

		QUALITY PLAN				CUSTOMER:		PROJECT:		SPEC. NO. :	
		SHEET 3 OF 3		CHARACTERISTICS CHECKED		SYSTEM		POWER CYCLE/ LP VALVES		QP NO. PE-QP-999-100-M004	
COMPONENT/ OPERATION		CATE- GORY		TYPE/METHOD OF CHECK		EXTENT OF CHECK		REFERENCE DOCUMENT		GATE/ GLOBE VALVE	
S.N.O.		CATEGORY		CHECK		NO LEAKAGE		I.R./ IBRTC (IF REQD)		AGENCY	
S.N.O.		CATEGORY		CHECK		NO LEAKAGE		I.R./ IBRTC (IF REQD)		AGENCY	

5.2	SEAT & BACK SEAT FOR MOTORISED/ PNEU. VALVES WITH ACTUATOR OPERATIONAL TESTING	CR	HYDRUALIC TEST	100%	APPD. DRG./ TECH. SPEC.	NO LEAKAGE	I.R./ IBRTC (IF REQD)	3/2	2,1	-
5.3	1. SMOOTH & FULL OPENING AND CLOSING	CR	MANUAL	100%	TECH. SPEC.	SMOOTH OPERATION OF VALVES & CLEAR BORE	INSPN. REPORT	3/2	2,1	-
	2. MOTOR /PNEU OPERATED VALVES	CR	ELEC.	100%	APP. DRG./ TECH. SPEC./ IS:9334	APP. DRG./ TECH. SPEC./ IS:9334	INSPN. REPORT	3/2	2,1	-
	2. LIMITTORQUE SWITCH SETTING FOR OPENING AND CLOSING TIME	CR	ELEC.	100%	APP. DRG./ TECH. SPEC./ IS:9334	APPD. DRG. / RELV. STD	INSP. REPORT	3/2	2,1	-
6.0	COMPLETE VALVES END CONNECTION DETAILS	MA	MEAS. MEAS.	SAMPLE 100%	APPD. DRG. / RELV. STD	APP. DRG. / RELV. STD	-DO- -DO-	3/2	2,1	-
7.0	1. OVERALL DIMENSION 1. DIMENSIONS	MA	PT	100%	ASTME:165	NO DEFECTS	TEST CERT.	3/2	2	1
8.0	2. SURFACE DEFECTS FOR B.W. ENDS 1. CLEANLINESS & COMPLETENESS	CR	VISUAL	100%	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC.	INSPN. REPORT	3/2	-	2,1
9.0	1. SURFACE PREPARATION 2. UNIFORMITY & THICKNESS AS PER BHEL TECH. SPEC	MI	VISUAL	100%	TECH. SPEC.	TECH. SPEC.	INSPN. REPORT	3/2	-	2,1
		MI	MEASUREMENT	100%	-DO-	-DO-	INSPN. REPORT	3/2	2	1
10.0	PACKING	MA	VISUAL	100%	AS PER BHEL TECH. SPEC.	AS PER BHEL TECH. SPEC.	-DO-	3/2	-	2,1

