

Fundamental Regulations
For the Making of Topographic Maps at the Scales of 1:10,000,
1:25,000, 1:50,000 and 1:100,000.

Issued by the Head of the Military Topographic Directorate of the General Staff and
the Head of the Main Administration for Geodesy and Cartography of the Ministry of
Internal Affairs (MVD) of the USSR.

Obligatory for all Agencies and Institutions of the USSR.

The *Fundamental Regulations For the Making of Topographic Maps at the Scales of 1:10,000, 1:25,000, 1:50,000 and 1:100,000* were developed by a commission consisting of the following: AS Nikolaev, SG Sudakov, CC Salov, NA Sokolova, FV Romanovskiy, MD Konshin, BV Troutskiy, EI Ardab'eva, MKh Baranov, AI Kuleshov, AB Rogov, VV Ivanov; with the participation of the following: MN Sokolov, VM Gusakov, EP Kryukov, AI Richkov, KA Borodina, PN Knish and DM Parigen.

CONTENTS

- I. General Regulations
 - II. The Purpose of Topographic Maps
 - III. The Projection, System of Coordinates and Heights, Sheet-Lines and Nomenclature.
 - IV. The Accuracy of Topographic Maps
 - V. Geodetic Foundations
 - VI. The Content of Maps
 - VII. Aerial-Photo-Survey (Aerial Photography).
 - VIII. Photographic Interpretation
 - IX. Control
 - X. Renewal of Topographic Maps
- Appendix to § 46

[Foot of page gives names of editors and printing dates and data.
NB: Printed at the Dunaev Factory.]

I. General Regulations

§ 1. The topographic maps at the scales of 1:10,000, 1:25,000, 1:50,000 and 1:100,000 are the general state maps of the USSR. These maps are made in conformity with the present *General Regulations*, and the *Conventional Signs and Examples*, issued by the General Staff and the Main Administration for Geodesy and Cartography of the MVD USSR. The said *General Regulations*, and *Conventional Signs and Examples of Maps* are obligatory for all agencies producing topographic surveys and compiling topographic maps.

§ 2. Topographic maps at the scales of 1:10,000, 1:25,000, 1:50,000 and 1:100,000 are made:

- by means of topographic surveys;
- by means of compilation from cartographic materials of larger scales.

§ 3. For the making of topographic maps the following types of topographic surveys are used:

- aerial-photo-topographic surveys;
- measured surveys.

At the present time, as is well known, aerial-photo-topographic surveys are used. Measured surveys are used exclusively in those cases when the possibility of producing aerial-photo-topographic surveys does not exist.

Photo-theodolite survey may be used in conjunction with aerial-photo-topographic surveys, and in special cases as an independent form of survey.

§ 4. Aerial-photo-topographic surveys are produced:

- by the stereo-topographic method;
- by the combination method.

In the main the stereo-topographic method is used for the making of topographic maps.

The combination method is used for the making of maps at the scales of 1:10,000 – 1:50,000, chiefly in flat plain and closed plain regions, and also for surveys with contour intervals of 1 m..

II. The Purpose of Topographic Maps

§ 5. Topographic maps at the scales of 1:10,000 – 1:100,000 are intended for the study and evaluation of the terrain, for orientation within it, for the production of measurements and calculations for planning and designing of various engineering structures, for the working out and carrying out of various measures of people's-economic and defence importance, and also for the solution of tasks of a scientific research character. They serve also as the foundation for the compilation of smaller-scale maps, special maps and other cartographic documents. The most important purposes and areas of application of topographic maps are indicated in § 6-9.

§ 6. Topographic maps at the scale of 1:10,000 are to be used:

In the People's economy:

- in the agricultural economy, for the land-management of collective farms and state farms in regions where the land is worked by labour-intensive cultivation and in regions with a complex situation and relief; and for detailed soil investigations in complex conditions of relief and great variety of soils, and for the working out of designs for the irrigation and drainage of land;
- in hydro-electrical construction, for the choice within the territory of construction of places for the disposition of hydro-technological structures, for the design of hydro-electrical power-stations on small rivers, for the designing and determination of the volume of reservoirs, and for engineering-geological exploration along the lines of dams and of plots of land for construction with complex geological conditions;
- in geology, for the carrying out of detailed reconnaissance of deposits of minerals;
- in transport construction, for the exploration in complex conditions of railways, motor roads and canals, for the compilation of engineering drawings of their courses, main and the distribution of subsidiary structures, and for the satisfactory investigation of rivers for drainage;
- in forestry, for the compilation of designs for woodland improvement and for measures to improve floatable rivers;
- in industry and the communal economy, for the compilation of technical designs of emplacements in regions of construction of industrial enterprises, in settlements, in the choice of courses of roads and of lines of communication, pipelines, power-cables &c.; for performing engineering-geological and hydro-geological investigations and the compilation of maps of regions of construction.

