社会開発調査部報告書

Japan InternationalCooperation Agency

State Committee for Land and Cartography
The Republic of Azerbaijan

The Study on National Digital Mapping

in

The Republic of Azerbaijan

Final Report (Summary)

February 2003

Pasco Corporation, Japan

Exchange Rate

US Dollar (US$)	Japanese Yen (¥)	Manat	Date
1.00	109.70	4,562	March 2000
1.00	126.65	4,660	July 2001
1.00	121.70	4,880	January 2003

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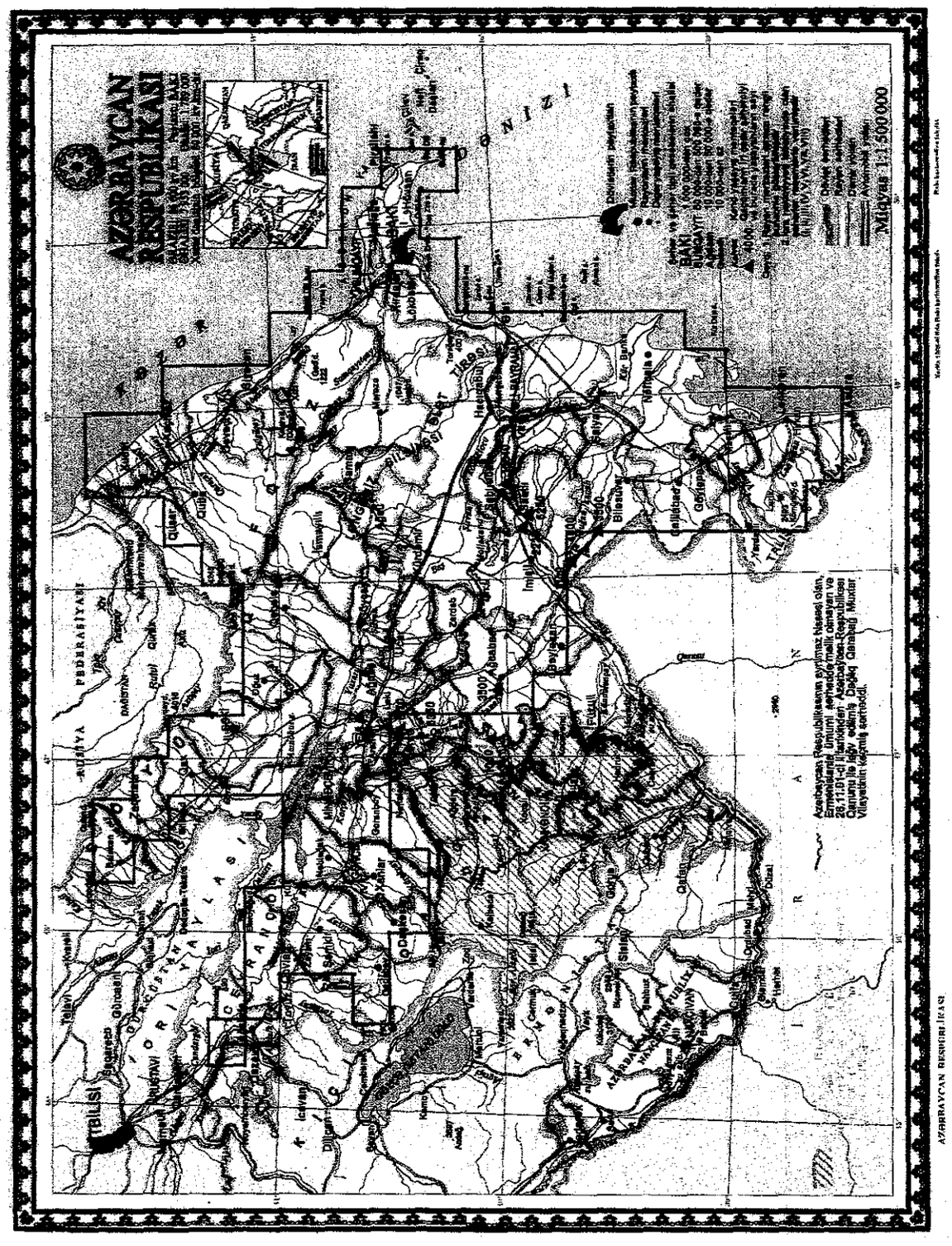
Location Map of the Study Area



PREFACE

In response to a request from the Government of the Republic of Azerbaijan, the Government of Japan decided to conduct the Study on National Digital Mapping Project in the Republic of Azerbaijan and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr.Takeshi Hirai (March 2000-January 2001) and Mr.Yoshiaki Otoku (February 2001- February 2003) of Pasco Corporation to Azerbaijan, four times between March 2000 and February 2003.

The team held discussions with the officials concerned of the Government of Azerbaijan and conducted the field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Azerbaijan for their close cooperation extended to the team.

February 2003

Takao Kawakami
President
Japan International Cooperation Agency

Letter of Transmittal

February 2003

Mr. Takao Kawakami
President
Japan International Cooperation Agency

Dear Sir,

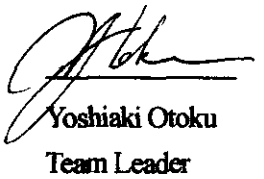
It is a great honor for me to submit herewith the Final Report on the Study on National Digital Mapping in the Republic of Azerbaijan.

The Study Team, which was organized by Pasco International Inc. and headed by myself, was dispatched to Azerbaijan four times from March 2000 to February 2003 to conduct the study works for national digital mapping in Azerbaijan under the contract for implementation of the said Study with Japan International Cooperation Agency (JICA) and to arrange for subcontracting the work of aerial photography and make the presentation on the digital topographic map data. In the meanwhile, the Study Team also conducted the works of digital plotting and compilation in Japan and wrapped up the results of these works in this Report.

On behalf of the Study Team, I would express my sincere appreciation of the unsparing favor and close cooperation that the Government of the Republic of Azerbaijan and its related agencies extended to all the Team members during their stay in Azerbaijan.

I also wish to express our deepest gratitude to JICA, Ministry of Foreign Affairs, Ministry of Land / Infrastructure and Transport, Embassy of Japan in Azerbaijan and other related governmental authorities for their invaluable advice and supports.

Yours faithfully,



Yoshiaki Otoku
Team Leader
The Study on National Digital Mapping
in the Republic of Azerbaijan

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INTRODUCTION

Azerbaijan declared itself independent on 28 May 1918 and the Azerbaijan Democratic Republic (ADR) was formed. ADR was suppressed by Russia's Red Army on 28 April 1920 and Azerbaijan was transformed to the Azerbaijan Soviet Socialist Republic (AzSSR).

Later, on 30 December 1922 AzSSR joined the Union of the Soviet Socialist Republics (USSR). From the time of joining the Soviet Union, AzSSR was under the centralized control from the socialist regime of the USSR.

On the eve of the dissolution of the USSR on 18 October 1991 the Supreme Council of the AzSSR passed the Constitution Act on the Independence of the Azerbaijan Republic. On 12 November 1995 the Constitution of the Azerbaijan Republic was adopted.

It should be noted that yet being AzSSR beginning from February 1988 a violent conflict erupted between Azerbaijan and Armenia regarding the independence of the Nagorno-Karabakhskaya Autonomous Area, which was the part of the Azerbaijan Republic.

Strife against separatists who tried to grab the Karabakh area from the Azerbaijan Republic consolidated the Azeri nation and raised its national self-consciousness. Armenian aggression resulted in the occupation of 20% of Azerbaijan's territory. Over a 1 mln. of Azerbaijan's citizens became refugees, and, nowadays, they suffer a great hardship. In May 1994, there was signed a temporary cease-fire agreement between Azerbaijan and Armenia.

The collapse of the Soviet Union negatively reflected on the Azerbaijan's economy. Taking account of the fact that the Soviet Union's economy was based on the inter-republic cooperation it had to rebuild almost all the home industry.

Beginning from 1994, there in the Azerbaijan Republic started up development and implementation of macroeconomic reforms aimed at stabilizing country's economy.

In July 1996, the meetings on policies between three Caucasian countries including Azerbaijan and the Government of Japan was held and Azerbaijan publicized its important future development sectors: a) Energy sector; b) Development of agricultural infrastructure; c) Development of transport and telecommunications infrastructure (roads, railways, telecommunications, water transportation in Caspian Sea); d) Social sector (including health and medical care, education, employment social security etc.); and e) Development legislation and systems necessary for market economy (including financial and monetary laws, foreign capital introduction laws etc.).

Also, the Government of Japan publicized its diplomatic policy for the "Silk Road Areas" in the address of

former Prime Minister Hashimoto in August 1997. He said that it was necessary to establish a large extent of these areas as the organic structural parts of the diplomacy for Eurasia and to develop the diplomacy more fastidiously than ever. Further, he said that he was looking at the efforts of the Japanese industry to participate in the energy resource development in the countries such as Azerbaijan and Kazakhstan. In this sense, Azerbaijan is one of the countries to which the Government of Japan attaches great importance in its diplomatic policies.

Among the countries of the former Soviet Union, Azerbaijan possesses a high technology in the conventional analog mapping for the precise topographic maps that are used for various purposes such as national land development reform.

In the Soviet Union two agencies were concerned with topographic map production: High Division for Geodesy and Cartography under the USSR's Council of Ministers (HDGC under USSR's CM) and Ordnance Survey (OS) under General Commandment of USSR's Military Forces. Topographic work was distributed between these agencies depending on the scale, type and territory. The territory of Azerbaijan was covered by 1/50,000-scale topographic maps prepared by Ordnance Survey. Therefore, the last updating for 1/50,000 scale was made in 1988. In spite of hard economic situation, lack of the finances, there in Azerbaijan were carried out works on the National Geodetic Network establishment, updating city plans on the scale of 1/2000, 1/5000, 1/10,000, updating the 1/10,000 and 1/25,000-scale topographic map of Azerbaijan. However, the lack of advanced technologies to meet the present-day standards was considered as a serious obstacle on the way to digital mapping development.

Azerbaijan surely possesses existing topographic maps, but these had been created for the main purposes of military and security, so that the 1/50,000-scale topographic maps covering the entire country have not been disclosed publicly.

In recent years, the interest in Azerbaijan and preference for investment in oil field development in the continental shelf of the Caspian Sea have been increasing not only among the enterprises in Azerbaijan but also in overseas countries including Japan. Thus, it is a pressing need to develop the spatial information on the national geography and topography for the national development and infrastructure redeployment, and to promote the civil use of the developed geographic and topographic information.

In this background, the Azerbaijan Republic made the request for the new technical secular change and correction in the existing 1/50,000-scale topographic maps and digitization of the topographic maps to Japan in October 1998.

In response to this request, the Government of Japan dispatched the Preliminary Study Team to Azerbaijan and signed the Scope of Work with the recipient agency in Azerbaijan, SCGC (State Committee for Geodesy and Cartography) to implement the "Study on National Digital Mapping in the Republic of Azerbaijan" in December 1999.

After that, SCGC was unified into SCLC (State Committee for Land and Cartography) in April 2001 and

restructured as State Aerogeodesy Corporation, one of the departments of SCLC.

The former SCGC (current SCLC) was in the leading position in the geodesy and mapping fields among the republics of the former Soviet Union and furnished technical guidance to the then communist countries in Asia and Africa as well as in some republics within the former Soviet Union. SCGC had a very high potential level of technology, but it suffered substantial financial and technical problems. In the former Soviet Union era and nowadays, SCLC creates and updates a number of map series that were deemed to be in the world's level, including detailed topographic maps, such as 1/10,000, 1/25,000 and 1/50,000-scale topographic maps, lifeline management maps, cadastral maps, a wealth of theme maps and atlases. However, this work is carried out by old technology and therefore this type of work is found to be expensive and time-consuming. Due to lack of equipment and facilities SCLC couldn't switch to the introduction of the advanced computer-aided mapping technology. So, the mapping techniques have remained in the level before the 1980's though the level of map products is high. The computer, peripheral equipment and associated software have been developed rapidly these past 10 years, and the environment comfortable enough to support the mapping technology is easily available at present. The digital map data created by using computer technology can also be used effectively in various fields that are supported by computers.

Therefore, SCLC desires to enhance the productivity in the mapping work through introduction of technologies such as the GPS survey as the latest survey technology and kinematics GPS aerial photography, digital photogrammetry, and computer-aided map compilation and production, and to establish the system in which map development projects can be implemented to a certain extent by a smaller number of engineers. This desire is one of the factors in the background of the request for this Study by Azerbaijan.

In Azerbaijan, the reconstruction of the economic structure is an impending issue, and it is needed to develop the latest fundamental maps to serve for formulating and implementing national development programs and various projects in the private sector, including foreign capital, as well as in the public sector. The fundamental map series in the forms of 1/10,000, 1/25,000 and 1/50,000-scale topographic maps were maintained in the former Soviet Union era as described above, but it is financially difficult to maintain all these maps in the future. In this Study, therefore, the 1/50,000-scale topographic maps have been determined as the appropriate fundamental maps in consideration of the available budget scale and organizational capacity, and the technical cooperation to ensure the introduction of the new digital mapping technology has been implemented.

The existing 1/50,000-scale topographic maps were specified for governmental purposes such as mainly for security and limited to governmental use. In updating the 1/50,000-scale topographic maps, the map symbols have been subjected to a substantial change to ensure that the maps can be reproduced for the civil use.

In the future, it is expected that the fundamental maps so completed in this Study will be disclosed not only for governmental use but also for civil use, contributing to the national development through introduction of private vitality.

1 *OUTLINE OF THE STUDY*

1.1 Objectives of the Study

This Study has the following objectives:

(1) To correct the secular changes in the existing topographic maps (of 1/50,000 scale) to convert them into maps for civil use. And to make digital maps by digitizing the topographic and geographic map data for a total area of approximately 60,000 km^2 of national land, in order to support the socioeconomic development of Azerbaijan Republic.

(2) To make the transfer of technology in digital mapping to State Committee of Land and Cartography (SCLC), the counterpart on the side of Azerbaijan through implementation of this Study.

1.2 Study Area

The area for the Study covers a total area of approximately 60,000 km^2 of Azerbaijan, exclusive of the Armenia-occupied area, Nakhichevan area and the national border areas.

1.3 Outline of the Study

This Study was implemented on the following items;

1.3.1 Aerial photography

In the aerial photography, the black/white aerial photographs to cover the entire study area were newly taken. The photographic scale was 1/40,000 and the survey of the photographic principal points was made using the kinematics GPS. The confidential items of the planimetric features in the photographed area were deleted on the SCLC side and the photographic films were saved as the digital image data in a CD-ROM.

1.3.2 Digitization of existing maps

The existing topographic maps were digitized in accordance with the map symbol specifications as determined by SCLC. In this case, the existing contour lines were not used as vector data, but finally used as raster data. The contour films for map printing were produced from the raster data.

About 100 items of symbols were used for vector digitization from the existing topographic maps.

1.3.3 Creation of DEM

DEMs (Digital Elevation Models) of the study area were created. For this purpose, the contour lines of

10m in the plain area and those of 50m in the mountainous areas were vectored from their existing maps.

1.3.4 Correction of secular changes

The points of secular changes were interpreted from the aerial photos that were recently taken and the corresponding planimetric features were corrected through the field survey and the stereo plotting.

Based on the correction data, the raster data and the vector data acquired from the existing topographic maps were corrected.

The field survey necessary for correcting the secular changes were implemented by SCLC under the supervision of the Japanese Study Team.

1.3.5 Creation of the films for color map printing plates

For 134 map sheets covering the area of approximately 52,000km^2 worked in Japan and Azerbaijan in the total study area (165 maps / 60,000km^2), the maps were compiled by a high-precision plotter and the films outputted through an image setter at a resolution ranging from 2000 dpi to 3000 dpi. The make-up films prepared were separated into 6 color plates for black, blue, orange, , green and brown, as determined through the discussions on symbols. Therefore, 6 make-up film plates for each map sheet were outputted.

1.3.6 CD-ROM production

The final data created in this study were duplicated on CD-ROM as their metadata for a various future use in the GIS field.

1.3.7 Transfer of technology

It was planned that SCLC would implement the digital mapping of 20% of the study area through OJT (on-the-job training) as the technology transfer, under the supervision of the Japanese Study Team.

The items of technology transfer are followings:

① GPS survey
② Image scanning
③ Image digitization
④ Digital photogrammetry
⑤ Vector data correction
⑥ Raster data correction
⑦ Inspection of digital maps
⑧ Creation of the films for color map printing plates

1.3.8 Equipment for the Study

It was planned that the Japanese side would purchase the following equipment and software necessary for the technology transfer to the Azerbaijan side, which would be installed at SCLC:

① GPS receivers

② Digital photogrammetry workstation

③ Image setter for out-put film making

④ Scanner

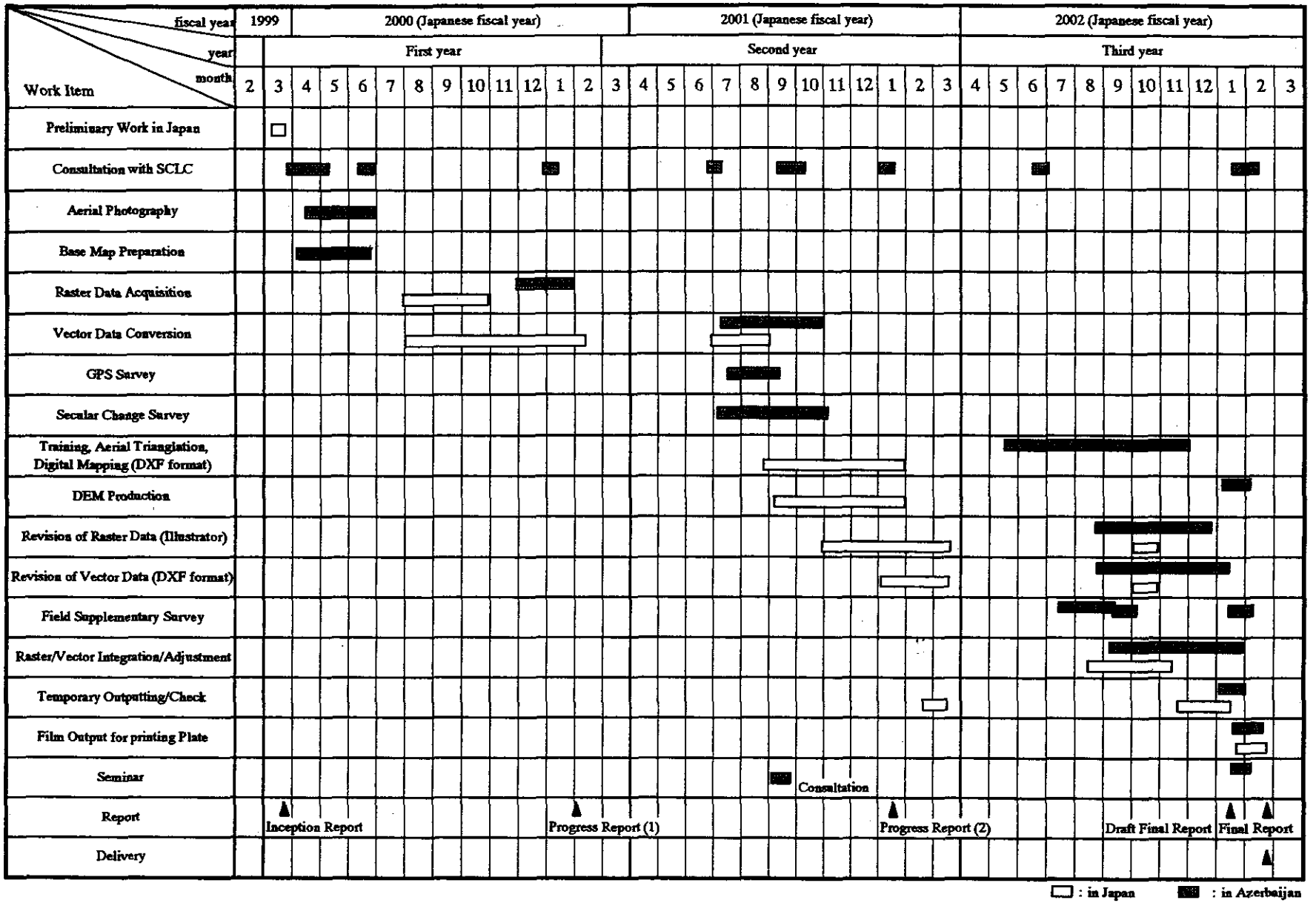
⑤ Stereo-plotter

⑥ PCs and related software for map digitizing, compilation and data analysis

1.3.9 Study period

This Study was scheduled to start around the end of March 2000 and complete its original processes for the period of about 33 months as requested by Azerbaijan, but the period for implementation of the Study was about 36 months until March 2003 because the transportation of a part of the equipment and other materials necessary for the technology transfer in Azerbaijan was delayed for the reason that was attributed to the Japanese side. (Table 1)

Table 1 Whole Annual Procedure



2 BASIC SPECIFICATIONS OF THE STUDY

This Study was implemented in accordance with the specifications as agreed in the Inception Report. For the other matters as not agreed between both sides of Japan and Azerbaijan, the JICA Overseas Work Specifications applied to those matters. (Table 2)

Table 2 Basic Specifications of the Study

Item	Description	Remarks
Aerial photography	Black and White wide-angle camera Scale 1: 40,000 Overlap:60% Sidelap:30%	S/W JICA Instructions
Topographic map	scale 1:50,000 Digital maps approx.165 sheets approx.60,000km^2 Plate making film: 1 set of 4 colors	S/W (Changed 6 colors)
Map symbols and their rule	Revised map symbols based on the ex-USSR map symbols: 1:50,000	S/W
Surveying standards	Reference ellipsoid: Krasovsky Projection: Gauss-Krüger Neatline: 10' × 15' Contour interval: Principal contour 20m	S/W JICA Instructions
Precision	fixed in consultation with SCGC	JICA Instructions
Special annotation	The following notes shall be annotated in place of the Marginal information: This map was prepared jointly by Japan International Cooperation Agency(JICA) under the Japanese Government Technical Cooperation Program and the State Committee for Land and Cartography of the Republic of Azerbaijan	S/W

The following items were the specifications agreed between Japan and Azerbaijan.

