**TENDER SPECIFICATIONS FOR ELECTRICAL REWIRING**

Requirement for the Electrical work for Digitization and Archival Documentation

The Museum has undertaken the project of digitization of collection under the Museum Modernization Plan supported by Ministry of Culture, Government of India. We have already purchased the digitization software and few hardware to assist in documentation. We have identified the requirement for electrical work.

For the purpose of electrical work, a detailed plan of the office and the list of electrical requirements like cable, wires, earthing, lights and fans is attached as Annexure I.

# A TECHNICAL SPECIFICATIONS

# 101 CABLING

1.0 SCOPE

1.1 The scope under this section covers the following :

 A) Power cables HV and LV

 B) Control cables

2.0 STANDARDS

2.1 The following standards shall be applicable :

 A) IS : 1753 : Specification for aluminium conductors for insulated cables

 B) IS : 2982 :Specification for copper conductors ininsulated cables

 C) IS : 5831 :Specification for PVC insulated and sheath of electric

 cables

 D) IS : 6474 :Polythelene insulation and sheath of electric cables

 E) IS : 3975 :Specification for mild steel wires, strips and tapes for

 armouring of cables

 F) IS : 692 :Paper insulated lead-sheathed cables for electricity

 supply

 G) IS : 694 :PVC insulated cables

 H) IS : 1554 :PVC insulated (heavy duty) electric cables

 I) IS : 4288 :PVC insulated & PVC sheathed solid aluminium

 conducted cables of voltage rating not exceeding 1100 V.

 J) IS : 5755 :Mineral insulated aluminium sheathed cable with

 aluminium conductors

 K) IS : 1255 :COP for installation and maintenance of paper insulated

 power cables (upto and including 33 KV)

 L) IS : 7098 :Specification for cross linked polythelene insulated PVC

 sheathed cables

 M) IS : 5959 :Polythene insulated and PVC sheathed (heavy duty)

 electric cables

 N) BS : 2004 :PVC insulated unarmoured cables for electric power &

 lighting.

 O) IS : 6380 :Electrometric insulation and sheath of electrical cable

 P) IS : 3961 :Recommended current ratings of cables

 Q) IS : 5819 :Recommended short circuit ratings for high voltage

 PVC cables

3.0 GENERAL REQUIREMENTS

3.1 The cables shall be either copper or aluminium as indicated. The HV cables shall be of paper insulated, PVC or XLPE and the M.V cables shall be of PVC or XLPE as indicated in the drawings and schedule of materials.

3.2 Power cables shall comply of the following :

 - HV cables to suit the system voltage

 - MV cables -1100 V grade with standard copper conductors upto

 and including 6 mm sq. and standard aluminium conductors for 10

 mm sq.

 - Colour coded insulation

 - PVC inner and outer sheathing applied for extrusion

 - Steel armouring between inner and outer sheathing

3.3 Control cables shall be 600V grade multi-core copper conductor with PVC insulation, armouring and sheathing. The cable sizes shall be selected to carry the continuous full load current, with stand short circuit currents and bring the voltage drop within the specified limits.

4.0 CONDUCTORS

4.1 The copper conductors shall comply with the requirements specified in IS : 2982 and aluminium conductor IS : 1753.

5.0 INSULATION

5.1 The type of insulation shall be as indicated in the drawing and bill of materials. The thickness of insulation shall be on the basis of insulation material, voltage and the conductor size conforming to the relevant standard specification. The cores shall be colour coded to Indian Standard Specifications.

5.2 The XLPE cables shall be with chemically cross-linked polythene of natural unfilled compound.

5.3 The PVC insulation & sheathing shall be of high quality & conforming to the following :

 - Volume resistivity @ 278 5.12 x 10

 - Tensile strength 125 kg/cm

 - Elongation 125%

6.0 SHEATHING

6.1 The sheathing shall be PVC and shall be before and after the armouring, the thickness of the sheathing shall be based on the conductor size and overall diameter below the sheathing.

7.0 ARMOURING

7.1 Single core cables shall be without armouring. But it insisted it shall be of magnetic material. Multi core cables shall be with armouring. The armouring for cables upto 16 mm sq. shall be galvanised wire armoured and above 25 sq.mm shall be steel strips.