In the Defence Forces:

- for the most detailed study and evaluation of the terrain, the organisation of systems of fire and the development of initial topographic data for firing, for the direction of troops in battle in large settlements and at other important lines and objects;
- for accurate measurements and calculations in the designing and construction of nodes and regions of defence, of aerodromes and other military-engineering structures and objects.

§ 7. Topographic maps at the scale of 1:25,000 are to be used:

In the People's economy:

- in the agricultural economy for the land-management of large-area collective farms and state farms, for detailed soil and geo-botanical investigations, and also for the compilation of preliminary designs for irrigation or drainage of large parcels of land;

– in hydro-electrical construction for the design of major water-stations, for the determination of the volume of reservoirs and areas of flooding, for the design in the surroundings of a reservoir of drainage lines, and for carrying out engineering-geological surveys of the territory of reservoirs;

– in geology for the carrying out of detailed reconnaissance works, and for geodetic research;

– in transport construction for the choice of the courses of railways, motor roads and canals;

– in forestry for the carrying out of woodland management works in high-grade woods, for the working up of preliminary designs for woodland improvement and of plans for the organisation of the woodland economy;

– in industry and the communal economy for the compiling of preliminary designs of the layout in regions of construction of industrial enterprises and settlements, for the choice of courses for roads, pipelines, lines of communication, power-lines &c.;

In the Defence Forces:

– in all arms, for the detailed study and evaluation of the landscape by commanders of subunits and sections for organisation, planning of the battle, and the direction of troops into battle, especially for a breach of a prepared defence by the enemy, the forcing of a water obstacle, and for the organisation of battle in places of settlement;

– in the artillery, for the topographic linkage of the battle array of the artillery, targeting, developing data for firing, and also for the planning of manoeuvres and fire of the artillery;

– in engineering and other specialist troops, for the design and construction of military-engineering structures, of nodes and regions of defence, and of military roads and aerodromes;

– in anti-aircraft artillery troops, for the organisation of the anti-aircraft defence of individual objects, the orientation of battle arrays and the development of data for firing;

– in military aviation forces, for the detailed study of individual objects of bombing, the approach to them, and also for the choice of landing areas and places for the construction of aerodromes;

– in military communications, for the choice of areas and routes for the construction of communications objects, and for the erection of aerial communication lines and laying of underground lines.

§ 8. Topographic maps at the scale of 1:50,000 are to be used:

In the People's economy:

- in geology as the topographic base for the compilation of detailed maps of deposits of ore, coal, and slates or of maps of the geology of production regions, and also for the carrying out of reconnaissance works;
- in transport construction, for the choice of the direction of the routes of railways, motor roads and canals;
- in forestry, for carrying out forestry management works;

In the Defence Forces – for the study and evaluation of the landscape by commanders and staffs of formations, and sections (subdivisions) for the organisation and planning of battle and the directing of the troops in battle, especially for attacks in tactical depth on the defences of the enemy; for orientation in the landscape for the navigation of troops, and also for calculations in the planning and organisation of military-engineering and other works for the equipment of the terrain,

Besides that, maps at the scale of 1:50,000 may be used by the troops for the same purposes as for the map at the scale of 1:25,000 (when this last is lacking).

§ 9. The topographic map at the scale of 1:100,000 is used:

In the People's economy:

- in agriculture, for land management and the compilation of plans of the organisation of cattle husbandry, for the determination of the water-collection area of a region of irrigation and of the sources of water supply, and also for the determination of the geological and hydro-geological construction of a region;
- in hydro-electrical construction, for the study of the water-current of the basin, the determination of its water-collecting area and regime of supply, and also for the carrying out of engineering-geological and hydro-geological investigations on the stages of the planned tasks;
- in geology, as the topographic base for compiling geological maps;
- in transport construction, for the preliminary choice of the course of railways, motor roads and canals, and for economic investigations connected with them;
- in forestry, for carrying out aerial valuation works.

In the Defence Forces – for the study and general evaluation of the landscape by commanders and staffs of combined arms units for the planning, organisation and conduct of the battle (operation) and for the direction of troops in battle. This map finds especially wide use for the planning and organisation of marches, for the pursuit of the enemy and in encounter battle.

In engineering and special troops the map at the scale of 1:100,000 is used for approximate calculations in the designing and organisation of engineering and other types of support of the battle (operation).

III. Projection, System of Coordinates and Heights, Sheet-lines, and Nomenclature.

§ 10. The topographic maps are constructed in the Gauss transverse-cylindrical rectangular projection, calculated in six-degree zones using the elements of the Krassovskiy ellipsoid, the 1942 system of coordinates and the Baltic system of heights.

In individual areas not provided with points of the state geodetic net, maps may, with the authorisation of the Military-Topographic Directorate or the Main Administration for Geodesy and Cartography, be constructed in a local system of coordinates and heights.

