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Revision of large scale maps

A b s t r a c t. Factors which influence the loss of timeliness of large-scale maps are presented in this paper. The main features of basic maps drafted to the scales of 1 : 500, 1 : 1 000, 1 : 2 000 and 1 : 5 000 and their fundamental principles and rules for their current and temporal up-dating are also discussed. The paper also presents conclusions concerning the efficiency of applying particular methods of surveying new elements of the map's contents in the process of temporal revision of the basic map.

1. Introduction

Terrain changes with the passing of time cause that maps become out of date.

The level of the loss of timeliness depends on:

— the level of intensity of investment implementation of the given area,

— the period of time which passed since the moment of map's elaboration till the moment of its application by the user,

— the level of minuteness of detail of the map's contents.

The level of investment intensity is, in general, the dominating factor.

The temporal factor is closely connected with the terrain changes. However, there are areas, which do not change in time, for example old town districts, the majority of forested areas.

The factor of the level of minuteness of detail of the map increases the number of changes on the map. It usually is in direct proportional relation — the higher the minuteness of detail, the higher the level of possible loss of up-datedness of the map.

Considering however, particular elements of the map's contents and classifying them into appropriate groups from the point of view of the differentiated rate of the loss of timeliness, some groups of elements can be distinguished, characterised by a differentiated rate of changes. For example in the group of elements presenting the map's terrain relief the rate of changes is minimal, excluding of course areas, which are changed due to technical factors (for example areas damaged by mining), or due to anthropogenic activities, which lead to artificial modelling of terrain in result of investment processes (for example designing of roads, settlements, strip mines, etc.).

However in the group of elements of the map's content as buildings and constructions, including also underground armament, within the „live" municipal and industrial centres, the rate of changes in census borders etc., is considerably higher.

The level of minuteness of the map's details is generally integrated with the scale of the map. Therefore, the larger the scale, the higher level of the minuteness of detail and thus the problem of map updating becomes more important. It concerns especially large-scale maps, which in view of the range of contents and practical socio-economic activity become fundamental, supplying not only source information on the state of terrain implementation, but they are also cartographic source and background material for elaborating various thematic maps.

Such large-scale maps in Poland are represented by:

— the basic map to the scale of 1 : 500, 1 : 1 000, 1 : 2 000 and 1 : 5 000,

— the topographic map to the scales of 1 : 10 000, 1 : 5 000 (the map to the scale of 1 : 5 000 was drafted for the purpose of densely build-up areas, which cover approximately 4% of the area of the country).

Besides, the basic map, in the future, will also be a cartographic source material for revising the topographic map, drafted to the scale of 1 : 10 000 (1 : 5 000).

The objective of this paper is to present the principles of up-dating the basic map. These principles were elaborated at the Institute of Geodesy and Cartography and then on their basis technical guiding principles, normalizing the process of revising the basic map in Poland, were carried out by the geodetic-cartographic institutes, subordinated to the Head Office of Geodesy and Cartography. The guiding principles complexively embrace the methods and technical rules characteristic for the current and temporal up-dating processes of the basic map, excluding the digital method. The guiding principles were adapted to the obligatory „Organizational rules of the basic map revision", elaborated by the Head Office of Geodesy and Cartography.

2. Characteristic features of the basic map

The basic map is the source cartographic elaboration, containing information on spatial location of general geographical sites as well as elements of ground registers and land armament.

The basic map is:

— a basic cartographic material, utilized for various needs of the national economy, and in particular for rural economy, and town and country planning, designing investment locations, etc.,

— a source cartographic elaboration for drafting derivative and other large-scale and medium-scale thematic maps as well as for the revision of the topographic map to the scale of 1 : 10 000 (1 : 5 000).

Depending on the density of terrain elemetns, the level of the underground armament and forecasted investment activities, the basic map is drafted to the following scales:

1) 1 : 500 — for city areas, of a high level of investments or for areas forecasted for intensive investments,

2) 1 : 1 000 — for areas of small towns, suburbs of large cities, town and industrial agglomerations, as well as country settlement areas in villages which are commune headquarters,

3) 1 : 2 000 — for the remaining compact settlement areas, agricultural areas of small unregular fields and census borders, larger compact agricultural and forested areas within the administrative borders of the cities,

4) 1 : 5 000 — for areas with scatterred rural-buildings, arable land and forests within the area of communes.

