INDICATIVE FIELD QUALITY PLAN

Annexure II

	ITEM : Civil Work	QP NO. : 1	PROJECT:	DEMONSTRATION OF METHANOL FIRING IN RAJIV GANDHI COMBINED CYCLE POWER PLANT , KAYAMKULAM
PE&SD	SUB-SYSTEM : CIVIL,PILE FOUNDATIONS, AND STRUCTURAL STEEL WORKS ETC.	REV. NO. : R1	PACKAGE:	ALL CIVIL PACKAGES
		DATE : 06.09.2024	CONTRACT NO. :	CS-0011-130A-9-FC-COA-7459 Dt.13.08.2024
		PAGE :	MAIN CONTRACTOR :	BHEL

Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	D*	Remarks
1	2	3		4	5	6	7	8	9		10
1	**GENERAL REQUIREMENTS**										
A	Setting up of Field QA&QC laboratory, Availability of requisite laboratory set up and equipment in good working condition & duly calibrated well before commencement of concerned activity.		As agreed / required	B	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. Drawings		SR	√	The contractor shall establish the mobilize the requisite laboratory equipment/set up and skilled QA&QC manpower within 30 days from the mobilization date of Main contractor at site. Functioning & calibration status of laboratory equipment in proper working condition to be verified on monthly basis.
B	Submission of QA & QC manpower deployment schedule and availability of manpower		As agreed / required	B	Physical	Manpower shall be deployed progressively as per the work front and discipline wise progress	Tech Specs and Const. Drawings		SR	√	
C	Sampling for testing of construction materials (Coarse aggregate, fine aggregate etc.), materials for concrete mix design etc.		As agreed / required	A	Physical	Once per each source	Tech Specs and Const. Drawings		SR/TR	√	Test report along with the recommendations from Owner acceptable laboratories to be submitted to EIC/FQA head for their review and acceptance.
D	Submission of Monthly Test/QA reports/data		As agreed / required	A	Physical	Monthly	Tech Specs and Const. Drawings		SR/TR	√	
E	Stacking and storage of construction materials and components at site		As per IS:4082	B	Physical	Random in each week	Tech Specs and Const. Drawings, Manufacturer's guidelines and IS 4082		SR		
F	Survey										
	Construction of Bench Mark / Grid Pillars	To mark reference co-ordinate & elevation	As required / agreed	B	Physical	Each Bench Mark/ Grid Pillars	As per technical specifications/approved drawings		SR	√	Joint protocol for co-ordinate and elevation
2	**EXCAVATION, FILLING/BACKFILLING AND COMPACTION WORKS**										
2.1	**Excavations-**										
i		Nature, type of soil/rock before and during excavations	As agreed / required	B	Visual/ Measurement	Random	Tech Specs and Const. Drawings/IS 1892		SR	√	GTI report to be referred. In case of ambiguity localised GTI may be carried out or excavation samples to be send to NTPC acceptable Third party lab for determination of soil/rock strata.
ii		Initial ground level before start of excavations, shape, Dimensions of excavations & Side slope of final excavation and Final excavation levels.	As agreed / required	B	Measurement	100%	Tech Specs and Const. Drawings		SR	√	
2.2	**Excavation in Hard Rock- If required**										
i		Receipt, Storage, accountability of Explosive	As agreed / required	B	Physical	Random in each week	Indian Explosive Act 1940/all statutory norms, Tech Specs and Const. Drawings		SR	√	Owner approved specialist blasting agency such as CMRI, NIRM shall be deployed at site for trial blasts, design blasts, blast vibration monitoring etc. Seismographs shall be deployed at site for monitoring of blast operation vibrations.
