Corrigendum to the Global e-tender Document for Supply, Installation and Commissioning of Test Equipment for BIS Laboratories:

A. The last date for submission of bids have been extended. The fresh dates are given below:

1. The last date for submission of bids: 07.07.2020 till 15: 00 hrs.
2. The date of opening of tender : 08-07-2020 till 15:30 hrs

B. The following amendment is issued with respect to a typographical error in the tender document:

Clause	Existing	Modified
Page no 34, clause 6 'Transportation' **Line 4**	THE BUREAU will provide Customs Duty Exemption Certificate for imported items as applicable and the successful bidder shall be responsible for necessary customs clearance	**Replace Line 4 with the following:** THE BUREAU will not provide Customs Duty Exemption Certificate for imported items as applicable and the successful bidder shall be responsible for necessary customs clearance

C. Amendment in Technical Specifications:

Mechanical equipment:

i. Amendment in Technical Specification of Fully Automatic Digital Micro Vickers Hardness Tester with Anti Vibration Table, PC and Software

Sr. No.	Existing	Modified
System specifications		
11.	Data Editing Data display, edit, output, retry, assist function	Deleted

ii. Amendment in Technical Specification of Fully Automatic Digital Vickers Hardness Tester with Anti Vibration Table, PC and Software

Sr. No.	Existing	Modified
System specifications		
11.	**Data Editing** Data display, edit, output, retry, assist function	Deleted

iii. Amendment in Technical Specification of Automatic Load cell based, Rockwell cum Superficial Rockwell Hardness Testing Machine

Sr. No.	Existing	Modified
1.	**Variable test force** The variable test force function must change pre. test force at a 100gf step from 29.42N to 98.07N (3kgf to 10kgf), and it must change test force power at a 0.9807N(100gf) step from 147.1N to 1840N (15kgf to 187.5kgf).	**Variable test force** The variable test force function must change pre. test force from 29.42N to 98.07N (3kgf to 10kgf), and it must change test force from 147.1N to 1840N (15kgf to 187.5kgf).
2.	**Top surface based measurement** The top reference measurement must less be affected by the bottom of the sample than the conventional bottom reference measurement.	Deleted

iv. Amendment in Technical Specification of Metallurgical Optical Microscope

Existing	Modified
Main body **A. Focusing mechanism** Adjustment knob: Coaxial focusing system with fine adjustment of 0.2 mm or less per rotation with facility for Coarse adjustment. **B. Illumination** Illuminator: Built in Koehler's incident illuminator with Halogen Lamp/ LED Lamp/ HG Fibre Illuminator, adjustable brightness, field and aperture diaphragm with yellow, green, blue and ground filters. Light distribution 100%, between camera port and binocular Included. Filter: ((ND16 and ND4), GIF, NCB), Polarizing block	**Main body** **A. Focusing mechanism** Adjustment knob: Coaxial focusing system with fine adjustment of 0.2 mm or less per rotation with facility for Coarse adjustment. **B. Illumination** Illuminator: Built in Koehler's incident illuminator with Halogen Lamp/ LED Lamp/ HG Fibre Illuminator, adjustable brightness, field and aperture diaphragm with yellow, green, blue and ground filters. Light distribution 100%, between camera port and binocular Included. Filter: ((ND16 and ND4) or similar ND filters, GIF, NCB), Polarizing block
Observation method Semi apochromatic, Bright filled, Darkfield, Polarizing, DIC	**Observation method** Fully/Semi apochromatic, Bright filled, Darkfield, Polarizing, DIC
Resolving nosepieces 7 position nosepieces	**Resolving nosepieces** 6 or 7 position nosepieces with coded features

v. Amendment in Technical Specification of Computerised Universal Testing Machine (100kN)

Sl. No	Existing	Modified
1.	**Types of tests to be performed** Tensile at ambient and at high Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above mentioned tests.	**Types of tests to be performed** Tensile at ambient Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above mentioned tests.
4	**Load accuracy** Class 1 or better	**Load accuracy** Class 0.5 or better
7	**Testing speed range** Adjustable (0.5-100) mm/min	**Testing speed range** Adjustable (0.5-100) mm/min or better range
8	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized cum Manual Displacement and Load control mode with digital display	**Control Mode** Servo Controlled Hydraulic Drive or Electromechanical Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized Displacement and Load control mode with digital display
13	**Grips for holding tensile samples** Self-Loading Wedge grips suitable for MS, SS Sheets, Rods • Grips for flat specimen: Thickness 0.5 - 10 mm; • Grips for round specimen: Φ12-Φ15 mm;	**Grips for holding tensile samples** Self-Loading grips suitable for MS, SS Sheets, Wires & Rods • Grips for flat specimen: Thickness 0.5 - 10 mm; • Grips for round specimen: Φ12-Φ15 mm; • Grips for wires: Φ6- Φ12 mm;
17	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Suitable extension measuring attachment for extension at high temperature up to 1200 deg C. Additional Electronic Extensometer: Variable Gauge	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Additional Electronic Extensometer: Variable Gauge Length (covering range 10 – 200 mm) & Class 0.5 as per IS 12872/ISO 9513.