The basic contents of the basic map is described by K-1 technical instruction „The basic map", published by the Head Office of Geodesy and Cartography in 1978. According to this instruction, the contents of the basic map consists of:

— horizontal and vertical points of the geodetical network, and the points of the basic gravimetric network, centurial magnetic points — marked by stable field points,

— borders: of the country, of the administrative division, register units, rural plots and surface division of the areas belonging to the state forestry,

— fences,

— buildings and constructions,

— technical-engineering devices (overground and udergrounds armament),

— road and concurrent devices,

— railroads and concurrent devices,

— water and concurrent devices,

— terrain relief and artificial terrain forms,

— types of arable lands and vegetation cover,

— recreational areas,

— monuments, cemeteries, statues and wayside crosses,

— descriptive texts connected with the map's contents,

— contours of the land classification and their symbols as well as numbers of plots, according to the ground registers.

It should be underlined that before the new technical rules (K-1) came into force the basic map was usually drafted as a section of situational-altitude map or only as a situational map.

Parallely to it, for the same given area individual ground register maps were elaborated to the scales of 1 : 1 000, 1 : 2 000 and 1 : 5 000 and

maps of land armament to the scales of 1 : 200, or 1 : 250, (the so called road routes within the urban areas).

The new technical principles established an uniform range of contents of the basic maps, introducing new, additional contents from the ground register map and from the map of underground armament. This assignation was made in order to decrease the number of changes introduced during the up-dating process. Till now, the situational elements, recurrent in the above mentioned maps underwent up-dating on three separate maps, and on the basic map — only once.

3. Fundamental principles and assumptions of revising the basic map

Such complex and broadly conceived contents of the basic map, in general including the elements of the three maps, existing recently in practical activity of the country — namely the basic map considered as: the situational-altitude map with its range of contents similar to the contents of the topographic map; the ground register map and the detail map of ground armament — faced the revision process with a very difficult and complicated problem. It required the elaboration of technical directions, allowing for the standardization of works connected with the revision of the basic map for the entire country and specification of methods and principles of surveyings and cartographic works during the process of revision of the basic map, carried out accordingly to the to-date instructions of GUGiK and also for the revision of the existing maps drafted on the basis of other instructions. The latter concerns the up--dating of the existing basic map, the map of ground armament and the ground register map. For these maps, it was necessary to determine the range of works connected with the process of revision and the cartographic form of presenting the contents, which due to the up-dating process underwent a change.

Considering the revision process of the basic map from the point of view of its immediate aims, and above all the aims resulting from the necessity of up-dating the map's contents, two types of revision can be distinguished, namely:

— current revision,

— temporal revision.

The current revision should be understood as a group of outdoor and laboratory works, allowing to determine the shape and location of newly built constructions and other details composing the contents of the basic map, immediately after these elements have been created and drafted on the first copy of the basic map. This is the partial revision, of the most important elements of the map's contents. The map, first of all, concerns the following contents:

— buildings, requiring the permission of local authorities for their construction,

— administrative borders, districts of the ground register system, arable ground plot borders and classification borders,

— descriptive, (connected with the map's contents).

The current revision is carried out on the basis of:

— the results of inventory surveys, in the case of building sites,

— geodetic-cartographic technical documentation, elaborated for legal purposes, in the case of administrative border changes and plot changes,

— documentation of the soil classification in the case of changes of arable grounds and the grade of the soil,

— results of other measurements, elaborated on the area covered by the basic map,

— decision of the administrative authorities, concerning the descriptive contents of the map (for example names of streets, the ordinal numbers of immovables).

During the current revision process, the so called „duty map" is carried out, which is elaborated on the copy of the basic map or any other map. Changes of those elements of the basic map contents which undergo the current revision, occurring in the country side, are schematically drafted on the „duty map".

The introduction of the duty map in the process of revision of the basic map is very important for controlling the activities connected with the implementation of building sites, due to registering on it:

— issued building permissions,

— demarcation of the sites,

— implemented inventory surveying of already built-up sites.

The duty map, also registers the fact of drafting a given site on the first copy of the basic map. It is predicted that also stage drafting on the duty map of changes of the ground register as well as changes of descriptive contents of the basic map (name of localities and physiographic sites and also names of streets and ordinal numbers of immovables). This permits to control element changes of the ground register and the descriptive contents of the basic map.

