

		STANDARD QUALITY PLAN								Valid From				
		ITEM : HEX BOLT & NUT ,STEP BOLT,PACK WASHER,SPRING WASHER				SQP NO: TRN/QA/M/SQP/402 Version No : 1.0 DATE: 04.05.2023								
										Approved by QA		Valid To		
SL No.	COMPONEN T/ OPERATION	CHARACTERISTICS	CATEGORY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	INSPECTION AGENCY			REMARKS	
					M	C/A				M	C	A		
1	2	3	4	5	6		7	8	9	**10			11	
A Raw Material Section														
1	NUT-BOLT(Incoming Inspection)													
1.1	HEX BOLTS/NUTS Gr 4,6,5,6/5	Chemical Properties	Major	Chemical Analysis	1 Pc per lot of 25MT	1 Pc per lot of 25MT	IS 1367 Part 3 & 6	IS 1367 Part 3 & 6	MTC/II R	√	V	V	V	
1.2		Mechanical Properties	Major	Hardness Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	IS 1367 Part 3 & 6	IS 1367 Part 3 & 6		√	P	V	V	
1.3		Dimensions	Major	Measurement	8 Pc per lot of 25MT	8 Pc per lot of 25MT	As per Approved Drq	As per Approved Drq		√	P	V	V	
1.4		Surface Integrity	Major	Etching Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	-	Free from cracks		√	P	V	V	
2	STEP BOLT & NUT(Incoming Inspection)													
2.1	STEP BOLTS/NUTS Gr 4,6,5,6/5	Chemical Properties	Major	Chemical Analysis	1 Pc per lot of 25MT	1 Pc per lot of 25MT	IS 1367 Part 3 & 6	IS 1367 Part 3 & 6	MTC/II R	√	V	V	V	
2.2		Mechanical Properties	Major	Hardness Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	IS 1367 Part 3 & 6	IS 1367 Part 3 & 6		√	P	V	V	
2.3		Dimensions	Major	Measurement	8 Pc per lot of 25MT	8 Pc per lot of 25MT	As per Approved Drq	As per Approved Drq		√	P	V	V	
2.4		Surface Integrity	Major	Etching Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	-	Free from cracks		√	P	V	V	
3	PACK WASHER (Incoming Inspection)													
3.1	Pack Washers	Chemical Properties	Major	Chemical Analysis	1 Pc per lot of 25MT	1 Pc per lot of 25MT	IS: 2062	IS: 2062	MTC/II R	√	V	V	V	
3.2		Dimensions	Major	Measurement	8 Pc per lot of 25MT	8 Pc per lot of 25MT	As per Approved Drq	As per Approved Drq		√	P	V	V	
3.3		Surface Integrity	Major	Etching Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	-	Free from cracks		√	P	V	V	
4	SPRING WASHER(Incoming Inspection)													
4.1	SPRING WASHER	Chemical Properties	Major	Chemical Analysis	1 Pc per lot of 25MT	1 Pc per lot of 25MT	IS: 4072	IS: 4072	MTC/II R	√	V	V	V	
4.2		Dimensions	Major	Measurement	8 Pc per lot of 25MT	8 Pc per lot of 25MT	As per Approved Drq	As per Approved Drq		√	P	V	V	
4.3		Surface Integrity	Major	Etching Test	8 Pc per lot of 25MT	8 Pc per lot of 25MT	-	Free from cracks		√	P	V	V	
B In Process Inspection(Bolt & Nut)														
5.1	Bolts:M16,M20,M24	Chemical properties	Major	Chemical Analysis	1 Sample per lot/size	1 Sample per lot/size		IS 1367	C : 0.55% Max,P : 0.05% Max.,S : 0.06% Max.	ITR	√	P	V	V
5.2	NUT: M16,M20,M24								C : 0.50% Max,P : 0.110% Max,S : 0.150% Max.		√	P	V	V
5.3	BOLTS:M16,M20,M24	Mechanical properties	Critical	WEDGE LOAD TEST	Lot Size	No. of Samples	Lot Size	No. of Samples	IS 1367, IS 12427	ITR	√	P	V	V
				(ULTIMATE TENSILE STRENGTH)	100000%	5	100000%	5	M 16: 78500N Min,M20:122 000NMin ,M24:176 000N		√	P	V	V
					1001-3000	8	1001-3000	8						
					3001-10000	13	3001-10000	13						
					10001-35000	20	10001-35000	20						
					Over 35000	32	Over 35000	32						
5.4				PROOF LOAD:(No slip of threads for 15 sec.)					M16:44000 N Min,M 20:68600 Nmin, M24:98800N Min		√	P	V	V
5.5				HARDNESS TEST					Min.: 79 HRB,Max.: 99.5 HRB		√	P	V	V
