONLY except that which is to be used for creating curved profile which shall be of commercial grade. The face veneers of plywood shall be 0.8 mm thick whereas the intermediate veneers shall be of 150 mm thick and shall have their opposite grain directions. The moisture content shall not be more than 12.5Cf% by mass. Unless otherwise explicitly specified only Boiling Waterproof grade plywood of specified thickness shall be used. Plywood shall be used in one piece only joining of pieces to form one single piece shall not be permitted except in

exceptional case where architect's written permission shall be necessary. All exposed edges of plywood shall be finished with T.W. lapping of appropriate size as shown in the drawings and as instructed by the Architect.

M-3: PRE-LAMINATED PARTICLEBOARDS OF EXTERIOR GRADE ALTERNATIVELY EXTERIOR GRADE PARTICLE BOARD HOT-PRESSED WITH 0.80MM THICK LAMINATE OF APPROVED MAKE & QUALITY ON BOTH THE SIDES

Pre-laminated particleboard shall be of approved make as shown in list of approved make (in order of preference). It must be of thickness as shown in bills of Quantities or in the drawings. It must be of exterior grade only. Edges of pre-laminated particleboard shall never be left exposed, the edges likely to remain exposed must be covered with beading element as per instructions or the Architect. The exterior grade pre-laminated particleboard shall be of shade and colour as approved by the Architect.

In case if exterior grade pre-laminated particleboard is not readily available than with consent of the owner's engineer and the Architect exterior grade particleboard of approved thickness shall be hot-pressed on both its sides with 0.80mm thick laminate or approved make and shade approved shade without any extra cost what-so-ever.

M-4: LAMINATES

Laminates shall be of approved make in order of preference shown in the list of approved makes. The laminates used shall be of approved type, finish etc. and shall not be less than 1.00 mm in thickness except when used for post-forming, laminate used for post-forming shall not be less than 0.8mm in thickness. The colour, shade & luster finish of laminates shall have to be approved by the Employer as well the Architect, The contractor shall deposit samples of approved laminates with the Employer & the Architect and shall keep a set on display at site of work till completion of work.

Laminates shall be stored flat and so covered as not to damage their surface. Damaged, dented, cracked & warped laminates shall not be used. Whenever patterned or wood grained laminates are to be used care shall be taken to match the pattern & grains in all directions. Laminates shall be used in single pieces only. In case of surface larger/longer than standard size of 1220 x 2400 mm where joint is unavoidable the same must be worked fine and finished such that it is not noticeable to casual vision.

Laminate shall be pressed to fit using glue of approved make. Extreme care shall be used to eliminate bubble formation. Laminate must be securely, evenly and properly be press fitted so as not to leave any portion loose, bubbled, curled, cracked, or with broken edges. Such defective laminated article shall be summarily rejected and shall have to be made anew.

Surface of the laminate shall not be damaged in process of press fitting otherwise the same shall be summarily rejected. Wherever so directed by the Architect the contractor shall chamfer the edges of laminates to create apparently sharp seamless joint without any extra cost. Extra care shall be taken to fix laminates on curved surface and it

must be ensured that the laminate does not crack in process of such press fitting. If required the contractor shall procure special type of laminate produced by approved make which permits such flexible press fitting without charging any extra cost. After the laminate is press fitted its edges shall be finished smooth, complete surface of the laminate shall be first cleaned completely to remove all temporary marks, adhesive stains etc. and shall be suitably covered to protect the surface from any accidental damage. If any accidental damage is caused prior to handing over of the finished article to the owner the same shall to be replaced completely without any extra cost.

M-5: VENEERS

Veneers shall be of approved make as per order of preference shown in the list of specified makes.

The selected veneer shall be procured in adequate quantity at once and stored not while keeping it covered to protect its surface from getting damaged. Veneers sheets shall be having backing of Plywood. Veneer sheets shall be free from defects like warping, dents, cracks, chipping; veneer sheets with termite or fungus marks shall be rejected. Veneer sheets shall first be treated with anti-termite treatment, which does not stain its surface.