Apart from that, on the duty map, the newly drafted elements, are accompanied by successive numbers taken either from „The set of announcements of the newly implemented building sites" or from „The sets of proofs of changes", worked out within the ground register.

Considering, that some elements of the map's contents are not embraced by the current revision, and that some elements can be ommitted in the process it is necessary to perform the so called „control of the current revision". This control should annually include 20% of the basic level administrative unit area (communes, towns, town districts).

The results of control should enable to present the ommitted and not drafted in the first copy of the basic map elements and to determine the percentage of the changes occurring in the given area.

The results of control should also allow to establish the possible needs for performing temporal revision.

The temporal revision, opposed to the current revision, embraces all the elements of the basic map's contents. Such understood temporal revision of the basic map includes the set of outdoor and laboratory activities, carried out at time intervals, resulting from current needs, enabling consistence of the contents of the basic map with the terrain situation. It is performed on the basis of results of supplementary surveying and the existing geodetic, cartographic and branch documentation.

The choice of the supplementary surveying and the revision method depends on the:

— occurring percentage of changes,
— size of the area,
— scale of the map,
— accessible equipment,
— costs,
— urgency of the revision,
— existing geodetic, cartographic and branch materials qualified for implementation after their previous analysis.

In effect of the economical analysis of the Institute of Geodesy and Cartography performed on experimental sites concerning the estimation of efficiency of geodetic methods for measurements of new elements of situational contents of the basic map in the revision process, the following conclusions were drawn:

1. For maps drafted to the scales of 1 : 500, and 1 : 1 000, with changes of up to 30%, it is economically reasonable to apply the method of direct measurement, while of the changes of 30—60% and more than 60%, it is reasonable to apply two equipoderant methods, namely the method of direct measurements and the stereophotogrammetric method.

2. For maps drafted to the scale of 1 : 2 000, with changes up to 30%, it is economically reasonable to apply the method of direct measurement or the method utilizing the photogrammetric map (orthophotomap, photomap), while for changes from 30% to 60% and more than 60%, it is reasonable to apply the method utilizing the photogrammetric map.

3. For maps drafted to the scale of 1 : 5 000, irrespective of the percentage of changes, it is reasonable to apply the method utilizing the photogrammetric map.

The above conclusions concerning the probability of applying particular methods of surveying new elements of the map's contents, have been established under the assumption that the area for which the aerial photographs were taken (for one flight) was not smaller than:

— 600 ha for the scale 1 : 500
— 1200 ha for the scale 1 : 1 000
— 3000 ha for the scale 1 : 2 000
— 6700 ha for the scale 1 : 5 000

In order to determine the percentage of changes a principle was accepted, that the full contents of the revised map comprise of:

a) the existing elements on the first copy and in the terrain,

b) the new elements drafted from geodetic, cartographic and branch materials,

c) the new elements drafted on the basis of results of supplementary surveying.

On the other hand, the percentage of changes in laboratory works is determined according to the full contents of the revised map and it is the total sum percentage of the elements presented above in points b and c, while the percentage of outdoor work is determined by the percentage of the elements, stated in point c.

The determination of the percentage of changes is performed on the basis of comparing the map with the terrain, while the determination of percentage of elements which are predicted for measurement — on the basis of comparing the map with the terrain, considering its drafting from the cartographic and branch materials onto the first copy.

The principle of determining the percentage of changes does not take into consideration elements which are on the first copy of the map, but not existant in the terrain. This is due to the fact, that the cost of ommitting an element from the map's contents in relation to drafting a new element (connected with its measurement and laboratory elaboration) is practically foresaken.

In supplementary measurements connected with the revision of the basic map a possibility was introduced to accept the points of the measuring grid on the chasen points of stable situational objects, which can be explicitly identified in the terrain (for example corners of buildings, projection of the corner of eaves, the centre of the ground cover of the underground armament) as well as marking of points of the measuring grid by means of signification (detection or painting) of the sign, for example on kerbs, concrete plates, etc.