5.6				SHEAR STRESS					Min 310 Mpa		√	P	V	V
5.7				HEAD SOUNDNESS					Angle β=60°					
6.1	NUT: M16,M20,M24			PROOF LOAD:(No slip of threads for 15 sec.)					M16:77000 N ,M 20: 122500 N Min,M24: 176500 N Min		√	P	V	V
6.2	Property class 5													
7.1		Dimensions	Major	HARDNESS TEST	IS:12427,IS:1439		IS:12427,IS:1439		Min.: 130 HV,Max.: 302 HV		√	P	V	V
8.1		Hot Dip Galvanizing	Major	Measurement	IS:12427,IS:1439		IS:12427,IS:1439		IS 12427, IS 14394	ITR	√	P	V	V
				Weight of Coating	Lot Size	No. of	Lot Size	No. of Samples	IS 1367, IS 2629	ITR	√	P	V	V
					1-3	3	1-3	3	Shall be as per approved drawings/Adani TS					
					4-500	3	4-500	3						
					501-1200	5	501-1200	5						
					1201-3200	8	1201-3200	8						
					3201-10000	13	3201-10000	13						
					over 10001	20	over 10001	20						
8.2				Thickness of Coating (By Elcometer)					IS 1367 (Part 13)		√	P	V	V
8.3				Uniformity of Coating					IS 1367 (Part 13)		√	P	V	V
8.4				Adhesion Test of Zinc Coating					IS 1367 (Part 13)		√	P	V	V
									Prying by stout knife(No peeling off of Zinc coatings)		√	P	V	V

		VISUAL INSPETION		For Surface finish & workmanship	Random		Random		IS 1367 (Part 17)	Surface to be free from defects like bare / black wspots, heavy ash & flux inclusions, lumps, pimples and runs.		√	P	V	V	
9.1	STEP BOLTS	Chemical properties	Major	Chemical Analysis	1 Sample per lot/size		1 Sample per lot/size		IS 1367	C : 0.55% Max,P : 0.05% Max.,S : 0.06% Max.	ITR	√	P	V	V	
	4.6/5.6/5									C : 0.50% Max,P : 0.110.% Max,S : 0.150% Max.		√	P	V	V	
10.1		MECHANICAL PROPERTIES Property class 4.6	Major	TENSILE LOAD TEST(ULTIMATE TENSILE STRENGTH)	Lot Size	No.of Samples			IS 1367 (Part 3)	Applicable to length > 2.5d		√	P	V	V	
					100000%	5				M 16: 62800N Min						
					1001-3000	8										
					3001-10000	13										
					10001-35000	20										
					Over 35000	32										
10.2				PROOF LOAD:						M 16: 35300 N Min						
10.3				HARDNESS TEST						Min.: 67 HRB,Max.: 99.5 HRB						
10.4				CANTILEVER TEST					As per IS 2614	For test 150 Kgs load for 10 sec than after there should be no permanant set at a point indicates after withdrawal of the load subject to a tolerance 30 µm						
10.5		DIMENSION PROPERTIES	Major						IS 10238	As per IS 10238		√	P	V	V	
11.1		Hot Dip Galvanizing	Major	Weight of Coating	Lot Size	No.of Samples	Lot Size	No.of Samples	IS 1367, IS 2629	Shall be as per approved drawings/Adani TS	ITR	√	P	V	V	
					1-3	3	1-3	3								
					4-500	3	4-500	3								
					501-1200	5	501-1200	5								
					1201-	8	1201-3200	8								
					3201-10000 over	13	3201-10000 over 10001	13								
11.2				Thickness of Coating (By Elcometer)					IS 1367 (Part 13)	Shall be as per approved drawings/Adani TS		√	P	V	V	
11.3				Uniformity of Coating					IS 1367 (Part 13)	4 Dips of 1 min each in Copper Sulphate solution(Sp.gr. 1.186 & temp 18° C ± 20° C)		√	P	V	V	
11.4				Adhesion Test of Zinc Coating					IS 1367 (Part 13)	Prying by stout knife		√	P	V	V	
11.5										No peeling off of Zinc coatings						
		VISUAL INSPETION		For Surface finish & workmanship	Random		Random		IS 1367 (Part 17)	Surface to be free from defects like bare / black wspots, heavy ash & flux inclusions, lumps, pimples and runs.		√	P	V	V	
	PACK & PLAIN	DIMENSION PROPERTIES			IS:2614				As per IS 2016 & IS 5369	As per IS 2016 & IS 5369		√	P	V	V	
12.1		GALVANIZING TEST							IS 4759 / IS 6745			√	P	V	V	