(1) General planimmetric accuracy of new maps

The new digital maps should be based on the accuracy of existing 1/50,000-scale maps

(2) Index precision of stereo plotting

Horizontal position: less than 0.3mm on a map

Height: less than 1.0m

3 COMPOSITION OF STUDY WORKS

3.1 Study Implementing Organizations

This Study was implemented by Pasco Corporation under contract with Japan International Cooperation Agency (JICA) and study works were conducted by JICA Study Team organized by Pasco Corporation under the work instruction of JICA. The work contract for each single fiscal year of Japan (12 months beginning in April) was created into between JICA and Pasco Corporation.

The Infrastructure Development Institute – Japan executed the technical assessment in each work process in this Study under the contract awarded by JICA.

3.2 Yearly Study Items

The yearly Study items instructed by JICA to Pasco Corporation for this Study were as follows:

(1) The First-year Study

Study period (March 22, 2000 to March 25, 2001)

1) *Preliminary study in Japan*
   - ① Preparation of the Inception Report
   - ② Collection of the related information and materials
2) The first stage work in Azerbaijan
   - ① Discussion of Inception Report
   - ② Consultation on the Study
   - ③ Collection of related information and materials
   - ④ Aerial photography (local subcontract)
   - ⑤ Preparation of the base map for the digitizing
   - ⑥ Preparation of the base map for DEM
   - ⑦ Raster data acquisition 1
3) The first stage work in Japan
   - ① Raster data acquisition 2
   - ② Vector data acquisition 1
   - ③ Preparation of the Progress Report 1

(2) The Second-year Study

Study period (July 22, 2001 to March 25, 2002)

1) The second stage work in Azerbaijan

① Explanation and discussion on the Progress Report 1

② GPS survey

③ Vector data acquisition 2

④ Secular change field survey

⑤ Discussion on the seminar

2) The second stage work in Japan

① Vector data acquisition 3

② Plotting 1

③ DEM production 1

④ Revision of the raster data 1

⑤ Revision of the vector data 1

⑥ Preparation of the Progress Report 2

(3) The Third-year Study

Study period (June 7, 2002 to March 20, 2003)

1) The third stage work in Azerbaijan

① Explanation and discussion of the Progress Report 2

② Plotting 2

③ Revision of the raster data 2

④ Revision of the vector data 2

⑤ DEM production 2

⑥ Supplemental field verification

2) The third stage work in Japan

① Revision of the vector data 3

② Raster and vector data integration and adjustment 1

③ Pre-outputting and inspection 1

④ Film preparation for plate-making 1

⑤ Metadata creation

⑥ Preparation of the Draft Final Report

3) The fourth stage work in Azerbaijan

① Raster and vector data integration and adjustment 2

② Pre-outputting and inspection 2

③ Preparation of materials for the seminar

④ Film preparation for plate-making 2

⑤ Seminar

⑥ Draft Final Report explanation and consultation

4) The fourth stage work in Japan

① Preparation of the Final Report

3.3 Dispatched personnel for the Study in Azerbaijan

The member of the Study Team and their periods dispatched from Japan to Azerbaijan for this Study are as follows:

(1) The first stage work in Azerbaijan

Member of Study Team	Assignment	Period of Dispatch
Takeshi Hirai	Team leader	Mar.28, 2000 ~ Apr.26, 2000 June 8, 2000 ~ June 28, 2000
Fujio Ito	Aerial photography	Apr.6, 2000 ~ July 12, 2000
Takashi Shimono	Map-compilation	Mar.28, 2000 ~ July 2, 2000
Daikichi Nakajima	Digital mapping	Mar.28, 2000 ~ July 2, 2000 Dec.12, 2000 ~ Feb.9, 2001
Kazunobu Kamimura	Coordination	Mar.28, 2000 ~ Apr.12, 2000
Hideaki Sakai	Coordination	Feb.1, 2001 ~ Feb.14, 2001

(2) The second stage work in Azerbaijan

Member of Study Team	Assignment	Period of Dispatch
Yoshiaki Otoku	Team leader	Sep.22, 2001 ~ Oct.12, 2001 Jan.12, 2002 ~ Jan.26, 2002
Kentaro Usuda	Field verification	July 9, 2001 ~ Nov.2, 2001
Daikichi Nakajima	Digital mapping	July 9, 2001 ~ Aug.7, 2001
Takashi Shimono	Digital compilation	Sep.4, 2001 ~ Nov.2, 2001
Yutaka Nakada	GPS survey	July 23, 2001 ~ Sep.20, 2001

(3) The third stage work in Azerbaijan

Member of Study Team	Assignment	Period of Dispatch
Yoshiaki Otoku	Team leader	June 17, 2002 ~ July 6, 2002
Kentaro Usuda	Supplemental survey	July 3, 2002 ~ Aug.31, 2002
Daikichi Nakajima	Digital mapping Digital compilation	June 17, 2002 ~ Aug.5, 2002 Aug.28, 2002 ~ Oct.28, 2002
Hidetoshi Kakiuchi	Coordination	Aug.19, 2002 ~ Sep.2, 2002

(4) The fourth stage work in Azerbaijan

Member of Study Team	Assignment	Period of Dispatch
Yoshiaki Otoku	Team leader	Jan.22, 2003 ~ Feb.20, 2003
Daikichi Nakajima	Supervision/Seminar	Jan.20, 2003 ~ Feb.20, 2003
Takashi Shimono	Film preparation/Seminar	Jan.22, 2003 ~ Feb.20, 2003
Hidetoshi Kakiuchi	Coordination	Feb 7, 2003 ~ Feb.20, 2003

4 RECEPTIONS OF TRAINEE IN JAPAN

The trainees of Azerbaijan and their period of training in Japan for digital mapping technology through the entire period of the Study were as follows:

Name	Organization	Period of Training
Mr. Adil S. Soultanov*	Chairman of former State Committee for Geodesy and Cartography	Nov.14, 2000 ~Dec.1, 2000
Mr. Alovsat S. Guliyev	Chief Photogrammetric Section State Aerogeodesy Corporation / SCLC	May 14, 2002 ~ June 16, 2002

Building of former State Committee for Geodesy and Cartography is presently occupied by State Aerogeodesy Corporation

P.S. *mark is a retired person

5 STUDY WORK PLANS AND RESULTS

The work plans and the results for the main study items relating to the quantities of products in this Study are shown in Table 3 and the Work Flow for the Study is in Figure 1.

Table 3 Work Plans and Results

F/Y	Items of Work	Planned Work Volume	Work Result Volume	Remarks
First-year	Aerial photography B/W 1/40,000-scale	60,000 km2 (79 flight lines)	60,000 km2 (99 flight lines)	
	Base map preparation For digitizing	60,000 km2 (165 sheets x 2 films)	60,000 km2 (160 sheets x 2 films)	
	Base map preparation For DEM	60,000 km2 (165 sheet x 1 film)	60,000 km2 (160 sheet x 1 film)	Fiscal Year 2000
	Raster data acquisition 1	12,000 km2 (35 sheets)	12,000 km2	
	Raster data acquisition 2	48,000 km2 (130 sheets)	48,000 km2 (130 sheets)	
	Vector data acquisition	38,000 km2	45,250 km2	
Second-year	GPS survey	20 points	23 points	
	Vector data acquisition	12,000 km2 (35 sheets)	12,000 km2 (35 sheets)	
	Secular change field survey	60,000 km2 (165 sheets)	60,000 km2 (165 sheets)	
	Vector data acquisition 3	2,750 km2	2,750 km2	FY2001
	Plotting 1	48,000 km2	48,000 km2	
	DEM production	48,000 km2	48,000 km2	
	Revision of raster data 1	48,000 km2	48,000 km2	
	Revision of vector data 1	48,000 km2	48,000 km2	
Third-year	Plotting 2	12,000 km2 (35 sheets)	12,000 km2 (35 sheets)	
	Raster data revision 2	12,000 km2	12,000 km2	
	Vector data revision 2	12,000 km2	12,000 km2	
	DEM production 2	12,000 km2	12,000 km2	
	Supplemental field Verification	60,000 km2 (165 sheets)	60,000 km2 (165 sheets)	
	Vector data revision 3	48,000 km2	48,000 km2	FY2002
	Raster & vector integration And adjustment 1	48,000 km2 (130 sheets)	48,000 km2 (130 sheets)	
	Pre-outputting & inspection 1	130 sheets	130 sheets	
	Film preparation for Plate making 1	130 sheets	130 sheets	
	Metadata creation	130 sheets	130 sheets	
	Raster & vector integration And adjustment 2	12,000 km2 (35 sheets)	12,000 km2 (35 sheets)	
	Pre-outputting & inspection 2	35 sheets	35 sheets	
	Film preparation for Plate making 2	35 sheets	35 sheets	

Figure 1 Work Flow of the Study

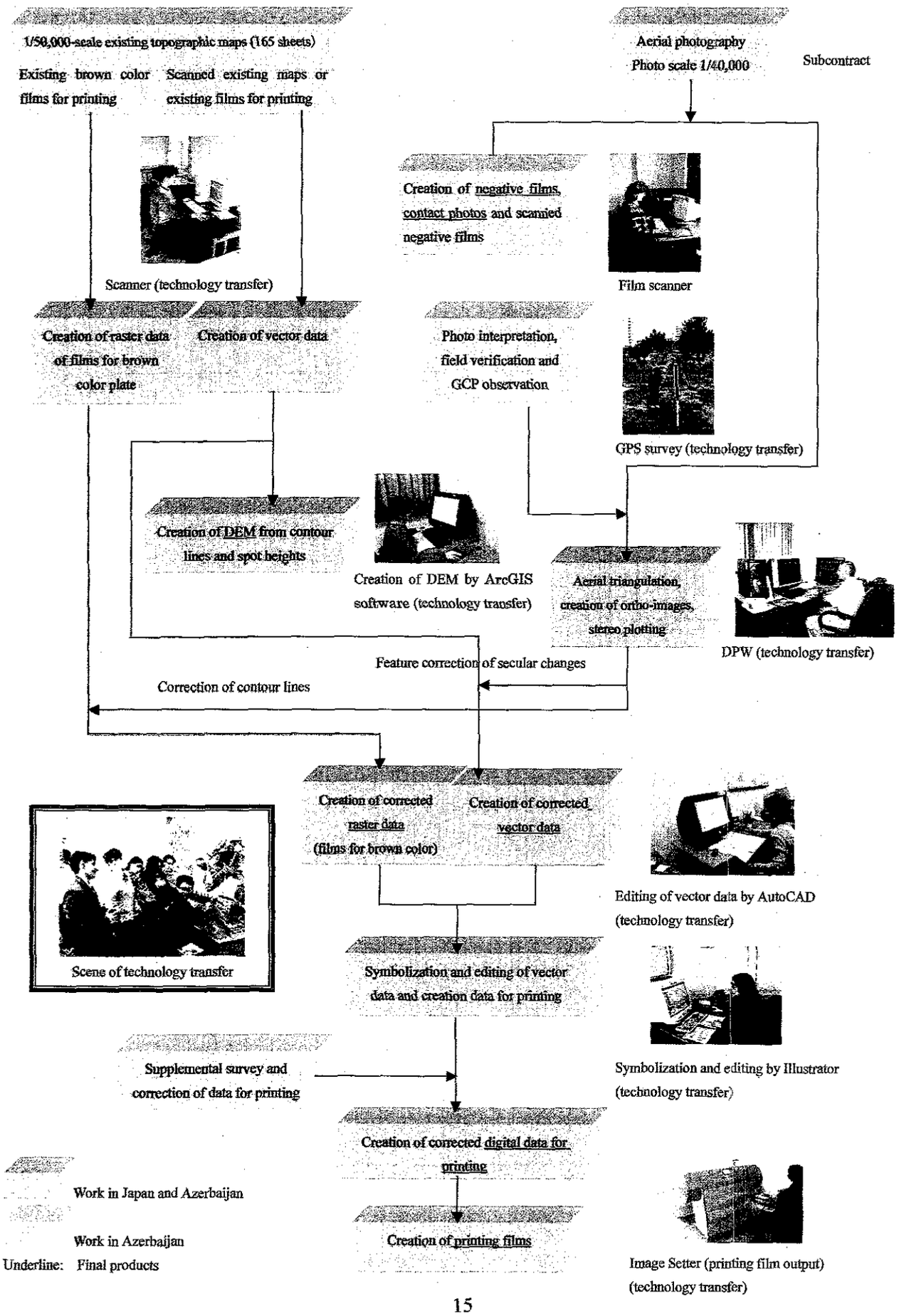
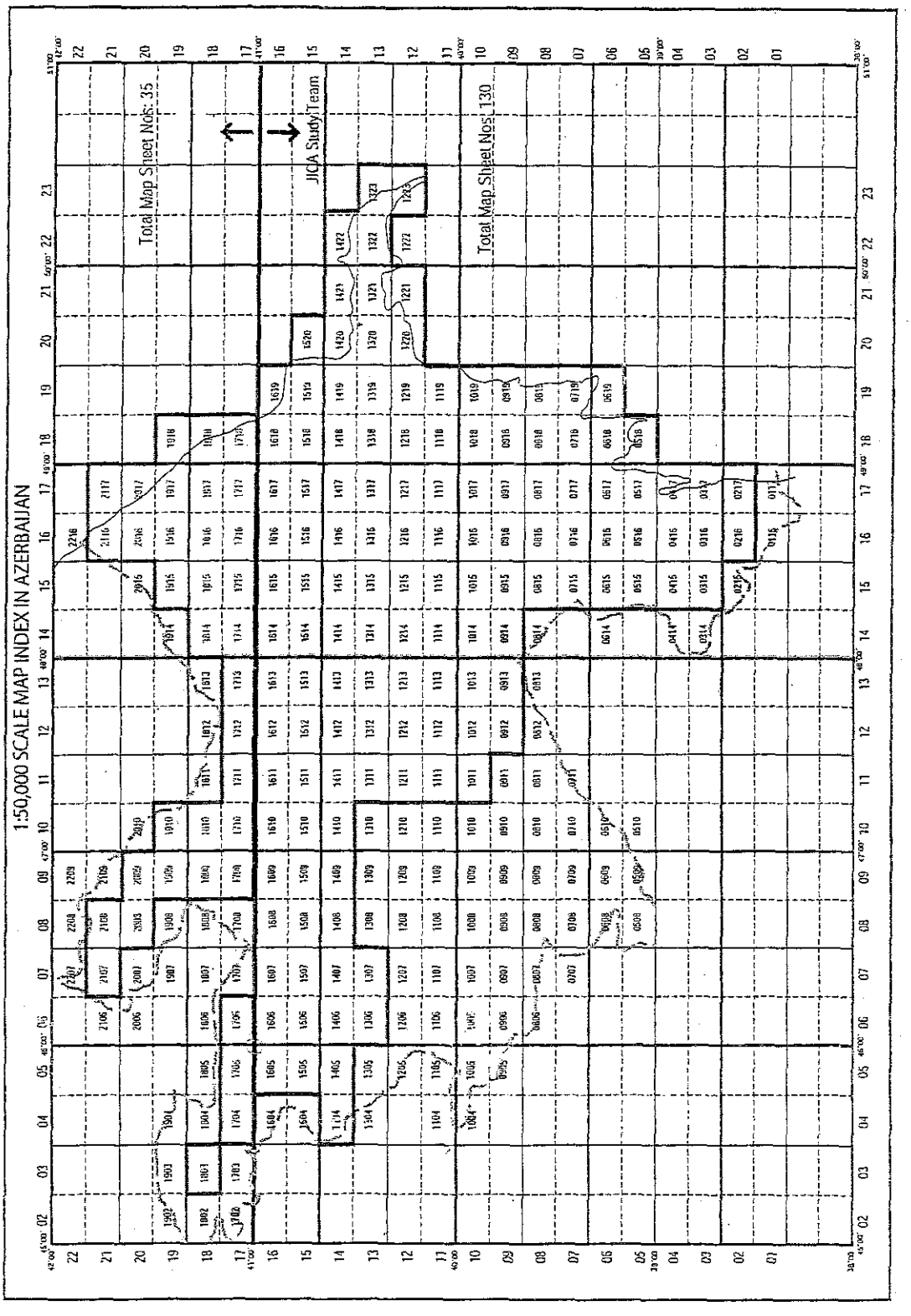


Figure 2 Details of the Study Area and Map Index



6 CONTENTS OF THE STUDY

The JICA Study Team headed by Mr. Takeshi Hirai had a consultation with SCLC for the methods of procedure, the survey standard and the techniques for technical transfer to SCLC of the Study on the Inception Report prepared by the JICA Study Team in June 2000, before commencement the Study. The contents of the Inception Report have accepted at SCLC in consequence.

As for the Study area, the area comprising approx. 60,000km2, total 165 map sheets at a 1/50,000-scale shown on Figure 2 were confirmed and it was decided that the OJT area by the JICA Study Team should be 35 map sheets covering 12,000km2 located the northern area of 41° north latitude in 165 sheets.

The printing plate original films of the existing 1/50,000-scale maps were collected for 160 map sheets excluded 5 map sheets and reproduced as the base maps for this Study.

The color printed maps, which could not collected the original films were scanned with color. These scanned data normalized, rectified, were used as the base maps also.

The existing 1/50,000-scale maps have been based on the application standard of the old Soviet Union's Map Symbols Specifications, therefore the classification of the Map Symbols was for a strategy purpose in great measure.

Having consultation with SCLC, the category of the Map Symbol Specifications in this Study was more simplified decreasing to around the half of original symbol's volume for the civil use.

