ATTACHMENT – 7.14 : EQUIPMENT CALIBRATION TABLE (CIVIL IM & TE)

EQUIPMENT	CALIBRATION INTERVAL	FUNCTIONAL TEST	CALIBRATION TOLERANCES	CALIBRATION METHOD	REMARKS
LABORATORY EQUIPMENT					
Test Sieves	every 12 months	Visual for damage in mesh	BS 410 table 3	Appendix F of BS 410	Check visual test every use for damage
L.A. Apparatus	N/A	Visual for surface wear of the shell and check ball diam. - replace as required	ASTM C 131 sec. 5	ASTM C 131 Appendix XI	
Weighing Scales (Mechanical)	every 12 months or when fails the functional test	Comparison test every day	BS 812 part 100 sec.4.2.1.1	BS 812 part 100 sec.4.4.4.1	
Weighing Scales (Electronic)	every 12 months or when fails the functional test	Comparison test every day	BS 812 part 100 sec.4.2.1.1	BS 812 part 100 sec.4.4.4.1	
Oven / Dryers	every 12 months or when found faulty by functional check	Check temperature controls every 3 months with calibrated thermometer	± 5° C	BS 812 part 100 sec.4.4.5.1	
Density meters (sand cone)	Replace	Visual for damages every use			
Density meters (Nuclear)	When the daily check count test does not produce required results	Every day before use to check count as per Manufacturer's recommendations	Refer to Manufacturer Literature	Refer to Manufacturer Literature	Calibration to be done by the Manufacturer or expert personnel with the right tools due to safety hazards involved
Flakiness & Elongation test Sieves	N/A	Visual for damage in mesh	BS 812 part 103 Appendix B	Appendix E of BS 410	
Proctor Measuring Apparatus (Mold)	N/A		ASTM D 1557	ASTM D 1557	
Plasticity index test Apparatus (Uttenberg)	N/A		Refer to manufacturer's instructions	Refer to manufacturer's instructions	
Thermometers (Normal Type)	N/A	Every month check temperature of water boiling point	BS 593	BS 812 part 100 sec. 4.4.4.2	
Thermometers (Digital Type)	N/A	Every month check temperature of water boiling point		BS 812 part 100 sec. 4.4.4.2	
Aggregate Density Mold	N/A	Visual for tear & wear	BS 812 part 100 sec. 4.4.5.4	If exceeds tolerance then replace	

ATTACHMENT - 7.14 : EQUIPMENT CALIBRATION TABLE (CIVIL IM & TE)

EQUIPMENT	CALIBRATION INTERVAL	FUNCTIONAL TEST	CALIBRATION TOLERANCES	CALIBRATION METHOD	REMARKS
Sand Density Mold	N/A	Visual for tear & wear	BS 812 part 100 sec. 4.4.5.4	If exceeds tolerance then replace	
Slump Cone	every use	Visual check for damages	BS 1881 part 102	N.A.	To be replaced if out of tolerance
Concrete Cubes Mold	every use	Visual check for damages every use	BS 1881 part 108 sec. 3	N.A.	To be replaced if out of tolerance
Concrete Cubes compression testing apparatus	every 12 months or when relocated or when found faulty in the comparative cube test	Every week a comparative cube test (BS 1881 part 127)	BS 1881 part 115	As per BS 1610	To be done by Manufacturer or Expert personnel
Vernier Caliper	every 12 months	Vs. Standard Block	0.1 mm	BS 812 part 100 sec. 4.4.4.3	
Micrometers	every 12 months	Vs. Standard Block	BS 812 part 100 sec. 4.2.1.3.3	BS 812 part 100 sec. 4.4.4.3	
Dial Gauge	supplied per manufacturer's specification	Operation check/visual	Manufacturer's recommendations	Manufacturer's recommendations	
Timers	every 12 months		BS 812 part 100 sec. 4.2.1.4	BS 812 part 100 sec. 4.4.4.4	
Volumetric Glassware	once before use for the first time		BS 5898 : 1980	BS 812 part 100 sec. 4.4.4.5	
SURVEYING EQUIPMENT					
Automatic Level	1 month (accuracy check)	Prior to use carry out 3-point check	Per operations manual	Per operations manual	service by manufacturer when instrument fails accuracy check
Theodolite	1 month (accuracy check)	Prior to use check reverse measurement of same angle	Per operations manual	Per operations manual	service by manufacturer when instrument fails accuracy check
Electronic Distance Meter	3 months (accuracy check - measurement constant 'K')	Functional check per manufacturer manual	Per operations manual	Per operations manual	service by manufacturer when instrument fails accuracy check
Measuring Tapes	Replace if damaged	Check for damages			
Leveling Staffs	When proven not to be vertical	Check spirit bubble vertically every use			
Concrete Batching Plants:	3 months	Refer to Manufacturer and project procedures			

Function test per Operator's Manual

Attachment – 7.14 : Equipment Calibration Table (Mechanical IM & TE)

EQUIPMENT	CALIBRATION INTERVAL	FUNCTIONAL TEST	CALIBRATION TOLERANCES	CALIBRATION METHOD	REMARKS
NDE Equipment:					
Ultrasonic Set	12-months	NDT Subcontractor Procedure	see Note.1	BS.4331 Part 2	Subcontractor Equipment
MPI Magnet Check	Monthly	Operation check	Lifts block		
Holiday Detector	3-months	N/A	Manufacturer's Recommendations	Manufacturer's Recommendations	
Film Densitometer	12-months	Operation check prior to use	Manufacturer's Recommendations	Note 2	
Radiation Survey Meter	12-months	Operation check	Manufacturer's Recommendations	Note 2	Subcontractor Equipment
Personal Dosimeter	12-months	Operation check	Manufacturer's Recommendations	Note 2	Subcontractor Equipment
Weld Inspection Equipment:					
Tong Tester (Clamp-on Volt/Amp Meter)	12-months	Operation check	Manufacturer's Recommendations	Electrical Procedure	vs. Standard Instrument
Welding Gauge	N/A	Visual check for damage	NOT REQUIRED	N/A	
Welding Machines	Note 3		Note 3		vs. Standard Instrument
Welding Rod Ovens	N/A	Operation check	Daily Audit / Note 3		vs. Standard Instrument
Welding Rod Quivers	N/A	Check temp. prior to use	Prior to Use / Note 3		vs. Standard Instrument
Thermocouple wire for PWHT	NOT REQUIRED	N/A	Per Cert. Of Compliance	Certificate of Conformance	Wire only to be registered
Temperature Recorder for PWHT	6-months	Operation check	Manufacturer's Recommendations	Manufacturer's Recommendations	by outside laboratory
High/Low Gauge	N/A	Visual check for damage	N/A	N/A	
Digital Thermometer	12-months	Operation check	+/-1%	Against Std. Instrument	
Piping / Mechanical Equipment:					
Pressure Gauge	3-months	Visual check for damage	+/- 5% FSD	vs. Standard instrument	
Dead Weight Tester (Budenberg)	12-months	N/A	24 - months or prior to start of testing	vs. Standard instrument	
Dial Gauge	Supplied per manuf. spec.	Operation check/ visual	Manufacturer's Recommendations	Manufacturer's Recommendations	
Torque Wrench	3-months	Operation check	Prior to Use	Note 4	
Micrometers	Every 12 months	Operation check vs std.block	Manufacturer's Recommendations	BS 870	
Vernier Caliper	Every 12 months	Operation check vs std.block	Manufacturer's Recommendations	BS 887	
Slip Gauges	2-years	Visual check for damage	Manufacturer's Recommendations	Manufacturer's Recommendations	
Combination Set/Squares	N/A	Visual check for damage	N/A	N/A	
Spirit Level	N/A	Operation check/visual check for damage	Dependent on application	Reverse check	
Tapes/Rules	N/A	Visual check for damage	N/A	N/A	

Notes

1. Ultrasonic sets are calibrated in use per NDT Subcontractor procedure for testing purposes. Additional calibration of the machine electronics to BS 4331 Part 2 is required every 12-months.

2. Calibrate to manufacturer's instructions or return to an external laboratory

3. Automatic e.g. SAW welding machines: Ammeter/voltmeter/tachometer (where fitted) ~ every 6 months

GTAW / GMAW welding machines (where fitted) ~ every 6 months

SMAW welding machines ~ Routine electromechanical maintenance as per manufacturer's recommendations and Generator set output ~ every month

Welding ovens and quivers ~ every month

4. Torque wrenches will be tested prior to use against a "Master". The "Master" wrench to be calibrated every 12 months by an external laboratory. "Master" to be purchased with a valid calibration certificate