



The South African Council for Professional and Technical Surveyors

Die Suid-Afrikaanse Raad vir Professionele en Teaniese Oometers

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# **NOTES FOR GUIDANCE FOR REGISTRATION AS PROFESSIONAL GEO-INFORMATION SCIENCE (GISc) PRACTITIONER**

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# **1 INTRODUCTION**

These notes, which have been approved by the Geo-Information Society of South Africa (GISSA) and the South African Council for Professional and Technical Surveyors (PLATO), have been compiled with a view to assisting students at South African tertiary institutions and others who intend qualifying for registration as Professional GISc Practitioner in terms of Section 7(4)(b) of the Professional and Technical Surveyors' Act, 1984 as amended. Candidates must note that the said Act and the Rules framed there under make provision for the registration in different divisions of the register according to their qualifications and training. Adherence to the requirements as set out below, will assist materially in avoiding unnecessary delays.

## **1.1 Definitions**

The "Council" means the South African Council of Professional and Technical Surveyors established in terms of Act 40 of 1984, or such agent acting on its behalf.

"PLATO" means the South African Council of Professional and Technical Surveyors established in terms of Act 40 of 1984, or such agent acting on its behalf.

"GISSA" refers to the Geo-Information Society of South Africa.

"NQF" National Qualification Framework as defined by SAQA.

"SAQA" The South African Qualification Authority.

"US" Unit standards, used to define modules of NQF GISc qualifications.

"GISc" Geo-Information Science refers to the science and technology of collection, measuring, processing, analysing, interpreting, disseminating, utilising, evaluating and managing-geographically related and spatially referenced information

"Mentor" refers to a practising registered Professional GISc Practitioner who act as guide and advisor to recent entrants to the profession

## **2 STATUTORY REQUIREMENTS**

In the first instance a candidate who wishes to register as a Professional GISc Practitioner, in the register provided for in Section 7(4)(b) of the Act, must first register in terms of Section 21(1) as a Professional GISc Practitioner in training after obtaining the necessary GISc

qualification as certified by the South African Council for Professional and Technical Surveyors. (Normally a 4 year Bachelors degree or a GISc NQF level 7 qualification)

A candidate who wishes to qualify for registration as a Professional GISc Practitioner and who will be entitled to undertake GISc related work shall undergo such post-graduate practical training as set out in paragraph 6 and pass a law examination and practical test set by the Council within such period as it may determine.

Section 20(1) of the Professional and Technical Surveyor's Act, 1984 sets out the requirements for registration as a Professional GISc Practitioner. A candidate must therefore submit certified copies of his/her birth and degree certificates to the Council as soon as possible. "Certified" means certified to be a true copy by a Commissioner of Oaths or a Justice of the Peace.

### **3 TRAINING IN THE FORM OF PRACTICAL EXPERIENCE**

#### **3.1 Period of training**

The period of practical training is a minimum of 260 working days and the nature of such training shall be approved and controlled by the Council. All experience must be obtained after the date of completion of the requirements for the qualification, provided that the candidate applies for registration as a Professional GISc Practitioner in training within two months of such date, failing which his/her period of training will be deemed to commence as from his/her actual date of application for registration as Professional GISc Practitioner in training. Provided further that if the candidate was registered with the Council as a GISc technician or technologist prior to obtaining the academic qualifications necessary for the Professional category and can produce a diary and employers' certificates to substantiate this claim, exemption for part of his or her practical training may be granted.

Training must be continuous and only in exceptional cases will a break in training be condoned. The normal acceptable minimum period of training with a single practitioner or firm of practitioners is 45 working days (i.e. two months), although lesser periods may be accepted in the case of categories of work given under paragraph 6.2.

A break in training will not be condoned unless a candidate makes timely application for such a break.

The requirements laid down for training in this memorandum must be strictly adhered to and the required training must be obtained working under the personal supervision of a registered, practising Professional GISc Practitioner or other suitably qualified person approved by the Council.

The candidate is required to notify the Council as soon as possible after registering as a Professional GISc Practitioner in training and starting his/her practical training, of the name of the Professional GISc Practitioner, firm or organisation with whom he/she is working. Any change in address or a change to another Professional GISc Practitioner, firm or organisation must be reported to the Registrar.