The "Digital Map Symbols for 1/50,000-scale" on Figure 3 shows the legend of map symbols adopted in this Study. The symbols, which were not used in new digital maps, were indicated as "excluded" in existing "1/50,000-scale Topographic Map Symbols Specifications" herein attached. About 85 symbols were not used and some similar symbols were combined also into one symbol.

Azeri annotations instead of Russian annotations on the existing maps were adopted in this Study according to the request of SCLC. SCLC side at the site implemented the survey for the annotations, then the annotation overlay for each digital map was prepared also.

6.1 Aerial Photography

Aerial photography with the GPS data has taken for the purpose of updating in the Study area. The format of aerial camera was 23 x 23cm with wide-angle focus lens. The JICA Study Team to FINMAP FM-International subcontracted the implementation.

Figure 3 Digital Map Symbols for 1/50,000-scale

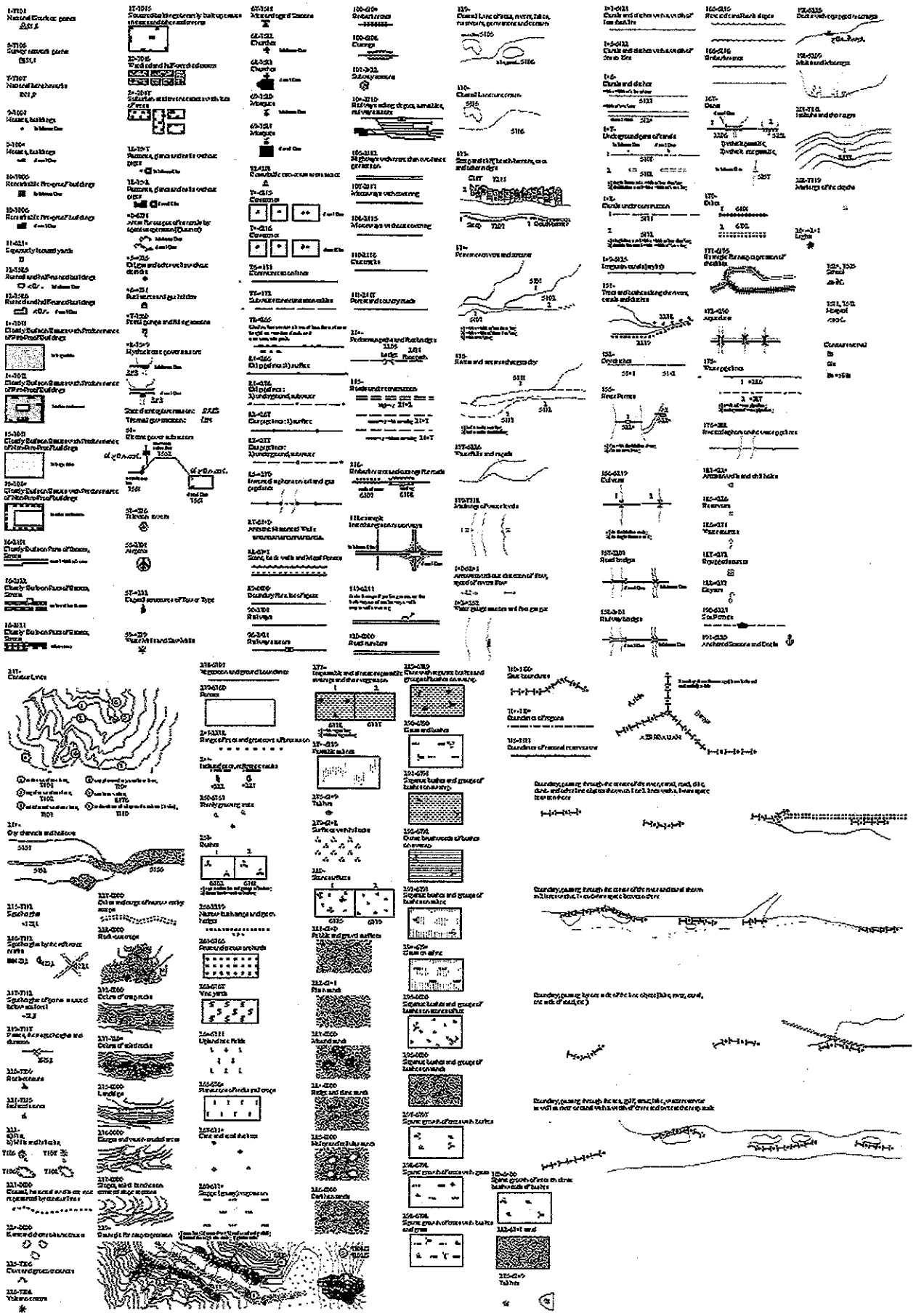
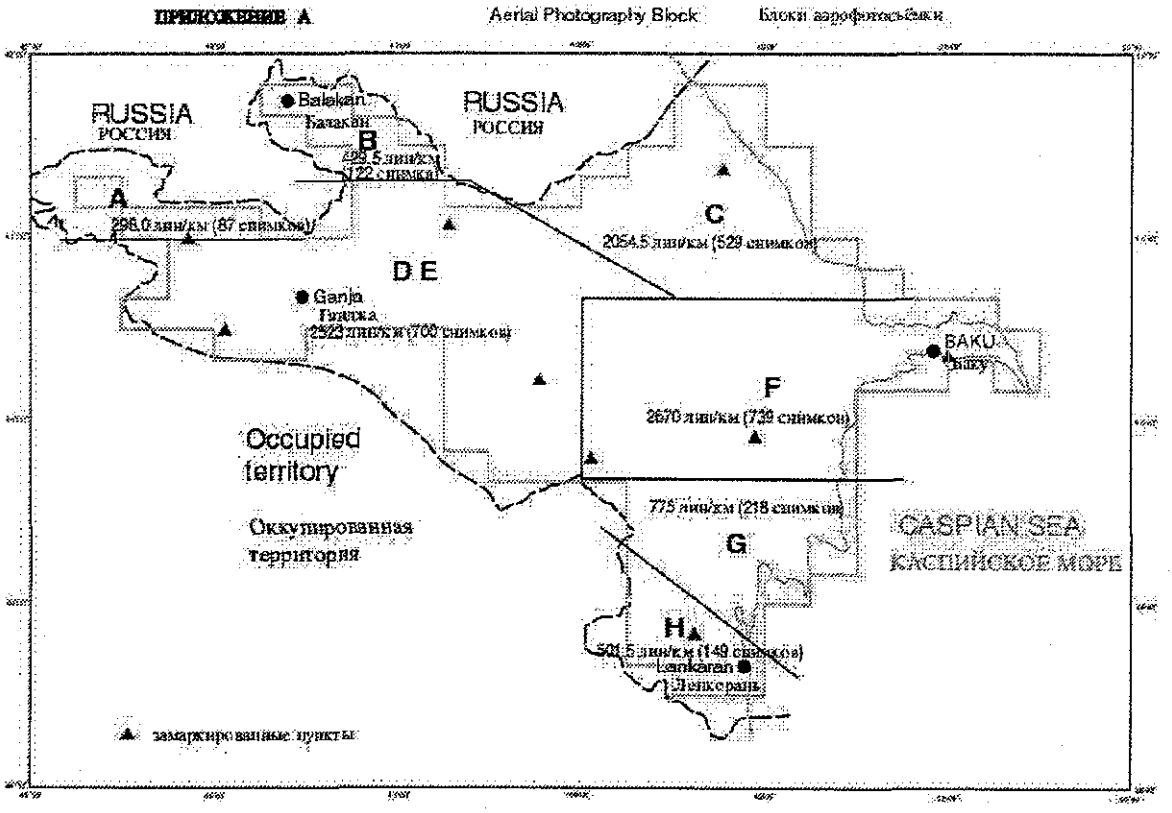


Figure 4 Block names of Aerial photography



6.1.1 Implementation

Aerial photography of the Study area of approx. 60,000km2 except the national borders and the area occupied by Armenia was taken dividing to 7 blocks based on the existing maps prepared by SCLC. The total flight courses were 99 lines and the volume of photographs was 2990 photos.

The first flight was carried out on April 25, 2000 and completed on July 5, 2000.

6.1.2 The contents of implementation

Aerial photography was conducted as follows.

Photo scale :	Approx. 1/40,000 (black & white)
Flight course :	99 courses (Original plan 79)
Photo area :	Approx. 60,000km2
Aerial camera :	Wild RC-30 (f:150mm、frame 23cm x 23cm)
Flight height :	6,000m ± 5%
Forward overlap :	60 ± 5%
Sidelap :	30 ± 5%
GPS device:	ASHTECH Z-12
Aircraft:	Rockwell Turbo Commander 690A

The DGPS (differential global positioning system) data capture was carried out with two ASTECH Z-12 Satellite-receivers. One as a rover installed in the aircraft, the other as a base-station on the ground.

The flight of aircraft was stopped 5km before the border of Russia, Iran, Georgia and 15km in front of occupied area by Armenia for the security reasons.

Aerial photographed area was divided into 7 blocks; Baku F(2), C, G, H, A, B and DE.(Figure 4) The block name, line number and photo number were annotated on the negative films.

Prior to the aerial photographing, the aerial-signals on 9 control points in the Study area were established by Azerbaijan side, for the successive aerial triangulation work.

6.1.3 The results of photographing

The results of aerial photographing were as follows.

Block	Course	Line km	Volume of photos
F(2)	18	2,670	739
C	21	2,055	529
G	11	775	218
H	11	502	149
A	6	298	87
B	6	430	122
DE	26	2,523	700
Total	99 courses	9,253 line km	2,544 photos

The DGPS coordinate processing based on WGS has taken processing after each photo flight.
After photographing, films were developed in Azerbaijan and the JICA Study Team conducted technical inspection on the following items in cooperation with SCLC staff ; haze / clouds, propriety of overlap / side-lap, existence of camera index, photographic clarity, and so on to control precision. After the technical inspection, SCLC eliminated confidential items on the negative films.
Finally all the negative films taken were scanned at a precision of 25 microns, and recorded on to DLT tapes.

The photo coordinates based on WGS were converted to the local coordinates referred on Krasovsky ellipsoid applying the conversion parameter which was analyzed by the GPS survey on existing control points in the second year's work.
The converted local coordinates of each photograph were served for the aerial triangulation analysis.

6.2 Digitization of Existing Maps

Reproductive positives of existing 1/50,000-scale topographic maps were prepared from the color film bases, which consist of black, brown, blue excluding color mask separation films of orange, yellow green. The confidential items exist on the maps were deleted by SCLC.
On the positive film maps for digitizing, total 9 cross grids were traced at the corner of the maps and inside of the maps with a suitable interval in order to normalize expansion and distortion of the images which were acquired by scanner.

6.2.1 Raster data acquisition

The base maps for digitizing, which were reproduced from color film bases, were scanned with

accuracy of 500dpi.

Some distortions introduced during scanning were corrected by normalization of the images using the traced grids information. Some graphical cleaning up such as speckles and image correction were carried out using Adobe Photo-shop, CAD Overlay and Arc/Info Software in computers.

The raster data of contour lines for new digital printing maps are to be used the raster image data without digitizing, and to be combined with the new planimetric digital data. Therefore, the data were needed for high quality image, the raster data for the brown plate films were reproduced using a flat-table scanner in Japan.

6.2.2 Vector data acquisition

Raster data acquired in the preceding clause were converted to vector data by computer in Japan and Azerbaijan. Raster/Vector conversion software was used for this process. Ground features, which were difficult to convert to vector data automatically, were digitized manually.

All vector data which was formatted into DXF were acquitted, and corded with layers of lines, points and polygons data following the " 1/50,000-scale Digital Map's Layer Classification" shown in Table 4. These vector data acquisition was implemented after normalization of the raster image by grids coordinates.

For the purpose of DEM (digital elevation model) generation, 10m interval contour lines in flat areas and 50m interval contour lines in mountainous areas and the spot height data were vectorized separately from the preparation of printing plate.

Table 4-1 Layer Specifications - Azerbaijan 1 : 50,000-Scale Map Automation

Symbol No.	Group	Type	Code No.	BD-Code	Attribute	Description
310	ADMIN	LINE	1100			National boundaries
314			1104			Provincial boundaries
315			1111			National reservation boundaries
16	ROAD	POLY	2101			Streets in the closely built-up area (true size)
105		LINE	2112			Highways
107			2113			Paved motorways
108			2115			Unpaved motorways
110			2116			Unpaved country roads
111			2117			Field, forest and caravan roads and paths
16			2121			Streets in the closely built-up area (Narrow)
16			2122			Streets in the closely built-up area (Wide)
115			2142			Roads under construction (Highways)
115			2143			Roads under construction (Paved)
115			2147			Roads under construction (Unpaved)
114			2131			Footpaths
190			5223			Ferries (Ocean)
155			5224			Ferries (River)
157			Road code	2203		Bridges
114			Road code	2205		Footbridges
167			Road code	2206		Road-Dam bridges
116			Road code	6103		Roads on the embankment
90	RAILWAY	LINE	2301			Railways
158			Rail code	2401		Bridges
100			Rail code	6104		Railways on the embankment
104			2310			Railway depots and sidetracks
96			2421			Railway stations
103		POIN	2422			Subway stations
14	BUILT-UP	POLY	3011			Closely built estates with fireproof buildings
14			3012			Built estates with fireproof buildings
15			3013			Closely built estates with non-fireproof buildings
15			3014			Built estates with non-Fireproof buildings
17			3015			Rarely built-on estates in cities
20			3016			Dilapidated building areas
24			3017			Houses surrounded by trees
9	BUILDING	POLY	3004			Houses, buildings (true size)
10			3006			Remarkable Fireproof Buildings (true Size)

Table 4-2 Layer Specifications - Azerbaijan 1 : 50,000-Scale Map Automation

Symbol No.	Group	Type	Code No.	BD-Code	Attribute	Description
69			3521			Mosques (true size)
68			3523			Churches (true size)
			3525			Schools (true size)
			3532			Hospitals (true size)
38			3548			Plants, factories and mills (true size)
51			3552			Substations (converter)
51			3553			Substations (true size)
12			3586			Ruins (true size)
9	BUILDING	POIN	3001			Houses, buildings (minimum size: 0.4 x 0.6mm)
10			3005			Remarkable Fireproof buildings (minimum size)
67			3511			Meteorological stations
69			3520			Mosques (minimum size)
68			3522			Churches (minimum size)
			3524			Schools (minimum size)
			3531			Hospitals (minimum size)
38			3547			Plants, factories and mills (minimum size)
48			3549			Hydropower stations
51			3551			Substations (transformer)
12			3585			Ruins (minimum size)
185			4226			Reservoirs
53			4236			Television and radio towers (masts)
55			2701			Airports and hydro-airports
47	WELL	POIN	3560			Petrol pumps and filling stations
183			4224			Water wells
45			4225			Oil, gas and other wells
46			4231			Oil and gas tanks (fuel stores and gasholders)
57			4232			Tower-type capital constructions
186			4271			Sources (springs)
187			4272			Spring with facilities
188			4273			Geysers (hot springs)
76	UTILITY	LINE	4131			Communication lines
77			4132			Underground (subwater) communication cables
78			4265			Electro-transmission lines
81			4266			Ground oil pipelines
82			4267			Ground gas pipelines
85			Util.code	4270		Underground part of oil and gas pipelines
81			4276			Underground oil pipelines
82			4277			Underground gas pipelines

Table 4-3 Layer Specifications - Azerbaijan 1 : 50,000-Scale Map Automation

Symbol No.	Group	Type	Code No.	BD-Code	Attribute	Description
175			4286			Ground water pipelines
175			4287			Underground water pipelines
176			4288			Underground part of water pipelines
134	HYDRO-POLY	POLY	5103			Wide rivers (shore line)
129			5105			Lakes, ponds
129			5106			Permanent coastal lines
135			5113			Seasonal dry Rivers and Streams (Shore Line)
130			5115			Non-permanent and indefinite lakes, ponds
130			5116			Non-permanent coastal lines
			5124			Canals double lines (width= more than 0.7mm)
172			Hydro code	4290		Aqueducts
147			Hydro code	5108		Underground canals (shore line)
156			Hydro code	5219		Culverts
171			Hydro code	6105		Watercourses on the embankment
134	HYDRO-LIN	LINE	5101			Rivers single-lines
134			5102			Wide rivers (parallel lines)
135			5111			Seasonal dry rivers and streams (single line)
135			5112			Seasonal dry rivers and streams (parallel lines)
143			5121			Canals single-lines (line width: 0.15mm and 0.2mm)
145			5122			Canals double-lines and Single-lines
146			5123			Canals double-lines (width=0.7mm, parallel lines)
149			5125			Irrigation canals overhead (above ground)
148			5131			Canals under construction (single line)
148			5132			Canals under construction (shore line)
172			Hydro code	4290		Aqueducts
147			Hydro code	5107		Underground canals (single line)
147			Hydro code	5108		Underground canals (parallel lines)
156			Hydro code	5219		Culverts
171			Hydro code	6105		Watercourses on the embankment
241	CARTO-LIN	LINE	2238			Narrow strips of forest and protective afforestation
256			2239			Lines of bushes
193			5209			Waterbreaks and moorages (true size)
165			5215			Revetments (along the canals)
166			5216			Concrete revetments (in the canal)
137			5226			Waterfalls (minimum size)
140			5241			Flow directions with velocity numbers
167			5257			Impassable dams (small)
167			5258			Impassable dams (large)

Table 4-4 Layer Specifications - Azerbaijan 1 : 50,000-Scale Map Automation

Symbol No.	Group	Type	Code No.	BD-Code	Attribute	Description
170			6101			Dikes (minimum size: less than 3m)
170			Road code	6101		Dikes with road (minimum size: less than 3m)
170			6102			Dikes (true size: more than 3m)
170			Road code	6102		Dikes with road (true size: more than 3m)
100			6108			Cuttings for railways or roads
87			6140			Ancient historical walls
88			6141			Stone, brick walls and metal fences
72	CARTO-PNT	POIN	4203			Permanent statues and monuments
244			4221			Independent trees (broad leaf)
244			4222			Independent trees (needle leaf)
59			4239			Watermills and saw mills
204			4241			Lights and signs
142			4252			Flow gauge stations (water gauge stations)
191			5220			Anchored stations and docks
192			5225			Equipped docks
225			7206			Cave and grotto entrances
226			7208			Muddy volcano craters
220			7209			Rock-Remains
221			7215			Stones 1) separately located stones; 2) stone clusters
271	VEGE-POL	POLY	6337			Swamps
271			6338			Cane swamps
274			6339			Passable saline lakes (salt)
239			6360			Forests
253			6361			Dense bushes
265			6364			Tea plantations (bush type)
261			6366			Fruit and citrus gardens (orchards)
262			6367			Vineyards
			6380			Inner doughnut open or empty area
264	VEGE-PNT	POIN	6311			Water rice fields
267			6314			Cane and reed thickets
269			6334			Grass
253			6362			Shrubs
250			6363			Scattered trees
238	VEGE-LIN	LINE	6301			Vegetation boundaries
74	LANDUSE	POLY	6215		M/X/Q	Cemeteries (M=muslim, X=christian, Q=Mix)
74			6216		M/X/Q	Cemeteries with trees (M=muslim, X=christian, Q=Mix)
229-10		6235			Boundaries of glacier snows	
119		POIN	6211			Parking areas (minimum size)
11			6214			Separate yards with houses
213	CONTOUR	LINE	7101	3270	E	Index contour lines (Glacier, elevation)

Table 4-5 Layer Specifications - Azerbaijan 1 : 50,000-Scale Map Automation

Symbol No.	Group	Type	Code No.	BD-Code	Attribute	Description
213			7102	3270	E	Intermediate contour lines (Glacier, elevation)
201			7112			Isobaths
1	CONTROL	POIN	7301			Horizontal control points
5			7305			Horizontal control points (ground survey points)
7			7307			Vertical control points (bench marks)
215	SPOTHGT	POIN	7312			Spot heights of photogrammetry
219			7317			Passes (spot heights)
139			7318			Markings of water-level height
202			7319			Markings of water depth
40	LANDUSE	LINE	6231			Quarries (Symbol before 1982, black line symbol)
152	HYDRO-LIN	LINE	5141			Dry ditches (blue dash single line)
152			5142			Dry ditches (blue dash shore line)
279	LANDFORM	POLY	6348			Surfaces with hillocks (Symbol before 1982)
275			6349			Takhirs
348	ANNOTATION	Text	8174			Elevation values of ground control points (symbol No. 1,2,5,6,7)
349		Text	8174			Elevation values of photogrammetry (No.275,276,277,278,219)
348-2		Text	8175			Water-level values of rivers and lakes (No. 139)
352-2		Text	8176			Contour values (numerical characters)
352-3		Text	8177			Depths of sea (symbol No. 202)
		Text	8178			Contour values of isobaths (numerical characters)
	Marginal Design	Line	9990			Neat line
		Point	9991			Cross mark (grid) points
		Text	9002			Map sheet number
		Line	9004			Geodetic coordinates number

CODE = Map Feature Codes; BD-CODE = Bridge/Dike Codes

6.3 Creation of DEM

The raster data of contour lines for printing maps are to be used the raster image data without digitizing, and to be combined with the new planimetric vector data. However, Digital Elevation Models of the Study area were created separately from the purpose of the production of color printing maps.

