


**Tentative Requirement of Tools And Facilities To Be Complied For Fabrication**

<b>S. No</b>	<b>Characteristic</b>	<b>Check List</b>
1.	<b>License</b>	A. Availability of factory registration license ,GST Registration etc.
2.	<b>Quality management</b>	A. Availability of work instruction/procedures for critical activities & its implementations.
3.	<b>Raw material control</b>	A. Incoming ram material acceptance -MTC review records available B. Availability of material correlation/identification procedures & its implementations by hard punching/by record keeping/painting etc C. Storage/stacking of raw material-in organized manner or elevated platform with proper identification
4.	<b>Material handling</b>	A. Availability of EOT crane/ Gantry Crane of required capacity to handle maximum Load required for movement. B. Availability of gantry cranes/Hydra/other handling equipment's capable to handle proposed heaviest component(if required other than EOT crane)
5.	<b>Handling of weld consumables</b>	A. Availability of calibrated baking oven, holding oven & portable ovens (in sufficient quantities) B. Proper storage of weld consumables or racks & other controlled conditions C. Weld consumables handling: Issue/return of electrodes from store properly documented/recorded.
6.	<b>Welding qualification</b>	A. Availability of qualified WPS & PQR B. Availability of sufficient no of qualified welders C. Availability of welder performance monitoring/defect rate monitoring systems
7.	<b>Machinery</b>	A. Availability of sufficient no of SAW welding machines B. Availability of sufficient number of GTAW welding machines C. Availability of sufficient number of welding machinery-SMAW/GTAW/FCAE etc. D. Availability of CNC plasma/torchy cutting machines/profile cutting machines E. Availability of PUG/Gas cutting machines F. Availability of radial drilling machine-capacity matching to proposed thickness & size of component G. Availability of weld edge preparation/bevel end cutting machines
8.	<b>Spare/Inspection Area</b>	A. Availability of said levelled floor for trail assembly adequate for proposed size of components with required material handling capacity
9.	<b>NDT/HEAT treatment/hydr/leak test facility</b>	A. Availability of sufficient size covered shed with concrete platform for fabrication activities B. Availability of beam straightening machine

S. No	Characteristic	Check List
		C. Availability of DPT/MPI facility-in house /outsourced to other agency D. Availability of RT facility-in house/outsourced (as applicable) E. Availability of UT facility-in house/outsourced (however done inside vendors own works) F. Availability of RT film viewer/dark room, densitometer, reference photograph etc. if RT is done
10.	<b>Professional qualification/quality manpower</b>	A. Availability of qualified & experience manpower for quality B. availability of qualified welding inspectors C. Availability of DP/MPT Level II qualified personal D. Availability of RT level II qualified personal if applicable E. Availability of UT level II qualified personal if required
11.	<b>Testing facility</b>	A. Availability of in house/outsourced testing facilities for chemical testing by spectro/PMI B. Availability of in house/outsourced testing facilities like UTS% elongation/ben/impact testing /hardens etc. C. Availability of calibrated tape/laser beam instruments to measure long column length for proto /assembly/ D. Availability of calibrated weld gauge, vernier, micrometer & measuring instruments
12.	<b>Surface cleaning &amp; painting</b>	A. Availability of covered shot/grit blasting facility with air compressor, mechanism to segregate fine shot (sieves) shots/grits re-collection mechanism, surface compactor/surface roughness meter etc. B. Availability of in house painting facility (separate covered area) airless gun for painting etc. C. Availability of in house testing facility, paint thickness & paint adhesion

CLAUSE NO.	Quality Assurance for Civil Works 		
	<p>post bid discussions. The contractor's proposal shall include vendor's site facilities, expertise, facilities established at the respective works, the process capability, process stabilization, QC systems followed, experience list, etc. along with his own technical evaluation for identified sub-Contractors proposed. The formats for furnishing above details shall be given to the Contractor at post bid discussion stage. Monthly progress reports on sub-contractor detail submission / approval shall be furnished. Such manufacturers / sub-vendors approval shall not relieve the contractor from any obligation, duty or responsibility under the contract.</p>		
6.4.0	<p>To facilitate advance planning of material testing/ approval of bought out items, well before the start of activity as per L-2 network, representative samples shall be procured by the contractor from approved sub-vendors and submitted to the engineer for his approval before bulk procurement at least two months prior to start of works. In case of manufacturers test certificate (MTC) is submitted for acceptance, it shall be clearly traceable and correlated with the consignment received at site. MTC of all bought out items shall essentially contain all the test parameters / characteristics specified in the technical specifications / standards / codes. In case the manufacturer's test certificate does not mention these details, sample from each lot shall be tested for these properties at the third party lab acceptable to NTPC. Approval of material / sample by the engineer shall not relieve the contractor of his responsibility, for their conformance to the specification, as well as the requisite performance and quality of material.</p>		
6.5.0	<p>Structural and reinforcement steel supply if in the scope of the contractor shall be procured from Main Steel Producers like SAIL, TISCO, RINL, Essar Steel, Ispat Industries, JSW Steel, Uttam Value Steel, Jindal Steel &amp; Power and Jai Balaji Industries Ltd, Durgapur (for 8-40mm reinforcement steel).</p>		
7.0.0	<p><b>MANUFACTURING QUALITY PLAN AND FIELD QUALITY PLAN</b></p>		
7.1.0	<p>All materials / components and equipment covered under the scope of work, shall be procured by the contractor for the purpose of the contract, after obtaining the written approval of the NTPC, which are to be manufactured at shop/ factory of the vendor/sub vendor shall be covered under a comprehensive quality assurance programme. The contractor's purchase specifications and inquiries shall call for Manufacturing Quality Plans (MQP) to be submitted by the sub-contractor/ sub-supplier/ sub-vendor. The MQP called for from the sub-contractor shall detail out for all the components and equipment, various tests / inspection, to be carried out as per the requirements of this specification and standards mentioned therein, quality practices and procedures followed by contractor's / sub-contractor's / sub-supplier's quality control organization, the relevant reference documents and standards, acceptance norms, inspection documents raised etc., during all stages of materials procurement, manufacture, assembly and final testing/ performance testing. Such quality plans of the vendors / sub-vendors shall be submitted to the NTPC for approval for MQP and such approved quality plans shall form a part of the purchase order / contract between the contractor and sub-contractor. The quality plans shall be submitted on electronic form e.g. CD or E-mail in addition to hard copy, for review and approval of NTPC. After approval the same shall be submitted in compiled form on CD in addition to hard copy.</p>		
7.2.0	<p>The contractor shall furnish copies of the reference documents/ plant standards / acceptance norms/ tests and inspection procedure etc., as referred in quality plans. These quality plans and reference documents/standards etc. will be subject to NTPC approval without which manufacturer shall not proceed. These approved documents shall form a part of the contract. In these approved quality plans, NTPC shall identify</p>		
<p>EPC PACKAGE FOR PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE-I (3X 800MW)</p>	<p>TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO.:CS-9585-001-2</p>	<p>SUB-SECTION-E-74 CIVIL WORKS</p>	<p>Page 5 of 26</p>



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### 1.0 PURPOSE

The purpose of this work instruction is to provide the uniform colour and coding scheme for the painting of the equipment and piping installed in our power plant by various vendors. This will help enhance the aesthetic ambience of an otherwise industrial environment. At the same time, for identification purpose, colour code/tags have been enumerated for labeling of articles; equipment, pipes, structures etc.

### 2.0 SCOPE

- 2.1. The Colour and Coding Scheme** covers applications of Ground Colour and Colour Tags/ Bands on power plant equipment, piping & ducting as final coat over and above the protective coatings for the purpose of identification.
- 2.1. The Surface Preparation** process and sequence of painting, Statutory requirements and other public Safety Regulations is beyond the scope of this standard.

### 3.0 DEFINITIONS AND ABBREVIATIONS

- 3.1. HOD – Head of the Department
- 3.2. MR – Management Representative
- 3.3. IS – Indian Standard

### 4.0 DESCRIPTION

- 4.1 ISO 9001 –2000, Clause 7.5.3
- 4.2 Quality Manual Section 7.5.3
- 4.3 QS-01-DIV-W-01. Guideline for drafting procedure / work instruction / guidelines.

### 5.0 PROCEDURE

#### 5.1 Colour Scheme for Equipment

Major Equipment in a Building or elsewhere shall be finished with main shade of a colour scheme, while the minor equipment, pipes, etc. shall be finished with secondary shade, as enumerated in accompanying annexures.

#### 5.2 Colour Scheme for Pipelines

The Ground Colour shall be as per the over all Colour Scheme. Generally it shall follow the secondary shade of Colour Scheme.