ABBREVIATIONS

CR = CRITICAL CHARACTERISTIC
MA = MAJOR CHARACTERISTIC
MI = MINOR CHARACTERISTIC

P = PERFORMED BY
P = PURCHASER (BHEL)2

W = WITNESSED BY
W = VENDOR

V = VERIFIED BY
3 = SUB VENDOR OF THE VENDOR

BHEL		PARTICULARS		BIDDER/VENDOR	
		NAME			
		SIGNATURE			
		DATE			
				BIDDER'S/ VENDOR'S COMPANY SEAL	



QUALITY PLAN			CUSTOMER :		PROJECT :		SPEC. NO				
SHEET 1 OF 3			BIDDER/VENDOR		QP NO. PE-QP-999-100-MO41		REV.00 DT. 31.03.99				
SYSTEM:			ITEM: PIPES & FITTINGS		VOLUME: II-B		SECTION D				
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
									P	W	V
1.0.0	MATERIAL CONTROL										
1.1.0	PIPES (MILL MADE)	1. PHY., CHEM. PROPS, DIMENSIONS, SURFACE FINISH, HEAT TREATMENT (IF APPLICABLE), LEAK TIGHTNESS	MA	PHY. CHEM. TESTS MEASUREMENTS, VISUAL EXAM, VERI. OF HT CHART HYDRO TEST	TECH. SPEC., IS:4711	APPD. DATA SHEET/ TECH. SPEC.	APPD. DATA SHEET/ TECH. SPEC.	MFR.TC/ LAB REPORT	3	-	2,1
1.2.0	FITTINGS	1. PHY. CHEM. PROP., 2. DIMNS., SURFACE FINISH, HEAT TREATMENT (IF APPLICABLE)	MA	PHY., CHEM. TESTS MEASUREMENTS, VISUAL EXAM, VERI. OF HT CHART	1/HEAT 100%	-DO- -DO-	-DO- -DO-	-DO- -DO-	3/2 3/2	- -	2,1 2,1
1.3.0	PLATE FOR FLANGES, FABRICATED PIPING AND FORGINGS FOR FLANGES	1. PHY. CHEM. PROP., 2. DIMNS., SURFACE FINISH, HEAT TREATMENT (IF APPLICABLE)	MA	PHY., CHEM. TESTS MEASUREMENTS, VISUAL EXAM VERI. OF HT CHART	1/CAST 100%	-DO- -DO-	-DO- -DO-	-DO- -DO-	3 3	- -	2,1 2,1
2.0.0	IN PROCESS CONTROL										
2.1.0	PIPES, FITTINGS, FLANGES - MACHINING, BENDING	1. DIMNS. INCLUDING THINNING, OVALITY, FINISH, WRINKLES ETC.	MA	MEASUREMENTS, VISUAL EXAM.	100%	MANUFAC-TURING DRG.	MANUFAC-TURING DRG.	I. R	3/2	-	2,1
2.2.0	WELDING PROCEDURE SPECIFICATION	1. CORRECTNESS	MA	EXAM	100%	IS:7307/ ASME - IX	IS:7307/ ASME - IX	FORMAT OF IS:7307/ ASME - IX	3/2	-	2,1
2.3.0	PROCEDURE QUALIFICATION AND WELDER'S QUALIFICATION	1. WELD SOUNDNESS	MA	PHY. TESTS	ASME IX IS:7310 IS:7307	IS:7310/ ASME - IX	IS:7310/ ASME - IX	FORMAT OF IS:7310/ ASME - IX	3/2	2,1	-
2.4.0	WELD FIT-UPS	1. DIMNS.,	MA	MEASUREMENT.	100 %	W.P.S.	W.P.S.	I.R	3/2	2	1

BHEL		BIDDER/VENDOR	
PARTICULARS		NAME	
SIGNATURE		DATE	
		BIDDER'S/VENDOR'S COMPANY SEAL	

2.5.0	WELDS A) BUTT WELDS WITH JOINT EFFICIENCY OF 1.0 & 0.9 i) ROOT RUN ii) FINAL RUN	ALIGNMENT, ORIENTATION	VISUAL	100%	APPD. DRGS.	APPD. DRGS.	INSPN. REPORT	3/2	2	1	FILMS TO BE SHOWN TO BHEL FOR APPROVAL
			PENETRANT TEST	100%	IS:3658/ ASTM E 165	ASME VIII DIV.I ASME B 31.1	-DO-	3/2	2/1	-	
			-DO- RADIOGRAPHY TEST	100% FOR JT. EFF. 1.0 & 10% FOR JT. EFF. 0.9	ASME B 31.1	ASME B 31.1	-DO-	3/2	-	2/1	
			MA								
			1) WELD DEFECTS								
3.0.0	B) OTHER BUTT WELDS WITH JOINT EFF. LESS THAN 0.9 COMPLETE PIPE WORK & PIPES INCLUDING GALVANIZED/ RUBBER LINED PIPING (BEFORE GALVANIZING/ RUBBER LINING)	1. WELD DEFECTS (FOR ROOT RUN & FINAL RUN) 1. WORKMANSHIP AND FINISH, DIMNS., ORIENTATION, LEAK TIGHTNESS	MA	PENETRANT TEST	100%	IS:3658/ ASTM E 165	ASME B 31.1	INSPN. REPORT	3/2	2.1	-
3.1.0	COMPLETE PIPE WORK (DULY GALVANIZED AS APPLICABLE)	1. FREEDOM FROM SURFACE DEFECTS 2. UNIFORMITY OF COATING	MA	VISUAL	100%	IS:4736/ IS 2629 & TECH. SPECN.	IS:4736/ IS 2629 & TECH. SPECN.	INSPN. REPORT	3/2	2.1	-
			MA	DIP TEST	SAMPLING AS PER IS	IS 2633 & TECH. SPECN.	IS 2633 & TECH.	-DO-	3/2	2.1	
BHEL											
PARTICULARS			NAME	BIDDER/VENDOR							
			SIGNATURE								
			DATE								
										BIDDER'S/ VENDOR'S COMPANY SEAL	



QUALITY PLAN

SHEET 3 OF 3

QUALITY PLAN SHEET 3 OF 3											CUSTOMER :		PROJECT :		SPEC. NO			
											BIDDER/VENDOR		QP NO. PE-QP-999-100-MO41		REV.00 DT. 31.03.99		VOLUME: II-B	
											SYSTEM:		ITEM: PIPES & FITTINGS		SECTION D			
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS								
									P W V									

3.2.0	COMPLETE PIPE WORK (RUBBER LINING AS APPLICABLE)	----- AS PER QUALITY PLAN FOR RUBBER LINING -----									
		3. MASS OF ZINC COATING	MA	STRIP TEST	-DO-	IS 4736/ IS 6745 & TECH. SPECN.	IS 4736 & TECH. SPECN.	-DO-	3/2	2,1	-
		5. ADHESION	MA	ADHESION TEST	-DO-	IS-2629/ IS 4736 & TECH. SPECN.	IS-2629/ IS 4736 & TECH. SPECN.	-DO-	3/2	2,1	-
4.0.0	PAINTING AND PACKING	1. SURFACE PREPARATION, DFT, NO. OF COATS, SOUNDNESS OF PACKING, MARKING ETC.	MA	VISUAL EXAM, MEASUREMENT	100%	APPD. PROCEDURE	APPD. PROCEDURE	I.R, MFRS CHECK LIST	3/2	-	2,1