Simultaneously, the obligation was introduced to perform topographic descriptions of points of the measuring grid, which in the future would facilitate to detect or recreate those points in the terrain and to measure the newly created situational elements on the basis of the same measuring grid, increasing this way their accuracy of location in the map (drafted for example, during the current revision) in relation to the nearest situational elements already existing in the map. There is also the possibility to base the measuring lines on the situational points of the 1st accuracy group (earlier measured on the basis of points of the geodetic

grid or with coordinates determined in a laboratory by the photogrammetric method), which are identified in the terrain, in the map or in the photogrammetric photograph. This can occur in such cases, when the length of the controlling elements referring to the points of the detail grid exceeds 400 m for urban areas and 600 m for agricultural and forested areas, however, under the condition that basing the measurement line on the situational points of the 1st accuracy group ensures the required accuracy in drafting the results of supplementary surveying in the map.

In the case of performing supplementary surveying by means of the photogrammetric method, it is recommended to utilize the aerial photographs in laboratory, photogrammetric determination of coordinates of:

— newly stabilized points of the measuring grid, previously registered in the terrain,

— chosen stable points of terrain objects, clearly visible on the aerial photograph and possible to be explicitly identified in the terrain and which were the additional points of the measuring grid,

— points of corners of changed borders (administrative, ground register and of groups of plots), marked by border signs and registered before the flight.

This recommendation aims at decreasing the hardship and costs of determining coordinates above the mentioned points, with the utilization of the direct measurement method. It will also facilitate the direct supplementary surveying of situational details within the temporal revision and the future current revision.

Presenting the user with the most up to date basic map, containing frequent introduction of changes to it (introduced within the current revision) causes, that due to technical-and-economical reasons, it should be published to the order of the interested users by means of the contact photoreproduction process.

The contact photoreproduction process should be performed on transparent material, usually in the form of a diaso print. This is conditioned by the quick loss of timeliness of the basic map's contents and by the high costs of the map's reproduction by means of other techniques (small edition).

4. Conclusions

The above presented basic principles and assumptions of the map revision were totally applied to elaborate technical directives of the basic map's revision. These directives are considered obligatory technical and technological advice, adapted to practical application by geodetic-and-cartographic enterprises and field services, in the process of works connected with the basic map revision. The directives complexively

include the technical methods and principles, characteristic for the process of the current and temporal revision. Besides, they include a number of appendices which are models and examples of registration of data acquired in the revision process. Their purpose is to improve and facilitate works connected with map revision and standardization of the method and form of presenting the results of works in Poland.

These appendices are:

— a list of conventional symbols for the „duty map",

— the duty map of the basic map's current revision to the scale of 1 : 2 000,

— the duty map of the newly constructed building sites, to the scale of 1 : 2 000,

— the duty map of ground register to the scale of 1 : 2 000,

— an approximate economic analysis of the application of different geodetic and cartographic methods in the process of the basic map revision,

— a terrain sketch of the situational supplementary surveying on the copy of the first sketch copy,

— a newly drafted terrain sketch of the terrain situational supplementary surveying,

— a terrain sketch of the situational supplementary surveying on the copy of the laboratory revised basic map,

— a terrain sketch of the situational supplementary surveying on the copy of the photographic map (tonal map) and line elements of the contents taken from the laboratory revised basic map,

— a terrain sketch of situational supplementary surveying on the copy of the photographic map (aerial photograph),

— additional symbols applied on the terrain sketches of the situational supplementary surveying,

— a diagram of drafting the first copy of the basic map on the cartographic foil, in the case of applying the direct surveying method in the supplementary measurements,

— a diagram of drafting the first copy of the basic map on the cartographic foil, in the case of applying the stereophotogrammetric method in the supplementary measurements,

— a diagram of drafting the first copy of the basic map on the cartographic foil, in the case of applying the photographic map in the supplementary measurements,

— a diagram of drafting the first copy of the basic map on the cartographic plate, in the case of applying the direct surveying method in the supplementary measurements,

— a diagram of drafting the first copy of the basic map on the cartographic plate, in the case of applying the stereophotogrammetric method in the supplementary measurements,

— a diagram of drafting the first copy of the basic map on the cartographic plate, in the case of applying the photographic map in the supplementary measurements.

Concluding, it should be mentioned, that the application of other revision and modernization methods of the basic map, than those determined by the directives but being the result of technical-and-organizational progress in the field of geodesy and cartography, is recommended in the condition of maintaining the technical parametres required under the K-1 and G-4 instructions for the final product.