#### 5.3 Identification

In the case of pipelines, IS: 9404 – 1979 “Colour code for identification of pipelines used in Thermal Power Plants” is followed for LABELLING or TAGGING so that Identification of numerous pipelines in a Thermal Power Plant can be done by

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adopting a system of colour coding consisting of a Colour Band Tag with distinct legend for each system. Direction of flow with an arrow shall be marked near valves junction fittings etc. To indicate flow & return flow pipes, words F&R will be written in the legend respectively.

### 5.4 Colour Band

Colour band is superimposed on the ground colour Fig 2A & 2B [Appendix C](#) to distinguish one kind or condition of the fluid it carries: for example, condensate from boiler feed, clarified water from drinking water etc.

### 5.5 Application

5.5.1 Ground colour may be applied in one of the following ways :-

- a. The ground colours shall be applied throughout the entire length of pipe line :-
- b. The Colour Code Band/ Tag as an identification mark shall be applied as follows:
  - i) At Start and finish of the pipes.
  - ii) At Inlet and at outlet of valves.
  - iii) Near junction and fittings.
  - iv) Before & after Walls and floors where pipe is crossing them.
  - v) It shall also be applied at intermediate points. But in no case, the distance between two consecutive colour bands shall exceed 5 meters.
- c. Colour bands shall have a minimum width of 75 mm. Where hazardous materials are carried in the pipes the colour bands shall be slant as shown in Fig.-3.
- d. The recommended colour bands for the pipe lines with their ISC/RAL nos. are given in Appendix – B.

### 5.6 Addition Identifications

#### 5.6.1 Lettering

- a) For identification purpose, Colour Code/Tags have been enumerated for labeling of articles; equipment, pipes, structures.
- b) The recommended size of lettering for pipes of different diameters is given below:

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Outside Dia of pipe of Covering	Size of Legend
mm	mm
20 to 100	10
100 to 250	40
250 & above	60

The lettering shall be given on a bordered rectangular patch background, which has been designated as Colour Code Tags/ Bands.

### 5.6.2 Direction of Flow

Where it is required to be indicated the direction of flow arrow may be painted near the valves fittings, junctions, walls etc. and at suitable intervals along the pipeline in a manner best suited to local conditions. These shall be black in colour. If a label or badge with a codified indication is attached to the pipe the direction of flow may be indicated by the painted end of the label or badge or a painted arrow.

### 5.6.3 Visibility of Markings

Consideration should be given to the visibility of the letters from the Working platforms. For example where the pipelines are located above the normal line of vision of the operator, the lettering should be placed below the horizontal line of the pipeline.

## 6.0 ASSOCIATED DOCUMENTS

- NIL -

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### APPENDIX A

#### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
<b>MAIN PLANT</b>							
1.	Main Turbine	Blue	5012	White		9010	Legend in black letters
2.	Main generator	Blue	5012	White		9010	Legend in black letters
3.	Condenser	Blue	5012	White		9010	Legend in black letters
4.	Ejectors & Vacuum Pumps	Blue	5012	White		9010	Legend in black letters
5.	Heat exchangers (eg. Deaerator LP & HP heaters, gland steam condenser, lube oil cooler, stators water cooler etc.	Blue	5012	White		9010	Legend in black letters
6.	Flash tanks (HP, LP, etc.)	Blue	5012	White		9010	Legend in black letters
7.	<b>Pumps</b>						
	i) Boiler feed pumps	Blue	5012	White		9010	Legend in black letters
	ii) Condensate	Blue	5012	White		9010	Legend in black

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	extraction pumps						letters
	iii) Lube oil	Grey	9002	White		9010	Legend in black letters
8.	Valves, gates, filters	Grey	9002	White		9010	Legend in black letters
9.	<b>Turbine oil system</b>						
	i) Main oil tank	Grey	9002	White		9010	Legend in black letters
	ii) Central oil tank	Grey	9002	White		9010	Legend in black letters
	iii) Oil purifier & Polishing filter	Grey	9002	White		9010	Legend in black letters
10.	Boiler steel supporting	Grey	9002	White		9010	Legend in black letters
11.	Boiler coating	Grey	9002	White		9010	Legend in black letters
12.	Superheaters (exposed portions if any)	Grey	9002	White		9010	Legend in black letters
13.	Metal structures						
	i) Primary Members	Blue	5012				Columns & Beams

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	ii)Secondary Members	Grey	9002				Tie/ Bracing's/ Struts etc.
14.	Hand rails	Blue	5012				Wherever required otherwise SS or GI
15.	Pipe supports	Black	9011				
16.	Gratings (non-galvanised)	Black	9011				
17.	Air ducts	Grey	9002	White		9010	Primary, secondary, rear, igniter, scanner air etc. with hot or cold indication to be identified in black letters.
18.	FANS/ PA/ Scanner (booster) air/ igniter air/ Seal air fan	Grey	9002	White		9010	Legend in Black Letters.
19.	Flue gas ducts	Grey	9002	White		9010	Legend in Black Letters.
20.	ID fans	Grey	9002	White		9010	Legend in Black Letters.
21.	Coal mills and associated feeders	Grey	9002	White		9010	Legend in Black Letters.
22.	Mill reject system grey green	Grey	9002	White		9010	Legend in Black Letters.

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
23.	Paddle feeders below track hopper	Golden Yellow	1004	Signal Red	537	3001	For moving parts parts black strips should be superimposed over the base colour.
24.	Travelling Tripper	Golden Yellow	1004	Signal Red	537	3001	For moving parts black strips should be superimposed over the base colour.
25.	Stacker cum	Golden Yellow		Signal Red	537	3001	For moving parts black strips should be superimposed over the base colour.
26.	Belt feeder	Golden Yellow		Signal Red	537	3001	For moving parts black strips should be superimposed over the base colour.
27.	Drive frames, take-off units chutes, guards of conveyors	Grey	9002	White		9010	Legend in Black letters
28.	Stringer & stands, mouthpieces, tail end frames head end frames, other	Grey	9002	White		9010	Legend in Black letters

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	supporting structures of various other accessories and other equipments, not covered in this list.						
29.	Coal crushers	Grey	9002	White		9010	Legend in black letters
30.	Vibrating feeders	Grey	9002	White		9010	Legend in black letters
31.	a. Dust extraction system piping	Grey	9002	White		9010	Legend in black letters
	b. Ventilation system consisting of GI ducting	Grey	9002	White		9010	Legend in black letters
	c. Dust suppression system consisting of GI piping	Grey	9002	White		9010	Legend in black letters
32.	Steel gratings and grids over emergency hopper	Black					
33.	Conveyor system – idler frames	Grey	9002				
34.	Structural steel work fabricated at site	Grey	9002				

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>

### FUEL OIL HANDLING SYSTEM

35.	HSD storage tank	Blue	5012	White		9010	Legend HSD to be displayed in Black letters
36.	Furnance oil storage tank	Blue	5012	White		9010	Legend FO to be displayed in Black letters
37.	Pumps, filters and valves	Blue	5012	White		9010	Legend in black letters

### ASH HANDLING SYSTEM

38.	Bottom ash hopper	Blue	5012	White		9010	Legend in black letters
39.	Scraper	Blue	5012	White		9010	Legend in black letters
40.	Clinker Grinder	Blue	5012	White		9010	Legend in black letters
41.	Flush mixer	Blue	5012	White		9010	Legend in black letters

### RAW WATER INTAKE EQUIPMENTS

42.	Intake gates						
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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	- Above water parts	Grey	9002				
	- Sub merged parts	Grey	9002			9010	
	- Rotating Mechanism	Grey	9002				
	- Sub Merged beams	Grey	9002				
	- Travelling	Grey	9002				

### INSTRUMENT AND SERVICE / PLANT AIR SYSTEM

43.	Trash Rack						
	- Above water stationary parts	Grey	9002	White		9010	Legend in black letters
	- Above/Under water/moving parts	Grey	9002	White		9010	
44.	Metal structures						
	- External	Grey	9002				
	- Internal	Grey	9002				

### DEMINERALIZED WATER SYSTEMS

45.	Filter beds and Ion Exchange resin beds.	Grey	9002				To be Identified by suitable legends.
46.	Air blowers	Grey	9002	White		9010	

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<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
							Legend in black letters
47.	Carbon dioxide exhausters.	Grey	9002	White		9010	Legend in black letters


### INSTRUMENT AND SERVICE/PLANT AIR SYSTEM

48.	Compressors with inter and after coolers	Blue	5012	White		9010	Identifying legends to be used.
49.	Heater/Drivers	Grey	9002	White		9010	-
50.	Air receivers	Blue	5012	White		9010	Legend in black letters