BHEL	PARTICULARS	BIDDER/VENDOR
	NAME	
	SIGNATURE	
	DATE	
BIDDER'S/ VENDOR'S COMPANY SEAL		

		MANUFACTURERS NAME & ADDRESS (AS PER BHEL APPROVED VENDOR LIST)		STANDARD QUALITY PLAN				PROJECT PACKAGE	
		ITEM: Chain Pulley Block With Trolley		QP NO REV DATE PAGE	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	PROJECT No CONTRACTOR	
Sl. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	7	8	9	REMARKS
1	2	3	4	5	6	7	8	9	11
RAW MATERIAL & B/OUT									
1	ITEMS:								
1	HOOKS	DIMENSIONS CHEMICAL COMPOSITION IDENTIFICATION & CORRELATION WITH TC	MA MI MA	MEASUREMENT LAB ANALYSER VERIFICATION		IS 8610 GR M/1 DRAWING	DRAWING & SPECIFICATION	P	
1	LOAD CHAIN	DIMENSIONS BREAKING STRENGTH		MEASUREMENT TENSILE TEST	100%	IS 6216	IS 6216	P	
1	RAW MATL FOR GEAR/RATCHET PAWL/RATCHET WHEEL	CHEMICAL COMPOSITION	MA	LAB ANALYSIS	ONE SAMPLE PER LOT	SPECS AS PER APPD. DRG.	RELEVANT STANDARD	P	
1	LOAD CHAIN WHEELS	TENSILE STRENGTH	MA	TENSILE TEST	ONE SAMPLE PER LOT	SPECS AS PER APPD. DRG.	RELEVANT STANDARD	P	
LEGENDS									
* RECORDS IDENTIFIED WITH 'TICK' () SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION ** M: MANUFACTURER/SUBCONTRACTOR C: CONTRACTOR NOMINATED INSPECTION AGENCY(BHEL) N: CUSTOMER INDICATE 'P' PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHIP" CUSTOMER SHALL IDENTIFY IN COLUMN "N"									
MANUFACTURER/ SUB CONTRACTOR		CONTRACTOR	REVIEWED BY NAME & SIGN OF APPROVING AUTHORITY & SEAL						

		MANUFACTURERS NAME & ADDRESS		STANDARD QUALITY PLAN				PROJECT PACKAGE			
		(AS PER BHEL APPROVED VENDOR LIST)		ITEM: Chain Pulley Block With Trolley		Q.P NO REV DATE		0 20.02.2001		PROJECT No CONTRACTOR	
Sl. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS
1	2	3	4	5	6	7	8	9	D+ M C N	10	11
2	PROCESS	PROOF LOAD	MA	LOAD TEST	100% IS 8610	IS 8610	IR	P	W		
	2 HOOKS	DPT AFTER PROOF LOAD	MA		100% ASTM 709	ASTM 709	IR	P	W		
	2 RACHET PAWL/RACHET WHEEL	HARDNESS SURFACE CRACKES	MA MA	HARDNESS TESTER DPT	100% IS : 1832 100% ASTM E	IS : 3832	IR	P P	W W		
2	LOAD CHAINS	PROOF - LOAD	MA	LOAD TEST	100% IS : 6216	IS:6216	MFRS	P			
3	FINAL INSPECTION	PROOF LOAD TEST	CR	LOAD TEST	100% IS: 3832	IS: 3832	IR	P	W	W	
	3 COMPLETE ASSEMBLY	OPERATIONAL EFFORT	MA	LOAD TEST	RANDOM IS: 3832	IS: 3832	IR	P	W	W	
		HEIGHT OF LIFT	MA	MEASUREMENT	100% IS: 3832	IS: 3832	IR	P	W	W	
		SWIVELLING OF HOOK	MA	VISUAL	100% IS: 3832	IS: 3832	IR	P	W	W	
		LEGENDS									
		* RECORDS IDENTIFIED WITH 'TICK' () SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION									
		** M: MANUFACTURER/SUBCONTRACTOR									
MANUFACTURER/ SUB CONTRACTOR		CONTRACTOR		C: CONTRACTOR NOMINATED INSPECTION AGENCY(BHEL)		N: CUSTOMER		INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION AS APPROPRIATE "CHP" CUSTOMER SHALL IDENTIFY IN COLUMN "N"		REVIEWED BY	
SIGNATURE		NAME & SIGN OF APPROVING AUTHORITY & SEAL									