### 3.2 Nature of Training

Training in all categories of work must be varied and must be undertaken under the personal supervision of a registered, practising Professional GISc Practitioner, registered GISc Technologist or other professional person suitably qualified who has been practising as such for at least five years after registration.

It is permissible to train under a Professional GISc Practitioner in salaried employment, but taking into consideration the requirements specified in paragraph 6, it is sometimes difficult to obtain the full range of training in such circumstances. In case of doubt the candidate should refer the matter to the Council.

It is important that the mentor should be a person who can instruct and provide the required experience. The mentor must also be capable of providing guidance in professionalism, professional ethics and professional practice. The candidate must select a mentor who can provide the correct quality of training. In case of doubt the candidate should refer the matter to the Council. In such a case the name, qualifications and experience of the mentor, other than a registered Professional GISc Practitioner, must be supplied to the Council so that it can assess the suitability of such a person.

#### 3.2.1 Compulsory Training

120 Working days in cartography/geo-spatial information management which comprises:

	TYPE OF WORK	WORKING DAYS
i	<p><b>DATA COLLECTION AND CAPTURE:</b></p> <p>This includes digitising from map compilation or ortho-images; data capture from co-ordinates or general plans; metadata capture and maintenance; map projections and re-projections. It also includes the design of data capturing processes, including the capture of metadata. This may also include position fixing using surveying techniques [GPS etc]. field recording of data by direct observation and by annotation of aerial photography and satellite imagery.</p>	20

ii	<b>DATA MANIPULATION:</b> This may include data processing; transformations; spatial data cleaning; data editing; attribute data cleaning; basic data classification; capture and metadata maintenance and principles of taxonomy; map projections and re-projections; working with database files; performing queries; data integration merging, splitting and aggregations.	15
iii	<b>REPRODUCTION PROCEDURES:</b> This includes the reproduction of prints by multi-colour printing on different output devices and other methods of output.	5
iv	<b>DATABASE AND SPATIAL MODELLING:</b> This includes working with different data models; designing feature classifications and definitions, design of symbology types, styles and colour. It also includes system design; data integrity analysis and maintenance; and data backup and recovery procedures.	15
V	<b>MAP PRODUCTION:</b> This includes map publication principles and design; and report writing. Both line [vector] and images [raster] work to be included. Of this work at least 10 days must be spent using WEB techniques/procedures.	20
Vi	<b>SPATIAL STATISTICS AND INTERPOLATION:</b> This includes working with centre of gravity, distance calculations and interpolations; spatial auto correlation; trends and forecasts.	5
Vii	<b>SPATIAL ANALYSIS:</b> This includes cartographic modelling, topological, buffer and Boolean type analysis for vector and raster data; network analysis; terrain and 3 and four ordinate analysis.	10
Viii	<b>REMOTE SENSING AND PHOTOGRAMMETRY:</b> This includes basic digital image analysis, and image ortho-rectification.	10
ix	<b>PROJECT MANAGEMENT:</b> This includes project planning, costing, determination of work procedures, resource allocation, project control, progress monitoring and reporting.	20
	<b>TOTAL</b>	<b>120</b>

### **3.2.2 Additional Training**

A minimum of 140 working days in at least three of the following, provided that not less than 10 working days are done in any category :

- a) Data collection, capture and processing (Additional to above)
- b) Spatial Data Manipulation (Additional to above)
- c) Map Production (Additional to above)
- d) Spatial information management, manipulation and recovery. (Additional to above)
- e) Databases and Spatial Data Modeling (Additional to above)
- f) Spatial data quality assessment and error management (Additional to above)
- g) Spatial Statistics, Interpolation and Analysis. (Additional to above)
- h) Project Management (Additional to above)
- i) Remote sensing and Image Processing

Note: It is expected of the candidate to undertake the work at a complex level and degree of difficulty.

### **3.3 Notes**

The work should include planning, specification writing, interviews with the client, writing of proposals to the client, analysis of results, and writing of the final report to the client. General office administration such as personnel management, logistics and financial management may also be included.

A detailed daily diary of all work undertaken during the training period must be kept. This diary must give an adequate description of the work done , the dates and the category of work with the number of working days in each category.

The use of modern technology is essential and the candidate must be proficient with this technology.