### MISCELLANEOUS EQUIPMENTS

51.	Cranes	Golden Yellow	1004	White		9010	Tower Cranes & Booms will have alternate sections for Signal Red/White for aviation requirement with diagonally painted sections in black.
	- Mono Rails & chain pulley systems	Golden Yellow	1004				
52.	Hooks	Signal Red	3001				
53.	Tanks	Grey	9002	white			Legend in Black letters

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<b>EQUIPMENT</b>							
		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
54.	Doors industrial type	Blue	5012				
55.	Solid wastes processing equipment	Grey	9002				
56.	Hydraulic power unit	Golden Yellow	1004	Signal Red	537	3001	
57.	Fencing	Black					
58.	Lighting poles	Aluminium					
59.	Chimney						As per safety regulations Top two bands in Gulf Red & White 3000 mm each.
<b>ELECTRICAL COMPONENTS</b>							
60.	<b>MAIN GENERATOR</b>						
	- Lub oil system	Grey	9002	White		9010	Legend in Black Letters
	- Seal Oil System						
	- Hydrogen system	Grey	9002	White		9010	Legend in Black Letters
	- Stator Water Sys.						
61.	<b>DIESEL GENERATOR SET</b>						
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<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	- Diesel Engine	Grey	9002	White		9010	
	- Generator	Grey	9002	White		9010	
62.	<b>L.T. TRANSFORMERS</b>						
	- Indoor	Blue	5012				Legend in Black Letters
	- Outdoor	Blue	5012				Legend in Black Letters
63.	33 KV class transformers	Blue	5012	Signal Red	537	3001	
64.	400 KV/33 KV tie transformers	Blue	5012	Signal Red	537	3001	
65.	<b>GENERATOR BUST DUCT</b>						
	- Inside of main plant building	Blue	5012	Signal Red	537	3001	
	- Outside of main plant building	Blue	5012	Signal Red	537	3001	
66.	Generator transformer	Blue	5012	Signal Red	537	3001	
67.	Battery charger	Grey	9002	White		9010	
68.	Mimic flow diagram						

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<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	400 KV	Purpur Violett	4007	White		9010	
	220 KV	Signal Gleb	1003	White		9010	
	132KV	Tarkis Blau	5018	White		9010	
	33.0 KV	Oliv Grun	6003	White		9010	
	21.0 KV/15.75 KV	Beige-rot	3012				
	11.0 KV	Zink Gleb	1018	White		9010	
	6.6 KV	Enzian Blau	5010	White		9010	
	3.3 KV	Gras Grun	6010	White		9010	
	415 V	Lehm Braun	8003	White		9010	
	220V DC	Tief Orange	2011				
	Gen Fld.	Tiefsch wartz	9005				
69.	Unit Control board (Control Room)	Grey	9002				
70.	Control panel, PLC panel & UPS for	Grey	9002				

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<b>EQUIPMENT</b>							
		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	CHP/AHP						
71.	<b>MOTORS</b>						
	- Indoor	Blue	5012				Enamel paint to be used
	- Outdoor	Blue	5012				
72.	<b>LT SWITCHGEAR (INDOOR)</b>						
	- LT Switchgear Exterior	Grey & Blue	9002 5012				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
	- MCC	Grey & Blue	9002 5012				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
	- D.C. Distribution board	Grey & Blue	9002 5012				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
	- L.T. busduct outside of enclosures	Blue	5012				
<b>ENGINEERING DIVISON</b>							



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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
73.	<b>6.6 KV SWGR</b>	Grey & Blue	9002 5012				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
	- 6.6 KV busduct inside of main plant bldg.	Blue	5012				
	- 6.6 KV busduct outside of main plant building	Blue	5012				
74	<b>33 KV SWGR cubicle</b>	Grey & Blue	9002 5012				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
	- CR Panels	Grey	9002				
	- Surge protection cubicle	Grey	9002				
75.	Control and console inserts	Grey	9002				
76.	Electronic system cabinets, computer system cabinets, BMS, ATRS, EHC system etc. (Control equipment room)	Blue & Grey	5012 & 9002				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)
77.	All locally mounted C&I systems panel cabinets local (External)	Blue & Grey	5012 & 9002				Front & Rear Panels in Grey (RAL 9002). End Panels sides in Blue (RAL 5012)

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
78.	Intercom	Equipment					
	- Hand sets unit	Grey	9002				
	- Hand sets plant	Grey	9002				
79	- Metal containers/ cable junction boxes	Grey	9002	White		9010	-
80.	<b>LIGHTING EQUIPMENT/PANELS</b>						
	- Exterior	Grey	9002				
81.	Unit Heaters	Grey	9002	Signal Red	537	3001	Legend in Black letters.
82.	<b>400 KW SWITCHYARD EQUIPMENTS</b>						
	I. Control and relay panels (control equipment room and switchyard control room)	Blue & Grey	5012 & 9002				Legend in Black letters. Ends in Blue. Front & Rear in Grey.
	II. PLCC	Blue & Grey	5012 & 9002				Legend in Black letters. Ends in Blue. Front & Rear in Grey
83.	Switchyard CB,	Grey	9002				

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### EQUIPMENT

		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
	Isolators, CTs, PTs, Lighting arrestors, Wave Traps, CVTs, Marshalling boxes, JBs, Local Panels						
84.	Porcelain parts like insulators	Brown	As per IS				Possibility of Using Grey Shade be explored.
85.	Generator Relay panels (GRP's)	Grey & Blue	9002				
86.	All other Structures and equipment.	Grey	9002				
87.	<b>INSTALLATION MATERIALS</b>						
	- Resin Tubes	Grey	9002				Legend in black letters.
	- Steel Tubes						Legend in black letters.
88.	Gang ways and trays	Grey	9002				Legend in black letters.
89.	Misc. steel structures (trellies, Portals, brackets)	Grey & Blue	9002 & 5012				Primary Structural in members (Columns & Beams) in Blue. Secondary members in Grey.
90.	Storage boxes	Grey	9002				Legend in black letters.

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<b>EQUIPMENT</b>							
		<i>Ground Colour</i>		<i>Identification Tag/Band</i>			
<i>Sl. No.</i>	<i>Equipment</i>	<i>Colour</i>	<i>RAL</i>	<i>Colour</i>	<i>ISC No.</i>	<i>Equivalent RAL No.</i>	<i>Remarks</i>
91.	<b>INSULATING OIL TREATMENT PLANT</b>						
	- Tanks and the equipment	Grey	9002	White		9010	Legend in Black Letters
92.	<b>IDENTIFICATIONS PLATES</b>						
	Mechanical equipment's and piping						
	- Background	White	9010				
	- Border	Black	9011				
	- Lettering	Black	9011				
<p>Note: 1 ) .For mechanical equipments ground colour indicated against each equipment shall be followed in case equipment is not insulated/cladded.</p> <p>2). However if enclosure is provided for the mechanical equipments, then the indicated ground colour for mechanical equipment shall be followed.</p>							
<b>ENGINEERING DIVISON</b>							



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### APPENDIX-B

### PIPELINES

S. No.	Medium	Ground Colour		Identification Tag/ Band Colour			Legend	Remarks
		Colour	RAL	COLOUR	ISC No	RAL #		
<b>1.</b>	<b>WATER</b>							
a.	Untreated or Raw/service	Grey	9002	Sea Green	217		RW/S W	
b.	Treated/ Demineralised	Grey	9002	Sea Green	217		DMW	
c.	Condensate	Grey	9002	Sea Green	217		MC	
i.	LP bypass spray	Grey	9002	Sea Green	217		LPBA	
ii.	Condensate Makeup line to condenser from surge tank and from DM Supply header	Grey	9002	Sea Green	217		CCM	
d.	Boiler feed	Grey	9002	Sea Green	217		BFD	
i.	HP bypass attemperation	Grey	9002	Sea Green	217		HPBA	
ii.	Super heater attemperation	Grey	9002	Sea Green	217		SHA	
iii.	Reheater	Grey	9002	Sea	217		RHA	

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		<i>Ground Colour</i>		<i>Identification Tag/ Band Colour</i>				
<i>S. No.</i>	<i>Medium</i>	<i>Colour</i>	<i>RAL</i>	<i>COLOUR</i>	<i>ISC No</i>	<i>RAL #</i>	<i>Legend</i>	<i>Remarks</i>
	attemperation			Green				
iv.	Aux. PRDS attemperation	Grey	9002	Sea Green	217		APRD SA	
<b>2.</b>	<b>STEAM</b>							
a.	Main	Aluminium*		Signal Red	537	3001	MS	*Aluminium is to be used only in case Where the pipes are not already clad with aluminium sheets.
b.	Auxiliary	Aluminium*		Signal Red	537	3001	AS	
c.	Bled (Extraction)	Aluminium*		Signal Red	537	3001	1 EX 2 EX 6 EX	
d.	Hot reheat	Aluminium*		Signal Red	537	3001	HR	
e.	Cold reheat	Aluminium*		Signal Red	537	3001	CR	
f.	HP bypass	Aluminium*		Signal Red	537	3001	HPB	
g.	LP bypass	Aluminium*		Signal Red	537	3001	LPB	
h.	Exhaust/vent (open to atmosphere) and safety valve	Aluminium*		Light Brown	537	3001	V/SVE	Hazard mark may be given
<b>ENGINEERING DIVISON</b>								