		MANUFACTURERS NAME & ADDRESS (AS PER BHEL APPROVED VENDOR LIST)		STANDARD QUALITY PLAN					PROJECT PACKAGE		
		ITEM: Chain Pulley Block With Trolley		TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
Sl. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	5	6	7	8	9	M	C	N
1	2	3	4	5	6	7	8	9	D*	**	10
3	PAINTING	CLEANED SHADE OF PAINT GOLDEN YELLOW	MA MA	VISUAL VISUAL	AT RANDOM AT RANDOM	SPEC. SPEC.	PE PE	IR IR	P P	- W	- W
3	NAME PLATE	VERIFICATION	MI	VISUAL	100%	PR	PR	IR	P	W	-
3	PACKING	VERIFICATION	MI	VISUAL	100%	PR	PR	IR	P	W	-
		LEGENDS * RECORDS IDENTIFIED WITH "TICK" () SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION ** M: MANUFACTURER/SUBCONTRACTOR C: CONTRACTOR NOMINATED INSPECTION AGENCY(BHEL) INDICATE 'P' PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHIP" NTPC SHALL IDENTIFY IN COLUMN "N"									
MANUFACTURER/ SUB CONTRACTOR		CONTRACTOR						REVIEWED BY		NAME & SIGN OF APPROVING AUTHORITY & SEAL	
SIGNATURE											

BH RAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING MANAGEMENT										
PROJECT VENDOR		SYSTEM ITEM SUBMERSIBLE PUMP SET								
STANDARD QUALITY PLAN										
S NO.	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CAUSE BY	TYPE / METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	10	11
C	RAW MATERIAL AND BOUGHT OUT CONTROL									
1	PUMP BOLLAS, DISCHARGE CASING, SUCTION CASING MOTOR STEEP BRG. MOUNTING	1. PHYSICAL CHEM PROPS	CS	PHYS. CHEM ANAL	1 MEATY BATCH	APPD. DRUG/APPD. DATA SHEET	APPD. DRUG/APPD. DATA SHEET	LAB REPORT	32	2.1 COMPLIANCE TC FOR C.I.M.S. AND TC FOR OTHERS
2	IMPELLER	DO	CS	DC	DO	DO	DO	DO	32	2.1 COMPLIANCE TC
3	BEARING SLEEVE BEARING RINGS COUPLING BEARING BUSHES	DO	MA	DC	DO	DO	DO	DO	32	2.1 COMPLIANCE TC
4	HEAT TREATMENT OF CASTINGS & APPLICATIONAL CASTINGS IN F. NITROGENISED	1. HEAT CYCLE	MA	VER OF 10-11 CHARTS	1. BATCH	DO	DO	CORRELATED SMART CHARTS	32	2.1 COMPLIANCE TC
5	BARFOOTINGS FOR PUMP AND MOTOR SHAFTS	1. PHYSICAL CHEM PROPS	CS	PHYS. CHEM ANAL	1. CAST OF 10-11	DO	DO	LAB REPORT	32	2.1 COMPLIANCE TC
		2. DIMENSIONS	MA	VE-5	1. CC	WER DPO	WER DPO	WER	32	2.1 IDENTIFICATION BY BHEL FOR 150 DIA
		3. INTERNAL DEFECT FOR SHAFT AND ABOVE DIA SHAFT	CS	1	1. CC				32	2.1 COMPLIANCE TC
6	CABLE	1. DIMENSIONS	MA	DC		WER DPO	WER DPO	WER TC	32	CABLES TO BE OF APPROVED MARKS ONLY
D P NO		REM/INSE/SOPI/05	REVIEWED BY		PEM	APPROVED BY		REM	ACCEPTED BY	
REV NO/DATE		0018-10-97	REVIEWED BY		COST REM	APPROVED BY		COST REM	VENDOR	
PAGE NO		1 OF 4	NAME			NAME			NAME	
			SIGNATURE			SIGNATURE			SIGNATURE	
			DATE			DATE			DATE	

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BAHARATI ELECTRONICALS LIMITED
PROJECT ENGINEERING MANAGEMENT

STANDARD QUALITY PLAN

PROJECT VENDOR SYSTEM ITEM SUBMERSIBLE PUMP SET

O.P. NO.	REV. NO/DATE	REVISION/SOP/06	NAME	SIGNATURE	DATE	PREPARED BY REM	REVIEWED BY GOS/ITEM	APPROVED BY PBM	ACCEPTANCE CLAIMS	FORMAT OF RECORD	SIGNATURE		REMARKS
											1	2	
10.01													
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BHARAT HEAVY ELECTRICS LIMITED
PROJECT ENGINEERING MANAGEMENT

STANDARD QUALITY PLAN

PROJECT
VENDOR:

SYSTEM
ITEM:

SUBMERSIBLE PUMP SET

S NO	COMPONENT OPERATION	CHARACTERISTICS CHECKED	QA / TYPE / METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE CRITERIA	DATE OF COMPLETION	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	10
4.3	STRIPDOWN AFTER PERFORMANCE TEST	1. UNIFORM WEAR TEAR & BREAKAGE	VISUAL EXAM AFTER STRIPPING	100%	TECH SPEC	NO UNIFORM WEAR TEAR & BREAKAGE		30	
4.4	COMPLETE PUMP SET UNIT	1. COMPLETENESS CORRECTNESS WORKMANSHIP AND FINISH OVERALL DIMENSIONS	NA	100%	APPD. GA-DWG	APPD. GA-DWG		30	
4.5	COMPLETION OF ALL STAGES	1. COMPLETION	NA	100%	TECH SPEC, APPD. SHEETS, APPD. DATA SHEETS	TECH SPEC, APPD. SHEETS, APPD. DATA SHEETS		30	
4.6	PAINING	1. SURFACE PREP	VISUAL MEAS	100%	100%	100%		30	
4.7	PACKING	2. UNIFORMITY & FINISH SOUNDNESS AESTHETIC	DC	100%	100%	100%		30	
O.P. NO.		PERMITS/SOPS	PREPARED BY		REVIEWED BY	APPROVED BY	ACCEPTED BY		
REV. NO/DATE		00/8-10-87	NAME		NAME	NAME	NAME		
PAGE NO.		4 OF 4	SIGNATURE		SIGNATURE	SIGNATURE	SIGNATURE		
			DATE		DATE	DATE	DATE		