ii		Execution of Blasting Operation	As agreed / required	B	Physical	Random in each shift	IS:4081, Tech Specs and Const. Drawings/ scheme		SR		
iii		Submission of Blasting report to EIC	As agreed / required	B	Physical	Each blast	Tech Specs and Const. Drawings			√	
iv		Excavation in Hard Rock (Blasting Prohibited)	As agreed / required	B	Physical	100%	As per approved drawing/ scheme, Tech Specs and Const. Drawings		SR	√	
2.3	**Filling/ Backfilling**										
i	Suitability of fill material	Grain size analysis, Organic Matter, Liquid Limit, plastic limit, Shrinkage limit & Free Swell Index and chemical analysis(like Organic Matter, Calcium carbonate, pH value, Total soluble sulphate etc.) as required in TS	As per IS: 2720	B	Physical	Once per each type of source or change of source subject to a min. of 2 samples	IS:2720 (Pt.IV), IS:2720 Pt.XXII, IS:2720 (Pt.XI)/relevant part, Tech Specs and Const. Drawings		SR/TR	√	Test report along with the recommendations regarding suitability of the fill material from NTPC acceptable laboratories to be submitted to EIC for review and acceptance. Geo technical investigation report may also be considered as basis for suitability of fill material if available as per the discretion of EIC.

2.4	**Standard proctor Test**	Optimum moisture content (OMC) and max. dry density (MDD) of filling/backfilling materials	As per IS: 2720	A	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.VII), Tech Specs and Const. Drawings	SR/TR	√	

2.5	**Compaction of Filling / Backfilling Works**									
i	Moisture content	Moisture content of fill before compaction	As per IS: 2720	B	Physical	Random	IS 2720 (Pt.II), Tech Specs and Const. Drawings	SR/TR	√	
ii		Dry density by core cutter method ---- OR---- Dry density in place by sand replacement method ---- OR---- any other method as per IS 2720	As per IS: 2720	A	Physical	i) For foundation back fill: one in every 10 foundations for each compacted layer. ii) For area filling: every 1000 SQM area for each compacted layer.	IS 2720 (Pt. XXIX)/ IS 2720 (Pt. XXVIII)/ IS 2720 Relevant Part/ Tech Specs and Const. Drawings	SR / TR	√	Number of readings for field density test may be decided by EIC according to the size of the soil bed which is subject to testing as the dry density of the soil varies appreciably from point to point. However, in no case, readings should be less than three as compaction result drawn out of less than three readings may give erroneous result.
iii		Relative density (Density Index)	As per IS: 2720	A	Physical	----do----- (I) & (ii) above	IS 2720 (Pt. XIV), Tech Specs and Const. Drawings	SR/TR	√	
3	**RAW MATERIALS FOR CONCRETE**									
3.1	**CEMENT**									
i	Material	Physical and chemical properties as per relevant IS codes	As required/ agreed	A	Review of MTC/ test reports	for each manufacturing Week number	IS : 269/ IS:1489/ IS:455, Tech Specs and Const. Drawings	MTC	√	To be procured from BIS approved source having valid BIS License. Each consignment of cement shall be duly correlated with manufacturers' TC.
ii		Testing of cement for Setting time (Initial & Final) and compressive strength	As per IS:4031	A	Physical	one for each manufacturing Week number	IS : 269/ IS:1489/ IS:455, Tech Specs and Const. Drawings	SR/Test Report	√	Additionally, If the cement is stored more than 90 days in godown of contractor then the same shall be retested for Setting time & Comp. Strength.
3.1 b	**Fly ash (if applicable)**									
		Physical and chemical properties as per IS 3812 Part I (Table 1 and 2)	As per IS 3812 Part I	A	Physical	once in a week or change of source whichever is earlier	IS:3812 Part I and Tech. Spec./Design mix.	SR/Test Report	√	Batching plant shall have facility for mixing of fly ash.
