

**GUJARAT ENERGY TRANSMISSION CORPORATION LTD.**



**STANDARD FIELD QUALITY PLAN  
TRANSMISSION LINES**

		01		June 2014
<b>Engineering Cell</b>	CE (Engineering)	Annx. 6 added	Revision	Date
<b>Submitted By</b>	<b>Approved By</b>	Rev. History	<b>DOCUMENT NO. GETCO/E/FQP/LINE/001</b>	

**STANDARD FIELD QUALITY PLAN FOR TRANSMISSION LINES**  
**DOCUMENT NO. GETCO/E/FQP/LINE/001 Rev.01 DT June 2014**

Sr. No	Description of Activity	Items to be checked	Tests checks to be done	Ref. documents	Check / Testing		Counter Check / Test	Accepting authority in GETCO
					agency	Extent		
1.	Detailed survey	a. Route alignment	Optimization of route length	a. Preliminary survey b. Topographical map c. Tower spotting data given by Engg. d. PLSCADD	Contractor	100% at field	100% based on record documents	Project in charge
		b. Route profiling & tower spotting	1. Ground clearance 2. Cold wt. span 3. Hot wt. span 4. Sum of Adj. span (Wind span) 5. Angle of Devn.	a. Sag template b. Tower spotting c. Route alignment d. PLSCADD	Contractor  -do- -do- -do-  -do-	100% at field -do- -do- -do-  -do-	100% based on record documents	Line in charge
2.	Check survey	Tower Location & Final Length	i) Alignment ii) Final length	a. Route alignment  b. Tower Schedule c. Profile d. PLSCADD	Contractor  -do- -do-	100% at field -do-	i) All angle towers in plains and 50% in hilly terrains. ii) Final length to be checked on 100% basis based on records / documents	Section in charge

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3.	Detailed Soil Investigation	a. Borelog	1. Depth of borelog 2. SPT Test 3. Collection of samples	As per Specification GETCO	Contractor	100% at Field	To witness 20% at Field	Section in charge
		b. Tests on samples	As per tech. specs.	As per Specification GETCO	Sample tested in third party NABL APPROVED LAB	100% by testing lab	Review of lab test results	Line in charge based on the report review by Engg. Cell
4.	Tower Foundation							
		A. Materials  1. Cement	1. Source approval	Source meeting GETCO Specification / Approved vendor	Contractor	As proposed by Contractor	To verify the proposal based on the supply made and factory test results	Line in charge
			2. Physical tests	As per document at Annexure-1 of this FQP at pg. 10, 11 & 12.	Samples to be taken jointly with GETCO and tested at GETCO approved lab.	Review of all MTC's and one sample for every 500 MT	100 % review of lab test results	Line in charge

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			3. Chemical Tests Chemical Composition of cement	-do-	Contractor to submit MTC	100% review of MTC by Contractor	100% review of MTC	Line in charge
		2. Reinforcement steel	1. Source approval	To be procured from main producers only or as per list of approved vendor issued by GETCO.	Contractor	As proposed by Contractor	To review the proposal based on the document	Line in charge
			2. Physical and chemical analysis test	As per annexure - 2 of this FQP at pg. 13	Contractor to submit MTC	All MTC's	100% review of MTC	Line in charge
		3. Coarse Aggregates	1. Source approval	Source meeting GETCO Specification , IS 456-2000	Contractor	Proposed by the Contractor, indicating the location of the quarry and based on the test results of join samples tested in third party NABL APPROVED LAB	To review the proposal based on the documents	Line in charge
			2. Physical tests	As per document at Annexure-3 of this FQP at page 14	Samples to be taken jointly and tested in third party NABL approved	One sample per lot of 200 cum or part thereof	100% review of lab test results	Line in charge

