

National Laboratory Association – South Africa NPC

P.O. Box 298
Persequor Park
Pretoria, South Africa, 0020
Reg. No: 1994/002856/08
Tel: (+27) 012 349 1500
Fax: (+27) 012 349 1501
<http://www.nla.org.za>

1 De Havilland Crescent
Persequor Technopark



The NLA – SA Certification of Persons Scheme for Civil Engineering Material Testers, CivCert

General Information

Reviewed by:

Carinne Joubert

Approved by:

Steve Sidney

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1. Purpose

This document describes the NLA – SA Certification of Persons Scheme for Civil Engineering Material Testers, CivCert.

2. Scope of the Certification Scheme

CivCert is a Certification of Persons Scheme for Civil Engineering Material Testers, run by the National Laboratory Association of South Africa (NLA – SA).

It offers formal recognition of the knowledge, experience and skills of Civil Engineering Material Testers working in civil engineering material laboratories.

Simply put, certification involves a process whereby applicants provide a portfolio of evidence and undergo an independent witnessing, demonstrating that they meet specified criteria, undertake to abide by a code of ethics, and then once certified, from time to time provide evidence that their skills are kept up to date in order to remain certified.

Initially all applications are administratively evaluated against specified criteria by the Scheme Administrator. A selected Review Panel is responsible for a technical evaluation of the evidence provided, and to make a recommendation to an independent Approval Committee for final certification. Once certified, the Civil Engineering Material Tester is then required to submit evidence on a five yearly basis in order to demonstrate that they continue to meet the criteria while simultaneously indicating that his/her skills sets remain relevant and up to date with modern times.

The scheme covers the civil engineering and related industries laboratory testing personnel competencies in the basic testing methods for aggregates, crushed granular materials, bitumen, asphalt and concrete against the SANS 3001 test method series and sampling of materials from SABITA Manual 37/TMH5.

3. References

NLA-CC-I-02	Pricelist
NLA-CC-I-03	Continuing Professional Development
NLA-CC-I-04	Candidate Instructions
NLA-CC-F-01 – NLA-CC-F-05	Application forms

4. Areas of responsibility

Changes to this document can only be approved by the Director of the NLA – SA.

5. Benefits of being certified

- Provides an opportunity for independent 3rd party recognition of competence,
- Improves marketability as a Civil Engineering Material Tester,
- Helps to provide a career path for Civil Engineering Material Testers,
- Encourages ethical behaviour.

6. Scheme Structure

The scheme currently consists of only one level:

Material Tester

This is for individuals who meet the theoretical and practical requirements as per the applicable application form (NLA-CC-F-01 – NLA-CC-F-05) and is typically aimed at individuals who are practically competent to undertake specific test methods (i.e. sampling,

sample preparation and testing) and are able to complete the bench sheet calculations. The more advanced calculations required in the methods as well as the plotting of results are not requirements for certification as a Material Tester.

7. Certification Process

Step 1: The candidates, in collaboration with their employer, should establish what role they currently fulfil in the laboratory to determine if they are at the level they are required to be at for certification.

All applications must be approved by a representative from the company and banking details supplied (refer to the applicable Application form).

Step 2: The candidate downloads, completes, signs and submits the applicable NLA – SA CivCert application form (NLA-CC-F-01 – NLA-CC-F-05). The evidence required shall be submitted to the NLA – SA Offices with the completed application form (refer to section 8 for details). The application is submitted via e-mail or hand delivered to the NLA – SA Offices.

Step 3: The Scheme Administrator arranges for an appropriate invoice for the application fee to be sent to the candidate. As soon as payment is received, the application is administratively evaluated by the Scheme Administrator. Should there be any information or evidence missing, the candidate is notified by e-mail to submit the missing evidence within two (2) weeks of proof of payment received. Once all evidence is on file to comply with the specified requirements, the process proceeds to the next step.

