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JUL 29 2005

DENR Administrative Order
No. 2005 13

SUBJECT : **Revised Guidelines for the Implementation of the Philippine Reference System of 1992 (PRS92)**

Pursuant to Executive Order No. 45, series of 1993 entitled "Adopting the Philippine Reference System of 1992 as the Standard Reference System for Surveys in the Philippines" as amended by Executive Order Nos. 280 and 321, series of 2000 and 2004, respectively, the following rules and regulations are hereby issued for the guidance and compliance of all concerned.

ARTICLE I – GENERAL PROVISIONS

Section 1. Policy

It is the policy of the State to effectively manage the country's natural resources through the adoption of a single survey reference system. Henceforth, the PRS 92 is hereby adopted as the single reference system for all surveys and mapping.

Section 2. Objectives

This order aims to prescribe the guidelines for the full implementation of the PRS92. It has the following objectives:

1. To provide the guidelines for the completion of a national geodetic network.

2. To provide the guidelines for integrating the old surveys and maps into the new network; and

3. To provide the guidelines for the maintenance of the national geodetic network.

Section 3. Scope and Coverage

These guidelines shall cover all land surveys and mapping activities, whether conducted by government agencies or private individuals and/or entities. In preparing nautical and aeronautical charts, however, other appropriate reference systems may be adopted.

Section 4. Definition of Terms

The following terms as used in these guidelines shall be defined as follows:

Aeronautical Chart – a representation of a portion of the earth, its culture and relief, specifically designed to meet the requirements of air navigation.

Control Point – a point on the ground, with position and elevation established by geodetic methods, which is used as a reference for a dependent survey. Control points are generally classified in four orders (with first order denoting highest quality) according to precision of the methods and instruments used in establishing them, and the accuracy of the resultant positions and elevations.

Densification – is a survey undertaken to establish additional control points in a given area to satisfy the requirements of the national geodetic network and facilitate referencing of other surveys in that area.

Field Offices – the Regional, Provincial and Community Environment and Natural Resources of the DENR

Geodetic Control Network – a system of strategically located control points covering large areas.

Geodetic Leveling – a leveling of high order accuracy, usually extended over large areas, to furnish accurate vertical control for all surveying and mapping operations.

Geoid – the equipotential surface of the earth that approximately coincides with the mean sea level.

Gravimetric Survey – a survey made to determine the acceleration of gravity at various places on the earth's surface.

Nautical Chart – a chart specifically designed to meet the requirements of marine navigation, showing depths of water, nature of bottom, configuration and characteristics of coast, dangers and aids to navigation.

Reference Spheroid/Ellipsoid – a theoretical figure that approximates the figure of the earth.

Tidal Observations – a series of continuous sea level measurements conducted at particular sites to provide the information required for the determination of sea level datum planes, tidal predictions and reduction of soundings.

Transformation Parameters – a set of numerical values that define the mathematical relationship between datums or coordinates.

ARTICLE II – POSITION OF SURVEYS

Section 5. Fixing of Survey Position

All surveys shall be fixed in position on the surface of the earth by monuments of permanent nature. The Philippine Plane Coordinate System (PPCS) shall continue to be adopted using the PRS92 parameters. The procedures and specifications provided for in the DENR Administrative Order No. 98-12 otherwise known as the Revised Manual for Land Surveying Regulations in the Philippines shall continue to be adopted.

ARTICLE III - GEODETIC CONTROL NETWORK ESTABLISHMENT

Section 6. Network Design

The national or primary geodetic network consists of interconnected and homogenously adjusted control points which form the basic reference of all surveys and mapping activities in the country. It is comprised by first and second order control points which are nominally spaced at 50 and 10 to 25 kilometers, respectively. The secondary network consists of third and fourth-order control points which shall be densified to an extent where each barangay in the country has at least a pair of control points. The existing Bureau of Lands Location Monuments (BLLMs), political boundary monuments, triangulation stations, primary stations of cadastral surveys and other similar stations shall be made part of the secondary network, *Provided* that: These points are resurveyed or converted into PRS92 and satisfy the accuracy requirements for such points.

