

STANDARDISED FIELD QUALITY PLAN



Item	Civil works for site awarded Packages (up to Rs 15 Lakhs)
Applicability	POWERGRID PROJECTS
Date of Issue	15 th September 2020
Validity	Till next revision

SFQP No.	DOC No.C/FQA/SFQP/SITE-M-CIVIL-2020
REV.	00

S. No.	Description of Activity	Items to be Checked	Tests/Checks to be done	Ref. documents	Check/Testing		Counter Check/Test by POWERGRID	Accepting authority in POWERGRID
					Agency	Extent		
1.0	Materials	1. Cement	Brand approval	Cement of approved brands according to the COV in POWERGRID website may be procured through Manufacturer/ Authorized dealers having proper traceability. Refer COV in POWERGRID website for list of producer. As per document at Annexure-1 of this FQP	Contractor	As proposed by contractor	100% verification for approved brand.	Site in Charge
			Physical & Chemical Tests		Contractor to submit MTC	Review of all MTC	100 % review of MTC results	Site Engineer
		2. a) Reinforcement Steel	Brand approval	Reinforcement Steel of approved brands according to the COV in POWERGRID website may be procured through Manufacturer/ Authorized dealers having proper traceability. Refer COV in POWERGRID website for list of producer. As per document at Annexure-2 of this FQP	Contractor	As proposed by contractor	100% review of MTC and 100% physical verification of embossing of manufacturer trade mark at site and photographs of the same with record.	Site in Charge
			Physical & Chemical Tests		Contractor to submit MTC	Review of all MTC	100 % review of MTC results	Site Engineer
			Unit Weight	Unit weight of three samples of each size / each brand (all sizes of 10 mm & above) to be carried out in presence of POWERGRID to ascertain their acceptance as per technical /IS specification. The weighted samples at site may be kept under custody till completion of tenure of contract with the records	Contractor	100%	100% counter check to be carried out	Site Engineer

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		2. b) Structural steel. For roof truss, door & window frames, boundary wall, gates, grills, railings gratings & rolling shutter etc.	Brand to be proposed by contractor.	POWERGRID Specifications	Contractor	As proposed by contractor	To verify the documents	Site in Charge
			1. Visual & Dimensional check for damages, rusting & pitting, welding, primer coating, painting/ galvanizing as applicable.	POWERGRID specifications and approved drawing	Contractor	100%	Random	Site Engineer
			2. Physical properties a) Structural steel (including tubular pipes)	Unit weight for each section/ each brand to be carried out in presence of POWERGRID to ascertain their acceptance as per technical specification/IS. The weighted samples at site may be kept under custody till completion of tenure of contract with the records	Contractor	Review of all MTC	100 % review of MTC results	Site in Charge

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		3. Coarse Aggregates	Source approval <i>(if approved source is not available in the vicinity)</i>	As per Annexure-3 of this SFQP	Contractor	Proposed by the contractor, indicating the location of quarry and based on test results of joint samples tested in POWERGRID approved lab.	100% review of test results	Site in Charge Once approved the particular quarry shall be used for all the running packages
		4. Fine aggregate	Source approval <i>(if approved source is not available in the vicinity)</i>	As per Annexure-4 of this FQP	Contractor	Proposed by the contractor, indicating the location of quarry/River Ghat based on test results of joint samples tested in POWERGRID approved lab.	100% review of test results	Site in Charge Once approved the particular quarry/River Ghat shall be used for all the running packages
		5. Water	1. Cleanliness	POWERGRID Specification (Water shall be fresh and clean)	Contractor	100% visual check at Field	Verification at random	Site Engineer
			2. PH Value	- do -	Contractor	One sample per source with calibrated PH meter at site	100% review of test results Ph value not less than 6	Site Engineer

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2.0	Concreting	Concrete Strength (For R.C.C.)	Cubes Compressive Strength	As per Annexure-5 of this SFQP.	Contractor Casting of cubes at site. Cubes to be tested for 28 days strength at POWERGRID Lab/ POWERGRID approved Lab. Cubes are to be taken in presence of POWERGRID officials.	One sample of 03 cubes for every 20 Cum or part thereof. The minimum quantity for cube sampling in a day shall be 3 Cum. In case quantity is less than 3 Cum in a day, no sampling is required to be taken for that day However, one sample shall be taken for every 20 Cum cumulative quantity of concreting for testing. Further, there shall be minimum one sample of cubes for each grade of RCC in the particular work.	100% review of test results. Normally testing shall be carried out at the POWERGRID in-house cube testing facility. Alternatively, samples shall be tested at POWERGRID approved Labs, in this case, test results shall be sent by the Lab, by E-mail directly to POWERGRID; further, hard copy of Test Certificate shall also be sent by the Lab directly to POWERGRID by Postal Address. Note: The efforts shall be made to carry out 100% cube testing in the in-house cube testing facility	Site in Engineer. Testing to be witnessed by POWERGRID.

