ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 6, Issue 11 , November 2019

Topographical survey through geodetic measurements of ground and underground electric lines and regulation of land use in research area

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ABSTRACT: In recent years, due to the improvement of geodesy and cartography in relation with science and technology and other fields of production, there have been significant changes in designing and using maps. The essence of these changes is using the capabilities of modern computers to create a digital model of the area according to the cartographic data, and develop and implement orthophotoplans.

I. THE PURPOSE OF THE TOPIC

Geodesic work is vital in the development of production of the country. Satellite technology is relevant for geodetic needs. Since geoarea is considered as a basis for decision-making in government, also geodesy and mapping provides accurate information on the development of the country's infrastructure, the defense and security of the country, the navigation services and other areas of human activities.

At present in the Republic, large-scale measures are being taken to improve geodetic and cartographic determining agricultural land and residential area, as well as the recording of allocated land to electricity. In this field, the methods of using geodetic and cartographic GIS systems for land surveying are being improved.The Strategy of Actions of the Republic of Uzbekistan for 2017-2021 includes the following: «…It is important to pay special attention to the applying intensive methods, first of all, modern agro-technologies, which save water and land resources to agricultural production".[1]

The use of satellite technologies of geographic information systems is rapidly developing, navigational geodetic technologies and navigational electronic maps are being created. Taking into consideration of geodesy and mapping in ensuring economic and strategic security and increasing the consumption of topographic and geodesic products in new geo-economic conditions, developed countries of the world are giving great importance to the development of geodesy and mapping and providing substantial investment support. International experience enables us to see the application of geographic information systems and the development of geo-information systems, including important functional capabilities and geoareal information processing tools. [3]

Nowadays, the world's leading manufacturers of geodetic instruments are producing traditional optical instruments, modern optical-electronic devices (electronic tachometric stations and electronic digital nivelers (leveler), as well as geodesic satellite receivers such as NAVSTAR (GPS) and GLONASS (Russia).Therefore, satellite methods are now widely used in the CIS countries to directly determine the coordinates of terrestrial and peripheral spatial points. Determination of coordinates with autonomous methods relies on the GPS receiver data from space NSAY satellites.

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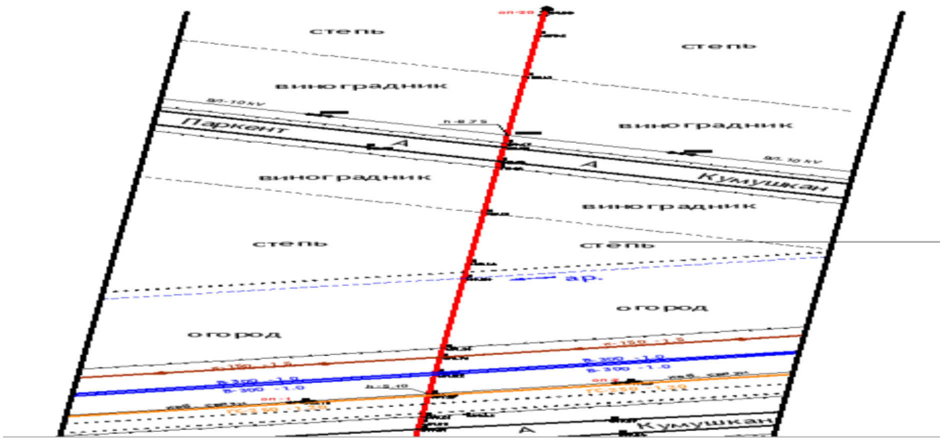
NSAY systems cover virtually all types of geodetic operations, ranging from state level geodetic networks to topographic surveys. Channels are used to receive signals. The 12-channel receiver is usually one-frequency, and the 24-channel receiver is two-frequency, which can receive GPS and GLONASS signals at each frequency .Up to 12 channels can be used to receive signals at a single frequency and can receive up to 12 satellites simultaneously. The total number of channels is distributed proportionally to the frequency or the number of usedsatellite systems.Two-frequency transmitters are more accurate than single-frequency transmitters as they are able to account for ionosphere correction.

Taking it into account, I did a topographic survey(with the help of topographic and geodetic measurements, fieldwork) of underground and overhead power lines from a high-voltage power station in the Parkent district of Tashkent region to a low-voltage power plant. I did my job based on study guides step by step.