Section 7. Establishment and Densification of the Control Network

The establishment and densification of the national geodetic network shall continue to be undertaken in accordance with the pertinent provisions of DAO 22 s. 1994, DAO 98-12 s. 1998 and other pertinent issuances until such time that new procedures and standards are formulated. In general, CGSD-NAMRIA shall be responsible for the establishment and densification of the primary network while the RSD-LMS shall be responsible for the establishment and densification of the secondary network and establishment of other lower-order control points.

The densification of the network shall be completed by the year 2010.

Section 8. Establishment of Control Points by Other Agencies and Private Surveyors

In cases where it is necessary for them to do so, survey teams of other government agencies and private survey practitioners shall be allowed to establish control points; *Provided* that: Said points satisfy the accuracy requirements; *Provided further:* That in such cases, an incentive system shall be established.

Section 9. Description of Monuments

Generally, Control Points shall be marked by concrete monuments. The standard concrete monuments shall be in accordance with the following specifications:

Order of Accuracy	Cross-Section	Length	Above Ground	Below Ground
First	30 x 30 cm	120 cm	20 cm	100 cm
Second	30 x 30 cm	120 cm	20 cm	100 cm
Third	25 x 25 cm	120 cm	20 cm	100 cm
Fourth	20 x 20 cm	100 cm	20 cm	80 cm

Control points may also be set on existing masonry and other similar permanent structures or on an exposed surface of immovable hard rock or boulder.

Section 10. Markings and Numbering of Control Points

The mark, inscriptions and numbering of control points are prescribed in Annex A of this order. Project controls that have been observed and integrated into PRS92 shall be marked as "PRS92".

Section 11. Transformation Parameters

In establishing new control points, the current set of parameters being used to transform WGS84 coordinates to PRS92 coordinates and vice versa shall continue to be utilized until such time that a new set or sets of transformation parameters are established. NAMRIA, in coordination with the LMB/LMS, shall conduct research and development work to determine the appropriate set or sets of local/zonal parameters. Guidelines on the process of adopting the new transformation parameters shall be issued thereafter.

Section 12. Connection Surveys

If the establishment of additional control points becomes necessary in view of the distance of the survey area from the established PRS92 control points, the Geodetic Engineer may, at his cost, request RSD-LMS or NAMRIA to undertake the survey. The Geodetic Engineer may also undertake the survey of additional control points provided that the procedures, documentation and accuracy requirements, as provided in this Order and other pertinent issuances are complied with. The control point survey data shall form part of the survey returns which shall then be evaluated for possible inclusion in the national geodetic network.

ARTICLE IV – MAINTENANCE OF THE GEODETIC NETWORK

Section 13. Inventory and Exchange of Control Point Information

The LMB/LMS and CGSD-NAMRIA shall keep up-to-date their respective lists of control points and exchange digital copies in a prescribed format of the same. The list shall include the name or

designation, location (municipality or barangay), grid and geographic coordinates and upon request, descriptions of the control points.

Section 14. Recovery of Control Points

(a) The DENR surveying units shall recover and connect to PRS92 all BLLMs and political boundary monuments (PBMs, CBMs, MBMs, BBMs), triangulation stations established by organizations, the work of which is of acknowledged standards and all primary stations of cadastral surveys and other similar stations of at least fourth order accuracy. The survey parties shall submit, as part of their survey report, a Location Monument Recovery Report (LMRR) in accordance with DAO 61 series of 1993, copy furnished to NAMRIA and LMB. The LMRR shall include a report on lost control points.

(b) In cases where it is necessary for them to do so, survey parties of other government agencies and private practitioners shall likewise be allowed to undertake recovery and connection to PRS 92 BLLMs and political boundary monuments (PBMs, CBMs, MBMs, BBMs), and triangulation stations; *Provided:* that they meet the accuracy standards; *Provided:* further that an incentive system for such cases shall be established. Said survey parties shall likewise submit LMRR as part of their survey returns. The reports shall describe the condition of the reference points as to whether they are still in their original state, damaged, disturbed and lost.