		<b>COLOUR AND CODING SCHEME</b>					DOC. NO. : QS-01-DIV-W-4	
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		<i>Ground Colour</i>		<i>Identification Tag/ Band Colour</i>				
<i>S. No.</i>	<i>Medium</i>	<i>Colour</i>	<i>RAL</i>	<i>COLOUR</i>	<i>ISC No</i>	<i>RAL #</i>	<i>Legend</i>	<i>Remarks</i>
<b>3. AIR</b>								
a.	Instrument	Grey	9002	Sky blue	101		IA	
b.	Service/Plant	Grey	9002	Sky blue	101		PA	
c.	Vacuum	Grey	9002	Sky blue	101		VC	
<b>4. AIR STEAM MIXTURE</b>								
a.	From turbine glands to gland steam condenser	Aluminium*		Sky Blue	101		ASM	*Aluminium is to be used only in cases where the pipes are not already clad with aluminium sheets.
b.	From condenser	Aluminium*		Sky Blue	101		ASM	*Aluminium is to be used only in cases where the pipes are not already clad with aluminium sheets.
c.	From heater shells to condenser	Aluminium*		Sky Blue	101		ASM	*Aluminium is to be used only in cases where the pipes are not already clad with aluminium sheets.
<b>5. GAS</b>								
a.	Natural gas	Grey	9002	Canary yellow	309		NG	*Hazard mark is given
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		<i>Ground Colour</i>		<i>Identification Tag/ Band Colour</i>				
<i>S. No.</i>	<i>Medium</i>	<i>Colour</i>	<i>RAL</i>	<i>COLOUR</i>	<i>ISC No</i>	<i>RAL #</i>	<i>Legend</i>	<i>Remarks</i>
b.	Other fuel gas	Grey	9002	Canary yellow	309			
c.	Hydrogen	Grey	9002	Canary yellow	309		H	
d.	Nitrogen	Grey	9002	Canary yellow	309		N	
e.	Chlorine	Grey	9002	Canary yellow	309		Cl	
f.	Carbon dioxide	Grey	9002	Canary yellow	309		CO2	
g.	Non condensable gas mixtures	Grey	9002	Canary yellow	309		NCG	
h.	Oxygen	Grey	9002	Canary Yellow	309		O	
<b>6.</b>	<b>OILS</b>							
a.	High speed diesel	Grey	9002	Light * brown	410		HSD	* Hazard Mark
b.	Furnance oil	Grey	9002	Light * brown	410		FO	* Hazard Mark
c.	Lubricating oil (including governing oil if lub oil is used for governing	Grey	9002	Light brown	410		LO	* Hazard Mark
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		<i>Ground Colour</i>		<i>Identification Tag/ Band Colour</i>				
<i>S. No.</i>	<i>Medium</i>	<i>Colour</i>	<i>RAL</i>	<i>COLOUR</i>	<i>ISC No</i>	<i>RAL #</i>	<i>Legend</i>	<i>Remarks</i>
	purposes)							
d.	Hydraulic power	Grey	9002	Light brown	410		HYD.O	
e.	Control fluid	Grey	9002	Light brown	410		CR.O	
f.	Transformer oil	Grey	9002	Light brown	410		TR.O	
7.	<b>PULVERIZED FUEL</b>	Grey	9002	Silver grey	628		PF	
8.	<b>FIRE INSTALLATIONS</b>	Fire Red	536 (ISC) 3001 (RAL)	White		9010	FIRE	Legend in Red Letters over White Background
9.	<b>CHEMICAL FEED</b>							
a.	HP dosing to boiler (Phosphate)	Grey	9002	Dark admiralty grey	632		HCF	Legend in Black Letters
b.	LP dosing to condensate (Hydrazine/ Ammonia)	Grey	9002	*Signal Red	537	3001	LCF	*Hazard mark is given
10.	<b>ACID PIPING</b> (in water treatment plant)	Grey	9002	*Signal Red	537	3001	+	+Name of the chemical (formula) to be used as legend for identifying the individual acids & alkalies
<b>ENGINEERING DIVISION</b>								



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S. No.	Medium	Ground Colour		Identification Tag/ Band Colour			Legend	Remarks
		Colour	RAL	COLOUR	ISC No	RAL #		
11.	<b>ALKALI PIPING</b> (in water treatment plant)	Grey	9002	*Signal Red	537	3001		*Hazard mark is given
12.	<b>ASH PIPE</b>	Grey	9002	French Blue	166		ASH	
13.	<b>IMPULSE PIPING</b>	Grey	9002	Same as process piping				

Note : Ground colour indicated against each piping shall be followed in case piping is not insulated /cladded.

**NOTE: FOR PAGE 27, GO TO PAGE NO.3, CLAUSE NO.5.4 AND CLICK ON Appendix-C WHICH IS HYPERLINKED.**

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CLAUSE NO.	<p style="text-align: center;"><b>TECHNICAL REQUIREMENTS</b></p> 		
6.04.03	<p>b) All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, sleeves, etc. shall be coated with temporary rust preventive fluid and during execution of civil works, the dried film of coating shall be removed using organic solvents.</p> <p><b>PAINTING OF STEEL SURFACES (OTHER THAN THOSE EMBEDDED IN CONCRETE)</b></p> <p>d) All steel surfaces shall be provided with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT to be applied over blast cleaned surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust quality should be as per ASTM D 520 Type 2</p> <p>e) Primer coat shall be followed with the application of Intermediate coat of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique.</p> <p>f) Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied shop after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Employer.</p> <p>Notes:</p> <ol style="list-style-type: none"> <li>For Primer, high quality surface preparation is necessary and good amount of moisture is required for proper curing. Below 70 % relative humidity, curing time may go up to 7 days or more. In such a case additional water sprinkling may be ensured for completion of curing. Additionally Inorganic zinc silicate cannot be recoated; even with itself. Typically it should be used when coating bare steel surface for first time.</li> <li>The most frequent problem associated when top coating Primer is bubbling/pinholing especially with non-weathered zinc silicate coatings. To a great extent, this bubbling of finish paint can be eliminated by applying a mist coat of intermediate/topcoat as the first pass of the product, allow the bubbles to subside and then apply a full coat, as required.</li> <li>In case topcoating of zinc silicate with epoxy/polyurethane coatings, is expected to be delayed, it is advisable to use a suitable tie coat to avoid formation of white rust. However, if white rust forms then clean the surface with high pressure water, dry and apply the subsequent coats as required.</li> <li>Touch up paintings on damaged areas: Surface preparation by manual tools, wire brush/ emery paper etc. Minimum 6 inches peripheral area, adjoining to damaged area to be covered. If metal surface is exposed, it is to be painted with Zinc rich epoxy (70 micron) or suitable primer with existing paint scheme. If primer is intact, intermediate &amp; top coat to be done with specified DFT in scheme.</li> </ol>		
6.04.04	<p><b>TOUCH-UP PAINTING ON DAMAGED AREAS</b></p> <p>a) For Coatings damaged up to metal surface</p> <p>Surface preparation shall be carried out by Manual Cleaning. Minimum 6 inches adjoining area with existing Coating shall be roughened by Wire brushing, emery paper rubbing etc., for best adhesion of patch Primer.</p>		
<p style="text-align: center;"><b>EPC PACKAGE FOR PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE-I (3X 800MW)</b></p>	<p style="text-align: center;"><b>TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO. CS-9585-001-2</b></p>	<p style="text-align: center;"><b>SUB-SECTION-D-01 CIVIL WORKS</b></p>	<p style="text-align: center;"><b>PAGE 107 OF 340</b></p>