### **3.4 Training Schedule**

When applying to the Council for evaluation of his/her training, (see paragraph 8) the candidate shall supply a Training Schedule as an extract from the diary prepared in the form of the attached specimen. This schedule must be compiled in chronological order and totaled. Each page must be signed by the mentor (with whom the candidate has trained) and the candidate.

The training schedule must contain an adequate description of the work performed to enable the Council to evaluate the type and scope of the work completed.

The detailed day to day diary from which the training schedule is an extract must be retained by the candidate in the event of the Council requiring more detailed information.

Should the Council be of the opinion that the training is inadequate or does not cover a wide scope of work, it may require the candidate to undergo further training.

### **3.5 Requirements of a Mentor**

A mentor must be a registered, practising Professional GISc Practitioner who has been practising as such for a minimum period of five years. Provided that the Council may, on written application by the mentor, relax the requirement of the five years experience. Provided further that where the experience to be gained is in a field of expertise that could not normally be obtained under the guidance of a Professional GISc Practitioner then, with the consent of the Council, such experience may be obtained under the personal supervision of a suitably qualified person.

Every mentor must provide, directly to the Council, a confidential written assessment on the competency of the candidate which assessment must include, *inter alia*, the type of experience gained by the candidate while in his or her employ, with emphasis on the professional aspects such as dealings with clients, attitude to senior and subordinate co-workers and assistants, punctuality and reliability and management skills acquired.

A person who has been found guilty of improper conduct or is practising under threat of a suspended sentence may not act as a mentor.

## **4 LAW EXAMINATION**

A candidate for registration as a Professional GISc Practitioner must apply to the Registrar to write a Law Examination.

Law examinations can be written in most major centres twice a year. Candidates will be notified of the time and venue for each examination accordingly.

The candidate will be expected to have a comprehensive knowledge of the laws relating to registration of a Professional GISc Practitioner. He or she should also be acquainted with certain aspects of related legislation as set out in the details below.

The law examination consists of two written papers.

The first paper will consist of questions on the Professional and Technical Surveyors Act [40 of 1984] and Rules. A pass mark of 65% is required for this paper.

The second paper will consist of questions on legislation related to GISc. A pass mark of 65% is required for this paper.

The Registrar will notify the candidate of a pass or failure.

#### 4.1 PLATO LAW EXAM SYLLABUS

<p>1. Professional and Technical Surveyors Act 40 of 1984 Exam A,</p>	<p>All applicants who have not previously written this exam.</p>
<p>2. Rules i.t.o. Act No. 40 of 1984, as amended (PLATO Rules) Exam A,</p>	<p>All applicants who have not previously written this exam.</p>

	PLS	SURV	GISc
<p>1. Land Survey Act No. 8/1997 B</p>	Yes	Yes	Yes
<p>2. Engineering Professions of SA Act No. 114/1990  Provide for an Engineering Council, registration of prof. engineers, technologists and technicians.</p>		Yes	
<p>3. Sea Shore Act 21/1935  President is owner of seashore, territorial waters, rights of the sea-shore and the sea.</p>	Yes	Yes	
<p>4. National Water Act 36/1998  Protection of water resources and management of use of water.</p>	Yes	Yes	

	PLS	SURV	GISc
<p><b>5. SA National Roads Agency Act 7/1998</b></p> <p>Create a national roads agency and policies on national roads.</p>	Yes	Yes	
<p><b>6. Subdivision of Agricultural Land 70/1970</b></p> <p>To control the subdivision and use of agricultural land.</p>	Yes		
<p><b>7. Provision of Certain Land for Settlement Act 126/1993</b></p> <p>Designation of certain land, subdivision and settlement of persons.</p>	Yes		
<p><b>8. Distribution and transfer of Certain state Land Act 119/1993</b></p> <p>Regulate the distribution and transfer of certain state land.</p>	Yes		
<p><b>9. Land Reform (Labour Tenants) Act 3/1996</b></p> <p>Rights of farm labourers to live on, or cultivate a farm.</p>	Yes		
<p><b>10. Extension of Security of Tenure Act 62/1997</b></p> <p>Rights and duties of owners and occupiers of land.</p>	Yes		
<p><b>11. Prescription Act 68/1969</b></p> <p>Acquisition (or loss) of ownership by prescription.</p>	Yes		
<p><b>12. Expropriation Act 63/1975</b></p> <p>Expropriation of land for public purposes.</p>	Yes	Yes	
<p><b>13. Fencing Act 31/1963</b></p> <p>Fencing of farms and boundaries along fences.</p>	Yes		