Step 4: Once all required evidence is received, the candidate is required to complete a theory related assessment which will determine if they are eligible to advance to a witnessing. The assessment must be conducted at least a month before the practical assessment (witnessing) to ensure that the candidate has passed with minimum requirements for theory before the witnessing is conducted (refer to section 9.1.1 for details).

Step 5: A witnessing is only conducted at an approved independent venue by approved independent evaluators once the candidate's witnessing fee has been received and they have passed the theory related assessment detailed in step 4.

Candidates are sorted into groups (not necessarily on a first come, first served basis) and informed as to where and when the witnessing will take place. Initially there *may* be a substantial delay given the potential quantities expected to register for certification. Once completed, the evidence of the witnessing is submitted to the Scheme Administrator by the independent evaluator(s).

Step 6: The Review Panel, which comprises of discipline specific reviewers, is responsible for a technical review of the application with the main objective of ensuring consistency in the witnessings performed and recommendations made by the various evaluators used. Where practical, the Review Panel meets within two weeks of the witnessing date. This evaluation is conducted against the requirements for the specific discipline pertaining to the application.

Step 7: If the Review Panel is satisfied that there is sufficient evidence that all the requirements are met, they make a recommendation to the Approval Committee for a final certification decision. The candidate is informed of the final outcome within two weeks of the Review Panel meeting, where practical (also refer to section 12 for the appeals procedure)

Step 8: The Scheme Administrator arranges for an appropriate certification invoice to be sent to the candidate and as soon as payment is received, a certificate is produced and electronically sent to the candidate within four weeks. A hard copy may be collected from the NLA – SA Offices.

8. Application Requirements

The detailed requirements for certification are described in the CivCert Registration Application Forms (NLA-CC-F-01 – NLA-CC-F-05), downloadable from the NLA – SA website.

In summary, the certification of Civil Engineering Material Testers consists of four main components:

1. The Code of Conduct adoption component,
2. An assessment of their theoretical knowledge,
3. A practical competence component (witnessing), and finally
4. A continuous professional development (CPD) component required to maintain certification once deemed competent.

The requirements are divided into the areas as described below. It is important to note that the Review Panel and Approval Committee are required to assess the candidates' technical compliance with the requirements on the paperwork evidence submitted (i.e. results of theoretical component assessment and evaluator reports on the independent witnessing). There will be a weighting of 80/20 between the practical (witnessing) and theoretical components, respectively. Candidates are to obtain at least the following as a minimum to be certified:

- Theoretical component a minimum of 60%
- Practical component to have an overall minimum score of 75%
- The overall combined mark with the applicable weighting is to be at least 75%

8.1 Qualifications and/or experience

The candidate is required to provide evidence of having obtained an applicable *complete* qualification **and/or** demonstrate sufficient years of experience working in a civil engineering materials laboratory

Evidence required upon application for certification

Copies of certificates of completed qualifications obtained from nationally and internationally recognised institutions are required. (Please note that this is separate to the theoretical onsite training requirements for certification purposes which is detailed in section 8.2)

Years of experience claims must be supported by evidence of having worked actively in a civil engineering materials laboratory. Acceptable evidence includes, but is not limited to, an updated CV applicable to the application or a signed letter on a company letterhead, preferably by the employer's representative or by another employee with knowledge of the candidate's claims.

8.2 Onsite theoretical training

The following basic knowledge as listed below is required per material type for certification purposes. Candidates are expected to gain such knowledge during their employment and are assessed on this knowledge during the written theory related assessment that forms part of the certification evaluation process (refer to section 9 below).

Evidence required upon application for certification

Proof of training must be supplied upon application for certification and can be in the form of laboratory bench sheet reports (which is also used as evidence of practical experience - see section 8.4) and/or certificates of completion/attendance for applicable/relevant training courses.