Section 15. Maintenance and Protection of Control Points

The LMS and NAMRIA shall be primarily responsible for the preservation of control points. They shall coordinate with local government units, other government agencies, and the private sector in undertaking said function. It shall also be the professional responsibility of every Geodetic Engineer to help protect these control points from destruction.

Section 16. Lost, Disturbed and Destroyed Control Points

Lost, damaged or destroyed control points/monuments shall be identified and re-established, if necessary.

Any person who shall intentionally destroy, alter, disturb or remove stations, monuments or control points shall be penalized in accordance with the provisions of the Cadastral Act, Revised Administrative Code and the Revised Penal Code.

ARTICLE V—TESTING OF GPS EQUIPMENT AND EVALUATION OF GPS DATA

Section 17. Testing of GPS Equipment

All GPS receivers shall be tested and certified by NAMRIA and registered with LMB every three (3) years. The LMS shall assume the responsibility of testing GPS receivers as soon as its personnel are capable of performing the task. The certificate of registration of the GPS used in any survey shall form part of the survey returns. Control

surveys made with instruments which have not been tested and certified or whose registrations have expired shall not be accepted for verification and approval by the RTD for Lands.

Section 18. Requirements for GPS Data Evaluation

All GPS data submitted for evaluation and verification shall include the following:

a. raw GPS data in appropriate format
b. fully accomplished field sheets
c. descriptions of all PRS92 controls used
d. Brand, model and serial numbers GPS receiver and antennae used

Section 19. Evaluation of GPS Data

The CGSD-NAMRIA shall continue to evaluate GPS data for all Control Point surveys for three (3) years, within which period the LMB and LMS shall attain the competence to evaluate GPS data. After said period, the LMB/LMS shall be responsible for the evaluation of the GPS data for third and fourth order control point surveys, while NAMRIA shall continue to evaluate GPS data for first and second order control point surveys.

ARTICLE V - GEODETIC NETWORK INFORMATION SYSTEM

Section 20. A Geodetic Network Information System (GNIS) shall be established to provide management and operational support to the DENR, other stakeholders and general users of the network. The GNIS shall consist of a national facility that shall have storing, updating, reporting, transformation, data analysis and security capabilities. The system shall also have online access by central and regional personnel for data sharing and efficient servicing of clients. Service fees shall be collected to recover costs.

Section 21. The NAMRIA, in coordination with the LMB and LMS, shall be responsible for the development, operation and maintenance of the system. It shall also publish analog and electronic copies of the National Geodetic Reference Book, as well as GNIS operations and users' manuals.

ARTICLE VI - INTEGRATION OF SURVEYS AND MAPS TO PRS92

Section 22. Integration of Surveys and Maps

Henceforth, all new surveys and maps shall be referenced to PRS 92. However, the integration of old surveys and maps of a particular area into PRS92 shall proceed only after the appropriate set of local transformation parameters is determined as provided in Section 11, Article III of this Order and approved by the RTD for Lands. The NAMRIA shall pilot the process of integration and prepare procedural manuals for the guidance of all concerned.

Section 23. Control Maps

PRS92 Control Maps shall be prepared by the LMS. The control maps shall include cadastral, land classification, and other areas covered by tenurial instruments, ancestral domain and government proclamations. The preparation of control maps shall be in accordance with the standards and specifications to be formulated under the PRS92 program.

ARTICLE VII - UPGRADING OF THE NATIONAL GEODETIC NETWORK

Section 24. Research and Development

(a) Upgrading of the National Geodetic Network shall be undertaken by the DENR, in coordination with other government agencies concerned Research and development activities shall be undertaken to define the appropriate geoid model, reference spheroid/ellipsoid, and datum. In order to optimize the utilization of the network geodetic leveling, tidal observations, elevation (above Mean Sea Level or MSL) of PRS 92 control points, gravimetric surveys and crustal observations shall also be carried out in collaboration with concerned agencies and organizations. Results of these activities shall serve as inputs in the definition of the most suitable network design and towards the transition from geodetic to geocentric datum.

(b) Policy research activities and legal studies shall also be pursued to determine the appropriate adjustments in policies and legal frameworks that have to be undertaken in the light of the PRS92 adoption.