The central meridians of the six-degree zones within the boundaries of the territory of the USSR are 21, 27, 33, 39, ..., 183 and 189 degrees. The values of abscissae are counted from the equator; the values of ordinates are counted from the central meridian, although the value of the ordinate of the central meridian is set at 500 km.

§ 11. Sheets of topographic maps have the form of a trapezium, the western and eastern sides (of the frame) of which form lines of meridians, and the northern and southern sides form lines of parallels.

To the south of the 60° parallel maps are issued as single sheets, the dimensions of which are given in table 1.

Table 1.

Scale of the Map	Size of the side of the Trapezium	
	in Latitude	in Longitude
1:10,000	2.5	3.75
1:25,000	5.0	7.5
1:50,000	10.0	15.0
1:100,000	20.0	30.0

North of the sixtieth parallel sheets of maps are issued doubled, and north of the seventy-sixth parallel quadrupled in width. For the doubling of the sheets of the 1:100,000 map an odd-numbered sheet by the nomenclature is united with the following even-numbered sheet. For the doubling of sheets of other scales sheets included in the trapezium of the next smaller scale are united (A with B, C with D, and so on). The grid of rectangular coordinates should be marked on the maps, the lines of which are drawn on sheets of the map at the scale of 1:10,000 every 10 cm., on sheets of the map at the scale of 1:25,000 every 4 cm., on sheets of the map at the scale of 1:50,000 every 2 cm., and on sheets of the map at the scale of 1:100,000 every 2 cm..

§ 12. The basis of the nomenclature of the maps is the established sheet-lines of the map at the scale of 1:1,000,000, in which the representation of the surface of the earth

is divided by parallels into zones of 4° of latitude, and by meridians into columns every 6° of longitude. The zones are designated by capital letters of the Latin alphabet, beginning at the equator. Counting of the columns proceeds from west to east from the meridian longitude 180° from Greenwich. The columns are designated with Arabic numbers from 1 to 60.

The nomenclature of a sheet of the 1:1,000,000 map is composed of a letter, designating the zone, and the number of the column; for example the sheet with the city of Moscow carries the nomenclature N-37.

A sheet of the map at the scale of 1:1,000,000 comprises 144 sheets of the map at the scale of 1:100,000, which are numbered with Arabic figures. The nomenclature of a sheet of the 1:100,000 map is composed of the designation of the sheet of the map at the scale of 1:1,000,000 with the addition of the index number of the sheet of the map at the scale of 1:100,000; for example N-37-14.

A sheet of the map at the scale of 1:100,000 comprises four sheets of the map at the scale of 1:50,000, designated by the capital letters А, Б, В, and Г of the Russian alphabet. The nomenclature of a sheet of the map at the scale of 1:50,000 is composed of the designation of the sheet of the map at the scale of 1:100,000 and the letter designating the sheet of the map at the scale of 1:50,000; for example N-37-14- А.

A sheet of the map at the scale of 1:50,000 comprises four sheets of the map at the scale of 1:25,000, designated by the lower case letters а, б, в, and г of the Russian alphabet. The nomenclature of a sheet of the map at the scale of 1:25,000 is composed of the designation of the sheet of the map at the scale of 1:50,000 and the letter designating the sheet of the map at the scale of 1:25,000; for example N-37-14- а.

A sheet of the map at the scale of 1:25,000 comprises four sheets of the map at the scale of 1:10,000, designated by the Arabic number 1, 2, 3, and 4. The nomenclature of a sheet of the map at the scale of 1:10,000 is composed of the designation of the sheet of the map at the scale of 1:25,000 and the letter designating the sheet of the map at the scale of 1:10,000; for example N-37-14- а- 1.

IV. The Accuracy of Topographic Maps

§ 13. Mean errors in the position on the map of objects and the outline of the terrain with respect to the nearest points of the planimetric survey net should not exceed 0.5 mm., or in mountainous, high-mountain and desert regions 0.75 mm..

§ 14. Mean errors of heights, written on the map, with respect to the nearest points of the height survey net should not exceed the values (in metres) indicated in Table 2.

Table 2.

Scale of Survey:	1:10,000	1:25,000	1:50,000	1:100,000
Region of Survey:				
Flat plain.	0.8	0.8	2.5	5
Dissected plains, and hilly areas with gradients predominantly less than 6°	0.8	1.6	3	7
Mountains and foothills, and also sandy deserts	2.5	2.5	5	10
High mountains	/	5	10	20

§ 15. Mean errors of the position of contours by height with respect to the nearest points of the survey basis should not exceed the values (in metres) given in table 3.

Table 3.

Scale of Survey:	1:10,000	1:25,000	1:50,000	1:100,000
Region of Survey:				
Flat plain.	1	1	3	6
Dissected plains, and hilly areas with gradients predominantly less than 6°	1	2	4	9

On maps of mountainous, high-mountain, and sandy-desert regions contours should correctly represent the form of the relief, and be coordinated with the spot-heights marked on the map and with the heights determined at the extremes of slopes.

