Tacis

TRACECA - Project

Trade and Transport Sectors

Implementation of Pavement Management Systems

Feasibility Study for Rehabilitation of Transit Roads in Georgia

Volume II

Final Feasibility Report

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APPENDICES

APPENDIX 1

A 1.1 TERMS OF REFERENCE

EUROPEAN UNION - TACIS

Technical Assistance to the Southern Republics of the CIS and Georgia - TRACECA

TRADE AND TRANSPORT SECTORS

Terms of Reference

for

Transit Roads - Georgia

Final Recipients:
TRACECA Region Ministries of Transport

CONTENTS

1. Background

1.1 During May 1993 a conference was held in Brussels organised by the Commission and attended by authorities of the eight Republics of the south of the former USSR:

Armenia,	Kyrgyzstan,
Azerbaijan,	Tadjikistan,
Georgia,	Turkmenistan,
Kazakstan,	Uzbekistan.

They are the Beneficiary States of this programme.

The objectives of the conference were :

- to stimulate co-operation among the participating Republics in all matters pertaining to the development and improvement of trade within the Region
- to promote the Central Asian - Trans Caucasian - Europe Transport Corridor
- to identify problems and deficiencies in the Region's trade and transport systems
- to define, in terms of contents and timing a Technical Assistance Programme to be financed by the European Union (EU)

TRACECA (Transport Corridor Europe Caucasus Asia) was thence created as a component of the TACIS interstate programme.

1.2 Regional sectoral Working Groups (trade, rail, road, maritime), composed of experts and officials from each TRACECA state and the EU, have been established as part of the TRACECA programme. They meet periodically in the Region and in Europe. They have inaugurated substantial specific projects of Regional importance, including this present one, and they will monitor results.

1.3 . The World Bank (WB) is negociating separate loans to two TRACECA States, Armenia and Georgia. In the case of Georgia there is the possibility of additional financing to accompany the WB loan, from another International Financial Institution (IFI). This present project comprises two modules, each linked respectively to the two WB programmes in the neighbouring Beneficiary States.

1.4 The EBRD is interested in financing a roads project in Azerbaijan. A TACIS national project has produced a feasibility study of the road south from Baku, to Alyat and further to the south. However the major TRACECA route turns west at Alyat towards the Georgian border. It now remains to investigate this route. The Islamic Bank has commissioned some studies of this route, but the outcome appears inconclusive.

2A. Introduction - Module A

In Georgia, the World Bank is prepared to engage limited resources for a Transport Rehabilitation Project, to avoid a complete collapse of the sector in the immediate future. Two components are foreseen: Institutional and Investment. For investment, road maintenance is considered a priority. This present project arises from the need to encourage other International Financial Institutions (IFI) to participate in concertion with the package, and to broaden the focus to consider rehabilitation.

In Azerbaijan, the EBRD interest in the east west route must be encouraged.

3A. Objectives

The objective of the project is to review existing reports and elaborate to the standard necessary for definitive negociations between Georgia and IFI, a feasibility study for rehabilitation works on the following road sections

Tblisi-Kashuri
Tblisi-Taltari-Azeri Border (-then continuing to Alyat, see below)
Tblisi-Marneuli-Guguti-Armenian Border
Marneuli-Sadakhlo-Armenian Border
Tblisi bypass
Samtrelia-Lanchkhuti-Ureki (shortening the route Tblisi-Batoumi)

4A. Scope of Work

4A.1 General

"General Requirements for the Preparation of the Feasibility Study" issued by one possible funding institution are included in annex. The Final Report of this project, in so far as concenrs Georgia, must satisfy these Requirements.

As these requirements are so general certain particular aspects of the project are highlighted hereafter

The work in Azerbaijan should conform to standards for feasibility studies set by the EBRD.

4A.2 Existing Studies

Extensive "Technical Documentation on Rehabilitation of the Highways of the Republic of Georgia-Volumes I and II, Tblisi 1995" has been prepared by the The State Highways Survey and Design Institute (Saksakhgzaprojecti), and is also included in annex.

The contents of this study are essentially technical. It identifies works which are to be included in this study.

The TRACECA Pavement Management System project will also provide pertinent input and it may influence the selection of priority works to be undertaken.

4A.3 Road Condition Assessment

The consultant will acquire and record all data necessary for road condition assessment and identify the works required to attain appropriate standards for the traffic. Typically this will include road geometry, pavement structure sub-grade characteristics, pavement deterioration and measurements such as deflection and roughness. Drainage systems and structures including bridges, tunnels and retaining works should be similarily inventoried.

4A.4. Traffic Data

Archived traffic data will be collected and reviewed. It is to be anticipated that traffic counts will need to be performed within the scope of this project.

Traffic should be categorised according to an internationally acceptable standard. Axle load surveys on sample sections must be performed. Transit traffic should be separately counted.

Road traffic forecasts should be projected for the next fifteen years. The forecasts may be based on macro-economic appraisal of trade and passenger flows, include high-low scenarios, and take into account the most authoritative economic projections available (eg.World Bank,...).

Any particuliarities of the traffic which might distort projections should be recorded (eg.food distribution campaign convoys,).

4A.5 Definition of Technical Solutions

The Consultant should review the current road and bridge design standards, justify and recommend appropriate acceptable standards for the future design to the various project sections.

The Consultant shall study the merits of the technical solutions proposed for the rehabilitation or completion of the designated roads, drainage, slope protections, bridges and any other necessary works. He should suggest any necessary changes and fully integrated the final proposed solution with the economic analysis, and the possible budget envelopes to be discussed with all parties to the project.

Unit costs for road, bridge and associated rehabilitation works shall be established and justified in accordance with the standard recommendations of IFI.

The availability and quality of all resources necessary to carry out the works should be verified. After discussion with Georgian and Azeri authorities and IFI, recommendations should be made on the division of works into appropriate lots.

The definition of technical solutions should be developed to the level of detail necessary to validate the economic analysis, and to establish the technical feasibility of the recommendations.

4A.6 Economic Evaluation

Vehicle operating costs (VOC) should be established for the known range of vehicle types. VOC should be formulated using a standard internationally accepted model (eg.HDM3), modified as necessary for local conditions.

The roads shall be considered in separate homogenous sections, for incremental cost/benefit analysis. The standard economic indexes such as cost/benefit, NPV, and IERR are to be presented.

Based on the preceding the consultant shall present the final economic evaluation and define the appropriate programme for the construction and rehabilitation works.

A multi-criteria approach may be presented to account for environmental, safety or other factors, (while respecting the overall "General Requirements for the Preparation of the Feasibility Study" in Georgia).

All data generated within the project should be stored on computerised spread sheets, and left with the Recipient State in an organised and reusable format. A copy should be provided to TACIS.

4A.7 Equipment

Any pavement testing equipment, computer hardware, software or other equipment required for the project should be left with the Recipient State. The Consultant should provide full details in his Technical Proposal.

4A.8 Other Related Projects

Several related reports prepared by Western consultants precede this project. They include:

Aménagement de la Section Erevan-Batoumi de l'Axe Routier Meghri-Batoumi	Georgia and Armenia	TACIS
Road Development Study	Republic of Kazakhstan	EBRD
Armenia Highway Study	Republic of Armenia	TACIS
Roads & Road Transport Study	Russia, Ukraine, Kazakhstan & Bielorussia	EBRD
Azerbaijan Road Project	Azerbaijan	TACIS

At the time of writing the following TRACECA projects, sharing certain domains of interest with this one, are expected to commence shortly. The first two are of particular relevance to the scope of this project:

- Implementation of Pavement Management Systems
- Regional Traffic Forecasting
- Improvement of Roadside Services

Other related projects are or may be expected to commence within the timeframe of this present one.

The Consultants appointed to carry out this project are to co-ordinate their work closely with all other related activities within the TRACECA region. A full collaboration with such projects will be required, including data sharing.

The preceding listing of related projects must not be considered limitative.

4A.9 Local Participation

National consultants should be deeply involved in all aspects of the project. All TRACECA countries have Institutions specialising in various aspects of transport planning and engineering. It is a firm requirement that Organisation and Methodologies include local experts and Institutions to:

- make full use of local experience, antecedent projects and data bases
- promote the emergence of a financially viable local consulting sector
- ensure the effective transfer of know-how to the Beneficiary states
- ensure the enduring effect of project output

Consultants should base their activities for this module largely in Georgia, carrying out the project in collaboration with a local technical organisation(s), and employing both senior and junior professional staff.

Consultants must make amply clear in their Technical Proposal the arrangements they have made to work with local entities. This should include the time allocated to locally hired staff (as distinct from counterpart staff).

Allthough training is not a defined objective of this project, the consultant may propose training initiatives for the transfer of project know-how unfamiliar to local professionals.

4A.10 Foreign Expertise

The Consultant is free to compose his expatriate Team for this project as he sees fit. The following domains of expertise should be visible in his proposed staff list:

- highway engineering
- structural engineering
- geotechnical engineering
- transport economics

Time allocated to foreign staff should be clearly described in the Technical Proposal, as should the division between time on site and time at home office.

4A.11 Logistics

The Consultant shall be responsible for arranging necessary living accommodation, international and local transportation, telecommunications, equipment (IT and other), surveys, investigations, document reproduction, printing, secretarial services, interpretation, translation, office space and all other input required for the purposes of the work.

5A. Time Table and Reporting

5A.1 The project is to be completed within a period of six months to Draft Final Report stage.

Task durations and staff assignments are to be clearly shown on planning schedules in the proposal. Milestones for output and key dates for data acquisition are to be indicated.

5A.2 All reports are to be delivered in the numbers, languages and locations as follows:

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	5	1	1	1	2
TRACECA CU (Georgia)	1	5	1	1	0
IFI	5	1	1	1	0

The word processing programme to be used will be agreed with TACIS (and DOS compatible).

5A.3 Reporting is to be in accordance with standard TACIS Guidelines and foresee:

Project inception report

An Inception Report shall be issued within 2 months of the commencement of the project. It shall summarise initial findings and propose any modifications to the methodology and work plan. In particular it will adapt the work plan to the Recipient State and funding institutions' needs, into account the parallel activities of other Technical Assistance programmes, avoiding duplication of effort.

Final Report

The Draft Final Report will be submitted at the end of month 6.

It will comprise the full feasibility study.

Any comments on the Draft Final Report will be issued by TACIS Brussels within six weeks of its receipt. The Final Report incorporating any modifications will be issued one month thereafter (2,5 months after issue of the Draft Final)

APPENDIX 4

FORM 1. - CLASSIFIED TRAFFIC COUNT - HOURLY .

ფორმა No1 - მოძრაობის თვლის კლასიფიკაცია საათების მიხედვით

ROAD NO. გზის No_____

Traffic Section No.: მოძრ. სექცია			Direction of Traffic მოძრაობის მიმართულება	From: დან:	
Trafic Section Name მოძრაობის სექციის დასახელება	From: დან:			To: მდე:	
	To: მდე:				
Date: თარიღი			Hour Beginning: დაწყების დრო		

	Car Jeep მსუბუქი მანქანა	Minibus მიკროავტობუსი	Van Pickup Truck <3 tons ფურგონი < 3 ტ	Bus ავტო-ბუსი	TRUCKS მოძრ. სექცია 2 axles >=3 tonnes 2 ღერძით	3 axles 3 ღერძით	4 axles 4 ღერძით	5 axles 5 ღერძით	>5 axles >5 ღერძით	Motor Cycles მოტოციკ-ლეტი	Agricultural Tractors სამეურნეო ტრანსპ.
National ადგილობრივი											
Inter-national საერთაშორისო											
TOTAL: სულ											
National											
Inter-national											

Table A.4.2 GEORGIA : RESULTS OF CLASSIFIED VOLUME COUNTS - FEBRUARY AND MARCH 1997

Road No.	Section Name	Km from	Km to	Count Location (km)	Vehicle Nationality	Average Daily Traffic (ADT) not adjusted for seasonality											
						CAR	UTILITY			BUS	TRUCK 2-AXLE	TRUCK 3-AXLE	TRUCK > 3 AXLE				TOTAL
							Minibus	Pickup	Sub total				Truck 4 ax	Truck 5 ax	Truck >5 a	Sub total	
S1	Tbilisi - Vladikavkaz junction	0	28	25	National	4,857	224	51	275	883	152	337	38	52	1	91	6,595
					Foreign	4	-	1	1	47	1	64	32	52	1	85	203
					Total	4,861	224	52	277	931	153	401	70	104	2	176	6,798
S1	Vladikavkaz junction - Gori junction	28	82	55	National	3,072	113	38	151	526	91	210	48	28	-	76	4,128
					Foreign	-	-	-	-	38	-	57	20	26	-	46	140
					Total	3,072	113	38	151	564	91	267	68	54	-	122	4,268
S1	Gori junction - Khashuri	82	128	85	National	3,144	153	52	205	600	100	262	86	38	2	126	4,435
					Foreign	-	2	-	2	72	6	74	51	45	1	97	251
					Total	3,144	155	52	207	672	106	336	137	83	3	223	4,687
S4	Tbilisi - Red Bridge bp	0	38	30	National	784	28	7	35	39	53	33	6	4	-	10	954
					Foreign	13	3	4	7	22	1	10	6	11	1	18	71
					Total	797	31	11	42	61	54	43	12	15	1	28	1,025
S6	Tbilisi - Marneuli	0	29	18	National	2,533	123	32	155	272	75	113	11	10	-	21	3,169
	(12 hours)				Foreign	-	-	-	-	6	-	-	-	-	-	-	6
					Total	2,533	123	32	155	278	75	113	11	10	-	21	3,176
S6	Marneuli - Bolnisi	29	53	38	National	1,685	51	29	80	173	31	31	2	-	-	2	2,001
	(12 hours)				Foreign	1	-	-	-	16	-	2	1	2	-	3	23
					Total	1,686	51	29	80	188	31	33	3	2	-	5	2,024
S6	Bolnisi - Guguti	53	98	68	National	680	23	14	37	86	39	26	-	-	-	-	868
	(12 hours)				Foreign	6	-	-	-	19	-	4	-	4	-	4	32
					Total	685	23	14	37	105	39	30	-	4	-	4	900
S6	Bolnisi - Guguti	53	98	98	National	153	7	3	10	26	10	7	-	-	-	-	206
	(12 hours)				Foreign	13	-	-	-	22	2	26	1	-	-	1	64
					Total	165	7	3	10	48	12	33	1	-	-	1	270
S7	Marneuli - Sadakhlo	0	34	16	National	1,003	13	14	27	135	27	27	9	6	-	15	1,235
	(12 hours)				Foreign	104	2	1	3	47	7	6	-	-	-	-	167
					Total	1,107	15	15	30	182	34	33	9	6	-	15	1,401
S9	Tbilisi Bypass	0	35	32	National	155	38	3	41	148	104	64	39	18	-	57	569
	(12 hours)				Foreign	-	-	-	-	-	-	16	58	71	8	137	153
					Total	155	38	3	41	148	104	80	97	89	8	194	722
S9	Tbilisi Bypass	35	48	41	National	1,564	57	9	66	187	91	185	12	26	-	38	2,132
	(12 hours)				Foreign	1	-	-	-	3	-	21	7	10	1	18	43
					Total	1,565	57	9	66	191	91	206	19	36	1	56	2,175
S12	Samtredia - Ureki	0	59	37	National	595	31	8	39	139	38	26	4	15	-	19	856
					Foreign	3	-	-	-	22	1	43	19	36	2	57	126
					Total	598	31	8	39	161	39	69	23	51	2	76	982

Source: Classified volume counts carried out for the Consultants by Sagavtogza staff.

Table A.4.3 Tbilisi - Red Bridge Border Post Road (S.4) : Hourly Traffic Distribution at km 30 from Tbilisi

Hour From	Hour To	Hourly Traffic Distribution - All Vehicles										Hourly Distribution (%)		
		Car	Minibus	Pickup	Bus	2-ax GV	3-ax GV	4-ax GV	5-ax GV	6+ax GV	TOTAL	Georgian	International	Total
24	1	19	0	0	4	0	0	1	0	0	24	2.0	7.0	2.3
1	2	6	1	0	0	1	0	0	0	0	8	0.8	0.0	0.8
2	3	7	2	1	3	0	0	0	0	0	13	0.8	7.0	1.3
3	4	8	0	0	2	0	0	0	0	0	10	0.8	2.8	1.0
4	5	3	1	0	3	0	0	0	0	0	7	0.4	4.2	0.7
5	6	8	0	0	1	0	0	0	0	0	9	0.6	4.2	0.9
6	7	4	0	0	2	0	0	0	0	0	6	0.5	1.4	0.6
7	8	11	1	0	1	0	3	0	1	0	17	1.8	0.0	1.7
8	9	19	0	0	0	0	6	0	0	0	25	2.0	8.5	2.4
9	10	54	1	0	3	1	4	1	0	0	64	6.5	2.8	6.2
10	11	63	5	2	4	6	1	0	1	0	82	7.9	9.9	8.0
11	12	67	3	0	2	9	3	1	2	0	87	8.9	2.8	8.5
12	13	50	3	1	1	8	1	1	1	0	66	6.9	0.0	6.4
13	14	50	2	0	4	1	1	0	0	0	58	5.6	7.0	5.7
14	15	58	2	2	3	4	0	5	4	0	78	7.4	9.9	7.6
15	16	63	4	1	1	2	2	1	1	1	76	7.2	9.9	7.4
16	17	60	3	1	1	6	1	0	0	0	72	7.4	1.4	7.0
17	18	62	2	1	3	1	3	0	1	0	73	6.8	11.3	7.1
18	19	50	0	2	4	6	1	1	1	0	65	6.5	4.2	6.3
19	20	55	0	0	5	7	5	0	0	0	72	7.5	0.0	7.0
20	21	31	0	0	8	1	7	1	1	0	49	4.8	4.2	4.8
21	22	24	1	0	4	1	1	0	1	0	32	3.4	0.0	3.1
22	23	12	0	0	2	0	4	0	0	0	18	1.9	0.0	1.8
23	24	13	0	0	0	0	0	0	1	0	14	1.4	1.4	1.4
TOTAL		797	31	11	61	54	43	12	15	1	1,025	100.0	100.0	100.0
Expansion factors (08.00-20.00 12 hrs. to 24 hour basis)		1.22	1.24	1.10	1.97	1.06	1.54	1.20	1.36	1.00	1.25	1.24	1.48	1.25

Source: Classified Volume Counts carried out for the Consultants by Sagavtogza staff.

Note: GV goods vehicles.

Table A.4.3 (continued) Samtredia - Ureki (S.12) Road : Hourly Traffic Distribution at km 37 from Samtredia

Hour From	Hour To	Hourly Traffic Distribution - All Vehicles										Hourly Distribution (%)		
		Car	Minibus	Pickup	Bus	2-ax GV	3-ax GV	4-ax GV	5-ax GV	6+ax GV	TOTAL	Georgian	International	Total
24	1	11	0	0	6	1	0	1	1	0	20	2.3	0.0	2.0
1	2	1	0	0	1	0	0	0	0	0	2	0.2	0.0	0.2
2	3	14	1	0	1	0	3	0	4	0	23	2.7	0.0	2.3
3	4	2	0	0	8	0	1	1	0	0	12	1.2	1.6	1.2
4	5	6	3	0	2	2	0	0	0	0	13	1.3	1.6	1.3
5	6	4	0	0	0	2	0	0	0	0	6	0.7	0.0	0.6
6	7	2	0	0	6	0	0	0	0	0	8	0.9	0.0	0.8
7	8	7	0	0	6	1	1	0	0	0	15	1.5	1.6	1.5
8	9	20	0	0	9	2	0	0	0	0	31	3.6	0.0	3.2
9	10	33	2	0	11	1	0	0	3	0	50	5.0	5.6	5.1
10	11	46	2	0	8	3	2	3	0	0	64	6.5	6.3	6.5
11	12	52	0	0	6	1	5	0	1	0	65	7.2	2.4	6.6
12	13	65	5	0	8	1	3	1	0	0	83	9.3	2.4	8.5
13	14	46	1	2	12	3	6	5	13	0	88	7.8	16.7	9.0
14	15	31	3	0	10	3	5	1	10	0	63	5.7	11.1	6.4
15	16	28	3	0	7	2	11	3	1	0	55	4.8	11.1	5.6
16	17	43	3	0	9	4	13	2	6	0	80	7.0	15.9	8.1
17	18	28	1	2	7	5	7	5	5	0	60	5.0	13.5	6.1
18	19	23	2	0	8	0	1	0	0	0	34	3.6	2.4	3.5
19	20	26	1	0	8	0	4	0	1	0	40	4.4	1.6	4.1
20	21	41	0	1	14	3	1	0	2	0	62	7.2	0.0	6.3
21	22	31	2	2	4	3	4	0	3	2	51	5.0	6.3	5.2
22	23	21	2	0	2	1	2	1	1	0	30	3.5	0.0	3.1
23	24	17	0	1	8	1	0	0	0	0	27	3.2	0.0	2.7
TOTAL		598	31	8	161	39	69	23	51	2	982	100.0	100.0	100.0
Expansion factors (08.00-20.00 12 hrs. to 24 hour basis)		1.36	1.35	2.00	1.56	1.56	1.21	1.15	1.28	3.00	1.38	1.42	1.13	1.38

Source: Classified Volume Counts carried out for the Consultants by Sagavtogza staff.

Note: GV goods vehicles.

Table A.4.4 GEORGIA STUDY ROADS: TRAFFIC GROWTH RATES BY VEHICLE TYPE

Road No.	Name	Best estimate - Annual Average Traffic Growth (%) 1997 - 2010						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S1	Km 25 - Gori junction	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S1	Gori junction - Khashuri	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S4	Tbilisi - Red Bridge (Azer.border)	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S6	Tbilisi - Marneuli	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S6	Marneuli - Bolnisi	5.0	4.5	4.0	3.0	4.5	5.5	4.9
S6	Bolnisi - Guguti (Armenian border)	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S7	Marneuli - Sadakhlo	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S9	Tbilisi bypass (west)	5.0	4.5	4.0	3.0	4.5	5.5	4.5
S9	Tbilisi bypass (east)	5.0	4.5	4.0	3.0	4.5	5.5	4.8
S12	Samtredia - Ureki	5.0	4.5	4.0	3.0	4.5	5.5	4.8

Road No.	Section Name	Best estimate - Annual Average Traffic Growth (%) 2010 - 2025						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	6.5	6.3	5.4	5.0	6.0	7.0	6.3
S1	Km 25 - Gori junction	6.5	6.3	5.4	5.0	6.0	7.0	6.3
S1	Gori junction - Khashuri	6.5	6.3	5.4	5.0	6.0	7.0	6.3
S4	Tbilisi - Red Bridge (Azer.border)	6.5	6.3	5.4	5.0	6.0	7.0	6.4
S6	Tbilisi - Marneuli	6.5	6.3	5.4	5.0	6.0	7.0	6.4
S6	Marneuli - Bolnisi	6.5	6.3	5.4	5.0	6.0	7.0	6.4
S7	Marneuli - Sadakhlo	6.5	6.3	5.4	5.0	6.0	7.0	6.3
S9	Tbilisi bypass (west)	6.5	6.3	5.4	5.0	6.0	7.0	6.3
S9	Tbilisi bypass (east)	6.5	6.3	5.4	5.0	6.0	7.0	6.2
S12	Samtredia - Ureki	6.5	6.3	5.4	5.0	6.0	7.0	6.3

Road No.	Section Name	High estimate - Annual Average Traffic Growth (%) 1997 - 2010						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S1	Km 25 - Gori junction	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S1	Gori junction - Khashuri	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S4	Tbilisi - Red Bridge (Azer.border)	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S6	Tbilisi - Marneuli	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S6	Marneuli - Bolnisi	6.5	6.2	5.5	4.2	6.0	6.2	6.4
S6	Bolnisi - Guguti (Armenian border)	6.5	6.2	5.5	4.2	6.0	4.7	6.3
S7	Marneuli - Sadakhlo	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S9	Tbilisi bypass (west)	6.5	6.2	5.5	4.2	6.0	6.2	5.8
S9	Tbilisi bypass (east)	6.5	6.2	5.5	4.2	6.0	6.2	6.3
S12	Samtredia - Ureki	6.5	6.2	5.5	4.2	6.0	6.2	6.2

Road No.	Section Name	High estimate - Annual Average Traffic Growth (%) 2010 - 2025						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S1	Km 25 - Gori junction	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S1	Gori junction - Khashuri	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S4	Tbilisi - Red Bridge (Azer.border)	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S6	Tbilisi - Marneuli	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S6	Marneuli - Bolnisi	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S6	Bolnisi - Guguti (Armenian border)	7.5	7.0	6.0	5.5	7.0	8.0	7.2
S7	Marneuli - Sadakhlo	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S9	Tbilisi bypass (west)	7.5	7.0	6.0	5.5	7.0	8.0	7.0
S9	Tbilisi bypass (east)	7.5	7.0	6.0	5.5	7.0	8.0	7.3
S12	Samtredia - Ureki	7.5	7.0	6.0	5.5	7.0	8.0	7.2

Table A.4.4 (continued) GEORGIA STUDY ROADS: TRAFFIC GROWTH RATES BY VEHICLE TYPE

Road No.	Section Name	Low estimate - Annual Average Traffic Growth (%) 1997 - 2010						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	3.6	3.5	2.7	2.0	3.0	4.0	3.4
S1	Km 25 - Gori junction	3.6	3.5	2.7	2.0	3.0	4.0	3.4
S1	Gori junction - Khashuri	3.6	3.5	2.7	2.0	3.0	4.0	3.4
S4	Tbilisi - Red Bridge (Azer.border)	3.6	3.5	2.7	2.0	3.0	4.0	3.5
S6	Tbilisi - Marneuli	3.6	3.5	2.7	2.0	3.0	4.0	3.5
S6	Marneuli - Bolnisi	3.6	3.5	2.7	2.0	3.0	4.0	3.5
S6	Bolnisi - Guguti (Armenian border)	3.6	3.5	2.7	2.0	3.0	3.7	3.4
S7	Marneuli - Sadakhlo	3.6	3.5	2.7	2.0	3.0	4.0	3.4
S9	Tbilisi bypass (west)	3.6	3.5	2.7	2.0	3.0	4.0	3.2
S9	Tbilisi bypass (east)	3.6	3.5	2.7	2.0	3.0	4.0	3.4
S12	Samtredia - Ureki	3.6	3.5	2.7	2.0	3.0	4.0	3.4

Road No.	Section Name	Low estimate - Annual Average Traffic Growth (%) 2010 - 2025						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	6.0	5.8	4.5	4.0	5.0	6.0	5.7
S1	Km 25 - Gori junction	6.0	5.8	4.5	4.0	5.0	6.0	5.7
S1	Gori junction - Khashuri	6.0	5.8	4.5	4.0	5.0	6.0	5.7
S4	Tbilisi - Red Bridge (Azer.border)	6.0	5.8	4.5	4.0	5.0	6.0	5.8
S6	Tbilisi - Marneuli	6.0	5.8	4.5	4.0	5.0	6.0	5.8
S6	Marneuli - Bolnisi	6.0	5.8	4.5	4.0	5.0	6.0	5.8
S6	Bolnisi - Guguti (Armenian border)	6.0	5.8	4.5	4.0	5.0	6.0	5.7
S7	Marneuli - Sadakhlo	6.0	5.8	4.5	4.0	5.0	6.0	5.8
S9	Tbilisi bypass (west)	6.0	5.8	4.5	4.0	5.0	6.0	5.4
S9	Tbilisi bypass (east)	6.0	5.8	4.5	4.0	5.0	6.0	5.7
S12	Samtredia - Ureki	6.0	5.8	4.5	4.0	5.0	6.0	5.7

Table A.4.5 GEORGIA STUDY ROADS: HIGH AND LOW ESTIMATE TRAFFIC FORECASTS, 1997 - 2025

Road No.	Section Name	Annual Average Daily Traffic (AADT) - 1997						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	6561	373	1240	206	519	209	9,108
S1	Km 25 - Gori junction	4,147	204	749	123	341	149	5,713
S1	Gori junction - Khashuri	4,244	278	882	141	427	267	6,239
S4	Tbilisi - Red Bridge (Azer.border)	1,071	54	75	73	55	32	1,360
S6	Tbilisi - Marneuli	3,419	210	373	102	153	28	4,285
S6	Marneuli - Bolnisi	2,276	108	249	41	44	5	2,723
S6	Bolnisi - Guguti (Armenian border)	563	32	95	33	37	1	761
S7	Marneuli - Sadakhlo	1,458	40	230	43	43	20	1,834
S9	Tbilisi bypass (west)	209	55	200	140	102	214	920
S9	Tbilisi bypass (east)	2112	90	256	123	271	69	2,921
S12	Samtredia - Ureki	806	53	210	52	78	83	1,282

No.	Section Name	High Growth Forecast - Annual Average Daily Traffic (AADT) - 2010						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	14,877	815	2,487	352	1,107	457	20,095
S1	Km 25 - Gori junction	9,403	446	1,502	210	727	326	12,615
S1	Gori junction - Khashuri	9,623	608	1,769	241	911	584	13,735
S4	Tbilisi - Red Bridge (Azer.border)	2,428	118	150	125	117	70	3,009
S6	Tbilisi - Marneuli	7,753	459	748	174	326	61	9,521
S6	Marneuli - Bolnisi	5,161	236	499	70	94	11	6,071
S6	Bolnisi - Guguti (Armenian border)	1,277	70	191	56	79	2	1,675
S7	Marneuli - Sadakhlo	3,306	87	461	73	92	44	4,064
S9	Tbilisi bypass (west)	474	120	401	239	218	468	1,920
S9	Tbilisi bypass (east)	4,789	197	513	210	578	151	6,438
S12	Samtredia - Ureki	1,828	116	421	89	166	181	2,801

No.	Section Name	High Growth Estimate - Annual Average Daily Traffic (AADT) - 2025						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	44,019	2,249	5,961	785	3,054	1,449	57,518
S1	Km 25 - Gori junction	27,823	1,230	3,600	469	2,007	1,033	36,162
S1	Gori junction - Khashuri	28,474	1,677	4,240	537	2,513	1,851	39,292
S4	Tbilisi - Red Bridge (Azer.border)	7,186	326	361	278	324	222	8,696
S6	Tbilisi - Marneuli	22,939	1,266	1,793	389	900	194	27,482
S6	Marneuli - Bolnisi	15,270	651	1,197	156	259	35	17,568
S6	Bolnisi - Guguti (Armenian border)	3,777	193	457	126	218	7	4,777
S7	Marneuli - Sadakhlo	9,782	241	1,106	164	253	139	11,684
S9	Tbilisi bypass (west)	1,402	332	961	534	600	1,484	5,313
S9	Tbilisi bypass (east)	14,170	543	1,231	469	1,595	478	18,485
S12	Samtredia - Ureki	5,408	320	1,009	198	459	576	7,969

Table A.4.5 (continued) GEORGIA STUDY ROADS: HIGH AND LOW ESTIMATE TRAFFIC FORECASTS, 1997 - 2025

Road No.	Section Name	Low Growth Forecast - Annual Average Daily Traffic (AADT) - 2010						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	10,391	583	1,753	266	762	348	14,104
S1	Km 25 - Gori junction	6,568	319	1,059	159	501	248	8,854
S1	Gori junction - Khashuri	6,721	435	1,247	182	627	445	9,657
S4	Tbilisi - Red Bridge (Azer.border)	1,696	84	106	94	81	53	2,115
S6	Tbilisi - Marneuli	5,415	328	527	132	225	47	6,674
S6	Marneuli - Bolnisi	3,605	169	352	53	65	8	4,251
S6	Bolnisi - Guguti (Armenian border)	892	50	134	43	54	2	1,175
S7	Marneuli - Sadakhlo	2,309	63	325	56	63	33	2,849
S9	Tbilisi bypass (west)	331	86	283	181	150	356	1,387
S9	Tbilisi bypass (east)	3,345	141	362	159	398	115	4,519
S12	Samtredia - Ureki	1,276	83	297	67	115	138	1,976

Road No.	Section Name	Low Growth Estimate - Annual Average Daily Traffic (AADT) - 2025						
		Car	Utility	Bus	Truck 2 axle	Truck 3 axle	Truck >3 axle	TOTAL
S1	Tbilisi - Km 25	24,902	1,359	3,393	480	1,584	834	32,552
S1	Km 25 - Gori junction	15,740	743	2,049	287	1,041	595	20,455
S1	Gori junction - Khashuri	16,108	1,013	2,413	328	1,304	1,065	22,232
S4	Tbilisi - Red Bridge (Azer.border)	4,065	197	205	170	168	128	4,933
S6	Tbilisi - Marneuli	12,977	765	1,021	238	467	112	15,579
S6	Marneuli - Bolnisi	8,638	393	681	96	134	20	9,963
S6	Bolnisi - Guguti (Armenian border)	2,137	117	260	77	113	4	2,707
S7	Marneuli - Sadakhlo	5,534	146	629	100	131	80	6,620
S9	Tbilisi bypass (west)	793	200	547	326	311	854	3,032
S9	Tbilisi bypass (east)	8,016	328	700	287	827	275	10,434
S12	Samtredia - Ureki	3,059	193	575	121	238	331	4,517

Table A.4.6 GEORGIA STUDY ROADS - FORECAST OF VOLUME-CAPACITY RATIOS

Year	BEST ESTIMATE FORECASTS - VOLUME-CAPACITY RATIOS										
	S.1 Tbilisi-Km 25	S.1 Km 25 - Gori Jct.	S.1 Gori Jct. Khashuri	S.4 Tbilisi - Red Bridge	S.6 Tbilisi - Marneuli	S.6 Marneuli - Bolnisi	S.6 Bolnisi - Guguti	S.7 Marneuli - Sadakhlo	S.9 Tbilisi by-pass (W)	S.9 Tbilisi by-pass (E)	S.12 Samtredia - Ureki
1997	0.2	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
1998	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
1999	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
2000	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
2001	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
2002	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2003	0.3	0.3	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2004	0.3	0.3	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2005	0.3	0.4	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2006	0.3	0.4	0.4	0.1	0.3	0.2	0.0	0.1	0.1	0.2	0.1
2007	0.3	0.4	0.4	0.1	0.3	0.2	0.0	0.1	0.1	0.2	0.1
2008	0.3	0.4	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2009	0.3	0.4	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2010	0.3	0.4	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2011	0.4	0.5	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2012	0.4	0.5	0.6	0.1	0.3	0.2	0.1	0.2	0.1	0.3	0.1
2013	0.4	0.5	0.6	0.1	0.4	0.2	0.1	0.2	0.1	0.3	0.1
2014	0.4	0.6	0.6	0.1	0.4	0.2	0.1	0.2	0.1	0.3	0.1
2015	0.5	0.6	0.7	0.1	0.4	0.3	0.1	0.2	0.1	0.3	0.1
2016	0.5	0.6	0.7	0.1	0.4	0.3	0.1	0.2	0.2	0.3	0.2
2017	0.5	0.7	0.8	0.2	0.5	0.3	0.1	0.2	0.2	0.3	0.2
2018	0.6	0.7	0.8	0.2	0.5	0.3	0.1	0.2	0.2	0.4	0.2
2019	0.6	0.8	0.9	0.2	0.5	0.3	0.1	0.2	0.2	0.4	0.2
2020	0.6	0.8	0.9	0.2	0.6	0.3	0.1	0.2	0.2	0.4	0.2
2021	0.7	0.9	1.0	0.2	0.6	0.4	0.1	0.3	0.2	0.4	0.2
2022	0.7	0.9	1.0	0.2	0.6	0.4	0.1	0.3	0.2	0.5	0.2
2023	0.8	1.0	1.1	0.2	0.7	0.4	0.1	0.3	0.2	0.5	0.2
2024	0.8	1.0	1.2	0.2	0.7	0.4	0.1	0.3	0.3	0.5	0.3
2025	0.9	1.1	1.2	0.2	0.8	0.5	0.1	0.3	0.3	0.6	0.3

Source: Consultant's estimates

Note: Assuming a peak hour capacity in passenger car equivalents of 4800 for the S.1 (Tbilisi-Km25) link.
Assuming a peak hour capacity in passenger car equivalents of 2400 for the all other links.

Table A.4.6 (continued) GEORGIA STUDY ROADS - FORECAST OF VOLUME-CAPACITY RATIOS

HIGH GROWTH ESTIMATE - VOLUME-CAPACITY RATIOS

Year	S.1 Tbilisi-Km 25	S.1 Km 25 - Gori Jct.	S.1 Gori Jct. Khashuri	S.4 Tbilisi - Red Bridge	S.6 Tbilisi - Marneuli	S.6 Marneuli - Bolnisi	S.6 Bolnisi - Guguti	S.7 Marneuli - Sadakhlo	S.9 Tbilisi by-pass (W)	S.9 Tbilisi by-pass (E)	S.12 Samtredia - Ureki
1997	0.2	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
1998	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
1999	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
2000	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
2001	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2002	0.3	0.3	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2003	0.3	0.3	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
2004	0.3	0.4	0.4	0.1	0.3	0.2	0.0	0.1	0.1	0.2	0.1
2005	0.3	0.4	0.4	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2006	0.3	0.4	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2007	0.4	0.4	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2008	0.4	0.5	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.1
2009	0.4	0.5	0.6	0.1	0.3	0.2	0.1	0.2	0.1	0.3	0.1
2010	0.4	0.5	0.6	0.1	0.4	0.2	0.1	0.2	0.1	0.3	0.1
2011	0.4	0.6	0.6	0.1	0.4	0.2	0.1	0.2	0.1	0.3	0.1
2012	0.5	0.6	0.7	0.1	0.4	0.3	0.1	0.2	0.1	0.3	0.1
2013	0.5	0.6	0.7	0.1	0.4	0.3	0.1	0.2	0.2	0.3	0.2
2014	0.6	0.7	0.8	0.2	0.5	0.3	0.1	0.2	0.2	0.4	0.2
2015	0.6	0.7	0.8	0.2	0.5	0.3	0.1	0.2	0.2	0.4	0.2
2016	0.6	0.8	0.9	0.2	0.6	0.3	0.1	0.2	0.2	0.4	0.2
2017	0.7	0.9	1.0	0.2	0.6	0.4	0.1	0.3	0.2	0.4	0.2
2018	0.7	0.9	1.0	0.2	0.6	0.4	0.1	0.3	0.2	0.5	0.2
2019	0.8	1.0	1.1	0.2	0.7	0.4	0.1	0.3	0.2	0.5	0.2
2020	0.8	1.1	1.2	0.2	0.7	0.5	0.1	0.3	0.3	0.5	0.3
2021	0.9	1.1	1.3	0.3	0.8	0.5	0.1	0.3	0.3	0.6	0.3
2022	1.0	1.2	1.4	0.3	0.8	0.5	0.2	0.4	0.3	0.6	0.3
2023	1.0	1.3	1.5	0.3	0.9	0.6	0.2	0.4	0.3	0.7	0.3
2024	1.1	1.4	1.6	0.3	1.0	0.6	0.2	0.4	0.3	0.7	0.3
2025	1.2	1.5	1.7	0.3	1.0	0.6	0.2	0.4	0.3	0.8	0.4

Source: Consultant's estimates

Note: Assuming a peak hour capacity in passenger car equivalents of 4800 for the S.1 (Tbilisi-Km25) link.
Assuming a peak hour capacity in passenger car equivalents of 2400 for the all other links.

APPENDIX 5

Table A.5.1 GEORGIA - VEHICLE OPERATING COST MODEL INPUTS

Inputs	Unit	GEORGIA					
		1 Car	4 Utility	5 Large Bus	8 Truck 2 axle (Medium)	9 Truck 3 axle (Heavy)	10 Truck >3 axle (Artic.)
Roadway Characteristics							
Surface type		Paved	Paved	Paved	Paved	Paved	Paved
Average roughness (IRI)	m/km	7	7	7	7	7	7
Average positive gradient	%	5	5	5	5	5	5
Average negative gradient	%	5	5	5	5	5	5
Proportion of uphill travel	%	50	50	50	50	50	50
Average horizontal curvature	deg/km	5	5	5	5	5	5
Average superelevation	fraction	0.00012C	0.00012C	0.00012C	0.00012C	0.00012C	0.00012C
Altitude of terrain	m.	500	500	500	500	500	500
Effective number of lanes		>1	>1	>1	>1	>1	>1
Vehicle Characteristics							
Tare (unladen) weight	kg	960	1,815	11,100	4,525	8,200	12,400
Load carried	kg	300	400	3,000	2,400	6,000	15,000
Maximum used driving power	metric HP	41	39	100	67	147	147
Maximum used braking power	metric HP	20	29	197	147	255	467
Desired speed	km/hour	98.3	94.9	93.4	88.8	88.8	84.1
Aerodynamic drag coefficient	dimensionless	0.45	0.46	0.65	0.85	0.85	0.63
Projected frontal area	m^2	1.8	2.72	6.3	5.2	5.2	5.75
Calibrated engine speed	rpm	3,500	3,300	2,300	1,800	1,800	1,700
Energy efficiency factor	dimensionless	0.95	0.95	0.95	1	1	1
Fuel adjustment factor (alpha 2)	dimensionless	1.16	1.16	1.15	1.15	1.15	1.15
Tyre Wear Data							
Number of tyres per vehicle		4	4	6	6	10	18
Wearable volume of rubber per tyre	dm^3			6.85	7.6	7.3	8.39
Retreading cost per new tyre	Fraction	0.3	0.3	0.3	0.3	0.3	0.3
Maximum number of recaps		1	1	1	1	1	1
Constant term of tread wear model	dm^3/m			0.164	0.164	0.164	0.164
Wear coefficient for tread wear mod	10-3 dm^3/kj			12.78	12.78	12.78	12.78
Vehicle Utilisation Data							
Average annual utilisation	km	17,000	30,000	60,000	40,000	40,000	50,000
Average annual utilisation	hours	350	750	1,250	1,150	1,000	1,250
Hourly utilisation ratio (HURATIO)	Fraction	0.4	0.5	0.5	0.5	0.6	0.65
Average service life	Years	17	12	10	15	12	10
Use constant service life ?		No	No	No	No	No	No
Age of vehicle in km	km	135,000	200,000	350,000	400,000	250,000	325,000
Passengers per vehicle		2	5	32			
Unit Costs							
New vehicle price	US$	7,000	9,750	45,000	18,000	40,000	48,000
Fuel cost (economic)	US$/litre	0.30	0.30	0.27	0.27	0.27	0.27
Lubricants cost	US$/litre	1.35	1.35	1.35	1.35	1.35	1.35
New tyre cost	US$	50	80	200	150	200	250
Crew time cost	US$/hour	0.20	0.35	0.55	0.55	0.61	0.61
Passenger delay cost	US$/hour	0.200	0.175	0.175			
Maintenance labout cost	US$/hour	0.35	0.35	0.35	0.35	0.35	0.35
Cargo delay cost	US$/hour						
Annual interest rate (%)	%	12	12	12	12	12	12
Overhead per vehicle km	US$		0.01	0.02	0.025	0.025	0.025
Additional Coefficients							
KP - Maintenance parts		0.308	0.308	0.483	0.371	0.371	0.371
CPo - Maintenance parts	1.00E-05	32.49	32.49	1.77	1.49	8.61	13.94
CPq - Maintenance parts	1.00E-02	13.7	13.7	3.56	251.79	35.31	15.65
QIPo - Maintenance parts		120	120	190	0	0	0
CLo - Maintenance parts		77.14	77.14	293.44	242.03	301.46	652.51
CLp - Maintenance parts		0.547	0.547	0.517	0.519	0.519	0.519
CLq - Maintenance parts		0	0	0.006	0	0	0
COo - Lubricants		1.55	1.55	3.07	3.07	3.07	5.15
FRATIO0 - VCURVE		0.268	0.22	0.233	0.292	0.292	0.179
FRATIO1 - VCURVE	1.00E-03	0	0	0	0.094	0.094	0.023
ARVMAX - VROUGH		259.7	239.7	212.8	177.7	177.7	130.9
BW - VDESIR		1	1	1	1	1	1
BETA - Speed		0.274	0.31	0.273	0.31	0.31	0.244
E0 - Speed		1.003	1.004	1.012	1.013	1.013	1.018
A0 - Fuel		-8,201	6,014	-7,276	-22,955	-22,955	-30,559
A1 - Fuel		33.4	37.6	63.5	95	95	156.1
A2 - Fuel		0	0	0	0	0	0
A3 - Fuel		5,630	3,846	4,323	3,758	3,758	4,002
A4 - Fuel		0	1.398	0	0	0	0
A5 - Fuel		0	0	8.64	19.12	19.12	4.41
A6 - Fuel		4,460	3,604	2,479	2,394	2,394	4,435
A7 - Fuel		0	0	11.5	13.76	13.76	26.08
NHO - Fuel		-10	-12	-50	-85	-85	-85
Alpha1		0.7	1	1	1	1	1

Table A.5.2 - SUMMARY OF WORLD BANK AND OTHER CRUDE OIL PRICE FORECASTS

Source	Actual price US$/barrel			Forecasts @ Current US$ / barrel			Forecasts @ Constant 1990 US$ / barrel		Forecasts @ Constant 1996 US$ / barrel	
	1994	1995	1996	1994	1995	1996	2000	2005	2000	2005
No.of forecasts				7	7	7	8	8	8	8
High				16.25	18.25	19.00	24.30	26.85	29.16	32.22
Low				11.75	13.55	13.80	13.05	12.15	15.66	14.58
Average	15.65	17.19	19.59	14.00	15.70	16.55	18.10	20.65	21.72	24.78
World Bank (a)				14.50	15.50	17.00	17.50	17.00	20.52	19.92
World Bank (b)							16.60	16.10	20.45	19.84

Source	Actual price US$/litre			Forecasts @ Current US$ / litre			Forecasts @ Constant 1990 US$ / litre		Forecasts @ Constant 1996 US$ / litre	
	1994	1995	1996	1994	1995	1996	2000	2005	2000	2005
No.of forecasts				7	7	7	8	8	8	8
High				0.102	0.115	0.120	0.153	26.850	0.184	0.203
Low				0.074	0.085	0.087	0.082	12.150	0.099	0.092
Average	0.099	0.108	0.124	0.088	0.099	0.104	0.114	20.650	0.137	0.156
World Bank (a)				0.091	0.098	0.107	0.110	0.107	0.129	0.126
World Bank (b)							0.105	0.102	0.129	0.125

Source: World Bank

Note: (a) Deflated by G-V countries' Manufucaturing Unit Value (MUV) Index

(b)Deflated by G-V countries' Consumer Price Index (CPI)

Table A.5.3 - ECONOMIC COST OF AUTOMOTIVE FUEL

Crude Oil Prices and World Bank Price Forecasts

Unit	Crude Oil Spot Prices (April 1997)			IEA Average Crude Import Costs		World Bank Forecasts	
	Gulf	North Sea	Russia	1996	1997	2000	2005
US$/barrel	16.50	18.00	17.00	19.59		20.45	19.84
US$/tonne	119.63	135.18	124.61	143.59		149.90	145.43
US$/litre	0.104	0.114	0.107	0.114		0.129	0.125

Automotive Fuel	**Pre-Tax Auto. Fuel Prices Based on the Above Crude Price Forecasts** Based on: Spot Crude Prices (April 1997)			IEA Average Crude Import Costs		World Bank Forecasts	
	Gulf	North Sea	Russia	1996	1997	2000	2005
PETROL							
Premium Unleaded (US$/litre)	0.249	0.271	0.256	0.271		0.308	0.299
Premium Leaded (US$/litre)	0.241	0.263	0.249	0.263		0.299	0.290
Automotive Diesel:							
Non-commercial (US$ / litre)	0.218	0.237	0.224	0.237		0.270	0.262
Commercial (US$/litre)	0.214	0.234	0.221	0.234		0.266	0.258

Automotive Fuel Pre-Tax as % of Crude Oil Price		*Crude % of Pre-tax Autofuel*
Premium Unleaded	*239*	*42*
Premium Leaded	*232*	*43*
Diesel - Non Commercial	*209*	*48*
Diesel - Commercial	*206*	*49*

Physical Conversion Factors

Conversion	Crude Oil				Automotive Fuel			
	Gulf	North Sea	Russia		Petrol -Premium	Petrol -Regular	Petrol -average	Diesel
Specific Gravity (kg/litre)	0.87	0.84	0.86		0.76	0.74	0.75	0.84
Barrels/tonne	7.25	7.51	7.33		8.30	8.52	8.41	7.51
Litres/barrel	158.54	158.52	158.63		158.50	158.60	158.50	158.50
Litres/tonne	1,149.43	1,190.48	1,162.79		1,315.79	1,351.35	1,333.33	1,190.48

APPENDIX 6.1

REVIEW OF ROAD DESIGN STANDARDS

APPENDIX 6

TABLE OF CONTENTS

1. INTRODUCTION

This report on the Review of Road Design Standards in one of the reports being produced under the European Union - Tacis sponsored TRACECA Project for the Implementation of Pavement Management Systems. The Project covers eight states of the south of the former Soviet Union which are five states in Central Asia

- Kazakhstan
- Kyrghyzstan
- Tadjikistan
- Turkmenistan
- Uzbekistan

and another three states in the Caucasus area

- Armenia
- Azerbaijan
- Georgia.

The introduction of the Terms of Reference already describes a number of deficiencies which were also encountered during the Consultant's studies and review like

- low standard/quality of road construction (e. g. laying techniques, compaction, mix design, workmanship)
- modern Western performance criteria, technical specifications and implementation technologies are little known in the region
- high nominal standards (e. g. design speed of 150 km/h)
- road safety is inadequate

During the Consultant's activities in the project area the above listed deficiencies were further studied, detailed and discussed in a number of meetings and seminars in each of the eight recipient states with the two main headings:

BITUMINOUS BOUND MATERIALS

REVIEW OF METHODS, TECHNOLOGIES AND RELATED STANDARDS IN THE RECIPIENT STATES AND COMPARISON WITH EUROPEAN AND OTHER WESTERN METHODS, TECHNOLOGIES AND STANDARDS

ROAD DESIGN AND ROAD SAFETY

REVIEW OF RELEVANT ROAD DESIGN AND ROAD SAFETY STANDARDS FOR THE TRACECA ROADS (MAGISTRALE) IN THE RECIPIENT STATES AND COMPARISON WITH WESTERN EUROPEAN STANDARDS

In this report under the same headings the topics of the seminars are summarised and the review/analysis of the relevant standards is detailed.

2. BITUMINOUS BOUND MATERIALS

2.1. Pavement Design

2.1.1 Design Philosophies

The pavement design of a road general depends on:

- planned design life
- traffic volume (traffic forecast)
- road category

Taking into consideration the above basic design factors the main aim of the pavement design should be to achieve

- riding comfort acceptable to road users
- economy (implementation and life time)
- limited surface deflection

In the former Soviet Union Standards (SUS) the governing factor for pavement design is the so-called stiffness modulus of the pavement structure, comprising the different pavement layers (e. g. subbase, base course, asphalt concrete). With this stiffness modulus the total pavement thickness and the allowable deflection is specified. The stiffness modulus is calculated under consideration of E-moduli of the respective pavement layers. Based on researches the SUS specifies the E-moduli, which then are used without further verification for the design and on site. The criteria for determination of asphalt layer thickness is the limit on the tensile stress at the bottom of the asphalt layer.

In European/Western standards (E/WS) the pavement design is based on tolerable stresses induced in the subgrade by traffic load. The different subgrade materials and their behaviour are considered with the respective subgrade bearing capacity (e. g. CBR, plate load test) leading to the total pavement thickness. The total pavement thicknesses result from standardised pavement layer thicknesses which have been empirically determined. In addition the materials requirements are specified and have to be verified on site by regular testing to ensure the required bearing capacity of each layer. The criteria for determination of asphalt layer thickness is to provide a satisfactory service over the planned design life period of the pavement, taking into consideration the effects (climate, traffic) on the road surface.

The main differences between the SUS pavement design and E/WS pavement design are:

Requirement	SUS Design	E/WS Design
pavement deformation is limited by	stiffness modulus of the pavement structure	stress on subgrade
asphalt layer thickness is determined by	tensile stress at bottom of asphalt layers	limitation of deterioration resulting in acceptable surface condition

In summary the SUS design procedure is a method using theoretical material values. Although an adequate stiffness of a road structure is an important requirement, this does not necessarily translate into a well designed road, comfortable to use and economic in construction and maintenance.

The E/WS design procedure is based on empirical factors which are the results of practical experience with specified control of each pavement layer on site.

2.1.2 Characterisation of pavement layers

The surface course or wearing course is the top layer of an asphalt pavement and should be constructed of dense asphalt concrete. Between surface course and base course a more porous asphalt layer the so called binder course is placed. The binder course should be an asphalt mixture with a high stability and shear strength.

Below the binder the base course (road base) is the main load spreading layer of the pavement. It will normally consist of crushed stone or suitable natural gravel. For roads with high traffic load the base course can be a bituminous treated layer with high compressive strength for the total layer thickness or for the upper part combined with a lower base course layer of cement or lime treated or untreated gravel sand mixture.

The subbase is the second load spreading layer underlying the base course. It normally consists of a material of lower quality than the base course such as a natural gravel-sand mixture. This layer also serves as a separating layer preventing contamination of the base course by subgrade material during construction. Base course and subbase have to be frost-resistant.

The subgrade (existing natural ground or embankment fill) should be compacted to fulfil the requirements of a sufficient bearing capacity.

2.1.3 Assessment of existing design methods in comparisation with western design procedures

In the example below a pavement designed to SUS is recalculated and compared with an E/WS design method. The SUS design provides a service life of the pavement of 15 years. Less than 6 years service life for the same pavement is the result of the recalculation with the E/WS method, the empirical method of AASHTO (American Association of State Highway and Transport Officials).

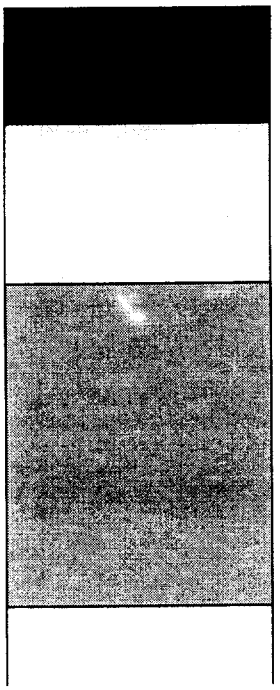
Design with SUS (VSN 46 - 72)

Design Traffic: 1342 equivalent standard vehicles per day in design lane

Initial traffic assuming 1.5 % growth = 1073 vpd

Accumulated $ESAL_{80}$ = 7.02 x 10^6 (15 years)

DESIGN SOLUTION
according to VSN 46 - 72



Wearing course 50 mm	E_1 = 1500 MN/m²
Binder course 80 mm	E_2 = 1000 MN/m²
Granular base 120 mm (crushed, cement treated)	E_3 = 600 MN/m²
Granular subbase 400 mm	E_4 = 200 MN/m²
Subgrade	E_5 = 28 MN/m²

Recalculation by AASHTO Method

The relation for the number of $ESAL_{80}$ is as follows :

$$\text{Log } ESAL_{80} = Z_R\ S_o + 9{,}36 \log (SN + 1) - 0.20 + \frac{\log ((\ PSI\ /(4.2-1.5))}{0.4 + (1094/\ (SN +1)^{5,15}} + 2.32 \log M_R - 8.07$$

Z_R = - 1.645 (Normal deviate for 35 % reliability level)

S_o = 0.45 (Standard deviation)

M_R = 5 10^3 for example 1 (Subgrade resilient modulus)

PSI = 4.2 - 2.5 = 1.7 (Change in the present serviceability index)

PSI = 4.2 Construction Quality common in USA

PSI = 2.5 Minimum acceptable PSI

Log $ESAL_{80}$ = - 0.740 + 7.083 - 0.396 + 8.582 - 8.07 = 6.459

$ESAL_{80}$ = 2.88 * 10^6 (Number of passes by Equivalent Standard Axle Load)

Design Traffic : 1342 equivalent standard axle loads per day in design lane (assumption)

= 2,88 * 10^6 / 1342 = 2146

2146 / 365 = 5.8 years Design life according AASHTO

2.1.4 Assessment and recommendation

The SUS design is a theoretical procedure. It is recommended to use a method more based on values of experience and empirical studies as demonstrated in the above example. Specially the present practice with computation using the stiffness modulus and the tensile stress at the bottom of the asphalt layers should be discarded. If it is necessary to use still the SUS then more attention has to be paid to the bearing capacity of the subgrade (testing of CBR, moisture content, grading). For roads with a high traffic load, as the magistrale are, the upper layer of the base course (road base) should always be a bituminous layer. The thickness of all frost resistance layers should be reconsidered according to local conditions and experience.

For the asphalt concrete itself it is recommended to reduce the maximum grain size of the aggregates and to use as binder a destillation bitumen.

2.2 Materials

Asphalt concrete is a mixture of sand, aggregates and bitumen. A mineral powder is added as filler to provide a sufficient quantity of fine material, which can be also cement or crushed limestone. Between bitumen and aggregates a sufficient adhesion is required. The value of adhaesion depends on the kind of bitumen and the aggregate.

Aggregates
The maximum grain size of the aggregates is of great importance for the mechanical values of the asphalt and directly related to thickness of asphalt layers.

Bitumen
The bitumen used in Western European countries for road construction is named according the average penetration value. For example B65 means B for Bitumen, 65 for 65 1/10 mm medium penetration (max/min limits of penetration 50/75). Bitumen in Europe is produced by a two step destillation procedure (atmospheric and vaccuum destillation).

The following types of bitumen are available B15, B25, B45, B65, B80, B200, B300.

For road construction (rolled asphalt) bitumen B65 and B80 is preferably used, and Bitumen B200, B300 for road surface treatment

Natural asphalt (bitumen) is found in Azerbaijan, Turkmenistan.

Natural asphalt (bitumen) is found in Azerbaijan, Turkmenistan.

Asphalt job mix design criteria and laboratory testing
The asphalt job mix design provides the optimum values for
- density
- air voids content
- bitumen content
- stability and flow value

standard laboratory tests for bitumen carried out on construction site
- penetration
- softening point
- breaking point
- ductility

Assessment and recommendation
Existing laboratory equipment in the eight recipient states was produced in the fromer Soviet Union and complies with the relevant SUS.

Main laboratory testing procedures for aggregates, sand, bitumen and asphalt is done according the SUS which differ only little to European/western tests standards. The Marshall test is widely known, but not used due to lack of equipment and missing requirement for limitations

2.3 Quality Control

The aim of quality control in production and implementation is to maintain a constant level of quality which in the long term results in a cost reduction

Regular testing of the product quality shall be done by the manufacturer before delivery to customers (testing as a measure of self controlling). Furthermore sample controlling and testing shall be carried out by an independent institution to supervise the manufactuer's testing in order to assure constantly the quality of the product/materials.

When materials are used for construction field and laboratory testing is required to assure that the materials used and the workmanship comply with the relevant standards and specifications. The usual approach on a construction site is that the contractor carries out own testing throughout the period of execution of works. The test results are to be submitted to the (independent) supervisor for verification and the supervisor will do own testing.

In the recipient states the European/western approach for quality control and the independent supervision of works is not existing and thus very often the materials and construction requirements of the existing standards and specifications are not achieved resulting in poor quality implementation and short service life with high maintenance costs. Therefore a quality control, a quality assurance system should be introduced which will support the durability of construction and encourage the countries' economy.

2.4 Asphalt Production and Pavement Placing Techniques

Asphalt products for road construction

There are generally two different types of asphalt mixtures used for road construction:

(i) rolled asphalt (with air voids)

The asphalt is placed and compacted at maximum density and there are still air voids not filled with bitumen. The specified temperature for placing hot asphalt mixtures is 120 - 180°C and compaction has to be completed before the temperature drops below 90°C.

In Europe the use of cold asphalt mixtures is restricted to special cases or locations (islands, moutainous regions, temporary repairs).

(ii) Mastic asphalt (without air viods)

In the asphalt mixture there are no air voids and therefore after placing no compaction is necessary. The specified paving temperature temperature is 220 - 240 °C.

Overheating of bitumen will result in a poor quality asphalt mixture and therefore the maximum admissible temperatures of bitumen for asphalt mixtures are specified:

Type of Bitumen	max. Temperature [°C]
B45	190
B65	180
B80	180

Lowest and highest temperatures for asphalt mixtures in °C leaving the mixer:

(i) SUS (GOST)

Type of Bitumen	Temperature of Asphalt [°C]
BND 40 / 60 BND 60 / 90 BND 90 / 130 BN 60 / 90 BN 90 / 130	140 - 160

Note: The maximum temperature may be 10 °C higher if the asphalt is placed at air temperatures below 5 °C.

(ii) E/WS (ZTV - Asphalt, German Standard)

Typ of Bitumen	Temperature of Asphalt for Binder Layer [°C]	Temperature of Asphalt for Surface Course [°C]
B45	130 - 190	140 - 190
B65	120 - 180	130 - 180
B80	120 - 180	130 - 180

Note: Surface course should not be placed at air temperatures below 3°C, Asphalt binder course not below 0 °C.

Asphalt mixing plants

A mixing plant for asphalt production shall be designed and operated so as to produce mixtures according to the Job-Mix-Formula. There are general two types of mixing plants used for asphalt production:

- Batch mixing plants
- Continuous mixing plants

Asphalt placing and compacting procedures

Placing of asphalt is done with an asphalt finisher (paver), normal working width 6 m to 8 m, which achieve a so-called precompaction of about 90% of required density. Paving speed is depending on kind, width and thickness of asphalt layers ranging from about 1.0 m/min. (surface course) to 2.5 m/min (binder course, base course).

Compacting of asphalt with tandem steel roller (vibration possible) and pneumatic roller.

Assessment and recommendation

In the recipient states the mixing equipment is of Soviet Union or east German origin. Most of the mixing plants are out of operation since a number of years by various reasons. Due to the lack of operating mixing plants and long haulage distances the use of cold mix asphalt became common for maintenance and repair works. Compacting was and is still done with static steel rollers. Pneumatic rollers and rollers with vibration possibility have not been encountered in the recipient states.

The existing mixing plants could produce a good quality asphalt, but this depends on the condition of the equipment and it is difficult to purchase spare parts. A similar problem for spare parts appears for asphalt placing equipment (pavers, rollers).

With regard to the above problems and the superiority of E/WS asphalt placing equipment some of the recipient states have started to use E/WS equipment to achieve a better quality in pavement construction. However, it is recommended to provide appropriate training for those equipment so that their possibilities are understood and can be fully utilised.

2.5 Rehabilitation of Asphalt Pavement

The deterioration of a pavement manifests itself by various signs of appearance or indicators which can be associated with the probable causes of the failure or imperfection. To determine if and to which extend rehabilitation measures are necessary as a first step an assessment of the road condition is required.

An assessment of road condition should include the following:

(i) surface condition
A visual condition survey of an asphalt pavement shall describe the types of pavement distress relating them to the likely causual factors. The visible manifestations related to pavementdistress generally fall into one of the following broad categories:

- cracking
- distortion
- disintegration
- skid resistance

(ii) bearing capacity
Special equipment is used to asses the actual bearing capacity. The Benkelman beam is widely known but the results of the measurements cannot be related to the different pavement layers. The Falling Weight Deflectometer (FWD) is a fast and most advanced method to collect relevant data from actual deflection measurements and following calculations give distinguished results for the different pavement layers.

(iii) pavement composition
Sampling and laboratory testing of the existing asphalt pavement reveals the actual condition of aggregates and bitumen as well as the used basecourse and subbase material.

(iv) pavement structure condition
After a certain time depending for example on traffic load and climatic conditions all pavements need maintenance and repairs to keep a certain level of ride comfort. If maintenance of a pavement is neglected for a longer period the deterioration of the road may accelerate. The pavement condition is quickly getting worse and is then unacceptable to road users. The high degree of deterioration of a neglected pavement results in destruction requiring an expensive reconstruction in the end. A permanent maintenance and repair of smaller deficiencies will extend the life time of a pavement and keeps the surface in good condition.

Assessment and Recommendation

During the road inspections carried out in the 8 recipient states very different quality of road maintenance/repair/rehabilitation works was observed ranging from good to very poor. Cases were observed where on the one hand cold asphalt was dropped into water filled potholes but also on the other hand proper edge cutting with preparation for receiving the asphalt and following compaction. Furthermore placing of asphalt concrete layers was carried out by pavers but without grade control or the materials was spread by graders. In only a few cases the resulting surface condition, in particular the road roughness, was satisfactory. When the above described deficiencies were discussed in the seminars with the specialists of the recipient institutes the main reason given was that maintenance is mostly done

according to financial possibilities/constraints and not according to technical requirements.

In summary the existing methodology as well as the equipment is in most of the recipient states unsatisfactory. As already described in the sub-chapter above some of the states have started to purchase modern European/western equipmnet and it is recommended to carry out training for operators, foremen, site engineers etc. to achieve an advanced knowledge in the methodology and techniques for road maintenance and rehabilitation works and for an optimum utilisation of the equipment.

2.6 Recycling Techniques and Methods for Asphalt Concrete

Cold and hot recycling

Cold recycled (cut/milled and pulverised) asphalt pavement can only be used for lower layers as base course or as binder course when adding bitumen emulsion and/ or cement or cement suspension. Depending on the traffic load and to achieve the required surface properties the compacted recycled road base is subsequently covered with a bituminous surface layer. Depending on laboratory testing results of the existing asphalt concrete hot recycled asphalt pavement may be used also for surface course with or without adding new materials.

Conventional methods

Deteriorated asphalt pavement is cut or milled and transported to a mixing plant. There the material is pulverised, heated and mixed with or without adding new aggregates and bitumen. The asphalt mixture is then transported to the construction site and placed on the road. This method is used when a mixing plant is close to the site since additional transport of removed asphalt pavement to the mixing plant and of the newly mixed material back to the road construction site has to be considered.

Mix in place recycling

The mix-in-place recycling is a very promising and economical method for the reconstruction of damaged asphalt roads. With this method the material of deteriorated roads is recycled in place and immediately used for the new pavement construction.

- Objectives of this method
  - Rehabilitation of road surface
  - Improvement of load bearing capacity
  - Improvement of frost resistance

- Advantages of this method
  - Avoidance of waste road construction material
  - Saving of natural resources
  - Environmental friendly
  - Reduction of material transports resulting in avoidance of traffic load burden on other rural/public roads in the area usually used for haulage

This construction method is characterised by a recycling equipment which cuts/mills and pulverises the existing road material if necessary including the unbound road base and subsequently mixes the crushed material with cement or bituminous binder agents. At this time available recycling equipment can be used on asphalt layers with a thickness of up to 150 mm. The following methods and techniques are used:

- Reshape: Deteriorated surface course/asphalt pavement will be heated, loosened and the hot material placed without adding material.
- Repave: The loosened and hot replaced material is immediately covered with a new hot asphalt layer containing only new material.
- Remix: Deteriorated surface course/asphalt pavement will be heated, loosened and new material (asphalt mixture or only bitumen) has to be added to get a mixture according the job mix design.

Assessment and Recommendation

Modern asphalt recycling techniques are requiring special equipment and a well trained labour force. In addition in all recipient states the budget for road maintenance and road repair is very limited so that recycling of asphalt concrete, if any, as for example in Uzbekistan and Kazakstan is very rare and done by specialised European/western companies.

However, the specialists of the recipient institutes met in the seminars are very interested in this modern and economical road/pavement rehabilitation technology. When the recycling technology is introduced it should be accompanied by special seminars and training not only for the use of equipment but also for technicians and engineers who have to do the laboratory testing of the existing pavement materials as well as the job mix design for the re-use.

3. ROAD DESIGN AND ROAD SAFETY

3.1 Road Design Standards

3.1.1 General

The standard for the geometrical design of roads and highways in the TRACECA states was developed in the former Soviet Union. In some of the states researches are ongoing for modification of this standard towards the development of national standards, which may consider local requirements as well as harmonisation with western European standards. However, no new standard has been published yet and the Soviet Union road standard (SNIP) is still in use.

For comparison with an western European standard the German standard for road and highway design is used and was presented in the seminars respectively.

The TRACECA Project includes selected international road links in the eight recipient states which in most cases are the so-called magistrale with the highest standard, but also with the next lower category of standard reflecting the requirements of lower traffic volume. The details of road design standards described in the following therefore cover these categories of the TRACECA roads.

3.1.2 Road Categories and Design Speeds

For an better overview all road categories and related design speeds are listed in the tables below. The relevant parameters of the Soviet Union road standard (SUS) are given in Table 3.1 and of the European/German road standard (E/GS) in Table 3.2. Categories not applicable for the TRACECA roads are shaded.

Apparent are the relative high design speeds of the SUS and the subdivision of the group category/road category with particulars of the E/GS. During seminars in the recipient institutes the scientific/research background of the two standards was discussed and some approaches were found as different, however, to discuss and evaluate all the differences of the development of the standards would be beyond the scope of the Project.

As discussed in the seminars the SUS design speed of 150 km/h has been used in flat terrain only (e.g. steppe of Kazakhstan) or not at all (e.g. Azerbaijan, Georgia, Kyrgyzstan, Uzbekistan) since the requirements are very high and the various constraints would have made the implementation to expensive. Considering this approach in the design practice, the differences of the two standards are marginal only.