	PLS	SURV	GISc
<p><b>14. Black Communities Development Act 4/1984</b></p> <p>Leasehold ownership.</p>	Yes		
<p><b>15. Development Facilitation Act 67/1995</b></p> <p>Measures to accelerate the pace of land development.</p>	Yes	Yes	Yes
<p><b>16. Upgrading of Land Tenure Rights Act 112/1991</b></p> <p>To convert land ownership rights into full ownership.</p>	Yes	Yes	Yes
<p><b>17. Advertising on Roads and Ribbon Development Act 21/1940</b></p> <p>Set building restrictions.</p>	Yes	Yes	
<p><b>18. Less Formal Townships Establishment Act 113/1991</b></p> <p>Makes provision for a shortened township establishment procedure.</p>	Yes	Yes	
<p><b>19. Physical Planning Act 125/1991</b></p> <p>Regulates planning at macro-level. Makes provision for development plans and regional structure plans.</p>	Yes	Yes	Yes
<p><b>20. Removal of Restrictions Act 84/1967</b></p> <p>To remove restrictions on land in a province.</p>	Yes		
<p><b>21. Communal Land Rights Act 11/2004</b></p>	Yes	Yes	
<p><b>22. Alienation of Land Act 68/1981</b></p> <p>To provide for the alienation of land and contract of sale.</p>	Yes		
<p><b>23. Sectional Titles Act 95/1986</b></p> <p>Provide for ownership of a portion of a building.</p>	Yes	Yes	Yes

	PLS	SURV	GISc
<p><b>24. Deeds Registries Act 47/1937</b></p> <p>Registration of deeds.</p>	Yes	Yes	Yes
<p><b>25. The Communal Property Association Act 28/1996</b></p> <p>A community who has been dispossessed of land, can collectively acquire, hold and manage land.</p>	Yes		
<p><b>26. Spatial Data Infrastructure Act 54/2003</b></p> <p>Facilitate the sharing of spatial information and metadata.</p>		Yes	Yes
<p><b>27. Regulations in terms of Act 54 of 2003</b></p> <p>once these are published.</p>			Yes
<p><b>28. Maritime Zones Act 15/1994</b></p>	Yes	Yes	
<p><b>29. Copyright Act 98/1978</b></p>			Yes
<p><b>30. Legal Deposit Act 54/1997</b></p> <p>Ensure the preservation of, and access to published documents.</p>			
<p><b>31. National Archives of South Africa Act 43/1996</b></p> <p>Management and care of the records of government bodies and the preservation of a national archival heritage.</p>			
<p><b>32. Promotion of Access to Information Act 2/2000</b></p> <p>Right of access to any information held by the state.</p>			Yes
<p><b>33. SA Geographical Names Council Act 118/1998</b></p> <p>Advise the minister on the transformation and standardisation of geographical names in SA.</p>			Yes

	PLS	SURV	GISc
<p><b>34. Statistics Act 6/1999</b></p> <p>Provide for the collection, production and dissemination of official statistics and the conducting of a census.</p>			Yes
<p><b>35. Electronic Communications and Transactions Act 25/2002</b></p> <p>To promote electronic communications and transactions. Sect. 1, 2, 11-14, 20, 42-46, 50-56.</p>			Yes
<p><b>36. Constitution of the Republic of S.A. 108/1996</b></p> <p>Bill of Rights: Sect. 7 - 39.</p>	Yes	Yes	Yes

#### LABOUR LEGISLATION

	PLS	SURV	GISc
<p><b>37. Basic Conditions of Employment Act 75/1997</b></p> <p>Establishes and enforces basic conditions of employment and forms part of every contract of employment, unless they have been replaced, varied or excluded in accordance with the Act.</p>	Yes	Yes	Yes
<p><b>38. Labour Relations Act 66/1995</b></p> <p>Generally gives effect to the fundamental right of fair labour practices as enshrined by the Constitution, amongst others membership of trade unions, collective negotiations and job security.</p>	Yes	Yes	Yes
<p><b>39. Occupational Health and Safety Act 85/1993</b></p> <p>Provide for the safety and health of persons at work. Ensures that no party can agree that work will be conducted in unsafe conditions.</p>	Yes	Yes	Yes

**N.B. Most of the relevant legislation can be down-loaded from the Internet Web-site:**  
[www.polity.org.za/govdocs/legislation](http://www.polity.org.za/govdocs/legislation)

Or can be obtained from : **Butterworths Professional Publishers, P O Box 4, Mayville, 4058.**

Contact tel. No's: **Johannesburg 011-784-8009, Durban 031-2683111 or Cape Town 021-5558900.**

**The law exam consist of the following parts :**

**Exam A**

PLATO Act and rules: 2 hours open book.