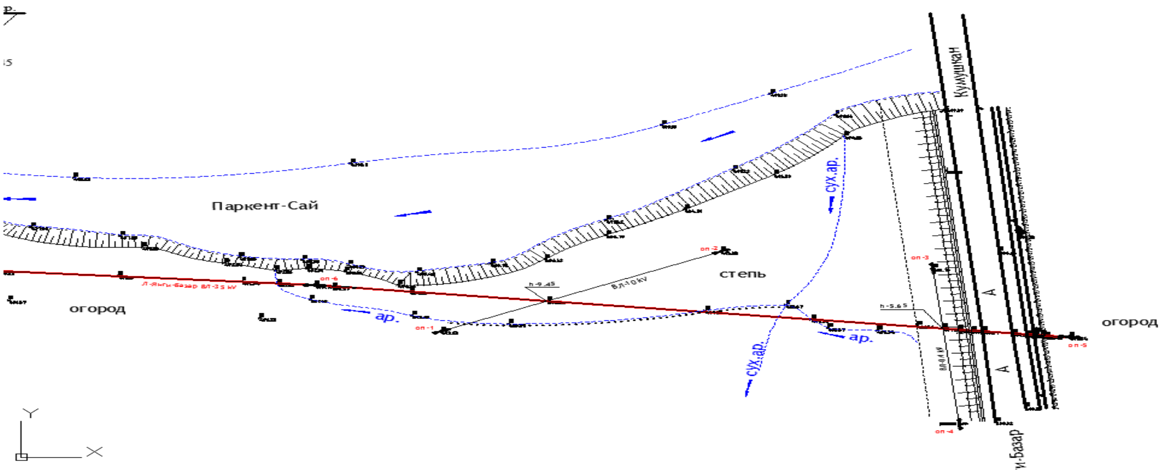
Before surveying of this project, researchers from different groups will study the environmental and economic aspects of the site and draw a route on the transmission line. Second, taking into account the total workload and voltages, residential and land areas are also included in this section.In the process of the work it is taken into account how many km the distance from the underground and how many kilometers it will pass over the land. The reason is that geodetic measurements are carried out based on the norms and rules established in the MAC and regulated by the Land Code. 1: 5000 scale.



II. TOPOGRAPHIC AND GEODETIC MEASUREMENTS ARE ON PAPER PROFILE DESCRIPTION.

The right choice of scale and geology is important in topographic and geodetic measurements. Scale is 1: 5000 for zones over 3 km and 1: 2000 for areas less than 3 km, 1: 500 or 1: 2000 for cable and a high voltage source. We will start topography and geodetic measurements with the Trimble M3, the usual light reflector, a 50-meter roulette and special uniform.

Figure 3 Illustration of profiles on paper by geodetic measurements from high-voltage power plants (substations) to low-voltage power plants.



The coordinate system is conditional and uses the Baltic Sea altitude system. The pictures are from the work process.
As we said earlier, the most important aspect of geology in topographic geodetic measurements is the geological survey of the studied area and the laboratory conclusions of geologists.All received works and conclusions will be analyzed and placed in a camera and submitted to the customer.

