On the basis of article 102 from the Law on Real Estate Cadastre ("Official Gazette of the Republic of Macedonia" No. 55/2013), the Steering Board of the Agency for Real Estate Cadastre adopted a

REGULATION FOR THE MANNER OF PREPARATION OF TOPOGRAPHIC MAPS, ORTOPHOTO MAPS AND CARTOGRAPHIC PRODUCTS

I. GENERAL PROVISIONS

Article 1
This Regulation shall prescribe the manner of preparation of topographic maps, ortophoto maps and cartographic products, the form and content of the geodetic report for topographic maps, as well as the form and content of the template for the authorization for the production of cartographic products and the approval for use of cartographic products.

Definitions

Article 2
Particular expressions used in this Regulation shall have the following meaning:

1. "Map" shall be a graphically formed image of the land area on a plane, reduced in a certain ratio, mathematically construed and generalized.

2. "Topographic map" shall be a general geographic map with a lot of information on the displayed area relating to roads, water, vegetation, terrain shape and boundaries of administrative areas, coupled with the description of the map, where all objects are displayed with equal prominence.

3. Topographic survey" shall be a procedure of collecting and processing of data for horizontal and vertical image of the land, including an application of geodetic methods.

4. "Topographic database" shall be a collection of objects, where each object represents some physical entity, concept or idea of reality.

5. "Cartographic database" shall be a base obtained from the topographic database by methods of generalization.

6. "Unified Modeling Language (UML)" shall be a standard graphic data modeling language.

7. "Digital Elevation Model (DEM)" shall be a general definition for digital three-dimensional (3D) height model.
8. “Digital Terrain Model (DTM)” shall be a collection of regularly distributed points under coordinate axes whose spatial coordinates are being used for forming a mathematical terrain model, taking into consideration the coordinates of the vegetation, constructed objects, roads, refraction lines and characteristic points.

9. “Digital Surface Model (DSM)” shall be a collection of regularly distributed points along the coordinate axes, whose spatial coordinates are used for forming mathematical model of the Earth surface.

10. “Aerial photogrammetric records” shall be images captured from above with measuring cameras.

11. “Satellite records” shall be records made by satellite.

12. “Measuring camera” shall be an analogue or digital photogrammetric camera, with familiar elements of interior orientation determined by calibration.

13. “Aerotriangulation” shall be method for determination of the elements of external orientation of the records, by using the coordinates of the geodetic and orientation points and of the carried out photogrammetric measurements.

14. “Ortophoto record” shall be the middle section of the aerial photogrammetric record, transferred from a central or other familiar projection into orthogonal by redressing.

15. “Ortophoto map” shall be a paper equivalent to the topographic map paper, consisted of one or mosaic of several ortophoto records in a single scale, in coordinate system.

16. “Scale” shall be the ratio between a certain length of the map and its appropriate length in nature.

17. “Global Navigation Satellite System (GNSS)” shall be a satellite system for geopositioning and navigation at a global level.

18. “Cartographic projection” shall be a projection defining the mathematical laws for projection of points from the Earth ellipsoid, or the Earth globe, in a plane.

19. “Coordinate network” shall be a network of coordinate lines of the ellipsoid (meridians and parallels).

20. “Cartographic network” shall be a projection of the coordinate network in a plane, i.e. a graphic display of meridians and parallels projected from the Earth ellipsoid in plane of the map.

21. “Nomenclature of map papers” shall be a division of the land surface in papers under certain rules and their numbering in appropriate scale.
22. “Accuracy of the position” shall be numerical way of describing the quality of the geopositioning that is mapping of the spatial data is made by.

23. “Attributes” shall be description of places, appearing or facilities in the Earth surface.

24. “Logical consistency” shall be a harmonization that is logical connection of the topographic data with the other data in the topographic database.

II. TOPOGRAPHIC MAPS

Topographic maps scale

Article 3
The topographic map scale shall be expressed in fractions, whose numerator is one, and the denominator is a number expressing how many times the natural length has been scaled on the horizontal map projection.

Types of topographic maps according to the scale

Article 4
Depending on the Pursuant to the scale in which the maps are made, the topographic maps shall be classified as:

- large scale, in scale from 1:25000 to 1:50000,
- medium scale, in scale from 1:100 000 to 1:200 000, and/or 1:250000, and
- small scale, in scale from 1:500 000 to 1:1 000 000.

