

საქართველოს რეგიონული განვითარებისა და
ინფრასტრუქტურის სამინისტროს
საავტომობილო გზების დეპარტამენტი
ა. ყაზბეგის გამზ. 12, 0160, თბილისი, საქართველო

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Rehabilitation-reconstruction works of Baghdati-Abastumani section of secondary significance Kutaisi (Saghoria)-Baghdati-Abastumani-Benara automobile road

Final Design Report

Lot V

Rehabilitation works for Km17-Km26 of Kakaskhidi-Zekari secondary road

Volume I

Explanatory note, Bills

Tbilisi 2018

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Explanatory Note

Introduction

Kakaskhidi - Zekari km17-km33 section of Kutaisi(Saghoria)-Baghdati-Abastumani-Benara secondary road includes two parts I - 8.8km and II - 7.2km. The design is elaborated by the Georgian branch of JSC Institute IGH. The purpose of the project is to prepare detailed design documentation for rehabilitation of this section.

Field Topographic Survey

The topographic survey of the road section is conducted with Lidar system, which is developed by the Georgian branch of JSC Institute IGH.

The plan show such situationasl elements as the : situation, existing artificial structures, etc.

Topogeodetic works are shown in UTM (WGS84) coordination system.

The design documentation is developed on the basis of the survey materials with the use of ROBUR-8.3 automated designing system and AutoCAD graphical program.

Part I

Description of Existing Road

Section of design road goes through unpopulated forest zone, and its second part in alpine zone. The site is located at approximately 1700-2100 m.a.s.l.

Subgrade in a design section is solid, the deformations and settlings aren't observed. . Road bed is quite narrow in some sections and its width varies from 3.0m to 4.5m. Exisging pavement on a design section is local soil. There are washed and furrowed zones by surface waters on some places of a design road. Pipes are inoperable and do not ensure the drainage of surface waters from a subgrade

Main Design Solutions

Within the frameworks of the possibilities during designing the right-of-way of existing road is used maximally, but due to narrowness of existing roadbed, the design roadbed requires widening, in such areas the design width of a road is achieved mainly with slopes' cutting on the left and right sides.

The length of rehabilitation section is 8751,41 m.

Based on a terrain and other factors of existing road, various turning angles are used on a plan of a design road, which are staked out with different value radii, out of which the minimal radius is 10m.

The design shows the sheet for turning angles, straights and curves with angle tip coordinates, as well as the parameters of a design transversal profile and coordinates.

During planning of longitudinal profile, the terrain-geological conditions of the existing road as well as the condition of existing roadbed have been taken into consideration.

A design line is arranged based on the structural thickness of a design pavement also with meeting vertical radii parameters as far as possible, for this reason the cuts and fills are observed on a longitudinal profile.

Maximum longitudinal slope is 10%, minimum radius of a vertical outward curve is 800m, inward curve – 1000m.

Longitudinal profile is arranged with absolute benchmarks. Existing and design benchmarks of a longitudinal profile belongs to a design road axis benchmarks.

Roadbed

Design roadbed is designed according to the requirement of typical design solution and with taking into consideration the existing condition.

Roadbed width in a design is 8 m. As the existing roadbed is quite narrow in certain areas, the design width is achieved with slopes' cutting. Also the construction of the walls is foreseen.

Design Artificial Structures

Different type artificial structures are used for the operation of a design road:

With the purpose to drain water from a carriageway 39 r/c round pipe $d=1.0\text{m}$, and 5 r/c rectangular pipes will be arranged on 44 chainages. The locations and volumes of the works are shown in relevant sheets.

For the purpose to maintain the carriageway parameters on certain section of a road, the lower support r/c and Gabion walls will be arranged. The drawings and volumes of works are shown in the design documentaion.

Road Pavement

The design foresees the followint road pavement structure:

- Subbase - with sand-gravel mixture, fraction 0-120mm, thickness 25 cm
- Crushed stone, fraction 0-40 mm, thickness 18 cm
- Coarse grained porous crushed stone asphalt concrete hot mixture, Mark II, thickness 6 cm
- Fine grained crushed stone asphalt concrete hot mixture, Type B, Mark II, thickness 4cm
- Shoulder fill with sand-gravel mixture, fraction 0-70mm

Road pavement structure and volumes of the works are shown on relevant drawing and sheet.

Part II

Main Design Solutions

Within the frameworks of the possibilities during designing the right-of-way of existing road is used maximally, but due to narrowness of existing roadbed, the design roadbed requires widening, in such areas the design width of a road is achieved mainly with slopes'. cutting on the left and right sides

The length of rehabilitation section is 7239,25 m.

Based on a terrain and other factors of existing road, various turning angles are used on a plan of a design road, which are staked out with different value radii, out of which the minimal radius is 10m.

The design shows the sheet for turning angles, straights and curves with angle tip coordinates, as well as the parameters of a design transversal profile and coordinates.

During planning of longitudinal profile, the terrain-geological conditions of the existing road as well as the condition of existing roadbed have been taken into consideration.

A design line is arranged based on the structural thickness of a design pavement also with meeting vertical radii parameters as far as possible, for this reason the cuts and fills are observed on a longitudinal profile.

Maximum longitudinal slope is 9%, minimum radius of a vertical outward curve is 1000m, inward curve – 1000m.

Longitudinal profile is arranged with absolute benchmarks. Existing and design benchmarks of a longitudinal profile belong to a design road axis benchmarks.

Roadbed

Design roadbed is designed according to the requirement of typical design solution and with taking into consideration the existing condition.

Roadbed width in a design is 6.5 m. As the existing roadbed is quite narrow in certain areas, the design width is achieved with slopes' cutting. Also the construction of the walls is foreseen.

Design Artificial Structures

Different type artificial structures are used for the operation of a design road:

With the purpose to drain water from a carriageway $d=1.0\text{m}$ r/c round s are arranged on 39 chainages, 13 units 1X 1,5 r/c rectangular pipes and 4X 2,5 on ch2+94. The locations and volumes of the works are shown in relevant sheets.

For the purpose to maintain the carriageway parameters on ch2+16 - ch2+74; ch2+66 - ch3+16, the lower support r/c walls will be arranged. The drawings and volumes of the works are shown in the design documentaion.

Road Pavement

As we mentioned in the previous chapter, the design section is the tunnel bypass road. Its design pavement is arranged with local crushed stone material, the area of the pavement – 47148m². During designing of the road pavement the condition of existing road pavement, roadbed parameters, terrain, natural conditions, post-construction operation and maintenance conditions are taken into consideration.

Based on all of these the following type road pavement is selected:

- Pavement layer – local crushed stone material, fraction 0-40 mm, thickness 25cm

Road pavement structure and the volume of the works are shown on the relevant drawing and in a sheet.

Natural Conditions of the Region

Engineering-geological survey has been conducted in 2017 for the rehabilitation design of Kutaisi (Saghoria) -Baghdati-Abastumani-Benara road. The engineering-geological survey of the road has been conducted based on visual inspection and the use of dug pit method.

The structure of the carriageway of existing road was studied, as well as the previous geological survey materials and the brief description of natural and geological conditions has been made. Engineering-geological survey is presented in separate volume.

Climatic data of the survey area are taken from the climatological construction code PN01.05-08, according to the data of Abastumani Meteo Station, the nearest station of the design area. With the value of 0.12, maximum horizontal acceleration (non-dimentional seismicity coefficient) according to the "Seismomedegi Mshenebloba" PN01.01-09 normative document, currently in force in Georgia.

Traffic Organization and Safety

For ensuring safety traffic movement and complete orientation of the drivers, the installation of traffic signs and marking of a carriageway are foreseen

Traffic Signs

The desing foresses the arrangement of standard traffic signs of I typical size. The production and installation of traffic signs should be accomplished according to the requirements of ΓOCT P 52289-2004, ΓOCT P 52290-2004, ΓOCT 14918-80 standards and the Georgian law on “Traffic Safety”-2013.

Standard traffic signs’ supports will be arranged with zinc galvanized metal profile with the thickness of 0,8-1,2mm .

All images on the board should be covered with high intensity prismatic-optical system “IV” class adhesive file, with the use of application method and primary pressing on a plotter. The shield should meet EN 12899 or ASTM D4956-13 standards.

Supports for constant traffic signs should be galvanized according to BS EN 873 standard requirements; Support should be tubelike or rectangular according to BS EN 10210 standard requirements.

Road Barriers

Road barriers are arranged according to the requirements of ΓOCT 52289-2004, ΓOCT 52607-2006, ΓOCT 52721-2007 or EN 1317-(1-5) standards

Organization of Rehabilitation Works

Introduction

Road reconstruction works should be carried out with meeting valid standards, norms, instruction and recommendations.

Work accomplishment technological schemes are typical. Works should be carried out according to design specifications.

In order to maximize labor productivity and minimize the duration of construction, works should be carried out through complex mechanisms and specialized production teams, using modern methods and forms of labor organization.

Preparatory Works

Prior to construction and rehabilitation works the organizational-technical and industrial-economic training should be carried out for creating optimal conditions and performing high quality work.

During preparatory period the works will start for ensuring working front: route restoration and fixing, cutting and unrooting of bushes (along a road)

Roadbed

Mainly different height cuts should be processed and low height fill should be arranged in narrow areas of roadbed. Arrangement of fills are foreseen with processed rocky soil. Fill should be arranged layer-by-layer on the whole width of a roadbed, from edges toward center with ramming using vibro-rammer, 6 repetitions on one section. Processing of the cuts should be arranged with horizontal layers on the whole length. The soil of a cut should be transported to a dumpsite.

Arrangement of Road Pavement

After the completion of the works on roadbed the rehabilitations works of the road pavement should be accomplished.

For the arrangement of a pavement the needed amount of local rocky soil, fraction 0-40mm, processed through locally installed cutting device, should be delivered (with taking into account the ramming coefficient). It should be placed on the rehabilitation section and profiled with auto-grader.

Compaction should be accomplished with smooth drum roller from edges towards a center with covering 1/3 of previous ramming trace. Repetitions of ramming should be defined locally with testing ramming. Indicator of final ramming is when a trace of a rammer isn't visible and wave isn't observed.

Labor Protection and Safety Techniques

It is necessary to meet the acting rules, norms and instructions of safety techniques, industrial sanitary and fire-safety, as well as providing all workers with these information. Before start of a work a construction organization should give instructions regarding safety techniques, conduct safety training.

The road vehicles should turn with small radius, should have operable sound alarm and lights, reliable brakes and anchors. Parking areas of vehicles should be fenced with barriers and arranged with red stop signals during daylight and with red signal lights during night.

Road workers should have individual protective (special cloths, boots, etc.) means, also the collective safety measures should be ensured (fencing of working areas, safety measures).

The shelter, protecting from rain and sun radiation should be ensured as well.

The construction organization is responsible and obliged to provide the safety, labor and industrial sanitary rules' protection.















Turning Angles, Straights and Curves
Road: Kakaskhidi-Zekari km17-km33, Part 1

Angle #	Angle Tip	Turning Angle		Element of Circular and Transient Curves							Chainage of the Elements					Distance between angle tips	Distance of Straight, m	Coordinates	
	Ch+			R	L1	L2	T1	T2	K	Б	Д	T.C.S. Ch+	C.C.S. Ch+	C.C.E. Ch+	T.C.E. Ch+				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Route Start	0+00.00		0°0'0"													29,31	18,13	4637103,450	323979,780
AT1	0+29.31		12°45'34"	100	0,00	0,00	11,18	11,18	22,27	0,62	0,09	0+18.13	0+18.13	0+40.40	0+40.40			4637088,890	323954,340
AT2	1+32.88	95°6'51"		15	15,00	0,00	23,90	17,02	32,40	7,69	8,52	1+08.98	1+23.98	1+41.38	1+41.38	103,66	68,58	4637058,530	323855,230
AT3	1+56.64	88°25'9"		15	0,00	15,00	15,21	22,01	30,65	4,69	6,58	1+41.42	1+41.42	1+57.07	1+72.07	32,28	0,04	4637028,630	323867,400
AT4	2+26.82		16°38'57"	100	0,00	0,00	14,63	14,63	29,06	1,06	0,21	2+12.19	2+12.19	2+41.24	2+41.24	76,76	40,11	4637055,600	323939,260
AT5	2+72.33	31°12'47"		60	20,00	20,00	26,83	26,83	52,69	2,58	0,97	2+45.50	2+65.50	2+78.19	2+98.19	45,72	4,26	4637058,720	323984,880
AT6	3+24.95		96°9'31"	15	15,00	0,00	24,21	17,33	32,67	7,92	8,86	3+00.74	3+15.74	3+33.41	3+33.41	53,59	2,55	4637089,550	324028,700
AT7	3+53.90		105°49'9"	15	0,00	15,00	20,48	27,45	35,20	8,38	12,73	3+33.41	3+33.41	3+53.62	3+68.62	37,82	0,00	4637056,470	324047,020
AT8	4+20.14	20°53'39"		100	0,00	0,00	18,44	18,44	36,47	1,69	0,41	4+01.70	4+01.70	4+38.16	4+38.16	78,97	33,08	4637038,500	323970,120
AT9	4+54.85		8°14'3"	100	0,00	0,00	7,20	7,20	14,37	0,26	0,02	4+47.66	4+47.66	4+62.03	4+62.03	35,13	9,49	4637018,830	323941,010
AT10	5+22.75	66°50'0"		30	15,00	10,00	27,30	25,07	47,49	6,38	4,87	4+95.45	5+10.45	5+32.94	5+42.94	67,92	33,42	4636989,260	323879,870
AT11	5+59.17		38°0'21"	30	10,00	15,00	15,66	17,64	32,40	1,75	0,90	5+43.52	5+53.52	5+60.92	5+75.92	41,30	0,57	4636948,010	323881,780
AT12	6+12.97		27°24'28"	100	0,00	0,00	24,38	24,38	47,84	2,93	0,93	5+88.58	5+88.58	6+36.42	6+36.42	54,69	12,67	4636903,400	323850,130
AT13	7+08.03	122°55'35"		30	15,00	15,00	63,23	63,23	79,36	33,45	47,09	6+44.80	6+59.80	7+09.16	7+24.16	95,99	8,38	4636859,480	323764,780
AT14	9+07.71		126°35'56"	25	20,00	20,00	60,97	60,97	75,24	32,11	46,70	8+46.74	8+66.74	9+01.98	9+21.98	246,77	122,58	4636736,680	323978,830
AT15	9+54.13	45°23'7"		50	20,00	20,00	31,03	31,03	59,61	4,56	2,46	9+23.10	9+43.10	9+62.71	9+82.71	93,12	1,12	4636699,460	323893,470
AT16	10+15.20	33°37'5"		80	15,00	15,00	31,70	31,70	61,94	3,69	1,46	9+83.50	9+98.50	10+30.44	10+45.44	63,52	0,79	4636640,180	323870,650
AT17	10+88.72	28°21'32"		60	20,00	20,00	25,22	25,22	49,70	2,17	0,74	10+63.50	10+83.50	10+93.20	11+13.20	74,99	18,07	4636566,980	323886,960
AT18	11+59.50		56°14'53"	55	30,00	30,00	44,72	44,72	83,99	8,13	5,45	11+14.78	11+44.78	11+68.77	11+98.77	71,52	1,58	4636512,940	323933,810
AT19	12+32.98	36°15'35"		30	15,00	15,00	17,41	17,41	33,99	1,90	0,83	12+15.57	12+30.57	12+34.56	12+49.56	78,93	16,80	4636436,820	323912,940
AT20	12+82.35		79°3'9"	30	15,00	15,00	32,49	32,49	56,39	9,30	8,60	12+49.85	12+64.85	12+91.24	13+06.24	50,20	0,29	4636389,930	323930,880

