SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			
								card						
		f) Outer sheath thickness	Major	Physical			Approved data sheet	Approved data sheet	-do-		P	W	W	
		g) Hot set test for insulation	Major	Physical			IEC 60540	IEC 60540	-do-		P	W	W	
		3) Paint Thickness & Adhesion	Major	Meas. & test	Mfr practices	-	-do-		-do-		P	-	-	
		4) Salt spray test	Major	Meas. & test	1 sample per year		Mfr practice	Mfr Practice	-do-		P	V	V	
3	Panel Assembly	1) Panel shell assembly, Top &back cover assembly, Panel door assembly, hinge fitting & door knob fitting etc.	Major	Process	100%	-	Mfr Internal Drgs made to meet NTPC Appd.Drgs.	Mfr Internal Drgs made to meet NTPC Appd. Drgs.	-do-		P	-	-	
		2) Size of busbar & busbar finish	Major	Process	100%	-	-do-	-do-	-do-		P	-	-	
		3) Colour coding of busbar	Major	Process	100%	-	-do-	-do-	-do-		P	-	-	
		4) Insulator type & mounting	Major	Process	100%	-	-do-	-do-	-do-		P	-	-	
		5) Busbar support distance & tightness of bolts for Main bus bars and bus bar joints	Major	Process	100%	-	Size KGM M8 0.85 M10 1.88 M12 3.2	Size KGM M8 0.85 M10 1.88 M12 3.2	-do-		P	-	-	

		6) Main , Control & Auxiliary Busbar Clearances	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
		6) Main , Control & Auxiliary Busbar Clearances	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-
		7) Tin / silver plating / bimetallic strip /washer between Cu & Al joints	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-
		8) CT / PT mounting arrangement & tightness	Major	Process	100%	-	-do-	-do-	-do-		P	-	-
		9) Termination for power & control circuits	Major	Process	100%	-	-do-	-do-	-do-		P	-	-
		10) Lug size & crimping quality	Major	Process	100%	-	Mfr Internal Drgs made to meet NTPC Appd. Drgs.	Mfr Internal Drgs made to meet NTPC Appd. Drgs.	QC Records		P	-	-
		11) Earthing busbar size & continuity ; earthing of panel & door	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-
		12) Breaker safety shutter operation	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-
		13) Spring loaded power & control contacts alignment	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-
4	Module assembly	1) Component identification	Major	Process	100%	-	-do-	-do-	QC Records		P	-	-

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		2) Component layout, mounting & dimensions	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
		3) Incoming & outgoing power & control contacts assembly & alignment	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
		4) Power circuit wire / strip termination & clearances	Major	Process	100%	-	Mfr Internal Drgs/spec made to meet NTPC Appd. Drgs.	Mfr Internal Drgs /spec made to meet NTPC Appd. Drgs.	QC Records	p	-	-	
		5) Busbar joints	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
		6) Functional Checks	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
6	Control Wiring	1) Wire Size & lug size. Colour of wire	Minor	Visual	100%	-	NTPC apprd. Wiring diagram	NTPC apprd. Wiring diagram	QC Records	P	-	-	
		2) Proper wire Clamping & Ferruling	Minor	Visual	100%	-	Shop practice	Shop practice	QC Records	P	-	-	
		3) Continuity as per wiring drg	Critical	Test	Sample	-	NTPC Appr. Drg.	NTPC Appr. Drg.	QC Records	P	-	-	
		4) Tightness of termination & crimping check	Major	Test	100%	-	Mfr. Std	Mfr. Std	QC Records	P	-	-	
D	**Final Inspection**												
2		1. Overall visual check for aesthetics, verticality of panels and alignment	Major	Visual	100%	10%	Approved GA Drgs	Approved GA Drg.	TC	P	W	W	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
		between two transport sections											
		2. Verification of overall Dimensions Including sheet steel thickness	Major	Meas.	100%	1 Sample of each type of panel/lot	Approved GA	Approved GA Drg.	TC	P	W	W	
		3)Busduct interface, phase sequence, flange dimensions & clearances	Major	Visual	100%	100%	NTPC appd Drg / NTPC Specification	NTPC appd Drg / NTPC Specification	TC	P	W	W	
		4. Busbar (Main –horizontal) – clearances, color coding, phase sequence identification for each transport unit	Critical	Meas. & Visual	100% Transport Units	10%	NTPC Appr. Drgs / NTPC Specification	NTPC Appr. Drgs / NTPC Specification	TC	P	W	W	
		5. Busbar support arrangement : centre – centre distance between supports	Major	Meas	100%	10%	NTPC accepted Type test reports	NTPC Appd Drgs/ NTPC spec.	TC	P	W	W	
		6. Overlapping of busbar joints	Major	Meas.	100%	10%	NTPC appd. Drgs	NTPC appd. Drgs	TC	P	W	W	
		7. Verification of tightness of busbar joints by torque wrench	Critical	Mech.	100%	10%	Size KGM M8 0.85 M10 1.88 M12 3.2	Size KGM M8 0.85 M10 1.88 M12 3.2	TC	P	W	W	
		8. CT /PT fixing & mounting arrangement	Major	Visual	100%	10%	NTPC Speci	NTPC Spec.	TC	P	W	W	

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN	PROJECT :
		ITEM : LT SWITCHGEAR SUB-SYSTEM: LT	QP NO.: REV.NO.: DATE: PAGE: …. OF….	PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:

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		9. Check shrouding of accessible live parts , Cable supports and tool falling shroud in cable alley and application of PVC sleeves on busbars	Major	Visual	100%	Random	NTPC Spec	NTPC Spec.	TC		P	W	W	.
		10. Verification of Components for make, type, rating & layout	Major	Visual	100%	10% of each type of module per lot	Makes as per LOA / Endorsement Sheet Type, rating & Layout as per NTPC approved GA / scheme drg	Makes as per LOA / Endorsement Sheet Type, rating & Layout as per NTPC approved GA / scheme drg	TC		P	W	V	
		11. Check control wiring / terminal arrangement & ferruling	Major	Visual	100%	10% Same as above	NTPC apppd drg	NTPC Appd drg	TC		P	W	W	
		12. Safety Shutters operation check	Critical	Electrical	100%	10% Same as above	NTPC Specification	NTPC specification	TC		P	W	W	
		13. Check door interlock & defeat interlock & adlocking feature	Major	Electrical	100%	10% Same as above	NTPC Specification	NTPC specification	TC		P	W	W	

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER
SIGNATURE	

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** **M:** MANUFACTURER/SUB-SUPPLIER C**:** MAIN SUPPLIER, **N**: NTPC
P: PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE,
CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"

FOR NTPC USE

DOC. NO.:	REV…… CAT…..	
REVIEWED BY	APPROVED BY	APPROVAL SEAL

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		14. Mech operation test for ACB as per IS	Critical	Electrical	100%	10 Same as above	IS 13947	IS 13947	TC	P	W	W	
		15. Breaker operation at service , test & isolate position	Critical	Electrical	100%	100%	IS 13947; NTPC appd drg	NTPC Spe;cification	TC	P	W	W	
		16. Power & control drawout contacts alignment check	Major	Electrical	100%	10% of each type of module per lot	NTPC Specification	NTPC Specification	TC	P	W	W	
		17. Check for Breaker antipumping & trip free feature	Major	Electrical	100%	100%	NTPC Specification	NTPC Specification	TC	P	W	W	
		18. Earthing of ACB Cradle	Major	Visual	100%	10%	NTPC Spec.	NTPC Spec.	TC	P	W	W	
		19. Interlocks & operation check: - elect. / mech - open, close: under test , service & isolation position	Critical	Electrical	100%	10% of each type of module per lot	Approved drgs & NTPC Specification	Approved drgs & NTPC Specification	TC	P	W	W	
		21. Earth bus dimensions, earthing of drawout modules, door etc.	Major	Electrical.	100%	10% of each type of module per lot	NTPC Appd GA Drg	NTPC Appd GA Drg	TC	P	W	W	

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		22. Check Paint shade, thickness, Adhesion & finish	Major	Visual/Test	100% for shade & finish; 2 - 3 samples / lot for thickness & adhesion check	2 - 3 samples / board	NTPC approved drg. For shade Paint Thickness to be checked as per NTPC spec.	NTPC approved drg. For shade Paint Thickness to be checked as per NTPC spec.	TC		P	W	W	Paint adhesion check by cross hatch method using adhesive type
		23. draw in- draw out- draw-in of modules at random and check damages of fixed contacts and lyra contacts if any		Visual	Random	Random	No damages				P	W	W	
		24. Degree of protection check, check profile & fixing of gaskets	Major	Visual	2 - 5 samples at gasketted joints per board	2 - 5 samples at gasketted joints per board	NTPC approved drgs / NTPC Specification	No insertion possible from openings & gasketted joints	TC		P	W	W	Paper insertion method for IP 5X compartments & 1 mm wire insertion method for IP 4X compartments. Type, Dimensions & profile of the gaskets should be same as type tested panel gaskets

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		25. IR Test before & after the HV Test	Major	Electrical.	100%	100%	IS-8623	IS-8623	TC	P	W	W	
		26. HV test on Power & control circuit.	Critical	Electrical	100%	100%	IS-8623	IS-8623	TC	P	W	W	
		27. Fitting of sheet steel covers at both ends of transport units	Major	Visual	100%	100%	NTPC Spec.	NTPC Spec.	TC	P	V	V	Surveillance check by Main contractor / NTPC
2	Packing	-Completeness -Sturdiness -Loose Items	Major	Visual	100%	-	Mfr. Std. Practice	Mfr. Std. Practice	QC Records	P	-	-	

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	ITEM : MV Switrchgear upto 33KV	INDICATIVE QUALITY PLAN	QP.NO:	REVIEWED BY	APPROVED BY
एनटीपीसी NTPC			Rev No.: 0		
		CONFORMING TO CODE : IS / IEC / NTPC TECHNICAL SPECIFICATION	Date:		
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						6 M	6 C/N					M	C	N	
1	2		3	4	5			7	8	9	D *	**	10		11
1.00	**Raw Material/Bought out Item Checks-**														
1	CT's	1	Make, type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., App. Drg. , Appd. Vendor List	As per P.O.Spec., App. Drg. , Appd. Vendor List	QC Record		P	V	-	
		2	All routine tests as per IS- 2705	Critical	Elec	100%	10% of each type	IS- 2705/ App. Drg./ App. Data sheet	IS- 2705/ App. Drg./ App. Data sheet	Supplier TC	√	V	V	-	
		3	PD before & after Pig Tail Connection	Critical	Elec	100%	10% of each typr	CT mfr standard	CT mfr standard	QC record	√	P	V	-	
2	PT's	1	Make, type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., App. Drg., Appd. Vendor List	As per P.O.Spec., App. Drg., Appd. Vendor List	QC Record		P	V	-	
		2	All routine tests as per IS- 3156	Critical	Elec	100%	10% of each type	IS- 3156/App. Drg./ App. Data sheet	IS- 3156/App. Drg./ App. Data sheet	Supplier TC	√	V	V	-	
3	Numerical Protection Relays	1	Make ,Type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., Appd. Vendor List	As per P.O.Spec., Appd. Vendor List	QC Records		P	V	-	
		2	FAT	Major	Elec	Special Inspection Levels, S1 (AQL 1.5) as per IS2500 Part-I per Type of relay		As per Approved FAT procedure		FAT Report	√	P	W	W	FAT inspection on Panel / Loose Relays at BHEL / Vendor works.
4	Door Gasket	1	Profile	Minor	Visual	1 Sample per lot	1 Sample per lot	Mnfr std./ spec.	Mnfr std./ spec.	QC record		P	V	-	Panel Type Test Report of Degree of Protection for Reference at the time of inspection
5	Bus bar Support Insulator/ Seal off bushing	1	Cantillever Strength	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS-9431	Mnfr / BHEL std./drg / IS-9431	Supplier TC		V	V	-	Not applicable for inter-panel SOB
		2	HV Test	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS-9431	Mnfr / BHEL std./drg / IS-9431	Supplier TC		V	V	-	
		3	PD Test	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS-9431	Mnfr / BHEL std./drg / IS-9431	Supplier TC		V	V	-	
		4	Comparative Tracking Index	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS-9431	>=600V	Supplier TC		V	V	-	
		5	Dimension	Major	Meas.	Supplier std.	Supplier std.	BHEL drg.	BHEL drg.	QC Record		P	V	-	

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						6 M	6 C/N					M	C	N	
1	2		3	4	5			7	8	9	D *	**	10		11
B	**In process checks**														
1	Vacuum Circuit Breaker	1	Type & Rating	Major	Visual	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I per board	Appd. Drawing	Appd. Drawing	Test Record		P	V	-	
		2	HV Test on Power Circuit	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		3	IR Test on Main, Auxiliary/ Control Circuit	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		4	Contact Resistance	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		5	Mechanical operation	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		6	Breaker Closing/ Tripping Time	Major	Test	100%		Mfg std.	Data sheet	Test Record		P	V	-	
2	Vacuum Contactor along with panel	1	Make, Type & Rating	Major	Visual	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I per board	Appd. Drawing	Appd. Drawing	Test Record		P	V	-	
		2	HV Test on Power Circuit	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		3	IR Test on Main, Auxiliary/ Control Ckt.	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		4	Contact Resistance	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		5	Mechanical operation	Major	Test	100%		IEC 62271-100	IEC 62271-100	Test Record		P	V	-	
		6	Closing/ Tripping Time	Major	Test	100%		Supplier TC	Supplier TC	Supplier TC		V	V	-	
C.	**Final Panel Assembly**														
	Panel	1	Verification of overall dimensions and labels	Major	Meas.	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I per board	As per approved Layout drgs.	As per approved Layout drgs.	Mfr. Record		P	W	W	
		2	Measurement of tightness of busbar joints by torque wrench	Critical	Meas.	100%	5 joints / offered lot	-	40 Nm	Mfr. Record		P	W	W	

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									Rev No.: 0						
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						6 M	6 C/N					M	C	N	
1	2		3	4	5			7	8	9	D *	**	10		11
		3	CT /PT fixing & mounting arrangement	Major	Visual	100%	10 Samples / offered lot	Mfg. drg.	Independently mounted	Mfr. Record		P	W	W	Check CT pig tail fixing with busbar/ connection (i.e. checking of fixing of equipotential wire applicable only for Slot CT).
		4	Busbar Clearance Check	Major	Measurement	100%	Aat random, at 2-3 points	Mfg. drg.	Approved Drawing	Mfr. Record		P	W	W	
		5	Functional / Operational check on Breaker/ Contactor, Operation of limit switches / Electrical Interlock Checks.	Critical	Test	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I per board	NTPC approved scheme & drg.	NTPC approved scheme & drg.	Mfr. Record		P	W	W	
		6	Main circuit contact Resistance Measurement (Top Busbar to Bottom Fixed Contact).	Critical	Test	100%		IEC 62271-100/ Temp. rise test report	IEC 62271-100/ Temp. rise test report	Mfr. Record		P	W	W	
		7	Safety Shutters operation check	Critical	Mech.	100%		BHEL, Drg.	BHEL, Drg.	Mfr. Record		P	W	W	
		8	5 Close/ open operation test for CB/ Contactor	Critical	Test	100%		IEC 62271-100	IEC 62271-100	Mfr. Record		P	W	W	
		9	Breaker/ Contactor Closing/ Tripping Time	Critical	Test	100%		Datasheet, mfr standard	Datasheet, mfr standard	Mfr. Record		P	W	W	
		10	Earthing of Breaker Truck / Doors	Major	Visual	100%		-	-	-		P	W	W	
		11	Circuit Breaker / Contactor alignment check while insertion to panel	Major	Visual	100%		-	-	-		P	W	W	
		12	Interchangeability check for similar rating breaker trucks	Major	Mech	100%	1 of each rating	Approved drgs	Approved drgs	-		P	W	W	
		13	Overall aesthetics, finish, Paint shade, thickness, Adhesion (On outer surface).	Major	Visual/Test	100%	1 Panel / offered lot	As per NTPC spec.	As per NTPC spec.	Mfr. Record		P	W	W	Paint adhesion check by cross hatch method using calibrated tape