Table 3.1: Soviet Union Road Standard 2.05.02-85, 1986

CATEGORY	DESIGN SPEED [Km/h]		
	GENERAL	WINDING TERRAIN	MOUNTAIN. TERRAIN
I - a	150	120	80
I - b	120	100	60
II	120	100	60
III	100	80	50
IV	80	60	40
V	60	40	30

Table 3.2: German Standard RAS-Q, 1982/1996

CATEGORY				DESIGN SPEED [km/h]
GROUP CATEGORY		ROAD CATEGORY		
A	MAGISTRALE, outside populated areas	A I	long distance/international link	90 - 120
		A II	regional link	80 - 120
		A III	interurban link	60 - 80 (100)
		A IV	major infrastructure link	60 - 80
B	HIGHWAYS, around or through towns	B II	major highway	(60) 70 - 80
		B III	main highway	(50) 60 - 70
		B IV	highway	50 - 60
C	MAJOR URBAN ROADS	C III	major road (highway)	50 (- 70)
		C IV	main road	(40) 50 (60)
D	URBAN MAIN ROADS	D IV	main road	40 - 50
		D V	main street	none
E	URBAN ACCESS ROADS	E V	street	none
		E VI	lane	none

Values in (...) = Exceptions

3.1.3 Geometrical Design Elements

Based on the selected road category and the design speed respectively the geometrical elements for the road design are defined.

The main parameters for ***horizontal and vertical alignment*** are summarised in Table 3.3 for the SUS and for the E/GS in Table 3.4. When as described above the requirements of the SUS design speed 150 km/h is not taken into consideration the two standards are very similar with more particulars given in the E/GS.

Table 3.3: Soviet Union Road Standard 2.05.02-85, 1986

DESIGN SPEED	MAX. GRADI - ENT	MINIMUM VERTICAL CURVE Radius Crest Curve	Radius Sag Curve general	Radius Sag Curve mountain.	MINIMUM HORIZONTAL CURVE general Radius	general Crossfall	mountainous Radius	mountainous Crossfall
150 km/h	3.0 %	30000 m	8000 m	4000 m	1200 m	2 - 3 %	1000 m	2 - 3 %
120 km/h	4.0 %	15000 m	5000 m	2500 m	800 m	3 - 4 %	600 m	5 - 6 %
100 km/h	5.0 %	10000 m	3000 m	1500 m	600 m	5 - 6 %	400 m	6 %
80 km/h	6.0 %	5000 m	2000 m	1000 m	300 m	6 %	250 m	6 %
60 km/h	7.0 %	2500 m	1500 m	600 m	150 m	6 %	125 m	6 %

Table 3.4: German Standard RAS-L-1, 1984, for Road Category **A**

DESIGN SPEED	MAX. GRADI - ENT	MINIMUM VERTICAL CURVE Radius Crest Curve	Radius Sag Curve	MINIMUM HORIZONTAL CURVE Radius and minimum Crossfall		Radius and maximum Crossfall	
120 km/h	4.0 %	20000 m	10000 m	3000 m	& 2.5 %	800 m	7 % (8 %)
100 km/h	4.5 %	10000 m	5000 m	1800 m	& 2.5 %	500 m	7 % (8 %)
90 km/h	5.0 %	7000 m	3500 m	1400 m	& 2.5 %	380 m	7 % (8 %)
80 km/h	6.0 %	5000 m	2500 m	1100 m	& 2.5 %	280 m	7 % (8 %)
70 km/h	7.0 %	3500 m	2000 m	800 m	& 2.5 %	200 m	7 % (8 %)
60 km/h	8.0 %	2750 m	1500 m	500 m	& 2.5 %	135 m	7 % (8 %)

Values in (...) = Exceptions

With the determined road category and the respective traffic volume both standards define the main parameters for the ***road cross section*** which are summarised in Table 3.5 for the SUS and for the E/GS in Table 3.6.

Again and as described for other parameters before the two standards for the road cross section are very similar and adequate with the exception of the decision point from two to four lanes in the SUS which requires at least four lanes for a traffic volume of above 14,000 vehicles per day. In the highest category A I of the E/GS and for up to 27,000 vehicles/day the 1982 RAS-Q standard required two lanes only which with regard to traffic flow and road safety recently has been revised (RAS-Q 1996, published on 15.08.96) to three lanes.

Table 3.5: Soviet Union Road Standard 2.05.02-85, 1986

CAT	TRAFFIC VOLUME (ADT) NORMAL + WINDING	TRAFFIC VOLUME (ADT) DIFFIC. TERRAIN	LANES NO.	LANES WIDTH	SHOULDER TOTAL (PAVED)	MEDIAN TOTAL (PAVED)	TOTAL ROAD WIDTH
I-a	> 80000	> 70000	8	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	43.50 m
	> 40000 ≤ 80000	> 34000 ≤ 70000	6	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	36.00 m
	> 14000 ≤ 40000	> 14000 ≤ 34000	4	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	28.50 m
I-b	> 80000	> 70000	8	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	42.50 m
	> 40000 ≤ 80000	> 34000 ≤ 70000	6	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	35.00 m
	> 14000 ≤ 40000	> 14000 ≤ 34000	4	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	27.50 m
II	6000 - 14000		2	3.75 m	3.75 m (0.75m)	--	15.00 m
III	2000 - 6000		2	3.50 m	2.50 m (0.75m)	--	12.00 m
IV	200 - 2000		2	3.00 m	2.00 m (0.50m)	--	10.00 m
V	< 200		1	(2.25 m)	1.75 m (--)	--	8.00 m

Table 3.6: German Standard RAS-Q, 1996

ROAD CAT.	TRAFFIC VOLUME (ADT) [veh./day]	LANES NO	LANES WIDTH	SHOULDER TOTAL (PAVED)	MEDIAN TOTAL (PAVED)	TOTAL ROAD WIDTH	NOTE
A I	45000 - 61000	6	3.75 m 3.50 m	4.50 m (3.00 m)	5.00 m (2x0.75m)	35.50 m	i
	29000 - 39000	4	3.75 m	4.75 m (3.25 m)	5.00 m (2x0.75m)	29.50 m	
	14000 - 27000	3	3.75 m 3.50 m 3.25 m	1.75/2.75 m (0.25 m)	0.50 m (0.50 m)	15.50 m	ii
A II	54000 - 66000	6	3.50 m	4.00 m (2.50 m)	4.00 m (2x0.50m)	34.00 m	
	35000 - 42000	4	3.50 m	4.00 m (2.50 m)	4.00 m (2x0.50m)	26.00 m	
	22000 - 27000	3	3.75 m 3.50 m 3.25 m	1.75/2.75 m (0.25 m)	0.50 m (0.50 m)	15.50 m	ii
	14000 - 21000	2	3.50 m	1.75 m (0.25 m)	--	10.50m	
A III	33000 - 42000	4	3.25 m	2.00 m (0.50m)	3.00 m (2x0.50m)	20.00 m	
	11000 - 21000	2	3.00 m	1.75 m (0.25m)	--	9.50 m	
A IV	11000 - 14000	2	3.00 m	1.75 m (0.25m)	--	9.50 m	

NOTES: (i) total width of 35.50 m with width of right lane 1 x 3.75 m and left lanes 2 x 3.50 m

(ii) total width of 15.50 m:
- no. of lanes 3 (2+1 alternating)
- width of single (1) lane 1 x 3.75 m with shoulder 2.75 m (0.25m paved)
- width of double (2) lanes 1 x 3.50 m (right) + 1 x 3.25 m (left) with shoulder 1.75 m (0.25m paved)
- width of "median" 0.50 m (paved)

3.2 Road Safety and Road Design Aspects

3.2.1 Preliminary Remarks

Road and traffic safety is based on the three 'E' which can be described as:

Engineering (e. g. standards for road design and traffic engineering, control of quality in implementation, supervision of works for and maintenance of a good/safe road condition)

Education (e. g. education of pedestrians and motorists, training, public promotion)

Enforcement (e. g. laws and regulations, police, justice)

and is a complex process where dynamic, visual, geometrical, drainage and psychological requirements need to be optimised.

In the following those aspects concerning road safety and related road design details are described which were presented and discussed in the seminars held in the recipient states.

3.2.2 Technical Aspects of Road Safety and Road Design

- **Sequence of Radii for horizontal Alignment**

  The relation of the radii of horizontal curves in the road alignment is specified in both standards, the SUS as well as the E/GS. The aim is to achieve a relative constant travelling speed resulting in safety for the road users (avoidance of unexpected narrow curves). In cases where constraints do not allow to follow the requirements of the standard(s) extensive signalisation is necessary.

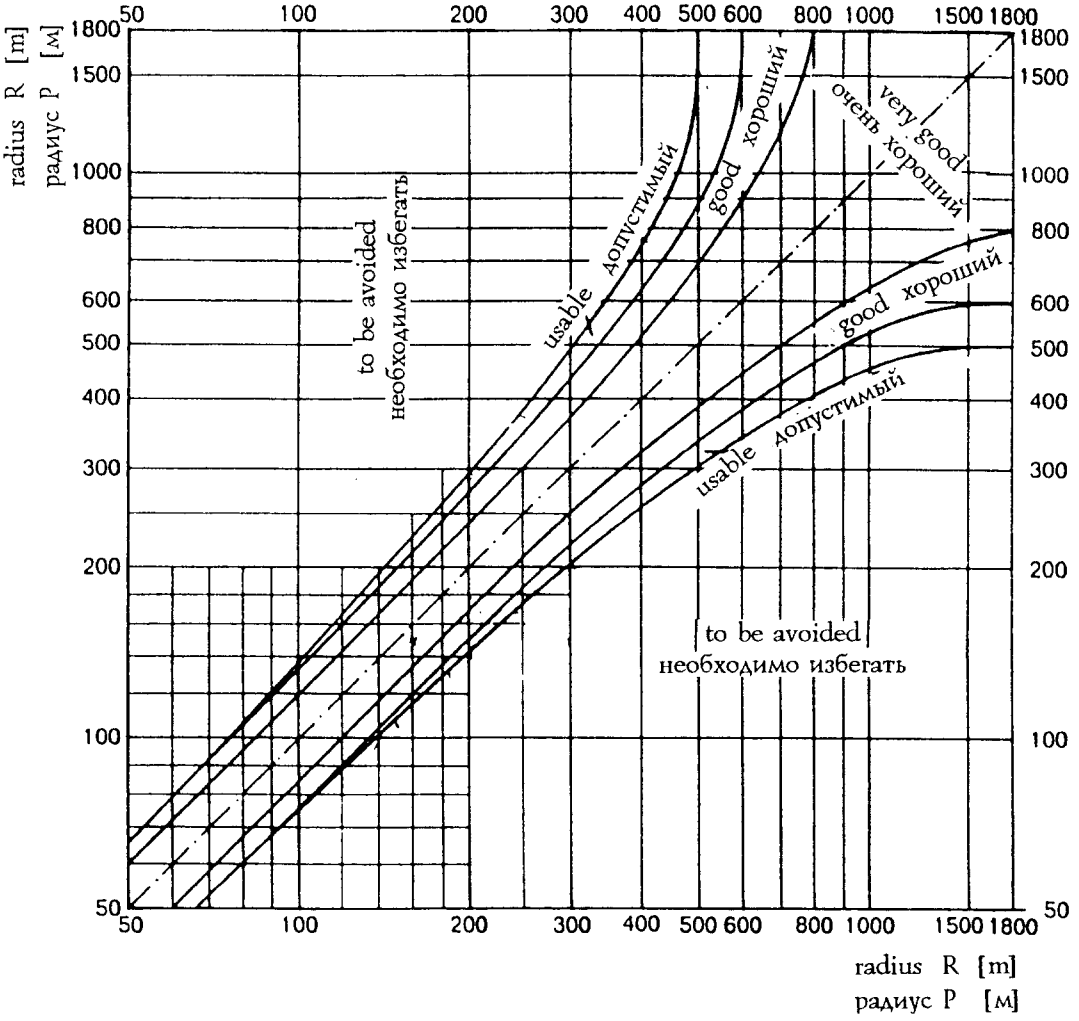
  In sub-chapter 4.3.3 of the SUS (SNIP 2.05.02 - 85) the relation of radii is specified as

  $$R_1 : R_2 = 1 : (\text{maximum } 1.3)$$

  which is considered as to rigid and not reflecting the requirements of moving vehicle dynamics.

  The suitability of the sequence of radii in the E/GS (RAS-L-1, 1984) is determined according to the diagramm below and improvement of the SUS is recommended.

Sequence of Radii for Horizontal Curves, RAS-L-1, 1984



- **Length of straight Road Section and minimum Radius of Curve after straight Road Section**

  At long straight road section it is rather difficult for drivers to assess distance and speed of approaching vehicles. Furthermore for the safety of road users it is important to decide on an appropriate radius after a straight section of road, where vehicles may build up speed. The SUS (SNIP) specifies maximum 5 km length of straight and should be complemented by the requirements of the E/GS for the radius after a straight road section as summarised in table 3.7 below.

Table 3.7: German Standard RAS-L-1, 1984

ROAD CATEGORY	LENGTH OF STRAIGHT	MINIMUM RADIUS
A I, A II	L ≥ 600 m	min R > 600 m
	L < 600 m	min R > L
A III, A IV, B II	L ≥ 500 m	min R > 500 m
	L < 500 m	min R > L

- **Junctions incl. Approaches and Slowing Down/Acceleration Lanes**

  For Junctions and intersections one of the main design requirement is safety for the road users which can be achieved when the junction/intersection system

  - provides adequate visibility
  - is easy to understand
  - is designed for appropriate speed
  - is furnished with adequate horizontal and vertical signalisation (road markings and traffic signs)

  Those requirements are of high importance especially for non-local drivers, who also need information signs for orientation and decision which direction to take well ahead of the junction.

  The priority in the SUS for junctions at grade is to achieve a relative high speed for vehicles entering and moving in the junction. The resulting relative big radii used in those junctions lead to large islands and a large area for the entire junction itself with the consequence of a reduced visibility.

  In comparison the E/GS has relative small radii in the junction with small islands resulting in a good visibility. To achieve a speed of entering vehicles with little difference to the through traffic acceleration lanes are provided.

  In summary the E/GS with constructural measures reducing the speed in the junction approach and providing good visibility which both make the 'system' of the junction clearly understandable has advantage in traffic safety and therefore the SUS should be improved accordingly.

  The SUS for grade separated junctions/intersections including clover leaves is very similar to the E/GS. During field visits in the course of the seminars several cases were observed where the SUS has been modified and shorter slowing down/acceleration lanes were constructed. This modification was explained with budget constraints and the relative low traffic volume at the time of the implementation. The theory is to provide the necessary slowing down/acceleration lanes when the traffic volume has reached a certain level and the full standard is required.

- **Signalisation**

  The SUS for road and traffic signs is in line with western European/international standards and modification is considered not to be necessary. In many cases the information signs were encountered with description in Latin letters in addition to the Cyrillic, which is appreciated by foreign road users and which should be shown on all informative signs along the international, the TRACECA roads. However, the quality of materials should be improved, especially the brightness of reflective material and/or the workmenship should be better controlled.

  The same applies for road marking. The SUS is appropriate and the materials/quality should be improved. Some modification/additions should be considered to increase traffic safety as for example on two lane roads arrows in the centreline ahead of a continous centreline marking (non overtaking). In general road marking has been neglected in the TRACECA states for some time by various reasons - budget constraints for maintenance, broken down equipment, supply of paint abandoned etc.

In the TRACECA states marker posts are used at junctions, bridge approaches, railway crossings and at culvert locations only. According to the SUS the posts are white with a black stripe, reflective material or reflectors are not used. The existing standard is considered as not appropriate and should be improved: size of post and use of reflectors. Marker posts are a very important component of road safety, especially in the darkness they provide together with an appropriate road marking the best possible guidance for road users. It is understood that the provision of marker post for the entire road network in the TRACECA states would be rather costive, but it is recommended that marker posts with an appropriate spacing (say 50 to 75 m) along the international, the TRACECA roads are successively installed when road sections are improved/rehabilitated.

- **Safety for Town Passages with high Traffic Volume**

The magistrale, the TRACECA roads inspected often run through towns and villages which is inconvenient for both the road users as well as the inhabitants. For the latter besides environmental inconvenience (exhaust gases, noise) the traffic on the magistrale form a danger for crossing vehicles and pedestrians. Low speed in the town passages resulting in longer travelling time (economic losses) is the inconvenience for drivers together with the potential high danger of an accident.

A by-pass for those towns and villages would be the best solution for the above problems. As in Europe also in the TRACECA states it takes several years up to decades to prepare such a by-pass project - feasibility, financing, land acquisition etc. - and until the implementation. Therefore it is necessary to implement measures for immediate improvement of the traffic safety and if possible for mitigation of the other inconveniences.

In the meetings and seminars held in the recipient it carried out that the local engineers/specialists are familiar with and aware of the required safety improvements but financing is not available possibly because other projects have a higher priority. The following measures were discussed and include also low-cost solutions which can produce considerable improvement:

(i) Where sufficient space can be made available private accesses to the magistrale should be abandoned and collected with a parallel minor road which then enters into the magistrale with a proper junction (= reduction of danger points).

(ii) Provision of safe pedestrian crossings
- subways or bridges (= very expensive)
- traffic lights (= expensive)
- prefabricated islands bolted on the road surface as safety waiting zone after crossing of one lane and before crossing the other (= low cost and quickly implemented)

(iii) Adequate road marking and traffic signs (= minimum requirement)

(iv) Sensibly determined/useful speed limits which will be understood and accepted by drivers:

- when the houses/village is situated on one side of the road only there is hardly any crossing traffic (vehicles and pedestrians) and the village name signboards which require a speed of 50 or 60 km/h should be removed and a speed of 70 or 80 km/h should be allowed by traffic signs (= improvement of traffic flow, reduction of travelling time)

- village name signboards which very often are placed several hundred meters before the first houses appear (leads to disregarding of the 50/60 km/h limit) should be relocated close to the real village entrance, where necessary the approach can be provided with a first speed limit of 70 or 80 km/h (= improvement of traffic flow, reduction of travelling time).

- **Emergency Escape Lanes at extended Descends**

  The SNIP does not include such a standard. Due to the nature of the terrain and the necessity local standards were developed in for example Kazakhstan and Kyrgyzstan which are appropriate.

- **Winter Maintenance**

  In those TRACECA states where winter conditions are experienced the aim and the requirements of winter maintenance are well known by the engineers/specialists of the institutes and departments in the recipient states. Presently the problem is that a reduced scope of winter maintenance can be carried out only due to budget constraints and equipment at the end of service life. In most cases application of salt or grit is done by throwing the material by shovel from a moving truck.

  In meetings and seminars (and during the Study Tour to Europe in November 1996) European methods and technologies were presented and possible development/improvements discussed which can be summarised as

  - updating/upgrading of winter maintenance management plans

  - introduction of modern/economically working equipment for removal of snow and for application of grit/salt (including the benefit for the environment)

3.2.3 Non Technical Aspects of Road Safety

- **Public Promotion/Information Programmes**

The above sub-chapters present and discuss a number of technical safety measures which are the one part of road and traffic safety. The other part which is assumed to be the more difficult one is the so-called human factor, which includes all participants in the public traffic from vehicle drivers to pedestrians. Technical safety measures may not provide the planned results when the human factor fails. It has been experienced for example when a bad road was rehabilitated and had received a smooth surface, all necessary signalisation and safety measures (road marking, marker posts etc.) the number of accidents increased because drivers tended to overspeed.

Risky behaviour may in many cases result from lack of discipline but also from not understanding or accepting measures and regulations. Therefore public promotion/information programmes are of high importance to provide the necessary background information for understanding and acceptance to increase safety. But also to enhance the understanding of one another like pedestrians and drivers as for example:

- pedestrians must understand that a car with a speed of, say, 50 km/h cannot come to a full stop within 10 metres.
- drivers have to control/keep the allowable maximum speed, if necessary reduce it, to give pedestrians a chance to cross safely the road
- etc.

Before independence of the TRACECA states public promotion/information programmes existed (e. g. on TV, radio) but only a few are left like the education/training of primary school pupils. It is therefore recommended to re-activate or initiate those programmes - on TV and radio, with brochures, advertisement etc. - which in Europe are running since decades and always have to continue.

- **Enforcement of Regulations**

During the seminars in the recipient institutes the decreasing discipline and the increase of violation of traffic regulations was put into discussion as another problem of road safety aspects. Besides the above mentioned public promotion/information programmes for education possibilities to control and discipline road users repeatedly violating regulations were discussed. As an example the system in force in Germany was presented as described below.

- **Point System for Violation of Traffic Regulations (Germany)**

In addition to fines a central register has been installed for supervising repeated violations. Registration is done for all fines above 55 US$. Samples of the point system are shown in the table below.

VIOLATION	POINTS	NOTE
Exceeding of speed limit in towns		
21 - 25 km/h	●	
26 - 30 km/h	●●●	
31 - 40 km/h	●●●	
41 - 50 km/h	●●●●●	i
51 - 60 km/h	●●●●●	i
> 60 km/h	●●●●●●	ii
Driving under the influence of alcohol		
0.8 - 1.1 °/oo	●●●●	
> 1.1 °/oo	●●●●●●●	
Exceeding technical vehicle check > 8 months	●●	
Driving without valid driving licence	●●●●●●	
Driving without valid third party insurance	●●●●●●	
Misuse of number plate	●●●●●●	
Bad signalisation of broken down vehicle	●●	
Worn out tyres (< 1.6 mm)	●●●●	
Disappearance of accident site	●●●●●●●	
Dangerous overtaking	●●	
Disregarding NO OVERTAKING sign	●●●●	
Disregarding STOP sign	●●●	
Disregarding RED traffic light	●●●	
Insufficient space to vehicle in front	●●●●	
Aggressive closing up and use of flashing light	●●●●●●●	
Driving without light in fog or heavy rain	●●●	
Turning or reversing on a motorway	●●●●	
Right-hand side overtaking outside towns	●●●	

NOTES: (i) One month confiscation of driving licence in addition
(ii) Two months confiscation of driving licence in addition

Action is taken by the central register department at a

SUM OF 9 POINTS: A warning letter is issued and advise is given to attend a training course, which attendance results in the deletion/reduction of 4 points.

SUM OF 14 POINTS: The theoretical and in some cases the practical examination test for the driving licence has to be repeated.

SUM OF 18 POINTS: A medical - psychological examination is required. Non-appearance is equal to not being qualified for a driving licence, which will then be confiscated.

- **Violation of Load Regulations (Germany)**

  For vehicles with a gross weight of >7.5 tons the following fines apply when the maximum gross weight or the allowable maximum axle load is exceeded.

EXCESS	> 5 %	FINE	70 US$
	> 10 %		80 US$
	> 15 %		90 US$
	> 20 %		140 US$
	> 25 %		200 US$
	> 30 %		270 US$

In cases with an excess of >30 % unloading might be required.

- **Legislation**

  In the meetings and seminars further questions and problems concerning road/traffic safety were discussed which can only be controlled by appropriate legislation as demonstrated in the above paragraphs with possibilities for enforcement of regulations.

  Two highlighted problems are given below:

  After independence in some of the recipient states it became somehow rather easy to get a driving license. The training is not any more comprehensive enough and many drivers drive vehicles (e. g. trucks) which class they have not acquired with their driving license.

  Another growing problem is the import of right-hand steering vehicles. Since the driver has a considerably reduced sight, overtaking other vehicles becomes dangerous. Also right-hand steering vans and mini buses have the doors for passengers on the left side, the road side respectively resulting in a danger for leaving/entering passengers especially children.

4. CONCLUSION AND RECOMMENDATION

4.1 Bituminous Bound Material

The low standard and the low quality of road construction respectively encountered in most of the eight recipient states is mainly caused by:

- an inadequate pavement design methodology
- use of sub-standard materials
- poor workmanship
- inadequate equipment

A modification/improvement of the pavement design is recommended in order to base the design on empirical data which are results of practical experience. Together with a longer service life of the pavement a more economical construction and maintenance can be expected.

However, an improved design methodology will not automatically improve the quality of the roads. Two of the above reasons for the present low quality of the roads can be summarised as the problem of quality and quality control. In the former Soviet Union the supervision of works was not functioning and although the testing procedures for materials differ only little to European/western test standards sub-standard/low quality materials have been used for construction. Even when good quality materials were available the specified standards were not achieved due to poor workmanship. A quality control/assurance system should be introduced which is essential for the durability of all road components (pavement, earthworks, bridges, etc.) and should include the testing of materials as well as the supervision of construction works. Furthermore training of all levels of staff involved in road construction and road maintenance works is necessary.

On the equipment side the situation deteriorated during the past years mainly due to lack of spare parts (may be funds as well) and associated maintenance. In some states modern European/western equipment was already introduced to improve the situation. Appropriate training in the use of this equipment is recommended. In this context special seminars and training for the new recycling technology is recommended which should range from testing of existing pavement material, pavement design for re-used materials to the operation of equipment.

4.2 Road Design and Road Safety

The road design standard presently used in the TRACECA states, the Soviet Union road standard (SNIP), is as far as reviewed in the course of the Project in most aspects adequate. Under consideration of economical and safety aspects some modifications are recommended which should be introduced in the current standard or in the national standards under preparation:

- deletion of the design speed of 150 km/h and its related design parameters
- introduction of a road cross section with three lanes (2+1 alternating) for a traffic volume of 14,000 to 27,000 vehicles per day
- improvement of road design standards for junctions and horizontal alignment
- improvement of signalisation
- improvement of safety in town passages

- reactivation/implementation of public promotion/information programmes for road/traffic safety
- amendments/additions of legislation if and where necessary

It should be noted that the three lane (2+1 alternating) cross section was encountered in a section of one of the TRACECA roads, namely in town/village passages of the M 39 in Kyrgyzstan west of Bishkek to Kara Balta and the border with Kazakhstan. This local standard should be reviewed with regard to results and findings described above.

APPENDIX 6.2

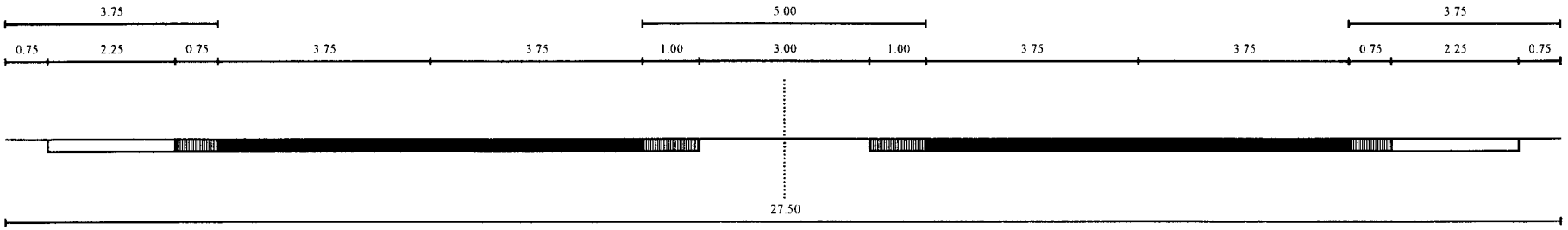
ROAD GEOMETRY STANDARDS

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

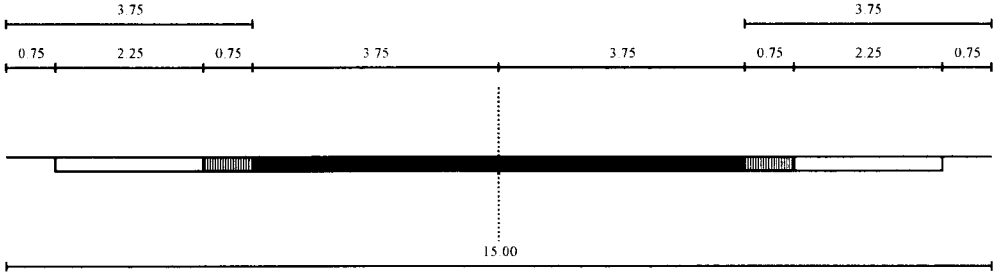
Road Geometry

- Standards -

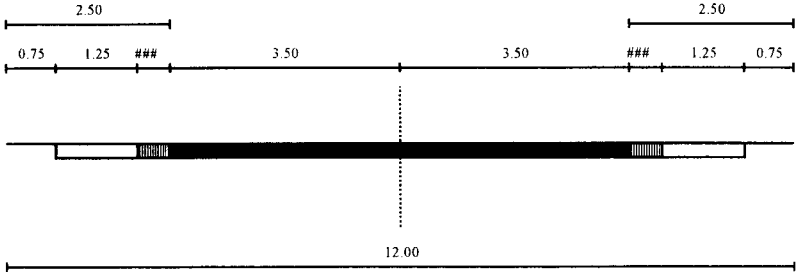
Road Category I -b (SNIP 2.05.02-85)



Road Category II (SNIP 2.05.02-85)



Road Category III (SNIP 2.05.02-85)



APPENDIX 6.3

GEOTECHNICAL REPORT

Table 1 : Field and testing program

Road	km	Pit N°	DCP	Grad.	PI	m/c	F/d	MDD	CBR	Remarks
S-1 Tbilisi - Khashuri	21	1		X	X					
	25	11								
	32	2		X	X			X	X	
	42		XXX	X	X					Landslide
			XXX							
	47	3								
	61	4		X	X	X				
	71	5		X				X		B/course
	80	6		X	X	X				
	88	7								
	89		X	X	X					Landslide
	96	8		X	X	X				
	109	9								
	120	10		X	X	X				
	129	10A								
S-4 Tbilisi - Red Bridge	14	1								
	17.5	2	X	X	X					
	23.1		X							
	23.5	3								
	25.4		XX							
	32.5	4		X	X		X	X		
	42.1	5		X	X	X				
				X	X					B/course
	42.7		X							
	51.6	6		X	X	X				
	54.7		X							
S-6 Tbilisi - Marneuli - Guguti	5.4	1		X	X	X				
	11.9	2		X	X					B/course
	15.5		XXX							Landslide
			XXX							
	17.5	3		X	X		X	X	X	
	26.2	4		X	X					
	32.6	5		X	X					
	41.9	6A								
	46.1	6		X	X	X				
	56.6	7		X	X	X		X		
	65.2		X	X	X					
	65.8	8								
	77.7	9		X	X	X				
				X						Asphalt
	84.5	10		X	X			X	X	
	94.5	11								
S-7 Marneuli - Sadakhlo	3.2	1								
	11.7	2		X	X			X	X	
	21.8	3		X	X		X			
	29.8	4		X	X	X				

Table 1 : Field and testing program

Road	km	Pit N°	DCP	Grad.	PI	m/c	F/d	MDD	CBR	Remarks
S-9 Tbilisi By-pass	1.8	1								
	11.6	2		X	X		X	X	X	
	13.2		X							
	15.5	3	X	X	X	X		X	X	
	19.6		X							
	20.4	4								
	25.4	5								
	26.4		X							
	33.2	6	X	X	X	X				
	43.9	7				X				
S-12 Samtredia - Ureki	3	1				X				
	14	2		X	X	X				
	26	3		X	X			X	X	
	36	4								
	49	5		X	X					
				X						B/course

Table 2 —Classification of Soils and Soil-Aggregate Mixtures (with Suggested Subgroups)

General Classification	Granular Materials (35% or less passing No. 200)							Silt-Clay Materials (More than 35% passing No. 200)				
Group Classification	A-1		A-3	A-2				A-4	A-5	A-6	A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5	A-7-6
Sieve Analysis: Percent passing: No. 10	50 Max.											
No. 40	30 Max.	50 Max.	51 Min.									
No. 200	15 Max.	25 Max.	10 Max.	35 Max.	35 Max.	35 Max.	35 Max.	36 Min.	36 Min.	36 Min.	36 Min.	36 Min.
Characteristics of fraction passing No. 40: Liquid Limit				40 Max.	41 Min.	40 Max.	41 Min.	40 Max.	41 Min.	40 Max.	41 Min.	41 Min.
Plasticity Index	6 Max.		N.P.	10 Max.	10 Max.	11 Min.	11 Min.	10 Max.	10 Max.	11 Min.	11 Min.	11 Min.
Group Index	0		0	0		4 Max.		8 Max.	12 Max.	16 Max.	LL-30 > PI	LL-30 < PI
											20 Max.	
Usual Types of Significant Constituent Materials	Stone Fragments Gravel and Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils			Clayey Soils	
General Rating as Subgrade	Excellent to Good							Fair to Poor				

CHART 2

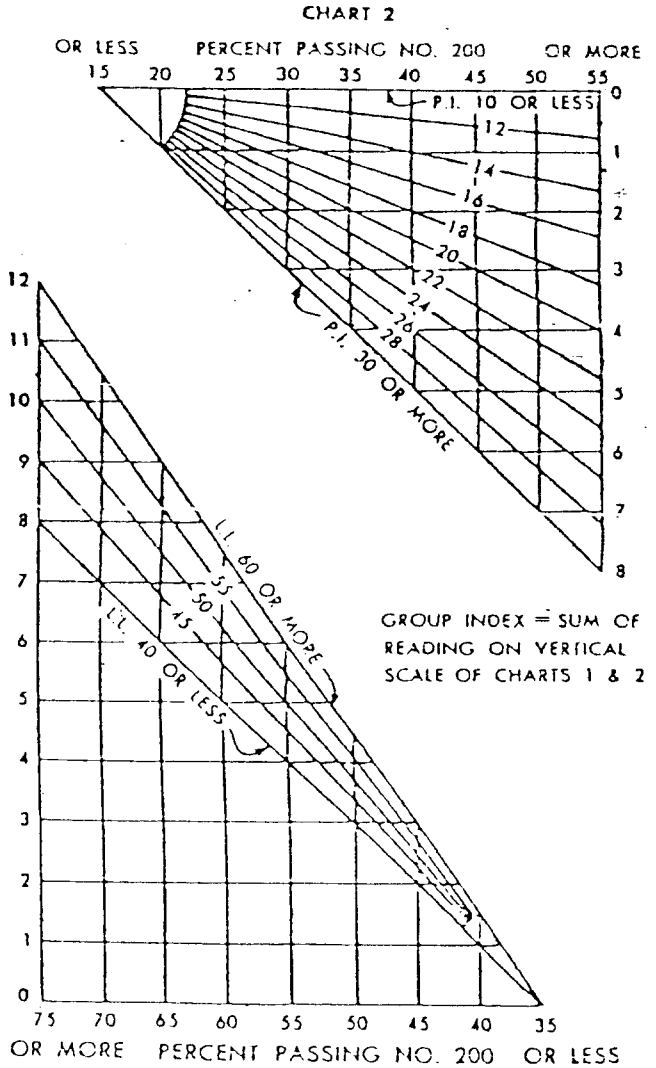


CHART 1

Figure —Group Index Charts.

Table 3.1 Subgrade

SUMMARY OF LABORATORY TEST RESULTS

Lab.	Location		Pit	Sieve analysis, % passing						LL	PI	Classific.	Natural		Max. density		CBR	Swell	Remarks
N°	Road	km	N°	25.0	10.0	5.0	2.0	0.5	0.071	(%)		HRB	γ (kp/m3)	MC (%)	γ (kp/m3)	OMC (%)	(%)		
1	S 1 Tbilisi - Khashuri	21.0	1				99	99	95	39	14	A-6(10)							
2	S 1 Tbilisi - Khashuri	32.0	2				92	91	86	39	19	A-6(12)			1.66	21.8		●	
3	S 1 Tbilisi - Khashuri	42.0	LS				100	99	82	27	13	A-6(9)							
4	S 1 Tbilisi - Khashuri	61.0	4				78	74	70	47	20	A-7-6(12)		29.0					
5	S 1 Tbilisi - Khashuri	80.0	6	69	54	50	47	44	36	27	10	A-2-4		16.4					
6	S 1 Tbilisi - Khashuri	89.0	7				98	97	92	69	34	A-7-5(16)							
7	S 1 Tbilisi - Khashuri	96.0	8	80	76	72	68	64	53	32	10	A-4(3)		19.0					
8	S 1 Tbilisi - Khashuri	120.0	10		92	89	87	82	68	25	8	A-4(6)		20.1					
9	S 4 Tbilisi - Red Bridge	17.5	2				100	99	98	55	22	A-7-5(15)		27.0					
10	S 4 Tbilisi - Red Bridge	32.5	4				71	68	57	38	13	A-6(5)	1.99	28.7	1.61	13.6			
11	S 4 Tbilisi - Red Bridge	42.1	5				91	88	74	36	15	A-6(9)		20.4					
12	S 4 Tbilisi - Red Bridge	51.6	6				84	78	59	34	14	A-6(6)		22.1					
13	S 6 Tbilisi - Guguti	5.4	1	70	55	45	36	27	15	36	24	A-2-6(0)		13.0					
14	S 6 Tbilisi - Guguti	17.5	3		94	89	81	74	58	32	13	A-6(5)	1.34	14.7	1.43	12.9		●	
15	S 6 Tbilisi - Guguti	26.3	4	68	48	44	38	35	22	37	12	A-2-6(0)							
16	S 6 Tbilisi - Guguti	32.6	5		88	79	74	69	58	33	7	A-4(4)							
17	S 6 Tbilisi - Guguti	46.1	6				58	49	30	45	22	A-2-7(0)		22.1					
18	S 6 Tbilisi - Guguti	56.7	7	78	72	68	63	56	44	33	12	A-6(2)		16.5	1.57	17.0			
19	S 6 Tbilisi - Guguti	65.2	8		98	89	70	56	47	29	9	A-4(2)							
20	S 6 Tbilisi - Guguti	84.5	10				97	92	78	34	16	A-6(10)			1.65	19.3		●	
21	S 6 Tbilisi - Guguti	77.7	9	71	64	60	55	50	43	38	12	A-6(2)		23.7					
22	S 7 Marneuli - Sadakhlo	11.7	2		93	88	83	78	68	32	14	A-6(8)			1.55	16.1		●	
23	S 7 Marneuli - Sadakhlo	21.8	3	82	68	61	53	46	35	28	13	A-2-6(1)	1.54	12.4					

Table 3.1 Subgrade

SUMMARY OF LABORATORY TEST RESULTS

Lab.	Location		Pit	Sieve analysis, % passing						LL	PI	Classific.	Natural	Max. density			CBR	Swell	Remarks
N°	Road	km	N°	25.0	10.0	5.0	2.0	0.5	0.071	(%)		HRB	γ (kp/m3)	MC (%)	γ (kp/m3)	OMC (%)	(%)		
24	S 7 Marneuli - Sadakhlo	29.6	4	41	35	31	28	25	18	24	11	A-2-4							
25	S 9 Tbilisi By-pass	11.6	2				94	89	38	24	8	$A\text{-}4_{(4)}$	1.84	11.7	1.83	13.5		●	
26	S 9 Tbilisi By-pass	15.5	3				94	93	92	52	22	$A\text{-}7\text{-}6_{(15)}$		23.4	1.39	31.5		●	
27	S 9 Tbilisi By-pass	33.2												14.9					
28	S 9 Tbilisi By-pass	36.2	6	64	30	23	19	17	11	25	11	$A\text{-}2\text{-}6_{(0)}$		10.5					
29	S 9 Tbilisi By-pass	43.9	7											12.6					
30	S 12 Samtredia - Ureki	3.0	1											7.3					
31	S 12 Samtredia - Ureki	14.0	2		96	92	81	71	52	32	9	$A\text{-}4_{(3)}$		20.3					
32	S 12 Samtredia - Ureki	26.0	3		94	88	78	68	52	32	9	$A\text{-}4_{(3)}$			1.67	19.5		●	
33	S 12 Samtredia - Ureki	49.0	5	88	81	78	75	71	50	26	7	$A\text{-}4_{(3)}$							

Table 3.3 B/C, Asphalt

SUMMARY OF LABORATORY TEST RESULTS

Lab.	Location		Pit	Sieve analysis, % passing									PI	Classific.	Max. density		Remarks
N°	Road	km	N°	50	25	20	10	5	2	1	0.5	0.071		HRB	γ (kp/m3)	OMC (%)	
34	S 1 Tbilisi - Khashuri	71.0	5	96	73	64	47	37	28	23	20	9	NP	A-1-a	2.24	4.3	
35	S 4 Tbilisi - Red Bridge	42.1	5	87	67	62	45	34	28	24	22	9	NP	A-1-a	2.36	4.6	
36	S 6 Tbilisi - Guguti	11.9	2	96	88	80	59	50	42	36	33	20	NP	A-1-b			
37	S 6 Tbilisi - Guguti	77.7	9	100	100	100	91	63	42	29	20	3					6,6% bitumen content
38	S 12 Samtredia - Ureki	49.0	5	95	77	70	55	46	41	36	33	17	NP	A-1-b			

Table 5.1 List of deficiencies

Location	Description	Length (m)	Required work
Road : S 1 Tbilisi - Khashuri			
42.0	landslide	200	see § 7.1.a
59.0	erosion of the toe of the slope	500	3
79.0	subgrade failure, high cutting	75	1 + 3
80.0	slope failure	50	3 + 4 (2000 m3)
87.0	embankment failure, road partly collapsed	300	see § 7.1.b
Road : S 4 Tbilisi - Red Bridge			
18.0	subgrade failure	50	1
19.0	embankment settlement	5	2
21.4	embankment settlement	25	2
22.5	embankment settlement	25	2
22.9	embankment settlement	50	2
23.0	embankment settlement	50	2
23.5	subgrade failure	30	1
24.0	subgrade failure	200	1 + 3
25.4	embankment settlement	300	2
25.8	subgrade failure	50	1 + 3
26.2	subgrade failure	50	1
27.4	embankment settlement	10	2
28.0	subgrade failure	30	1
28.9	embankment settlement	50	2
29.3	subgrade failure	30	1
30.5	subgrade failure	50	1
32.1	embankment settlement	30	2
32.5	subgrade failure	50	2
32.7	subgrade failure	50	1 + 3
33.2	embankment settlement	20	2
33.9	embankment settlement	30	2
34.3	embankment settlement	30	2
34.4	embankment settlement	30	2
37.6	embankment settlement	100	2
43.1	subgrade failure	10	1
43.3	subgrade failure		1
43.5	subgrade failure		1 + 3
44.1	embankment settlement		2 + 3
45.8	subgrade failure		1
48.1	subgrade failure		1 + 3
54.4	subgrade failure		1
54.5	subgrade failure		1
54.7	embankment settlement		2
Road : S 6 Tbilisi - Marneuli - Guguti (Armenian Border)			
10.5	subgrade failure	50	1
11.1	subgrade failure	100	1 + 3
12.2	embankment settlement	20	2
14.4	subgrade failure	100	1 + 3
14.9	subgrade failure	50	1 + 3
15.2	landslide	600	
16.7	subgrade failure	75	1
17.1	subgrade failure	150	1 + 3
17.4	subgrade failure	100	1 + 3

Table 5.1 List of deficiencies

Location	Description	Length (m)	Required work
20.4	subgrade failure	30	1
23.3	subgrade failure, capillar water	75	1
28.3	embeded interval drainage of the pavement layers (kerbstones)	100	1
29.3	embeded interval drainage of the pavement layers (kerbstones)	50	1
30.3	subgrade failure	100	1
31.1	subgrade failure	150	1
31.6	subgrade failure	75	1
32.2	embankment settlement	200	2
36.0	subgrade failure	50	1
41.1	subgrade failure	20	1
41.9	subgrade failure	50	1
54.0	subgrade failure	15	1 + 3
55.5	subgrade failure	15	1 + 3
56.3	embankment settlement	25	2
59.2	embankment settlement	75	2
62.1	subgrade failure	100	1 + 3
62.5	settlement of the bridge approach	50	2
64.0	subgrade failure	50	1
65.2	embankment settlement	75	2
65.8	subgrade failure	100	1
66.1	subgrade failure	25	1
69.5	subgrade failure	150	1 + 3
70.9	embankment settlement	15	2
74.2	embankment settlement	20	2
75.4	subgrade failure	100	1 + 3
76.1	subgrade failure	200	1 + 3
77.4	subgrade failure	50	1 + 3
77.7	slope failure	70	3 + 4(1000 m3) + 5
78.0	subgrade failure	75	1 + 3
78.5	subgrade failure	50	1 + 3
79.6	subgrade failure	75	1 + 3
80.0	subgrade failure	50	1 + 3
81.7	subgrade failure	75	1 + 3
82.7	subgrade failure	250	1 + 3
83.2	subgrade failure	75	1 + 3
83.6	subgrade failure	150	1 + 3
83.7	subgrade failure	150	1
84.8	subgrade failure	50	1 + 3
85.2	subgrade failure	25	1 + 3
86.9	subgrade failure	75	1 + 3
87.2	embankment settlement	75	2
87.6	subgrade failure	75	1 + 3
87.9	embankment settlement	15	2
88.0	subgrade failure	75	1 + 3
88.1	subgrade failure	50	1 + 3
88.2	subgrade failure	50	1 + 3
88.5	embankment settlement	50	2
88.9	subgrade failure	100	1 + 3
89.3	subgrade failure	50	1 + 3
89.5	subgrade failure	100	1 + 3
89.7	slope failure	100	1 + 3 + 4(1000 m3) + 5

Table 5.1 List of deficiencies

Location	Description	Length (m)	Required work
90.1	subgrade failure	250	1 + 3
91.3	subgrade failure	100	1 + 3
91.7	subgrade failure	150	1 + 3
92.1	subgrade failure	150	1 + 3
92.5	subgrade failure	100	1 + 3
92.6	subgrade failure	100	1 + 3
92.9	subgrade failure	300	1 + 3
93.2	subgrade failure	75	1 + 3
93.6	subgrade failure	100	1 + 3
94.0	subgrade failure	150	1 + 3
94.3	subgrade failure	25	1 + 3
94.5	subgrade failure	75	1 + 3
95.0	subgrade failure	200	1 + 3
95.6	subgrade failure	150	1 + 3
96.2	subgrade failure	100	1 + 3
96.6	subgrade failure	75	1
97.1	subgrade failure	100	1
Road : S 7 Marneuli - Sadakhlo (Armenian Border)			
6.5	subgrade failure	50	1
11.5	subgrade failure	25	1
11.8	subgrade failure	50	1
17.0	subgrade failure	75	1 + 3
18.1	subgrade failure	50	1
18.8	subgrade failure	50	1
19.4	subgrade failure	75	1 + 3
21.3	subgrade failure	200	1 + 3 + 5
21.9	subgrade failure	50	1 + 3
22.3	subgrade failure	50	1
22.5	subgrade failure	100	1 + 3
23.1	subgrade failure	100	1 + 3
24.5	subgrade failure	100	1 + 3
24.9	subgrade failure	75	1 + 3
25.1	subgrade failure	50	1 + 3
25.5	subgrade failure	75	1 + 3
26.3	subgrade failure	200	1 + 3
27.8	subgrade failure	100	1 + 3
27.9	subgrade failure	75	1 + 3
28.0	subgrade failure	75	1 + 3
28.5	subgrade failure	75	1 + 3
28.8	subgrade failure	75	1 + 3
28.9	subgrade failure	125	1 + 3
29.1	subgrade failure	75	1 + 3
29.8	subgrade failure	75	1 + 3
30.0	subgrade failure	1000	1
31.0	subgrade failure	1000	1
32.0	subgrade failure	300	1
34.0	subgrade failure	150	1
34.2	subgrade failure	200	1
Road : S 9 Tbilisi By-pass			
2.4	subgrade failure	75	1
2.7	subgrade failure	100	1

Table 5.1 List of deficiencies

Location	Description	Length (m)	Required work
5.5	embankment settlement	100	2
6.5	subgrade failure	50	1 + 3
7.3	embankment settlement	50	2
7.9	subgrade failure	200	1 + 3
9.8	subgrade failure	25	1
10.8	subgrade failure	25	1 + 3
11.1	subgrade failure	20	1
12.6	embankment settlement	50	2
12.9	subgrade failure	100	1 + 3
13.2	embankment settlement	20	2
13.5	subgrade failure	250	1 + 3
13.7	subgrade failure	100	1 + 3
15.0	landslide	600	see § 7.5.a
15.8	subgrade failure	100	1 + 3
16.5	subgrade failure	100	1 + 3
16.8	subgrade failure	100	1 + 3
19.6	embankment settlement	200	2 + 6
20.4	subgrade failure	150	1 + 3
20.8	subgrade failure	100	1
21.0	subgrade failure	15	1
21.4	subgrade failure	50	1
22.5	settlement on bridge approach	25	2
22.8	subgrade failure	25	1
23.8	embankment settlement	50	2
24.1	embankment settlement	50	2
24.6	embankment settlement	10	2
25.1	embankment settlement	25	2
25.9	embankment settlement	15	2
26.4	subgrade failure	150	1
26.5	embankment settlement	50	2
27.2	settlement on bridge approach	20	2
28.2	settlement on bridge approach	25	2
33.2	embankment failure	100	see § 7.5.b
33.6	embankment settlement	200	see § 7.5.c
37.6	embankment settlement	10	2
38.6	embankment settlement	10	2
39.3	embankment settlement	10	2
42.2	embankment settlement	15	2
43.9	embankment settlement	50	2
44.3	embankment settlement	50	2
47.7	embankment settlement	50	2
Road : S 12 Samtredia - Ureki			
6.0	subgrade failure	150	1
20.0	subgrade failure	15	1
26.0	subgrade failure	50	1
30.0	subgrade failure	300	1
35.0	subgrade failure	100	1
41.0	subgrade failure	150	1
50.0	subgrade failure	100	1
54.0	subgrade failure	75	1

Table 6 In -situ subgrade strength

Chainage					CBR (%)
Road S 1 Tbilisi - Khashuri					
km	15	-	km	40	7
km	40	-	km	43	5
km	43	-	km	59	12
km	59	-	km	64	3
km	64	-	km	88	12
km	88	-	km	91	3
km	91	-	km	125	8
km	125	-	km	130	7
Road S 4 Tbilisi - Red Bridge					
km	11	-	km	17	10
km	17	-	km	19	3
km	19	-	km	26	6
km	26	-	km	37	7
km	37	-	km	47	6
km	47	-	km	56	4
Road S 6 Tbilisi - Guguti					
km	3	-	km	14	12
km	14	-	km	17	5
km	17	-	km	28	10
km	28	-	km	43	8
km	43	-	km	53	12
km	53	-	km	61	5
km	61	-	km	67	8
km	67	-	km	94	5
Road S 7 Marneuli - Sadakhlo					
km	0	-	km	20	4
km	20	-	km	32	6
Road S 9 Tbilisi Bypass					
km	0	-	km	10	8
km	10	-	km	12	6
km	12	-	km	21	4
km	21	-	km	48	12
Road S 12 Samtredia - Ureki					
km	0	-	km	5	12
km	5	-	km	8	10
km	8	-	km	56	7

Table 7

LOCATION OF GRAVEL SOURCES

N°	Road section	km	offset	Quarry name	River	Material type	Asphalt plant	Crushing plant	Remarks
1	S 1 Tbilisi - Khashuri	41	10	Dzegvi	Mtkvari	natural gravel	+	+	
2	S 1 Tbilisi - Khashuri	56	17	Metekhi	Mtkvari	natural gravel	+	+	
3	S 1 Tbilisi - Khashuri	85	3	Gori	Liakhvi	natural gravel	+	+	
4	S 1 Tbilisi - Khashuri	130	3	Khtsisi	Mtkvari	natural gravel	+	+	
5	S 4 Tbilisi - Red Bridge	21	5	Veli	Mtkvari	natural gravel	+	+	
6	S 4 Tbilisi - Red Bridge	46	15	Imiri	Khrami	natural gravel		+	
7	S 6 Tbilisi - Guguti	3	10	Veli	Mtkvari	natural gravel	+	+	
8	S 6 Tbilisi - Guguti	55	0	Arakhlo	Ktsia (Khrami)	natural gravel	+	+	
9	S 7 Marneuli - Sadakhlo	0	10	Arakhlo	Ktsia (Khrami)	natural gravel	+	+	
10	S 7 Marneuli - Sadakhlo	10	0	Imiri	Khrami	natural gravel		+	
11	S 9 Tbilisi By-pass	0	15	Dzegvi	Mtkvari	natural gravel	+	+	
12	S 9 Tbilisi By-pass	45	3	Veli	Mtkvari	natural gravel	+	+	
13	S 12 Samtredia - Ureki	50	5	Supsa	Supsa	natural gravel	+	+	

FEASIBILITY STUDY
FOR ROAD REHABILITATION IN GEORGIA
Geotechnical Investigation

KOCKS INGENIEURE

DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 1**

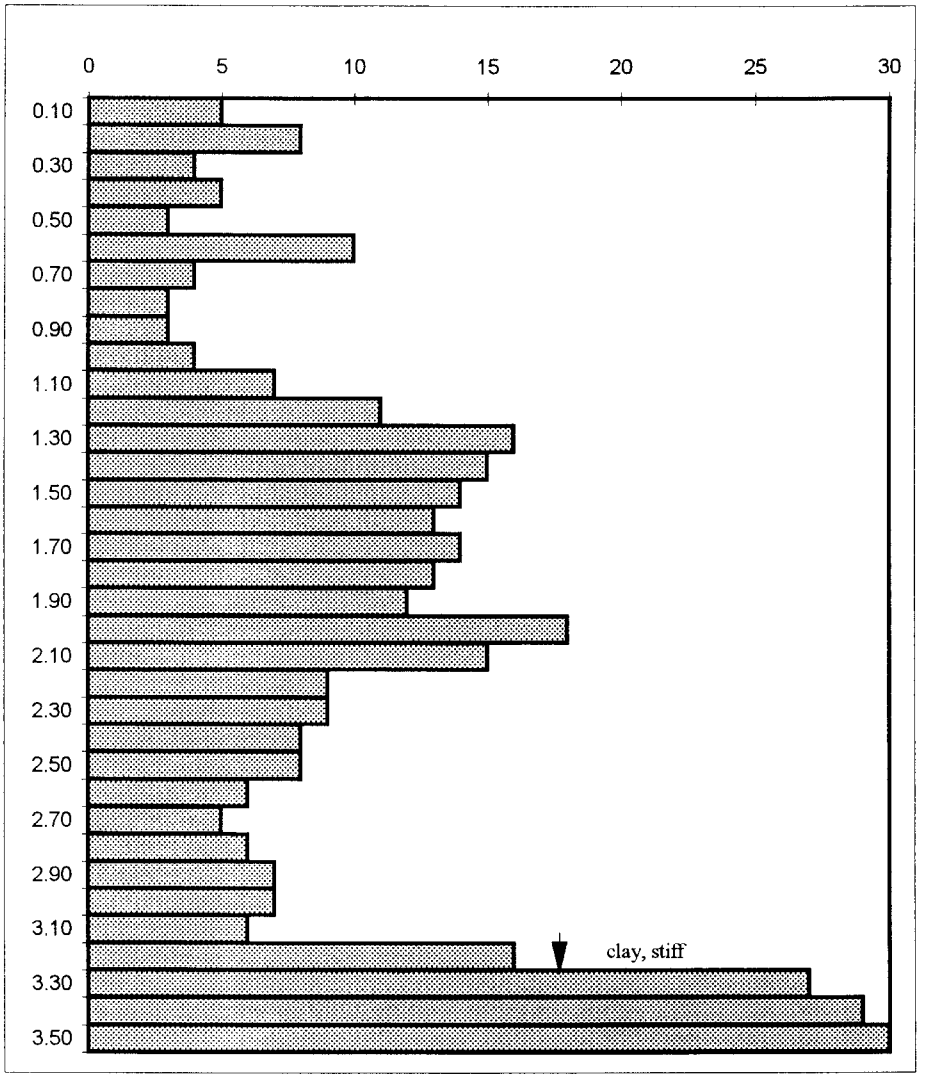
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Khashuri km 042 + 000 / RHS

Date / Дата : 20/04/97

Level / Уровень: nat. Ground at the toe of embankment

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	5
0.20	8
0.30	4
0.40	5
0.50	3
0.60	10
0.70	4
0.80	3
0.90	3
1.00	4
1.10	7
1.20	11
1.30	16
1.40	15
1.50	14
1.60	13
1.70	14
1.80	13
1.90	12
2.00	18
2.10	15
2.20	9
2.30	9
2.40	8
2.50	8
2.60	6
2.70	5
2.80	6
2.90	7
3.00	7
3.10	6
3.20	16
3.30	27
3.40	29
3.50	30



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 2**

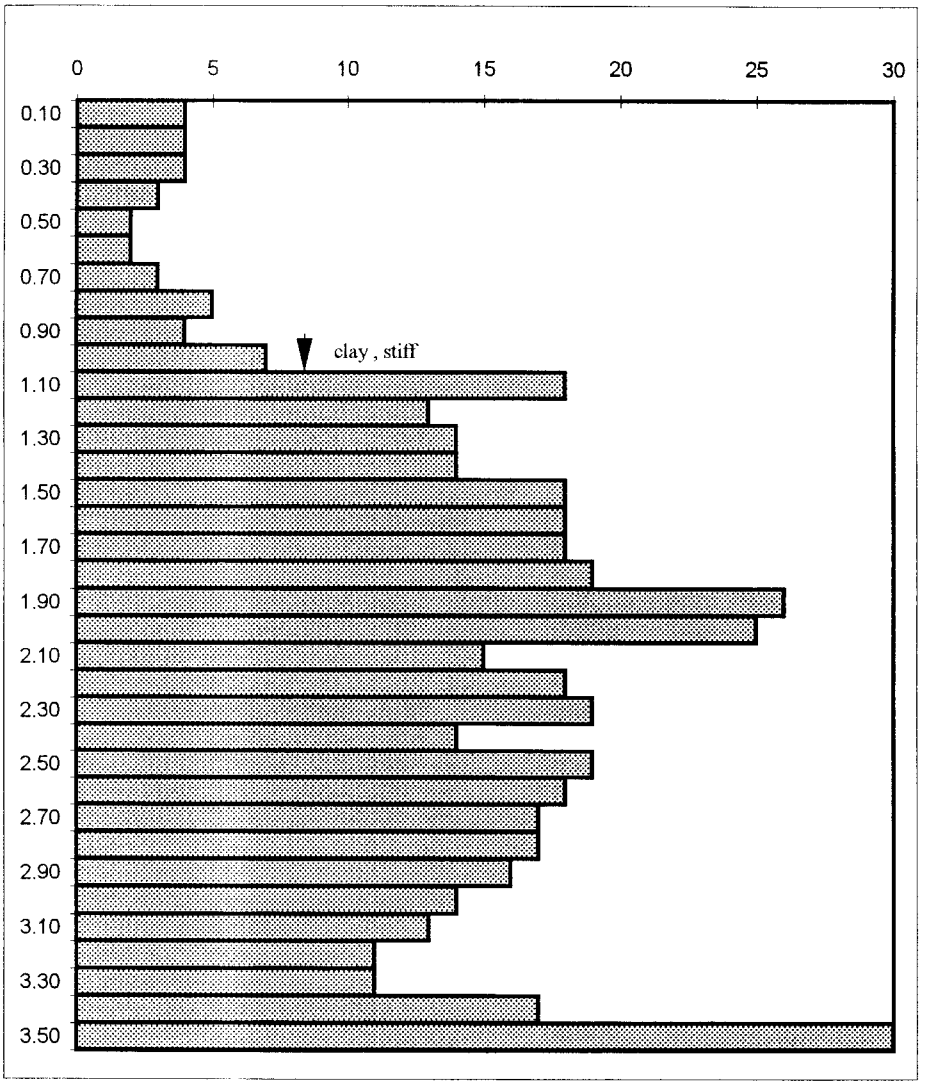
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Khashuri km 042 + 000 / RHS

Date / Дата : 20/04/97

Level / Уровень: nat. ground at the toe of embankment

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	4
0.20	4
0.30	4
0.40	3
0.50	2
0.60	2
0.70	3
0.80	5
0.90	4
1.00	7
1.10	18
1.20	13
1.30	14
1.40	14
1.50	18
1.60	18
1.70	18
1.80	19
1.90	26
2.00	25
2.10	15
2.20	18
2.30	19
2.40	14
2.50	19
2.60	18
2.70	17
2.80	17
2.90	16
3.00	14
3.10	13
3.20	11
3.30	11
3.40	17
3.50	30



FEASIBILITY STUDY
FOR ROAD REHABILITATION IN GEORGIA
Geotechnical Investigation

KOCKS INGENIEURE

DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 3 & 4**

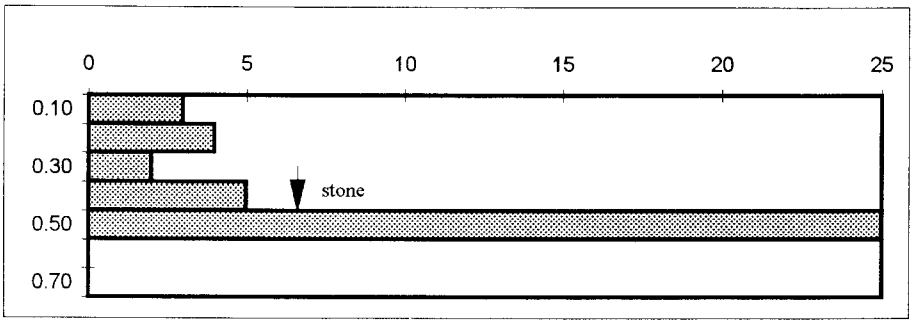
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Khashuri km 042 + 000 / RHS

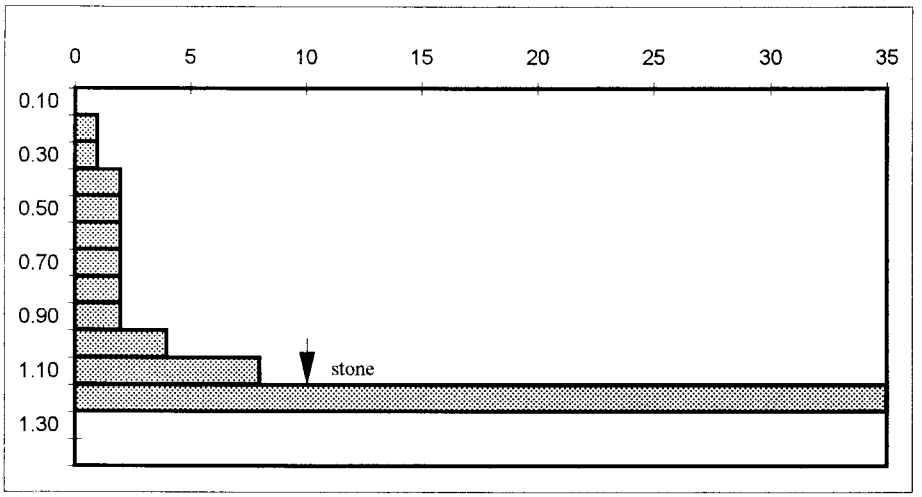
Date / Дата : 20/04/97

Level / Уровень: slope area

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	3
0.20	4
0.30	2
0.40	5
0.50	25
0.60	
0.70	



Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	0
0.20	1
0.30	1
0.40	2
0.50	2
0.60	2
0.70	2
0.80	2
0.90	2
1.00	4
1.10	8
1.20	35
1.30	
1.40	



FEASIBILITY STUDY
FOR ROAD REHABILITATION IN GEORGIA
Geotechnical Investigation

KOCKS
INGENIEURE

DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 5 & 6**

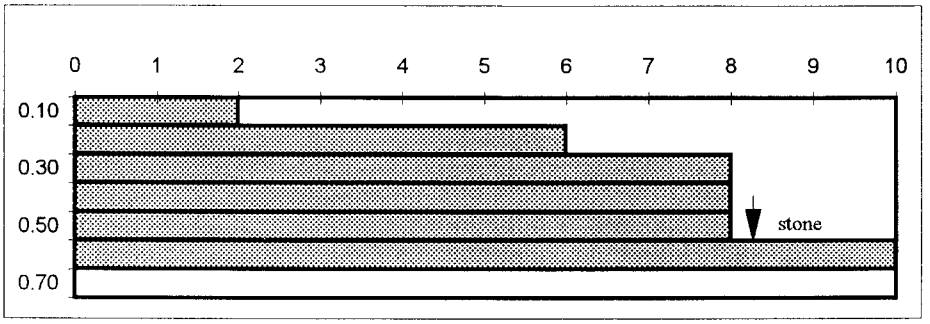
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Khashuri km 042 + 000 / LHS

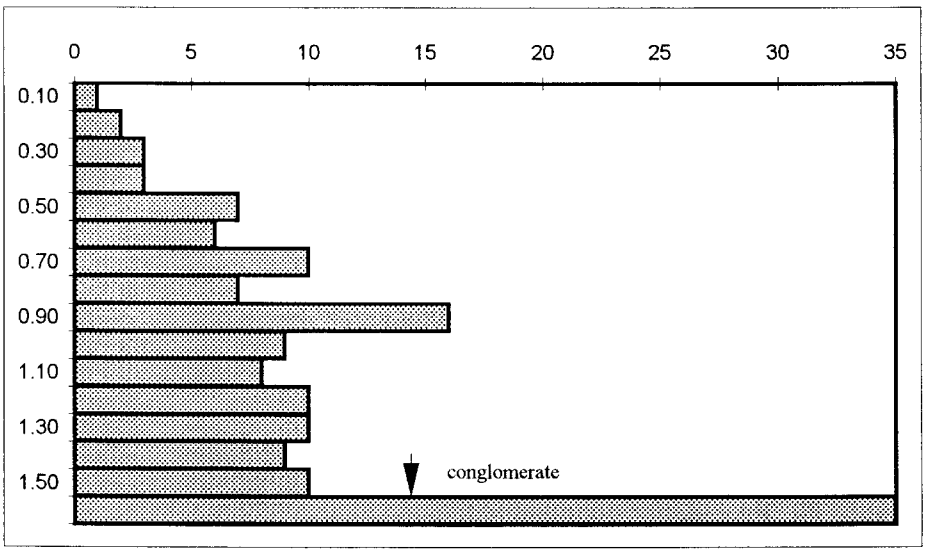
Date / Дата : 20/04/97

Level / Уровень: area of cut

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	6
0.30	8
0.40	8
0.50	8
0.60	10
0.70	



Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	1
0.20	2
0.30	3
0.40	3
0.50	7
0.60	6
0.70	10
0.80	7
0.90	16
1.00	9
1.10	8
1.20	10
1.30	10
1.40	9
1.50	10
1.60	35



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 7**

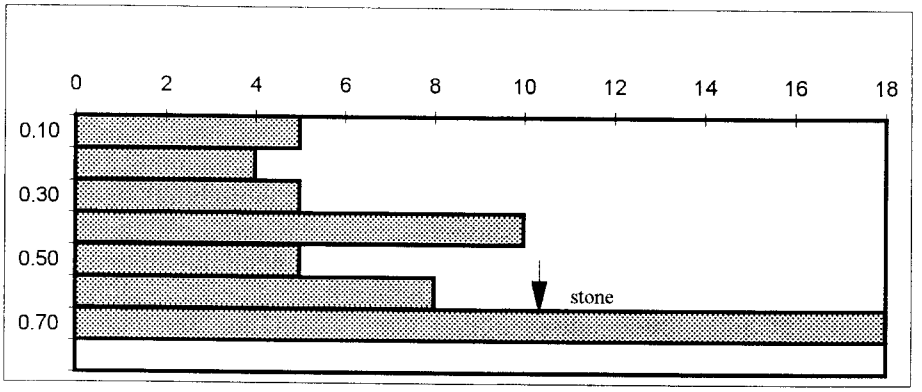
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Khashuri km 088 + 000 / LHS

Date / Дата : 20/04/97

Level / Уровень : area of slope

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	5
0.20	4
0.30	5
0.40	10
0.50	5
0.60	8
0.70	18