The requirements for accuracy of position of contours on maps of enclosed (non-wooded) regions are established in the mission of the survey, but in any case errors of position of contours should not exceed twice the error established for corresponding open regions.

§ 16. The requirements for accuracy of survey of relief at the scale of 1:10,000 with a contour interval of 1 m. are established by the Main Administration for Geodesy and Cartography of the MVD of the USSR.

§ 17. Errors, equal to double significance of the sizes indicated in § 13-15 should be considered as the maximum.

Errors in the position on the map of objects, the outline and of contours with respect to the points of the survey net exceeding the maxima are not to be accepted.

V. Geodetic Foundations

§ 18. The following serve as the geodetic foundations of topographic maps at the scales of 1:10,000 to 1:100,000:

- a) in connection with the planimetry – points of the state triangulation or polygonometry, and points of the planimetric survey net;
- b) in connection with the heights – benchmarks and signs of the levelling, points of the triangulation and polygonometry, the heights of which are determined by geometric or geodetic levelling, and also points of the height-survey net.

All points of the state geodetic net and points of the survey net, used as points for the field development, are identified on photographs, and when identification is impossible the nearest point of the outline clearly represented on a photograph is linked to it. Points of the height development may also be brought in as coordinates.

§ 19. Points of the survey net, used as points of the planimetric development, are determined with respect to the nearest points of the state geodetic net with a mean error of not more than 0.1 mm on the map.

Points of the survey net, used as points of height for the field development, are determined with respect to the nearest points of the state geodetic net with mean errors not exceeding the values in metres indicated in table 4.

Table 4.

Scale of Survey:	1:10,000	1:25,000	1:50,000	1:100,000
Region of Survey:				
Flat plain.	0.15	0.25	0.8	1.5
Dissected plains, and hilly areas with gradients predominantly less than 6°	0.2	0.4	0.8	1.5
Mountains and foothills, and also sandy deserts	0.5	0.5	1.2	2.5
High mountains	/	1	2.6	5

Points of the planimetric field development of photographs are identified on the photographs with mean errors not exceeding 0.1 mm..

Points of the planimetric field development of photographs should as far as possible be evenly situated in the photographic area and reliably supply boundaries of the areas of the survey.

§ 20. A part of the points of the planimetric and height development of the photographs is used for the reduction and external orientation of the photogrammetric nets and individual photo-pairs, and a part for the assessment of the accuracy of the photogrammetric nets constructed and of the sheets of the map compiled.

§ 21. On every sheet of the map at the scales of 1:10,000 and 1:25,000 there should be not less than three, and in southern regions four, planimetric points reliably fixed on the terrain with determined heights, including in that number the points of the state geodetic net and polygonometry, and also points of the planimetric survey net.

For surveys at the scales of 1:50,000 and 1:100,000 the density and distribution of points of the planimetric survey net are determined by special directions concerning the region of production of the work.

§ 22. For surveys at the scales of 1:10,000 and 1:25,000 of flat plain regions every stereo-pair is provided with a minimum of four points of the field height preparation, situated either at the corners of its working area, or in a different order, but so that they may provide reliable longitudinal and transverse orientation of every stereo-pair independently. In the absence of outlines identified on photographs, the order of the distribution of the points of the field height preparation is established, depending on

the peculiarities of the region to be mapped, in the technical planning documents; in this case the technical planning documents are to be approved by the Main Administration for Geodesy and Cartography or the Military Topographic Directorate.

For surveys at the scales of 1:50,000 and 1:100,000 of flat plain regions, and also for surveys at the scales of 1:10,000 and 1:25,000 of all other regions the points of the field height preparation of photographs should be evenly distributed over the area of the survey plot; for this every height point should assure an area not greater (in square kilometres) than indicated in table 5.

Table 5.

Scale of Survey:	1:10,000	1:25,000	1:50,000	1:100,000
Region of Survey:				
Flat plain.	/	/	12	20
Dissected plains, and hilly areas with gradients predominantly less than 6°	1	4	20	40
Mountains and foothills, and also sandy deserts	2	6	30	50
High mountains	/	8	40	70

§ 23. The norms of the density of the points of the field height preparation of photographs indicated in § 22 are to be taken as minima. The quantity of these points should be increased:

- a) – at the edges of survey plots;
- b) – at the junctions of aerial survey routes;
- c) – at rivers and lakes (cutting of waters);
- d) – at the bottom of slopes in mountain regions;
- e) – in the absence on the photographs of the normal contrasts (for example in surveys of steppe and desert spaces) or the presence of excessive contrasts (for example on photographs of mountainous regions taken in low-angle sunlight).