As far as possible a single sheet of veneer shall be used to cover a given surface. For surfaces larger than 1220 x 2400 mm size where joint is unavoidable the joint shall be so worked out as to be not noticeable to casual observer. Direction of grain and pattern shall be carefully matched at such joints to maintain visual continuity. Surrounding surfaces shall have matching grain direction. Veneers shall be press fitted to the receiving surface by applying glue of approved make and rubber rolled to eliminate bubbles or any kind. Surfaces with bubble formation shall be rejected and shall have to be done anew without any extra cost. The complete press fit operation shall be carried out in such a manner as not to leave marks or any kind on the surface of the veneer upon completion. The glued work shall be allowed to set for not less than 12 hours before edge finishing is carried out. The completed work shall be kept covered to protect against any accidental damage. Damaged work shall be rejected and shall have to be done anew without charging any extras.

M-6: JOINERY OF TIMBER/PLYWOOD TO OTHER RECONSTRUCTED PARTICLE BOARDS, METAL ITEMS GLASS FIBER ITEMS ETC.

When timber or plywood is to be joined with any other material like reconstructed particle board, Metal items, Glass, Fiber items etc. the same shall be done as per the Architect's instructions using adhesives of type approved by the Architect and University engineer. The details of such joinery shall be provided by the Architect separately in form of drawings or instructions. No extra payment of any kind shall be made on account of arch joinery separately.

M-7: LIPPING A MOULDINGS

All exposed edged of plywood shall be finished with lapping by means of fitting seasoned superior quality teakwood [Ghana Teak] batten made from seasoned superior quality teakwood free from bends, twists, cracks, splits, knots, and decay of any kind and shall be of width matching to that of plywood and thickness as specified in the Architects drawing but not less than 6 mm thickness in any case. The T. W. batten to be used for lapping shall not have any knots in its lengthy as far as possible the T.W. batten shall be used in single piece for given length, however for length beyond 2400 mm a joint may be permitted which must be in form of a mitered butt joint. Battens with bend, cracks, twists, splintered ends & Knots shall not be permitted to be used for lapping. The lapping shall be carried out by applying glue of approved quality on surface of the ply wood as well the T.W. batten being used for lapping and fixed tight by using headless nails driven deep so as to permit minimal planning it required. Where indicated the batten for tipping shall project beyond the surface to be lipped as shown in the Architects drawing; no extra charge of any kind shall be admissible for lapping of any kind.

Teakwood moldings shall be made from seasoned superior quality teakwood [Ghana Teak) free from bends, twists, cracks, splits, knots, and decay of any kind. The width and thickness of the teakwood moldings shall be as specified in the Architects drawing and suitably over sized T.W. shall be used so as to finally confirm to the finished dimensions shown in the Architects drawing. Special care shall be taken in making of curved moldings, which shall be carried out in such a manner so as not to have more than 3 segments per one half round; joints occurring due to use of such segments shall not be visible to casual observer. When molding is to be used in juxtapose with wood grained veneer or laminate the teakwood selected for moldings must be of even color matching to that at veneer/laminate. Teakwood molding shall be fixed tight to the given edge by applying approved quality glue to both the contact edges and then fixing with headless nails driven deep enough to permit smooth finishing at the surface. The molding shall be held tight for not less than 6 hours before any finishing process is carried out on it.

IMPORTANT NOTE: all furniture items shall be treated with approved quality anti-termite treatment which shall be applied to all sides of finished timber including inside of joints, exteriors etc. which must have effect for not less than five years and shall be suitable for their final finishes.

M-8: GLASS

All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes, blisters and other defects. The kind of glass to be used shall be as mentioned in the item or specification or in the special provision or as shown in detailed drawings. Thickness of glass panels shall be uniform. The specification of different kind of glasses shall be as under.

FLOAT GLASS:

In absence of any specified thickness of float glass in term of weight in item or detailed specification of the item of work the same shall be assumed to be 5mm.

Float glass if not specified otherwise shall mean plain, transparent float glass without dry tint or shade.

M-9: FIXTURE AND FASTENINGS

GENERAL: The fixtures and fastenings that is but hinges, tees and strap hinges, sliding door bolts, tower bolts, door latch, bath-room latch, handles, door stoppers, casement window fasteners, casement stays, and ventilators catch shall be made of the metal as specified in the item or its specification.