8.0 INSTALLATION

8.1 Power cable laying shall strictly be as follows :

 In full length without joints or splices.

 - Mark the routing on drawings and at site and get it approved, if the routes

 are not available on drawings.

 - Cable trays to be used for cables laid indoors except for single cables. The cable trays shall be of ladder type fabricated out of

 structural steel, GI perforated or aluminium perforated as

 indicated. The cable trays shall be of adequate strength to

 carry the weight of cables without sagging. Structural brackets

 grounted in the buildup trenches to support the cable such

 supports shall be at intervals of not less than 750 mm centres.

 All the structural steel work shall be finished with two coats of

 paint over primer.

 - Spacing of cable support for self-supported cables on wall, ceiling

 or trenches shall be as follows :

 Horizontal run Vertical run

 Upto 10 mm 350 mm 450 mm

 16 to 95 mm 450 mm 500 mm

 120 to 400 mm 700 mm 900 mm

 - For cables laid indoors, plastic identification marks at every 20 m

 straight run, at bends & both ends.

 - Cables laid underground shall be at a depth not less than 600 mm

 with sand bedding & protective bricks or tiles extending atleast 100

 mm on both sides. Markers to be provided above ground at bends, loops & crossing.

 - Provide hume pipes, trenches or tunnels at built-up areas & road

 crossings.

 - Provide loops of minimum 500 mm radius at each ends.

 - Cable should not be bend to a radius of not less than 20 times the

 diameter of the cables.

 - Individual cable shall be clamped with saddle, clamp, spacer etc.

 - Cables on trays shall be tied using lockable nylon ties of appropriate length.

8.2 Control cables shall be laid away from the power cables & shall be on suitable trays.

8.3 The power cable termination shall have necessary brass glands & shall be as follows :

 - Pressure clamp insertion type upto 4 sq.mm

 - Tinned copper termination shall be through pressure clamp

 insertion type lugs.

9.0 TESTING

9.1 HT & LT cables shall be tested after installation using 1000V & 500V insulation resistance tester respectively and the following readings recorded :

 - Continuity on all conductors

 - Insulation resistance

 A) Between conductors

1. All conductors & ground

# 102 PANELS &DISTRIBUTION BOARDS

1.0 SCOPE

1.1 The scope under this section cover the sub-distribution boards and feeder pillars for lighting and power distribution.

2.0 STANDARDS

2.1 The following standards shall be applicable :

 A) IS : 2607 Air break isolators for voltages not exceeding

 1000 V.

 B) IS : 13032 Enclosed distribution fuse boards and cutouts for

 voltages not exceeding 1000 V.

 C) IS : 2086 Carrier and base used in rewireable type electric

 fuses upto 650V.

 D) IS : 3106 COP for selection, installation and maintenance of

 fuses- voltage not exceeding 650 V.

 E) IS : 5039 Distribution pillars for voltage not exceeding

 1000 V.

 F) IS : 8828} Miniature circuit breaker.

 IEC : 898}

3.0 GENERAL REQUIREMENTS

3.1 The distribution boards shall be complete with :

 - Sheet steel enclosure of 16 SWG suitable for recessed semi-

 recessed or surface mounting or of thermoplastic/ABS body.

 - Electrolytic grade copper, busbars, incoming and outgoing

 feeders

 - Earthing terminals

 - Circuit diagram indicating load distribution on the inside cover

 - Weather proof enclosure and canopy for outdoor DB's and feeder

 pillar.

 - Double door vertical or horizontal.

4.0 ENCLOSURE & FABRICATION

4.1 The fabrication of the enclosure shall comply the following.

 - 16 SWG sheet enclosure with circular knock-outs

 - Wire race for individual phases.

 - Phase barriers of insulating material for three phase DB's

 - 2 nos. earthing terminals with lug type connection

4.2 - Wherever wiring is with 3C –flexible wires, minimum space of

 150 mm shall be provided between MCB & enclosure all around as well as between MCBs of different phase.