Basic topographic map

Article 5
The topographic map prepared/drafted in scale of 1:25 000 shall be the basic topographic map, and shall be distinguished from the other topographic maps by its original content, accuracy of data and the optimal ratio of the amount of data per unit area.

Mathematical basis

Article 6
The mathematical basis, in which the topographic maps are drafted, shall be defined by the geodetic datum (coordinate system) and the cartographic projection.

Geodetic datum

Article 7
The data for the geodetic datum, in which the topographic maps are drafted, shall be:

- reference system: State coordinate system,
- reference ellipsoid: Bessel 1841,
- semi-major axis (a): 6377397.155 m,
- reciprocal of flattening (1/f): 299.1528128156,
- cartographic projection: Gauss Kruger,
- Projection zone: 7,
- Prime meridian at: Greenwich
- Central meridian: 21°0000"
- Prime circle of latitude: Equator,
- Scale factor along the central meridian: 0.9999,
- Value of Y along the central meridian: 500 000m,
- Value of X along the prime circle of latitude: 0 m,
- Unit of measure: meter,
- Horizontal datum: Hermans Kogell and,
- Vertical datum: sea level, mareograph in Trieste.

**Cartographic projection**

**Article 8**
Topographic maps shall be prepared in the Gauss Kruger projection, which is the State cartographic projection for the Republic of Macedonia.

**Form of the topographic maps data**

**Article 9**
Topographic maps shall be prepared in digital and paper form, on the basis of the data from the carried out survey, in accordance with the cartographic standards.

**Organization of the topographic maps data**

**Article 10**
Data from the basic topographic map shall be organized into a topographic database, and the data from the topographic maps in a smaller scale shall be organized into a cartographic database according to the nomenclature of topographic maps based on the scale.

**III. TOPOGRAPHIC SURVEY**

**Survey for the preparation of topographic maps**

**Article 11**
The survey for the purpose of production of topographic maps includes a survey of topographic objects and terrain with an accuracy determined by the scale in which
they are made, collecting their qualitative and quantitative properties, as well as collecting data on the geographical names.

**Method and scope of the geographic survey**

**Article 12**

(1) The topographic survey shall be performed by aerophotogrammetric method of terrain surveying.

(2) The topographic survey shall cover: preparation of the terrain for surveying, determination of coordinates of the geodetic points and terrain surveying.

(3) Data collected from the topographic survey as referred to in paragraph (1) of this Article shall be basis for preparing topographic maps and for establishment of the topographic database.

**III.1. AEROPHOTOGRAMMETRIC SURVEY METHOD**

**Data resources**

**Article 13**

Aerophotogrammetric images obtained from the aerophotogrammetric surveying shall be the basic data resources for the preparation of topographic maps.

**Project for aerophotogrammetric survey**

**Article 14**

The aerophotogrammetric surveying project shall consist of:

- survey plan made on a topographic map in an appropriate scale, including survey directions, scale of the survey, type and focus of the survey camera and flying altitude,
- plan including the positions of orientation points, type and dimensions of photo-signals, and
- date, name, surname and signature of the person carrying out the survey project.

**Scale of survey**

**Article 15**

(1) The scale of survey shall not be less that 1:4 compared to the scale in which the topographic map is being drafted.

(2) The focus of the camera used for survey shall be taken into account while determining the scale of the survey.

**Survey camera**
Article 16

(1) Aerophotogrammetric survey shall be done with an analogue or a digital aerophotogrammetric camera.

(2) While survey with an analogue camera, the scale of survey shall be the basic factor for defining the accuracy of the survey.

(3) While performing the survey with a digital camera, the accuracy shall be expressed in the spatial size of the image element of the terrain GSD (Ground Sampling Distance).

(4) The camera from paragraph (1) of this Article should have a certificate for calibration, not older than 2 years.

Longitudinal and cross section

Article 17

The longitudinal section should provide a stereoscopic view of two adjacent photo images and it should not be less than 60%, and the cross section should provide a connection between the photo images of adjacent rows should not be less than 20%.

Photo materials

Article 18

(1) The photo materials, applied in the aerial photogrammetric survey with analogue cameras, should have:
  - high general sensitiveness
  - good sensitometric capacity (panchromatic, super chromatic, infrared, color and infra color)
  - the resolution of the photo material should be higher than 40 lines/mm.