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						6 M	6 C/N					M	C	N	
1	2		3	4	5			7	8	9	D *	**	10		11
		14	HV test on Power & control ckt.	Critical	Test	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I	IEC 62271-200	IEC 62271-200	Mfr. Record		P	W	W	
		15	IR Test before & after the HV Test with 500V meggar for control circuit and 5.0KV Meggar for Power Ckt.	Major	Test	100%		IEC 62271-200	IEC 62271-200	Mfr. Record		P	W	W	
		16	Door locking arrangement	Major	Visual	100%		Internal Arc test report	Internal Arc test report	-		P	W	W	
		17	Degree of protection check	Major	Test	100%		NTPC approved drgs / NTPC Spec	Paper should not come out when door is closed.	Mfr. Record		P	W	W	Paper pulling method for IP 5X Instrument Panel.
		18	Proper Wire Dressing / Crimping	Major	Visual	100%		-	-	-		P	W	W	
		19	Gland plate material and thickness check	Minor	Meas.	100%		App. Drg.	App. Drg.	Mfr. Record		P	W	W	
	Earthing Truck	1	Rating & Type	Major	Visual	100%	100%	As per NTPC s	As per NTPC spec.	Mfr. Record		P	W	W	
		2	5 Close/ open operation test for CB/ Contactor	Major	Functional test	100%		-do-	-do-	Mfr. Record		P	W	W	
		3	Electrical interlock check	Major	Functional test	100%		-do-	-do-	Mfr. Record		P	W	W	

D: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER / SUB-SUPPLIER: C: MAIN SUPPLIER, N: N
FORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	**INDICATIVE MANUFACTURING QUALITY PLAN**		PROJECT :
		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: …. OF….	MAIN-SUPPLIER:

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
	BOUGHT OUT ITEMS												
1.1	Insulator	Dimension (ID,OD,P.C.D)	Major	Measure	1 sample/ Size/ lot	-	Drawing/ P.O.	Drawing/ P.O.	F01 A (8.2.4) / STC		P	-	-	
	_	Flange Thickness	DO	DO	DO	-	DO	DO	DO		P	-	-	
	_	Creepage	DO	DO	DO	-	DO	DO	DO		P	-	-	
	_	Total Height	DO	DO	DO	-	DO	DO	DO		P	-	-	
	_	Hole Dia.	DO	DO	DO	-	DO	DO	DO		P	-	-	
	_	Electrical Routine Test	DO	Test	DO	-	IS 5621 - 1980	IS 5621 - 1980	STC		V	-	-	
	_	Temp. Cycle Test	DO	DO	DO	-	DO	DO	DO		V	-	-	
	_	Porosity Test	DO	DO	DO	-	DO	DO	DO		V	-	-	
	_	Visual	DO	Physical	100%	-	Free From Damage	Free From Damage	F01 A (8.2.4) / STC		P / V	-	-	
1.2	Supper Enamelled Copper wire	Dimension	Major	Measure	1 sample/ Size/ lot	-	IS 13730	IS 13730	F01Y (8.2.4) / STC		P / V	-	-	
		Elongation	DO	Test	DO	-	DO	DO	DO		P / V	-	-	
		Springness	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Flexiblity & adherence	DO	DO	DO	-	DO	DO	DO		P / V	-	-	

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER
SIGNATURE	

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CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"

FOR NTPC USE

DOC. NO.:	REV…… CAT…..	
REVIEWED BY	APPROVED BY	APPROVAL SEAL

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN		PROJECT :
		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
		Solvent Test	DO	DO	DO	-	DO	DO	STC		V	-	-	
		Breakdown Voltage	DO	DO	DO	-	DO	DO	F01Y (8.2.4) / STC		P / V	-	-	
		Continuty of Covering	DO	DO	DO	-	DO	DO	STC		V	-	-	
		Resistance to abrasion	DO	DO	DO	-	DO	DO	F01Y (8.2.4) / STC		P / V	-	-	
		Resistance Measurement	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Heat Shock Test	DO	DO	DO	-	DO	DO	DO		V	-	-	
		Cut Through Test	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
1.3	MS Tank	Dimension	Major	Measure	1 sample /Size / lot	-	Drawing/ P.O.	Drawing/ P.O.	F01(8.2.4)		P	-	-	
		Material	DO	Test	DO	-	DO	DO	STC		V	-	-	
		Surface Finish	DO	Physical	DO	-	Free From Damage	Free From Damage	Inhouse TC		P	-	-	
		Pressure test	DO	Test	100%	-	test@30 psi	No Leakage	DO		P/V	-	-	
1.4	Core (C.R.G.O)	Dimension	Major	Measure	1 sample /lot	-	P.O./Drg.	P.O./Drg.	F01(8.2.4)		P	-	-	
		Surface defects	DO	Visual	DO	-	Free From Damage	Free From Damage	DO		P	-	-	
		Weight	DO	Measure	DO	-	P.O./Drg.	P.O./Drg.	DO		P	-	-	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER		FOR NTPC USE			
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		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
1.5	Bellow (SS)	**Dimension**	Major	Measure	1 sample/ Size/ lot	-	As per P.O./Drg.	As per P.O./Drg.	F01W(8.2.4)/STC		P / V	-	-	
		Flange Thickness	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Flange (O.D.,P.C.D.,Holes)	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Chemical composition	DO	Test	DO	-	DO	DO	STC		V	-	-	
		Leakage Test	DO	DO	DO	-	check @30psi	No leakage	F01W(8.2.4)/STC		P / V	-	-	
1.6	Viton Rubber O Ring	Dimension (ID,OD,Thk)	Major	Measure	1 sample/ Size/ lot		P.O./Drg./Mfg.std.	P.O./Drg./Mfg. std.	F01F(8.2.4)/STC		P / V	-	-	
		Hardness	DO	Test	DO		DO	DO	DO		P / V	-	-	
		Tensile Strength	DO	DO	DO		DO	DO	STC		V	-	-	
		Ultimate Elongation	DO	DO	DO		DO	DO	DO		V	-	-	
		Compression set at	DO	DO	DO		DO	DO	DO		V	-	-	
		200^{0}C for 22 Hrs												
		Heat Resistance @ 250^{0}C,	DO	DO	DO		DO	DO	DO		V	-	-	
		70 Hrs.												
		Ageing in Transformer Oil	DO	DO	DO		DO	DO	DO		V	-	-	
		at 200^{0}C for 72 Hrs												

				DOC. NO.:	REV…… CAT…..	
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	**LEGEND:** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** **M:** MANUFACTURER/SUB-SUPPLIER C**:** MAIN SUPPLIER, **N**: NTPC **P:** PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE, **CHP:** NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"	FOR NTPC USE			
SIGNATURE				REVIEWED BY	APPROVED BY	APPROVAL SEAL

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN		PROJECT :
		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: …. OF….	MAIN-SUPPLIER:

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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
		Change in Volume	DO	DO	DO		DO	DO	DO		V	-	-	
		Change in Hardness	DO	DO	DO		DO	DO	DO		V	-	-	
		Change in Tensile Strength	DO	DO	DO		DO	DO	DO		V	-	-	
		Change in Elongation	DO	DO	DO		DO	DO	DO		V	-	-	
		Density	DO	DO	DO		DO	DO	DO		V	-	-	
1.7	Insulating Crepe Paper	Dimension Thickness	Major	Test	1sample/lot	-	PO/Mfg.std./Tech. Data sheet	PO/Mfg.std./Tech. Data sheet	F01R (8.2.4)/STC		P / V	-	-	
		Grammage/Substance	DO	DO	DO	-	IS 9335/IEC 60554	IS 9335/IEC 60554	DO		P / V	-	-	
		Tensile Strength (MD)	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Elongation at Break (MD)	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Conductivity of aq. Extract	DO	DO	DO	-	DO	DO	DO		P / V	-	-	Max. 5
		Ph of aq. Extract	DO	DO	DO	-	DO	DO	DO		P / V	-	-	ERDA test result once in half yearly
		Ash Content	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Moisture Content	DO	DO	DO	-	DO	DO	DO		P / V	-	-	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER		FOR NTPC USE			
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		Hill Count	DO	DO	DO	-	PO/Mfg.std.	PO/Mfg. std.	DO		P / V	-	-	

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					M	C / N				M		C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
1.8	Insulating Kraft Paper	Dimension (Thickness)	Major	Test	1sample/lot	-	PO/Mfg.std./Tech. Data sheet	PO/Mfg.std./Tech. Data sheet	F 01 L (8.2.4)/STC		P / V	-	-	
		Substance	DO	DO	DO	-	IS 9335/IEC 60554	IS 9335/IEC 60554	DO		P / V	-	-	
		Density	DO	DO	DO	-	DO	DO	DO		V	-	-	
		Tensile Index	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Tear Index	DO	DO	DO	-	DO	DO	STC		V	-	-	ERDA test result once in half yearly
		Elongation	DO	DO	DO	-	DO	DO	F 01 L (8.2.4)/STC		P / V	-	-	
		Ash Content	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Moisture Content	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Ph Value	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Conductivity	DO	DO	DO	-	DO	DO	DO		P / V	-	-	Max. 5

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	**INDICATIVE MANUFACTURING QUALITY PLAN**		PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:
		ITEM : POTENTIAL TRANSFORMER SUB-SYSTEM: 33 KV OIL FILLED	QP NO.: REV.NO.: DATE: PAGE: …. OF….	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
		Electrical Strength in Air	DO	DO	DO	-	DO	Min. 7kv/mm	DO		P / V	-	-	
1.9	Copper Lugs	Dimension	Major	Measure	1 sample/ Size/ lot	-	P.O. / Drawing	P.O. / Drawing	F01C(8.2 .4)/STC		P / V	-	-	
		I.D. & Hole Dia. of barrel	DO	DO	DO	-	DO	DO	DO		P / V	-	-	Cu. Purity Test from 3rd Party NABL Approved Lab
		Conductivity	DO	Test	DO	-	As per IACS	97.0 % Min.	DO		P / V	-	-	
		Cu purity test	DO	DO	DO	-	As per IS 191	99.90 % Min.	Lab Report		V	-	-	
1.10	Semi Conducting Black crepe paper	Thickness	Major	Measure	1sample/l ot	-	Mfg.std./Tech. Data sheet	Mfg.std./Tech. Data sheet	F01 F (8.2.4)/ STC		P / V	-	-	
		Width	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Substance	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Tensile Strength	DO	Test	DO	-	DO	DO	DO		P / V	-	-	
		Elongation at Break	DO	DO	DO	-	DO	DO	DO		P / V	-	-	

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER
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FOR NTPC USE

DOC. NO.:	REV…… CAT…..	
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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
1.11	Aluminium Crepe Paper	Thickness	Major	Measure	1 sample/lot	-	Mfg.std./Tech. Data sheet	Mfg.std./Tech. Data sheet	F01R(8.2 .4) / STC		P / V	-	-
											P / V	-	-
		Width	DO	DO	DO	-	DO	DO	DO		P / V	-	-
		Substance	DO	DO	DO	-	DO	DO	DO		P / V	-	-
		Tensile Strength	DO	Test	DO	-	DO	DO	DO		P / V	-	-
		Elongation at Break	DO	DO	DO	-	DO	DO	DO		P / V	-	-
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
1.12	Transformer Oil	Appearance	Major	Visual	1 sample/lot	-	IEC 60296	Oil Shall be Clear	F01(8.2. 4) /STC		P / V	-	-
								& Transparent					
		Density @ 20^0C	DO	Test	DO	-	DO	Max. 0.895	STC		V	-	-
		Kinematic viscosity@ 40^0C	DO	DO	DO	-	DO	Max. 12	DO		V	-	-
		Pour Point Deg.C	DO	DO	DO	-	DO	Max.(- 40)	DO		V	-	-

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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
		Water content	DO	DO	DO	-	DO	Max.20 mg/Kg	DO		V	-	-	
		BDV (New unfiltered)	DO	DO	DO	-	DO	Min. 30	F01(8.2. 4) /STC		P / V	-	-	
		DDF @90^{0}C	DO	DO	DO	-	DO	Max. 0.001	DO		P / V	-	-	
		Particle Count	DO	DO	DO	-	DO	No gen. Req.	STC		V	-	-	
		Neutralization Value/Acidity	DO	DO	DO	-	DO	Max. 0.01	DO		V	-	-	
		Interfacial Tension	DO	DO	DO	-	DO	Min. 40 mN/mtr	DO		V	-	-	
		Total Sulpher Content	DO	DO	DO	-	DO	Max. 0.15%	DO		V	-	-	
		Corrosive Sulpher	DO	DO	DO	-	DO	Non Corrosive	DO		V	-	-	
		Dibenzyl Disulphide	DO	DO	DO	-	DO	Not Det.(< 5mg/kg)	DO		V	-	-	
		Antioxidant Additives,	DO	DO	DO	-	DO	0.08 - 0.40 %	DO		V	-	-	
		Metal Passivator	DO	DO	DO	-	DO	Not Det.(< 5mg/kg)	DO		V	-	-	
		Furfural Content	DO	DO	DO	-	DO	Not Det.(<0.05mg /kg)	DO		V	-	-	
		Oil Charactersitics after Oxidation Stability test @ 120^{0}C for 500 hrs)											

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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
		Total acidity	DO	DO	DO	-	IEC 60296	Max. 0.3 mgKOH/gm	STC		V	-	-	
		Total sludge	DO	DO	DO	-	DO	Max. 0.05%	DO		V	-	-	
		DDF @90 Deg.C	DO	DO	DO	-	DO	Max. 0.05	DO		V	-	-	
		Gassing tendency @50Hz	Major	Test	1 sample/lot	-	IEC 60296	0 - 5	STC		V	-	-	
		Flash Point PMCC,Deg.C	DO	DO	DO	-	DO	Min. 135^{0}C	DO		V	-	-	
		PCB Content	DO	DO	DO	-	DO	Not Det.(< 2mg/kg)	DO		V	-	-	
		PCA Content	DO	DO	DO	-	DO	Max. 3%	DO		V	-	-	
		Carbon Type analysis												
		Cn%	DO	DO	DO	-	DO	Min. 45	DO		V	-	-	
		Cp %	DO	DO	DO	-	DO	Max. 49	DO		V	-	-	
		Ca %	DO	DO	DO	-	DO	Max. 6	DO					
2.0	IN - PROCESS INSPECTION													
2.1	Testing before	Turn Ratio	Major	Test	100%	-	IS 3156	IS 3156	P.C.C		P	-	-	
	assembly	High Voltage power frequency test @ 3kv	DO	DO	DO	-	DO	DO	DO		P	-	-	