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AT21	13+52.34	99°47'22"		30	15,00	15,00	43,47	43,47	67,25	17,05	19,70	13+08.86	13+23.86	13+61.11	13+76.11	78,59	2,62	4636348,420	323864,150
AT22	13+96.29		37°5'41"	30	15,00	15,00	17,65	17,65	34,42	1,97	0,89	13+78.64	13+93.64	13+98.06	14+13.06	63,65	2,52	4636300,880	323906,470
AT23	14+35.86		12°11'24"	100	20,00	20,00	20,69	20,69	41,28	0,74	0,11	14+15.17	14+35.17	14+36.45	14+56.45	40,46	2,11	4636260,550	323909,690
AT24	14+93.44		56°50'56"	15	15,00	10,00	15,48	13,66	27,38	2,88	1,76	14+77.95	14+92.95	14+95.34	15+05.34	57,68	21,51	4636203,380	323902,050
AT25	15+44.04		116°37'22"	15	0,00	15,00	24,99	32,05	38,03	11,83	19,01	15+19.05	15+19.05	15+42.08	15+57.08	52,36	13,71	4636180,800	323854,810
AT26	16+08.26	42°14'47"		40	15,00	15,00	23,04	23,04	44,49	3,13	1,58	15+85.22	16+00.22	16+14.72	16+29.72	83,23	28,15	4636264,010	323856,380
AT27	16+69.53		43°13'2"	20	15,00	15,00	15,57	15,57	30,09	2,01	1,06	16+53.96	16+68.96	16+69.04	16+84.04	62,85	24,24	4636311,330	323815,020
AT28	17+17.97	95°3'50"		15	15,00	0,00	23,88	17,01	32,39	7,68	8,50	16+94.09	17+09.09	17+26.48	17+26.48	49,50	10,04	4636360,800	323816,790
AT29	17+47.67	107°41'20"		15	0	15	21,18	28,16	35,69	8,9	13,65	17+26.49	17+26.49	17+47.18	17+62.18	38,2	0,01	4636358,790	323778,640
AT30	17+98.86	13°41'23"		100	0	0	12	12	23,89	0,72	0,11	17+86.86	17+86.86	18+10.75	18+10.75	64,84	24,68	4636298,130	323801,560
AT31	18+48.72		24°15'52"	50	15	15	18,28	18,28	36,17	1,33	0,39	18+30.44	18+45.44	18+51.61	18+66.61	49,97	19,68	4636256,890	323829,780
AT32	18+91.88		27°8'32"	55	15	15	20,81	20,81	41,05	1,75	0,57	18+71.07	18+86.07	18+97.12	19+12.12	43,55	4,45	4636214,020	323837,440
AT33	19+47.09		94°30'58"	15	15	0	23,72	16,85	32,24	7,56	8,33	19+23.37	19+38.37	19+55.62	19+55.62	55,79	11,25	4636160,680	323821,110
AT34	19+78.82		112°40'6"	15	0	15	23,19	30,22	37	10,43	16,41	19+55.63	19+55.63	19+77.62	19+92.62	40,05	0,01	4636175,380	323783,850
AT35	20+22.02	85°34'32"		20	15	15	26,41	26,41	44,87	7,89	7,95	19+95.61	20+10.61	20+25.49	20+40.49	59,62	2,99	4636218,120	323825,420
AT36	20+62.30		6°58'2"	250	0	0	15,22	15,22	30,4	0,46	0,04	20+47.08	20+47.08	20+77.48	20+77.48	48,22	6,59	4636254,310	323793,550
AT37	21+12.42		30°41'37"	35	15	15	17,17	17,17	33,75	1,57	0,59	20+95.25	21+10.25	21+14.00	21+29.00	50,16	17,77	4636295,690	323765,210
AT38	21+87.32	88°26'36"		15	15	0	22,02	15,22	30,65	6,37	6,58	21+65.30	21+80.30	21+95.96	21+95.96	75,49	36,3	4636371,020	323760,320
AT39	22+18.02	109°45'50"		15	0	15	21,99	28,99	36,24	9,5	14,74	21+96.03	21+96.03	22+17.27	22+32.27	37,28	0,08	4636369,620	323723,070
AT40	22+51.17		13°53'21"	150	0	0	18,27	18,27	36,36	1,11	0,18	22+32.90	22+32.90	22+69.27	22+69.27	47,89	0,63	4636325,190	323740,940
AT41	22+85.76	18°3'17"		100	0	0	15,89	15,89	31,51	1,25	0,26	22+69.87	22+69.87	23+01.38	23+01.38	34,76	0,6	4636290,770	323745,800
AT42	23+61.41		39°40'36"	60	25	25	34,28	34,28	66,55	4,25	2,02	23+27.13	23+52.13	23+68.68	23+93.68	75,92	25,75	4636222,580	323779,180
																109,26	39,12		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
AT43	24+68.65	86°12'25"		30	15	15	35,85	35,85	60,14	11,52	11,57	24+32.80	24+47.80	24+77.93	24+92.93		56,62	2,2	4636116,380	323753,500
AT44	25+13.70		40°11'16"	30	15	15	18,57	18,57	36,04	2,28	1,1	24+95.13	25+10.13	25+16.17	25+31.17				4636099,460	323807,530
AT45	25+60.28		31°35'4"	30	10	10	13,52	13,52	26,54	1,32	0,5	25+46.76	25+56.76	25+63.30	25+73.30		47,68	15,59	4636059,220	323833,100
AT46	25+85.24	24°25'57"		30	10	10	11,52	11,52	22,79	0,84	0,25	25+73.72	25+83.72	25+86.52	25+96.52		25,47	0,43	4636033,750	323833,470
AT47	26+20.05		26°53'1"	32	15	15	15,2	15,2	30,01	1,2	0,39	26+04.84	26+19.84	26+19.86	26+34.86		35,05	8,33	4636002,060	323848,440
AT48	26+69.39		18°41'30"	100	0	0	16,46	16,46	32,62	1,35	0,29	26+52.94	26+52.94	26+85.56	26+85.56		49,74	18,08	4635952,340	323847,040
AT49	27+16.27	69°45'6"		30	15	15	28,61	28,61	51,52	6,95	5,7	26+87.65	27+02.65	27+24.18	27+39.18		47,16	2,1	4635908,100	323830,680
AT50	27+68.22		63°17'43"	25	15	15	23,12	23,12	42,62	4,81	3,62	27+45.11	27+60.11	27+72.73	27+87.73		57,66	5,93	4635870,620	323874,490
AT51	28+12.11	46°52'52"		25	15	15	18,48	18,48	35,46	2,66	1,5	27+93.63	28+08.63	28+14.09	28+29.09		47,5	5,91	4635824,490	323863,120
AT52	28+48.56		48°22'26"	25	15	15	18,87	18,87	36,11	2,82	1,64	28+29.69	28+44.69	28+50.79	28+65.79		37,95	0,6	4635792,680	323883,810
AT53	28+79.58		15°37'19"	80	0	0	10,97	10,97	21,81	0,75	0,14	28+68.61	28+68.61	28+90.42	28+90.42		32,67	2,82	4635761,180	323875,170
AT54	29+44.76		21°59'23"	100	0	0	19,43	19,43	38,38	1,87	0,48	29+25.33	29+25.33	29+63.71	29+63.71		65,31	34,91	4635705,170	323841,570
AT55	29+83.74		22°13'31"	100	0	0	19,64	19,64	38,79	1,91	0,49	29+64.10	29+64.10	30+02.89	30+02.89		39,46	0,39	4635681,400	323810,070
AT56	30+19.12	31°37'5"		30	15	15	16,07	16,07	31,56	1,5	0,58	30+03.05	30+18.05	30+19.60	30+34.60		35,87	0,16	4635672,220	323775,400
AT57	30+85.19	46°43'16"		30	15	15	20,58	20,58	39,46	3,02	1,69	30+64.61	30+79.61	30+89.07	31+04.07		66,65	30,01	4635623,920	323729,470
AT58	31+46.10		95°0'9"	15	15	0	23,86	16,99	32,37	7,67	8,48	31+22.24	31+37.24	31+54.61	31+54.61		62,61	18,17	4635561,410	323732,930
AT59	31+73.64		101°35'49"	15	0	15	19,02	25,96	34,1	7,31	10,88	31+54.62	31+54.62	31+73.72	31+88.72		36,02	0,01	4635562,560	323696,930
AT60	32+33.27		13°24'57"	150	0	0	17,64	17,64	35,12	1,03	0,16	32+15.63	32+15.63	32+50.75	32+50.75		70,51	26,91	4635631,150	323713,310
AT61	32+89.47		31°53'51"	50	15	15	21,84	21,84	42,84	2,2	0,84	32+67.63	32+82.63	32+95.46	33+10.46		56,35	16,88	4635681,420	323738,760
AT62	33+35.33	26°26'56"		50	15	15	19,29	19,29	38,08	1,55	0,5	33+16.05	33+31.05	33+39.13	33+54.13		46,71	5,58	4635705,660	323778,690
AT63	34+27.32	45°49'56"		30	15	15	20,3	20,3	39	2,91	1,6	34+07.02	34+22.02	34+31.02	34+46.02		92,48	52,89	4635783,820	323828,110
AT64	34+82.53	93°15'49"		15	15	0	23,35	16,5	31,92	7,3	7,94	34+59.17	34+74.17	34+91.09	34+91.09		56,81	13,16	4635839,060	323814,820
AT65	35+09.11	98°23'29"		15	0	15	18	24,9	33,26	6,58	9,65	34+91.11	34+91.11	35+09.37	35+24.37		34,52	0,02	4635829,080	323781,770
AT66	35+54.60		68°19'9"	30	15	15	28,05	28,05	50,77	6,63	5,33	35+26.55	35+41.55	35+62.32	35+77.32		55,14	2,18	4635779,180	323805,240
AT67	36+17.56		35°44'40"	40	20	20	23,01	23,01	44,95	2,46	1,07	35+94.55	36+14.55	36+19.51	36+39.51		68,29	17,23	4635729,340	323758,540