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3.0	Brick Masonry							
	a) Clay Bricks b) Fly Ash Bricks		Physical tests 1. Dimensional tolerance (For a particular work where less than 5000 nos. of bricks are to be used, only visual checks are to be done)	POWERGRID Specification/ enclosed Annexure-6	Contractor (samples to be taken jointly and tested at site in presence of POWERGRID)	Enclosed Annexure -6	100% review of test results	Site Engineer
			2. Compressive Strength	POWERGRID Specification/ enclosed Annexure-6	-Do-	-Do-	-Do-	Site Engineer
			3. Water Absorption	POWERGRID Specification/ enclosed Annexure-6	-Do-	-Do-	-Do-	Site Engineer
			4. Efflorescence	POWERGRID Specification/ enclosed Annexure-6	-Do-	-Do-	-Do-	Site Engineer



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4.0	Stone for Masonry	Stone	1. Compressive Strength <i>(if approved source is not available in the vicinity)</i>	IS: 1121 (Part-I) & CPWD Specification clause 7.1 Stone with round surface shall not be used	By Contractor	One sample per source shall be tested in POWERGRID approved Lab If the volume of Stone masonry is >25 cum	100% review of Test Results	Site Engineer
			2. Water Absorption <i>(if approved source is not available in the vicinity)</i>	IS: 1124-1974 & CPWD Specification clause 7.1 Stone with round surface shall not be used	By Contractor	One sample per source shall be tested in POWERGRID approved Lab If the volume of Stone masonry is >25 cum	100% review of Test Results	Site Engineer
5.0	Tiles for Floorings & walls	1. Glazed/ Ceramic tiles 2. Vitrified Tiles (of approved brand)	1. Water Absorption 2. Crazing Test 3. Impact Test Strength	IS: 15622 & POWERGRID Specification	By Contractor	100% If total quantity of tiles is > 50 sqm	100 % review of MTC/Broucher/Catalogue results	Site in Charge

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6.0	Finishing materials of building	Type / quality /class of finishing building material (of approved brand)	Physical verification of Different items as per specifications	POWERGRID Specifications	Contractor	100%	100%	Site In charge.
7.0	Timber	1.Timber for Door & Window Frame	1. Moisture content	IS: 287 & CPWD Specification	By Contractor	If total quantity of timber is > 0.5 cum	100 % review of MTC results If MTC is not available 1 sample to be tested at POWERGRID approved Lab.	Site In charge.
8.0	Aluminum Door& window sections	1. Physical & Chemical Properties 2. Anodic coating/ Powder Coating*	1.End Immersion Test 2. Knife Test 3.Glue Adhesion Test Thickness of Coating	POWERGRID Specification IS : 733 & IS : 1285 Specifications enclosed at Annexure- 9 IS : 5523 POWERGRID specification, approved drawings and CPWD specification	By Contractor Contractor to submit MTC By Contractor	100% If total quantity of shutters is > 20 nos. Review of all MTCs	100 % review of MTC results If MTC is not available 1 sample to be tested at POWERGRID approved Lab. 100 % review of MTC results	Site In charge. Site Engineer



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					Agency	Extent						
9.0	G.S. Barbed Wire/ Concertina Fencing Coil	G.S. Barbed Wire/ Concertina Fencing coil	1. Visual Check	IS: 278, POWERGRID specification & CPWD specification.	By Contractor	100%	100 % review of MTC results	Site Engineer				
			2. Dimension Weight & Size.						By Contractor	100%	100 % review of MTC results If MTC is not available 1 sample to be tested at POWERGRID approved Lab.	Site Engineer
			3. Tensile test, zinc coating test and ductility test						By Contractor	100%	100 % review of MTC results If MTC is not available 1 sample to be tested at POWERGRID approved Lab.	Site Engineer
10.0	Road (WBM / WMM layers)											
	Material	A. Coarse Aggregates	Source approval <i>(if approved source is not available in the vicinity)</i>	As per document at Annexure-8 of this FQP	Contractor.	Proposed by the contractor, indicating the location of quarry and based on test results of joint samples tested in POWERGRID approved lab.	100% review of test results	Site In charge Once approved the particular quarry shall be used for all the running packages				