STANDARD QUALITY PLAN

PROJECT
VENDOR

SYSTEM SUBMERSIBLE PUMP SET

COMPONENT	WAS/ACTED BY	DATE	TYPE / METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE CRITERIA	FORMAT OF RECORD		REMARKS
							P	V	
1. MOTOR ASSEMBLY	STAT. DYN. TESTING	10/1/78	CP. STANC. DYNAMIC BALANCING	100%	ISO 1041	15	IR	22	WITNESSING C.N. FOR RATING 5 RW 1450V
2. PUMP ASSEMBLY	COMPLETE TEST	10/1/78	ME. VISUAL FLAM	100%	MFG DRG	MT 3.00	DO	30	DO
3. ELECTRICAL WIRING	WIRING DIAGRAM	10/1/78	ME. WIRING	100%	MFG DRG. BHEL SPEC	MT 3.00 BHEL SPEC	DO	30	DO
4. FINAL INSPECTION TESTS DURING DECOMMISSION CONTROL	TESTING	10/1/78	CP. STANC. DYNAMIC BALANCING	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
5. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
6. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
7. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
8. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
9. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
10. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
11. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
12. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
13. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
14. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
15. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
16. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
17. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
18. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
19. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
20. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
21. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
22. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
23. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
24. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
25. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
26. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
27. PUMP MOTOR	TESTING	10/1/78	ME. VISUAL FLAM	100%	TECH. SPEC. MFG. DATA SHEET	15	IR	22	MINIMUM 12 HOURS AFTER DECOMMISSIONING. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT. RANGE 15-25 PERCENT.
28.									

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO. :							
				BIDDER/VENDOR		QP NO. PE-QP-999-100-M004		REV. 00 DT. 31.03.99		SPEC. TITLE					
S.NO.	COMPONENT/ OPERATION	SHEET 1 OF 3	CHARACTERISTICS CHECKED	SYSTEM	POWER CYCLE/ LP VALVES	EXTENT OF CHECK	TYPE/METHOD OF CHECK	CATE- GORY	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	SECTION	VOLUME	REMARKS

1.0	MATERIALS	1. PHYS. CHEM. PROPS	MA	PHYS. CHEM. TESTS	ONE/HEAT	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC.	TEST CERT.	3/2	2	1	CORRELATION REQD. FOR BODY BONNET, SPINDLE - FOR GREY C.I. ONLY PHYS. TEST.
1.1	BODY, BONNET, YOKE, WEDGE/DISC, SPINDLE, BODY SEAT, BACK SEAT, THRUST PLATE	1. HEAT TREATMENT	MA	REVIEW OF H.T. CHART VISUAL	100%	-DO-	-DO-	H.T. CHART	3/2	2	1	
		3. SURFACE DEFECTS	MA		100%	MSS-SP-55	MSS-SP-55	INSPN. REPORT -DO-	3/2	2	1	
1.2	BODY & BONNET FOR RATING 900 & ABOVE (ALSO FOR LOWER RATING IF REQUIRED IN SPEC.)	1. SURFACE DEFECTS	CR	PT/MT	100%	ANSI B16.34 AND TECH. SPEC.	ANSI B16.34 AND TECH. SPEC.		3/2	2,1	-	
		2. SUB-SURFACE DEFECTS	CR	RT/UT	100%	ANSI B16.34 AND TECH. SPEC.	ANSI B16.34 AND TECH. SPEC.	-DO-	3/2	-	2,1	FILM REVIEW BY BHEL
1.3	ACTUATORS	1. TORQUE TESTING & SETTING OF TORQUE SWITCH	MA	MECH., ELEC. TESTS	100%	TECH. SPEC./ APPD. DRG./ DATA SHEET/ IS:9334	APPD. DRG./ DATA SHEET/ IS:9334	INSPN. REPORT	3	2,1	1*	*BHEL TO WITNESS IF QTY. MORE THAN 10/TYPE
		2. TRAVEL/STROKE	MA									
		3. TRAVEL TIME	MA									
		4. OPERATION OF LIMIT SWITCH	MA									
		5. MANUAL OPERATION THROUGH HAND WHEEL	MA									
		6. OPERATION TEST WITH POWER SUPPLY VARIATION ENERGISES TO OPEN/CLOSE	MA									
		7. IR, HV, IR	MA	WATER, DUST TEST	1/TYPE	TECH. SPEC./ APPD. DRG./ DATA SHEET/ IS:9334	APPD. DRG./ DATA SHEET/ IS:9334	3RD PARTY TEST CERT.	3	-	2,1	
		8. DEGREE OF PROTECTION	MA									