**AMENDMENT NO. 1 TO TECHNICAL SPECIFICATION (SECTION VI)**

Sl. No	SPECIFICATION REFERENCE				EXISTING	READ AS
	SEC/PART	SUB SEC.	PAGE No.	CLAUSE No.		
						<p>bracings are preferably be provided with combined footing. In such cases, where rigid combined foundations are provided below braced columns, differential settlement between those columns needs not be considered. Moreover, when rigid raft is provided, the differential settlement amongst the columns supported on the rigid raft need not be considered. However, the differential settlement between the raft and the adjacent column footing of the same structure are to be considered.</p> <p>In the structural analysis for calculating loads due to differential settlement, following approach may be considered: All the alternate columns in structure shall be applied downward differential settlement as described above and analyzed at a time. The resultant forces/ reactions shall be considered with reversible effects along with other load cases for design of structures and footings.</p>
274	Part B	D-01 Civil Works	107 of 340	6.04.03	<p><b>Painting of Steel Surfaces (other than those embedded in Concrete)</b></p> <p>All steel surfaces shall be provided with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT to be applied over blast cleaned surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron. The primer coat shall be applied in</p>	<p><b>Painting of Steel Surfaces (other than those embedded in Concrete)</b></p> <p>All steel surfaces shall be provided with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT to be applied over blast cleaned surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc <b>dust</b></p>
<b>PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE-I (3X800 MW) EPC PACKAGE BIDDING DOCUMENT NO.: CS-9585-001-2</b>					<b>AMENDMENT NO. CS-9585-001-2-AMDT-09</b>	<b>Page 111 of 171</b>

**AMENDMENT NO. 1 TO TECHNICAL SPECIFICATION (SECTION VI)**

Sl. No	SPECIFICATION REFERENCE				EXISTING	READ AS
	SEC/PART	SUB SEC.	PAGE No.	CLAUSE No.		
					shop immediately after blast cleaning by airless spray technique. Zinc dust <b>quality should be as per ASTM D 520 Type 2</b>	<b>composition and properties shall be Type-II as per ASTM D520-00</b>
275	Part B	D-01 Civil Works	109 TO121 of 340	7.00.00	<b>Foundation system and geotechnical data</b>	<b>Foundation system and geotechnical data”</b> given in Annexure-1 to this amendment shall replace the contents of clause no 7.00.00- <b>Foundation system and geotechnical data</b> to Tech Spec,Part-B,Sub-Section-D-01.
276	Part B	D-01 Civil Works	123 of 340	8.1.2.13	Structural steel column base plates and bolts, gussets, etc., shall not project above the floor level. These shall be encased by concrete cover up to floor level with concrete grade M 25	Structural steel column base plates and bolts, gussets, etc., shall not project above the floor level <b>unless and noted otherwise</b> . These shall be encased by concrete cover up to floor level with concrete grade M 25
277	Part B	D-01 Civil Works	126 of 340	8.2.0 General (h)	-	<b>REINFORCEMENT COUPLERS:</b> Reinforcement couplers (mechanical splicing systems with upset parallel threaded couplers) may be used in reinforced concrete works, subject to following conditions: a. Couplers shall meet the performance requirements of IS 16172:2014 for class H. i. It shall have minimum tensile strength corresponding to Fe550D which is 600 N/mm <sup>2</sup> and failure shall take place outside the length of splice as per clause no 9.2.1 of IS:16174. ii. Percentage elongation at maximum force in the reinforcing bar outside the length of mechanical splice shall be minimum 3 % before the failure of test piece as per clause no. 9.2.2 of IS:16174.

<b>एनटीपीसी</b> <b>NTPC</b>		<b>NTPC LIMITED</b>		DOC.NO.	0000-999-QOG-W-001
		CORPORATE QUALITY ASSURANCE & INSPECTION		REV.NO.	11
				DATE:	14/07/2017
		<b>RATIONALISED LIST OF WELDING CONSUMABLES FOR SITE USE</b>		PAGE	1 of 18
<b>S NO</b>	<b>TYPE</b>	<b>BRAND NAME</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>	<b>REMARKS</b>

## [1] SMAW ELECTRODES FOR STRUCTURES

1(A) E6013					
1	E6013	AARYA-13	Aarya Electrodes (P) Ltd.	Agra	Rutile electrode for welding non-pressure parts of mild and low carbon steels
2	E6013	SUNWELD	Abirami Electrodes	Coimbatore	
3	E6013	METALBOND	Ador Weiding Ltd.	Pune	
4	E6013	ACCURATE ARC E6013	Accurate Weldarc Pvt Ltd	Raipur	
5	E6013	ALPHA 6013	Alpha Arc (P) Ltd	Ghaziabad	
6	E6013	WELDER - G	Alpha Flux &Eletrodes	Trichy District	
7	E6013	SUNGOLD	Asokaa Alloys	Coimbatore	
8	E6013	AWT E6013	Atharve Welding Technologies (I)	Solapur	
9	E6013	B&H ULTRA	B&H Electrodes (P) Ltd	Mohali	
10	E6013	MONARC-S	Bagherwal Electrodes (P) Ltd.	Indore	
11	E6013	SONY ARC E6013	Balaji Electrodes	Coimbatore.	
12	E6013	A-ONE E6013	Bright Weld Technologies	Coimbatore.	
13	E6013	SHIVA-S	Calcutta Electrodes (P) Ltd.	Raipur	
14	E6013	CLASSIC 6013 PLUS.	Classic Electrodes ( India ) Ltd.	Kolkata	
15	E6013	ATLAS-13	Cosmos Electrodes (P) Ltd	Indore	
16	E6013	Standard	D&H India Ltd.	Indore	
17	E6013	Norma	D&H Secheron Electrodes (P) Ltd	Indore	
18	E6013	ELMARK 11	Elmarc Electrodes (P) Ltd.	Chennai	



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		RATIONALISED LIST OF WELDING CONSUMABLES FOR SITE USE		PAGE	2 of 18
S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS
1(A)	E6013				
19	E6013	ESAB Ferrospeed Plus	ESAB India Ltd	Chennai	Rutile electrode for welding non-pressure parts of mild and low carbon steels
20	E6013	NUMBER ONE	Eureka Systems And Electrodes (P) Ltd	Coimbatore	
21	E6013	ELECTRA-6	Fusion Engg. Products Private Ltd.	Gamaria	
22	E6013	GEECON PINK	Gee Limited	Kalyan (W)	
23	E6013	Regular-S	Honavar Electrode Pvt Ltd	Mumbai	
24	E6013	IDEAL 40	Ideal Electrodes	Coimbalore.	
25	E6013	CROWN 13S	K.M.Crown Welding Consumables (P)	Dewas	
26	E6013	KELARC 6013	Kollipara Electrodes (P) Ltd.	Krishna Dist.	
27	E6013	MAGNARC 63	Magnarc Electrodes (P) Ltd.	Visakhapatnam	
28	E6013	MAILARC 13R	Mailam India Limited	Pondicherry	
29	E6013	MANGALAM E 6013	Malu Electrodes (P) Ltd.	Nagpur	
30	E6013	MANTEK GP-13.	MantekElectrods Private Ltd	Trichy	
31	E6013	MARUTHI 6013X-	Maruthi Electrodes (P) Ltd.	Bangalore	
32	E6013	Maruti-44	Maruti Weld Private Ltd.	New Delhi	
33	E6013	MEGA E6013	Mega Weld Technologies	Coimbatore	
34	E6013	MICRO-6013	Micro Weld (India)	Ludhiana	
35	E6013	MIGLANI ARK-X	Miglani Engineers	Haridwar.	



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
1(A)	E6013					
36	E6013	STEELON STANDARD	Modi Arc Electrodes Co	Ghaziabad	Rutile electrode for welding non-pressure parts of mild and low carbon steels	
37	E6013	GM 20	ModiHitech India Ltd.	New Delhi		
38	E6013	MEDAL ARC	Nivetha Electrodes	Tiruchirapally		
39	E6013	EKNOWELD	Nucor Weld(India)(P) Ltd.	Bangalore		
40	E6013	GALA WELD	Orange Electrodes Industries	Asangaon		
41	E6013	SUN ARC X - 19	Orion Wire Manufacturing Co.	Bharuch		
42	E6013	ANAND-13	P.R.Industries	Kota		
43	E6013	RATNA 6013X	Raajratna Electrodes Ltd	Ahmedabad		
44	E6013	RAJCORD-13S	Raj Kesari Electrodes	Udaipur		
45	E6013	RASI E6013	Rasi Electrodes Ltd.	Chennai		
46	E6013	ROYAL S	Royal Arc Electrodes (P) Ltd	Thane		
47	E6013	JACKSON 5	Royal Welding Wires (P) Ltd.	Kanchipuram		
48	E6013	BALAJI	Rukhmani Electrodes (P) Ltd.	Kolkata		
49	E6013	KAYNOZ 7S	Seth Electrodes (P) Ltd.	Khurai		
50	E6013	ESL' ARC-62	Shieldarc Equipments (P) Ltd	Kolkata		
51	E6013	VATSARC 19 PLUS.	Solarc Weld Rods	Chennai		
52	E6013	SUDO 6013	Spectra Super Alloys Ltd	Jamshedpur		
53	E6013	SUNSHINE E6013	Sri Renga Electrodes (P) Ltd	Trichy		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
1(A)	E6013					
54	E6013	SUNDEEP S	Sundeeep Electrodes (P) Ltd.	Hapur	Rutile electrode for welding non-pressure parts of mild and low carbon steels	
55	E6013	OVERCORD S	Superon Schweisstechnik (I) Ltd	Haryana		
56	E6013	BEST ARC MS11-	V.N.C.Electrodees	Karur		
57	E6013	PRIMEARC-13	Valency Compounds Services Pvt Ltd	Ahmednagar		
58	E6013	PRIMA-6013S	Varun Electrodes (P) Ltd.	Panipat		
59	E6013	SPEEDARC E6013	Voltarc Electrode (P) Ltd	Tirupathi		
60	E6013	WA-6013-S	Weld Alloy Products Ltd.	G Noida		
61	E6013	WELDALL	Weldall Electrodes (India)	Nagpur		
62	E6013	NOVAX - 13	Weldcom Electrodes (P) Ltd.	Surat		
63	E6013	MAXIMA-6013X	Weldcraft Private Ltd.	Bangalore		
64	E6013	WELDFAST SUPER	Weldwell Electrodes	Nagpur		