Written by candidates for professional land surveyors and technicians. Also written by applicants for registration as surveyor and professional engineering surveyor who have not previously written this exam.

**Exam B**

Land Survey Act and Deeds Registries Act: 3 hours open book.

Written by candidates for registration as professional land surveyors.

**Exam C**

Other acts and court cases as marked for PLS on the previous pages: 3 hours closed book.

In most cases only an overview of the act is required. Completion of trial survey.

Written by candidates for registration as professional land surveyors.

**Exam D**

Other acts as marked for Surveyors the previous pages: 3 hours closed book.

In most cases only an overview of the act is required.

Written by candidates for registration as surveyors. Also written by applicants for registration as professional engineering surveyor who have not previously written this exam.

### Exam E

5 Mining related acts: 3 hours closed book.

Written by candidates for registration as Mine surveyors and Prof. Mine surveyors.

### Exam F

Other acts as marked for GISc on the previous pages: 3 hours closed book.

In most cases only an overview of the act is required.

Written by candidates for registration as GISc professional and technologist.

Candidates will therefore write the following exams:

1	1. Professional Land surveyors:	A, B, C
2	2. Professional Engineering surveyors:	A, D (if they have not previously written it.)
3	3. Surveyors:	A, D
4	4. Survey technicians and GISc technicians:	A
5	5. Mine surveyors and Prof. Mine surveyors:	A, E
6	6. GISc Technologists and Professionals:	A, F (if they have not previously written it.)

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## **5 APPLICATION FOR PRACTICAL TESTS**

When the candidate is of the opinion that they have met the requirements set out in Paragraph 3, they should apply to the Council for registration in the relevant category.

The application must be accompanied by:

- a) An application form and the relevant fee;
- b) The Schedule of Practical Experience referred to in Paragraph 3;
- c) A certified copy of his or her NQF level 7 GISc Qualification or other certificate of equivalence; and
- d) A Certificate of Employment as prescribed in the Rules. A separate Certificate of Employment is required in respect of each mentor with whom the candidate has served.

“Certified” means certified to be a true copy by a Commissioner of Oaths or a Justice of the Peace.

## **5.1 Details of Practical Test**

The practical tests could consist of one or more tasks.

A task could be to prepare a full proposal to a client for the implementation of a system, including the management of the information, and/or undertaking the analysis of a specified problem.

A candidate should not normally need more than three weeks to complete the practical test. Continuity of the work is essential and a break will only be permitted in exceptional circumstances due to factors beyond the control of the candidate.

## **6 COMPLETION OF REGISTRATION PROCEDURE**

Evaluation will take place as soon as possible after completion of the work and the candidate should remain in close touch with the examiner until his/her requirements have been met. A candidate will be informed at an early stage if he/she is required to take an oral examination or if a practical test needs further attention.

After evaluation has been completed the examiner will transmit all the results and papers to the Moderator. The Moderator will make a recommendation to the Council accordingly. If the candidate has been unsuccessful in any aspect, he/she will be advised by the Registrar that he/she will have to repeat certain parts (or even the whole) of the practical tests after a certain period.

If the candidate has been entirely successful he/she will be advised by the Registrar that he/she complies with the requirements of Section 20(1)(a), (b), (c), (d), and (e) of Act No 40 of 1984 and that he/she may apply to the Registrar for registration as a Professional GISc Practitioner.

The Registrar will request him/her to make (in terms of Section 20(1)(f) of the Act) a professional oath or affirmation in relation to his/her profession.

He/she will also be required to apply for registration on the prescribed application form and to pay the registration fees.

When these formalities have been completed the candidate will become registered as a Professional GISc Practitioner with the South African Council for Professional and Technical Surveyors