BHEL	PARTICULARS		BIDDER/VENDOR
	NAME		
	SIGNATURE		
	DATE		
			BIDDER'S/ VENDOR'S COMPANY SEAL

QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO.:	
BIDDER/VENDOR		BIDDER/VENDOR		QIP NO./PE-QIP-999-100-M004		REV. 00 DT.31.03.99	
SHEET 2 OF 3		SYSTEM		POWER CYCLE/ LP VALVES		SECTION	
COMPONENT/ OPERATION		CHARACTERISTICS CHECKED		GATE/ GLOBE VALVE		VOLUME	
S.NO.		CATE- GORY		ITEM: REFERENCE DOCUMENT		AGENCY	
		TYPE/METHOD OF CHECK		ACCEPTANCE NORMS		REMARKS	
		EXTENT OF CHECK		FORMAT OF RECORD		P W V	

2.0	2. PNEUMATIC ACTUATORS	1. LEAK TIGHTNESS	CR	PNEUMATIC TEST AT 1.2 X DESIGN	100%	APPD. DATA SHEET/MFG. STD.	NO LEAKAGE	INSPN. REPORT	3	2.1	1*	*BHEL TO WITNESS IF QTY. MORE THAN 10/ TYPE
3.0	3. DEPOSIT ON DISC / BODY SEAT/BACK SEAT	2. ACCURACY	CR	CALIBRATION	100%	-DO-	APPD. DATA SHEET/MFG. STD.	CALIBRATION REPORT	3	2.1	1*	
		3. SIMULATION (OPERATION, AIR TO OPEN/CLOSE)	CR	OPERATION AT RATED PRESSURE P.T	100%	-DO-	-DO-	INSPN. REPORT	3	2.1	1*	
		1. SURFACE DEFECTS	CR	ASTME:165 & TECH.SPEC.	ANSI B16.34 & TECH.SPEC.	-DO-	3/2	2.1	2.1			
3.1	3.0 IN-PROCESS INSPECTION OF ALL COMPONENTS	1. DIMENSIONS, WORKMANSHIP AND FINISH	MA	MEAS., VISUAL	100%	MFG.DRG.	MFG.DRG.	LOG BOOK	3/2	-	-	FOR 900 CLASS & ABOVE TO BE WITNESSED BY BHEL
3.2	WEDGE/DISC, BODY SEAT RING, BACK SEAT, SPINDLE, THRUST PLATE	1. HARDNESS	MA	TESTING	100%	APP.DRG.	APP. DRG./ ANSI B16.34	TEST CERT.	3/2	-	2.1	
3.3	SPINDLE, BODY SEAT RING, WEDGE/DISC, BACK SEAT	1. SURFACE DEFECTS	CR	P.T.	100%	ANSI B16.34 AND TECH. SPEC./	ANSI B16.34 AND TECH. SPEC.	-DO-	3/2	-	2.1	
3.4	WEDGE/DISC & SEAT RING, SPINDLE AND BACK SEAT	1. LAPPING	CR	BLUE MATCHING	100%	UNIFORM CONTACT	METAL TO METAL	INSPN. REPORT	3/2	-	2.1	
4.0	ASSEMBLY	1. DIMENSIONS	MA	MEAS.	100%	APPD.DRG.	APPD.DRG.	-DO-	3/2	2.1	-	FOR GATE VALVES ONLY
5.0	TESTING BODY, SEAT, BACK SEAT	2. WEAR TRAVEL	MA	MEAS.	100%	-DO-	-DO-	-DO-	3/2	2.1	-	
		3. VALVE LIFT	MA	MEAS.	100%	-DO-	-DO-	-DO-	3/2	2.1	-	
5.1		1. LEAK TIGHTNESS OF BODY	CR	HYDRAULIC TEST	100%	APPD. DRG./ TECH. SPEC.	NO LEAKAGE	I.R./IBRTC (IF REQD)	3/2	2.1	-	
		2. LEAK TIGHTNESS OF BACK SEAT AND SEAT	CR	-DO-	100%	-DO-	-DO-	-DO-	3/2	2.1	-	
		3. LEAK TIGHTNESS OF SEAT	CR	PNEUMATIC TEST	100%	-DO-	-DO-	-DO-	3/2	2.1	-	

BHEL		PARTICULARS		BIDDER/VENDOR	
		NAME			
		SIGNATURE			
		DATE		BIDDER'S/ VENDOR'S COMPANY SEAL	

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO. :					
				BIDDER/VENDOR		Q.P. NO. PE-QP-999-100-M004		REV. 00 DT. 31.03.99		SPEC. TITLE			
S.NO.	COMPONENT/ OPERATION	SHEET 3 OF 3	CHARACTERISTICS CHECKED	SYSTEM	POWER CYCLE/ LP VALVES	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	SECTION	VOLUME	REMARKS