VI. The Content of the Maps

§ 24. On topographic maps at the scales of 1:10,000 to 1:100,000, with different degrees of fullness and detail depending on the scale of the map, the following are reliably and clearly to be represented:

- the supporting geodetic and astronomical points;
- populated places and isolated buildings;
- industrial, agricultural and social-cultural objects;
- the network of route-ways (railways, motor-roads, tracks), and their associated structures;
- hydro-technology structures;
- the hydrography (the shore-lines of the sea, rivers, canals, lakes and water-sources);
- the relief of the land, and of the floor of the sea and of major water-bodies;
- the vegetation cover;
- soils, wetlands, salt-marshes;
- boundaries and fences;
- [military] ground features and reference points.

Each of the listed elements of the content is represented on the map in accordance with the present *General Requirements* and with the requirements of current special instructions.

Supporting Points

§ 25. On topographic maps at the scales from 1:10,000 to 1:100,000 are shown the triangulation, polygonometric, and astronomic points, and the markers and bench marks of the state levelling net (with the exception of wall-mounted and provisional ones), and also the infill points of the survey net in the terrain as centres.

The conventional signs of the points of the triangulation, polygonometry and the points of the survey net infilled in the terrain are to be accompanied by the written note outside the centre, and the conventional signs of benchmarks – by the written note of the head of the bench mark. The indicated notes should be in agreement with the catalogues of geodetic points.

On maps at the scale of 1:10,000 the printing of annotations of points and benchmarks in the form of a fraction is permitted, in the numerator of which is indicated the extract from the catalogue with rounding to 0.1 m. of the record of the point or benchmark, and in the denominator the record of the surface of the ground.

On maps at the scale of 1:10,000 are shown the enumeration of all types of supporting points in full.

On maps at the scale of 1:25,000, 1:50,000 and 1:100,000 points of the state geodetic net of the 1st, 2nd and 3rd orders are all shown, and points of the 4th order and points of the planimetric field basis are marked fully only in such case as the general quantity of all the points marked onto the map of the state geodetic net and the points of the survey net do not exceed 10 in one square decimetre on the map.

Inhabited Places

§ 26. On topographic maps at the scales of 1:10,000 to 1:100,000 inhabited places are divided by type, by population, and by political-administrative importance.

Inhabited places are subdivided by type into towns, settlements of urban type (workers' settlements, resorts), settlements of dacha type, and settlements of rural type. As towns and settlements of urban type are considered only those inhabited places for which there exists a special resolution of the Presidium of the Supreme Soviet of the USSR and of the Supreme Soviets of Union Republics.

Towns and settlements of rural type are subdivided by population into:

- Towns with population
 - greater than 500,000 inhabitants,
 - from 100,000 to 500,000 inhabitants
 - from 50,000 to 100,000 inhabitants

from 20,000 to 50,000 inhabitants
from 10,000 to 20,000 inhabitants
less than 10,000 inhabitants.

Settlements of rural type with numbers of houses
more than 200
from 100 to 200
from 20 to 100
less than 20.

At settlements of dacha and rural type the number of houses is noted on the map.

On the 1:10,000 map settlements of urban and of dacha type are subdivided by population into:

Settlements with number of houses
more than 200
from 100 to 200
less than 100.

By political-administrative importance on topographic maps at the scales of 1:10,000 to 1:100,000 are distinguished: the capital of the USSR, capitals of Soviet Socialist Republics, capitals of Autonomous Soviet Socialist Republics (ASSR), centres of Krai, centres of Oblasts not included in a Krai, centres of Autonomous Oblasts, centres of Oblasts included within a Krai, centres of National Okrugs, centres of Rural Regions, settlement and rural councils.

Inhabited places are marked on all maps. In regions with a large number of individual dwellings, on maps at the scales of 1:50,000 and 1:100,000, a part of the buildings in places of dense gathering of them is omitted. In uninhabited and little-inhabited regions all buildings, sites of yurts, tents [chum], 'somona', 'urto', and also ruins of individual buildings having importance for orientation are shown.

The representations of all inhabited places are accompanied with annotations of their official names. In the case that an inhabited place has a second unofficial name deep-rooted among the local population, then this second name is also annotated on the map. In regions with a large number of separate houses part of these are placed as representations on the map at the scale of 1:100,000 without inscriptions of their names.

In the representation of inhabited places special attention is paid:

- to the correct and visual demonstration of the external outline, internal layout, and density of building of the inhabited place and the approaches to it, and to the demonstration of green spaces;
- to distinguishing the main streets and thoroughfares, prominent fire-resistant and individually worthwhile buildings and reference points, and also of structures situated at the crossings of streets and thoroughfares.

Beyond the external outline the representation of the inhabited place begins the representation of the roads going through the outskirts of the inhabited place, fences, rivers, ditches, and in their absence the boundaries of the adjoining lands.

Thoroughfares marked out on the terrain in planned construction sites are represented as streets, and the spaces between them as lands in accordance with their nature.