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					agency	Extent		
					lab			
		4. Fine aggregate	1. Source approval	Source meeting GETCO Specification, IS 456-2000	Contractor	Proposed by the Contractor, indicating the location of the quarry and based on the results of joint samples tested in third party NABL approved lab.	To review the proposal based on the documents.	Line In charge
			2. Physical test	As per Annexure-4 of this FQP at page 15	Samples to be taken jointly and tested in third party NABL approved lab.	One sample per lot of 200 cum or part thereof	100% review of lab test results	Line In charge
		5. Water	1. Cleanliness (Water shall be fresh and clean)	As per IS 456-2000	Contractor	100% visual check at Field	Verification random at	Site Engineer
			2. Suitability of water for concreting	As per IS 456-2000	Contractor	100% Visual Check at Field	Verification random at	Site Engineer

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		B. Classification	1. Visual observation of soil strata 2. Ground water level 3. History of water table in adj. Area / surface water 4. Soil Investigation wherever required.	As per IS 456-2000	Contractor	100% at Field	100% at Field	a. Section in charge b. In case of WBC/SFR/FS acceptance by Line In charge c. For Spl. Fdns. / pile fdns. Acceptance by Project In-charge
		C. Concrete Works a. Before concreting						
		1. Bottom of excavated earth 2. Stub setting  3. Reinforcement steel	Depth of foundation  1) Centre Line 2) Diagonals 3) Level of stubs Placement	Appd. Drgs.  -do-  Bare bending schedule	Contractor  -do-  -do-	100% at Field -do-  -do-	100% check by GETCO -do-  -do-	Jr.Engr/ Engr. -do-  -do-
		b. During concreting						
		1. Workability	Slump test	Range 25 mm to 55 mm refer document at Annexure-5 of this FQP at pg. 16	Contractor	100% at field	20% check at random	Jr.Engr. / Eng.

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					agency	Extent		
		2. Concrete Strength	Cubes comp. Strength	CPWD SPEC as referred in document at annexure-5 of this page at 16	Casting of cubes at site. Cubes to be tested at third party NABL appd. Lab for 28 days strength	One sample of 3 cubes in each tower locations.	100% review of lab test results. Cubes at 20% location are to be taken in presence of GETCO OFFICIALS	Section In charge
5.	Pile foundations	1. All materials like cement, steel coarse / fine aggregate, water	To be tested as per procedure enumerated in the respective columns above					
		2. Before concreting	1. Check for center line of each pile	Appd. Drawings	Contractor	100%	100%	Site Engr.
			2. Check for dia / verticality of each pile	-do-	-do-	-do-	-do-	-do-
			3. Check for depth of each pile	-do-	-do-	-do-	-do-	-do-
		3. During Concreting						
		a. Workability	1. Slump test	100-150 mm as per GETCO specn.	Contractor	Every one hour. For each pile	100% at field	Site Engr.

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		b. Concrete strength	2. Cubes compressive strength	As per GETCO specn.	Contractor. One set of cubes (Min. 6 nos.) to be taken and tested for 7&28 days strength at third party NABL appd. Lab.	One set for each pile. For pile caps, beams, Chimney, one sample for every 20 cu. M or part thereof for each day of concreting	100% cubes for piles, 20% Pile caps, beams, chimney etc. to be taken in presence of GETCO officials, 100% review of test results.	Section In charge
6.	Tower Erection	1. Materials a. Tower member/bolts & nuts/washers/accessories	Visual checking for 1. Stacking 2. Cleanliness 3. Galvanizing 4. damages	Appd. Drgs. / BOM	Contractor	100% at stores	100% verification of records	Site Engineer
		2. Erection of Super - structure	1. Sequence of erection	As per Appd. Drgs/. GETCO specification	Contractor	100% at field	100% at check	Site Engineer
			2. Check for completeness	-do-	-do-	-do-	-do-	-do-
			3. Tightening of nuts and bolts	-do-	-do-	-do-	-do-	-do-
			4. Check for verticality	-do-	-do-	-do-	-do-	-do-