3.2	**Coarse Aggregate**									
i		Moisture content	IS:2386	B	Physical	To be done every day before start of work	IS : 456/IS : 383/IS: 2386 Part-III/Tech Spec	SR/LB	√	During monsoon, frequency may be increased and accordingly water content in concrete will be adjusted.
ii		Sieve analysis, flakiness index, elongation index	IS:2386	B	Physical	One per 100 cum. or part thereof	IS: 2386 Part-I, IS:383 / Tech Spec	SR/LB/TR	√	
iii		Specific gravity, Soundness, Water absorption, Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale, Total of % of all deleterious materials),	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS: 2386 Part-II, IS: 2386 Part-V, IS:456, IS:383/Tech Spec	SR/LB/ TR	√	
iv		Alkali aggregate reactivity and Petrographic examination	IS 2386	A	Physical	Once for each source & for every change of source.	IS: 2386 (Part-VII/VIII), IS:383 /Tech Spec/ASTM C-1260 / ASTM 1293	SR/LB/ TR	√	During Design mix, these tests to be carried out
v		Crushing value, Abrasion value and Impact value	IS:2386	A	Physical	Once for each source & for every change of source	IS:383, IS-2386 Part IV/Tech Spec	SR/LB/ TR	√	
3.3	**Fine Aggregate**									
i		Moisture content	IS:2386	B	Physical	To be done every day before start of work	IS : 456/IS : 383/IS: 2386 Part-III/Tech Spec	SR/LB	√	During monsoon, frequency may be increased and accordingly water content in concrete will be adjusted.
ii		Sieve analysis, Silt content	As agreed / required	B	Physical	One per 100 cum. or part thereof	Tech Spec/ IS 2386 / IS 456/ IS 383	SR/LB/ TR	√	
iii		Specific gravity, Soundness, Water absorption, Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale, Total of % of all deleterious materials (excluded mica as well as included mica content)), organic impurities	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS: 2386 Part-II, IS: 2386 Part-V, IS:456, IS:383/Tech Spec	SR/LB/ TR	√	During Design mix, these tests to be carried out
iv		Alkali aggregate reactivity and Petrographic examination	IS 2386	A	Physical	-do-	IS: 2386 (Part-VII/VIII), IS:383 /Tech Spec/ASTM C-1260 / ASTM 1293	SR/LB/ TR	√	

3.4	**Water**	Complete Testing as per IS:456-2000	As per IS:456	B	Testing	Once for each source and thereafter yearly in case of borewell. If water is used from open source like river, stream, canal etc., then water testing is to be done quarterly.	IS:456-2000/ Tech. spec.	TR	√	
3.5	**Admixtures for Concrete**	Material/Type of admixture and its suitability	As per IS:9103	A	Review of MTC/ test reports	For each lot received at site	As per Designed mix and IS:9103/ Tech. Spec.	Test Report/ MTC	√	Random sample may be send to Owner acceptable third party testing lab. for testing requirements as per TS and IS codes. Frequency of check may be decided by EIC/Head FQA based on quantity, requirement and Relevant IS code.
4	**CONCRETING (MIXING, CONVEYING, PLACEMENT, COMPACTION, CURING & TESTING)**									
4.1	**Batching Plant (if installed)**									
i		Calibration of Batching Plant		A	Physical	After initial setting up of batching plant, calibration by NABL accredited agency must be done before use of batching plant for production of concrete.	Review of calibration chart/ Certificate/IS 4925	Calibration Certificate	√	Additionally, Batching Plant shall be calibrated regularly at least once in a 3 months in-house. The weights for batching plant calibration to be calibrated once in year by NPL/NABL accredited lab./Weights & Measures Dept.
4.2	**CONCRETE**									
i)		Design Mix.	As per IS 456	A	Physical	Before the start of the work	Tech. Spec., IS 456	TR	√	Design mix will be carried out at the start of the work with all tests as per Annexure I.
i		4 Trial mixes to ascertain the workability and cube strength	After receiving the recommended mix design	A	Physical	4 trial mix. for each mix proportion as per IS 10262	Tech. Spec.,IS 456/IS 10262	SR/LB	√	The concrete for field trials shall be produced by methods of actual concrete production. (Initially Baby/mini mixture may be used till the installation of Batching Plant at site).