The DEMs were generated employing the vector data of contour lines and the spot height data in ArcInfo GIS software as the three-dimensional analyzing data.

The vector data and the height data were layered in ArcInfo as the ArcInfor "coverage", then generated the DEMs automatically with the intervals of 50m.(Figure 5)

After generation of the each map sheet's DEM, the DEM data was checked and revised the some elevation errors.

Each map DEM data was connected to adjacent map sheets as seamless DEM data finally.

The OJT area's DEMs were created under the supervision on the Stady Team in Azerbaijan.

Figure 5 Digital Elevation Model (Sheet No.1321)

6.4 Correction of Secular Changes

The 1/50,000-scale existing maps were produced before the independence of Azerbaijan during the old Soviet Union, then some secular changes were surveyed in this age. But, after independence in 1991, no secular changes were surveyed.

In this Study, the secular changes survey was carried out by means of the newly taken aerial photographs.

6.4.1 Field verification & Supplemental survey

SCLC staff implemented Field verification for the secular changes in 2001 employing the aerial photographs taken in 2000.

Prior to the field verification, preliminary verification was done to find out the secular changed area contrasting the existing maps with the photographs. As a result, the portions of secular changes in the Study area were approximately 25% to 30% of the total. Then, the portions were marked on the photographs.

These marked areas on the photographs were verified in the field based on the map symbols specifications. The results of field verification were described on the photographs.

The surveys for the annotation of geographical names were executed in parallel with the field verification. According to the request of Azerbaijan side, the annotation on digital maps was to annotate in Azeri instead of Russian on existing maps.

The supplemental survey was carried out based on the manuscripts revised the secular changes of digital maps as the third year's work in Azerbaijan.

6.4.2 Stereo-plotting

The secular changes verified were plotted digitally by means of Digital Photogrammetric Workstation using the scanning data of aerial photographs both in Japan and Azerbaijan.

The plotting was adopted two kinds of method, the one was direct digitizing by DPD and the other was digitizing of the ortho-photos which was generated by DPW. Aerial triangulation results were used for the plotting.

The data acquisition of the plotting relating to secular change was the same composition of the vector data acquisition of cording and classification of lines, points and polygons data.

6.4.3 Revision of vector data

Vector data acquired at "Vector data acquisition of existing maps" were revised in computer using the data obtained at "Stereo-plotting" for the Study area as final vector data.

In case of inconsistency of the raster data of contour lines and vectorized planimetric feature, the contour lines were plotted and revised the raster data partially.

6.4.4 Revision of raster data

Based on the final vector data revised, DXF data were compiled as raster map data using Adobe Illustrator V.8 software. After that DXF data were converted to "AI" format, raster data in Adobe Illustrator, all coded data were symbolized according to the Map Symbols Specifications. Then, the compilation of necessary replacement as the scaled map were implemented on computer displays

6.5 Creation of the Films for Color Map Printings

Final raster data, which were revised secular changes and symbolized, were compiled the group of same color objects files in black, blue, green, yellow and brown raster data combined for contour lines, then converted to EPS files for DTP (Desk Top Printing).

The output films for printing plates were required high resolution between at least 2,000 to 3,000dpi images. Therefore, the film for color map printings were outputted from the EPS files by means of "Image Setters" managing by computer.

In this Study, the films for the 35 maps were created in Azerbaijan.

The plate makings and color printings were to be prepared all in Azerbaijan.

6.6 CD-ROM Production

The final vector data and raster data produced in this Study were prepared each 5 copies on CD-ROM as meta-data annotated the data origination and submitted to Azerbaijan side.

6.7 Transfer of Technology

The cooperative work with the counterparts in Azerbaijan was carried out through the process of new digital maps generation by means of latest technology.

The following technical items were transferred to the staffs of SCLC as listed.

Technical Item	Counterpart	Year
① GPS Survey	Mr. Gorhma Kerimov Mr. Namaz Asadov Mr. Valeh Agabalayev Mr. Alam Kerimov	2001
② Image Scanning & Digitizing	Mr. Latif Guseynov Mr. Yusif Akhadi Mr. Emil Bayramov*	2001
③ Digital Photogrammetry	Mr. Alovsat Guliyev Ms. Shakhla Suvorova Ms. Gulnara Mamedova	2002
④ Revision of Vector data	Mr. Latif Guseynov Mr. Emil Bayranov Mr. Yusif Akhadi Ms. Sakina Ibragimora Ms. Samira Abbasova Ms. Aygun Nagiyeva Ms. Zamira Beybutova	2002
⑤ Revision of Raster data	Mr. Latif Guseynov Mr. Emil Bayranov Mr. Yusif Akhadi Ms. Sakina Ibragimova Ms. Samira Abbasova Ms. Aygun Nagiyeva Ms. Zamira Beybutova	2002
⑥ Out-put and Inspection	Mr. Latif Guseynov Mr. Yusif Akhadi Ms. Sakina Ibragimova Ms. Samira Abbasova Ms. Aygun Nagiyeva Ms. Zamira Beybutova Ms. Aygun Veliyeva	2003
⑦ Preparation of the Plate making	Mr. Agil Ahmadov Ms. Shakhla Suvorova Ms. Elmira Jafarova Ms. Adilya Mamedova Ms. Malek Guliyeva Ms. Gulnara Mamedova	2003

P.S. *mark is a retired person.

The detailed contents of technical transfer to SCLC were as follows:

6.7.1 GPS Survey

Geodetic coordinates on the observation spots were determined by receiving and analyzing the geodetic data provided by the satellites, and computing the differential values between Azerbaijani National Coordinates and WGS 84.

The technical items concerning the selection, using the GPS operational manuals prepared by the Study Team transferred observation and analysis of the control points.

6.7.2 Acquisition of Raster and Vector Data

Digitizing was carried out for the scanning raster data on the existing topographic maps at a scale of 1/50,000. The digitizing works were conducted through raster image generation by scanning the topographic maps, distortion correction of scanning images and acquisition of vector data on the planimetric features by employing draw computer software.

Acquisition of the vector data on the scanning images of the background on the computer was conducted by means of tracing the points, lines and polygons of the images in accordance with the operational manuals.

The digitizing of the existing topographic maps was transferred by using the operational manuals, feature catalogues and identification cards prepared by the Study Team.

6.7.3 Digital Photogrammetry

The staff of SCLC conducted orthophoto production in order to revise the vector data by means of digital photogrammetry using DPW (Digital Photogrammetry Workstation) following the procedures of photo control points survey through pricking of the existing control points, aerial triangulation, DEM production and orthophoto production in accordance with the operational manuals prepared by the Study Team.

6.7.4 Revision of Vector Data

The staff of SCLC conducted the revision of vector data by employing computer draw software, Auto CAD. The revision of vector data was carried out through tracing the points, lines and polygons of the features having secular changes on the orthophoto images of the background on the computer. The classification of points, lines and polygons was based on the code classification of map symbols and the operational manuals prepared by the Study Team.

6.7.5 Revision of Raster Data

The staff of SCLC conducted the symbolization of vector data updated secular changes by employing the computer software for drawing and compilation, Adobe Illustrator.

The manuals for symbolization, map symbols and specifications were prepared on the agreement between SCLC and the Study Team.

6.7.6 Output and Inspection

Digital data which has been symbolized by Illustrator was outputted by plotters, and these outputs were inspected with the eye, and corrected by staff of SCLC in accordance with map symbols and specifications. The Study Team has prepared the accuracy control checklists in order that the staff of SCLC conducted the inspection for such as missing and duplication of the features, data consequence, unity of formats and accuracy of positions.

6.7.7 Preparation of Films for Printing Plates

Digital data for printing symbolized by Illustrator was inputted into high resolution lazar plotter for printing, Image Setter, classified in colors and set for resolution degrees in order to produce the printing film positives in 6 special colors.

The staff of SCLC prepared the printing film positives in accordance with the specifications and manuals prepared by the Study Team.

6.8 Equipment for the Study in Azerbaijan

The specifications of the equipment for OJT were prepared after verifying their equipment and status of operation. An equipment list and specifications was prepared referring to the basic policy of that to be applied their recent mapping techniques. A set of the equipment was a model which SCLC can manage its maintenance. The Team examined possibility of the local procurement of the equipment and the cost.

As the results, Japanese side purchased the following equipment and software necessary for the technology transfer to the Azerbaijan side, which were installed at State Aerogeodesy Corporation / SCLC.

① GPS receivers
② Digital photogrammetry workstation
③ Image setter for out-put film making
④ Scanner
⑤ Stereo plotter
⑥ PCs and related software for map digitizing, compilation and data analysis

These detail specifications and their volume were descried in following Tables.

List of GIS equipment installed at State Aerogeodesy Cooperation / SCLC

At the end of August 2001

Items	Remarks	Quantity
1. Desktop Computer		
① Dell / Optiplex GX110MT CPU: Pentium III 933Mhz HDD; 20Gb FDD: 3.5" 1.44Mb CD-ROM: OS: Windows 98 Monitor: Dell 19" Mouse / Keyboard	For map digitizing & compilation	1 set
② Power Macintosh CPU: 450Mhz HDD; 20Gb CD-ROM: OS: Mac. Monitor: 19" Mouse / Keyboard	For map digitizing & compilation	1 set
③ Loupe (drawing)	For symbolization	3 sets
2. Soft-ware		
① Autodesk Aout-CAD MAP 2000	Draw, Map(GIS)	1 license
② Autodesk, CAD-Overlay 2000	Draw support	1 lic.
③ Raster to Vector 4	Data change to Vector	2 lic
④ Adobe Illustrator V.8.0 for Macintosh	Draw	2 lic.
⑤ Adobe Photo-shop V.5.5 for Macintosh	Draw	2 lic.
⑥ Free Hand V.9.0 for Macintosh	Draw	2 lic.
⑦ Ms Office 2000 Pro.	Office	1 lic
⑧ Windows 2000 Professional	OS	1 lic

At the end of March 2002

Items	Remarks	Quantity
1.Digital Photogrammetric Workstation Leica DPW770		
① DELL Precision Workstation 530MT CPU: Dual Intel Xeon 1.5Ghz Chipset; 860i 400Mhz system bus optimized for RDRAM Memory: 1GB RDRAM (8 RIMM Slots) AGP: Pro 4x VGA/DVI 36Gb SCSI U160/M 10,000RPM 73Gb SCSI U160/M 10,000RPM CD-ROM: x48 Drive Internal: LTO Tape Device Integrated 3 Com 10/100Mb Eathernet controller with WuOL Z-Screen Kit; Polarizing bezel to fit over 21" monitor enabling 3D viewing.x 2 TopoMouse: NT Flexible and programmable Buttons	Hardware for DPW	1 set

Items	Remarks	Quantity
OS: Windows 2000 Pro.		
Z-Screen Kit, Dell Keybord		
External: HP DLT 40 Tape Device		
② Software		
CORE SOCET SET lic.-NT		1 license
STEREO lic.-NT		1 lic
APM lic.-NT		1 lic.
ATE lic.-NT		1 lic.
ITE lic.-NT		1 lic.
TRUE ORTH lic.-NT		1 lic.
ORTH-MOSAIC lic.-NT		1 lic.
PRO600 lic.-NT		1 lic.
MicroStation Geographics "J" lic.		1 lic.
ORIMA/SOCET-TE/GPS lic.-NT		1 lic.
2. Leica GPS System 500	For Control Points	
① Reference Station	Survey	1 set
SR530 dual frequency receiver		
AT503 antenna		
GEB121, NiMh, 6V/3.6Ah battery		
GKL122 Pro Charger x 4		
Hard Container for GPS receiver		
Tribrack GDF112 BASIC		
GRT146 Carrier with 5/8 inch screw		
Antenna cable (2.8m)		
Technical documentation		
PCMCIA-ATA flash card		
Tripod GTS05		
Satellite 2AsxE radio modem, Tranceiver		
Housing for Satellite radio modem		
GAIFLEX radio antenna, fits, 2.8m cable		
TR500 terminal		
GEV71 external battery		
Large battery GEB71, NiCd, 12V7Ah		
Base with 5/8 inch screw		
Telescopic tow with 5/8 inch screw		
Arc 3cm long screw		
2.8m antenna cable, 1.6m extension cable		
1.8m connect cable		
② Rover Station		1 set
SR530 dual frequency receiver		
AT502 antenna		
GEB121, NiMh, 6V/3.6Ah battery		
Hard Container for GPS receiver		
PCMCIA-ATA flash card		
Tripod GTS05		
Satellite 2AsxE radio modem, Tranceiver		
Housing for Satellite radio modem		
Technical documentation		
GAIFLEX radio antenna, fit, 2.8m cable		

Items	Remarks	Quantity
Grip with circular bubble		
Bottom section aluminum pole x 2		
Mini-pack for GPS receiver		
TR500 terminal		
Base with 5/8 inch screw		
Telescopic tow with 5/8 inch screw		
Arc 3cm long screw		
1.2m antenna cable, 1.6m extension cable		
1.8m connect cable		
GEV71 external battery		
Card reader, Data transfer cable		
③ Software		
SK-Pro lic., & protection key		1 license
Datum & Map transformation		1 lic.
Design and adjustment		1 lic.
GIS/CAD output		1 lic.
RINEX import		1 lic.
3. GPS mobile System Leica		
Reference & Rover station	For field survey	2 sets
GS50 single frequency GPS receiver		
At501 antenna & 1.2m antenna cable		
TR500 terminal & 1.8m connect cable		
Hand strap with belt crip		
GEV71 external battery		
GEB121 batteries,NiMh, 6V/3.6Ah x 2		
Hard container for GS50 receiver		
Tripod GST05		
Tribrach GDF112 Basic		
GRT146 Carrier		
Minipack holds, GPS receiver and modems		
PCMCIA Ataflash card		
Telescopic rod with 5/8 inch screw		
User manuals		
Getting started with GS50		
Card reader for flash and SRAM PCMCIA		
Data transfer cable, 2.8m Lemo		
Connects GPS receiver to PC		
4. Total Station Leica TC1100		2 sets
Laster plummet	For geodetic survey	1 pc
Control panel		1 pc
User manual TPS1100, English/Russian		1 pc.
Field Manuals TPS1100 System, English		1 pc.
Field Manuals TPS1100 applications, English		1 pc.
CD-ROM TPR Series Surveying		1 pc.
Container		1 pc.
GEB121 battery, NiMh, 6V/3.6Ah		1 pc.
Charger GK122 Pro, European Version		1 pc.

Items	Remarks	Quantity
Tribrach GDF121 Pro.		2 pcs.
PCMCIA flash card		1 pc
Data transfer cable Lemo 0/RS232		1 pc
Alminum tripod GST05L		1 pc
Circular Prism GPR1		1 pc
Single prism holder		1 pc
Target plat GZT4		1 pc
Dawn string bag for GPH1		1 pc
Reflector pole GSL11, extends to 2.15m		1 pc
Card Reader for flash and SRAM / PCMCIA		1 pc
5. Laptop Computer		
Dell / Latitude C610		2 sets
CPU: Intel Pentium III / 1.0 GHz		
Memory: 128Mb 100Mhz SDRAM		
Hard Drive: 20Gb		
FDD: 3.5" 1.44Mb, removable		
8 x DVD Drive		
ATI RADEON-TM graphics 16Mb		
AC97 audio		
Integrated Mini-PCI 56K Modem		
Display: 14.1" XGA and SXGA		
OS: Windows 98		
6. Others		
① MICROFLEX CE5320	Data logger for Total Station	1 set
② DAPCE5320 / SurvCE	Software for logger	1 license
7. Surver		
Dell / PowerEdge 2500		1 set
PE2500 Server Tower Option		
CPU: Pentium III 1GHz		
Memory: 512Mb 133MHz SDRAM		
HDD: 4x18Gb SCSI		
CD-ROM: 10/24x EIDE		
FDD: 3.5" 1.44Mb		
6-Drive (1x6) Hot Plug Backplane PE2500		
PERC3/Di 125Mb RAID, U160 SCSI, Dual Channel		
Non Redundant Power Supply (1x550W PSU)		
Terminator Card		
Intel PRO/100 + 10/100 PCI Ethernet NIC		
OS: MS Win 2000 Server, 5 CALs, English		
Monitor, 15" E551 Value Monitor		
2 Botton IntelliMouse, Keyboard Slimline		
8. Workstation		
① Dell / Optiplex GX 240SMT		2 sets

Items	Remarks	Quantity
CPU: Pentium V 1.6Ghz, cash L2 256Kb FSB 400MHz, Intel 845 chipset Memory: 256Mb up to 1Gb, PC133, SDRAM Two gold plate DIMM slots AHA 2940 SCSI Controller HDD: 9Gb SCSI CD-ROM: 48x FDD: 3.5" 1.44Mb /O Ports: 4 USB, 2 serial, 1 parallel, 2 PS/2 Video M.: 16Mb 4xAGP ATI Rage Ultra128 Audio: Integrated AC97 with SoftSynthesizer Integrated 3Com Etherlink 10/100 PCI Dell Keyboard and Mouse OS: MS Windows 2000 Pro Monitor: Dell 21" FD Trinitron		
② Dell / Optiplex GX 240SMT HDD: 16Gb SCSI - the others same with ① -		1 set
9. Desktop computer Dell / Optiplex GX 240SMT CPU: Intel Pentium V 1.6Ghz, cash L2 256Kb FSB 400MHz, Intel 845 chipset Memory: 128Mb up to 1Gb, PC133, SDRAM Two gold plate DIMM slots HDD: 20Gb EIDE Uitra ATA/100 20, 7200RPM CD-ROM: 48x FDD: 3.5" 1.44Mb I/O Ports: 4 USB, 2 serial, 1 parallel, 2 PS/2 Video M.: 16Mb 4xAGP ATI Rage Ultra128 Audio: Integrated AC97 with SoftSynthesizer Integrated 3Com Etherlink 10/100 PCI Dell Keyboard and Mouse OS: MS Windows 2000 Pro Monitor: Dell 17" Value monitor		1 set
10. Flatbed Scanner Epson Expression 1640XL Pro.		1 set
11. Color inkjet plotter HP DJ1055CM Plus A0 format, Resolution; 600 x 600 dpi color, 1200 dpi b/w Memory; 128Mb HDD; 7.5Gb Adobe Postscript Buit-in HP Jet network card, cartridges		1 set
12. Accessories ① UPS Inform 1200 ② UPS Inform H500		7 pcs 1 pc

Items	Remarks	Quantity
③ UPS Inform 2000		2 pcs
④ CD writer/re-write HP		1 pc
⑤ External ZIP Drive IOMEGA		1 pc
⑥ Internal ZIP Drive IOMEGA		1 pc
⑦ ZIP Disk IOMEGA		3 pcs
⑧ Network Items CISCO WS-1548-DS		1 set
13. Image Setter	For film output	
① DOLEV 4Press Pro Extreme; Produces hight quality films Image area: 743mm x 580mm Dolev4Press, Turbo Screening Automatic FAF for Brisque Brisque extreme Hope EG-750 film processor and bridge		1 set
② IBM 43P Tiger2 station PPC RISC SPU 604 375MHz, 256Mb RAM 9Gb system disk, 18Gb user disk, 18Mb VRAM 10/100 Ethernet card Modem The Brisque contains Ethershare licenses for six users IBM keyboard & mouse 17" Trinitron monitor		1 set
③ Chemicals and films Film: 660mm x 61m x 1 roll Film Developer: 2 cans x 10litters (1:3) Film Fixer: 2cans x 10litters (1:3)		1 set
④ Cost of installation & 6 months warranty		1 set
14. Scanner Vidar Truscann Titan II Pro A0 format, Optical resolution 400dpi, Scaled resolution up to 1600dpi Accuracy: ±0.10%± 1pixel Document width: up to 42 inches Scan thickness: up to 3mm Data capture: 36bit color Warranty: 24 months	For raster data Generation	1 set
15. Software	For GIS & CAD	
① ArcGIS ArcView 8.1 (including Russian version)		1 license
② ArcGIS ArcEditor 8.1 (including Russ. Version)		1 lic.
③ ArcGIS ArcInfo 8.1 (including Russian Version)		1 lic.
④ ArcGIS Spatial Analyst 8.1		1 lic.
⑤ ArcGIS 3D Analyst 8.1		1 lic.
⑥ ArcPress for ArcGIS 8.1		1 lic.
⑦ AutoCAD Map R3		1 lic.
⑧ Autodesk CAD Overlay		1 lic

7 FINAL RESULTS FOR THE STUDY

The final results delivered to State Committee for Land and Cartography of Azerbaijan were as following table.