	Length (covering range 10 – 200 mm) & Class 0.5 as per IS 12872/ISO 9513.	

vi. Amendment in Technical Specification of Computerised Universal Testing Machine (500kN)

Sl. No	Existing	Modified
1	**Types of tests to be performed** Tensile at ambient and at high Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above mentioned tests.	**Types of tests to be performed** Tensile at ambient Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above mentioned tests.
4	**Load accuracy** Class 1 or better	**Load accuracy** Class 0.5 or better
7	**Testing speed range** Adjustable (0.5-100) mm/min	**Testing speed range** Adjustable (0.5-100) mm/min or better range
8	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized cum Manual Displacement and Load control mode with digital display	**Control Mode** Servo Controlled Hydraulic Drive and Electromechanical Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized Displacement and Load control mode with digital display
17	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Suitable extension measuring attachment for extension at high temperature up to 1200 deg C. Additional Electronic Extensometer: Variable Gauge Length (covering range 10 – 200	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Additional Electronic Extensometer: Variable Gauge Length (covering range 10 – 200 mm) & Class 0.5 as per IS 12872/ISO 9513.

	mm) & Class 0.5 as per IS 12872/ISO 9513.	

vii. Amendment in Technical Specification of Computerised Universal Testing Machine (1000kN)

Sl. No	Existing	Modified
1	**Types of tests to be performed** Tensile at ambient and at high Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above-mentioned tests.	**Types of tests to be performed** Tensile at ambient Temperature, compression, Shear and 3-point bending. The supplied machine must have all standard accessories/fixtures required for performance of the above-mentioned tests.
4	**Load accuracy** Class 1 or better	**Load accuracy** Class 0.5 or better
7	**Testing speed range** Adjustable (0.5-100) mm/min	**Testing speed range** Adjustable (0.5-100) mm/min or better range
8	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized cum Manual Displacement and Load control mode with digital display	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized Displacement and Load control mode with digital display
17	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Suitable extension measuring attachment for extension at high temperature up to 1200 deg C. Additional Electronic Extensometer: Variable Gauge Length (covering range 10 – 200 mm) & Class 0.5 as per IS 12872/ISO 9513.	**Extensometer** Non-contact (Laser Type) Extensometer interfaced with system software (Field of view from 50 mm to 200 mm and accuracy class 0.5 as per IS 12872/ISO 9513), for testing at room temperature. Additional Electronic Extensometer: Variable Gauge Length (covering range 10 – 200 mm) & Class 0.5 as per IS 12872/ISO 9513.

viii. Amendment in Technical Specification of Computerised Universal Testing Machine (2000kN)

Sl. No	Existing	Modified
4	**Load accuracy** Class 1 or better	**Load accuracy** Class 0.5 or better
8	**Testing speed range** Adjustable (0.5-100) mm/min	**Testing speed range** Adjustable (0.5-100) mm/min or better range
9	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized cum Manual Displacement and Load control mode with digital display	**Control Mode** Servo Controlled Hydraulic Drive (Displacement control, Load Control, Strain Control, Stress Control, etc) Computerized Displacement and Load control mode with digital display

ix. Amendment in Technical specifications for Automatic Digital Brinell Hardness Testing Machine

<table>
<tr><th>Sl. No.</th><th>Existing</th><th>Modified</th></tr>
<tr><td>18</td><td>Basic Accessories

Flat Anvil: 150mm (Diameter) or equivalent
V shape Anvil: 150mm (Diameter) or equivalent

Reference Block with national/international traceability certificate:
<table>
<tr><td>a) 10/3000 (Minimum thickness:16 mm)
≤ 200 HBW
300≤ HBW≤400
≥ 500 HBW</td><td>b) 5/1500 (Minimum thickness:12 mm)
≤ 200 HBW
300≤ HBW≤400</td></tr>
<tr><td>c) 2.5/1000 (Minimum thickness:6 mm)
≤ 200 HBW</td><td>d) 1/500 (Minimum thickness:6 mm)
≤ 200 HBW</td></tr>
</table></td><td>Basic Accessories

Flat Anvil: 150mm (Diameter) or equivalent
V shape Anvil: 150mm (Diameter) or equivalent

Reference Block with national/international traceability certificate:
<table>
<tr><td>a) 10/3000 (Minimum thickness:16 mm)
≤ 200 HBW
300≤ HBW≤400
≥ 500 HBW</td><td>b) 5/750 (Minimum thickness:12 mm)
≤ 200 HBW
300≤ HBW≤400</td></tr>
<tr><td>c) 2.5/187.5 (Minimum thickness:6 mm)
≤ 200 HBW</td><td>d) 1/30 (Minimum thickness:6 mm)
≤ 200 HBW</td></tr>
</table></td></tr>
</table>

x. Amendment in Technical Specification of Automatic Computerized Compression Testing Machine