5.2	SEAT & BACK SEAT FOR MOTORISED/ PNEU. VALVES WITH ACTUATOR OPERATION AL TESTING	1. LEAK TIGHTNESS OF SEAT	CR	HYDRUALIC TEST	100%	APPD. DRG./ TECH. SPEC.	NO LEAKAGE	I.R./ IBRTC (IF REQD)	3/2	2.1	-	
5.3	1. MANUALLY OPERATED VALVES	1. SMOOTH & FULL OPENING AND CLOSING	CR	MANUAL	100%	TECH. SPEC.	SMOOTH OPERATION OF VALVES & CLEAR BORE	INSPN. REPORT	3/2	2.1	-	
	2. MOTOR /PNEU OPERATED VALVES	1. ASCENDING& DESCENDING LIFT CHARACTERISTIC 2. LIMIT/TORQUE SWITCH SETTING FOR OPENING AND CLOSING TIME	CR	ELEC.	100%	APP. DRG./ TECH. SPEC./ IS:9334	APP. DRG./ TECH. SPEC./ IS:9334	INSPN. REPORT	3/2	2.1	-	
6.0	COMPLETE VALVES END CONNECTION DETAILS	1. OVERALL DIMENSION 1. DIMENSIONS	MA	MEAS	SAMPLE 100%	APPD.DRG. / RELV.STD	APP.DRG. / RELV.STD	-DO-	3/2	2.1	-	
7.0		2. SURFACE DEFECTS FOR B.W. ENDS	CR	PT	100%	ASTME:165	NO DEFECTS	TEST CERT.	3/2	2	1	
8.0	FINAL INSPECTION	1. CLEANLINESS & COMPLETENESS	MA	VISUAL	100%	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC	INSPN. REPORT	3/2	-	2.1	
9.0	PAINTING	1. SURFACE PREPARATION 2. UNIFORMITY & THICKNESS	MI	VISUAL	100%	TECH. SPEC.	TECH. SPEC.	INSPN. REPORT	3/2	-	2.1	
10.0	PACKING	AS PER BHEL TECH. SPEC	MA	MEASUREMENT	100%	-DO-	-DO-	INSPN. REPORT	3/2	2	1	
				VISUAL	100%	AS PER BHEL TECH. SPEC.	AS PER BHEL TECH. SPEC	-DO-	3/2	-	2.1	

ABBREVIATIONS
 CR = CRITICAL CHARACTERISTIC P = PERFORMED BY W = WITNESSED BY V = VERIFIED BY
 MA = MAJOR CHARACTERISTIC 1 = PURCHASER (BHEL)2 = VENDOR 3 = SUB VENDOR OF THE VENDOR
 MI = MINOR CHARACTERISTIC

BHEL	PARTICULARS	BIDDER/VENDOR
	NAME	
	SIGNATURE	
	DATE	
		BIDDER'S/ VENDOR'S COMPANY SEAL

SECTION D2

STANDARD TECHNICAL SPECIFICATION (ELECTRICAL)

STANDARD TECHNICAL SPECIFICATION FOR LIGHTING AND AVAITION

DATASHEET A

STANDARD QUALITY PLANS

DATASHEET B

1. These lighting notes and details shall be read and construed in conjunction with the Illumination Layout and Drawings.
2. Except specifically approved by site office, installation of exposed conduits, mounting of lighting fixtures etc. shall be taken up only after all other services such as Piping, Air Ducting, Cable Tray/Busduct Hanger, Structural Bracings etc. in a particular area have been installed.
3. The Contractor shall develop final conduit/cable routing based on fixture location and other site conditions.
4. Unless otherwise shown, the mounting heights of lighting fixtures and accessories shall be generally as follows :
 - a) i) Low-Bay Lighting Fixtures
in general indoor Areas
of Industrial plants. : 3500 mm from bottom
to finished floor
 - ii) Medium Bay Type Fixtures. : 3500 to less than
8000 mm from bottom
to finished floor
 - iii) High Bay Type Fixtures : 8000 mm and above
from Bottom to finished
floor
 - b) Bracket lights over door
Openings : 300 mm bottom of
Fixture Above top of
opening.
 - c) In Boiler Platforms : Pendant below Boiler
Platforms or with
Brackets from Hand-
Rail 3000mm above
platform.
 - d) Receptacles :
 - i) In control room/office : 450 mm from finished floor
to centre
 - ii) Elsewhere : 900 mm from finished floor
to centre
 - e) Local Switches : 1500 mm from finished floor
to centre
 - f) Lighting Panels : 1800 mm from finished floor
to top
5. Unless otherwise noted, all lighting fixtures shall be fed from respective lighting panels. Normal AC lighting panels will be fed from Main lighting distribution boards (MLDB). Emergency AC lighting panels will be fed from Emergency Main lighting distribution boards (ELDB). DC Emergency lighting distribution boards (DCELOB) will be fed from MLDB and Main DC distribution boards.
6. All outdoor lighting fixtures, unless it is fed from time switch controlled lighting panel shall be provided with outdoor type local switches.