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			5. Tack welding for bolts & nuts	GETCO specification	Contractor	100% at field	100% Check	Site Engineer
		3. Tower footing resistance (TFR)	TFR at locations before and after earthing	GETCO specification	Contractor	100% at field	20 % locations to be verified	Line In charge
7.	Stringing	1. Materials						
		a. Insulators	1. Visual check for cleanliness / glazing / cracks and white spots.	GETCO specification	Contractor	100% at field	100 % verification of records and to carry random checks 10%	Site Engineers
			2. IR value	(min. 50 M Ohms)	-do-	One test per sample size of 20 for every lot of 10,000	To verify Contractor's records 100% and joint check 20% of total tests	-do-
			3. E&M test		Insulator supplier	A. 20 per 10,000 for discs. b. 3 per 1500 for long rod	Collection of samples sealing them and handling over by GETCO to Insulator supplier	Tests to be witnessed / Appd. By GETCO at Manufacturer's works.
			4. Traceability (Make / batch No. / Locations where installed)	Packing list / CIP	Contractor	100% at field	100% Review of records	Site Engineer

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			5. Grading Ring availability and placement marking on SRI (220 & 400 kV class)	GETCO specification – on end fittings (220 kV- live side, 400 kV – both side)	Contractor	100% at field	100 % verification of records and to carry random checks 10%	Site Engineers
		b. Conductor	On receipt 1. Visual check of drum	Packing list	Contractor	100% at stores	20% check	Site Engineer
			2. Check for seals at both ends, and GETCO sticker on outer end	-do-	-do-	-do-	-do-	-do-
			3. Check depth from top of flange to the top of the outer most layer	-do-	-do-	-do-	-do-	-do-
		c. Earthwire	Check for seals at both ends	Packing list	Contractor	100% at stores	20% check	-do-
		2. Field activity						
		a. Before stringing	1. Readiness for stringing	Stringing procedures as per GETCO specification	Contractor	Readiness certificate to be submitted by the contractor	Review of certificate	Line In charge
			2. Completeness of towers, Bolt-nut tightened, tack welding done.	As per Appd. Drgs/. GETCO specification	Contractor	100% at field	Review of certificate & to carry random checks 100%	Executive Engineer

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			Certificate for the tower completeness to be submitted by contractor.					
			3. Availability of rollers for Earthwire/Conductor in working condition	As per the requirements of section	Contractor	100% at field	Review of certificate	Line In charge
			4. Availability of scaffolding arrangements, loose earthing sets	As per the requirements of section	Contractor	100% at field	Review of certificate	Line In charge
			5. Availability of approved stringing chart and sag-board	As per the requirements of section	Contractor	100% at field	Review of certificate	Line In charge
			6. For overhead crossing of EHV line, verification of span & tower type with extension	Approved crossing profile & stringing chart	Contractor	100% at field	100 % verification of records and to carry check 100%	Line In charge
			7. For overhead crossing of EHV line, height of Earthwire/OPGW of below line shall be verified with total station	Shall match with approved crossing profile	Contractor	100% at field	100 % verification of records and to carry check 100%	Line In charge
		b. During stringing	(Conductor / Earth-wire)					

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			1. Scratch / cut check (Visual)	Appd. Drawings / GETCO Specn.	Contractor	100% at Field	100% record & field check 20%	Site Engineer
			2. Repair sleeve	-do-	-do-	-do-	-do-	-do-
			3. Mid span joints	-do-	-do-	-do-	-do-	-do-
			4. Guying ( in case of towers not designed for one side stringing_	Appd.. Guying arrangement / GETCO specn.	-do-	-do-	100%	Section In charge
			5. Grading Ring provided for SRI	Approved drawing of SRI (220 kV live side, 400 kV both side)	Contractor	100% at field	100 % verification of records and to carry random checks 20%	Site Engineers
		c. After stringing	Check for					
			1. Sag / Tension	As per Annexure - 6	-do-	-do-	100% record & field check 20%	Site Engr.
			2. Electrical clearances	As per appd. Drgs. / GETCO specifications	-do-	-do-	-do-	-do-