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ACTUALISATION DES CARTES AUX GRANDES ÉCHELLES

Résumé

Le degré de la desactualisation des cartes aux grandes échelles est influencé par: le degré d'intensification de l'investissement de l'aménagement du territoire donné, le temps entre le moment de l'élaboration de la carte et le moment de son exploitation par l'utilisateur ainsi que le nombre de détails dans le contenu de la carte.

En Pologne les cartes suivantes constituent les cartes aux grandes échelles de caractère fondamental:

— carte fondamentale aux échelles 1 : 500, 1 : 1 000, 1 : 2 000 et 1 : 5 000 (pour un terrain donné on adopte seulement une de ces échelles en fonction des besoins et du caractère du terrain),

— carte topographique aux échelles 1 : 10 000 et 1 : 5 000 (la carte à l'échelle 1 : 5 000 a été établie seulement pour quelques régions d'un degré élevé d'urbanisation qui ne constituent que 4% de la surface du pays).

Vu que la carte fondamentale consitue le matériel cartographique de source pour l'actualisation de la carte topographique (aux échelles 1 : 10 000 et 1 : 5 000) on a discuté les principes techniques de l'actualisation courante et périodique de la carte fondamentale.

Dans le cadre du procédé de l'actualisation courante il est dressé une carte dite „carte de service" sur laquelle on marque de façon schématique les changements qui ont lieu dans le terrain; on y enregistre: des autorisations pour la construction, des implantations de bâtiments dans le terrain, des levés d'inventaire de constructions bâties, des changements annoncés dans le cadre du cadastre foncier ainsi que des changements concernant le contenu descriptif de la carte. De plus sur la „carte de service" on signale le fait du marquage sur le plan-minute des nouveaux éléments de la carte fondamentale et de l'élimination du plan-minute d'élements périmés.

Vu qu'une partie des éléments du contenu de la carte n'est pas soumise à l'actualisation courante et qu'au cours de cette actualisation peuvent être ommis les éléments qui doivent être actualisés, on réalise sur le terrain un „contrôle de l'actualisation courante". Celle-ci concerne annuellement 20% de la surface fondamentale de l'unité administrative.

Les résultats de ce contrôle permettent de déterminer le pourcentage des changements montrés sur la carte et le besoin éventuel d'exécution de l'actualisation périodique.

L'actualisation périodique, contrairement à l'actualisation courante, concerne tous les éléments du contenu de la carte.

Le choix d'une méthode des levés complementaires et d'une méthode de l'actualisation du plan-minute dépend du pourcentage des changements survenant, de la grandeur de la surface, de l'échelle de la carte, de l'appareillage dont dispose le géomètre, des frais, de la nécessité d'exécution de l'actualisation et de l'xistence des matériels géodésiques, cartographiques et d'autres spécialisés (concernant les installations souterraines).

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ЕЖИ ЗВЕЖИНЬСКИ

ОБНОВЛЕНИЕ КРУПНОМАСШТАБНЫХ КАРТ

Резюме

На степень деактуализации крупномасштабных карт влияют: уровень интенсивности строительного освоения данной территории, время прошедшее с момента разработки карты до момента её использования потребителем, а также степень подробности содержания карты. Чем крупнее масштаб карты, тем большая подробность содержания и тем важнейшей становится проблема обновления карты.

Роль крупномасштабных карт основного характера играют в Польше:

— основная карта в масштабах 1 : 500, 1 : 1 000, 1 : 2 000, 1 : 5 000 (для данной местности принимается только один из масштабов карты в зависимости от выступающих потребностей и характера местности),

— топографическая карта в масштабах 1 : 10 000 и 1 : 5 000 (карта в масштабе 1 : 5 000 составлена была только для избранных районов густо застроенных, составляющих около 4% поверхности страны).

Имея в виду то, что основная карта является исходным картографическим материалом для обновления топографической карты (в масштабе 1 ь 10 000 и 1 : 5 000), в статье рассмотрены технические принципы текущего и периодического обновления основной карты.

В рамках процесса текущего обновления ведется, так называемая, „дежурная карта", на которой схематически указаны изменения, происходящие на местности, регистрируя: выданное разрешение на строительство, разбивку строительных объектов на местности, выполненные инвентаризационные измерения построенных объектов, а также как изменения, предъявленные в рамках учета земель, так и изменения, касающиеся описательного содержания карты. Кроме того на дежурной карте отмечается факт нанесения новых элементов на составительский оригинал основной карты и снятия с составительского оригинала неактуальных элементов.