5.0 CORROSION TREATMENT

5.1 Sheet steel work shall be provided with 7 tank anticorrosive treatment. The panel shall be finished with 2 coats of approved synthetic enamel paint over two coats of red-oxide primer, oven dried.

6.0 BUSBARS

6.1 The busbars shall be as follows :

 - The electrolytic grade copper bar suitable for incoming feeder with

 current carrying capacity of min. 800A/sq. inch.

 - Individual phase and neutral bars located in respective phase

 cubicle for three phase DB's.

7.0 MINIATURE CIRCUIT BREAKERS

7.1 The MCB's shall comply the following feature :

 - Short circuit capacity of minimum 9 KA

 - Quick make, quick break, non welding silver alloy contacts

 suitable for manual and automatic operation

 - Inverse time over load and instantaneous short circuit tripping

 mechanism with trip free operation.

 - Common operating handle and integral tripping for multipole MCB

 - Pressure clamp terminals for users upto 4 mm sq. and bolted lugs

 for higher rating.

 - Phenol formaldehyde moulded enclosure.

 - B curve for lighting d curve for UPS supply & c curve for motor

 duty (AC etc.).

8.0 FUSES

8.1 The fuses shall comply the following features :

 - HRC link type with carriers

 - Short circuit rating of minimum 25 KA

 - Pressure clamp terminals for wires upto 4 mm sq. and bolted

 lugs for higher rating.

9.0 INSTALLATION & TESTING

9.1 The distribution boards shall be mounted on necessary angle crow frame work.

9.2 Insulation resistance shall be tested with 1000V meggar and the values should be as shown below :

 - Between phases : 2.5 megohms

 - Between phases & neutral : 1.5 megohms

# 103 WIRING INSTALLATION

1.0 SCOPE

1.1 The scope under this section covers wiring installation consisting of :

 A) Lighting circuit

 B) Power circuit

 C) Equipment & machinery

 D) Low voltage installation

2.0 STANDARDS

 A) IS : 732 COP for electrical wiring installation (system

 voltage not exceeding 650 V)

 B) IS : 1646 COP for fire safety for buildings (General)

 electrical installation

 C) IS : 5216 Guide for safety procedures & practice in electric

 work.

 D) IS : 4648 Guide for electrical layouts on residential buildings

 E) IS : 302 General & safety requirements for light electrical

 appliances

 F) IS : 9537 Specification of conduits for electrical installation

 G) IS : 1653 Rigid steel conduits for electrical wiring.

 H) IS : 2509 Rigid non metallic conduits for electrical installation

 I) IS : 3480 Flexible steel conduits for electrical wiring

 J) IS : 3667 Fittings for rigid steel conduits for electrical wiring

 K) IS : 3837 Accessories for rigid steel conduits for electrical

 (wiring)

 L) IS : 6946 Flexible (pliable) non-metallic conduits for

 electrical installation.

 M) IS : 3419 Fittings for rigid steel conduits for electrical

 wiring

 N) IS : 694 PVC insulated wires

 O) IS : 8130 Conductors for insulated electric cables &

 flexible cords

 P) IS : 5133 Boxes for enclosures of electrical accessories

 Q) IS : 2148 Flame proof enclosure for electrical apparatus

 R) IS : 1293 3 pin plugs and sockets

 S) IS : 4705 Switch socket outlet (non-inter locking type)

 T) IS : 5561 Electrical power connectors

 U) IS : 2004 PVC insulated wires

3.0 CONDUIT WIRES

3.1 Conduit wiring shall be from LDB, PDB, panels, MCC or isolators as indicated and shall be complete with :

 - Conduit & accessories

 - Wires & interconnections

 - Control switches & sockets

 - Outlet boxes with terminal connectors &earthing

4.0 NON-METALLIC CONDUITS

4.1 Non-metallic conduits shall be heavy/medium guage PVC as specified in schedule of work as per IS : 9537 with following dimensions subject to tolerances. All accessories shall also be of the same material.