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			i) Ground clearance	-do-	-do-	-do-	-do-	-do-
			ii) Live metal clearance etc.	-do-	-do-	-do-	-do-	-do-
			3. Jumpering	-do-	-do-	-do-	-do-	-do-
			4. Copper bond	As per Appd. Drngs. / GETCO Specification	Contractor	100% at field	100% record & field Check 20%	Site Engineer
			5. Placement of spacer / damper	As per specn. / drgs. / placement chart	-do-	-do-	-do-	-do-
8.	Final Testing							
	a. Pre - commissioning of lines	a. Readliness of lines for pre-commissioning	1. Completeness of line 2. Meggar test of line	GETCO latest pre-commissioning procedure	Contractor	100%	100% joint checking	Project In charge
	b. Commissioning of line	Readliness of lines for pre-commissioning	2. Digital photograph of each tower to ascertain the completeness of tower	a. GETCO latest pre-commissioning procedure b. Pre-commissioning Report c. CEA clearance	-do-	-do-	-do-	-do-

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			3. Electrical clearane Inspectors from CEA		-do-	-do-	-do-	-do-

**ORDINARY PORTLAND CEMENT**

Sr. No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269	Ordinary Portland Cement 43 grade as per IS 6112	Ordinary Portland Cement 53 grade as per IS 122269	Remarks
1.					
a)	<b>Physical tests</b>				To be conducted in appr'd. Lab.
(i)	Fineness	Specific surface area shall not be less than 225 sq. m. per Kg. or 2250 Cm <sup>2</sup> /gm.	Specific surface area shall not be less than 225 sq. m. per Kg or 2250 Cm <sup>2</sup> /gm.	Specific surface area shall not be less than 225 sq. m. per Kg or 2250 Cm <sup>2</sup> /gm.	Blaine's air permeability method as per IS 4031 (Part-2)
(ii)	Compressive strength	72+/- 1 hour: Not less than 16 Mpa (16 N/mm <sup>2</sup> )	72+/- 1 hour: Not less than 23 Mpa (23 N/mm <sup>2</sup> )	72+/- 1 hour: Not less than 27 Mpa (16 N/mm <sup>2</sup> )	As per IS 4031 (Part-6)
		168+/- 2 hour: Not less than 22 Mpa (22 N/mm <sup>2</sup> )	168+/- 2 hour: Not less than 33 Mpa (33 N/mm <sup>2</sup> )	168+/- 2 hour: Not less than 37 Mpa (37 N/mm <sup>2</sup> )	
		672+/- 4 hour: Not less than 33 Mpa (33 N/mm <sup>2</sup> )	672+/- 4 hour: Not less than 43 Mpa (43 N/mm <sup>2</sup> )	672+/- 4 hour: Not less than 53 Mpa (53 N/mm <sup>2</sup> )	
(iii)	Initial & Final setting time	Initial setting time : Not less than 30 minutes	Initial setting time : Not less than 30 minutes	Initial setting time : Not less than 30 minutes	As per IS 4031 (Part-5)
		Final setting time : Not more than 600 minutes	Final setting time : Not more than 600 minutes	Final setting time : Not more than 600 minutes	-do-
(iv)	Soundness	Unaerated cement shall not have an expansion of more than 10mm when tested by Le chatlier and 0.8% Autoclave test.	Unaerated cement shall not have an expansion of more than 10mm when tested by Le chatlier and 0.8% Autoclave test.	Unaerated cement shall not have an expansion of more than 10mm when tested by Le chatlier and 0.8% Autoclave test.	Le chatlier and Autoclave test as per IS 4031 (Part-3)
b	<b>Chemical composition tests</b>				
		Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.66 to 1.02	Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.66 to 1.02	Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.66 to 1.02	
		Ratio of percentage of alumina to that of iron oxide <b>Minimum 0.66%</b>	Ratio of percentage of alumina to that of iron oxide <b>Minimum 0.66%</b>	Ratio of percentage of alumina to that of iron oxide <b>Minimum 0.66%</b>	
		Insoluble residue, percentage by mass <b>Max. 4.00%</b>	Insoluble residue, percentage by mass <b>Max. 4.00%</b>	Insoluble residue, percentage by mass <b>Max. 4.00%</b>	
		Magnesia percentage by mass Max. 6%	Magnesia percentage by mass Max. 6%	Magnesia percentage by mass Max. 6%	
		Total sulphur content calculated as sulphuric	Total sulphur content calculated as sulphuric	Total sulphur content calculated as sulphuric	