Ввиду того, что часть элементов содержания карты не охвачена объёмом текущей актуализации, а также, что во время этой актуализации могут быть опущены элементы, входящие в её объем, ведется на местности, так называемый, „контроль текущей актуализации". Охватывает он ежегодно 20% поверхности основной административной единицы.

Результаты контроля дают возможность определить процент изменений, выступающих на карте, и эвентуальную потребность проведения периодического обновления. Периодическая актуализация, в отличии от текущей актуализации, охватывает все элементы содержания карты.

Выбор метода дополнительных измерений и метода обновления составительского оригинала зависит от выступающего процента изменений, величины пространства, масштаба карты, имеющегося у исполнителя оборудования, стоимости, срочности проведения актуализации, существующих геодезических, картографических и отраслевых материалов, касающихся подземной коммуникации.

Перевод: Róża Tołstikowa

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AKTUALIZACJA MAP WIELKOSKALOWYCH

Streszczenie

Na stopień dezaktualizacji map wielkoskalowych wpływa: stopień intensywności inwestycyjnej zagospodarowywania danego terenu, czas upływający od momentu opracowania mapy do momentu jej wykorzystania przez użytkownika oraz stopień szczegółowości treści mapy. Czym większa skala mapy tym większa szczegółowość treści i tym ważniejszy staje się problem aktualizacji mapy.

Rolę wielkoskalowych map o charakterze podstawowym pełnią w Polsce:

— mapa zasadnicza w skalach 1 : 500, 1 : 1 000, 1 : 2 000, 1 : 5 000 (dla danego terenu przyjmowana jest tylko jedna ze skal mapy w zależności od występujących potrzeb i charakteru terenu),

— mapa topograficzna w skalach 1 : 10 000 i 1 : 5 000 (mapa w skali 1 : 5 000 została założona tylko dla wybranych rejonów silnie zurbanizowanych, stanowiących około 4% powierzchni kraju).

Z uwagi na to, że mapa zasadnicza stanowi kartograficzny materiał źródłowy do aktualizacji mapy topograficznej (w skali 1 : 10 000 i 1 : 5 000), w artykule omówiono zasady techniczne aktualizacji bieżącej i okresowej mapy zasadniczej.

W ramach procesu aktualizacji bieżącej prowadzi się tzw. „mapę dyżurną", na której sygnalizuje się w sposób schematyczny zmiany zachodzące w terenie, rejestrując na niej: wydane pozwolenia na budowę, wytyczenia obiektów budowlanych w terenie, wykonane pomiary inwentaryzacyjne wybudowanych obiektów oraz zmiany zgłaszane w ramach ewidencji gruntów, jak również zmiany dotyczące treści opisowej mapy. Ponadto na mapie dyżurnej zaznacza się fakt wniesienia nowych elementów na pierworys mapy zasadniczej i usunięcia z pierworysu elementów nieaktualnych.

Z uwagi na fakt, że część elementów treści mapy nie jest objęta zakresem aktualizacji bieżącej oraz, że w czasie tej aktualizacji mogą być pominięte elementy wchodzące w jej zakres, przeprowadza się w terenie tzw. „kontrolę aktualizacji bieżącej". Obejmuje ona co rocznie 20% powierzchni podstawowej jednostki administracyjnej.

Wyniki kontroli umożliwiają określenie procentu zmian zaistniałych w terenie i warunkują ewentualną potrzebę przeprowadzenia aktualizacji okresowej.

Aktualizacja okresowa w odróżnieniu od aktualizacji bieżącej obejmuje wszystkie elementy treści mapy.

Wybór metody pomiarów uzupełniających oraz metody aktualizacji pierworysu uzależnia się od procentu zmian, wielkości obszaru, skali mapy, posiadanego sprzętu przez wykonawcę, kosztów, pilności wykonania aktualizacji, istniejących materiałów geodezyjnych, kartograficznych i branżowych — dotyczących urządzeń podziemnych.

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PPWK, Warszawa 1982 r. Nakład 700+100 egz., ark. wyd. 8, ark. druku 6,25 Papier druk. sat. kl. III 71 g, 70×100. Oddano do składu 12.XII.1981 r. Podpisano do druku w kwietniu 1982 r. Druk ukończono w maju 1982 r. Cena zł 48,—
ZGK Zakład nr 5 w Bytomiu, zam. 9002 — 104