 NOM. DIA ID OD

 1) 20 dia 15.8 20

 2) 25 dia 20.6 25

 3) 32 dia 26.6 32

 4) 40 dia 34.4 40

5.0 METALLIC CONDUITS

5.1 All conduits & accessories shall comply the following features:

 - Solid welded pipes with black enamelling

 - Wall thickness of

 16 SWG upto 40 mm dia

 14 SWG above 40 mm dia

 - Conduit accessories of similar wall thickness & include bends,

 elbows, juction boxes, reducers, nipple, spliter coupling plugs,

 etc.

 - Junction boxes shall be with the required number of outlets &

 cover 50/75 mm deep as per site conditions.

 - Flexible conduits made out of continuous length of spirally

 wound, inter-linked strip steel with fired zinc coating on both

 sides.

 - Flexible HDPE pipes short length of upto 500 mm may be used as adaptor for drop to the fixtures wherever false ceiling is there.

6.0 WIRES

6.1 Wires shall comply the following features :

 - PVC insulated bright annealed copper stranded conductors.

 - 600 V grade wires for single phase circuits and 1000 V grade

 for 3 phase circuits.

 - Colour coded as below :

 Phase - R - Red

 Phase - Y - Yellow

 Phase - B - Blue

 Neutral - Black

 Earth - Green or yellow/green

7.0 CONTROL SWITCHES AND SOCKETS

7.1 The control switches and sockets shall be of rated capacity and shall comply the following features :

 A) CONTROL SWITCHES

 - Silver contacts with shrouded current carrying terminals

 - Moulded urea formaldehyde casing and cover plates

 B) SOCKET OUTLETS

 - Brass or copper female outlets enclosed in urea formaldehyde

 or porcelain casing

 - Control switches & fuses

 - Urea formaldehyde cover plates

 C) INDUSTRIAL OUTLETS

 - Brass or copper female outlet enclosed urea formaldehyde

 or porcelain casing.

 - Aluminium alloy enclosure with cover

 - Scraping in earthing terminals

 - DP/TP MCB

 D) OUTLET BOXES

 The outlet boxes shall be factory fabricated out of machine

 pressed sheet steel passivated as per the switch manufacturer.

8.0 LAYING OF CONDUITS

8.1 The size of conduit shall be selected on the following basis :

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Conduit size mm dia

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Wire sq. mm 20 25 32 40 50 63

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Maximum number of wires

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.0 4 8 10 x x x

1.5 4 8 10 x xx

2.5 4 6 8 x xx

4 2 4 6 x xx

6 x 2 4 x x x

10 x x 2 4 x x

16 x x x x 4 x

25 x x x x 4 x

35 x x x xx 4

50 x xxxx 4

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Note : x indicates not applicable

8.2 The conduit laying shall be as follows :

 - On the routes indicated on the drawing or to be marked on the

 drawing and at site and got approved before laying.

 - Conduit junction boxes/pull through boxes to be installed at

 spaces not more than 12 m or two 90 deg. bends, the junction

 boxes shall be flush with ceiling.

 - Conduits to be kept 100 mm minimum from pipes and non

 electrical services

 - Separate and colour coded conduits/runways to be used for

 1) Lighting circuits

 2) Emergency lighting circuit

 3) Power circuit

 4) Low voltage circuit

 - Fixing screws to be rust proof or cheese head screws

 - Conduit buried in concrete to be fastened to the reinforcement

 and get approved before casting the slab.

 - Conduits embedded in wall to be fixed by staples at 500 mm

 intervals.

 - Conduits embedded in floor screen to be of PVC or galvanised

 and painted with emulsified bitumen

 - Conduits to be free from sharp edges and burrs and necessary

 PVC bushing to be provided wherever necessary.

 - Outlet boxes to have minimum size of 50 x 50 x 32 mm or as

 per switch manufacturer's specification.

 - Flexible conduits are acceptable only at machine end and for

 short extension to outlets (not exceeding 500 mm in false

 ceiling)

 - Chasing the brick wall shall be done by cutters/circular discs.

 - All metallic conduits and accessories shall be threaded type and exposed threads and bends shall be given one coat of black enamel paint over a coat of redoxide paint.

 - Non-metallic conduit shall be jointed using solvent specified by the conduit manufacturers.

9.0 EARTHING

9.1 Insulated earth conductors of specified size shall be taken through

 the conduits.