They shall be of Stainless Steel as specified. The fixtures shall be heavy, medium or light type as specified. The fixtures and fastenings shall be smooth satin finished and shall be such as will ensure ease of operations

The samples at fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.

Their sizes shall conform to those prescribed in C-13(B) in respect of other dimensions not specified they shall conform in relevant I.S.

Brass and stainless Steel fixtures and fastenings shall be bright finished / malt finished as specified.

HOLDFASTS:

Holdfast shall be made from mild steel flat 50mm. thick at one end the holdfast shall be bent at right angle and two no. of 6mm. diameter holes shall be made in it for fixing it to the frame with screws. At the other end the holdfast, shall be forked and bent at right angles in opposite directions.

HINGES:

All hinges shall be of stainless steel material with its pin also of stainless steel. Railways standard heavy type hinges shall be used when so specified.

CONCEALED HINGES:

All concealed hinges shall be of specified make and type. The concealed hinge shall be of type that opens the shutters for more than 90 degree and where specified shall be

of snap shut spring loaded type. The fixing of concealed hinge shall be as per manufacturer's template and instruction manual.

SLIDING DOOR BOLTS (ALDROPS):

In case at single leaf door, where iron socket plate or brass or aluminum fixing bolt [or sliding door bolt] cannot be fixed, a hole of suitable size shall be drilled in the door frame and a counter sunk plate not less than 1.5 mm. thick out to shape shall be fixed at the face of the hole.

TOWER BOLTS (BARREL TYPE):

Mild steel door bolts shall be made in one piece. Knobs of the tower bolts shall be cast and knob fixed in the bolt. In case of brass and aluminum tower bolts, steel spring and ball shall be provided between bolt and the barrel.

DOOR LATCH:

The size of door latch shall be taken as the length at latch.

BATHROOM LATCH:

Bathroom latch shall be similar to tower bolt. The inside grip length of the handles shall determine the size of the handles. Handles shall have a base plate of length 50mm.

DOOR STOPPERS:

Doorstopper shall be either floor doorstopper type or door catch type. Floor doorstopper shall be of overall size as specified shall have rubber cushion.

DOOR CATCH:

Door catch shall be fixed at a height of about 900mm. from the floor level such that one part of the catch is fitted on the inside of the shutter and the other part is fixed in the wall with necessary wooden plug arrangements for approximate fixity. The catch shall be fixed 20mm. inside the face of the door for easy operation of catch.

WOODEN DOOR STOP WITH HINGES:

Wooden doorstop of size 100mm x 60mm x 40mm. shall be fixed on the door frame with a hinge of 75mm. size and at a height of 900mm. from the floor level. The wooden doorstop shall be provided with 3 coats of approved all point.

CASEMENT WINDOW FASTNER:

Casement window fastener for single leaf window shutter shall be left or right handed as directed.

CASEMENT STAYS (STRAIGHT PEG STAY):

The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially as directed. Size of the stays shall be 250mm. to 300mm as directed.

VANTILATOR CATCH:

The pattern and shape of the catch shall be as approved.

PIVOT:

The bars and socket plate shall be made from minimum 3 mm. thick plates, and projected pivot shall not be less than 12mm.diameter and 12mm length and shall be firmly riveted to the base plate in case of iron pivot and cased in single piece with the base plate in the case of brass pivot.

DRAWER SLIDES:

The drawer slides shall be of specified make and of roller slide type. The Drawer slide shall be such as to permit full drawer pull open. The drawer slide shall be fixed in proper line and level and shall operate smoothly.

CABLE MANAGER:

The cable manager shall be of specified make and size. The cable manager shall be having powder coated finish. The cable manager shall be fixed at designated place.

M-10: PAINTS:**(A) OIL PAINTS:**

Oil paint shall be of the specified colour and shade, and approved by the Architect/Engineer-in-charge. The ready mixed paints shall only be used. However, if ready mixed paint of specified shade or tint is not available, while ready mixed paint with approved strainer will be allowed. In such a case the contractor shall ensure that the shade of the paint so allowed shall be uniform.