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		B) Stone Screening	Source approval <i>(if approved source is not available in the vicinity)</i>	As per document at Annexure-8 of this FQP	Contractor.	Proposed by the contractor, indicating the location of quarry and based on test results of joint samples tested in POWERGRID approved lab.	100% review of test results	Site In charge Once approved the particular quarry shall be used for all the running packages
		C) Binding Material	Source approval <i>(Plasticity index)</i> <i>(if approved source is not available in the vicinity)</i>	As per document at Annexure-8 of this FQP	Contractor	Proposed by the contractor, indicating the location of quarry and based on test results of joint samples tested in POWERGRID approved lab.	100% review of test results	Site In charge
		D) Laying of sub base Course	Physical check	As per CPWD spec clause 17.7.2	Contractor	100%	Random	Site Engineer
		E) Laying of base Course	Physical check	As per CPWD spec clause 17.8.1	Contractor	100%	Random	Site Engineer



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Annexure-1(Sheet 01 of 03)

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CEMENT

ORDINARY PORTLAND CEMENT			
S. No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269: 2015	Ordinary Portland Cement 53 grade as per IS 269: 2015
a)	Physical tests	To be conducted in POWERGRID approved Lab/ Review of MTC only	
(i)	Fineness	Specific surface area shall not be less than 225 sq.m. per Kg. or 2250 cm ² per gm.	Specific surface area shall not be less than 225 sq.m. per Kg or 2250 cm ² per gm.
(ii)	Compressive strength	72 ± 1 hour : Not less than 16 Mpa (16 N/mm ²) 168 ± 2 hour : Not less than 22 Mpa (22 N/mm ²) 672 ± 4 hour : Not less than 33 Mpa (33 N/mm ²), <i>Not more than 48Mpa (48N/mm²)</i>	72 ± 1 hour : Not less than 27Mpa (27 N/mm ²) 168 ± 1 hour : Not less than 37Mpa (37 N/mm ²) 672 ± 1 hour : Not less than 53 Mpa (53 N/mm ²)
(iii)	Initial & Final setting time	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes
iv)	Soundness	Unaerated cement shall not have an expansion of more than 10mm when tested by Le Chatlier and 0.8% by Autoclave test.	Unaerated cement shall not have an expansion of more than 10mm when tested by Le Chatlier and 0.8% by Autoclave test.
			Blaine's air permeability method as per IS 4031 (Part-2):1999, Reaffirmed 2013
			As per IS 4031 (Part-6): 1988, Reaffirmed 2014
			As per IS 4031 (Part-5): 1988 Reaffirmed 2014.
			-do-
			Le Chatlier and Autoclave test as per IS 4031 (Part-3): 1988, Reaffirmed 2014.

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		Annexure-1(Sheet 02 of 03)	
S. No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269: 2015	Ordinary Portland Cement 43 grade as per IS 269: 2015
b)	Chemical composition tests		
	a) Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.66 to 1.02%	a) Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.66 to 1.02%	a) Ratio of percentage of lime to percentage of silica, alumina & iron oxide 0.80 to 1.02%
	b) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%	a) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%	a) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%
	c) Insoluble residue, percentage by mass Max. 5.00%	c) Insoluble residue, percentage by mass Max. 5.00%	c) Insoluble residue, percentage by mass Max. 5.00%
	d) Magnesia percentage by mass Max. 6%	d) Magnesia percentage by mass Max. 6%	d) Magnesia percentage by mass Max. 6%
	e) Total Sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.	e) Total Sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.	e) Total Sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.
	f) Total loss on ignition shall not be more than 5 percent	f) Total loss on ignition shall not be more than 5 percent	f) Total loss on ignition shall not be more than 4 percent
	g) Chloride content, percent by mass, max 0.1%	g) Chloride content, percent by mass, max 0.1%	g) Chloride content, percent by mass, max 0.1%
			Review of MTC only

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Annexure-1 (Sheet 03 of 03)