(2) Digital aerial photogrammetric surveys are made by scanning the photo materials from paragraph (1) of this Article. The resolution of the digital aerophotogrammetric images (the pixel size) should not exceed 20 microns.

Time for survey

Article 19

The terrain survey shall be carried out in the period of the year with low vegetation, in parts of the day when the shadows are small and the weather conditions are stable.

Photo signaling of orientation points

Article 20
The photo signaling of the orientation points shall be done with photo signals in white color, in one of the following forms and dimensions, shown on the image below, where $r_s$ is the scale of recording:

(a)  
(b)  
(c)

Preparatory activities for aerial photogrammetric survey

Article 21
Before starting with the aerial photogrammetric survey, the terrain shall be prepared for surveying by:

- photo signaling of the existing geodetic points and the additional orientation points, in accordance with the survey project, and
- drafting of a description of the position of each orientation point.

Technical report from the performed survey

Article 22
(1) Upon the aerial photogrammetric terrain survey, the contractor shall prepare a technical report for the survey, consisted of:

- survey date,
- survey scale,
- camera by which the survey is made,
- camera focus,
- certificate for camera calibration and
- data for the projection centers for a GNSS supported survey including assessment of the accuracy.
(2) All additional and repeated surveys shall be marked with red on the topographic map, on which the survey plan has been prepared.

III.2. TERRAIN ACTIVITIES

Terrain determination of orientation points

Article 23

(1) Upon the recording made, the photo signaled orientation points shall be identified. The number of the point shall be written on the contact copy and it shall be marked by circle in red color.

(2) When the number of photo-signaled orientation points is not enough, visible details may be used as orientation points, as additional points.

(3) For the terrain activities performed to determine the coordinates of the orientation points, a geodetic report shall be prepared for the determination of coordinates of orientation points and shall const of:

- title page,
- verification page,
- content,
- technical report,
- overview sketch of orientation points,
- list of verified coordinates for the points of the existing geodetic base,
- original data from terrain measurements,
- data from calculations made including assessment of accuracy,
- list of coordinates of orientation points and
- description of the position of the orientation points.

(4) The geodetic report from paragraph (3) of this Article shall be prepared in paper and electronic form.

(5) The form and content of the geodetic report referred to in paragraph (3) of this Article shall be provided in Annex 1 which is an integral part of this Regulation

Terrain decoding

Article 24

(1) The terrain decoding is done on photo maps (photo sketches).

(2) During the terrain decoding referred to in paragraph (1) of this Article, data shall be collected on: inhabited areas, public objects, roads, railroads, waters, power lines, land use and other data, in accordance with the digital topographic key.

(3) For the terrain activities performed to decode the terrain, a geodetic report shall be prepared for the determination of coordinates of orientation points and shall const of:

- title page,
- verification page,
- content,
- technical report,
- overview sketch of the area being decoded, with links between the photo sketches, and
- photo sketches from the decoding (with the original data from the decoding, data for the time period of decoding and the experts that carried out the decoding).

(4) The geodetic report referred to in paragraph (3) of this Article shall be prepared in paper and electronic format.
(5) The form and content of geodetic report referred to in paragraph (3) of this Article shall be provided in Annex 2, which is an integral part of this Regulation.

Connecting points

Article 25
(1) Orientation points (geodetic points and additional points) shall be densified with connecting points between adjacent stereo pairs and lines, according to the required schedule of points in each stereo-pair.
(2) The connection points of the contact copies shall be marked with a circle in green color and the number of connection point next of it.

IV. AEROTRIANGULATION

Orientation of stereo pairs

Article 26
(1) While performing the internal orientation, at least four edge tags shall be measured. The deviations after the alignment should not exceed 15 microns.
(2) For the relative orientation, at least 6 points shall be measured on the photo image, while the parallax after the alignment should not exceed 15 microns.

Aerotriangulation procedure

Article 27
(1) Aerotriangulation shall mean a working process made by photogrammetric hardware and software for the purpose of obtaining settled coordinates of orientation and connection points.
(2) The connection points in the model or on the photograph may be measured manually or automatically, along the length of the line or between lines.
(3) The aero triangulation shall provide elements of external orientation for each particular photograph, on the basis of which stereo pairs are formed or digital ortophoto is being made.