Sr. No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269	Ordinary Portland Cement 43 grade as per IS 6112	Ordinary Portland Cement 53 grade as per IS 122269	Remarks
		anhydride (SO <sub>3</sub> ), percentage by mass Not more than 2.5 and 3.0 when tri-calcium aluminate percent by mass is 5 or less and greater than 5 respectively.	anhydride (SO <sub>3</sub> ), percentage by mass Not more than 2.5 and 3.0 when tri-calcium aluminate percent by mass is 5 or less and greater than 5 respectively.	anhydride (SO <sub>3</sub> ), percentage by mass Not more than 2.5 and 3.0 when tri-calcium aluminate percent by mass is 5 or less and greater than 5 respectively.	
c)	Total loss on Ignition	Not more than 5 percent	Not more than 5 percent	Not more than 5 percent	
2.	<b>POZZOLANA PORTLAND CEMENT AS PER IS 1489</b>				
a)	Physical tests	Fineness	Specific surface area shall not be less than 300 sq. m.. per Kg. or 3000 Cm <sup>2</sup> /gm		
		Compressive strength	168+/- hour : not less than 22 Mpa (22 N/mm <sup>2</sup> ) 672+/- hour : not less than 22 Mpa (22 N/mm <sup>2</sup> )		
		Initial & Final setting time	Initial setting time : Not less than 30 minutes Initial setting time : Not less than 600 minutes		
		Soundness	Un-aerated cement shall not have an expansion of more than 10 mm		Le chatlier and Autoclave test as per IS 4031 (Part-3)
b)	Chemical composition tests				
		a) Magnesia percentage by mass Max. 6%			
		b) Insoluble material, percentage by mass $x + 2 (100-x)/100$ where x is the declared % of pozzolana in the PPC			
		c) Total sulphur content calculated as sulphuric anhydride (SO <sub>3</sub> ), percentage by mass Not more than 2.75 and 3.0 when tri-calcium aluminate percent by mass is 7 or less and greater than respectively.			
c)	Total loss on Ignition	Not more than 5 percent			



**ACCEPTANCE CRITERIAL AND PERMISSIBLE LIMITS FOR REINFORCEMENT STEEL**

**Annexure - 2**

<b>Sr. No.</b>	<b>Name of the test</b>	<b>Mild and medium tensile steel as per IS 432</b>	<b>Cold twisted Deformed bars Fe 415 as per IS 1786</b>	<b>Remarks</b>
i)	Chemical analysis test	Carbon (for 20 mm dia and below) 0.23% Max.  Carbon (For over 20 mm dia) 0.25%	Carbon 0.30% Max	
		Sulphur 0.055%	Sulphur 0.060%	
		Phosphorus 0.055%	Phosphorus 0.060%	
			Sulphur & Phosphorus 0.11%	
ii)	Physical tests	a) Ultimate Tensile stress For all dia bars 410 N/Sq. mm.(Min)	a) Ultimate Tensile stress 10% more than actual 0.2% proof stress but not less than 485 N/Sq.mm.)	Testing in approved lab
		b) Yield stress (N/Sq.mm) For bars upto 20 mm dia 250 For bars above 20 mm dia 240 c) percentage of elongation 23%	b) 0.2% of proff stress / Yield stress (N/Sq. mm) min. For bars upto 20 mm dia 415 c) Percentage of elongation 14.5% (min)	Testing in approved lab
iii)	Bend & Rebend tests	Pass	Pass	Testing in approved lab

**ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR COARSE AGGREGATES AS PER IS 383**

**Annexure - 3**

<b>3.</b>	<b>Coarse Aggregates</b>										
i)	Physical Tests										
	a)Determination of particles	a. IS Sieve Designation	% age passing for Single-Sized Aggregate of nominal size					Percentage Passing for grades Aggregate of nominal size			
			40 mm	20 mm	16 mm	12.5 mm	10 mm	40 mm	20 mm	16 mm	12.5 mm
		63 mm	100	-	-	-	-	-	-	-	-
		40 mm	85 to 100	100	-	-	-	95 to 100	100	-	-
		20 mm	0 to 20	85 to 100	100	-	-	30 to 70	95 to 100	-	-
		16 mm	-	-	85 to 100	100	-	-	-	90-100	-
		12.5mm	-	-	-	85 to 100	100	-	-	-	90 to 100
		10 mm	0 to 5	0 to 20	0 to 30	0 to 45	85 to 100	10 to 35	25 to 35	30 to 70	40 to 85
		4.75 mm	-	0to 5	0 to 5	0 to 10	0 to 20	0 to 5	0 to 10	0 to 10	0 to 100
		2.36 mm	-	-	-	-	0 to 5	-	-	-	-
	b. Flakiness index		Not to exceed 25%								
	c. Crushing Value		Not to exceed 45%								
	d. Presence of deletrious material		Total presence of deleterious materials not to exceed 5%								
	e. Soundness test (for concrete work subject to frost action)		12% when tested with sodium sulphate and 18% when tested with magnesium sulphate								

**ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR FINE AGGREGATES AS PER IS 383****Annexure-4**

4.	<b>Fine aggregates</b>				
i)	Physical Tests	IS Sieve Designation	Percentage passing for graded aggregate of nominal size		
	a) Determination of particle size		F.A. Zone I	F.A. Zone II	F.A. Zone III
		10 mm	100	100	100
		4.75 mm	90-100	90-100	90-100
		2.36 mm	60-95	75-100	85-100
		1.18 mm	30-70	55-90	75-100
		600 microns 12.5 mm	15-34	35-59	60-79
		300 microns	5 to 20	8 to 30	12 to 40
		150 microns	0-10	0-10	01-0
	b) Silt content		Not to exceed 8%	Not to exceed 8%	Not to exceed 8%
	c) Presence of deleterious material	Total presence of deleterious materials shall not exceed 5%			
	d) Soundness Applicable to concrete work subject to frost action	12% when tested with sodium sulphate and 15% when tested with magnesium sulphate			

## **ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CONCRETE WORK**

**Annexure-5**

<b>1)</b>	<b>Concrete</b>	a) Workability	Slump shall be recorded by slump cone method and it shall be between 25-55
		b) Compressive strength	Three samples of 15 cm cube for 28 days compressive strength for all concrete works except pile foundation work shall be taken. For pile foundation works, six cubes, three for 7 days testing and balance three for 28 days testing shall be taken.

### **Notes:**

1. For nominal (Volumetric concrete mixes, compressive strength for 1:1.5:3 (Sand: fine aggregates: Coarse aggregates) concrete shall be 265 kg/Sq.cm. for 28 days and for 1:2:4 nominal mix, it shall be 210 kg/Sq.cm.
2. ACCEPTANCE CRITERIA BASED ON 28 DAYS COMPRESSIVE STRENGTHS FOR NOMINAL MIX CONCRETE:
  - a) The average of the strength of three specimen be accepted as the compressive strength of the concrete, provided the strength of any individual cube shall neither be less than 70% nor higher than 130% of the specified strength.
  - b) If the actual average strength of accepted sample exceeds specified strength by more than 30%, the Engineer-in charge, if he so desires, may further investigate the matter. However, if the strength of any individual cube exceeds more than 30% of the specified strength, it will be restricted to 30% only for computation of strength.
  - c) If the actual average strength of accepted sample is equal to or higher than specified upto 30%, the strength of the concrete shall be considered in order and the concrete shall be accepted at full rates.
  - d) If the actual average strength of accepted sample is less than specified strength but not less than 70% of the specified strength, concrete may be accepted at reduced rate at the discretion of Engineer-in-charge.
  - e) If the actual average strength of accepted sample is less than 70% of specified strength, the Engineer-in-charge shall reject the defective portion of work represent by sample and nothing shall be paid for the rejected work. Remedial measures necessary to retain the structure shall taken at the risk and cost of contractor. If, however, the Engineer-in-charge so desires, he may order additional tests to be carried out to ascertain if the structure can be retained. All the charges in connection with these additional tests shall be borne by the contractor.