§ 27. On the map at the scale of 1:10,000 in the representation of inhabited places all structures of a permanent type are shown; only in a closely-packed distribution of numerous buildings are some excluded in order to generalise, mainly not expressing uninhabited buildings at the scale of the map.

In inhabited places of rural type structures are shown with a subdivision into inhabited and uninhabited, and also into fire-resistant and non-fire-resistant. Fire-resistant buildings prominent for their height are particularly distinguished.

All official and public buildings (stations, hospitals, clubs, educational institutions, theatres, &c.) are considered inhabited, are represented on the map with subdivision into fire-resistant and non-fire-resistant, and are accompanied by explanatory inscriptions.

Buildings under construction are shown as existing.

Destroyed buildings of large sizes are shown on the map. The ruins of small structures are not shown if they do not present themselves as reference markers.

§ 28. On the map at the scale of 1:25,000 in towns, settlements of urban type, and settlements of rural type with a quarterly [block] layout the quarters [blocks] with a predominance (more than 50%) of fire-resistant structures are distinguished from quarters with predominantly non-fire-resistant structures, and also prominent buildings and structures of industrial importance. In settlements of dacha type and settlements of rural type as a rule all inhabited structures are shown. Only in crowded arrangements of inhabited structures and in the impossibility of their representation at the scale of the map part of these are excluded or joined to structures standing adjacent. In urban quarters individual structures are shown if the distances between them are not less than 20 metres.

Of uninhabited structures as a rule all structures distributed outside inhabited places are also represented by the exterior of their outline; in a vacant part of a quarter uninhabited structures are also shown.

§ 29. On the map at the scale of 1:50,000 inhabited places are represented with regard to the requirements set forth for the map at the scale of 1:25,000, with partial generalisation on account of the scale. Thickly distributed individual structures, both within and without an inhabited place, are shown with a lessening, with conservation in the first place of all prominent buildings, structures of industrial purpose and of fire-resistant construction. All structures situated at the corners of quarters are also retained.

§ 30. On the map at the scale of 1:100,000 towns, settlements of urban type and settlements of rural type with a quarterly compact layout are represented without separation within quarters of the individual structures; small quarters are shown with

generalisation due to the exclusion of a part of the second-rank streets and thoroughfares.

Structures in settlements of dacha type and also in settlements with unsystematic plans are represented with partial reduction of them in places of dense distribution.

Inhabited places of dispersed type are represented with a reduction of individual farmsteads in the case of their close distribution, but with retention of the basic character of the density of their distribution and obligatorily showing the most characteristic of them (situated on roads, on commanding heights, at crossroads, &c.).

Of the industrial enterprises and structures inside inhabited places, the most important and largest, having importance as reference points, are represented.

Isolated inhabited buildings, situated outside inhabited places are, as a rule, all shown. Uninhabited structures situated outside inhabited places are shown with a reduction in places of dense clustering, but with an obligatory representation of all extreme structures and also structures having importance as reference points.

Industrial, Agricultural and Social-Cultural Objects

§ 31. On topographic maps at the scale of 1:10,000 to 1:100,000 the following are shown:

- a) industrial and agricultural objects and buildings: factories, works, power-stations; oil-fields, oil and gas rigs, mine-shafts, adits, mines, open-cast mines, quarries, places of open working of minerals, peat-workings, salt workings, dumps of worked out rock (spoil heaps); surface and sub-surface oil and gas pipelines; stores of fuel, gas-holders; aerial electricity lines; saw-mills including water-driven ones; elevators, watermills and windmills, wind-turbines; service buildings of machine-tractor stations and workshops, state farms, collective farms, logging enterprises, offices of forestry and road-operation districts, foresters' houses, fish farms;
- b) establishments of communication: radio stations, telephone stations, telegraph and radio-telegraph offices and post offices; meteorological stations; lines of communication (telegraph, telephone) and radio relays, underwater and underground cables;
- c) social-cultural objects and structures (schools, hospitals, sanatoria and rest homes, stadia), memorials, monuments and sculptural figures, graveyards and common graves.

Electrical lines, lines of communication and radio-relays within inhabited places, and also in the strips of land allotted to railways and main roads are not indicated on the maps. Schools and hospitals situated in inhabited places of rural type are distinguished as a rule on maps at all scales, but in large inhabited places (of urban type) only on maps at the scales of 1:10,000 to 1:25,000.

Radiotelegraph and telegraph offices and post offices are shown only in inhabited places of rural type in little-inhabited regions.

The Transport Net and Associated Facilities

§ 32. On topographic maps at the scales of 1:10,000 to 1:100,000 railways and motor roads, paths, and associated facilities are shown.

§ 33. Railways are subdivided into the following classes:

- a) by the gauge of the track – normal [Russian] gauge or narrow-gauge;
- b) by the number of tracks – single-tracked, double-tracked, triple-tracked and so forth, and also single-tracked with a track-bed for two tracks;
- c) by the type of traction – electrified, with steam or diesel, horse or tractor traction;
- d) by condition – operating, under construction and dismantled.

