

# **FIELD QUALITY PLAN**

**FOR**

**FQP-Extension of GJB for Establishing manufacturing facility of  
Heat exchangers for Nuclear Project.**



**FACTORY CIVIL DEPARTMENT**

**BHARAT HEAVY ELECTRICALS LIMITED**

**BHOPAL**

## **FIELD QUALITY PLAN**

**FOR**

### **FQP-Extension of GJB for Establishing manufacturing facility of Heat exchangers for Nuclear Project**

<b>DOCUMENT NO.</b>	FQP/FCX/004	
<b>ORIGINAL DATE OF ISSUE</b>	30.09.2019	
<b>REVISION NO. &amp; DATE</b>	Nil	
<b>DATE OF ISSUE</b>	30.09.2019	
<b>PREPARED BY</b>	HARSH MOURYA Sr. ENGINEER (FCX-Planning)	
<b>REVIEWED BY</b>	V Rajesh MANAGER (FCX-Planning)	
<b>APPROVED BY</b>	A K Vyas Sr. Manager (FCX)	



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## AUTHORISATION FOR DIFFERENT CATEGORIES OF CHECKS

Classification of Check		Inspection Authority	Clearing Authority
Symbol	Description	BHEL	BHEL
A	Critical	Sr. Engr ( FCX-PLG)	Manager ( FCX-PLG)
B	Major	Sr. Engr ( FCX-PLG)	Manager ( FCX-PLG)
C	Minor	Sr. Engr ( FCX-PLG)	Manager ( FCX-PLG)

**NOTE :**

- 1 Quantum of check shall be 100% for all characteristics unless otherwise mentioned in reference documents. Contractors will be responsible for getting the work inspected by inspecting authority after carrying out inspection by themselves as per Field Quality Plan.
- 2 In case of non-conformity, before accepting, clearing agency shall ensure disposition and the same shall be reflected in the log-sheet /protocol.
- 3 For checks where log sheets are not called for, suitable records shall be maintained in the form of log book / protocols.
- 4 Abbreviations used in the column “Type of Check” are
  - R : Record Verification
  - M : Measurement
  - W : Witness
  - T : Test
- 5 Abbreviations used in the column “Format of Record” are
  - SR: Site Register
  - TR : Test Report
- 6 In case of non-availability of inspecting/clearing authority of prescribed level the job shall be performed by higher authorities or the persons authorized by sectional head



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S No.	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM/ FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>1.0</b>	<b>GENERAL REQUIREMENTS</b>							
1.1	Setting up of Field QA & QC laboratory	V	As agreed/required	A	Once prior to start of work	Tech Spec	SR	Contractor may also opt to get the material tested in outside reputed laboratory. In such a case, contractor has to establish a field laboratory with only instruments required for in-situ testing.
1.2	Availability of requisite laboratory setup & equipment in good working condition well before commencement of concerned activity .	V	As agreed/required	A	Once prior to start of work	Tech Spec	SR	
<b>2.0</b>	<b>EXCAVATIONS &amp; FILLING IN FOUNDATION WORKS</b>							
2.1	<b>EXCAVATION</b>							
2.1.1	Check for the initial ground level before start of excavations.	M	As agreed/required	B	100%	Tech Spec & Const Drawing	SR	
2.1.2	Check for the final shape and Dimensions of Excavation including final excavation level & required clearances	M	As agreed/required	B	100%	Tech Spec & Const Drawing	SR	



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<b>3.0 Fabrication Works</b>								
<b>3.1 Electrodes</b>								
3.1.1	Moisture Free storage for electrodes as per IS 1395:1982	W	As per IS:1395:1982	B	100%	As per IS:1395:1982	SR/LB	
3.1.2	100% visual examination shall be carried out in the vicinity of welds for arc strikes, undercuts, cleats, tacks & gouges & shall be ground and blended. The entire butt weld area shall be dye penetrant/magnetic particles tested.	W	As per Corporate Standard AA 0622101	B	100%	As per Corporate Standard AA 0622101	Test Report	
3.1.3	Visual checks/Dye penetration test as per criticality of the joint	W	As per relevant standards	A	100%	As per relevant standards	IR	
<b>3.2 Galvalume Sheet &amp; Polycarbonate sheet</b>								
<b>Note : Source Inspection and Test witness as required shall be done.</b>								
3.2.1	Physical dimensions such as pitch, crest depth etc	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.2	Tensile Strength	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.3	Thickness of Color coating	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.4	Bend test	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.5	Impact resistance test	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.6	Pencil hardness test	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	



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3.2.7	Scratch resistance test	W	IS 14246	A	For each supply of 10 tonnes	IS 14246	Test record	
3.2.8	Composition test	W	IS 15961	A	For each supply of 10 tonnes	IS 15961	Test record	
3	POLYCARBONATE SPECIFICATIONS				IS 14443:1997 REAFFIRMED 2013			



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4.3.1	Bulkage & Moisture Content	30.09.2019	As per IS:2386 Part III	B	Once for Each stack of 100 Cum or part there of.	As per IS:2386 Part III ,IS:383	Form-3&4	
4.3.2	Silt, Clay content, soundness.	T	As per IS:2386 Part II,V,VI & VIII	B	Once per source & for on every change of source	As per IS:2386 Part-II, V, VI,VII IS:383	Test Report	
4.3.3	Sieve analysis, particle size & shape	T	As per IS:2386 Part I	B	Once per 100 cum or every change of source	As per IS:2386 IS:383/	Form-2	
4.3.4	Specific Gravity, Water absorption, bulk density & voids	T	As per IS:2386 Part III	B	Once per source & for on every change of source	As per IS:2386 Part- III, IS:383	Test Report	
4.4	<b>SAND</b>							
4.4.1	Fineness Modulus(Sieve analysis)	T	As per IS:2386 Part I	B	Once per 100 cum or every change of source	As per IS:2386 IS:383/	Form-2	
4.4.2	Silt Content	T	As per IS:2386	B	Once per source & for on every change of source	As per IS:2386 IS:383/	Test Report	
4.4.3	Bulkage/Moisture Content	T	As per IS:2386 Part III	B	Once per 100 cum or every change of source	As per IS:2386 Part III ,IS:383	Form-3 &4	



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4.5	<b>CONCRETE</b>							
4.5.1	Crushing strength (Works tests cubes)	W&T	Cube Crushing Machine	A	As per IS :456	IS:516 & IS:456, IS:10262	Form-6	
4.5.2	Workability-Slump Test	W&T	Slump Cone	B	In every load for RMC and every 10 cum for BMC.	IS:456 & IS:1199	Form-7	
5.0	<b>BRICKS</b>							
5.1	Water absorption	T	As per IS:3495 (Part-I)	A	As per IS:3495 & IS 5454	IS 1077 , IS 3495 & IS 5454	Form-8	
5.2	Compressive Strength	T	Compressive strength testing machine	A	Sampling as per IS:1077	IS 1077 , IS 3495 & IS 5454	Form-8	
5.3	Check for dimension, soundness, colour, warpage & Efflorescence	V & M & T		B	Sampling as per IS:1077 A set of 20 bricks min. for each lot of 50,000 or part thereof	IS 1077 , IS 3495 & IS 5454	Form-8	