### **General**

- 1) This standard Field Quality Plan is not to limit the supervisory checks which are otherwise required to be carried out during execution of work as per drawings / Technical specifications etc.
- 2) All materials / Equipments should be purchased from GETCO's approved Vendors only.
- 3) Contractors shall be responsible for implementing / documenting the FQP. Documents shall be handed over by the contractor to GETCO after the completion of the work.
- 4) Projection in charge means over all in charge of work. Line in charge mean in charge of the line. Section in-charge means incharge of the section.
- 5) In case of deviation the approving authority will be one step above the officer designated for acceptance in this quality plan subject to minimum level of Lien in charge.
- 6) Acceptance criteria and permissible limits for tests are indicated in the Annexures. However for further details / tests GETCO specification and relevant Indian standards shall be referred.
- 7) Tests as mentioned in this FQP shall generally be followed. However, E.I.C., reserves the right to order additional tests wherever required necessary at the cost of the agency..
- 8) All counter checks / tests by GETCO shall be carried out by GETCO's officials atleast at the level of Jr.Engr.

**SAG AND CLEARANCES**

Name of Line													
Name of Contractor													
A/T No.													
Jurisdiction													
1	2	3	4	5	6	7	8		9				
Section (AP to AP)	Individual Span (in meters)	Date of string ing / Final Sag	Ambie nt Tempe rature	Sag measu red	Final Groun d cleara nce	Minim um Live to metal cleara nce at cross arms	Crossing HV/EHV/Railway		Recheck before charging of line				
							Overhead	Underpass	Date	Temp.	Groun d cleara nce	Crossing HV/EHV/Railway	
							Clearance between top conductor/EW/ OPGW of existing line to bottom conductor of new line	Clearance between top conductor/EW /OPGW of new line to bottom conductor of existing line				Overhead	Underpass
												Clearance between top conductor/EW/ OPGW of existing line to bottom conductor of new line	Clearance between top conductor/EW/ OPGW of new line to bottom conductor of existing line

Signed &amp; Sealed by Contractor

## NOTE :-

- 1) THE ANNEXURE-6 COLUMN (1) TO (8) SHALL BE FILLED UP AT THE TIME OF STRINGING AND SUBMITTED TO LINE IN-CHARGE.
- 2) THE ANNEXURE-6 SHALL BE DULY FILLED UP SECTION WISE AND SUBMITTED TO LINE IN-CHARGE IN ADVANCE (BEFORE 15 DAYS MINIMUM) BEFORE SCHEDULED LINE CHARGING. THE SAME SHALL BE REVIEWED AND CROSSING LOCATIONS SHALL BE VERIFIED BY LINE IN-CHARGE.
- 3) THE ANNEXURE-6 SHALL BE A PART OF CONTRACT CLOSING DOCUMENT.

**CERTIFICATE FOR TOWER COMPLETENESS BEFORE STRINGING ACTIVITY**

Name of Line							
Name of Contractor							
A/T No.							
Date							
Section							
Particulars	Tower Loc. No.	Tower Loc. No.	Tower Loc. No.	Tower Loc. No.	Tower Loc. No.	Tower Loc. No.	Tower Loc. No.
1. All members & Bolt-Nut provided as per tower erection drawing & BOM approved.							
2. Bolt – Nut tightened.							
3. Tack welding done on Bolt-Nut.							
4. Tower earthing provided.							
5. Verticality of Tower (no bending in main legs)							

Signed & Sealed by Contractor

NOTE :-

- 1) THE CERTIFICATE SHALL BE DULY FILLED UP SECTION WISE AND TOWER WISE AND SUBMITTED TO LINE IN-CHARGE OF AGENCY IN ADVANCE. THE SAME SHALL BE REVIEWED AND CROSS CHECK 100% BY EE.
- 2) THE CERTIFICATE SHALL BE A PART OF CONTRACT CLOSING DOCUMENTS.