S. No.	Name of the test	Remarks
2.	POZZOLANA PORTLAND CEMENT AS PER IS 1489	To be conducted in POWERGRID approved Lab/ Review of MTC only
a)	Physical tests	Specific surface area shall not be less than 300 sq.m. per Kg. or 3000 Cm ² /gm
	i) Fineness	
	ii) Compressive strength	a) 72 ± 1 hour : Not less than 16 Mpa (16 N/mm ²) b) 168 ± 2 hour : Not less than 22 Mpa (22 N/mm ²) c) 672 ± 4 hour : Not less than 33 Mpa (33 N/mm ²)
	iii) Initial & Final setting time	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes
	iv) Soundness	Unaerated cement shall not have an expansion of more than 10mm Le Chatlier test and 0.8% by Autoclave test as per IS 4031 (Part-3)
b)	Chemical composition tests	
	a) Magnesia percentage by mass Max. 6%	Review of MTC only
	b) Insoluble material, percentage by mass $x + 4 (100-x)/100$ where x is the declared % of pozzolana in the PPC	-do-
	c) Total sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.0	-do-
	d) Total loss on ignition shall not be more than 5 percent	-do-

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Annexure-2

**ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR REINFORCEMENT STEEL
AS PER IS 1786-1985 Edition-4.3 (2004-12)**

S. No.	Name of the test	Fe 415	Fe 500	Fe 500D	
i)	Chemical analysis test	Carbon	0.30 Percent Maximum	0.25 Percent Maximum	
		Sulphur	0.060 Percent Maximum	0.055 Percent Maximum	0.040 Percent Maximum
		Phosphorus	0.060 Percent Maximum	0.055 Percent Maximum	0.040 Percent Maximum
		Sulphur & Phosphorus	0.11 Percent Maximum	0.105 Percent Maximum	0.075 Percent Maximum
		Physical tests			
ii)	a) Tensile Strength Minimum	10% more than actual 0.2% proof stress but not less than 485 N/Sq.mm.	8 % more than actual 0.2% proof stress but not less than 545 N/Sq.mm	10% more than actual 0.2% proof stress but not less than 565 N/Sq.mm	
	b) 0.2% of proof stress/Yield stress Minimum, N/mm ²	415	500	500	
	c) Elongation percent , Minimum	14.5	12	16	
iii)	Bend & Re-bend tests	Pass	Pass	Pass	

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Annexure-3

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR COARSE AGGREGATES AS PER IS 383:2016

3. Coarse Aggregates (Physical Tests)	a. IS Sieve Designation	%age passing for Single-Sized Aggregate of nominal size							Percentage Passing for graded Aggregate of nominal size							
		40 mm	20 mm	16 mm	12.5 mm	10 mm	40 mm	20 mm	16 mm	12.5 mm	40 mm	20 mm	16 mm	12.5 mm		
	63 mm	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	40 mm	85 to 100	100	-	-	-	-	-	-	90 to 100	100	-	-	-	-	-
	20 mm	0 to 20	85 to 100	100	-	-	-	-	-	30 to 70	90 to 100	100	-	-	100	-
	16 mm	-	-	85 to 100	100	-	-	-	-	-	-	90-100	-	-	-	-
	12.5 mm	-	-	-	85 to 100	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 55	30 to 70	40 to 85	0 to 10	0 to 5	0 to 10	0 to 10	0 to 10	-
	4.75 mm	-	0 to 5	0 to 5	0 to 10	0 to 20	0 to 5	0 to 10	0 to 5	0 to 10	0 to 5	0 to 10	0 to 5	0 to 10	0 to 5	0 to 10
	2.36 mm	-	-	-	-	0 to 5	0 to 5	0 to 10	0 to 5	0 to 5	0 to 5	0 to 5	0 to 5	0 to 5	0 to 5	0 to 5
	b. Combined Flakiness and Elongation index	Not to exceed 40%														
	c. Crushing Value	Not to exceed 30%														
	d. Presence of deleterious material	<i>Total presence of deleterious materials not to exceed 5% for uncrushed, 2% for crushed and manufactured coarse aggregates</i>														
	e. Hardness	Abrasion value not more than 50%, Impact value not more than 45%														
	f. Soundness test (for concrete work subject to frost action)	Not to exceed 12% when tested with sodium sulphate and 18% when tested with magnesium sulphate														

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Annexure-4

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR FINE AGGREGATES AS PER IS 383

4. Fine aggregates	IS Sieve Designation	Percentage passing for		
		F.A. Zone I	F.A. Zone II	F.A. Zone III
i) Physical Tests				
a) Determination of particle size	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	15-34	35-59	60-79
	300 microns	5 to 20	8 to 30	12 to 40
	150* microns	0-10	0-10	0-10
b) Presence of deleterious material *	<i>Total presence of deleterious materials not to exceed 5% for uncrushed & 2% for crushed/Mixed and manufactured fine aggregates.</i>			
c) Soundness Applicable to concrete work subject to frost action	10% when tested with sodium sulphate and 15% when tested with magnesium sulphate			

*For crushed stone sands, the permissible limit on 150 micron IS Sieve is increased to 20 percent.