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 1**

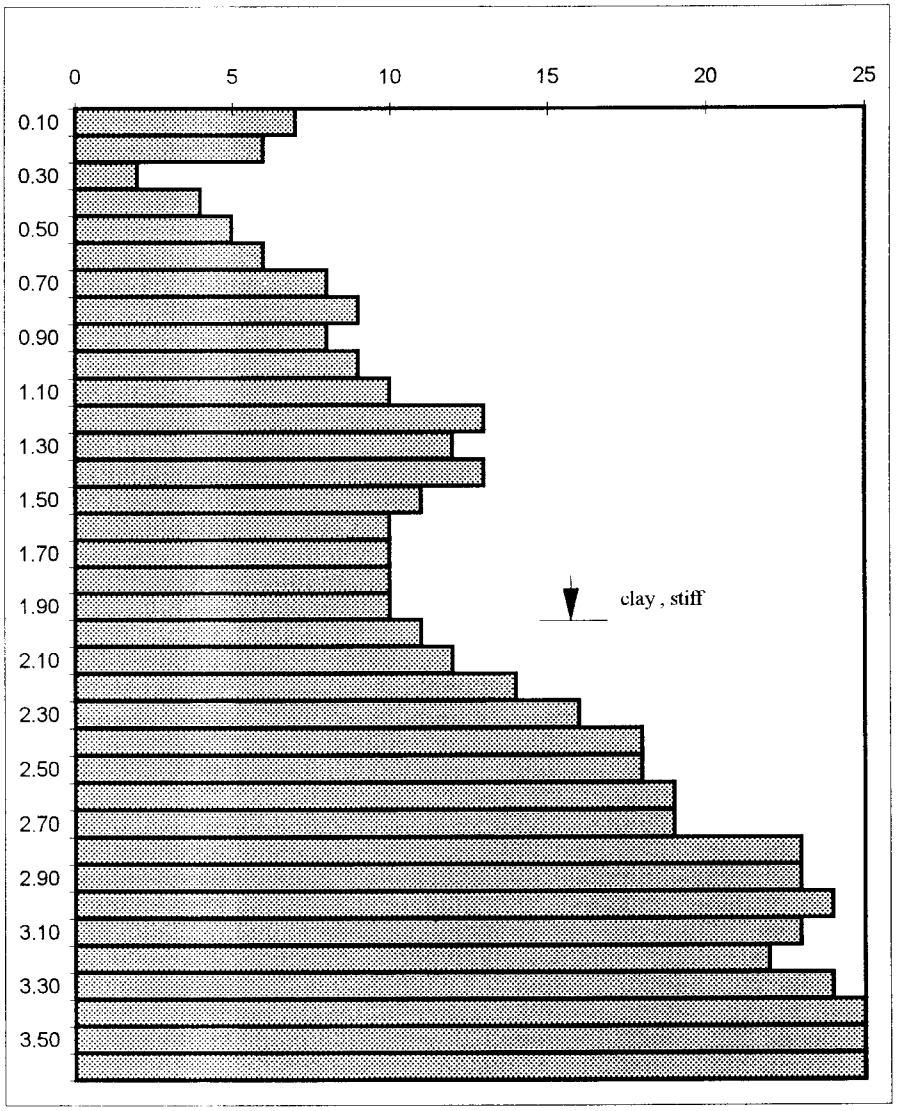
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Azerbaijan Border (Red Bridge) km 015 + 500 / RHS

Date / Дата : 17/04/97

Level / Уровень : Shoulder surface in area of cut

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	7
0.20	6
0.30	2
0.40	4
0.50	5
0.60	6
0.70	8
0.80	9
0.90	8
1.00	9
1.10	10
1.20	13
1.30	12
1.40	13
1.50	11
1.60	10
1.70	10
1.80	10
1.90	10
2.00	11
2.10	12
2.20	14
2.30	16
2.40	18
2.50	18
2.60	19
2.70	19
2.80	23
2.90	23
3.00	24
3.10	23
3.20	22
3.30	24
3.40	25
3.50	25
3.60	25



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 2**

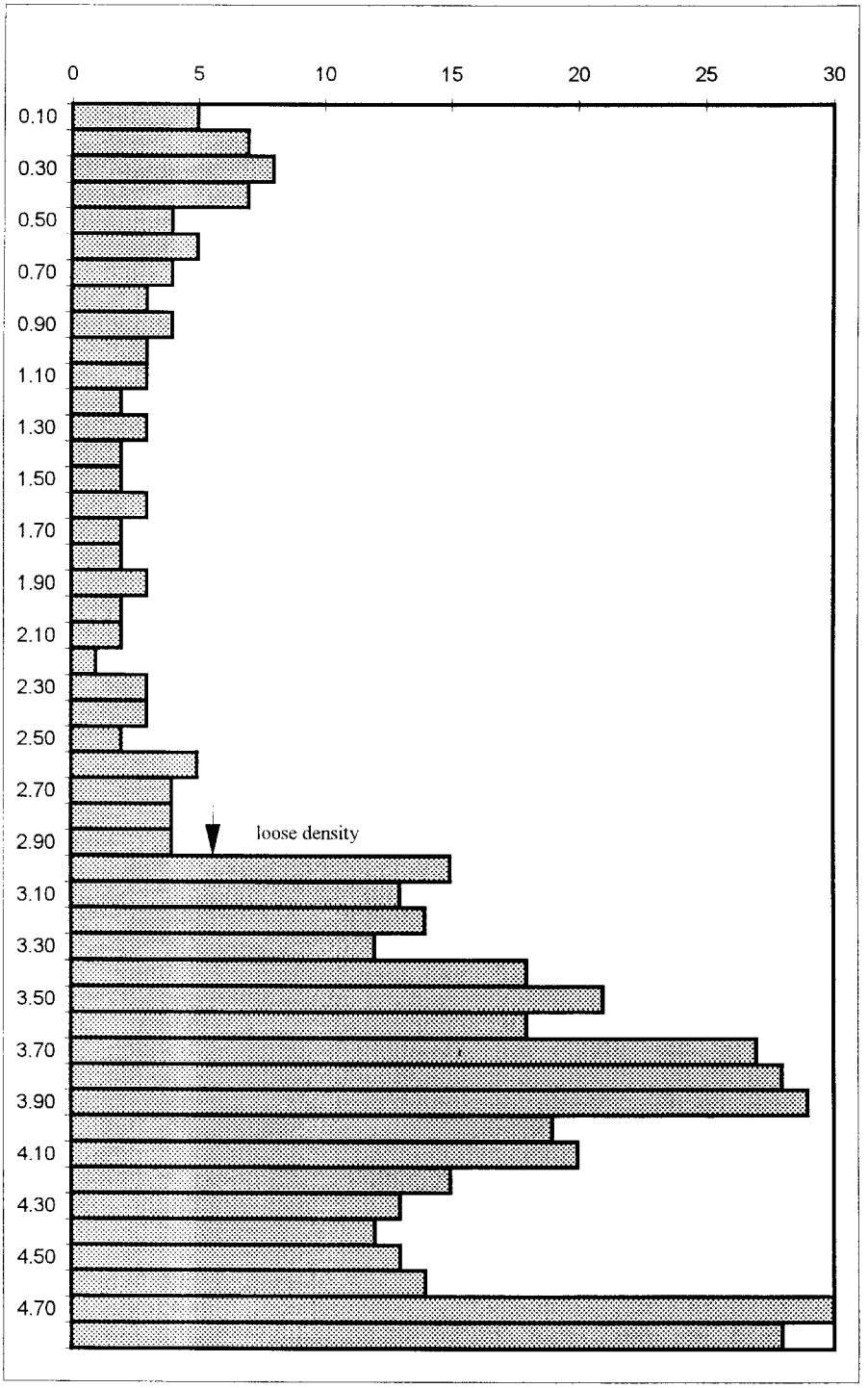
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Azerbaijan Border (Red Bridge) km 021 + 100 / RHS

Date / Дата : 17/04/97

Level / Уровень : Shoulder surface, high embankment

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	5
0.20	7
0.30	8
0.40	7
0.50	4
0.60	5
0.70	4
0.80	3
0.90	4
1.00	3
1.10	3
1.20	2
1.30	3
1.40	2
1.50	2
1.60	3
1.70	2
1.80	2
1.90	3
2.00	2
2.10	2
2.20	1
2.30	3
2.40	3
2.50	2
2.60	5
2.70	4
2.80	4
2.90	4
3.00	15
3.10	13
3.20	14
3.30	12
3.40	18
3.50	21
3.60	18
3.70	27
3.80	28
3.90	29
4.00	19
4.10	20
4.20	15
4.30	13
4.40	12
4.50	13
4.60	14
4.70	30
4.80	28



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 3**

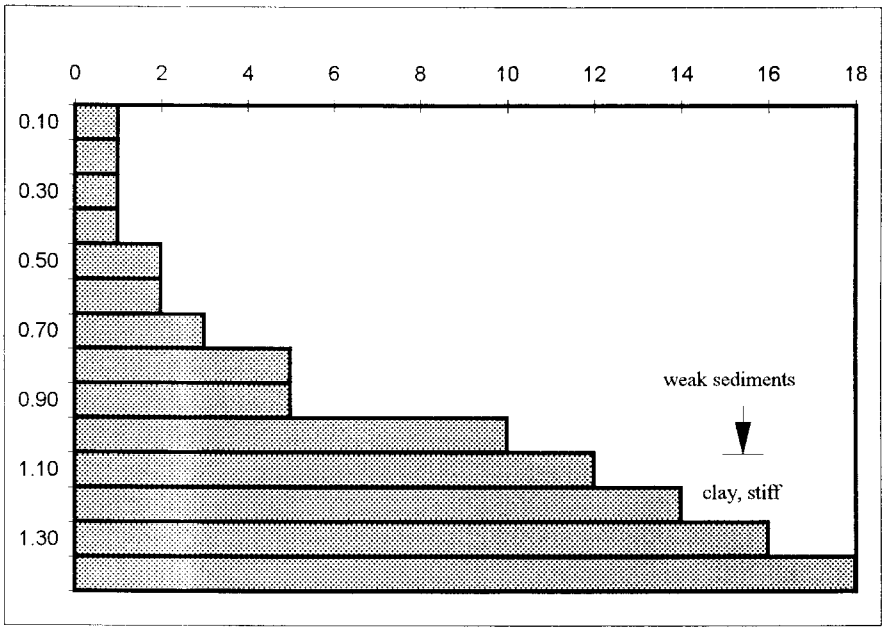
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Azerbaijan Border (Red Bridge) km 025+ 400 / RHS

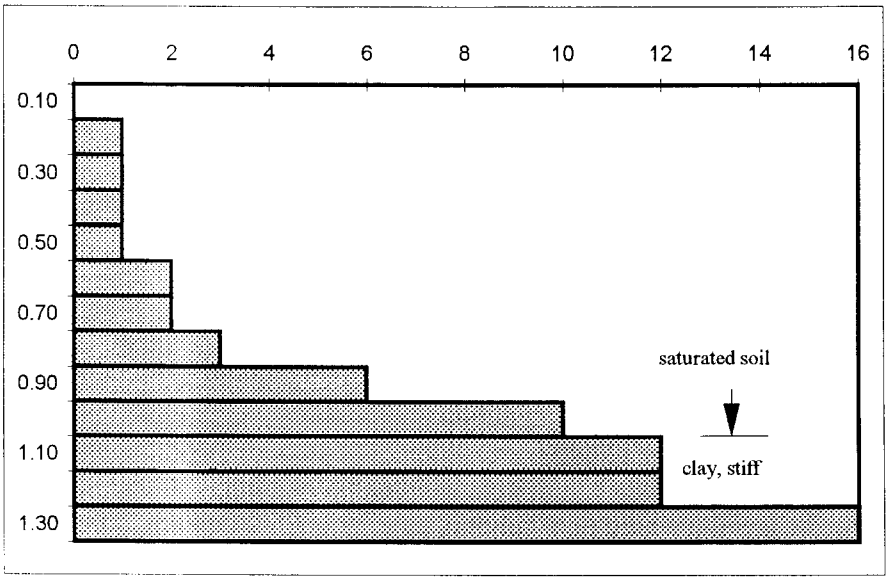
Date / Дата : 17/04/97

Level / Уровень : Shoulder surface nat. Ground, marshy area

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	1
0.20	1
0.30	1
0.40	1
0.50	2
0.60	2
0.70	3
0.80	5
0.90	5
1.00	10
1.10	12
1.20	14
1.30	16
1.40	18



Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	0
0.20	1
0.30	1
0.40	1
0.50	1
0.60	2
0.70	2
0.80	3
0.90	6
1.00	10
1.10	12
1.20	12
1.30	16



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 4**

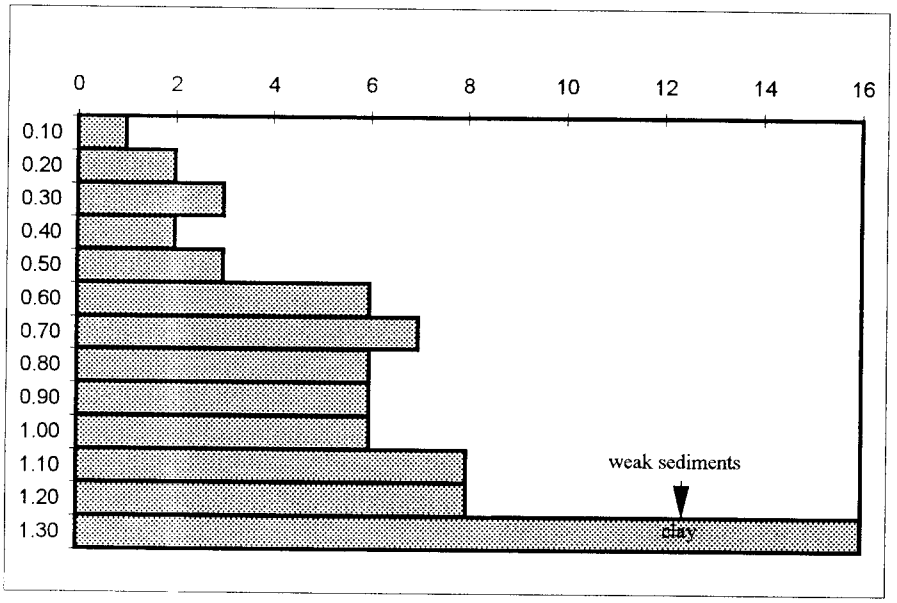
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Azerbaijan Border (Red Bridge) km 042 + 700 / RHS

Date / Дата : 17/04/97

Level / Уровень : Shoulder surface natural ground, swampy area

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	1
0.20	2
0.30	3
0.40	2
0.50	3
0.60	6
0.70	7
0.80	6
0.90	6
1.00	6
1.10	8
1.20	8
1.30	16



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 5**

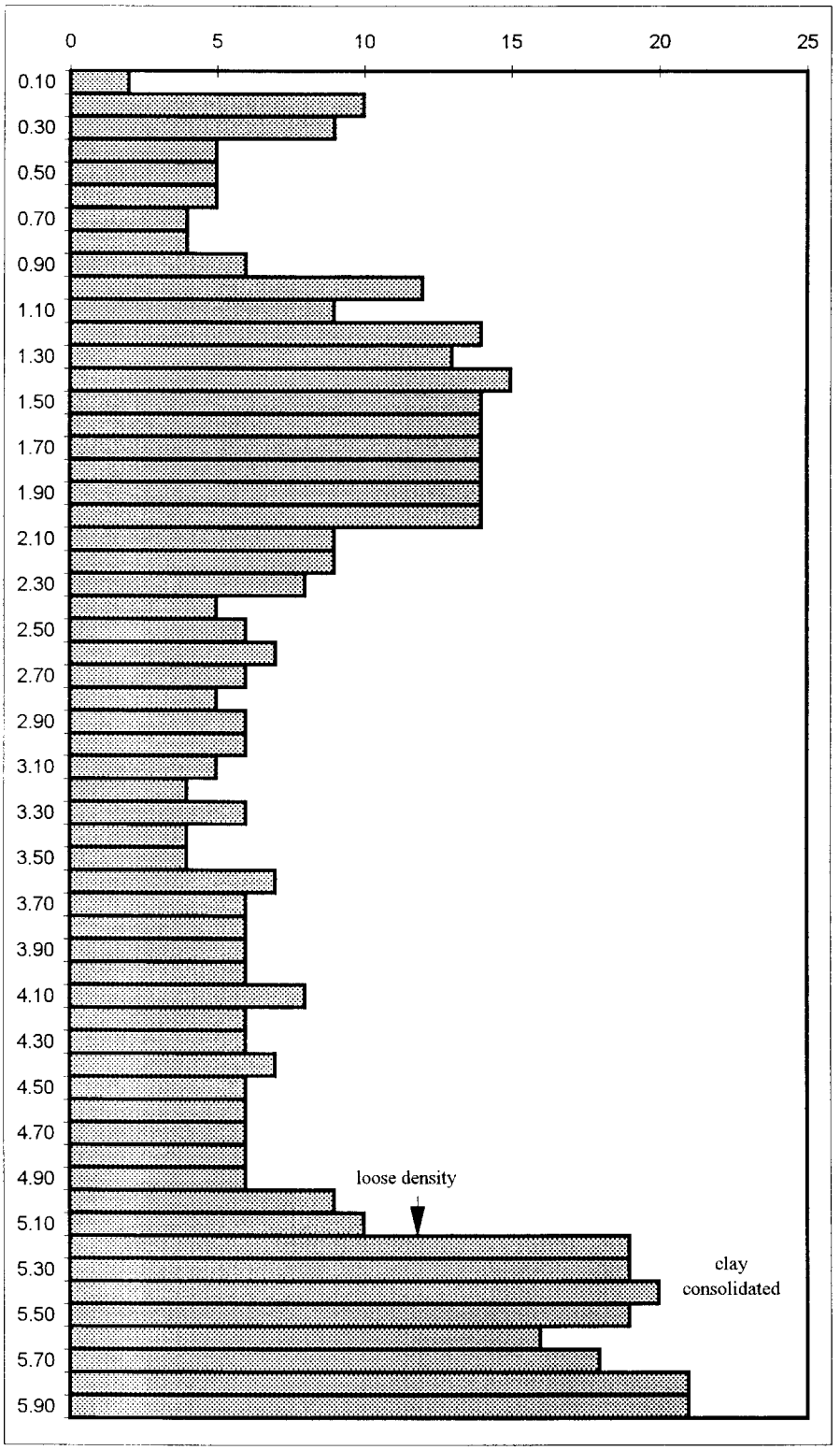
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Azerbaijan Border (Red Bridge) km 054 + 700 / LHS

Date / Дата : 17/04/97

Level / Уровень : Shoulder surface high embankment

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	10
0.30	9
0.40	5
0.50	5
0.60	5
0.70	4
0.80	4
0.90	6
1.00	12
1.10	9
1.20	14
1.30	13
1.40	15
1.50	14
1.60	14
1.70	14
1.80	14
1.90	14
2.00	14
2.10	9
2.20	9
2.30	8
2.40	5
2.50	6
2.60	7
2.70	6
2.80	5
2.90	6
3.00	6
3.10	5
3.20	4
3.30	6
3.40	4
3.50	4
3.60	7
3.70	6
3.80	6
3.90	6
4.00	6
4.10	8
4.20	6
4.30	6
4.40	7
4.50	6
4.60	6
4.70	6
4.80	6
4.90	6
5.00	9
5.10	10
5.20	19
5.30	19
5.40	20
5.50	19
5.60	16
5.70	18
5.80	21
5.90	21



FEASIBILITY STUDY
FOR ROAD REHABILITATION IN GEORGIA
Geotechnical Investigation

KOCKS
INGENIEURE

DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 1 & 2**

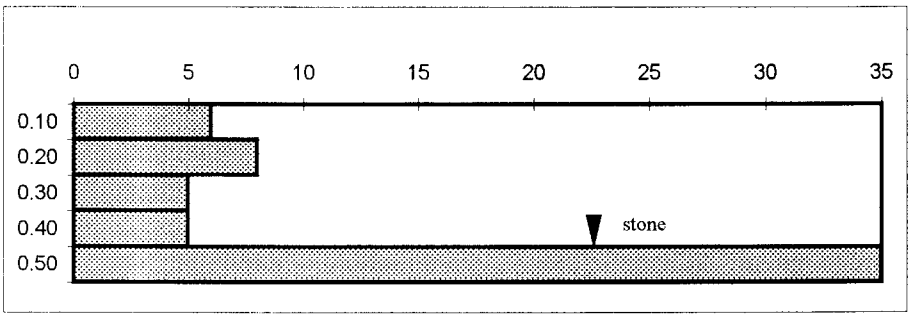
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Marneuli - Guguti - Armenia Border km 015 + 500 / RHS

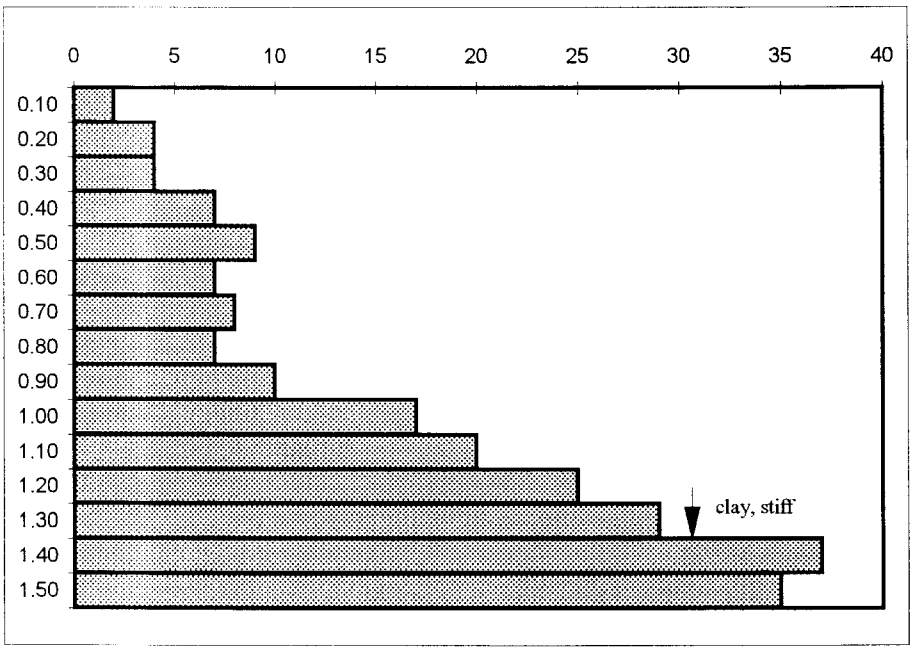
Date / Дата : 18/04/97

Level / Уровень : slope area

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	6
0.20	8
0.30	5
0.40	5
0.50	35
0.60	



Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	4
0.30	4
0.40	7
0.50	9
0.60	7
0.70	8
0.80	7
0.90	10
1.00	17
1.10	20
1.20	25
1.30	29
1.40	37
1.50	35



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 3 & 4**

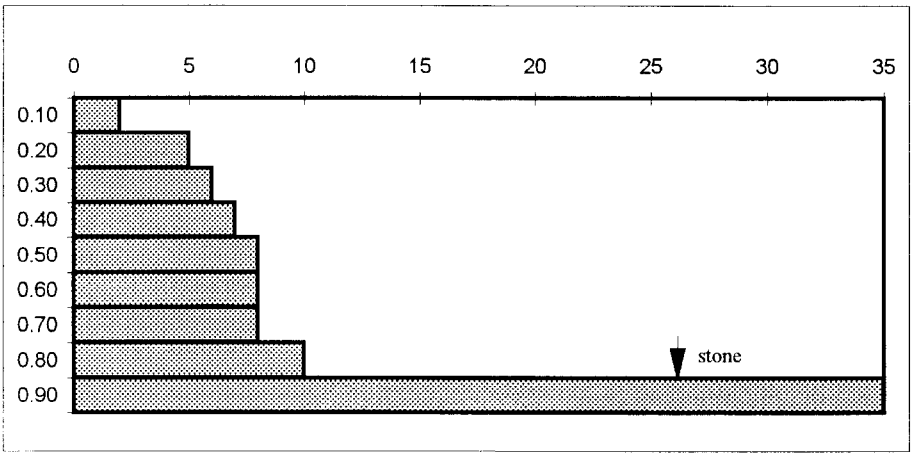
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Marneuli - Guguti - Armenia Border km 015 + 500 / RHS

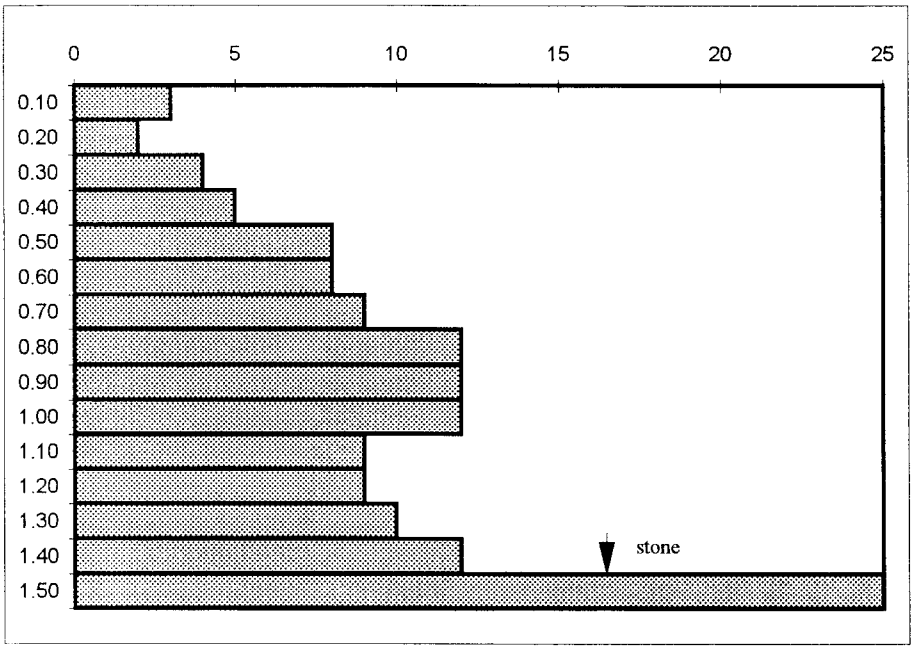
Date / Дата : 18/04/97

Level / Уровень : area of slope

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	5
0.30	6
0.40	7
0.50	8
0.60	8
0.70	8
0.80	10
0.90	35
1.00	



Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	3
0.20	2
0.30	4
0.40	5
0.50	8
0.60	8
0.70	9
0.80	12
0.90	12
1.00	12
1.10	9
1.20	9
1.30	10
1.40	12
1.50	25



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 5**

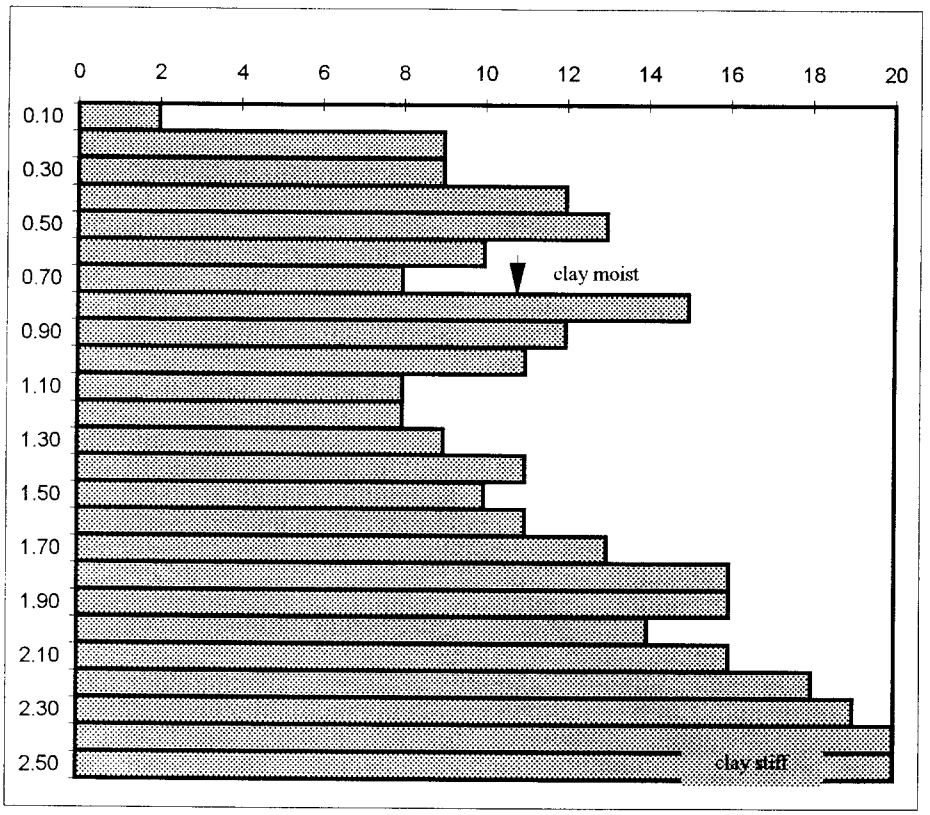
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Marneuli - Guguti - Armenia Border km 015 + 500 / LHS

Date / Дата : 18/04/97

Level / Уровень : natural ground, toe of embankment

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	9
0.30	9
0.40	12
0.50	13
0.60	10
0.70	8
0.80	15
0.90	12
1.00	11
1.10	8
1.20	8
1.30	9
1.40	11
1.50	10
1.60	11
1.70	13
1.80	16
1.90	16
2.00	14
2.10	16
2.20	18
2.30	19
2.40	20
2.50	20



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 6**

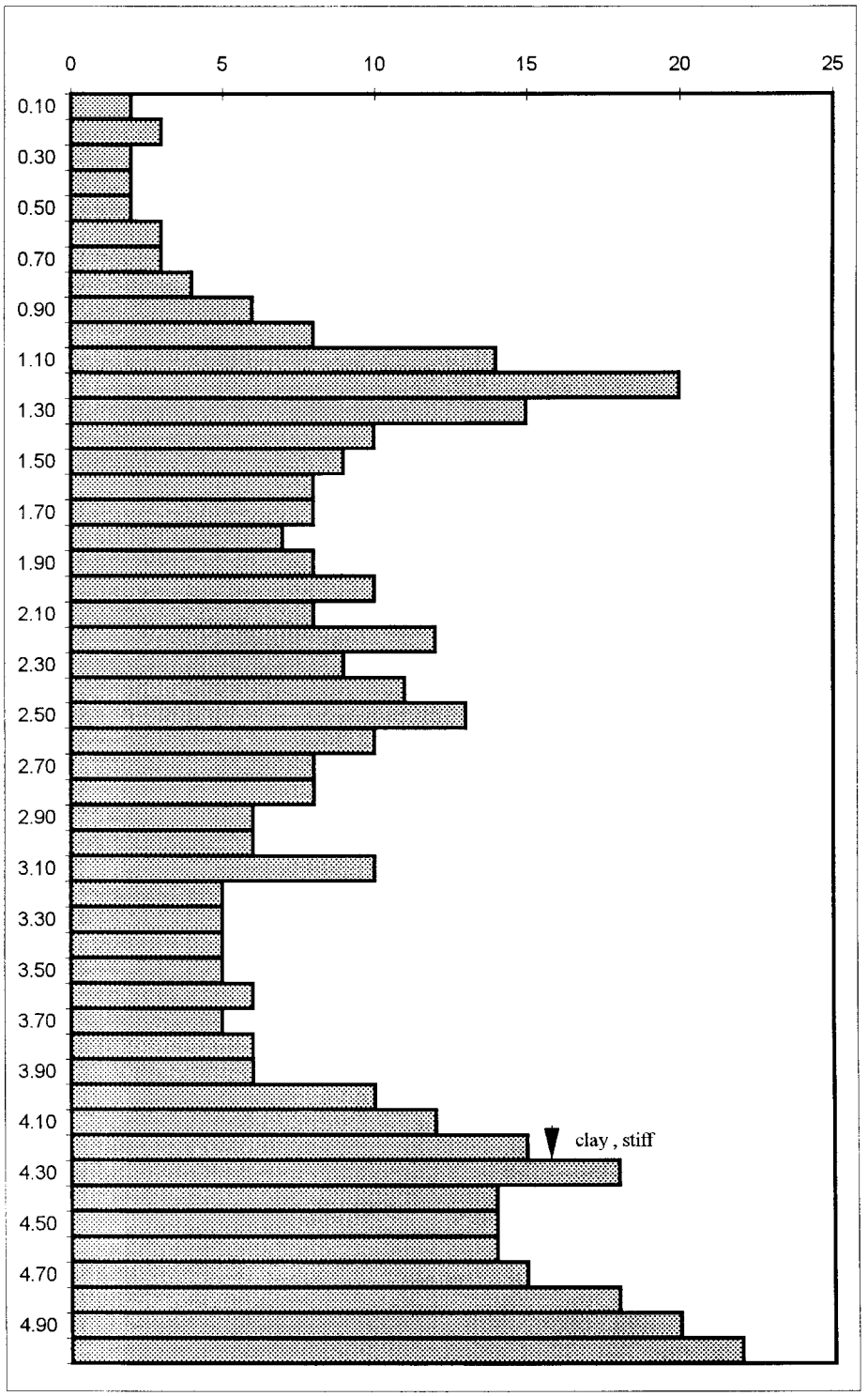
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi - Marneuli - Guguti - Armenia Border km 065+ 200 / LHS

Date / Дата : 19/04/97

Level / Уровень : area of shoulders, high embankment

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	2
0.20	3
0.30	2
0.40	2
0.50	2
0.60	3
0.70	3
0.80	4
0.90	6
1.00	8
1.10	14
1.20	20
1.30	15
1.40	10
1.50	9
1.60	8
1.70	8
1.80	7
1.90	8
2.00	10
2.10	8
2.20	12
2.30	9
2.40	11
2.50	13
2.60	10
2.70	8
2.80	8
2.90	6
3.00	6
3.10	10
3.20	5
3.30	5
3.40	5
3.50	5
3.60	6
3.70	5
3.80	6
3.90	6
4.00	10
4.10	12
4.20	15
4.30	18
4.40	14
4.50	14
4.60	14
4.70	15
4.80	18
4.90	20
5.00	22



FEASIBILITY STUDY
FOR ROAD REHABILITATION IN GEORGIA
Geotechnical Investigation

KOCKS INGENIEURE

DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 1**

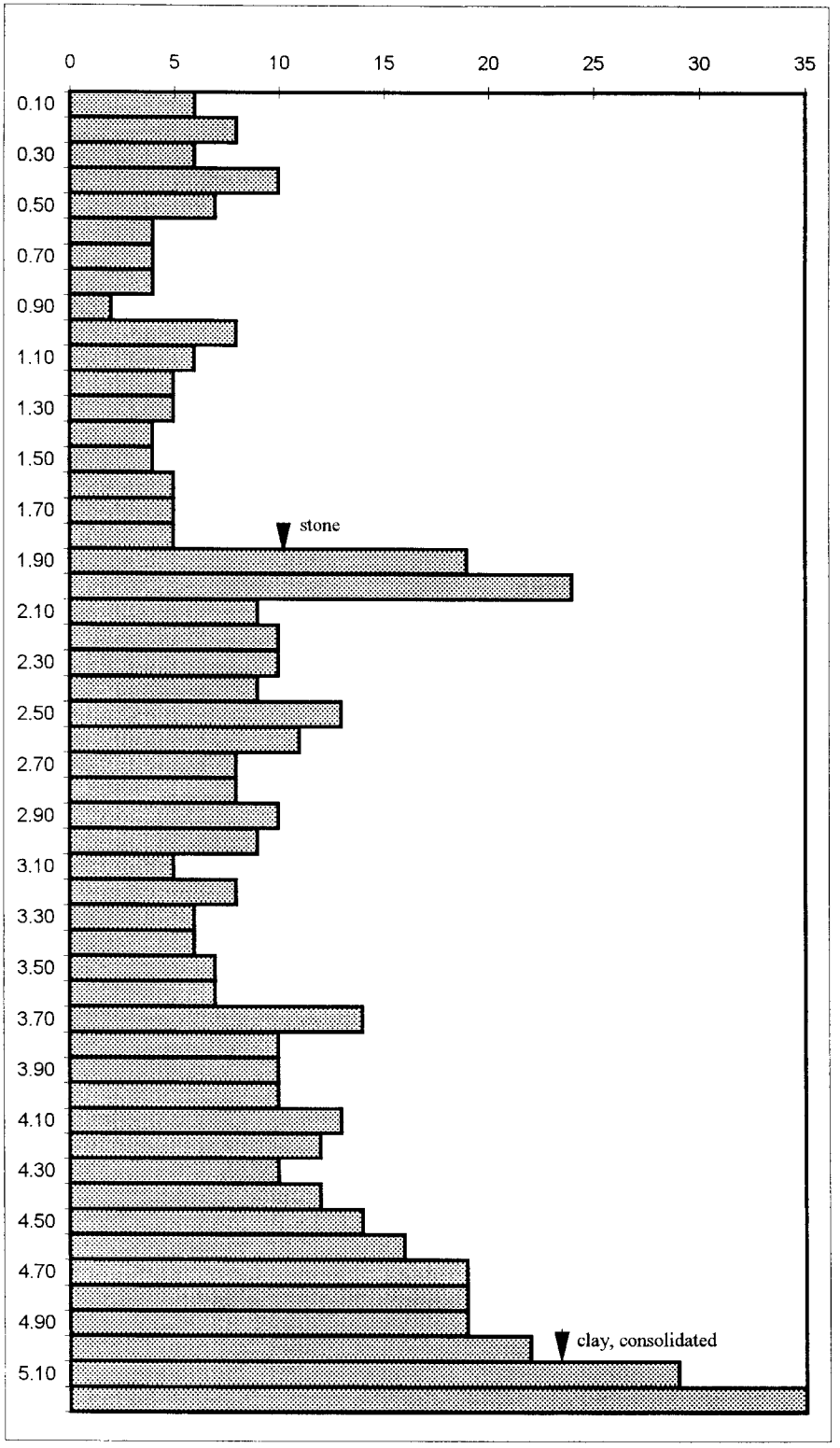
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi By-pass km 013 + 200 / LHS

Date / Дата : 16/04/97

Level / Уровень: high embankment, area of shoulders

Depth Глубина [m]	No. of blows Число ударов N_{10}
0.10	6
0.20	8
0.30	6
0.40	10
0.50	7
0.60	4
0.70	4
0.80	4
0.90	2
1.00	8
1.10	6
1.20	5
1.30	5
1.40	4
1.50	4
1.60	5
1.70	5
1.80	5
1.90	19
2.00	24
2.10	9
2.20	10
2.30	10
2.40	9
2.50	13
2.60	11
2.70	8
2.80	8
2.90	10
3.00	9
3.10	5
3.20	8
3.30	6
3.40	6
3.50	7
3.60	7
3.70	14
3.80	10
3.90	10
4.00	10
4.10	13
4.20	12
4.30	10
4.40	12
4.50	14
4.60	16
4.70	19
4.80	19
4.90	19
5.00	22
5.10	29
5.20	35



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 2**

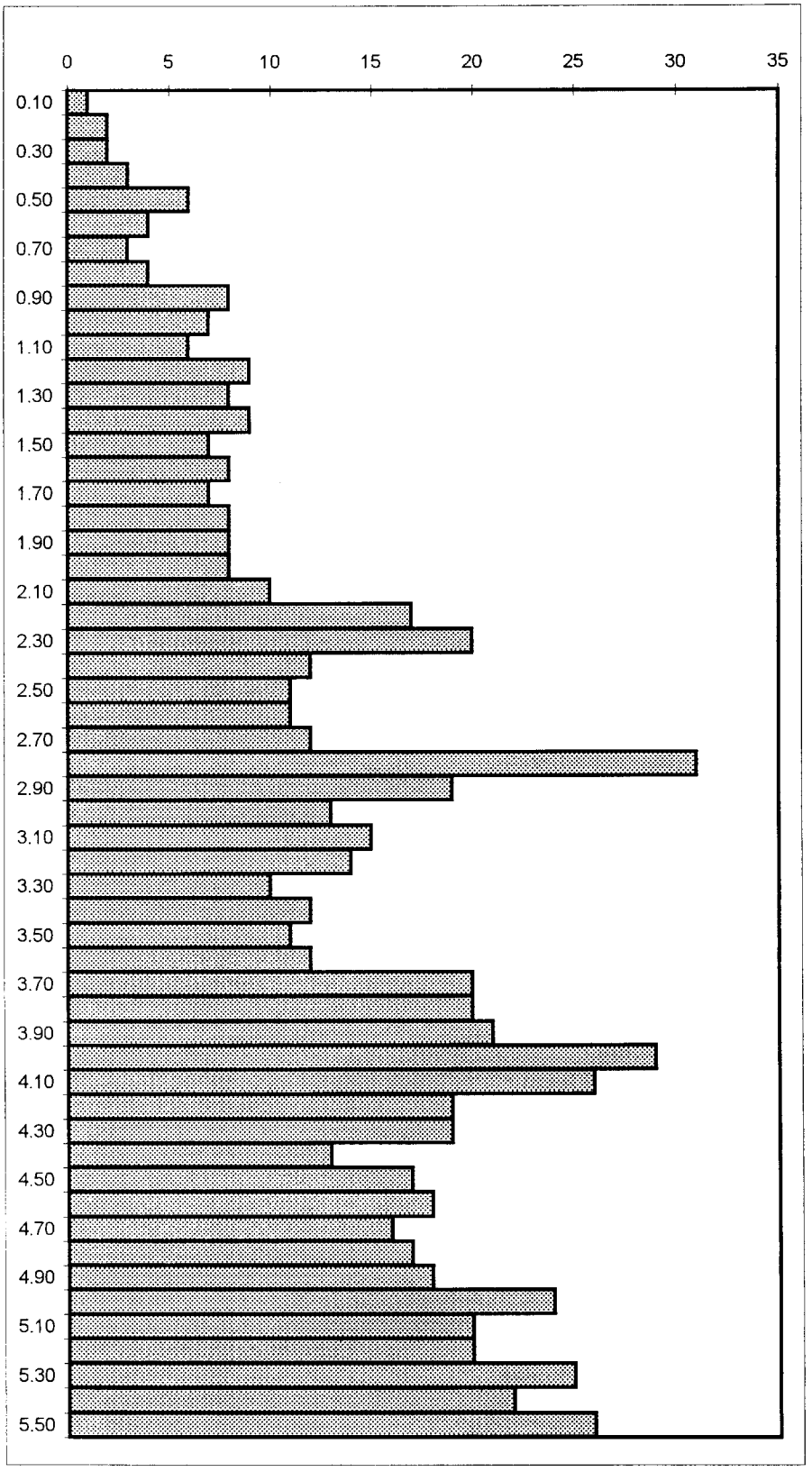
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi By-pass km 015 + 200 / LHS

Date / Дата : 15/04/97

Level / Уровень : area of landslide, cut section

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	1
0.20	2
0.30	2
0.40	3
0.50	6
0.60	4
0.70	3
0.80	4
0.90	8
1.00	7
1.10	6
1.20	9
1.30	8
1.40	9
1.50	7
1.60	8
1.70	7
1.80	8
1.90	8
2.00	8
2.10	10
2.20	17
2.30	20
2.40	12
2.50	11
2.60	11
2.70	12
2.80	31
2.90	19
3.00	13
3.10	15
3.20	14
3.30	10
3.40	12
3.50	11
3.60	12
3.70	20
3.80	20
3.90	21
4.00	29
4.10	26
4.20	19
4.30	19
4.40	13
4.50	17
4.60	18
4.70	16
4.80	17
4.90	18
5.00	24
5.10	20
5.20	20
5.30	25
5.40	22
5.50	26



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 3**

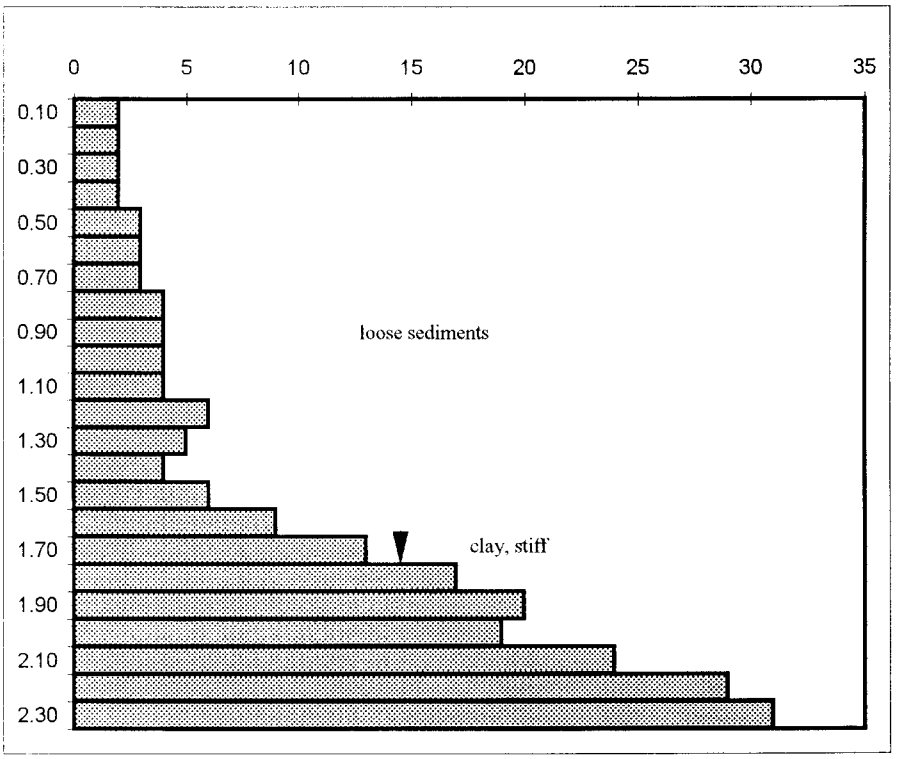
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi By-pass km 019 + 600 / RHS

Date / Дата : 16/04/97

Level / Уровень : Natural ground , swampy area

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	2
0.20	2
0.30	2
0.40	2
0.50	3
0.60	3
0.70	3
0.80	4
0.90	4
1.00	4
1.10	4
1.20	6
1.30	5
1.40	4
1.50	6
1.60	9
1.70	13
1.80	17
1.90	20
2.00	19
2.10	24
2.20	29
2.30	31



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 4**

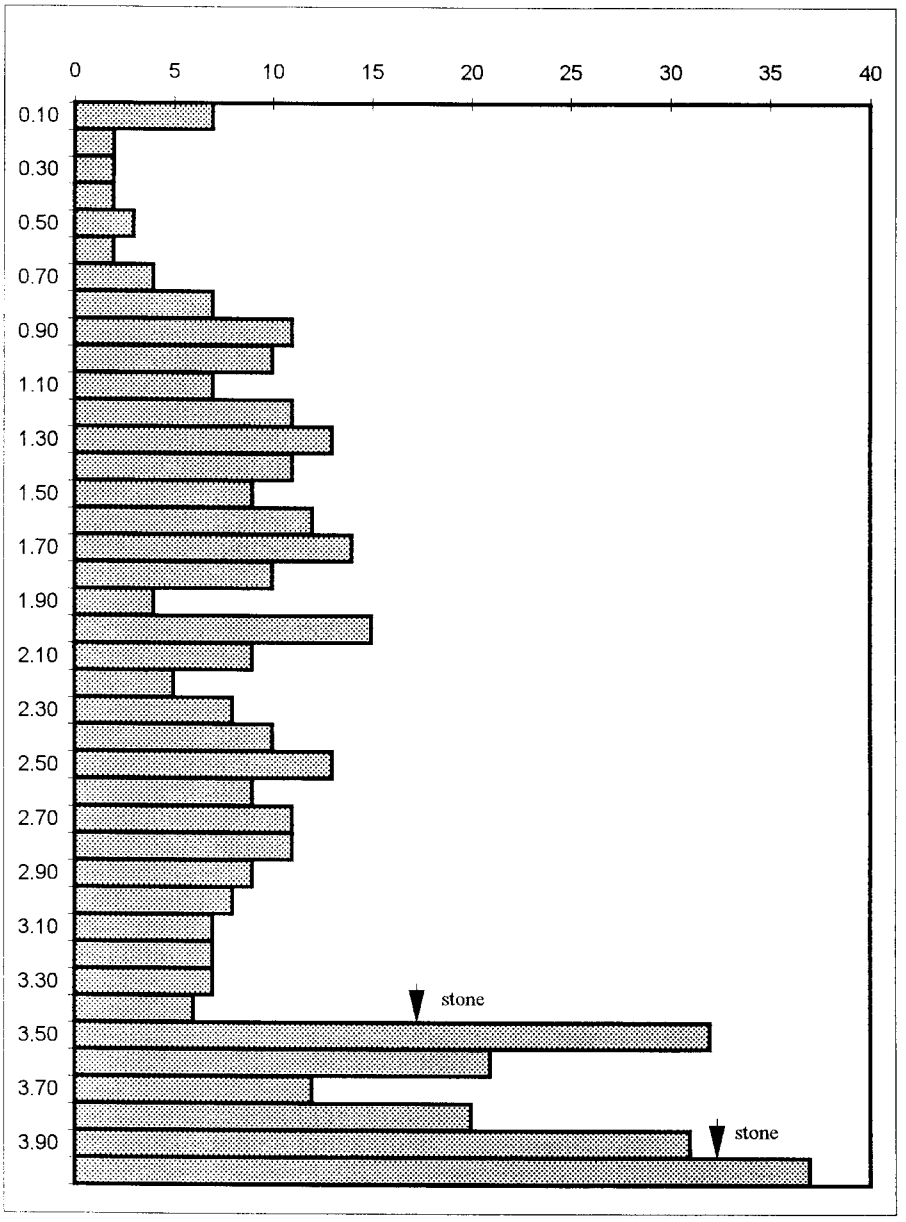
Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi By-pass km 026 + 400 / LHS

Date / Дата : 16/04/97

Level / Уровень: high embankment ,area of slope

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	7
0.20	2
0.30	2
0.40	2
0.50	3
0.60	2
0.70	4
0.80	7
0.90	11
1.00	10
1.10	7
1.20	11
1.30	13
1.40	11
1.50	9
1.60	12
1.70	14
1.80	10
1.90	4
2.00	15
2.10	9
2.20	5
2.30	8
2.40	10
2.50	13
2.60	9
2.70	11
2.80	11
2.90	9
3.00	8
3.10	7
3.20	7
3.30	7
3.40	6
3.50	32
3.60	21
3.70	12
3.80	20
3.90	31
4.00	37



DYNAMIC CONE PENETROMETER (LDP - 5, light ver. acc. DIN 4094) **No. 5**

Динамический конусный пенетрометр (ЛДП-5, легкий в соотв.ДИН4094)

Location /место : Tbilisi By-pass km 033 + 200 / RHS

Date / Дата : 16/04/97

Level / Уровень : Shoulder surface

Depth	No. of blows
Глубина	Число ударов
[m]	N_{10}
0.10	4
0.20	13
0.30	17
0.40	35

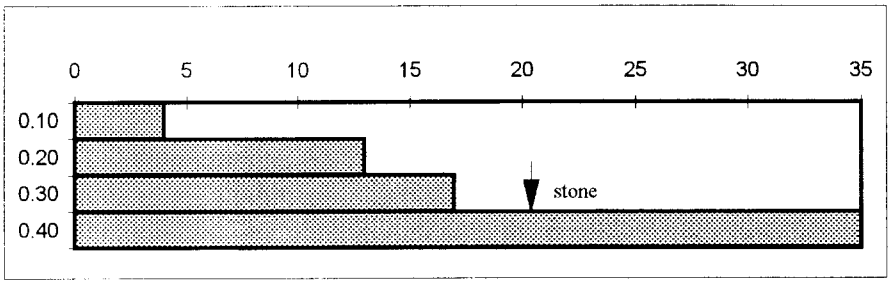


Table 4.1. Composition of existing pavement

Abbreviations:

W/C = bituminous wearing course
R/b = bituminous binder/base course
B/mac = bituminous macadam with surface dressing
B/c = granular base course
S/b = granular sub-base
S/G = subgrade

Road S1 Tbilisi-Khashuri ; Total length 115 km, dual carriageway from km 0 to km 12

- km 21 RHS

W/C	4	10 cm
R/b	6	
B/c	13 cm	
S/b	55 cm	
S/G	clay yellow of mod. plasticity	

- km 25 LHS

W/C	6	15 cm old surfacing
R/b	9	
B/c	30 cm partly crushed	
S/G	conglomerate	

- km 32

W/C	7	20 cm
R/b	13	
B/c	35 cm partly crushed	
S/G	clay yellowish	

- km 47

W/C	3	7 cm
R/b	4	
B/c	38 cm partly crushed	
S/G	clay gravely, yellowish	

- km 61

W/C	6	14 cm
R/b	8	
B/c	25 cm partly crushed	
S/G	top soil, blackish	

- km 71

W/C	6	12 cm
R/b	6	
B/c	25 cm partly crushed	
S/G	conglomerate	

- km 80

W/C	6	17 cm
R/b	11	
B/c	30 cm	
S/G	clay & conglomerate	

- km 88

W/C	10	20 cm road has been resealed
R/b	10	
B/c	60 cm crushed stone	
S/G	clay of high plasticity yellowish	

- km 96

W/C	3	13 cm
R/b	10	
B/c	30 cm river gravel	
S/G	clay	

- km 109

W/C	6	16 cm
R/b	10	
B/c	60 cm river gravel	
S/G	clay yellow (terrace)	

Table 4.1. Composition of existing pavement

- km 120
  - W/C 4
  - R/b 6
  - R/b 10
  - } 20 cm
  - B/c 50 cm river gravel
  - S/G clay brownish

- km 129
  - W/C 30
  - B/c 15 cm river gravel
  - S/G clay

Road S 4, Tbilisi- Red Bridge

- km 14.0
  - W/C 18
  - R/b 12
  - B/mac 6
  - } 36 cm old pavement
  - B/c 20 cm river gravel
  - S/G clayey gravel

- km 17.5
  - W/C 6
  - R/b 8
  - B/mac 10
  - } 24 cm
  - B/c 50 cm river gravel
  - S/G clayey saturated

- km 23.5
  - W/C 4
  - R/b 6
  - } 10 cm
  - B/c 20 cm river gravel
  - S/G gravely clay

- km 32.5
  - W/C 8 cm
  - B/c 20 cm river gravel
  - S/G clay

- km 42.1
  - W/C 10 cm
  - B/c 35 cm river gravel
  - S/G clay

- km 51.6
  - W/C 5
  - R/b 6
  - } 11 cm
  - B/c 25 cm
  - B/mac 6 cm
  - } 31 cm river gravel
  - S/G clay

Road S 6, Tbilisi-Marneuli-Guguti (Armenian border)

- km 5.4
  - W/C 6
  - R/b 15
  - } 21 cm
  - B/c 24 cm conglomerate
  - S/G clay gravel

- km 11.9
  - W/C 5
  - R/b 15
  - B/mac 6
  - } 26 cm low bitumen content
  - B/c 14 cm conglomerate
  - S/G shales sandy

- km 17.5
  - W/C 6
  - B/mac 7
  - } 13 cm
  - B/c 10 cm crushed stone
  - S/G clay

Table 4.1. Composition of existing pavement

- km 26.2
  W/C 6 } 12 cm
  B/mac 6 }
  B/c 25 cm river gravel
  S/G clay gravely

- km 32.6
  W/C 7 cm
  B/c 30 cm river gravel
  S/G clay of volcanic origin

- km 41.9
  W/C 7 cm
  B/c 33 cm river gravel
  S/G clay, gravely & cobbles

- km 46.1
  W/C 4 } 10 cm
  B/mac 6 }
  B/c 25 cm river gravel
  S/G clay

- km 56.6
  W/C 5 } 11 cm
  B/mac 6 }
  B/c 28 cm river gravel
  S/G clay

- km 65.7
  W/C 6 } 13 cm
  B/mac 7 }
  B/c 17 cm conglomerate
  S/G clay

- km 77.7
  W/C 5 } 12 cm
  R/b 7 }
  B/c 10 cm crushed stone
  S/G clay (weathered basalt)

- km 84.5
  W/C 4 } 9 cm
  R/b 5 }
  B/c 10 cm river gravel
  S/G weathered lava

- km 94.5
  W/C 6 cm
  B/c 10 cm crushed stone
  S/G weathered volcanic

Road S 7, Marneuli-Sadakhlo (Armenian border)

- km 3.2
  W/C 5 cm
  B/c 10 cm river gravel
  S/G river gravel

- km 11.7
  W/C 6 cm
  B/c 20 cm river gravel
  S/G clay

- km 21.8
  W/C 7 cm
  B/c 15 cm river gravel
  S/G weathered volcanic

- km 29.6
  W/C 7 cm
  B/c 23 cm river gravel
  S/G clay

Table 4.1. Composition of existing pavement

Road S 9, Tbilisi Bypass

- km 1.8

W/C	6	24 cm	
R/b	18		
B/c	10	60 cm	crushed stone
S/b	50		nat. gravel
S/G	clay of moderate plasticity		

- km 11.6

W/C	3	21 cm	
R/b	12		
R/b	6		
B/c	12 cm partly crushed		
S/G	clay of moderate plasticity		

- km 15.5

W/C	5	20 cm	
R/b	15		
B/c	80 cm partly crushed		
S/G	clay high plasticity		

- km 20.4

W/C	5	20 cm	
R/b	15		
B/c	20 cm river gravel		
S/G	clay of moderate plasticity		

- km 25.4

W/C	18 cm		
B/c	13 cm crushed tone		
S/G	clay & gravel		

- km 33.2

W/C	3	7 cm	
R/b	4		
B/c	14 cm crushed stone		
S/G	clay & gravel		

- km 43.9

W/C	7	15 cm	
R/b	8		
B/c	10	55 cm	crushed stone
S/b	45		clayey gravel
S/G	clay		

1.6 Road S 12, Samtredia - Ureki

- km 3

W/C	16 cm		
B/c	20 cm sandy gravel		
S/G	silty sand		

- km 14

W/C	6	18 cm	
R/b	6		
B/mac	6		
B/c	20 cm sandy gravel		
S/G	clay (weathered volcanic)		

- km 26

W/C	7	19 cm	
R/b	12		
B/c	32 cm river gravel		
S/G	clay (weathered volcanic)		

- km 36

W/C	6	22 cm	
R/b	16		
B/c	35 cm river gravel		
S/G	clay		

- km 49

W/C	6	15 cm	
R/b	9		
B/c	20 cm river gravel		
S/G	clay		

APPENDIX 6.4

PAVEMENT STRENGTH REPORT

INTRODUCTION

25. June 1997

This report contains the results of bearing capacity measurements by means of Falling Weight Deflectometer (see part 8) carried out during the spring 1997 on the S1, S4, S6, S7, S9 and S12 roads in Georgia.

The pupose of te measurements was to state the bearing capacity of the existing road construction and define the necessary reinforcement need for the traffic load of the coming 15 years.

The results are to be a part of a feasiability study for the entire road section.

Necessary information (traffic prognosis and existing pavement construction) for the calculations has been delivered by Kocks Consult.

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0001.001

Design date: 06-25-1997

Link ref.: S1

Mea. date: 2349 2

The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might be material or technical reasons why another layer thickness than the here stated should be carried out, especially in connection with thin overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
0 - 2250	35	8	15	101
2250 - 7750	100	3	15	1080
7750 - 11250	65	5	15	405
11250 - 13250	150	0	15	1451
13250 - 16750	150	1	15	1215
16750 - 22250	80	3	15	439
22250 - 24750	150	0	15	1924
24750 - 27750	150	1	15	878
27750 - 30750	150	1	15	574
30750 - 33250	75	2	15	0
33250 - 40250	100	1	15	0
40250 - 42250	85	2	15	0
42250 - 47250	70	8	15	1181
47250 - 50750	150	1	15	878
50750 - 53250	45	6	15	169
53250 - 55750	25	14	15	371
55750 - 60750	40	9	15	608
60750 - 63750	150	1	15	1316
63750 - 65750	5	14	15	0
65750 - 68750	95	2	15	506
68750 - 71250	0	20	20	0
71250 - 73250	55	4	15	169
73250 - 76750	65	7	15	878
76750 - 79750	85	4	15	776
79750 - 82750	5	14	15	101
82750 - 85750	70	2	15	0
85750 - 88250	100	1	15	236
88250 - 90750	40	9	15	304
90750 - 94250	90	3	15	911
94250 - 96250	40	6	15	0
96250 - 100750	75	4	15	608