			Weight of Zinc Coating							Shall be as per approved drawings/Adani TS						
12.2			Thickness of Zinc Coating						IS 4759	Shall be as per approved drawings/Adani TS		√	P	V	V	
12.3			Uniformity of Zn Coating						IS 2633	Material to withstand 4 dips of one minute each without showing signs of red deposits of copper upon base metal.		√	P	V	V	
12.4			Ahesion Test of Zinc Coating						IS 2629	No removal or lifting of coating in areas between hammer impressions / coating should not peel off.		√	P	V	V	
	SPRING WASHER M16,M20,M24	Chemical Composition	Major	Chemical Anaysis	1 Pc per lot of 25MT		1 Pc per lot of 25MT		IS:4072	IS:4072		√	V	V	V	
13.1		Mechanical Properties	Major	TWIST TEST	As per IS 6821		As per IS 6821		IS 3063	At 90° No crack		√	P	V	V	
13.2				HARDNESS TEST					IS 3063	Min:43HRC,Max: 51HRC		√	P	V	V	
13.3				PERMANENT SET TEST					IS 3063	After Compression load of M16:56300N,M20:88000,M24:127000 for 2 minutes,Minum free height should not be less than M16:5.6,M20:6.4,M24:8 mm		√	P	V	V	

13.4				PERMANENT LOAD TEST						10 spring lock washers threaded on a bolt and separated from one another by parallel-faced washers shall not crack or fracture after 48 hours conditioning at ambient temperature under the compression loads		√	P	V	V	
14.1		GALVANIZING TEST	Major	AVERAGE COATING THICKNESS					IS 1573	Shall be as per approved drawings/Adani TS		√	P	V	V	
14.2				LOCAL THICKNESS						Shall be as per approved drawings/Adani TS		√	P	V	V	
14.3				VISUAL INSPECTION						Washers shall be free from burre,rust,pit marks,loose scale ad defect that might affect their serviceability		√	P	V	V	
C	FINAL Inspection(Bolt & Nut)															
15	Bolts:M16,M20, M24	Chemical properties	Major	Chemical Analysis	1 Sample per lot/size		1 Sample per lot/size		IS 1367	C : 0.55% Max,P : 0.05% Max.,S : 0.06% Max.	IR	√	P	H	H	
	NUT: M16,M20,M24									C : 0.50% Max,P : 0.110.% Max,S : 0.150% Max.		√	P	H	H	
16.1	BOLTS:M16,M20,M 24	Mechanical properties	Critical	WEDGE LOAD TEST	Lot Size	No.of Samples	Lot Size	No.of Samples	IS 1367, IS 12427	Applicable to length > 2.5d	IR	√	P	H	H	
				(ULTIMATE TENSILE STRENGTH)	100000%	5	100000%	5		M 16: 78500N Min,M20:122						
16.2					1001-3000	8	1001-3000	8								
					3001-10000	13	3001-10000	13								
					10001-35000	20	10001-35000	20								
					Over 35000	32	Over 35000	32								
16.3				PROOF LOAD:(No slip of threads for 15 sec)						M16:44000 N Min,M 20:68600 Nmin, M24:98800N Min		√	P	H	H	
16.4				HARDNESS TEST						Min.: 79 HRB,Max.: 99.5 HRB		√	P	H	H	
16.5				SHEAR STRESS						Min 310 Mpa		√	P	H	H	
16.6				HEAD SOUNDNESS						Angle β=60°						
17	NUT: M16,M20,M24			PROOF LOAD:(No slip of threads for 15 sec)						M16:77000 N ,M 20: 122500 N Min,M24: 176500 N Min		√	P	H	H	
	Property class 5															
17				HARDNESS TEST						Min.: 130 HV,Max.: 302 HV		√	P	H	H	
18		Dimensions	Major	Measurement	IS:12427,IS:1439		IS:12427,IS:1439		IS 12427, IS 14394	IS 12427, IS 14394	IR	√	P	H	H	
19.1		Hot Dip Galvanizing	Major	Weight of Coating	Lot Size	No.of Samples	Lot Size	No.of Samples	IS 1367, IS 2629	Shall be as per approved drawings/Adani TS	IR	√	P	H	H	
					1-3	3	1-3	3								
					4-500	3	4-500	3								
					501-1200	5	501-1200	5								
					1201-3200	8	1201-3200	8								
					3201-10000	13	3201-10000	13								
					over 10001	20	over 10001	20								
19.2				Thickness of Coating (By Elcometer)					IS 1367 (Part 13)	Shall be as per approved drawings/Adani TS		√	P	H	H	