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** **M:** MANUFACTURER/SUB-SUPPLIER C**:** MAIN SUPPLIER, **N**: NTPC **P:** PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE, **CHP:** NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"	FOR NTPC USE	DOC. NO.:	REV…… CAT…..	
SIGNATURE				REVIEWED BY	APPROVED BY	APPROVAL SEAL

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	**INDICATIVE MANUFACTURING QUALITY PLAN**		PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:
		ITEM : POTENTIAL TRANSFORMER SUB-SYSTEM: 33 KV OIL FILLED	QP NO.: REV.NO.: DATE: PAGE: …. OF….	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
		Accuracy test determination of errors according to the requirements of appropriate accuracy class (20% rate volatge) & polarity test	DO	DO	DO	-	DO	DO	DO		P	-	-	
		Final accuracy	DO	DO	DO	-	DO	DO	DO		P	-	-	
2.2	Assembly	Visual Inspection & Fitment of Secondary Terminals	Major	Test	100%	-	IS 3156	IS 3156	P.C.C		P	-	-	
		H.V. @ 3KV (primary neutral to earth)	DO	DO	DO	-	DO	DO	DO		P	-	-	
		I.R. Measurement	DO	DO	DO	-	DO	DO	DO		P	-	-	
		Polarity test	DO	DO	DO	-	DO	DO	DO		P	-	-	
		Fitment of Insulators	DO	Physical	DO	-	Drg./Mfg.std.	Drg./Mfg.std.	DO		P	-	-	
		Tank cleanliness & Painting	DO	DO	DO	-	Free From Damage	Free From Damage	DO		P	-	-	

				DOC. NO.:	REV…… CAT…..	
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	**LEGEND:** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** **M:** MANUFACTURER/SUB-SUPPLIER C**:** MAIN SUPPLIER, **N**: NTPC **P:** PERFORM **W**: WITNESS AND **V:** VERIFICATION. AS APPROPRIATE, **CHP:** NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"	FOR NTPC USE			
SIGNATURE				REVIEWED BY	APPROVED BY	APPROVAL SEAL

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN		PROJECT :
		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: …. OF….	MAIN-SUPPLIER:

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
					M	C / N				M		C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
		Secondary H.V. Test(Secondary terminal to earth)	DO	Test	DO	-	IS 3156	IS 3156	DO		P	-	-	
2.3	Vacuum Drying & Oil Impregnation	Leakage check after assembly	Major	Test	100%	-	test@30psi	No leakage	P.C.C.		P	-	-	
		Oil Test Before filling	DO	DO	1sample/lot	-	IEC 60296	IEC 60296	DO		P	-	-	
		Tan Delta @ 90^0C & B.D.V				-								
		DGA	DO	DO	Randomly	-	IEC 60599	IEC 60599	Test report		P	-	-	
		Oil Level check(After filling)	DO	Physical	100%	-	Drg./Mfg.std.	Drg./Mfg.std.	P.C.C.		P	-	-	
	If applicable	Fitment of Bellow	DO	DO	DO	-	Drawing	Drawing	DO		P	-	-	
		Bellow Pressing	DO	DO	DO	-	1.2Kg/cm²	No Leakage	DO		P	-	-	
		Final Height of Bellow	DO	DO	DO	-	As per Drawing	As per Drawing	DO		P	-	-	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER		FOR NTPC USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE						

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		ITEM : POTENTIAL TRANSFORMER	QP NO.: REV.NO.: DATE:	PACKAGE : CONTRACT NO. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: …. OF….	MAIN-SUPPLIER:

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.		11.
3.0	FINAL INSPECTION		RIO TO REVIEW TYPE TEST CLEARANCE.										
	ROUTINE TEST	Visual & Dimension Check	Critical	Measure	1 Sample	**1 Sample**	App.Drg./GTP	App.Drg./GTP	Test		P	**W**	**W**	
		Oil leakage test.	Critical	Measure	1 Sample	**1 Sample**	App.Drg./GTP	App.Drg./GTP	Test		P	**W**	**W**	
		Verification of Terminal marking & Polarity	DO	Test	100%	**100%**	IS 3156/IEC 61869	IS 3156/IEC 61869	DO		P	**W**	**W**	
		Power Frequency voltage withstand Test on Primary winding	DO	DO	DO	**DO**	DO	DO	DO		P	**W**	**W**	
		Power Frequency voltage withstand Test on Secondary winding	DO	DO	DO	**DO**	DO	DO	DO		P	**W**	**W**	
		Induced over voltage withstand test	DO	DO	DO	**DO**	DO	DO	DO		P	**W**	**W**	
		Determination of errors	DO	DO	DO	**DO**	DO	DO	DO		P	**W**	**W**	
		Capacitance & Tan delta @10 k.v. & Um/√3	DO	DO	DO	**DO**	DO	DO	DO		P	**W**	**W**	
		Oil Test (BDV,Tan Delta, Sp. Res, Moisture)	Critical	Measure	1 Sample	**1 Sample**	App.Drg./GTP	App.Drg./GTP	Test		P	**W**	**W**	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER		FOR NTPC USE	REVIEWED BY / APPROVED BY / APPROVAL SEAL	
SIGNATURE					

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN	PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:
		ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
1	Zinc Oxide Blocks	a) Visual Examination	Major	Physical	100%	100%	IEC 60099-4	IEC 60099-4	TC / Inspection Records	√	P	V	V
		b) Energy Capability test	Critical	Electrical	100%	100%	IEC 60099-4	IEC 60099-4		√	P	V	V
		c) Residual Voltage Test	Critical	Electrical	100%	100%	IEC 60099-4	IEC 60099-4		√	P	V	V
		d) Line discharge class test	Critical	Electrical	3Samples / batch	3Samples / batch	IEC 60099-4	IEC 60099-4		√	P	V	V
		e) High current test	Critical	Electrical	3Samples / batch	3Samples / batch	IEC 60099-4	IEC 60099-4		√	P	V	V
		f) Thermal stability test	Critical	Electrical	3Samples / batch	3Samples / batch	IEC 60099-4	IEC 60099-4		√	P	V	V
		g) Watt loss or resistive current	Critical	Electrical	3Samples / batch	3Samples / batch	IEC 60099-4	IEC 60099-4		√	P	V	V
2	Porcelain Bushing	a) Major Dimensions	Major	Physical	2Samples/lot	2Samples/lot	Supplier Drg.	Supplier Drg.	TC / Inspection Records	√	P	V	V	Lot mentioned in this RQP refers to batch quantity offered for inspection by supplier.
		b) Visual Examination	Major	Physical	100%	100%	IS: 5621-1980	IS: 5621-1980			P	V	V
		c) Porosity Test	Major	Physical	2Sample/lot	2Sample/lot	IS: 5621-1980	IS: 5621-1980	T.C.	√	V	V	V
		d) Electrical Routine Test	Critical	Elect.	100%	100%	IS: 5621-1980	IS: 5621-1980	T.C.	√	V	V	V
		e) Temp. Cycle Test	Major	Physical	2Samples/lot	2Samples/lot	IS: 5621-1980 IS: 5621-1980	IS: 5621-1980	T.C.	√	V	V	V

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SIGNATURE				REVIEWED BY / APPROVED BY / APPROVAL SEAL

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN	PROJECT :
		ITEM : SURGE ARRESTOR / QP NO.:	PACKAGE :
		SUB-SYSTEM: / REV.NO.:	CONTRACT NO. :
		DATE:	MAIN-SUPPLIER:
		PAGE: …. OF….	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
3	Aluminium Castings for S.A – Ends	a) Major Dimensions b) Visual Examination c) Tensile test on Test bar d) Chemical Analysis	Major Major Major Major	Physical Physical Mech. Mech.	2Samples/lot 100% 1Sample for every lot of 2000kgs of cast alloy		Supplier drg. ASTM B-85 ASTM B-85/ BS : 1490 ASTM B-85/ BS : 1490	Supplier drg. ASTM B-85 ASTM B-85/ BS : 1490 ASTM B-85/ BS : 1490	TC / Inspection Records T.C. T.C.	 √ √	P P V V		
4	Sealing Rings	a) Dimensions b) Hardness (Shore A) c) Compression set d) Ageing Test	Major Major Major Major	Physical Mech. Mech. Mech.	2Samples/lot 2Samples/lot 2Samples/lot 2Samples/lot	2Samples/lot 2Samples/lot 2Samples/lot 2Samples/lot	Supplier drg. DIN 53505 ASTM 2000 (D 395) ASTM 2000 (D 573)	Supplier drg. DIN 53505 ASTM 2000 (D 395) ASTM 2000 (D 573)	TC / Inspection Records T.C. T.C.	 √ √ √	P P V V	V V V V	V V V V	
5	Pressure Release Diaphragm	a) Visual Check b) Dimensions c) Pressure Test	Major Major Major	Physical Physical Mech.	100% 1Sample/lot 1Sample/lot	100% 1Sample/lot 1Sample/lot	ITP-INW-9B Supplier drg. ITP-INW-9B	ITP-INW-9B Supplier drg. ITP-INW-9B	TC / Inspection Records	√	P P P	V	V

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		ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
6	Grading Rings / Corona Rings	a) Visual Examination b) Dimensions c) Tensile Strength test	Major Major Major	Physical Physical Mech.	100% 1Sample/lot 1Sample/lot		ITP- INW-22 / 22A Supplier drg. IS : 733	ITP- INW-22 / 22A Supplier drg. IS : 733	TC / Inspection Records T.C.	√ √ √	P P V		
7	Counters	a) Visual Inspection b) Counter Operation	Major Critical	Physical Elect.	100% 100%		Manufacturer Std0 Manufacturer Std0	Manufacturer Std0 Manufacturer Std0	TC / Inspection Records	√	P P		
8	Millie-Ammeters	a) Insulation resistance b) Comparison test c) H.V Test	Critical Critical Critical	Elect. Elect. Elect.	3 Samples/lot 100% 2 Samples/lot		Manufacturer Std Manufacturer Std Manufacturer Std	Manufacturer Std Manufacturer Std Manufacturer Std	TC / Inspection Records	√ √ √	P P P		

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		ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….	PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:

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					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
IN PROCESS INSPECTION FOR SURGE ARRESTORS													
1	Assembly of Surge Arresters	a) Visual check b) Seal leak Test	Major	Visual Measurement	Physical test		Sample Sample	IEC 60099-4 IEC 60099-4			P P		
FINAL INSPECTION & TESTING													
RIO to review Type Test Clearance													
A	Surge Arresters Routine Test	a) Visual &Dimensions	Major	Physical	100%	100%	Supplier drg	Supplier drg	QA/QC Records	√	P	V	V	
		b) Reference Voltage	Critical	Electrical	100%	100%	IEC 60099-4	IEC 60099-4		√	P	V	V	
		c) Residual voltage	Critical	Electrical	100%	100%	IEC 60099-4	IEC 60099-4		√	P	V	V	
		d) Leakage current @MCOV	Critical	Electrical	100%	100%	IEC 60099-4	Manufacturer Std		√	P	V	V	
		e) P.D. Test	Critical	Electrical	100%	100%	IEC 60099-4			√	P	V	V	
		f) Sealing Test	Major	Physical	100%	100%	IEC 60099-4	IEC 60099-4		√	P	V	V	
		g) Verticality check on completely assembled surge Arrester **(If Applicable)**	Major	Physical	1Sample/lot	1Sample/lot	IEC 60099-4	IEC 60099-4 Deviation in verticality – not to exceed 10 mm		√	P	V	V	

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		ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
B	Surge Monitor Routine Test	a) Visual Examination b) Dimensions c) i) Counter Operation test ii) Ammeter Operation test d) Seal leak test	Major Major Critical Critical Major	Physical Physical Electrical Electrical Physical	100% 3 Samples/lot 100% 100% 100%	100% 3 Samples/lot 100% 100% 100%	IEC 60099-4 Supplier drg.	Manufacturer Std Supplier drg. Manufacturer Std Manufacturer Std Manufacturer Std	QA/QC Records	√ √ √ √ √	P P P P P	V V V V V	V V V V V	

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS ' W"	FOR NTPC USE	DOC. NO.:	REV…… CAT…..
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		ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….	PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
C	Surge Arresters Acceptance Tests	a) Visual &Dimensions	Major	Physical	Cube root of qty. offered	Cube root of qty. offered	Apprd Drgs	Apprd Drgs	QA/QC Records	√	P	W	W
		b) Reference Voltage test	Critical	Electrical	Cube root of qty. offered	Cube root of qty. offered	IEC 60099-4	IEC 60099-4		√	P	W	W
		c) Residual voltage test	Critical	Electrical	Cube root of qty. offered	Cube root of qty. offered	IEC 60099-4	IEC 60099-4		√	P	W	W
		d) P.D. Test	Critical	Electrical	Cube root of qty. offered	Cube root of qty. offered	IEC 60099-4	IEC 60099-4		√	P	W	W
		e) Galvanizing Test i) Uniformity of Zinc Coating.	Major	Measurement / chemical	1sample / lot	1sample / lot	IS: 3070/2633	IS: 3070/2633		√	P	W	W
		ii) Weight of Zinc Coating.	Major	Measurement / chemical	1sample / lot	1sample / lot	IS:3070/ 6745	IS:3070/ 6745		√	P	W	W

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER
SIGNATURE	

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MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFACTURING QUALITY PLAN ITEM : SURGE ARRESTOR SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: …. OF….	PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C / N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.		11.
D	Surge Monitor Acceptance Tests	a) Visual Examination	Major	Physical	Cube root of qty. offered	Cube root of qty. offered	IEC 60099-4	Manufacturer Std	QA/QC Records	√	P	W	W
		b) Dimensions	Major	Physical	Cube root of qty. offered	Cube root of qty. offered		Supplier drg.		√	P	W	W
		c) i) Counter operation test at 100A & 10KA, 8/20 µ sec.	Critical	Electrical	Cube root of qty. offered	Cube root of qty. offered		Manufacturer Std		√	P	W	W
		ii) Ammeter operation test	Critical	Electrical	Cube root of qty. offered	Cube root of qty. offered		Manufacturer Std		√	P	W	W