ii		Concrete Cube strength Test	IS:516	A	Physical	As per IS 456 clause 15.2.2	IS:516, IS:456, Tech. Spec.	SR/LB/ TR	√	Min. of 6 cubes for each mix, 3 specimen shall be tested at 7 days & remaining 3 shall be for 28 days Comp. Strength. *Quantity of Concrete in the Work, m³* — *Number of Samples* 1 - 5 — 1 6 - 15 — 2 16 - 30 — 3 31 - 50 — 4 51 and above — 4 plus one additional sample for each additional 50 m³ or part thereof NOTE—At least one sample shall be taken from each shift.
iii		Workability - slump test	IS:1199	B	Physical	At the time of concrete pouring at site every two hrs.	IS:456/Tech. Spec.	SR/LB/ TR	√	
iv		Temperature Control of Concrete as per Tech. spec./IS standard	Thermometer	B	Physical	100%	Temperature as per technical specification/Relevant standard	SR	√	
v		Water Cement Ratio		B	Physical	For each batch of concrete	As per approved Design Mix	SR/Batch slip	√	
vi		Placement of concrete, Compacting, Curing	As required	B	Physical	At Random	IS:456, Period of curing as per IS 456	SR		
4.3	**TESTS / CHECKS ON RCC STRUCTURE IN HARDENDED CONDITION**									
i		Visual inspection of concrete surface just after removal of shuttering	As agreed / required	B	Visual	100%	As per IS:456/ tech. Specification.	SR		
ii		Dimensional check on finished structures	As agreed / required	B	Measurement	100%	As per IS:456/ tech. Specification and Const. Drawings	SR/LB	√	
iii		Position and alignment of embedded parts and inserts	As agreed / required	B	Visual	100%	As per provisions and tolerances of equipment supplier, Tech Specs and Const. Drawings			
iv		Embedment of inserts in concrete shall be checked for gap if any using hammer for all dynamic foundations	As agreed / required	B	Physical	100%	As per Technical Specification	SR	√	No hollow sound
v		Submission of grouting / repair methodology to EIC for approval if concrete surface / position and alignment of embedded parts / inserts are found defective	--	B	Review and approval	once for each type of defect	As per provisions and tolerances, Tech Specs and Const. Drawings		√	

vii		Core Test	IS:516	A	Physical	As required by Owner EIC.	As per IS:456, IS 516	SR/LB/ TR	√	Compressive strength based on core test is required to be carried out in case of doubt regarding the grade of concrete used, either due to poor workmanship or based on the results of cube strength test as per 4.2 ii) above and as per discretion of EIC.
viii		Water Tightness Test of liquid retaining structure/ tanks	As required	A	Test	100%	IS:3370/ Tech. Specification	SR/LB	√	
5	**REINFORCEMENT STEEL AND ITS PLACEMENT**									
i	Material	Physical and chemical properties as per relevant IS codes and Tech spec.	As agreed/required	A	Review of MTC	Each batch/lot of delivery	As per IS 1786, IS 432, IS 1566, IS 13920 , Tech spec and cont. drawing	MTC	√	To be procured from Owner approved source.
	Coupler	Physical and chemical properties as per relevant IS codes and Tech spec.	As agreed/required	A	Review of MTC	Each batch/lot of delivery	IS 16172, Tech spec and cont. drawing	MTC	√	MTC shall contain all the parameters specified in the technical specifications
ii		Freedom from cracks surface flaws, Lamination & excessive rust.	As agreed / required	B	Visual	Random in each shift	IS: 1852, IS:432, IS:1786, Tech Specs and Const. Drawings	SR		To be checked at site. Steel collected from source should be free from excessive rust. To be stored as per Technical Specs.