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AT68	36+77.07	77°12'24"		30	15	15	31,68	31,68	55,43	8,79	7,94	36+45.38	36+60.38	36+85.81	37+00.81	60,58	5,88	4635717,660	323699,110
AT69	37+35.23		43°46'50"	30	15	15	19,66	19,66	37,92	2,67	1,4	37+15.57	37+30.57	37+38.49	37+53.49	66,11	14,76	4635651,580	323697,180
AT70	37+83.59	69°10'2"		25	15	15	24,97	24,97	45,18	5,82	4,76	37+58.62	37+73.62	37+88.80	38+03.80	49,76	5,13	4635616,670	323661,720
AT71	38+27.65		85°32'46"	15	15	0	21,27	14,5	29,9	5,86	5,87	38+06.39	38+21.39	38+36.28	38+36.28	48,83	2,59	4635571,970	323681,360
AT72	38+56.65		105°18'29"	15	0	15	20,3	27,27	35,07	8,24	12,5	38+36.35	38+36.35	38+56.42	38+71.42	34,86	0,07	4635555,510	323650,620
AT73	39+04.44		56°24'25"	30	15	15	23,74	23,74	44,53	4,4	2,95	38+80.70	38+95.70	39+10.24	39+25.24	60,29	9,28	4635614,280	323637,200
AT74	39+55.50	56°8'13"		30	15	10	23,44	21,28	41,89	4,41	2,82	39+32.06	39+47.06	39+63.95	39+73.95	54,00	6,82	4635653,420	323674,400
AT75	40+09.70		60°45'28"	30	10	15	22,86	25,05	44,31	4,8	3,6	39+86.84	39+96.84	40+16.15	40+31.15	57,02	12,89	4635709,080	323661,970
AT76	40+53.34		8°51'47"	60	0	0	4,65	4,65	9,28	0,18	0,02	40+48.69	40+48.69	40+57.97	40+57.97	47,24	17,54	4635740,590	323697,170
AT77	40+87.38	18°56'43"		50	15	15	15,87	15,87	31,53	0,88	0,2	40+71.51	40+86.51	40+88.05	41+03.05	34,06	13,54	4635759,120	323725,750
AT78	41+48.24	40°27'2"		40	15	15	22,31	22,31	43,24	2,88	1,39	41+25.93	41+40.93	41+54.17	41+69.17	61,07	22,88	4635807,190	323763,410
AT79	41+92.07	88°42'34"		15	15	0	22,09	15,29	30,72	6,42	6,65	41+69.98	41+84.98	42+00.70	42+00.70	45,21	0,81	4635852,370	323761,540
AT80	42+22.27	106°14'59"		15	0	15	20,64	27,61	35,32	8,49	12,94	42+01.63	42+01.63	42+21.95	42+36.95	36,86	0,93	4635851,670	323724,690
AT81	42+53.68		44°8'37"	20	15	15	15,76	15,76	30,41	2,08	1,12	42+37.92	42+52.92	42+53.33	42+68.33	44,35	0,97	4635809,340	323737,900
AT82	42+86.03		34°44'33"	30	15	15	16,97	16,97	33,19	1,76	0,74	42+69.07	42+84.07	42+87.26	43+02.26	33,47	0,74	4635779,460	323722,800
AT83	43+33.44	4°6'30"		250	0	0	8,97	8,97	17,93	0,16	0,01	43+24.48	43+24.48	43+42.40	43+42.40	48,15	22,22	4635756,530	323680,460
AT84	44+07.53	72°6'2"		30	15	15	29,55	29,55	52,75	7,49	6,34	43+77.99	43+92.99	44+15.74	44+30.74	74,10	35,58	4635716,670	323618,000
AT85	44+63.13		75°8'46"	30	15	15	30,8	30,8	54,35	8,24	7,26	44+32.33	44+47.33	44+71.67	44+86.67	61,94	1,59	4635656,740	323633,670
AT86	45+44.80	108°35'5"		30	15	15	49,66	49,66	71,85	21,93	27,46	44+95.15	45+10.15	45+52.00	45+67.00	88,94	8,48	4635612,940	323556,270
AT87	46+37.94		106°42'54"	30	15	13	48,16	47,22	69,88	20,84	25,5	45+89.79	46+04.79	46+46.66	46+59.66	120,60	22,79	4635532,380	323646,010
AT88	47+06.53	86°46'8"		25	15	15	31,46	31,46	52,86	9,91	10,06	46+75.07	46+90.07	47+12.93	47+27.93	94,09	15,41	4635483,400	323565,680
AT89	47+63.77		79°54'35"	30	15	15	32,88	32,88	56,84	9,54	8,92	47+30.89	47+45.89	47+72.74	47+87.74	67,30	2,96	4635424,060	323597,420
AT90	48+55.13	96°11'9"		30	15	10	41,08	38,75	62,86	15,46	16,97	48+14.04	48+29.04	48+66.90	48+76.90	100,27	26,31	4635362,000	323518,660
AT91	49+14.82		89°47'28"	25	15	15	32,76	32,76	54,18	10,82	11,34	48+82.06	48+97.06	49+21.24	49+36.24	76,67	5,16	4635307,240	323572,320
AT92	49+79.44	100°51'13"		30	10	10	41,46	41,46	62,81	17,31	20,12	49+37.98	49+47.98	49+90.79	50+00.79	75,96	1,74	4635253,880	323518,260
AT93	50+24.18		42°20'42"	30	15	15	19,22	19,22	37,17	2,51	1,28	50+04.96	50+19.96	50+27.13	50+42.13	64,85	4,17	4635217,130	323571,700
																40,32	5,94		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
AT94	50+63.23	21°35'20"		40	15	15	15,16	15,16	30,07	0,96	0,25	50+48.06	50+63.06	50+63.14	50+78.14		66,75	38,45	4635177,860	323580,860
AT95	51+29.73		56°11'36"	15	10	10	13,14	13,14	24,71	2,32	1,56	51+16.59	51+26.59	51+31.30	51+41.30				4635123,000	323618,890
AT96	51+81.18		91°3'7"	15	15	0	22,73	15,9	31,34	6,86	7,29	51+58.46	51+73.46	51+89.79	51+89.79		53,02	17,15	4635073,660	323599,480
AT97	52+08.49		99°42'45"	15	0	15	18,41	25,33	33,6	6,88	10,14	51+90.07	51+90.07	52+08.68	52+23.68		34,59	0,28	4635086,910	323567,530
AT98	52+53.87	77°20'57"		15	10	10	17,21	17,21	30,25	4,57	4,17	52+36.66	52+46.66	52+56.91	52+66.91		55,52	12,99	4635133,870	323597,140
AT99	53+03.96		16°40'7"	80	0	0	11,72	11,72	23,27	0,85	0,17	52+92.24	52+92.24	53+15.51	53+15.51		54,25	25,32	4635172,160	323558,700
																36,16	6,67			
AT100	53+39.95	37°29'12"		30	15	15	17,77	17,77	34,63	2,01	0,91	53+22.18	53+37.18	53+41.81	53+56.81		63,13	34,84	4635203,950	323541,480
AT101	54+02.16		30°36'39"	20	10	10	10,52	10,52	20,69	0,95	0,35	53+91.64	54+01.64	54+02.33	54+12.33		20,54	5,09	4635229,690	323483,840
AT102	54+22.35		18°39'24"	30	0	0	4,93	4,93	9,77	0,4	0,09	54+17.42	54+17.42	54+27.19	54+27.19				4635246,450	323471,960
																23,11	2,11			
AT103	54+45.38		71°59'37"	15	10	10	16,08	16,08	28,85	3,88	3,31	54+29.30	54+39.30	54+48.14	54+58.14		59,68	15,16	4635268,590	323465,340
AT104	55+01.74	108°23'29"		15	15	0	28,44	21,45	35,88	11,17	14,01	54+73.30	54+88.30	55+09.18	55+09.18		37,23	0,18	4635302,540	323514,420
AT105	55+24.96	89°55'59"		15	0	15	15,6	22,42	31,04	4,95	6,98	55+09.36	55+09.36	55+25.41	55+40.41		67,58	23,00	4635324,910	323484,660
AT106	55+85.57	51°40'16"		30	15	15	22,16	22,16	42,05	3,68	2,27	55+63.41	55+78.41	55+90.46	56+05.46		39,13	1,43	4635270,940	323443,980
AT107	56+22.43	29°46'14"		30	15	15	15,54	15,54	30,59	1,36	0,49	56+06.89	56+21.89	56+22.48	56+37.48				4635233,090	323453,890
																33,12	8,00			
AT108	56+55.06	15°35'12"		70	0	0	9,58	9,58	19,04	0,65	0,12	56+45.48	56+45.48	56+64.52	56+64.52		45,05	16,91	4635209,440	323477,080
AT109	56+99.99		40°9'22"	30	15	15	18,56	18,56	36,03	2,27	1,1	56+81.43	56+96.43	57+02.45	57+17.45		34,58	4,97	4635186,930	323516,110
AT110	57+33.47	17°9'35"		40	10	10	11,05	11,05	21,98	0,56	0,12	57+22.42	57+32.42	57+34.40	57+44.40				4635154,410	323527,860
																38,92	7,49			
AT111	57+72.28		46°6'46"	30	15	15	20,39	20,39	39,14	2,94	1,63	57+51.89	57+66.89	57+76.04	57+91.04		65,80	26,22	4635123,330	323551,300
AT112	58+36.46		42°14'33"	30	15	15	19,19	19,19	37,12	2,49	1,27	58+17.26	58+32.26	58+39.38	58+54.38		27,32	4,10	4635058,350	323540,910
AT113	58+62.50	4°36'38"		100	0	0	4,03	4,03	8,05	0,08	0	58+58.48	58+58.48	58+66.52	58+66.52		89,48	68,27	4635041,290	323519,590
AT114	59+51.98	35°28'29"		30	15	15	17,18	17,18	33,57	1,82	0,79	59+34.80	59+49.80	59+53.37	59+68.37		35,01	4,42	4634979,940	323454,450
AT115	59+86.20		21°41'13"	70	0	0	13,41	13,41	26,5	1,27	0,32	59+72.80	59+72.80	59+99.29	59+99.29				4634945,600	323447,630
AT116	60+36.93		86°23'17"	15	15	0	21,48	14,7	30,12	6	6,07	60+15.45	60+30.45	60+45.57	60+45.57		51,05	16,16	4634902,750	323419,880
																36,23	1,21			
AT117	60+67.10		105°21'34"	15	0	15	20,32	27,28	35,08	8,26	12,52	60+46.78	60+46.78	60+66.86	60+81.86		62,59	19,24	4634920,490	323388,280
AT118	61+17.17	31°36'27"		30	15	15	16,06	16,06	31,55	1,5	0,58	61+01.10	61+16.10	61+17.65	61+32.65				4634964,990	323432,290
AT119	61+55.76		36°31'22"	25	15	15	15,85	15,85	30,94	1,72	0,76	61+39.91	61+54.91	61+55.85	61+70.85		39,17	7,26	4635003,150	323441,150
																64,74	21,47			
AT120	62+19.74	32°58'14"		50	25	25	27,42	27,42	53,77	2,69	1,08	61+92.32	62+17.32	62+21.09	62+46.09				4635045,120	323490,450
																45,62	9,09			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AT121	62+64.28	10°23'49"		100	0	0	9,1	9,1	18,15	0,41	0,05	62+55.18	62+55.18	62+73.33	62+73.33			4635088,830	323503,500
AT122	63+05.86	74°51'4"		15	15	0	18,75	12,12	27,1	4,29	3,77	62+87.11	63+02.11	63+14.20	63+14.20	41,63	13,78	4635130,210	323508,010
AT123	63+38.45	110°37'9"		15	0	15	22,33	29,34	36,46	9,77	15,21	63+16.12	63+16.12	63+37.58	63+52.58	36,36	1,91	4635143,470	323474,140
AT124	64+07.12		46°32'31"	30	15	15	20,52	20,52	39,37	3	1,67	63+86.60	64+01.60	64+10.97	64+25.97			4635059,590	323473,040
AT125	64+62.91		15°33'8"	50	10	10	11,84	11,84	23,57	0,55	0,1	64+51.07	64+61.07	64+64.64	64+74.64	57,46	25,10	4635020,620	323430,820
AT126	65+00.26	38°46'3"		40	15	15	21,65	21,65	42,06	2,65	1,23	64+78.62	64+93.62	65+05.68	65+20.68	37,46	3,98	4635003,520	323397,480
AT127	65+50.16		24°5'24"	50	15	15	18,2	18,2	36,02	1,32	0,38	65+31.96	65+46.96	65+52.98	65+67.98	51,13	11,28	4634956,840	323376,620
AT128	65+96.96	1°15'21"		100	0	0	1,1	1,1	2,19	0,01	0	65+95.87	65+95.87	65+98.06	65+98.06	47,18	27,88	4634925,380	323341,470
AT129	66+42.95		35°4'7"	80	20	20	35,34	35,34	68,96	4,12	1,71	66+07.61	66+27.61	66+56.58	66+76.58	45,99	9,55	4634893,960	323307,880
AT130	66+99.74		28°44'52"	30	15	15	15,25	15,25	30,05	1,29	0,45	66+84.48	66+99.48	66+99.54	67+14.54			4634885,800	323249,960
AT131	67+32.70	28°1'28"		40	15	15	17,53	17,53	34,56	1,47	0,5	67+15.17	67+30.17	67+34.73	67+49.73	33,41	0,63	4634897,630	323218,710
AT132	67+95.53	13°0'57"		50	0	0	5,7	5,7	11,36	0,32	0,05	67+89.82	67+89.82	68+01.18	68+01.18	63,33	40,09	4634889,590	323155,890
AT133	68+35.07	49°18'16"		45	20	20	30,81	30,81	58,72	4,92	2,89	68+04.27	68+24.27	68+42.99	68+62.99	39,60	3,09	4634875,850	323118,750
AT134	69+12.02		54°42'14"	40	20	20	30,89	30,89	58,19	5,5	3,58	68+81.13	69+01.13	69+19.33	69+39.33	79,83	18,14	4634801,010	323090,950
AT135	69+62.68	61°35'29"		15	15	15	16,75	16,75	31,12	3,18	2,37	69+45.94	69+60.94	69+62.06	69+77.06	54,24	6,61	4634787,060	323038,530
AT136	69+90.53		39°20'47"	15	10	10	10,44	10,44	20,3	1,22	0,59	69+80.08	69+90.08	69+90.39	70+00.39	30,22	3,02	4634757,680	323031,480
AT137	70+42.97	15°58'49"		30	0	0	4,21	4,21	8,37	0,29	0,05	70+38.76	70+38.76	70+47.12	70+47.12	53,02	38,37	4634725,650	322989,220
AT138	70+84.15		44°53'37"	30	10	10	17,45	17,45	33,51	2,61	1,39	70+66.70	70+76.70	70+90.21	71+00.21	41,24	19,58	4634692,660	322964,480
AT139	71+52.98	57°28'20"		30	15	15	24,1	24,1	45,09	4,57	3,12	71+28.88	71+43.88	71+58.97	71+73.97	70,22	28,67	4634682,590	322894,980
AT140	71+94.28	31°8'56"		40	15	15	18,71	18,71	36,75	1,77	0,66	71+75.57	71+90.57	71+97.32	72+12.32	44,41	1,60	4634642,110	322876,720
AT141	72+59.15		41°0'22"	30	15	15	18,82	18,82	36,47	2,36	1,17	72+40.33	72+55.33	72+61.80	72+76.80	65,54	28,02	4634577,040	322884,550
AT142	72+95.63		28°1'58"	40	15	15	17,53	17,53	34,57	1,47	0,5	72+78.09	72+93.09	72+97.66	73+12.66	37,65	1,29	4634545,880	322863,420
AT143	73+29.69	15°10'25"		20	0	0	2,66	2,66	5,3	0,18	0,03	73+27.03	73+27.03	73+32.33	73+32.33	34,56	14,37	4634529,750	322832,850
AT144	73+63.13		75°39'13"	15	15	0	18,93	12,29	27,31	4,39	3,91	73+44.20	73+59.20	73+71.51	73+71.51	33,46	11,87	4634506,930	322808,380
AT145	74+02.54		126°31'15"	15	0	15	30,54	37,67	40,62	16,31	27,59	73+72.00	73+72.00	73+97.62	74+12.62	43,32	0,49	4634530,310	322771,900
AT146	74+39.80	19°48'3"		80	0	0	13,96	13,96	27,65	1,21	0,28	74+25.84	74+25.84	74+53.48	74+53.48	64,85	13,22	4634553,360	322832,520
AT147	74+83.47	87°20'19"		20	15	15	27	27	45,49	8,29	8,52	74+56.46	74+71.46	74+86.95	75+01.95	43,94	2,98	4634581,970	322865,870
																33,02	0,65		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AT148	75+07.96		24°12'23"	25	0	0	5,36	5,36	10,56	0,57	0,16	75+02.60	75+02.60	75+13.17	75+13.17			4634608,000	322845,560
AT149	75+48.60	22°28'30"		30	0	0	5,96	5,96	11,77	0,59	0,15	75+42.64	75+42.64	75+54.41	75+54.41	40,80	29,48	4634647,630	322835,860
AT150	75+65.78		41°30'3"	30	0	0	11,37	11,37	21,73	2,08	1	75+54.42	75+54.42	75+76.15	75+76.15	17,33	0,01	4634661,610	322825,610
AT151	76+04.66		42°29'22"	30	15	15	19,27	19,27	37,25	2,52	1,29	75+85.39	76+00.39	76+07.64	76+22.64	39,88	9,24	4634701,320	322829,280
AT152	76+56.31	51°4'56"		40	20	20	29,29	29,29	55,66	4,79	2,92	76+27.02	76+47.02	76+62.68	76+82.68	52,94	4,38	4634736,910	322868,470
AT153	77+06.13	90°56'54"		15	15	0	22,7	15,87	31,31	6,84	7,26	76+83.43	76+98.43	77+14.74	77+14.74	52,74	0,75	4634789,560	322865,410
AT154	77+35.09	102°22'45"		15	0	15	19,28	26,22	34,3	7,5	11,2	77+15.81	77+15.81	77+35.11	77+50.11	36,22	1,07	4634786,860	322829,290
AT155	77+72.38		67°29'13"	15	15	15	17,87	17,87	32,67	3,78	3,08	77+54.51	77+69.51	77+72.17	77+87.17	48,49	4,40	4634740,400	322843,190
AT156	78+08.21	25°58'46"		70	0	0	16,15	16,15	31,74	1,84	0,56	77+92.06	77+92.06	78+23.80	78+23.80	38,91	4,89	4634715,830	322813,020
AT157	78+69.83	58°50'10"		30	15	15	24,58	24,58	45,81	4,8	3,35	78+45.25	78+60.25	78+76.05	78+91.05	62,17	21,45	4634659,420	322786,890
AT158	79+05.32		9°18'34"	100	0	0	8,14	8,14	16,25	0,33	0,04	78+97.18	78+97.18	79+13.43	79+13.43	38,85	6,13	4634627,210	322808,600
AT159	79+39.75		100°38'53"	15	15	15	26,27	26,27	41,35	9,46	11,19	79+13.48	79+28.48	79+39.83	79+54.83	34,46	0,05	4634595,890	322822,980
AT160	79+90.50	10°51'47"		100	0	0	9,51	9,51	18,96	0,45	0,06	79+81.00	79+81.00	79+99.96	79+99.96	61,94	26,16	4634580,880	322762,890
AT161	80+43.13		6°30'28"	150	0	0	8,53	8,53	17,04	0,24	0,02	80+34.60	80+34.60	80+51.64	80+51.64	52,68	34,64	4634558,720	322715,100
AT162	80+86.64		21°9'40"	80	20	20	24,98	24,98	49,55	1,6	0,41	80+61.66	80+81.66	80+91.21	81+11.21	43,53	10,02	4634544,990	322673,790
AT163	81+50.84	58°45'1"		15	15	15	16,23	16,23	30,38	2,92	2,08	81+34.61	81+49.61	81+49.99	81+64.99	64,61	23,41	4634548,130	322609,250
AT164	81+85.63		48°8'57"	20	15	15	16,61	16,61	31,81	2,42	1,41	81+69.02	81+84.02	81+85.83	82+00.83	36,87	4,03	4634517,580	322588,620
AT165	82+48.25	5°17'42"		100	0	0	4,62	4,62	9,24	0,11	0,01	82+43.63	82+43.63	82+52.87	82+52.87	64,03	42,79	4634508,870	322525,190
AT166	83+22.11	57°36'44"		20	20	20	21,37	21,37	40,11	3,77	2,63	83+00.74	83+20.74	83+20.86	83+40.86	73,87	47,88	4634492,110	322453,240
AT167	83+58.53		50°9'14"	20	10	10	14,45	14,45	27,51	2,31	1,38	83+44.08	83+54.08	83+61.59	83+71.59	39,04	3,23	4634455,260	322440,350
AT168	84+32.94		15°18'11"	200	0	0	26,87	26,87	53,42	1,8	0,32	84+06.07	84+06.07	84+59.49	84+59.49	75,80	34,49	4634428,620	322369,390
AT169	85+16.00	61°11'35"		20	20	20	22,23	22,23	41,36	4,19	3,1	84+93.77	85+13.77	85+15.13	85+35.13	83,38	34,28	4634420,970	322286,360
AT170	86+00.35		29°29'22"	100	50	50	51,54	51,54	101,47	4,48	1,61	85+48.81	85+98.81	86+00.27	86+50.27	87,44	13,67	4634340,800	322251,440
Route End	87+51.41		0°0'0"													152,68	101,14	4634248,970	322129,460