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Annexure-5

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CONCRETE WORK

1)	Concrete	b) Compressive strength	For nominal (volumetric) concrete mixes compressive strength for 1:1.5:3 (Cement : Fine aggregates : Coarse aggregates) concrete 28 days strength shall be min 265Kg/cm ² and for 1:2:4 (Cement: Fine Aggregate: Coarse Aggregate) nominal mix concrete 28 days strength shall be min 210Kg/cm ² .
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Notes:

1) **ACCEPTANCE CRITERIA BASED ON 28 DAYS COMPRESSIVE STRENGTHS FOR NOMINAL MIX CONCRETE: As per clause 5.4.10.4 of CPWD Specifications, Volume 1**

- (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 strength of any individual cube exceeds more than 30% of specified strength, it will be restricted to 130% only for computation of strength.
- (c) If the actual average strength of accepted sample is equal to or higher than specified strength up to 30% then 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, the concrete may be accepted after reconfirmation by NDT/Core test on the location portion represented by the cube samples in line with approved Standard Testing Procedure of POWERGRID
- (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 represented by sample and nothing shall be paid for the rejected work. Remedial measures necessary to retain the structure shall be 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.

2) 53 Grade cement shall be used after obtaining specific approval of the Engineer in charge

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Annexure- 6 (Sheet 01 of 02)

SAMPLING PLAN FOR BRICK-WORK

Scale of sampling and permissible number of defectives for visual and dimensional characteristics.

No of Bricks in the lot	For characteristics specified for individual bricks		For Dimensional characteristics for group of 20 bricks- No of bricks to be selected
	No of bricks to be selected	Permissible no of defective in the sample.	
(1)	(2)	(3)	(4)
5001-35000	20	2	40

Note: For a particular work where less than 5000 nos. of bricks are to be used, only visual checks are to be done.

Scale of sampling for physical characteristics

Lot size	Sampling size for compressive strength water absorption and efflorescence	Permissible No of defectives for efflorescence
(1)	(2)	(3)
5001-35000	5	0

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Annexure- 6 (Sheet 02 of 02)

ACCEPTABLE CRITERIA FOR BRICK WORK

1) Dimensional Tolerances: The dimensions of modular/ Non modular bricks when tested shall be within the following limits per 20 bricks.

S.No	DESCRIPTION	MODULAR BRICKS	NON-MODULAR BRICKS
1	LENGTH	372 to 388 cm (380± 8 cm)	432 to 468 cm (450 ± 18)
2	WIDTH	176 to 184 cm (180± cm)	213 to 231cm (222± 9)
3	HEIGHT	176 to 184 cm (180± 4 cm)	134 to 146 cm (140 ± 6)

- 2) Compressive strength: the bricks shall have a minimum average compressive strength as specified in POWERGRID specification. The compressive strength of any individual brick tested shall not fall below the min. average compressive strength specified for the corresponding class of brick by more than 20%. In case compressive strength of any individual brick tested exceeds the upper limit specified for the corresponding class of bricks, the same shall be limited to upper limit of the class as specified for the purpose of calculating the average compressive strength.
- 3) Water absorption: The average water absorption of bricks shall not be more than 20% by weight.
- 4) Efflorescence: The rating of efflorescence of bricks shall not be more than moderate.

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Annexure-7

TABLE - I : SAMPLING FREQUENCY FOR BARBED WIRE

S. No.	NUMBER OF REELS IN THE LOT	NO. OF REELS TO BE SELECTED FOR SAMPLING
1.	UPTO 25	3
2.	26 TO 50	4
3.	51 TO 150	5
4.	151 TO 300	7
5.	301 AND ABOVE	10

TABLE - II : ACCEPTABLE TENSILE PROPERTIES AS PER IS 278

S. NO.	SIZE OF LINE WIRE (MM)	TENSILE STRENGTH OF LINE WIRE N/SQ.MM	MINIMUM BREAKING LOAD OF COMPLETED BARBED WIRE (KN)
1.	2.50	390 TO 590	3.7
2.	2.24	390 TO 590	3.0



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Annexure-8 (Sheet 01 of 02)