	Existing	Modified
ACTM	**3000KN for Compressive Strength test of Precast Concrete Blocks for Pavingas per IS 15658:2006 and other similar products like Concrete Cubes 150mm Min. and Cylinders dia. 150 mm Min.**	**3000 kN for Compressive Strength test of Precast Concrete Blocks for Paving per IS 15658:2006 and other similar products like Concrete Cubes 150 mm Min. and Cylinders dia. 150 mm Min and 500 kN for Compressive Strength of Cement Cubes as per IS 4031 (Part-6):1988.**
Equipment Description & Purpose	Automatic Computerized Compression Testing Machine (ACTM) – Capacity 3000KN for Compressive Strength test of Precast Concrete Blocks for Paving as per IS 15658:2006 and other similar products like Concrete Cubes 150mm Min. and Cylinders dia. 150 mm Min., equipped with automatic pace rate control, capable of applying load without shock continuously at a rate of 15±3 N/mm2 per minute, conforming to all requirements of Annexure D of IS 15658:2006, diameter of bearing block face 320mm min.,	Automatic Computerized Compression Testing Machine (ACTM) – Capacity 3000 kN for Compressive Strength test of Precast Concrete Blocks for Paving as per IS 15658:2006 equipped with automatic pace rate control, capable of applying load without shock continuously at a rate of 15±3 N/mm^2 per minute, conforming to all requirements of Annexure D of IS 15658:2006, diameter of bearing block face 320 mm min., complete with all required fixtures, tools, accessories etc. and testing of other similar products like concrete cubes 150 mm min and cylinders dia 150 mm min as per IS 516:1959 Machine should also have separate loading arrangement with capacity 500 kN for testing of Compressive Strength of Cement Cubes as per IS 269:2015, IS 8042:2015, IS 455:2015, IS 1489 (Part-1):2015 and IS 4031 (Part-6): 1988 as per details given below:

	complete with all required fixtures, tools, accessories etc.and as per details given below:		
1.	**Machine Capacity** 3000kN	**Machine Capacity** 3000 kN with separate loading arrangement for 500 kN (Dual frame)	
		For 3000 kN	For 500 kN
2.	**Least count** 0.1 kN	**Least count** 0.1 kN	**Least count** 0.02 kN
3.	**Platen size** Min. 320mm diawith steel plates size 14”	**Platen size** Min. 320 mm dia with steel plates size 14”	**Platen size** Square 100 mm min.
4.	**Clearance between platens** 400mm	**Clearance between platens** 400 mm	**Clearance between platens** 450 mm Max.
5.	**Automatic Pace Rate control with printable load rate graph indicating the specified limits** Range of pace rate control to any present value between 0.5KN/s to 20KN/s	**Automatic Pace Rate control with printable load rate graph indicating the specified limits** Range of pace rate control to any present value between 0.5 kN/s to 20 kN/s	**Automatic Pace Rate control with printable load rate graph indicating the specified limits** 35 N/mm^2/min Refer clause 7.1.1 of IS 4031 (Part-6):1988
	Capable of applying load without shock continuously at a PRESET rate within ±3 N/mm2 per minute for testing of concrete paving blocks	Capable of applying load without shock continuously at a PRESET ratewithin ±3 N/mm2 per minute for testing of concrete paving blocks	Capable of applying load steadily and uniformly, starting from zero at a rate of 35 N/mm^2/min
	Numerical indication of load/ stress rate	Numerical indication of load/ stress rate	Numerical indication of load/ stress rate with Graphical view of load /

	with Graphical view of load / stress rate indicating the specified limits printable on test report via. software	with Graphical view of load / stress rate indicating the specified limits printable on test report via. software	stress rate indicating the specified limits printable on test report via. software
6.	**Steel bearing blocks and plates for holding specimen** Bearing blocks shall have Minimum hardness of 60 (HRC) and a minimum thickness of 25 mm with top block spherically seated and shall comply all requirements of Clause D-1 of IS 15658:2006.	**Steel bearing blocks and plates for holding specimen**	**Steel bearing blocks and plates for holding specimen**
	The surfaces of the steel bearing blocks and plates shall not depart from the plane by more than 0.025 mm in any 15mm dimension.	Bearing blocks shall have Minimum hardness of 60 (HRC) and a minimum thickness of 25 mm with top block spherically seated and shall comply allrequirements of Clause D-1 of IS 15658:2006.	Self centering platens
15.	**Software** Calculation of results like Compressive strength, Compressive strength calculation for paving blocks as	**Software** Calculation of results like Compressive strength, Compressive strength calculation for paving blocks as per requirements of IS 15658:2006 and Cement Cubes as per IS 4031 (Part-6):1988 etc. with facility to print test report.	

	per requirements of IS 15658:2006.	

Electrical equipment:

i. Annexure C 1: Dynamometer and vibration test equipment with computer controlled test bench

Sl. No	Subject	Existing specifications	Amendment
2) d.	Technical requirements, 2) d.	Digital power meter of accuracy 0.5 %	Digital Power Meter : Replace with following: Digital power meter of accuracy 0.2 %
2) r.	Technical requirements, 2) r	The test setup shall be provided with good workmanship and powder coated exterior with proper appearance.	Replace text of 2)r. with following: The test set up shall be provided with good workman ship and powder coated control panel with proper appearance.