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1749	87+35.00	4,00	3,50	3,50	4,00	1783,098	1783,118	1783,188	1783,118	1783,098	20,00	20,00	4634255,650	322144,975	4634256,049	322144,674	4634258,846	322142,570	4634261,642	322140,465	4634262,041	322140,164
1750	87+40.00	4,00	3,50	3,50	4,00	1783,345	1783,365	1783,435	1783,365	1783,345	20,00	20,00	4634252,643	322140,981	4634253,042	322140,680	4634255,838	322138,575	4634258,635	322136,470	4634259,034	322136,169
1751	87+45.00	4,00	3,50	3,50	4,00	1783,593	1783,613	1783,683	1783,613	1783,593	20,00	20,00	4634249,636	322136,986	4634250,035	322136,685	4634252,831	322134,580	4634255,628	322132,475	4634256,027	322132,175
1752	87+50.00	4,00	3,50	3,50	4,00	1783,840	1783,860	1783,930	1783,860	1783,840	20,00	20,00	4634246,629	322132,991	4634247,028	322132,691	4634249,824	322130,586	4634252,621	322128,481	4634253,020	322128,180
1753	87+51.41	4,00	3,50	3,50	4,00	1783,910	1783,930	1784,000	1783,930	1783,910	20,00	20,00	4634245,778	322131,861	4634246,177	322131,560	4634248,973	322129,455	4634251,770	322127,350	4634252,169	322127,050

Volumes of Earth Works
Road: Kakaskhidi-Zekari km17-km33, Part 1

Location		Volume m ³						
Design Kilometer	Ch+	Fill	Cut			Ditch		
			II Category 9b	VII Category 19/20a	VIII Category 20b	II Category 9b	VII Category 19/20a	VIII Category 20b
1	2	3	4	5	6	7	8	9
1	0+00.00							
		15,40	320,39	384,29	17,00	0,00	2,35	3,91
"	1+00.00							
		6,76	301,73	612,10	231,26	0,00	6,99	3,04
"	2+00.00							
		82,17	295,03	592,95	395,96	0,00	0,61	5,87
"	3+00.00							
		11,13	488,50	1676,89	6572,02	0,01	2,08	6,71
"	4+00.00							
		674,83	289,17	1001,09	1499,69	0,00	0,00	6,27
"	5+00.00							
		544,60	437,66	1634,75	4125,77	0,00	0,00	6,87
"	6+00.00							
		1121,76	375,78	1404,70	3838,87	0,00	0,00	6,27
"	7+00.00							
		582,07	256,92	902,46	1581,93	2,61	8,47	5,24
"	8+00.00							
		1237,01	319,94	1071,63	1863,39	0,00	0,00	6,27
"	9+00.00							
		34,94	530,58	1984,70	6432,64	0,00	0,00	7,12
"	10+00.00							
Total km 1		4311	3616	11266	26559	3	21	58
2	10+00.00							
		1,18	626,02	2368,67	9552,42	0,00	0,00	6,80
"	11+00.00							
		921,60	375,80	1408,49	7737,16	5,38	9,41	4,56
"	12+00.00							
		773,92	236,49	812,24	1361,51	0,19	0,95	5,71
"	13+00.00							
		1727,55	162,46	563,37	1370,03	10,98	24,78	8,25
"	14+00.00							
		735,17	503,78	1917,76	8930,29	0,00	0,23	7,23
"	15+00.00							
		210,68	368,52	1274,02	5611,08	0,01	0,11	4,75
"	16+00.00							
		369,82	231,30	658,41	613,91	0,40	3,45	6,70
"	17+00.00							
		275,76	611,08	2143,00	14369,30	0,14	5,26	5,39
"	18+00.00							
		326,80	250,86	848,94	1717,51	0,00	0,00	6,27
"	19+00.00							
		196,76	560,77	2102,99	17127,34	0,00	0,60	10,01
"	20+00.00							
Total km 2		5539	3927	14098	68391	17	45	66
3	20+00.00							
		19,91	457,52	1475,89	5149,49	0,00	0,00	7,06
"	21+00.00							
		491,01	278,31	918,76	1452,45	0,00	0,00	6,38
"	22+00.00							
		33,70	851,72	3272,45	22047,25	0,01	0,00	6,02
"	23+00.00							
		4,01	762,92	2718,32	14674,93	0,42	0,74	8,71
"	24+00.00							
		24,50	823,45	3014,38	16027,66	0,00	0,00	6,63
"	25+00.00							
		108,12	597,43	2278,22	12764,14	0,00	0,00	6,79
"	26+00.00							
		60,90	592,41	2231,78	11442,21	0,00	0,00	6,25
"	27+00.00							
		51,12	547,56	1984,19	8250,37	0,00	0,00	6,58
"	28+00.00							

1	2	3	4	5	6	7	8	9
		23,61	477,47	1594,87	4838,11	0,00	0,00	6,40
"	29+00.00							
		3,76	360,81	997,66	787,12	0,00	0,00	6,26
"	30+00.00							
Total km 3		821	5750	20487	97434	0	1	67
4	30+00.00							
		101,50	325,70	1094,11	3185,07	0,00	0,00	6,51
"	31+00.00							
		48,00	724,30	2693,66	28165,07	0,00	0,41	8,15
"	32+00.00							
		6,00	699,51	2640,97	17173,24	0,00	0,00	6,44
"	33+00.00							
		111,33	252,38	852,81	1396,98	0,00	0,00	6,13
"	34+00.00							
		141,66	380,33	1342,63	7730,58	0,00	0,00	21,73
"	35+00.00							
		12,84	706,97	2717,21	22423,82	0,00	0,00	6,60
"	36+00.00							
		258,10	301,50	1084,16	2663,88	0,00	0,00	6,68
"	37+00.00							
		830,37	233,93	806,46	1954,47	6,16	10,64	5,55
"	38+00.00							
		216,92	625,07	2369,70	17291,44	1,36	9,66	5,30
"	39+00.00							
		97,62	543,35	2049,29	8102,73	0,00	0,00	6,45
"	40+00.00							
Total km 4		1824	4793	17651	110087	8	21	80
5	40+00.00							
		302,85	263,63	935,46	2213,10	0,00	0,00	6,46
"	41+00.00							
		134,13	357,67	1224,54	3592,95	0,00	0,00	6,14
"	42+00.00							
		0,00	1031,19	3883,23	30105,88	1,17	0,05	6,27
"	43+00.00							
		5,80	626,54	2328,69	9008,20	0,00	0,00	6,36
"	44+00.00							
		162,63	472,33	1718,46	6072,50	0,00	0,00	6,46
"	45+00.00							
		55,73	531,85	1997,54	8638,23	0,00	0,00	6,79
"	46+00.00							
		44,35	566,39	1981,61	7562,69	0,00	0,00	6,40
"	47+00.00							
		14,64	739,53	2701,06	13684,45	0,05	0,04	6,43
"	48+00.00							
		61,10	459,91	1605,22	6887,65	0,00	0,00	6,70
"	49+00.00							
		60,78	372,44	1195,68	2551,04	0,00	0,00	7,21
"	50+00.00							
Total km 5		842	5421	19572	90317	1	0	65
6	50+00.00							
		163,73	344,40	1079,82	2966,77	0,00	0,00	6,40
"	51+00.00							
		3,62	547,29	1831,99	9994,86	0,00	0,01	7,87
"	52+00.00							
		0,97	864,69	3352,64	31748,92	0,00	0,00	9,88
"	53+00.00							
		4,96	693,14	2618,38	10092,48	0,00	0,00	6,26
"	54+00.00							
		0,00	464,18	1686,00	2791,12	0,00	0,00	6,40
"	55+00.00							
		0,00	1128,24	4079,66	30806,76	0,00	0,00	6,54
"	56+00.00							
		0,00	886,03	3161,44	19301,32	0,00	0,00	6,59
"	57+00.00							
		0,00	918,98	3433,78	22178,84	0,00	0,00	6,48
"	58+00.00							
		0,00	623,28	2133,99	5151,42	0,00	0,00	6,27
"	59+00.00							
		0,00	486,37	1744,80	2577,01	0,00	0,00	6,35
"	60+00.00							
Total km 6		173	6957	25123	137609	0	0	69
7	60+00.00							

1	2	3	4	5	6	7	8	9
		0,00	889,17	3393,28	25347,20	0,00	0,00	6,31
"	61+00.00							
		0,48	732,49	2657,73	12255,63	0,00	0,00	6,36
"	62+00.00							
		76,54	415,44	1355,16	2779,77	0,00	0,00	6,27
"	63+00.00							
		0,00	1170,43	4530,59	36654,98	0,00	0,00	7,10
"	64+00.00							
		0,00	950,07	3634,17	15064,19	0,00	0,00	6,48
"	65+00.00							
		0,00	1271,75	4916,68	27295,53	0,00	0,00	6,35
"	66+00.00							
		0,00	747,08	2814,36	7495,10	0,00	0,00	6,27
"	67+00.00							
		0,00	695,78	2546,33	6861,76	0,00	0,00	6,64
"	68+00.00							
		0,11	468,64	1574,14	2965,31	0,00	0,00	6,54
"	69+00.00							
		1,78	402,92	1431,39	3376,12	0,00	0,00	6,40
"	70+00.00							
Total km 7		79	7744	28854	140096	0	0	65
8	70+00.00							
		0,00	505,65	1532,94	4117,60	0,00	0,00	6,27
"	71+00.00							
		0,00	600,65	2186,12	8616,17	0,00	0,00	6,85
"	72+00.00							
		32,84	502,66	1896,75	8499,77	0,00	0,00	6,27
"	73+00.00							
		369,29	359,56	1206,07	3691,89	0,00	3,41	4,85
"	74+00.00							
		0,00	1036,56	4016,23	27693,48	0,00	0,00	6,28
"	75+00.00							
		0,00	982,65	3753,68	19444,18	0,00	0,00	6,28
"	76+00.00							
		0,00	739,29	2760,37	9937,82	0,00	0,00	6,94
"	77+00.00							
		0,00	1025,37	3980,34	28486,68	0,00	0,00	10,37
"	78+00.00							
		0,00	841,71	3200,05	14124,93	0,00	0,00	6,48
"	79+00.00							
		0,00	628,75	2352,29	7757,52	0,00	0,00	6,27
"	80+00.00							
Total km 8		402	7223	26885	132370	0	3	67
9	80+00.00							
		0,00	466,55	1570,26	2739,54	0,00	0,00	6,27
"	81+00.00							
		51,19	408,27	1473,47	3913,85	0,00	0,00	6,31
"	82+00.00							
		0,97	516,28	1920,01	6415,79	0,00	0,00	6,12
"	83+00.00							
		0,00	661,98	2487,30	9638,13	0,00	0,00	6,36
"	84+00.00							
		0,00	768,24	2940,82	11707,87	0,00	0,00	6,23
"	85+00.00							
		0,00	996,55	3777,98	17922,53	0,00	0,00	6,39
"	86+00.00							
		712,93	122,57	377,98	419,34	8,32	15,70	2,57
"	87+00.00							
		102,82	167,78	613,47	2145,95	0,00	0,00	1,68
"	87+51.42							
Total km 9		868	4108	15161	54903	8	16	42
Grand Total:		14859	49538	179095	857765	37	106	578

Road: Kakaskhidi-Zekari km17-km33, Part 1

Arrangement of Road Pavement												
Location			Section Length	Pavement					Base	Subbase with sand-gravel mixture, fraction 0-120mm, thickness 25cm	Shoulder fill with sand-gravel mixture, fraction 0-70mm	Comments
Design Kilometer	from ch+	to ch+		Width	Fine grained solid crushed stone asphalt concrete hot mixture, Type B, Mark II, thickness 4cm	Applying of Liquid Bitumen on 0.3 l/m2	Coarse grained porous crushed stone asphalt concrete hot mixture, Mark II, thickness 6cm	Applying of Liquid Bitumen on 0.6 l/m2	Gravel, fraction 0-40mm, thickness 18cm			
				Area, with taking into account the widening of the curves								
			m	m	m ²	ton	m ²	ton	m ²	m ³	m ³	
1	2	3	4	6	7	8	9	10	11	12	14	15
1	0+000	1+000	967	7,3	7101,8	2,13	7101,8	4,3	7665	2290	270	
2	1+000	2+000	952	7,8	7387,0	2,22	7387,0	4,4	7941	2307	249	
3	2+000	3+000	1000	7,4	7445,1	2,23	7445,1	4,5	8028	2402	283	
4	3+000	4+000	1000	7,8	7832,3	2,35	7832,3	4,7	8414	2451	266	
5	4+000	5+000	1000	7,6	7570,3	2,27	7570,3	4,5	8152	2416	277	
6	5+000	6+000	1000	7,6	7573,1	2,27	7573,1	4,5	8156	2436	284	
7	6+000	7+000	1000	7,7	7714,9	2,31	7714,9	4,6	8297	2476	286	
8	7+000	8+000	1000	7,6	7623,8	2,29	7623,8	4,6	8206	2444	282	
9	8+000	8+751	670	7,5	5006,7	1,50	5006,7	3,0	5401	1645	191	
Totally			8589		65254,8	19,6	65254,8	39,2	70260,6	20865,8	2388,2	