LOW HYDROGEN SMAW ELECTRODES FOR STRUCTURES						
1(B)	E7018					
1	E7018	SUPABASE 7018	Ador Welding Ltd	Pune	Basic coated low hydrogen electrodes for welding of thick sections in structural steels	
2	E7018	ALPHA 7018	Alpha Arc Pvt Ltd	Ghaziabad		
3	E7018	SUPER WELD 7018	Alpha Flux & Electrodes	Trichy District		
4	E7018	ANAND THERME	Anand Arc Ltd	Chennai		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
1(B)	E7018					
5	E7018	MONOTHERME	Bagherwal Electrodes (P) Ltd.	Indore	Basic coated low hydrogen electrodes for welding of thick sections in structural steels	
6	E7018	SHIVATHERME-18	Calcutta Electrodes (P) Ltd.	Raipur		
7	E7018	CLASSIC LH-7018	Classic Electrodes ( India ) Ltd.	Kolkata		
8	E7018	SUPRA MAX-18	Cosmos Electrodes Pvt Ltd	Indore		
9	E7018	SUPRATHERME	D&H Secheron Electrodes Pvt Ltd	Indore		
10	E7018	SUPER LH	D&H India Limited	Indore		
11	E7018	ESAB-36H	ESAB India Ltd	Chennai		
12	E7018	EUTHERME LH	Eureka Systems And Electrodes P.Ltd	Coimbatore		
13	E7018	BASICOTE 6	Fusion Engg Products Private Ltd	Gamaria		
14	E7018	GRICON GREEN	GEE Limited	Kalyan (W)		
15	E7018	ULTIMATE-18----	Honavar Electrodes Pvt Ltd	Mumbai		
16	E7018	KELARC-7018	Kollipara Electrodes Pvt Ltd	Krishna Dist.		
17	E7018	CROWN-18	K.M. Crown Welding Consumables Pvt	Dewas		
18	E7018	MAGNAARCH LH	Magnarc Electrodes (P) Ltd.	Visakhapatnam		
19	E7018	MAGNA-8	Magna Engineering	Vijaywada		
20	E7018	MAIL ARC 18	Mailam India Limited	Pondicherry		
21	E7018	MANGALAM E 7018	Malu Electrodes (P) Ltd.	Nagpur		
22	E7018	MANTEK LH 18	Mantek Electrods Private Ltd	Trichy		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS
1(B)	E7018				
23	E7018	MARUTHI 7018	Maruthi Electrodes (P) Ltd	Bangalore	Basic coated low hydrogen electrodes for welding of thick sections in structural steels
24	E7018	ULTRA - 7018	Maruti Weld Private Limited	New Delhi	
25	E7018	MODI 7018	Modi Arc Electrodes Co.	Ghaziabad	
26	E7018	GM18	Modi Hitech India Ltd	New Delhi	
27	E7018	SUPERIAL LH E7018	Murli Electrode (P) Ltd	Nagpur	
28	E7018	EKNOWELD	Nucor Weld(India) Ltd	Bangalore	
29	E7018	RATNA 7018	Raajratna Electrodes Ltd	Ahmedabad	
30	E7018	SUPERLET - 18	Raj Kesari Electrodes Pvt Ltd	Udaipur	
31	E7018	RASI 7018LH	Rasi Electrodes Ltd	Chennai	
32	E7018	ROYAL THERM	Royal Arc Electrodes Ltd	Thane	
33	E7018	JACKSON 18H	Royal Welding Wires Pvt Ltd	Kanchipuram	
34	E7018	REPL 7018	Rukhmani Electrodes (P) Ltd.	Kolkata	
35	E7018	SAITRON LH-7018	Saitron Engineers Pvt Ltd	Nagpur	
36	E7018	SUPRADYNE	Solarc Weld Rods	Chennai	
37	E7018	SUDO 7018	Spectra Super Alloys Ltd	Jamshedpur	
38	E7018	SUNSHINE - 18	Sri Renga Electrodes (P) Ltd	Trichy	
39	E7018	SUNDEEP 7018	Sundeep Electrodes Pvt Ltd	Hapur	
40	E7018	SUPERCITO OERLICON	Superon Schweisstechnik India Ltd	Haryana	



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
1(B)	E7018					
41	E7018	ISWP SPARK 7018	The Indian Steel & Wire Products Ltd	Jharkand	Basic coated low hydrogen electrode for welding of thick sections in structural steels	
42	E7018	SEVEN ARCS-18	Thirumala Electrodes Co	Trichy		
43	E7018	PRIMA7018	Varun Electrodes Pvt Ltd	Panipat		
44	E7018	BESTARC-LH-18	V.N.C.Electrodees	Karur		
45	E7018	VJ-7018	Vijey Electrodes And Wires (P) Ltd.	Chennai		
46	E7018	SPEEDARC-7018	Voltarc Electrodes (P) Ltd	Tirupathi		
47	E7018	WA 7018	Weld Alloy Products Ltd	G Noida		
48	E7018	MAXIDURE-7018	Weldcraft Private Ltd.	Bangalore		
49	E7018	EXCEL - 18---	Weld Excel India Ltd	Ludhiana		
50	E7018	WELDFAST LH 18	Weldfast Electrodes Pvt Ltd	Nagpur		

[2] LOW HYDROGEN SMAW ELECTRODES FOR PRESSURE PARTS					
2(A) E7018					
1	E7018	AARYA-7018	Aarya Electrodes Pvt Ltd	Agra	Basic coated low hydrogen electrodes for welding of thick sections in structural steels and pressure parts
2	E7018	SUPABASE 7018	Ador Welding Limited	Pune	
3	E7018	ANAND THERME	Anand Arc Ltd.	Chennai	
4	E7018	B&H-7018	B&H Electrodes Pvt Ltd	Mohali	
5	E7018	SUPRA MAX-18	Cosmos Electrodes (P) Ltd	Indore	