9.2 The size of earth wire shall be of size 50% of phase conductor subject to a maximum and minimum shown below :

 Copper Aluminium GI

 Minimum (sq.mm) 1.5 2.5 4

 Maximum (sq.mm) 150 175 350

9.3 All outlet boxes, switch & socket boxes, and light fitting to be earthed properly.

9.4 The switch/socket outlet shall be factory built suitable for the particular make of switch/outlet.

**10.4** WIRING

1.0 SCOPE

1.1 The wiring in conduit shall comply the following :

 - Single core PVC insulated copper aluminium wires as specified

 below or as shown on drawings and schedule of material

 - Wire sizes

 Copper Aluminium

 Light circuit point 1.5 sq.mm 2.5 sq.mm

 Light secondary point 1.5 sq.mm 2.5 sq.mm

 Power points 2.5/4.0 sq.mm 4.0 sq.mm

 Machineries According to the load current

1.2 A maximum 3 circuits of same phase can be taken per conduit and

 each circuit shall have independent neutral and earthwire from DB.

 Jointing of wires are not permissible, however looping may be done

 from the circuit point/secondary points.

1.3 Metalic/non-metalictrunking may be used if number of conduits are

 many. The metalictrunking shall be earthed security at DB end and

throughout the length.

1.4 Single trunking with metallic partition may be used for different

 voltage services.

2.0 TESTING

2.1 The entire installation to be tested for :

 1) Insulation resistance

 2) Earth continuity

 3) Polarity of single pole switches

2.2 3 copies of test certificates shall be submitted for the approval.

# 105 LIGHT FITTINGS AND FANS

1.0 SCOPE

1.1 The scope of this section covers light fittings, lamps, ceiling fans and exhaust

fans.

2.0 STANDARDS

2.1 The following standards shall be applicable :

 A) IS : 3646 COP for interior illumination

 B) IS : 1913 General and safety requirements for electric

 lighting fittings.

 C) IS : 7027 Transistorised ballasts for fluorescent tubes

 D) IS : 1534 Ballasts for fluorescent lamps

 E) IS : 6616 Ballasts for HPMV lamps

 F) IS : 2215 Starters for fluorescent lamps

 G) IS : 3324 Holders for starters for tubular fluorescent lamps

 H) IS : 3323 Bipin lamp holders for tubular fluorescent lamps

 I) IS : 1569 Capacitors for electrical discharge lamps

 J) IS : 2418 Tubular fluorescent lamp for general lighting

 services

 K) IS : 5081 Glass tubes for fluorescent lamps

 L) IS : 481 Tungsten filament miscellaneous electric lamps

 M) IS : 6701 Tungsten filament miscellaneous electric lamps

 N) IS : 2183 Schedule of or HPSV lamps

 O) IS : 7023 Methods for tests for HPMV lamps

 P) IS : 2147 Degree of protection provided by enclosure for

 low voltage switch gear and control gear

 Q) IS : 4327 General requirement for switchgear and control

 gear for voltages not exceeding 1000 V.

 R) IS : 374 Electrical ceiling type fan & regulators

 S) IS : 1169 Electrical pedestal type fans & regulators

 T) IS : 2997 Air circulator type electrical fan and regulators

 U) IS : 6272 Industrial cooling fans (man coolers)

 V) IS : 1709 Fixed capacitors for fans.

3.0 GENERAL REQUIREMENTS-FITTINGS

3.1 The general requirements for the light fittings shall be as follows :

 - Sheet metal mounting frame and enclosure with fixing accessories

 - Sheet metal white stove enamelled reflector.

 - Control gear such as ballast, starter and capacitor

 - Lamp holder

 - Diffuser and other attachments to reduce glare

3.2 The enclosure for the light fittings and other accessories shall conform to the IS : 2147 and IS : 2148 depending on the location mounting of the fittings.

3.3 The type of fittings and lamps shall be as indicated in the drawing and schedule of material.

3.4 The ballasts shall be of copper wound, open type vacuum impregnated with minimum loss, silent operation and without radio interference or electronic ballasts as indicated in the schedule of material.