Geodetic report for aero triangulation
Article 28

(1) For the performed aero triangulation, a geodetic report shall be prepared with:
- title page,
- verification page,
- content,
- technical report,
- overview sketch of the orientation points and stereo pairs/photographs,
- list of coordinates of orientation points,
- results from the measuring of image/model coordinates,
- results from the alignment with corrections of the coordinates,
- exit coordinates of the aero triangulation for the orientation points with an appraisal of the accuracy, and
- list of eliminated points.

(2) Geodetic report referred to in paragraph (1) of this Article shall be prepared in paper and electronic format.

(3) The form and content of geodetic report referred to in paragraph (1) of this Article shall be provided in Annex 3, which is an integral part of this Regulation.


Control of the technical report from the carried out aerophotogrametric surveying

Article 29

(1) After the carried out aerophotogrametric survey, the data shall be controlled and it shall be established whether:

- deviation from the flight altitude is less than 5% from the projected one,
- vertical deviation of recordings is less than 5 gradius (g) and rotating images less than 15 gradius (g),
- Aero photogrammetry images are usable (uniformity of the negative, absence of deep shadows, clouds, fog and snow)
- Edge marks are visible,
- numbering of the photos is correct,
- the contrast of successive shots is uniform, and
- the area that is being surveyed with stereoscopic coverage.

(2) After the carried out control referred to in paragraph (1) of this Article, minutes are prepared into which shall be entered the notes from the executed control, the date and the geodetic expert from the Agency of Real Estate Cadastre (hereinafter: "the Agency") that carried out the control and the time limit for removal of the identified shortcomings.

Control of the geodetic report for determining orientation points
Article 30

(1) By controlling the geodetic report for determining the orientation points, an inspection shall be done of the data from the performed measurements, calculations and achieved accuracy.

(2) During the control referred to in paragraph (1) of this Article it shall be determined whether the geodetic report has been prepared in the prescribed form and content and whether the appropriate method of determining the orientation points has been applied.

(3) For the performed control referred to in paragraph (1) and paragraph (2) of this Article, a field report shall be prepared with the notes from the control performed, the date and the geodetic expert from the Agency that performed the control, as well as the time limit for removal of the identified shortcomings.

Control of the geodetic report for the decoding

Article 31

(1) By controlling the geodetic report for the decoding, it shall be determined whether the geodetic report has been prepared in the prescribed form and content.

(2) During the control referred to in paragraph (1) of this Article, an inspection shall be done of the data contained in the photo sketches from the decoding.

(3) For the performed control referred to in paragraph (1) and paragraph (2) of this Article, a field report shall be prepared with the notes from the control performed, the date and the geodetic expert from the Agency that performed the control, as well as the time limit for removal of the identified shortcomings.

Control of the geodetic report for aero triangulation

Article 32

(1) By controlling the geodetic report for aero triangulation, an inspection shall be done of:

- the layout and number of connecting points,
- the mean error of the internal and relative orientation,
- the deviation of coordinates of the orientation points determined on the field with coordinates obtained from the aero triangulation, and
- mean square error from the alignment.

(2) For the performed control referred to in paragraph (1) of this Article a field report shall be prepared with the notes from the control performed, the date and the geodetic expert from the Agency that performed the control and the time limit for removal of the identified shortcomings.

VI. TOPOGRAPHIC DATABASE

Topographic data model
Article 33

The topographic data model shall define the packages, classes and elements of the data, their spatial preview, attributes, rules, relation and cartographic overview, thus enabling efficient access to the data, as well as performance of appropriate operations.

Topographic database for the scale of 1:25000

Article 34

(1) The architecture of the topographic database for the scale 1:25000 shall be unified and it shall derive from the topographic data model where all the data are given by using the object concept.

(2) The topographic database in scale 1:25000 shall consist of 10 data packages as follows: administrative areas, land classification, roads, railways, waters, small objects, topographic characteristics, text (textual recording), reference raster and spatial scheme with a coordinate network and frame.

(3) Each of the packages referred to in paragraph (2) of this Article shall be one whole consisted of classes, described by certain information, i.e. data, connected with their markings and specifications, the so called attributes.

(4) The structure of the topographic database including the data packages shall be presented by the following scheme:
VII. MAPPING THE CONTENT OF THE TOPOGRAPHIC MAP

Levels of the digital topographic map

Article 35

The digital topographic map shall consist of eight vector levels, including: administrative areas, land classification, roads, railways, waters, small objects, topographic characteristics, text (textual recording) and one raster data level - orthophoto map, presented in the following picture:
Administrative areas

Article 36

The level of data for administrative areas shall consist of files for: state border, border of the self-government units and the borders of the national parks.