100750	106250	35	8	15	338
106250 -	111250	50	6	15	661
111250 -	113100	45	4	15	0

BEARING CAPACITY OF EQUAL SECTIONS

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Client: TACIS

Sec. no.: 0001

Link no.: 0001.001

A/S PHØNIX
P. P. C

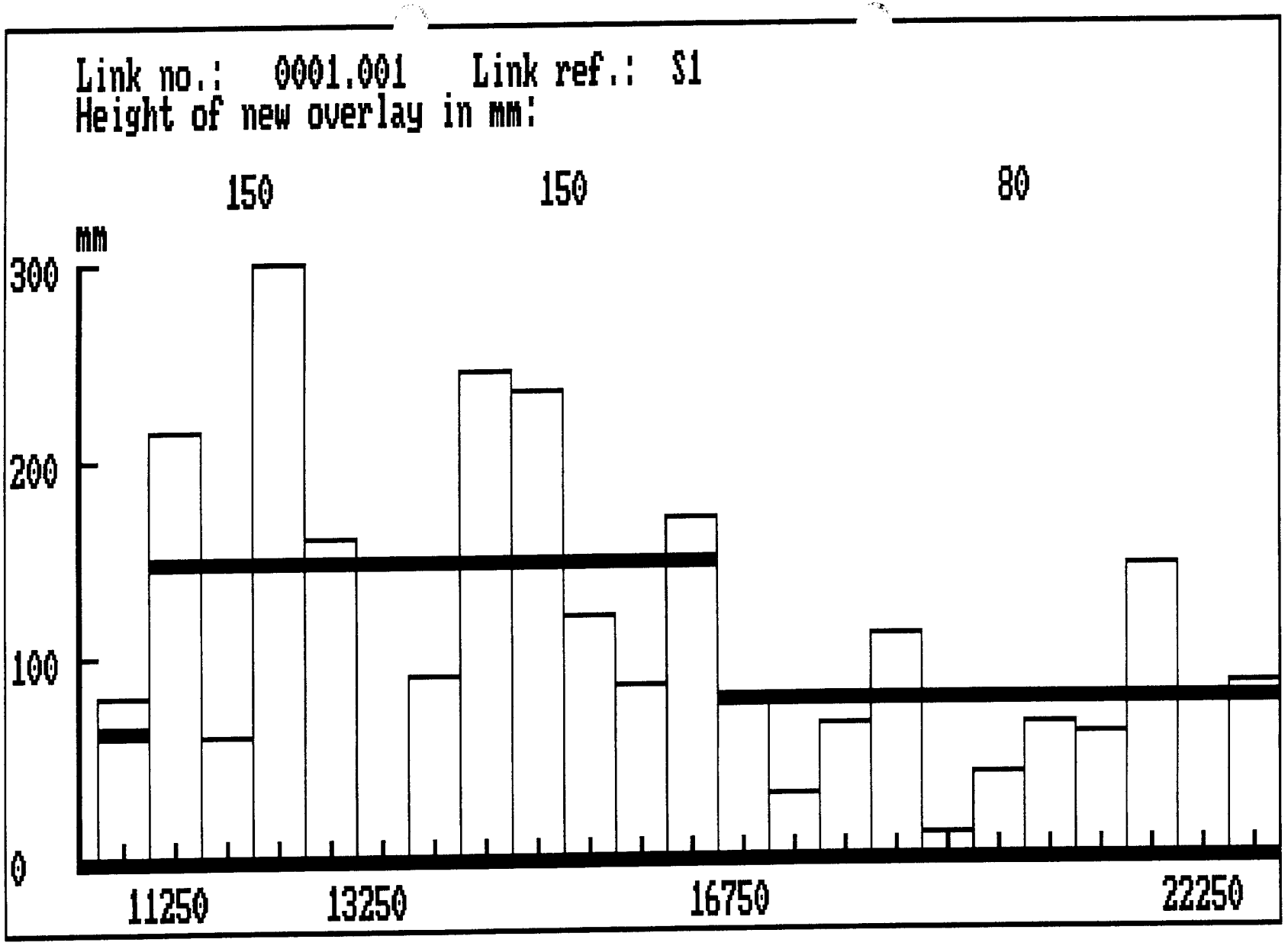
Design date: 06-25-1997

Link ref.: S1

Mea. date: 2349 2

The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might
be material or technical reasons why another layer thickness than the here
stated should be carried out, especially in connection with thin
overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
113100 - 116000	40	7	15	429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mm
300
200
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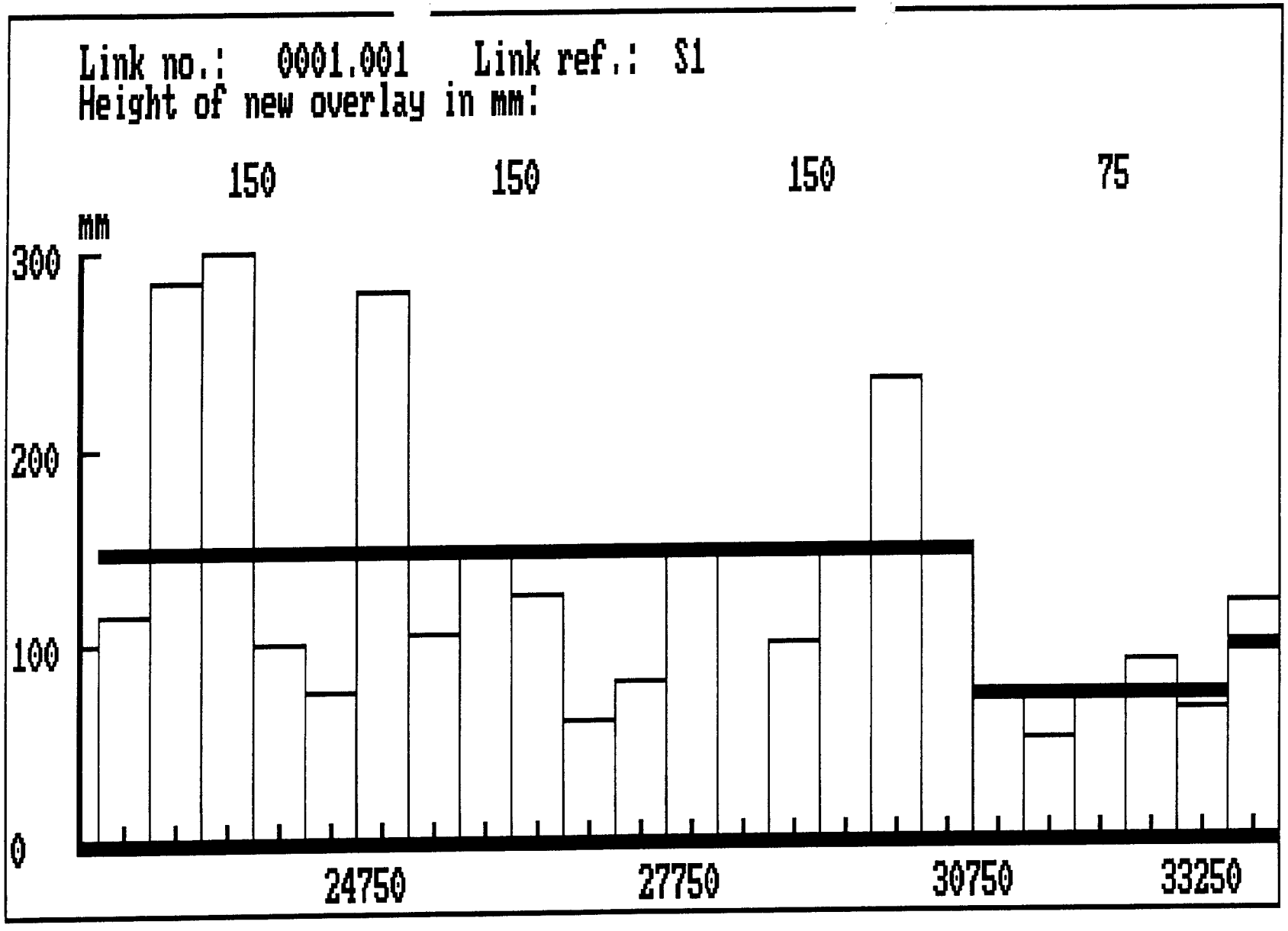
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150
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mm
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200
100
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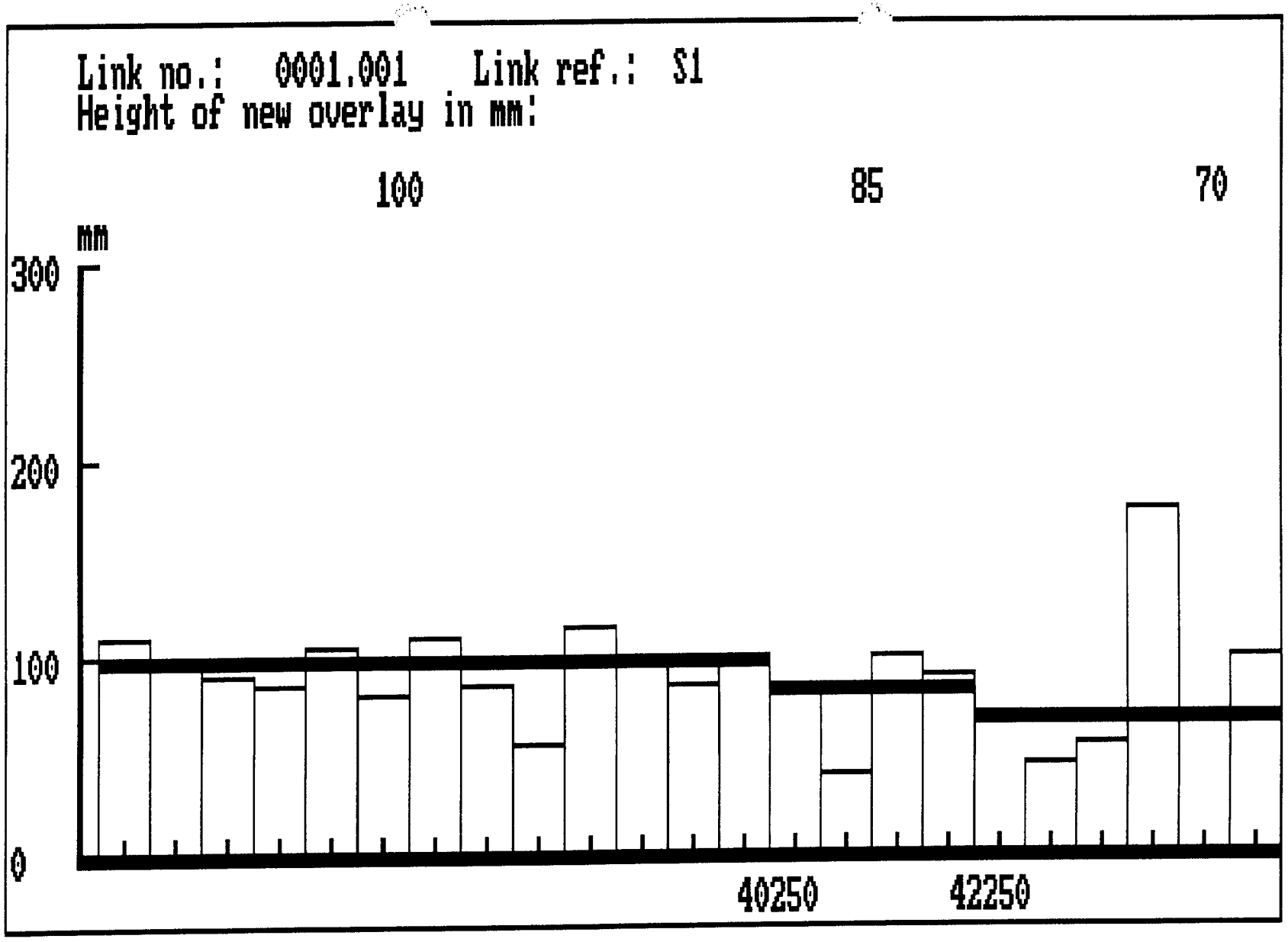
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85
70
mm
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200
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0
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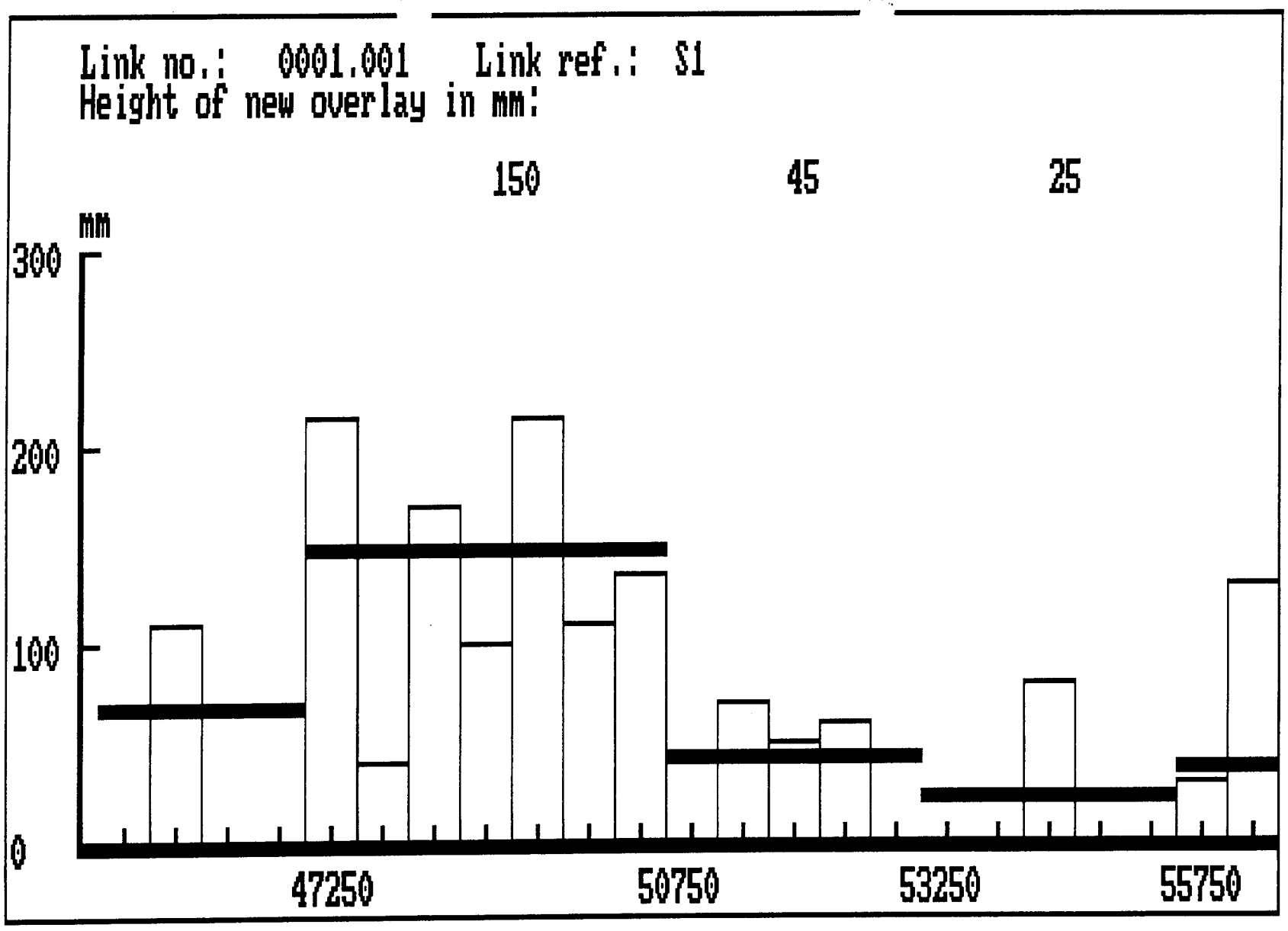
42250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25
mm
300
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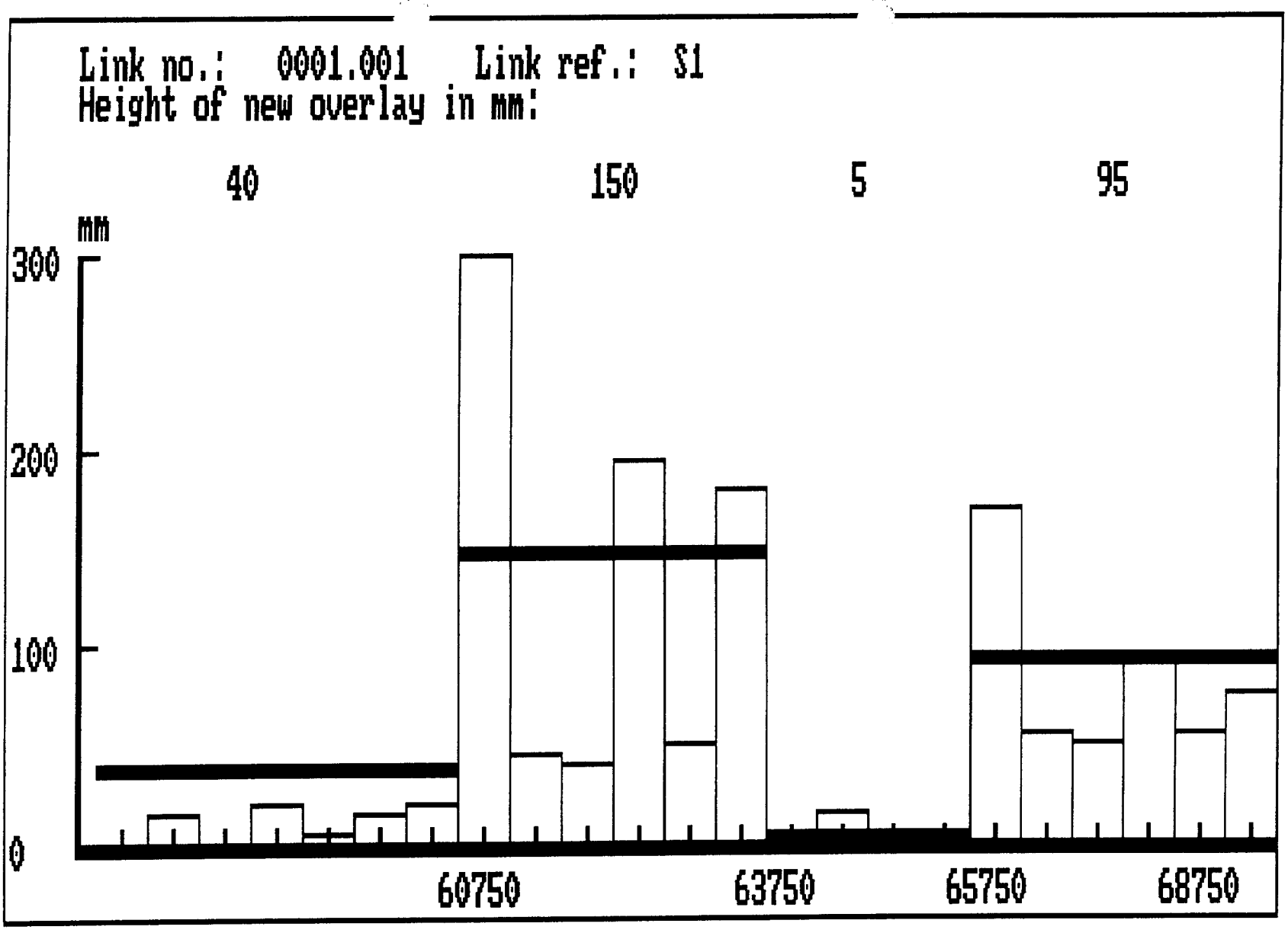
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mm
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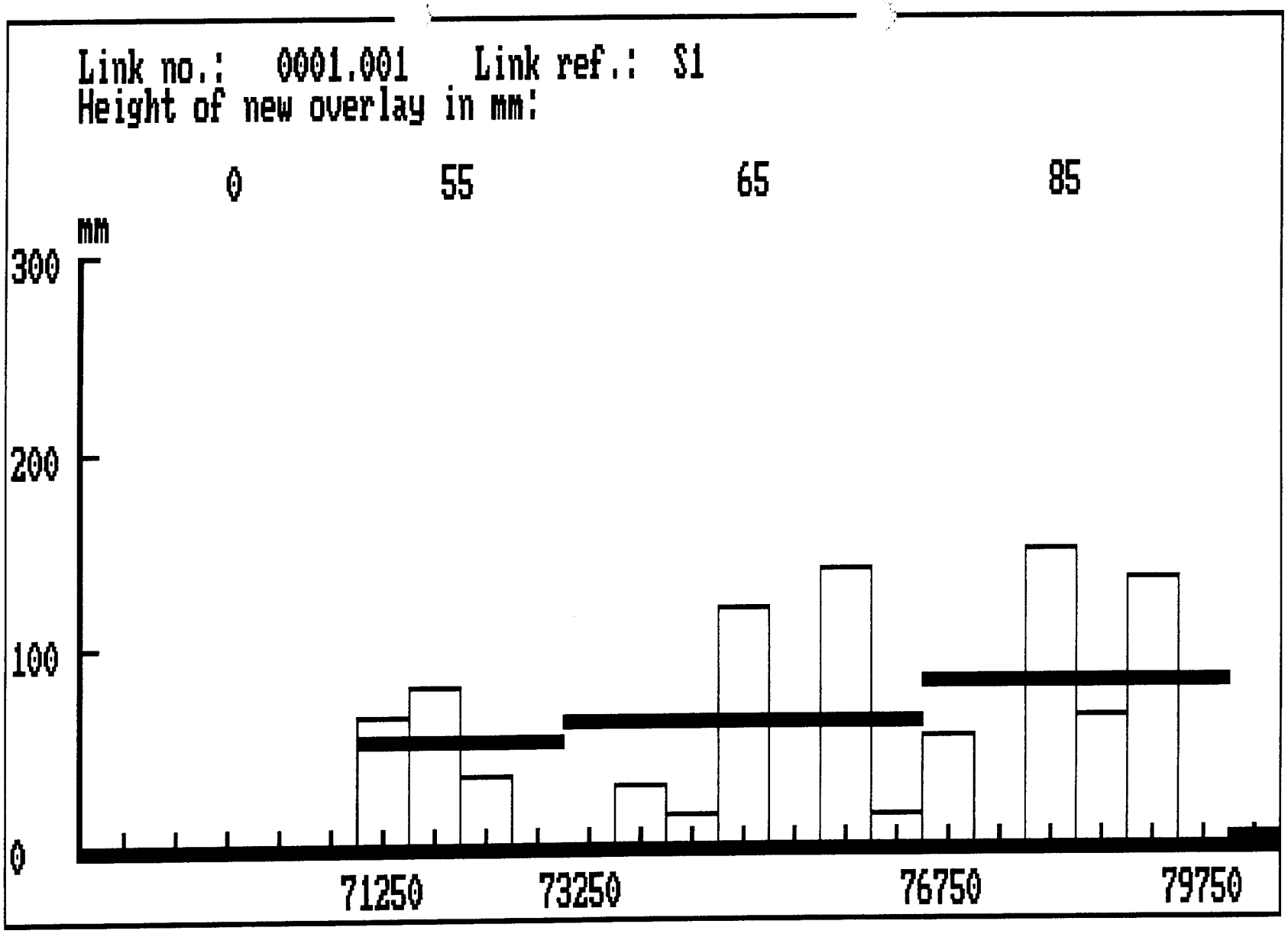
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mm
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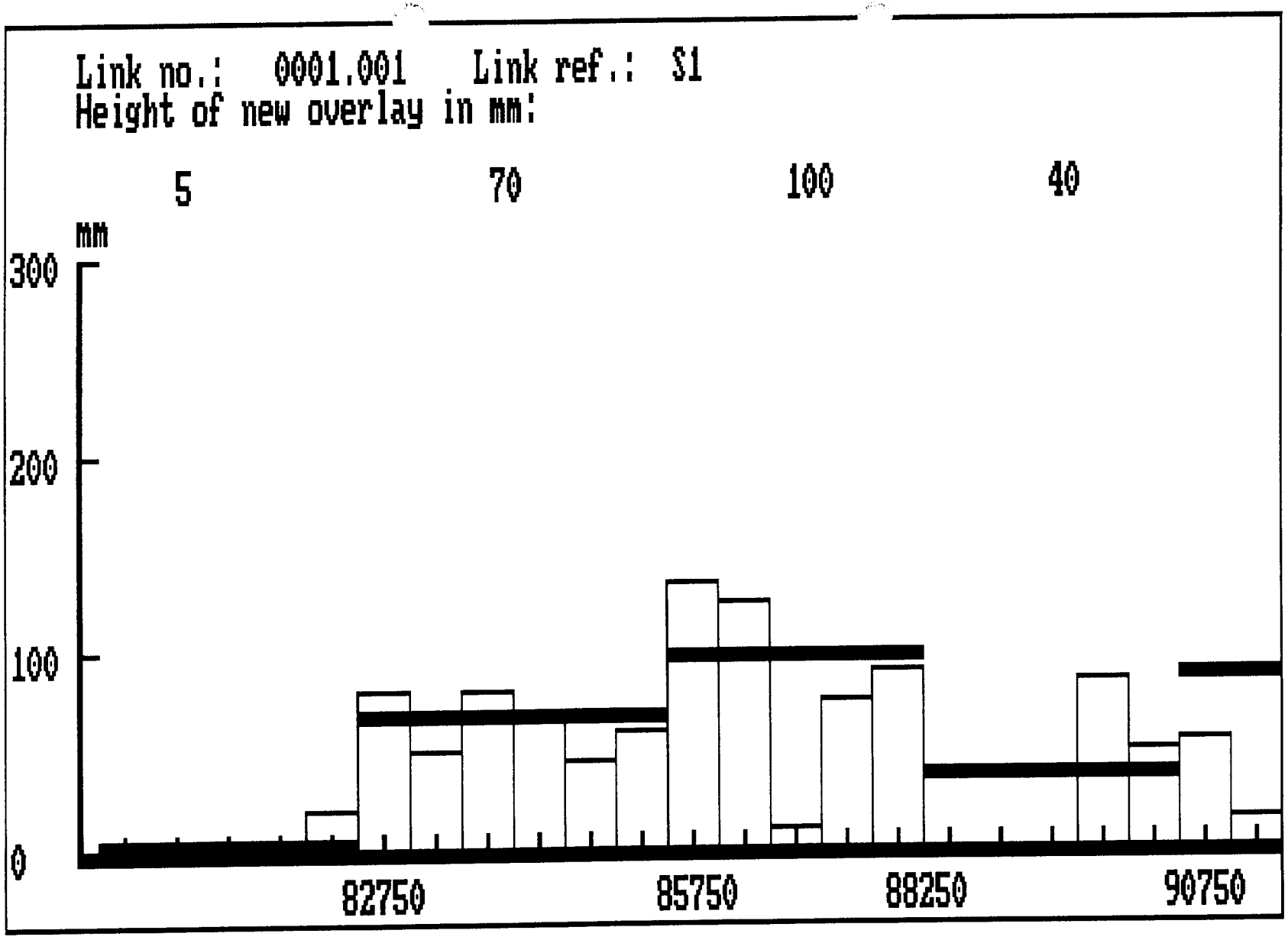
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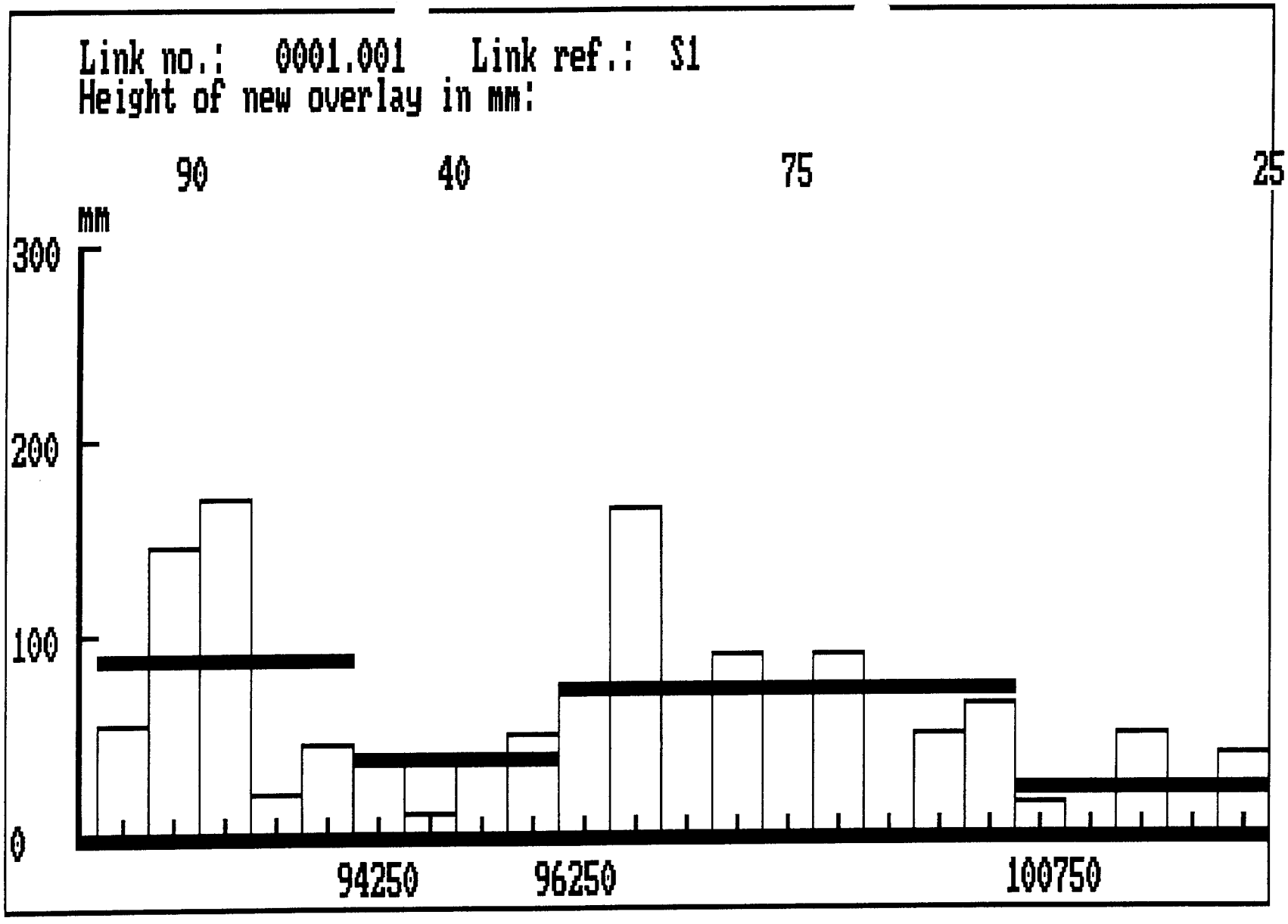
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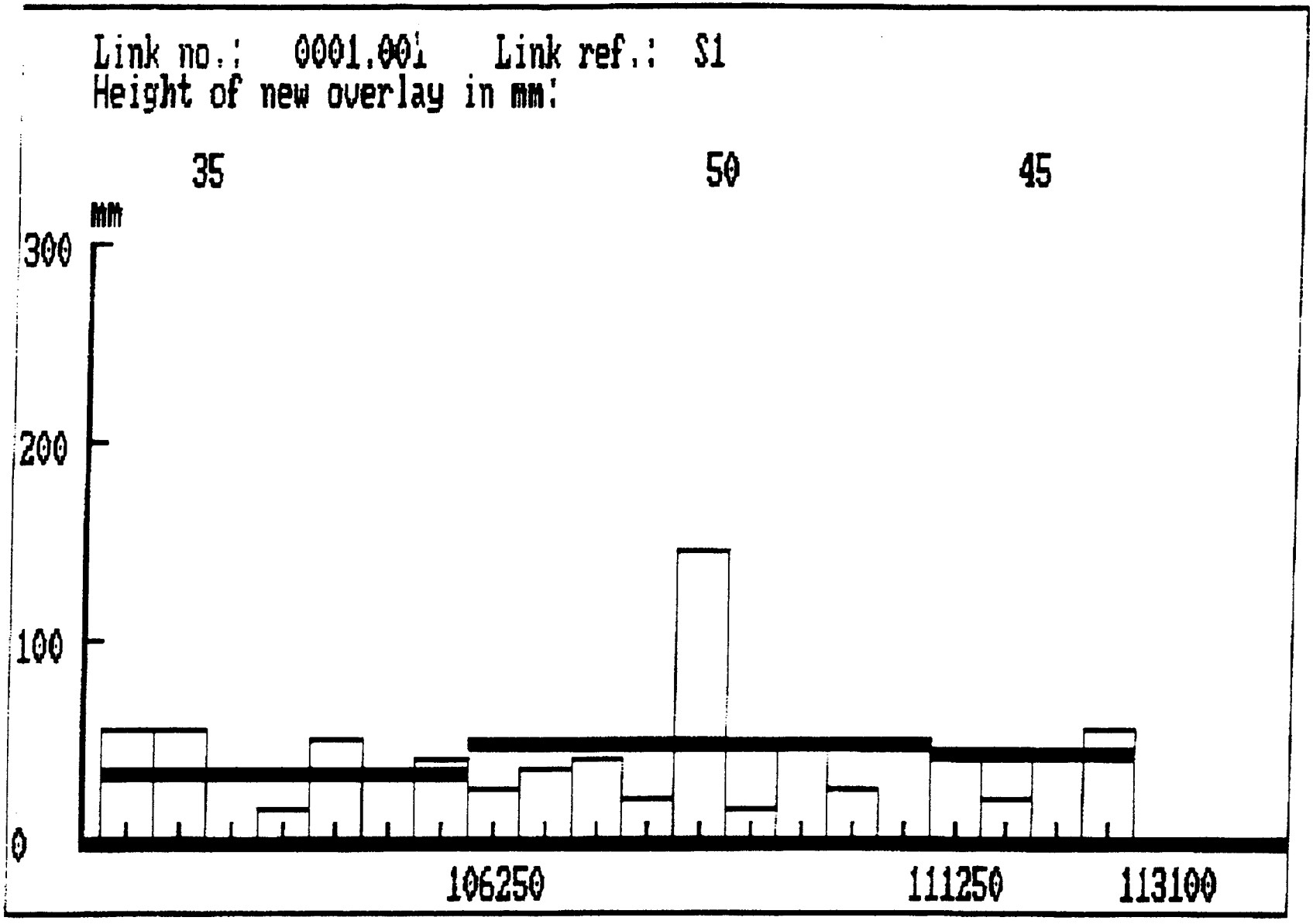
96250
100750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45
mm
300
200
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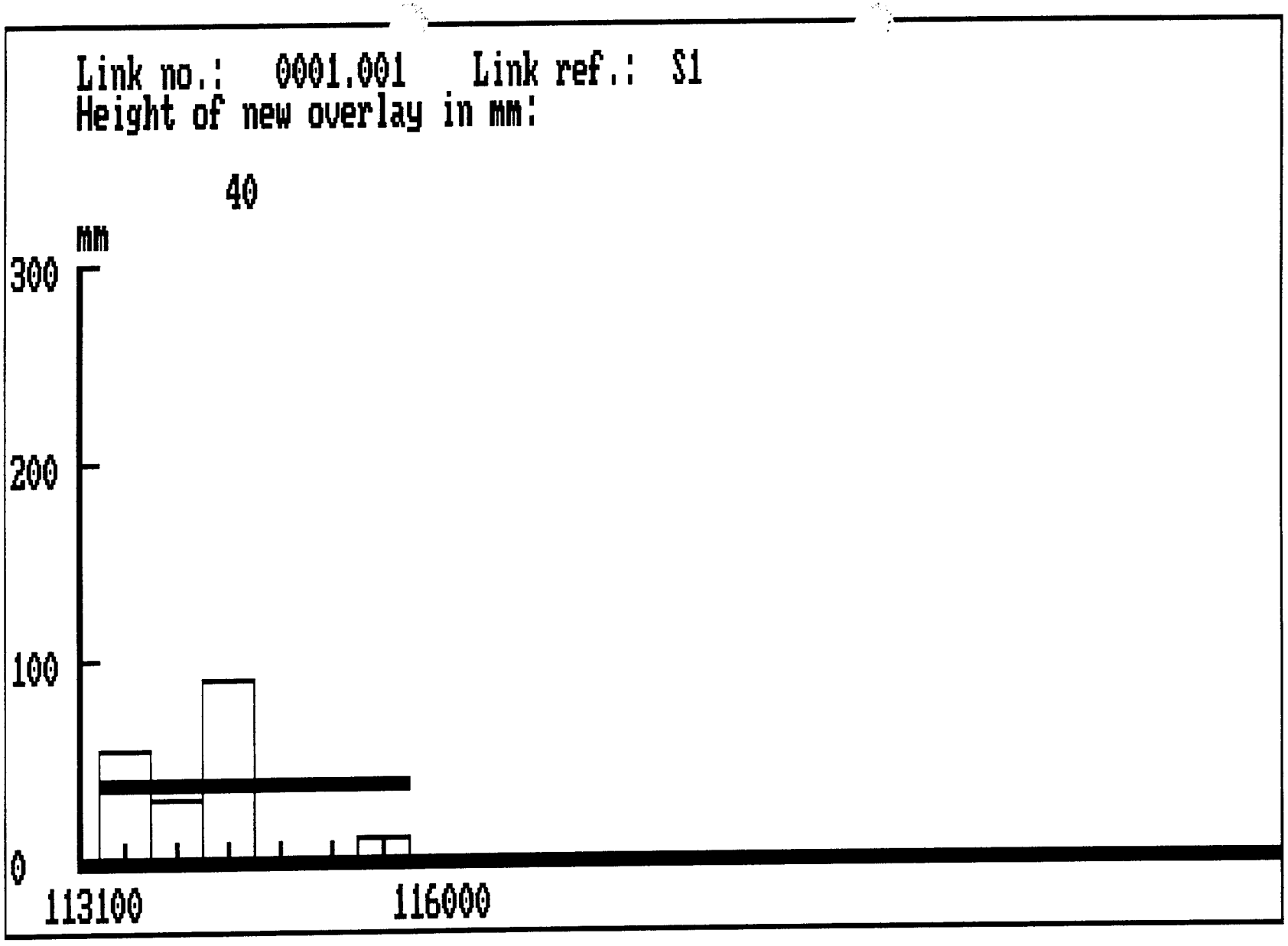
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mm
300
200
100
0
113100
116000

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0004.001

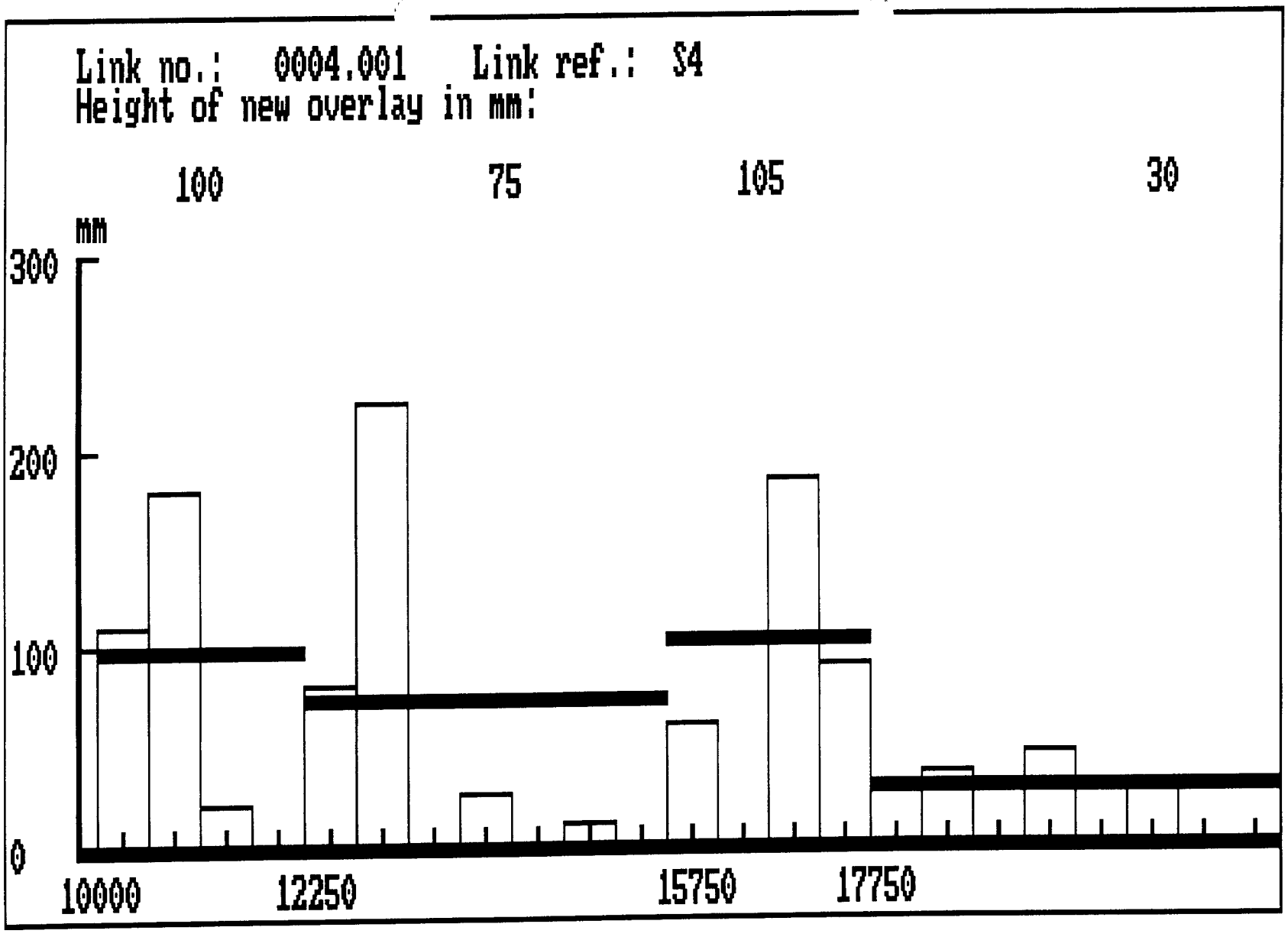
Design date: 06-25-1997

Link ref.: S4

Mea. date: 2649 2

The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might be material or technical reasons why another layer thickness than the here stated should be carried out, especially in connection with thin overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
10000 - 12250	100	4	15	540
12250 - 15750	75	9	15	1013
15750 - 17750	105	2	15	540
17750 - 23250	30	10	15	439
23250 - 25250	95	1	15	270
25250 - 27250	30	9	15	135
27250 - 31250	115	0	15	0
31250 - 34750	95	1	15	405
34750 - 36750	100	1	15	236
36750 - 41250	60	5	15	810
41250 - 42750	110	1	15	236
42750 - 46250	40	5	15	169
46250 - 48750	65	2	15	203
48750 - 52250	40	5	15	203
52250 - 55000	60	4	15	439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105
30
mm
300
200
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10000
12250
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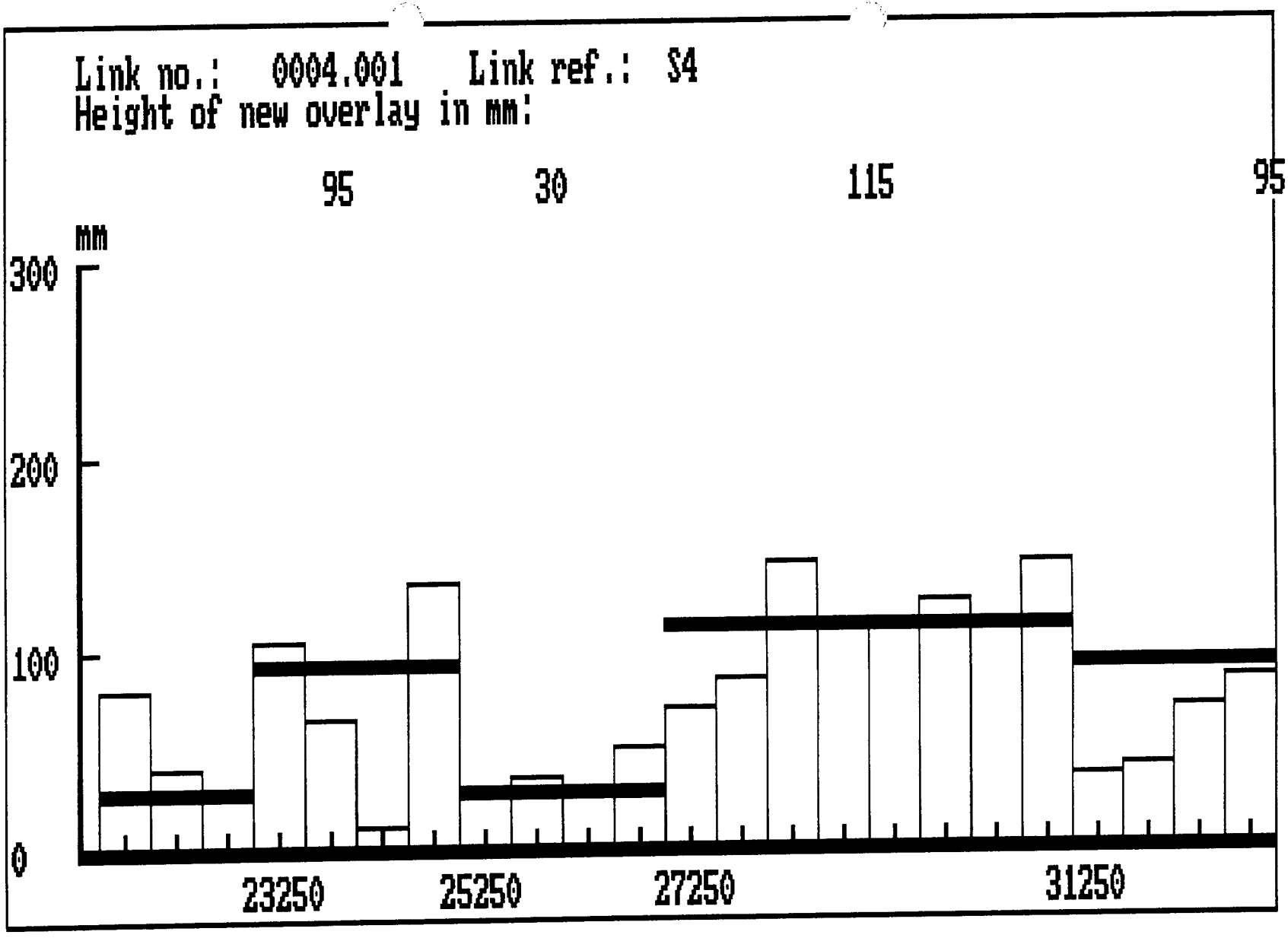
17750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95
mm
300
200
100
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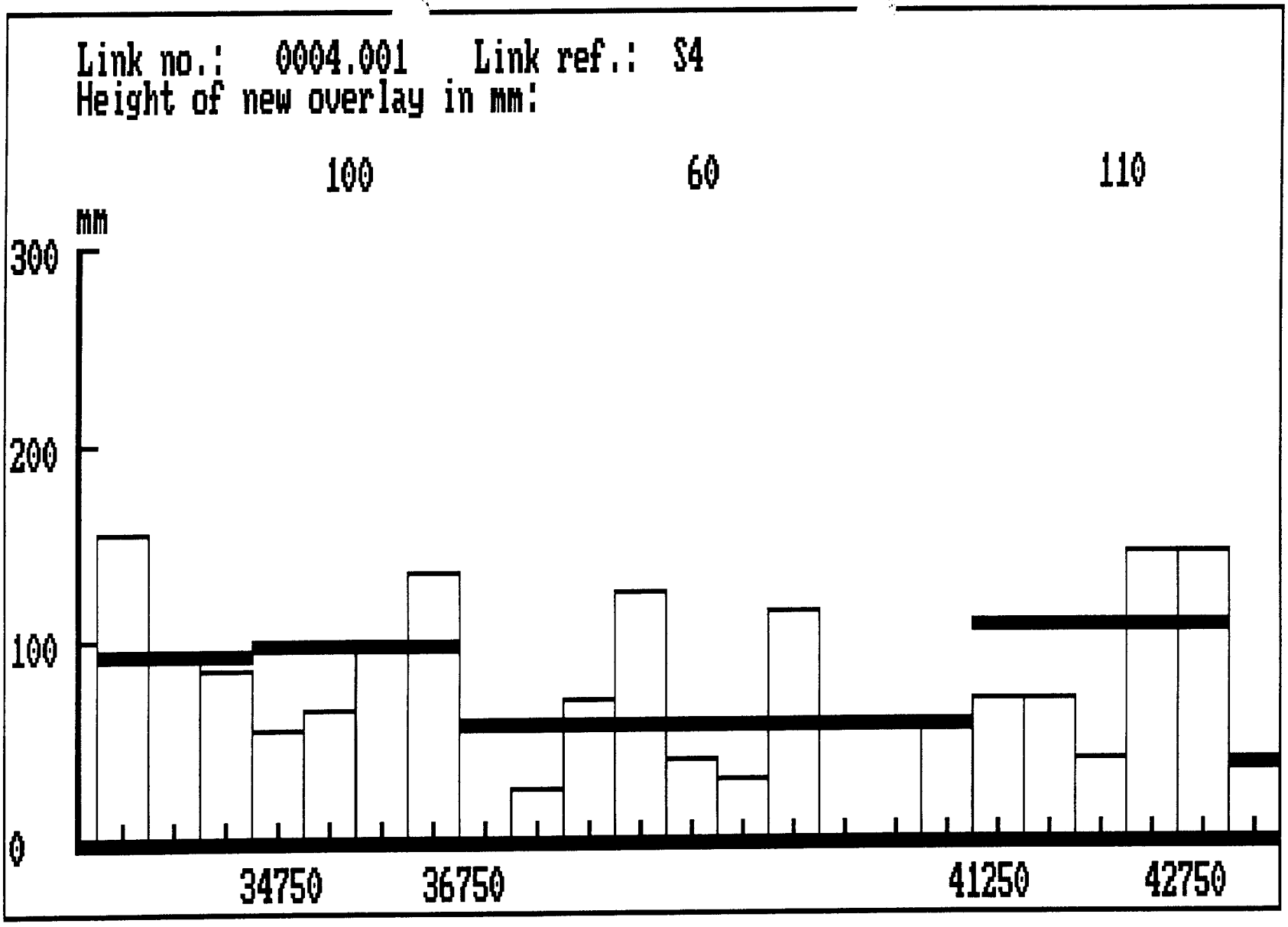
31250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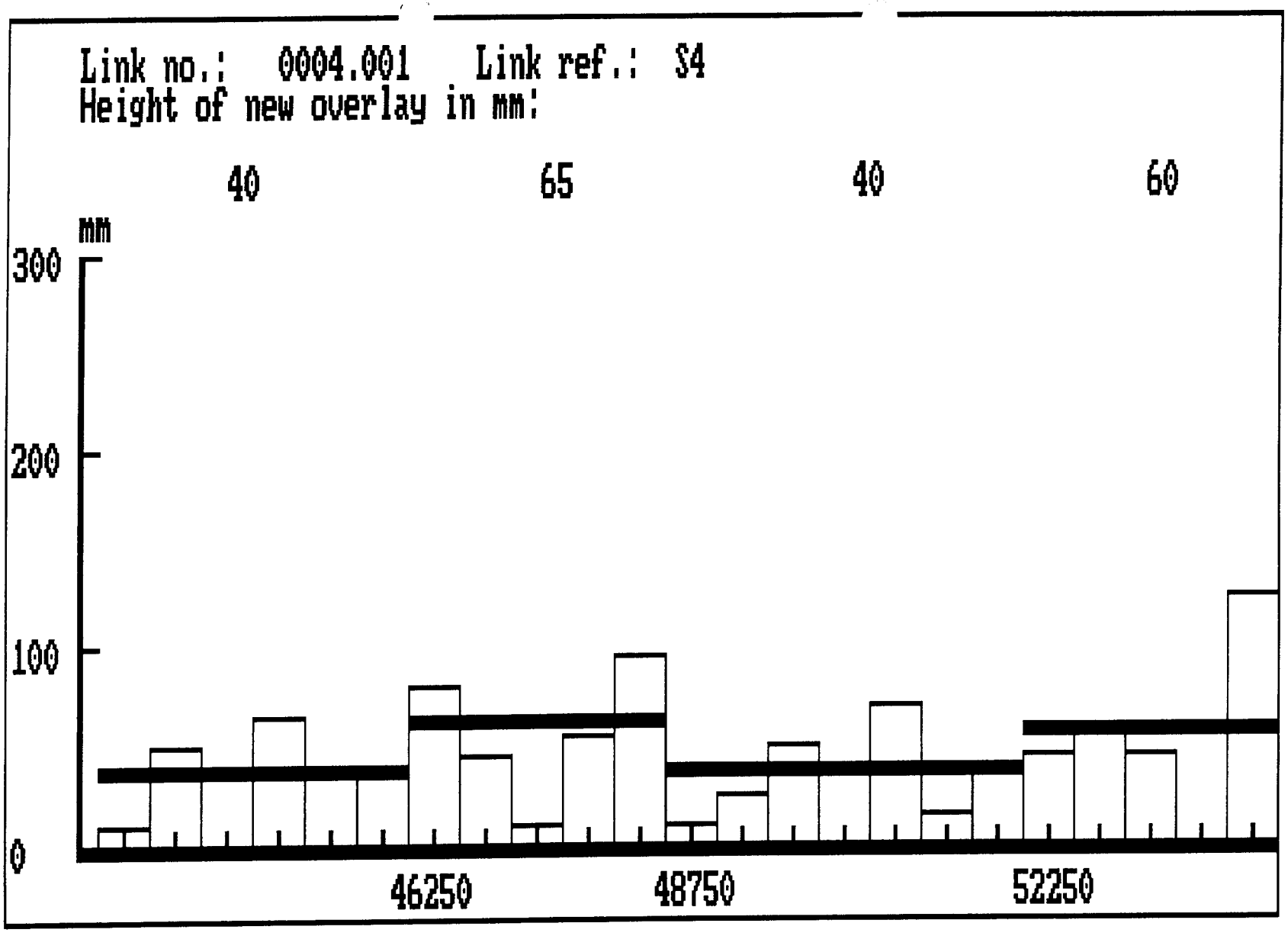
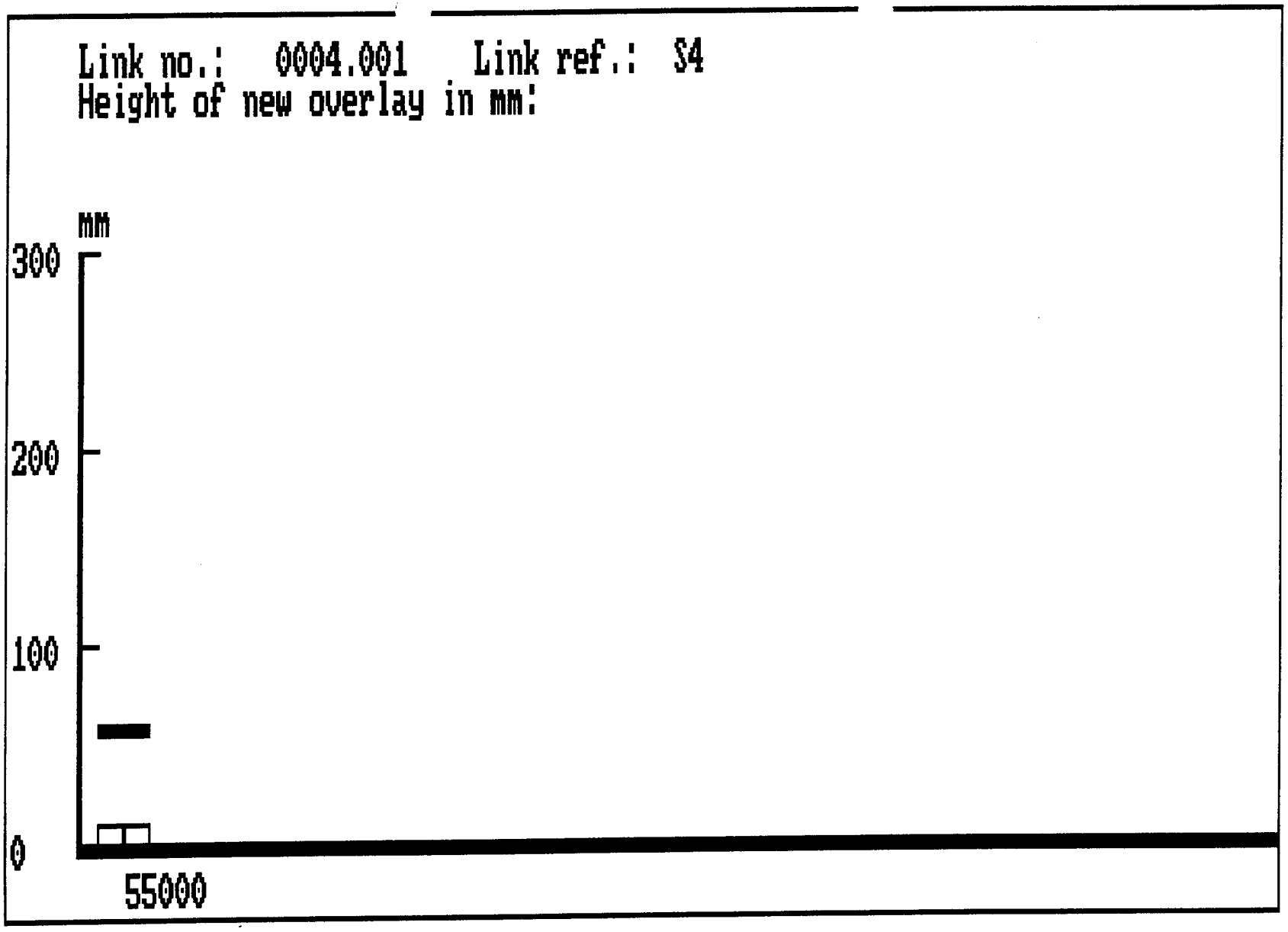
110
mm
300
200
100
0
34750
36750
41250
42750


Link no.: 0004.001 Link ref.: S4
Height of new overlay in mm:
40
65
40
60
mm
300
200
100
0
46250
48750
52250


Link no.: 0004.001 Link ref.: S4
Height of new overlay in mm:
mm
300
200
100
0
55000

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0006.001

Design date: 06-25-1997

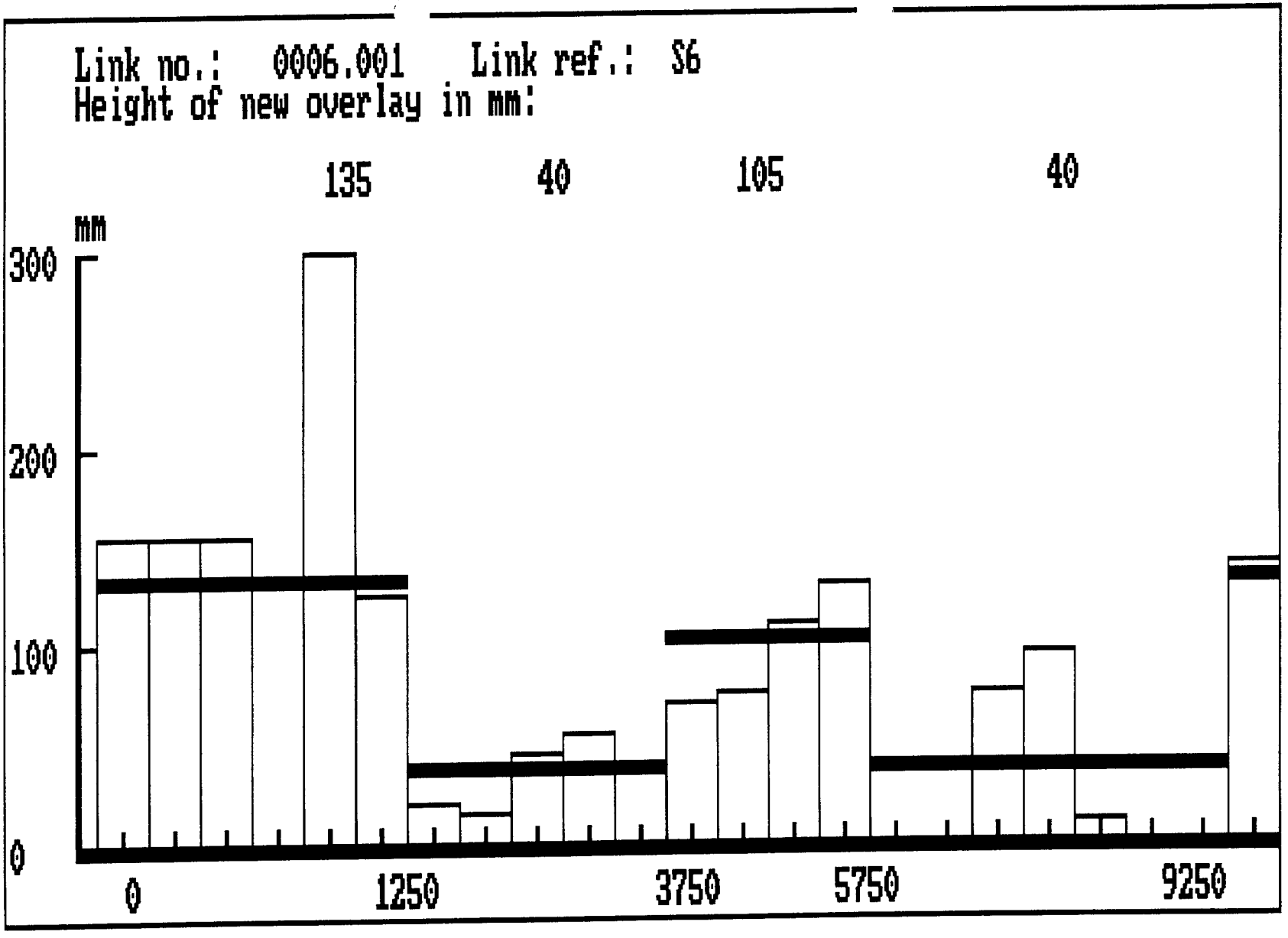
Link ref.: S6

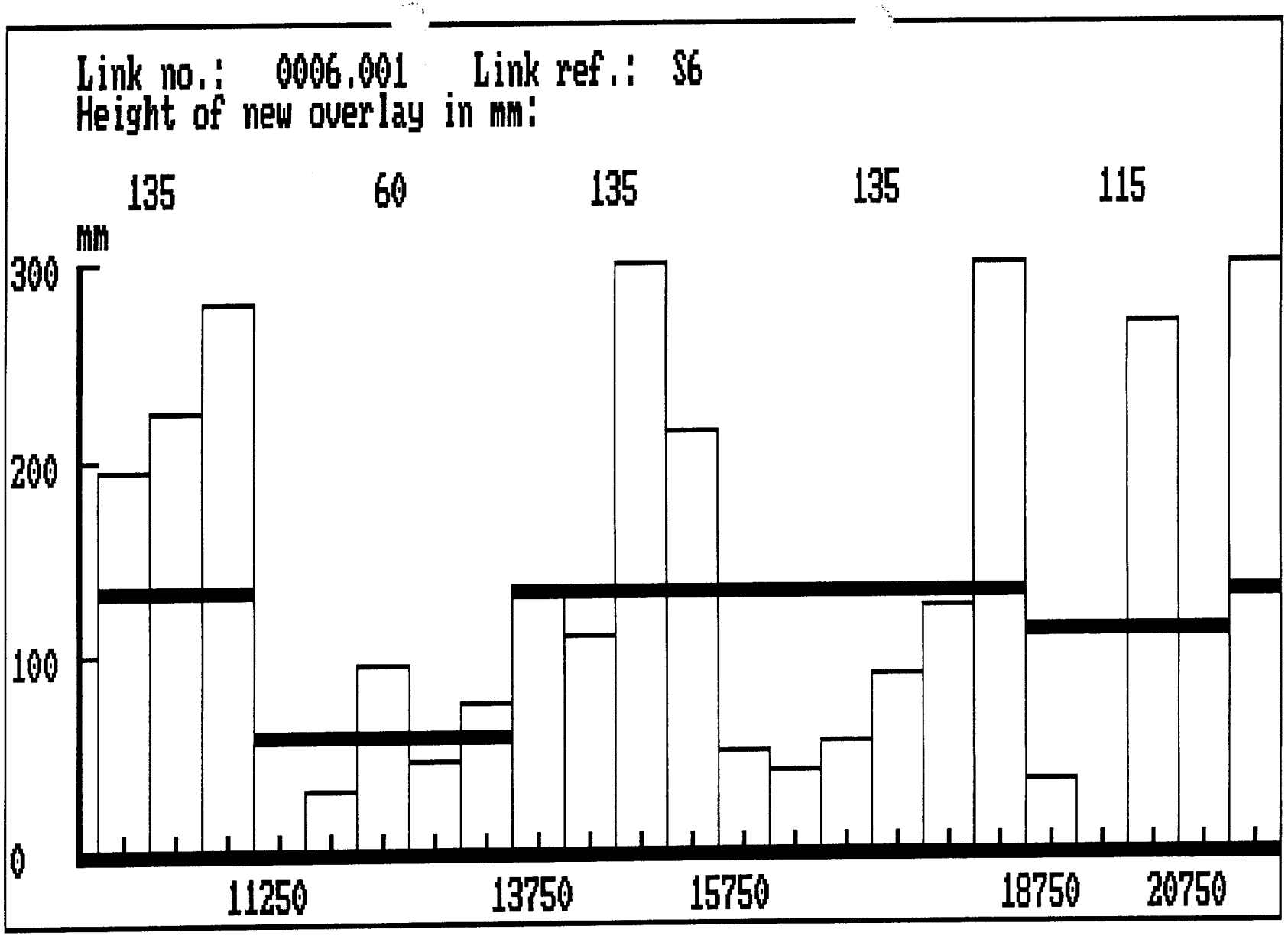
Mea. date: 24/04/92

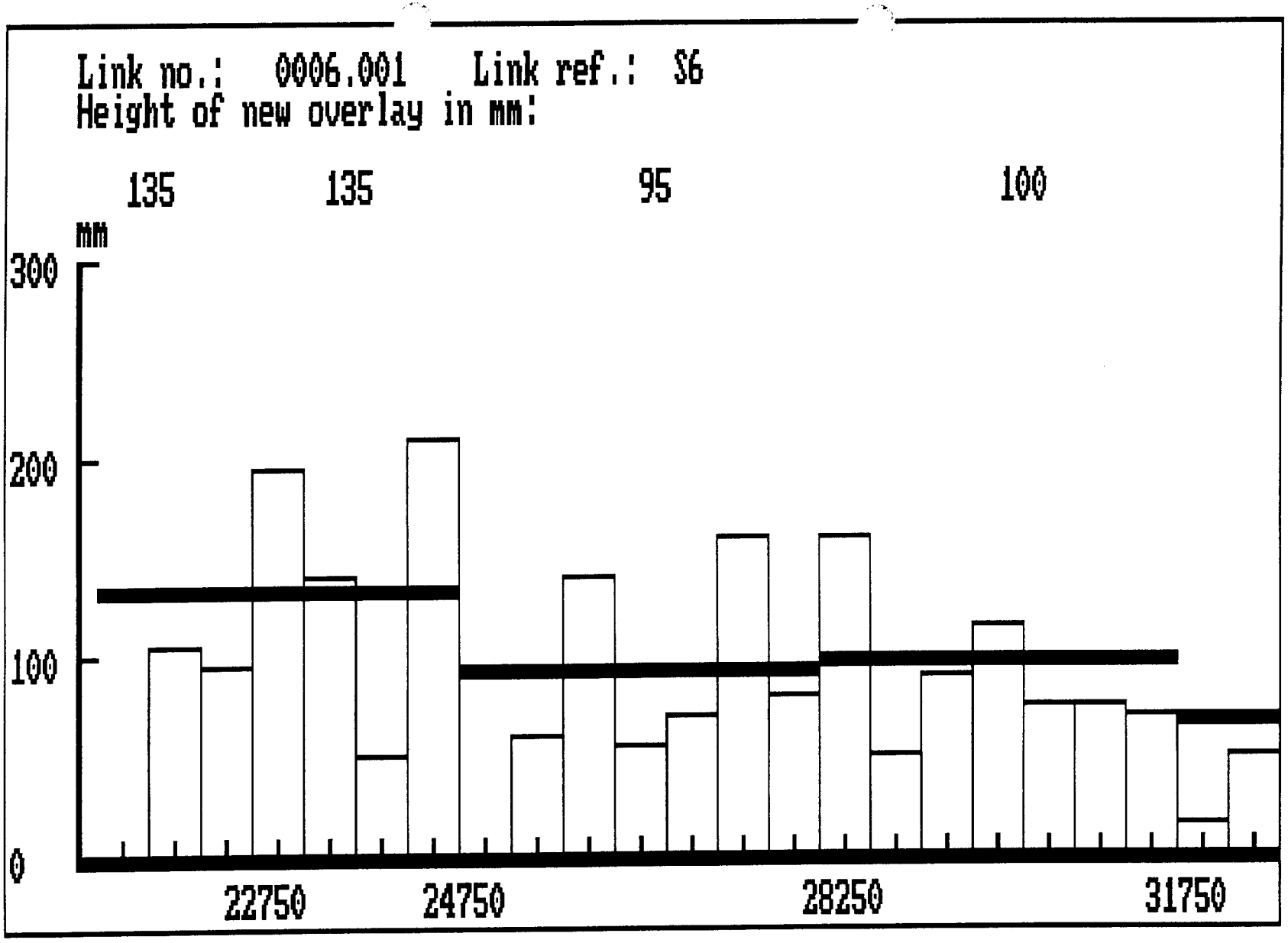
The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might be material or technical reasons why another layer thickness than the here stated should be carried out, especially in connection with thin overlay thicknesses.

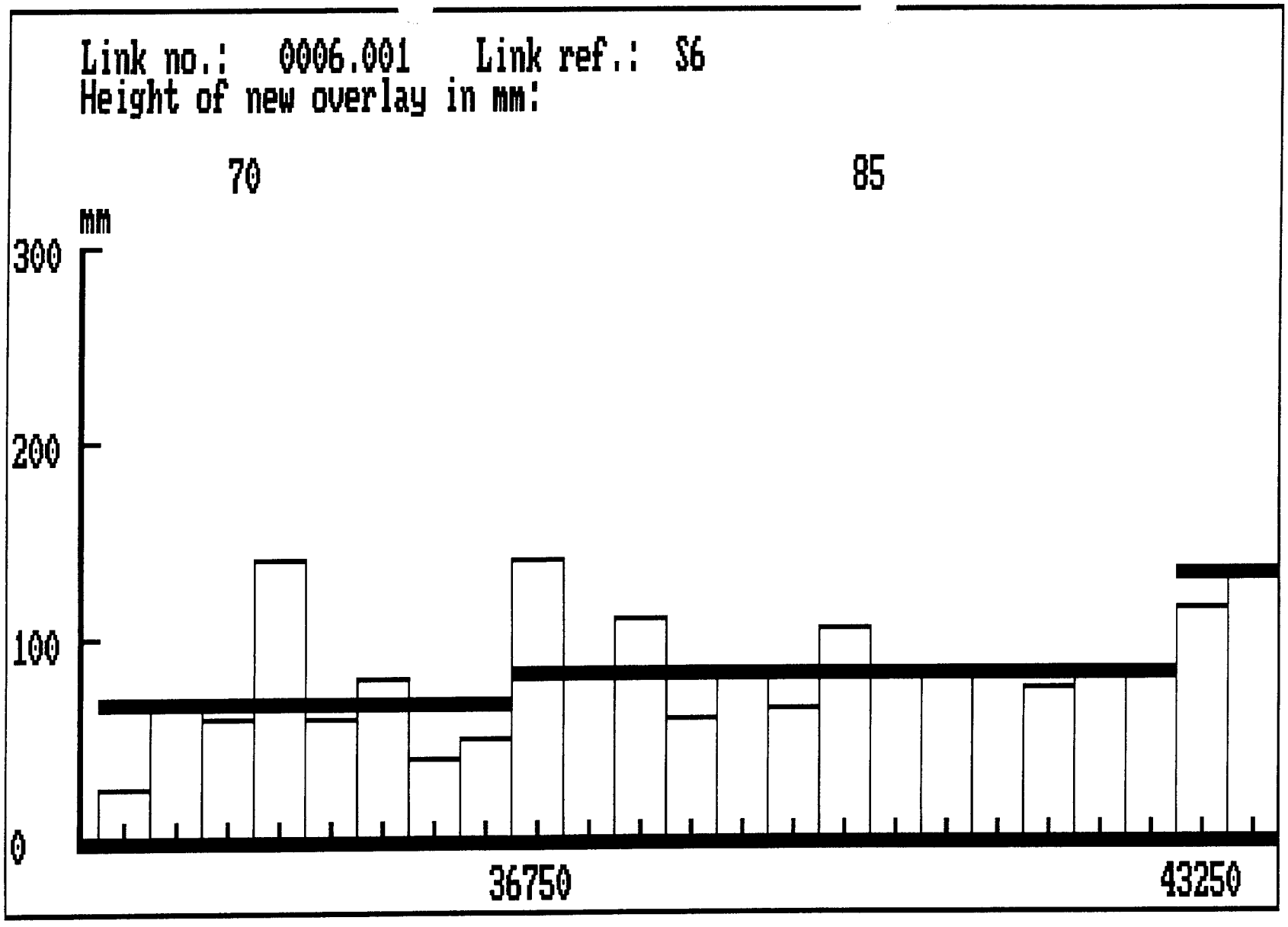
Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
0 - 1250	135	1	15	1112
1250 - 3750	40	5	15	101
3750 - 5750	105	1	15	0
5750 - 9250	40	11	15	608
9250 - 11250	135	0	15	1991
11250 - 13750	60	4	15	236
13750 - 15750	135	0	15	1654
15750 - 18750	135	2	15	1114
18750 - 20750	115	8	15	1046
20750 - 22750	135	2	15	1114
22750 - 24750	135	0	15	911
24750 - 28250	95	2	15	743
28250 - 31750	100	1	15	405
31750 - 36750	70	3	15	473
36750 - 43250	85	2	15	371
43250 - 46250	135	0	15	1114
46250 - 49750	75	8	15	878
49750 - 53250	105	3	15	1215
53250 - 57250	90	2	15	709
57250 - 61250	105	0	15	405
61250 - 63250	135	0	15	1586
63250 - 66250	135	0	15	675
66250 - 68250	75	3	15	0
68250 - 70250	135	0	15	878
70250 - 72750	135	0	15	2903
72750 - 76250	135	1	15	1789
76250 - 78750	135	2	15	1114
78750 - 82250	135	0	15	3679
82250 - 84750	120	0	15	0
84750 - 87250	135	0	15	1316
87250 - 90750	130	0	15	236

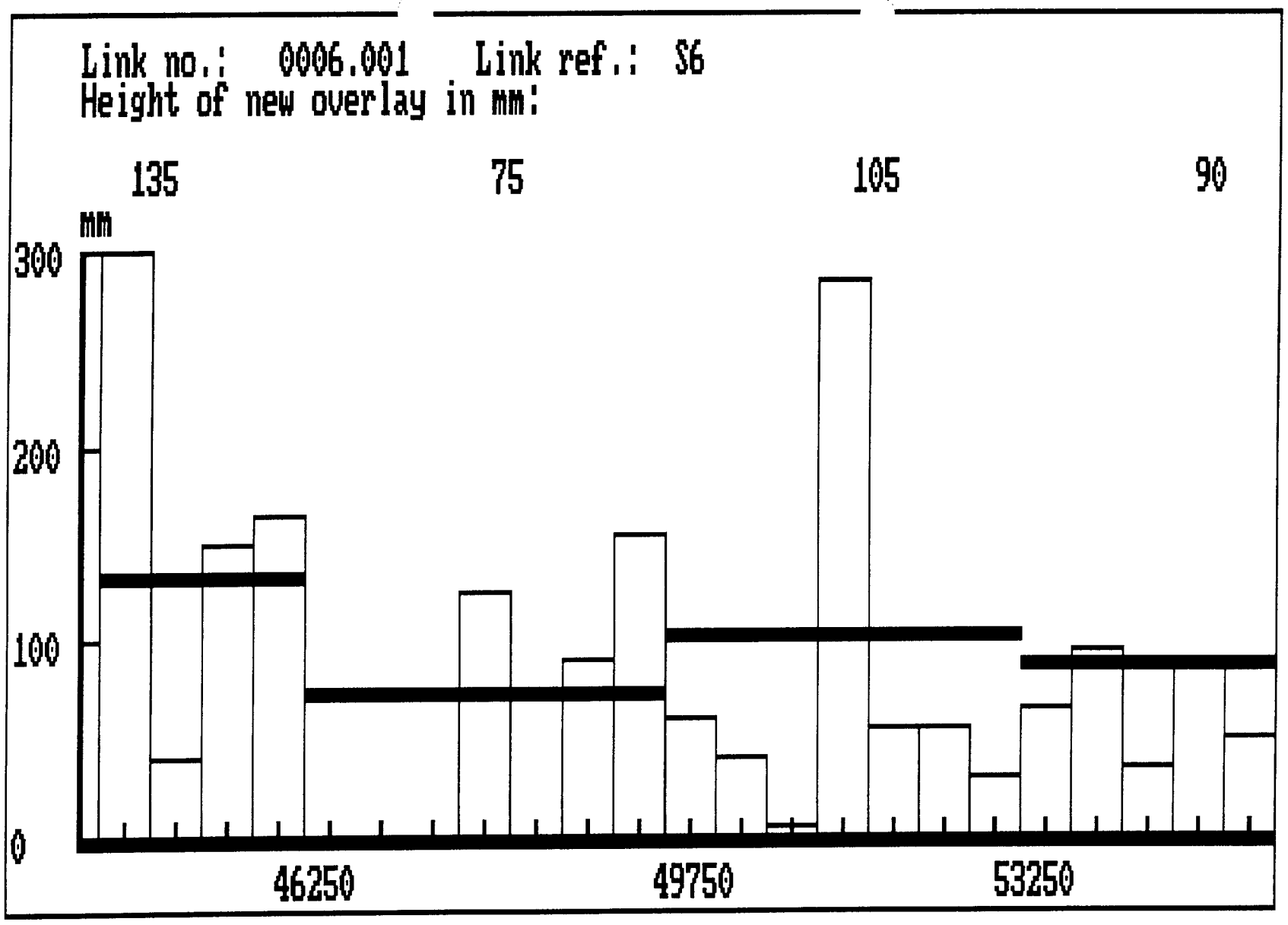
90750	-	94000	90	1	15	0

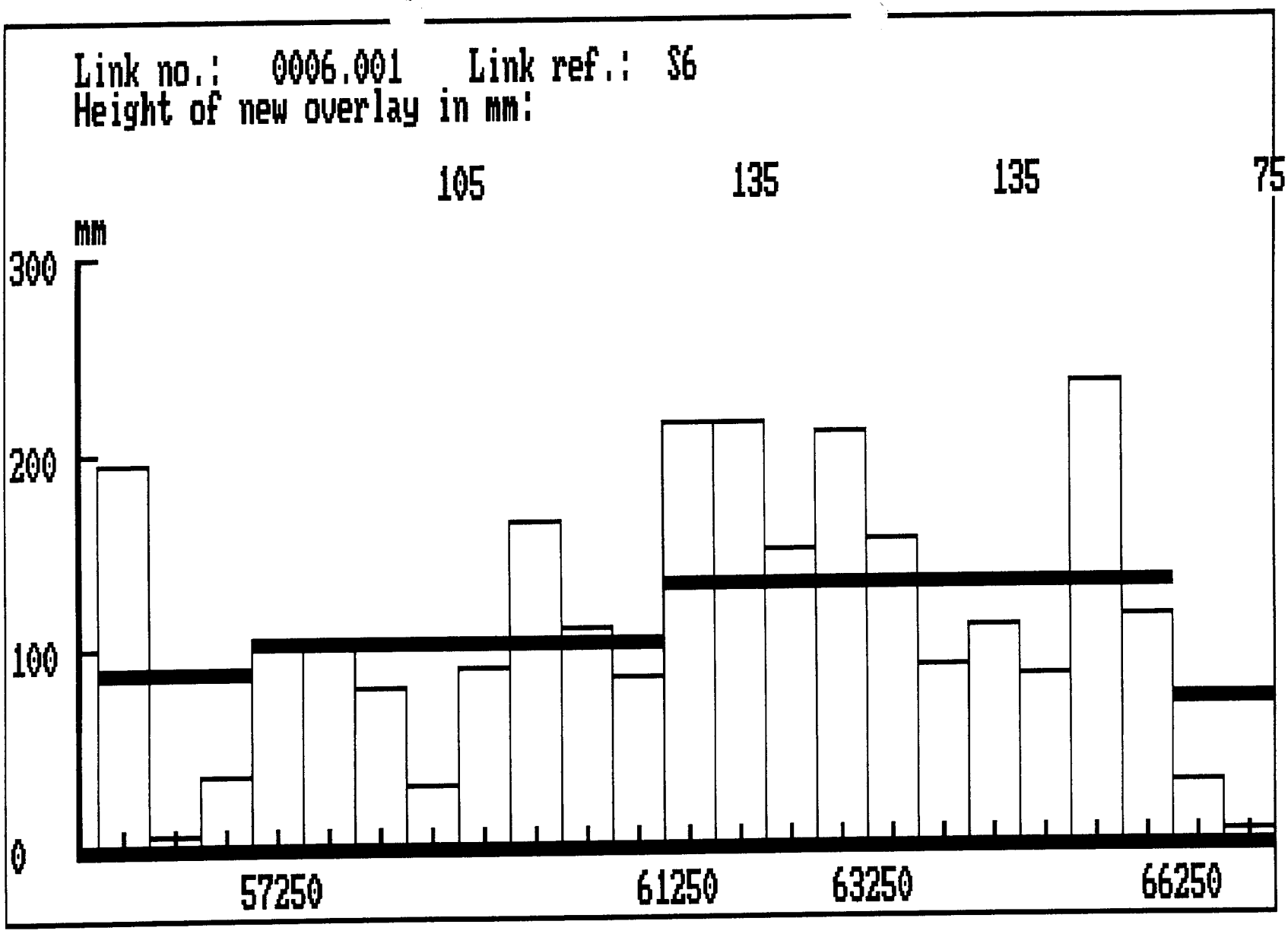

Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
40
105
40
mm
300
200
100
0
0
1250
3750
5750
9250

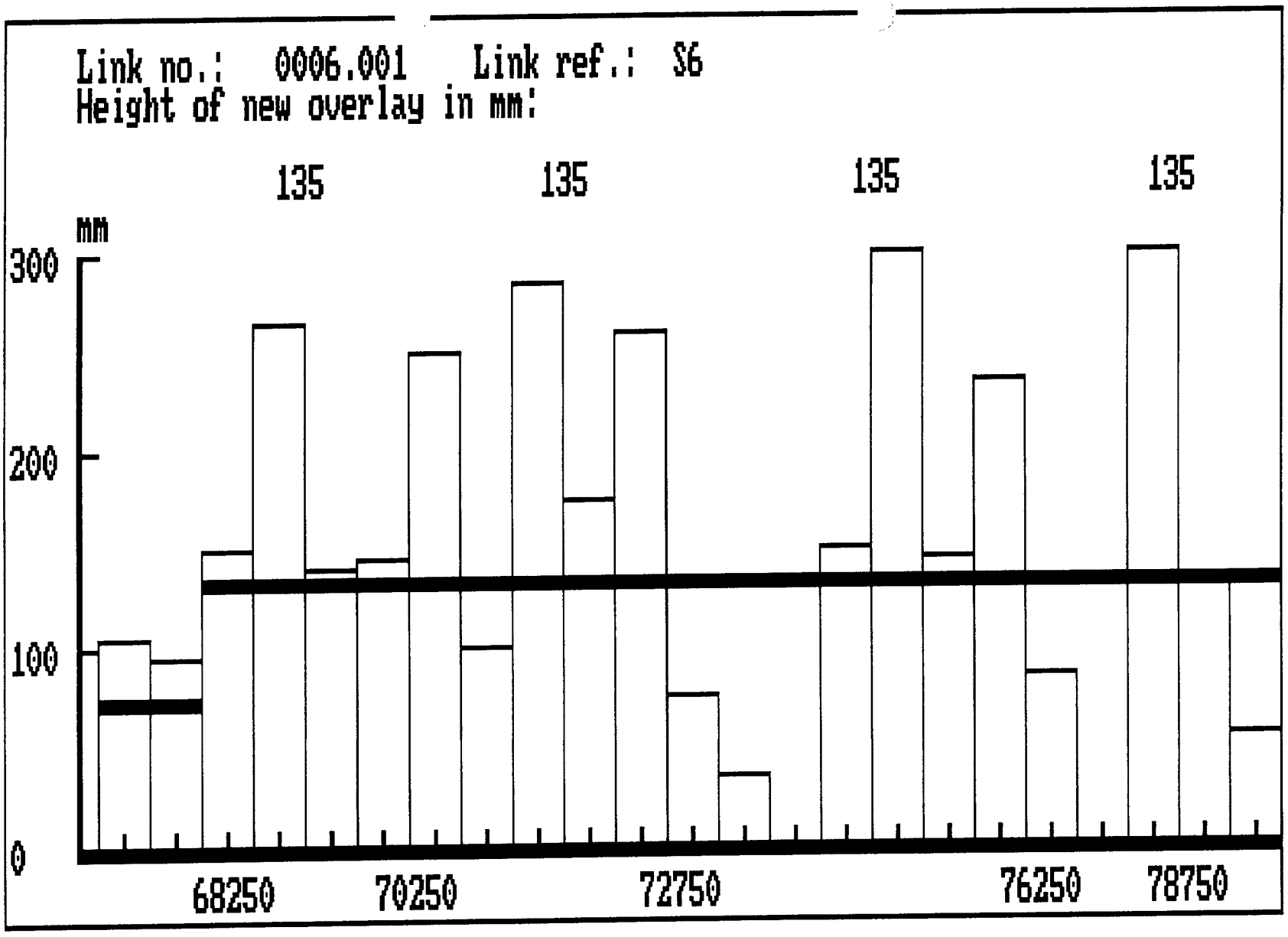

Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
60
135
135
115
mm
300
200
100
0
11250
13750
15750
18750
20750

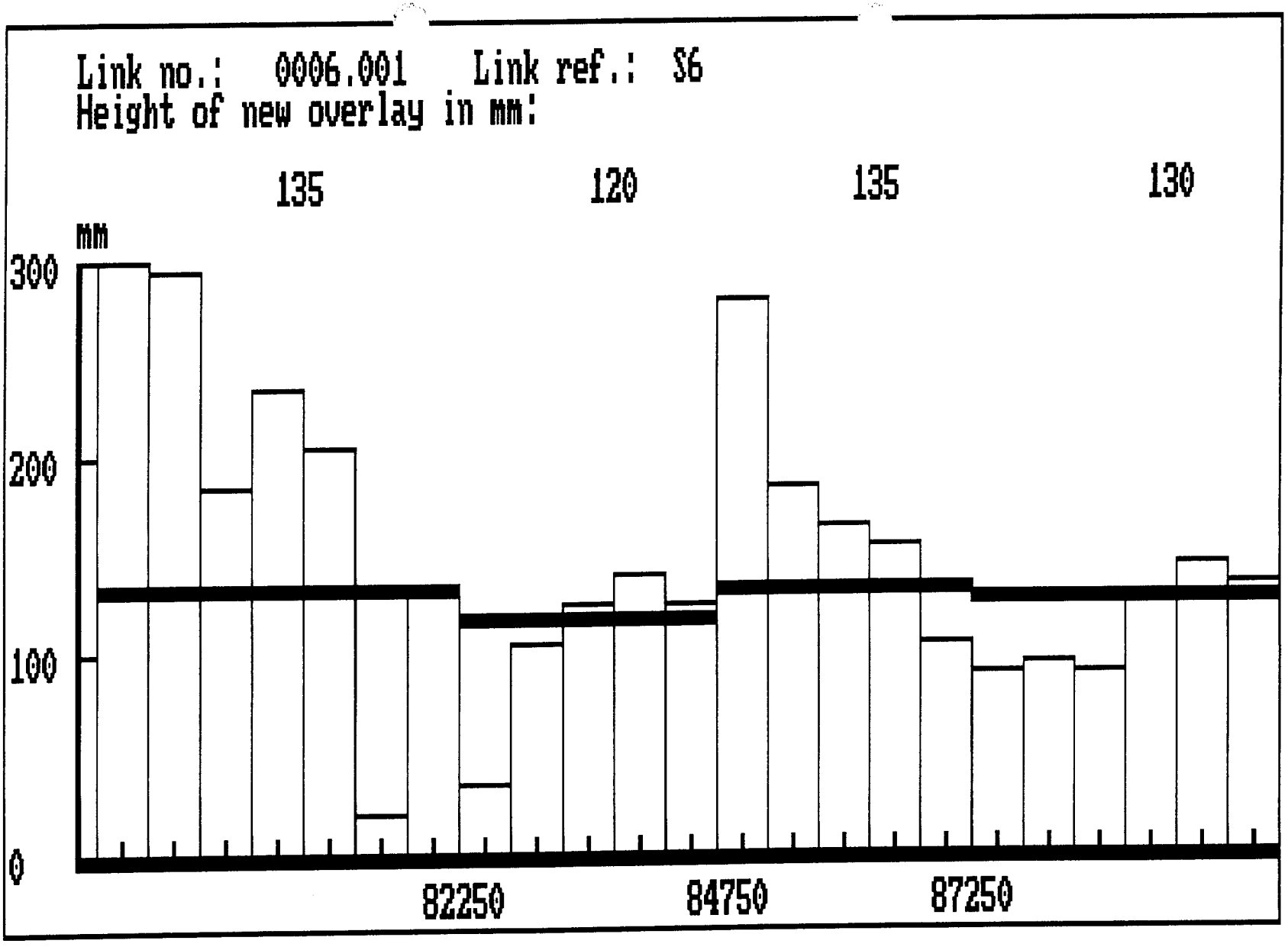

Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
135
95
100
mm
300
200
100
0
22750
24750
28250
31750

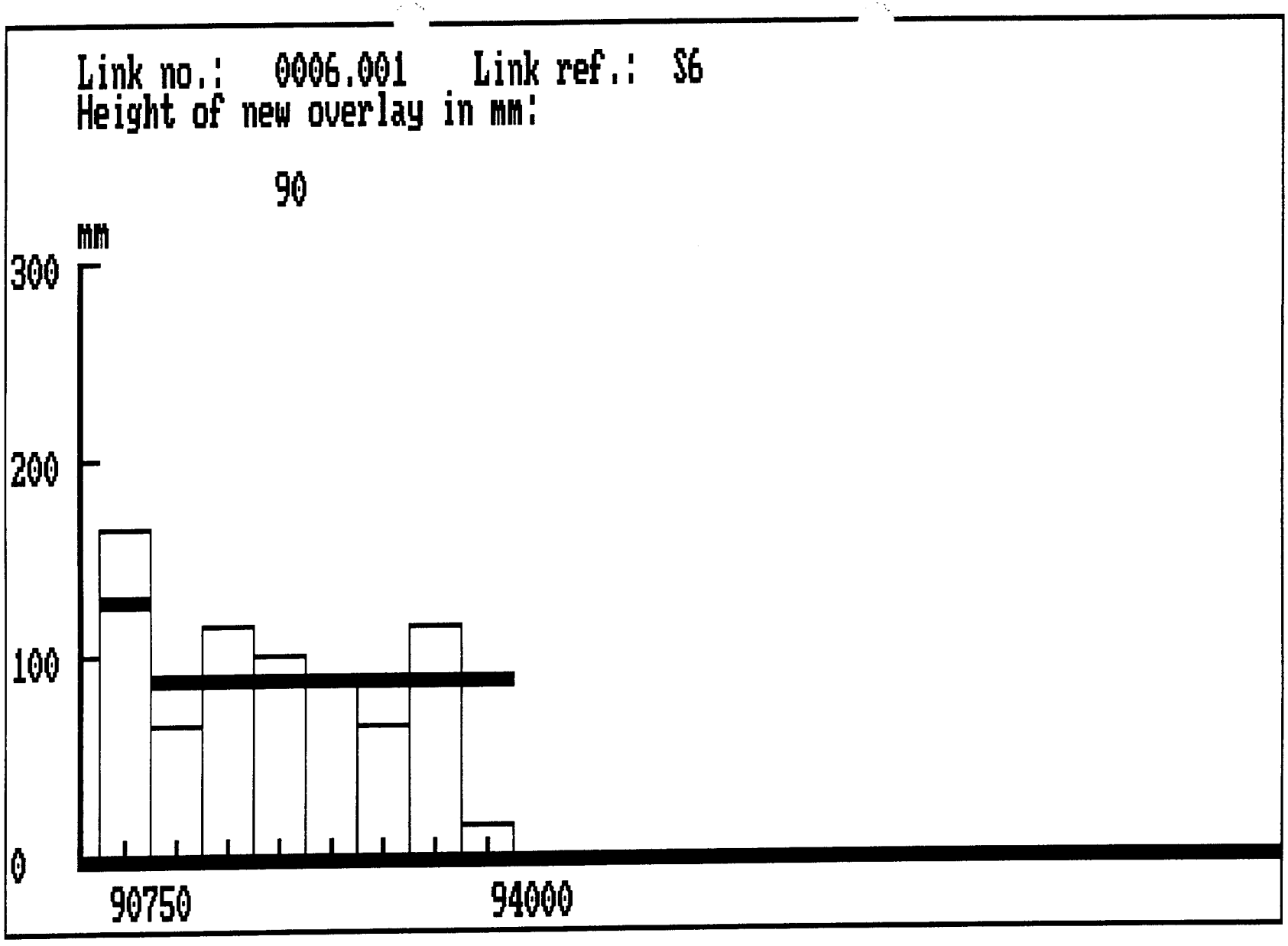

Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
70
85
mm
300
200
100
0
36750
43250


Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
75
105
90
mm
300
200
100
0
46250
49750
53250


Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
105
135
135
75
mm
300
200
100
0
57250
61250
63250
66250


Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
135
135
135
mm
300
200
100
0
68250
70250
72750
76250
78750


Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
135
120
135
130
mm
300
200
100
0
82250
84750
87250


Link no.: 0006.001 Link ref.: S6
Height of new overlay in mm:
90
mm
300
200
100
0
90750
94000

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TAC18

Sec. no.: 0001

Link no.: 0007.001

Design date: 11 10 1997

Link ref.: 87

Mea. date: A8 2

The classification is based on sections -> 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as indicative, as there might
be material or technical reasons why another layer thickness than the here
stated should be carried out, especially in connection with thin
overlay thicknesses.

Section		Overlay Thickness in mm	<---------Life---------> before years	after years	extra tons
0	3750	60	5	15	338
3750	7750	135	0	15	473
7750	11250	55	5	15	0
11250	15250	120	0	15	405
15250	17750	135	0	15	0
17750	19750	135	0	15	2194
19750	22250	135	0	15	2835
22250	24250	135	0	15	2363
24250	26000	135	0	15	2160

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

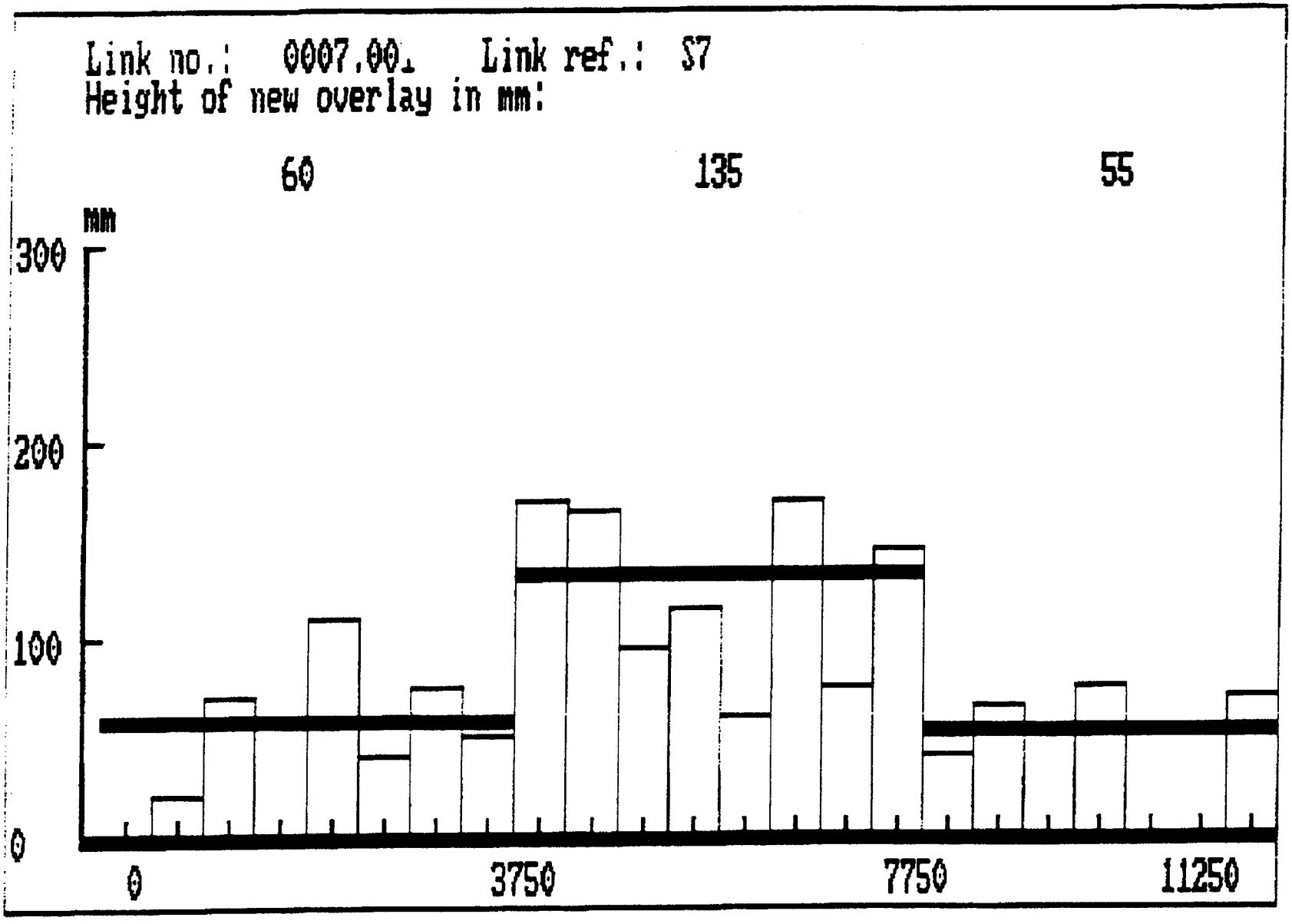
Link no.: 0007.001

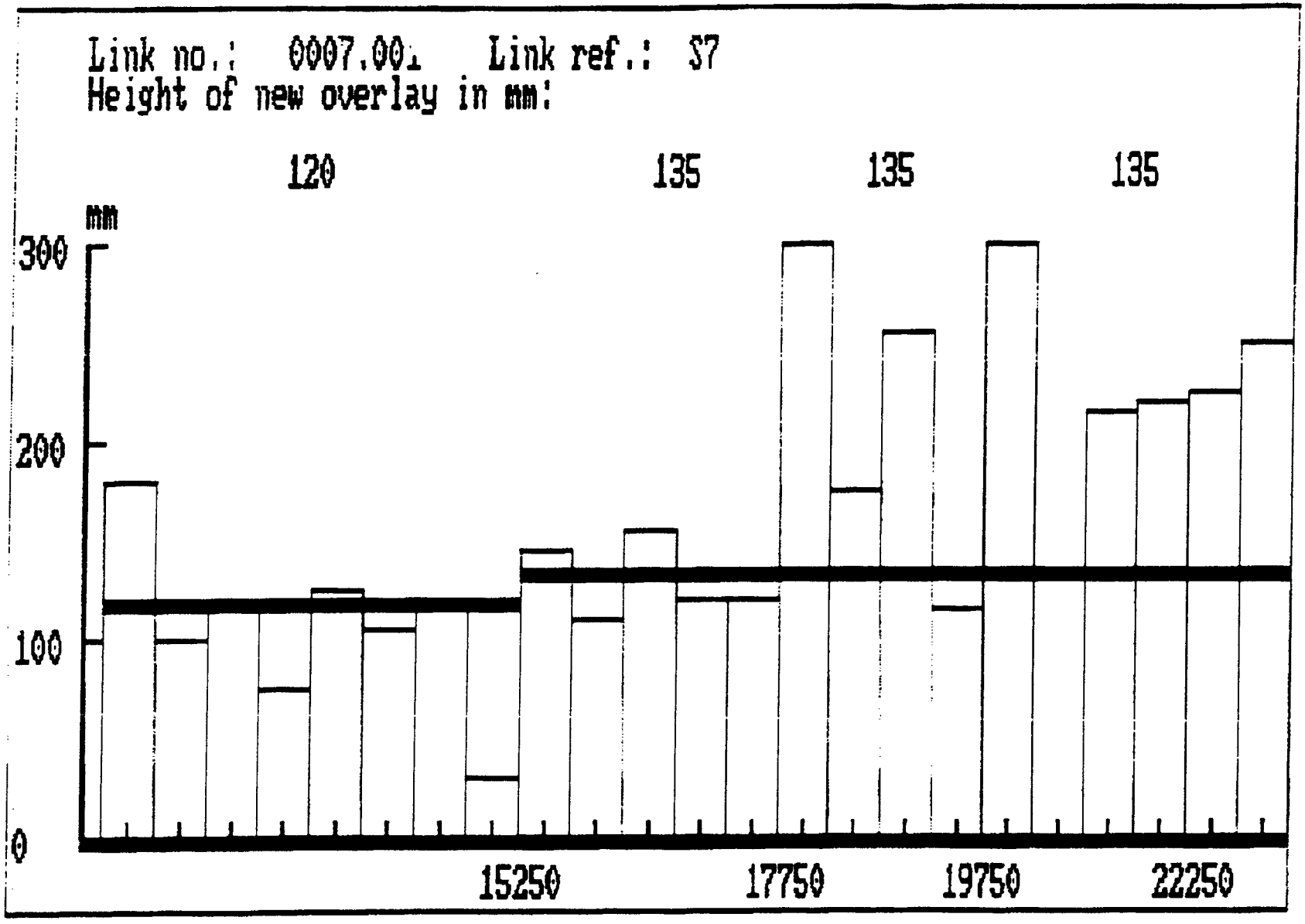
Design date: 06-25-1997

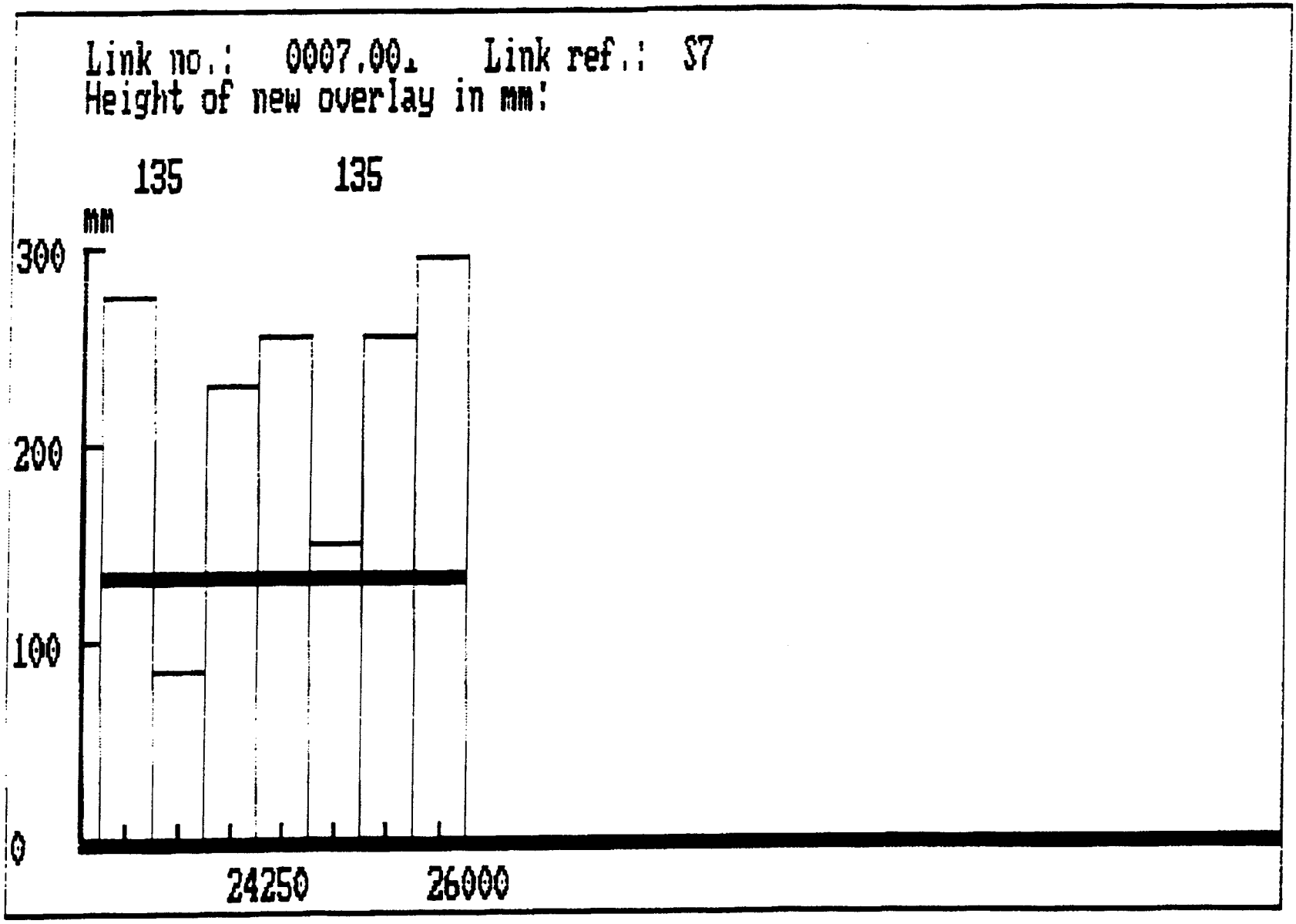
Link ref.: S7 Mea. date: AS 2

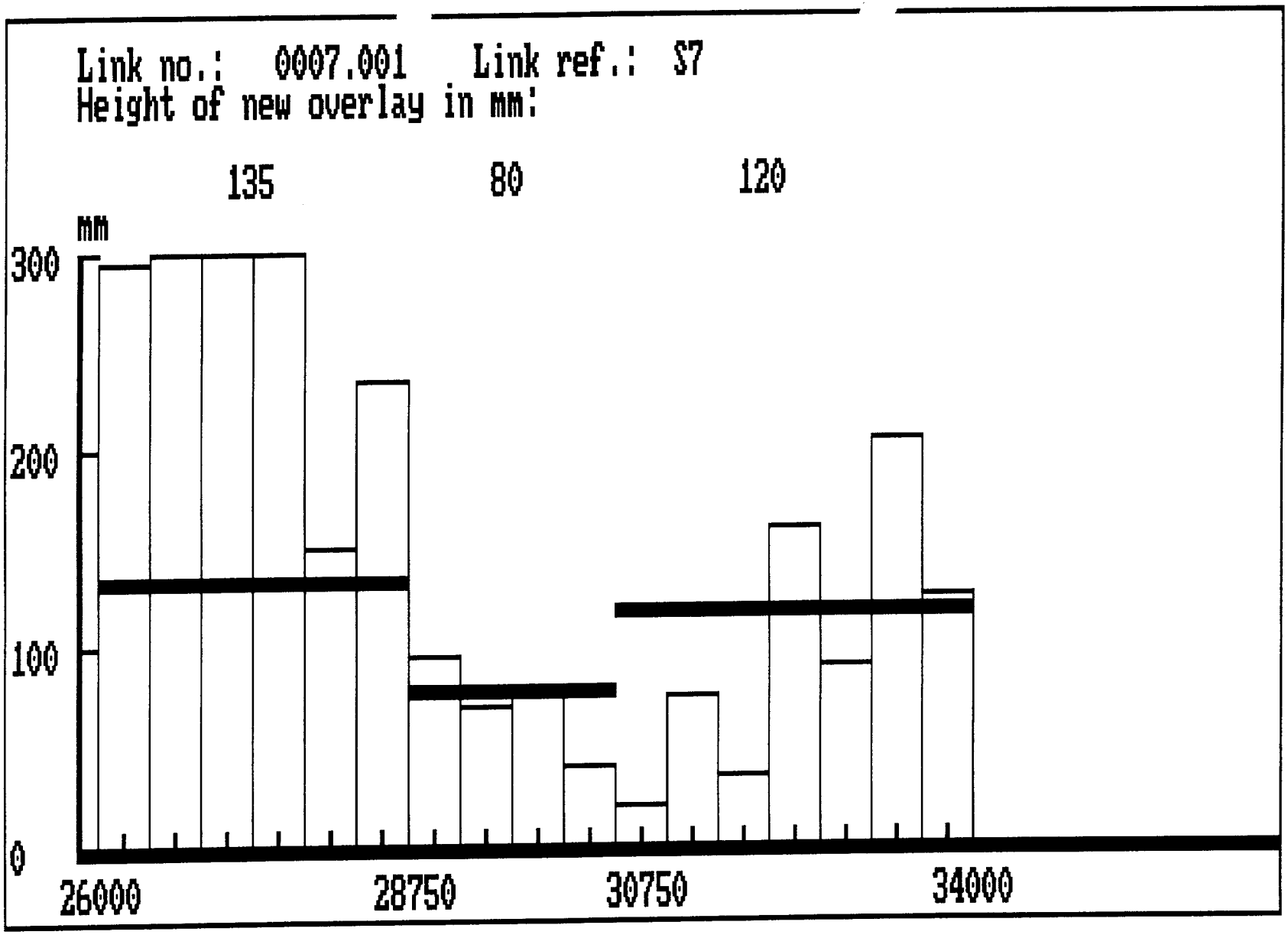
The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might
be material or technical reasons why another layer thickness than the here
stated should be carried out, especially in connection with thin
overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
26000 - 28750	135	0	15	4556
28750 - 30750	80	2	15	0
30750 - 34000	120	1	15	844


Link no.: 0007.001 Link ref.: S7
Height of new overlay in mm:
60
135
55
mm
300
200
100
0
0
3750
7750
11250


Link no.: 0007.001 Link ref.: S7
Height of new overlay in mm:
120
135
135
135
mm
300
200
100
0
15250
17750
19750
22250


Link no.: 0007.00 Link ref.: S7
Height of new overlay in mm:
135
135
mm
300
200
100
0
24250
26000


Link no.: 0007.001 Link ref.: S7
Height of new overlay in mm:
135
80
120
mm
300
200
100
0
26000
28750
30750
34000

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0009.001

Design date: 06-25-1997

Link ref.: S9

Mea. date: 2249 2

The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might be material or technical reasons why another layer thickness than the here stated should be carried out, especially in connection with thin overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
0 - 3250	15	14	15	203
3250 - 6250	140	0	15	1755
6250 - 9250	30	13	15	270
9250 - 11250	140	0	15	2531
11250 - 14500	85	4	15	776
14500 - 16750	140	0	15	1029
16750 - 27750	90	4	15	2126
27750 - 29750	140	0	15	236
29750 - 33250	95	3	15	844
33250 - 35000	65	8	15	287

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0009.001

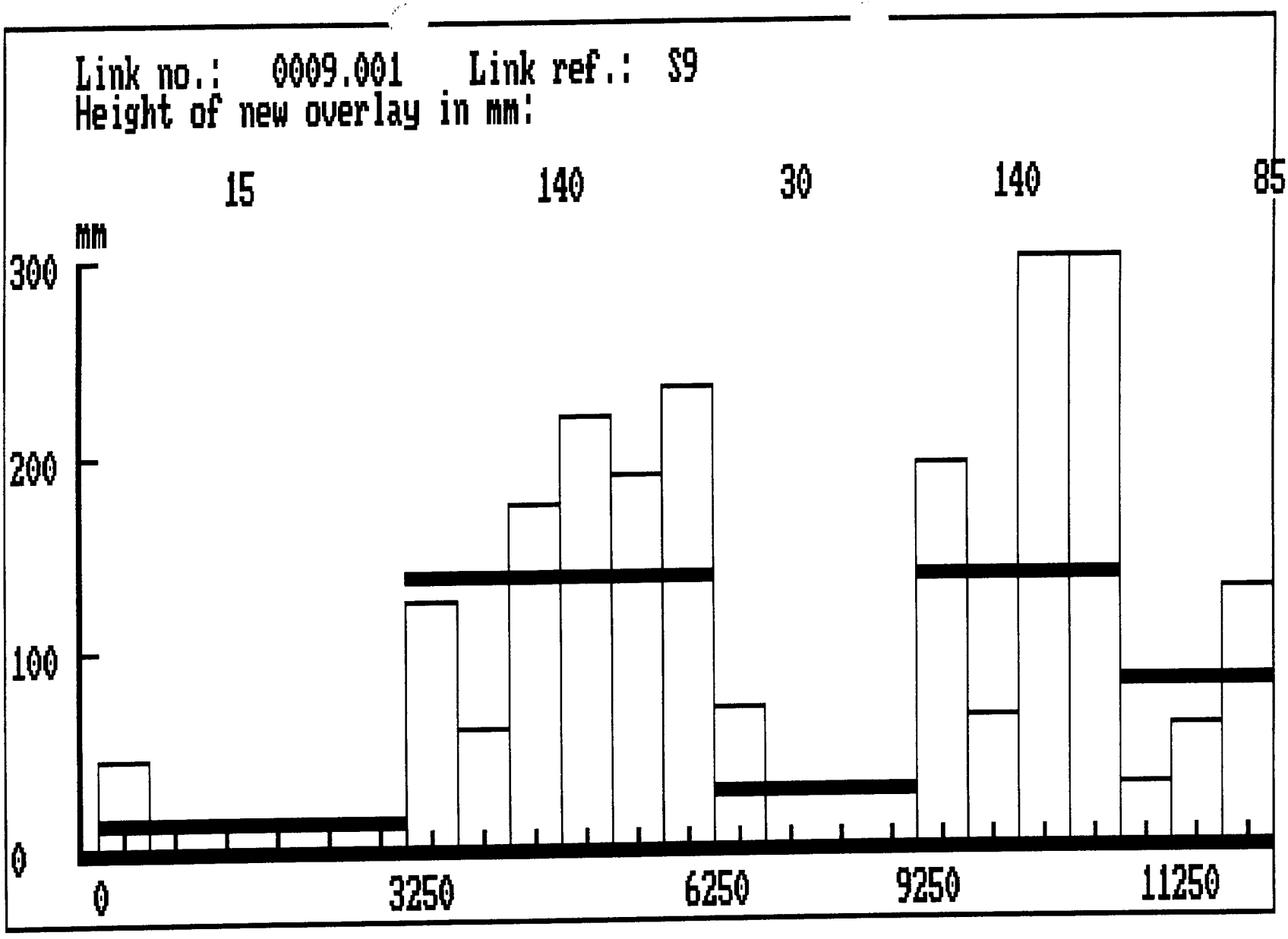
Design date: 11-10-1997

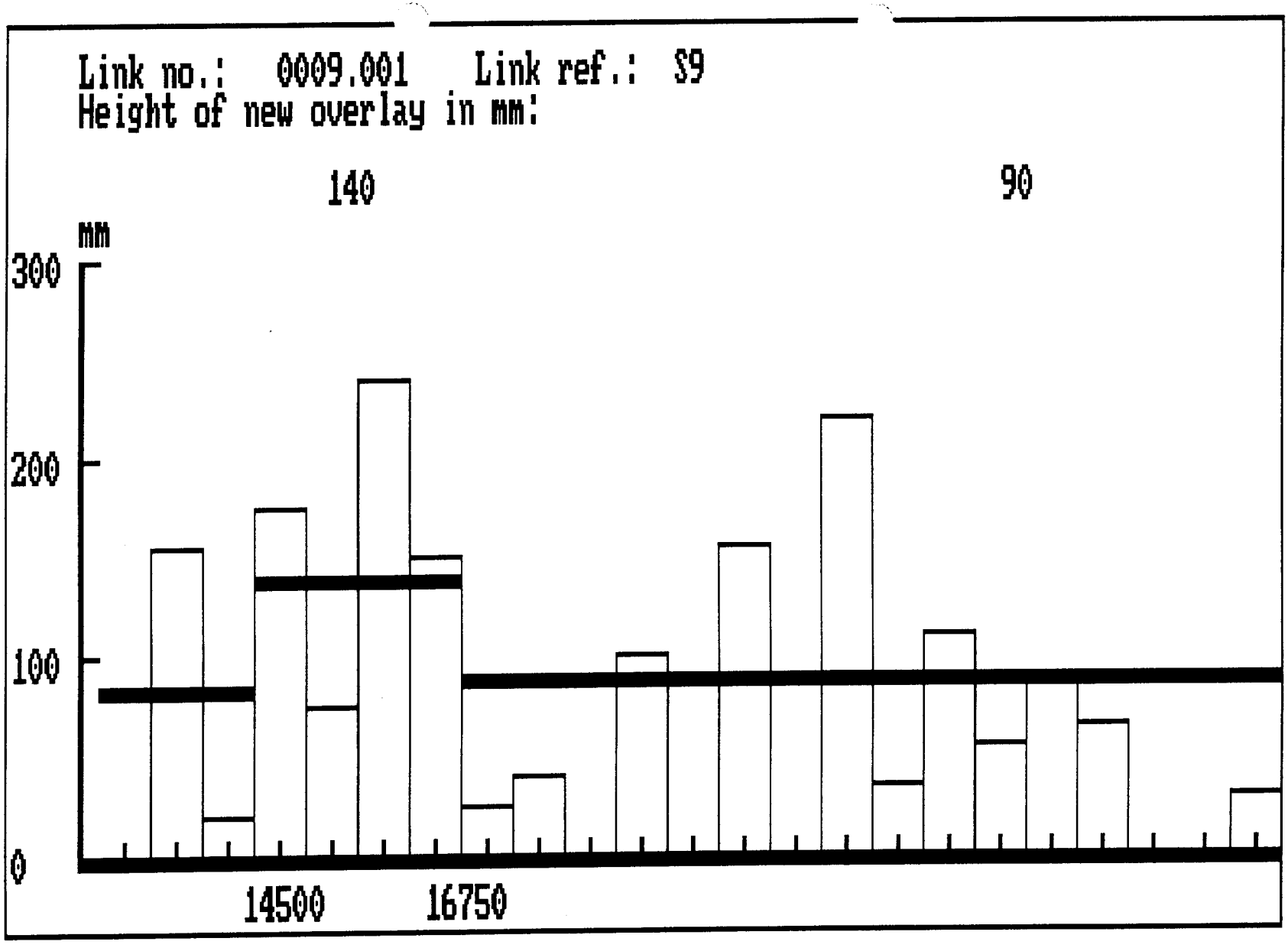
Link ref.: S9

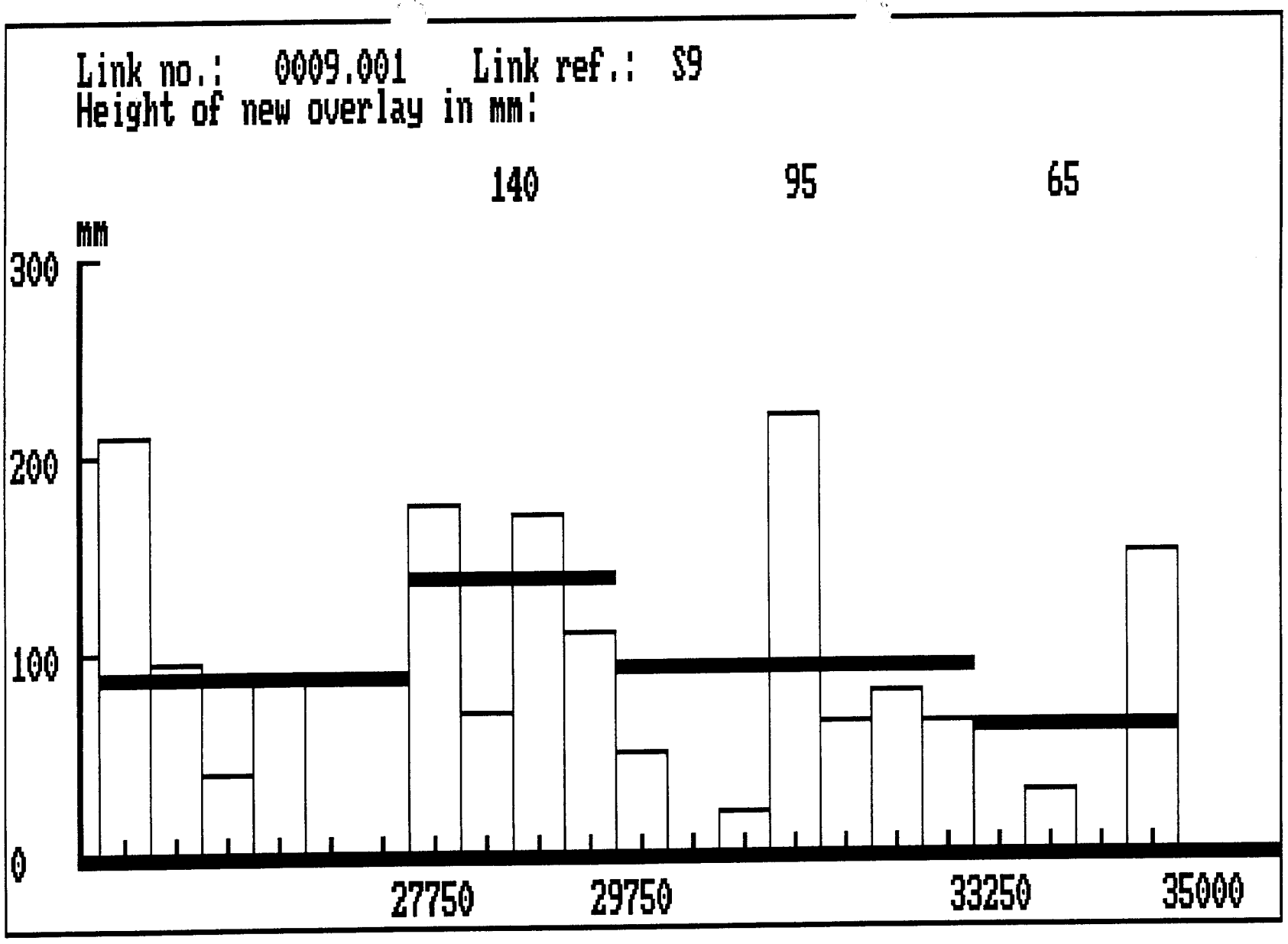
Mea. date: 2249 2

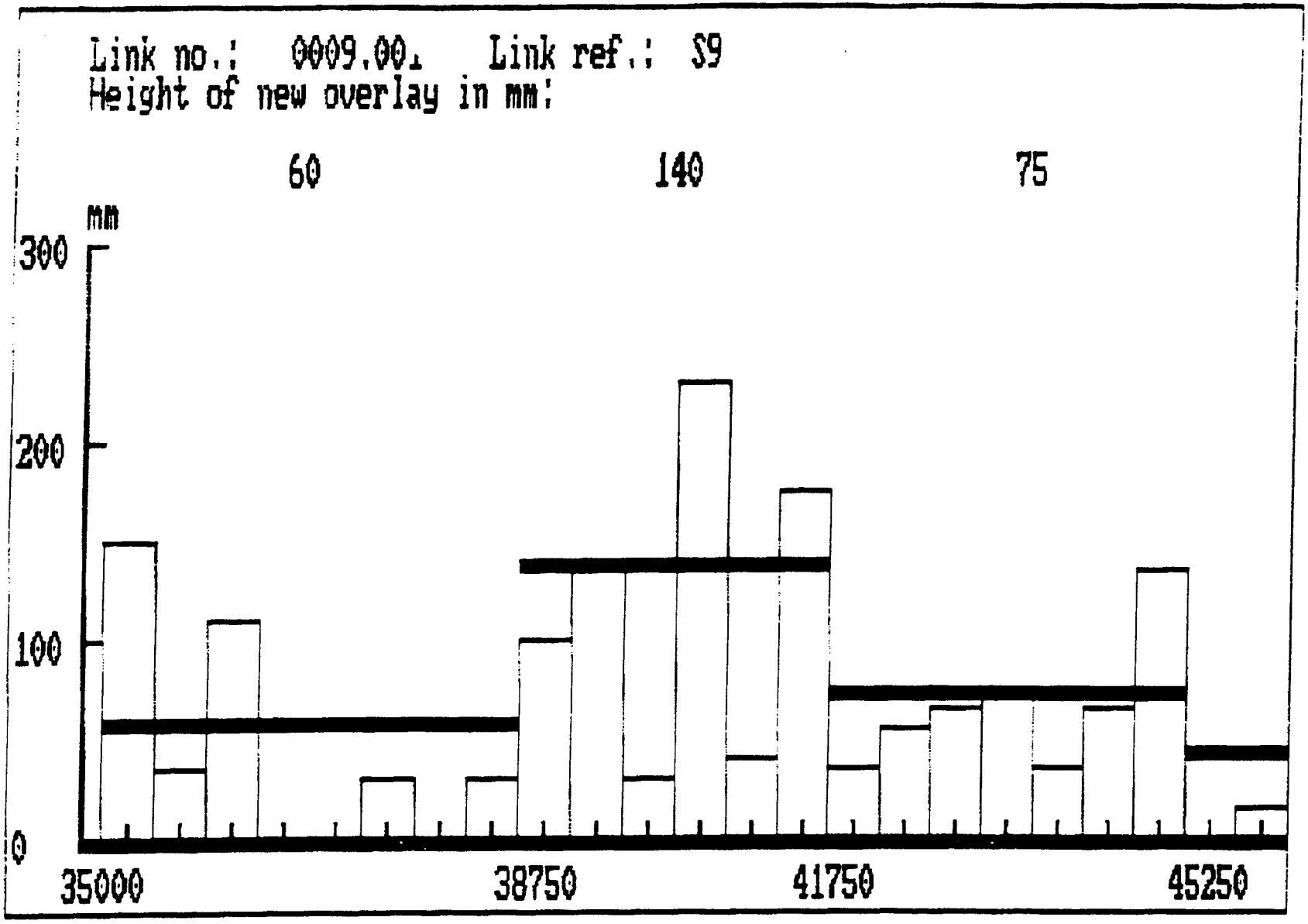
The classification is based on sections -> 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might
be material or technical reasons why another layer thickness than the here
stated should be carried out, especially in connection with thin
overlay thicknesses.

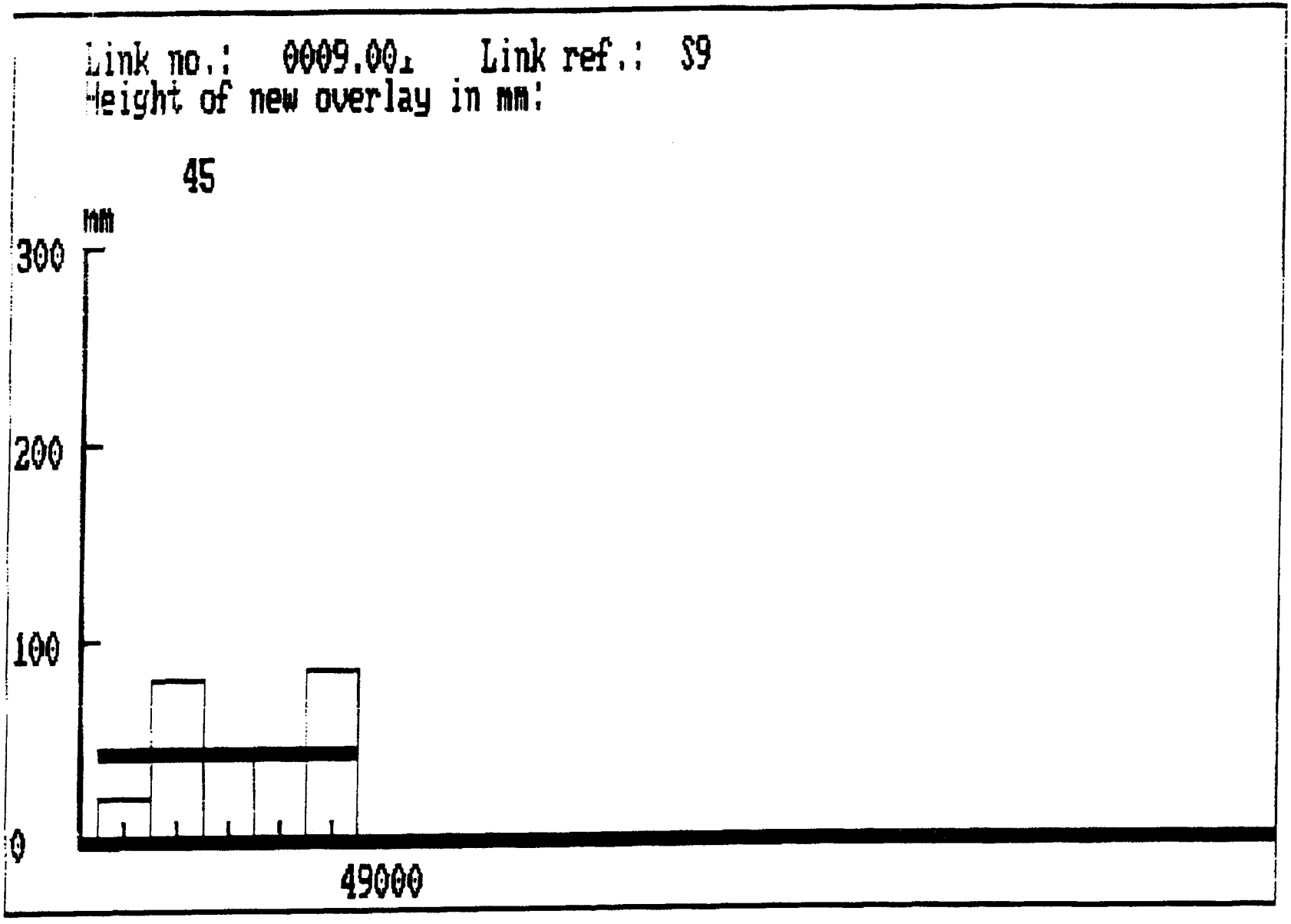
Section	Overlay Thickness in mm	<---- Life ----> before years	after years	extra tons
35000 - 38750	60	7	15	641
38750 - 41750	140	1	15	844
41750 - 45250	75	2	15	405
45250 - 49000	45	7	15	906


Link no.: 0009.001 Link ref.: S9
Height of new overlay in mm:
15
140
30
140
85
mm
300
200
100
0
0
3250
6250
9250
11250


Link no.: 0009.001 Link ref.: S9
Height of new overlay in mm:
140
90
mm
300
200
100
0
14500
16750


Link no.: 0009.001 Link ref.: S9
Height of new overlay in mm:
140
95
65
mm
300
200
100
0
27750
29750
33250
35000


Link no.: 0009.00 Link ref.: S9
Height of new overlay in mm:
60
140
75
mm
300
200
100
0
35000
38750
41750
45250


Link no.: 0009.00₁ Link ref.: S9
Height of new overlay in mm:
45
mm
300
200
100
0
49000

BEARING CAPACITY OF EQUAL SECTIONS

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A/S PHØNIX
P. P. C

Client: TACIS

Sec. no.: 0001

Link no.: 0012.001

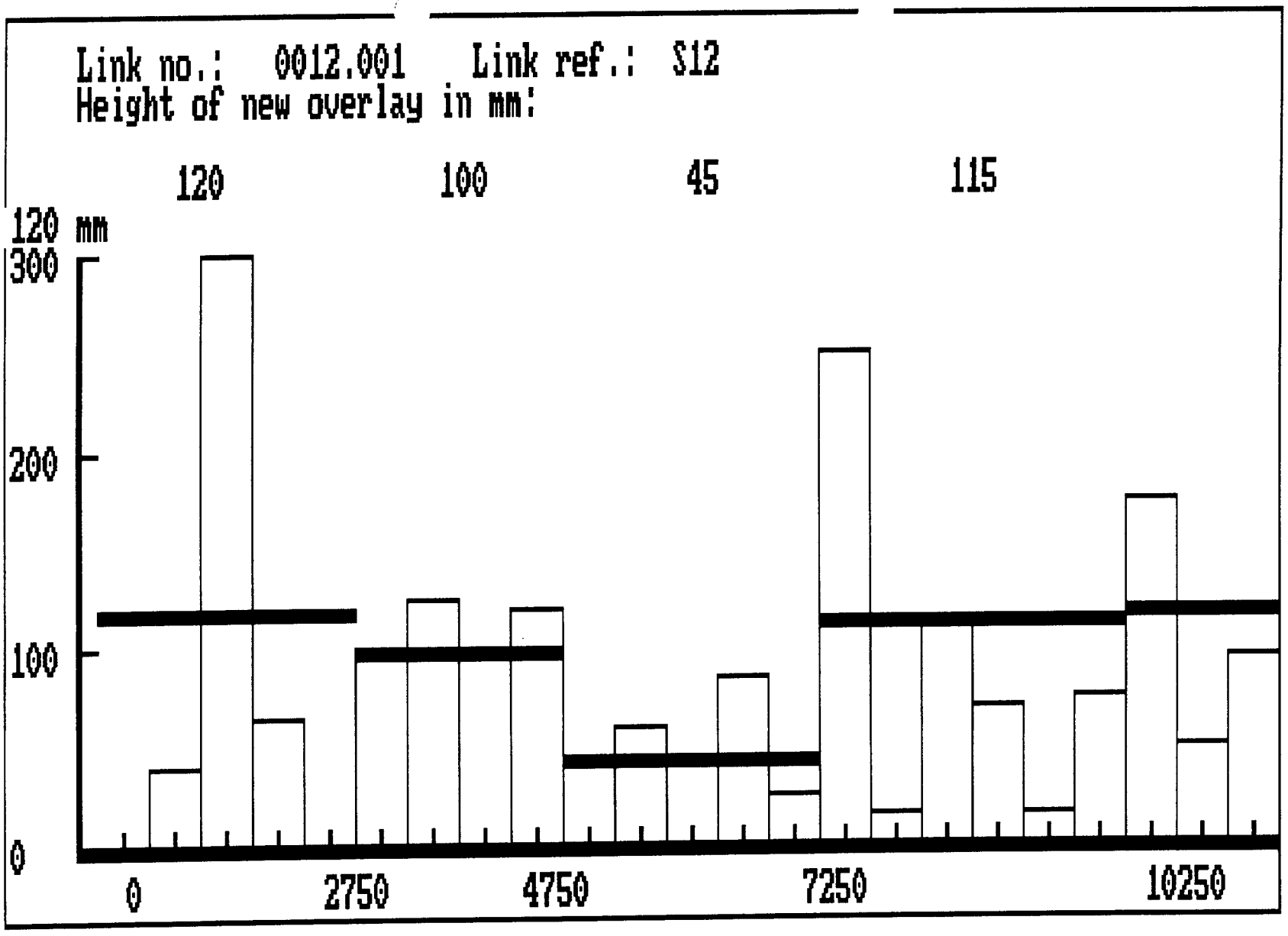
Design date: 06-25-1997

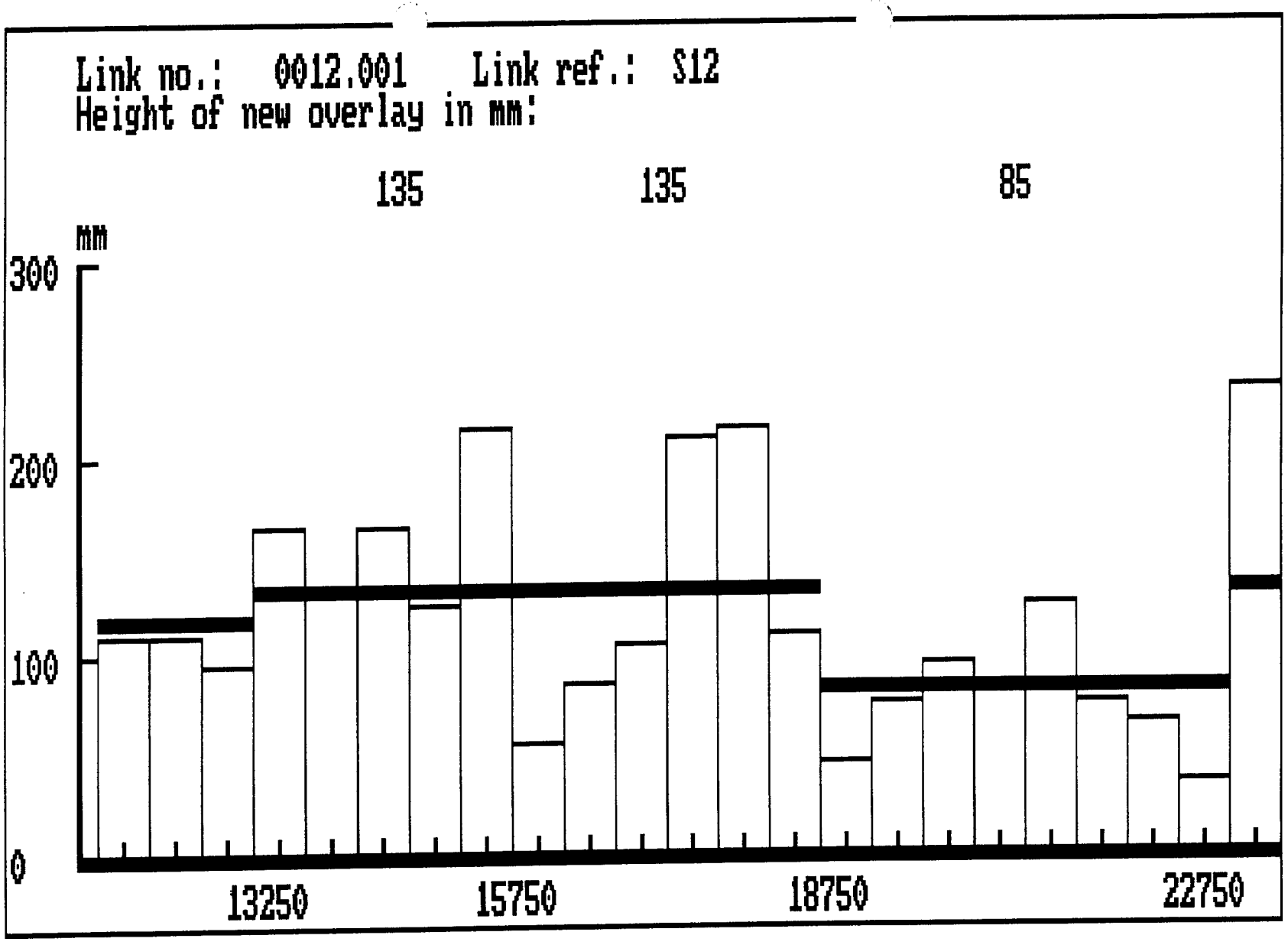
Link ref.: S12

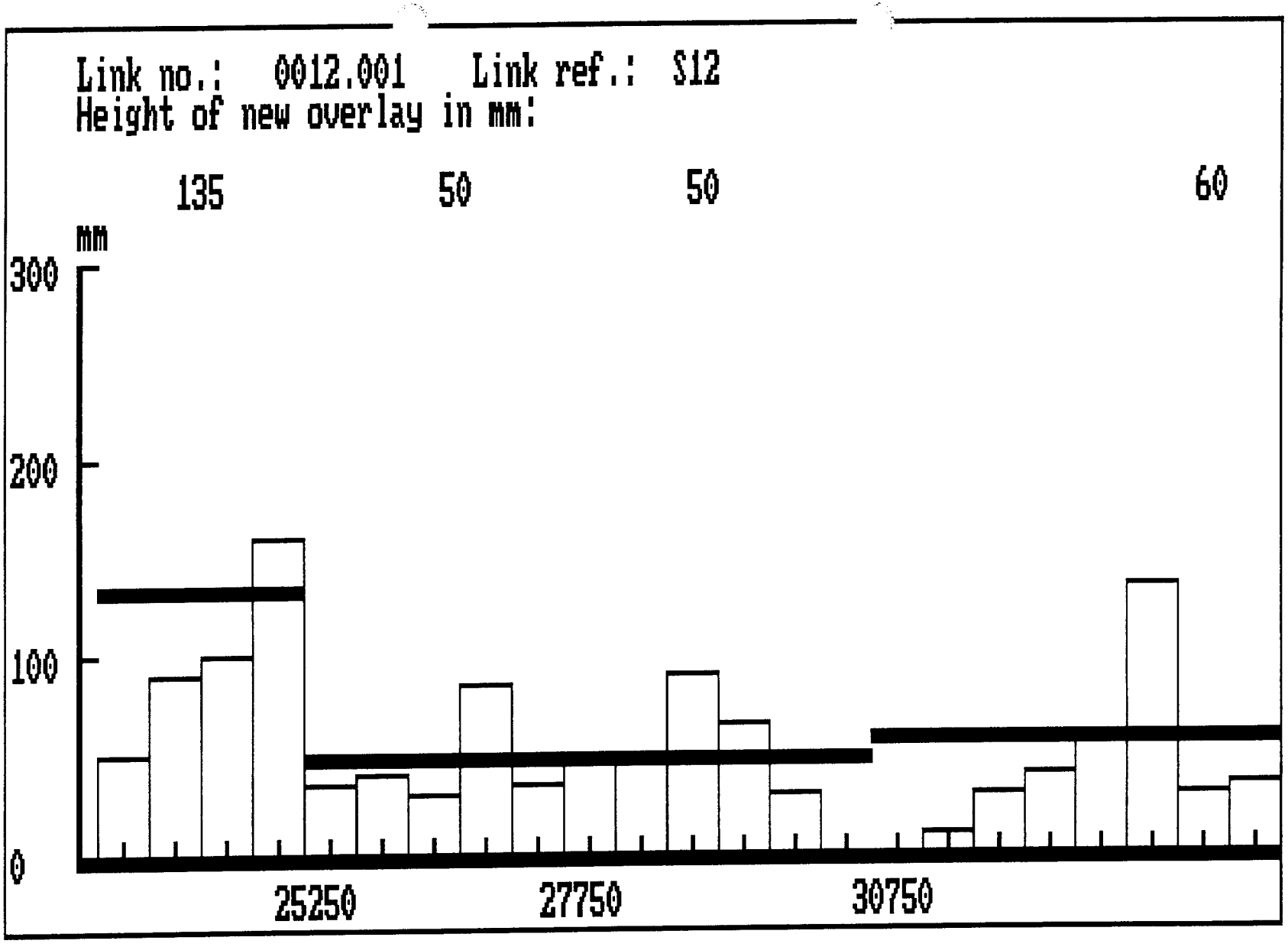
Mea. date: 2849 2

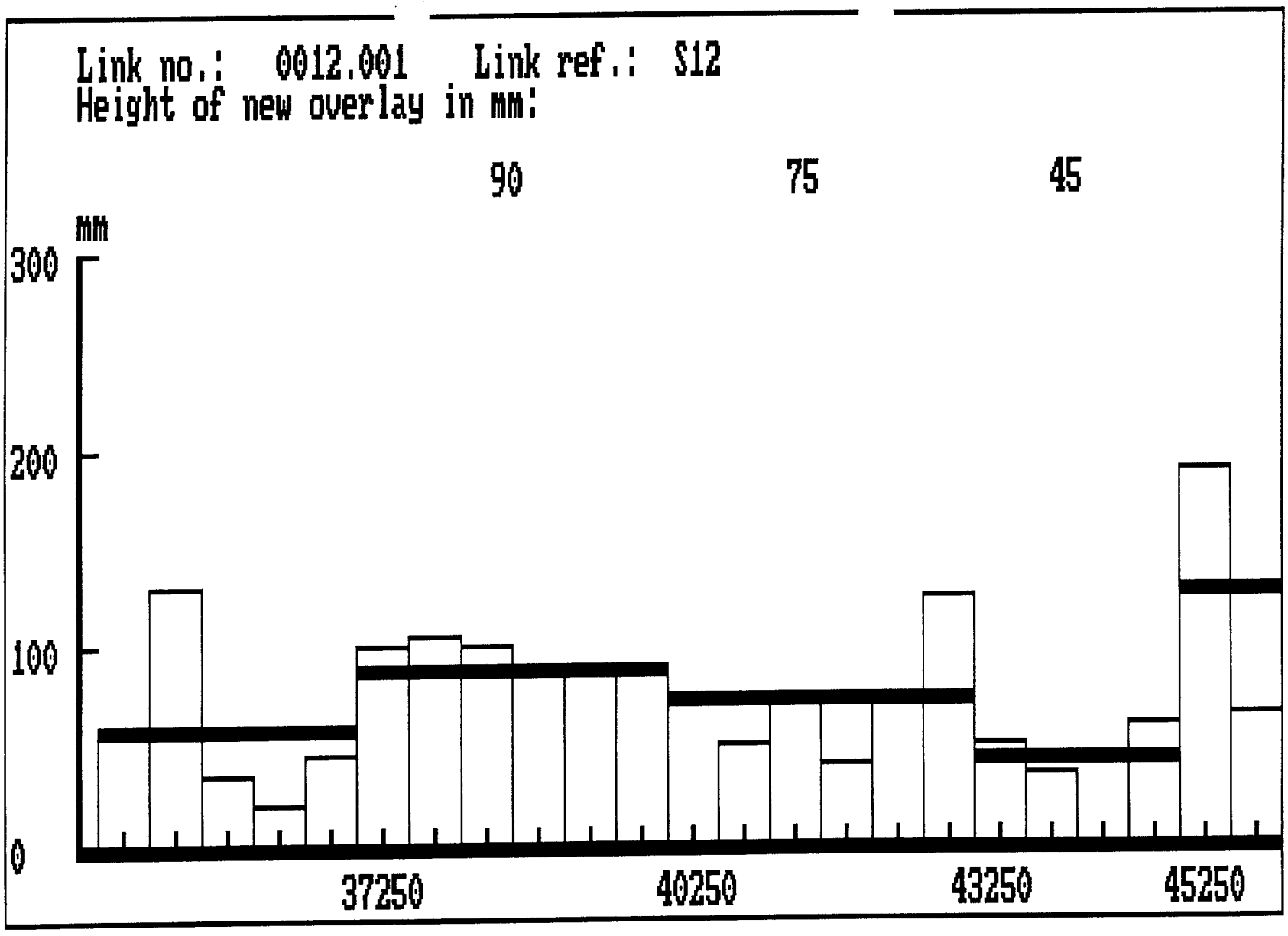
The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might
be material or technical reasons why another layer thickness than the here
stated should be carried out, especially in connection with thin
overlay thicknesses.

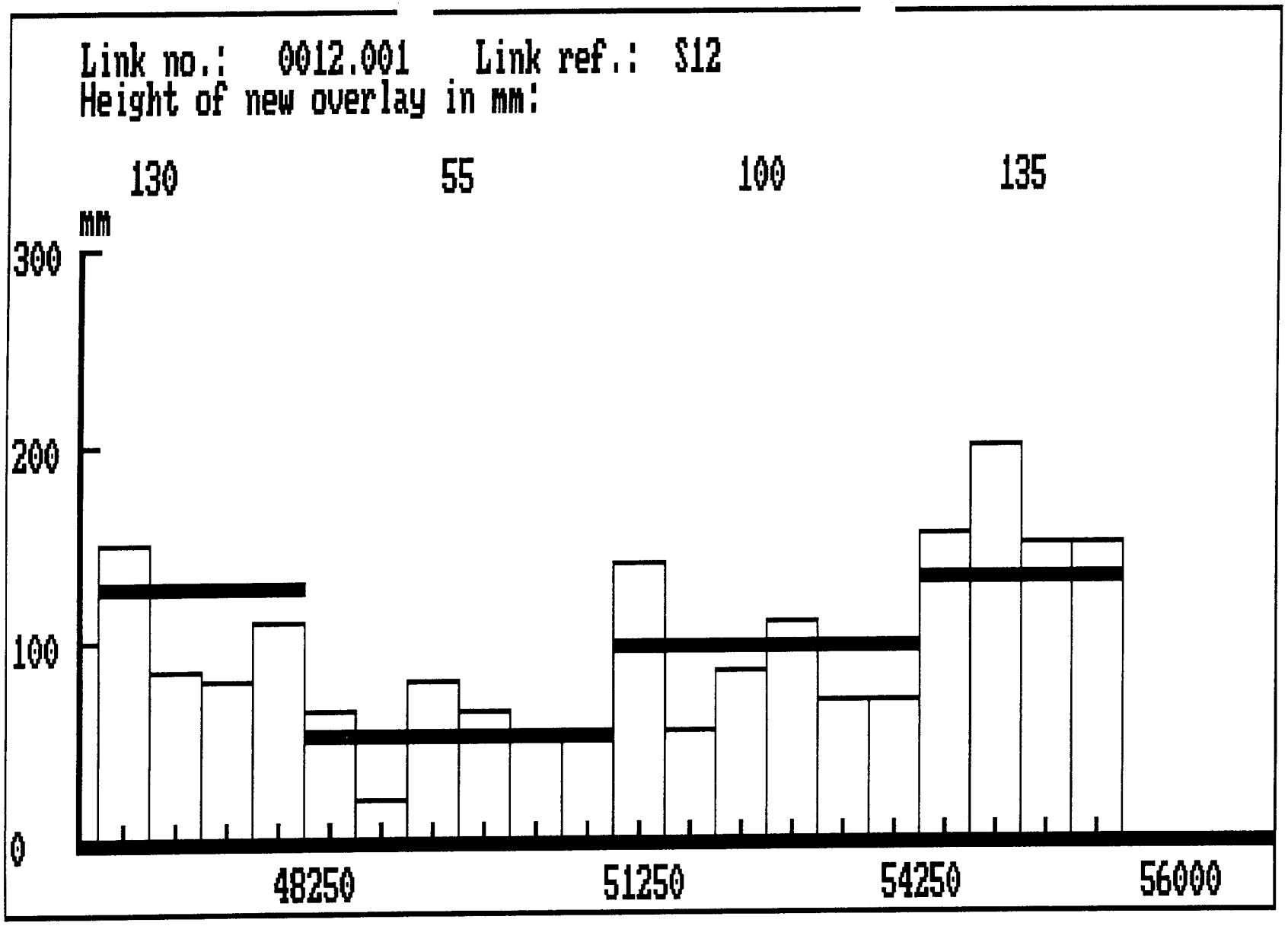
Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
0 - 2750	120	6	15	1215
2750 - 4750	100	2	15	0
4750 - 7250	45	6	15	270
7250 - 10250	115	2	15	911
10250 - 13250	120	0	15	371
13250 - 15750	135	0	15	540
15750 - 18750	135	0	15	1046
18750 - 22750	85	1	15	270
22750 - 25250	135	0	15	675
25250 - 27750	50	3	15	236
27750 - 30750	50	5	15	270
30750 - 37250	60	3	15	979
37250 - 40250	90	1	15	0
40250 - 43250	75	2	15	338
43250 - 45250	45	4	15	0
45250 - 48250	130	0	15	405
48250 - 51250	55	4	15	169
51250 - 54250	100	1	15	270
54250 - 56000	135	0	15	439


Link no.: 0012.001 Link ref.: S12
Height of new overlay in mm:
120
100
45
115
120 mm
300
200
100
0
0
2750
4750
7250
10250


Link no.: 0012.001 Link ref.: S12
Height of new overlay in mm:
135
135
85
mm
300
200
100
0
13250
15750
18750
22750


Link no.: 0012.001 Link ref.: S12
Height of new overlay in mm:
135
50
50
60
mm
300
200
100
0
25250
27750
30750


Link no.: 0012.001 Link ref.: S12
Height of new overlay in mm:
90
75
45
mm
300
200
100
0
37250
40250
43250
45250


Link no.: 0012.001 Link ref.: S12
Height of new overlay in mm:
130
55
100
135
mm
300
200
100
0
48250
51250
54250
56000

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S1

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
0/R	*	1109	1335	128	2	8	100	680	1,65E+12	35	1,75	25,77	35,00	4,14	15,23	4,74
0/L		9422	932	475	2	14	100	680	1,65E+12	5	2,17	49,50	35,00	5,50	2,18	5,58
500/L	*	1045	1203	137	2	6	100	680	1,65E+12	45	1,80	24,71	35,00	4,16	19,58	4,93
1000/R	*	1445	1739	154	2	19	100	680	1,65E+12	0	1,89	30,49	35,00	4,47	0,00	4,47
1500/L	*	1000	1151	263	2	5	100	680	1,65E+12	50	2,15	23,93	35,00	4,47	21,75	5,32
2000/R	*	1239	1491	227	2	12	100	680	1,65E+12	15	2,10	27,75	35,00	4,57	6,53	4,83
2500/L		12919	172	100	2	1	100	680	1,65E+12	75	1,52	49,50	35,00	4,85	32,63	6,14
3000/R		9791	40	196	2	0	100	680	1,65E+12	210	2,03	49,50	-29,08	2,84	91,36	6,44
3500/L		5583	379	263	2	1	100	680	1,65E+12	85	2,15	49,50	35,00	5,47	36,98	6,93
4000/R	R	716	1116	272	2	4	100	680	1,65E+12	60	2,15	17,97	35,00	4,24	26,10	5,27
4500/L	*	1739	2002	265	2	20	100	680	1,65E+12	0	2,15	33,79	35,00	4,86	0,00	4,86
5000/R	*	742	893	171	2	2	100	680	1,65E+12	75	1,96	18,61	35,00	4,07	32,63	5,36
5500/L		5799	117	134	2	0	100	680	1,65E+12	150	1,79	49,50	32,52	5,02	65,26	7,59
6000/R	*	1633	1965	233	2	20	100	680	1,65E+12	0	2,11	32,67	35,00	4,77	0,00	4,77
6500/L		8974	159	119	2	1	100	680	1,65E+12	105	1,69	49,50	35,00	5,02	45,68	6,82
7000/R		13910	348	107	2	4	100	680	1,65E+12	40	1,59	49,50	35,00	4,92	17,40	5,60
7500/L	*	693	798	144	2	2	100	680	1,65E+12	85	1,84	17,39	35,00	3,91	36,98	5,36
8000/R	*	1072	1291	159	2	7	100	680	1,65E+12	35	1,91	25,17	35,00	4,28	15,23	4,88
8500/L	*	3708	4270	409	2	20	100	680	1,65E+12	0	2,19	47,28	35,00	5,43	0,00	5,43
9000/R	*	782	941	371	2	3	100	680	1,65E+12	70	2,19	19,54	35,00	4,34	30,45	5,54
9500/L	*	1633	1880	471	2	20	100	680	1,65E+12	0	2,17	32,67	35,00	4,84	0,00	4,84
10000/R	*	871	1049	206	2	4	100	680	1,65E+12	60	2,06	21,47	35,00	4,28	26,10	5,31
10500/L		3784	254	372	2	0	100	680	1,65E+12	125	2,19	47,64	35,00	5,45	54,38	7,59
11000/R	*	712	858	176	2	2	100	680	1,65E+12	80	1,98	17,87	35,00	4,06	34,80	5,43
11500/L		5850	52	156	2	0	100	680	1,65E+12	215	1,90	49,50	-14,02	3,30	93,53	6,98
12000/R	*	880	1059	219	2	4	100	680	1,65E+12	60	2,08	21,65	35,00	4,32	26,10	5,34
12500/L		1465	9	97	2	0	200	350	1,65E+12	300	1,49	49,50	-59,03	1,11	130,51	6,26
13000/R		1495	68	507	2	0	200	350	1,65E+12	160	2,15	49,50	0,71	4,13	69,61	6,87
13500/L		4722	561	224	2	20	200	350	1,65E+12	0	2,09	49,50	35,00	5,42	0,00	5,42

14000/R		8393	34	140	2	2	200	350	1,65E+12	90	1,82	49,50	-19,77	2,99	39,15	4,54
14500/L		3071	17	108	2	0	200	350	1,65E+12	245	1,60	49,50	-40,24	1,96	106,58	6,16
15000/R		5795	10	216	2	0	200	350	1,65E+12	235	2,08	49,50	-55,92	1,82	102,23	5,85
15500/L		1062	132	217	1	0	200	350	1,65E+12	120	2,08	49,50	20,30	4,83	52,20	6,89
16000/R		1583	178	119	2	2	200	350	1,65E+12	85	1,69	49,50	29,13	4,79	36,98	6,24
16500/L		1274	66	99	1	0	200	350	1,65E+12	170	1,51	49,50	-0,17	3,45	73,96	6,37
17000/R		2168	147	111	2	2	200	350	1,65E+12	80	1,62	49,50	23,48	4,50	34,80	5,87
17500/L		1127	575	138	2	7	200	350	1,65E+12	30	1,81	49,50	35,00	5,14	13,05	5,65
18000/R		4026	107	185	2	3	200	350	1,65E+12	65	2,00	49,50	14,10	4,51	28,28	5,62
18500/L		1343	132	137	1	0	200	350	1,65E+12	110	1,80	49,50	20,30	4,56	47,85	6,44
19000/R		1534	621	161	2	12	200	350	1,65E+12	10	1,92	49,50	35,00	5,25	4,35	5,42
19500/L		8150	71	186	2	7	200	350	1,65E+12	40	2,01	49,50	1,98	4,03	17,40	4,72
20000/R		2270	184	95	2	3	200	350	1,65E+12	65	1,47	49,50	30,11	4,61	28,28	5,72
20500/L		1786	217	111	2	3	200	350	1,65E+12	60	1,62	49,50	34,99	4,95	26,10	5,98
21000/R		3093	50	80	2	1	200	350	1,65E+12	145	1,27	49,50	-8,37	2,89	63,08	5,38
21500/L		2001	159	127	2	2	200	350	1,65E+12	80	1,74	49,50	25,80	4,71	34,80	6,08
22000/R		1731	166	152	1	1	200	350	1,65E+12	85	1,88	49,50	27,07	4,90	36,98	6,36
22500/L		1820	104	119	1	1	200	350	1,65E+12	115	1,69	49,50	13,26	4,16	50,03	6,13
23000/R		817	24	50	1	0	200	350	1,65E+12	285	0,63	40,65	-30,06	1,04	123,98	5,93
23500/L		2165	12	69	2	0	200	350	1,65E+12	300	1,09	49,50	-50,53	1,05	130,51	6,19
24000/R		2582	101	152	2	1	200	350	1,65E+12	100	1,88	49,50	12,40	4,32	43,50	6,03
24500/L		1003	262	142	2	1	200	350	1,65E+12	75	1,83	47,96	35,00	5,10	32,63	6,39
25000/R		1696	17	92	2	0	200	350	1,65E+12	280	1,43	49,50	-40,24	1,80	121,81	6,60
25500/L		9088	362	386	2	1	70	380	1,65E+12	105	2,19	44,28	35,00	5,31	45,68	7,11
26000/R		6910	194	182	2	0	70	380	1,65E+12	150	1,99	40,86	34,39	4,96	65,26	7,53
26500/L	*	511	588	147	2	0	70	380	1,65E+12	125	1,86	8,37	35,00	3,57	54,38	5,71
27000/R		463	1362	153	2	6	70	380	1,65E+12	60	1,89	7,14	35,00	3,55	26,10	4,57
27500/L		12874	439	409	2	1	70	380	1,65E+12	80	2,19	48,62	35,00	5,48	34,80	6,85
28000/R		14374	104	218	2	0	70	380	1,65E+12	150	2,08	49,50	14,40	4,60	65,26	7,17
28500/L	*	2055	2367	320	2	20	70	380	1,03E+12	0	2,18	25,73	35,00	4,58	0,00	4,58
29000/R	*	558	672	279	2	1	70	380	1,03E+12	100	2,16	9,47	35,00	3,91	43,50	5,63
29500/L	*	247	284	113	2	0	70	380	1,03E+12	150	1,64	-0,69	35,00	2,99	65,26	5,56
30000/R		9755	35	113	2	0	70	380	1,03E+12	235	1,64	45,16	-20,53	2,61	102,23	6,64
30500/L		12106	91	99	2	0	70	380	1,03E+12	150	1,51	47,85	10,11	3,80	65,26	6,37
31000/R		12835	343	133	2	1	70	380	1,03E+12	75	1,78	48,58	35,00	5,07	32,63	6,36
31500/L	*	1012	1165	320	2	7	70	380	1,03E+12	50	2,18	16,90	35,00	4,23	21,75	5,08

32000/R		12991	356	206	2	1	70	380	1,03E+12	70	2,06	48,73	35,00	5,36	30,45	6,56
32500/L		9997	305	130	2	1	70	380	1,03E+12	90	1,76	45,47	35,00	4,93	39,15	6,48
33000/R		8386	575	195	2	2	70	380	1,03E+12	65	2,03	43,28	35,00	5,11	28,28	6,23
33500/L		5069	305	228	2	0	70	380	1,03E+12	120	2,10	37,00	35,00	4,94	52,20	6,99
34000/R	*	485	583	169	2	1	70	380	1,03E+12	110	1,95	7,72	35,00	3,63	47,85	5,52
34500/L		9073	315	296	2	1	70	380	1,03E+12	95	2,17	44,26	35,00	5,29	41,33	6,92
35000/R	*	643	774	198	2	2	70	380	1,03E+12	90	2,04	11,24	35,00	3,86	39,15	5,40
35500/L		14149	239	210	2	1	70	380	1,03E+12	85	2,07	49,50	35,00	5,39	36,98	6,85
36000/R	*	511	615	142	2	1	70	380	1,03E+12	105	1,83	8,37	35,00	3,54	45,68	5,34
36500/L		5855	485	182	2	1	70	380	1,03E+12	80	1,99	38,79	35,00	4,90	34,80	6,27
37000/R	*	489	589	165	2	1	70	380	1,03E+12	110	1,94	7,82	35,00	3,62	47,85	5,51
37500/L		8836	385	230	2	1	70	380	1,03E+12	85	2,10	43,93	35,00	5,21	36,98	6,67
38000/R		11488	527	196	2	3	70	380	1,03E+12	55	2,03	47,20	35,00	5,27	23,93	6,21
38500/L	*	481	554	166	2	1	70	380	1,03E+12	115	1,94	7,62	35,00	3,62	50,03	5,59
39000/R	*	598	720	174	2	1	70	380	1,03E+12	95	1,97	10,33	35,00	3,75	41,33	5,38
39500/L		1901	243	194	2	1	140	250	1,03E+12	85	2,03	49,50	27,38	5,06	36,98	6,51
40000/R		9736	60	132	2	1	140	250	1,03E+12	95	1,78	49,50	-2,13	3,64	41,33	5,27
40500/L		4570	149	173	2	2	140	250	1,03E+12	80	1,96	49,50	17,06	4,59	34,80	5,96
41000/R		1663	597	238	2	5	140	250	1,03E+12	40	2,11	46,19	35,00	5,31	17,40	6,00
41500/L		2116	196	272	2	1	140	250	1,03E+12	100	2,15	49,50	22,84	5,00	43,50	6,72
42000/R		1542	247	99	2	1	140	250	1,03E+12	90	1,51	44,30	27,72	4,35	39,15	5,89
42500/L		1790	1577	179	2	20	140	250	1,03E+12	0	1,98	48,02	35,00	5,26	0,00	5,26
43000/R		3880	338	247	2	4	140	250	1,03E+12	45	2,13	49,50	34,34	5,43	19,58	6,20
43500/L		1353	517	190	2	3	140	250	1,03E+12	55	2,02	41,04	35,00	5,01	23,93	5,96
44000/R		8340	25	149	2	0	140	250	1,03E+12	175	1,87	49,50	-20,61	3,01	76,13	6,01
44500/L		13205	818	167	2	20	140	250	1,03E+12	0	1,94	49,50	35,00	5,27	0,00	5,27
45000/R		3055	306	62	3	2	140	250	1,03E+12	100	0,94	49,50	32,24	4,16	43,50	5,88
45500/L		8752	793	225	2	20	140	250	1,03E+12	0	2,09	49,50	35,00	5,42	0,00	5,42
46000/R		3826	112	172	2	1	140	250	1,03E+12	110	1,96	49,50	11,04	4,35	47,85	6,23
46500/L	*	3023	3481	154	3	20	140	250	1,03E+12	0	1,89	49,50	35,00	5,22	0,00	5,22
47000/R		12783	1013	229	2	20	140	250	1,03E+12	0	2,10	49,50	35,00	5,43	0,00	5,43
47500/L		10366	16	121	2	0	140	250	1,03E+12	215	1,70	49,50	-30,02	2,47	93,53	6,16
48000/R		617	1456	85	3	6	140	250	1,03E+12	40	1,35	21,45	35,00	3,57	17,40	4,26
48500/L		1656	81	97	1	0	140	250	1,03E+12	170	1,49	46,08	4,20	3,47	73,96	6,39
49000/R		2084	241	82	2	1	140	250	1,03E+12	100	1,30	49,50	27,20	4,33	43,50	6,04
49500/L		1697	43	84	1	0	140	250	1,03E+12	215	1,33	46,69	-9,16	2,81	93,53	6,50

50000/R	R	7101	66	129	2	1	140	250	1,03E+12	110	1,76	49,50	-0,12	3,70	47,85	5,59
50500/L	'	10660	33	108	2	1	140	250	1,03E+12	135	1,60	49,50	-14,75	2,97	58,73	5,28
51000/R		6649	474	116	2	17	140	250	1,03E+12	0	1,66	49,50	35,00	4,99	0,00	4,99
51500/L		10636	111	109	2	2	120	250	1,03E+12	70	1,61	49,50	10,85	3,98	30,45	5,18
52000/R		4973	380	123	2	4	120	250	1,03E+12	50	1,72	49,50	35,00	5,05	21,75	5,90
52500/L		14634	91	184	2	2	120	250	1,03E+12	60	2,00	49,50	6,65	4,21	26,10	5,24
53000/R		2229	3060	129	3	20	120	250	1,03E+12	0	1,76	45,85	35,00	4,94	0,00	4,94
53500/L		14115	620	165	2	20	120	250	1,03E+12	0	1,94	49,50	35,00	5,27	0,00	5,27
54000/R		8366	2783	123	3	20	120	250	1,03E+12	0	1,72	49,50	35,00	5,05	0,00	5,05
54500/L		6773	180	73	2	2	120	250	1,03E+12	80	1,16	49,50	21,05	3,94	34,80	5,31
55000/R		1913	1624	140	3	20	120	250	1,03E+12	0	1,82	42,58	35,00	4,88	0,00	4,88
55500/L		14255	1010	137	3	20	120	250	1,03E+12	0	1,80	49,50	35,00	5,13	0,00	5,13
56000/R		2339	1997	59	3	9	120	250	1,03E+12	30	0,87	46,88	35,00	4,10	13,05	4,61
56500/L		3721	112	137	2	0	120	250	1,03E+12	130	1,80	49,50	11,04	4,19	56,55	6,42
57000/R		12398	1189	158	2	20	120	250	1,03E+12	0	1,91	49,50	35,00	5,24	0,00	5,24
57500/L	*	1339	1542	106	3	11	120	250	1,03E+12	15	1,58	34,95	35,00	4,34	6,53	4,59
58000/R		10415	525	88	3	16	120	250	1,03E+12	0	1,38	49,50	35,00	4,71	0,00	4,71
58500/L		9072	347	106	2	8	120	250	1,03E+12	20	1,58	49,50	34,90	4,91	8,70	5,25
59500/L		13306	319	112	2	14	120	250	1,03E+12	5	1,63	49,50	33,12	4,89	2,18	4,97
60000/R		4035	673	249	2	10	120	250	1,03E+12	15	2,13	49,50	35,00	5,46	6,53	5,72
60500/L		8102	397	94	2	9	120	250	1,03E+12	20	1,46	49,50	35,00	4,79	8,70	5,13
61000/R		1503	10	92	2	0	120	250	1,03E+12	300	1,43	37,42	-39,94	1,33	130,51	6,48
61500/L		6258	110	109	2	5	170	300	1,03E+12	45	1,61	49,50	12,79	4,06	19,58	4,83
62000/R		3020	258	93	2	5	170	300	1,03E+12	40	1,45	49,50	34,37	4,75	17,40	5,44
62500/L		1166	46	93	1	0	170	300	1,03E+12	195	1,45	45,33	-9,29	2,87	84,83	6,21
63000/R		1143	433	174	2	3	170	300	1,03E+12	50	1,97	44,72	35,00	5,11	21,75	5,97
63500/L		902	65	89	1	0	170	300	1,03E+12	180	1,40	37,55	-0,53	2,86	78,31	5,94
64000/R		7133	612	159	2	20	170	300	1,03E+12	0	1,91	49,50	35,00	5,24	0,00	5,24
64500/L		5597	203	184	2	11	170	300	1,03E+12	15	2,00	49,50	28,30	5,07	6,53	5,32
65000/R	*	3040	3040	323	2	20	170	300	1,03E+12	0	2,18	49,50	35,00	5,51	0,00	5,51
65500/L		2666	852	245	2	20	170	300	1,03E+12	0	2,12	49,50	35,00	5,45	0,00	5,45
66000/R		3071	39	142	2	0	170	300	1,03E+12	170	1,83	49,50	-13,47	3,25	73,96	6,17
66500/L		2070	237	215	2	3	170	300	1,03E+12	55	2,08	49,50	32,22	5,30	23,93	6,24
67000/R		534	626	222	2	3	170	300	1,03E+12	50	2,09	21,67	35,00	4,32	21,75	5,18
67500/L		1656	181	177	1	1	170	300	1,03E+12	90	1,98	49,50	25,40	4,93	39,15	6,47
68000/R		1981	251	149	2	3	170	300	1,03E+12	55	1,87	49,50	33,67	5,14	23,93	6,09

68500/L		2196	189	238	2	2	170	300	1,03E+12	75	2,11	49,50	26,49	5,11	32,63	6,39
69000/R		7952	524	114	2	20	170	300	1,03E+12	0	1,65	49,50	35,00	4,98	0,00	4,98
69500/L		5008	449	309	2	20	200	600	1,03E+12	0	2,18	49,50	35,00	5,51	0,00	5,51
70000/R		11311	336	215	2	20	200	600	1,03E+12	0	2,08	49,50	35,00	5,41	0,00	5,41
70500/L		3645	395	121	2	20	200	600	1,03E+12	0	1,70	49,50	35,00	5,03	0,00	5,03
71000/R		7258	372	210	2	20	200	600	1,03E+12	0	2,07	49,50	35,00	5,39	0,00	5,39
71500/L	R	1186	199	384	2	2	200	600	1,03E+12	65	2,19	49,50	35,00	5,52	28,28	6,63
72000/R		2462	102	316	2	2	200	600	1,03E+12	80	2,18	49,50	21,75	4,99	34,80	6,36
72500/L	L	1185	370	365	2	5	200	600	1,03E+12	35	2,19	49,50	35,00	5,52	15,23	6,12
73000/R		2042	498	276	2	20	200	600	1,03E+12	0	2,16	49,50	35,00	5,49	0,00	5,49
73500/L		1272	670	272	2	16	200	600	1,03E+12	0	2,15	49,50	35,00	5,48	0,00	5,48
74000/R	R	2043	232	126	2	6	200	600	1,03E+12	30	1,74	49,50	35,00	5,07	13,05	5,58
74500/L		2716	271	106	2	10	200	600	1,03E+12	15	1,58	49,50	35,00	4,91	6,53	5,17
75000/R		2246	67	158	2	1	200	600	1,03E+12	120	1,91	49,50	0,47	3,88	52,20	5,93
75500/L		3029	410	207	2	20	200	600	1,03E+12	0	2,06	49,50	35,00	5,39	0,00	5,39
76000/R		4560	27	134	2	1	200	600	1,03E+12	140	1,79	49,50	-45,56	1,94	60,90	4,34
76500/L		2120	293	145	2	10	200	600	1,03E+12	15	1,85	49,50	35,00	5,18	6,53	5,43
77000/R		1397	210	152	2	3	200	600	1,03E+12	55	1,88	49,50	35,00	5,21	23,93	6,15
77500/L		9706	780	120	2	20	130	300	1,03E+12	0	1,70	49,50	35,00	5,02	0,00	5,02
78000/R		1192	126	275	1	0	130	300	1,03E+12	150	2,16	35,17	16,22	4,18	65,26	6,75
78500/L		3519	312	352	2	2	130	300	1,03E+12	65	2,19	49,50	35,00	5,52	28,28	6,63
79000/R		1934	136	102	1	0	130	300	1,03E+12	135	1,54	46,38	18,16	4,08	58,73	6,40
79500/L		472	1660	95	3	15	130	300	1,03E+12	0	1,47	13,71	35,00	3,39	0,00	3,39
80000/R	*	3995	3995	223	3	20	130	300	1,03E+12	0	2,09	49,50	35,00	5,42	0,00	5,42
80500/L		10366	982	149	2	20	130	300	1,03E+12	0	1,87	49,50	35,00	5,20	0,00	5,20
81000/R		11956	498	148	2	20	130	300	1,03E+12	0	1,86	49,50	35,00	5,19	0,00	5,19
81500/L		7238	559	154	2	18	130	300	1,03E+12	0	1,89	49,50	35,00	5,22	0,00	5,22
82000/R	*	2920	2920	184	2	20	130	300	1,03E+12	0	2,00	49,50	35,00	5,33	0,00	5,33
82500/L		13010	208	147	2	10	130	300	1,30E+12	20	1,86	49,50	28,92	4,95	8,70	5,29
83000/R		1226	446	169	2	1	130	300	1,30E+12	80	1,95	35,82	35,00	4,74	34,80	6,11
83500/L		3710	376	168	2	3	130	300	1,30E+12	50	1,95	49,50	35,00	5,28	21,75	6,13
84000/R		764	550	164	2	1	130	300	1,30E+12	80	1,93	24,87	35,00	4,29	34,80	5,66
84500/L		3767	332	171	2	2	130	300	1,30E+12	70	1,96	49,50	35,00	5,29	30,45	6,49
85000/R		4084	390	111	2	3	130	300	1,30E+12	45	1,62	49,50	35,00	4,95	19,58	5,72
85500/L		3284	371	115	2	3	130	300	1,30E+12	60	1,66	49,50	35,00	4,99	26,10	6,01
86000/R		3481	113	200	2	0	130	300	1,30E+12	135	2,04	49,50	13,47	4,52	58,73	6,84

86500/L		4163	115	183	2	0	130	300	1,30E+12	125	2,00	49,50	13,91	4,50	54,38	6,64
87000/R		6810	517	166	2	12	130	300	1,30E+12	10	1,94	49,50	35,00	5,27	4,35	5,44
87500/L		9055	66	141	2	2	160	600	1,30E+12	75	1,83	49,50	-0,30	3,77	32,63	5,05
88000/R		2587	180	99	2	1	160	600	1,30E+12	90	1,51	49,50	35,00	4,84	39,15	6,38
88500/L		14149	385	156	2	20	160	600	1,30E+12	0	1,90	49,50	35,00	5,23	0,00	5,23
89000/R	*	1707	1707	139	2	20	160	600	1,30E+12	0	1,82	49,50	35,00	5,15	0,00	5,15
89500/L	R L	5518	424	118	2	17	160	600	1,30E+12	0	1,68	49,50	35,00	5,01	0,00	5,01
90000/R		1546	226	135	2	1	160	600	1,30E+12	85	1,79	49,50	35,00	5,12	36,98	6,58
90500/L		2345	330	122	2	4	160	600	1,30E+12	50	1,71	49,50	35,00	5,04	21,75	5,90
91000/R	*	644	644	209	2	3	160	600	1,30E+12	55	2,06	25,74	35,00	4,46	23,93	5,40
91500/L		4572	377	155	2	10	160	600	1,30E+12	15	1,89	49,50	35,00	5,22	6,53	5,48
92000/R		4623	171	181	2	3	160	600	1,30E+12	55	1,99	49,50	35,00	5,32	23,93	6,26
92500/L		1031	121	96	1	0	160	600	1,30E+12	145	1,48	39,15	30,40	4,22	63,08	6,71
93000/R		3101	54	112	2	0	160	600	1,30E+12	170	1,63	49,50	-10,46	3,17	73,96	6,08
93500/L		5556	283	151	2	9	160	600	1,30E+12	20	1,88	49,50	35,00	5,21	8,70	5,55
94000/R		5876	152	143	2	4	160	600	1,30E+12	45	1,84	49,50	35,00	5,17	19,58	5,94
94500/L	R	2855	336	136	2	5	160	600	1,30E+12	40	1,80	49,50	35,00	5,13	17,40	5,81
95000/R		1155	975	151	2	12	160	600	1,30E+12	10	1,88	42,39	35,00	4,93	4,35	5,10
95500/L	R	6805	159	112	2	6	160	600	1,30E+12	35	1,63	49,50	35,00	4,96	15,23	5,56
96000/R		3492	270	151	2	4	160	600	1,30E+12	50	1,88	49,50	35,00	5,21	21,75	6,06
96500/L		1732	259	180	2	1	160	600	1,30E+12	75	1,99	49,50	35,00	5,32	32,63	6,60
97000/R	R	2847	58	60	2	0	160	600	1,30E+12	165	0,90	49,50	-6,84	2,58	71,78	5,41
97500/L		11382	226	104	2	20	160	600	1,30E+12	0	1,56	49,50	35,00	4,89	0,00	4,89
98000/R		10348	48	117	2	2	160	600	1,30E+12	90	1,67	49,50	-16,42	2,98	39,15	4,52
98500/L		7204	370	149	2	20	160	600	1,30E+12	0	1,87	49,50	35,00	5,20	0,00	5,20
99000/R	R	1955	227	106	2	1	160	600	1,30E+12	90	1,58	49,50	35,00	4,91	39,15	6,45
99500/L		6926	309	148	2	16	160	600	1,30E+12	0	1,86	49,50	35,00	5,19	0,00	5,19
100000/R		1221	529	352	2	3	160	600	1,30E+12	50	2,19	43,97	35,00	5,30	21,75	6,16
100500/L		1324	199	162	2	2	200	500	1,30E+12	65	1,92	49,50	35,00	5,25	28,28	6,37
101000/R		2239	324	118	2	10	200	500	1,30E+12	15	1,68	49,50	35,00	5,01	6,53	5,27
101500/L		4660	354	141	2	20	200	500	1,30E+12	0	1,83	49,50	35,00	5,16	0,00	5,16
102000/R		5555	78	90	2	5	200	500	1,30E+12	50	1,41	49,50	6,80	3,63	21,75	4,49
102500/L		6662	394	117	2	20	200	500	1,30E+12	0	1,67	49,50	35,00	5,00	0,00	5,00
103000/R		1824	260	129	2	5	200	500	1,30E+12	40	1,76	49,50	35,00	5,09	17,40	5,77
103500/L	R	2889	294	116	2	14	200	500	1,30E+12	5	1,66	49,50	35,00	4,99	2,18	5,08
103500/L		3206	128	71	2	4	200	500	1,30E+12	55	1,13	49,50	27,71	4,17	23,93	5,11

104000/R		3106	362	115	2	20	200	500	1,30E+12	0	1,66	49,50	35,00	4,99	0,00	4,99
104500/L		1532	507	102	2	10	200	500	1,30E+12	15	1,54	49,50	35,00	4,87	6,53	5,13
105000/R		1290	309	87	2	4	200	500	1,30E+12	50	1,37	49,50	35,00	4,70	21,75	5,56
105500/L	R	5041	469	317	2	20	200	500	1,30E+12	0	2,18	49,50	35,00	5,51	0,00	5,51
106000/R		1245	362	106	2	4	200	500	1,30E+12	40	1,58	49,50	35,00	4,91	17,40	5,59
106500/L		2210	300	101	2	9	200	500	1,30E+12	25	1,53	49,50	35,00	4,86	10,88	5,29
107000/R		6670	79	118	2	7	200	500	1,30E+12	35	1,68	49,50	7,34	3,92	15,23	4,52
107500/L		1556	300	123	2	5	200	500	1,30E+12	40	1,72	49,50	35,00	5,05	17,40	5,73
108000/R		2230	312	113	2	9	200	500	1,30E+12	20	1,64	49,50	35,00	4,97	8,70	5,31
108500/L		2149	57	96	2	0	200	500	1,30E+12	145	1,48	49,50	-6,43	3,18	63,08	5,66
109000/R		1843	437	124	2	11	200	500	1,30E+12	15	1,72	49,50	35,00	5,05	6,53	5,31
109500/L		1896	225	160	2	4	200	500	1,30E+12	45	1,92	49,50	35,00	5,25	19,58	6,02
110500/L		3066	239	120	2	9	200	500	1,30E+12	25	1,70	49,50	35,00	5,02	10,88	5,45
111000/R	R	2873	331	152	2	16	200	500	1,30E+12	0	1,88	49,50	35,00	5,21	0,00	5,21
111500/L		1451	326	109	2	5	200	500	1,30E+12	40	1,61	49,50	35,00	4,94	17,40	5,62
112000/R		3983	183	113	2	10	200	500	1,30E+12	20	1,64	49,50	35,00	4,97	8,70	5,31
112500/L		1688	255	115	2	4	200	500	1,30E+12	45	1,66	49,50	35,00	4,99	19,58	5,76
113000/R		936	328	157	2	2	200	500	1,30E+12	55	1,90	45,50	35,00	5,08	23,93	6,02
113500/L		990	315	154	2	2	200	500	1,30E+12	55	1,89	47,49	35,00	5,14	23,93	6,08
114000/R		819	599	462	2	6	200	500	1,30E+12	30	2,17	40,74	35,00	5,16	13,05	5,67
114500/L		2209	114	116	2	1	200	500	1,30E+12	90	1,66	49,50	22,82	4,51	39,15	6,06
115000/R		5429	409	229	2	20	200	500	1,30E+12	0	2,10	49,50	35,00	5,43	0,00	5,43
115500/L		3061	417	136	2	20	200	500	1,30E+12	0	1,80	49,50	35,00	5,13	0,00	5,13
116000/R		2209	401	807	2	13	200	500	1,30E+12	10	1,96	49,50	35,00	5,28	4,35	5,46

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S4

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
10500/L		1361	253	50	3	1	100	200	1518600	110	0,63	29,42	22,58	2,67	47,85	4,56
11000/R	R	8491	14	182	2	0	100	200	1518600	180	1,99	49,50	-26,27	2,91	78,31	5,99
11500/L	KRG	9256	178	74	3	8	100	200	1518600	20	1,18	49,50	16,65	3,78	8,70	4,13
12000/R	KR	7088	545	78	3	17	100	200	1518600	0	1,24	49,50	35,00	4,57	0,00	4,57
12500/L	KRG	646	449	70	3	1	100	200	1518600	80	1,11	16,14	32,27	3,01	34,80	4,39
13000/R		7831	10	101	2	0	100	200	1518600	225	1,53	49,50	-31,95	2,22	97,88	6,08
13500/L	R	7158	1548	88	3	20	100	200	1518600	0	1,38	49,50	35,00	4,71	0,00	4,71
14000/R	KRG	4354	371	87	3	8	100	200	1518600	25	1,37	49,50	29,05	4,47	10,88	4,89
14500/L	R	1047	4346	89	3	20	100	200	1518600	0	1,40	24,74	35,00	3,75	0,00	3,75
15000/R		7891	607	59	3	13	100	200	1518600	10	0,87	49,50	35,00	4,20	4,35	4,37
15500/L	KR	2437	2206	129	3	20	100	200	1518600	0	1,76	39,80	35,00	4,70	0,00	4,70
16000/R	KRG	12244	58	73	2	2	100	200	1518600	60	1,16	49,50	-2,28	3,02	26,10	4,05
16500/L	R	9867	2628	113	3	20	100	200	1518600	0	1,64	49,50	35,00	4,97	0,00	4,97
17000/R	R	11572	9	85	2	0	100	200	1518600	185	1,35	49,50	-33,73	1,97	80,48	5,14
17500/L	KR	5102	117	81	2	0	80	200	1518600	90	1,29	42,37	9,57	3,34	39,15	4,88
18000/R		1228	4353	148	3	20	80	200	1518600	0	1,86	22,07	35,00	4,11	0,00	4,11
18500/L	R	4077	975	64	3	7	80	200	1518600	35	0,99	39,18	35,00	3,91	15,23	4,51
19000/R	KR	11884	2122	120	3	20	80	200	1518600	0	1,70	49,50	35,00	5,02	0,00	5,02
19500/L	R	141	1763	66	3	3	80	200	1518600	45	1,03	-8,79	35,00	2,06	19,58	2,83
20000/R	*	1047	1369	230	3	20	80	200	1518600	0	2,10	19,80	35,00	4,26	0,00	4,26
20500/L		2081	1237	78	3	8	80	200	1518600	25	1,24	29,59	35,00	3,79	10,88	4,22
21000/R		7054	685	162	2	20	80	200	1518600	0	1,92	46,99	35,00	5,15	0,00	5,15
21500/L	R *	1519	1915	120	3	20	80	200	1518600	0	1,70	25,10	35,00	4,06	0,00	4,06
22000/R	R	9515	91	70	2	1	80	200	1518600	80	1,11	49,50	5,32	3,27	34,80	4,64
22500/L		4224	351	153	2	4	80	200	1518600	40	1,89	39,68	28,11	4,56	17,40	5,24
23000/R	R	2612	1987	128	3	20	80	200	1518600	0	1,75	32,83	35,00	4,42	0,00	4,42
23500/L	K	1513	168	198	2	0	80	200	1518600	105	2,04	25,04	15,67	3,64	45,68	5,44
24000/R	R	783	962	64	3	2	80	200	1518600	65	0,99	15,65	35,00	2,98	28,28	4,10

24500/L	R	12361	291	210	2	10	80	200	1518600	10	2,07	49,50	24,95	5,00	4,35	5,17
25000/R		4999	60	179	2	0	80	200	1518600	135	1,98	42,08	-1,71	3,58	58,73	5,89
25500/L	KR	4327	1376	87	3	20	80	200	1518600	0	1,37	40,02	35,00	4,33	0,00	4,33
26000/R		6882	383	79	3	6	80	200	1518600	35	1,26	46,64	29,58	4,26	15,23	4,86
26500/L	KR *	5327	6715	117	3	20	80	200	1518600	0	1,67	42,99	35,00	4,75	0,00	4,75
27000/R	R	7714	112	75	2	3	100	350	1518600	50	1,20	49,50	15,45	3,75	21,75	4,61
27500/L	R	10509	60	75	2	1	100	350	1518600	70	1,20	49,50	-2,99	3,03	30,45	4,23
28000/R		2766	125	155	1	1	100	350	1518600	85	1,89	42,06	18,69	4,29	36,98	5,75
28500/L	KR	2781	48	175	2	0	100	350	1518600	145	1,97	42,15	-9,58	3,26	63,08	5,74
29000/R	R	384	146	40	2	0	100	350	1518600	115	0,26	6,87	23,28	1,45	50,03	3,42
29500/L	KR	3201	78	103	1	0	100	350	1518600	110	1,55	44,66	4,76	3,50	47,85	5,38
30000/R		5451	44	52	2	0	100	350	1518600	125	0,69	49,50	-12,15	2,16	54,38	4,30
30500/L	R	4316	490	112	2	17	100	350	1518600	0	1,63	49,50	35,00	4,96	0,00	4,96
31000/R	KR	1998	57	152	1	0	100	350	1518600	145	1,88	36,26	-4,50	3,13	63,08	5,62
31500/L	R	4638	235	147	2	5	100	350	1518600	35	1,86	49,50	35,00	5,19	15,23	5,79
32000/R		3923	259	197	2	4	100	350	1518600	40	2,04	48,28	35,00	5,32	17,40	6,00
32500/L	R	1959	219	287	2	1	100	350	1518600	70	2,17	35,91	35,00	4,96	30,45	6,16
33000/R		1304	192	147	2	1	100	350	1518600	85	1,86	28,66	31,37	4,22	36,98	5,68
33500/L	R	14977	13	115	2	0	100	350	1518600	155	1,66	49,50	-48,17	1,71	67,43	4,37
34000/R		2361	122	205	1	0	100	350	1518600	95	2,05	39,24	17,98	4,31	41,33	5,94
34500/L	R	2827	133	118	1	1	100	350	1518600	85	1,68	42,45	20,53	4,16	36,98	5,62
35000/R	R	2563	256	228	2	3	100	350	1518600	55	2,10	40,70	35,00	5,08	23,93	6,02
35500/L		7706	85	135	2	1	100	350	1518600	65	1,79	49,50	7,30	4,03	28,28	5,15
36000/R		1559	134	124	1	0	100	350	1518600	100	1,72	31,84	20,75	3,80	43,50	5,51
36500/L	R	5493	32	115	2	0	110	310	1518600	135	1,66	49,50	-19,09	2,86	58,73	5,17
37000/R	K	411	951	106	2	20	110	310	1518600	0	1,58	8,89	35,00	3,31	0,00	3,31
37500/L	KR	788	542	143	2	8	110	310	1518600	25	1,84	21,65	35,00	4,07	10,88	4,50
38000/R		8771	54	106	2	1	110	310	1518600	70	1,58	49,50	-5,40	3,32	30,45	4,52
38500/L	KRG	2030	65	100	1	0	110	310	1518600	125	1,52	40,20	-0,55	3,08	54,38	5,23
39000/R	R	13054	62	113	2	4	110	310	1518600	40	1,64	49,50	-1,79	3,52	17,40	4,21
39500/L	R	4244	222	223	2	6	110	310	1518600	30	2,09	49,50	31,58	5,29	13,05	5,80
40000/R	KR	1349	93	80	1	0	110	310	1518600	115	1,27	32,19	8,82	2,89	50,03	4,86
40500/L	R *	870	1097	142	2	20	110	310	1518600	0	1,83	23,59	35,00	4,14	0,00	4,14
40500/L	R	7401	27	76	2	0	110	310	1518600	130	1,21	49,50	-23,54	2,23	56,55	4,46
41000/R	R	2988	185	230	2	2	110	310	1518600	55	2,10	47,78	26,81	5,04	23,93	5,98
41500/L	KR	2728	141	91	1	1	110	310	1518600	70	1,42	45,99	19,71	4,01	30,45	5,21

41500/L		7875	90	141	2	3	110	310	1518600	50	1,83	49,50	7,96	4,09	21,75	4,95
42000/R	K *	382	482	117	2	4	110	310	1518600	40	1,67	7,46	35,00	3,35	17,40	4,03
42500/L		4687	29	106	2	0	110	310	1518600	145	1,58	49,50	-21,67	2,68	63,08	5,16
42500/L	KR	10627	63	95	2	3	110	310	1518600	50	1,47	49,50	-1,37	3,36	21,75	4,22
43000/R	R	985	411	139	2	4	110	310	1518600	35	1,82	26,02	35,00	4,22	15,23	4,82
43500/L		438	720	215	2	13	110	310	1518600	10	2,08	10,14	35,00	3,85	4,35	4,03
44000/R	R	3329	175	114	2	3	110	310	1518600	50	1,65	49,50	25,36	4,60	21,75	5,46
44500/L	R	1818	344	116	2	5	110	310	1518600	35	1,66	38,04	35,00	4,54	15,23	5,14
45000/R		12160	45	93	2	2	110	310	1518600	65	1,45	49,50	-10,17	2,99	28,28	4,11
45500/L	R	2685	268	107	2	4	110	310	1518600	40	1,59	45,68	35,00	4,77	17,40	5,45
46000/R	KR	5089	391	163	2	19	110	310	1518600	0	1,93	49,50	35,00	5,26	0,00	5,26
46500/L	KR	1933	144	99	1	1	110	310	1518600	80	1,51	39,24	20,26	3,86	34,80	5,23
47000/R	KRG	9505	80	76	2	3	110	310	1518600	45	1,21	49,50	4,88	3,35	19,58	4,13
47500/L	R	3285	347	76	2	11	110	310	1518600	10	1,21	49,50	35,00	4,54	4,35	4,71
48000/R	K	399	351	158	2	2	110	310	1518600	55	1,91	8,31	35,00	3,61	23,93	4,56
48500/L	R	3201	88	89	1	1	110	310	1518600	95	1,40	49,13	7,37	3,62	41,33	5,25
49000/R	R	3374	356	213	2	12	110	310	1518600	10	2,07	49,50	35,00	5,40	4,35	5,57
49500/L		8342	126	126	2	6	110	310	1518600	25	1,74	49,50	16,77	4,35	10,88	4,78
50000/R	R	10261	67	129	2	3	110	310	1518600	50	1,76	49,50	0,24	3,72	21,75	4,57
50500/L		5727	137	131	2	4	110	310	1518600	40	1,77	49,50	18,96	4,47	17,40	5,15
51000/R		1602	190	98	2	1	110	310	1518600	70	1,50	35,56	27,51	3,99	30,45	5,19
51500/L	R	1310	530	195	2	10	110	310	1518600	15	2,03	31,61	35,00	4,66	6,53	4,91
52000/R	R	520	512	104	2	5	110	310	1518600	35	1,56	13,50	35,00	3,47	15,23	4,07
52500/L	KRG	5035	138	123	2	3	110	310	1518600	45	1,72	49,50	19,15	4,42	19,58	5,19
53000/R	KR	13077	45	122	2	2	110	310	1518600	60	1,71	49,50	-10,17	3,26	26,10	4,29
53500/L	R	11671	67	128	2	4	110	310	1518600	45	1,75	49,50	0,24	3,71	19,58	4,48
54000/R	KR	2911	471	161	2	17	110	310	1518600	0	1,92	47,26	35,00	5,16	0,00	5,16
54500/L	R	10440	20	130	2	0	110	310	1518600	125	1,76	49,50	-31,39	2,48	54,38	4,62
55000/R	KRG	1539	528	107	2	12	110	310	1518600	10	1,59	34,77	35,00	4,34	4,35	4,51

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S6

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
0/R		5458	10	152	2	1	210	240	4803300	155	1,88	49,50	-38,34	2,32	67,43	4,98
0/		1258	7	177	2	0	210	240	4803300	270	1,98	49,50	-45,57	2,13	117,46	6,76
0/L		3493	16	115	2	0	210	240	4803300	150	1,66	49,50	-28,82	2,47	65,26	5,04
2/R		1470	674	176	2	20	210	240	4803300	0	1,98	49,50	35,00	5,30	0,00	5,30
500/L		2318	4	132	2	0	210	240	4803300	300	1,78	49,50	-56,90	1,48	130,51	6,63
1000/R	R	2753	29	128	2	1	210	240	4803300	125	1,75	49,50	-16,78	3,04	54,38	5,18
1500/L		1570	194	356	2	9	210	240	4803300	20	2,19	49,50	21,72	5,00	8,70	5,34
2000/R		1936	195	230	2	13	210	240	4803300	15	2,10	49,50	21,83	4,91	6,53	5,17
2500/L	R	1429	150	120	1	3	210	240	4803300	45	1,70	49,50	16,51	4,30	19,58	5,07
3000/R	KR	989	162	103	1	1	210	240	4803300	55	1,55	49,50	18,07	4,21	23,93	5,16
3500/L		3718	67	84	2	6	210	240	4803300	40	1,33	49,50	0,19	3,29	17,40	3,97
4000/R	R	1267	116	138	1	1	210	240	4803300	70	1,81	49,50	11,30	4,21	30,45	5,41
4500/L		3672	44	128	2	3	210	240	4803300	75	1,75	49,50	-8,33	3,37	32,63	4,66
5000/R	R	1400	58	205	1	1	210	240	4803300	110	2,05	49,50	-2,74	3,90	47,85	5,78
5500/L	R	1047	52	154	1	0	210	240	4803300	130	1,89	49,50	-4,95	3,65	56,55	5,87
6000/R	R *	5683	5963	303	3	20	210	240	4803300	0	2,18	49,50	35,00	5,50	0,00	5,50
6500/L	R	2484	5830	138	3	20	260	140	4803300	0	1,81	49,50	35,00	5,14	0,00	5,14
7000/R	R	1663	49	118	2	2	260	140	4803300	75	1,68	49,50	-3,59	3,49	32,63	4,77
7500/L	R	2878	23	236	2	2	260	140	4803300	95	2,11	49,50	-12,53	3,57	41,33	5,20
8000/R	K	2958	68	119	2	14	260	140	4803300	10	1,69	49,50	0,28	3,65	4,35	3,82
8500/L	R	3897	823	200	3	20	260	140	4803300	0	2,04	49,50	29,75	5,17	0,00	5,17
9000/R	K	2608	546	166	3	20	260	140	4803300	0	1,94	49,50	24,90	4,87	0,00	4,87
9500/L		102	219	41	3	0	260	140	4803300	140	0,30	-43,56	14,10	-0,86	60,90	1,54
10000/R	KRG	911	18	82	1	0	260	140	4803300	195	1,30	49,50	-15,42	2,65	84,83	5,99
10500/L	KRG	1198	10	90	2	0	260	140	4803300	225	1,41	49,50	-22,37	2,48	97,88	6,34
11000/R	KR	818	9	108	2	0	260	140	4803300	280	1,60	49,50	-23,61	2,62	121,81	7,42
11500/L	R	2219	220	106	3	20	260	140	4803300	0	1,58	49,50	14,16	4,09	0,00	4,09
12000/R	KRG	1438	143	89	1	5	260	140	4803300	30	1,40	49,50	9,07	3,70	13,05	4,22

12500/L	KR	4241	130	99	1	1	130	100	4803300	95	1,51	49,50	5,67	3,69	41,33	5,31
13000/R	R	8568	106	144	2	4	130	100	4803300	45	1,84	49,50	3,95	3,95	19,58	4,72
13500/L	R	2250	1599	99	3	2	130	100	4803300	75	1,51	49,50	26,85	4,52	32,63	5,81
14000/R	K	2623	273	78	3	1	130	100	4803300	130	1,24	49,50	11,93	3,66	56,55	5,89
14500/L		3918	79	123	2	0	130	100	4803300	110	1,72	49,50	1,47	3,72	47,85	5,61
15000/R	R	7184	7	105	2	0	130	100	4803300	300	1,57	49,50	-18,99	2,77	130,51	7,92
15500/L		9750	10	111	2	0	130	100	4803300	215	1,62	49,50	-15,98	2,95	93,53	6,63
16000/R	R	872	6097	112	3	4	130	100	4803300	50	1,63	27,93	35,00	4,11	21,75	4,97
16500/L		5585	1539	93	3	6	130	100	4803300	40	1,45	49,50	26,53	4,44	17,40	5,13
17000/R	R	2995	575	159	3	4	130	100	4803300	55	1,91	49,50	18,22	4,58	23,93	5,52
17500/L		8458	54	234	2	1	130	100	4803300	90	2,11	49,50	-1,74	3,99	39,15	5,53
18000/R		9237	33	80	2	1	130	100	4803300	125	1,27	49,50	-5,90	2,99	54,38	5,13
18500/L	R	8188	6	124	2	0	130	100	4803300	300	1,72	49,50	-20,29	2,87	130,51	8,02
19000/R	R	12836	81	160	2	5	130	100	4803300	35	1,92	49,50	1,68	3,93	15,23	4,53
19500/L	R *	1545	1621	121	3	20	120	250	4803300	0	1,70	38,01	35,00	4,58	0,00	4,58
20000/R		4971	13	129	2	0	120	250	4803300	270	1,76	49,50	-34,40	2,35	117,46	6,98
20500/L	R *	1560	1637	157	3	20	120	250	4803300	0	1,90	38,22	35,00	4,79	0,00	4,79
21000/R	K	3731	6	105	2	0	120	250	4803300	300	1,57	49,50	-50,72	1,52	130,51	6,66
21500/L	R	8094	574	151	2	20	120	250	4803300	0	1,88	49,50	35,00	5,21	0,00	5,21
22000/R	KR	2597	134	137	1	0	120	250	4803300	105	1,80	49,12	14,82	4,32	45,68	6,12
22500/L	K	4516	110	83	2	1	120	250	4803300	95	1,32	49,50	10,66	3,69	41,33	5,32
23000/R		869	55	119	1	0	120	250	4803300	195	1,69	25,71	-3,97	2,54	84,83	5,89
23500/L		1970	92	61	1	0	120	250	4803300	140	0,92	43,21	6,88	2,89	60,90	5,29
93500/L	KLG *	362	446	116	3	0	60	100	1177400	115	1,66	3,49	16,08	2,44	50,03	4,41
94000/R	KG *	5262	6480	99	3	10	60	100	1177400	15	1,51	32,11	35,00	4,16	6,53	4,41
24000/R	KR	9132	112	291	2	3	120	250	4803300	50	2,17	49,50	11,04	4,55	21,75	5,41
24500/L	KR	13399	11	156	2	0	120	250	4803300	210	1,90	49,50	-37,93	2,36	91,36	5,95
25000/R	KR	9468	1112	123	3	20	120	250	4803300	0	1,72	49,50	35,00	5,05	0,00	5,05
25500/L	KRG	2988	289	117	2	2	120	250	4803300	60	1,67	49,50	31,04	4,85	26,10	5,87
26000/R	KRG	3591	64	618	2	0	120	250	4803300	140	2,09	49,50	-0,77	4,01	60,90	6,41
26500/L	KRG	5701	497	84	2	3	70	300	4803300	55	1,33	38,46	35,00	4,23	23,93	5,17
27000/R	KRG *	670	710	161	2	3	70	300	4803300	70	1,92	11,75	35,00	3,76	30,45	4,96
27500/L	KRG	6509	77	79	2	0	70	300	4803300	160	1,26	40,11	3,76	2,99	69,61	5,73
28000/R	KR *	579	613	87	2	2	70	300	4803300	80	1,37	9,93	35,00	3,14	34,80	4,51
28500/R	KRG	8243	69	65	2	0	70	300	4803300	160	1,01	43,06	0,98	2,74	69,61	5,49
29000/R	KRG *	817	866	78	3	5	70	300	4803300	50	1,24	14,23	35,00	3,18	21,75	4,04

29500/L	KRG *	357	378	69	2	1	70	300	2535400	90	1,09	3,90	35,00	2,62	39,15	4,16
30000/R	KRG	5996	113	91	2	0	70	300	2535400	115	1,42	39,09	13,47	3,49	50,03	5,46
30500/L	R	9557	173	130	2	1	70	300	2535400	75	1,76	44,91	24,25	4,49	32,63	5,77
31000/R	K *	462	490	114	2	2	70	300	2535400	75	1,65	7,12	35,00	3,31	32,63	4,59
31500/L	KR *	497	526	174	2	2	70	300	2535400	70	1,97	8,03	35,00	3,66	30,45	4,86
32000/R	RG *	848	898	186	2	12	70	300	2535400	15	2,01	14,69	35,00	3,96	6,53	4,22
32500/L	KR *	636	674	105	2	5	70	300	2535400	50	1,57	11,10	35,00	3,39	21,75	4,24
33000/R	KRG *	822	871	102	2	11	70	300	2535400	25	1,54	14,30	35,00	3,48	10,88	3,91
33500/L	KR	8007	234	92	2	1	70	300	2535400	65	1,43	42,70	31,90	4,37	28,28	5,49
34000/R	KR *	563	597	110	2	3	70	300	2535400	60	1,62	9,58	35,00	3,37	26,10	4,40
34500/L	KGR	3323	101	68	2	0	70	300	2535400	140	1,07	31,73	10,62	2,74	60,90	5,14
35000/R	KR	9059	250	72	2	2	70	300	2535400	60	1,14	44,24	33,57	4,21	26,10	5,24
35500/L	KRG *	416	440	71	2	1	70	300	2535400	80	1,13	5,81	35,00	2,73	34,80	4,10
36000/R	R	2955	586	167	2	5	70	300	2535400	40	1,94	30,26	35,00	4,51	17,40	5,20
36500/L	KRG	1443	622	94	2	5	70	300	2535400	50	1,46	21,32	35,00	3,68	21,75	4,53
37000/R	R	1769	124	180	2	0	70	300	2535400	140	1,99	23,86	15,82	3,55	60,90	5,95
37500/L	KG *	413	437	87	2	1	70	300	2535400	80	1,37	5,72	35,00	2,98	34,80	4,35
38000/R	KRG	11324	79	66	2	0	70	300	2535400	110	1,03	47,02	4,40	3,06	47,85	4,94
38500/L		6460	314	101	2	2	70	300	2535400	60	1,53	40,02	35,00	4,49	26,10	5,52
39000/R	R	11594	117	113	2	1	70	300	2535400	85	1,64	47,32	14,35	4,07	36,98	5,53
39500/L	*	524	556	83	2	3	70	300	2535400	65	1,32	8,69	35,00	3,04	28,28	4,15
40000/R	*	271	288	141	2	0	70	300	2535400	105	1,83	0,46	35,00	3,22	45,68	5,02
40500/L	*	441	467	76	2	2	70	300	2535400	80	1,21	6,54	35,00	2,85	34,80	4,22
41000/R	R *	410	435	130	2	1	70	300	2535400	85	1,76	5,63	35,00	3,36	36,98	4,82
41500/L		8182	410	181	2	16	100	250	2535400	0	1,99	49,50	35,00	5,32	0,00	5,32
42000/R		1122	298	79	2	1	100	250	2535400	75	1,26	25,98	31,68	3,53	32,63	4,82
42500/L		10537	70	87	2	1	100	250	2535400	80	1,37	49,50	1,12	3,37	34,80	4,74
43000/R		592	3047	135	3	20	100	250	2535400	0	1,79	14,58	35,00	3,75	0,00	3,75
43500/L	R	5128	71	102	2	0	100	250	2535400	115	1,54	49,50	1,42	3,55	50,03	5,52
44000/R	R	3530	69	58	1	0	100	250	2535400	130	0,85	46,40	0,81	2,71	56,55	4,94
44500/L	KR	4079	7	139	2	0	100	250	2535400	300	1,82	48,98	-47,47	1,88	130,51	7,02
45000/R	KRG *	574	608	97	2	5	100	250	2535400	40	1,49	14,03	35,00	3,42	17,40	4,11
45500/L		3106	56	105	1	0	100	250	2535400	150	1,57	44,12	-3,59	3,17	65,26	5,74
46000/R		2585	50	423	2	0	100	250	2535400	165	2,18	40,85	-5,98	3,56	71,78	6,39
46500/L	R *	1058	1122	153	2	20	100	250	2535400	0	1,89	24,93	35,00	4,25	0,00	4,25
47000/R		12394	288	217	2	17	100	250	2535400	0	2,08	49,50	30,96	5,25	0,00	5,25

47500/L	R	1124	1726	135	3	20	100	250	2535400	0	1,79	26,01	35,00	4,20	0,00	4,20
48000/R	R	3270	79	102	1	0	100	250	2535400	125	1,54	45,04	3,67	3,46	54,38	5,60
48500/L	R *	1401	1485	213	2	20	100	250	2535400	0	2,07	29,93	35,00	4,63	0,00	4,63
49000/R	R	10599	54	109	2	1	100	250	2535400	90	1,61	49,50	-4,36	3,39	39,15	4,93
49500/L	K	3405	52	164	2	0	100	250	2535400	155	1,93	45,76	-5,15	3,53	67,43	6,19
50000/R	KRG	3119	259	187	2	2	100	250	2535400	60	2,01	44,20	28,72	4,88	26,10	5,91
50500/L	K	5126	283	137	2	4	100	250	2535400	40	1,80	49,50	30,59	4,96	17,40	5,65
51000/R	K	886	862	193	2	14	100	250	2535400	5	2,03	21,77	35,00	4,26	2,18	4,35
51500/L	KR	13099	5	172	2	0	100	250	2535400	285	1,96	49,50	-54,57	1,76	123,98	6,65
52000/R	KRG	4629	214	83	2	2	100	250	2535400	55	1,32	49,50	24,70	4,24	23,93	5,18
52500/L	R	6296	159	124	2	2	100	250	2535400	55	1,72	49,50	18,43	4,40	23,93	5,34
53000/R	R *	649	688	120	2	7	100	250	2535400	30	1,70	16,22	35,00	3,71	13,05	4,23
53500/L	K	12943	45	88	2	2	100	250	1177400	65	1,38	49,50	-8,20	3,01	28,28	4,13
54000/R	R	2263	106	113	1	0	100	250	1177400	95	1,64	38,48	9,87	3,55	41,33	5,17
54500/L	R	6509	144	159	2	4	100	250	1177400	35	1,91	49,50	16,34	4,51	15,23	5,11
55000/R	R	12713	32	115	2	1	100	250	1177400	85	1,66	49,50	-15,40	3,00	36,98	4,46
55500/L	K *	371	393	111	2	2	100	250	1177400	50	1,62	6,26	35,00	3,25	21,75	4,11
56000/R	K	2303	21	143	2	0	100	250	1177400	195	1,84	38,79	-24,29	2,41	84,83	5,75
56500/L	KRG	2941	480	153	2	15	100	250	1177400	5	1,89	43,15	35,00	4,97	2,18	5,05
57000/R	KRG	6370	156	105	2	5	100	250	1177400	35	1,57	49,50	18,03	4,23	15,23	4,83
57500/L	K	2176	97	94	1	0	100	250	1177400	100	1,46	37,78	8,00	3,26	43,50	4,97
58000/R	K	4787	62	83	2	0	100	250	1177400	100	1,32	49,50	-1,44	3,21	43,50	4,93
58500/L	K	1346	156	88	1	0	130	170	1177400	80	1,38	37,99	12,26	3,36	34,80	4,74
59000/R	KR	6417	82	82	2	6	130	170	1177400	30	1,30	49,50	3,03	3,37	13,05	3,89
59500/L	KRG	4408	44	95	2	1	130	170	1177400	90	1,47	49,50	-5,90	3,19	39,15	4,73
60000/R	K	3835	18	120	2	0	130	170	1177400	165	1,70	49,50	-18,73	2,91	71,78	5,74
60500/L	K	272	335	48	3	0	130	170	1177400	110	0,56	0,94	23,22	1,51	47,85	3,40
61000/R	K	12049	17	149	2	1	130	170	1177400	85	1,87	49,50	-19,55	3,05	36,98	4,50
61500/L	K	1372	15	50	1	0	130	170	1177400	215	0,63	38,43	-21,34	1,30	93,53	4,98
62000/R	K	4457	6	94	2	0	130	170	1177400	215	1,46	49,50	-34,49	2,05	93,53	5,73
62500/L	KR	4799	17	187	2	0	130	170	1177400	150	2,01	49,50	-19,55	3,19	65,26	5,76
63000/R	K	5444	7	116	2	0	130	170	1177400	210	1,66	49,50	-32,28	2,34	91,36	5,94
63500/L	KR	9880	9	105	2	0	130	170	1177400	155	1,57	49,50	-28,67	2,39	67,43	5,05
64000/R	KR	1044	119	195	1	0	130	170	1177400	90	2,03	32,10	8,37	3,63	39,15	5,17
64500/L	KR	3420	40	110	2	0	130	170	1177400	110	1,62	49,50	-7,27	3,28	47,85	5,16
65000/R	KR	2312	74	258	2	1	130	170	1177400	85	2,14	49,50	1,56	4,15	36,98	5,61

65500/L	KR	2570	9	195	2	0	130	170	1177400	235	2,03	49,50	-28,67	2,85	102,23	6,88
66000/R	KRG	2784	40	116	2	0	130	170	1177400	115	1,66	49,50	-7,27	3,33	50,03	5,30
66500/L	KR	2077	242	120	1	5	130	170	1177400	30	1,70	48,04	18,56	4,32	13,05	4,83
67000/R	KRG	1300	775	109	3	13	130	170	1177400	5	1,61	37,18	35,00	4,45	2,18	4,54
67500/L	KR	3889	39	292	2	1	130	170	1177400	105	2,17	49,50	-7,63	3,82	45,68	5,62
68000/R	KRG	9489	18	156	2	1	130	170	1177400	95	1,90	49,50	-18,73	3,11	41,33	4,74
68500/L	KR	6691	14	173	2	0	120	100	1177400	150	1,96	49,50	-13,14	3,40	65,26	5,97
69000/R	KR	1567	9	101	2	0	120	100	1177400	265	1,53	38,32	-16,87	2,38	115,28	6,92
69500/L	KR	1290	47	428	2	0	120	100	1177400	140	2,18	34,16	-2,91	3,41	60,90	5,81
70000/R	KRG	2491	31	81	1	0	120	100	1177400	145	1,29	48,23	-6,43	2,94	63,08	5,42
70500/L	KRG	5705	6	233	2	0	120	100	1177400	250	2,11	49,50	-20,29	3,26	108,76	7,54
71000/R	KRG	4958	41	178	2	1	120	100	1177400	100	1,98	49,50	-4,07	3,77	43,50	5,49
71500/L	KRG	5355	1	171	2	0	120	100	1177400	285	1,96	49,50	-35,41	2,51	123,98	7,40
72000/R	KR	1120	27	61	1	0	120	100	1177400	175	0,92	31,13	-7,59	1,85	76,13	4,85
72500/L	KRG	1002	10	102	1	0	120	100	1177400	260	1,54	28,75	-15,98	2,05	113,11	6,50
73000/R	KR	8165	37	230	2	1	120	100	1177400	75	2,10	49,50	-4,93	3,86	32,63	5,14
73500/L	KRG	3518	159	247	2	5	120	100	1177400	35	2,13	49,50	7,37	4,37	15,23	4,97
74000/R	KRG	246	16213	171	3	20	120	100	1177400	0	1,96	-1,28	35,00	3,29	0,00	3,29
74500/L	KRG	3701	25	481	2	0	120	100	1177400	150	2,17	49,50	-8,24	3,79	65,26	6,36
75000/R	KRG	5038	5	99	2	0	120	100	1177400	300	1,51	49,50	-21,83	2,60	130,51	7,74
75500/L	KRG	4023	23	155	2	0	120	100	1177400	145	1,89	49,50	-8,95	3,49	63,08	5,98
76000/R	K	6058	8	129	2	0	120	100	1177400	235	1,76	49,50	-17,86	3,00	102,23	7,03
76500/L	K	12357	21	104	2	1	120	100	1177400	85	1,56	49,50	-9,71	3,13	36,98	4,59
77000/R	K	3812	3408	208	3	20	120	100	1177400	0	2,06	49,50	33,24	5,32	0,00	5,32
77500/L	K	3334	2	104	2	0	90	100	1177400	300	1,56	40,85	-29,56	2,01	130,51	7,15
78000/R	KRG	9805	23	164	2	0	90	100	1177400	135	1,93	49,50	-8,95	3,53	58,73	5,84
78500/L	KRG *	2436	3000	72	3	3	90	100	1177400	55	1,14	35,81	32,16	3,82	23,93	4,76
79000/R	KRG	7190	3	140	2	0	90	100	1177400	300	1,82	49,50	-26,14	2,74	130,51	7,88
79500/L	KRG	2153	7	139	2	0	90	100	1177400	295	1,82	33,83	-18,99	2,40	128,34	7,46
80000/R	K	10981	12	194	2	0	90	100	1177400	185	2,03	49,50	-14,44	3,41	80,48	6,58
80500/L	KR	1546	15	467	2	0	90	100	1177400	235	2,17	28,52	-12,55	2,80	102,23	6,83
81000/R	KRG	4053	17	695	2	0	90	100	1177400	205	2,04	43,98	-11,50	3,32	89,18	6,83
81500/L	R	10456	168	239	2	7	90	100	1177400	20	2,12	49,50	7,84	4,38	8,70	4,72
82000/R	R	5111	43	369	2	0	90	100	1177400	130	2,19	47,70	-3,67	3,93	56,55	6,15
82500/L	KR	6576	196	265	2	5	90	100	1177400	35	2,15	49,50	9,14	4,46	15,23	5,06
83000/R	KRG	4097	77	267	2	0	90	100	1177400	105	2,15	44,15	1,25	3,94	45,68	5,74

83500/L	KRG	2643	76	72	1	0	90	100	1177400	125	1,14	37,12	1,14	2,65	54,38	4,79
84000/R	KRG	3232	47	459	2	0	90	100	1177400	140	2,17	40,35	-2,91	3,65	60,90	6,05
84500/L	KRG	5545	44	342	2	0	90	100	1177400	125	2,19	49,01	-3,47	3,98	54,38	6,13
85000/R	KRG	1669	8	179	2	0	90	100	1177400	280	1,98	29,75	-17,86	2,45	121,81	7,25
85500/L	KRG	8000	14	152	2	0	90	100	1177400	185	1,88	49,50	-13,14	3,31	80,48	6,49
86000/R		9415	15	169	2	0	90	100	1177400	165	1,95	49,50	-12,55	3,41	71,78	6,23
86500/L	KRG	2546	43	284	2	0	90	100	1177400	155	2,16	36,52	-3,67	3,46	67,43	6,12
87000/R	KRG *	398	490	135	3	0	60	100	1177400	105	1,79	4,51	16,87	2,64	45,68	4,44
87500/L	KRG	6900	137	126	2	0	60	100	1177400	90	1,74	35,01	6,11	3,36	39,15	4,90
88000/R	KRG *	380	468	154	3	0	60	100	1177400	95	1,89	4,01	16,48	2,70	41,33	4,33
88500/L	KRG	11546	92	616	2	0	60	100	1177400	90	2,09	40,51	2,75	3,80	39,15	5,34
89000/R	KRG	14016	42	156	2	0	60	100	1177400	125	1,90	42,58	-3,86	3,42	54,38	5,57
89500/L	KRG	1125	1263	51	3	0	60	100	1177400	145	0,66	15,62	24,86	2,25	63,08	4,74
90000/R	KRG	12200	41	390	2	0	60	100	1177400	135	2,19	41,10	-4,07	3,65	58,73	5,96
90500/L	KRG	12333	26	216	2	0	60	100	1177400	165	2,08	41,22	-7,91	3,39	71,78	6,22
91000/R	KRG	10903	149	126	2	1	60	100	1177400	65	1,74	39,90	6,82	3,58	28,28	4,69
91500/L	*	1306	1608	70	3	0	60	100	1177400	115	1,11	17,21	26,90	2,85	50,03	4,82
92000/R	KRG *	513	632	132	3	0	60	100	1177400	100	1,78	7,22	19,02	2,81	43,50	4,52
92500/L	KRG *	613	755	146	3	1	60	100	1177400	90	1,85	9,12	20,52	3,02	39,15	4,56
93000/R	KGR *	1329	1636	141	3	2	60	100	1177400	65	1,83	17,40	27,05	3,58	28,28	4,69

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S7

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
0/R	KRG *	12842	12842	193	3	20	50	100	1540200	0	2,03	34,71	35,00	4,77	0,00	4,77
500/L	R *	7900	7900	131	3	10	50	100	1540200	0	1,77	30,38	35,00	4,35	0,00	4,35
1000/R	KR *	1836	1836	224	3	2	50	100	1540200	50	2,09	17,38	28,02	3,88	21,75	4,74
1500/L	KRG *	8452	8452	231	3	20	50	100	1540200	0	2,10	30,98	35,00	4,70	0,00	4,70
2000/R	KRG *	1721	1721	116	3	1	50	100	1540200	95	1,66	16,80	27,47	3,41	41,33	5,04
2500/L	KRG *	4588	4588	164	3	6	50	100	1540200	20	1,93	25,54	35,00	4,32	8,70	4,66
3000/R	KR *	3640	3640	115	3	2	50	100	1540200	60	1,66	23,47	33,80	3,91	26,10	4,94
3500/L	KR *	4810	4810	131	3	4	50	100	1540200	35	1,77	25,96	35,00	4,17	15,23	4,77
4000/R	KR *	154	154	115	3	0	50	100	1540200	160	1,66	-4,71	7,10	1,75	69,61	4,49
4500/L	K *	209	209	113	3	0	50	100	1540200	150	1,64	-1,98	9,68	1,94	65,26	4,52
5000/R	KR *	2056	2056	128	3	1	50	100	1540200	80	1,75	18,39	28,97	3,62	34,80	4,99
5500/L	KLR *	1710	1710	113	3	1	50	100	1540200	95	1,64	16,74	27,42	3,38	41,33	5,01
6000/R	KRG *	3135	3135	159	3	3	50	100	1540200	45	1,91	22,14	32,54	4,07	19,58	4,84
6500/L	KR *	166	166	123	3	0	50	100	1540200	155	1,72	-4,04	7,74	1,86	67,43	4,52
7000/R	K *	2966	2966	139	3	2	50	100	1540200	55	1,82	21,65	32,07	3,93	23,93	4,88
7500/L	KR *	258	258	138	3	0	50	100	1540200	135	1,81	-0,11	11,46	2,26	58,73	4,57
8000/R	KR *	895	1115	131	3	5	60	200	1540200	25	1,77	13,17	35,00	3,67	10,88	4,10
8500/L	K *	548	683	133	3	2	60	200	1540200	45	1,78	7,92	35,00	3,47	19,58	4,24
9000/R	KR *	700	872	137	3	4	60	200	1540200	35	1,80	10,54	35,00	3,60	15,23	4,20
9500/L	KR *	450	561	127	3	1	60	200	1540200	60	1,74	5,82	35,00	3,35	26,10	4,38
10000/RR	K *	1413	1760	200	3	20	60	200	1540200	0	2,04	18,05	35,00	4,13	0,00	4,13
10500/L	KR	945	3786	131	3	20	60	200	1540200	0	1,77	13,75	35,00	3,69	0,00	3,69
11000/R	KR *	868	1081	89	3	2	60	200	1540200	50	1,40	12,84	35,00	3,28	21,75	4,14
11500/L	KRG	9705	37	70	2	0	60	200	1540200	160	1,11	38,65	-9,87	2,24	69,61	4,98
12000/R	KRG *	293	365	111	3	1	60	200	1540200	85	1,62	1,23	28,77	2,81	36,98	4,26
12500/L	K *	900	1121	45	3	1	60	200	1540200	95	0,46	13,23	35,00	2,36	41,33	3,99
13000/R	K *	543	677	112	3	2	60	200	1540200	60	1,63	7,83	35,00	3,32	26,10	4,35
13500/L	K	410	650	62	3	0	60	200	1540200	100	0,94	4,82	35,00	2,51	43,50	4,23

14000/R	KRG *	296	368	108	3	1	60	200	1540200	85	1,60	1,34	28,91	2,79	36,98	4,25
14500/L	KR *	377	470	81	3	0	60	200	1540200	95	1,29	3,93	33,04	2,75	41,33	4,37
15000/R	KR *	984	1226	139	3	7	60	200	1540200	15	1,82	14,18	35,00	3,75	6,53	4,01
15500/L	KRG *	205	255	70	3	0	60	200	1540200	125	1,11	-2,59	22,72	1,90	54,38	4,04
16000/R	KR *	243	303	137	2	0	60	200	1540200	95	1,80	-0,77	25,63	2,78	41,33	4,41
16500/L	KRG	11701	48	69	2	0	60	200	1540200	135	1,09	40,65	-5,47	2,47	58,73	4,79
17000/R	KR *	401	499	95	3	0	70	150	1540200	105	1,47	5,35	25,54	2,69	45,68	4,48
17500/L	K *	486	606	88	3	0	70	150	1540200	100	1,38	7,75	28,00	2,79	43,50	4,51
18000/R	KLR	3357	6	170	2	0	70	150	1540200	300	1,95	31,85	-30,43	2,01	130,51	7,15
18500/L	K	11771	31	121	2	0	70	150	1540200	150	1,70	47,50	-9,64	3,19	65,26	5,77
19000/R	K	3559	19	60	2	0	70	150	1540200	240	0,90	32,58	-15,84	1,56	104,41	5,67
19500/L	R	6351	130	83	2	0	70	150	1540200	95	1,32	39,81	8,51	3,22	41,33	4,85
20000/R	R	13120	4	58	2	0	70	150	1540200	300	0,85	48,86	-35,56	1,37	130,51	6,51
20500/L	R *	181	225	133	2	0	70	150	1540200	120	1,78	-4,57	15,45	2,21	52,20	4,27
21000/R	R	7106	24	74	2	0	70	150	1540200	195	1,18	41,21	-12,88	2,29	84,83	5,64
21500/L	KRG	11757	16	110	2	0	70	150	1540200	200	1,62	47,49	-18,01	2,78	87,01	6,21
22000/R	KR	10599	16	93	2	0	70	150	1540200	205	1,45	46,20	-18,01	2,56	89,18	6,07
22500/L	K	4974	17	94	2	0	70	150	1540200	235	1,46	36,76	-17,25	2,23	102,23	6,25
23000/R	KRG	5594	15	102	2	0	70	150	1540200	250	1,54	38,22	-18,83	2,31	108,76	6,59
23500/L	KRG *	523	651	138	3	1	70	150	1540200	70	1,81	8,66	28,90	3,29	30,45	4,49
24000/R	KRG	9645	18	95	2	0	70	150	1540200	195	1,47	45,02	-16,52	2,59	84,83	5,93
24500/L	KRG	2918	21	81	2	0	70	150	1540200	230	1,29	30,11	-14,57	1,90	100,06	5,84
25000/R	KRG	7078	60	63	2	0	70	150	1540200	130	0,97	41,16	-1,28	2,54	56,55	4,77
25500/L	KRG	4107	17	217	2	0	70	150	1540200	240	2,08	34,37	-17,25	2,75	104,41	6,87
26000/R	KRG	8043	9	102	2	0	70	150	2485300	295	1,54	42,75	-25,30	2,23	128,34	7,29
26500/L	KRG	7715	5	115	2	0	70	150	2485300	300	1,66	42,23	-32,74	2,03	130,51	7,17
27000/R	KRG	12245	7	65	2	0	70	150	2485300	300	1,01	48,00	-28,48	1,78	130,51	6,92
27500/L	KRG	12666	5	93	2	0	70	230	2485300	300	1,45	48,42	-50,20	1,38	130,51	6,52
28000/R	KRG	12334	39	106	2	0	70	230	2485300	150	1,58	48,09	-10,33	3,07	65,26	5,64
28500/L	KRG	1356	32	73	1	0	70	230	2485300	235	1,16	20,55	-14,17	1,41	102,23	5,44
29000/R	KRG *	340	423	83	3	1	70	230	2485300	95	1,32	3,29	35,00	2,83	41,33	4,45
29500/L	KRG *	435	542	102	3	2	70	230	2485300	70	1,54	6,36	35,00	3,17	30,45	4,37
30000/R	KRG *	355	443	115	2	1	70	230	2485300	80	1,66	3,83	35,00	3,19	34,80	4,56
30500/L	KRG *	597	744	153	2	7	70	230	2485300	40	1,89	10,31	35,00	3,67	17,40	4,36
31000/R	KRG	10454	492	150	2	9	70	230	2485300	20	1,87	46,02	35,00	5,06	8,70	5,41
31500/L	KRG *	382	476	123	2	2	70	230	2485300	75	1,72	4,74	35,00	3,28	32,63	4,57

32000/R	KRG	694	1621	74	3	6	70	230	2485300	35	1,18	12,19	35,00	3,04	15,23	3,64
32500/L	KRG	11488	37	80	2	0	70	230	2485300	160	1,27	47,20	-11,35	2,69	69,61	5,43
33000/R	KRG *	304	379	151	2	1	70	230	2485300	90	1,88	1,90	33,82	3,28	39,15	4,83
33500/L	KRG	10562	21	93	2	0	70	230	2485300	205	1,45	46,15	-22,34	2,38	89,18	5,90
34000/R	KRG *	186	232	75	2	0	70	230	2485300	125	1,20	-4,23	24,29	1,99	54,38	4,13

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S9

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
500/L		5191	29	174	2	7	240	600	4422000	45	1,97	49,50	-41,94	2,27	19,58	3,04
1000/R		6887	353	198	2	20	240	600	4422000	0	2,04	49,50	35,00	5,37	0,00	5,37
1500/L		6577	225	181	2	20	240	600	4422000	0	1,99	49,50	35,00	5,32	0,00	5,32
2000/R		7093	360	189	2	20	240	600	4422000	0	2,01	49,50	35,00	5,34	0,00	5,34
2500/L		2470	224	254	2	20	240	600	4422000	0	2,14	49,50	35,00	5,47	0,00	5,47
3000/R		1843	278	170	2	20	240	600	4422000	0	1,95	49,50	35,00	5,28	0,00	5,28
3500/L	L	785	46	352	1	0	240	600	4422000	125	2,19	47,07	-18,58	3,31	54,38	5,46
4000/R		2989	41	314	2	4	240	600	4422000	60	2,18	49,50	-24,40	3,17	26,10	4,20
4500/L		1242	21	233	2	0	240	600	4422000	175	2,11	49,50	-58,29	1,76	76,13	4,76
5000/R		456	17	125	1	0	240	600	4422000	220	1,73	23,84	-68,99	-0,05	95,71	3,72
5500/L	R	2782	10	104	2	0	240	600	4422000	190	1,56	49,50	-95,86	-0,27	82,66	2,99
6000/R		180	17	1219	1	0	240	600	4422000	235	1,64	-15,92	-68,99	-1,71	102,23	2,32
6500/L		4810	23	133	2	4	240	600	4422000	70	1,78	49,50	-53,68	1,62	30,45	2,82
7000/R		2817	119	146	2	20	240	600	4422000	0	1,85	49,50	29,55	4,97	0,00	4,97
8500/L		4121	428	166	3	20	210	120	4422000	0	1,94	49,50	18,87	4,63	0,00	4,63
9000/R		2861	170	192	2	19	210	120	4422000	0	2,02	49,50	9,52	4,35	0,00	4,35
9500/L		324	28	309	1	0	210	120	4422000	195	2,18	8,07	-8,74	2,15	84,83	5,49
10000/R		1507	101	190	1	1	210	120	4422000	65	2,02	49,50	4,25	4,13	28,28	5,25
10500/L		869	6	207	2	0	210	120	4422000	300	2,06	44,99	-24,35	2,87	130,51	8,01
11000/R		914	1	139	2	0	210	120	4422000	300	1,82	46,88	-42,49	1,99	130,51	7,13
11500/L		1157	423	134	3	7	210	120	4422000	30	1,79	49,50	18,76	4,48	13,05	4,99
12000/R		4126	43	139	2	3	210	120	4422000	60	1,82	49,50	-4,40	3,59	26,10	4,62
12500/L		162	6787	20	3	0	210	120	4422000	130	-1,13	-17,87	35,00	-0,46	56,55	1,77
13000/R		7130	1796	176	3	20	210	120	4422000	0	1,98	49,50	33,40	5,24	0,00	5,24
13500/L		515	44	55	1	0	210	120	4422000	155	0,77	25,41	-4,17	1,61	67,43	4,26
14000/R		3045	66	70	2	9	240	600	4422000	20	1,11	49,50	-0,30	3,05	8,70	3,39
15000/R		1884	14	155	2	0	240	600	4422000	175	1,89	49,50	-78,82	0,74	76,13	3,74
15500/L		1545	64	65	2	2	240	600	4422000	75	1,01	49,50	-1,85	2,89	32,63	4,17

16000/R		913	13	113	2	0	240	600	4422000	240	1,64	49,50	-82,57	0,34	104,41	4,45
16500/L		704	36	64	1	0	240	600	4422000	150	0,99	42,41	-30,99	1,44	65,26	4,01
17000/R		2174	91	89	2	8	240	600	4422000	25	1,40	49,50	15,97	3,98	10,88	4,41
17500/L		2312	71	114	2	6	240	600	4422000	40	1,65	49,50	3,40	3,73	17,40	4,42
18000/R		3099	192	145	2	20	240	600	4422000	0	1,85	49,50	35,00	5,18	0,00	5,18
18500/L		1751	62	89	1	1	200	200	4422000	100	1,40	49,50	-1,15	3,30	43,50	5,02
19000/R		3688	41	89	2	2	200	200	4422000	85	1,40	49,50	-8,13	3,03	36,98	4,48
19500/L	K	201	65	45	1	0	200	200	4422000	155	0,46	-9,33	-0,36	0,07	67,43	2,73
20000/R		1148	133	65	1	1	200	200	4422000	85	1,01	49,50	11,73	3,42	36,98	4,88
20500/L	R L	801	18	167	1	0	200	200	4422000	220	1,94	39,94	-22,03	2,65	95,71	6,42
21000/R		1180	418	84	3	7	200	200	4422000	35	1,33	49,50	31,06	4,51	15,23	5,11
21500/L		1592	54	114	1	0	200	200	4422000	110	1,65	49,50	-3,49	3,46	47,85	5,35
22000/R		2048	108	92	1	3	200	200	4422000	55	1,43	49,50	8,21	3,71	23,93	4,65
22500/L		1365	87	116	1	0	200	200	4422000	85	1,66	49,50	4,56	3,80	36,98	5,25
23000/R		721	179	175	1	1	200	200	4422000	65	1,97	36,19	16,74	4,06	28,28	5,17
23500/L		11633	375	302	2	20	180	130	4422000	0	2,18	49,50	19,00	4,87	0,00	4,87
24000/R		8159	78	109	2	15	180	130	4422000	0	1,61	49,50	1,77	3,63	0,00	3,63
24500/L		4321	103	200	2	7	180	130	4422000	30	2,04	49,50	4,82	4,18	13,05	4,70
25000/R		3410	12	413	2	0	180	130	4422000	210	2,19	49,50	-18,77	3,40	91,36	7,00
25500/L		1209	102	496	2	1	180	130	4422000	95	2,16	49,15	4,71	4,28	41,33	5,91
26000/R		822	1591	102	3	5	180	130	4422000	40	1,54	36,78	34,85	4,36	17,40	5,05
26500/L		1263	121	406	1	1	180	130	4422000	85	2,19	49,50	6,59	4,40	36,98	5,86
27000/R		11156	1386	241	3	20	180	130	4422000	0	2,12	49,50	33,34	5,38	0,00	5,38
27500/L		13286	253	139	3	20	180	130	4422000	0	1,82	49,50	14,68	4,34	0,00	4,34
28000/R		2833	23	80	2	0	180	130	4422000	175	1,27	49,50	-11,63	2,77	76,13	5,77
28500/L		2668	88	104	1	2	180	130	4422000	70	1,56	49,50	3,09	3,63	30,45	4,83
29000/R		925	39	431	2	0	180	130	4422000	170	2,18	40,57	-5,84	3,55	73,96	6,46
29500/L	*	466	704	140	3	0	70	140	4422000	110	1,82	7,22	27,90	3,21	47,85	5,09
30000/R	*	1651	1683	210	3	4	70	140	4422000	50	2,07	23,00	35,00	4,35	21,75	5,21
30500/L		7063	12506	121	3	20	70	140	4422000	0	1,70	41,13	35,00	4,70	0,00	4,70
31000/R	*	3012	3069	168	3	9	70	140	4422000	20	1,95	30,50	35,00	4,53	8,70	4,87
31500/L		12403	22	243	2	0	70	140	4422000	220	2,12	48,16	-13,05	3,51	95,71	7,28
32000/R	*	700	713	303	3	2	70	140	4422000	65	2,18	12,30	28,05	3,77	28,28	4,88
32500/L	*	911	1376	152	3	1	70	140	4422000	80	1,88	15,59	35,00	3,87	34,80	5,25
33000/R	*	1253	1277	207	3	3	70	140	4422000	65	2,06	19,56	34,94	4,21	28,28	5,32
33500/L	R *	9694	14652	1282	3	20	70	140	4422000	0	1,59	45,08	35,00	4,75	0,00	4,75

34000/R	*	1615	1646	307	3	7	70	140	4422000	30	2,18	22,73	35,00	4,45	13,05	4,97
34500/L	*	1964	2969	345	3	19	70	140	4422000	0	2,19	25,17	35,00	4,56	0,00	4,56
35000/R		9029	70	162	2	0	70	140	4422000	150	1,92	44,20	0,63	3,69	65,26	6,26

INTERNATIONAL GEORGIAN ROADS: BEARING CAPACITY RESULTS pr. POINT 1997

ROAD S12

chainage/lane	remarks	E1	E2	E subg.	Cr.layer	est.life	H1	H2	est.traffic	overlay	SNSG	a(I)*h(I)	a(I)*h(I)	SNC	A(I)*H(I)	SNC
[m]		[Mpa]	[Mpa]	[Mpa]		[Years]	[mm]	[mm]	[S. A.]	[mm]		E1	E2	before str.	str. layer	after str.
0/R	KRG	2127	676	147	3	20	170	200	3097400	0	1,86	49,50	35,00	5,19	0,00	5,19
1000/R	KR	1081	262	140	2	4	170	200	3097400	40	1,82	43,03	23,17	4,43	17,40	5,12
1500/L	KR	1866	6	86	2	0	170	200	3097400	300	1,36	49,50	-40,58	1,71	130,51	6,85
2000/R	KRG	1104	167	155	1	1	170	200	3097400	65	1,89	43,67	15,57	4,23	28,28	5,34
2500/L	RG	3975	401	82	3	20	170	200	3097400	0	1,30	49,50	30,36	4,45	0,00	4,45
3000/R	KR	1438	87	104	1	0	170	200	3097400	95	1,56	49,50	4,56	3,69	41,33	5,32
3500/L	KRG	742	132	48	1	0	170	200	3097400	125	0,56	31,63	11,60	2,26	54,38	4,41
4000/R	KRG	3011	597	76	3	20	170	200	3097400	0	1,21	49,50	35,00	4,54	0,00	4,54
4500/L	KR	779	74	98	1	0	170	200	3097400	120	1,50	33,11	1,83	2,88	52,20	4,93
5000/R	RG	1772	394	128	2	17	170	200	3097400	0	1,75	49,50	30,06	4,89	0,00	4,89
5500/L	KRG	2030	124	405	2	2	170	200	3097400	60	2,19	49,50	10,55	4,55	26,10	5,58
6000/R'	KRG	6120	518	134	3	20	170	200	3097400	0	1,79	49,50	34,68	5,10	0,00	5,10
6500/L	KRG	1389	102	169	1	0	170	200	3097400	85	1,95	49,50	7,25	4,19	36,98	5,64
7000/R	KRG	870	703	87	3	7	170	200	3097400	25	1,37	36,46	35,00	4,19	10,88	4,62
7500/L	R	2250	9	203	2	0	170	200	3097400	250	2,05	49,50	-33,73	2,67	108,76	6,96
8000/R	RG	4057	133	128	2	10	170	200	3097400	15	1,75	49,50	11,73	4,16	6,53	4,42
8500/L	KRG	2107	56	126	2	1	170	200	3097400	110	1,74	49,50	-2,87	3,57	47,85	5,46
9000/R	R	2309	92	329	2	2	170	200	3097400	70	2,19	49,50	5,51	4,35	30,45	5,55
9500/L	KRG	371	1518	84	3	9	170	200	3097400	15	1,33	10,64	35,00	3,13	6,53	3,39
10000/R	KRG	242	281	88	2	1	170	200	3097400	75	1,38	-2,31	24,36	2,25	32,63	3,54
10500/L	KRG	913	32	244	1	0	170	200	3097400	175	2,12	37,92	-12,32	3,13	76,13	6,13
11000/R		992	386	80	3	4	170	200	3097400	50	1,27	40,43	29,71	4,04	21,75	4,89
11500/L	KRG	1293	94	129	1	0	170	200	3097400	95	1,76	48,46	5,87	3,90	41,33	5,53
12000/R	KRG	525	114	102	1	0	170	200	3097400	110	1,54	21,15	9,13	2,73	47,85	4,62
12500/L	KRG	2233	53	104	2	1	170	200	3097400	110	1,56	49,50	-3,80	3,36	47,85	5,25
13000/R	R	393	147	127	2	0	170	200	3097400	95	1,74	12,38	13,42	2,76	41,33	4,39
13500/L	KRG	1355	32	102	1	0	170	200	3097400	165	1,54	49,50	-12,32	3,01	71,78	5,83
14000/R	G	1137	53	140	1	0	170	200	3097400	135	1,82	44,56	-3,80	3,43	58,73	5,74

14500/L	R	684	41	126	1	0	170	200	3097400	165	1,74	29,17	-8,13	2,57	71,78	5,39
15000/R	KRG	406	80	183	1	0	170	200	3097400	125	2,00	13,37	3,15	2,65	54,38	4,79
15500/L	R	2881	14	193	2	0	170	200	3097400	215	2,03	49,50	-26,27	2,94	93,53	6,63
16000/R	R	3577	85	130	2	3	170	200	3097400	55	1,76	49,50	4,17	3,88	23,93	4,82
16500/L	KRG	1070	122	134	1	0	170	200	3097400	85	1,79	42,72	10,27	3,88	36,98	5,33
17000/R	KRG	547	115	119	1	0	170	200	3097400	105	1,69	22,40	9,27	2,94	45,68	4,74
17500/L	R	4110	9	110	2	0	170	200	3097400	210	1,62	49,50	-33,73	2,24	91,36	5,84
18000/R	R	417	22	91	1	0	170	200	3097400	215	1,42	14,18	-18,64	1,25	93,53	4,93
18500/L	R	537	99	154	1	0	170	200	3097400	110	1,89	21,84	6,75	3,02	47,85	4,90
19000/R		4010	83	96	2	4	170	200	3097400	45	1,48	49,50	3,77	3,58	19,58	4,35
19500/L	R	616	187	161	2	1	170	200	3097400	75	1,92	26,00	17,48	3,63	32,63	4,92
20000/R	R	707	136	134	1	0	170	200	3097400	95	1,79	30,17	12,11	3,45	41,33	5,08
20500/L	KRG	486	112	86	1	0	205	330	3097400	85	1,36	22,69	14,57	2,83	36,98	4,28
21000/R	RG	451	57	67	1	0	205	330	3097400	125	1,05	19,96	-4,25	1,67	54,38	3,81
21500/L	KRG	831	103	203	1	1	205	330	3097400	75	2,05	42,29	12,23	4,20	32,63	5,48
22000/R	R	1048	106	173	1	1	205	330	3097400	65	1,96	49,50	13,03	4,43	28,28	5,54
22500/L	R	536	263	117	2	3	205	330	3097400	35	1,67	26,27	35,00	4,09	15,23	4,69
23000/R	KRG	1303	8	134	2	0	205	330	3097400	235	1,79	49,50	-58,94	1,42	102,23	5,44
23500/L	R	508	189	145	2	2	205	330	3097400	50	1,85	24,31	29,14	3,95	21,75	4,81
24000/R		1023	73	176	1	0	205	330	3097400	90	1,98	49,50	2,64	4,03	39,15	5,57
24500/L	RG	838	73	91	1	0	205	330	3097400	100	1,42	42,59	2,64	3,20	43,50	4,92
25000/R	R	2456	17	202	2	0	205	330	3097400	160	2,05	49,50	-37,94	2,50	69,61	5,25
25500/L	R	839	204	171	2	4	205	330	3097400	35	1,96	42,64	31,27	4,87	15,23	5,47
26000/R	RG	607	210	170	2	3	205	330	3097400	40	1,95	30,81	32,07	4,43	17,40	5,12
26500/L	KR	1954	127	240	2	7	205	330	3097400	30	2,12	49,50	18,07	4,78	13,05	5,29
27000/R	R	1574	64	148	2	1	205	330	3097400	85	1,86	49,50	-1,02	3,77	36,98	5,23
27500/L	KRG	1896	117	212	2	6	205	330	3097400	35	2,07	49,50	15,78	4,64	15,23	5,24
28000/R		745	165	209	1	2	205	330	3097400	45	2,06	38,30	25,36	4,57	19,58	5,34
28500/L	KRG	1363	374	78	2	20	205	330	3097400	0	1,24	49,50	35,00	4,57	0,00	4,57
29000/R	G	971	76	192	1	0	205	330	3097400	90	2,02	47,97	3,77	4,06	39,15	5,60
29500/L	KRG	3638	43	202	2	3	205	330	3097400	65	2,05	49,50	-12,10	3,52	28,28	4,64
30000/R	KRG	1105	165	156	1	4	205	330	3097400	30	1,90	49,50	25,36	4,85	13,05	5,36
30500/L	KRG	2832	499	103	2	20	205	330	3097400	0	1,55	49,50	35,00	4,88	0,00	4,88
31000/R	KR	4491	546	184	2	20	205	330	3097400	0	2,00	49,50	35,00	5,33	0,00	5,33
31500/L	KRG	4598	72	218	2	13	205	330	3097400	10	2,08	49,50	2,26	4,12	4,35	4,29
32000/R	KG	820	222	132	2	5	205	330	3097400	30	1,78	41,80	33,62	4,75	13,05	5,26

32500/L	KRG	2606	82	189	2	5	205	330	3097400	40	2,01	49,50	5,88	4,20	17,40	4,88
33000/R	KRG	500	169	123	2	1	205	330	3097400	55	1,72	23,73	26,02	3,68	23,93	4,62
33500/L	KR	273	56	116	1	0	205	330	3097400	135	1,66	1,62	-4,74	1,54	58,73	3,86
34000/R	RG	772	247	153	2	5	205	330	3097400	30	1,89	39,60	35,00	4,83	13,05	5,34
34500/L	KRG	1972	112	80	2	5	205	330	3097400	35	1,27	49,50	14,57	3,80	15,23	4,40
35000/R	KRG	748	143	142	1	1	205	330	3097400	55	1,83	38,44	21,37	4,19	23,93	5,13
35500/L	KRG	2284	25	129	2	1	205	330	3097400	130	1,76	49,50	-27,20	2,64	56,55	4,86
36000/R	KRG	565	252	129	2	3	205	330	3097400	35	1,76	28,19	35,00	4,25	15,23	4,85
36500/L	R	2043	136	94	2	8	205	330	3097400	20	1,46	49,50	19,97	4,19	8,70	4,54
37000/R	RG	1437	127	121	1	2	205	330	3097400	45	1,70	49,50	18,07	4,36	19,58	5,14
37500/L	R	1244	60	93	1	0	205	330	3097400	100	1,45	49,50	-2,82	3,28	43,50	5,00
38000/R		208	92	132	2	0	205	330	3097400	105	1,78	-8,31	9,09	1,81	45,68	3,61
38500/L	KRG	766	76	175	1	0	205	330	3097400	100	1,97	39,31	3,77	3,67	43,50	5,38
39000/R		867	86	108	1	0	205	330	3097400	85	1,60	43,84	7,21	3,61	36,98	5,07
39500/L		2418	297	102	2	20	205	330	3097400	0	1,54	49,50	35,00	4,87	0,00	4,87
40000/R		491	103	106	1	0	205	330	3097400	90	1,58	23,06	12,23	2,97	39,15	4,51
40500/L	R	1759	462	134	2	20	205	330	3097400	0	1,79	49,50	35,00	5,12	0,00	5,12
41000/R		797	155	91	1	1	205	330	3097400	50	1,42	40,76	23,62	3,96	21,75	4,82
41500/L	R	1258	86	209	1	1	205	330	3097400	75	2,06	49,50	7,21	4,30	32,63	5,58
42000/R		847	177	135	1	3	205	330	3097400	40	1,79	42,98	27,31	4,56	17,40	5,25
42500/L	KRG	1046	192	161	1	1	150	200	3097400	70	1,92	37,09	17,93	4,09	30,45	5,29
43000/R		2317	56	279	2	0	150	200	3097400	125	2,16	49,50	-2,87	4,00	54,38	6,14
43500/L	KRG	669	341	276	2	2	150	200	3097400	50	2,16	25,14	27,62	4,24	21,75	5,09
44000/R		1066	356	180	2	4	150	200	3097400	35	1,99	37,60	28,35	4,59	15,23	5,19
44500/L	KG	217	28632	35	3	20	150	200	3097400	0	0,02	-4,95	35,00	1,20	0,00	1,20
45000/R		1125	214	425	2	2	150	200	3097400	60	2,18	39,04	19,76	4,50	26,10	5,53
45500/L	KR	2439	22	251	2	0	150	200	3097400	190	2,13	49,50	-18,64	3,35	82,66	6,60
46000/R	KRG	1143	179	256	1	1	150	200	3097400	65	2,14	39,46	16,74	4,35	28,28	5,47
46500/L	KRG	2443	39	87	2	0	150	200	3097400	150	1,37	49,50	-8,98	2,97	65,26	5,54
47000/R	G	455	226	109	2	1	150	200	3097400	85	1,61	14,84	20,68	3,01	36,98	4,46
47500/L	KRG	566	362	80	3	2	150	200	3097400	80	1,27	20,68	28,63	3,22	34,80	4,59
48000/R	KRG	646	128	101	1	0	150	200	3097400	110	1,53	24,21	11,08	2,92	47,85	4,81
48500/L	KRG	1063	221	144	1	2	150	200	3097400	65	1,84	37,52	20,30	4,12	28,28	5,24
49000/R	RG	4603	163	106	2	9	150	200	3097400	20	1,58	49,50	15,16	4,13	8,70	4,47
49500/L	KRG	2471	102	200	1	1	150	200	3097400	80	2,04	49,50	7,25	4,28	34,80	5,65
50000/R	R	1354	244	85	1	2	150	200	3097400	65	1,35	43,99	21,97	3,94	28,28	5,06

50500/L	KRG	11884	160	187	2	20	150	200	3097400	0	2,01	49,50	14,85	4,54	0,00	4,54
51000/R	R	3427	116	123	2	3	150	200	3097400	55	1,72	49,50	9,42	4,04	23,93	4,98
51500/L	R	2936	37	327	2	0	150	200	3097400	140	2,19	49,50	-9,87	3,75	60,90	6,15
52000/R		1420	293	88	3	4	150	200	3097400	55	1,38	45,26	25,06	4,16	23,93	5,10
52500/L	R	1610	121	162	1	0	150	200	3097400	85	1,92	48,62	10,13	4,24	36,98	5,70
53000/R	KRG	1028	99	145	1	0	150	200	3097400	110	1,85	36,63	6,75	3,56	47,85	5,44
53500/L	KRG	3677	89	159	2	2	150	200	3097400	70	1,91	49,50	4,95	4,06	30,45	5,26
54000/R	R	3988	83	136	2	2	150	200	3097400	70	1,80	49,50	3,77	3,90	30,45	5,10
54500/L	R	4423	21	158	2	0	150	200	3097400	155	1,91	49,50	-19,43	3,09	67,43	5,75
55000/R	R	5687	11	186	2	0	150	200	3097400	200	2,01	49,50	-30,34	2,76	87,01	6,19
55500/L	R	4012	28	115	2	0	150	200	3097400	150	1,66	49,50	-14,57	3,03	65,26	5,60
56000/R	KRG	1466	50	149	1	0	150	200	3097400	150	1,87	46,11	-4,79	3,50	65,26	6,07

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0001.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S1 Mea. date: 970423 2
Start at: TBILISI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
0/R	*	1109	1335	0	128	2	8	100	680	0	16473900	35
0/L		9422	932	0	475	2	14	100	680	0	16473900	5
500/L	*	1045	1203	0	137	2	6	100	680	0	16473900	45
1000/R	*	1445	1739	0	154	2	19	100	680	0	16473900	0
1500/L	*	1000	1151	0	263	2	5	100	680	0	16473900	50
2000/R	*	1239	1491	0	227	2	12	100	680	0	16473900	15
2500/L		12919	172	0	100	2	1	100	680	0	16473900	75
3000/R		9791	40	0	196	2	0	100	680	0	16473900	210
3500/L		5583	379	0	263	2	1	100	680	0	16473900	85
4000/R	R	716	1116	0	272	2	4	100	680	0	16473900	60
4500/L	*	1739	2002	0	265	2	20	100	680	0	16473900	0
5000/R	*	742	893	0	171	2	2	100	680	0	16473900	75
5500/L		5799	117	0	134	2	0	100	680	0	16473900	150
6000/R	*	1633	1965	0	233	2	20	100	680	0	16473900	0
6500/L		8974	159	0	119	2	1	100	680	0	16473900	105
7000/R		13910	348	0	107	2	4	100	680	0	16473900	40
7500/L	*	693	798	0	144	2	2	100	680	0	16473900	85
8000/R	*	1072	1291	0	159	2	7	100	680	0	16473900	35
8500/L	*	3708	4270	0	409	2	20	100	680	0	16473900	0
9000/R	*	782	941	0	371	2	3	100	680	0	16473900	70
9500/L	*	1633	1880	0	471	2	20	100	680	0	16473900	0
10000/R	*	871	1049	0	206	2	4	100	680	0	16473900	60
10500/L		3784	254	0	372	2	0	100	680	0	16473900	125
11000/R	*	712	858	0	176	2	2	100	680	0	16473900	80
11500/L		5850	52	0	156	2	0	100	680	0	16473900	215
12000/R	*	880	1059	0	219	2	4	100	680	0	16473900	60

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
12500/L		1465	9	0	97	2	0	200	350	0	16473900	300
13000/R		1495	68	0	507	2	0	200	350	0	16473900	160
13500/L		4722	561	0	224	2	20	200	350	0	16473900	0
14000/R		8393	34	0	140	2	2	200	350	0	16473900	90
14500/L		3071	17	0	108	2	0	200	350	0	16473900	245
15000/R		5795	10	0	216	2	0	200	350	0	16473900	235
15500/L		1062	132	0	217	1	0	200	350	0	16473900	120
16000/R		1583	178	0	119	2	2	200	350	0	16473900	85
16500/L		1274	66	0	99	1	0	200	350	0	16473900	170
17000/R		2168	147	0	111	2	2	200	350	0	16473900	80
17500/L		1127	575	0	138	2	7	200	350	0	16473900	30
18000/R		4026	107	0	185	2	3	200	350	0	16473900	65
18500/L		1343	132	0	137	1	0	200	350	0	16473900	110
19000/R		1534	621	0	161	2	12	200	350	0	16473900	10
19500/L		8150	71	0	186	2	7	200	350	0	16473900	40
20000/R		2270	184	0	95	2	3	200	350	0	16473900	65
20500/L		1786	217	0	111	2	3	200	350	0	16473900	60
21000/R		3093	50	0	80	2	1	200	350	0	16473900	145
21500/L		2001	159	0	127	2	2	200	350	0	16473900	80
22000/R		1731	166	0	152	1	1	200	350	0	16473900	85
22500/L		1820	104	0	119	1	1	200	350	0	16473900	115
23000/R		817	24	0	50	1	0	200	350	0	16473900	285
23500/L		2165	12	0	69	2	0	200	350	0	16473900	300
24000/R		2582	101	0	152	2	1	200	350	0	16473900	100
24500/L		1003	262	0	142	2	1	200	350	0	16473900	75
25000/R		1696	17	0	92	2	0	200	350	0	16473900	280
25500/L		9088	362	0	386	2	1	70	380	0	16473900	105
26000/R		6910	194	0	182	2	0	70	380	0	16473900	150
26500/L	*	511	588	0	147	2	0	70	380	0	16473900	125
27000/R		463	1362	0	153	2	6	70	380	0	16473900	60
27500/L		12874	439	0	409	2	1	70	380	0	16473900	80
28000/R		14374	104	0	218	2	0	70	380	0	16473900	150
28500/L	*	2055	2367	0	320	2	20	70	380	0	10342600	0
29000/R	*	558	672	0	279	2	1	70	380	0	10342600	100
29500/L	*	247	284	0	113	2	0	70	380	0	10342600	150
30000/R		9755	35	0	113	2	0	70	380	0	10342600	235
30500/L		12106	91	0	99	2	0	70	380	0	10342600	150
31000/R		12835	343	0	133	2	1	70	380	0	10342600	75
31500/L	*	1012	1165	0	320	2	7	70	380	0	10342600	50
32000/R		12991	356	0	206	2	1	70	380	0	10342600	70
32500/L		9997	305	0	130	2	1	70	380	0	10342600	90
33000/R		8386	575	0	195	2	2	70	380	0	10342600	65
33500/L		5069	305	0	228	2	0	70	380	0	10342600	120
34000/R	*	485	583	0	169	2	1	70	380	0	10342600	110
34500/L		9073	315	0	296	2	1	70	380	0	10342600	95
35000/R	*	643	774	0	198	2	2	70	380	0	10342600	90
35500/L		14149	239	0	210	2	1	70	380	0	10342600	85
36000/R	*	511	615	0	142	2	1	70	380	0	10342600	105
36500/L		5855	485	0	182	2	1	70	380	0	10342600	80
37000/R	*	489	589	0	165	2	1	70	380	0	10342600	110
37500/L		8836	385	0	230	2	1	70	380	0	10342600	85
38000/R		11488	527	0	196	2	3	70	380	0	10342600	55
38500/L	*	481	554	0	166	2	1	70	380	0	10342600	115
39000/R	*	598	720	0	174	2	1	70	380	0	10342600	95
39500/L		1901	243	0	194	2	1	140	250	0	10342600	85
40000/R		9736	60	0	132	2	1	140	250	0	10342600	95
40500/L		4570	149	0	173	2	2	140	250	0	10342600	80
41000/R		1663	597	0	238	2	5	140	250	0	10342600	40
41500/L		2116	196	0	272	2	1	140	250	0	10342600	100
42000/R		1542	247	0	99	2	1	140	250	0	10342600	90

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
42500/L		1790	1577	0	179	2	20	140	250	0	10342600	0
43000/R		3880	338	0	247	2	4	140	250	0	10342600	45
43500/L		1353	517	0	190	2	3	140	250	0	10342600	55
44000/R		8340	25	0	149	2	0	140	250	0	10342600	175
44500/L		13205	818	0	167	2	20	140	250	0	10342600	0
45000/R		3055	306	0	62	3	2	140	250	0	10342600	100
45500/L		8752	793	0	225	2	20	140	250	0	10342600	0
46000/R		3826	112	0	172	2	1	140	250	0	10342600	110
46500/L	*	3023	3481	0	154	3	20	140	250	0	10342600	0
47000/R		12783	1013	0	229	2	20	140	250	0	10342600	0
47500/L		10366	16	0	121	2	0	140	250	0	10342600	215
48000/R		617	1456	0	85	3	6	140	250	0	10342600	40
48500/L		1656	81	0	97	1	0	140	250	0	10342600	170
49000/R		2084	241	0	82	2	1	140	250	0	10342600	100
49500/L		1697	43	0	84	1	0	140	250	0	10342600	215
50000/R	R	7101	66	0	129	2	1	140	250	0	10342600	110
50500/L	'	10660	33	0	108	2	1	140	250	0	10342600	135
51000/R		6649	474	0	116	2	17	140	250	0	10342600	0
51500/L		10636	111	0	109	2	2	120	250	0	10342600	70
52000/R		4973	380	0	123	2	4	120	250	0	10342600	50
52500/L		14634	91	0	184	2	2	120	250	0	10342600	60
53000/R		2229	3060	0	129	3	20	120	250	0	10342600	0
53500/L		14115	620	0	165	2	20	120	250	0	10342600	0
54000/R		8366	2783	0	123	3	20	120	250	0	10342600	0
54500/L		6773	180	0	73	2	2	120	250	0	10342600	80
55000/R		1913	1624	0	140	3	20	120	250	0	10342600	0
55500/L		14255	1010	0	137	3	20	120	250	0	10342600	0
56000/R		2339	1997	0	59	3	9	120	250	0	10342600	30
56500/L		3721	112	0	137	2	0	120	250	0	10342600	130
57000/R		12398	1189	0	158	2	20	120	250	0	10342600	0
57500/L	*	1339	1542	0	106	3	11	120	250	0	10342600	15
58000/R		10415	525	0	88	3	16	120	250	0	10342600	0
58500/L		9072	347	0	106	2	8	120	250	0	10342600	20
59500/L		13306	319	0	112	2	14	120	250	0	10342600	5
60000/R		4035	673	0	249	2	10	120	250	0	10342600	15
60500/L		8102	397	0	94	2	9	120	250	0	10342600	20
61000/R		1503	10	0	92	2	0	120	250	0	10342600	300
61500/L		6258	110	0	109	2	5	170	300	0	10342600	45
62000/R		3020	258	0	93	2	5	170	300	0	10342600	40
62500/L		1166	46	0	93	1	0	170	300	0	10342600	195
63000/R		1143	433	0	174	2	3	170	300	0	10342600	50
63500/L		902	65	0	89	1	0	170	300	0	10342600	180
64000/R		7133	612	0	159	2	20	170	300	0	10342600	0
64500/L		5597	203	0	184	2	11	170	300	0	10342600	15
65000/R	*	3040	3040	0	323	2	20	170	300	0	10342600	0
65500/L		2666	852	0	245	2	20	170	300	0	10342600	0
66000/R		3071	39	0	142	2	0	170	300	0	10342600	170
66500/L		2070	237	0	215	2	3	170	300	0	10342600	55
67000/R		534	626	0	222	2	3	170	300	0	10342600	50
67500/L		1656	181	0	177	1	1	170	300	0	10342600	90
68000/R		1981	251	0	149	2	3	170	300	0	10342600	55
68500/L		2196	189	0	238	2	2	170	300	0	10342600	75
69000/R		7952	524	0	114	2	20	170	300	0	10342600	0
69500/L		5008	449	0	309	2	20	200	600	0	10342600	0
70000/R		11311	336	0	215	2	20	200	600	0	10342600	0
70500/L		3645	395	0	121	2	20	200	600	0	10342600	0
71000/R		7258	372	0	210	2	20	200	600	0	10342600	0
71500/L	R	1186	199	0	384	2	2	200	600	0	10342600	65
72000/R		2462	102	0	316	2	2	200	600	0	10342600	80
72500/L	L	1185	370	0	365	2	5	200	600	0	10342600	35

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
73000/R		2042	498	0	276	2	20	200	600	0	10342600	0
73500/L		1272	670	0	272	2	16	200	600	0	10342600	0
74000/R	R	2043	232	0	126	2	6	200	600	0	10342600	30
74500/L		2716	271	0	106	2	10	200	600	0	10342600	15
75000/R		2246	67	0	158	2	1	200	600	0	10342600	120
75500/L		3029	410	0	207	2	20	200	600	0	10342600	0
76000/R		4560	27	0	134	2	1	200	600	0	10342600	140
76500/L		2120	293	0	145	2	10	200	600	0	10342600	15
77000/R		1397	210	0	152	2	3	200	600	0	10342600	55
77500/L		9706	780	0	120	2	20	130	300	0	10342600	0
78000/R		1192	126	0	275	1	0	130	300	0	10342600	150
78500/L		3519	312	0	352	2	2	130	300	0	10342600	65
79000/R		1934	136	0	102	1	0	130	300	0	10342600	135
79500/L		472	1660	0	95	3	15	130	300	0	10342600	0
80000/R	*	3995	3995	0	223	3	20	130	300	0	10342600	0
80500/L		10366	982	0	149	2	20	130	300	0	10342600	0
81000/R		11956	498	0	148	2	20	130	300	0	10342600	0
81500/L		7238	559	0	154	2	18	130	300	0	10342600	0
82000/R	*	2920	2920	0	184	2	20	130	300	0	10342600	0
82500/L		13010	208	0	147	2	10	130	300	0	13035300	20
83000/R		1226	446	0	169	2	1	130	300	0	13035300	80
83500/L		3710	376	0	168	2	3	130	300	0	13035300	50
84000/R		764	550	0	164	2	1	130	300	0	13035300	80
84500/L		3767	332	0	171	2	2	130	300	0	13035300	70
85000/R		4084	390	0	111	2	3	130	300	0	13035300	45
85500/L		3284	371	0	115	2	3	130	300	0	13035300	60
86000/R		3481	113	0	200	2	0	130	300	0	13035300	135
86500/L		4163	115	0	183	2	0	130	300	0	13035300	125
87000/R		6810	517	0	166	2	12	130	300	0	13035300	10
87500/L		9055	66	0	141	2	2	160	600	0	13035300	75
88000/R		2587	180	0	99	2	1	160	600	0	13035300	90
88500/L		14149	385	0	156	2	20	160	600	0	13035300	0
89000/R	*	1707	1707	0	139	2	20	160	600	0	13035300	0
89500/L	R L	5518	424	0	118	2	17	160	600	0	13035300	0
90000/R		1546	226	0	135	2	1	160	600	0	13035300	85
90500/L		2345	330	0	122	2	4	160	600	0	13035300	50
91000/R	*	644	644	0	209	2	3	160	600	0	13035300	55
91500/L		4572	377	0	155	2	10	160	600	0	13035300	15
92000/R		4623	171	0	181	2	3	160	600	0	13035300	55
92500/L		1031	121	0	96	1	0	160	600	0	13035300	145
93000/R		3101	54	0	112	2	0	160	600	0	13035300	170
93500/L		5556	283	0	151	2	9	160	600	0	13035300	20
94000/R		5876	152	0	143	2	4	160	600	0	13035300	45
94500/L	R	2855	336	0	136	2	5	160	600	0	13035300	40
95000/R		1155	975	0	151	2	12	160	600	0	13035300	10
95500/L	R	6805	159	0	112	2	6	160	600	0	13035300	35
96000/R		3492	270	0	151	2	4	160	600	0	13035300	50
96500/L		1732	259	0	180	2	1	160	600	0	13035300	75
97000/R	R	2847	58	0	60	2	0	160	600	0	13035300	165
97500/L		11382	226	0	104	2	20	160	600	0	13035300	0
98000/R		10348	48	0	117	2	2	160	600	0	13035300	90
98500/L		7204	370	0	149	2	20	160	600	0	13035300	0
99000/R	R	1955	227	0	106	2	1	160	600	0	13035300	90
99500/L		6926	309	0	148	2	16	160	600	0	13035300	0
100000/R		1221	529	0	352	2	3	160	600	0	13035300	50
100500/L		1324	199	0	162	2	2	200	500	0	13035300	65
101000/R		2239	324	0	118	2	10	200	500	0	13035300	15
101500/L		4660	354	0	141	2	20	200	500	0	13035300	0
102000/R		5555	78	0	90	2	5	200	500	0	13035300	50
102500/L		6662	394	0	117	2	20	200	500	0	13035300	0

Point	Remarks	E1	E2	E3	Esub	Critical	Estimated	Ex.layer			Estimated	New
		MPa	Mpa	MPa	MPa	layer	life	H1	H2	H3	traffic	overlay
							years	mm	mm	mm	8.16 t	mm
103000/R		1824	260	0	129	2	5	200	500	0	13035300	40
103500/L	R	2889	294	0	116	2	14	200	500	0	13035300	5
103500/L		3206	128	0	71	2	4	200	500	0	13035300	55
104000/R		3106	362	0	115	2	20	200	500	0	13035300	0
104500/L		1532	507	0	102	2	10	200	500	0	13035300	15
105000/R		1290	309	0	87	2	4	200	500	0	13035300	50
105500/L	R	5041	469	0	317	2	20	200	500	0	13035300	0
106000/R		1245	362	0	106	2	4	200	500	0	13035300	40
106500/L		2210	300	0	101	2	9	200	500	0	13035300	25
107000/R		6670	79	0	118	2	7	200	500	0	13035300	35
107500/L		1556	300	0	123	2	5	200	500	0	13035300	40
108000/R		2230	312	0	113	2	9	200	500	0	13035300	20
108500/L		2149	57	0	96	2	0	200	500	0	13035300	145
109000/R		1843	437	0	124	2	11	200	500	0	13035300	15
109500/L		1896	225	0	160	2	4	200	500	0	13035300	45
110500/L		3066	239	0	120	2	9	200	500	0	13035300	25
111000/R	R	2873	331	0	152	2	16	200	500	0	13035300	0
111500/L		1451	326	0	109	2	5	200	500	0	13035300	40
112000/R		3983	183	0	113	2	10	200	500	0	13035300	20
112500/L		1688	255	0	115	2	4	200	500	0	13035300	45
113000/R		936	328	0	157	2	2	200	500	0	13035300	55

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0001.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S1 Mea. date: 2349 2
Start at: TBILISI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
113500/L		990	315	0	154	2	2	200	500	0	13035300	55
114000/R		819	599	0	462	2	6	200	500	0	13035300	30
114500/L		2209	114	0	116	2	1	200	500	0	13035300	90
115000/R		5429	409	0	229	2	20	200	500	0	13035300	0
115500/L		3061	417	0	136	2	20	200	500	0	13035300	0
116000/R		2209	401	0	807	2	13	200	500	0	13035300	10

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0004.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S4 Mea. date: 2649 2
Start at: TBILISI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	Ex.layer H2 mm	Ex.layer H3 mm	Estimated traffic 8.16 t	New overlay mm
10500/L		1361	253	0	50	3	1	100	200	0	1518600	110
11000/R	R	8491	14	0	182	2	0	100	200	0	1518600	180
11500/L	KRG	9256	178	0	74	3	8	100	200	0	1518600	20
12000/R	KR	7088	545	0	78	3	17	100	200	0	1518600	0
12500/L	KRG	646	449	0	70	3	1	100	200	0	1518600	80
13000/R		7831	10	0	101	2	0	100	200	0	1518600	225
13500/L	R	7158	1548	0	88	3	20	100	200	0	1518600	0
14000/R	KRG	4354	371	0	87	3	8	100	200	0	1518600	25
14500/L	R	1047	4346	0	89	3	20	100	200	0	1518600	0
15000/R		7891	607	0	59	3	13	100	200	0	1518600	10
15500/L	KR	2437	2206	0	129	3	20	100	200	0	1518600	0
16000/R	KRG	12244	58	0	73	2	2	100	200	0	1518600	60
16500/L	R	9867	2628	0	113	3	20	100	200	0	1518600	0
17000/R	R	11572	9	0	85	2	0	100	200	0	1518600	185
17500/L	KR	5102	117	0	81	2	0	80	200	0	1518600	90
18000/R		1228	4353	0	148	3	20	80	200	0	1518600	0
18500/L	R	4077	975	0	64	3	7	80	200	0	1518600	35
19000/R	KR	11884	2122	0	120	3	20	80	200	0	1518600	0
19500/L	R	141	1763	0	66	3	3	80	200	0	1518600	45
20000/R	*	1047	1369	0	230	3	20	80	200	0	1518600	0
20500/L		2081	1237	0	78	3	8	80	200	0	1518600	25
21000/R		7054	685	0	162	2	20	80	200	0	1518600	0
21500/L	R *	1519	1915	0	120	3	20	80	200	0	1518600	0
22000/R	R	9515	91	0	70	2	1	80	200	0	1518600	80
22500/L		4224	351	0	153	2	4	80	200	0	1518600	40
23000/R	R	2612	1987	0	128	3	20	80	200	0	1518600	0

Point	Remarks		E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
23500/L	K		1513	168	0	198	2	0	80	200	0	1518600	105
24000/R	R		783	962	0	64	3	2	80	200	0	1518600	65
24500/L	R		12361	291	0	210	2	10	80	200	0	1518600	10
25000/R			4999	60	0	179	2	0	80	200	0	1518600	135
25500/L	KR		4327	1376	0	87	3	20	80	200	0	1518600	0
26000/R			6882	383	0	79	3	6	80	200	0	1518600	35
26500/L	KR	*	5327	6715	0	117	3	20	80	200	0	1518600	0
27000/R	R		7714	112	0	75	2	3	100	350	0	1518600	50
27500/L	R		10509	60	0	75	2	1	100	350	0	1518600	70
28000/R			2766	125	0	155	1	1	100	350	0	1518600	85
28500/L	KR		2781	48	0	175	2	0	100	350	0	1518600	145
29000/R	R		384	146	0	40	2	0	100	350	0	1518600	115
29500/L	KR		3201	78	0	103	1	0	100	350	0	1518600	110
30000/R			5451	44	0	52	2	0	100	350	0	1518600	125
30500/L	R		4316	490	0	112	2	17	100	350	0	1518600	0
31000/R	KR		1998	57	0	152	1	0	100	350	0	1518600	145
31500/L	R		4638	235	0	147	2	5	100	350	0	1518600	35
32000/R			3923	259	0	197	2	4	100	350	0	1518600	40
32500/L	R		1959	219	0	287	2	1	100	350	0	1518600	70
33000/R			1304	192	0	147	2	1	100	350	0	1518600	85
33500/L	R		14977	13	0	115	2	0	100	350	0	1518600	155
34000/R			2361	122	0	205	1	0	100	350	0	1518600	95
34500/L	R		2827	133	0	118	1	1	100	350	0	1518600	85
35000/R	R		2563	256	0	228	2	3	100	350	0	1518600	55
35500/L			7706	85	0	135	2	1	100	350	0	1518600	65
36000/R			1559	134	0	124	1	0	100	350	0	1518600	100
36500/L	R		5493	32	0	115	2	0	110	310	0	1518600	135
37000/R	K		411	951	0	106	2	20	110	310	0	1518600	0
37500/L	KR		788	542	0	143	2	8	110	310	0	1518600	25
38000/R			8771	54	0	106	2	1	110	310	0	1518600	70
38500/L	KRG		2030	65	0	100	1	0	110	310	0	1518600	125
39000/R	R		13054	62	0	113	2	4	110	310	0	1518600	40
39500/L	R		4244	222	0	223	2	6	110	310	0	1518600	30
40000/R	KR		1349	93	0	80	1	0	110	310	0	1518600	115
40500/L	R	*	870	1097	0	142	2	20	110	310	0	1518600	0
40500/L	R		7401	27	0	76	2	0	110	310	0	1518600	130
41000/R	R		2988	185	0	230	2	2	110	310	0	1518600	55
41500/L	KR		2728	141	0	91	1	1	110	310	0	1518600	70
41500/L			7875	90	0	141	2	3	110	310	0	1518600	50
42000/R	K	*	382	482	0	117	2	4	110	310	0	1518600	40
42500/L			4687	29	0	106	2	0	110	310	0	1518600	145
42500/L	KR		10627	63	0	95	2	3	110	310	0	1518600	50
43000/R	R		985	411	0	139	2	4	110	310	0	1518600	35
43500/L			438	720	0	215	2	13	110	310	0	1518600	10
44000/R	R		3329	175	0	114	2	3	110	310	0	1518600	50
44500/L	R		1818	344	0	116	2	5	110	310	0	1518600	35
45000/R			12160	45	0	93	2	2	110	310	0	1518600	65
45500/L	R		2685	268	0	107	2	4	110	310	0	1518600	40
46000/R	KR		5089	391	0	163	2	19	110	310	0	1518600	0
46500/L	KR		1933	144	0	99	1	1	110	310	0	1518600	80
47000/R	KRG		9505	80	0	76	2	3	110	310	0	1518600	45
47500/L	R		3285	347	0	76	2	11	110	310	0	1518600	10
48000/R	K		399	351	0	158	2	2	110	310	0	1518600	55
48500/L	R		3201	88	0	89	1	1	110	310	0	1518600	95
49000/R	R		3374	356	0	213	2	12	110	310	0	1518600	10
49500/L			8342	126	0	126	2	6	110	310	0	1518600	25
50000/R	R		10261	67	0	129	2	3	110	310	0	1518600	50
50500/L			5727	137	0	131	2	4	110	310	0	1518600	40
51000/R			1602	190	0	98	2	1	110	310	0	1518600	70
51500/L	R		1310	530	0	195	2	10	110	310	0	1518600	15

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
52000/R	R	520	512	0	104	2	5	110	310	0	1518600	35
52500/L	KRG	5035	138	0	123	2	3	110	310	0	1518600	45
53000/R	KR	13077	45	0	122	2	2	110	310	0	1518600	60
53500/L	R	11671	67	0	128	2	4	110	310	0	1518600	45
54000/R	KR	2911	471	0	161	2	17	110	310	0	1518600	0
54500/L	R	10440	20	0	130	2	0	110	310	0	1518600	125
55000/R	KRG	1539	528	0	107	2	12	110	310	0	1518600	10

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0006.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S6 Mea. date: 2549 2
Start at: MARNEULI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	Ex.layer H2 mm	Ex.layer H3 mm	Estimated traffic 8.16 t	New overlay mm
0/R		5458	10	0	152	2	1	210	240	0	4803300	155
0/		1258	7	0	177	2	0	210	240	0	4803300	270
0/L		3493	16	0	115	2	0	210	240	0	4803300	150
2/R		1470	674	0	176	2	20	210	240	0	4803300	0
500/L		2318	4	0	132	2	0	210	240	0	4803300	300
1000/R	R	2753	29	0	128	2	1	210	240	0	4803300	125
1500/L		1570	194	0	356	2	9	210	240	0	4803300	20
2000/R		1936	195	0	230	2	13	210	240	0	4803300	15
2500/L	R	1429	150	0	120	1	3	210	240	0	4803300	45
3000/R	KR	989	162	0	103	1	1	210	240	0	4803300	55
3500/L		3718	67	0	84	2	6	210	240	0	4803300	40
4000/R	R	1267	116	0	138	1	1	210	240	0	4803300	70
4500/L		3672	44	0	128	2	3	210	240	0	4803300	75
5000/R	R	1400	58	0	205	1	1	210	240	0	4803300	110
5500/L	R	1047	52	0	154	1	0	210	240	0	4803300	130
6000/R	R *	5683	5963	0	303	3	20	210	240	0	4803300	0
6500/L	R	2484	5830	0	138	3	20	260	140	0	4803300	0
7000/R	R	1663	49	0	118	2	2	260	140	0	4803300	75
7500/L	R	2878	23	0	236	2	2	260	140	0	4803300	95
8000/R	K	2958	68	0	119	2	14	260	140	0	4803300	10
8500/L	R	3897	823	0	200	3	20	260	140	0	4803300	0
9000/R	K	2608	546	0	166	3	20	260	140	0	4803300	0
9500/L		102	219	0	41	3	0	260	140	0	4803300	140
10000/R	KRG	911	18	0	82	1	0	260	140	0	4803300	195
10500/L	KRG	1198	10	0	90	2	0	260	140	0	4803300	225
11000/R	KR	818	9	0	108	2	0	260	140	0	4803300	280

Point	Remarks		E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
11500/L	R		2219	220	0	106	3	20	260	140	0	4803300	0
12000/R	KRG		1438	143	0	89	1	5	260	140	0	4803300	30
12500/L	KR		4241	130	0	99	1	1	130	100	0	4803300	95
13000/R	R		8568	106	0	144	2	4	130	100	0	4803300	45
13500/L	R		2250	1599	0	99	3	2	130	100	0	4803300	75
14000/R	K		2623	273	0	78	3	1	130	100	0	4803300	130
14500/L			3918	79	0	123	2	0	130	100	0	4803300	110
15000/R	R		7184	7	0	105	2	0	130	100	0	4803300	300
15500/L			9750	10	0	111	2	0	130	100	0	4803300	215
16000/R	R		872	6097	0	112	3	4	130	100	0	4803300	50
16500/L			5585	1539	0	93	3	6	130	100	0	4803300	40
17000/R	R		2995	575	0	159	3	4	130	100	0	4803300	55
17500/L			8458	54	0	234	2	1	130	100	0	4803300	90
18000/R			9237	33	0	80	2	1	130	100	0	4803300	125
18500/L	R		8188	6	0	124	2	0	130	100	0	4803300	300
19000/R	R		12836	81	0	160	2	5	130	100	0	4803300	35
19500/L	R	*	1545	1621	0	121	3	20	120	250	0	4803300	0
20000/R			4971	13	0	129	2	0	120	250	0	4803300	270
20500/L	R	*	1560	1637	0	157	3	20	120	250	0	4803300	0
21000/R	K		3731	6	0	105	2	0	120	250	0	4803300	300
21500/L	R		8094	574	0	151	2	20	120	250	0	4803300	0
22000/R	KR		2597	134	0	137	1	0	120	250	0	4803300	105
22500/L	K		4516	110	0	83	2	1	120	250	0	4803300	95
23000/R			869	55	0	119	1	0	120	250	0	4803300	195
23500/L			1970	92	0	61	1	0	120	250	0	4803300	140
93500/L	KLG	*	362	446	0	116	3	0	60	100	0	1177400	115
94000/R	KG	*	5262	6480	0	99	3	10	60	100	0	1177400	15
24000/R	KR		9132	112	0	291	2	3	120	250	0	4803300	50
24500/L	KR		13399	11	0	156	2	0	120	250	0	4803300	210
25000/R	KR		9468	1112	0	123	3	20	120	250	0	4803300	0
25500/L	KRG		2988	289	0	117	2	2	120	250	0	4803300	60
26000/R	KRG		3591	64	0	618	2	0	120	250	0	4803300	140
26500/L	KRG		5701	497	0	84	2	3	70	300	0	4803300	55
27000/R	KRG	*	670	710	0	161	2	3	70	300	0	4803300	70
27500/L	KRG		6509	77	0	79	2	0	70	300	0	4803300	160
28000/R	KR	*	579	613	0	87	2	2	70	300	0	4803300	80
28500/R	KRG		8243	69	0	65	2	0	70	300	0	4803300	160
29000/R	KRG	*	817	866	0	78	3	5	70	300	0	4803300	50
29500/L	KRG	*	357	378	0	69	2	1	70	300	0	2535400	90
30000/R	KRG		5996	113	0	91	2	0	70	300	0	2535400	115
30500/L	R		9557	173	0	130	2	1	70	300	0	2535400	75
31000/R	K	*	462	490	0	114	2	2	70	300	0	2535400	75
31500/L	KR	*	497	526	0	174	2	2	70	300	0	2535400	70
32000/R	RG	*	848	898	0	186	2	12	70	300	0	2535400	15
32500/L	KR	*	636	674	0	105	2	5	70	300	0	2535400	50
33000/R	KRG	*	822	871	0	102	2	11	70	300	0	2535400	25
33500/L	KR		8007	234	0	92	2	1	70	300	0	2535400	65
34000/R	KR	*	563	597	0	110	2	3	70	300	0	2535400	60
34500/L	KGR		3323	101	0	68	2	0	70	300	0	2535400	140
35000/R	KR		9059	250	0	72	2	2	70	300	0	2535400	60
35500/L	KRG	*	416	440	0	71	2	1	70	300	0	2535400	80
36000/R	R		2955	586	0	167	2	5	70	300	0	2535400	40
36500/L	KRG		1443	622	0	94	2	5	70	300	0	2535400	50
37000/R	R		1769	124	0	180	2	0	70	300	0	2535400	140
37500/L	KG	*	413	437	0	87	2	1	70	300	0	2535400	80
38000/R	KRG		11324	79	0	66	2	0	70	300	0	2535400	110
38500/L			6460	314	0	101	2	2	70	300	0	2535400	60
39000/R	R		11594	117	0	113	2	1	70	300	0	2535400	85
39500/L		*	524	556	0	83	2	3	70	300	0	2535400	65
40000/R		*	271	288	0	141	2	0	70	300	0	2535400	105

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
40500/L	*	441	467	0	76	2	2	70	300	0	2535400	80
41000/R	R *	410	435	0	130	2	1	70	300	0	2535400	85
41500/L		8182	410	0	181	2	16	100	250	0	2535400	0
42000/R		1122	298	0	79	2	1	100	250	0	2535400	75
42500/L		10537	70	0	87	2	1	100	250	0	2535400	80
43000/R		592	3047	0	135	3	20	100	250	0	2535400	0
43500/L	R	5128	71	0	102	2	0	100	250	0	2535400	115
44000/R	R	3530	69	0	58	1	0	100	250	0	2535400	130
44500/L	KR	4079	7	0	139	2	0	100	250	0	2535400	300
45000/R	KRG *	574	608	0	97	2	5	100	250	0	2535400	40
45500/L		3106	56	0	105	1	0	100	250	0	2535400	150
46000/R		2585	50	0	423	2	0	100	250	0	2535400	165
46500/L	R *	1058	1122	0	153	2	20	100	250	0	2535400	0
47000/R		12394	288	0	217	2	17	100	250	0	2535400	0
47500/L	R	1124	1726	0	135	3	20	100	250	0	2535400	0
48000/R	R	3270	79	0	102	1	0	100	250	0	2535400	125
48500/L	R *	1401	1485	0	213	2	20	100	250	0	2535400	0
49000/R	R	10599	54	0	109	2	1	100	250	0	2535400	90
49500/L	K	3405	52	0	164	2	0	100	250	0	2535400	155
50000/R	KRG	3119	259	0	187	2	2	100	250	0	2535400	60
50500/L	K	5126	283	0	137	2	4	100	250	0	2535400	40
51000/R	K	886	862	0	193	2	14	100	250	0	2535400	5
51500/L	KR	13099	5	0	172	2	0	100	250	0	2535400	285
52000/R	KRG	4629	214	0	83	2	2	100	250	0	2535400	55
52500/L	R	6296	159	0	124	2	2	100	250	0	2535400	55
53000/R	R *	649	688	0	120	2	7	100	250	0	2535400	30
53500/L	K	12943	45	0	88	2	2	100	250	0	1177400	65
54000/R	R	2263	106	0	113	1	0	100	250	0	1177400	95
54500/L	R	6509	144	0	159	2	4	100	250	0	1177400	35
55000/R	R	12713	32	0	115	2	1	100	250	0	1177400	85
55500/L	K *	371	393	0	111	2	2	100	250	0	1177400	50
56000/R	K	2303	21	0	143	2	0	100	250	0	1177400	195
56500/L	KRG	2941	480	0	153	2	15	100	250	0	1177400	5
57000/R	KRG	6370	156	0	105	2	5	100	250	0	1177400	35
57500/L	K	2176	97	0	94	1	0	100	250	0	1177400	100
58000/R	K	4787	62	0	83	2	0	100	250	0	1177400	100
58500/L	K	1346	156	0	88	1	0	130	170	0	1177400	80
59000/R	KR	6417	82	0	82	2	6	130	170	0	1177400	30
59500/L	KRG	4408	44	0	95	2	1	130	170	0	1177400	90
60000/R	K	3835	18	0	120	2	0	130	170	0	1177400	165
60500/L	K	272	335	0	48	3	0	130	170	0	1177400	110
61000/R	K	12049	17	0	149	2	1	130	170	0	1177400	85
61500/L	K	1372	15	0	50	1	0	130	170	0	1177400	215
62000/R	K	4457	6	0	94	2	0	130	170	0	1177400	215
62500/L	KR	4799	17	0	187	2	0	130	170	0	1177400	150
63000/R	K	5444	7	0	116	2	0	130	170	0	1177400	210
63500/L	KR	9880	9	0	105	2	0	130	170	0	1177400	155
64000/R	KR	1044	119	0	195	1	0	130	170	0	1177400	90
64500/L	KR	3420	40	0	110	2	0	130	170	0	1177400	110
65000/R	KR	2312	74	0	258	2	1	130	170	0	1177400	85
65500/L	KR	2570	9	0	195	2	0	130	170	0	1177400	235
66000/R	KRG	2784	40	0	116	2	0	130	170	0	1177400	115
66500/L	KR	2077	242	0	120	1	5	130	170	0	1177400	30
67000/R	KRG	1300	775	0	109	3	13	130	170	0	1177400	5
67500/L	KR	3889	39	0	292	2	1	130	170	0	1177400	105
68000/R	KRG	9489	18	0	156	2	1	130	170	0	1177400	95
68500/L	KR	6691	14	0	173	2	0	120	100	0	1177400	150
69000/R	KR	1567	9	0	101	2	0	120	100	0	1177400	265
69500/L	KR	1290	47	0	428	2	0	120	100	0	1177400	140
70000/R	KRG	2491	31	0	81	1	0	120	100	0	1177400	145