iii		Bar bending schedule with necessary lap, Spacers & Chairs	As agreed / required	B	Physical & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502	SR	√	
iv		Acceptance - disposition of cage w.r.t. reference axes, cover, spacing of bars, spacers and chairs after the reinforcement cage is put inside the formwork	Measuring tape & as required	B	Visual & Measurement	Random in each shift*	IS 456, Tech Specs and Const. Drawings	SR	√	* 'for foundations, frequency shall be Each foundation
6	**FOUNDATION SYSTEM**									
i		Foundation casting - Layout, Shape, dimensions, Reinforcement, concreting, curing etc.	As required / agreed	B	Physical	Each foundation	As per technical specifications and construction drawings	SR	√	lines and levels to be checked. Concrete Grade to be checked as per Mix Design
7	**STAGING AND FORMS**									
i		Materials and accessories	As agreed / required	B	Visual	Once before start of work	As per relevant IS, Tech Specs and Const. Drawings	SR		
ii		Soundness of staging, shuttering and scaffolding including application of mould oil / release agent	As agreed / required	B	Visual	Once before start of work	As per manufacturer's spec.and as per 3696,4014, 4990, Tech Specs and Const. Drawings	SR		
iii		Acceptance of formwork before start of concreting : disposition w.r.t. reference axes, size, etc.	Measuring tape & as required	B	Physical / visual	Before start of each concreting	As per provisions and tolerances in IS 456, Tech Specs and Const. Drawings	SR	√	

9	**EMBEDDED PARTS (INCLUDING LAYING OF RAILS & ANCHOR FASTENERS) --If Applicable.**									
i		Material	As agreed / required	B	Review of MTC/ test reports	Each batch/lot of delivery	As per Tech Specs and Const. Drawings	SR/MTC	√	
i		Position / alignment / levels of embedded parts / bolt hole / pipe sleeves / rails / PVC pipes / etc. as per TS and construction Drg.	As agreed / required	B	Physical/ measurement	100%	As per Tech Specs and Const. Drawings	SR/ Protocol	√	Exposed surface of the embedded parts other than holding down bolts are to be painted with as per technical specifications.
ii		Welding / tying of embedment to reinforcement	As agreed / required	B	Physical/ measurement	Random in each shift	As per Tech Specs and Const. Drawings	SR		
10	**JOINTS IN CONCRETE, DAMP PROOF COURSE**									
i	JOINTS IN CONCRETE	Joint material - bitumen impregnated fibre board, PVC water stops, Sealing compound, Expanded polystyrene board, Hydrophilic strip, Acrylic polymer etc. (as given in technical spec)	As per manufacturer Standards	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings, IS 1838, IS 1834, IS12200	SR/MTC	√	
ii	DAMP PROOF COURSE	Material - Hot bitumen and water proofing materials etc. (as given in technical spec).	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings, IS 702	SR/MTC	√	
iii		Acceptance of installation of Joints material & Acceptance of damp proof course.	As agreed / required	B	Acceptance	Each installation randomly	Tech Specs and Const. Drawings		√	
11	**GROUTING**									
i		Material	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR//MTC	√	
ii		Compressive strength of grouting material before its use.	As agreed / required	A	Physical	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/LB/ TR	√	
iii		Compressive strength of cubes after grouting.	As agreed / required	A	Physical	Random	Tech Specs and Const. Drawings	SR/LB/ TR	√	
iv		Acceptance of the grouts : Mixing, placement, application and grout pressure (as applicable)	As agreed / required	B	Physical	Each grout section	Tech Specs and Const. Drawings	SR	√	
12	**MASONARY WORKS**									
12.1	**Test on Bricks**									
i		Compressive strength, water absorption, efflorescence.	As agreed / required	A	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings	SR/LB/ TR	√	
ii		Dimensions , shape, warpage.	As agreed / required	B	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings	SR/LB	√	Warpage test is applicable for facing bricks only as per IS:2691.