State border

Article 37

(1) The file where the content of the state border shall be formed only for the papers from topographic map through which the border passes.

(2) The data from the file referred to in paragraph (1) of this Article shall be obtained by taking and connecting the points given by coordinates Y and X from the geodetic reports and records for the state border.

Local self-government unit borders

Article 38

(1) The files where the data for the local self-government unit borders are kept shall be formed for each paper of the topographic map.

(2) The content of the files referred to in paragraph (1) of this Article shall be formed on the basis of the Y and X coordinates for the points of the local self-government unit borders, which are taken from the Spatial Units Registry.

National park borders
Article 39

(1) The files, where the data for borders of the national parks are kept, shall be formed for the papers of the topographic map through which the borders pass.

(2) Coordinates Y and X shall be entered into the files referred to in paragraph (1) of this Article, for the points from the borders of the national parks, in digital form, obtained by the competent authority.

Mapping

Article 40

(1) Data for: land classification, roads, railways, waters, small objects, topographic characteristics and text (textual recording) shall be mapped on the topographic map.

(2) The data mapping from paragraph (1) of this Article shall be made from oriented stereo pairs.

(3) The data mapping from paragraph (1) of this Article, as well as the data from Articles 37, 38 and 39 shall be made pursuant to the data topographic model from Article 33 of this Regulation, the digital topographic key and the spatial data specification from scale 1:25000.

(4) The form and the content of the digital topographic key are given in Annex 4 as integral part of this Regulation.

(5) The form and the content of the specification for the spatial data are given in Annex 5 as integral part of this Regulation.

Geometric accuracy

Article 41

The geometric accuracy of the topographic map data, expressed by the mean error in map coordinate reading, should not exceed +0.0002*M, where M is the denominator of the map scale.

VIII. CARTOGRAPHIC PROCESSING OF DATA

Stages of data processing

Article 42

The cartographic processing of data shall include:

- connecting the adjacent papers of the topographic map,
- topology construction,
- connection of the graphic with the topographic database, and
- preparation for printing.
Connecting the adjacent papers of the topographic map

Article 43
The connection between the adjacent papers of the topographic map shall be made by taking the coordinates, type and attributes of the border elements from already made topographic paper and by transferring to the topographic map paper in the process of drafting.

Topology Construction

Article 44
The construction of topology shall cover data verification under types of elements, while:

- detecting and eliminating the dual lines and polygons,
- detecting unconnected lines and polygons and connecting them,
- detecting and eliminating of very small lines, and
- detecting parts of lines extending out from the intersection.

Connecting of the graphic with the attribute data in the topographic database

Article 45
Within the topographic database, the graphic elements of each object shall be connected with the appropriate attribute data in relation 1:1 that is each element of the graphic should have one appropriate record in the attribute table of the topographic database.

Terrain control of the mapped data

Article 46
(1) Terrain control of the mapped data shall be made on a printed work copy of the topographic map where the removal of the identified shortcomings is done.
(2) During the terrain control, data shall be collected for the objects not visible in the stereo model, as well the data for the attribute characteristics of the objects not collected in the procedure of encryption, for the purpose of obtaining an appropriate topographic sign.
(3) The data on the period of realization of the terrain control, as well as the experts in charge of the control, shall be registered on the printer work copy of the topographic map paper on which the terrain control is made.
(4) The terrain control from paragraph (1) of this Article shall be done by the person who prepared the topographic map.

Preparation for printing

Article 47
The preparation for printing shall cover:
- defining of the symbols for point, line and polygon objects,
- selection of fonts including the necessary characteristics, in accordance with the digital topographic key from Article 40, paragraph (4) of this Regulation,
- cartographic processing of the files for each sheet of the topographic map,
- organization of the files by layers, under the principle of cartographic visualization of the content, and
- creation of the final layout outside the frame, being drafted in two versions (Macedonian and English).

**Printing**

Article 48

(1) The topographic map sheets in scale 1:25000 shall be printed in four basic colors: blue, violet, yellow and black.

(2) If necessary, the colors of paragraph (1) of this Article may be complemented with brown, grey and light grey color.

(3) The division of sheets in appropriate scale, for the entire territory of the Republic of Macedonia, shall be printed on the background of the topographic map.