LIGHTING NOTES & DETAILS

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7. Separate neutral wire shall be provided for each circuit. Wiring throughout the installation shall be such that there is no break in the neutral wire in the from of switch or fuse.
8. All exposed conduit runs in battery room, chemical feed station area, water treatment building etc. shall be suitably painted with acid/alkali proof paints.
9. The entire metallic conduit system whether embedded or exposed, shall be electrically continuous and thoroughly grounded.
10. Lighting fixtures shall not be suspended directly from junction box in the main conduit run.
11. Separate conduits shall be used for wiring lighting circuits of different lighting distribution system such as normal AC lighting/emergency AC lighting/emergency DC lighting/low voltage lighting.
12. A.C. and D.C. circuits shall not be run in the same conduit and junction boxes. Circuits fed from different transformers and different batteries (D.C. Source) shall not be run through same conduit and junction boxes.
13. Receptacle circuits shall be kept separate and distinct from lighting and fan circuits.
14. Wires/cable shall be spliced only at junction boxes with ring-tongue lugs or approved equal.
15. For cable/wire numbering, PVC sleeve with cable/wire Tag number of different colour code shall be used.
16. For roads/outdoor areas, main runs from street/area lighting panels shall be by means of AYW cables, directly buried in ground with proper protection as per details shown or through duct bank.
17. When buried cables cross road/railway track, additional protection to be provided in form of hume/G.I. Pipe.
18. Flame proof installations shall be carried out with Flame proof conduits, flame proof accessories and junction boxes.
19. Unless otherwise noted, the minimum size of cables, wires, conduits, junction boxes shall be as below :

A) CABLES

- i) From main lighting distribution Boards to 400 V normal AC lighting panels : 1x3-1/2C, 95 Sq.mm AL PVC
- ii) From emergency lighting Dist. Boards (EMLDB) to 400 V emergency AC lighting Panels : 1x3-1/2C, 95 Sq.mm AL PVC



LIGHTING NOTES & DETAILS

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- iii) From main lighting Dist. Boards (MLDB) TO 400V AC/ 220V DC emergency Lighting distribution board (DCELDDB) : 1x3-1/2C, 95 Sq.mm AL PVC
- iv) From 220V main DC dist. Boards to 400V AC/220V DC emergency lighting distribution board (DCELDDB) : 2 x 4C, 35 Sq.mm AL PVC
- v) From PMCC/MCC/DB to 100A, 3 Phase Receptacles : 1 x 3-1/2C, 95 Sq.mm AL PVC
- vi) From 400 normal AC street/ Area lighting panels to street lighting pole Junction Box : 1x4C, 35 Sq.mm AL PVC
- vii) From PMCC/MCC/DB to 83A, 3 Phase Receptacles : 1 x 4C, 35 Sq.mm AL PVC

B. WIRES

Wires shall be PVC insulated, 650V grade and of following sizes :

- i) From lighting panels to Junction Boxes : 1C, 10 Sq.mm AL (Stranded)
- ii) From Junction Boxes to Lighting Fixtures : 1C, 2.5 Sq.mm Cu.
- iii) From Junction Boxes to Flood light Fixtures : 2 x 2.5 Sq.mm, 1C, Cu
- iv) From lighting Panels to 230V AC 5/15A, 1 Phase Receptacles & 24V AC supply Modules type M4 : 1C, 10 Sq.mm AL (Stranded)
- v) From 24V A.C. supply Modules to 230 V A.C. 5A Receptacles : 1C, 10 Sq.mm AL (Stranded)

C. CONDUITS

All conduits shall be of galvanized steel of following minimum sizes :

CABLE SIZE	CONDUIT. SIZE				
	20MM	25MM	32MM	40MM	50MM
i) 10 Sq.mm AL	2	5	7	8	10
ii) 2.5 Sq.mm CU	3	5	9	10	12

6) Maximum No. of Conductors Admissible for Conduit



LIGHTING NOTES & DETAILS

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0 JUNCTION BOXES

CONDUIT SIZE (MM)	JUNCTION BOX SIZE (MM)			
	4-WAY	3-WAY	STRAIGHT THROUGH	90°
i) 20 / 25	150x150x100	150x100x100	88 Ø	88 Ø
ii) 32 / 40	254x200x127	254x200x127	150x150x100	
iii) 50	254x200x127	254x200x127	254x200x127	

20 All lighting panels/distribution boards, junction boxes, receptacles, Fixtures, Conduits, etc. shall be grounded in compliance with the provision of I.E. rule and as detailed below :

- i) Lighting Panels : 35 x 6 MM G.S. Flat
- ii) Distribution Boards : 50 x 6 MM G.S. Flat
- iii) Power Receptacles, Junction Boxes etc. : 12 SWG G.I. Wire
- iv) Lighting fixtures, switches, conduits etc. : 16 SWG, G.I. wire.
- v) Street Light Poles and Towers for Floodlighting : 25 x 3 MM G.S. Flat

21 A continuous ground conductor of 16 SWG G.I. wire shall run along each conduit run and bonded to it every 600 MM.

22. The electrical installation work shall meet the requirements of Indian Electricity Rules, relevant IS codes of practice and safety codes, all as amended upto date. In addition, other rules or regulations as applicable to the work shall be followed. In case of any discrepancy, the more restrictive rule shall be binding.

23 Typical details of lighting fixtures, other lighting system components and their mounting arrangement as shown herein are for general guidance only. The type no. of some make has been referred in the various drawings. Only to indicate desired appearance, construction features and performance of the fixture. The contractor has to design the same fulfilling the requirement of the specification.



LIGHTING NOTES & DETAILS

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