8.2.1 **Aggregates**

Aggregate test methods

- a. SABITA Manual 37/TMH5: conveyors & stockpiles (sampling)
- b. SABITA Manual 37/TMH5 - riffing and coning & quartering (sampling preparation)
- c. SANS 3001-AG1, AG2 & AG4 - particle distribution and particle shape (FI & ALD)
- d. SANS 3001-AG20, AG21, TMH1 B9 (LBD/CBD) & AG10 - density (BD & AD) and strength of aggregates (ACV & 10% FACT)

8.2.2 **Soils, Gravels and Crushed stone**

Soils, gravels and crushed stone base materials test methods

- a. SABITA Manual 37/TMH5 – stockpiles, pavement layers (untreated) (sampling)
- b. SABITA Manual 37/TMH5 - riffing and coning & quartering (sampling preparation)
- c. SANS 3001-GR1, GR10 & GR11, PR5 - particle size distribution and Atterberg Limits (LL, PL, LS & PI)
- d. SANS 3001-GR30 & GR40 – MDD & OMC and CBR
- e. SANS 3001-NG5 – nuclear gauge field density (probe readings)

8.2.3 **Bituminous binders**

Bituminous binders test methods

- a. SABITA TG1-MB1 (sampling PMB) & TMH5 – Penetration grade, emulsion & cutback sampling
- b. EN1426, ASTM D36 & D4402, TG1 MB-17 – Penetration grade, softening point (pen & PMB) & viscosity tests
- c. SANS 3001-BT10 & BT11 – sand patch and ball penetration tests

8.2.4 **Asphalt**

Asphalt test methods

- a. SABITA Manual 37/TMH5 – uncompacted from truck, core/slab removal (sampling)
- b. SABITA Manual 37/TMH5 - riffing and coning & quartering (sampling preparation)
- c. SANS 3001-AS1, AS2, AS4 (alternatively TMH1 C9T), AS10, AS11, AS20 – briquette manufacture, stability & flow, ITS, BD, MVD & binder extraction respectively

8.2.5 **Concrete**

Concrete test methods

- a. SANS 3001-CO fresh concrete on site & laboratory & mixing, slump, cube making, flow tests
- b. SABITA Manual 37/TMH5 and/or SANS 3001-CO1 – sampling of fresh concrete
- c. SABITA Manual 37/TMH5 and/or SANS 3001-CO1 – sampling of hardened concrete
- d. SANS 3001-CO density & cube strength testing

8.3 **Required physical abilities**

None prescribed as requirements by the CivCert Certification of Persons scheme.

8.4 **Practical experience**

Candidates are to obtain practical knowledge and skills at the laboratories where they are employed in the execution of the test methods as listed below for each material type. They will be required to demonstrate a selection of such practical skills in a witnessing that forms part of the certification evaluation process (refer to section 9 below).

Evidence required upon application for certification

Proof of practical experience in the form of laboratory bench sheet reports signed by the candidate and his/her manager must be supplied upon application for certification.

8.4.1 Aggregates

- a. Draw from storage and assemble testing apparatus for the relevant test
- b. Check compliance of apparatus to specifications of test method
- c. Execute laboratory and housekeeping activities
- d. Organise samples, data information and documentation
- e. Conduct sampling of aggregates (refer to table below for applicable methods)
- f. Extract a representative and sized test sample (refer to table below for applicable methods)
- g. Determine particle distribution and particle shape of aggregates (refer to table below for applicable methods)
- h. Determine the density and strength of aggregates (refer to table below for applicable methods)
- i. Processes and procedures for conducting laboratory activities, housekeeping and organising data
- j. Processes and procedures of executing sample preparation activities and conducting physical testing of aggregate materials, recording the information on a standard bench sheet including basic calculating and submitting completed bench sheet results.
- k. Processes and procedures of executing field sampling.