Section 25. Re-establishment of the National Level Network

The NAMRIA, in coordination with LMB and LMS, shall re-establish the national level network by operating tide stations and running level lines along the major highways of the main islands of the archipelago. This shall be done in accordance with the existing standards set by the CGSD-NAMRIA.

Section 26. Active Geodetic Stations

The use of active geodetic stations shall be encouraged to expedite field observations, optimize use of resources, monitor the effects of crustal motions, and provide other related geodetic services to user communities. The operation of a network of active geodetic stations shall be supported by a central and regional data centers.

ARTICLE VIII - INFORMATION, COMMUNICATION, EDUCATION AND CAPABILITY BUILDING

Section 27. Conduct of ICE Activities

ICE activities shall be undertaken to generate awareness and support from stakeholders and the general public and create a pool of national experts in geodesy and allied fields. Strategies shall include

conduct of information campaigns and technology transfers, continuing professional education and forging of partnerships with governmental, non-governmental and private organizations.

Section 28. Documentation of ICE Models

Models for the various ICE strategies shall be documented and packaged into manuals for the guidance and reference of all implementing units.

ARTICLE IX - IMPLEMENTATION ARRANGEMENTS

Section 29. Program Steering Committee

(a) The overall management of the PRS92 program shall be vested in a Program Steering Committee (PSC) which is hereby created and shall be composed of the DENR Undersecretary for Lands as chairman, and NAMRIA Administrator, LMB Director, MGB Director, FMB Director, PAWB Director and DENR Director for Planning and Policy Studies Office as members.

(b) The PSC shall promulgate the policies, procedures and standards, operational manuals, and approve programs, plans and activities to effectively implement the PRS92. It shall also ensure that all offices/units within the DENR shall synchronize all their activities pertaining to PRS92, including, but not limited to, planning, coordination, implementation, monitoring and evaluation of field activities. Likewise, the PSC shall see to it that the annual budgetary requirements for the PRS92 activities are included in the DENR budget. The PSC shall adopt a functional structure and mechanisms that will guarantee horizontal and vertical coordination within the DENR and among the other stakeholders.

Section 30. The Technical Working Group

The PSC shall be assisted by a Technical Working Group, which is likewise hereby created, and shall undertake the formulation of policies, procedures and standard and coordinate the preparation of plans and programs. Members to the Technical Working Group shall be representatives of the agencies comprising the Steering Committee with the chair designated by the Steering Committee Chair. The Steering Committee members shall designate their respective representatives to the Technical Working Group.

Section 31.The National Secretariat

A National Secretariat that shall provide administrative and technical support to both the Steering Committee and Technical Working Group is also hereby created. The Secretariat shall be designated by the Steering Committee.

Section 32. The Regional Operations Committee

(a) The Regional Operations Committees (ROC) composed of the Regional Executive Director as head with the RTDs for Lands, Forestry

and PAWCZMS, the Mines Regional Director, the Chief of the Regional Surveys Division, the Land Evaluation party Coordinator and the Regional Planning, Budget and Public Affairs Officers are likewise hereby created for each region.

(b) The ROC shall promulgate the operational policies at their respective regions and formulate an integrated operations plan and supervise its implementation to ensure that full integration of PRS92 is achieved on or before 2010. The ROC shall also ensure the optimal use of survey personnel, equipment and financial resources through coordinated planning and implementation of survey activities. In order to achieve this, the Regional FNSPs and LEPs are hereby merged to form the Regional Composite Survey Teams (CSTs) under the supervision of the RTD for Lands.

Section 33. Coordination with Other Government Agencies and Private Survey Practitioners

(a) All DENR officials concerned shall coordinate with other government agencies and private survey practitioners to disseminate the information that only PRS92-compliant surveys shall be approved, subject to the provisions of Section 22 hereof.

(b) The Regional LMS shall provide technical assistance to other government agencies in their integration of their old surveys and maps into PRS92 and ensure the submission by these agencies of their PRS92 maps and/or old surveys and maps to the DENR.

ARTICLE X – MISCELLANEOUS PROVISIONS

Section 34. Separability Clause

If any clause, sentence, section or provision of these guidelines is held or declared unconstitutional or invalid by a competent court, the remaining parts hereof shall not be affected.