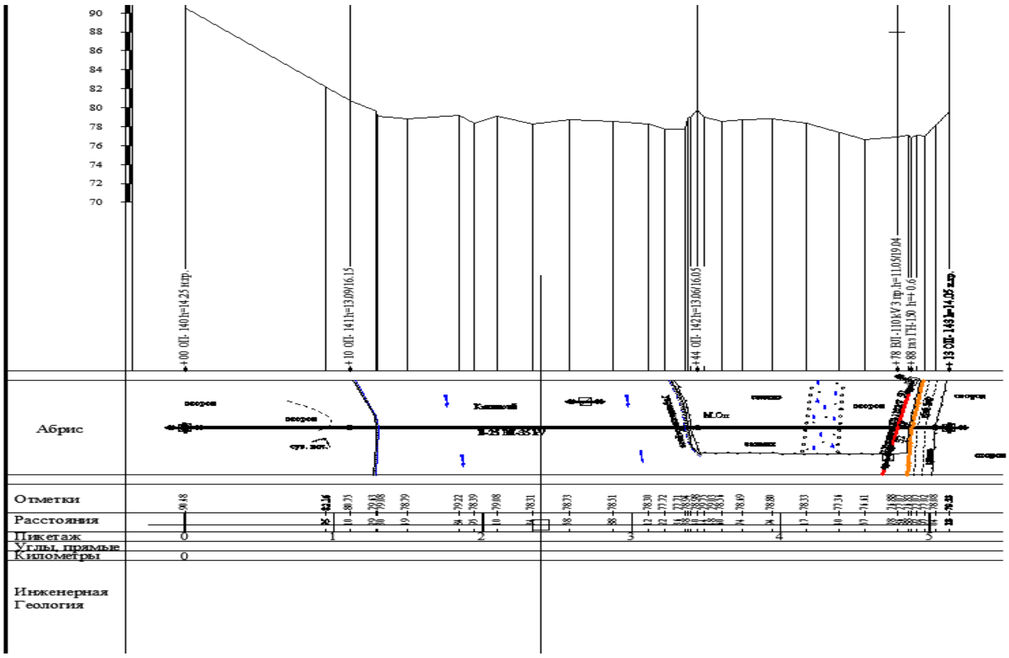


Figure 4 Topographic and geological profile.

ISSN: 2350-0328

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№ Station	Owner of the land	Stations		Name	Lengthmeters	Note
		start	Finish			
1	2	3	4	5	6	7
Moving station (point) №1 HV-110kV Line-Kiziltogpillar №149						
1		00+00	02+90	redstream	290	S.st
2		02+90	02+95	slope	5	
3		02+95	04+56	wateryland	161	
4		04+56	04+77	dry land	21	
5		04+77	06+11	farmland	134	F.st
					611	
Moving station (point) №3 HV-35kV L-25 Pillar №142 L=0,6						
1		00+00	00+95	farmland	129	S.st
2		00+95	01+29	wateryland	125	
3		01+29	01+30	slope	1	
4		01+30	03+36	stream	206	
5		03+36	03+38	slope	2	
6		03+38	04+17	wateryland	79	
7		04+17	04+40	dry land	23	
8		04+40	04+92	farmland	52	
9		04+92	04+97	farmland	5	
10		04+97	05+04	watery land	7	
11		05+04	05+13	farmland	9	F.st
					513	
Moving station (point) №4 HV-35kV(space) Line - Pillar №21 L=1						
1		00+00	00+32	unproductive land	32	S.st
2		00+32	00+68	vineyard	36	
3		00+68	00+75	asphalt	7	
4		00+75	01+01	vineyard	26	
5		01+01	01+33	unproductive land	32	
6		01+33	02+02	farmland	69	
7		02+02	02+09	watery land	7	
8		02+09	02+16	asphalt	7	
9		02+16	02+21	watery land	5	
10		02+21	02+45	farmland	24	
11		02+45	02+72	pilled land	27	
12		02+72	02+73	slope	1	
13		02+73	04+09	stream	136	
14		04+09	04+53	watery land	44	
15		04+53	04+96	jungle	43	
16		04+96	05+16	farmland	20	
17		05+16	07+22	unproductive land	206	F.st
					722	

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Moving station (point) №5 HV-35kVKumushkan (name of HV line) №125 L-0,5						
1		00+00	00+55	garden	55	S.st
2		00+55	00+96	stream	41	
3		00+96	01+20	watery land	24	
4		01+20	01+23	slope	3	
5		01+23	01+37	watery land	14	
6		01+37	01+42	slope	5	
7		01+42	01+52	watery land	10	
8		01+52	02+33	watery land	81	
9		02+33	02+51	slope	18	
10		02+51	02+54	slope	3	
11		02+54	02+89	watery land	35	
12		02+89	02+94	slope	5	
13		02+94	03+30	watery land	36	
14		03+30	03+40	slope	10	
15		03+40	03+54	watery land	14	
16		03+54	03+57	slope	3	
17		03+57	03+95	watery land	38	
18		03+95	04+12	pilled land	17	
19		04+12	04+52	vineyard	40	
20		04+52	05+01	vineyard	49	
21		05+01	05+07	vineyard	6	
22		05+07	05+19	farmland	12	F.st
					519	

Note: S.st – start station F.st – finish station Pillar №21 L=1 – pillar number and length HV -35-110 KV - to high voltage

II. CONCLUSION

In conclusion, it should be noted that in this article the relevance of satellite technologies for geodesy and mapping needs is highlighted.The geodetic measurements are made by the above mentioned leading manufacturers of geodetic instruments in the world to determine not only agricultural land, but also residential.As we mentioned above the most important aspect of geology in topographic geodetic measurements is the geological survey of the studied area and the laboratory conclusions of geologists.Land monitoring and the organization of proper land use and submission of annual reports are the most important issues in land use.

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