Table 8.4.1: Test methods required for certification for Aggregates

Sampling	SABITA 37/TMH5	Manual	MB1	Stockpiles
			MB2	Conveyor belt
Splitting of samples	SABITA 37/TMH5	Manual	MD1	Riffling
			MD2	Coning & quartering
Test methods	SANS 3001		AG1	Grading
			AG2	ALD direct measure
			AG4	Flakiness Index
			AG10	ACV & 10% FACT
			AG20	BD, AD & water absorption +5 mm
			AG21	BD, AD & water absorption -5 mm
	TMH1	B9	LBD & CBD	

8.4.2 Soils, Gravels and Crushed Stone

- a. Draw from storage and assemble testing apparatus for the relevant test
- b. Check compliance of apparatus to specifications of test method
- c. Execute laboratory and housekeeping activities
- d. Organise samples, data information and documentation
- e. Conduct sampling of soils, gravels and crushed stone materials (refer to table below for applicable methods)
- f. Extract a representative and sized test sample (refer to table below for applicable methods)
- g. Determine particle size distribution and Atterberg Limits of soils, gravels and crushed stone materials (refer to table below for applicable methods)
- h. Determine compaction and strength characteristics of untreated soils, gravels and crushed stone materials (refer to table below for applicable methods)
- i. Processes and procedures for conducting laboratory activities, housekeeping and organising data
- j. Processes and procedures of executing field sampling and on-site testing (refer to table below for applicable methods)
- k. Processes and procedures of executing sample preparation activities and conducting physical testing of soils, gravels and crushed stone materials, recording the information on a standard bench sheet including basic calculating and submitting completed bench sheet results

Table 8.4.2: Test methods required for certification for Soils, Gravels and Crushed Stone

Sampling	SABITA 37/TMH5	Manual	MB1	Stockpiles
			MC1	Pavement layers (untreated)
Splitting of samples	SABITA 37/TMH5	Manual	MD1	Riffling
			MD2	Coning & quartering
Test methods	SANS 3001		GR1	Grading
			GR10	LL, PL & LS
			GR11	LL 2 point
			GR30	MDD
			GR40	CBR
			PR5	GM
On-site testing			NG5	Nuclear gauge density

8.4.3 Bituminous Binders

- Draw from storage and assemble testing apparatus for the relevant test
- Check compliance of apparatus to specifications of test method
- Execute laboratory and housekeeping activities
- Organise samples, data information and documentation
- Conduct sampling and field testing of bituminous binders (refer to table below for applicable methods)
- Determine the properties of bituminous base binders (refer to table below for applicable methods)
- Processes and procedures for conducting laboratory activities, housekeeping and organising data
- Processes and procedures of executing field sampling and on-site testing (refer to table below for applicable methods)
- Processes and procedures of executing sample preparation activities and conducting physical testing of bituminous binders, recording the information on a standard bench sheet including basic calculating and submitting completed bench sheet results

Table 8.4.3: Test methods required for certification for Bituminous Binders

Sampling	SABITA	TG1-MB1	Sampling PMB
	SABITA 37/TMH5 Manual	MB4	Pen, emulsion & cutback sampling
Test methods	EN	1426	Penetration test
	ASTM	D36	Softening point
		D4402	Dynamic viscosity
	SABITA manual	TG1 MB-17	PMB softening point
On-site testing	SANS 3001	BT10	Sand Patch
		BT11	Ball penetration

8.4.4 Asphalt

- Draw from storage and assemble testing apparatus for the relevant test
- Check compliance of apparatus to specifications of test method
- Execute laboratory and housekeeping activities
- Organise samples, data information and documentation
- Conduct sampling and field testing of asphalt (refer to table below for applicable methods)
- Extract a representative and sized test sample (refer to table below for applicable methods)
- Determine the properties of asphalt (refer to table below for applicable methods)

- h. Processes and procedures for conducting laboratory activities, housekeeping and organising data
- i. Processes and procedures of executing sample preparation activities and conducting physical testing of asphalt, recording the information on a standard bench sheet including basic calculating and submitting completed bench sheet results