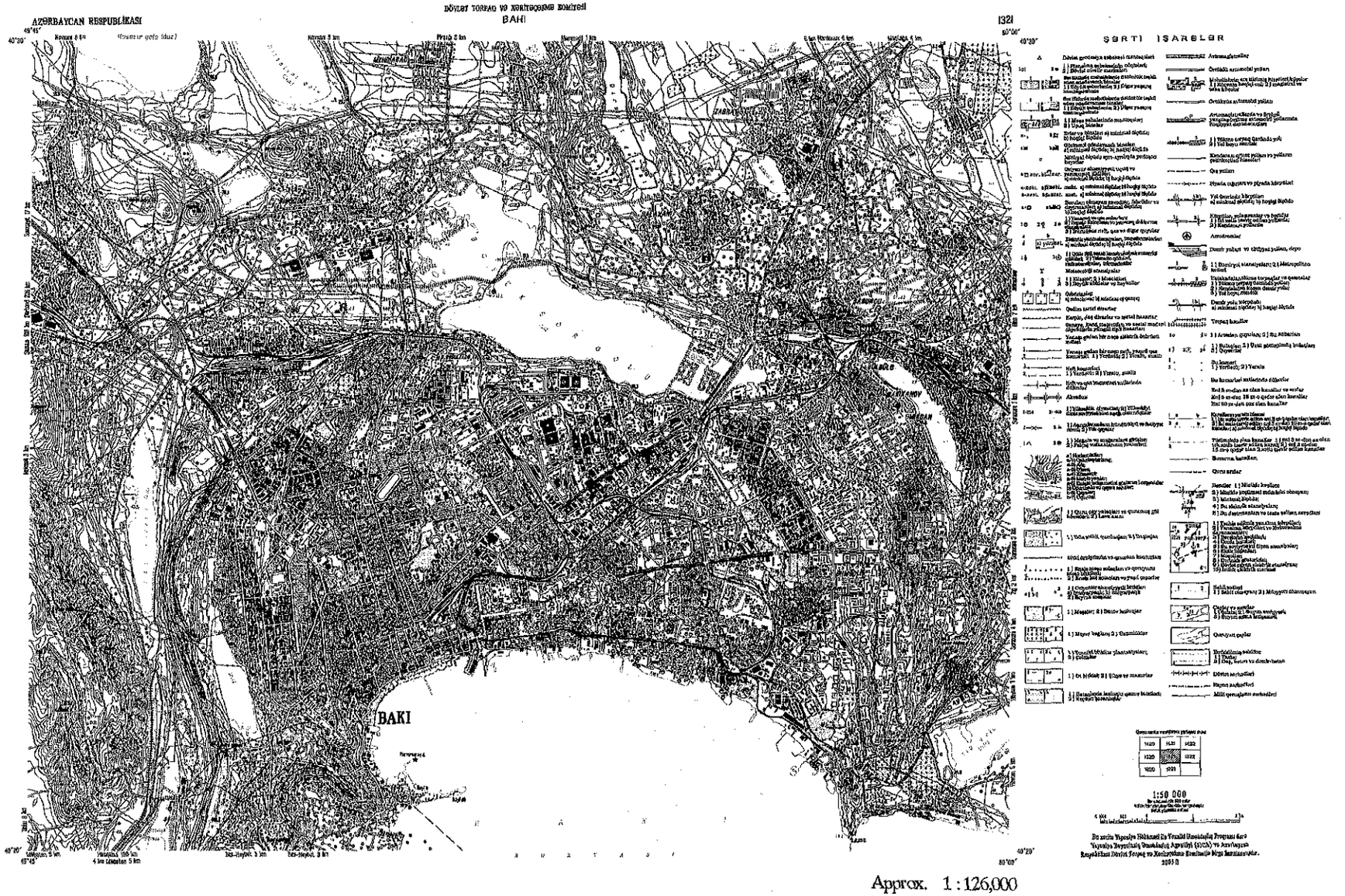
Final results

(1)	Report	
1)	Inception Report	English and Russian 20 copies each
2)	Progress Report 1	-ditto-
3)	Progress Report 2	-ditto-
4)	Draft final report	
	Main report	English / Russian 20 copies each
	Summary	-ditto-
5)	Final Report	
	main report	English / Russian 20 copies each
	Summary	-ditto-
(2)	Final products	
1)	Aerial Photos	
	Negative film	1 set
	Contact Photos	3 sets
	Digital Image Data	5 sets
	Photo Index	1 set
2)	Digital map data	
	Raster data	5 sets
	Vector data	5 sets
	DEM	5 sets
3)	1/50,000 Topographical map	
	Plate-making film	1 set
	Digital image data	5 sets
4)	Meta-data CD-ROM	1 set

APPENDIX

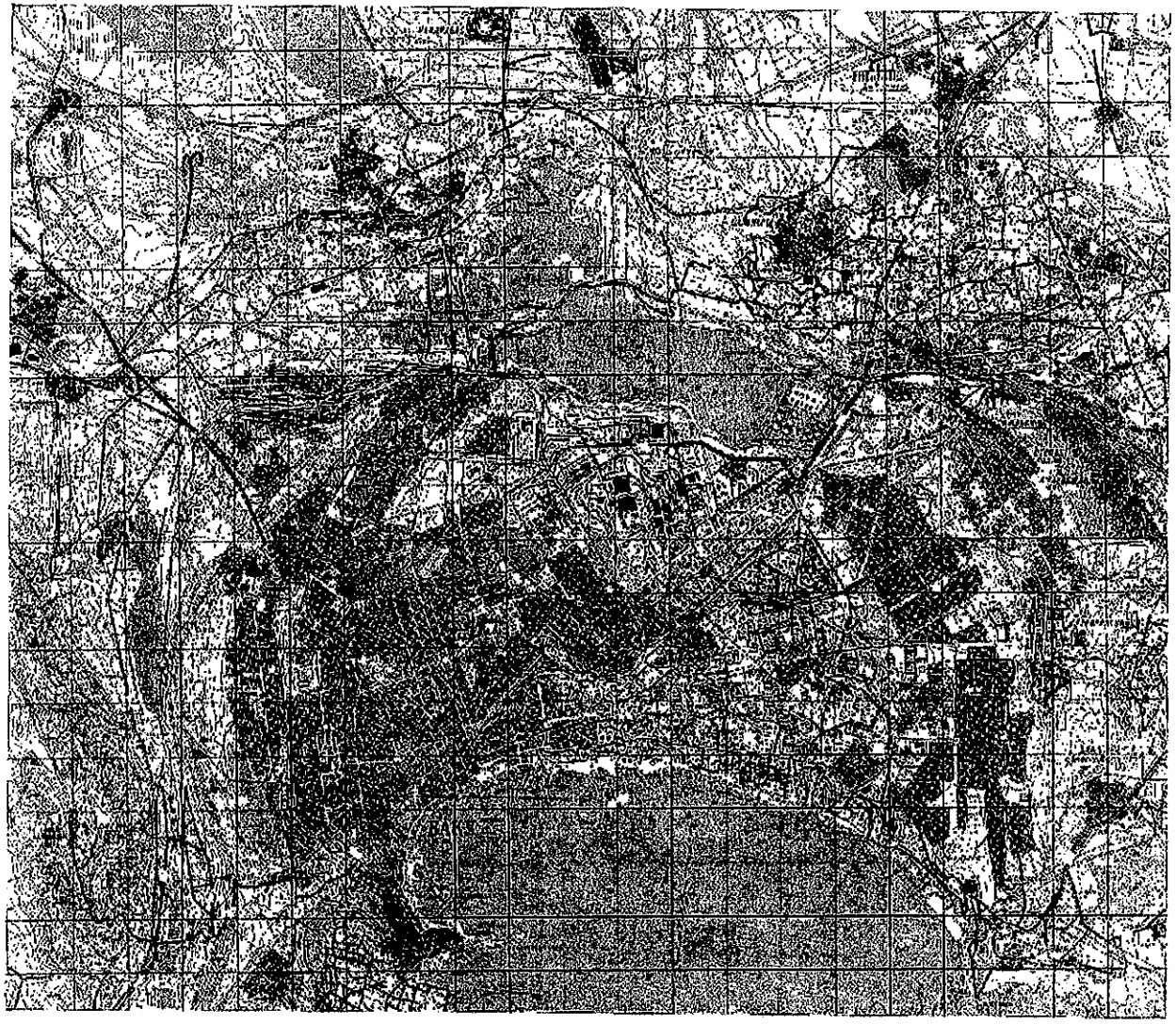
1. **1/50,000-Scale New Digital Map (Sheet No.1321)**
2. **1/50,000-Scale Existing Map**
3. **1/50,000-Scale Digital Map Symbols Specifications**

1. 1/50,000-Scale New Digital Map (Sheet No.1321)



Approx. 1 : 126,000

2. 1/50,000-Scale Existing Map



3. 1/50,000-Scale Digital Map Symbols Specifications

УСЛОВНЫЕ ОБОЗНАЧЕНИЯ ДЛЯ П/О ADOBE ILLUSTRATOR, ИСПОЛЬЗУЕМЫЕ В СОЗДАНИИ ОБЩЕГЕОГРАФИЧЕСКОЙ КАРТЫ МАСШТАБА 1:50 000 ТЕРРИТОРИИ АЗЕРБАЙДЖАНА

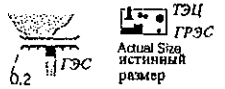
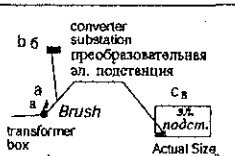
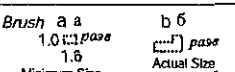
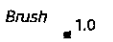
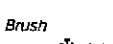
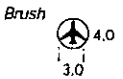
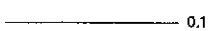
SYMBOLS FOR S/W ADOBE ILLUSTRATOR TO BE USED IN THE PREPARATION OF 1: 50,000 SCALE GEOGRAPHIC MAP OF AZERBAIJAN

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Control Point Геодезические пункты	1	National Geodetic points Пункты государственной геодезической сети	7301	1_7301_National GP	On. stroke, fill, text Задействованы операции над линией, заливкой и текстом	Brush 1.8 91,6 1.5 0.2	*Used font is T132 its point 6.5pt* *Используемый шрифт T 132 6.5pt*
	5	Survey network points Точки съёмочной сети, закреплённые на местности центрами	7305	5_7305_SNP	On. stroke, fill, text Задействованы операции над линией, заливкой и текстом	Brush 1.4 51,1 1.5	*Used font is T132 its point 6.5pt* *Используемый шрифт T 132 6.5pt*
	7	National bench marks Реперы и марки государственной нивелирной сети	7303	7_7307_National BM	On. stroke, text Задействованы операции над линией, и текстом	Brush 1.2 71,9 1.5	*Used font is T132 its point 6.5pt* *Используемый шрифт T 132 6.5pt*
	215 216 217	Spot heights Отметки высот	7312	215_7312_Spot heights	On. fill, text Задействованы операции над заливкой и текстом	Brush 0.3 123,4 1.5 123,4 123,4 54,0 123,4	*Used font is T132 its point 6.5pt* *Используемый шрифт T 132 6.5pt*
	219	Passes, their spot heights and duration Перевалы, отметки их высот и время действия	7317	219_7317_Pass spot heights	On. stroke, text Задействованы операции над линией и текстом.	Brush 2.0 1.6 0.15 3525,4 1.5	*Used font is T132 its point 9.5pt* *Используемый шрифт T 132 9.5pt*
	139	Markings of water levels Отметки урезов воды	7318	139_7318_Water levels	On. stroke, text, Fill is white. Задействованы операции над линией и текстом. Белая заливка	Brush 139 56 0.8 55 1.5 0.1	*Used font is T132 its point 6.5pt.* * In case of double line rivers filling Overprint fill operation shouldn't be activated. 139_7318_Water levels layer should be placed on the above river, water objects. *Используемый шрифт T 132 6.5pt.* * В случае заливки рек, выражаемых двойной линией операция Overprint fill не производиться. Информация слоя 139_7318_Water levels должна лежать над слоями рек и пр. водных объектов.
	202	Markings of the depths Отметки глубин	7319	202_7319_Markings of depths	On. text Задействованы операции над текстом	1.5	*Used font is T132 its point 6.0pt.* * In case of double line rivers filling Overprint fill operation shouldn't be activated. 202_7319_Markings of depths layer should be placed on the above the river, water objects. *Используемый шрифт T 132 6.0pt.* * В случае заливки рек, выражаемых двойной линией операция Overprint fill не производиться. Информация слоя 202_7319_Markings of depths должна лежать над слоями рек и пр. водных объектов.
Buildings and Other Structures Здания и прочие сооружения	9	Houses, buildings Дома и здания	3001 3004	a, a; 9_3001_Houses, buildings min b, б; 9_3004_Houses, buildings act	On. fill Задействованы операции над заливкой	Brush a a 0.5x0.5 Minimum Size минимальный размер b б Actual Size истинный размер	If these symbols are without any secular changes, they should be represented same as on the existing maps. В случае, если данные символы не претерпели каких-либо периодических изменений, они должны представляться так же, как и на существующих картах.
	10	Remarkable fire-proof buildings Выдающиеся огнестойкие здания	3005 3006	a, a; 10_3005_Remark fireproof min b, б; 10_3006_Remark fireproof act	On. stroke, fill Задействованы операции над линией и заливкой	Brush a a 1.0x1.4 Minimum Size минимальный размер b б 0.1 0.2 Actual Size истинный размер	

Brush; При работе с данными символами необходимо применять функцию " Brush "

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Buildings and Other Structures Здания и прочие сооружения	14	Closely Built-on Estates with Predominance of Fire-Proof Buildings Плотно застроенные кварталы с преобладанием огнестойких строений	3011 3012	1; 14_3011_Close Fireproof city 2; 14_3011_mask 2; 14_3012_Close Fireproof 2; 14_3012_mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	1 2	Surface layer should be placed under layers 14_3011_Close Fireproof city and 14_3012_Close Fireproof. Слой поверхности (маска) должен располагаться под слоями 14_3011_Close Fireproof city и 14_3012_Close Fireproof.
	15	Closely Built-on Estates with Predominance of Non-Fire-Proof buildings Плотно застроенные кварталы с преобладанием неогнестойких строений	3013 3014	1; 15_3013_Close NonFireproof city 1; 15_3013_mask 2; 15_3014_Close NonFireproof 2; 15_3014_mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	1 2	Surface layer should be placed under layers 15_3013_Close NonFireproof city and 15_3014_Close NonFireproof. Слой поверхности (маска) должен располагаться под слоями 15_3013_Close NonFireproof city и 15_3014_Close NonFireproof.
	17 18 19	Scattered buildings or rarely built up estates in cities and other settlements Редко застроенные кварталы в городах и прочих населённых пунктах	3015	17_3015_Scattered buildings	On stroke. Задействованы операции над линией.	0.1	
	20	Wrecked and half-wrecked estates Разрушенные и полуразрушенные кварталы	3016	20_3016_Wrecked estates 20_3016_mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		Surface layer should be placed under layer 20_3016_Wrecked estates. Слой поверхности (маска) должен располагаться под слоем 20_3016_Wrecked estates.
	24	Suburban settlement estates with lots of trees Кварталы со множеством деревьев в поселках дачного и сельского типа	3017	24_3017_Suburban settlement est 24_3017_mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		Surface layer should be placed under layer 24_3017_Suburban settlement est. Слой поверхности (маска) должен располагаться под слоем 24_3017_Suburban settlement est.
	67	Meteorological Stations Метеорологические станции	3511	67_3511_Meteorological stations	On stroke, fill. Задействованы операции над линией. Нет операции над заливкой.	Brush 2.0	True position of this symbol is center of its triangle. Истинное положение данного символа - центр треугольника.
	69	Mosques Мечети	3520 3521	a, a; 69_3520_Mosques min b, б; 69_3521_Mosques act	On stroke, fill. Задействованы операции над линией. Нет операции над заливкой.	Brush a a 1.0 2.0 Minimum Size минимальный размер; б b Actual Size истинный размер	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	68	Churches Церкви, костелы, кирки	3522 3523	a, a; 68_3522_Churches min b, б; 68_3523_Churchs act	On fill. Задействованы операции над заливкой.	Brush a 1,5 Minimum Size минимальный размер; б Actual Size истинный размер	True position of this symbol is center of cross. Истинное положение данного символа - центр крестика.
		Schools Школы	3524 3525	an_sch a, a; 3524_school_mini b, б; 3525_school_act	On fill, text. Задействованы операции над заливкой и текстом.	a a школы 1.4 0.5x0.5 Minimum Size минимальный размер; б б школы Actual Size истинный размер	*Used font is BM 431 its point 6.2pt*. an_sch is layer for the annotation. *Используемый шрифт BM 431 6.2pt.* Слой an_sch - слой подписей.
		Hospitals Больницы	3531 3532	an_hosp a, a; 3531_hospial_mini b, б; 3532_hospial_act	On fill, text. Задействованы операции над заливкой и текстом.	a a 1.4 больнницы 0.5x0.5 Minimum Size минимальный размер; б б больнницы Actual Size истинный размер	*Used font is BM 431 its point 6.2pt*. an_hosp is layer for the annotation. *Используемый шрифт BM 431 6.2pt.* Слой an_hosp - слой подписей.
	38	Factories, plants and mills without pipes Заводы, фабрики и мельницы без труб	3547 3548	a, a; 38_3547_Plant without pipe min b, б; 38_3548_Plant without pipe act	On fill. Задействованы операции над заливкой.	Brush a a 0.5x0.5 2.0 Minimum Size минимальный размер; б б Actual Size истинный размер	Location of symbols priority is right side of the factory building. Символ располагается справа от главного здания завода (фабрики)

