1) PAINTING AND POLISHING Of the Institute Building From outside and all Internal corridors at National Institute of Technology, Raipur (CG) NIT No. MBI/CON/662/127 dtd: 13/12/2012

1.1 Scope of Work
The finishing works shall include providing plastering, painting, sealing coats and decoration to internal and external surfaces of the building, all as shown in the drawings and as specified or as directed by the Engineer-in-Charge.

1.2 Applicable Specifications
All work shall generally be carried out as per CPWD Specifications 96 Part 13 - Finishing except as modified hereunder:

1.3 Materials
a) General
i) All materials shall be obtained only from approved shade, texture, finish of approved manufacturers of building paints; ICI, Berger, Jenson and Nicholson, Nerolac, Asian Paints and Goodlass Nerolac.

iii) All paints and other materials shall be delivered in sealed containers bearing information as per statutory requirements. The Contractor shall in addition furnish a letter with each consignment from the manufacturer giving the following data:
   (a) Manufacturer's name or recognised trade Mark.
   (b) The appropriate title and specification number.
   (c) Whether priming, undercoat or finishing coat.
   (d) Lead free, if required.
   (e) Whether for interior or exterior use.
   (f) The colour reference.
   (g) The method of application.
   (h) The batch number and date of manufacture.

iv) For containers of materials other than paints the above data shall be provided to the extent that it is appropriate.

v) No paint shall be used after a period of 6 months from the date of manufacture or the expiry period given by the manufacturer. If this period is exceeded, the paint shall be removed forthwith from the site by the Contractor and nothing extra shall be paid on this account.

vi) Only such number of containers as are required for immediate use shall be opened.

vii) All brushes, paint rollers, spraying equipment, kettles etc., used in carrying out the work shall be clean and dry. They shall be thoroughly re-cleaned before being used for a different type or class of material.

viii) Cutting in shall be neatly and accurately performed.

ix) No painting shall be done during inclement weather conditions, in dusty
Atmosphere or when it is raining or when the temperature is less than 10°C or when the
humidity is high. Engineering Projects(I)Ltd.
x) Sequence shall be properly planned such that finished work is not spoiled by subsequent preparatory works.
xi) Flood coat shall be provided for preservatives.

xii) Successive coats of undercoat shall have different tints.
xiii) Paint shall be applied only to properly prepared, clean, sound and dry surfaces.
xiv) Each coat of paint shall be thoroughly dry before the next coat is applied and the surfaces of primers and undercoats shall be lightly rubbed down and dusted off.
xv) Coats of paint shall be applied at proper intervals to secure maximum adhesion. Where two hard gloss finishing coats are scheduled, the second coat shall be applied within 48 hours.
xvi) The method of application by brush, roller or spray shall be decided by the Engineer-in-Charge.

b) Paints from one manufacturer
Materials for the priming coat, putty undercoats and finishing coats of paint for any one system shall be obtained from the same manufacturer.

c) Paints, Primers, Distempers and Textured
i) Synthetic enamel shall be approved make and shade.

ii) Priming paints for steel work shall be red lead priming paint, conforming to IS:102 or red oxide zinc chrome priming paint conforming to IS:2074.

iii) Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade New work (two or more coats) over and including priming coat with cement primer.

iv) Plaster of Paris Putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete

d) Filler with Plaster of Paris
Interior plaster shall be filled, made even and smooth with Plaster of Paris, anhydrous gypsum, conforming to IS:2547.

e) French spirit polish
French polish shall conform to IS:348. It shall be prepared by dissolving pure shellac (conforming to IS:347) in methylated spirits. Also refer clause 13.50.1 of CPWD Specifications 96.

f) Colours
Paints for the work shall match the colours specified/approved by the Engineer-in-Charge. Blending of paints or tinting shall not be permitted.
The Contractor shall assume that multi-colour schemes of decoration will be adopted in which changes of colour will occur only at internal or external angles of wall and ceilings. Nothing extra shall be payable for use of more than one colour of paint in one area/surface.

**g) Samples**

Samples for testing may be taken from the sealed containers, spray gun containers or from the workmen’s kettles on the works. In addition the Engineer at his discretion may require sealed containers to be set aside for subsequent testing. Engineering Projects(I)Ltd.

Signature of contractor & EPI

Any work found to be done with unsatisfactory materials or not done in an acceptable manner shall be rejected. Such works shall be made good by the Contractor at no extra cost, to the entire satisfaction of the Engineer.

If any paint that is delivered to site is found to be defective or unsatisfactory its use shall be suspended and the manufacturer and the Engineer notified immediately.

**h) Storage and Handling**

Inflammable materials like thinners etc. shall be stored separately. An adequate number of fire extinguishers of suitable type shall be kept in ready to use condition in the store.

**i) Surface preparation**

**Iron and steelwork**

(a) Bare iron and steelwork including sheeting and pipes shall be thoroughly prepared by removing all dirt, rust and loose mill scale to the entire satisfaction of the Engineer-in-Charge.

(b) Preparation shall include the use of chipping hammers, scrapers, power tools with mechanical wire brushes and Carborundum grinding discs. The use of mechanical chisels and other impact tools may exceptionally be ordered if in the opinion of the Engineer-in-Charge their use is necessary.

(c) All rivets, welds, angles, joints and openings shall be properly cleaned.

(d) All tools shall be operated in such a manner that no sharp ridges or burrs are left and no cuts made in the steel.

(e) Dust and other loose material shall be removed after cleaning. Oil and grease shall be removed with white spirit.

(f) The priming coat shall be applied before any contamination or rusting occurs.

(g) All surfaces shall be washed with mineral spirits to remove any dirt or grease before applying paint. Where rust or scale is present, it shall be wire brushed and cleaned with emery paper.

(h) Steelwork shall be given one shop coat of primer before delivery to site. In case this gets damaged in transit the damaged areas shall be cleaned off, wire brushed, and spot...
primed immediately after delivery. A second coat of primer shall be applied at site after erection.

j) Precautions
(a) Old brushes, if they are to be used with emulsion paints, should be completely dried of turpentine or oil paints by washing in warm soap water. Brushes should be quickly washed in water immediately after use and kept immersed in water in break periods to prevent the paint from hardening on the brush.
(b) In the preparation of surfaces for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes, etc.
(c) Splashes on floors etc. shall be cleaned out without delay and definitely everyday, as they will be difficult to remove after hardening.
(d) Washing of surfaces treated with emulsion paints shall not be done within 3 to 4 weeks of application.

k) Preparation of paint
i) Mixing:
(a) All liquid paints shall be thoroughly stirred using mechanical stirrers with a minimum speed of 650rpm to a uniform consistency when containers are opened and before being transferred to paint kettles.
(b) Paste paints shall be beaten up thoroughly as directed by the manufacturer prior to thinning.

ii) Thinning
(a) Thinning for oil paints shall not normally be permitted. In exceptional circumstances, the Engineer-in-Charge may permit thinning with up to 5% of white spirit by volume or a thinner as recommended by the paint manufacturer to maintain the paint in a working consistency.
(b) PVA emulsion paints shall be thinned with potable water for the first coat only depending on the porosity of the surface to be painted. In any case, the quantity of water shall not exceed 50% by volume. Subsequent coats shall not be thinned.

iii) Straining
Any paint showing bittiness in application shall be strained through fine gauze.
(a) Addition of other materials
With the exception of the thinners given in (b) above, no other materials shall be added to the paints.
(b) Mixing of different paints together
Mixing of different paints together shall not be permitted.
I) Protection
(a) All ironmongery, finger plates, power points, lighting fixtures, grills, diffusers, fixtures of other services, machinery, plant and equipment, flooring, glazing etc. shall be protected using PVC sheets weighing 1000g/sqm and masking tapes. Flooring, wherever laid, even though it may not have been polished shall be protected likewise.
(b) Masking tapes shall be used.
(c.) Covering for protection shall be left in position upto completion, to the satisfaction of the Engineer.

m) Method of Application

i) Brush painting
a. Paint shall be applied so that the finished surface is free from brush marks.
b. All areas or parts shall be laid off correctly.
c. All paint edges shall be good, sharp and true to line.