Section 35. Repealing Clause

All orders, rules and regulations inconsistent with this Order are hereby repealed or modified accordingly.

Section 36. Effectivity

This Order shall take effect upon acknowledgement of the Office of the National Administrative Register, and fifteen (15) days after its publication in a newspaper of general circulation.

MICHAEL T. DEFENSOR
Secretary

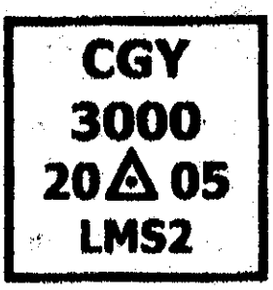
DENR
USECLANDS-0000817

Publication: Manila Standard Today
August 5, 2005

ANNEX A

Markings and Numbering of Control Points

1. The top surface of the monument shall be marked and inscribed as shown:



where: **CGY 3000** is the control point number
2005 is the year of establishment
LMS2 (LMS Region2) is the office or entity that established the control point
△ is the control point mark, consisting of a brass rod, copper nail or any other permanent mark set flush at the center of a triangle

2. The control point number shall be identified by the province where it is located followed by a designated number. The province codes are as follows:

Province	Code	Province	Code
Abra	ABR	La Union	LUN
Agusan del Norte	AGN	Leyte	LYT
Agusan del Sur	AGS	Maguindanao	MGD
Aklan	AKN	Marinduque	MRQ
Albay	ABY	Masbate	MST
Antique	ATQ	Metro Manila	MMA
Apayao	APA	Misamis Occidental	MSW
Aurora	ARA	Misamis Oriental	MSE
Basilan	BSL	Mountain Province	MPV
Bataan	BTN	Negros Occidental	NGW
Batanes	BTS	Negros Oriental	NGE
Batangas	BTG	North Cotabato	CTN
Benguet	BGT	Northern Samar	SMN
Biliran	BLR	Nueva Ecija	NEJ
Bohol	BHL	Nueva Vizcaya	NVY

Province	Code	Province	Code
Bukidnon	BKN	Occidental Mindoro	MRW
Bulacan	BLN	Oriental Mindoro	MRE
Cagayan	CGY	Palawan	PLW
Camarines Norte	CMN	Pampanga	PMG
Camarines Sur	CMS	Pangasinan	PNG
Camiguin	CGN	Quezon	QZN
Capiz	CPZ	Quirino	QRN
Catanduanes	CNS	Rizal	RZL
Cavite	CVT	Romblon	RML
Cebu	CBU	Samar	SMR
Compostela Valley	COV	Sarangani	SNI
Davao del Norte	DVA	Siquijor	SQJ
Davao del Sur	DVS	Sorsogon	SRG
Davao Oriental	DVE	South Cotabato	CTS
Eastern Samar	SME	Southern Leyte	LYS
Guimaras	GMS	Sultan Kudarat	SKT
Ifugao	IFG	Sulu	SUL
Ilocos Norte	ILN	Surigao del Norte	SRN
Ilocos Sur	ILS	Surigao del Sur	SRS
Iloilo	ILO	Tarlac	TRC
Isabela	ISB	Tawi-Tawi	TTW
Kalayaan Group	KLY	Zambales	ZBS
Kalinga	KAL	Zamboanga del Norte	ZGN
Laguna	LAG	Zamboanga del Sur	ZGS
Lanao del Norte	LAN	Zamboanga Sibugay	ZSI
Lanao del Sur	LAS		

3. The numbering of control points shall be from 1 to 3000 for those established by NAMRIA and 3001 and so forth for those established by LMS and other entities.

4. The name of the office or entity that established the control point shall be inscribed using only one word which could either be an acronym (NAMRIA, LMS2, DPWH, DAR), company name (CERTEZA, FFCRUZ, RCHOLDINGS) or surname of a person (DELACRUZ, VILLAFUERTE, LOPEZ).

5. To avoid duplication of numbers, the establishing entity shall coordinate with NAMRIA for first and second order control points and with the concerned regional LMS office for third and fourth order control points.