ii. Annexure C 3: EMI/EMC test

Sl. No	Subject	Existing Specifications	Amendment
2	CE/RE/Radiated immunity/ Disturbance Power Measurement	Chamber: Anechoic Chamber (Size: Approx. 6mx4mx3.3m) Field Power Amplifier: 80 MHz - 3 GHz 10 V/m & 30V/m	Chamber: Anechoic Chamber (4 m height scanning should be possible) Field Power Amplifier: 80 MHz-6 GHz 10 V/m 30 V/m for 1 m test distance
3	Electric Fast Transient Burst	' three phase five lines, Ac and DC Max 32 A'	Remove last line: ' three phase five lines, Ac and DC Max 32 A' Add: Additional CDN for current measurement (6 lines) up to 100 A
4	Conducted Susceptibility	COSAT Test Automation Software Spectrum Analyzer Module: 9 kHz - 2 GHz	Software: COSAT or any other test automation software Spectrum Analyzer Module: 9 KHz-230 MHz

		Signal Generator Module: 9 kHz - 2 GHz	Signal Generator Module: 9 KHz-230 MHz
7	Damp Oscillatory Wave Generator	According to IEC/EN 61000-4-18 (Latest Edition) Oscillation frequencies 3 MHz, 10 MHz, 30 MHz ± 10 % Voltage OC direct out 0.4 kV – 4.4 kV Voltage OC CDN out 0.4 kV – 4.0 kV Voltage calibrated 0.5 kV – 4 kV ± 10 % Voltage waveform decay Pk5 > ½ · Pk1, Pk10 < ½ · Pk1 Output impedance 50 Ω Voltage rise time 5 ns ± 30 % Pulse repetition max. 6666 / s Burst duration 1 ms – 20 s Burst repetition 10 ms – 200 s Current SC direct & CDN 8 A – 88 A @ all frequencies Current SC calibrated 10 A – 80 A ± 20 % Current rise time < 330 ns @ 3 MHz < 100 ns @ 10 MHz < 33 ns @ 30 MHz Current waveform decay Pk5 > ¼ · Pk1, Pk10 < ¼ · Pk1 Polarity positive, negative, alternating	Replace the existing text with the following: Damped oscillatory waves immunity test The test shall be carried out according to IEC 61000-4-18, under the following conditions: Only for transformer operated meters; Tested as table top equipment; Meter in operating condition: - Voltage and auxiliary circuits energized with reference voltage; - With rated current In and cosϕ resp. sin ϕ according to the value given in the relevant standard Test voltage on voltage circuits and auxiliary circuits with a reference voltage > 40 V: Common mode: 2.5 kV; Differential mode: 1.0 kV; Test frequencies: 100kHz, repetition rate: 40Hz; 1 MHz, repletion rate: 400Hz; Test duration: 60s (15 cycles with 2 s on, 2 s off, for each frequency) During the test the behavior of the equipment shall not be perturbed and the variation in error shall be within the limits as specified in the relevant standards.

iii. Annexure C 4: Vibration and Shock Test equipment

Subject	**Existing Specifications**	**Amendment**
Vibration test equipment	---	New Addition: According to IS 9000 (Part 8) New Addition: Horizontal sweep table required
Shock Test equipment	---	New Addition: According to IS 9000 : Part 7 : Sec 1 to 5 New Addition: Shall be able to perform bump test as well

iv. Annexure C 5: Meter test system bench 10 position with at least 10 ICT

Page no.	Subject	Existing Specifications	Amendment
Page 532	Scope: Line 1	This specification defines the requirement of a Three Phase Fully Automatic, Computer Controlled Meter test bench associated with Reference Standard Meter (RSM) of 0.01% accuracy class	The replace the text of line 1 with the following: This specification defines the requirement of a Three Phase Fully Automatic, Computer Controlled Meter test bench associated with Reference Standard Meter (RSM) of accuracy class 0.02 % or better:
Page no 532	Test Bench	Test bench shall be capable to perform the following additional tests: 4) DLMS Communication protocol	The test bench shall be capable to perform the following additional tests: Replace text of 4) with "DLMS compliance"
Page. No. 528	Current Amplifier	The basic accuracy of current output (10mA … 120A range) shall be 0.02% of set value	Replace point 3 with the following: The basic accuracy of current output (100 mA…120A range) or better shall be 0.02 % of set value.
Page No 527	Precision Electronic Reference Standard Meter	1st para, second line : The class of accuracy of the reference standard meter shall be 0.02% for active, reactive and apparent energy for current range 10mA … 120A.	1st para, second line: replace second line as: The class of accuracy of the reference standard meter shall be 0.02 % or better for active, reactive and apparent energy for current range 100mA…120A or better.
Page no. 526	Technical Data of Reference Standard Meter	Point 6: Current Range:1mA…120A Point no. 7: Accuracy class: 0.01% for Current, Voltage, Power and Energy in any mode	Point 6 :Current Range: Replace the existing text with the following: Current range: **100mA**…120A **or better.** Point no. 7: Accuracy Class: Replace the existing text with the following: Accuracy class: 0.02% or better for Current, Voltage, Power and energy in any mode.
Page no. 526	Three Phase Isolation Current Transfor	Technical Data of ICT: Ratio Error of < 0.02% for current range of 100mA … 120A Phase Error of < 0.8 minutes for current range of 100mA … 120A	Technical Data of ICT: • Ratio Error of <0.02% for current range of 100mA…120A or better