Table 8.4.4: Test methods required for certification for Asphalt

Sampling	SABITA Manual 37/TMH5	MB7	Uncompacted from truck
		MC2	Core/slab removal
Splitting of samples	SABITA Manual 37/TMH5	MD1	Riffling
		MD2	Coning & quartering
Test methods	SANS 3001	AS1	Briquette manufacture
		AS2	Stability & Flow
		AS4	ITS (alternatively TMH1 C19T)
		AS10	Bulk density
		AS11	Maximum Voidless Density
		AS20	Binder extraction and grading

8.4.5 Concrete

- a. Draw from storage and assemble testing apparatus for the relevant test
- b. Check compliance of apparatus to specifications of test method
- c. Execute laboratory and housekeeping activities
- d. Organise samples, data information and documentation
- e. Conduct sampling and field testing of fresh and hardened concrete (refer to table below for applicable methods)
- f. Determine the properties of fresh and hardened concrete (refer to table below for applicable methods)
- g. Processes and procedures for conducting laboratory activities, housekeeping and organising data
- h. Processes and procedures of executing sampling of constituent materials, sample preparation activities and conducting physical testing of concrete materials and concrete, recording the information on a standard bench sheet including basic calculating and submitting completed bench sheet results

Table 8.4.5: Test methods required for certification for Concrete

Sampling	SABITA Manual 37/TMH5 SANS 3001	MB9 CO1 CO3	Fresh: from ready mix truck or heap Hardened: drilling/coring
Test methods	SANS 3001	CO1	Mixing, Slump, Flow Cube making, tests
		CO2	Density & cube strength testing

8.5 Code of Conduct

Since the results produced in a Civil Engineering Materials Laboratory relies heavily on the integrity of the Civil Engineering Material Testers performing the measurements, ethical behaviour is a critical component of being a “Certified Civil Engineering Material Tester”. It is therefore a requirement of the CivCert scheme that candidates undertake to abide by a code of conduct and confirm this willingness by signing a copy of the Code of Conduct contained in the application form.

Should a certified Civil Engineering Material Tester be found to be conducting themselves in a manner contrary to the adopted Code of Conduct, a disciplinary process could lead to their de-certification.

8.6 Recertification

A certified Civil Engineering Material Tester is required to participate in Continuing Professional Development (CPD) activities during the 5 year certification cycle, which include:

- Continued employment in the industry (compulsory)
- Theory related assessment to gauge Material Tester's knowledge of changes to test methods since initial certification
- A combination of training activities, seminar/conference/meeting participation and online questionnaires based on articles (relevant to testing) available on the NLA-SA CPD website

Application for recertification requires that the certified person provides evidence of such CPD activities nearing the end of the certification cycle.

The requirements for the CPD activities are detailed in document NLA-CC-I-03, CivCert Certification of Persons Scheme Continuing Professional Development and certified persons are encouraged to start with CPD activities soon after being certified to enable them to comply to the requirements at the end of the certification cycle.

9. Assessment methods

9.1 Initial certification

During initial certification, a candidate completes a written theory related assessment as well as undergo a witnessing of practical skills:

9.1.1 Written assessment

An electronic questionnaire (maximum two hours) is completed prior to the proposed witnessing date to determine the candidate's theoretical understanding of the test and sampling methods in the particular discipline the candidate is being evaluated on (refer to the methods listed in section 8.2). This assessment is undertaken at the candidate's place of work. The candidate is required to register on the NLA-SA CPD website at least three days prior to undertaking the assessment in order to have access to the assessment on the date and time communicated to them. Controls are implemented during the assessment to ensure that it is undertaken independently by the candidate.

If the candidate obtains more than the minimum of 60 % for the written assessment, they are allocated a date for the practical assessment. Should the candidate not obtain the minimum requirement for the written assessment, they are allowed to rewrite the written assessment immediately to see if they can improve their score. If the 60 % minimum score is still not achieved, they will be allowed to rewrite after a 30 day waiting period at no additional cost. Should the candidate fail this assessment, they may only reapply for certification after a six (6) month waiting period. An application fee is applicable to such an application.