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SIGNATURE				REVIEWED BY	APPROVED BY	APPROVAL SEAL

	NTPC	□N□C□T□□ □□□L□ □□□L□T□ PL□N									
		□T□M □C□□L □N□ □T□□CT□□□L □T□□L □ □□□□ □□□ □□L□□ P□□□□CT□					□P N□□□		□□□□□□ □□ □□		□PP□□□□□ □□
		□□□□□□□T□M □		C□N□□ □M□NC□ T□ □NTPC □P□C□□C□T□□N			□□□□N□ □□□				
							□□T□ □				
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□	Availability of QA& QC manpower and laboratory		-	A	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. Drawings		SR	√	
□	Sampling for testing of buliding materials, concrete mix design etc.		As agreed / required	A	Physical	As specified in FQP for various materials	Tech Specs and Const. Drawings		SR/TR	√	Test report along with the recommendations from specialist agency to be submitted to NTPC.
C	Submission of schedule of tests to be done monthly / quaterly		-	A	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. Drawings		SR	√	
□	Stacking and storage of construction materials and components at site		As per IS:4082	A	Physical	Random	Tech Specs and Const. Drawings and IS: 4082		SR	√	
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□□		Nature, type of soil/rock before and during excavations	As agreed / required	C	Visual	Random in eah shift	Tech Specs and Const. Drawings		SR		
□□		Initial ground level before start of excavations	As agreed / required	C	Measurement	100%	Tech Specs and Const. Drawings		SR	√	
□□		Final shape and Dimensions of excavations.	As agreed / required	C	Measurement	100%	Tech Specs and Const. Drawings		SR		
□□		Final excavation lelvels	As agreed / required	B	Measuement	100%	Tech Specs and Const. Drawings		SR	√	
□□		Side slope of final excavation	As agreed / required	B	Measurement	Random in each shift	Tech Specs and Const. Drawings		SR		
	□i□□□ □□□□i□□										
□□	□t□□d□rd □r□□t□r Te□t	Optimum moisture content and max. dry density before fill	As per IS: 2720, Proctor needle apparatus,etc.	B	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.VII), Tech Specs and Const. Drawings		SR/TR	√	
□□□	M□i□t□re □□□te□t	Moisture content of fill before compaction	As per IS: 2720, balance, oven, rapid moisture meter, etc.	B	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.II), Tech Specs and Const. Drawings		SR/TR	√	
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i		Dry density by core cutter method ---- OR---- Dry density in place by sand displacement method	As per IS: 2720/compaction test (core cutter), balance, rapid moisture meter etc.	A	Physical	One sample for every 10000 SQM area for each compacted layer.	IS 2720 (Pt. XXIX), Tech Specs and Const. Drawings OR IS 2720 (Pt. XXVIII), Tech Specs and Const. Drawings		SR/TR	√	

	NTPC	[illegible] QUALITY PLAN								
		[illegible]				[illegible]		[illegible]	[illegible]	
		[illegible]		CONFORMANCE TO NTPC SPECIFICATION						
Sl.No	Activities and Operations	Characteristics/Instruments		Class	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record	Remarks
A)	MATERIALS									
1)	CEMENT									
		Physical & Chemical Properties	as per IS:4031	A	Testing	At Random	As per relevant IS Codes/ Tech Specification		TR √	Each consignment of cement shall be duly correlated with manufactureres TC. One sample from each lot shall be tested for stetting time and compressive strength . If cement is stored more than 60 days in godown of contractor same shall be retested for comp. Strength & setting time.
2)	Coarse aggregate	Moisture content	as per IS:2386	B	Physical	Once for each stack of 100 Cu.M. or part there of	IS : 456 IS : 383/Tech Spec		SR/LB √	During monsoon when this has to be done every day before start of concreting
ii		Specific gravity, water absorption	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS:383/Tech Spec	IS:456,	SR/LB/TR √	
iii		Sieve analysis, flakiness index, elongation index,	IS:2386	B	Physical	One per 100 cum., or part thereof	IS: 2386 Part-I, Spec	IS:383/Tech	SR/LB √	
iv		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	A	Physical	Once per source/ on every change of source	IS: 2386 Part-II, Spec	IS:383/Tech	SR/LB/TR √	
v		Soundness	IS:2386	A	Physical	-do-	IS: 2386 Part-V, IS:383		SR/LB/TR √	
vi		Crushing value abrasion value and impact value	IS:2386	A	Physical	-do-	IS:383, IS-2386 Part IV/Tech Spec		SR/LB/TR √	
3)	Fine aggregate									
i		Moisture content, water absorption	balance , oven, rapid moisture meter etc	B	Physical	To be done every day before start of work	IS: 2386 Part-III	IS:383	SR/LB/TR √	
ii		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	A	Physical	Once per source& for on every change of source	IS: 2386 Part-II, IS:383		SR/LB/TR √	
iii		All other tests similar to coarse aggregates as mentioned above.					IS-2386, IS-383		SR/LB/TR √	except test for flankiness index,elongation index, abrasion value, impact value
4)	Water									
i		Complete tests as per IS:456	Buret, conical flask, pipette etc	B	Testing	One for each source.	IS:3025 part 22 and 23 (for test procedure), IS:456(for acceptance criteria)		SR/LB/TR √	

[illegible] QUALITY PLAN

Sl. No.	Activity and Operation	Characteristics/Instruments		Class	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
A)	CONCRETE										
i		Crushing strength (works Tests cubes)	IS:516	A	Physical	One set of 6 cubes per 50 CuM or part thereof for each grade of concrete per shift whichever is earlier.	IS:516, IS:456, NTPC Tech. Spec.		SR/LB/TR	√	Min. of 6 cubes for each mix, 3 specimen shall be tested at 7 days remaining 3 shall be for 28 days comp. Strength.
ii		Workability - slump test	IS:1199	B	Physical	At the time of concrete pouring at site every two hrs	IS:456/NTPC Tech. Spec.		SR/LB/TR	√	
[illegible]	Admixture for Concrete	Type of admixture	As per IS:9103	B	Review of MTC	For each lot received at site	Designed mix and IS:9103		MTC	√	Admixture of appd. Brand and tested quality shall be used (each lot of admixture will included with brochure in which the type of admixture and its properties shall be clearly indicated)
[illegible]	Concrete [illegible]										
i		mixing of concrete shall be done in a approved mixer such as to produce a homogenous mix				To be calibrated at the time of starting and subsequently once in three months, and shall conform to IS:4925	Review of calibration chart/ Certificate, IS 4926			√	
ii		Arrangement for transportation & placement of concrete.	As required	C	Visual	100%	Before clearance for concreting		Inspection Report	√	
iii		Handling and Transportation of concrete	As required	C	Physical	100%	As per construction/erection methodology (to be approved one week prior to start of		SR		
i[illegible]		Placement of concrete	Visual	B	Physical	100%	As per construction/erection methodology and tech.specs / No segregation		SR	√	
[illegible]		Compacting	As required	C	Physical	At Random	IS:456		SR	√	
[illegible]i		Curing	As required	C	Physical	At Random	Period of curing as per IS 456 (use gunny bags / curing compound)		SR	√	
[illegible]	[illegible]										
i		Dimensional check on finished structures & Dimensional tolerances	As required	B	Measurement	Approved Drawing	As per IS:456/ tech. Specification.		SR/LB	√	
ii		Water Tightness Test of liquid retaining structure/ tanks	As required	B	Test	100%	IS:3370/ Tech. Specification		SR/LB	√	
[illegible]	[illegible]										
i		Physical and Chemical Properties for each lot as per relevant IS codes	As required/ agreed	A	Review of MTC	Each batch of delivery	IS : 1786, IS:432, IS:1566, Tech Specs and Const. Drawings		MTC	√	Applicable if steel is procured by Contractor

INDICATIVE FIELD QUALITY PLAN

ITEM : CIVIL AND STRUCTURAL STEEL [illegible] BULK PRODUCTS

SUB SYSTEM :

CONFORMANCE TO NTPC SPECIFICATION

QP No.:
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Sl.No.	Activities and Operation	Characteristics/Instruments		Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
ii		Freedom from cracks surface flaws, Lamination.	As agreed / required	C	Visual	Random in each shift	IS: 1852, IS:432, IS:1786, Tech Specs and Const. Drawings		SR		To be checked at site. Steel collected from source should be free from excessive rust. To be stored as per Technical Specs.
	PLACEMENT OF REINFORCEMENT STEEL										
i		Bar bending schedule with necessary lap, Spacers & Chairs	As agreed / required	B	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502		SR	√	
ii		Bending of bars, cutting tolerance	As agreed / required	C	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502		SR	√	
iii		Acceptance - Cover, spacing of bars, spacers and chairs after the reinforcement cage is put inside the formwork	As agreed / required	B	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings		SR	√	
	STAGING AND FORMWORK										
i		Materials and accessories	As agreed / required	C	Visual	Once before start of work	As per relevant IS, Tech Specs and Const. Drawings		SR		
ii		Soundness of staging, shuttering and scaffolding including application of mould oil / release agent	As agreed / required	C	Visual	Once before start of work	As per manufacturer's spec.and as per 3696,4014, 4990, Tech Specs and Const. Drawings		SR		
iii		Acceptance of formwork before start of concreting		B	Physical / visual	Before start of each concreting	As per provisions and tolerances, Tech Specs and Const. Drawings		SR	√	
	DAMP PROOF COURSE						Tech Specs and Const. Drawings				
i		Material - Hot bitumen and water proofing materials etc	As agreed / required	B	Review of MTC	Each batch of delivery at site	Tech Specs and Const. Drawings, IS 702		SR	√	
ii		Acceptance of damp proof course	As agreed / required	B	Acceptance	100%	Tech Specs and Const. Drawings		SR		
	GROUTING										
i		Material	As agreed / required	B	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	
		Type of mix - fluid mix, plastic mix, stiff mix etc.	As agreed / required	C	Physical	Prior to start of work	Tech Specs and Const. Drawings		SR	√	
ii		Mixing, placement, application and grout pressure	As agreed / required	C	Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
iii		Compressive strength	As agreed / required	C	Physical	Random in each shift	Tech Specs and Const. Drawings		SR	√	
iv		Acceptance of the grouts	As agreed / required	B	Physical	Each grout section	Tech Specs and Const. Drawings		SR		

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		Dimensions , shape, compressive strength, water absorption, warpage, efflorescence.	As agreed / required	B	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings		Inspection Report	√	Efflorescence shall be checked at each source.
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i		Curing	As agreed / required	C	Physical	100%	Tech specifications, construction drawings and agreed methodology		SR		
ii		Thickness and finishing of plaster, grooves etc	As agreed / required	B	Visual/ Measurement	Random in each shift	Tech Specs and Const. Drawings		SR/LB		
iii		Truness of plastering system	As agreed / required	B	Visual/ Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
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i	Materials and accessories- Oil Bound, Acrylic Emulsion, Chemical Resistant, Oil Resistant Paint etc.	Shade, type from brand and manufacturer as approved by NTPC EIC	As agreed / required	B	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
ii	Surface prepration	As required	As agreed / required	C	Physical /visual	Random in each shift	Tech Specs and Const. Drawings		SR		
iii	Acceptance of painted surfaces	As required	As agreed / required	B	Physical	Each surface at random	Tech Specs and Const. Drawings		SR		
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i		Paining Materials and accessories	-	B	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
ii		Surface prepration	As agreed / required	C	Physical /visual	Each Erection Mark	Tech Specs and Const. Drawings, Relevant code/ standards		SR	√	
iii		Primer Thickness	Elcometer	C	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
i□		DFT of paint	Elcometer	C	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
□		Acceptance of painted surfaces	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR		
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		Methodology for the application of water proofing system	As required	B	Review	for each type of treatment	Tech Specs and Const. Drawings		SR	√	
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i	Graded under bed	Levels / slopes	As required	C	Physical	100%	Tech Specs and Const. Drawings				
ii	Elastomaric coatings	Material- Primer coat, finishing coat	As required	B	Review of MTC	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	

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iii	Wearing course	Materials - PCC, chicken wire mesh, elastomeric sealant	As required	B	Review of MTC	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	
i□		Acceptance of water proofing work	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings				
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i	PVC coated chain link fencing, Welded wire mesh (IS 1566), Reinforced barbed tape galvanised (IS 2629) etc.	Materials	As agreed / required	B	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications / relevant IS Codes
ii		Acceptance of the installation	As agreed / required	B	Physical / measurements	Each installation	Tech Specs and Const. Drawings		SR		
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i		Glass/ PVC strips in joints	As agreed / required	C	Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
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ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
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i		Quality, texture, thickness, colour for each lot of delivery from approved source	As agreed / required	C	Physical	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
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i	Materials	GI/ MS pipes and fittings	As agreed / required	B	Review of MTC	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii	Disinfection	Before use	As agreed / required	C	Physical	Each installation	Tech Specs and Const. Drawings		SR		
iii	Hydraulic test	Before use / leakage	As agreed / required	B	Physical	Each installation	Tech specs and const drawings		SR	√	
i□		Acceptance and working	As agreed / required	A	Acceptance	Random	Tech Specs and Const. Drawings		SR		
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i	M□teri□□	SCI / CI pipes and fittings / joints	As agreed / required	B	Review of MTC	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii		Acceptance and leakage	As agreed / required	B	Physical	Random	Tech Specs and Const. Drawings		SR		

[illegible] PLAN

	NTPC	ITEM : CIVIL AND STRUCTURAL [illegible]					FQP No.			[illegible]	
		[illegible]			CONFORMANCE TO NTPC SPECIFICATION		Revision No.				
							Date				
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Sl. No.	Activities and Operations	Characteristics / Instruments		Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
[illegible]	Granular Sub-base [illegible]										
i		Gradation	As required / agreed	B	Physical	One test per 200 cum of aggregate	As per Technical Specifications/ BOQ /IRC/MORTH		SR	√	
ii		Atterberg Limit	As per IS: 2720	B	Physical	One test per 200 cum of aggregate			SR	√	
iii		Moisture content prior to compaction	As per IS: 2720	B	Physical	One test per 250 SQM of aggregate			SR	√	
iv		Density of compacted layer	As per IS: 2720	A	Physical	One test per 500 SQM of aggregate			SR / TR	√	
v		Deleterious constituents	As required / agreed	B	Physical	As required			SR	√	
vi		CBR	As per IS: 2720	B	Physical	As required			SR / TR	√	
[illegible]	Water Bound Macadam (Non-bituminous)										
i		Aggregate Impact value	Agrregate Impact value Test Apparatus	A	Physical	One test per 200 cum of Test aggregate			SR	√	
ii		Grading	Set of IS Sieves	B	Physical	One test per 100 cum of aggregate			SR		
iii		Flakiness index and elongation index	Flakiness test gauge	B	Physical	One test per 200cun of agregate			SR		
iv		Atterberg Limits of binding material	Atterberg limits determination	A	Physical	One test per 25 cum of binding material			SR	√	
v		Atterberg Limits of portion of agreggate passing 425 micron sieve	Atterberg limits determination	A	Physical	One test per 100cum of aggregate			SR	√	
[illegible]	Bituminous surfacing as Open Graded Premix Carpet and Seal coat										
i		Quality of binder	Penetrometre with St. needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as applicable	As per Technical Specifications/ BOQ /IRC/MORTH		SR	√	
ii		Aggregate Impact Value / Los angeles abrasion value	Aggregate Impact ValueTest apparatus	A	Physical	One test per 50 cum of aggregate			SR	√	
iii		Flakiness Index and elongation indexof aggregates	Flakiness test gauge	B	Physical	One test per 50 cum of aggregate			SR		
iv		Stripping value of aggregate (Immersion tray test)	As required / agreed	B	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.			SR		

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□	□	□		□	□	□	□	□	□	□□	□□
□		Water absorption test		A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.			SR	√	
□i		Water sensitivity of mix	As required / agreed	A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.			SR	√	
□ii		Grading of aggregates	Set of Sieves	B	Physical	One test per 25 cum of aggregates			SR		
□iii		Soundness (Magnesium and Sodium Sulphate)	As required as per IS:2386	A	Physical	Once per source by each method and on every change of source			SR	√	
i□		Polished stone value	As required as per BS:812(Part 114)	B	Physical	As required			SR		
□		Temperature of binder at application	Thermometer	B	Physical	At regular close intervals			SR		
□i		Binder content	Bitumen extractor	A	Physical	One test per 500 cum& not less than two tests per day			SR	√	
□ii		Rate of spread of materials	As required / agreed	B	Physical	One test per 500 cum and not less than 2 tests per day	As per Technical Specifications/ BOQ /IRC/MORTH		SR		
□iii		Percentage of fractured faces	Bitumen extractor	A	Physical	When gravel is used one test per 50cum of aggregates			SR	√	
□□□	T□□□ C□□t□Prime □□□t□□□ □□□t										
i		Quality of binder	Penetrometre with Standard needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as applicable			SR	√	
ii		Temperature of binder at application	Thermometer	B	Physical	At regular close intervals			SR		
iii		Rate of spread of binder	As required / agreed	B	Physical	One test per 500 cum and not less than 2 tests per day			SR		