	mer (ICT)		• Phase Error of <0.8 minutes for current range of 100mA…120 A or better
Page no. 523	Meter Test rack	Line 1: The test rack shall consist of a fixed frame for mounting of meters under test, scanning heads, Quick connecting system and error display units	Line 1, delete "quick connecting system"
page no. 521	Voltage and current test lead sets:	Second point : One set of Current leads suitable for **40A** and one set of current leads for 120A to be provided for 10 meter testing at a time.	Replace second point by: 'One set of Current leads suitable for **12A** and one set of current leads for 120 A to be provided for 10 meter testing at a time.'
Page no. 521	Calibration and validation	Point c) The equipment shall comply to the requirements of IS 13779, IS 15884 and IS 14697 (current versions with latest amendments) in all respects.	Point c) Replace the existing text with the following: c) The equipment shall comply to the requirements of IS 13779, IS 15884, IS 14697 and IS 16444 (current versions with latest amendments) in all respects.
Addition	--	----	New Addition: Add following text to the specifications : Demonstration by the representative of the supplier who has got the order
Addition	Voltage and Current Amplifier VA rating	-----	New addition: Add following text to the specifications : The VA rating indicated are for general indication only, However bidder has to ensure that the test gear shall be capable of testing and calibration 10 meters of all types, mentioned under technical requirement including load of Isolating current transformers. If as per requirement, higher rating is necessary, they shall select the same. Source should be capable to run at peak load without abnormal deviation in current & voltage waveform.

V. Annexure C 15: HV, RIV tester

Subject	Existing Specifications	Amendment

Tender Document, Page No 27: Sl. No 35	Sl. No. 35: HV tester(up to 700 KV and RIV tester)	Replace HV tester(up to 700 KV and RIV tester) with the following: Sl. No. 35: HV, RIV tester
Voltage Measurement	Voltage measurement: Upto 1000 kV(rms) with digital display	Voltage measurement: Up to 750 KV(rms) with digital display
New addition:	--	New addition: Shielded room requirement is not a part of this tender
New addition:	--	New addition: Insulator set of ratings available from 11 KV to 750 KV, required
New addition:	--	New addition: Duty Cycle: as per standard specifications
New addition:	--	New addition: Capacitive load components for testing of cables/conductors required

vi. Annexure C 19: Power analyser single phase

subject	**Existing Specifications**	**Amendment**
Sl. No. 1 Suitability	Sl. No. 1 Suitability selectable display update rate (ranging from 100 ms till 10 s) and auto ranging of integration feature	Sl. No. 1 Suitability: Replace Selectable display update rate(ranging from 100ms to 10s) with the following" "100 ms to 10 sec auto ranging for integration purpose and display update rate from 500 msec onwards"
Sl No. 7 , Input other attributes	: Sl No. 7 , Input other attributes Power & Current values integrated separately for positive & negative polarities. Averaging function with Exponential average & moving average up to 64 numbers	Sl No. 7 , Input other attributes: Replace 'averaging function with exponential average' with the term 'averaging function' only.
Sl. No. 9 (e): safety Features	Sl. No. 9 (e): safety Features	Sl. No. 9 (e): safety Features : Replace the existing text with:

	Operating temperature 0˚C to 55˚C and humidity 10% to 95% RH.	Operating temperature : 27 +- 5 degree C and humidity 35% to 70% RH.

vii. Annexure C 20: Impulse tester

Subject	Existing Specifications	Amendment
2) Technical Requirements:	Sl. 2(b): Range of Impulse test voltage should be 0-5kV and 0-15kV, adjustable with both polarities, Least count 0.001kV for both range	Sl. 2(b): Replace "Least Count 0.001 KV" to " Least Count 0.01 KV"

Analytical equipment:

i. SPARK OES

S No	Existing Specification text	Amended Text
1.	Detector System Fully PMT based detectors only. Multiple detectors to cover the range as per specified metal alloy bases with superior resolution and signal to noise ratio.	Detector System: PMT or (PMT+CCD) based detector . Multiple Detectors to cover the range as per specified metal alloy bases with superior resolution and signal to noise ratio
2.		New Line to be added in Metal/alloy bases/ standards : Metal/Alloy bases/Standards: CRMs should have traceability to International Standards

ii. **Amendment in Technical Specification of AAS**

Sl. No.	Original Text	Amended Technical Specification
1	Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment	Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and/or horizontal burner adjustment,
2	Measurement Measurements of mean, RSD and CV, Background only mode, Integration of peak height and	Measurement Measurements of mean, RSD and CV, (Background only mode deleted), Integration of peak height and peak areas.

	peak areas	
3	Flame Arrester Flame arrester should be provided in the tube which connects the assembly to the absorption cell	Flame Arrester: Flame arrester should be provided in the tube which connects the assembly to the absorption cell, if required.
4	Graphite Tube Atomizer with Zeeman and Deuterium background correction & Furnace vision system accessory to provide high definition images of events inside the graphite furnace cuvette, allowing monitoring of the sample injection and behaviour during the dry and ash phases of the furnace program.	Graphite Tube Atomizer with Zeeman and Furnace with Deuterium background correction & Furnace vision system accessory to provide high definition images of events inside the graphite furnace cuvette, allowing monitoring of the sample injection and behavior during the dry and ash phases of the furnace program.
5		To be added: System should be having integrated flame and graphite mode with automatic switch over facility

iii. <u>Amendment in Technical Specification of CS Analyzer</u>

Sl. No.	**Original Text**	**Amended Text**
1	Microprocessor based PC controlled simultaneous carbon & sulphur analyser for steel (MS, SS and Tool steel)	Microprocessor based PC controlled simultaneous carbon & Sulphur analyser for Steel (MS, SS & Tool steel) & Sulphur in Cement
2	System should be capable to handle sample weight of up to 2 g	System should be capable to handle sample weight of up to 2 g and analyzing at least 20 sample automatically through auto-sampler based system
3	On-site demonstration to the users and Operation and Maintenance Training	On site demonstration to the satisfaction_of the users and Operation & maintenance training
4		To be added UPS: Branded 15 KVa UPS or better suitable for providing uninterrupted power supply to the instrument with backup of minimum 30 min.

iv. Amendment in Technical Specification of OHN Analyzer

Sl. No.	Original Text	Amended Text
1	The determinators should be equipped with latest generation independent detector for both oxygen & Nitrogen measurement. Oxygen should be measured through series of IR detectors at least two CO_2IR-detectors for measuring High & Low range and at least one CO IR detector. The IR Detector should be independently heated without using any oven to thermally isolate the detectors from environmental temperature fluctuations and must save down time & the same IR-detector should not use any moving part like chopper blade etc. Nitrogen should be measured by latest generation independently heated plug-n-play type dual flow controlled Thermal Conductivity Detector (TCD) with auto range change facility.	The determinators should be equipped with latest generation independent detector for Oxygen , Hydrogen & Nitrogen measurement. Oxygen should be measured through series of IR detectors at least two CO_2IR-detectors for measuring High & Low range and at least one CO IR detector. The IR Detector should be independently heated without using any oven to thermally isolate the detectors from environmental temperature fluctuations and must save down time & the same IR-detector should not use any moving part like chopper blade etc. Nitrogen should be measured by latest generation independently heated plug-n-play type dual flow controlled Thermal Conductivity Detector (TCD) with auto range change facility.
2		To be added : Analysis time : 5 minutes or lesser

v. Amendment in Technical Specification of Triple Quadrupole GC MS/ MS System with FID

Sl. No.	Original Text	Amended text
1	Suitable purge and trap system to install on GC MSMS to analyze Pesticide residue as per USEPA methods	Suitable purge and trap system to install on GC MSMS to analyze residue as per USEPA methods.
2	Solid Phase Extraction for Water sample analysis along with consumable for 2000 samples to be supplied. Quechers kit for PDW /milk products/infant food to be provided-1000 Nos. each per matrix Two nos. Microprocessor based Nitrogen evaporation system with 15 ml capacity and 200 ml capacity from ambient temperature to 70 degree C water bath.	Solid Phase Extraction for Water sample analysis along with consumable for 2000 samples and manifold to be supplied. QuEChERS kit for milk products / infant food to be provided- 1000 Nos. each per matrix as required. 2 nos. Microprocessor based Nitrogen evaporation system with 15 ml capacity and 200 ml capacity from ambient temperature to 70 degree C water bath.

3	**A) SOFTWARE**: Windows Based software with multitasking and capable of performing the following functions: It must be able to control all the devices from same software. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified. Data acquisition, integration, calibration, quantification and QC calculations must be automated. Automatic MRM/SRM method Development must be feasible. All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. with digital calibrated Flow Meter (for Gas as well as Liquid from 0.1 ml to 400 ml). Value should set through Software by PC. Manual and Auto tune options should be provided. Library searching facility with Licensed NIST, Wiley and Pesticide Library (in CD/ROM Format with Online updation). Fatty Acid Methyl Esters, and artificial flavors. **Licensed software should be provided & it should be 21 CFR part 11 compliant**. **B) HARDWARE:** , Intel core i7 (6^{th} generation or better) processor, 16 GB RAM or more, 1 TB HDD or more, LED Flat-Color size-27" or bigger, DVD Multidrive, USB Port minimum 06 Nos, Optical mouse with pad, Keyboard, laser Jet Printer Color or higher configuration for use with the above system to be provided. Computer should have **licensed version of Windows 10** and other supporting softwares installed.	**A) SOFTWARE**: Windows Based software with multitasking and capable of performing the following functions: It must be able to control all the devices from same software. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified. Data acquisition, integration, calibration, quantification and QC calculations must be automated. Automatic MRM/SRM method Development must be feasible. All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. with digital calibrated Flow Meter (for Gas as well as Liquid from 0.1 ml to 400 ml). Value should set through Software by PC. Manual and Auto tune options should be provided. Library searching facility with Licensed NIST, Wiley and Pesticide Library (in CD/ROM Format with Online updation). Fatty Acid Methyl Esters. **Licensed software should be provided & it should be 21 CFR part 11 compliant**. **B) HARDWARE:** , Intel core i7 (6^{th} generation or better) processor, 16 GB RAM or more, 1 TB HDD or more, LED Flat-Color size-27" or bigger, DVD Multidrive, USB Port minimum 06 Nos, Optical mouse with pad, Keyboard, laser Jet Printer Color or higher configuration for use with the above system to be provided. Computer should have **licensed version of Windows 10** and other supporting softwares installed.