Besides that tramway lines and suspended ways are shown. Tramway lines and railways under construction are shown without indication of the width of the gauge and number of tracks.

§ 34. Motor roads are subdivided by the extent of their technical improvement into the following classes:

- a) ‘capital’ roads;
- b) improved chaussee;
- c) chaussee;
- d) improved earthen roads;
- e) earthen (country) road;
- f) field and forestry roads;
- g) roads with a wooden [corduroy] surface;
- h) winter roads (with separation of motor winter-roads).

Besides the indicated classes of motor roads, roads under construction (capital, chaussees, and improved earthen roads) are distinguished, fascine sections of improved earthen roads and earthen roads, and difficult to drive sections of chaussees, improved earthen roads and earthen roads.

The widths of capital roads, chaussees and improved earthen roads are indicated on the maps, and also their surface material.

Paths are subdivided into pack-horse tracks and foot paths. Sections of mountain paths on artificial ledges (‘ovringi’) are distinguished, with an indication of their length.

§ 35. Of the structures associated with roads and railways the following are shown on the map:

- a) on railways – railway stations, passing loops, platforms and loading/unloading areas; block posts, travelling posts [? signal boxes], workers barracks and booths, main railway stations, depots, water towers, semaphore signals; station tracks and sidings, tunnels, embankments with an indication of their height and cuttings with a indication of their depth; bridges with differentiation by size, construction and the materials from which they are built; pipes and water-drains under the permanent way, underpasses and footbridges across the railway tracks, kilometre posts in regions of poor reference points;

b) on motor roads – bridges with indications of sizes, load capacity and the materials of which they are constructed, pipes for draining water under the course of the road; corduroy roads and comb-roads [?], exits from roads with a covering; embankments with an indication of their height and cuttings with an indication of their depth; motor-columns [?] and filling stations; light roadside installations, fences and plantings along roads; different types of crossings, ferries with an indication of weight capacity, ferries [different word] and fords with an indication of the depth and quality of the bottom; mountain passes with an indication of the time of their opening; kilometre posts and road-signs in regions of poor reference points.

§ 36. All railways are represented. On the map at the scale of 1:10,000 station tracks are shown in all cases, and on the maps at the scale of 1:25,000 to 1:100,000 depending on the possibility of placing them on the map.

All capital, chaussee and improved earthen roads are represented on the maps. Earthen, country, field and forestry roads are carried in full or in a selection depending on the scale of the map and the character of the region, although roads being the single approach to an inhabited place or other important object, and also roads leading along administrative boundaries are all carried.

Footpaths are all shown only in regions where they are the fundamental paths of communication, and in the remaining regions only in those cases when they are the only way to an inhabited place or other important object or they serve as a reference points.

Bridges less than 3 m. in length on country, field and forestry roads are shown without indication of their length and load-capacity.

Cuttings and embankments with a height (depth) of more than 1 m. (at the scale of 1:100,000, 2 m.) and a length of not less than 3 mm. at the scale of the map are all represented, and cuttings and embankments of lesser dimensions are only shown in the case that they are significant as reference points.

§ 37. On the map at the scale of 1:10,000 all tramway lines are represented, including even passing places on the streets of inhabited places. In addition sections of railways elevated on piers and in galleries along cliffs or slopes are distinguished.

Besides the enumerated classes of bridges, bridges coming apart at the time of moving ice-floes and floods are distinguished. In addition to semaphores, colour-light signals and colour-light signal-gantries are represented.

All kilometre posts on horse-drawn and motor roads are shown, and in places with poor reference points some of them are accompanied by annotations of the number of kilometres.

On railways, kilometre posts are indicated only in places of poor reference points.

§ 38. On the map at the scale of 1:25,000 all tramway lines are represented, including passing places in the streets of inhabited places.

As a rule all kilometre posts on horse-drawn and motor roads are shown, and in places with poor reference points some of them are accompanied by inscriptions of the number of kilometres. On railways, kilometre posts are indicated only in places of poor reference points.

§ 39. On the map at the scale of 1:50,000 tramway lines are represented only outside inhabited places and in the outskirts of these last. The permanent way of dismantled railways is shown only in regions of poor reference points.

Small bridges across dry ditches and dry river-beds, and also bridges across insignificant obstacles on earthen roads, are represented with selection.

Kilometre posts on horse-drawn and motor roads are shown only in places of poor reference points; some of these are accompanied by annotations of the number of kilometres.

§ 40. On the map at the scale of 1:100,000 tramway lines are represented only outside inhabited places.

The permanent way of dismantled railways is shown only in regions of poor reference points, with regard to the requirements laid out in the general part of this section.

Railway barracks and trackside huts in habitable regions, distributed in inhabited places, are not distinguished by explanatory annotations.