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
2(A)	E7018					
6	E7018	SUPER LH	D&H India Ltd.	Indore	Basic coated low hydrogen electrodes for welding of thick sections in structural steels and pressure parts	
7	E7018	SUPRATHERME	D&H Secheron Electrodes (P) Ltd.	Indore		
8	E7018	ESAB-36H	ESAB India Ltd	Chennai		
9	E7018	BASICOTE 6	Fusion Engg. Products Private Ltd.	Gamaria		
10	E7018	GRICON GREEN	Gee Limited	Kalyan (W)		
11	E7018	ULTIMATE - 18.	Honavar Electrodes Pvt Ltd.	Mumbai		
12	E7018	CROWN-18	K.M.Crown Welding Consumables (P)	Dewas		
13	E7018	KELARC-7018	Kollipara Electrodes (P) Ltd.	Krishna Dist.		
14	E7018	MAIL ARC 18	Mailam India Limited	Pondicherry		
15	E7018	MANTEK LH 18	MantekElectrods Private Ltd	Trichy		
16	E7018	MARUTHI 7018	Maruthi Electrodes (P) Ltd.	Bangalore		
17	E7018	ULTRA - 7018	Maruti Weld Private Ltd.	New Delhi		
18	E7018	MODI 7018	Modi Arc Electrodes Co.	Ghaziabad		
19	E7018	GM 18	ModiHitech India Ltd.	New Delhi		
20	E7018	EKNOWELD	Nucor Weld(India)(P) Ltd.	Bangalore		
21	E7018	SUPERLET - 18.	Raj Kesari Electrodes	Udaipur		
22	E7018	RASI 7018LH	Rasi Electrodes Ltd.	Chennai		
23	E7018	ROYAL THERME	Royal Arc Electrodes (P) Ltd	Thane		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
2(A)	E7018					
24	E7018	JACKSON 18H	Royal Welding Wires (P) Ltd.	Kanchipuram	Basic coated low hydrogen electrodes for welding of thick sections in structural steels and pressure parts	
25	E7018	SAITRON LH-7018	Saitron Engineers Pvt Ltd	Nagpur		
26	E7018	SUNSHINE - 18	Sri Renga Electrodes (P) Ltd	Trichy		
27	E7018	SUNDEEP 7018	Sundeep Electrodes (P) Ltd	Hapur		
28	E7018	SUPERCITO OERLICON E	Superon Schweisstechnik (I) Ltd	Haryana		
29	E7018	SEVEN ARCS-18	Thirumala Electrodes Co.	Trichy		
30	E7018	PRIMA7018	Varun Electrodes (P) Ltd.	Panipat		
31	E7018	VJ-7018	Vijey Electrodes and Wires Pvt	Chennai		
32	E7018	SPPEDARC E-7018	Voltarc Electrodes ( P ) Ltd	Tirupathi		
33	E7018	WELDALLH 7018	Weldall Electrodes(India)	Nagpur		
34	E7018	WA 7018	Weld Alloy Products Ltd.	G Noida		
35	E7018	EXCEL-18	Weld Excel India Ltd.	Ludhiana		
36	E7018	WELDFAST LH-18	Weldfast Electrodes Pvt Ltd	Nagpur		

2(B)	E7018-1					
1	E7018-1	TENALLOY-Z-PLUS	Ador Welding Limited	Pune	Low hydrogen iron powder electrode recommended for welding pr parts of carbon steels	
2	E7018-1	SUPER-LH(SPL)	D&H India Ltd	Indore		
3	E7018-1	Supra ThermeSpl.	D&H Secheron Electrodes (P) Ltd.	Indore		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
2(B)	E7018-1					
4	E7018-1	GRICON GREEN SPL	Gee Limited	Kalyan (W)	Low hydrogen iron powder electrode recommended for welding pr parts of carbon steels	
5	E7018-1	Ultimate-18 SPL	Honavar Electrodes Pvt Ltd.	Mumbai		
6	E7018-1	MAILARC-18PLUS	Mailam India Limited	Pondicherry		
7	E7018-1	MODI 7018 SPL	Modi Arc Electrodes Co.	Ghaziabad		
8	E7018-1	ROYAL THERME SPL	Royal Arc Electrodes Limited	Thane		
9	E7018-1	VJ 7018-1	Vijey Electrodes And Wires (P)	Chennai		

[3] ALLOY STEEL SMAW ELECTRODE						
3(A) E7018-A1						
1	E7018-A1	Molytherme	D&H Secheron Electrodes (P) Ltd	Indore	Low hydrogen iron powder electrode recommended for welding pr parts of carbon steels	
2	E7018-A1	MODI-7018-A1	Modi Arc Electrodes Co.	Ghaziabad		
3	E7018-A1	ULTIMATE 18A1	Honavar Electrodes Pvt Ltd.	Mumbai		
4	E7018-A1	RAJWELD-18A1	Raj Kesari Electrodes	Udaipur		
3(B) E8018-B2						
1	E8018-B2	Cromotherme - 1	D&H Secheron Electrodes (P) Ltd	Indore	Low hydrogen electrode used for welding pr parts of 1Cr 1/2 Mo	
2	E8018-B2	GRIDUCT3	Gee Limited	Kalyan (W)		
3	E8018-B2	ULTIMATE-80-B2	Honavar Electrodes Pvt Ltd.	Mumbai		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS
3(B)	E8018-B2				
4	E8018-B2	MAILARC 1CR	Mailam India Limited	Pondicherry	Low hydrogen electrode used for welding pr parts of 1Cr 1/2 Mo
5	E8018-B2	MANTEK CROMO 1	MantekElectrods Private Ltd	Trichy	
6	E8018-B2	ULTRA-CR-1	Maruti Weld Private Ltd.	New Delhi	
7	E8018-B2	MODI-8018-B2	Modi Arc Electrodes Co.	Ghaziabad	
8	E8018-B2	GM 80-B2	ModiHitech India Ltd.	New Delhi	
9	E8018-B2	RAJWELD-8018B2	Raj Kesari Electrodes	Udaipur	
10	E8018-B2	VJ-8018-B2	Vijey Electrodes And Wires (P)	Chennai	

3(C)	E9018-B3				
1	E9018-B3	SUPER - CR - 2	D&H India Ltd.	Indore	Low hydrogen 2 1/4Cr 1 Mo electrode used for welding pressure parts of similar material composition and 1/2 Cr 1/2 Mo 1/4 V steels
2	E9018-B3	Cromotherme - 2	D&H Secheron Electrodes (P) Ltd	Indore	
3	E9018-B3	GRIDUCT - 4	Gee Limited	Kalyan (W)	
4	E9018-B3	ULTIMATE-90B3	Honavar Electrodes Pvt Ltd.	Mumbai	
5	E9018-B3	MAILARC 2CR	Mailam India Limited	Pondicherry	
6	E9018-B3	ULTRA - CR-2	Maruti Weld Private Ltd.	New Delhi	
7	E9018-B3	MODI-9018B3	Modi Arc Electrodes Co.	Ghaziabad	
8	E9018-B3	GM 90 B3	ModiHitech India Ltd.	New Delhi	
9	E9018-B3	VJ-9018-B3	Vijey Electrodes And Wires (P)	Chennai	



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
3(D)	E9015-B9					
1	E9015-B9	CROMO E91	Air-Liquide Welding France	France	Electrodes for T91 / P91 / F91 tubes, pipes & forgings as per ASME	
2	E9015-B9	CM-95B9	Kanematsu Trading Corporation (Kobelco)	Japan		
3	E9015-B9	CHROMET 9MV-N	Metrode Products Ltd.	UK		
4	E9015-B9	THERMANIT MTS - 3	VoestalpineBohler Welding	Germany		

[4]	ALLOY STEEL FILLER RODS FOR GTAW (TIG WELDING)				
4(A)	ER80S-D2				
1	ER80S-D2	MnMo	Metrode Products Ltd.	UK	Used for weldig tubes for carbon & 1/2 Mo steels in pressure parts
2	ER80S-D2		Nippon Steel & Sumikin Bussan	Japan	
3	ER80S-D2	Union 1 Mo Mn	VoestalpineBohler Welding	Germany	

4(B)	ER80S-B2				
1	ER80S-B2	TIGFIL 80S -B2	Ador Welding Ltd.	Pune	Used for welding of pressure parts of similar materials
2	ER80S-B2	F CR MO 1	D&H Secheron Electrodes (P) Ltd.	Indore	
3	ER80S-B2	OK TIGROD 13.16	ESAB India Ltd	Chennai	
4	ER80S-B2	GM 80S-B2	I A Barnes & Co Ltd	UK	
5	ER80S-B2	INETIG B2	Industria Nazionale Elettrodi S.P.A	Italy	



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4(B)	ER80S-B2					
6	ER80S-B2	TG-S80B2	Kanematsu Trading Corporation (Kobelco)	Japan	Used for welding of pressure parts of similar materials	
7	ER80S-B2	GETIG 80S B2	GEE Limited	Kalyan (W)		
8	ER80S-B2	MARUTHI TB2	Maruthi Electrodes (P) Ltd.	Bangalore		
9	ER80S-B2	METRODE ER80S-B2	Metrode Products Ltd.	UK		
4(C)	ER90S-B3					
1	ER90S-B3	TIGFIL 90S - B	Ador Welding Ltd.	Pune	Used for welding pressure parts of 2 1/4Cr 1 Mo and 1/2 Cr 1/2 Mo 1/4 V steels	
2	ER90S-B3	FCRMO-2	D&H Sechron Electrodes Pvt Ltd	Indore		
3	ER90S-B3	GM90S-B3	I A Barnes & Co Ltd	UK		
4	ER90S-B3	INETIG B3	Industria Nazionale Elettrodi S.P.A	Italy		
5	ER90S-B3	TG-S90B3	Kanematsu Trading Corporation (Kobelco)	Japan		
6	ER90S-B3	MARUTHI TB3	Maruthi Electrodes (P) Ltd.	Bangalore		
7	ER90S-B3	METRODE ER90S-B3	Metrode Products Ltd.	UK		
8	ER90S-B3	UNION ER 90 S-B3	VoestalpineBohler Welding	Germany		