PHYSICAL, REQUIREMENT OF COARSE AGGREGATE

S. No.	Type of Construction.	Type of W.B.M.	Test Method	Requirements
1.	Sub-base	Los Angeles Abrasion Value or Aggregate Impact value	IS:2386(Part.IV) IS:2386 (Part IV) IS:5640	60% max. * 50% max
2.	Base	a) Los Angeles Abrasion Value or Aggregate Impact value b) Flakiness Index	IS:2386(Part IV) IS:2386 (Part IV) IS:5640 IS:2386 (Part I)	50% max. * 40% max ** 15% max
3.	Surface Course	a) Los Angeles Abrasion Value or Aggregate Impact value b) Flakiness Index	IS:2386(Part IV) IS:2386 (Part IV) IS:2386 (Part I)	40% max. 30% max 15% max
4	Binding Material	Plasticity index	IS :2720 (Part V)	Less than 6

* Aggregates may satisfy requirements of either of the two tests

** The requirements of flakiness index shall be enforced only in case of crushed/broken stone and crushed slag.

*** Aggregates like brick metal, kankar and laterite which get softened in presence of water, shall be tested for impact value under wet conditions in accordance with IS:5640.

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Annexure-8 (Sheet 02 of 02)

GRADING REQUIREMENTS OF COARSE AGGREGATE FOR W.B.M

Grading No.	Size Range	Sieve designation	% by weight passing the sieve
1	90mm to 45mm (Suitable for sub base courses of compacted layer of not less than 90mm thickness).	125mm	100
		90mm	90-100
		63mm	25-60
		45mm	0-15
		22.4mm	0-5
2.	63mm to 45mm	90mm	100
		63mm	90-100
		53mm	25-75
		45mm	0-15
		22.4mm	0-5
3.	53mm to 22.4mm	63mm	100
		53mm	95-100
		45mm	65-90
		22.4mm	0-10
		11.2mm	0-5
4	Screening A) 13.2 mm	13.2 mm	100
		11.2 mm	95-100
	B) 11.2 mm	5.6 mm	15-35
		180 micron	0-10
		11.2 mm	100
		5.6 mm	90-100
		180 micron	15-35

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Annexure-9

**ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR ALUMINIUM SECTIONS
AS PER IS 733-1983 & IS 1285-2002 (Designation 63400)**

S. No.	Name of the test	Acceptable limits as per IS 1285-2002
i)	Chemical analysis test	
	Magnesium (Mg)	0.40 – 0.90 Percent
	Silicon (Si)	0.30 – 0.70 Percent
	Manganese (Mn)	0.30 Percent Maximum
	Iron (Fe)	0.60 Percent Maximum
	Copper (Cu)	0.10 Percent Maximum
	Zinc (Zn)	0.20 Percent Maximum
ii)	Titanium	0.20 Percent Maximum
	Chromium	0.10 Percent Maximum
	Aluminium	Reminder
	Physical tests (For Designation 63400 & Condition/Tempor 'W')	
b)	Tensile Strength	140.00 MPa Minimum
	0.2% of proof stress/Yield stress	80.00 MPa Minimum
	Elongation percent on 50mm	14.0 % Minimum
iii)	Thickness of the finished Anodic/polyester powder coating measured by micron meter	Shall not be less than 50 micron nor more than 120 micron at any point.

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General Notes:

- 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) Contractor shall be responsible for implementing/documenting the SFQP. Documents shall be handed over by the contractor to POWERGRID after the completion of the work.
- 3) Project in-charge means over all in-charge of work. Site in-charge means in-charge of the Station/line. Site engineer means in -charge of the section.
- 4) Site Engineer's responsibility may be allocated to Site JE, with the approval of Regional Head, only in such cases where, Site Engineer is not in position.
- 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 Site ~~Line~~ in-charge.
- 6) Acceptance criteria and permissible limits for tests are indicated in the Annexures. However for further details/tests POWERGRID/CPWD specification and latest 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 for various materials if necessary. Contractor shall arrange testing as directed by the Engineer in charge.
- 8) All counter checks/tests by POWERGRID shall be carried out by POWERGRID's officials' at least at the level of Site Engineer.
- 9) Cement is to be used in the order; it is delivered (i.e. First in First Out). In case the cement remains in storage for more than 3 months, the cement shall be retested before use and shall be rejected, if it fails to conform to any of the requirements given in the relevant Indian Standard. Cement shall be packed in bags and stored in accordance with the provisions in IS 4082:1996, Reaffirmed 2003.
- 10) **All the charges in connection with NDT/ Core tests in case of failure of cube samples shall be borne by the contractor.**
- 11) **Where ever testing at third party laboratory is required, the actual test charges to be reimbursed to contractor on submission of the documents for testing charges along with the bills.**