19.3				Uniformity of Coating					IS 1367 (Part 13)	4 Dips of 1 min each in Copper Sulphate solution(Sp.gr. 1.186 @ temp 18° C ± 20° C)		√	P	H	H	
19.4				Adhesion Test of Zinc Coating					IS 1367 (Part 13)	Prying by stout knife		√	P	H	H	
										No peeling off of Zinc coatings						
20		VISUAL INSPETION		For Surface finish & workmanship	Random		Random		IS 1367 (Part 17)	Surface to be free from defects like bare / black wspots, heavy ash & flux inclusions, lumps, pimples and runs.		√	P	H	H	
21	STEP BOLTS	Chemical properties	Major	Chemical Analysis	1 Sample per lot/size		1 Sample per lot/size		IS 1367	C : 0.55% Max,P : 0.05% Max.,S : 0.06% Max.	IR	√	P	H	H	
	4.6/5.6/5									C : 0.50% Max,P : 0.110.% Max,S : 0.150% Max.		√	P	H	H	
22		MECHANICAL PROPERTIES Property class 4.6	Major	TENSILE LOAD TEST(ULTIMATE TENSILE STRENGTH)	Lot Size	No.of Samples			IS 1367 (Part 3)	Applicable to length > 2.5d		√	P	H	H	
					100000%	5				M 16: 62800N Min						
					1001-3000	8										
					3001-10000	13										
					10001-35000	20										
					Over 35000	32										
22				PROOF LOAD:						M 16: 35300 N Min		√	P	H	H	
22				HARDNESS TEST						Min.: 67 HRB,Max.: 99.5 HRB		√	P	H	H	

22				CANTILEVER TEST					As per IS 2614	For test 150 Kgs load for 10 sec than after there should be no permanent set at a point indicates after withdrawal of the load subject to a tolerance 30 µm measurement error		√	P	H	H	
23		DIMENSION PROPERTIES	Major						IS 10238	As per IS 10238		√	P	H	H	
24		Hot Dip Galvanizing	Major	Weight of Coating	Lot Size	No.of	Lot Size	No.of Samples	IS 1367, IS 2629	Shall be as per approved drawings/Adani TS	IR	√	P	H	H	
					1-3	3	1-3	3								
					4-500	3	4-500	3								
					501-1200	5	501-1200	5								
					1201-3200	8	1201-3200	8								
					3201-10000	13	3201-10000	13								
					over 10001	20	over 10001	20								
24				Thickness of Coating (					IS 1367 (Part 13)	Shall be as per approved drawings/Adani TS		√	P	H	H	
24				Uniformity of Coating					IS 1367 (Part 13)	4 Dips of 1 min each in Copper Sulphate solution(Sp.gr. 1.186 & temp 18° C ± 20° C)		√	P	H	H	
24				Adhesion Test of Zinc Coating					IS 1367 (Part 13)	Prying by stout knife		√	P	H	H	
										No peeling off of Zinc coatings						
25		VISUAL INSPETION		For Surface finish & workmanship	Random		Random		IS 1367 (Part 17)	Surface to be free from defects like bare / black wspots, heavy ash & flux inclusions, lumps, pimples and runs.		√	P	H	H	
26	PACK & PLAIN	DIMENSION PROPERTIES			IS:2614				As per IS 2016 & IS 5369	As per IS 2016 & IS 5369						
27.1		GALVANIZING TEST	Weight of Zinc Coating						IS 4759 / IS 6745	Shall be as per approved drawings/Adani TS		√	P	H	H	
27.2			Thickness of Zinc Coating						IS 4759	Shall be as per approved drawings/Adani TS		√	P	H	H	
27.3			Uniformity of Zn Coating						IS 2633	Material to withstand 4 dips of one minute each without showing signs of red deposits of copper upon base		√	P	H	H	
27.4			Ahesion Test of Zinc Coating						IS 2629	No removal or lifting of coating in areas between hammer impressions / coating should not peel off.		√	P	H	H	
28	SPRING	Chemical Composition	Major	Chemical Anayis	1 Pc per lot of		1 Pc per lot of		IS:4072	IS:4072		√	P	H	H	
29		Mechanical Properties	Major	TWIST TEST	As per IS 6821		As per IS 6821		IS 3063	At 90° No crack		√	P	H	H	
29				HARDNESS TEST					IS 3063	Min:43HRC,Max: 51HRC		√	P	H	H	