Annexure –A

Table A List of Pesticide Residues

S. No.	Name of Contaminant	Limits as specified in ISs	Remarks
25	Monocrotophos	Less than 0.0001 mg/l	Deleted

Table B List of FSSAI Pesticide

S. No.	Name of Contaminant	Limits as specified in ISs	Remarks
9	2,4-D	0.05 mg/l	Deleted
12	Paraquat Dicholoride (Determined as Paraquat cations	Milk (whole) 0.01 mg/l	Deleted
14	Carbendazim	0.10 (fat basis) mg/l	Deleted
15	Benomyl	0.10 (fat basis) mg/l	Deleted
16	Carbofuran (sum of carbofuran and 3 – hydroxyl carbofuran expressed as carbofuran)	0.05 (fat basis) mg/l	Deleted
18	Edifenphos	0.01 (fat basis) mg/l	Deleted

Clarification :

PDW means Packaged Drinking Water as per IS 14543:2016

Milk and Milk Products means (but not limited to) the following Indian Standards:

i. IS 13334 Part 1 : 2014, Skimmed Milk Powder Standard Grade
ii. IS 1166 : 1986 Condensed Milk.
iii. IS 1806:2018 Malted Milk Food (pl check whether this is required)
iv. IS 1656:2007, Milk Cereal Based Complimentary Foods,
v. IS 11536:2007, Processed Cereal Based Complimentary Foods

vi. **Technical Specification for Liquid Chromatography Mass Spectrometry (LC- MSMS) Triple Quadrupole**

Sl. No.	Original Text	Amended Text
1	High pressure Quaternary gradient operations and capable of switching between four solvents	High pressure Quaternary / **Binary** operations and capable of switching between four solvents
2	The auto sampler design should have variable injection volume between. Temperature setting range should be from ambient to +4 to 35ºC Suitable racks capable of holding minimum 100 vials at a time for handling 1ml and 1.5ml Vials should be offered.	The auto sampler design should have variable injection volume between. Temperature setting range should be form ambient to to +4 to 35^0C Suitable racks capable of holding minimum 90 vials at a time for handling 1ml and 1.5ml or higher volume Vials should be offered
3	Auto-tuning with sensitivity and resolution optimization for both positive ion and negative ion modes.	Auto-tuning by software with sensitivity and resolution optimization for both positive ion and negative ion modes.
4	Mass Accuracy : 0.15 Dalton or better	Mass accuracy requirement deleted
5	ESI Positive: 1 pg Reserpine (on column), specify the following with documentary evidence: (a) Chromatographic signal to noise (S/N – minimum 2,00,000:1) (b) CV with number of repetitive	ESI Positive: 1 pg Reserpine (on column), specify the following with documentary evidence: (a) Chromatographic signal to noise (S/N – minimum 2,00,000:1) (b) CV with number of repetitive injections (minimum three injections, CV 5 % or

	injections (minimum three injections, CV< 0.5 % or better). (c) Injection volume (µl) ESI negative: 1 pg Chloramphenicol (on column), specify the following with documentary evidence: (a) Chromatographic signal to noise (S/N – minimum 2,00,000:1) (b) CV with number of repetitive injections (minimum three injections, CV< 0.5 % or better). (c) Injection volume should be 1.0 µl with 1pg/µl concentration.	better). (c) Injection volume (µl) ESI negative: 1 pg Chloramphenicol (on column), specify the following with documentary evidence: (a) Chromatographic signal to noise (S/N – minimum 2,00,000:1) (b) CV with number of repetitive injections (minimum three injections, CV< 5 % or better). (c) Injection volume should be 1.0 µl with 1pg/µl concentration.
	Certified Reference Material	To be added: Certified Reference Material All pesticides and their analogues & their isomers and indicated Aflatoxin and Vitamins (the later two for Milk Products) as mentioned in Annexures. All CRMs should be as per ISO 17034 and shall be supplied with at least 1 year shelf-life/validity at the time of supply (the supply should be adequate enough to meet the requirements for analyzing approx. 50 BIS samples per month for three years for Pesticide residues and 10 BIS samples for Aflatoxin/Vitamins). Based on the instrument requirement quoted the supplier to specify the quantity to be supplied and how they have arrived at the quantity. CRMs for individual pesticides required.