	NTPC	[illegible] FIELD QUALITY PLAN									
		ITEM: CIVIL AND STRUCTURAL STEEL [illegible]					QP No.:			REVIEWED BY	APPROVED BY
		[illegible] SYSTEM:		CONFORMANCE TO NTPC SPECIFICATION			REV. NO.:				
							DATE:				
							PAGE:				
							VALID UPTO:				
Sl.No.	Activities and Operations	Characteristics/ Instruments		Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
[illegible]	Alignment/ Level/ Surface regularity and rectification										
		Horizontal alignment, Surface levels and Surface regularity	As required / agreed	B	Physical	As per section 900 of MORTH specification	As per Technical Specifications/ BOQ/ Referred Standards and construction drawings		SR		
		Rectification	As required / agreed	B	Physical	Each rectification	As per Technical Specifications/ BOQ/ Referred Standards and construction drawings		SR	√	
[illegible]	STRUCTURAL STEEL MATERIAL (For site fabrication)										
i	Procured by contractor	Structural steel procured from NTPC approved sources- Mechanical (YS, UTS, Elg, UT if specified),,and Chemical properties (CE as per IS)		A	Review	For each batch of each section delivered at site	Technical Specification and Construction Drawings, IS 2062		SR	√	Correlated MTC shall be verified.
[illegible]	PRE-WELDING REQUIREMENTS										
i		Welding Procedure Specification * (WPS)	-	A	Review	Each Welding Process	Technical Specification and Construction Drawings, ASME-IX/ AWS D 1.1		WPS	√	*To be approved by CQA
ii		PQR and Welder's Qualification	-	A	Physical	Each welder	PQR/ WQR, AWS-D1.1/ASME-IX,		TR	√	
iii		Welding consumables	-	B	Physical	Random in each shift	Approved WPS, Latest NTPC		SR	√	
[illegible]	SETUP										
i		Marking and Cutting	Tape, ruler etc	B	Visual & Measurement	Each plate/ Section	Technical Specification and Construction Drawings/ Approved cutting plan		SR		
ii		Match markings for trial assembled components	-	B	Physical	Each fit-up	Technical Specification and Construction Drawings		SR		
iii		Weld Fit Up- Edge Preparation/ Gap/ Alignment	Tape, ruler etc	B	Physical	Each fit-up	Technical Specification and Construction Drawings, IS 7215		SR	√	If required suitable stiffners shall be provided to prevent deflection.
[illegible]	PRE-HEATING (wherever applicable)										
i		Pre-Heating Temperature	Thermal chalk	B	Measurement	Each pre-heating	Technical Specification and Construction Drawings, Approved WPS		SR	√	
ii		Post Weld Heat Treatment (PWHT), if required	Thermo couple with time temperature recorder	A	Time & Temperature	Each PWHT	Technical Specification and Construction Drawings, Approved WPS		SR	√	
[illegible]	WELDING REQUIREMENTS										
i		Sequence of welding	-	B	Physical	Random in each shift	Technical Specification and Construction Drawings, Agreed scheme		SR		
ii		Removal/ grinding of temporary attachments	-	B	Measurement	All cleats/ attachments	Technical Specification and Construction Drawings, Approved Drg.		SR		
iii		Completeness after welding- Dimensions/ distortion	Weld gauge	B	Visual	Each structure component	Technical Specification and Construction Drawings, IS 822		SR	√	

		[illegible] FIELD QUALITY PLAN									
	NTPC	ITEM: CIVIL AND STRUCTURAL STEEL [illegible]					QP No.:		[illegible]	APPROVED BY:	
		[illegible]		CONFORMANCE TO NTPC SPECIFICATION			[illegible]				
S.No.	Activities and Operation	Characteristics/instruments		Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
iv		Completeness of welding (each butt & fillet weld)		B	Visual	Each structure component	Technical Specification and Construction Drawings, Approved Drg.		SR	√	
[illegible]	NON DESTRUCTIVE AND DESTRUCTIVE TESTING										
[illegible]	FILLET WELDS										
i		size and visual examination	As required/ agreed	B	Visual/ Measurement	100%	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR		As per requirement of NTPC Engineer
ii		Dye Penetration Test	As required/ agreed	B	Physical	5% of Weld length with min. 300mm at each loaction	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR		
[illegible]	BUTT WELDS										
i		Visual examination	As required/ agreed	B	Visual	Random in each shift	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR		As per requirement of NTPC Engineer
ii		DPT	As required/ agreed	B	Physical	100% on all butt welds after back gouging on root run and 10% on final weld.	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR		All butt welds to be back gouged before DPT
iii		Radiography Test	As required/ agreed	A	Physical	10%	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR	√	Wherever RT is not feasible UT to be carried out. In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular loaction. Acceptance criteria of NDT on welds shall be as per AWS D1.1.
[illegible]	FOUNDATION CHECK										
i		Dimensions and levels- Shape, lines (including diagonal checks)	Theodolite, Tape etc	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR	√	
ii		Foundation Bolts and Embedments- Verticality, Levels, pitch distance	Theodolite, Tape, Piano wires etc	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR	√	
[illegible]	PAINTING SYSTEM										
i		Paining Materials and accessories	-	A	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Mfr.'s T.C. shall be correlated with the consignment received.
ii		Submission of painting methodology	-	B	For Review of painting system	Before start of painting work	Tech Specs and Const. Drawings				
iii		Surface prepration	As agreed / required	B	Physical /visual	Each Erection Mark	Tech Specs and Const. Drawings,		SR	√	
iv		Primer Thickness	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
v		DFT of paint	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
vi		Acceptance of painted surfaces	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR		
[illegible]	PREASSEMBLY CHECKS										
i		Punch Erection marks and match marks on members	-	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				Markings for - Assembly designation, Part number, Weight, Any other important

	NTPC	INSPECTION CUM FIELD QUALITY PLAN									
		ITEM : CIVIL AND STRUCTURAL STEEL ... PRODUCTS					FQP No.				
				CONFORMANCE TO NTPC SPECIFICATION			Rev No.				
							DATE				
							PAGE				
							VOLUME/PART				
Sl.No	Activities and Operations	Characteristics/Instruments		Category Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record		Remarks
ii		Pre-assembly as per match mark	-	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				
iii		Camber, sweep and total length after trial assembly of structure.	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
iv		Control assembly check at shop	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Every first and tenth set of identical structure	Tech Specs and Const. Drawings				
v		Completion of primer & intermediate coat of paint		B	Visual / Physical	Random	Tech Specs and Const. Drawings		SR		
	ERECTION CHECKS										
i		Alignment, slopes, level, tolerances of erected member	Theodolite, Tape, plumb, piano wires etc	B	Measurement	Each structural member	Tech Specs and Const. Drawings		SR	√	
ii		Tightening of bolts/ Torque including foundation bolts with lock nuts	Wrench/ Torque wrench if specified	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
iii		Completion of all erection fillet & butt welds		B	Visual	Each structural member	Tech Specs and Const. Drawings		SR	√	
iv		Acceptance of erected structure	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Each erected structure	Tech Specs and Const. Drawings, IS 7215 and IS 12843		SR	√	
	PERMANENT BOLTS AND NUTS AND WASHERS										
i		Material- Permanent mild steel Bolts, mild steel Nuts, High strength structural Bolts, Washers-Dimensions, properties, Class, storage along with MTC	Screw gauge, Vernier, Tape etc.	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
ii		Contact surfaces before bolting	-	B	Physical	Random before asembly for bolting	Tech Specs and Const. Drawings, IS 4000		SR		
iii		Inspection of the assembled bolts	-	B	Physical	Randomly in each shift for assembeled bolts	Tech Specs and Const. Drawings, IS 4000		SR		
iv		Tensioning	As agreed / required	B	Physical	Randomly during snug tight test and after full tensioning	Tech Specs and Const. Drawings, IS 4000		SR	√	
v		Acceptance of installed bolts	-	B	Physical	Each bolt	Tech Specs and Const. Drawings		SR		

Legend to be used: ... Critical ... Major ... Minor ... Site Register ... Test Report ... MTC ... Manufacturer's Test Certificate

Category ... NTPC ... System

Category ... Engineer ... Site Erection Engineer ... Category ... Erection Engineer ... Category ... Construction Engineer

Format No. ... P...

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
□□□□	□□□ **M□teri□□□□□□□t □□t □tem C□e□□□□**														Steel to be procured from NTPC approved Main Steel Producers.
□□□□	□□t □r□□ed □tr□□t□r□□□tee□ □□□□e □e□ti□□□ □□r□ □ P□□te□	a	Chemical composition	Major	Chemical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product	**NTPC □□□d □r□** □□□□□□□ □□□□□□ □□□□□□□ □□□□□□□ □□□□□□□	**NTPC □□□d □r□** □□□□□□□ □□□□□□ □□□□□□□ □□□□□□□ □□□□□□□	Mfr. Test Certificate	√	P	V	-	
		b	Tensile Test (TS,YS, % Elongation	Major	Mechanical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product				√	P	V	-	
		c	Bend Test	Major	Mechanical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product				√	P	V	-	
		d	Visual Check for surface finish	Major	Visual	100%	100%				√	P	V	-	
		e	Dimension	Major	Measure	As Per IS:2500 SSP Level-I AQL	As Per IS:2500 SSP Level-I AQL	□□□□□□ □□□□□□□ □□□□□□□**P**□□□□□□□	□□□□□□ □□□□□□□ □□□□□□□ **P**□□□□□□□	TR	√	P	V	V	
		i)	For angle-Leg-length, out of squareness, camber-weight												
		ii)	For Bars-Diameter, Ovality												
		iii)	For Plates:- Thickness, Weight												
□□□	□i□□		Chemical composition	Major	Measure	One sample/Lot	One sample/Lot IS: 209		IS:209, Zn-99.95%	Producers' TC/ Check Test report	√	P	V	V	Wherever Manufacturer's Test Certificate is not available. Check Test Report to be produced from recognised test house.

NTPC	[illegible]		NTPC [illegible]											
			[illegible] NTPC [illegible]											
[illegible]	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
[illegible]	2		3	4	5			7	8	9	D*	**	10		11
[illegible]	[illegible]														
[illegible]	[illegible]	a)	Straightening	Major	Visual	100%	100%	IS:802-P-II Approved drgs Shop Sketches	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		b)	Cropping (cutting)	Major	Visual	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II Approved drgs Shop Sketches	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		c)	Stamping	Major	Visual	100%	100%	Approved drgs/ NTPC Spec.	Approved drgs/ NTPC Spec.	Fabricator's inspection Report.	-	P	V		
		d)	Making hole by punching /drilling	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		e)	Edge Security	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		f)	Hole to Hole distance	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		g)	Overall length of members	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		h)	Gauge distance	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		i)	Notching Flange cut ,Corner Cut & Level Cut	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II	Fabricator's inspection Report.	-	P	V		
		j)	Heel Grinding	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II NTPC Spec./ Approved drgs	Fabricator's inspection Report.	-	P	V		
		k)	Bending MS Section	Major	Measure	100%	100%	IS:802-P-II	IS:802-P-II NTPC Spec./ Approved drgs	Fabricator's inspection Report.	-	P	V		
		l)	Bending MS Plate	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:802-P-II	IS:802-P-II NTPC Spec./ Approved drgs	Fabricator's inspection Report.	-	P	V		
		m)	Other dimensions	Major	Measure	1st Piece & every 50th Piece	1st Piece & every 50th Piece	IS:7215	IS:7215	Fabricator's inspection Report.	-	P	V		

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
□□□	□ e di□□□□i□et □ e d														
□□□□	Welding Procedure Specification	a)	Suitability	Critical	Verify	100%	100%	IS:822 / ASME-SEC-IX	IS:822 / ASME-SEC-IX	QW-482	√	P	V	V	WPS to be submitted for approval. Butt joint in lattice and pipe are not allowed.
□□□□	Procedure Qualification	a)	Qualification	Critical	Physical	As per IS/ASME-SEC - IX	As per IS/ASME-SEC - IX	IS:822 / ASME-SEC-IX & WPS	IS:822 / ASME-SEC-IX & WPS	QW-483	√	P	W	W	
□□□□	Welder Performance Qualification	a)	Qualification	Critical	Physical	As per IS/ASME-SEC - IX	As per IS/ASME-SEC - IX	IS:822 / ASME-SEC-IX & WPS	IS:822 / ASME-SEC-IX & WPS	QW-484	√	P	W	W	
□□□□	□□□e□ti□□ □□ □e d□	a)	welds size	Major	Physical	100%	10% Random	Approved Dags	Approved Dags	Inspection	√	P	V		
		b)	weld Quality	Critical	DPT	100%	10% Random	ASTME-E-165	ASTME-E-165	Records	√	P	W		
□□□□	Inspection of fabrication parts (Black)before galvanising	a)	a) Dimension to 2.1	Major	Measure	IS:2500-P-1 ,AQL, SSP Level-II	IS:2500-P-1 ,AQL, SSP Level-II	Approved Dags IS:802-P-II	Approved Dags IS:802-P-II	Inspection Records	√	P	W		
		b)	Surface finish	Major	visual	IS:2500-P-1 ,AQL, SSP Level-II	IS:2500-P-1 ,AQL, SSP Level-II	Approved Dags IS:802-P-II	Approved Dags IS:802-P-II	Inspection Records	-	P	V	-	
□□□□	Proto Assembly	a)	Dimensions	Critical	Assembly	100%	One Structure of each type	NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	√	P	W	W	
		b)	Fit-up/ Fowling/Notching	Critical	Assembly	100%	One Structure of each type	NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	√	P	W	W	
□□□□	Revision of Drawings/Shop sketch on Proto feedback	a)	Revisions of Drawings (For re-approval)	Major	Review	Wherever effected		NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	√	P	V	V	Revised Drawings to be submitted for NTPC Approval
□□□	□ □L□□N□□N□														
□□□□	Degreesing	a)	Solution strength	Major	visual	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	Galvanising to be done at NTPC Approved Galvaniser only.
		b)	PH Value	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS			CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
							6 M	6 C/N					M	C	N	
□	2		3		4	5			7	8	9	D*	**	10		11
□□□□	Rinsing	a)	Cleanliness	Major	Visual	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	Galvanising to be done at NTPC Approved Galvaniser only.
□□□□	Picking	a)	Acid Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
		b)	Iron Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
□□□□	Rinsing		Cleanliness(Mill scale paint marks etc.)	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
□□□□	Pre-fluxing	a)	Dry fluxing	Major	Chem	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
		b)	Iron Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
		c)	Specific gravity	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
		d)	pH Value	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
		e)	Temperature	Major	Measure	Hourly	Hourly	IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	
□□□□	Pre-Heating		Temperature	Major	Measure	Hourly	Hourly	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
□□□□	Hot Dip Galvanising	a)	Temperature	Major	Measure	Continuous recording & hourly measurement	Continuous recording & hourly measurement	IS:2629	450 C to 475 C	Galvaniser's QC Records	√	P	V	V	Zinc bath temperature to be recorded continuously on graph & hourly manual recording shall also be done using digital temp. indicator & actual verification by thermometer
		b)	Immersion time	Major	Measure	Each lot	Each lot	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
		c)	Removal of excessive zinc while lifting from zinc bath by bumping process	Major	Physical	Each item	Each item	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
□□□□	Quenching in Running water		Cooling & cleaning	Major	Physical	Each item	Each item	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
□□□□	Post treatment or Dichromating		Solution Strength	Major	chem	Once in day	Once in day	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
□□□□	checks on member after galvanising	a)	Surface defects & finish	Major	Visual	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
		b)	Thickness of zinc coating	Major	Measure	One Sample/ Shift	One Sample/ Shift	IS:4759 & NTPC Spec & Drg.	IS:4759 & NTPC Spec & Drg.	Galvaniser's QC Records	√	P	V	V	
		c)	Mass of zinc coating	Major	Test	One Sample/ Shift	One Sample/ Shift	IS:6745 & NTPC Spec & Drg.	IS:6745 & NTPC Spec & Drg.	Galvaniser's QC Records	√	P	V	V	
		d)	Uniformity of zinc coating (Preece test)	Major	chem	One Sample/ Shift	One Sample/ Shift	IS:2633	IS:2633	Galvaniser's QC Records	√	P	V	V	
		e)	Adhesion test of zinc coating (Pivoted Hammer Test/ Knife test	Major	Physical	One Sample/ Shift	One Sample/ Shift	IS:2629	IS:2629	Galvaniser's QC Records	√	P	V	V	
□□□□	Stensiling of Mark/ Number	a)	Marking	Major	Visual	100%	100%	Approved Dags	Approved Dags	Galvaniser's QC Records	√	P	V	V	At both ends with black paint
□	**□N□L □N□P□CT□□N**														
□□□	Fabricated Menders after Galvanising	a)	Surface finish, Defects & dicromating	Major	Visual	5% Random Sample		IS:2629 IS:4759	IS:2629 IS:4759	Final Insp Report.	-	-	-	-	
		b)	Dimensions	Major	Measure	1% Random sample from each lot offered for inspection on single occasion		IS:802-P-II /Approved Drgs	IS:802-P-II/ Approved Drgs		√	P	W	W	
□□□	Verification of basic material quality	a)	Chemical composition	Major	Chem	1 Random Sample per 40MT or part there of for each class of product		NTPC Appd Drgs	NTPC Appd Drgs	Third Party Lab Report	√	P	V	V	Sample for chemical test to be sent for third party lob or test to be witnessed at vendor works
		b)	Tensile test(TS,YS,%E)	Major	Mech			IS:2062, IS:228 IS:1608, IS:1599	IS:2062, IS:228 IS:1608, IS:1599	Fabricator's QC Report	√	P	W	W	
		c)	Bend Test	Major	Mech						√	P	W	W	