i) Primers
d. Priming coats shall be applied by brush to give a coat of adequate thickness with no misses and to satisfy the porosity of the surface. The priming shall be well worked into the surface, joints, angles and other places where moisture is likely to collect.
e. Steelwork surfaces shall be primed immediately after cleaning. Priming coats applied off-site that have suffered from exposure on the site or in transit shall be touched up or re-primed as necessary before undercoating.
f. Where there is a doubt as to the adequacy of the primer to fully satisfy the porosity of the surface, the Engineer-in-Charge shall be informed and his directions taken.

iii) Undercoats
e. Undercoats shall be applied evenly over the whole surface to give a solid film, care being taken to avoid uneven thickness of paint at edges and angles.

iv) Finishing coats
g. Finishing coats shall be applied evenly over the whole surface to give a solid film free from brush marks, sags, runs, peeling or other defects.
h. Finished work shall be uniform, of approved colour, smooth and free from runs, sags, defective brushing and clogging. Edges of paint adjoining other materials or colours shall be sharp and clean, to correct lines and levels without overlapping.

v) Protection
All finished work shall be protected upto completion and handing over.

n) Cleaning
All areas shall be left in a neat, clean and tidy condition after the painting work is over.
**o) Scaffolding**
Scaffolding shall be erected for all painting work. Ladders shall only be used in exceptional circumstances where permitted by the Engineer-in-Charge. Care shall be taken to avoid any damage to floors and walls.

**p) Measurements**
i) Painting shall be measured as per clause 13.25.6, 13.33.6 of CPWD Specifications 96.
ii) Painting in small widths and girths, cornices etc., shall also be measured in general painting. Painting for all floor levels and all heights shall be measured under the same item.

**q) Rate**
The rate shall include the cost of materials, labour involved in all the operations described above. The cost for primer work shall be paid separately. Engineering Projects(I)Ltd.
Signature of contractor & EPI

**2.4 Acrylic Emulsion Paint**

**2.4.1 Materials**
Emulsion paint of approved brand and manufacture shall be used. The primer where used as on new work shall be primer as described in the item. These shall be of the same manufacture as emulsion paint. The acrylic emulsion paint be diluted with prescribed thinner in a manner recommended by the manufacturer. Only sufficient quantity of paint required for day’s work shall be prepared.

The paint and primer shall be brought by the contractor in sealed tins in sufficient quantities at a time to suffice for a fortnight's work, and the same shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty tins shall not be removed from the site of work, till this item of work has been completed and passed by the Engineer-in-Charge.

**2.4.2 Preparation of the Surface**
For new work the surface shall be thoroughly cleaned of dust, The surface shall be sandpapered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of paris mixed with water on the entire surface including filling up the undulations and then sand papering the same after it is dry.

In the case of old work, all loose pieces and scales shall be removed by sandpapering. The surface shall be cleaned of all grease dirt etc.

The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of the paint shall be applied over the patches. The patched surface shall be allowed to dry thoroughly before the regular coat of distemper is applied.
2.4.3 Application Priming Coat
The priming coat shall be with primer, as required in the description of the item. The application of the primer shall be as described in 13.30.2.2. Acrylic emulsion paint is not recommended to be applied, within six months of the completion of wall plaster. However, newly plastered surfaces if required to be painted before a period of six months shall be given a coat of alkali resistant priming paint conforming to IS : 109 and allowed to dry for at least 48 hours before distempering is commenced.
For old work no primer coat is necessary. 2.4.4 Acrylic emulsion Coat
For new work, after the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the paint, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. One coat of paint properly diluted with thinner (or other liquid as stipulated by the manufacturer) shall be applied with brushes in horizontal strokes followed immediately by vertical ones which together constitute one coat. The subsequent coats shall be applied in the same way. Two or more coats of distemper as are found necessary shall be applied over the primer coat to obtain an even shade.
A time interval of at least 24 hours shall be allowed between successive coats to permit proper drying of the preceding coat.
For old work the paint shall be applied over the prepared surface in the same manner as in new work. One or more coats of paint as are found necessary shall be applied to obtain an even and uniform shade.
15 cm double bristled painting brushes shall be used. After each days work, brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with paint shall not be used on the work.
The specifications in respect of scaffolding, protective measures and measurements shall be as described under 13.25.

2.4.5 Rate
The rate shall include the cost of all labour and materials involved in all the above operations (including priming coat) described above