**IX. CONTROL OF TOPOGRAPHIC DATA**

**Control over the topographic database**

Article 49

(1) The control over the topographic database is done over each sheet of the topographic map separately, and for each level.

(2) The control referred to in paragraph (1) of this Article shall include the control of:

- completeness,
- logical consistency,
- accuracy of the position,
- semantic accuracy, and
- temporal accuracy.

(3) The manner of executing the control referred to in paragraph (1) of this Article shall be prescribed with the spatial data specification in the scale of 1:25000 referred to in Article 40, paragraph (5) of this Regulation.

**Final control**

Article 50
(1) The copy of the topographic map sheet which was submitted as final, by the drafter, shall be subject to final control.
(2) The final control shall be made by a geodetic expert from the Agency.
(3) For the performed control referred to in paragraph (1) of this Article, a quality control table shall be prepared for topographic map sheet in vector and raster form, into which data shall be entered for the type of performed controls, the date and the geodetic expert from the Agency that performed the control.
(4) The form and content of the quality control table for the topographic map sheet in vector form shall be provided in Annex 6 which is an integral part of this Regulation.
(5) The form and content of the quality control table for the topographic map sheet in raster form shall be provided in Annex 7, which is an integral part of this Regulation.

X. UPDATING AND GENERALIZATION OF TOPOGRAPHIC MAPS AND PRODUCTION OF ORTOPHOTO AND THEMATIC MAPS

Updating of topographic maps

Article 51

(1) By updating the topographic maps, the data from the topographic maps shall be harmonized with the actual situation on the field.
(2) When the changes on the field are of a smaller scale, the topographic maps shall be updated by surveying the field by applying the classical surveying methods or by applying the methods of global satellite positioning.
(3) When the changes on the field are of a greater scale, the topographic maps shall be updated by aerophotogrammetric surveying or by using the satellite photographs.
(4) The updating of the topographic maps can be done by using the up-to-date ortophoto maps.
(5) The Agency has the jurisdiction to perform aerial shooting, each five years, for the purpose of producing ortophoto maps/plans.

Generalization of topographic maps

Article 52

Generalization shall be the simplification of the content of the map depending on the scale and/or purpose on the map. The methods and means of generalization shall be defined in the specifications for preparation of topographic maps at appropriate scale.

Preparation of topographic maps in smaller scales

Article 53
From the topographic or cartographic database, following the methods of
generalization, topographic maps in smaller scale shall be prepared as follows:

- from the topographic database for the scale of 1:25000, topographic maps in the scale of 1:50000 shall be prepared,
- from the cartographic database for the scale of 1:50000, topographic maps in the scale of 1:100000 shall be prepared,
- from the topographic database for the scale of 1:25000, topographic maps in the scale of 1:20000 and/or 1:250000 shall be prepared,
- from the cartographic database for the scale of 1:200000 and/or 1:250000 topographic maps in the scale of 1:500000 shall be prepared, and
- from the cartographic database for the scale of 1:500000 topographic maps in the scale of 1:1000000 shall be prepared.

**Control of topographic maps in smaller scales**

**Article 54**

Control of topographic maps in smaller scales shall be done in the manner prescribed in Article 49 of this Regulation.

**Printing the topographic maps in smaller scales**

**Article 55**

The printing of topographic maps in smaller scales shall be done in the manner prescribed in Article 48 of this Regulation.

**Ortophoto maps**

**Article 56**

(1) Ortophoto maps shall be prepared according to the division of topographic map sheets into appropriate scale.
(2) For the preparation of ortophoto maps, the necessary elements shall be as follows:

- aerophotogrammetric images photographed with a digital camera, scanned aerophotogrammetric images or satellite images
- elements for internal and external orientation of the aerial photogrammetric images, and
- digital model of the terrain.

**Thematic maps**

**Article 57**

(1) The topographic and cartographic database shall be used as the basis for the preparation of thematic maps.
(2) With the thematic maps, a cartographic display is given of a variety of topics from the natural and social environment that is directly related to space. By applying
cartographic elements of thematic maps, different information is displayed about the status of the territory in the space, its layout, quantities and properties.

**Metadata**

Article 58
(1) For topographic maps the Agency shall prepare metadata, according to the prescribed metadata standards.
(2) The metadata shall be stored, maintained and browsed in the metadata catalogue administered in the Agency.