Small bridges across dry ditches and dry river-beds, and also bridges across insignificant obstacles on improved earthen and country roads, are represented with selection.

Kilometre posts on horse-drawn and motor roads are shown only in places of poor reference points, and not more often than every 4 km., and the number of kilometres is annotated only in individual cases.

Hydrography

§ 41. On topographic maps at the scales of 1:10,000 to 1:100,000 the following are indicated:

- a) the shore lines of seas, lakes, ponds and other water bodies; islands, coastal rocks and sandbanks; tidal zones;
- b) rivers, streams, canals (on the surface, underground and under construction), ditches;
- c) natural water-sources (springs, springs [different word], mineral and hot sources), and artificial water-sources (wells of all types and the associated facilities for the collection of rainwater and ground-water);

In addition, notes are brought from sea-charts on depths, isobaths at the depths of 2, 5, 10, 50, & 100 m., symbols of coastal sea-lights, ship canals and additional characteristics of coastal seas and the larger lakes (dangerous shores, banks, rocks

underwater and above the water, cliffs, lights, indications of the directions of sea voyages).

§ 42. Shorelines are shown with subdivision into sloping and steep, with a beach and without a beach, and according to the character of the soil – into rocky [cliff-like], stony and sandy.

The line of the sea-coast shown on the maps should correspond to the line of division [] of the water between the highest level at the time of flood-tide and at the least low-tide – the line of the surf.

The shore line of lakes, ponds, rivers and other water-bodies should correspond to the line of division of the water at its lowest level.

Rivers are shown with division into rivers with a constant current of water and those drying up; underground and disappearing sections of rivers are also distinguished.

According to the width of the stream and the scale of the map, rivers are represented with one or two lines.

Canals, canalised rivers, ditches and ‘aryks’ [Central Asian irrigation ditches] with a width of less than 3 m. are represented with one line; those with greater width are represented with two lines.

Lakes are shown as perennial and as drying up.

On the maps all mineral springs are as far as possible indicated.

In waterless and drought-afflicted regions all springs are shown without exception.

On rivers and canals of a width greater than 3 m., their width and depth is annotated at least every 15 cm. on the map and obligatorily at all fords; on rivers and canals represented with two lines the surface speed of the flow of water is indicated in addition. The maps do not show the width and depth of ditches represented with one line.

On rivers, sections drying up and disappearing are distinguished and waterfalls, rapids, shallows and shoals are shown, furthermore at waterfalls the height of the fall of water is indicated.

On the maps is indicated: the direction of flow of rivers and canals; markers of the water level in rivers, lakes and large ponds, moreover annotations of the markers of the divisions of the water in rivers are laid down not less than every 15 cm. on the map.

In waterless and drought-afflicted regions on maps at the scales of 1:10,000 to 1:100,000 are indicated in addition markers of the level of the earth at wells and springs, the depth and characteristics of the water in wells, the time of filling of the

well (flow rate)¹ and the characteristics of the condition of the well (dry, filled &c.). On maps at the scale of 1:10,000 and 1:25,000 annotations of the level of the earth, the characteristics of the water in wells and springs, and also the depth of wells are shown in all regions.

Landing stages are shown on the maps with subdivision into floating and fixed.

For the representation of locks the material from which they are constructed is indicated.

Water pipelines are shown with subdivision into surface and sub-surface ones. Aqueducts are also shown.

Weirs and dams are subdivided into underwater and above-water ones, and the material of construction is indicated. At large dams the levels of the head-water and tail-water are indicated, and also the width of the crest.

On maps of waterless regions 'kyarizi' (systems of wells united by underground galleries) are shown.

§ 43. On the map at the scale of 1:10,000 all objects listed in § 41 are represented with the greatest fullness and detail, besides which, on the map at this scale are represented the following objects not shown on maps of the smaller scales:

- coasts with fortified and un-fortified planning of the slopes;
- descents and steps on embankments;
- surface gutters for water-supply;
- water-supply columns;
- fountains.

They carry a zone of drainage (an ebb and flow zone) when its width is greater than 5 mm. at the scale of the map. For this the soil of the drainage is shown.

Rivers and canals with a width up to 3 m. are represented with one line, and with more than 3 m. with two lines.

Permanent irrigation and drainage ditches are shown in full. Bolsters along canals and ditches are shown when their height is not less than 0.5 m..

Dry ditches of depth up to 0.5 m. and width up to 1 m. are shown only if of a length more than 1 cm. on the map. Dry ditches serving as orientation marks are shown irrespective of their size.

Wells and springs outside inhabited places are all shown without exclusions, but within the bounds of inhabited places are shown selectively and only shown fully in inhabited places of waterless and arid regions.

§ 44. On the map at the scale of 1:25,000 rivers with a width of greater than 5 m. are represented with two lines.

¹ According to information collected by local organisations.

Sections 45 to 78 not translated.