897.13 DPWH
07. 28. 2015

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
MANILA

JUL 28 2015

DEPARTMENT ORDER)
)
NO. 118)
Series of 2015) 07.28.15

SUBJECT: Amending the Procedures for the Calibration of Testing Equipment of the Regional and District Offices

In order to ensure the accuracy of test results obtained from testing equipment used in various DPWH infrastructure projects, testing equipment shall be calibrated based on defined schedules and requirements for calibration as shown in Annex A.

Considering that some Regional Laboratories do not have the necessary calibration equipment, it is hereby directed that those Regional Offices which have such calibration equipment conduct calibration on their laboratory testing equipment and those in District Offices within their jurisdiction as well as the Regional and District Offices of the Department, indicated opposite its office as shown below:

Regional Office with Calibration Equipment	Regional/District Offices Assigned for Calibration
NCR	Regions IV-A and V
Region I	CAR, Regions II and III
Region VII	Regions VI and VIII
Region X	Regions IX, XI, XII and XIII

The Bureau of Research and Standards (BRS) is likewise directed to calibrate its own testing equipment, and those of Project Management Offices and Region IV-B and its District Engineering Offices.

Calibration of laboratory testing equipment shall be conducted at least once a year or according to its manufacturer's operating instructions. The calibration procedures outlined in Annex B should be strictly observed. Only personnel with adequate training and experience in calibration works shall be assigned.

In order to monitor compliance with this Order, a report shall be submitted to the BRS by the above-mentioned Regional Offices with calibration equipment every quarter of the year, following the prescribed format (Annex C - G), Calibration/Verification Report.

This Order shall take effect immediately and supersedes Department Order No. 82, Series of 1996 - Calibration of Testing Equipment of the Regional and District Offices.

ROGELIO L. SINGSON
Secretary

Department of Public Works and Highways
Office of the Secretary

WIN5U01117

5.5.2 FET/JFS

Annex A

LIST OF EQUIPMENT FOR CALIBRATION

APPARATUS	MODE OF CALIBRATION	FREQUENCY
Concrete Rebound Hammer	Using Anvil	Every 15,000 Impact
Ultrasonic Tester For Concrete Cracks	Validation	Before Use
Skid Resistance And Friction Tester	Zeroing	Before Use
Profilometer	Self-Calibrating	Before Use
Falling Weight Deflectometer Trailer Mounted	Out-Source	Yearly
Universal Testing Machine	In-House	Yearly
Compression Machine	In-House	Yearly
California Bearing Ratio	In-House	Yearly
Balances	In-House	Yearly
Oven	In-House	Yearly
Abrasion Machine	In-House	Every Two Years
Hydrometer	In-House	Every Two Years
Furnace	In-House	Yearly
Temperature Measuring Devices	In-House	Twice A Year
Temperature Baths	In-House	Yearly
Caliper	In-House	Yearly
Sieves	In-House	Twice A Year
Viscometer	In-House	Every 3 Years
Penetrometer And Needles	In-House	Twice A Year
Ductility Apparatus	In-House	Yearly
Gyratory Compactor	Out-Source	Twice A Year
PH-Meter	In-House	Before Use
Speedy Moisture Tester	In-House	Twice A Year
Sand Cone Density Sand	In-House	As Necessary
Sand Cone Density Apparatus	In-House	Yearly
Slump Cone Apparatus	In-House	Yearly
Autoclave Apparatus	In-House	Yearly
Vicat Apparatus	In-House	Every Two Years
Mechanical Mixing Apparatus	In-House	Every Two Years
Length Comparator	In-House	Yearly
Molds	In-House	Yearly

CALIBRATION PROCEDURES FOR LABORATORY EQUIPMENT

1. PURPOSE

The purpose of this procedure is to provide a standard calibration procedure, schedule and requirements for calibration, performance verification, and maintenance of instruments and equipment.

2. SCOPE

This procedure applies to all the equipment used by the Regional and District Offices of the Department.

3. DEFINITIONS

- **Calibration** - Adjustment or standardization of the accuracy of the measuring instrument/equipment, usually by comparison with a certified reference or standard.
- **Equipment** – machines or tools used for testing construction materials incorporated in the implementation of DPWH infrastructure projects.
- **Frequency** – the schedule of calibration of testing equipment.