3.5 The light fittings and the lamps shall be suitable for long life and shall withstand voltage variation of minimum ± 10% .

3.6 The aircraft obstruction lights shall be of neon cold cathode helix with longer life,or LED type housed inside thick glass dome.

3.7 The fittings shall be prewired with PVC insulated copper wires of adequate capacity but not less than 1.5 sq.mm copper. The light fittings shall be provided with earthing terminals.

4.0 FANS

4.1 The fans shall be driven by copper wound electrical motors housed inside cast aluminium enclosure.

4.2 The fans shall be with double ball bearing to achieve smooth and silent operation.

4.3 The fan assembly and blades in the case of fans other than centrifugal fans shall be of cast aluminium with properly balanced blades.

4.4 The fan shall be provided with capacitors for starting up single phase fans and to achieve better power factors for 3 phase fans.

5.0 INSTALLATION

5.1 Fans shall be mounted on pre-embedded hook. The drawing of the junction box which shall be got approved. Wherever, pre-embedded hooks are not available anchor fastners shall be used.

5.2 The light fixtures suspended shall include two nos. down rods with ball and socket joints. For the recessed fittings, the mounting supports shall be taken from the ceiling.

6.0 TESTING AND COMMISSIONING

6.1 Fans and light fittings shall be checked for visible damages before installation and proper performance.

Please refer annexure for details of specifications and quantities required.

Please send the quotations in sealed envelops superscribed with “Quotation for Electrical work for Digitization and Archival Documentation” in the prescribed format addressed to

The Director General,

Chhatrapati Shivaji Maharaj Vastu Sangrahalaya

(Formerly Prince of Wales Museum)

159-161, M G Road, Fort, Mumbai-400 023

**Last Date for submission: 14th March 2016 upto 4 PM.**

Annexure I

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sub: Requirement of Electrical work for Archive

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SL.NO | UNIT | DESCRIPTION | QTY | RATE | AMOUNT |
|   |   |   |   | MATERIAL | LABOUR | TOTAL |   |
| **1.0** |  | **DISTRIBUTION BOARDS** |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 1.1 |   | Supply, installation, testing and commissioning of |   |   |   |   |   |
|   |  | double doors, verticle distribution board as  |   |   |   |   |   |
|   |  | specified and complete with copper busbar, |   |   |   |   |   |
|   |  | interconnections, earthing and fixing accessories, |   |   |   |   |   |
|   |  | labelling etc.  |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 1.1.1 | Each |  DB - Office consisting of : | 1 |   |   |   |   |
|   |  |  |   |   |   |   |   |
|   |  | a) 1 no. 63A 4P RCBO as incomer |   |   |   |   |   |
|   |  | b) 18 nos. 10A/20A SP MCBs |   |   |   |   |   |
|   |  | Makes : LEGRAND / HAGER / INDO ASIAN |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| **2.0** |  | **CABLING**  |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 2.1 | Each | 4C - 16 sq.mm cable termination with glands, | 2 |   |   |   |   |
|   |  | lugs and accessories for existing cable |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 2.2 | Each | Supply and installation of 150 x 50 mm covered | 5 |   |   |   |   |
|   |  | trunking complete with accessories |   |   |   |   |   |
|   |   |   |   |   |   |   |   |