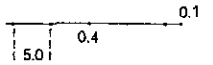
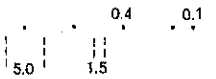
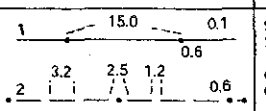
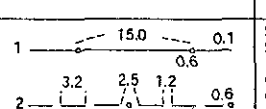
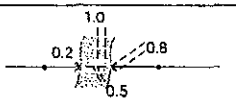
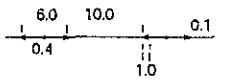
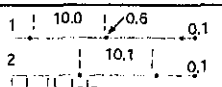
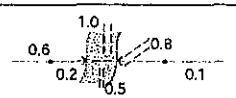
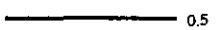
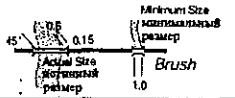
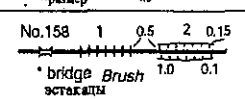
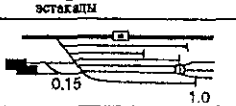
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Buildings and Other Structures Здания и прочие сооружения	48	Electric power stations Электростанции (ГЭС) (ГРЭС, ТЭЦ) и др.	3549	an_power sta 48_3549_Electric power stations	On stroke, fill, text. Задействованы операции над линией, заливкой, текстом		*Used font is Bm431 its point 6.2pt*, an_power sta is layer for the annotation. *Используемый шрифт Bm 431 6.2pt.* Слой an_power sta - слой подписей.
	51	Electric power substations (transformer and converter) Электроподстанции (трансформаторные и преобразовательные)	3551 3552 3553	an_substation a, a; 51_3551_transformer box b, б; 51_3552_converter substation c,в; 51_3553_substation act	On stroke, fill, text. Задействованы операции над линией, заливкой, текстом		*Used font is Bm431 its point 6.2pt*, an_substation is layer for the annotation. True position of transformer box symbol is center of its circle. *Используемый шрифт Bm 431 6.2pt.* Слой an_substation - слой подписей. Истинное положение символа трансформаторной будки - центр кружка.
	12	Ruined and half-ruined buildings Разрушенные и полуразрушенные строения, имеющие значение ориентиров	3585 3586	a, a; 12_3585_Ruined buildings min b, б; 12_3586_Ruined buildings act an_ruine	On stroke, text. Задействованы операции над линией и текстом		*Used font is Bm431 its point 6.2pt*, an_ruine is layer for the annotation. *Используемый шрифт Bm 431 6.2pt.* Слой an_ruine - слой подписей.
	219	Reservoirs Водохранилища	4226	185_4226_Reservoirs	On fill. Задействованы операции над заливкой.		
	52 53 54	Television, radio, radio relay aerial masts Теле-, радио- и радиорелейные мачты	4236	53_4236_TV towers	On stroke, fill. Задействованы операции над линией и заливкой.		True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	55	Airports Аэродромы	2701	55_2701_Airports	On stroke, fill. Задействованы операции над линией и заливкой.		
	89	Boundary for a lot space Лёгкие ограждения промышленных, сельскохозяйственных и социально-культурных объектов (деревянные заборы, изгороди, ограждения из колючей проволоки и т.п.)			On stroke. Задействованы операции над линией.		
	119	Auto transport parking areas on the highways and motorways with improved covering Стоянки автотранспорта на автомагистралях и автомобильных дорогах с усовершенствованным покрытием	6211	119_6211_Parking areas an_paking area	On stroke. Off fill. Задействованы операции над линией. Нет операций над заливкой.		*Used font is Bm431 its point 6.2pt*, an_paking area is layer for the annotation. *Используемый шрифт Bm 431 6.2 pt.* Слой an_paking area - слой подписей.
	11	Separately located yards Отдельно расположенные дворы, не выражающиеся в масштабе карты	6214	11_6214_Separate located yards	On stroke, fill. Задействованы операции над линией и заливкой.		True position of this symbol is center of solid rectangle. Истинное положение данного символа - центр внутреннего чёрного прямоугольника.

Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Buildings and Other Structures Здания и прочие сооружения	74	Cemeteries Кладбища	6215M 6215X 6215Q 6216M 6216X 6216Q	1; 74_6215_Cemeteries_M min 2; 74_6215_Cemeteries_X min 3; 74_6215_Cemeteries_Q min -1; 74_6216_Cemeteries_M act -2; 74_6216_Cemeteries_X act -3; 74_6216_Cemeteries_Q act 74_6216_mask	On stroke, fill. Off Green mask. Задействованы операции над линией и заливкой. Нет операций над зелёной маской.	a 1.2 1.6 2.4 3.2 1 2 3 *Brush* Minimum Size минимальный размер -1 Actual Size истинный размер b 3.0 0.6 -2 -3	Symbols + Is the Christian; Symbols ☽ is the Muslim; * Mixed symbols + ☽ is the Christian and the Muslim. b) cemeteries with closely located woodland; Символы: + христианское кладбище; ☽ мусульманское кладбище; Смешанные символы: +☽ христианское и мусульманское кладбища; б) кладбища с густой древесной растительностью; Surface layer should be placed under the 74_6216_Cemeteries. Слой поверхности (маска) должен находиться под слоем 74_6216_Cemeteries.
Topography Рельеф	229-4	Boundaries of glacier fields Границы фирновых полей	6235	229_6325_glacier fields	On stroke. Задействованы операции над линией.	0.6 0.3	
Buildings and Other Structures Здания и прочие сооружения	47	Petrol pumps and filling stations Бензоколонки и заправочные станции	3560	47_3560_Petrol pumps	On stroke, fill. Задействованы операции над линией и заливкой.	*Brush* 2.4 1.4 0.4	True position of this symbol is corner of its bottom line. Истинное положение данного символа - угол нижней линии.
Hydrography and its Structures Гидрография и гидросооружения	183	Artesian wells and drill holes Артезианские колодцы и артезианские скважины	4224	183_4224_Artesian wells	On fill. Задействованы операции над заливкой.	*Brush* 1.4	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
Buildings and Other Structures Здания и прочие сооружения	45	Oil,gas and other wells without derricks Нефтяные, газовые и др. скважины без вышек	4225	45_4225_Oil without derricks	On stroke, fill. Задействованы операции над линией и заливкой.	*Brush* 1.0	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	46	Fuel stores and gas holders Склады горючего и газгольдеры	4231	46_4231_Fuel stores	On stroke, fill. Задействованы операции над линией и заливкой.	*Brush* 1.6	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	57	Capital structures of Tower Type (water towers, etc.) Капитальные сооружения башенного типа (водонапорные башни и т.д.)	4232	57_4232_Tower type structures	On stroke, fill. Задействованы операции над линией и заливкой.	*Brush* 2.4	True position of this symbol is center of its bottom circle. Истинное положение данного символа - центр нижнего кружка.
Hydrography and its Structures Гидрография и гидросооружения	186	Water sources (springs, streams) Источники (ключи, родники)	4271	186_4271_Water sources	On fill. Задействованы операции над заливкой.	*Brush* 1.0	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	187	Equipped sources Оборудованные источники	4272	187_4272_Equipped sources	On stroke, fill. Задействованы операции над линией и заливкой.	*Brush* 1.0 2.0	True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	188	Geysers Гейзеры	4273	188_4273_Geysers	On fill. Задействованы операции над заливкой.	*Brush* 3.0 1.2	True position of this symbol is center of its bottom circle. Истинное положение данного символа - центр нижнего кружка.

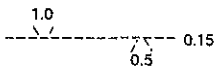
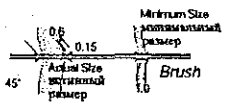
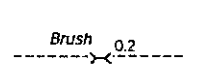
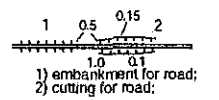
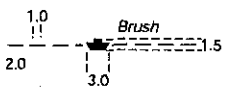
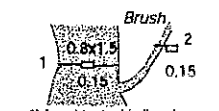
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Infrastructures Инфраструктура	76	Communication lines (telephone, telegraph,broadcasting) Линии связи (телефонные, телеграфные, радиотрансляции)	4131	76_4131_Communication lines	On strokes. Задействованы операции над линиями.		This symbol is shown by two kinds of objects which are dotted line and continued line. Данный символ показывается двумя типами объектов - пунктирной и непрерывной линиями.
	77	Subwater communication cables Подводные кабели связи	4132	77_4132_Subwater cables	On strokes. Задействованы операции над линиями.		This symbol is shown by two kinds of objects which are dotted line and dashed line. Данный символ показывается двумя типами объектов - пунктирной и штриховой линиями.
	81	Oil pipelines: 1) surface; 2) underground, subwater; Нефтепроводы: 1) наземные; 2) подземные, подводные;	4266 4276	1; 81_4266_Oil lines surface 2; 81_4276_Oil lines underground	On strokes. Задействованы операции над линиями.		Symbol No.1 is shown by two kinds of objects which are dotted line and continued line. Symbol No.2 is shown by two kinds of objects which are dotted line and dashed line. Символ №1 показывается двумя типами объектов - пунктирной и непрерывной линиями. Символ №2 показывается двумя типами объектов - пунктирной и штриховой линиями.
	82	Gas pipelines: 1) surface; 2) underground, subwater; Газопроводы: 1)наземные; 2)подземные, подводные;	4267 4277	1; 82_4267_Gas lines surface 2; 82_4277_Gas lines underground	On strokes. Задействованы операции над линиями.		Symbol No.1 is shown by two kinds of objects which are of circle object and continued line. Symbol No.2 is shown by two kinds of objects which are of circle object and dashed line. Символ №1 показывается двумя видами объектов - кружком и непрерывной линией. Символ №2 показывается двумя видами объектов - кружком и штриховой линией.
	85	Inverted siphons on oil and gas pipelines Дюкеры на линиях нефте- и газопроводов	****P	85_****_Invert siphon on line	On strokes. Задействованы операции над линиями.		Depending on the type of pipeline (i.e. oil or gas pipeline) layer name should be changed. В зависимости от типа трубопровода (т.е. нефтяной или газовый трубопровод) название слоя должно меняться.
	78	Electric transmission lines of less than 14m in height on wooden stands and iron concrete posts Линии электропередачи (ЛЭП) на деревянных опорах и железобетонных столбах высотой менее 14м	4265	78_4265_Power lines<14m	On strokes. Задействованы операции над линиями.		This symbol is shown by three kinds of objects which are arrow shape object and continued line and dotted line. Данный символ показывается тремя типами объектов - стреловидным объектом, непрерывной и пунктирной линиями.
Hydrography and its Structures Гидрография и гидросооружения	175	Water pipelines Водопроводы	4286 4287	175_4286_overland water pipe 175_4287_under water pipeline	On strokes. Задействованы операции над линиями.		Symbol No.1 is shown by two kinds of objects which are circle object and continued line. Symbol No.2 is shown by two kinds of objects which are circle object and dashed line. Символ №1 показывается двумя типами объектов - кружком и непрерывной линией. Символ №2 показывается двумя типами объектов - кружком и штриховой линией.
	176	Inverted siphons on the water pipelines Дюкеры на линиях водопроводов	4228	176_4288_Inverted siphons	On strokes. Задействованы операции над линиями.		
Railways Железные дороги	90	Railways Железные дороги	2301	90_2301_Railways	On stroke. Задействованы операции над линией.		
	158	Railway bridges Железнодорожные мосты	2301L	158_2301L_Railway bridges	On stroke. Задействованы операции над линией.		This symbol layer should be placed above layer 90_2301_Railways. Слой данного символа должен находиться над слоем 90_2301_Railways.
	100	Embankments and cuttings Насыпи и выемки	2301W 6108W	100_2301W_Embankments 100_6108_cuttings	On stroke. Задействованы операции над линией.		
	104	Railways siding, depots, turntables, railway stations Депо, вокзалы, станционные пути, выражающиеся в масштабе карты, поворотные круги	2310	104_2310_siding, etc.	On stroke. Задействованы операции над линией.		

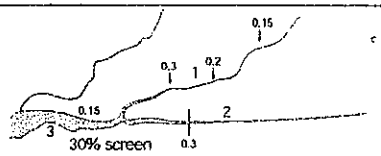
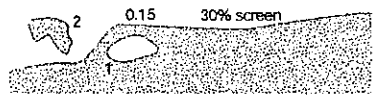
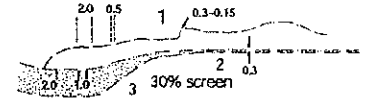
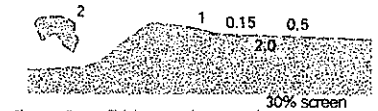
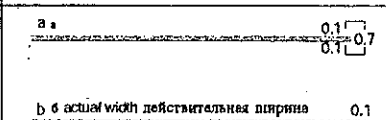
Brush; При работе с данными символами необходимо применять функцию " BRUSH".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Railways Железные дороги	96	Railway stations Станции железнодорожные	2421	96_2421_Railways stations	On stroke, fill. Задействованы операции над линией и заливкой.	2.0x1.2 Brush Minimum Size 0.15 минимальный размер	This symbol layer should be placed above the 90_2301_Railways layer. Слой данного символа должен наноситься над слоем 90_2301_Railways.
	103	Subway stations Линии метрополитена	2422	103_2422_Subway stations	On stroke, fill. Задействованы операции над линией и заливкой.	Brush Ⓜ 2.2	Under ground prats of subway are not expressed on the map. Подземные участки метрополитена на карте не выражаются.
Roads Дороги	105	Highways with more than two lanes per section Автомагистрали (автострады) с более чем 2-мя проезжими частями	2112	105_2112_Highway with per sect 105_2112_Highway Orange 105_2112_Highway bl	On strokes. Off orange line. Задействованы операции над линиями. Нет операций над оранжевой линией.	0.2 0.12 1.4 0.2	This symbol is shown by three kinds of objects which are center line, orange covered line, black fat line and for each type of line respective layer should be created: 105_2112_Highway with per sect, 105_2112_Highway Orange, 105_2112_Highway bl. Данный символ показывается тремя линиями - центральной, оранжевой и чёрной жирной. Для каждого типа линии должен быть создан соответствующий слой: 105_2112_Highway with per sect, 105_2112_Highway Orange, 105_2112_Highway bl.
	107	Motorways with covering Автомобильные дороги с покрытием (шоссе)	2113	107_2113_Motorways Orange 107_2113_Motorway bl	On strokes. Off orange line. Задействованы операции над линиями. Нет операций над оранжевой линией.	0.1 0.1 0.6	This symbol is shown by two kinds of lines which are orange covered line, black fat line and for each type of line respective layer should be created: 107_2113_Motorways Orange, 107_2113_Motorway bl. Данный символ показывается двумя линиями - оранжевой и чёрной жирной. Для каждого типа линии должен быть создан соответствующий слой: 107_2113_Motorways Orange, 107_2113_Motorway bl.
	108	Motorways without covering (improved country roads) Автомобильные дороги без покрытия (улучшенные грунтовые дороги)	2115	108_2115_Way w 108_2115_Way without cover bl	On strokes. Off white line. Задействованы операции над линиями. Нет операций над белой линией.	0.1 0.1 0.6	This symbol is shown by two kinds of lines which are orange covered line, black fat line and for each type of line respective layer should be created, 1108_2115_Way w, 108_2115_Way without cover bl. Данный символ показывается двумя линиями - оранжевой и чёрной жирной. Для каждого типа линии должен быть создан соответствующий слой: 1108_2115_Way w, 108_2115_Way without cover bl.
	110	Cart tracks Грунтовые проселочные дороги и труднопроезжие участки дорог	2116	110_2116_Cart tracks	On stroke, fill. Задействованы операции над линией и заливкой.	0.2	
	111	Forest and country roads Полевые и лесные дороги	2117	111_2117_Forest, country road	On stroke. Задействованы операции над линией.	3.0 0.15 0.5	
	16	Closely Built-on Parts of Estates, Streets Плотно застроенные части кварталов; улицы	1; 2101 2; 2122 3; 2121	1; 16_2101_actual width bl 1; 16_2101_actual width white 2; 16_2122_main streets w 2; 16_2122_main streets bl 3; 16_2121_other streets w 3; 16_2121_other streets bl	On stroke. Задействованы операции над линией.	1 0.1 2 0.8 3 0.5	Symbols No.2 and No.3 are shown by two kinds of lines which are white covered line, black fat line and for each type of line respective layer should be created, No2, is as 16_2122_main streets w, 16_2122_main streets bl, No3. Is as 16_2121_other streets w, 16_2121_other streets bl. For symbol No.1 polygon should be made and layers should be divided as: 16_2101_actual width white, 16_2101_actual width bl. Символы №2 и 3 показываются двумя видами линий - белой и чёрной жирной линией. Для каждого символа должен быть создан соответствующий слой: для №2: 16_2122_main streets w, 16_2122_main streets bl, для №3: 16_2121_other streets w, 16_2121_other streets bl. для №1 должен быть создан полигон и слои след. образом: 16_2101_actual width white, 16_2101_actual width bl.
	115	Roads under construction Строящиеся дороги	1; 2142 2; 2143 3; 2147	1; 115_2142_highway under sep 2; 115_2142_highway under_Orange 3; 115_2142_highway under_bl 1; 115_2143_covered under_Orange 2; 115_2143_covered under_bl 1; 115_2147_road under_w 2;115_2147_road under_bl		1 3.0 1.5 2 3	These symbols are shown by dashed lines combination. Descriptions for these symbols are the same as follows: for No.1 as for code 2112; for No.2 as for code 2113; for No.3 as for code 2115. Данные символы показываются в виде комбинации штриховых линий. Пояснения по слоям данных символов такое же как и в след. случаях: для №1 по тому же принципу, что и для кодового номера 2112; для №2 по тому же принципу, что и для кодового номера 2113; для №3 по тому же принципу, что и для кодового номера 2115.

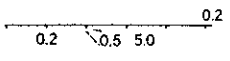
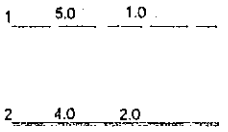
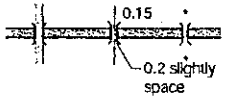
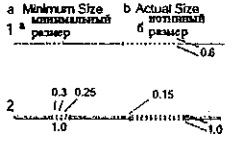
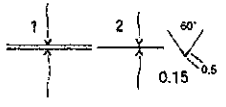
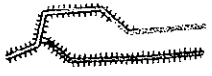
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Roads Дороги	114**	Pedestrian paths Пешеходные тропы	2131	114_2131_foot path	On stroke. Задействованы операции над линией.		
	157	Road bridges Мосты и путепроводы, не выражающиеся в масштабе карты	****B	157_****B_Road bridges	On stroke. Задействованы операции над линией.		This symbol layer should be placed above the 107_2113_Motorways Orange. **** means the road code No. For example, in case of the acrossing road code is as No. 2113 which bridge code No. is 2113B. Слой данного символа должен наноситься над слоем 107_2113_Motorways Orange. **** означает кодовый номер дороги. Например, в случае пересекающей дороги кодовый номер №2113, а если добавить B (мост), то результирующим номером будет №2113B.
	114*	Foot bridges Пешеходные мосты	****F	114_****F_foot path	On stroke. Задействованы операции над линией.		This symbol layer should be placed above the 1114_2131_foot path. **** means the road code No. For example, in case of the acrossing road code is as No. 2113 which foot bridge code No. is 2113F. Слой данного символа должен наноситься над слоем 1114_2131_foot path. **** означает кодовый номер дороги. Например, в случае пересекающей дороги кодовый номер №2113, а если добавить F (пешеходный мост), то результирующим номером будет №2113F.
	167	Dams passable Плотины проезжие	****R	167_****R_Dam passable	On stroke. Off orange line. Задействованы операции над линией. Нет операций над оранжевой линией.		This symbol layer should be placed above the roads symbols layer. **** means the road code No. For example, in case of the acrossing road code is as No. 2113 which dam code No. is 2113R. Слой данного символа должен наноситься под слоем символа дорог. **** означает кодовый номер дороги. Например, в случае пересекающей дороги кодовый номер №2113, а если добавить R (плотина), то результирующим номером будет №2113R.
	116	Embankments and cuttings for roads Насыпи и выемки на дорогах	****V 6180	116_****V_embankments for road 116_6108_cutting for road	On stroke. Задействованы операции над линией.		This symbol layer should be placed under the roads symbols layer. **** means the road code No. For example, in case of the road code is No. 2113 which embankment code is as No. is 2113V, in case of the road with embankment is along river or minimun size which the codes are 2113Y, actual size is 2113Z. Слой данного символа должен наноситься под слоем символа дорог. **** означает кодовый номер дороги. Например, в случае дороги кодовый номер №2113, а если добавить V (насыпь), то результирующим номером будет №2113V. В случае дороги по насыпи вдоль реки для минимального размера насыпи кодовый номер №2113Y, а в случае истинного размера №2113Z.
	190	Sea Ferries: railway ferry, car transportation ferry; Морские паромы: железнодорожный паром; авомобильный паром	5221	190_5221_railway ferry	On stroke, fill. Задействованы операции над линией и заливкой.		
	155	River Ferries Паромные переправы через реки	1; 5222 2; 5223	155_5222_River ferry (wide) 155_5224_River ferry (narrow)	On stroke. Задействованы операции над линией.		This symbol layer should be placed above the river line and its surface. Слой данного символа должен наноситься над слоями линии реки и её поверхности (маска).