Volumes of the Works for the Arrangement of Reinforced Concrete Lower Walls Road: Kakaskhidi-Zekari km17-km33, Part 1																					
#	Location from ch+ to ch+	Length	Height	Processing of Soil				Transportation of porcessed soil to a dumpsite	Processing of a soil, leaving at the site	Monolithic concrete levelling layer, thickness 10 cm	Monolithic Concrete B25, W6, F200		Reinforcement		Drainage Pipe		Arrange ment of expansio n joint	Wall waterpro ofing (surface, 2x)	Arrangement of a drainage behind a wall		Backfilling of a soil behind a wall with bulldozer/exc avator, mechanized compaction
				with excavator mounted hydro hammers	with excavator mounted hydro hammers	explosion, with the use of blast hole charge up to 1m	manually, with demolition hammers				Wall body	Wall foundation	AIII	AI					Stone, size 150- 200mm	Fertile clay	
				Soil - 19/20a	Soil - 20 b	Soil - 20 b	Soil - 20 b		Soil - 20 b												
		m	m	m³	m³	m³	m³	m³	m³	m³	m3	m3	kg	kg	unit	l.m	m	m²	m³	m³	m³
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>	<i>21</i>	<i>22</i>
1	6+72÷7+17	55,0	5-7	194,0	130,0	87,0	45,0	331,0	131,0	13,0	157,3	275,7	2763	686	27,0	28,4	40,0	449,0	27,0	18,0	131,0
2	8+46÷9+00	62,0	3-7	208,0	142,0	340,0	77,0	408,0	359,0	13,0	134,5	222	2186,0	487,0	28,0	28,0	36,0	390,0	27,4	18,3	359,0
3	11+28÷11+75	51,0	6-9	367,0	250,0	665,0	143,0	670,0	755,0	18,0	288,9	456,6	3728	820	25,0	35,0	44,0	561,0	40,4	27,0	755,0
4	12+20÷13+34,44	112,4	3-7	275,0	201,0	217,0	73,5	479,5	287,0	28,0	273,4	503,66	5077,0	1233,0	52,0	52,0	50,0	805,0	61,8	41,6	287,0
5	13+48÷14+64	115,0	5-7	538,0	367,0	100,0	112,0	593,0	524,0	27,5	366,3	556,5	5994,0	1450,0	57,0	60,0	81,0	950,0	55,2	36,8	524,0
6	16+36÷17+14	78,0	3-7	274,0	210,0	189,0	75,0	392,0	356,0	13,3	168,4	268	2855,0	685,0	38,0	38,0	46,0	553,0	37,5	25,0	356,0
7	18+28÷18+92	67,0	3-5	275,0	160,0	134,0	65,0	303,0	331,0	10,9	97,26	176,89	1920,0	500,0	32,0	27,0	26,0	410,0	30,1	20,1	331,0
8	19+08÷19+36	29,4	3-5	100,0	42,0	20,0	18,0	94,0	86,0	5,0	50	75	712,5	235,5	14,0	9,9	6,4	181,0	13,5	8,8	86,0
9	20+48÷20+68	19,7	3	76,0	38,0	23,0	15,0	57,0	95,0	7,0	22	44	435,6	158,4	9,0	7,0	3,0	105,0	9,0	5,9	95,0
10	21+06÷21+52	44,0	3-4	151,0	100,0	51,0	34,0	150,0	186,0	15,0	68	114	1201,2	410,4	22,0	16,0	21,0	260,0	20,2	13,2	228,0
11	21+89÷22+01	15,1	5	67,5	30,0	6,0	11,5	63,0	52,0	6,20	33	53	412,8	141,0	7,0	6,0	-	108,0	7,0	4,5	52,0
12	27+23÷27+35	10,8	3	34,0	21,0	5,0	7,0	32,0	35,0	5,6	10,5	24	196,7	75,4	5,0	3,6	-	50,0	5,0	3,2	35,0
13	28+68÷28+78	11,5	4	38,0	22,0	15,0	10,0	50,0	35,0	1,7	9,1	17,3	479,0	123,0	6,0	5,0	-	72,0	5,2	3,5	50,0
14	30+20÷30+30	9,1	3-5	31,4	26,0	20,0	8,6	43,0	43,0	2,0	17	27	250,8	84,8	4,0	2,8	-	51,0	4,2	2,7	43,0
15	30+68÷31+11	39,25	3-5	142,5	77,0	55,0	30,5	128,0	177,0	8,0	55	98	872,1	307,7	19,0	13,5	9,6	240,2	18,1	11,8	177,0
16	34+43÷34+57	12,0	3	7,0	39,0	16,0	7,0	46,0	23,0	2,4	12,1	27,2	274,5	70,5	6,0	5,0	3,5	61,0	5,5	3,7	23,0
17	37+44÷38+15	66,4	3-7	328,0	154,0	172,0	70,0	428,0	296,0	15,2	170,46	258,02	2708,6	656,0	32,0	25,0	42,0	440,0	45,8	30,5	296,0
18	41+91÷41+99	7,0	3	18,0	12,0	31,0	6,0	37,0	30,0	1,4	7,0	15,2	155,4	41,5	4,0	3,0	-	35,0	3,2	2,1	30,0
19	73+06÷73+74	72,82	3-5	277,0	163,0	95,0	53,5	318,5	270,0	27,0	116	197	1784,1	618,6	33,0	23,0	31,0	476,0	33,5	21,8	270,0
20	86+07÷86+43	35,0	4-10	196,0	119,0	172,0	48,0	323,0	212,0	13,9	141,14	206,94	2158,0	488,0	17,0	15,0	22,0	354,0	21,9	14,6	212,0
21	Totally	912,5		3597,4	2303,0	2413,0	909,6	4946,0	4283,0	234,1	2197,36	3616,01	36163,8	9271,9	437,0	403,2	461,5	6551,2	471,5	313,1	4340,0

Volumes of the Works for the Arrangement of Gabion Lower Support Walls
 Road: Kutaisi (Saghoria) - Baghdati - Abastumani - Benara, km 17 - km 33

#	Location from ch+ to ch+	Length	Processing of a soil, transportation to a dumpsite				Processing of a soil, leaving at the site	Crushed stone bed, thickness 20cm (demolition of porcessed local layer)	Gabion baskets, size 2x1x1 m wire, standard EN 10218-2 or EN 10223- 3 d-2.7 mm	Gabion baskets, size 1.5x1x1 m wire, standard EN 10218- 2 or EN 10223-3 d-2.7 mm	m	Manual filling of a gabion with rip-rap stone (soil processed in a pit)	Backfilling of soil behind a wall with bulldozer / excavator, mechanized compaction
			With excavator / excavator mounted hydro hammers			manually / manually with demolition hammers	With excavator / excavator mounted hydro hammers						19
			19	37	28v	28v	19						
		m	m³	m³	m³	m³	m³	m³	m³	unit/kg	unit/kg	kg	m³
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Right													
1	33+64 ÷ 34+14	58	249	67	16	33,2	148	32	67 / 1172,5	58 / 765,6	96,9	221,0	148
2	40+50 ÷ 41+16	68	222	80	16	31,8	141	38	62 / 1085,0	68 / 897,6	99,1	226,0	141
Left													
1	2+88 ÷ 3+14	28	108	39	8	15,5	76	16	41 / 717,5	42 / 554,4	63,6	145,0	76
2	37+10 ÷ 37+36	26	132	16	8	15,6	68	19	49 / 857,5	40 / 528,0	69,3	158,0	68
3	44+19 ÷ 44+29	10	23	0	0	2,3	3	5	5 / 87,5	10 / 132,0	11,0	25,0	3
4	48+60 ÷ 48+76	16	59	25	15	9,9	51	10	10 / 175,0	29 / 382,8	27,9	63,5	51
5	48+92 ÷ 49+17	30	113	60	15	18,8	78	17	43 / 752,5	30 / 396,0	57,4	131,0	78
6	50+22 ÷ 50+36	14	71	28	42	14,1	78	11	29 / 507,5	28 / 369,6	43,9	100,0	78
7	50+54.5 ÷ 50+89	34,5	127	36	200	36,3	158	18	63 / 1102,5	70 / 924,0	101,3	231,0	158
8	51+47 ÷ 51+61	14	27	14	79	12,0	95	10	33 / 577,5	31 / 409,2	49,3	112,5	95
Totally		299	1131	365	399	190	896	176	402 / 7035	406 / 5359	620	1413	896

Volumes of the Works for the Arrangement of R/C Round Culverts d=1.0 m - I

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Name of Works	Unit of Measure	Location Ch+										Total
			0+10	2+80	3+86	5+60	9+30	10+20	12+70	24+50	26+00	27+14	
			d=1.0m L=10 m	d=1.0m L=11 m	d=1.0m L=10m	d=1.0m L=11m	d=1.0m L=10m	d=1.0m L=10m	d=1.0m L=10m	d=1.0m L=12m	d=1.0m L=9m	d=1.02m L=10m	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Processing of a soil with excavator mounted hydro hammers												
	– Loading and transportation to a dumpsite												
	• soil19/20a	m ³	14	19	--	26	17	--	28	--	46	35	185
	• soil20b	m ³	42	35	15	8	13	--	19	--	32	27	191
	– leaving at the site												
	• soil19/20a	m ³	45	48	--	--	--	--	--	--	--	--	93
	• soil20b	m ³	--	--	--	--	--	--	--	--	--	--	--
2	Manual processing of a soil with demolition hammers, Loading and transportation to a dumpsite												
	• soil19/20a	m ³	6	7	--	2	1	--	1	--	4	3	24
3	• soil20b	m ³	4	3	1	--	1	--	1	--	3	3	16
	pre loosening of rocky soil 29e with shot holes, steps' height 1m												
	– loading with excavator and transportation to a dumpsite	m ³	42	102	110	89	82	121	56	135	46	73	856
	– processing with excavatorleaving at the site	m ³	--	--	52	35	38	54	30	46	45	57	357
	– manual processing, throwing 2x	m ³	4	10	18	12	12	18	8	18	9	14	123
4	arrangement of r/c culvert body: – Production of r/c culvert sections d=1.0m L=1.0m p=900kg, wall thickness δ=10cm, transportation and installation	unit/m ³	--	1/0.35	--	1/0.35	--	--	--	--	1/0.35	--	3/1.05

[illegible]

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Volumes of the Works for the Arrangement of R/C Round Culverts d=1.0 m - II

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

N	Name of Works	Unit of Measure	Location Ch+										Total
			27+94	30+37	30+96	32+17	32+85	36+85	37+75	39+10	39+95	43+83	
			d=1.0m L=10 m	d=1.0m L=10 m	d=1.0m L=10m	d=1.0m L=10m	d=1.0m L=11m	d=1.0m L=11m	d=1.0m L=10m	d=1.0m L=11m	d=1.0m L=10m	d=1.02m L=10m	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Processing of a soil with excavator mounted hydro hammers												
	– Loading and transportation to a dumpsite												
	• soil19/20a	m ³	35	44	38	--	34	38	32	42	25	16	304
	• soil20b	m ³	27	37	26	--	28	32	26	36	25	14	251
	– leaving at the site												
	• soil19/20a	m ³	--	--	--	--	--	--	--	--	22	--	22
	• soil20b	m ³	--	--	--	--	--	--	--	--	--	--	--
2	Manual processing of a soil with demolition hammers, Loading and transportation to a dumpsite												
	• soil19/20a	m ³	3	4	3	--	3	4	3	4	4	1	29
	• soil20b	m ³	3	3	2	--	2	3	2	3	2	1	21
3	pre loosening of rocky soil 29e with shot holes, steps' height 1m												
	– loading with excavator and transportation to a dumpsite	m ³	73	52	62	145	94	98	22	84	45	118	793
	– processing with excavatorleaving at the site	m ³	57	55	30	52	29	27	14	14	--	44	322
	– manual processing, throwing 2x	m ³	14	11	9	18	12	13	3	8	5	17	110
4	arrangement of r/c culvert: – Production of r/c culvert sections d=1.0m L=1.0m p=900kg, wall thickness δ=10cm, transportation and installation	unit/m ³	--	--	--	--	1/0.35	1/0.35	--	1/0.35	--	--	3/1.05

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Volumes of the Works for the Arrangement of R/C Round Culverts d=1.0 m - III

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

N	Name of Works	Unit of Measure	Location Ch+										Total
			44+15	45+25	46+80	48+43	50+78	52+88	57+35	59+52	61+42	65+03	
			d=1.0m L=10 m	d=1.0m L=12 m	d=1.0m L=10m	d=1.0m L=10m	d=1.0m L=9m	d=1.0m L=10m	d=1.0m L=12m	d=1.0m L=11m	d=1.0m L=12m	d=1.0m L=14m	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Processing of a soil with excavator mounted hydro hammers												
	– Loading and transportation to a dumpsite												
	• soil19/20a	m ³	42	--	--	--	--	--	--	--	--	--	42
	• soil20b	m ³	27	10	24	10	--	--	--	--	--	--	71
	– leaving at the site												
	• soil19/20a	m ³	30	40	40	30	120	22	8	20	18	--	328
	• soil20b	m ³	--	12	6	16	70	15	10	20	22	--	171
2	Manual processing of a soil with demolition hammers, Loading and transportation to a dumpsite												
	• soil19/20a	m ³	8	4	4	3	10	2	1	2	1	--	35
	• soil20b	m ³	3	2	3	2	7	1	1	2	2	--	23
3	pre loosening of rocky soil 29e with shot holes, steps' height 1m												
	– loading with excavator and transportation to a dumpsite	m ³	54	150	206	120	250	128	160	179	175	148	1570
	– processing with excavatorleaving at the site	m ³	--	--	--	--	20	12	22	10	--	52	116
	– manual processing, throwing 2x	m ³	6	12	20	10	20	15	18	18	17	20	156

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	– body concrete B22.5F200W6 waterproofing	m ³	3,4	3,5	3,4	3,5	3,4	3,4	3,5	3,4	3,4	3,5	34,4
	– surface (hot bitumen two layers)	m ²	11,7	11,8	11,7	11,8	11,6	11,6	11,8	11,8	11,6	11,8	117,2
7	stone apron	m ³	--	7,1	7,1	7,1	--	7,1	7,1	7,1	7,1	7,1	56,8
8	arrangement of r/c wall at the culvert outlet	l.m.	--	--	--	--	8	--	--	--	--	--	8,0
	– concrete preparatory layer B15 F200 W6 h _{mo} δ=10 ъm	m ³	--	--	--	--	6,5	--	--	--	--	--	6,5
	– arrangement of monolithic r/c foundation	m ³	--	--	--	--	56,8	--	--	--	--	--	56,8
	• concrete B25F200W6	kg	--	--	--	--	440	--	--	--	--	--	440,0
	• reinforcement A-III												
	– arrangement of monolithic r/c wall body	m ³	--	--	--	--	39,2	--	--	--	--	--	39,2
	• concrete B25F200W6	kg	--	--	--	--	1676	--	--	--	--	--	1676,0
	• reinforcement A-III												
	–arrangement of surface waterproofing with hot bitumen	m ²	--	--	--	--	110	--	--	--	--	--	110,0
9	Arrangement of r/c wall transverse drainage	unit/l.m.	--	--	--	--	4/4.8	--	--	--	--	--	4/4.8
	- Plastic pipe d=20 ъm	m ³	--	--	--	--	5	--	--	--	--	--	5,0
	-fertile clay h=20 ъm	m ³	--	--	--	--	8	--	--	--	--	--	8,0
	- stone fill h=30 ъm												
10	Arrangement of Gabion gaskets at the culvert outlet with 2.7mm galvanized wire, cell size 8x10 ъm standard EN 10223-3												
	– 1.0X1.0X2.0m	unit/kg	5/87.5	--	--	--	--	--	--	--	--	--	5/87.5
	–1.0X1.0X1.5m	unit/kg	--	--	--	--	5/66	--	--	--	--	--	5/66
	–manual placement of rip rap stone	m ³	10	--	--	--	7,5	--	--	--	--	--	17,5
	– binding wire	kg	5	--	--	--	4	--	--	--	--	--	9

11	Placement of delivered sand-gravel soil behind pipe walls and on a body by excavator, mechanized ramming layer by layer	m ³	50	60	50	50	40	48	60	56	62	68	544
12	Backfilling of pre processed soil in a foundation pit with excavator, mechanized compaction layer by layer												
	• soil19/20a	m ³	30	40	40	30	120	22	8	20	18	--	328
	• soil20b	m ³	--	12	6	16	90	27	22	30	22	52,00	277,00
13	Cutting of a bed at the culvert outlet – Processing of a soil withgh excavator mounted hydro hammers, Loading and transportation to a dumpsite												
	• soil19/20a	m ³	--	6	8	18	--	10	40	--	18	10	110
	• soil20b	m ³	--	--	--	12	--	--	--	--	14	8	34
	– Pre loosening of a soil with shot holes, steps' height 1m. loading with excavator, transportation to a dumpsite												
	• soil20b	m ³	--	--	--	--	--	--	--	--	--	120	120
14	Arrangement of special profile concrete parapet B22.5F200W6	unit/m ³	3/2.31	3/2.31	3/2.31	3/2.31	4/3.08	3/2.31	3/2.31	3/2.31	3/2.31	3/2.31	31/23.87
15	Painting of a parapet with perchlorvinyl paint	m ²	10,8	10,8	10,8	10,8	14,4	10,8	10,8	10,8	10,8	10,8	111,6

Volumes of the Works for the Arrangement of R/C Round Culverts d=1.0 m - IV

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

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[illegible]

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Volume of the Works for the Arrangement of Reinforced Concrete Rectangular Culverts with Section 1.0x1.5 m

