

**REQUIREMENTS OF EXPERIENCE FOR ENLISTMENT IN A PARTICULAR CATEGORY**

**I. CIVIL WORKS:**

1. Route Survey (C01):-Experience of route survey including hydrographical survey of rivers, lakes etc. for laying of pipelines, canals, railway track, highway etc.
2. Topographical Survey (C01):-Experience of topographical survey of land for the purpose of putting up industrial plant etc.
3. Soil Investigation (C02):- Experience of Soil Investigation Works including Collection of soil samples and laboratory analysis of the same for industrial plants including list of available equipments/plants/ machineries etc., no. of rigs, type, make and year of manufacture, location of laboratory and list of laboratory equipments.  
  
Bio-data of key personnel shall include site supervision, interpretation of data collected at site, laboratory test results, analysis, preparation of comprehensive soil report and recommendation thereof.
4. Piling (C05):- Experience of any type of piling such as cast-in-situ driven, bored piles and driven steel tubulars and agency will be enlisted for all types of piling work. In case of cast-in-situ driven piles, experience of similar work is also required, which need not be qualifying job. The agency shall furnish list of available equipments/plants/ machineries etc., no. of rigs, type, make and year of manufacture, location of laboratory and list of laboratory equipments separately for bored & driven cast in –situ piles.  
  
Bio-data of key personnel shall include site supervision, interpretation of data collected at site, design and drawings, pile load test results etc..
5. Offshore Geo-technical Investigations (C22):- Soil Investigation of seabed works.
6. Geophysical and Oceanographic Survey (C25):- Experience in carrying out geophysical, geological and oceanographical investigations for projects involving Port & Harbours/SPM installation/submarine pipeline route surveys, offshore Oil & Gas Platforms etc.  
  
Experience in submarine pipeline inspection surveys with special emphasis on operating ROTV/ROV equipments.  
  
Experience in developing GIS database will be an added qualification.
7. Onshore Geophysical Survey (C26):- Experience of carrying out geophysical (seismic refraction & electrical resistivity, borehole geophysical logging) and Geological Investigations for projects involving construction of underground storages, construction of major industries.
8. Dredging & Reclamation Works (C27):- Experience in carrying out Offshore dredging and reclamation operations.
9. Site Grading, Roads and Building Works (C30) : Experience of civil works in plant/industry, infrastructure, dams, canals, highways, tunnels, bridges, flyovers, airports, hospitals, university, college, hostels, residential townships etc.
10. Civil, Structural and Underground Piping Works for Units & Offsites (C31) : Experience required for civil and structural works of process based Industrial plants only. Experience of under ground piping system in the plant with gravity flow comprising of steel pipe/ductile iron pipes in unit areas and RCC pipes in offsite areas will be considered as a part of civil and structural works. In case of under ground steel pipes such pipes shall be corrosion resistant coated / lined.

## **II. ELECTRICAL WORKS:**

1. Switch Yard (E02):- Contractor shall have adequate experience in turnkey execution of EHV switchyards involving complete design, engineering, supply, installation, testing & commissioning. The contractor should possess in-house design set up with adequate experience of having carried out design of EHV switchyard. Alternatively he should have a tie-up with established consultant having adequate past experience of having carried out EHV switchyard design.
2. Electrical Heat Tracing (E05):- Contractor shall have adequate experience in design, engineering, supply, installation, testing & commissioning of electrical heat tracing system in hydrocarbon process plants. In case the contractor is not a manufacturer of electrical heat tracers, he should have a tie up with a tracer manufacturer for carrying out basic system design for the heat tracing system with back-to-back guarantee.
3. Electrical Works (E09) : Contractor shall have adequate experience in installation, testing & commissioning of electrical equipment in plant/industry, hotels, hospitals, airports, power distribution in cities.
4. Electrical Works for Hydrocarbon Service (E10) : Contractor shall have adequate experience in installation, testing & commissioning of electrical equipment in hydrocarbon process plants involving hazardous areas only.

## **III. INSTRUMENTATION WORKS:**

1. Instrumentation Works (I01):- Similar works of plants and utilities involving Hydrocarbon service only.

## **IV. MECHANICAL WORKS:**

1. Storage Tanks (M01):- Contractor shall have experience of fabrication and erection of storage tanks. Experience in design of floating roof tanks is required for floating roof tanks. In case agency has not designed floating roof tanks he will have to submit MOU with some reputed back-up consultant alongwith PTR of back-up consultant with respect to design of floating roof tanks. Apart from the above, agency shall have to furnish successful operation certificate of floating roof for a period of one year. This certificate must be issued by the owner. Data will be maintained based on tonnage erected for cone roof/ floating roof tanks in one work order and for design of floating roof tanks based on same or other work orders.
2. Sphere (M02):- The agency shall have experience in fabrication, erection and heat treatment of Horton spheres including water spray system. Agency shall also have a full-fledged design & drawing office and shall have to furnish organogram indicating responsibility of various technical persons of design/drawing office.
3. Fired Heater Systems (M03):- The agency should have similar experience of minimum one job involving the following (a) project management (b) procurement and supply of heater system components/ auxiliaries except ID/FD Fan, burners, APH tubes, tube bends, tube support castings (c) fabrication and erection of subassembly of coils, construction, inspection on their own (d) structural fabrication, erection, assembly, design, engg., supply of refractory on their own or through sub-contractors (e) however experience of residual mechanical/ structural design, preparation of engg. drawings of minimum two similar jobs is required. The work shall be in successful operation for minimum one year.