Contd. 2 /-(2)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SL.NO | UNIT | DESCRIPTION | QTY | RATE | AMOUNT |
|   |   |   |   | MATERIAL | LABOUR | TOTAL |   |
| **3.0** |  | **WIRING** |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.1 | Point  | Wiring in surface PVC casing capping with | 10 |   |   |   |   |
|   |  | 3 x 1.5 sq.mm. copper wire for light fittings, |   |   |   |   |   |
|   |  | fans and 6A sockets |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.2 | Point | Wiring in surface PVC casing - capping with  | 19 |   |   |   |   |
|   |  | 3 x 2.5 sq.mm copper wires for 16A sockets / |   |   |   |   |   |
|   |  | 20A sockets |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.3 | Each | 16A socket outlet with switch complete with | 15 |   |   |   |   |
|   |  | accessories, modular plate type |   |   |   |   |   |
|   |  | Makes : WIPRO NORTH-WEST |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.4 | Each | 2 nos. 6/16A socket with switches, concealed | 2 |   |   |   |   |
|   |  | in floor box, pop-up type, 6 module with brush  |   |   |   |   |   |
|   |  | stainless steel furnish |   |   |   |   |   |
|   |  | Make : LEGRAND POP-UP |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.5 | Each | 20A socket outlet with starter and push button  | 2 |   |   |   |   |
|   |  |  complete with accessories, modular plate type. |   |   |   |   |   |
|   |  | Makes : WIPRO NORTH-WEST |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 3.6 | Each | 6A one way switch, modular type | 3 |   |   |   |   |
|   |  |   |   |   |   |   |   |
| 3.7 | Each | 120W fan regulator with switch complete with | 3 |   |   |   |   |
|   |  | accessories |   |   |   |   |   |
|   |   |   |   |   |   |   |   |

Contd. 3 /-(3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SL.NO | UNIT | DESCRIPTION | QTY | RATE | AMOUNT |
|   |   |   |   | MATERIAL | LABOUR | TOTAL |   |
| **4.0** |  | **LIGHT FITTINGS & FANS** |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 4.1 |  | Supply and / or installation,testing and |   |   |   |   |   |
|   |  |  commissioning of light fittings and fans  |   |   |   |   |   |
|   |   | complete with : |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
|   |  | a) Fixture with lamp & control gear accessories |   |   |   |   |   |
|   |  | b) Termination & earthing |   |   |   |   |   |
|   |   | c) Fixing/mounting accessories |   |   |   |   |   |
|   |  | d) Down rods and mounting frames |   |   |   |   |   |
|   |   |  for ceiling/exhaust fans |   |   |   |   |   |
|   |  | e) All fluorescent/CFL lamps with electronic |   |   |   |   |   |
|   |  |  ballasts having less than 10% THD |   |   |   |   |   |
|   |  | f) T5 lamps, similar to OSRAM SMARTLUX |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 4.1.1 | Each | Supply and installation of 2 x 28W fluorescent  | 5 |   |   |   |   |
|   |  | lamp suspended linear light fitting similar to  |   |   |   |   |   |
|   |  | TULIP Light trough T5P1065 228P |   |   |   |   |   |
|   |  |   |   |   |   |   |   |
| 4.1.2 | Metre | Supply and installation of 14W fluorescent  | 1 |   |   |   |   |
|   |  | wall bracket light fitting similar to TULIP SLIMLINE |   |   |   |   |   |
|   |  | TFC 1107B |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 4.1.3 | Each | Supply and installation of 1200 mm sweep  | 3 |   |   |   |   |
|   |  |  white ceiling fans with suspension rods,  |   |   |   |   |   |
|   |  | white powder coated,ORIENT SUMMER DELIGHT, |   |   |   |   |   |
|   |  | WHITE |   |   |   |   |   |
|   |   |   |   |   |   |   |   |

Contd. 4 /-(4)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SL.NO | UNIT | DESCRIPTION | QTY | RATE | AMOUNT |
|   |   |   |   | MATERIAL | LABOUR | TOTAL |   |
| **5.0** |  | **EARTHING** |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 5.1 | Metre | Providing No.12 SWG bare copper wire earthing | 70 |   |   |   |   |
|   |  |  for the distribution boards using clamps / |   |   |   |   |   |
|   |  |  saddles, lugs and accessories  |   |   |   |   |   |
|   |   |   |   |   |   |   |   |
| **6.0** |  | **MISCELLANEOUS** |   |   |   |   |   |
|   |  |   |   |   |   |   |   |
| 6.1 | Job | Removal of existing wiring / outlets / light fittings / | 1 |   |   |   |   |
|   |  | DBS / FANS etc. |   |   |   |   |   |
|   |  |  |   |   |   |   |   |
| 6.2 | Job | Wiring of smoke detectors to existing fire alarm | 1 |   |   |   |   |
|   |  | system |   |   |   |   |   |
|   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |
|   |  | **TOTAL** |  |  |  |  |  |
|   |   |   |   |   |   |   |   |

 |