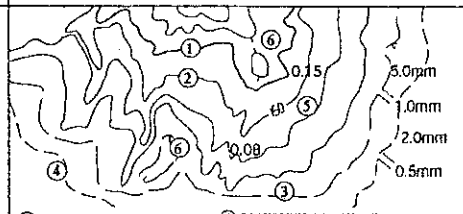
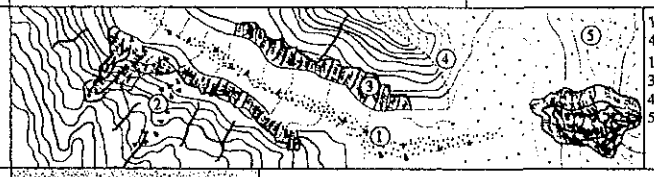
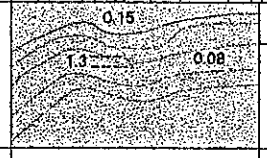
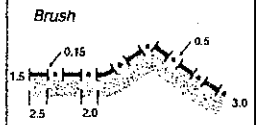
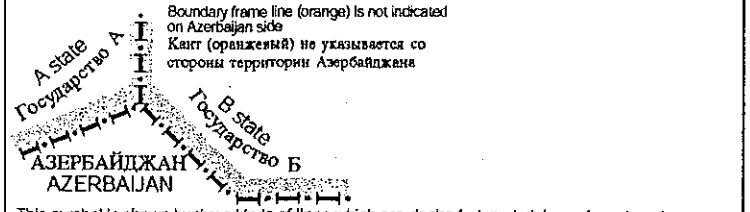
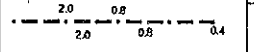
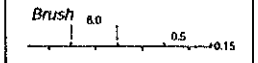
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Hydrography and its Structures Гидрография и гидросооружения	134	Permanent rivers and streams Реки и ручьи постоянные	1; 5101 2; 5102 3; 5103	1; 134_5101_streams < 5m 2; 134_5102_river from 5 to 30m 3; 134_5103_river over 30m river mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	 1) with a width of less than 5m; 1) шириной менее 5м; 2) with a wide of from 5 to 30m; 2) шириной от 5 до 30м; 3) with over 30m; 3) шириной более 30м.	River symbols of No.1 are shown by three kinds of lines which widths are 0.3mm, 0.2mm, and 0.15mm; 0.15 - head waters; 0.2 - main stream; 0.3 - lower reaches which are parts of connecting double line river. *These river symbols should be represented same as on the exsisting maps. The masks layer should be placed under its lines layer. Символы рек №1 выражаются тремя типами линий разной ширины: 0,3мм, 0,2мм и 0,15мм. 0,15мм - истоки; 0,2мм - основные течения; 0,3мм - низовья, выражающиеся двойной линией. *Данные символы рек должны представляться так же, как и на существующих картах. Слой с маской должен находиться под слоем линий.
	129	Coastal Line of seas, rivers, lakes, reservoirs, permanent and certain Береговая линия морей, рек, озер, водохранилищ постоянная и определенная	1; 5105 2; 5106	1; 129_5105_Coast lines 2; 129_5106_lake, pond, reservoir water mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	 1) coast lines ; 2) lakes, ponds, reservoirs ; 1) береговые линии; 2) озера, пруды, водохранилища	The masks layer should be placed under its lines layer. Слой с маской должен находиться под слоем линий.
	135	Rivers and streams that gets dry Реки и ручьи пересыхающие	1; 5111 2; 5112 3; 5113	1; 135_5111_dry stream < 5m 2; 135_5112_dry river 5 to 30m 3; 135_5113_dry river over 30m dry river mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	 1) indicated in one line; 2) indicated in double line; 1) указаны одинарной линией; 2) указаны двойной линией.	The masks layer should be placed under its lines layer. Слой с маской должен находиться под слоем линий.
	130	Coastal Line: 1) not permanent; 2) uncertain; Береговая линия: 1) Непостоянная; 2) неопределенная	1; 5115 2; 5116	1; 130_5115_uncertain coast line 2; 130_5116_uncertain lake, pond.. water mask	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	 1) coast lines ; 2) lakes, ponds, reservoirs ; 1) береговые линии; 2) озера, пруды, водохранилища	The masks layer should be placed under its lines layer. Слой с маской должен находиться под слоем линий.
	143	Canals and ditches with a width of less than 3m Каналы и канавы шириной менее 3м	5121	143_5121_Canal, ditch < 3m	On stroke. Задействованы операции над линией.		
	145	Canals and ditches with a width of 3m to 5m Каналы и канавы шириной от 3 до 5м	5122	canal_mask 145_5122_Canal, ditch 5 to15m	On strokes. Off light blue line. Задействованы операции над линиями. Нет операций над светлой голубой линией.		This symbol is shown by two kinds of lines which are light blue line, blue fat line and for each type of line respective layer should be created: canal_mask, 145_5122_Canal, ditch 5 to15m., 146_5123_Canal, ditch 15 to 30m., The masks layer should be placed above its lines layer. Данный символ выражается двумя типами линий: светлой голубой и жирной голубой. Для каждого типа линий должен быть создан соответствующий слой: 145_5122_Canal, ditch 5 to15m., 146_5123_Canal, ditch 15 to 30m. Слой с маской должен находиться над слоем линий.
	115	Canals and ditches with a width of 15m to 30m and over 30m Каналы и канавы шириной более 30м	a; 5123 b; 5124	canal_mask a; 146_5123_Canal, ditch 15 to 30m b; 146_5124_Canal, ditch over 30m	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	 a) double line canal width of 15m to 30m; b) double line canal width of over 30m; а) каналы шириной от 15 до 30м, изображаемые двойной линией; б) каналы шириной более 30м, изображаемые двойной линией.	The masks layer should be placed under its lines layer. Слой с маской должен находиться под слоем линий.

Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Hydrography and its Structures Гидрография и гидросооружения	149	Irrigation canals (aryks) Оросительные каналы (арыки)	5215	149_5125_Irrigation canals	On stroke. Задействованы операции над линией.		This symbol is shown by two kinds of lines which are dashed and continued line. Данный символ выражается двумя типами линий: штриховой и непрерывной.
	148	Canals under construction Строящиеся каналы	1; 5131 2; 5132	1; 148_5131_single under const canal_mask canal_white_mask 2; 148_5132_double under const	On strokes. Off light blue line. Задействованы операции над линиями. Нет операций над светлой голубой линией.		No.2 symbol is shown by three kinds of lines which are dashed, continued white line and continued blue fat line for each type of line respective layer should be created: canal_mask, canal_white_mask, 148_5132_double under const, The masks layer should be placed above the blue fat lines layer. Символ №2 выражается тремя типами линий: штриховой, непрерывной белой и непрерывной жирной голубой. Для каждого типа линий должен быть создан соответствующий слой: canal_mask, canal_white_mask, 148_5132_double under const. Слой с маской должен находиться над слоем жирной голубой линии. 1) single line canal with a width of less than 3m: 2) double line canal with a width of 3 to 15m: 1) каналы шириной менее 3м, изображаемые одинарной линией; 2) каналы шириной от 3 до 15м, изображаемые двойной линией.
	172	Aqueducts Акведуки	****A	172_****A_Aqueducts	On stroke. Задействованы операции над линией.		Depending on the type of overpassing objects layer name should be changed. This symbol layer should be placed above all kinds of road masks layer and this symbol cuts all kinds of road lines within the width of this symbol. В зависимости от типов пересекающих объектов должно меняться и название слоя. Слой данного символа должен находиться над слоем всех видов дорожных масок. Данный символ как бы разрезает все виды дорожных линий.
	147	Underground parts of canals Подземные участки каналов	1; ****S 2; ****U	147_5107_under.. single line 147_5108_under.. double line	On strokes. Off light blue line. Задействованы операции над линиями. Нет операций над светлой голубой линией.		Depending on the type of overpassing objects layer name should be changed. This symbol layer should be placed above all kinds of canal masks layer. В зависимости от типов пересекающих объектов должно меняться и название слоя. Слой данного символа должен находиться над слоем всех видов канальных масок. 1) single line canal a width of less than 3m: 2) double line canal with a width of 3 to 15m: 1) каналы шириной менее 3м, изображаемые одинарной линией; 2) каналы шириной от 3 до 15м, изображаемые двойной линии.
	156	Culverts; 1) for double line roads; 2) for single line cart track; Мосты через незначительные препятствия и трубы; 1) в случае дорог, выражаемых двойной линией; 2) в случае проселочных дорог, выражаемых одинарной линией	****C	156_5219_Culveerts	On stroke. Задействованы операции над линией.		1) for double line roads: 2) for single line cart track; In case if the canal doesn't cross the river, it's not necessary to represent the culvert symbols. 1) дорог, обозначаемых в две линии; 2) проселочных дорог; Если канал не пересекает реку, символ мостов через незначительные препятствия и труб не указывается.
	171	Watercourses (rivers, canals, and diches) on the embankment	****K	171_****K_Dikes	On strokes. Off light blue line. Задействованы операции над линиями. Нет операций над светлой голубой линией.		Depending on the type of canal layer name should be changed. В зависимости от типа канала должно меняться и название слоя.

Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Over print Оттиск наложения	Symbol Символ	Description Пояснение
Topography Рельеф	213	Contour Lines Горизонтали	1; 7101 2; 7102 3; 7103 4; 7104 5; 7104 6; 7110	1; 213_7101_Index contour 2; 213_7102_Regular contour 3; 213_7103_Add_contour 4; 213_7102_Sup contour 5; 213_8176_Cont vale. 6; 7110_Slope dir.	On stroke, fill Задействованы операции над линией, заливкой.	 ① index contour line; ① горизонтали основные утолщенные; ② regular contour line; ② горизонтали основные; ③ additional contour line; ③ горизонтали дополнительные (полугоризонтали); ④ supplementary contour line; ④ горизонтали вспомогательные (на произвольной высоте); ⑤ contour value; ⑤ подписи горизонталей в метрах; ⑥ indication of slopes direction (ticks); ⑧ указатели направления скатов (бергштрихи).	Must be represented as raster data Должно быть представлено в растровом виде If it's necessary to get vector contour line, one should use DXF data code No. В том случае, если необходимо получение векторных горизонталей, следует использовать кодовые номера DXF. *Used font is T132 its point 6pt* *Используемый шрифт T 132 6pt*
	229	Contour lines of Glaciers	7101G 7102G	229_7101G_Glacier_INDX_cont. 229_7102G_Glacier_pri._cont.	On stroke, fill Задействованы операции над линией, заливкой.		1) moraines; 2) stone rivers; 3) rocks and rocky cliffs; 4) boundaries of glacier fields; 5) glacier relief 1) морены; 2) каменные реки; 3) скалы и скалистые обрывы; 4) границы фирновых полей; 5) рельеф ледника
	201	Markings of the depths Отметки глубин	7112	201_7112_Isobaths 201_7112_Isobaths and signs	On stroke, fill Задействованы операции над линией, заливкой.		Description Пояснение *Used font is T132 its point 6pt* *Используемый шрифт T 132 6pt*
	310	State boundaries Границы государственные	1100	310_1100_State boundaries 310_1100_mask	On stroke. Задействованы операции над линией.		 Boundary frame line (orange) is not indicated on Azerbaijan side Кант (оранжевый) не указывается со стороны территории Азербайджана This symbol is shown by three kinds of lines which are dashed, dotted, ticky and continued orange fat line. For each type of line respective layer should be created: 310_1100_State boundaries, 310_1100_mask. The mask layer should be placed under the blue fat lines layer. Данный символ выражается четырьмя типами линий: штриховой, пунктирной, засечкообразной и оранжевой непрерывной жирной. Для каждого типа линий должен быть создан соответствующий слой: 310_1100_State boundaries, 310_1100_mask. Слой с маской должен находиться под слоем голубой жирной линии.
	314	Boundaries of regions Границы районов	1104	314_1104_Boundaries of regions	On stroke. Задействованы операции над линией.		This symbol is shown by two kinds of lines which are dashed and dotted. Данный символ выражается двумя типами линий: штриховой и пунктирной.
	315	Boundaries of national reservations Границы национальных заповедников	1111	315_1111_national reservations	On stroke. Задействованы операции над линией.		This symbol is shown by two kinds of lines which are dashed and continuous. Данный символ выражается двумя типами линий: штриховой и непрерывной.

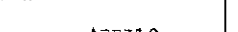
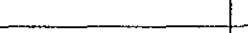
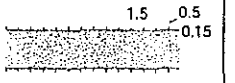
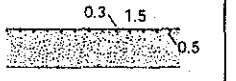
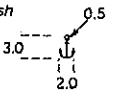
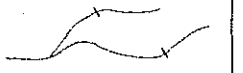
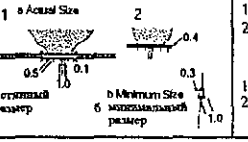
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Vegetation Растительный покров	238	Vegetation and ground boundaries Контуры растительного покрова и грунтов	6301	238_6301_boundaries	On stroke. Задействованы операции над линией.	0.5 0.25	
	264	Upland rice fields: 1) moisturized during vegetation; 2) submerged during vegetation. Рисовые поля: 1) увлажняемые в период вегетации; 2) затопляемые в период вегетации.	6311	264_6311_Upland rice fields	On stroke. Задействованы операции над линией.	Brush 2.2 1.2 2.2	
	267	Cane and reed thickets Камышовые и тростниковые заросли	6314	267_6314_Cane and reed thickets	On. fill Задействованы операции над заливкой.	Brush 0.9 0.9	
	269	1)Steppe (grassy) vegetation; 2)subshrubs 1)Степная (травянистая) растительность 2)полукустарники	6334	269_6334_Steppe vegetation	On. fill Задействованы операции над заливкой.	Brush 0.3 4.0 1.5 8.0	
	271	Impassable and almost impassable swamps Болота непроходимые и труднопроходимые	6337	271_6337_swamp	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		Used pattern is Az swamp (Swatches). Используемый макет Az swamp (из окна Swatches).
	271	Impassable and almost impassable swamps with vegetation Болота непроходимые и труднопроходимые с растительностью на них	6338	267_6314_Cane and reed thickets 271_6337_swamp	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	Brush	Used pattern is Az swamp. Используемый макет Az swamp (из окна Swatches).
	274	Passable salines Солончаки проходимые	6339	274_6339_Passable salines	On stroke. Задействованы операции над линией.		This symbol pattern should be represented as raster data. Данный макет символа должен представляться в растровом виде.
	239	Forests Леса	6360	239_6360_Forests	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		
	253	Bushes; dense brushwoods of bushes Кустарники; сплошные заросли.	6361	253_6361_Bush 253_6361_Bush mask	On stroke, fill. Off surface Задействованы операции над линией, заливкой. Нет операции над маской.	Brush 0.5 0.1 0.3	Each vegetation symbols should be treated by applying Overprint fill and Overprint stroke operations. In case of surface filling is off. При работе с каждым из символов растительности необходимо задействовать операции Overprint fill и Overprint stroke. В случае же маски операция над заливкой не задействована.
	253	Bushes; separate bushes and groups of bushes Кустарники; отдельные кусты и группы кустов	6362	253_6362_Bush	On stroke, fill. Задействованы операции над линией, заливкой.	Brush 0.5 0.1 0.3	Each vegetation symbols should be treated by applying Overprint fill and Overprint stroke operations. При работе с каждым из символов растительности необходимо задействовать операции Overprint fill и Overprint stroke.

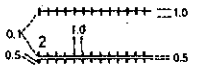
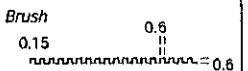
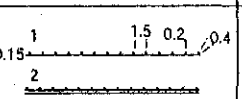
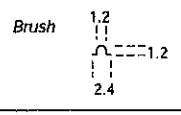
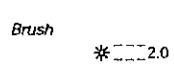
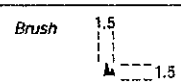
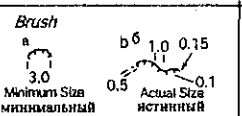
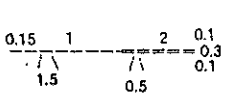
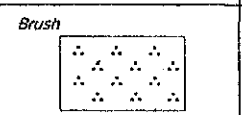
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Vegetation Растительный покров	250	*Thinly growing trees* **Редкие леса (редколесье)**	6363	250_6363_Thinly growing trees	On stroke. *Задействованы операции над линией.*	*Brush* 0.8 0.1	
	265	Plantations of industrial crops **Плантации технических культур**	6364	265_6364_Industrial crops 265_6364_mask	On stroke, fill. Off surface. Задействованы операции над линией, заливкой. Нет операции над маской.	*Brush* 1.2 2.2 2.2	Each vegetation symbols should be treated by applying Overprint fill and Overprint stroke operations. In case of surface filling is off. **При работе с каждым из символов растительности необходимо задействовать операции Overprint fill и Overprint stroke. В случае же маски операция над заливкой не задействована.**
	261	Fruit and citrous orchards ***Фруктовые и цитрусовые сады***	6366	261_6366_Fruit orchards 261_6366_mask	On stroke, fill. Off surface. Задействованы *операции над линией*, заливкой. Нет операции над маской.	*Brush* 2.2 2.2 0.5 0.1	Each vegetation symbols should be treated by applying Overprint fill and Overprint stroke operations. In case of surface filling is off. ***При работе с каждым из символов растительности необходимо задействовать операции Overprint fill и*** Overprint stroke. **В случае же маски операция над заливкой не задействована.**
	262	Vine yards **Виноградники**	6367	262_6367_Vine yards 262_6367_mask	On stroke, fill. Off surface. Задействованы операции над линией, заливкой. Нет операции над маской.	*Brush* 4.8 1.5 0.6 0.1	Each vegetation symbols should be treated by applying Overprint fill and Overprint stroke operations. In case of surface filling is off. **При работе с каждым из символов растительности необходимо задействовать операции Overprint fill и Overprint stroke. В случае же маски операция над заливкой не задействована.**
		Other open space **Другие открытые пространства**	6380D	6380D_open space			Area to be unable to be applied to any symbols and any polygon category. **Область, к которой невозможно применить какие-либо символы и какую-либо категорию полигонов.**
	241	Range of trees and protective afforestation **Узкие полосы леса и защитные лесонасаждения**	2238	241_2238_Range of trees	On stroke. Задействованы операции над линией.	*Brush* 2.5 0.5	If their length is less than 2cm, they shall be omited. **Полосы длиной менее 2м опускаются.**
	256	Narrow bush strips and green hedges **Узкие полосы кустарников и живые изгороди**	2239	256_2239_Narrow bush strips	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	*Brush* 0.5 0.1 0.3 2.8	If their length is less than 5mm, they shall be excluded. **Полосы длиной менее 5мм опускаются.**
Cartography and Others Картография и другое	72	Remarkable statues and monuments **Выдающиеся памятники и монументы**	4203	72_4203_Remarkable sutatues	On stroke. Задействованы операции над линией.	*Brush* 1.5	True position of this symbol is center of its bottom circle. **Истинное положение данного символа - центр нижнего кружка.**
	244	Isolated trees, reference marks **Отдельно стоящие деревья, имеющие значение ориентиров**	1; 4221 2; 4222	244_4221_trees: decidous 244_4222_trees: coniferous	On stroke. Задействованы операции над линией.	*Brush* 1 2 2.0	1) decidous; 2) coniferous **1) лиственные; 2) хвойные**
	59	Water Mills and Saw Mills **Водяные мельницы и лесопильни**	4239	59_4239_Water and Saw Mills	On stroke. Задействованы операции над линией.	*Brush* 2.0	True position of this symbol is center of its circle. **Истинное положение данного символа - центр кружка.**

Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	OXF Code OXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Cartography and Others Картография и прочее	204	Lights Огни	4241	204_4241_Lights	On fill. Задействованы операции над заливкой.	*Brush* 	True position of this symbol is center of its star. Истинное положение данного символа - центр звёздочки.
	142	Water gauge stations and foot gauges Водомерные посты и футштоки	4252	142_4252_Water gauge stations	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.	*Brush* 	True position of this symbol is center of its bottom line. Истинное положение данного символа - центр нижней линии.
	193	Moles and Moorages Молы и причалы	5209	193_5209_Moles and Moorages	On stroke. Задействованы операции над линией.		
	165	Reveted canal bank slopes Берега с укреплёнными откосами на каналах и канализированных участках рек	5215	165_5125_canal bank slopes	On stroke. Задействованы операции над линией.		
	166	Embankments Набережные	5216	166_5216_Embankments	On stroke. Задействованы операции над линией.		
	191	Anchored Stations and Docks Якорные стоянки и пристани без оборудованных причалов	5220	191_5220_Anchored Stations	On stroke. Задействованы операции над линией.	*Brush* 	True position of this symbol is bottom of two intercrossing lines. Истинное положение данного символа - нижняя часть пересечения двух линий.
	192	Docks with equipped moorages Пристани с оборудованными причалами, не выражающимися в масштабе карты	5225	an_doc 192_5225_Docks	On fill, text. Задействованы операции над заливкой и текстом.		*Used font is BM 431 its point 6.2pt* . an_doc is layer for the annotation. *Используемый шрифт BM 431 6.2pt.* Слой an_doc - слой подписей.
	137	Waterfalls and rapids: 1) large waterfall; 2) large rapids; Водопады и пороги: 1) большой водопад; 2) большой порог	5226	137_5226_Waterfalls, rapids	On stroke. Задействованы операции над линией.		
	140	Arrows to Indicate direction of flow, speed of rivers flow Стрелки, указывающие направление и скорость течения рек	5241	140_5241_Direction, speed	On stroke. Задействованы операции над линией.		0.2 - speed of flow in m/s 0.2 - скорость течения в м/с *Used font is T132 its point 6.0pt* . *Используемый шрифт T132 6.0pt* .
	167	Dams Плотины	5258 5257	1;167_****R_Dam passable 2; 167_5258_Dam b; 167_5257_Dam min	On stroke. Задействованы операции над линией.		1) vehicle passable; Refer to page 7 No.167 Dam passable 2) vehicle not passable: 1) проезжие; Относится к стр.7 №167 Плотины проезжие 2) непроезжие;

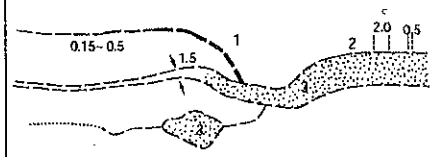
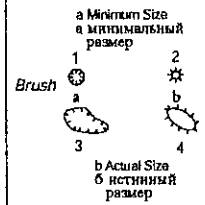
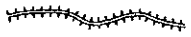
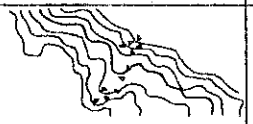
Brush: При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Cartography and Others Картография и другое	170	Dikes Дамбы	6101 ****Y 6102 ****Z	170_6101_Dike single line 170_6102_Dike double line	On stroke. Задействованы операции над линией.		****Y, ****Z refer to symbol No. 116. No.1 symbol is shown by two kinds of lines which are dashed line and continued line. *No.2 symbol layer should be placed under the roads symbols layer.* ****Y, ****Z относятся к символу №116. Символ №1 выражается двумя типами линий: штриховой и непрерывной. Слой символа №2 должен находиться под слоем символов дорог.
	87	Ancient Historical Walls Древние исторические стены	6140	87_6140_Historical Walls	On stroke. Задействованы операции над линией.		
	88	Stone, brick walls and Metal Fences Каменные, кирпичные стены и металлические ограды	6141	88_6141_Stone Wall, Metal Fence	On stroke. Задействованы операции над линией.		No.1 symbol is shown by two kinds of lines which are dashed line and continued line. In case of overlapping between road line and line of fences (or wall etc.), road line should be omitted. Символ №1 выражается двумя типами линий: штриховой и непрерывной. В случае, если линия дороги совмещена с линией стены или ограды, оставляется только одна линия ограды или стены.
	225	Cave and grotto entrances Входы в пещеры и гроты	7206	225_7206_Cave entrances	On stroke. Задействованы операции над линией.		True position of this symbol is center of its bottom line. Истинное положение данного символа - центр нижней линии.
	226	Volcano craters Кратеры вулканов	7208	226_7208_Volcano craters	On stroke. Задействованы операции над линией.		True position of this symbol is center of its circle. Истинное положение данного символа - центр кружка.
	220	Rock-remains Скалы-останцы	7209	220_7209_Rock remains	On fill. Задействованы операции над заливкой.		True position of this symbol is center of its bottom line. Истинное положение данного символа - центр нижней линии.
	221	Isolated stones; Отдельно лежащие камни	7215	221_7215_Isolated stones	On fill, stroke. Задействованы операции над заливкой, линией.		True position of this symbol is center of its bottom line. Истинное положение данного символа - центр нижней линии.
	40	Areas for out put of minerals by opencut operation (Quarries) Места добычи полезных ископаемых открытым способом (карьеры)	6231	40_6231_Quarries	On stroke. Задействованы операции над линией.		This symbol are shown by two kinds of lines which are dashed line and continued line. Данный символ выражается двумя типами линий: штриховой и непрерывной.
	152	Dry ditches Сухие канавы	1; 5141 2; 5142	1; 152_5141_Dry ditch (single) 2; 152_5142_Dry ditch (double)	On stroke. Задействованы операции над линией.		1) indicated in one line; 2) indicated in double line; This symbol are shown by two kinds of lines which are dashed line and fat continued white line. 1) указаны одинарной линией; 2) указаны двойной линией. Данный символ выражается двумя типами линий: штриховой и жирной белой непрерывной.
	279	Surfaces with hillocks Кочковатые поверхности	6348	279_6348_Surfaces with hillocks	On fill. Задействованы операции над заливкой.		

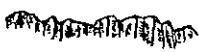
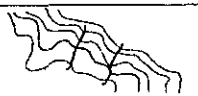
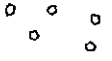
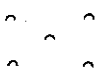
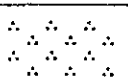
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol, Символ	Description Пояснение
Cartography and Others Картография и другое	275	Takhirs Такыры	6349	275_6349_Takhirs	On. fill. Задействованы операции над заливкой.	*Brush*	
		Houses, buildings Дома и здания		a, a; 9_3001_Houses, buildings min b, 6; 9_3004_Houses, buildings act	On. fill Задействованы операции над заливкой.	a a *Brush* 0.5x0.5 Minimum Size минимальный размер; b б Actual Size истинный размер	In case of the orange and yellow polygon areas, if these symbols have no secular changes they should be represented same as on the existing maps. В случае символов оранжевой и жёлтой полигональных областей и отсутствия периодических изменений, данные символы должны выражаться так же, как и и на существующих картах.
	Basically, brown color symbols (contour symbols) are not to be digitized and must be provided as raster image. However, in case of large secular changes they should be digitized. Code No.s for data and symbols are shown below. В целом, коричневые символы (символы рельефа) должны представляться в растровом виде. Однако, в случае крупных периодических изменений данные объекты подлежат дигитализации. Ниже приводятся кодовые номера данных и символов.						
	40	Areas for out put of minerals by opencut operation (Quarries) Места добычи полезных ископаемых открытым способом (карьеры)	6231	40_6231_Quarries	On. stroke. Задействованы операции над линией.	a a *Brush* 3.0 Minimum Size минимальный размер; b б 1.0 0.15 0.5 0.1 Actual Size истинный размер	This symbol is shown by two kinds of lines which are dashed line and continued line. Данный символ выражается двумя типами линий: штриховой и непрерывной.
	133-1	Steep slope Обрывистый участок	7203	133_7203_Steep	On. stroke. Задействованы операции над линией.	1.0 0.1 0.5	This symbol is shown by two kinds of lines which are dashed line and continued line. Данный символ выражается двумя типами линий: штриховой и непрерывной.
	220	Dry ditches Сухие канавы	1; 5241 2; 5242	1; 152_5141_Dry ditch (single) 2; 152_5142_Dry ditch (double)	On. stroke. Задействованы операции над линией.	0.15 1 2 0.1 0.3 0.1 1.5 0.5	1) indicated in one line; 2) indicated in double line; This symbol are shown by two kinds of lines which are dashed line and fat continued white line. 1) указаны одинарной линией; 2) указаны двойной линией. Данный символ выражается двумя типами линий: штриховой и жирной белой непрерывной.
	221	Beach barriers Береговой вал		133_0000_Beach barrier	On. fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	213	Contour Lines Горизонтали	1; 7101 2; 7102 3; 7103 4; 7104 5; 7104 6; 7110	1; 213_7101_Index contour 2; 213_7102_Regular contour 3; 213_7103_Add_contour 4; 213_7102_Sup contour 5; 213_8176_Cont vale. 6; 213_7110_Slope dir.	① 0.15 5.0mm; 50; ⑤ 1.0mm; ⑥ 0.08 2.0mm; ④ 0.5mm; ③ ① index contour line; ① горизонтали основные утолщенные; ② regular contour line; ② горизонтали основные; ③ additional contour line; ③ горизонтали дополнительные (полугоризонтали); ④ supplementary contour line; ④ горизонтали вспомогательные (на произвольной высоте); ⑤ contour value; ⑤ подписи горизонталей в метрах; ⑥ indication of slopes direction (ticks); ⑥ указатели направления скатов (бергштрихи).	Description Пояснение *Used font is T132 its point 6pt* *Используемый шрифт T 132 6pt*

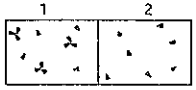
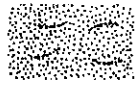
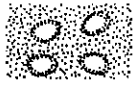
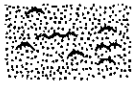
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Cartography and Others Картография и другое	214	Dry channels and hollows of dried-up lakes Сухие русла (узбои, вади и т.д.) и котловины высохших озёр	1; 5151 2; 5152 3; 5155	1; 214_5151_singl_Dry river 2; 214_5152_double_Dry river 3; 214_5155_Dry river mask	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	225	a) Pits; b) Hills and hillocks; а) ямы; б) курганы и бугры.	1; 7105 2; 7106 3; 7107 4; 7108	1; 222_7105_Pits 2; 222_7107_hill 3; 222_7106_Pits 4; 222_7108_hill	On stroke. Задействованы операции над линией.		Description Пояснение This symbol should be represented as raster data. These symbols are shown by two kinds of lines which are dashed line and continued line. Данный символ должен представляться в растровом виде. Данные символы выражаются двумя типами линий: штриховой и непрерывной.
	223	Coastal, historical swells etc. not represented by contour lines Валы береговые, исторические и др. не выражающиеся горизонталями.		223_0000_Historical swell, etc.	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	224	Karst and thermo-karst craters Карстовые и термокарстовые воронки, не выражающиеся в масштабе карты		224_0000_Karst craters	On stroke. Задействованы операции над линией.		This symbol are shown by two kinds of lines which are dotted line and continued line. Данный символ выражается двумя типами линий: пунктирной и непрерывной.
	227	Dikes and range of narrow rocky steeps Дайки и др.узкие крутостенные гряды из твердых пород		227_0000_narrow rocky steeps	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. This symbols are shown by two kinds of lines which are dashed line and continued line. Данный символ должен представляться в растровом виде. Данные символы выражаются двумя типами линий: штриховой и непрерывной.
	228	Rock-out crops Лавовые потоки		228_0000_Rock-out crops	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	229-1	Moraines Морены		229_0000_Moraines	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	229-2	Stone rivers Каменные реки		229_0000_Stone rivers	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.

Brush; При работе с данными символами необходимо применять функцию " *BRUSH* ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Buildings and Other Structures Здания и прочие сооружения	229-3	Rocks and rocky cliff Скалы и скалистые обрывы	7211	229_7211_cliff	On stroke, fill. Задействованы операции над линией, заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	229-11	Gullies Ложбины	5156	229_5156_Gullies	On stroke, fill. Задействованы операции над линией, заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	232	Debris of crisp rocks Осыпи рыхлых пород	7204	232_7204_Debris of crisp rocks	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	233	Debris of solid rocks Осыпи твердых пород		233_0000_Debris of solid rocks	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	235	Landslips Оползни		235_0000_Landslips	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	236	Gorges and water- eroded areas Овраги и промоины		236_0000_eroded areas	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	237	a) Slopes, b) solid benches on terraced slope sections а) Обрывы б) укрепленные уступы полей на террасированных участках склонов		237_0000_Slope, solid bench	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	275-b	Takhirs Такыры	6349	275_6349_Takhirs	On stroke, fill. Off surface. Задействованы операции над линией, заливкой. Нет операции над маской.		During treating of this symbol it needs to apply Overprint fill and Overprint stroke operations. In case of surface filling is off. При работе с данным символом необходимо задействовать операции Overprint fill и Overprint stroke. В случае же маски операция над заливкой не задействована.
	276	Polygonal surfaces Полигональные поверхности		276_0000_Polygonal surfaces	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	277	Surfaces with mounds Поверхности с буграми, не выражающимися в масштабе карты		277_0000_Surface with mounds	On stroke. Задействованы операции над линией.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	278	Clayey surfaces Глинистые поверхности		278_0000_Clayey surface	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	279	Surfaces with hillocks Кочковатые поверхности	6348	279_6348_Surfaces with hillocks	On fill. Задействованы операции над заливкой.	Brush 	This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.

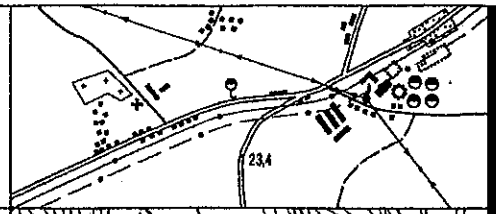
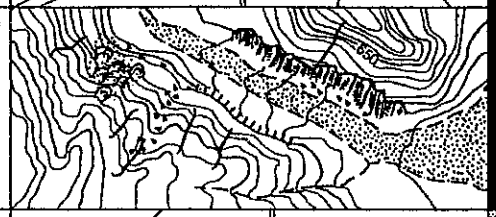
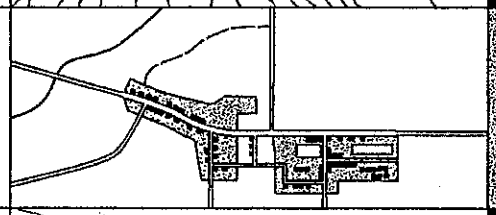
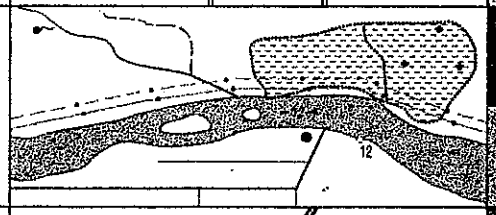
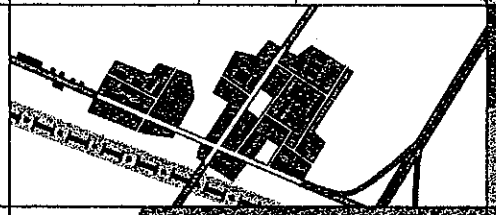
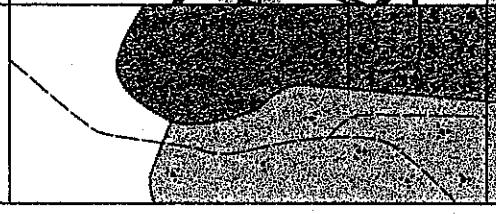
Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

ITEM Графа	No.	Name Наименование	DXF Code DXF Код	Layer name Название слоя	Overprint Оттиск наложения	Symbol Символ	Description Пояснение
Buildings and Other Structures Здания и прочие сооружения	280	Stone surfaces Каменистые поверхности	1; 6235 2; 6235	280_6235_Stone and detritus 280_6339_Stone surface	On fill. Задействованы операции над заливкой.		1) stone placers and detritus surfaces 2) stone surfaces 1) каменистые россыпи и щебеночные поверхности 2) каменистые поверхности This symbol should be represented as raster data. Данный символ должен представляться в растровом виде.
	281	Pebble and gravel surfaces Галечниковые и гравийные поверхности	6340	281_6340_Pebble and gravel	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	282	Plain sands Пески ровные	6341	282_6341_Plain sands	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	283	Mound sands Пески бугристые		283_0000_Mound sands	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	284	Ridge and dune sands Пески грядовые и дюнные		284_0000_Ridge and dune sands	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	285	Holey and cellular sands Пески лунковые и ячеистые		285_0000_Holey, cellular sands	On stroke. Off fill. Задействованы операции над линией. Нет операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).
	286	Barkhan sands Пески барханные		286_0000_Barkhan sands	On fill. Задействованы операции над заливкой.		This symbol should be represented as raster data. Used pattern is AZ sand (Swatches). Данный символ должен представляться в растровом виде. Используемый макет AZ sand (из окна Swatches).

Brush; При работе с данными символами необходимо применять функцию " BRUSH ".

SCALE of colours used in 6-coloured topographic maps printing

ШКАЛА цветов красок, применяемых для печати топографических карт в 6 красок

1	Black Чёрная		Outline. Useage color should be K 100 from the CMYK color separation. Контур
2	Brown Коричневая		Relief and related annotations. Useage color should be Az Brown from the Swatches. Рельеф и соответствующие подписи.
3	Yellow (pale) Жёлтая (расслабленная)		Blocks with predomination of non-fireproof buildings 1:50 000 scaled maps. Useage color should be AZ Yellow from the Swatches. Кварталы с преобладанием неогнеупорных зданий на картах масштаба 1:50 000.
4	Cyan Синяя		Hydrography and related annotations; eternal snows,glaciers, salines and swamps. Useage color should be C100 from from the CMYK color separation. Water expansions (30% stipple pattern with 150 lines/inch) Водные пространства (30% точечная сетка в 150 лин/дюйм)
5	Orange (pale) Оранжевая (расслабленная)		Blocks with predominance of fireproof buildings on 1:50 000 scaled maps. Useage color should be AZ Orange100 from the Swatches. Кварталы с преобладанием огнеупорных зданий на картах масштаба 1:50 000. State boundaries colouring (50% stipple pattern with 150 lines/inch). Окраска государственных границ (50% точечная сетка в 150 лин/дюйм).
6	Green		Forests and orchards. Useage color should be AZ forest100 from the Swatches. Площади лесов и садов. Dwarf vegetation (forest, brushwoods of bushes)- 50% stipple pattern with 150 lines/inch. Площади низкорослой растительности (лес, сплошные заросли кустарника) - 50% точечная сетка в 150 лин/дюйм.