12.4	**Test on Mortar**									
i	Sand	Grading	As agreed / required	B	Test	once per 100 Cum or part thereof	IS:2116	SR/LB	√	
ii		Compressive strength	As agreed / required	B	Test	At random	IS 2250-1981, Tech Specs and Const. Drawings	SR/TR	√	
12.5	**Masonry construction**	Workmanship, verticality and alignment	As agreed / required	B	Visual/ Physical	100%	IS 2212, IS 1905 , Tech Specs and Const. Drawings	SR/LB		
13	**PLASTERING- MATERIAL AND WORKMANSHIP**									
i	Sand	Deleterious Material	As agreed / required	B	Physical	Once per source	IS : 2386 (Part-I &II) & IS :2116, Tech Specs and Const. Drawings	SR/TR	√	
ii		Grading	As agreed / required	B	Physical	50 Cum./or part thereof	Tech Specs and Const. Drawings	SR/TR	√	
iii		Silt content	As agreed / required	B	Physical	One per 100 cum., or part thereof	CPWD/ Tech Spec/ IS 2386/ IS 456/ IS 383	SR/LB/ TR	√	
iv	Stone grit plaster/ granular textured coat finish (if applicable)	Material	As agreed / required	B	Review of MTC	For each lot received at site	Tech Specs and Const. Drawings	SR/MTC	√	
v	**Galvanised wire mesh (if applicable)**	Galvanized hexagonal wire netting for lath plastering	As agreed / required	B	Review of MTC/ test reports	Each batch/lot of delivery at site	Tech Specs and Const. Drawings	SR/MTC	√	
vi		Thickness, Trueness and finishing of plaster, grooves etc.	As agreed / required	B	Visual/ Measurement	Random in each shift	Tech Specs and Const. Drawings	SR/LB	√	

14	**PAINTING SYSTEM - CONCRETE WORKS AND PLASTERED MASONARY SURFACES**									
i	Materials and accessories- Oil Bound, Acrylic Emulsion, Chemical Resistant, Oil Resistant Paint etc. as applicable (as given in technical spec).	Shade, type from brand and manufacturer as approved by EIC.	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	
ii	Surface preparation	As required	As agreed / required	B	Physical / visual	Random in each shift	Tech Specs and Const. Drawings	SR		
iii	Acceptance of painted surfaces	Shade, finish, WFT	As agreed / required	B	Physical/visual	Each surface at random	Tech Specs and Const. Drawings	SR	√	
14.2	**PAINTING SYSTEM - STEEL WORKS (OTHER THAN STRUCTURAL STEEL WORKS)**									
i		Painting Materials and accessories	-	A	Review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings	SR/MTC	√	
ii		Surface preparation	As agreed / required	B	Physical / visual	Each Erection Mark	Tech Specs and Const. Drawings, Relevant code/ standards	SR	√	
iii		Primer Thickness	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings	SR	√	
v		Acceptance of painted surfaces : DFT, Finish, Shade	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings	SR	√	
18	**Fencing and Gates if applicable**									
i	PVC coated chain link fencing (IS 2720), Welded wire mesh (IS 1566), Reinforced barbed tape galvanised (IS 2629) etc.	Materials	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications
ii	Structural steel, painting system, caster wheel, ball and bearing, fixtures and fasteners	Materials	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications
iii		Alignments, erection painting, DFT etc. and acceptance of the installation and working	As agreed / required	B	Physical / measurements	Each installation	Tech Specs and Const. Drawings	SR	√	
20.2	**RCC Pipes**									
i	Material (As per TS)	RCC pipes	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs,IS 458 and Const. Drawings	SR/TR/MTC	√	To be procured from BIS Approved Sources having valid BIS License.