9.1.2 Practical assessment (witnessing) (Also refer to Candidate Instructions, NLA-CC-I-04)

At least 80 % of the test and sampling methods required for certification in a material type (refer to section 8.4) applied for, are reviewed in the witnessing by an approved independent evaluator at an approved independent laboratory facility.

A standard checklist per test method is completed during the witnessing by the evaluator to rank the candidate's ability. The entire method is reviewed using samples prepared for each candidate at various stages of the test and each part of the method witnessed is reported on. Once a process is seen to be acceptable, it may be halted and the next step reviewed, e.g. there is no need to witness all sieves with a similar approach to witnessing for FI & ALD determinations. This decision will be left at the discretion of the evaluators once they are confident in the candidate's ability to complete each stage of the method competently.

For methods that for practical reasons cannot be witnessed, the process will be talked through by the evaluator with the candidate and their responses noted on the witnessing sheets.

Once the various steps have been witnessed, an example of a bench sheet with all the data normally obtained *may* be issued to the candidate to complete the basic bench calculations. The correctness of the calculations is checked by the Review Panel to save time during the witnessing. An approved material *may* be used in all witnessing to determine the accuracy of the candidate's ability to obtain an acceptable result within acceptable tolerances.

9.1.3 Evaluators

The evaluators who conduct the witnessings are either:

- Technical signatories with a minimum of five (5) years' experience in the material type being evaluated in a SANAS accredited laboratory, or
- Registered technical assessors with SANAS, or
- Registered with the Engineering Council of South Africa (ECSA) as an engineering professional with 5 years laboratory experience in the material type being evaluated.

9.2 Recertification

The assessment process for recertification will mostly be a desktop exercise in the form of a review of evidence provided for the CPD requirements detailed in document NLA-CC-I-03, CivCert Certification of Persons Scheme Continuing Professional Development. An electronic assessment may be included to confirm that the candidate is up to date with the latest test methods procedures.

10. Criteria for suspension or withdrawal of certification

Certification may be suspended or withdrawn in cases where a certified person:

- is found to have acted in an incompetent or unethical manner;
- has impaired ability due to physical or mental impairment;
- does not comply with the requirements of the Certification Scheme;
- makes unauthorised or misleading claims or statements regarding their certification;
- uses their certification in a misleading manner;
- has not been active in the industry for a period of 1 year at the time of recertification.

11. Criteria for changing the scope or level of certification

Currently the Scheme does not allow for certified persons to change the scope or level of certification within the initial 5 years.

12. The Applicant's/Candidate's/Certified Person's rights

The applicant, candidate or certified person has the right to appeal in writing any decisions made regarding certification, recertification or decertification within one calendar month (30 days) of the event leading to the appeal. The appeals procedure can be downloaded from the NLA – SA website.

A certified person, upon being granted certification status and whilst the certificate is current, is entitled to make claims in accordance with the scope of certification awarded.

13. Duties and responsibilities of the certified person

A certified person:

- shall sign an agreement to be bound by the Code of Conduct as part of the application process and shall be committed to:
 - respecting the dignity of other individuals
 - act on the basis of a well-informed conscience

- act in the best interest of the community
- uphold the principles of the Code.
- must comply with the requirements of the Certification Scheme.
- may make claims regarding their certification only with respect to the scope for which certification has been awarded.
- shall not use their certification in a misleading manner.
- shall not make any unauthorised or misleading statements regarding their certification.
- may not use their certification in such a manner so as to bring the NLA – SA or the scheme into disrepute.
- shall inform the NLA – SA without delay of matters that may affect their capability to fulfil certification requirements.
- must maintain skills in the scope for which certification has been awarded to remain certified.
- shall immediately discontinue any claim to hold certification upon suspension, withdrawal or expiry of their certification and shall return all certificates to the NLA – SA under such circumstances.

14. What does it cost?

The costs associated with being certified can be found in the most recent version of the CivCert Scheme Pricelist, NLA-CC-I-02, which can be downloaded from the NLA – SA website.