**XI. CARTOGRAPHIC PRODUCTS**

**Competence for the production of cartographic products**

Article 59
(1) The Agency shall be responsible for producing overview, thematic and school maps, overview sheets of maps, map publications, atlases, albums, models.
(2) For the production of the cartographic products referred to in paragraph (1) of this Article, data shall be used from the topographic and cartographic database in the appropriate scale.

**Authorization for the production of cartographic products**

Article 60
(1) Cartographic products referred to in Article 59, paragraph (1) of this Regulation can also be produced by other legal entities with a previously issued authorization for the production of cartographic products (hereinafter: “authorization”) by the Agency.
(2) The authorization shall be printed on a white 220 grams high quality glossy paper, in A4 format on which the seal of the Agency is embossed.
(3) The form and content of the authorization referred to in paragraph (1) of this Article shall be provided in Annex 8 which is an integral part of this Regulation.

**Authorization committee**

Article 61
(1) The determination whether the requirements have been met shall be done by the authorization committee (hereinafter „Committee“) established by the Director of the Agency.
(2) The Committee referred to in paragraph (1) of this Article shall consist of three members, two out of which shall be from the organizational unit at the Agency, responsible for the cartography, and the president is one of the senior civil servants in the Agency.
(3) The president and the members of the Committee shall have deputies.
Conditions for acquire an authorization

Article 62
(1) The legal entities referred to in Article 60, paragraph (1) of this Regulation, that are to acquire an authorization, need to meet the following criteria:

- to be registered in the appropriate register in the Central Registry of the Republic of Macedonia for performing activities related to cartography,
- to possess licensed software for the preparation of cartographic products (at least one license) or an open source software,
- to have the suitable office equipment (at least two desks and two chairs) and proper computer equipment (at least a personal computer, a printer / plotter and a scanner),
- to have adequate facilities for performing cartographic activity with total internal usable area of not less than 20 m², suitable for carrying out the activity, and
- to have at least one employee with a university degree with a VII/1 degree or 300 credits according to ECTS, specializing in surveying or geography.

Request to issue an authorization

Article 63
(1) In order to acquire an authorization, the legal persons referred to in Article 60, paragraph (1) of this Regulation, shall submit a request to the Agency.
(2) Along with the request referred to in paragraph (1) of this Article, the legal persons shall submit evidence for meeting the requirements referred to in Article 62 of this Regulation.

Fee for authorization

Article 64
(1) For the issuance of an authorization, i.e. for inspection whether the requirements for issuing an authorization have been met, a fee shall be paid to the Agency.
(2) The amount of the fee referred to in paragraph (1) of this Article shall be determined depending on the costs for the inspection whether the requirements for issuing an authorization have been met, and it shall be prescribed by the Steering Board of the Agency.

Inspection whether the requirements for issuing an authorization have been met

Article 65
(1) Whether the requirements for issuing an authorization have been met shall be determined by the Committee referred to in Article 61 of this Regulation.
(2) For the inspection whether the requirements for issuing an authorization have been met, the Committee shall draft a report.
Depending on the report referred to in paragraph (2) of this Article, when the requirements referred to in Article 62 of this Regulation have been met, the Agency shall issue an authorization.

(4) The organizational unit at the Agency, which deals with the cartography issues, shall keep records for the authorizations issued.

(5) In the records referred to in paragraph (4) of this Article, data shall be entered on: ordinal number, name of the legal entity, unique company/business entity/business identification number, headquarters, number and date of the received authorization and number and date of the decision to revoke the authorization decision.

(6) The form and content of the template for the records of the issues authorizations shall be provided in Annex 9 which is an integral part of this Regulation.

**Failure to meet the requirements determined during the inspection**

Article 66

(1) If during the inspection for the fulfillment of the requirements for issuing an authorization, the Committee has identified certain deficiencies, it shall draft a report and oblige the applicant, within a period not longer than eight days from the date of the inspection, to rectify the deficiencies.

(2) If within the deadline prescribed in paragraph (1) of this Article, the deficiencies are not rectified, the Agency shall not issue an authorization, for which it shall notify the applicant in written.

(3) The legal entity which shall not be issued an authorization may not, before the expiry of 15 days from the date of the inspection, submit a new request for issuance of an authorization.

**Performing supervision over the work of legal entities**

Article 67

(1) The Agency shall perform supervision over the legal entities authorized to produce cartographic products within the competences prescribed with the Law on Real Estate Cadastre, under an ex-officio procedure and at the request of a client.