In case of heat duty of more than 20 MMK Cal/Hr on qualifying job, agency will be considered capable for all higher heat duty heaters.

4. Piping, Equipment & Machinery Erection (M05) :- Experience of erection of piping, installation of equipments, machinery etc. in process plant industry covering aboveground and underground piping. Experience of pre-fabrication of piping spools as per isometric drawings will be preferred.
5. Stainless Steel Silos (M06):- Contractor shall have experience of design, fabrication, erection of silos with material of construction for all parts as stainless steel only. Agency shall also have a full-fledged design & drawing office and shall have to furnish organogram indicating responsibility of various technical persons of design/drawing office.
6. Refractory Works (M07):- Refractory works in any industry with details of equipment lined, type of lining, quantity of refractory materials, year of execution etc. Further list of tool & tackles required for lining of refractory should be given in list of construction equipment.
7. Insulation (M08):- Similar works of Thermal Insulation. Experience of cryogenic/ acoustic insulation will not be considered. Experience of Annual Rate Contract (ARC) jobs will not be considered.
8. Painting (M09):- Similar experience of industrial plants only. Experience of ARC jobs will not be considered.
9. Laying of Cross Country Pipeline (M11):- Similar experience of laying of cross country pipeline with hydrocarbon service and lines shall be underground and buried. Experience of water pipelines, ATF lines in cities, group gathering stations and loading/unloading lines in jetty areas will not be considered similar. Minimum diameter shall be 8" and cumulative length of all sizes above 8" shall be 50 KM.
10. Equipment Erection/Heavy Lift (M14):- Similar experience with weight of single lift minimum 300 MT by cranes. Experience of lift with ginpole/derrick will not be considered.
11. Pipeline Crossing by Horizontal Directional Drilling (HDD) (M17):- Similar jobs of laying of cross country pipeline using HDD method.
12. Mounded Storage (M19):- The agency shall have experience of executing Mounded Storage system as a package on single point responsibility basis with minimum empty weight of bullets 250 MT and 25 mm wall thickness. Agency shall also have a full-fledged design & drawing office and shall have to furnish organogram indicating responsibility of various technical persons of design/drawing office.
13. City Gas Pipeline (M20):- Similar experience of Buried Carbon Steel/ Non Carbon Steel, City Gas Pipelines only.

#### **V. PACKAGE PLANTS:**

1. Raw Water Treatment Plant (P01):- Similar work with scope of work including design, detail engg., supply, construction, testing, commissioning and guarantee runs etc. in one work order. Exposure in Hydrocarbon Industry is also required.
2. Cooling Towers (P02):- Experience in supply and installation of cross flows/counter flow cooling towers of RCC/Timber construction and Fresh/Sea Water Service and of proven thermal design or client approved collaborator will be applicable. Similar work with scope of work including design, detail engg. supply, construction, testing, commissioning and guarantee runs in one work order.

3. Waste Water/Effluent Treatment Plant (P03):- Experience of contractor shall be considered in case of Effluent plant as follows:
  - Contractor must have designed, supplied and constructed effluent treatment plant of refinery/ petrochemical/ gas processing plants etc. similar work with scope of work including design, detail engg., supply, construction, testing, commissioning and guarantee runs in one work order.
4. DM Water Treatment plant/ Condensate Polishing Unit (P04):- Experience of contractor shall be considered as below:
  - Contractor must have designed and supplied/ constructed DM plant or CPU for large industry with scope of work including design, detail engg., supply, construction, testing, commissioning and guarantee runs in one work order.
5. Power plant (P07):- Similar work covering total plant with single point responsibility.
6. Cathodic Protection System for Cross Country Pipelines (P10):- Similar work of temporary and permanent cathodic protection system by using anodes and impressed current systems respectively with scope of work including design, detail engg., supply, construction, testing and commissioning etc..
7. Material handling System (P11):- Similar work involving belt conveyors/pipe conveyors with scope of work including design, detail engg., supply, construction, testing, commissioning etc. in one work order.
8. Composite Works (Civil, Mechanical, Electrical and Instrumentation Works) – (P12):- Similar work covering civil, mechanical, electrical and instrumentation type jobs in one work order and with value of Mechanical works more than 80%.
9. Desalination Plants (RO) (P17):- Similar work experience with scope of work as design, detail engg., supply, construction, testing and commissioning etc. in same work order. This will cover feed of brackish water, sea water. Further, it will also cover outlet of STP/ETP/ WWTP for zero discharge system.
10. Cathodic Protection System for Plant (P18):- Similar work experience of plants with scope of work as design, engg., Supply, Construction, Testing and Commissioning etc.
11. Offshore Platforms (P22):- Similar experience of installation of offshore platforms.
12. Sea Water Intake System (P23) : - Similar work experience from design to construction with single point responsibility.
13. River Water Intake (Well) System (P24) : - Similar work experience from design to construction with single point responsibility.
14. Ranney Well System (P25) : - Similar work experience from design to construction with single point responsibility.

## VI. ENVIRONMENTAL STUDIES:

a)	Baseline Data Collection	(W02)
b)	Flora & Fauna Impact Assessment Studies	(W03)
c)	Land use/Land Cover Pattern Studies	(W04)
d)	Marine Impact Assessment Studies	(W05)
e)	Socio Economic Impact Assessment Studies	(W06)
f)	Occupational Health	(W09)