4. FREQUENCY

Refer to Annex A.

5. EQUIPMENT

As defined on the calibration sheet and equipment specific Standard Operating Procedures for calibration. The specific equipment are listed in Annex A.

6. PROCEDURE

6.1 Operate the equipment in accordance with the relevant Operating Instructions.

6.2 Perform the equipment calibration according to the equipment specific Standard Operating Procedure.

6.3 Fill out form "Calibration/Verification Report" Sheet, see Annex C - G.

6.4 Attach "Calibration Sticker" to the equipment, see Annex H.

6.5 The performance verification of the equipment (only where necessary) shall be repeated prior to routine laboratory use.

6.6 When external calibrations are performed, service providers that demonstrate competence, measurement capability, and traceability shall be used. Calibration certificates from these providers shall contain the measurement results, including the measurement uncertainty and/or a statement of compliance.

7. RE-CALIBRATION

7.1 If the calibration does not conform, repeat the procedure.

7.2 If the second calibration does not conform, clean and check equipment according to the manufacturer's instructions. Then, repeat the procedure.

8. LIMITS

Calibration Instructions must be applied in accordance with the equipment specific Standard Operating Procedure. The general limit of accuracy and sensitivity will depend on manufacturer's manual/instructions.

9. DOCUMENTATION

Document calibration results as per the attached "Calibration/Verification Report" Sheet, see Annex C - G. The Calibration records shall include:

- Identity of the item of equipment and software
- Name of manufacturer and model
- Serial number or unique Identifier(Calibration Sticker)
- Date of calibration
- Validity of calibration
- Current location
- Manufacturer's instructions or a reference to location
- Reference standard, certified reference material or reference material used for calibration
- Copies of all reports, results of calibration, and/or certificates of calibration.
- Maintenance plan and due date for the next calibration
- Identity of the individual performing calibration

REPUBLIC OF THE PHILIPPINES
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BUREAU OF RESEARCH AND STANDARDS
EDSA, QUEZON CITY

Annex C

Date: _____

Lab. Report No.: _____

CALIBRATION/ VERIFICATION REPORT

Name of Client: _____ Date of Calibratio _____
Office Address: _____ Valid Until: _____
Machine: _____ Capacity: _____
Brand Model: _____ Serial Number: _____

For (kN): _____
Calibration factor: _____

Machine Indicated	Reading of Loadcell (Div)				Calibration Factor		
Load, in Division	Trial 1	Trial 2	Trial 3	Average	kN/Division	Factor	Average
							lbs./ div.
							kgs./ div.

Note:

1. Proving ring factor is _____.
2. Calibration/ verification was perfomed with the use of G-04RD Universal Calibration Equipment of Morehouse Instrument Co., Inc. in accordance to **ASTM E74-06.**

Remarks:

Calibration Performed by:

NAME
Designation

Reviewed by:

NAME
Designation

Checked by:

NAME
Designation

NAME
Designation

Attested by:

NAME
Designation

Annex D

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BUREAU OF RESEARCH AND STANDARDS
EDSA, QUEZON CITY

Date: _____

Lab. Report No.: _____

CALIBRATION/ VERIFICATION REPORT

Name of Client: _____ Date of Calibration: _____
Office Address: _____ Valid Until: _____
Machine: _____ Capacity: _____
Brand Model: _____ Serial Number: _____

For (kN): _____
Calibration factor: _____

Applied Force			Reading of Loadcell (Div)			Average Reading of Loadcell		Percentage Error		Above ± 1%?
KN	Lbf	Div	Trial 1	Trial 2	Trial 3	Div	KN			

Note:

1. Results of the verification shows that the indicated load of the testing machine is within the tolerable limits of ±1%.
2. Proving ring factor is _____.
3. Calibration/ verification was performed with the use of G-04RD Universal Calibration Equipment of Morehouse Instrument Co., Inc. in accordance to **ASTM E74-06.**

Remarks:

Calibration Performed by:

NAME
Designation

NAME
Designation

Reviewed by:

NAME
Designation

Checked by:

NAME
Designation

Attested by:

NAME
Designation

Annex E

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BUREAU OF RESEARCH AND STANDARDS
EDSA, QUEZON CITY

Date: _____

Lab. Report No.: _____

CALIBRATION/ VERIFICATION REPORT

Name of Client: _____ Date of Calibration: _____
Office Address: _____ Valid Until: _____
Machine: _____ Capacity: _____
Brand Model: _____ Serial Number: _____

Charges	STEEL SPHERES			
	Diameter in Millimeter (mm)		Weight in Grams (g)	
	Actual	Standard	Actual	Standard
#1		46.80		A total weight of **5,000±25g**
#2		-do-		
#3		-do-		
#4		-do-		
#5		-do-		
#6		-do-		
#7		-do-		
#8		-do-		
#9		-do-		
#10		-do-		
#11		-do-		
#12		-do-		
Ave. size in mm:		**Total Weight in Grams:**		

Note:

1. Calibration/ verification was performed by using the standard procedure of sieving aggregates based on **ASTM C 535-89.**

Remarks:

Calibration Performed by:

_____
NAME
Designation

Reviewed by:

_____
NAME
Designation

Checked by:

_____
NAME
Designation

_____
NAME
Designation

Attested by:

_____
NAME
Designation

Annex F

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BUREAU OF RESEARCH AND STANDARDS
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Date: _____

Lab. Report No.: _____

CALIBRATION/ VERIFICATION REPORT

Name of Client: _____
Office Address: _____
Machine: _____
Brand Model: _____

Date of Calibration: _____
Valid Until: _____
Capacity: _____
Serial Number: _____
Loading Range: _____

Balance Indicated Load	Balance Actual Load	Balance Error	
Gram (g)	Gram (g)	In Gram (g)	In Percent (%)

Note:

1. Calibration/ verification was performed with the use of a set of standard weights. The maximum permissible error is within point one **(0.10%)** of the range used based on **AASHTO M 231.**

Remarks:

Calibration Performed by:

NAME
Designation

Reviewed by:

NAME
Designation

Checked by:

NAME
Designation

NAME
Designation

Attested by:

NAME
Designation

Annex G

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BUREAU OF RESEARCH AND STANDARDS
EDSA, QUEZON CITY

Date: _____

Lab. Report No.: _____

CALIBRATION/ VERIFICATION REPORT

Name of Client: _____ Date of Calibration: _____
Office Address: _____ Valid Until: _____
Machine: _____ Capacity: _____
Brand Model: _____ Serial Number: _____
Loading Range: _____

Indicated Reading (°C)	Actual Reading (°C)	Correction (°C)

Note:
1. Calibration/ verification was performed with the use of Armour Thermometer with a capacity of **300°C** and observed as stated above.

Remarks:

Calibration Performed by:

NAME
Designation

Reviewed by:

NAME
Designation

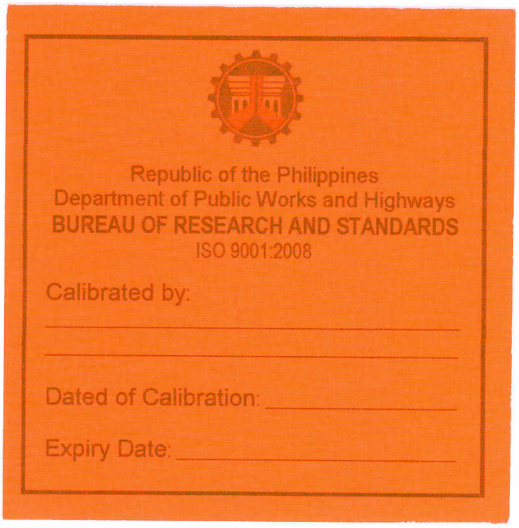
Checked by:

NAME
Designation

NAME
Designation

Attested by:

NAME
Designation


Republic of the Philippines
Department of Public Works and Highways
BUREAU OF RESEARCH AND STANDARDS
ISO 9001:2008
Calibrated by:
Dated of Calibration:
Expiry Date: