ENDORSEMENT SHEET FOR PAINTING SCHEDULE

REFERENCE / *STANDARD* / PAINTING SCHEDULE

TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION	**BHEL DOC No.** PL:C3-PS/8222	**To be filled in by NTPC**

PROJECT NAME	**NTPC KORBA Stage I,II &III FGD (3x200 MW + 3x500 MW + 1x500 MW)**
CONTRACT NO.:	**CS-2100-109(3)-9-FCNOA-6843 DATED :22/08/19, BHEL WORK NO. 8222**
MAIN SUPPLIER	**M/S BHEL-TIRUCHIRAPALLI**
MANUFACTURER WORKS & ADDRESS	**M/S BHEL-TIRUCHIRAPALLI /NTPC APPROVED SUBCONTRACTORS/VENDORS OF BHEL**
ITEM /EQUIPMENT / SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE/SIZE/RATING etc.	**ENDORSEMENT SHEET FOR PAINTING SCHEDULE FOR FGD BOLTED STRUCTURES & ISG BLDG**
APPROVED DOC NO.: RQP/PAINTING SCHEDULE/RFQP/SFQP	**3130-109-PVM-B-308 REV. NO.: 02 DATE:28/03/2022 NTPC RAMAGUNDAM**

-REVIEW & ENDORSEMENT BY NTPC

PROJECT SPECIFIC DOC NUMBER ALLOTTED

MDL NO.: 2100-109-PVM-B-285

REV. NO.:00 DATE:

Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)

(TICK APPLICABLE)

√I. That the item/ component is identical to that considered for PAINTING SCHEDULE approval.

The PAINTING SCHEDULE is endorsed for this project without any change. √

II. That there are minor changes in the item/ component with respect to that considered for QP approval, however the same do not affect the contents of PAINTING SCHEDULE. OR

III. That there are minor changes in the item/ component with respect to that considered for QP approval, however the same affect the PAINTING SCHEDULE slightly, as indicated below / in attached sheet.

The PAINTING SCHEDULE is endorsed for this project with changes as indicated.

DISTRIBUTION OF ENDORSEMENT OF

A) PAINTING SCHEDULE:

1. MAIN SUPPLIER (WITH A COPY OF PAINTING SCHEDULE)
2. MANUFACTURER
3. RIO
4. CQA-SPL
5. CQA-O/C

Signature Not Verified

Digitally signed by HIRENDRA SONKAR
Date: 2022.05.19 11:47:08 IST
Reason: CAT I
Location: NTPCEOC

A. Santhakumari, AGM/ Plant lab
SIGN.: (Main Supplier) DATE: 13/05/22

K. Srinivasan, Deputy Manager/ Plant lab
SIGN.: (Manufacturer) DATE: 13/05/22

NTPC (Reviewed /Approved by/ Date & Seal)

एनटीपीसी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
(Formerly National Thermal Power Corporation Ltd.)
केन्द्रीय कार्यालय नोएडा
Corporate Centre NOIDA

Reference: CC:3100:109:7122 Date:28-03-22

From:	CTF AGM	To:	BHEL BHEL
		CC:	- - -

SUBJECT : RSTPP, FGD

Please find enclosed following drawings/documents for necessary action at your end as indicated in purpose code.

VENDOR DRG NO:	null
NTPC DRG NO:	3130-109-PVM-B-308
REVISION NO:	02
DRG TITLE:	Painting scheme for Fabricated Bolted Structure (BHEL-Trichy)
APP CATEGORY:	IV
RELEASE DATE:	28-03-22
COMMENTS:	No comments

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirapalli - 620 014

NTPC – RAMAGUNDAM (3X200MW+3X500MW) FGD PROJECT- UNIT-1,

Ref: PL: C3-PS/8218-Rev.01 & Transmittal ref: CC:3100:109:7048 Dt.01.03.2022.

BHEL Reply against NTPC comments/ observations on the referred painting schedule as follows

1. **NTPC comment:** Colour shall be as per colour coding document with document number QS-01-DIV-W-4 with latest revision.

BHEL reply: Sheet 5, Note 4 is modified with above comments.

Revised document is submitted for CAT.I approval.

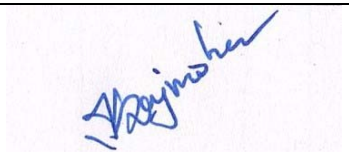
Signature Not Verified

Digitally signed by D K Jain
Date: 2022.03.28 21:32:18 IST
Reason: CAT IV
Location: NTPCEOC

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli - 620 014

FGD BOLTED STRUCTURES of NTPC RAMAGUNDAM (3X200MW+3X500MW) PEDAPALLI DISTRICT, TELANGANA CUSTOMER NO: FG-8218, UNIT-1 PAINTING SCHEDULE

NTPC Drawing No: 3130-109-PVM-B-308

Prepared by	**K. Srinivasan** **Deputy manager/ Plant Lab**		**Document No: PL: C3 - PS/ 8218**
Reviewed by	**K. Rajmohan** **DGM/ PE/ FB**		**Revision No: 02 Dated: 19-03-2022**
Approved by	**A. Santhakumari** **AGM / Plant Lab**		**Sheet No. 01 of 07.**

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RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	**12-01-2022**	New	**Prepared in line with NTPC Bidding Doc. No. CS-0011-109(3)-9, Sub-section-IV-D, Civil works, Cl. 31.00.00.**
01	**07.02.2022**	Sheet 3 – Sl.no.1, Remarks included with reference to note 1 & 2. Sheet 3- PGMAs of Sl.no.2 have been splitted in to primary and secondary members. Sheet 4- High build is indicated.	**Modified as per comments for CAT.IVR approval by NTPC 'Transmittal for comments on painting scheme for fabricated bolted structure' Ref: CC:3100:109:6977 Dt.02.02.2022 & NTPC drawing no: 3130-109-PVM-B-308.**
02	**19.03.2022**	Sheet 5 – Note 4 is modified.	**Modified as per comments for CAT.IVR approval by NTPC 'Transmittal for comments on painting scheme for fabricated bolted structure' Ref: CC:3100:109:7048 Dt.01.03.2022 & NTPC drawing no: 3130-109-PVM-B-308.**

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1 PS5C	**Fasteners:** (threaded and machined surfaces) FX-700,710,720,730,740,750,760; FM-700,710,720,730,740,750,760; **Foundation materials:** (threaded and machined surfaces) FX-010,011,012,013,014,015,016; FM-010,011,012,013,014,015,016;	SSPC – SP3 Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20µm per coat	1	--	--	--	--	--	20 Also refer note 1 & 2
2 (i) PS19C8	**Columns, Columns-Trestles, Beam & Bracings** FX-100,110,120,130,140,150,160; FX-200,210,220,230,240,250,260 FM-100,110,120,130,140,150,160; FM-200,210,220,230,240,250,260	Blast cleaning to SA2 ½ (Near white metal) conforming to ISO 8501-1 with surface profile 40-60 µm	Inorganic Ethyl Zinc Silicate Primer DFT=70µm per coat (refer sheet 6 Sl.no.7 for details)	1	Epoxy based MIO pigmented intermediate coat DFT 100µm per coat (refer sheet 6 Sl.no.6 for details)	1	Aliphatic acrylic Polyurethane paint DFT 70µm (refer sheet 6 Sl.no.1 for details)	1	Light blue Shade To RAL 5012	240
2 (ii) PS19C4	**Misc. structures, wall beams, Wall beams - roof & side runners:** FX-600,640,650,660,900; FX-910,920,930,940,950,960; FM-300,310,320,330,340,350,360 FM-600,610,620,630,640,650, FM-660,900,910,920,930,940; FM-950,960; **FLOOR & PLATFORMS-GALLERIES:** FX-300,310,320,330,340,350,360; FM-390;								Grey White Shade To RAL 9002	240

For structural steel, all coats shall be applied at shop.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
3 PS6	**Hand rails and posts, ladders / rungs Floor Grills, Step treads** FX-800,810,820,830,840,850,860; FM-800,810,820,830,840,850,860;	SSPC – SP8/ Acid pickling	**Hot dip Galvanizing to a coating weight of 610 g/m^2 (minimum) and to a coating thickness of 85µm.** **Refer Notes given below ****							

Notes **: The Guard plates, Hood Ladders, Stringer channels, angles and plates shall be painted as per painting scheme prescribed in Sl. No: 02.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
4 PS 1BE	**All Columns below '0' level (embedded in concrete)** **PGs** FX, FM	SSPC-SP3/ Power Tool Cleaning	High Build Chlorinated Rubber Based Zinc Phosphate primer %VS=40, (min) DFT=50 microns per coat	1	--	--	No paint	No paint	Grey	50

NOTES:

1. **Rust Preventive Coating should be given on HSFG Bolt and nut threads.**
2. **Machined surfaces and all retainers are to be applied with a coating of Temporary Rust Preventive oil.**
3. **All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves, 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.**
4. **Ground shade/ Colour of Finish paints & identification tag/Band for structures shall be followed as per NTPC doc. ref no: QS-01-DIV-W-4, rev.0.**
5. **PGMAs under Sub-Vendor items are not indicated. For all bought-out and sub-vendors items including PGMAs mentioned above falling under the scope of BHEL the same scheme as for main equipment as covered in this document shall be followed.**
6. **This painting Schemes is valid for only Customer No: FG/8218, FGD bolted structures of NTPC RAMAGUNDAM STPS (3x200MW+3x500MW).**
7. **No painting is required for Stainless Steel, non-ferrous & galvanized components.**
8. **The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be visually inspected for good adherence. If the coating is intact, direct coating of alkyd based red oxide paints over the coating is permitted. In case, the coating has peeled off over a large area, then the coating is to be removed by suitable solvents / heating to 350 –400 °C for an hour before primer paint application –but, in this case, it should be ensured that the minimum surface cleanliness required for primer paint application shall be SSPC – SP2 (equivalent – Hand Tool cleaning).**
9. **In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods of <25mm/tubes/drain pipes & bent rods are used, power tool / hand tool cleaning to SSPC – SP3 / SP2 shall be followed and red oxide primer IS12744 with DFT 60µ & synthetic enamel IS2392 DFT 40 microns, shade 692 of IS 5 shall be done.**
10. **For all commissioning components-erection materials (xx-993) two coats of Red oxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning.**
11. **Touch-up paintings, making good any damaged shop painting and completing any unfinished portion of the shop coat shall be carried out as per clause applicable painting scheme.**
12. **All components covered under different PGMA's are to be painted. In case any component is left out, the same shall be deemed to be included under the relevant section based on paint logic approved.**
13. **For very small components like clamps etc. which are not having feasible dimensions for blast cleaning, painting scheme of note no. 9 shall be followed.**
14. **For very small components with weldable primer at edges, the entire component shall be applied with weldable primer. Structural members having welded connections at site, relevant area can be painted with primer paint instead of Weldable primer.**
15. **Painting scheme for all temporary structures shall be PS 1AE i.e. 1 coat of Red oxide Zinc Phosphate primer (Alkyd Base) to IS 12744-DFT-30µ and 2 coats of Synthetic Enamel paint (Long Oil Alkyd) to IS 2932-DFT-2X20µ Shade Yellow –Shade No. 356 of IS 5- Total DFT 70µ. These are to be cut & removed at site after erection. (It excludes components covered under Sr. No. 2 & 3 of description table).**
16. **All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.**
17. **It is mandatory that for finish coat each layer shall have a permanent DFT and free from any paint defects like sags, wrinkles etc. Total DFT of a component correspond to respective painting scheme has to be ensured and recorded by inspection agency as per QP.**
18. **For chequered plates having thickness <=5mm, surface preparation can be power tool cleaning to St3 and painting shall be in line with note no.9.**
19. **Handrails, step treads of PGMA under Sl. No. 2 need to be galvanized in line with scheme for handrails (i.e. Sl .No. 3).**
20. **All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.**

Painting Scheme – Details for procurement & application purposes

Sl. No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)	DFT in microns per coat (approx.)	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% (min) 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 Delta – E).	8	2	55	70	Grey white/ Light Blue	RAL 9002/ RAL 5012	Airless Spray	24
2	Red oxide zinc phosphate primer paint to IS 12744 (latest)	10	1	--	30	-	--	Brush / Spray	12
3	Long oil alkyd synthetic enamel finish paint to IS2932 (latest)	17	1	--	20	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
4	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	25	--	--	--	12
5	HB Chlorinated Rubber Based Zinc Phosphate Primer-Colour Grey	8	1	40	50	Grey	--	Brush / Spray	12
6	Two component polyamide cured epoxy based polyamide cured MIO pigmented intermediate coat. (containing lamellar MIO minimum 30% on pigment)	8	2	80	100 (min)	Brown/ grey	--	Airless Spray	24
7	Two component moisture curing zinc (ethyl) silicate primer, metallic Zinc content 80% (min), Zinc dust quality shall be as per ASTM D 520 Type 2.	8	2	60	70 (min)	Grey	--	Airless Spray	24

The covering capacity of paints specified is only approximate.
The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers.

Painting of Damaged Areas

(Areas where the paint has deteriorated badly by erosion and areas where the paint film has lost its adhesion and where the steel has rusted appreciably, should be repainted as follows)

Sl.No.	Components	Surface Prepa-ration	Primer coat		Intermediate coat		Finish coat			Total DFT µm
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1	Paint damaged components fall under Sl.no: 2	Power tool cleaning of minimum 6" of surrounding areas to bare metal	Epoxy zinc rich primer to IS 14589 Grade II	2 T.DFT 70µ (min)	As given in scheme	1	As given in scheme	1	As given in scheme	As given in scheme