All the paints shall meet with the following general requirements:

- I. Paint shall not show excessive setting in a freshly opened full tin and shall easily be mixed with a paddle to a smooth homogeneous state. The paint shall show not cording; livening, caking or colour separation and the same shall be free from lumps and skins.
- II. The paint as received shall brush easily, possess good leveling properties and show no running or sagging tendencies.
- III. The paint shall not skin wittin.48hours in a three-quartered filled closed container.
- IV. The paint shall dry to a smooth uniform finish free from roughness, grit, unevenness and other imperfections.

Ready mixed paint shall be used exactly as received from the manufactures and generally according to their instruction and without any admixtures, whatsoever.

(B) SYNTHETIC ENAMEL PAINTS:

The enamel paint shall satisfy in general requirements as mentioned in specification of oil points. Enamel paint shall conform to I.S.520/1954 or as revised from time to time.

[C] AUTOMOTIVE PAINT/ DUCO PAINT:

The Automotive paint or Duco paint shall be of approved make and shade. The surface to be painted shall be first prepared smooth by applying proper grade of sandpaper/water-paper and then if any pores are noticed the same shall be filled with approved quality synthetic filler agent. The complete surface shall be then applied an even coat of sealer putty and permitted to dry. The surface shall be again grinded smooth and even using appropriate grade of water-paper. When the surface is properly smooth and leveled without any pores or cracks the same shall be spray painted with approved quality automotive /Deco paint. The adjoining surfaces which are not to be painted with this application shall be suitably masked using appropriate masking tape. The paint shall be permitted to dry at room temperature and attain smooth lustrous finish.

M-11: FRENCH POLISH

The French polish of required tint and shade shall be prepared with the below mentioned ingredients and other necessary materials.

- I. Denatured spirit or approved quality.
- II. Chandras
- III. Shellac
- IV. pigment

The French polish so prepared shall conform to I.S. 1954 or as revised from time to time.

M-12: MALAMINE POLISH

Melamine emulsion to be used for polish work shall be of reputed manufacturer or approved type. Sealers and strainers approved by manufacturer shall be used. **Melamine** polish shall be canted out on properly primed surface using spray equipment only.

M-13: FOAM FOR UPHOLSTRY WORK

Foam for upholstery work shall be procured from approved make only and shall be of thickness and density as specified. The Foam shall be of fresh stock free from stains, tear, holes, indentation marks, loss of shape and shall be with smooth straight edges. Damaged foam shall be rejected. Use of second hand foam is prohibited. Foam shall be cut by expert workers using suitable tools so as to produce smooth edges free from any jiggered appearance. Foam shall be joined using rubber solution of appropriate grade only. As far as possible foam shall be used in single piece only unless a special shape is required to be formed by joining of foam. All foam work shall be protected from damage till suitably covered with grey lining cloth.

M-14: TAPESTRY

All tapestry shall be of approved make, shade, pattern and finish. All tapestry shall be fresh free from any stains, tear, shrinkage or any other similar defect. Tapestry shall be selected in close consultation with the architect, engineer and the owner. When pattern is apparent in any given tapestry care shall be taken to ensure that the pattern matches at crucial junctions and that direction of pattern is not vitiated. The chosen tapestry shall be well protected throughout its use and after the same is used for upholstery work shall be coated with a fabric protection spray as per manufacturer's specifications and guidelines.

M-15: CURTAIN CLOTH

Curtain cloth shall be of approved shade, pattern, make and finish. All curtain cloth shall be fresh free from any stains, tear, shrinkage or any other similar defect. Curtain cloth shall be selected in close consultation with the architect, engineer and the owner. When pattern is apparent in any given tapestry care shall be taken to ensure that the pattern matches at crucial junctions and that direction of pattern is not vitiated. The chosen curtain cloth shall be well protected throughout its use and after the same is installed the same shall be coated with a fabric protection spray as per manufacturer's specifications and guidelines. Whenever so directed the curtain cloth shall be provided with suitable lining cloth on its inside. The length of the curtain shall be considered minimum 1.5 times its actual opening size so as to provide for proper folds for curtains.