29.1				PERMANENT SET TEST					IS 3063	After Compression load of M16:56300N,M20:88000,M24:127000 for 2 minutes,Minum free height should not be less than M16:5.6,M20:6.4,M24:8 mm		√	P	H	H	
29.2				PERMANENT LOAD TEST						10 spring lock washers threaded on a bolt and separated from one another by parallel-faced washers shall not crack or fracture after 48 hours conditioning at ambient temperature under the compression loads		√	P	H	H	
30.1		GALVANIZING TEST	Major	AVERGAE COATING THICKNESS					IS 1573	Shall be as per approved drawings/TS		√	P	H	H	
30.2				LOCAL THICKNESS						Shall be as per approved drawings/TS		√	P	H	H	
31				VISUAL INSPECTION						Washers shall be free from burre,rust,pit marks,loose scale ad defect that might affect their serviceability		√	P	H	H	

LEGEND:- D* Records identified with tick (✓) shall be essentially included by supplier & manufacturer in Quality Documentation package.
** M: Manufacturer / Sub-Supplier, C: Main Supplier, A: ADANI or their authorized representative.
Format of Records:- MTC: Material Test Certificate, TPL: Third Party Lab, RTC: Routine Test Certificate, IR:- Inspection Report, IIR:- Incoming Inspection Report
Use the following term as appropriate in columns 10. P: Perform, V: verification and H: Customer Hold Point to be witnessed and work shall not proceeded till it is witnessed and cleared in writing.
GENERAL NOTES : 1) This is generalised SQP, hence should be read in conjunction with PO, BOQ, RFP,TS, GTP, DRAWING and shall deem to include additional test / requirements / Stringent parameter asked if any as per the contract specific requiremens as applicable to specific contract and Bidder shall compliance the same without any commercial implication to owner. 2) Testing Instruments used during inspection must be calibrated from NABL accredited lab only. Instruments used during testing should be within valid calibration date. 3) In case of any tests being carried out at third party laboratory, such laboratory/facility shall be NABL accredited/acceptable to Adani. 4) Manufacturer shall ensure that all the test mentioned in technical specification of project / package need to be carried out strictly without fail, if it is not covered under SQP. 5) The manufacturer shall maintain the proper co relation from raw material test certificates / records to finish product and records should be offered for verification during inspection by ATL / Their nominated TPIA. 6) Whenever Indian standard / International standard are referred their last amended shall be included. The same shall be applicable if manufacturer specification / plant standard also so long as these changes are made with the approval of competent authority of manufacturer. 7) Manufacturer shall not offed repaired cables for inspection under any circumstances. 8) All packing cases / crats should be marked with ATL PO details and as per ATL technical specification 9) ATL may review the effective implementation of the processes during the product stage / final inspection. 10)In case of any dispute final decision will be based on PO/RFP/BOQ/TS/SQP in sequential manner. 11) As per Plastic Waste Management Rules, 2016, rule 4 clause (d) the contactor/Supplier/Vendor shall not use plastic sheet of less than 50 (Fifty) microns in thickness for the purpose of packing or wrapping the commodity/Commodities supplied to Adani Transmission Limited.