ii		Acceptance and leakage	As agreed / required	B	Physical	Random	Tech Specs and Const. Drawings	SR		
21.0	**SPECIAL ITEMS**									
21.1	**Earthing Mat (Grounding System) if applicable**									
i	Material (As per TS)	Earthing mat	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	As per relevant IS and Tech. Specs / Manufacturer's, IS 3043	SR/TR/MTC	√	
ii		Weld sizes & length	Visual/Tape	B	Visual/ Measurement	100%	Tech Specs and Const. Drawings			Owner approved electrodes shall be used
iii		D P test	DP test Kit	A	Physical	10% at random of the offered lot	Tech Specs and Const. Drawings	TR	√	
iv		Earth test	Earthing test kit	A	Physical	100%	Tech Specs and Const. Drawings,	SR/TR	√	
21.2	**Bitumen layer for tank foundation**									
i	Material (As per TS)	Grade of bitumen	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	As per relevant IS and Tech. Specs /MTC	SR/MTC	√	APPROVED SOURCE FOR MATERIAL PROCUREMENT SHALL BE ALL GOVERNMENT REFINARIES
ii	Acceptance and workmanship	Application / workmanship	As agreed / required	B	Physical	Random	Tech Specs and Const. Drawings	SR		
23	**PILING WORK (If Applicable)**									
23.1	**Execution**									
i		Borehole diameter	As required	B	Physical	100%	As per appd. Drawings and technical specification	SR/LB	√	
ii		Pile layout	Total station	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	
iii		Recording ground level and pile termination level	As required	B	Measurement	Random	As per appd. Drawings and technical specification	SR/LB	√	
iv		Cleaning/Flushing of pile bore	As required	B	Measurement	Each pile	IS 2911/ Tech. Specs.	SR/LB	√	
v		Size of bore and During boring of pile record commencement of SPT/ core recovery to ensure socketing length equivalent in terms of the Diameter of the pile below the socketing horizon.(if applicable)	As required	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	
vi		Pouring of concrete to project above cut off level.	As required	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	

23.2	**Testing**									
i		Bentonite	IS:2720	A	Physical / Test report	Once per lot	As per IS:2720, IS 2911/ tech. Specs.	MTC/TR	√	One sample from each source (brand/manufacturer) to be tested at Owner acceptable third party lab.
ii		Density check on sample of mud collected from pile bore bottom	IS 2911	B/A	Physical	Each pile/ Randomly 1 in 10 piles (i.e. 10%)	IS 2911/ Tech. Specs./approved PILING METHODOLOGY	SR/LB	√	Tests to be done before placing of concrete.
ii		Slump test of concrete	IS:1199	B	Physical	Every 2 hrs at pouring point of concrete	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
iii		Concrete Cube strength Test	IS:456	A	Physical	One set of 6 cubes per 50 Cum or part thereof for each grade of concrete per shift whichever is earlier.	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
iv		Initial pile load test, Vertical (Compression), Lateral (horizontal) and pull-out (tension).	IS:2911 / as required	A	Testing	As per Technical Specification/IS standard	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
v		Routine pile tests (VERTICAL LOAD TEST (COMPRESSION) and LATERAL LOAD TEST (horizontal))	IS:2911 / as required	A	Testing	As per Technical Specification/IS standard	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
vi		Pile Integrity Tests (PIT)	PEM / as required	A	Testing	100%	IS:2911, As per appd. Drawings and technical specification and suppliers manual	Test Report	√	
		LEGENDS : * Records identified with tick (√) shall be essentially included by supplier in QA documentation. # Class A : Critical, Class B : Major, Class C : Minor. Class 'A' checks shall be witnessed by Owner FQA and Execution Engineer, Class 'B' checks shall be witnessed by Owner Execution Engineer, Class 'C' checks shall be witnessed by Main contractor engineer. CLASS 'A' &' B' CHECKS SHALL BE NTPC CHP STAGE. SR - Site Register, TR- Test Report, LB-Log Book, IR - Inspection Report, MTC - Manufacturer's Test Certificate. Surveillance of Class 'A' checks shall be perform By Owner Head (FQA), Class 'B' by Owner FQA Engineer and for class 'C' Another Executing Engineer authorised by Head (Executing Deptt). **Note: Any non confirmity/ deviation to the Quality plan must be brought to notice of NTPC/Owner.** **Dispositioning authority shall be the authorised representative of NTPC/Owner as per NTPC FQA system manual**					For Owner Use	Owner DOC NO. :			
							एनटीपीसी NTPC A Maharatna Company			
Main-supplier								REVIEWED BY	APPROVED BY	APPROVAL SEAL