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
□□□	Fillet Welding Quality		Weld Quality	Major	Visual	100%		IS:822	IS:822	Fabricator's QC Report	√	P	W	W	FOR 3.3, W= RANDOM 10% Butt weld not permitted
□□□	Galvanising	a)	a)Thickness of Zinc Coating	Critical	Measure	1 Random Sample per 40MT or part there of for each class of product		IS:2629 & NTPC Spec.	IS:2629 & NTPC Spec.	Fabricator's QC Report	√	P	W	W	
		b)	Mass of zinc coating	Critical	Measure			IS:6745 & NTPC Spec.	IS:6745 & NTPC Spec.	Fabricator's QC Report	√	P	W	W	
		c)	Uniformity of zinc coating	Critical	Measure			IS:2633	IS:2633	Fabricator's QC Report	√	P	W	W	
		d)	Adhesion test of zinc Coating (Pivoted Hammer/ Knife Test)	Critical	Measure			IS:2629	IS:2629	Fabricator's QC Report	√	P	W	W	
□□□	Review of Documents (TC/TR)	a)	Documents review	Major	Review	As Marked in col 9D		As Applicable	As Applicable	As per QA Plan	-	P	V	V	
□	**P□C□N□ □T□□N□ □□N□L□N□ □ □□N□L□N□**		Packing	Major	Review	As Marked in col 9D		IS:2629	Pieces of light sections to be wire bundled & heavy sections to be supplied loose. Stacking to have proper ventilation. Damage to be avoided.	As per QA Plan	-	P	V	V	1. Sequential supplies to be monitored & insured by main contractor. 2. Material rejected by NTPC shall be kept under separate custody marked with paint till all the supplies are despatched to site or destroyed by cutting Presence of NTPC representative.
□	□□P□TC□		Verification												
		a)	Sequential supplies	Major	Review	100%		Appd Drgs BOM of LOA	Appd Drgs BOM of LOA Packing List	Fabricator's Dispatch	-	P	V	V	
		b)	Stensiling/Part No.												
		c)	Quality												

L□□□N□□ □ Records, identified with "Tick" (√) shall be essentially included by SUPPLIER in QA documentation.
□□ **M**□MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE,
C□P□ NTPC SHALL IDENTIFIED IN COLUM "N" AS 'W'.

	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
	2		3	4	5			7	8	9	D*	**	10		11
1.01		a)	Chemical Composition	Major	Chemical	1 Sample for 40 MT or Part thereof.		IS:1161	IS:1161	Producer's TC/TR	-	P	V	V	Steel tp procured from NTPC approved Main Steel Producers & NTPC approved sources only.
		b)	Tensile Test (TS YS & %EL)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:1161	IS:1161	Producer's TC/TR	-	P	V	V	
		c)	Flattening Test (above 50NB)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:2328	IS:2328	Producer's TC/TR	-	P	V	-	
		d)	Surface finish & defects	Major	Visual Measure	100%		IS:1161	IS:1161	Producer's TC/TR	-	P	V	-	
		e)	Dimension Length Thickness, OD, Edge preparation	Major	Visual Measure	100%		IS:1161	IS:1161	Producer's TC/TR	-	P	V	-	
1.02		a)	Chemical Composition	Major	Chemical	1 Sample for 40 MT or Part thereof.		IS:2062 IS:228	IS:2062 IS:228	Producer's TC/TR	-	P	V	V	Steel tp procured from NTPC approved Main Steel Producers as per the tech spec.
		b)	Tensile Test (TS YS & %EL)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:1608	IS:1608	Producer's TC/TR	-	P	V	V	
		c)	Bend Test	Major	Mechanical	1 Sample for 20 MT or Part thereof.		IS:2062 IS:1599	IS:2062 IS:1599	Producer's TC/TR	-	P	V	V	
		d)	Surface Finish & Defects	Major	Visual	100%		IS:2062	IS:2062	GLST TC/TR	-	P	V	-	
		e)	Dimensions	Major	Measure	As per IS:2500 Part I		IS:2062 IS:1852 (For Plates) IS:808 (For Angle)	IS:2062 IS:1852 (For Plates) IS:808 (For Angle)	GLST TC/TR	-	P	V	-	
1.03			Chemical Composition	Major	Chemical	One Sample for 200 MT		IS:209	IS:209 ZN-99-95%	GLST TC/TR	-	P	V	V	1.03 Co-relation of Material Test Certificate to be maintained
2.00															
2.01	Welding Procedure Specification(WPS)	a)	Suitability	Critical	Review	100%		IS:822 ASME-SEC-IX	IS 802 Part II/ IS 7215/Approved Drawing/Shop Sketches	QW-482	-	P	V	V	WPS to be submitted for approval. If WPS & WQR is already Approved for other Project then the same shall be verified during inspection and shall be applicable for this project.
2.02	Procedure Qualification Record(PQR)	a)	Qualification	Critical	Test	IS:822, ASME-SEC-IX		WPS	WPS	QW-483	-	P	V	V	As above
2.03	Welder Performance Qualification	a)	Qualification	Critical	Test	IS:822, ASME-SEC-IX		WPS	WPS	QW-484	-	P	V	V	As above

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
2.04	Fabrication of Base Plate & other items	a)	Centre line hard punching	Major	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		b)	Drilling/Machining/chamfering/deburring	Major	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
2.05	Pipe	a)	Centre Line Hand-Punching-Length, edge Preparation	Critical	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
2.06	Assembly		Fit up & Tack Welding	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
2.07	Welding		Sequential Welding	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
2.08	Inspection Of Weld		Welding defects	Major											
			(a) Visual	Major	Visual	100% of each Type		NTPC appd Drgs	Free from slag & welding defects.	Inspection Records	-	P	V	V	
			(b) Size	Major	Measure	100% of each Type		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	V	
			(c) Competences	Major	Visual	100% of each Type		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	V	
			(d) DPT	Major	NDT	100% of each Type		NTPC appd Drgs	ASTM-E-165	Inspection Records	-	P	V	V	
2.09	Inspection of Welded Pipe Support Structures	a)	Dimensions Hole to Hole, Edge Security	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		b)	(b) Straightness	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		c)	Parallelirity of flanges	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		d)	Perpendicularly of Pipe & base Plate	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		e)	Distortion	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
		f)	Completeness	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	P	V	-	
2.10	Proto Assembly	a)	Fit-up/Notching	Major	Measure	1 No Structure of each type		NTPC Appd Drgs & Shop Sketch	NTPC Appd Drgs & Shop Sketch	Inspection Records	-	P	V	-	
		b)	Dimension	Major	Measure	1 No Structure of each type		NTPC Appd Drgs & Shop Sketch	NTPC Appd Drgs & Shop Sketch	Inspection Records	-	P	V	W	

	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
	2		3	4	5			7	8	9	D*	**	10		11
3.00															3.00 Galvanising to be done of NTPC Approved Galvaniser only.
3.01	Degreasing	a)	Solution Strength	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	V	3.01 Sample test coupons of each section to be attached with the structure & shall not be deattached till the final inspection is over.
		b)	(b) PH Value	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.02	Rinsing	a)	cleanliness	Major	Visual	100%		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
		b)	PH Value	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.03	Pickling	a)	Acid content	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	V	
		b)	Iron Content	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.04	Rinsing	a)	cleanliness Mill scale	Major	visual	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
		b)	PH Value	Major	Chem	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.05	Fluxing	a)	Specific gravity	Major	Physical	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	V	
		b)	PH Value	Major	Chemical	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.06	Pre-Heating	c)	Temperature	Major	measure	Hourly		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	-	
3.07	Hot-Dip Galvanising	a)	Temperature	Major	measure	Hourly		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	V	3.07 Calibrated Instrument to be used
		b)	Removal of execevie Zinc While lifting from zinc bath	Major	Physical	Each item		IS 2629	IS 2629	Manufacturer's Format of Record	-	P	V	V	
3.08	Quenching in Running Water		Cooling & Cleaning	Major	Physical	Each Item		IS:2629	IS:2629	Galvaniser's QC Records	-	P	-	-	
3.09	Post Treatment or Dichromating	a)	Solution Strength	Major	Physical	Each Item		IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V	

	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS		
						6 M	6 C/N					M	C	N			
	2		3	4	5			7	8	9	D*	**	10		11		
3.10	Check on structures after Galvanising	a)	Surface defects & Finish	Major	Chem	Once in a day		Is:4759 & IS:2629	Is:4759 & IS:2629	Galvaniser's QC Records	-	P	V	V			
		b)	Survey of Thickness of Zinc Coating by Elecometer	Major	Measure	100%		Is:4759 & IS:2629	Is:4759 & IS:2629	Galvaniser's QC Records	-	P	V	V			
		c)	Thickness of Zinc Coating	Major	Measure	3 Sample/Lot		Is:4759 & IS:2629	Is:4759 & IS:2629	Galvaniser's QC Records	-	P	V	V			
		d)	Mass of Zinc Coating	Major	Chem	3 Sample/Lot		IS:6745	NTPC Spec.	Galvaniser's QC Records	-	P	V	V			
		e)	Uniformity of Zinc Coating	Major	Chem	3 Sample/Lot		IS:2633	IS:2633	Galvaniser's QC Records	-	P	V	V			
		f)	Adhesion Test of Zinc coating(Pivoted Hammer Test/Knife Test)	Major	Physical	3 Sample/Shift		IS:2629	IS:2629	Galvaniser's QC Records	-	P	V	V			
	Finishing		Removal of excessive zinc														
3.11	Stensiling of Mark No/Part number		Marking	Major	Visual	100%		NTPC Appd Drgs.	NTPC Appd Drgs.	Galvaniser's QC Records	-	P	V	V			
4.01	Galvanised steel Pipe support Structure	a)	Surface Finish, defects & dichronating	Critical	Visual	100%		IS:2629 & IS:4759	IS:2629 & IS:4759	Inspection report	-	P	W	W	(a) Galvanising tests to be carried out on randomly selected samples from the tried up test coupons		
		b)	dimensions	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	P	W	W	(b) Butt Weld not permitted		
		c)	Straightness	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	P	W	W	c) For 4.01, witness shall be 10% on random basis		
		d)	Parallelity of Flange	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	P	W	W			
		e)	Perpendicularity of Pipe & base Plate	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	P	W	W			
		f)	Distortion	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	P	W	W			
		g)	Completeness	Critical	Visual	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	-	-	-			
		h)	Stenciling of Part no.	Major	Visual	100%		Part Drg.	Part Drg.	Inspection report	-	P	W	W			

□□N□	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
						6 M	6 C/N					M	C	N	
□	2		3	4	5			7	8	9	D*	**	10		11
4.02	Fillet Welding Quality		Weld Quality	Critical	Visual	10%		IS:822	Is:822	Inspection report	-	P	W	W	
4.03	Galvanising Test	a)	Thickness of Zinc Coating	Critical	Measure	Random Sample from Each Lot		IS:2629 & IS:4759	IS:2629 & IS:4759	Inspection report	-	P	W	W	
		b)	Mass of Zinc Coating	Critical	Chem	Random Sample from Each Lot		IS:6745	NTPC Spec.	Inspection report	-	P	W	W	
		c)	Uniformity of Zinc Coating (Preece Test)	Critical	Chem	Random Sample from Each Lot		IS:2633	IS:2633	Inspection report	-	P	W	W	
		d)	Adhesion Test of Zinc coating (Pivoted Hammer Test/Knife test)	Critical	Physical	Random Sample from Each Lot		IS:2629	IS:2629	Inspection report	-	P	W	W	
4.04	Review of Documents	a)	Compliance of previous stage	Major	Review	As applicable		As applicable	As applicable	As applicable					CHP
		b)	Sequential Supplies	Major	Review	As applicable		I.O.A	I.O.A	As applicable	-	P	V	V	4.04 Sequential Supplies to be mentioned as per contract & ensured by Main Contractor
4.05	Packing		Packing	Major	Review	100%		Packing List	Packing List	As applicable	-	P	V	V	5.00 Material rejected by NTPC shall be kept under separated custody duly marked with paint till al the supplies are despatch to site or destroyed by cutting in presence of Nap representative
5	Despatch		Verification of Quantity	Major	Packing	100%		BOM & LOA	BOM & LOA	Despatch Record					

L□□□N□□ □ Records, identified with "Tick" (√) shall be essentially included by SUPPLIER in QA documentation.
□□ M□MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE,
C□P□ NTPC SHALL IDENTIFIED IN COLUM "N" AS 'W'.