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Name of Works	Unit of Measure	Location Ch+								Total	Comment						
			13+80		49+72		54+24		56+20				70+50		81+52		86+15	
			1.0x1.5m m	L=12	1.0x1.5m m	L=11	1.0x1.5m m	L=11	1.0x1.5m m	L=12			1.0x1.5m L=12 m	1.0x1.5m m	L=12	1.0x1.5m L=11.4 m		
1	2	3	4	5	6	7	8	9	10	11	12							
1	Soil processing with excavator mounted hydro hammers – Loading and transportatio to a dumpsite • soil 19/20a • soil 20b – leaving at the siite • soil 19/20a • soil 20b	m³	20	90	90	35	65	90	--	390								
		m³	53	72	73	20	40	70	--	328								
		m³	52	--	--	--	--	--	50	102								
		m³	5	--	--	--	--	--	25	30								
2	Manual processing of a soil with demolition hammers, loading and transportation to a dumpsite • soil 19/20a • soil 20b	m³	8	10	9	3	6	10	5	51								
		m³	--	8	8	2	4	7	2	31								
3	Pre loosening of rocky soil 29 ^o with shot-holes, steps' height 1m – loading with excavator , transportation to a dumpsite – processing with excavator, leaving at the site – manual processing, double throwing	m³	--	65	204	285	185	110	--	849								
		m³	--	135	120	117	93	90	20	575								
		m³	--	20	36	38	25	20	2	141								
4	Arrangement of reinforced concrete rectangular body: – gravel bedding h=20 cm –concrete bedding h=15-44 cm – body concrete B30F200W6 – reinforcement A-III – Triangular discharge	m³	6,6	6,7	7,2	7,9	7,9	7,9	7,3	51,5	B22.5F200 W6							
		m³	2,6	2,6	2,8	3,1	3,1	3,1	5,3	22,6								
		m³	14,52	13,31	13,31	14,52	14,52	14,52	13,8	98,5								
		kg	2878,8	2638,9	2638,9	2878,8	2878,8	2878,8	2734,9	19527,9								
		m³	0,4	0,35	0,35	0,4	0,4	0,4	0,35	2,65	cement mortar M300							

1	2	3	4	5	6	7	8	9	10	11	12
	– Placement of bitumen soaked flex tow between pipe sections	kg	20	20	20	20	20	20	20	140	two layers of hot bitumen
	–Surface waterproofing	m ²	68	68	78	84	84	84	68	534	
	–Greasing waterproofing	m ²	5,7	5,7	5,7	5,7	5,7	5,7	5,7	39,9	
	–Arrangement of foam board plastic sheets on the pipe walls for protecting waterproofing	m ²	43,0	42,2	47,8	50,6	50,6	50,6	39,2	324	
5	Arrangement of concrete toes at the inlet and outlet of a pipe										
	–gravel bedding h=20 cm	m ³	0,4	0,65	1	1	1	1	0,4	5,45	
	–concrete B30F200W6	m ³	0,8	2,7	3,6	3,6	3,6	3,6	0,8	18,7	
6	Arrangement of water catchment well										
	– sand gravel bedding h=20 cm	m ³	--	1,5	1,5	1,5	1,5	1,5	--	7,5	
	– Chute concrete B25F200W6	m ³	--	3	3	3	3	3	--	15	
	– body concrete B25F200W6	m ³	--	6,7	6,6	6,7	6,6	6,7	--	33,3	
	Waterproofing										
	– surface (hot bitumen two layers)	m ²	--	19,2	19,0	19,2	19,0	19,2	--	95,6	
7	Arrangement of winged outlet										
	– gravel bedding h=10 cm	m ³	--	--	--	--	--	1,2	1,2	2,4	B22.5F200 W6
	– concrete bedding h=15 cm	m ³	--	--	--	--	--	0,8	1,2	2	
	–wing toe concrete B30F200W6	m ³	--	--	--	--	--	1,3	1,3	2,6	
	– chute concrete B30F200W6	m ³	--	--	--	--	--	1,2	1,2	2,4	
	– wings' concrete B30F200W6	m ³	--	--	--	--	--	1,2	1,2	2,4	
	– chute and wings' reinforcement B48 A-III	kg	--	--	--	--	--	358	358	716	
	– surface waterproofing	m ²	--	--	--	--	--	15	15	30	
	– stone apron	m ³	--	--	--	--	--	8,4	8,5	16,9	
	socle concrete B30F200W6	m ³	0,35	0,7	1,2	1,2	1,1	1,1	0,35	6	

1	2	3	4	5	6	7	8	9	10	11	12
9	Arrangement of r/c wall at a culvert outlet	l.m.	--	10	--	--	--	--	--	10	two layers
	– concrete preparation layer B15 F200 W6 hmo6=10 cm	m ³	--	5,6	--	--	--	--	--	5,6	
	– Arrangement of monolithic r/c foundation										
	• concrete B25F200W6	m ³	--	41	--	--	--	--	--	41	
	• reinforcement A-III	kg	--	413	--	--	--	--	--	413	
	– Arrangement of monolithic r/c wall body										
	• concrete B25F200W6	m ³	--	25	--	--	--	--	--	25	
10	Arrangement of transverse drainage of r/c wall	unit/l.m.	--	3/3.6	--	--	--	--	--	3/3.6	
	- plastic pipe d=20 cm	m ³	--	5	--	--	--	--	--	5	
	- fertile clay h=20 cm	m ³	--	8,5	--	--	--	--	--	8,5	
11	Arrangement of Gabion wall at the pipe outlet 2.7 mm with galvanized wire, cell size 8x10 cm, standard EN 10223-3										
	– gravel beddign h=20 cm	m ³	6	--	6	6	6	--	--	24	
	– 1.0X1.0X2.0m	unit/kg	4/70	--	4/70	4/70	4/70	--	--	16/280	
	– 1.0X1.0X1.5m	unit/kg	22/290.4	--	22/290.4	22/290.4	22/290.4	--	--	88/1161.6	
	– manual placement of rip rap stone	m ³	41	--	41	41	41	--	--	164	
12	–binding wire	kg	20	--	20	20	20	--	--	80	
	Arrangement of Gabion wall at the pipe outlet 2.7 mm with galvanized wire, cell size 8x10 cm, standard EN 10223-3										
	– 1.0X1.0X2.0m	unit/kg	7/122.5	3/52.5	3/52.5	5/87.5	5/87.5	--	7/122.5	30/525	
	– 1.0X1.0X1.5m	unit/kg	2/26.4	2/26.4	2/26.4	--	--	--	--	6/79.2	

1	2	3	4	5	6	7	8	9	10	11	12
	– manual placement of rip rap stone	m ³	17	9	9	10	10	--	14	69	
	–binding wire	kg	7,5	4	4	5	5	--	6,5	32	
13	Placement of rip rap stone around a culvert body, compaction	m ³	180	100	100	110	110	112	216	928	
14	Placement of delivered sand-gravel soil on a culvert with excavator, mechanized ramming layer by layer	m ³	20	20	20	20	20	20	20	140	
15	Placement of pre-processed soil on culvert body and in front of a wall with bulldozer, displacement on 20m, mechanized ramming										
	• soil 19/20s	m ³	52	--	--	--	--	--	50	102	
	• soil 20s	m ³	--	135	120	117	93	90	45	600	
16	Cutting of a bed at the culvert outlet										
	– Processign of a soil wit excavator mountedd hydro hammers,, loading and transportawtion to a dumpsite										
	• soil 19/20s	m ³	16	--	18	30	45	14	16	139	
	• soil 20s	m ³	--	--	6	22	30	--	--	58	
	– Pre loosening of a with shot-holes, steps' height 1m, loading with excavator, transportation to a dumpsite										
	• soil 20s	m ³	--	--	--	28	25	--	--	53	
17	Arrangement of special profile concrete parapet B22.5F200W6	unit/m ³	6/4.62	6/4.62	6/4.62	6/4.62	6/4.62	4/3.08	4/3.08	38/29.26	
18	Painting of a parapet with perchlorvinyl paint	m ²	21,6	21,6	21,6	21,6	21,6	14,4	14,4	136,8	

Culverts' Locations and Stakeout

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Ch +	Diameter	Culvert Length	Benchmark, m						
1	2	3	4	5	6	7	8	9	10	11
1	0+10	d-10	10	1164,83	1164,73	1166,44	1166,44	1166,44	1166,44	1166,53
2	2+80	d-10	12	1179,44	1179,34	1181,05	1181,05	1181,05	1181,05	1181,14
3	3+86	d-10	12	1185,57	1185,47	1187,18	1187,18	1187,18	1187,18	1187,27
4	5+60	d-10	12	1196,78	1196,68	1198,39	1198,39	1198,39	1198,39	1198,48
5	9+30	d-10	10	1231,32	1231,22	1232,93	1232,93	1232,93	1232,93	1233,02
6	10+20	d-10	10	1241,67	1241,57	1243,28	1243,28	1243,28	1243,28	1243,37
7	12+70	d-10	11	1267,26	1267,16	1268,87	1268,87	1268,87	1268,87	1268,96
8	13+80	d-10	16	1278,06	1277,86	1279,67	1279,67	1279,67	1279,67	1279,76
9	24+50	d-10	10	1358,65	1358,55	1360,26	1360,26	1360,26	1360,26	1360,35
10	26+00	d-10	10	1369,4	1369,3	1371,01	1371,01	1371,01	1371,01	1371,1
11	27+14	d-10	10	1377,57	1377,47	1379,18	1379,18	1379,18	1379,18	1379,27
12	27+94	d-10	10	1383,3	1383,2	1384,91	1384,91	1384,91	1384,91	1385
13	30+96	d-10	10	1404,94	1404,14	1406,55	1406,55	1406,55	1406,55	1406,64
14	32+17	d-10	10	1411,35	1411,25	1412,96	1412,96	1412,96	1412,96	1413,05
15	32+85	d-10	10	1415,77	1415,67	1417,38	1417,38	1417,38	1417,38	1417,47
16	37+75	d-10	10	1446,87	1446,67	1448,48	1448,48	1448,48	1448,48	1448,57
17	39+10	d-10	12	1453,32	1453,12	1454,93	1454,93	1454,93	1454,93	1455,02
18	39+95	d-10	10	1458,05	1457,85	1459,66	1459,66	1459,66	1459,66	1459,75
19	43+83	d-10	10	1477,8	1477,6	1479,41	1479,41	1479,41	1479,41	1479,5
20	44+15	d-10	10	1480,18	1479,98	1481,79	1481,79	1481,79	1481,79	1481,88
21	45+25	d-10	10	1487,89	1487,69	1489,5	1489,5	1489,5	1489,5	1489,59
22	46+80	d-10	10	1498,69	1498,49	1500,3	1500,3	1500,3	1500,3	1500,39
23	48+43	d-10	10	1510,31	1510,11	1511,92	1511,92	1511,92	1511,92	1512,01
24	49+72	1x1.5	13	1520,18	1520,18	1522,29	1522,29	1522,29	1522,29	1522,38
25	50+78	d-10	10	1527,07	1526,87	1528,68	1528,68	1528,68	1528,68	1528,77

26	52+88	d-10	10	1542,12	1541,92	1543,73	1543,73	1543,73	1543,73	1543,82
27	54+24	1x1.5	13	1549,49	1549,49	1551,6	1551,6	1551,6	1551,6	1551,69
28	56+20	1x1.5	13	1559,37	1559,37	1561,48	1561,48	1561,48	1561,48	1561,57
29	57+35	d-10	10	1566,73	1566,53	1568,34	1568,34	1568,34	1568,34	1568,43
30	59+52	d-10	10	1578,41	1578,21	1580,02	1580,02	1580,02	1580,02	1580,11
31	61+42	d-10	12	1589,92	1589,72	1591,53	1591,53	1591,53	1591,53	1591,62
32	65+03	d-10	12	1609,94	1609,74	1611,55	1611,55	1611,55	1611,55	1611,64
33	65+75	d-10	12	1614,98	1614,78	1616,59	1616,59	1616,59	1616,59	1616,68
34	67+35	d-10	11	1626,24	1626,04	1627,85	1627,85	1627,85	1627,85	1627,94
35	68+18	d-10	10	1632,58	1632,38	1634,19	1634,19	1634,19	1634,19	1634,28
36	69+50	d-10	10	1642,52	1642,32	1644,13	1644,13	1644,13	1644,13	1644,22
37	70+50	1x1.5	13	1648,58	1648,58	1650,69	1650,69	1650,69	1650,69	1650,78
38	71+67	d-10	12	1657,93	1657,73	1659,54	1659,54	1659,54	1659,54	1659,63
39	75+65	d-10	12	1688,24	1688,04	1689,85	1689,85	1689,85	1689,85	1689,94
40	78+65	d-10	12	1708,6	1708,4	1710,21	1710,21	1710,21	1710,21	1710,3
41	81+52	1x1.5	13	1731,77	1731,77	1733,88	1733,88	1733,88	1733,88	1733,97
42	83+10	d-10	10	1746,52	1746,32	1748,13	1748,13	1748,13	1748,13	1748,22
43	85+12	d-10	12	1764,96	1764,76	1766,57	1766,57	1766,57	1766,57	1766,66
44	86+15	d-10	11	1774,31	1774,11	1775,92	1775,92	1775,92	1775,92	1776,01

Fencing with Steel Rope

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Location			Section Length	Comment
	From Ch +	To Ch +	From Axis		
				Linear Meter	
1	2	3	4	5	6
1	1+75.00	3+25.00	to the left	150	
2	8+00.00	10+00.00	to the left	200	
3	10+50.00	11+75.00	to the left	125	
4	13+75.00	14+00.00	to the left	25	
5	17+80.00	19+50.00	to the left	170	
6	22+65.00	23+60.00	to the left	95	
7	24+55.00	26+60.00	to the left	205	
8	26+70.00	31+40.00	to the left	470	
9	35+55.00	38+30.00	to the left	275	
10	42+65.00	46+40.00	to the left	375	
11	46+65.00	51+80.00	to the left	515	
12	58+45.00	60+40.00	to the left	195	
13	68+30.00	70+35.00	to the left	205	
14	72+00.00	73+80.00	to the left	180	
15	79+65.00	82+45.00	to the left	280	
16	83+00.00	83+15.00	to the left	15	
17	86+00.00	86+50.00	to the left	50	
Totally to the left				3530	
1	0+00.00	1+20.00	to the right	120	
2	3+85.00	7+20.00	to the right	335	
3	12+15.00	15+00.00	to the right	285	
4	15+30.00	17+25.00	to the right	195	
5	20+30.00	22+10.00	to the right	180	
6	32+70.00	34+80.00	to the right	210	
7	39+00.00	42+05.00	to the right	305	
8	51+60.00	52+50.00	to the right	90	
9	53+85.00	54+95.00	to the right	110	
10	61+80.00	62+75.00	to the right	95	
11	63+00.00	63+15.00	to the right	15	
Totally to the right				1940	
Grand Total				5470	