M-16: TOUGHENED GLASS

Glass to be toughened shall be 1st quality float glass free from any defect like waves, bubbles, crack, flacks & shall be of true surface. The glass to be toughened shall be of specified thickness. All the required cuts, holes, beveling, chamfering creation of slots, polishing of edges etc. shall be carried out prior to commencement of toughening process. Toughening process shall be carried out by experienced company and the glass shall be "oven baked" to required temperature which is sustained for specified period. Cooling of glass shall be carried out in proper medium in gradual manner only. Weight of 12mm thick toughened glass shall be @30 Kg/m². All toughened glass shall carry toughening process applicator's logo label of permanent nature on one of the corner edge.

M-17: GRID FALSE CEILING

Providing & Fixing of Armstrong Mineral Fibre Acoustical Suspended Ceiling System with Angled Tegular edge tiles with Prelude 24mm exposed grid.

The tiles should have Humidity Resistance (RH) of 95%, NRC 0.5, Light Reflectance $\geq 85\%$, Thermal Conductivity $k = 0.052 - 0.057$ w/m K, Colour White, Fire Performance UK Class 0 / Class 1 (BS 476 pt - 6 & 7) in module size of 600 x 600 x 15mm , suitable for Green Building application, with Recycled content of 30%.

The tile shall be laid on Armstrong Prelude 32 with 24 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 32mm and a load carrying capacity of 6 Kgs/M2 (as per standard installation layout mentioned below) & pull out strength of minimum 100 Kgs.. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with Suspension system of Armstrong make. The Tile & Grid system used together should carry a 10 year warranty. Warranty Certificate and Test Reports for NRC, CAC and Fire rating shall be provided by Vendor. Mineral Fibre Acoustic Modular Ceiling Tile should be GREENPRO certified and qualifies as GREEN PRODUCT certified by CII Green Products and Services Council.

INSTALLATION: To comprise main runner spaced at 1200mm securely fixed to the structural soffit using Armstrong suspension system (specifications below) at 1200mm maximum. The First/Last Armstrong suspension system at the end of each main runner should not be greater than 450mm from the adjacent wall.

Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm to form 1200 x 600 mm module. Cut cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross tees centrally between the 1200 mm cross tees.

Perimeter trim to be Armstrong wall angles of size 3000x19x19mm, secured to walls at 450 mm maximum.

Installation to be carried out by Armstrong Trained Installation team & Installation should be carried out as per Armstrong recommended procedure.

ARMSTRONG SUSPENSION SYSTEM accessories manufactured and supplied by Armstrong World Industries consisting of M6 Anchor Fasteners with hanger hole, pre Straightened Hanger wire of dia – 2.5 mm of 1.80 m length having a tensile strength of 344-413 MPa and a minimum pull strength of 110 kgs. (Adjustable hook clips of 0.7mm thick, galvanized spring steel can also be used for installation purpose as an additional accessory. The adjustable clip also consists of a 4 mm aquiline wire to be used with the main runner).

M-18: ACUSTICAL PANELING WORK

Providing and supplying Armstrong 'Optra Acoustical Wall Paneling' with square edges made of fibre glass substrate 25mm thick and wrapped on the front side with an acoustically transparent and classified for Fire reaction Class A, as per ASTM E-84, fabric with an option of colors – Husk, Copper, Sangria, Sesame, Coffee, Charcoal, Titanium, Flame, Peanut and Shell as per the choice of the Architect of size 600x600mm, 600x1200mm providing a minimum sound absorption level of 0.85 NRC to be affixed to wall using Wall panel Impalers supplied by Armstrong Ceiling Solutions and construction adhesives as per the instructions laid down by the manufacturer. 1 Year Warranty Certificate and Test Reports for NRC and Fire rating shall be provided by Vendor.

INSTALLATION:

In order to fix the panels to the wall, the Impalers shall be fixed to the wall surface using self tapping screws. 3 nos. in case of 600x600mm, 4 nos in case of 600x1200mm wall panel Impalers to be used for the installation purpose. Silica based construction adhesive to be dabbed on to the projecting elements (spikes) of the impalers. Armstrong Optra wall panels shall be pierced through the spikes of the impalers ensuring the line and level of the panels are maintained. Installation to be carried out by Armstrong Trained Installation team & Installation should be carried out as per Armstrong recommended procedure.