SQE _10

4) LT SWITCHGEAR & LT BUSDUCT

(MCC, PCC, ACDB, DCDB, FUSE BOARDS, LOCAL PUSH BUTTON STATION, LOCAL MOTOR STARTERS)

ATTRIBUTES / CHARACTERIS-TICS → / ITEMS/ COMPONENTS/ SUB SYSTEM ASSEMBLIY ↓	Make, Model, Type, Rating & TC	Dimensions & Finish	Electrical properties	Mechanical Properties	Chemical properties	Functional & Operational Features as per NTPC Spec.	Item to conform to relevant Standards	Pretreatment as per IS 6005	Paint Shade, Adhesion, Thickness & Finish	Functional Checks	Milli-volt drop Test	IR – HV – IR Test	Degree of Protection Routine test as per NTPC spec	All Routine tests as per NTPC spec. & IS
Sheet Steel (IS : 513)	Y	Y		Y	Y		Y							
Aluminum Bus bar Material (IS : 5082)	Y	Y	Y	Y	Y		Y							
Copper Bus bar Material (IS : 613)	Y	Y	Y	Y	Y		Y							
Support Insulator	Y	Y	Y	Y			Y							
Air Circuit Breaker (IS: 13947)	Y	Y				Y	Y			Y	Y			Y
Energy Meters (IS : 13010, 13779)	Y	Y				Y	Y			Y				Y
Power & Aux. Contactors (IS : 13947)	Y	Y				Y	Y			Y				
Protection & Aux. Relays	Y	Y				Y	Y			Y				Y

(IS : 3231) (IEC 60255 / IEC 61850)														
Control & Selector Switches (IS : 13947)	Y	Y				Y	Y			Y				
CT's & PT's (IS 2705 / 3156)	Y	Y					Y							Y
MCCB (IS : 13947)	Y	Y					Y			Y				
Indicating Meters (IS : 1248)	Y	Y				Y	Y			Y				Y
Indicating Lamps (IS : 13947)	Y	Y				Y	Y			Y				
Air Break Switches (IS : 13947)	Y	Y				Y	Y			Y				
Control Terminal Blocks	Y	Y				Y	Y							

LT SWITCHGEAR

(MCC, PCC, ACDB, DCDB, FUSE BOARDS, LOCAL PUSH BUTTON STATION, LOCAL MOTOR STARTERS)

ATTRIBUTES / CHARACTERIS-TICS → **ITEMS/ COMPONENTS/ SUB SYSTEM ASSEMBLIY** ↓	Make, Model, Type, Rating & TC	Dimensions & Finish	Electrical properties	Mechanical Properties	Chemical properties	Functional & Operational Features as per NTPC Spec.	Item to conform to relevant Standards	Pretreatment as per IS 6005	Paint Shade, Adhesion, Thickness &	Functional Checks	Milli-volt drop Test	IR – HV – IR Test	Degree of Protection Routine test as per NTPC spec	All Routine tests as per NTPC spec. & IS
Fuse (IS 13703)	Y	Y				Y	Y							
Control Transformer (IS : 12021)	Y	Y				Y	Y			Y				Y
Push Buttons (IS : 4794)	Y	Y				Y	Y			Y				
Transducer (IEC : 60688)	Y	Y				Y	Y			Y				Y
MCB (IS : 8828)	Y	Y				Y	Y			Y				
Breaker Handling Trolley	Y	Y				Y			Y	Y				Y
Synthetic Rubber Gasket (IS : 11149)	Y	Y		Y	Y		Y							

LT SWITCHGEAR (IS : 8623)	Y	Y				Y	Y	Y	Y	Y		Y	Y	Y

Notes:

1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Makes of all major Bought Out Items will be subject to NTPC approval.

5) CABLING, EARTHING, LIGHTNING PROTECTION

ATTRIBUTES / CHARACTERISTICS ITEMS/COMPONENTS / SUB SYSTEMS	Dimension	Paint shade, paint thickness, adhesion	Pre-treatment of sheet	IP protection	Proof load*	Surface finish	Deflection test*	HV & IR	Galvanise Test (If Applicable)	Functional	Bought out items/Bill of material	Routine tests as per relevant standard & specification	Acceptance tests as per relevant standard & specification	Constructional feature as per NTPC Specification
Wall Mounted-Lighting Panel (IS-513, IS:5, IS:2629, 2633, 6745)	Y	Y	Y	Y		Y		Y		Y	Y	Y	Y	Y
Switch box/junction box/ Receptacles Panel (IS-513, IS:5, IS:2629, 2633, 6745)	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y
Cable glands(BS-6121)	Y													Y
Cable lug	Y													Y
Lighting wire (IS-694)	Y											Y		
Flexible conduits	Y											Y		Y
Conduits (Galvanise & Epoxy) IS-9537 & IS-2629, 2633, 6745	Y		Y						Y			Y		Y
RCC Hume Pipe (IS-458)												Y		
Cable termination & straight through joint (IS 13573)	Y											Y		Y
Cable Trays, bends, tees, crosses, Flexible supports system & accessories IS-513, 2629,2633,6745	Y		Y		Y	Y	Y		Y			Y	Y	Y

Trefoil clamp	Y													Y
GI flats for earthing & lighting protection (IS 2062, 2629, 6745,2633)	Y		Y						Y			Y		Y
GI wire (IS-280)	Y											Y		
Fire Sealing System (BS –476)												Y	Y	Y

.Note:1.This is an indicative list of tests /checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.

2.* Deflection Test on cable trays and Proof Load test on cable trays support system will be as per details given in the NTPC technical specification & approved MQP. The above acceptance tests shall be done only on one sample from each size of offered lot. This test is not applicable on bends, tees & crosses.

3. Make of all items will be subject to NTPC approval.

6) Control Cables

Attributes / Characteristics / Item / Components / Sub System Assembly	Make, Type & T.C as per relevant standard	Dimension/surface finish	Mechanical properties	Chemical Composition	Spark Test(as applicable)	Electrical properties	Lay length & Sequence	Armour coverage, cross over, looseness, gap between two wires	Sequential marking/ Batch marking/ surface finish/ cable length	T.S & elongation before & after ageing on outer sheath & insulation	Thermal stability	Anti termite coating on wooden drums	Constructional requirements feature as per NTPC specification	Routine & Acceptance Tests as per relevant standard & NTPC specification	FRLS Tests
Copper (IS-8130)	Y	Y	Y	Y		Y									
PVC insulation Compound (IS: 5831)	Y		Y			Y				Y	Y				
FRLS PVC Compound (IS-5831, ASTM-D2843, IS10810(Part 58), IEC-60754 Part-1)	Y		Y							Y	Y				Y
Extrusion & curing /Manufacturing of Core		Y			Y						Y				
Core Laying							Y								
Armour wire/strip	Y	Y	Y												
Inner sheath	Y	Y													
Armouring		Y						Y							
Outer Sheathing		Y							Y						
Finished Cable (IS-5831, ASTM-D2843, IS10810 (Part 58), IEC-60754 Part-1, IEC 60332 part III cat B)							Y	Y	Y	Y	Y		Y	Y	Y
Wooden drum(IS-10418) /Steel Drum		Y										Y	Y		

Notes:

1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Make of all major Bought out items will be subject to NTPC approval.

ROUTINE TESTS		**Following routine tests shall be carried out on each drum of finished cables for all sizes.**
1)		Conductor Resistance test
2)		High voltage test
ACCEPTANCE TESTS		**Following Acceptance tests shall be carried out on each size of cables, in the offered lot.**
A) For Conductor (as per sampling plan mentioned in IS: 1554)		
	1)	Annealing test (Copper)
	2)	Resistance test
B) For Armour Wires / Formed Wires (If applicable) (as per sampling plan mentioned in IS: 1554)		
	1.	Measurement of Dimensions
	2.	Tensile Tests
	3.	Elongation Test
	4.	Torsion Test For Round wires only
	5.	Wrapping Test
	6.	Resistance Test
	7.	Mass of Zinc coating test For G S wires / Formed wires only
	8.	Uniformity of Zinc coating For G S wires / Formed wires only
	9.	Adhesion test For G S wires / Formed wires only
	10.	Freedom from surface defects
C) For PVC insulation & PVC Sheath (as per sampling plan mentioned in IS: 1554)		
	1)	Test for thickness
	2)	Tensile strength & Elongation before ageing (for tests after ageing see “D”)

D) Ageing test:

		Criteria	Condition	Test Requirements	Remarks
PVC insulation & outer sheath:	Samples as per relevant IS, from each size of cables in the offered lot, shall be tested for tensile strength & elongation (before ageing). **Tensile & elongation testing shall preferably be done with a computerized machine.** The values will be compared with corresponding values mentioned in the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% of the corresponding values of Type Test report. (Please note that test values should be more than the minimum values indicated in relevant standard).		All sizes which meet the criteria	The size which has maximum negative deviation from type test report values will be put on accelerated ageing test. The samples shall be aged in air oven at temperature of 130ºc+/- 2ºc for 5 hours and tested for TS & elongation. Acceptance norms shall be as per IS.	In case the size does not meet the requirement in accelerated ageing test **then all sizes (which had met the criteria) will be put on ageing test as per IS.**
			Sizes which do not meet the criteria	Every size will be put on ageing test as per IS.	----

E) Following tests will be carried out on completed cables as per IS on each size:

1)	Insulation resistance test (Volume resistivity method)
2)	High voltage test

F) Following tests shall be carried out on only one size of offered lot (comprising of all sizes):

1)	Thermal stability test on PVC insulation and outer sheath
2)	Oxygen index test on outer sheath
3)	Smoke density rating test on outer sheath
4)	Acid gas generation test on outer sheath

G) Flammability test as per IEC 60332 - Part- 3 (Category- B) on completed cable will be carried out as per following sampling plan:

This test will be carried out using composite sampling i.e. irrespective of size; cables of one particular type (i.e. armoured, unarmoured) will be bunched together, as per calculations in line with the IEC. All sizes of armoured & unarmoured cables shall be covered.

H) Following tests shall be carried on one length of each size (armoured & unarmoured) of offered lot:

1)	Constructional / dimensional check, surface finish, length measurement, sequence of cores, armour coverage, Gap between two consecutive armour wires / formed wires, Sequential marking, drum / outer sheath extrusion's batch number marking
2)	Measurement of Eccentricity & Ovality

7) LT Power Cables

Item / Components / Sub System Assembly \ Attributes / Characteristics	Make, Type & T.C as er relevant standard	Dimension/surface finish	Mechanical properties	Chemical Composition	Spark Test(as applicable)	Electrical properties	Hot Set Test/ Eccentricity & Ovality	Lay length & Sequence	Armour coverage, cross over, looseness, gap between two wires	Sequential marking/ Batch marking/ surface finish/ cable length	T.S & elongation before & after ageing on outer sheath &	Thermal stability	Anti termite coating on wooden drums	Constructional requirements feature as per NTPC specification	Routine & Acceptance Tests as per relevant standard & NTPC specification	FRLS Tests
Aluminum (IS-8130)	Y	Y	Y	Y		Y										
XLPE Compound (IS-7098)	Y		Y			Y	Y				Y					
PVC insulation Compound (IS: 5831)	Y		Y			Y					Y	Y				
FRLS PVC Compound (IS-5831, ASTM-D2843, IS10810(Part 58), IEC-60754 Part-1)	Y		Y								Y	Y				Y
Extrusion & curing /Manufacturing of Core (PVC / XLPE)		Y			Y		Y					Y				
Core Laying								Y								
Armour wire/strip	Y	Y	Y													
Inner sheath	Y	Y														
Armouring		Y							Y							
Outer Sheathing		Y								Y						
Power Cable (Finished) (IS-5831, ASTM-D2843, IS10810(Part 58), IEC-60754 Part-1, IEC 60332 part III cat B)								Y	Y	Y	Y	Y		Y	Y	Y
Wooden drum(IS-10418) /Steel Drum		Y											Y	Y		

Notes:
1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Make of all major Bought out items will be subject to NTPC approval.

ROUTINE TESTS	**Following routine tests shall be carried out on each drum of finished cables for all types (PVC / XLPE insulated) & sizes.**	
3)	Conductor Resistance test	
4)	High voltage test	
ACCEPTANCE TESTS	**Following Acceptance tests shall be carried out on each size of each type (PVC / XLPE insulated) of cables, in the offered lot.**	
A) For Conductor (as per sampling plan mentioned in IS: 1554 / 7098)		
	1)	Annealing test (Copper)
	2)	Tensile Test (Aluminum)
	3)	Wrapping Test (Aluminum)
	4)	Resistance test
B) For Armour Wires / Formed Wires (If applicable) (as per sampling plan mentioned in IS: 1554 / 7098)		
	1.	Measurement of Dimensions
	2.	Tensile Tests
	3.	Elongation Test
	4.	Torsion Test For Round wires only
	5.	Wrapping Test
	6.	Resistance Test
	7.	Mass of Zinc coating test For G S wires / Formed wires only
	8.	Uniformity of Zinc coating For G S wires / Formed wires only
	9.	Adhesion test For G S wires / Formed wires only
	10.	Freedom from surface defects
C) For PVC / XLPE insulation & PVC Sheath (as per sampling plan mentioned in IS: 1554 / 7098)		
	1)	Test for thickness
	2)	Tensile strength & Elongation before ageing (for tests after ageing see “D”)
	3)	Hot set test (For XLPE insulation)

D) Ageing test:

	Criteria	Condition	Test Requirements	Remarks
PVC insulation & outer sheath:	Samples as per relevant IS, from each size of cables in the offered lot, shall be tested for tensile strength & elongation (before ageing). **Tensile & elongation testing shall preferably be done with a computerized machine.**	All sizes which meet the criteria	The size which has maximum negative deviation from type test report values will be put on accelerated ageing test. The samples shall be aged in air oven at temperature of 130ºc+/-2ºc for 5 hours and tested for TS & elongation. Acceptance norms shall be as per IS.	In case the size does not meet the requirement in accelerated ageing test **then all sizes (which had met**

	The values will be compared with corresponding values mentioned in the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% of the corresponding values of Type Test report. (Please note that test values should be more than the minimum values indicated in relevant standard).			**the criteria) will be put on ageing test as per IS.**
		Sizes which do not meet the criteria	Every size will be put on ageing test as per IS.	----
XLPE insulation	Samples as per relevant IS, from each size of cables in the offered lot,will be put on ageing test as per IS.			
E) Following tests will be carried out on completed cables as per IS on each size of each type (PVC / XLPE insulated)				
	1)	Insulation resistance test (Volume resistivity method)		
	2)	High voltage test		
F) Following tests shall be carried out on only one size of offered lot (comprising of all sizes & types)				
	1)	Thermal stability test on PVC insulation and outer sheath		
	2)	Oxygen index test on outer sheath		
	3)	Smoke density rating test on outer sheath		
	4)	Acid gas generation test on outer sheath		
G) Flammability test as per IEC 60332 - Part- 3 (Category- B) on completed cables as per following sampling plan:				
		This test will be carried out using composite sampling i.e. irrespective of size; cables of one particular type (i.e. armoured PVC insulated, unarmoured PVC insulated, armoured XLPE insulated, unarmoured XLPE insulated) will be bunched together, as per calculations in line with the IEC. All sizes of PVC & XLPE insulated, armoured & unarmoured cables shall be covered. For one particular type, cables with OD less than or equal to 30 mm shall be clubbed together in touching formation while cables with OD greater than 30 mm shall be clubbed together leaving a gap equal to OD of cable having least diameter. Cable OD shall be taken as nominal overall diameter as per NTPC approved datasheet.		
H) Following tests shall be carried on one length of each size of each type (PVC / XLPE insulated) of offered lot:				
	1)	Constructional / dimensional check, surface finish, length measurement, sequence of cores, armour coverage, Gap between two consecutive armour wires / formed wires, Sequential marking, drum / Batch (outer sheath extrusion batch)number marking on sheath		
	2)	Measurement of Eccentricity & Ovality		

8) MV (3.3 kV / 6.6. kV / 11 kV / 33 kV) Cables

Item / Components / Sub System Assembly \ Attributes / Characteristics	Make, Type & T.C as per relevant standard	Dimension/surface finish	Mechanical properties	Chemical Composition	Spark Test(as applicable)	Electrical properties	Hot Set Test/ Eccentricity & Ovality	Lay length & Sequence	Armour coverage, cross over, looseness, gap between two wires	Sequential marking/ Batch marking/ surface finish/ cable length	T.S & elongation before & after geing on outer sheath &	Thermal stability on outer sheath	Metallic (Cu) Screening If applicable)	Anti termite coating on wooden drums	Constructional requirements feature as per NTPC specification	Routine & Acceptance Test as per relevant standard & NTPC specification	FRLS Test
Aluminum (IS-8130)	Y	Y	Y	Y		Y											
Semiconducting Compound	Y		Y			Y											
XLPE Compound (IS-7098 Part-II)	Y		Y			Y					Y						
FRLS PVC Compound (IS-5831, ASTM-D2843, IS10810(Part 58) ,IEC-60754 Part-1)	Y		Y								Y	Y					Y
Triple Extrusion & curing /Manufacturing of Core		Y			Y		Y										
Copper Tape	Y	Y	Y			Y											
Polyster tape	Y	Y															
Core Laying								Y									
Armour wire/strip	Y	Y	Y														
Copper tapping	Y	Y											Y				
Inner sheath	Y	Y															
Armouring		Y							Y								
Outer Sheathing		Y								Y							
Power Cable (Finished)								Y	Y	Y	Y	Y			Y	Y	Y
Wooden drum(IS-10418) /Steel Drum		Y												Y	Y		

Notes:

1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Make of all major Bought out items will be subject to NTPC approval.