Arrangement of Plastic Directional Signal Poles

#	Location			Section Length	Locatio of Poles		Total Number of Poles	Comment
	From Ch +	To Ch +	From Axis		with spacing 10 m	with spacing 20 m		
					Linear Meter	0		
1	2	3	4	5	6	7	8	9
1	0+00.00	0+30.00	to the left	30.42	4	-	4	
2	0+40.00	1+00.00	to the left	70.01	-	4	4	
3	1+20.00	1+70.00	to the left	39.77	5	-	5	
4	3+70.00	4+10.00	to the left	39.71	-	3	3	
5	4+20.00	4+60.00	to the left	39.80	4	-	4	
6	4+70.00	5+00.00	to the left	29.93	-	2	2	
7	5+10.00	7+20.00	to the left	199.50	20	-	20	
8	7+60.00	7+90.00	to the left	164.66	-	2	2	
9	10+10.00	10+50.00	to the left	38.49	4	-	4	
11	12+20.00	12+60.00	to the left	37.80	4		4	
12	13+10.00	13+68.00	to the left	61.99	6	-	6	
13	14+10.00	14+40.00	to the left	30.54	4	-	4	
14	14+50.00	14+80.00	to the left	30.07	-	2	2	
15	15+60.00	15+90.00	to the left	29.94		2	2	
16	16+00.00	16+30.00	to the left	27.68	3		3	
17	16+40.00	16+60.00	to the left	20.21		2	2	
18	16+70.00	17+70.00	to the left	80.97	9		9	
19	19+90.00	20+40.00	to the left	54.63	5	-	5	
20	20+50.00	21+00.00	to the left	50.46	-	3	3	
21	21+10.00	21+30.00	to the left	21.15	3	-	3	
22	21+40.00	21+70.00	to the left	29.84		2	2	
23	21+80.00	22+60.00	to the left	63.13	7		7	
24	23+70.00	23+80.00	to the left	21.02	2		2	
25	23+90.00	24+40.00	to the left	49.81		3	3	
26	24+50.00	24+60.00	to the left	8.67	1		1	
27	26+60	26+70	to the left	10	1		1	
28	31+90.00	32+20.00	to the left	30.10		2	2	
29	32+30.00	33+50.00	to the left	120.51	13		13	
30	33+60.00	34+10.00	to the left	49.97		3	3	
31	34+20.00	35+40.00	to the left	98.96	10		10	
32	38+70.00	42+40.00	to the left	379.07	37		37	
33	52+20.00	54+15.00	to the left	195	18		18	
34	54+60	58+30	to the left	370	17		17	
35	60+90	63+90	to the left	460.47	29		29	
36	64+20	65+60	to the left	140	14		14	
37	65+70.00	66+20.00	to the left	50.09		3	3	
38	66+30.00	67+40.00	to the left	111.57	12		12	
39	67+50.00	68+00.00	to the left	49.29		3	3	
40	68+10.00	68+20.00	to the left	18.48	2		2	
41	70+40.00	70+80.00	to the left	40.14		3	3	
42	70+90.00	71+90.00	to the left	196.81	11		11	
43	74+20.00	75+20.00	to the left	93.51	10		10	
44	75+30.00	75+50.00	to the left	19.14		1	1	
45	75+60.00	77+58.00	to the left	181.53	19		19	
46	77+90.00	79+20.00	to the left	135.19	13		13	
47	82+50.00	83+00.00	to the left	49.90	-	3	3	
48	83+23.00	83+45.00	to the left	286.20	3	-	3	
49	83+82	86+00	to the left	218	23	-	23	
50	87+30	87+50	to the left	90.00	2	-	2	

1	2	3	4	5	6	7	8	9
Total Number of Poles to the Left							358	
1	1+80.00	3+80.00	to the right	198.58	19	-	19	
2	7+60.00	8+40	to the right	130.04		4	4	
3	8+50	10+30.00	to the right	164.65	17	-	17	
4	10+40.00	10+70.00	to the right	30.10	-	2	2	
5	10+80.00	11+80.00	to the right	97.68	10	-	10	
6	17+60.00	18+40.00	to the right	80.65		5	5	
7	18+50.00	20+10.00	to the right	161.25	14		14	
8	22+30.00	22+90.00	to the right	71.03	7	-	7	
9	23+00.00	23+40.00	to the right	39.85		2	2	
10	23+50.00	24+30.00	to the right	87.88	9		9	
11	24+90.00	25+10.00	to the right	19.03	2		2	
12	25+20.00	25+60.00	to the right	38.51		2	2	
13	25+70.00	28+90.00	to the right	316.12	32		32	
14	29+00.00	29+40.00	to the right	39.49		2	2	
15	29+50.00	30+20.00	to the right	69.26	7		7	
16	30+30.00	30+80.00	to the right	51.00		3	3	
17	30+90.00	32+60.00	to the right	160.12	16		16	
18	35+20.00	36+50.00	to the right	122.18	13		13	
19	36+87.00	39+00.00	to the right	224.11	20		20	
20	42+40.00	42+90.00	to the right	55.39	5		5	
21	43+00.00	43+90.00	to the right	90.80		5	5	
22	44+30.00	45+10.00	to the right	85.45	8		8	
23	45+70.00	46+00.00	to the right	50.67		2	2	
24	46+10.00	46+90.00	to the right	74.42	8		8	
25	47+20.00	48+20.00	to the right	105.35	11		11	
26	48+70.00	49+45.00	to the right	85.19	8		8	
27	50+00	50+70.00	to the right	78.63	7		7	
28	50+80.00	51+10.00	to the right	30.00		2	2	
29	51+30.00	51+55.00	to the right	35.98	3		3	
30	52+60.00	53+80.00	to the right	121.83	13		13	
31	55+40.00	55+60.00	to the right	20.00		2	2	
32	56+00.00	57+80.00	to the right	177.98	18		18	
33	57+90.00	59+60.00	to the right	169.01		9	9	
34	59+70.00	61+80.00	to the right	188.70	19		19	
35	62+80.00	62+99.00	to the right	21.29	3		3	
36	63+60.00	67+30.00	to the right	362.13	37		37	
37	67+40.00	68+00.00	to the right	60.99		4	4	
38	68+10.00	71+35.00	to the right	327.54	33		33	
39	71+70.00	71+90.00	to the right	31.37	3		3	
40	72+00.00	72+40.00	to the right	40.44		3	3	
41	72+50.00	74+60.00	to the right	187.29	19		19	
42	75+70.00	76+80.00	to the right	109.21	11		11	
43	77+50.00	81+30.00	to the right	381.35	38		38	
44	81+70.00	83+00.00	to the right	126.67		7	7	
45	83+40.00	85+00.00	to the right	155.36	16		16	
46	85+30.00	86+50.00	to the right	128.65	12		12	
47	87+30.00	87+50.00	to the right	20.00		2	2	
Total Number of Poles to the Right							494	
Total Number of Poles							852	

Individual Design Information Road Signs

Road: Kakashidi-Zekari km17-km33, Reconstruction - Part 1

#	Location		Signs' locations to an axis (to the left, to the right)	Signs/ number according to standards	Support Height	Board Size (ყპი)	Number of signs on two supports	Name of a Sign	Comment
	ch	+							
1	2	3	4	5	6	7	8	9	10
1	7	20	to the right	7.11	4.0	8 (2500X510)	1	Site Name	
2	7	60	to the left	7.11	4.0	8 (2500X510)	1	Site Name	
3	11	80	to the right	7.11	4.0	8 (2500X510)	1	Site Name	
4	12	25	to the left	7.11	4.0	8 (2500X510)	1	Site Name	
5	15	05	to the right	7.11	4.0	8 (2500X510)	1	Site Name	
6	15	15	to the left	7.11	4.0	8 (2500X510)	1	Site Name	
7	82	40	to the right	7.10.1	4.0	11(3000X680)	1	Direction indicator	
8	84	30	to the left	7.10.1	4.0	18 (3000X1020)	1	Direction indicator	
Totally			8 road sign						

Including:

ყპი 8 _ 6 units

ყპი 11 _ 1 units

ყპი 18 _ 1 units

Standard Design Road Signs

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Location of signs on a road according to chainages			Location of signs to an axis (to the left, to the right)	Number of signs according to ГОСТ 10807-78	Number of signs on supports		Support height	Comment
	km	Ch	+			on one	on two		
1	2	3	4	5	6	7	8	9	10
1	1	0	00	to the right	1.13.2 8.2.1	2	–	3,5	8750 m
2		1	20	to the right	1.35.3 1.35.6	2	–	2,75	
3		1	30	to the right	1.35.3 1.35.6	2	–	2,75	
4		1	40	to the right	1.35.3 1.35.6	2	–	2,75	
5		1	50	to the right	1.35.3 1.35.6	2	–	2,75	
6		1	60	to the right	1.35.3 1.35.6	2	–	2,75	
7		1	70	to the right	1.35.3 1.35.6	2	–	2,75	
8		3	10	to the left	1.35.3 1.35.6	2	–	2,75	
9		3	20	to the left	1.35.3 1.35.6	2	–	2,75	
10		3	30	to the left	1.35.3 1.35.6	2	–	2,75	
11		3	40	to the left	1.35.3 1.35.6	2	–	2,75	
12		3	50	to the left	1.35.3 1.35.6	2	–	2,75	
13		3	60	to the left	1.35.3 1.35.6	2	–	2,75	
14		5	10	to the right	1.35.3 1.35.6	2	–	2,75	
15		5	20	to the right	1.35.3 1.35.6	2	–	2,75	
16		5	30	to the right	1.35.3 1.35.6	2	–	2,75	
17		5	70	to the right	1.15 8.2.1	2	–	3,5	10% 700 m
18		6	60	to the right	1.35.3 1.35.6	2	–	2,75	
19		6	70	to the right	1.35.3 1.35.6	2	–	2,75	
20		6	80	to the right	1.35.3 1.35.6	2	–	2,75	
21		6	90	to the right	1.35.3 1.35.6	2	–	2,75	
22		7	00	to the right	1.35.3 1.35.6	2	–	2,75	
23		7	10	to the right	1.35.3 1.35.6	2	–	2,75	
24		8	60	to the left	1.35.3 1.35.6	2	–	2,75	
25		8	70	to the left	1.35.3 1.35.6	2	–	2,75	
26		8	80	to the left	1.35.3 1.35.6	2	–	2,75	
27		8	90	to the left	1.35.3 1.35.6	2	–	2,75	
28		9	00	to the left	1.35.3 1.35.6	2	–	2,75	
29		9	10	to the left	1.35.3 1.35.6	2	–	2,75	

1	2	3	4	5	6	7	8	9	10
30	2	12	60	to the left	1.35.3 1.35.6	2	–	2,75	
31		12	70	to the left	1.35.3 1.35.6	2	–	2,75	
32		12	80	to the left	1.35.3 1.35.6	2	–	2,75	
33		12	90	to the left	1.35.3 1.35.6	2	–	2,75	
34		13	00	to the left	1.35.3 1.35.6	2	–	2,75	
35		13	20	to the right	1.35.3 1.35.6	2	–	2,75	
36		13	30	to the right	1.35.3 1.35.6	2	–	2,75	
37		13	40	to the right	1.35.3 1.35.6	2	–	2,75	
38		13	50	to the right	1.35.3 1.35.6	2	–	2,75	
39		13	60	to the right	1.35.3 1.35.6	2	–	2,75	
40		14	90	to the left	1.35.3 1.35.6	2	–	2,75	
41		15	00	to the left	1.35.3 1.35.6	2	–	2,75	
42		15	30	to the left	1.35.3 1.35.6	2	–	2,75	
43		15	40	to the left	1.35.3 1.35.6	2	–	2,75	
44		15	50	to the left	1.35.3 1.35.6	2	–	2,75	
45		16	00	to the left	8.2.1 1.15	2	–	3,5	700 m 10%
46		16	30	to the right	1.15 8.2.1	2	–	3,5	9% 150 m
47		17	10	to the right	1.35.3 1.35.6	2	–	2,75	
48		17	20	to the right	1.35.3 1.35.6	2	–	2,75	
49		17	30	to the right	1.35.3 1.35.6	2	–	2,75	
50		17	40	to the right	1.35.3 1.35.6	2	–	2,75	
51		17	50	to the right	1.35.3 1.35.6	2	–	2,75	
52		19	30	to the left	1.35.3 1.35.6	2	–	2,75	
53		19	40	to the left	1.35.3 1.35.6	2	–	2,75	
54		19	50	to the left	1.35.3 1.35.6	2	–	2,75	
55		19	60	to the left	1.35.3 1.35.6	2	–	2,75	
56		19	70	to the left	1.35.3 1.35.6	2	–	2,75	
57		19	80	to the left	1.35.3 1.35.6	2	–	2,75	
58		20	10	to the right	1.35.3 1.35.6	2	–	2,75	
59		20	20	to the right	1.35.3 1.35.6	2	–	2,75	
60		20	30	to the right	1.35.3 1.35.6	2	–	2,75	
61		20	60	to the left	1.14 8.2.1	2	–	3,5	9% 150 m
62		21	80	to the right	1.35.3 1.35.6	2	–	2,75	
63		21	90	to the right	1.35.3 1.35.6	2	–	2,75	
64		22	00	to the right	1.35.3	2	–	2,75	

1	2	3	4	5	6	7	8	9	10
64	3	22	00	to the right	1.35.3 1.35.6	2	–	2,75	
65		22	10	to the right	1.35.3 1.35.6	2	–	2,75	
66		22	20	to the right	1.35.3 1.35.6	2	–	2,75	
67		24	40	to the right	1.35.3 1.35.6	2	–	2,75	
68		24	50	to the right	1.35.3 1.35.6	2	–	2,75	
69		24	60	to the right	1.35.3 1.35.6	2	–	2,75	
70		24	70	to the right	1.35.3 1.35.6	2	–	2,75	
71		24	80	to the right	1.35.3 1.35.6	2	–	2,75	
72	4	31	30	to the left	1.35.3 1.35.6	2	–	2,75	
73		31	40	to the left	1.35.3 1.35.6	2	–	2,75	
74		31	50	to the left	1.35.3 1.35.6	2	–	2,75	
75		31	60	to the left	1.35.3 1.35.6	2	–	2,75	
76		31	70	to the left	1.35.3 1.35.6	2	–	2,75	
77		31	80	to the left	1.35.3 1.35.6	2	–	2,75	
78		34	20	to the right	1.35.3 1.35.6	2	–	2,75	
79		34	30	to the right	1.35.3 1.35.6	2	–	2,75	
80		34	40	to the right	1.35.3 1.35.6	2	–	2,75	
81		34	70	to the right	1.35.3 1.35.6	2	–	2,75	
82		34	80	to the right	1.35.3 1.35.6	2	–	2,75	
83		34	90	to the right	1.35.3 1.35.6	2	–	2,75	
84		35	00	to the right	1.35.3 1.35.6	2	–	2,75	
85		35	10	to the right	1.35.3 1.35.6	2	–	2,75	
86		35	40	to the left	1.35.3 1.35.6	2	–	2,75	
87		35	50	to the left	1.35.3 1.35.6	2	–	2,75	
88		35	60	to the left	1.35.3 1.35.6	2	–	2,75	
89		36	60	to the right	1.35.3 1.35.6	2	–	2,75	
90		36	70	to the right	1.35.3 1.35.6	2	–	2,75	
91		36	80	to the right	1.35.3 1.35.6	2	–	2,75	
92		38	20	to the left	1.35.3 1.35.6	2	–	2,75	
93		38	30	to the left	1.35.3 1.35.6	2	–	2,75	
94		38	40	to the left	1.35.3 1.35.6	2	–	2,75	
95		38	50	to the left	1.35.3 1.35.6	2	–	2,75	
96		38	60	to the left	1.35.3 1.35.6	2	–	2,75	
97		41	40	to the right	1.35.3 1.35.6	2	–	2,75	
98		41	50	to the right	1.35.3 1.35.6	2	–	2,75	