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4(D)	ER90S-B9				
1	ER90S-B9	CARBOROD CrMo91	Air-Liquide Welding France	France	TIG welding rods for T91 / P91 / tubes and pipes as per ASME
2	ER90S-B9	TG-S90B9	Kanematsu Trading Corporation (Kobelco)	Japan	
3	ER90S-B9	9CRM0V-N TIG	Metrode Products Ltd.	UK	
4	ER90S-B9	THERMANIT MTS 3	VoestalpineBohler Welding	Germany	

[5]	<b>STAINLESS STEEL SMAW ELECTRODES</b>				
5(A)	E308-16				
1	E308-16	Rutox A	D&H Secheron Electrodes (P) Ltd	Indore	Stainless steel electrodes used for welding 304 and 308 materials
2	E308-16	OK 61.50	ESAB India Ltd	Chennai	
3	E308-16	MAILEX-A	Mailam India Limited	Pondicherry	
4	E308-16	SS-308	Modi Arc Electrode Co.	Ghaziabad	
5	E308-16	ROYAL-1A	Royal Arc Electrodes Limited	Thane	

5(B)	E308L-16				
1	E308L-16	Rutox-B	D&H Secheron Electrodes (P) Ltd	Indore	Stainless steel electrodes used for welding SS-409M to SS-409M
2	E308L-16	OK 61.30	ESAB India Ltd	Chennai	



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5(C)	E309-16					
1	E309-16	Cronitherme 25/12	D&H Secheron Electrodes (P) Ltd	Indore	25/12 stainless steel electrodes for welding stainless steel and ferritic steel combination and SS butter layers	
2	E309-16	OK 67.67	ESAB India Ltd	Chennai		
3	E309-16	SILVERSHINE - 309	Honavar Electrodes Pvt Ltd	Mumbai		
4	E309-16	MAILEX-25/12	Mailam India Limited	Pondicherry		
5	E309-16	SS-309	Modi Arc Electrodes Co.	Ghaziabad		
6	E309-16	ROYAL-D2	Royal Arc Electrodes Limited	Thane		
5(D)	E309L-16					
1	E309L-16	D&H-309-L	D&H Secheron Electrodes (P) Ltd	Indore	SS electrode used for welding SS-409M and mild steel	
2	E309L-16	OK 67.60	ESAB India Ltd	Chennai		
5(E)	E310-16					
1	E310-16	D&H 310-16	D&H Secheron Electrodes (P) Ltd	Indore	25/10 SS electrode for welding SS and ferritic steel combination	
2	E310-16	OK 67.13	ESAB India Ltd	Chennai		
5(F)	E316-16					
1	E316-16	Rutox Mo	D&H Secheron Electrodes (P) Ltd	Indore	18/8 2% Mo type stainless steel electrode	
3	E316-16	OK 63.50	ESAB India Ltd	Chennai		
	E316-16	ROYAL - 2A	Royal Arc Electrodes Limited	Thane		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS
5(G)	E316L-16				
1	E316L-16	RUTOX-D	D&H Secheron Electrodes Pvt Ltd	Indore	
2	E316L-16	OK 63.30	ESAB India Ltd	Chennai	

5(H)	E347-16				
1	E347-16	Rutox A ( ST)	D&H Secheron Electrodes (P) Ltd	Indore	18/8 stabilised stainless steel electrode for welding 308, 321 and 347 stainless steel materials
2	E347-16	OK 61.80	ESAB India Ltd	Chennai	
3	E347-16	GRINOX 47	GEE Limited	Kalyan (W)	
4	E347-16	SILVERSHINE- 347 -16	Honavar Electrodes Pvt Ltd	Mumbai	
5	E347-16	MAILEX-ANB	Maitam India Limited	Pondicherry	
6	E347-16	SUPERALLOY 1A(S)	Maruti Weld Private Limited	New Delhi	
7	E347-16	SS-347	Modi Arc Electrodes Co.	Ghaziabad	
8	E347-16	GM 347	Modi Hitech India Ltd	New Delhi	
9	E347-16	ROYAL-1B	Roya Arc Electrodes Limited	Thane	

5(I)	ENiCrFe3				
1	ENiCrFe3	D&H 1212 NS	D&H Secheron Electrodes (P) Ltd	Indore	Inconel-182 electrodes for dissimilar welding and buttering
2	ENiCrFe3	GEMET 821N	GEE Limited	Kalyan (W)	



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS	
5(I)	ENICrFe3					
3	ENICrFe3	CRYOMATE -3NS	Honavar Electrodes Pvt Ltd	Mumbai	Inconel-182 electrodes for dissimilar welding and buttering	
4	ENICrFe3	INCONEL 182	Special Metals Welding Products	UK		
5	ENICrFe3	THERMANIT NICRO 182	VoestalpineBohler Welding	Germany		
[6]	STAINLESS STEEL FILLER RODS FOR GTAW (TIG WELDING)					
6(A)	ER308					
1	ER308	ER 308	D&H Secheron Electrodes (P) Ltd	Indore	Used for SS 304 & SS 308 materials	
6(B)	ER347					
1	ER347	GETIG 347	GEE Limited	Kalyan (W)	Used for SS 304 and SS 308 materials	
2	ER347	TG-S347	Kanematsu Trading Corporation (Kobelco)	Japan		
3	ER347	347S96	Metrode Products Ltd.	UK		
4	ER347	THERMANIT H347	VoestalpineBohler Welding	Germany		



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S NO	TYPE	BRAND NAME	MANUFACTURER	LOCATION	REMARKS
6(C) Super 304H					
1	Super 304H	TG-SUPER 304 H	Kanematsu Trading Corporation (Kobelco)	Japan	For TIG welding of super 304H
2	Super 304H	YT-304H	Nippon Steel & Sumikin Bussan	Japan	
3	Super 304H	THERMANIT 304 H CU	VoestalpineBohler Welding	Germany	

6(D) ERNiCr3					
1	ERNiCr3	TIG-521	Ador Fontech Limited	Bangalore	Inconel 82 TIG rods for pressure parts SS to alloy steel
2	ERNiCr3	TG-S70NCB	Kanematsu Trading Corporation (Kobelco)	Japan	
3	ERNiCr3	MARUTHY TNiCr3	Maruthi Electrodes (P) Ltd.	Bangalore	
4	ERNiCr3	20.70.NB	Metrode Products Ltd.	UK	
5	ERNiCr3	THERMANIT NiCrO 82	VoestalpineBohler Welding	Germany	

**NOTES**

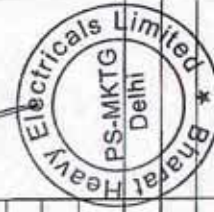
1. In case of main plant equipment like boiler pressure parts and TG, special welding consumables, if any shall be used as per OEM recommendations.

2. If semi-automatic or automatic welding processes are used, welding consumables shall be used as per OEM recommendations.



ANNEXURE-1

SR. NO.	ITEM	LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB-SUPPLIER APPROVAL				NTPC DOC NO	REMARKS
		QAP / INSP. CAT	QAP NO.	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING		
PROJECT: PATRATU STPP-I (3X800 MW)		SUB SYSTEM: CIVIL WORKS				REV. NO. 0	DATE 05.04.2017
PACKAGE: EPC							
MAIN SUPPLIER: BHEL							
CONTRACT NO.: CS-9585-001-2							
1.	CEMENT	III	-	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
2.	CONSTRUCTION CHEMICALS - ADMIXTURES, PLASTISIZERS, RETARDERS WATER PROOFING COMPOUNDS GROUTS	III	-	SIKA INDIA LTD CICO TECHONOLOGIES LTD FOSROC CHEMICALS (I) PVT LTD BASF	-	N N N N	
3.	FALSE CEILING - GLASS REINFORCED GYPSUM SYSTEM, MINERAL FIBRE BOARD SYSTEM, PREPAINTED COIL COATED STEEL SYSTEM	III	-	SAINT GOBAIN HUNTER DOUGLOUS TIGER STEEL INTERARCH LLOYD INSULATION MG INDUSTRIES ARM STRONG	NEW DELHI MUMBAI PUNE/MUMBAI NOIDA - FARIDABAD NEW DELHI	N N N N N N N	
4.	PAINT AND PAINTING SYSTEM	III	-	BERGER SHALIMAR PAINTS JENSON AND NICHOLSON KANSAI NEROLAC AKZO NOBEL ASIAN PAINTS	- - - - - -	N N N N N N	
5.	COLOUR COATED SHEET (FOR COIL)	I	-	UNION STEEL DONGBU STEEL BHUSHAN STEEL AND STRIPS LTD. ESSAR STEEL LTD NATIONAL STEEL AND AGRO	KOREA KOREA RAIGAD PUNE DHAR	A A A A A	



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