ROUTINE TESTS	**Following routine tests shall be carried out on each drum of finished cables for all types & sizes.**	
5)	Conductor Resistance test	
6)	High voltage test	
7)	Partial discharge test **(for Screened cables only)**	
ACCEPTANCE TESTS	**Following Acceptance tests shall be carried out on each size of each type (voltage rating) of cables, in the offered lot.**	
A) For Conductor (as per sampling plan mentioned in IS: 7098 Part II)		
	3)	Annealing test (Copper)
	4)	Tensile Test (Aluminum)
	5)	Wrapping Test (Aluminum)
	6)	Resistance test
B) For copper tape / Wires (as per sampling plan mentioned in IS: 7098 Part II)		
	1)	Measurement of Dimensions
	2)	Conductivity check
B) For Armour Wires / Formed Wires (If applicable) (as per sampling plan mentioned in IS: 7098 Part II)		
	11.	Measurement of Dimensions
	12.	Tensile Tests
	13.	Elongation Test
	14.	Torsion Test For Round wires only
	15.	Wrapping Test
	16.	Resistance Test
	17.	Mass of Zinc coating test For G S wires / Formed wires only
	18.	Uniformity of Zinc coating For G S wires / Formed wires only
	19.	Adhesion test For G S wires / Formed wires only
	20.	Freedom from surface defects
C) For XLPE insulation & PVC Sheath (as per sampling plan mentioned in IS: 7098 Part II)		
	3)	Test for thickness
	4)	Tensile strength & Elongation before ageing (for tests after ageing see “D”)
	5)	Hot set test (For XLPE insulation)

D)	Ageing test:			
	Criteria	**Condition**	**Test Requirements**	**Remarks**
PVC outer sheath :	Samples as per relevant IS, from each size of each type (voltage rating) of cables in the offered lot, shall be tested for tensile strength & elongation (before ageing). **Tensile & elongation testing shall preferably be done with a computerized machine.** The values will be compared with corresponding values mentioned in the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% of the corresponding values of Type Test report. (Please note that test values should be more than the minimum values indicated in relevant standard).	All sizes which meet the criteria	For PVC: The size which has maximum negative deviation from type test report values will be put on accelerated ageing test. The samples shall be aged in air oven at temperature of 130°c+/- 2°c for 5 hours and tested for TS & elongation. Acceptance norms shall be as per IS.	In case the size does not meet the requirement in accelerated ageing test **then all sizes (which had met the criteria) will be put on ageing test as per IS.**
		Sizes which do not meet the criteria	Every size will be put on ageing test as per IS.	----
XLPE Insulation	Samples as per relevant IS, from each size of each type (voltage rating) of cables in the offered lot, will be put on ageing test as per IS.			

E)	**Following tests will be carried out on completed cables as per IS on each size of each type**	
	1)	Insulation resistance test (Volume resistivity method)
	2)	High voltage test
	3)	Partial discharge test (for Screened cables only)
F)	**Following tests shall be carried out on only one size of offered lot (comprising of all sizes & types)**	
	1)	Thermal stability test on outer sheath
	2)	Oxygen index test on outer sheath
	3)	Smoke density rating test on outer sheath
	4)	Acid gas generation test on outer sheath
	5)	Flammability test as per IEC 60332 - Part- 3 (Category- B) on completed cable
G)	**Following tests shall be carried on one length of each size of each type of offered lot:**	
	1)	Constructional / dimensional check, surface finish, length measurement, sequence of cores, armour coverage, Gap between two consecutive armour wires / formed wires, Sequential marking, marking of drum no. / Batch number of outer sheath extrusion
	2)	Measurement of Eccentricity & Ovality

INSTRUMENTATION CABLE

ITEMS \ TESTS	Conductor Resistance ® & (A)	High Voltage ® & (A)	Insulation Resistance ® & (A)	Constructional detail, dimensions (A)	Outer-Sheathe/core marking, end sealing (A)	Thermal Stability (A) +	Visual, Surface finish (A) +	Electrical Parameters ** (A) +	Persulphate Test (A) +	Overall/Coverage/Continuity (A)	Swidesh chimney Test (SS-4241475) (A) ++	FRLS Test * (A) ++	Tensile & Elongation before & after aging (A) ++	Vol. Resistivity. at room & Elevated Temp. (A) ++	Spark test report review ®
1. Instrument cable twisted and shielded															
Conductor(IS-8130)	Y			Y			Y								
Insulation(VDE-207)				Y	Y	Y	Y						Y		Y
Pairing/Twisting				Y	Y		Y								
Shielding				Y			Y			Y					
Drain wire	Y			Y			Y		Y	Y					
Inner Sheath				Y	Y	Y	Y					Y	Y		
Outer Sheath				Y	Y	Y	Y					Y	Y		
Over all cable	Y	Y	Y	Y	Y		Y	Y			Y			Y	
Cable Drums(IS-10418)				Y			Y								

Note : High Temp. cables shall be subjected to tests as per VDE-207(Part-6)
Compensating cables shall be checked for Thermal EMF/Endurance test as per IS 8784.
Note : This is an indicative list of tests/checks. The manufacture is to furnish a detailed Quality Plan indicating his practice & Procedure along with relevant supporting documents during QP finalization for all items.
Note : ® - Routine Test A - Acceptance Test Y - Test Applicable
Note : Sampling Plan for Acceptance test shall be as per IS 8784 (As applicable)

- * FRLS Tests: Oxygen / Temp Index (ASTM D-2863), Smoke Density Rating (ASTM – D 2843), HCL Emission (IEC-754-1)
- ** Characterisitic Impedence, Attenuation, Mutual Capacitance, Cross Talk (As applicable)

+ Sample size will be One No. of each size/type per lot.
++ Sample size will be One No. sample for complete lot offered irrespective of size/type.

POWER SUPPLY FOR C&I SYSTEMS (UPS/BATTERY/BATTERY CHARGER/ACDB/DCDB)

ITEMS \ TESTS	Visual/dimension/rating/ Paint Adhesion/ Thickness (R)	General arrangement/BOM/make of components /Mimic ®	Efficiency ,regulation(R)	Input voltage variation (A)	Out put voltage and frequency adj.range(A)	Premilinary light load test(R)	Load transfer retransfer test (R) *	AC input faliure and return test (R)	Parralel operation and current divison(R)	Relative harmonic content(R)	Restart with PRI A.C and battery (separately)(R)	System transfer and retransfer (R)*	Asynchronous transfer(R)	Ripple content(R)	Load limiter operation (R)	IR/HV(R)	Tests as per standard &specification (R)&(A)
UPS/CONVERTER (IEC-146 PT-4)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VOLTAGE STABILISER	Y	Y	Y	Y	Y					Y		Y				Y	
LEAD ACID BATTERY(TUBLAR)-IS-1651																	Y
LEAD ACID BATTERY (PLANTE)-IS-1652																	Y
NICKEL CADMIUM BATTERY(IS-10918/IEC-623)																	Y
SMF BATTERY																	Y
ACDB/DCDB	Y	Y														Y	Y
BATTERY CHARGER	Y	Y	Y	Y	Y				Y					Y	Y	Y	Y

R-Routine Test A- Acceptance Test Y – Test applicable

* Transfer time and Over shoot /under shoot during load & system transfer shall be recorded .

Note: 1) Detailed procedure of Environmental Stress Screening test shall be as per Quality Assurance Programme in General Technical Conditions

2) This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the Practices and Procedure adopted alongwith relevant supporting documents.

12) STATION LIGHTING SQE_17

Item Components Sub System Assembly / Attributes Characteristic	Make, Type , Rating/ TC	Dimension	Pre-Treatment of sheat	Paint Shade Thickness Adhesion & Finish	Galvanization Tests	IP Test	Bought Out Items/ Bill of Material	HV & IR	Functional Check as per spec.	Constructional Feature as per NTP spec	Routine Test as per relevant std and spec	Acceptance Test as per relevant std and spec	Item to conform to relevant standard
Luminaries (IS-10322 Part-5 Sec.1 (non – LED type)	Y					Y		Y			Y	Y	Y
Electronic Ballast	Y										Y	Y	Y
Lighting Wire (IS-694)	Y										Y		
Fans (IS-374)	Y										Y		
Pole (IS-2713)	Y			Y						Y	Y	Y	
Lamps (IS-9800, IS-9974)	Y										Y	Y	
Lighting Mast (with raise & lower lantern type)	Y	Y			Y					Y	Y	Y	
Wall Mounted Lighting Panel (IS-513, IS-5)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Switch Box/ Junction Box/Receptacles/ Local Push Button Station / Lighting Panel (IS-513, 2629, 2633, 4759, 6745)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Cable Gland (BS-6121)	Y	Y									Y		
Cable Lug (IS-8309)	Y	Y									Y		
Flexible Conduit	Y										Y		
Lighting Transformer (IS-11171)	Y									Y	Y		
Epoxy & Galvanised Conduit (IS-9537, 2629, 2633, 4759, 6745)	Y	Y									Y		Y

13) LED Luminaire Quality Requirements

1) **LED modules to conform to IS: 16103 part 2. Manufacturer to issue a certificate of compliance for the same.**
2) **Control gear to conform to IS 15885 part 2 section 13. Manufacturer to issue a certificate of compliance for the same.**
3) **LED luminaire to conform to IS 16107 part 2 section 1. Manufacturer to issue a certificate of compliance for the same.**
4) **LED luminaire marking to be as per IS 16107 part 2 section 1. Manufacturer to issue a certificate of compliance for the same.**
5) **Acceptance tests as per IS 16107 part 2 section 1 to be carried out on LED luminaire except long duration tests i.e. a) Chromaticity coordinates & correlated color temperature (CCT); b) Color rendering index (CRI). Manufacturer will submit a COC for above tests i.e. CCT & CRI**
6) **LED driver make, model, type & rating may be as per recommendations of LED module manufacturer**.

Notes:

1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Make of all major Bought Out Items will be subject to NTPC approval

15) SWITCHYARD

Attributes / Characteristics / Items/Components Sub Systems	Make, model, Type & Rating, Test Certificate	Routine & Acceptance Test as per IS / IEC	Functional requirements as per NTPC Specification
Circuit Breaker (IEC:62271-100)	Y	Y	Y
Hollow insulator (IEC:233/ IS:5621)	Y	Y	Y
Isolator (IEC:62271-102)	Y	Y	Y
Current Transformer (IEC:60044/BS:3938/IS2705 / IEC: 61869)	Y	Y	Y
Voltage Transformer (IEC:186A / 358/IS3156/IEC60044/ IEC: 61869)	Y	Y	Y
Bus Post Insualtor (IEC:168 / 815 / IS:2544)	Y	Y	Y
Disc,Pin & String Insualtor (IEC:383 / IS:731)	Y	Y	Y
Surge Arrestor (IEC:99-4/IS:3070)	Y	Y	Y
Hardware fittings for Insulator (IS:2486 / BS:3288)	Y	Y	Y
Clamps & Connector (IS:10162 / 5561/ 617)	Y	Y	Y
Aluminium Tube (IS:5082 / 2673 / 2678)	Y	Y	Y
Conductor (IS:398)	Y	Y	Y
Galvanised Steel Structures (IS:2062/2629/4759/6745)	Y	Y	Y
Vibration Damper (IS:9708)	Y	Y	Y

Attributes / Characteristics / Items/Components Sub Systems	Make, Type Rating,and Model, Test Certificates	Routine & Acceptance Test as per relevant IS/IEC	Functional requirements as per NTPC Specification
Transmission Line Pole	Y	Y	Y
Control & Relay Panel	Y	Y	Y
Protection Relays	Y	Y	Y
Event Logger	Y	Y	Y
Time Synchronising Equipment	Y	Y	Y
Transmission Line Pole	Y	Y	Y
Relay Test Kit	Y	Y	Y
Surge Monitor	Y	Y	Y

Notes : 1) This is an indicative list of test/checks. The manufacture is to furnish a detailed
Quality Plan indicating the practice and procedure along with relevant supporting
documents during QP finalisation for all items.
2) All major Bought Out Items will be subject to NTPC approval.

FIRE EXTINGUISHERS

a) All fire extinguishers shall be tested as per relevant standard.

b) Performance / function test shall be carried out on sampling basis as per relevant code / standard.

16)Energy Meter

Attributes / Characteristics → / Items / Components / Sub- assembly ↓	Make, Model, Type, Rating & Finish	Conform to relevant Standard & NTPC spec	Dimensional check and Paint shade, thickness, adhesion & Finish checks	Complete physical examination for constructional features as per NTPC approved drgs & specification	Burn-In Test and Elevated Temperature Test as per specification	All routine & acceptance tests as per IS 13779
Electronic Components	Y	Y				
PCB for electronic cards	Y					
Electronic Cards	Y	Y		Y	Y	
Terminal Blocks as per IS 13779	Y	Y				
Instrument Transformer CTs & PTs (IS : 2705 & S 3156)	Y	Y				
Sheet Steel (IS : 513)	Y	Y				
Synthetic Rubber Gaskets S 11149	Y	Y				
Energy meter S 13779	Y		Y	Y	Y	Y

Notes:

1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
2. Makes of all major Bought Out Items will be subject to NTPC approval.