ANNEXURE

Sl. No.	Nomenclature and Drawing No.	Manufacturing technology & Testing/Inspection facilities required to produce the item	Essential (To posses by the vendor in his premises) (P&M list and Testing /Inspection equipment list to be submitted	Desirable (May be possessed by the vendor in his premises (Or) out sources) (Self declaration to be submitted)
1	1.BOLT	Raw material cutting	Band saw cutting machine to Dia 100 mm	
		Die (Tool)		Appropriate CAD/CAM software for designing of dies suitable to fasteners as given drawing/specification
		Blank head form forging	Press to exert to around 75-ton force to form head in die forming as per drawing through various dies	
		Machining	Suitable CNC or conventional lathe machine for machining the bolt as per drawing / specification requirement.	
			Suitable drilling machine along with all drilling accessories to drill minimum 2 mm or as per drawing.	
		Thread rolling	Rolling machine of capacity 15 to 50 ton force and 1 to 2.5 mm pitch or more as per requirement Or CNC or Conventional thread cutting lathe with auto loading equipment along with relevant cutters and fixtures	
		Isothermal Hardening	Salt bath with natural salt temperature up to 950 deg C. base bath to cool with composition of sodium hydroxide and calcium hydroxide with temperature up to 350 deg C or Equivalent process	
		Heat treatment	Induction/Electrical /Oil fired furnace to heat up to 1400 deg C.	

		Tempering furnace	Induction/Electrical /Oil fired furnace to heat up to 600 to 700 deg C.	
		Coating facility	Zinc Chromatizing / Chemical Oxidizing / chemical Phosphating and Chromatizing Nickel. The relevant bath like facility with chemical concentration as per drawing documents	
		Inspection	UTM, Hardness tester, Impact testing machine, MPI test. (NABL accredited lab) Relevant gauges , Feeler gauges, Thread plug gauge, Testing facility for coating thickness, etc.	
2	1.NUT I	Raw material cutting	Band saw cutting machine to Dia 100 mm	
		Die (Tool)		Appropriate CAD/CAM software for designing of dies suitable to fasteners as given drawing/specification
		Blank form forging	Press to exert to around 75-ton force to form head in hot forming as per drawing through various dies.	
		Machining /Drilling	Suitable CNC or conventional machine for machining and drilling the nut as per drawing / specification requirement	
		Tapping	Suitable tapping machine to form pitch of 1mm to 2.5 mm pitch or more as per drawing /specification	
		Isothermal Hardening	Salt bath with natural salt temperature up to 950 deg C. base bath to cool with composition of sodium hydroxide and calcium hydroxide with temperature up to 350 deg C or Equivalent process	
		Heat treatment	Induction/Electrical /Oil fired furnace to heat up to 1400 deg C.	
		Tempering furnace	Induction/Electrical /Oil fired furnace to heat up to 600 to 700 deg C.	

		Coating facility	Zinc Chromatizing / Chemical Oxidizing / chemical Phosphating and Chromatizing Nickel. The relevant bath like facility with chemical concentration as per drawing documents	
		Tempering furnace	Induction/Electrical /Oil fired furnace to heat up to 600 to 700 deg C.	
		Coating facility	Zinc Chromatizing / Chemical Oxidizing / chemical Phosphating and Chromatizing Nickel. The relevant bath like facility with chemical concentration as per drawing documents	
		Inspection	UTM, Hardness tester, Impact testing machine, MPI test. (NABL accredited lab) Relevant gauges , feeler gauges	

(RAMESH KUMAR)
TEAM LEADER
WM/OHA-I

— On leave —
(R.J.SANTHOSH KUMAR)
MEMBER
JWM/OHPDN

(T.GANANATHAN)
MEMBER
JWM/QA(OH)