1	2	3	4	5	6	7	8	9	10
99	5	41	80	to the right	1.35.3 1.35.6	2	–	2,75	
100		41	90	to the right	1.35.3 1.35.6	2	–	2,75	
101		42	00	to the right	1.35.3 1.35.6	2	–	2,75	
102		42	10	to the right	1.35.3 1.35.6	2	–	2,75	
103		42	20	to the right	1.35.3 1.35.6	2	–	2,75	
104		42	30	to the right	1.35.3 1.35.6	2	–	2,75	
105		42	50	to the left	1.35.3 1.35.6	2	–	2,75	
106		42	60	to the left	1.35.3 1.35.6	2	–	2,75	
107		43	90	to the right	1.35.3 1.35.6	2	–	2,75	
108		44	00	to the right	1.35.3 1.35.6	2	–	2,75	
109		44	10	to the right	1.35.3 1.35.6	2	–	2,75	
110		44	20	to the right	1.35.3 1.35.6	2	–	2,75	
111		44	40	to the left	1.35.3 1.35.6	2	–	2,75	
112		44	50	to the left	1.35.3 1.35.6	2	–	2,75	
113		44	60	to the left	1.35.3 1.35.6	2	–	2,75	
114		44	70	to the left	1.35.3 1.35.6	2	–	2,75	
115		44	80	to the left	1.35.3 1.35.6	2	–	2,75	
116		45	10	to the right	1.35.3 1.35.6	2	–	2,75	
117		45	20	to the right	1.35.3 1.35.6	2	–	2,75	
118		45	30	to the right	1.35.3 1.35.6	2	–	2,75	
119		45	40	to the right	1.35.3 1.35.6	2	–	2,75	
120		45	50	to the right	1.35.3 1.35.6	2	–	2,75	
121		46	00	to the left	1.35.3 1.35.6	2	–	2,75	
122		46	10	to the left	1.35.3 1.35.6	2	–	2,75	
123		46	20	to the left	1.35.3 1.35.6	2	–	2,75	
124		46	30	to the left	1.35.3 1.35.6	2	–	2,75	
125		46	40	to the left	1.35.3 1.35.6	2	–	2,75	
126		46	50	to the left	1.35.3 1.35.6	2	–	2,75	
127		46	90	to the right	1.35.3 1.35.6	2	–	2,75	
128		47	00	to the right	1.35.3 1.35.6	2	–	2,75	
129		47	10	to the right	1.35.3 1.35.6	2	–	2,75	
130		47	40	to the left	1.35.3 1.35.6	2	–	2,75	
131		47	50	to the left	1.35.3 1.35.6	2	–	2,75	
132		47	60	to the left	1.35.3 1.35.6	2	–	2,75	
133		47	70	to the left	1.35.3	2	–	2,75	

1	2	3	4	5	6	7	8	9	10
133	6	47	70	to the left	1.35.3 1.35.6	2	–	2,75	
134		47	80	to the left	1.35.3 1.35.6	2	–	2,75	
135		48	30	to the right	1.35.3 1.35.6	2	–	2,75	
136		48	40	to the right	1.35.3 1.35.6	2	–	2,75	
137		48	50	to the right	1.35.3 1.35.6	2	–	2,75	
138		48	60	to the right	1.35.3 1.35.6	2	–	2,75	
139		48	90	to the left	1.35.3 1.35.6	2	–	2,75	
140		49	00	to the left	1.35.3 1.35.6	2	–	2,75	
141		49	10	to the left	1.35.3 1.35.6	2	–	2,75	
142		49	20	to the left	1.35.3 1.35.6	2	–	2,75	
143		49	30	to the left	1.35.3 1.35.6	2	–	2,75	
144		49	50	to the right	1.35.3 1.35.6	2	–	2,75	
145		49	60	to the right	1.35.3 1.35.6	2	–	2,75	
146		49	70	to the right	1.35.3 1.35.6	2	–	2,75	
147		49	80	to the right	1.35.3 1.35.6	2	–	2,75	
148		49	90	to the right	1.35.3 1.35.6	2	–	2,75	
149	6	51	20	to the left	1.35.3 1.35.6	2	–	2,75	
150		51	30	to the left	1.35.3 1.35.6	2	–	2,75	
151		51	40	to the left	1.35.3 1.35.6	2	–	2,75	
152		51	70	to the left	1.35.3 1.35.6	2	–	2,75	
153		51	80	to the left	1.35.3 1.35.6	2	–	2,75	
154		51	90	to the left	1.35.3 1.35.6	2	–	2,75	
155		52	00	to the left	1.35.3 1.35.6	2	–	2,75	
156		52	10	to the left	1.35.3 1.35.6	2	–	2,75	
157		52	20	to the left	1.35.3 1.35.6	2	–	2,75	
158		52	40	to the right	1.35.3 1.35.6	2	–	2,75	
159		52	50	to the right	1.35.3 1.35.6	2	–	2,75	
160		52	60	to the right	1.35.3 1.35.6	2	–	2,75	
161		54	30	to the left	1.35.3 1.35.6	2	–	2,75	
162		54	40	to the left	1.35.3 1.35.6	2	–	2,75	
163		54	50	to the left	1.35.3 1.35.6	2	–	2,75	
164		54	80	to the right	1.35.3 1.35.6	2	–	2,75	
165		54	90	to the right	1.35.3 1.35.6	2	–	2,75	
166		55	00	to the right	1.35.3 1.35.6	2	–	2,75	
167		55	10	to the right	1.35.3 1.35.6	2	–	2,75	

1	2	3	4	5	6	7	8	9	10
168		55	20	to the right	1.35.3 1.35.6	2	–	2,75	
169		55	30	to the right	1.35.3 1.35.6	2	–	2,75	
170		55	70	to the right	1.35.3 1.35.6	2	–	2,75	
171		55	80	to the right	1.35.3 1.35.6	2	–	2,75	
172		55	90	to the right	1.35.3 1.35.6	2	–	2,75	
173	7	60	20	to the left	1.35.3 1.35.6	2	–	2,75	
174		60	30	to the left	1.35.3 1.35.6	2	–	2,75	
175		60	40	to the left	1.35.3 1.35.6	2	–	2,75	
176		60	50	to the left	1.35.3 1.35.6	2	–	2,75	
177		60	60	to the left	1.35.3 1.35.6	2	–	2,75	
178		60	70	to the left	1.35.3 1.35.6	2	–	2,75	
179		60	80	to the left	1.35.3 1.35.6	2	–	2,75	
180		63	00	to the right	1.35.3 1.35.6	2	–	2,75	
181		63	10	to the right	1.35.3 1.35.6	2	–	2,75	
182		63	20	to the right	1.35.3 1.35.6	2	–	2,75	
183		63	30	to the right	1.35.3 1.35.6	2	–	2,75	
184		63	40	to the right	1.35.3 1.35.6	2	–	2,75	
185		63	50	to the right	1.35.3 1.35.6	2	–	2,75	
186		64	00	to the left	1.35.3 1.35.6	2	–	2,75	
187		64	10	to the left	1.35.3 1.35.6	2	–	2,75	
188		64	20	to the left	1.35.3 1.35.6	2	–	2,75	
189		71	40	to the right	1.35.3 1.35.6	2	–	2,75	
190		71	50	to the right	1.35.3 1.35.6	2	–	2,75	
191		71	60	to the right	1.35.3 1.35.6	2	–	2,75	
192		73	50	to the left	1.35.3 1.35.6	2	–	2,75	
193		73	60	to the left	1.35.3 1.35.6	2	–	2,75	
194		73	70	to the left	1.35.3 1.35.6	2	–	2,75	
195		73	80	to the left	1.35.3 1.35.6	2	–	2,75	
196		73	90	to the left	1.35.3 1.35.6	2	–	2,75	
197		74	00	to the left	1.35.3 1.35.6	2	–	2,75	
198		74	10	to the left	1.35.3 1.35.6	2	–	2,75	
199		74	70	to the right	1.35.3 1.35.6	2	–	2,75	
200		74	80	to the right	1.35.3 1.35.6	2	–	2,75	
201		74	90	to the right	1.35.3 1.35.6	2	–	2,75	
202	8	76	00	to the right	1.35.3	2		2,75	

1	2	3	4	5	6	7	8	9	10
202	8	70	90	to the right	1.35.6	2	–	2,75	
203		77	00	to the right	1.35.3 1.35.6	2	–	2,75	
204		77	10	to the right	1.35.3 1.35.6	2	–	2,75	
205		77	20	to the right	1.35.3 1.35.6	2	–	2,75	
206		77	30	to the right	1.35.3 1.35.6	2	–	2,75	
207		77	40	to the right	1.35.3 1.35.6	2	–	2,75	
208		77	60	to the left	1.35.3 1.35.6	2	–	2,75	
209		77	70	to the left	1.35.3 1.35.6	2	–	2,75	
210		77	80	to the left	1.35.3 1.35.6	2	–	2,75	
211		79	20	to the left	1.35.3 1.35.6	2	–	2,75	
212		79	30	to the left	1.35.3 1.35.6	2	–	2,75	
213		79	40	to the left	1.35.3 1.35.6	2	–	2,75	
214		79	50	to the left	1.35.3 1.35.6	2	–	2,75	
215		79	60	to the right	1.15 8.2.1	2	–	3,5	9% 500 m
216	9	81	40	to the right	1.35.3 1.35.6	2	–	2,75	
217		81	50	to the right	1.35.3 1.35.6	2	–	2,75	
218		81	60	to the right	1.35.3 1.35.6	2	–	2,75	
219		83	10	to the right	1.35.3 1.35.6	2	–	2,75	
220		83	20	to the right	1.35.3 1.35.6	2	–	2,75	
221		83	30	to the right	1.35.3 1.35.6	2	–	2,75	
222		83	50	to the left	1.35.3 1.35.6	2	–	2,75	
223		83	60	to the left	1.35.3 1.35.6	2	–	2,75	
224		83	70	to the left	1.35.3 1.35.6	2	–	2,75	
225		85	10	to the right	1.35.3 1.35.6	2	–	2,75	
226		85	20	to the right	1.35.3 1.35.6	2	–	2,75	
227		87	40	to the left	8.2.1 1.14	2	–	3,5	500 m 9%
228		87	50	to the left	1.13.1 8.2.1	2	–	3,5	8750 m

Needed Number of Construction Vehicles and Transport Means

Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1 – Part 2

#	Name	Unit of Measure	Number
1	2	3	4
1	Autograder	unit	2
2	Excavator	unit	4
3	Bulldozer	unit	4
4	Wheeled crane	unit	2
5	Pneumatic rammer	unit	2
6	Vibrating rammer	unit	2
7	Smooth-drum roller	unit	2
8	Motor grader	unit	1
9	Asphalt paver	unit	1
10	Irrigation-washing machine	unit	2
11	Concrete mixer	unit	3
12	Dump truck	unit	15
13	Open lorry	unit	2

Road: Kakaskhidi-Zekari km17-km26, Rehabilitation

[illegible]

Summary Sheet of the Volumes of Works
Road: Kakaskhidi-Zekari km17-km33, Reconstruction - Part 1

#	Name of Works	Unit of Measure	Number	Comment
1	2	3	4	5
Chapter I. Preparatory Works				
1	Route restoration and fixing	km	8,751	
2	Cutting of bushes and thorny plants (along the road)	hec	3,5	
Chapter II. Subgrade				
1	Processing of a soil with excavator, loading and transportation to dump site	m ³	34670,0	I category
2	Processing of a soil by bulldozer, loading with excavator, transportation to dump site	m ³	14868,0	I category
3	Soil processing with blast hole charges	m ³	103686,0	VII category
4	Processing of a soil with excavator mounted hydro hammers	m ³	933173,0	VII category
5	Loading of processed soil with excavator on dump trucks and transportation for the arrangement of Gabion gaskets	m ³	1211,0	VII category
6	Loading of processed soil with excavator on dump trucks and transportation to a fill	m ³	14859,0	VII category
7	Loading of processed soil with excavator on dump trucks and transportation to a dump site	m ³	1020789,0	VII category
8	Soil processing in the ditches by excavator, loading on dump trucks, transportation to a dumpsite	m ³	33,0	II category
9	Soil processing in the ditches manually, loading on dump trucks, transportation to a dumpsite	m ³	4,0	II category
10	Soil processing in the ditches with excavator mounted demolition hammers	m ³	620,0	VII category
11	Soil processing in the ditches manually with demolition hammers	m ³	64,0	VII category
12	Loading processed soil on dump trucks with excavator, transportation to a dumpsite	m ³	684,0	VII category
Chapter III. Artificial Structures				

1	Arrangement of reinforced concrete round culverts d-1.0 m	unit /linear m	39/421	
2	Arrangement of reinforced concrete right angled culverts1X1,5 m	unit /linear m	7/81,4	
3	Arrangement of Gabion lower support wall	linear m	299	
4	Arrangement of reinforced concrete lower support wall	linear m	912,5	
5	Arrangement of a new steel reinforced concrete bridges	unit	4	
Chapter IV. Road Pavement				
1	Fine grained solid crushed stone asphalt concrete hot mixture, Type B, Mark II, thickness 4cm	m ²	65254,8	
2	Applying of Liquid Bitumen on 0.3 l/m2	t	19,6	
3	Coarse grained porous crushed stone asphalt concrete hot mixture, Mark II, thickness 6cm	m ²	65254,8	
4	Applying of liquid bitumen; 0.6l/m ²	t	39,2	
5	Crushed stone, fraction 0-40 mm, thickness 18 cm	m ²	70260,6	
6	Subbase with sand-gravel mixture, fraction 0-120mm, thickness 25cm	m ³	20865,8	
7	Shoulder fill with sand-gravel mixture, fraction 0-70mm	m ³	2388,2	
Arrangement of Traffic Signs and Markings				
1	Standard road reflector traffic signs' shields. I & II typical sizes. covered with high intensity prismatic optical system VIII class adhesive film: - Warning signs Triangle 900X900X900 mm: Right angled 500X615mm:	 unit unit	 8 440	
	- Additional information signs Right angled 350X700 mm;	 unit	 8	
Total		unit	456	
2	Arrangement of individual design signs according to ГОСТ 10807-78- two-language-writing on aluminum profile frame, covered with retroreflector engineering prismatic film, according to "EN12899-1 or/and ASTM D4956-13" III-IV _ Information sign 7. 11 2500X510 _ Directional sign 7.10.1 3000X680 _ Directional sign 7.10.1 3000X1020 Totally individual traffic signs	 unit/m ² unit/m ² unit/m ² unit/m ²	 6/7,65 1/2,04 1/3,06 8/12,75	

3	Fixing of traffic signs on metal supports with 72-100 mm pipes with concrete foundation B22,5F200W6; - B51-8 2.7 72 mm - LD-5 3.5m 72 mm - LD-16/4 4.0m 100 mm	unit / t unit / t unit / t	220/4,409 8/0,193 16/0,512	
	Totally metal supports	unit / t	244/5,114	
	Supports' foundation concrete: 244units x 0,20 m ³	m ³	48,8	B22,5F200W6
4	Marking of a carriageway with one-component marking paint on acrylyl base, improved with night vision retroreflector glass balls, size 100-600 mcm, according to ГОСТ 23457-86			
	_ solid line, width 100 mm (1,1)	linear m/m ²	26253/2625,3	
	Totally horizontal marking	m ²	2625,3	
5	Plastic direction signal reflective poles to be arranged on the shoulders ГОСТ 50.970-2011 and russian EH 8993.3207	unit	852	
6	Fenscing with steel rope, 28 sections	linear m	5470	
	Metal support Ppost CD-6 CD-7 CD-8	unit/kg	56/2292,08 56/2950,08 2152/88081,36	
	Filling of supports with monolithic concrete	m ³	21,52	B25,5F200W6
	Monolithic concrete of a foundation	unit/m ³	2208/154,5	B25,5F200W6
	Monolithic concrete of a support Dowel bar	unit/m3 unit/kg	56/5,6 56/41,44	B25,5F200W6
	Surface waterproofing with hot bitumen, 2x	m ²	791,2	
	Painting of supports with white nitrocellulose enamel	m ²	961,6	
	Painting of supports with black nitrocellulose enamel	m ²	129,12	
	Steel upper spring	unit/kg	2152/4260,96	
	Steel lower spring	unit/kg	2152/2603,92	
	Steel rope clamps	kg	1720,56	CЖ-1-448 units CЖ-2 8608.units F-3
	Steel rope tightener	unit/kg	112/2349,872	Bracing T-1, hooked bracing T-2,eye ring, washer, nut, F-3

	Thick rope KH Ø 19.5mm L-13946 m; (1 linear m-1.41 kg)	kg	11388	
	retroreflector element	unit	2208	