(2) When conducting the procedure referred to in paragraph (1) of this Article, legal entity shall be obliged to enable smooth execution of the works of the authorized officer from the Agency, to provide the necessary working conditions and establishing of the facts and to make available all necessary documents and data.

(3) For the performed control, the authorized officer from the Agency shall draft a report which states the notes, statements and other relevant facts and circumstances, in view of the established facts.

**Proposal for revoking the authorization**

Article 68

(1) If during the inspection deficiencies have been identified in the fulfillment of the requirements referred to in Article 62 of this Regulation, the officer from the Agency shall submit a proposal for revoking the authorization to the Director of the Agency.
(2) In addition to the proposal referred to in paragraph (1) of this Article, a photocopy shall be submitted of the report referred to in Article 67 paragraph (3) of this Regulation.

Revoking the authorization

Article 69

(1) At the proposal referred to in Article 68 of this Regulation, the Director of the Agency shall adopt a decision for revoking the authorization.

(2) The legal entities whose authorization has been revoked shall be listed in the records referred to in Article 65 paragraph (4) of this Regulation.

Obligatory content of the cartographic products

Article 70

(1) The data from the topographic and/or cartographic database for the appropriate scale relating to the hydrographic, road and railway infrastructure, topographic features and administrative areas, should be used in the preparation of cartographic products.

(2) Apart from the cartographic content, the basic data that each cartographic product should contain shall be:

- name of the cartographic product,
- scale,
- cartographic projection and other mathematical elements,
- cartographic key/legend,
- name of the author (i.e. name of the copyright holder),
- name and headquarters of the publisher, place and year of publishing,
- source of the basic cartographic data,
- number and date of the authorization for putting into use of the cartographic product and name of the authority that issued the authorization,
- international standardized number of the cartographic product,
- designation С (copyright) with the name of the copyright holder, and
- circulation.

Consent for putting the cartographic product into use

Article 71

(1) Before putting into use the cartographic product, the legal entity that produced it is obliged to submit a request to the Agency for obtaining consent for putting into use the cartographic product.

(2) In addition to the request referred to in paragraph (1) of this Article the legal entity shall submit the cartographic product in electronic form, in hard copy (3 copies) and the proof for payment of the fee for using topographical data and/or cartographic database for the appropriate scale, which he used in the preparation of the cartographic product.
(3) The Agency shall issue the consent referred to in paragraph (1) of this Article, once determined that during the preparation of the cartographic product the topographic and/or cartographic database for the appropriate scale were used, as part of the geodetic-cadastral information system, and that the fee has been paid.

(4) The consent referred to in paragraph (1) of this Article, the Agency shall issue within 15 days from the day of receiving the request for issuing consent for putting in the cartographic product.

(5) The cartographic product that the legal person puts into use, should be identical with the cartographic product the Agency issued the consent for.

(3) The form and content of the consent referred to in paragraph (1) of this Article shall be provided in Annex 10 which is an integral part of this Regulation.

Fee for issuing consent

Article 72

(1) For issuing the consent referred to in Article 71 of this Regulation, a fee shall be paid to the Agency.

(2) The amount of the fee referred to in paragraph (1) of this Article shall depend on the scope and content of the cartographic product, and shall be prescribed by the Steering Board of the Agency.

Records of the issued consent for the issuance of cartographic products

Article 73

(1) The organizational unit at the Agency in charge of cartography keeps records for the issued consents for putting into use of cartographic products.

(2) In the records referred to in paragraph (1) of this Article data shall be entered on: name of the legal entity that acquired the consent, their headquarters, and unique company/business entity/business identification number, name of the cartographic product, its international standardized number and the number and date of the acquired consent.

(3) The form and content of template for recording the issued authorizations for the issuing of cartographic products shall be provided in Annex 11 which is an integral part of this Regulation.

XII. TRANSITIONAL AND FINAL PROVISIONS

Article 74

With the entry into force of this Regulation, the Regulation on the manner of production of topographic maps ("Official Gazette of the Republic of Macedonia", number 30/2009) shall no longer be valid.

Article 75

This Regulation shall enter into force on the eight day following its publication in the "Official Gazette of the Republic of Macedonia".
Chair of the Steering Board
Skopje

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Aneta Jordanova

ANNEXES