Clause 32 Indicative (Not Limited to) list of List of Pesticide Residues is given below

S. No.	Name of Contaminant	Limits as specified in ISs
25	Monocrotophos in Packaged Drinking Water as per IS 14543:2016	Less than 0.0001 mg/l

Indicative (Not Limited to) List of Pesticide Residues for Milk and Milk Products

S. No.	Name of Contaminant	Limits as specified in ISs
9	2,4-D	0.05 mg/l
12	Paraquat Dicholoride (Determined as Paraquat cations	Milk (whole) 0.01 mg/l
14	Carbendazim	0.10 (fat basis) mg/l
15	Benomyl	0.10 (fat basis) mg/l
16	Carbofuran (sum of carbofuran and 3 – hydroxyl carbofuran expressed as carbofuran)	0.05 (fat basis) mg/l

18	Edifenphos	0.01 (fat basis) mg/l

Clarification :

PDW means Packaged Drinking Water as per IS 14543:2016

Milk and Milk Products means (but not limited to) the following Indian Standards:

i. IS 13334 Part 1 : 2014, Skimmed Milk Powder Standard Grade
ii. IS 1166 : 1986 Condensed Milk.
iii. IS 1656:2007, Milk Cereal Based Complimentary Foods,
iv. IS 11536:2007, Processed Cereal Based Complimentary Foods

vii. Amendment in ICP-MS Technical Specifications

Sl. No.	**Original Text**	**Amended Text**
1	Computer controlled with at least three channel peristaltic pump, preferably Peltier cooled spray chamber with suitable nebulizer and injector	Computer controlled with at least three channel peristaltic pump, Peltier cooled spray chamber with suitable nebulizer and injector
2	Argon ICP source with computer controlled 27/40 MHz RF generator operating from 500 – 1600 W or better.	Argon ICP source with computer controlled 27 or better MHz RF generator operating from 500-1600 W or better.
3	Digital solid state RF generator with dynamic impedance matching with nano seconds.	Digital solid state RF generator with dynamic impedance matching
4	Ni based sample and skimmer cones	Ni/Cu based sample and skimmer cones
5	Autosampler with 250 vial capacity & 5000 tubes. Peltier cooled spray chamber for low oxide ratio and polyatomic interference. Software controlled Aerosol dilution system should be included	Autosampler with 20 vial capacity & 5000 tubes. Peltier cooled spray chamber for low oxide ratio and polyatomic interference. Software controlled Aerosol dilution system should be included. Universal cone interface for best sensitivity for high matrix as well as low matrix samples without changing any hardware in the interface

	Universal cone interface for best sensitivity for high matrix as well as low matrix samples without changing any hardware in the interface Inert kit for HF digested samples should be provided checkout solution, tuning solution, internal standard solution. Suitable Microwave digestion system shall be supplied for anlaysis of solid samples like Infant Milk powder, Cereal based complementary foods etc.	Inert kit for HF digested samples should be provided checkout solution, tuning solution, internal standard solution. Suitable Microwave digestion system with 12 number or better vessels shall be supplied for analysis shall be supplied for analysis of solid samples like Infant Milk powder, Cereal based complementary foods etc.
6	Gas cylinders for ICPMS- Argon (04 No.), He gases cylinder (02 Nos.), Reaction Gas cylinder as per system requirement , Gas purification panels with fittings for supplied gases,02 stage manual manifold for Argon gas, Fume hood/Exhaust, UPS 15KVA/1Hr Back up should be supplied along with the equipment	Gas cylinders for ICPMS-Argon (04 No.). He gases cylinder (02 Nos.) Reaction Gas cylinder as per system requirement. Gas purification panels with fittings for supplied gases 02 stage manual manifold for Argon gas. Fume Hood/Exhaust UPS 20 kVA UPS with at least 120 min back up should be supplied along with the equipment. Suitable number of two stage double diaphragm stainless steel gas regulator to be supplied.
7	Three set of Ni based sample and skimmer cones	Three set of Ni/Cu based sample and skimmer cones

viii. Amendment in -Rays Fluorescence Spectrometer – Technical Specifications

Sl. No.	**Original Text**	**Amended Text**
1	To hold 60 or more samples in pressed powder pellet and fused glass bead form.	To hold 10 or more samples in pressed powder pellet and fused glass bead form.
2	H.T. Generator Power: 50 W or more	H.T Generator Power: 200watt or higher
3	Crystal Changer 8 positions, bidirectional, automatic	Crystal Changer 3 position or better, bidirectional, automatic
4	Minimum 5 Crystals to be quoted to cover above range	Minimum 3 Crystals or better to be quoted to cover above range
5	Sample Holders 50 Nos Steel rings for sample preparation 100 Nos.	Sample Holders 50 Nos Steel rings for sample preparation 50 Nos.
6	Suitable Water Chiller – external for cooling of the X-Ray Tube and XRF	Suitable Air/ Water Chiller/ if required for cooling of the X-Ray Tube and XRF.
7	X Ray tube End Window, Rh target, Ceramic Insulation to match the generator	X ray Tube End Window, Rh /Pd target , Ceramic Insulation to match the generator.
8	Sample preparation : Pressed Powder. A) Automatic Pressed	Sample Preparation : Pressed Powder. A) Automatic Pressed pelletiser with pressure upto 40 Tons

	pelletiser with pressure upto 40 Tons B) Vibratory Mill , Heavy Duty floor standing with Tungsten Carbide Bowl	B) Vibratory Mill , Heavy Duty floor standing with Tungsten Carbide Bowl Pressed Pellet sample preparation equipment is also to be supplied
9	X-ray Detectors Flow proportional counter, scintillation counter	Flow Proportional counter, Scintillation detector or equivalent.