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
70500/L	KRG	5705	6	0	233	2	0	120	100	0	1177400	250
71000/R	KRG	4958	41	0	178	2	1	120	100	0	1177400	100
71500/L	KRG	5355	1	0	171	2	0	120	100	0	1177400	285
72000/R	KR	1120	27	0	61	1	0	120	100	0	1177400	175
72500/L	KRG	1002	10	0	102	1	0	120	100	0	1177400	260
73000/R	KR	8165	37	0	230	2	1	120	100	0	1177400	75
73500/L	KRG	3518	159	0	247	2	5	120	100	0	1177400	35
74000/R	KRG	246	16213	0	171	3	20	120	100	0	1177400	0
74500/L	KRG	3701	25	0	481	2	0	120	100	0	1177400	150
75000/R	KRG	5038	5	0	99	2	0	120	100	0	1177400	300
75500/L	KRG	4023	23	0	155	2	0	120	100	0	1177400	145
76000/R	K	6058	8	0	129	2	0	120	100	0	1177400	235
76500/L	K	12357	21	0	104	2	1	120	100	0	1177400	85
77000/R	K	3812	3408	0	208	3	20	120	100	0	1177400	0
77500/L	K	3334	2	0	104	2	0	90	100	0	1177400	300
78000/R	KRG	9805	23	0	164	2	0	90	100	0	1177400	135
78500/L	KRG *	2436	3000	0	72	3	3	90	100	0	1177400	55
79000/R	KRG	7190	3	0	140	2	0	90	100	0	1177400	300
79500/L	KRG	2153	7	0	139	2	0	90	100	0	1177400	295
80000/R	K	10981	12	0	194	2	0	90	100	0	1177400	185
80500/L	KR	1546	15	0	467	2	0	90	100	0	1177400	235
81000/R	KRG	4053	17	0	695	2	0	90	100	0	1177400	205
81500/L	R	10456	168	0	239	2	7	90	100	0	1177400	20
82000/R	R	5111	43	0	369	2	0	90	100	0	1177400	130
82500/L	KR	6576	196	0	265	2	5	90	100	0	1177400	35
83000/R	KRG	4097	77	0	267	2	0	90	100	0	1177400	105
83500/L	KRG	2643	76	0	72	1	0	90	100	0	1177400	125
84000/R	KRG	3232	47	0	459	2	0	90	100	0	1177400	140
84500/L	KRG	5545	44	0	342	2	0	90	100	0	1177400	125
85000/R	KRG	1669	8	0	179	2	0	90	100	0	1177400	280
85500/L	KRG	8000	14	0	152	2	0	90	100	0	1177400	185
86000/R		9415	15	0	169	2	0	90	100	0	1177400	165
86500/L	KRG	2546	43	0	284	2	0	90	100	0	1177400	155
87000/R	KRG *	398	490	0	135	3	0	60	100	0	1177400	105
87500/L	KRG	6900	137	0	126	2	0	60	100	0	1177400	90
88000/R	KRG *	380	468	0	154	3	0	60	100	0	1177400	95
88500/L	KRG	11546	92	0	616	2	0	60	100	0	1177400	90
89000/R	KRG	14016	42	0	156	2	0	60	100	0	1177400	125
89500/L	KRG	1125	1263	0	51	3	0	60	100	0	1177400	145
90000/R	KRG	12200	41	0	390	2	0	60	100	0	1177400	135
90500/L	KRG	12333	26	0	216	2	0	60	100	0	1177400	165
91000/R	KRG	10903	149	0	126	2	1	60	100	0	1177400	65
91500/L	*	1306	1608	0	70	3	0	60	100	0	1177400	115
92000/R	KRG *	513	632	0	132	3	0	60	100	0	1177400	100
92500/L	KRG *	613	755	0	146	3	1	60	100	0	1177400	90
93000/R	KGR *	1329	1636	0	141	3	2	60	100	0	1177400	65

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0007.001

A/S PHØNIX
P. P. C

Design date: 11-10-1997

Link ref.: 87 Mem. data: AB 2
Start at: MARNEULI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
E. kor. factor	1.00

Signature index:

B-Block cracking	R-Rutting
A-Alligator cracking	O-No remarks
C-Other cracking	S-Surface defect
P-Potholes	N-Future design
D-Deformation	X-Local def. only
Y-General defect	Z-Reconstruction area
T-Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 1-layer system

E value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks		H1 MPa	H2 Mpa	H3 MPa	Kmab MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
0/R	KKG	*	12842	12842	0	193	3	20	50	100	0	2485300	0
500/L	K	*	7900	7900	0	131	3	9	50	100	0	2485300	20
1000/R	KR	*	1836	1836	0	224	3	2	50	100	0	2485300	70
1500/L	KKG	*	8452	8452	0	241	3	20	50	100	0	2485300	0
2000/R	KKG	*	1771	1771	0	116	3	1	50	100	0	2485300	110
2500/L	KKG	*	4588	4588	0	164	3	5	50	100	0	2485300	40
3000/R	KR	*	3640	3640	0	115	3	2	50	100	0	2485300	75
3500/L	KR	*	4810	4810	0	131	3	4	50	100	0	2485300	50
4000/R	KR	*	154	154	0	115	3	0	50	100	0	2485300	170
4500/L	K	*	209	209	0	113	3	0	50	100	0	2485300	165
5000/R	KR	*	2056	2056	0	128	3	1	50	100	0	2485300	95
5500/L	KKK	*	1710	1710	0	113	3	0	50	100	0	2485300	115
6000/R	KKG	*	3135	3135	0	159	3	3	50	100	0	2485300	60
6500/L	KR	*	166	166	0	123	3	0	50	100	0	2485300	170
7000/R	K	*	2966	2966	0	139	3	2	50	100	0	2485300	75
7500/L	KR	*	258	258	0	118	3	0	50	100	0	2485300	145
8000/R	KR	*	895	1115	0	131	3	5	60	200	0	2485300	40
8500/L	K	*	548	683	0	113	3	2	60	200	0	2485300	65
9000/R	KR	*	700	872	0	137	3	3	60	200	0	2485300	50
9500/L	KR	*	450	561	0	127	3	1	60	200	0	2485300	75
10000/RR	K	*	1413	1760	0	200	3	20	60	200	0	2485300	0
10500/L	KR		945	3766	0	131	3	20	60	200	0	2485300	0
11000/R	KR	*	868	1081	0	89	3	2	60	200	0	2485300	70
11500/L	KKG		9705	37	0	70	2	0	60	200	0	2485300	180
12000/R	KKG	*	291	365	0	111	3	0	60	200	0	2485300	100
12500/L	K	*	900	1121	0	45	3	1	60	200	0	2485300	120

			MPa	Mpa	MPa	MPa	layer	life years	H1 mm	H2 mm	H3 mm	traffic 8.16 t	overlay mm
3000/R	K	*	543	677	0	112	3	1	60	200	0	2485300	75
13500/L	K		410	650	0	62	3	0	60	200	0	2485300	125
14000/R	KRG	*	296	368	0	108	3	0	60	200	0	2485300	105
14500/L	KR	*	377	470	0	81	3	0	60	200	0	2485300	115
15000/R	KR	*	984	1226	0	139	3	0	60	200	0	2485300	30
15500/L	KRG	*	205	255	0	70	3	0	60	200	0	2485300	145
16000/R	KR	*	243	303	0	137	2	0	60	200	0	2485300	110
16500/L	KRG		11701	48	0	69	2	0	60	200	0	2485300	155
17000/R	KR	*	401	499	0	95	3	0	70	150	0	2485300	120
17500/L	K	*	486	606	0	88	3	0	70	150	0	2485300	120
18000/R	KR		3357	6	0	170	2	0	70	150	0	2485300	300
18500/L	K		11771	31	0	121	2	0	70	150	0	2485300	175
19000/R	K		3559	19	0	60	2	0	70	150	0	2485300	255
19500/L	R		6351	110	0	83	2	0	70	150	0	2485300	115
20000/R	R		33120	4	0	58	2	0	70	150	0	2485300	300
20500/L	R	*	181	225	0	133	2	0	70	150	0	2485300	130
21000/R	R		7106	24	0	74	2	0	70	150	0	2485300	215
21500/L	KRG		11757	16	0	110	2	0	70	150	0	2485300	220
22000/R	KR		10599	16	0	93	2	0	70	150	0	2485300	225
22500/L	K		4974	17	0	94	2	0	70	150	0	2485300	250
23000/R	KRG		5594	15	0	102	2	0	70	150	0	2485300	275
23500/L	KRG	*	523	651	0	130	3	1	70	150	0	2485300	85
24000/R	KRG		9645	18	0	95	2	0	70	150	0	2485300	230
24500/L	KRG		2918	21	0	81	2	0	70	150	0	2485300	255
25000/R	KRG		7078	60	0	63	2	0	70	150	0	2485300	150
25500/L	KRG		4107	17	0	217	2	0	70	150	0	2485300	255
26000/R	KRG		8043	9	0	102	2	0	70	150	0	2485300	295

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0007.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S7 Mea. date: AS 2
Start at: MARNEULI
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
26000/R	KRG	8043	9	0	102	2	0	70	150	0	2485300	295
26500/L	KRG	7715	5	0	115	2	0	70	150	0	2485300	300
27000/R	KRG	12245	7	0	65	2	0	70	150	0	2485300	300
27500/L	KRG	12666	5	0	93	2	0	70	230	0	2485300	300
28000/R	KRG	12334	39	0	106	2	0	70	230	0	2485300	150
28500/L	KRG	1356	32	0	73	1	0	70	230	0	2485300	235
29000/R	KRG *	340	423	0	83	3	1	70	230	0	2485300	95
29500/L	KRG *	435	542	0	102	3	2	70	230	0	2485300	70
30000/R	KRG *	355	443	0	115	2	1	70	230	0	2485300	80
30500/L	KRG *	597	744	0	153	2	7	70	230	0	2485300	40
31000/R	KRG	10454	492	0	150	2	9	70	230	0	2485300	20
31500/L	KRG *	382	476	0	123	2	2	70	230	0	2485300	75
32000/R	KRG	694	1621	0	74	3	6	70	230	0	2485300	35
32500/L	KRG	11488	37	0	80	2	0	70	230	0	2485300	160
33000/R	KRG *	304	379	0	151	2	1	70	230	0	2485300	90
33500/L	KRG	10562	21	0	93	2	0	70	230	0	2485300	205
34000/R	KRG *	186	232	0	75	2	0	70	230	0	2485300	125

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0009.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S9 Mea. date: 2249 2
Start at: P 34000 RIGHT
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
500/L		5191	29	0	174	2	7	240	600	0	4422000	45
1000/R		6887	353	0	198	2	20	240	600	0	4422000	0
1500/L		6577	225	0	181	2	20	240	600	0	4422000	0
2000/R		7093	360	0	189	2	20	240	600	0	4422000	0
2500/L		2470	224	0	254	2	20	240	600	0	4422000	0
3000/R		1843	278	0	170	2	20	240	600	0	4422000	0
3500/L	L	785	46	0	352	1	0	240	600	0	4422000	125
4000/R		2989	41	0	314	2	4	240	600	0	4422000	60
4500/L		1242	21	0	233	2	0	240	600	0	4422000	175
5000/R		456	17	0	125	1	0	240	600	0	4422000	220
5500/L	R	2782	10	0	104	2	0	240	600	0	4422000	190
6000/R		180	17	0	1219	1	0	240	600	0	4422000	235
6500/L		4810	23	0	133	2	4	240	600	0	4422000	70
7000/R		2817	119	0	146	2	20	240	600	0	4422000	0
8500/L		4121	428	0	166	3	20	210	120	0	4422000	0
9000/R		2861	170	0	192	2	19	210	120	0	4422000	0
9500/L		324	28	0	309	1	0	210	120	0	4422000	195
10000/R		1507	101	0	190	1	1	210	120	0	4422000	65
10500/L		869	6	0	207	2	0	210	120	0	4422000	300
11000/R		914	1	0	139	2	0	210	120	0	4422000	300
11500/L		1157	423	0	134	3	7	210	120	0	4422000	30
12000/R		4126	43	0	139	2	3	210	120	0	4422000	60
12500/L		162	6787	0	20	3	0	210	120	0	4422000	130
13000/R		7130	1796	0	176	3	20	210	120	0	4422000	0
13500/L		515	44	0	55	1	0	210	120	0	4422000	155
14000/R		3045	66	0	70	2	9	240	600	0	4422000	20

Point	Remarks		E1	E2	E3	Esub	Critical	Estimated	Ex.layer			Estimated	New
			MPa	Mpa	MPa	MPa	layer	life	H1	H2	H3	traffic	overlay
								years	mm	mm	mm	8.16 t	mm
15000/R			1884	14	0	155	2	0	240	600	0	4422000	175
15500/L			1545	64	0	65	2	2	240	600	0	4422000	75
16000/R			913	13	0	113	2	0	240	600	0	4422000	240
16500/L			704	36	0	64	1	0	240	600	0	4422000	150
17000/R			2174	91	0	89	2	8	240	600	0	4422000	25
17500/L			2312	71	0	114	2	6	240	600	0	4422000	40
18000/R			3099	192	0	145	2	20	240	600	0	4422000	0
18500/L			1751	62	0	89	1	1	200	200	0	4422000	100
19000/R			3688	41	0	89	2	2	200	200	0	4422000	85
19500/L	K		201	65	0	45	1	0	200	200	0	4422000	155
20000/R			1148	133	0	65	1	1	200	200	0	4422000	85
20500/L	R L		801	18	0	167	1	0	200	200	0	4422000	220
21000/R			1180	418	0	84	3	7	200	200	0	4422000	35
21500/L			1592	54	0	114	1	0	200	200	0	4422000	110
22000/R			2048	108	0	92	1	3	200	200	0	4422000	55
22500/L			1365	87	0	116	1	0	200	200	0	4422000	85
23000/R			721	179	0	175	1	1	200	200	0	4422000	65
23500/L			11633	375	0	302	2	20	180	130	0	4422000	0
24000/R			8159	78	0	109	2	15	180	130	0	4422000	0
24500/L			4321	103	0	200	2	7	180	130	0	4422000	30
25000/R			3410	12	0	413	2	0	180	130	0	4422000	210
25500/L			1209	102	0	496	2	1	180	130	0	4422000	95
26000/R			822	1591	0	102	3	5	180	130	0	4422000	40
26500/L			1263	121	0	406	1	1	180	130	0	4422000	85
27000/R			11156	1386	0	241	3	20	180	130	0	4422000	0
27500/L			13286	253	0	139	3	20	180	130	0	4422000	0
28000/R			2833	23	0	80	2	0	180	130	0	4422000	175
28500/L			2668	88	0	104	1	2	180	130	0	4422000	70
29000/R			925	39	0	431	2	0	180	130	0	4422000	170
29500/L		*	466	704	0	140	3	0	70	140	0	4422000	110
30000/R		*	1651	1683	0	210	3	4	70	140	0	4422000	50
30500/L			7063	12506	0	121	3	20	70	140	0	4422000	0
31000/R		*	3012	3069	0	168	3	9	70	140	0	4422000	20
31500/L			12403	22	0	243	2	0	70	140	0	4422000	220
32000/R		*	700	713	0	303	3	2	70	140	0	4422000	65
32500/L		*	911	1376	0	152	3	1	70	140	0	4422000	80
33000/R		*	1253	1277	0	207	3	3	70	140	0	4422000	65
33500/L	R	*	9694	14652	0	1282	3	20	70	140	0	4422000	0
34000/R		*	1615	1646	0	307	3	7	70	140	0	4422000	30
34500/L		*	1964	2969	0	345	3	19	70	140	0	4422000	0
35000/R			9029	70	0	162	2	0	70	140	0	4422000	150

ROAD EVALUATION REPORT

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A/S MICONIX
P. E. C

Client: TACIS

Sec. no.: 0001

Link no.: 0009.001

Design date: 11-10 1997

Link ref.: 59
Start at: P 34000 RIGHT
Surface: ASP

Meas. date: 2249 2

Calculation parameters:
Load radius 150 mm
Contact pressure 0.70 MPa
Poisson's ratio 0.35
Annual traf. growth 2.8 %
Design temperature 30 C
Design period 15 years
S. kor. factor 1.00

Signature index:
B-Block cracking
A-Alligator cracking
C-Other cracking
P-Potholes
D-Deformation
Y-General defect
T-Temperature taken
R-Rutting
O-No remarks
S-Surface defect
U-Future design
X-Local def. only
Z-Reconstruction area

* after remarks indicates that the point has been calculated as a 2 layer system and that the thickness and E values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub Mpa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
35000/R		9029	70	0	162	2	0	70	140	0	4422000	150
35500/L		12682	405	0	203	2	5	70	140	0	5214800	35
36000/R		6170	866	0	88	3	1	70	140	0	5214800	110
36500/L	*	4042	7318	0	216	3	20	70	140	0	5214800	0
37000/R	*	11097	16773	0	287	3	20	70	140	0	5214800	0
37500/L	*	2326	3516	0	160	3	7	70	140	0	5214800	30
38000/R		4885	19101	0	146	3	20	70	140	0	5214800	0
38500/L	R	3030	298	0	248	2	7	150	550	0	5214800	30
39000/R	R	5857	50	0	135	2	1	150	550	0	5214800	100
39500/L		1295	61	0	180	1	0	150	550	0	5214800	140
40000/R		2389	324	0	145	2	7	150	550	0	5214800	30
40500/L	R	4354	16	0	127	2	0	150	550	0	5214800	230
41000/R		3537	209	0	146	2	5	150	550	0	5214800	40
41500/L		1194	51	0	216	1	0	150	550	0	5214800	175
42000/R		2244	296	0	86	2	5	150	550	0	5214800	35
42500/L		1514	280	0	241	2	3	150	550	0	5214800	55
43000/R		1932	210	0	796	2	2	150	550	0	5214800	65
43500/L		1704	191	0	449	2	2	150	550	0	5214800	75
44000/R		6718	116	0	78	2	0	150	550	0	5214800	35
44500/L		4828	104	0	90	2	3	150	550	0	5214800	65
45000/R		2145	70	0	108	2	0	150	550	0	5214800	135
45500/L		4060	332	0	108	2	17	150	550	0	5214800	0
46000/R		5490	210	0	195	2	11	150	550	0	5214800	15
46500/L		4879	223	0	199	2	9	150	550	0	5214800	20
47000/R		3361	110	0	71	2	1	150	550	0	5214800	80
47500/L		8062	210	0	178	2	20	150	550	0	5214800	0

	MPa	Mpa	MPa	MPa	layer	life years	H1 mm	H2 mm	H3 mm	traffic 8.16 t	overlay mm
48000/K	1981	264	0	66	2	4	150	550	0	5214800	45
46500/L	2101	146	0	254	2	1	150	550	0	5214800	85

ROAD EVALUATION REPORT

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Client: TACIS

Sec. no.: 0001

Link no.: 0012.001

A/S PHØNIX
P. P. C

Design date: 06-25-1997

Link ref.: S12 Mea. date: 2749 2
Start at: SAMTREDIA
Surface: ASF

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	2.8 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1 MPa	E2 Mpa	E3 MPa	Esub MPa	Critical layer	Estimated life years	Ex.layer H1 mm	H2 mm	H3 mm	Estimated traffic 8.16 t	New overlay mm
0/R	KRG	2127	676	0	147	3	20	170	200	0	3097400	0
1000/R	KR	1081	262	0	140	2	4	170	200	0	3097400	40
1500/L	KR	1866	6	0	86	2	0	170	200	0	3097400	300
2000/R	KRG	1104	167	0	155	1	1	170	200	0	3097400	65
2500/L	RG	3975	401	0	82	3	20	170	200	0	3097400	0
3000/R	KR	1438	87	0	104	1	0	170	200	0	3097400	95
3500/L	KRG	742	132	0	48	1	0	170	200	0	3097400	125
4000/R	KRG	3011	597	0	76	3	20	170	200	0	3097400	0
4500/L	KR	779	74	0	98	1	0	170	200	0	3097400	120
5000/R	RG	1772	394	0	128	2	17	170	200	0	3097400	0
5500/L	KRG	2030	124	0	405	2	2	170	200	0	3097400	60
6000/R'	KRG	6120	518	0	134	3	20	170	200	0	3097400	0
6500/L	KRG	1389	102	0	169	1	0	170	200	0	3097400	85
7000/R	KRG	870	703	0	87	3	7	170	200	0	3097400	25
7500/L	R	2250	9	0	203	2	0	170	200	0	3097400	250
8000/R	RG	4057	133	0	128	2	10	170	200	0	3097400	15
8500/L	KRG	2107	56	0	126	2	1	170	200	0	3097400	110
9000/R	R	2309	92	0	329	2	2	170	200	0	3097400	70
9500/L	KRG	371	1518	0	84	3	9	170	200	0	3097400	15
10000/R	KRG	242	281	0	88	2	1	170	200	0	3097400	75
10500/L	KRG	913	32	0	244	1	0	170	200	0	3097400	175
11000/R		992	386	0	80	3	4	170	200	0	3097400	50
11500/L	KRG	1293	94	0	129	1	0	170	200	0	3097400	95
12000/R	KRG	525	114	0	102	1	0	170	200	0	3097400	110
12500/L	KRG	2233	53	0	104	2	1	170	200	0	3097400	110
13000/R	R	393	147	0	127	2	0	170	200	0	3097400	95

Point	Remarks	E1	E2	E3	Esub	Critical	Estimated	Ex.layer			Estimated	New
		MPa	Mpa	MPa	MPa	layer	life	H1	H2	H3	traffic	overlay
							years	mm	mm	mm	8.16 t	mm
13500/L	KRG	1355	32	0	102	1	0	170	200	0	3097400	165
14000/R	G	1137	53	0	140	1	0	170	200	0	3097400	135
14500/L	R	684	41	0	126	1	0	170	200	0	3097400	165
15000/R	KRG	406	80	0	183	1	0	170	200	0	3097400	125
15500/L	R	2881	14	0	193	2	0	170	200	0	3097400	215
16000/R	R	3577	85	0	130	2	3	170	200	0	3097400	55
16500/L	KRG	1070	122	0	134	1	0	170	200	0	3097400	85
17000/R	KRG	547	115	0	119	1	0	170	200	0	3097400	105
17500/L	R	4110	9	0	110	2	0	170	200	0	3097400	210
18000/R	R	417	22	0	91	1	0	170	200	0	3097400	215
18500/L	R	537	99	0	154	1	0	170	200	0	3097400	110
19000/R		4010	83	0	96	2	4	170	200	0	3097400	45
19500/L	R	616	187	0	161	2	1	170	200	0	3097400	75
20000/R	R	707	136	0	134	1	0	170	200	0	3097400	95
20500/L	KRG	486	112	0	86	1	0	205	330	0	3097400	85
21000/R	RG	451	57	0	67	1	0	205	330	0	3097400	125
21500/L	KRG	831	103	0	203	1	1	205	330	0	3097400	75
22000/R	R	1048	106	0	173	1	1	205	330	0	3097400	65
22500/L	R	536	263	0	117	2	3	205	330	0	3097400	35
23000/R	KRG	1303	8	0	134	2	0	205	330	0	3097400	235
23500/L	R	508	189	0	145	2	2	205	330	0	3097400	50
24000/R		1023	73	0	176	1	0	205	330	0	3097400	90
24500/L	RG	838	73	0	91	1	0	205	330	0	3097400	100
25000/R	R	2456	17	0	202	2	0	205	330	0	3097400	160
25500/L	R	839	204	0	171	2	4	205	330	0	3097400	35
26000/R	RG	607	210	0	170	2	3	205	330	0	3097400	40
26500/L	KR	1954	127	0	240	2	7	205	330	0	3097400	30
27000/R	R	1574	64	0	148	2	1	205	330	0	3097400	85
27500/L	KRG	1896	117	0	212	2	6	205	330	0	3097400	35
28000/R		745	165	0	209	1	2	205	330	0	3097400	45
28500/L	KRG	1363	374	0	78	2	20	205	330	0	3097400	0
29000/R	G	971	76	0	192	1	0	205	330	0	3097400	90
29500/L	KRG	3638	43	0	202	2	3	205	330	0	3097400	65
30000/R	KRG	1105	165	0	156	1	4	205	330	0	3097400	30
30500/L	KRG	2832	499	0	103	2	20	205	330	0	3097400	0
31000/R	KR	4491	546	0	184	2	20	205	330	0	3097400	0
31500/L	KRG	4598	72	0	218	2	13	205	330	0	3097400	10
32000/R	KG	820	222	0	132	2	5	205	330	0	3097400	30
32500/L	KRG	2606	82	0	189	2	5	205	330	0	3097400	40
33000/R	KRG	500	169	0	123	2	1	205	330	0	3097400	55
33500/L	KR	273	56	0	116	1	0	205	330	0	3097400	135
34000/R	RG	772	247	0	153	2	5	205	330	0	3097400	30
34500/L	KRG	1972	112	0	80	2	5	205	330	0	3097400	35
35000/R	KRG	748	143	0	142	1	1	205	330	0	3097400	55
35500/L	KRG	2284	25	0	129	2	1	205	330	0	3097400	130
36000/R	KRG	565	252	0	129	2	3	205	330	0	3097400	35
36500/L	R	2043	136	0	94	2	8	205	330	0	3097400	20
37000/R	RG	1437	127	0	121	1	2	205	330	0	3097400	45
37500/L	R	1244	60	0	93	1	0	205	330	0	3097400	100
38000/R		208	92	0	132	2	0	205	330	0	3097400	105
38500/L	KRG	766	76	0	175	1	0	205	330	0	3097400	100
39000/R		867	86	0	108	1	0	205	330	0	3097400	85
39500/L		2418	297	0	102	2	20	205	330	0	3097400	0
40000/R		491	103	0	106	1	0	205	330	0	3097400	90
40500/L	R	1759	462	0	134	2	20	205	330	0	3097400	0
41000/R		797	155	0	91	1	1	205	330	0	3097400	50
41500/L	R	1258	86	0	209	1	1	205	330	0	3097400	75
42000/R		847	177	0	135	1	3	205	330	0	3097400	40
42500/L	KRG	1046	192	0	161	1	1	150	200	0	3097400	70
43000/R		2317	56	0	279	2	0	150	200	0	3097400	125

Point	Remarks	E1	E2	E3	Esub	Critical	Estimated	Ex.layer			Estimated	New
		MPa	Mpa	MPa	MPa	layer	life	H1	H2	H3	traffic	overlay
							years	mm	mm	mm	8.16 t	mm
43500/L	KRG	669	341	0	276	2	2	150	200	0	3097400	50
44000/R		1066	356	0	180	2	4	150	200	0	3097400	35
44500/L	KG	217	28632	0	35	3	20	150	200	0	3097400	0
45000/R		1125	214	0	425	2	2	150	200	0	3097400	60
45500/L	KR	2439	22	0	251	2	0	150	200	0	3097400	190
46000/R	KRG	1143	179	0	256	1	1	150	200	0	3097400	65
46500/L	KRG	2443	39	0	87	2	0	150	200	0	3097400	150
47000/R	G	455	226	0	109	2	1	150	200	0	3097400	85
47500/L	KRG	566	362	0	80	3	2	150	200	0	3097400	80
48000/R	KRG	646	128	0	101	1	0	150	200	0	3097400	110
48500/L	KRG	1063	221	0	144	1	2	150	200	0	3097400	65
49000/R	RG	4603	163	0	106	2	9	150	200	0	3097400	20
49500/L	KRG	2471	102	0	200	1	1	150	200	0	3097400	80
50000/R	R	1354	244	0	85	1	2	150	200	0	3097400	65
50500/L	KRG	11884	160	0	187	2	20	150	200	0	3097400	0
51000/R	R	3427	116	0	123	2	3	150	200	0	3097400	55
51500/L	R	2936	37	0	327	2	0	150	200	0	3097400	140
52000/R		1420	293	0	88	3	4	150	200	0	3097400	55
52500/L	R	1610	121	0	162	1	0	150	200	0	3097400	85
53000/R	KRG	1028	99	0	145	1	0	150	200	0	3097400	110
53500/L	KRG	3677	89	0	159	2	2	150	200	0	3097400	70
54000/R	R	3988	83	0	136	2	2	150	200	0	3097400	70
54500/L	R	4423	21	0	158	2	0	150	200	0	3097400	155
55000/R	R	5687	11	0	186	2	0	150	200	0	3097400	200
55500/L	R	4012	28	0	115	2	0	150	200	0	3097400	150
56000/R	KRG	1466	50	0	149	1	0	150	200	0	3097400	150

Measured deflections on Georgian roads April 1997

Sector no.	Road no.	Road name	Chainage/ lane	Contact presure	Temp	Def 1 R=0	Def 2 R=210	Def 3 R=330	Def 4 R=510	Def 5 R=810	Def 6 R=1270	SCI	Evd1	Evd2	Evd3	Evd4	Evd5	Evd6
1	1.001	"S1	0/R	791	26	266	234	208	119	69	39	470	783	318	228	257	279	315
1	1.001	"S1	0/L	837	28	163	99	75	50	38	28	162	1352	795	668	648	537	465
1	1.001	"S1	500/L	782	28	271	241	212	117	68	41	507	760	305	221	259	280	297
1	1.001	"S1	1000/R	772	26	206	180	167	87	44	21	575	987	403	277	344	428	572
1	1.001	"S1	1500/L	801	28	239	187	151	56	26	13	257	882	403	317	554	751	958
1	1.001	"S8	2000/R	878	26	224	184	164	74	34	18	351	1032	449	320	459	629	758
1	1.001	"S1	2500/L	778	28	464	398	350	147	62	31	222	441	184	133	205	306	390
1	1.001	"S8	3000/R	738	26	719	626	324	87	48	33	160	270	111	136	328	375	348
1	1.001	"S1	3500/L	804	28	313	206	133	55	25	12	105	676	367	362	566	784	1042
1	1.001	"S8	4000/R	827	26	300	120	97	60	38	22	38	726	648	510	534	530	584
1	1.001	"S1	4500/L	856	28	170	154	125	77	53	36	969	1326	523	410	430	394	370
1	1.001	"S8	5000/R	749	26	301	299	215	102	58	40	8499	655	236	208	284	315	291
1	1.001	"S1	5500/L	783	28	628	484	345	132	76	51	92	328	152	136	230	251	239
1	1.001	"S8	6000/R	791	26	165	144	122	78	53	35	711	1262	516	388	393	364	351
1	1.001	"S1	6500/L	756	28	485	394	303	128	74	44	153	410	180	149	229	249	267
1	1.001	"S8	7000/R	777	26	336	284	264	137	75	41	278	609	257	176	220	253	295
1	1.001	"S1	7500/L	791	28	362	309	272	125	76	51	276	575	241	174	245	254	241
1	1.001	"S8	8000/R	762	26	239	201	183	103	63	40	379	839	356	249	286	295	296
1	1.001	"S1	8500/L	795	28	81	75	67	46	33	22	2641	2584	997	710	669	587	562
1	1.001	"S8	9000/R	759	26	247	213	158	48	16	10	434	809	335	287	612	1156	1180
1	1.001	"S1	9500/L	811	28	145	109	69	33	18	10	357	1472	700	703	951	1098	1261
1	1.001	"S8	10000/R	762	26	260	213	178	76	37	22	298	772	336	256	388	502	538
1	1.001	"S1	10500/L	778	28	382	228	169	51	26	19	66	536	321	275	591	729	637
1	1.001	"S8	11000/R	740	26	304	300	204	86	45	27	4222	641	232	217	333	401	426
1	1.001	"S1	11500/L	749	28	833	675	386	102	46	28	88	237	104	116	284	397	416
1	1.001	"S8	12000/R	762	26	254	209	173	73	32	19	313	790	343	264	404	580	623
1	1.001	"S1	12500/L	746	28	1198	1065	710	166	75	47	114	164	66	63	174	242	247
1	1.001	"S8	13000/R	833	26	477	327	171	50	35	28	78	460	240	291	645	580	463
1	1.001	"S1	13500/L	854	28	232	176	142	74	44	25	232	969	456	360	447	473	531
1	1.001	"S8	14000/R	778	26	372	366	227	112	64	38	2806	551	200	205	269	296	318
1	1.001	"S1	14500/L	762	28	724	671	381	152	76	48	299	277	107	120	194	244	247
1	1.001	"S8	15000/R	740	26	470	463	250	79	38	26	2408	414	150	177	363	475	442
1	1.001	"S1	15500/L	780	28	532	337	246	82	49	33	56	386	218	190	368	388	367
1	1.001	"S8	16000/R	756	26	498	375	326	129	66	39	105	400	190	139	227	279	301
1	1.001	"S1	16500/L	762	28	760	596	433	157	74	43	82	264	120	105	188	251	275
1	1.001	"S8	17000/R	757	26	481	392	312	138	74	44	157	414	182	145	212	249	267
1	1.001	"S1	17500/L	811	28	436	267	242	120	70	42	62	490	286	201	262	282	300
1	1.001	"S8	18000/R	777	26	348	296	199	91	53	34	280	588	247	234	331	357	355
1	1.001	"S1	18500/L	801	28	580	420	328	130	76	50	77	364	179	146	239	257	249
1	1.001	"S8	19000/R	777	26	341	220	188	100	59	36	91	600	332	247	301	321	336
1	1.001	"S1	19500/L	791	28	300	278	183	93	54	35	721	694	268	259	329	357	351

1	1.001	"S8	20000/R	759	26	484	400	316	158	91	53	168	413	178	144	186	203	223
1	1.001	"S1	20500/L	759	28	483	361	293	142	83	51	105	414	198	155	207	223	231
1	1.001	"S8	21000/R	748	26	614	553	395	184	102	59	253	321	127	113	157	179	197
1	1.001	"S1	21500/L	762	28	470	368	301	136	84	56	131	427	195	151	217	221	212
1	1.001	"S8	22000/R	856	26	506	378	272	119	67	42	100	445	213	188	278	311	317
1	1.001	"S1	22500/L	856	28	622	494	369	159	92	60	106	362	163	139	208	227	222
1	1.001	"S8	23000/R	744	26	1430	1183	683	296	155	90	57	137	59	65	97	117	129
1	1.001	"S1	23500/L	751	28	1036	966	685	239	119	77	228	191	73	66	122	154	152
1	1.001	"S8	24000/R	775	26	447	367	251	109	60	38	176	456	199	185	275	315	317
1	1.001	"S1	24500/L	799	28	539	331	307	116	69	42	51	390	227	156	267	282	296
1	1.001	"S8	25000/R	749	26	958	840	602	181	82	53	127	206	84	74	160	223	220
1	1.001	"S1	25500/L	854	28	352	198	141	49	29	19	63	639	406	362	675	718	699
1	1.001	"S8	26000/R	778	26	571	357	250	70	17	3	50	359	205	186	430	1116	4032
1	1.001	"S1	26500/L	727	28	479	381	278	109	61	40	139	400	179	156	258	291	283
1	1.001	"S8	27000/R	743	26	389	211	207	103	59	37	52	503	331	215	279	307	312
1	1.001	"S1	27500/L	853	28	293	175	135	46	26	17	87	766	458	378	718	800	780
1	1.001	"S8	28000/R	801	26	591	424	305	86	49	34	74	357	178	157	361	398	366
1	1.001	"S1	28500/L	778	28	160	134	105	51	29	18	551	1280	546	443	591	654	672
1	1.001	"S8	29000/R	782	26	384	259	231	68	33	24	92	536	284	203	445	578	507
1	1.001	"S1	29500/L	791	28	932	777	495	143	63	36	92	223	96	96	214	306	342
1	1.001	"S8	30000/R	743	26	1150	890	589	132	55	30	51	170	78	75	218	329	385
1	1.001	"S1	30500/L	759	28	815	624	489	156	74	43	69	245	114	93	188	250	274
1	1.001	"S8	31000/R	772	26	443	328	279	123	70	44	110	459	221	166	243	269	273
1	1.001	"S1	31500/L	982	28	316	267	195	78	51	37	295	818	346	301	487	469	413
1	1.001	"S8	32000/R	762	26	360	248	230	82	44	29	105	557	289	198	360	422	408
1	1.001	"S1	32500/L	740	28	476	339	280	123	72	46	89	409	205	158	233	251	250
1	1.001	"S8	33000/R	777	26	336	220	210	82	43	26	97	609	332	221	367	440	465
1	1.001	"S1	33500/L	751	28	448	253	231	73	38	25	50	441	279	195	398	482	467
1	1.001	"S8	34000/R	762	26	481	383	281	100	53	35	139	417	187	162	295	350	338
1	1.001	"S1	34500/L	727	28	348	207	182	56	31	21	72	550	330	239	503	572	538
1	1.001	"S8	35000/R	798	26	397	335	216	84	47	29	233	529	224	221	368	414	428
1	1.001	"S1	35500/L	725	28	395	273	213	75	42	27	97	483	250	204	374	421	417
1	1.001	"S8	36000/R	762	26	494	465	300	114	62	39	555	406	154	152	259	300	304
1	1.001	"S1	36500/L	777	28	402	247	222	95	53	35	68	509	296	209	317	357	345
1	1.001	"S8	37000/R	778	26	492	417	269	103	57	37	193	416	175	173	292	333	327
1	1.001	"S1	37500/L	775	28	372	234	193	71	37	23	78	548	311	240	423	511	524
1	1.001	"S8	38000/R	911	26	385	266	260	100	49	31	99	623	322	210	353	453	457
1	1.001	"S1	38500/L	778	28	512	450	260	99	56	35	243	400	163	179	304	339	346
1	1.001	"S8	39000/R	777	26	422	375	251	91	47	28	324	485	195	185	331	403	431
1	1.001	"S1	39500/L	740	28	456	290	237	89	49	34	66	427	240	187	322	368	338
1	1.001	"S8	40000/R	793	26	460	424	309	125	70	43	438	454	176	154	246	276	287
1	1.001	"S1	40500/L	804	28	444	352	225	96	54	33	147	477	215	214	324	363	379
1	1.001	"S8	41000/R	762	26	343	202	161	73	43	29	71	585	355	283	404	432	408
1	1.001	"S1	41500/L	762	28	416	260	180	62	35	23	69	482	276	253	476	531	515
1	1.001	"S8	42000/R	736	26	641	445	357	152	80	48	61	302	155	123	187	224	238
1	1.001	"S1	42500/L	798	28	314	208	188	97	61	39	107	669	361	254	318	319	318
1	1.001	"S8	43000/R	743	26	296	211	170	59	30	17	144	661	331	261	488	604	679
1	1.001	"S1	43500/L	782	28	434	255	241	96	55	38	56	474	288	194	315	347	320

1	1.001	"S8	44000/R	762	29	541	500	317	111	62	40	386	371	143	144	266	300	296
1	1.001	"S1	44500/L	791	28	229	199	169	99	60	37	496	909	374	280	309	321	332
1	1.001	"S8	45000/R	754	29	660	547	456	210	107	51	126	301	130	99	139	172	230
1	1.001	"S1	45500/L	791	28	222	173	143	72	43	26	272	938	430	331	425	448	473
1	1.001	"S8	46000/R	746	29	473	367	252	98	60	40	125	415	191	177	295	303	290
1	1.001	"S1	46500/L	791	28	207	190	173	106	66	40	924	1006	391	274	289	292	307
1	1.001	"S8	47000/R	803	29	193	157	136	78	49	32	387	1095	481	353	399	399	390
1	1.001	"S1	47500/L	761	28	578	569	333	138	80	52	1872	347	126	137	213	232	228
1	1.001	"S8	48000/R	824	29	630	400	357	190	116	67	47	344	194	138	168	173	191
1	1.001	"S1	48500/L	753	28	857	631	490	172	85	56	56	231	112	92	169	216	209
1	1.001	"S8	49000/R	777	29	703	531	397	194	115	69	75	291	138	117	155	165	175
1	1.001	"S1	49500/L	740	28	1045	809	594	192	83	52	56	186	86	75	149	217	221
1	1.001	"S8	50000/R	759	29	500	439	304	127	69	44	246	400	163	149	231	268	268
1	1.001	"S1	50500/L	725	28	503	486	404	144	74	47	973	379	140	107	195	239	240
1	1.001	"S8	51000/R	762	29	358	303	260	131	75	44	263	560	236	175	225	248	269
1	1.001	"S1	51500/L	778	28	500	444	323	151	88	55	271	410	165	144	199	215	220
1	1.001	"S8	52000/R	775	29	440	345	268	133	82	51	141	464	211	173	226	230	236
1	1.001	"S1	52500/L	798	28	377	333	212	97	61	40	344	557	225	225	318	319	310
1	1.001	"S8	53000/R	804	29	323	234	219	126	79	47	139	655	323	220	247	248	266
1	1.001	"S1	53500/L	811	28	272	235	184	104	64	40	400	785	324	264	302	309	315
1	1.001	"S8	54000/R	811	29	269	221	211	131	82	48	293	794	345	230	240	241	263
1	1.001	"S1	54500/L	762	28	620	543	429	216	120	73	195	324	132	106	137	155	162
1	1.001	"S8	55000/R	799	29	368	255	224	121	77	48	105	572	295	213	256	253	259
1	1.001	"S1	55500/L	798	28	269	230	207	121	75	46	375	781	326	231	255	259	270
1	1.001	"S8	56000/R	777	30	542	428	415	231	125	62	119	377	171	112	130	152	195
1	1.001	"S1	56500/L	856	28	681	514	307	136	76	49	77	331	157	167	244	275	272
1	1.001	"S8	57000/R	911	30	292	237	197	120	77	47	253	821	361	277	294	288	301
1	1.001	"S1	57500/L	790	28	396	373	275	147	86	50	701	525	199	172	208	224	246
1	1.001	"S8	58000/R	782	30	418	372	313	174	101	58	331	492	198	149	174	189	210
1	1.001	"S1	58500/L	740	28	398	346	282	136	71	40	286	489	201	157	211	254	288
1	1.001	"S1	59500/L	778	28	375	335	262	138	77	45	382	546	218	178	218	246	269
1	1.001	"S8	60000/R	807	30	300	198	149	68	42	26	111	708	383	324	459	468	483
1	1.001	"S1	60500/L	759	28	435	378	289	162	98	58	261	459	189	157	181	189	203
1	1.001	"S8	61000/R	711	30	1853	1451	836	183	84	59	33	101	46	51	150	206	187
1	1.001	"S1	61500/L	727	28	408	367	313	141	80	50	375	469	186	139	200	222	226
1	1.001	"S8	62000/R	740	30	472	391	310	160	91	54	175	413	178	143	179	198	213
1	1.001	"S1	62500/L	711	16	848	678	461	147	55	26	80	221	99	92	187	315	425
1	1.001	"S8	63000/R	778	30	450	262	223	96	55	35	53	455	279	209	314	345	346
1	1.001	"S1	63500/L	727	16	881	667	487	171	80	48	61	217	102	89	165	222	235
1	1.001	"S8	64000/R	882	30	280	231	201	111	66	39	288	829	359	263	308	326	352
1	1.001	"S1	64500/L	804	16	295	256	208	98	54	36	381	717	295	231	318	363	347
1	1.001	"S8	65000/R	828	30	139	120	101	58	38	25	778	1568	649	490	553	531	515
1	1.001	"S1	65500/L	778	16	228	158	134	74	49	33	169	898	463	347	407	387	367
1	1.001	"S8	66000/R	762	30	630	531	364	120	59	39	146	318	135	125	246	315	304
1	1.001	"S1	66500/L	762	16	350	256	205	83	51	35	133	573	280	222	355	364	338
1	1.001	"S8	67000/R	843	30	538	221	217	79	41	25	22	412	359	232	413	501	524
1	1.001	"S1	67500/L	753	16	432	316	233	86	40	23	108	459	224	193	339	459	509
1	1.001	"S8	68000/R	856	30	511	357	309	118	52	30	78	441	225	166	281	401	444

1	1.001	"S1	68500/L	777	16	355	263	205	72	34	22	138	576	278	227	418	557	549
1	1.001	"S8	69000/R	777	30	293	260	242	140	84	51	460	698	281	192	215	225	237
1	1.001	"S1	69500/L	795	16	167	135	110	46	17	7	432	1253	554	432	669	1140	1766
1	1.001	"S8	70000/R	778	30	173	156	128	77	48	30	908	1184	469	364	391	395	403
1	1.001	"S1	70500/L	807	16	279	235	225	127	72	40	328	761	323	215	246	273	314
1	1.001	"S8	71000/R	778	30	195	167	146	77	44	27	523	1050	438	319	391	431	448
1	1.001	"S1	71500/L	824	16	376	232	169	49	25	17	73	577	334	292	651	803	754
1	1.001	"S8	72000/R	756	30	385	298	234	61	18	12	152	517	239	193	480	1024	979
1	1.001	"S1	72500/L	778	16	287	161	148	44	19	11	76	714	454	315	685	998	1100
1	1.001	"S8	73000/R	778	30	254	154	135	54	26	14	104	806	475	345	558	729	864
1	1.001	"S1	73500/L	828	16	262	147	141	59	29	16	83	832	530	351	543	696	805
1	1.001	"S8	74000/R	762	30	407	300	265	143	88	61	118	493	239	172	206	211	194
1	1.001	"S1	74500/L	761	16	339	286	256	138	74	41	272	591	250	178	213	251	289
1	1.001	"S8	75000/R	795	30	577	478	337	113	53	35	143	363	156	141	272	366	353
1	1.001	"S1	75500/L	830	16	247	186	146	94	66	44	211	885	420	340	342	307	293
1	1.001	"S8	76000/R	762	30	580	546	338	118	58	35	474	346	131	135	250	320	338
1	1.001	"S1	76500/L	775	16	327	249	223	97	45	22	167	624	293	208	309	420	548
1	1.001	"S8	77000/R	754	30	450	298	254	115	69	47	75	441	238	178	254	266	249
1	1.001	"S1	77500/L	887	16	314	277	252	148	88	52	408	744	301	211	232	246	265
1	1.001	"S8	78000/R	859	30	696	380	304	83	51	39	30	325	213	169	401	411	342
1	1.001	"S1	78500/L	856	16	304	206	181	54	21	13	118	741	391	283	614	994	1024
1	1.001	"S8	79000/R	828	30	808	582	447	169	81	49	55	270	134	111	190	249	263
1	1.001	"S1	79500/L	762	16	491	303	284	165	102	62	56	409	236	161	179	182	191
1	1.001	"S8	80000/R	778	30	147	134	125	84	61	41	1200	1393	546	372	359	311	295
1	1.001	"S1	80500/L	791	16	234	200	182	97	46	23	430	890	372	260	316	419	535
1	1.001	"S8	81000/R	762	30	273	238	217	110	65	41	426	735	301	210	268	286	289
1	1.001	"S1	81500/L	762	16	273	230	200	104	61	38	335	735	311	228	284	304	312
1	1.001	"S8	82000/R	748	30	188	156	148	92	61	40	444	1047	451	302	315	299	291
1	1.001	"S1	82500/L	778	16	305	278	218	110	62	38	578	672	263	214	274	306	318
1	1.001	"S8	83000/R	833	30	523	301	255	115	72	49	44	419	260	195	280	282	264
1	1.001	"S1	83500/L	775	16	349	267	198	102	63	41	160	585	273	234	294	300	294
1	1.001	"S8	84000/R	746	30	503	263	231	100	62	40	37	390	267	193	289	293	290
1	1.001	"S1	84500/L	778	16	358	276	208	101	61	40	161	572	265	224	298	311	302
1	1.001	"S8	85000/R	759	30	438	337	259	129	73	40	130	456	212	175	228	253	295
1	1.001	"S1	85500/L	811	16	453	357	326	143	77	46	140	471	214	149	220	257	274
1	1.001	"S8	86000/R	751	30	501	366	206	76	42	25	93	395	193	218	383	436	467
1	1.001	"S1	86500/L	830	16	486	389	246	93	47	28	141	450	201	202	346	430	461
1	1.001	"S8	87000/R	772	30	298	235	199	105	65	43	214	682	309	232	285	290	279
1	1.001	"S1	87500/L	761	16	374	359	236	107	57	33	1095	536	199	193	275	325	359
1	1.001	"S8	88000/R	807	30	541	429	353	159	82	46	121	393	177	137	196	240	273
1	1.001	"S1	88500/L	812	16	202	188	156	87	46	21	1138	1058	406	311	361	430	601
1	1.001	"S8	89000/R	759	30	214	201	174	110	71	42	1236	934	355	261	267	261	281
1	1.001	"S1	89500/L	807	16	283	245	229	134	80	46	390	751	310	211	233	246	273
1	1.001	"S8	90000/R	746	30	492	325	278	105	48	25	68	399	216	161	275	379	464
1	1.001	"S1	90500/L	804	16	378	285	264	134	80	48	139	560	265	182	232	245	260
1	1.001	"S8	91000/R	759	30	377	376	231	75	34	20	17067	530	190	197	392	544	590
1	1.001	"S1	91500/L	786	16	269	223	199	92	40	19	308	769	331	236	331	479	643
1	1.001	"S8	92000/R	736	30	344	282	223	83	33	18	226	563	245	197	343	544	636

1	1.001	"S1	92500/L	772	16	730	534	432	163	80	47	64	278	136	107	183	235	255
1	1.001	"S8	93000/R	727	30	678	583	368	142	80	52	155	282	117	118	198	222	217
1	1.001	"S1	93500/L	791	16	284	245	205	115	71	46	379	733	304	231	266	272	267
1	1.001	"S8	94000/R	756	30	368	318	216	110	67	41	296	541	224	209	266	275	287
1	1.001	"S1	94500/L	774	16	331	259	239	119	65	40	186	616	281	194	252	290	301
1	1.001	"S8	95000/R	778	30	315	172	156	109	69	43	65	650	425	298	276	275	281
1	1.001	"S1	95500/L	901	16	411	376	306	159	85	49	447	577	225	176	219	258	286
1	1.001	"S8	96000/R	801	30	367	285	262	113	62	39	162	575	264	183	274	315	319
1	1.001	"S1	96500/L	791	16	397	275	242	89	43	25	97	525	270	196	344	448	492
1	1.001	"S8	97000/R	723	30	824	726	518	248	146	89	154	231	94	84	113	121	126
1	1.001	"S1	97500/L	798	16	293	277	265	169	111	71	1011	717	271	180	183	175	175
1	1.001	"S8	98000/R	778	30	476	461	280	130	75	43	1105	430	159	166	232	253	281
1	1.001	"S1	98500/L	811	16	250	220	191	132	96	65	502	854	347	254	238	206	194
1	1.001	"S8	99000/R	830	30	549	396	357	172	98	64	81	398	197	139	187	206	202
1	1.001	"S1	99500/L	946	16	313	276	229	135	89	55	408	796	322	247	271	259	267
1	1.001	"S8	100000/R	885	30	350	166	163	59	33	23	44	666	501	325	581	654	598
1	1.001	"S1	100500/L	791	16	433	309	276	113	69	47	98	481	241	171	271	279	262
1	1.001	"S8	101000/R	837	30	416	304	256	134	78	43	112	530	259	196	242	262	303
1	1.001	"S1	101500/L	950	16	305	267	247	129	75	42	394	820	335	230	285	309	352
1	1.001	"S8	102000/R	804	30	478	443	338	171	86	47	453	443	171	142	182	228	266
1	1.001	"S1	102500/L	793	16	244	224	206	141	94	57	785	856	333	230	218	206	216
1	1.001	"S8	103000/R	778	30	426	301	269	116	57	31	97	481	243	173	260	333	390
1	1.001	"S1	103500/L	801	16	340	287	256	152	100	64	273	620	262	187	204	195	195
1	1.001	"S1	103500/L	791	16	500	456	380	214	132	74	355	416	163	125	143	146	166
1	1.001	"S1	104000/R	785	16	309	258	235	129	76	42	280	669	286	200	236	252	291
1	1.001	"S1	104500/L	775	16	369	266	263	152	93	55	120	553	274	176	197	203	219
1	1.001	"S1	105000/R	756	16	465	339	331	180	111	68	99	428	210	137	163	166	173
1	1.001	"S1	105500/L	811	16	169	136	106	48	23	12	417	1263	561	458	654	859	1051
1	1.001	"S1	106000/R	769	16	423	296	274	136	68	36	94	479	244	168	219	276	332
1	1.001	"S1	106500/L	775	16	379	307	288	135	61	28	193	538	237	161	222	310	430
1	1.001	"S1	107000/R	785	16	349	334	249	126	69	38	1092	592	221	189	241	277	321
1	1.001	"S1	107500/L	756	16	385	278	259	138	94	61	115	517	256	175	212	196	193
1	1.001	"S1	108000/R	769	16	352	275	257	128	64	34	174	575	263	179	233	293	352
1	1.001	"S1	108500/L	759	16	600	530	366	168	95	60	216	333	135	124	175	195	197
1	1.001	"S1	109000/R	785	16	340	248	224	130	83	50	136	608	298	210	234	231	244
1	1.001	"S1	109500/L	775	16	362	280	203	109	74	48	161	564	260	228	275	255	251
1	1.001	"S1	110500/L	772	16	335	287	246	140	91	58	305	607	253	188	213	207	207
1	1.001	"S1	111000/R	824	16	303	245	207	123	82	54	239	716	316	238	259	245	237
1	1.001	"S1	111500/L	775	16	413	298	267	130	69	36	107	494	245	174	231	274	335
1	1.001	"S1	112000/R	759	16	334	299	253	134	77	45	438	598	239	179	219	240	262
1	1.001	"S1	112500/L	759	16	405	307	282	148	95	62	132	493	232	161	199	195	190
1	1.001	"S1	113000/R	798	16	432	267	255	116	77	51	64	486	281	187	266	253	243
1	1.001	"S1	113500/L	806	16	436	275	220	100	59	33	67	487	276	219	312	333	380
1	1.001	"S1	114000/R	795	16	282	121	119	44	31	22	46	742	618	400	699	625	562
1	1.001	"S1	114500/L	785	16	472	402	266	128	71	39	208	438	184	177	237	269	313
1	1.001	"S1	115000/R	775	16	186	158	138	90	65	47	519	1097	461	336	333	291	256
1	1.001	"S1	115500/L	843	16	303	240	220	120	69	39	215	732	330	229	272	298	336
1	1.001	"S1	116000/R	827	16	190	111	88	23	12	8	127	1146	700	562	1392	1680	1607

1	4.001	"S4	10500/L	777	24	1237	879	794	330	175	110	34	165	83	59	91	108	110
1	4.001	"S4	11000/R	791	22	800	689	340	92	51	32	133	260	108	139	333	378	384
1	4.001	"S4	11500/L	778	24	671	582	460	218	119	73	167	305	126	101	138	159	166
1	4.001	"S4	12000/R	777	22	553	467	388	215	127	81	168	370	156	120	140	149	149
1	4.001	"S4	12500/L	749	24	980	623	499	229	139	88	30	201	113	90	127	131	132
1	4.001	"S4	13000/R	753	22	1038	944	523	192	114	86	166	191	75	86	152	161	136
1	4.001	"S4	13500/L	778	24	432	356	304	171	102	58	186	474	205	153	176	186	209
1	4.001	"S4	14000/R	778	22	628	496	411	204	119	80	102	326	147	113	148	159	151
1	4.001	"S4	14500/L	762	24	468	333	329	158	84	44	90	429	215	139	187	221	269
1	4.001	"S4	15000/R	775	22	621	545	488	285	181	116	198	329	134	95	105	104	104
1	4.001	"S4	15500/L	777	24	388	279	233	109	60	31	113	527	262	200	276	316	390
1	4.001	"S4	16000/R	759	22	729	675	493	231	144	94	293	274	106	92	127	128	126
1	4.001	"S4	16500/L	795	24	322	266	236	145	94	57	252	650	281	202	212	206	217
1	4.001	"S4	17000/R	740	22	942	918	496	189	107	69	695	207	76	89	152	169	167
1	4.001	"S4	17500/L	743	24	917	670	430	196	120	76	51	213	104	103	147	151	152
1	4.001	"S4	18000/R	782	22	360	242	226	125	82	56	97	572	304	207	242	232	217
1	4.001	"S4	18500/L	753	24	683	538	468	246	144	89	93	290	132	96	119	127	132
1	4.001	"S4	19000/R	830	22	361	293	262	147	91	57	204	605	266	190	219	222	226
1	4.001	"S4	19500/L	740	24	968	558	553	254	157	104	24	201	125	80	113	115	111
1	4.001	"S4	20000/R	830	22	337	275	205	84	53	36	225	648	284	242	383	382	358
1	4.001	"S4	20500/L	788	24	669	488	424	202	120	71	69	310	152	111	151	160	173
1	4.001	"S4	21000/R	811	22	422	294	249	122	82	57	93	506	259	195	257	241	221
1	4.001	"S4	21500/L	854	24	438	373	301	169	111	76	224	513	215	170	196	188	175
1	4.001	"S4	22000/R	740	22	877	723	522	243	144	98	92	222	96	85	118	125	117
1	4.001	"S4	22500/L	749	24	520	338	240	110	70	46	61	379	208	187	264	261	253
1	4.001	"S4	23000/R	778	22	423	299	296	141	75	52	98	484	245	157	214	253	233
1	4.001	"S4	23500/L	814	24	794	364	219	120	93	69	18	270	210	222	263	213	183
1	4.001	"S4	24000/R	762	24	900	614	596	270	167	111	41	223	117	76	109	111	107
1	4.001	"S4	24500/L	801	24	393	284	210	87	52	35	113	537	265	228	356	375	356
1	4.001	"S4	25000/R	775	24	827	528	451	115	67	52	37	247	138	103	261	282	232
1	4.001	"S4	25500/L	791	24	546	419	364	199	131	84	103	381	177	130	154	147	146
1	4.001	"S4	26000/R	807	24	709	567	501	215	113	70	96	300	134	96	145	174	179
1	4.001	"S4	26500/L	962	24	293	246	206	186	70	44	306	864	368	279	200	335	340
1	4.001	"S4	27000/R	762	24	712	607	534	209	101	60	139	282	118	85	141	184	197
1	4.001	"S4	27500/L	749	24	753	677	492	214	118	75	202	262	104	91	135	155	155
1	4.001	"S4	28000/R	762	24	688	453	269	95	50	28	48	292	158	169	311	371	423
1	4.001	"S4	28500/L	723	24	914	633	375	100	54	39	42	208	107	115	280	326	288
1	4.001	"S4	29000/R	686	24	1561	924	897	368	187	120	16	116	70	46	72	89	89
1	4.001	"S4	29500/L	740	24	877	644	470	148	71	42	54	222	108	94	194	254	274
1	4.001	"S4	30000/R	723	24	1134	983	659	324	203	138	98	168	69	66	86	87	81
1	4.001	"S4	30500/L	833	24	485	351	310	142	69	37	92	452	223	161	227	294	350
1	4.001	"S4	31000/R	725	24	992	640	461	111	59	41	31	192	107	94	253	300	275
1	4.001	"S4	31500/L	749	24	477	345	216	106	62	38	94	413	204	207	274	294	306
1	4.001	"S4	32000/R	777	24	444	296	236	91	56	38	77	461	247	197	331	338	318
1	4.001	"S4	32500/L	817	24	534	282	181	64	43	28	36	403	272	270	494	463	454
1	4.001	"S4	33000/R	711	24	685	379	334	116	71	50	31	273	176	127	237	244	221
1	4.001	"S4	33500/L	762	24	856	835	540	155	98	67	795	234	86	84	190	190	177
1	4.001	"S4	34000/R	777	24	678	411	298	85	45	30	39	302	178	156	354	421	403

1	4.001	"S4	34500/L	759	24	732	506	339	146	90	60	52	273	141	134	201	206	197
1	4.001	"S4	35000/R	798	24	484	291	209	87	56	40	53	434	258	228	355	347	310
1	4.001	"S4	35500/L	785	24	626	508	355	125	74	47	118	330	145	132	243	259	260
1	4.001	"S4	36000/R	740	24	813	495	335	143	94	65	33	240	141	132	200	192	177
1	4.001	"S4	36500/L	799	24	910	770	498	148	81	51	103	231	98	96	209	240	244
1	4.001	"S4	37000/R	753	24	582	324	304	157	100	65	37	341	219	148	186	184	180
1	4.001	"S4	37500/L	762	24	539	301	277	117	73	47	40	372	238	165	252	254	252
1	4.001	"S4	38000/R	727	24	629	553	377	150	90	58	198	304	124	115	188	197	195
1	4.001	"S4	38500/L	775	24	1043	742	583	186	120	83	40	196	98	80	161	157	145
1	4.001	"S4	39000/R	814	24	577	527	352	155	93	59	313	371	145	138	203	213	214
1	4.001	"S4	39500/L	866	24	461	319	229	90	56	38	83	495	255	226	373	377	354
1	4.001	"S4	40000/R	727	24	1059	715	568	209	121	82	34	181	96	77	135	146	138
1	4.001	"S4	40500/L	777	24	364	328	224	124	82	54	428	562	223	208	243	231	224
1	4.001	"S4	40500/L	738	24	915	836	527	208	115	73	198	212	83	84	137	156	157
1	4.001	"S4	41000/R	762	24	473	304	206	94	70	52	65	424	236	221	314	265	228
1	4.001	"S4	41500/L	761	24	761	567	463	178	97	61	66	263	126	98	166	191	194
1	4.001	"S4	41500/L	846	24	590	492	305	134	82	54	146	377	162	166	244	251	244
1	4.001	"S4	42000/R	807	24	670	662	374	160	102	69	2114	317	115	129	195	193	182
1	4.001	"S4	42500/L	762	24	976	820	495	180	103	76	92	206	87	92	164	180	156
1	4.001	"S4	42500/L	807	24	658	595	388	173	100	60	246	323	128	124	181	197	209
1	4.001	"S4	43000/R	856	24	644	369	341	144	89	61	36	350	218	150	230	234	218
1	4.001	"S4	43500/L	956	24	606	260	228	107	75	51	21	415	346	251	346	311	291
1	4.001	"S4	44000/R	788	24	634	470	377	164	104	72	77	327	158	125	186	185	170
1	4.001	"S4	44500/L	828	24	628	413	317	165	102	69	52	347	188	156	194	198	187
1	4.001	"S4	45000/R	757	24	642	599	416	179	103	67	371	310	119	109	164	179	176
1	4.001	"S4	45500/L	814	24	621	456	313	165	105	67	76	345	168	156	191	189	189
1	4.001	"S4	46000/R	798	24	385	287	222	118	82	56	130	546	261	215	262	237	222
1	4.001	"S4	46500/L	711	24	746	517	418	165	96	65	52	251	129	102	167	181	170
1	4.001	"S4	47000/R	866	24	763	689	504	222	124	71	209	299	118	103	151	170	190
1	4.001	"S4	47500/L	853	24	680	529	421	218	130	74	88	330	152	121	151	160	179
1	4.001	"S4	48000/R	798	24	755	332	290	121	80	55	18	278	226	165	255	243	226
1	4.001	"S4	48500/L	777	24	866	669	521	188	103	66	67	236	109	89	160	184	183
1	4.001	"S4	49000/R	882	24	432	281	247	113	77	58	74	537	295	214	302	279	236
1	4.001	"S4	49500/L	782	24	513	431	306	138	91	59	175	401	171	153	219	209	206
1	4.001	"S4	50000/R	777	24	558	487	306	141	89	61	210	367	150	152	213	213	198
1	4.001	"S4	50500/L	801	24	564	448	343	138	86	57	117	374	168	140	225	227	218
1	4.001	"S4	51000/R	878	24	881	601	495	205	125	84	42	262	137	106	166	171	162
1	4.001	"S4	51500/L	878	24	491	277	247	106	69	47	45	471	298	213	321	310	290
1	4.001	"S4	52000/R	846	24	766	430	368	177	101	65	29	291	185	138	185	204	202
1	4.001	"S4	52500/L	846	24	634	498	353	148	88	56	99	351	160	143	221	234	235
1	4.001	"S4	53000/R	762	24	566	521	303	136	81	52	350	354	138	150	217	229	228
1	4.001	"S4	53500/L	778	24	535	475	317	132	76	49	253	383	154	147	228	250	247
1	4.001	"S4	54000/R	801	24	425	285	233	112	75	49	82	496	264	206	277	260	254
1	4.001	"S4	54500/L	743	24	722	671	399	130	76	51	312	271	104	111	221	238	226
1	4.001	"S4	55000/R	830	24	587	393	354	180	116	78	59	372	199	140	179	174	165
1	6.001	"S6	0/R	769	32	493	482	307	105	46	27	1521	411	150	150	284	407	443
1	6.001	"S6	0/	738	32	992	818	458	105	53	40	81	196	85	96	272	339	287
1	6.001	"S6	0/L	756	32	601	555	370	141	77	49	344	331	128	122	208	239	240

1	6.001	"S6	2/R	775	32	361	223	205	93	56	35	77	565	327	226	323	337	344
1	6.001	"S6	500/L	751	32	890	833	525	133	58	40	281	222	85	86	219	316	292
1	6.001	"S6	1000/R	762	32	581	500	295	128	77	49	182	345	143	155	230	241	242
1	6.001	"S6	1500/L	762	32	339	199	180	53	30	22	72	592	360	253	557	619	538
1	6.001	"S6	2000/R	782	32	370	254	213	87	58	42	101	556	289	220	348	329	289
1	6.001	"S6	2500/L	743	32	546	398	325	135	79	51	84	358	176	137	213	229	226
1	6.001	"S6	3000/R	866	32	778	519	479	172	84	50	44	293	157	108	195	251	269
1	6.001	"S6	3500/L	782	32	557	500	408	178	86	46	269	370	147	115	170	222	264
1	6.001	"S6	4000/R	778	32	592	417	364	133	54	37	69	346	175	128	226	351	327
1	6.001	"S6	4500/L	775	32	486	426	307	127	74	46	250	420	171	151	236	255	262
1	6.001	"S6	5000/R	914	32	675	481	341	103	60	41	63	356	179	160	344	371	347
1	6.001	"S6	5500/L	885	32	836	587	360	123	65	41	48	279	142	147	279	332	336
1	6.001	"S6	6000/R	888	32	114	103	93	53	29	15	1406	2051	811	571	649	746	920
1	6.001	"S6	6500/L	856	32	291	204	197	115	65	35	138	774	395	260	288	321	380
1	6.001	"S6	7000/R	740	32	520	407	316	132	77	48	119	375	171	140	217	234	240
1	6.001	"S6	7500/L	749	32	331	270	150	79	54	38	229	596	261	299	367	338	306
1	6.001	"S6	8000/R	778	32	417	355	271	151	97	65	235	491	206	172	199	196	186
1	6.001	"S6	8500/L	837	32	244	184	165	110	82	58	215	903	428	303	295	249	224
1	6.001	"S6	9000/R	882	32	343	250	196	114	77	48	134	677	332	269	300	279	286
1	6.001	"S6	9500/L	659	32	2244	915	876	322	172	101	5	77	68	45	79	93	101
1	6.001	"S6	10000/R	740	32	891	689	486	189	111	69	66	219	101	91	152	163	167
1	6.001	"S6	10500/L	872	32	949	785	580	217	125	83	86	242	104	90	156	170	163
1	6.001	"S6	11000/R	801	32	991	749	430	156	85	53	53	213	101	111	199	230	235
1	6.001	"S6	11500/L	817	32	469	373	356	155	79	46	142	459	206	137	204	252	276
1	6.001	"S6	12000/R	817	32	624	483	373	181	105	61	94	345	159	131	175	190	208
1	6.001	"S6	12500/L	762	32	661	525	393	156	78	46	100	303	136	116	189	238	258
1	6.001	"S6	13000/R	790	32	453	382	265	110	61	36	203	459	194	178	278	316	341
1	6.001	"S6	13500/L	775	32	590	425	378	156	75	43	75	346	171	123	192	252	280
1	6.001	"S6	14000/R	749	32	801	605	511	198	101	61	66	246	116	88	146	181	191
1	6.001	"S6	14500/L	775	32	647	494	340	136	83	53	85	315	147	136	221	228	227
1	6.001	"S6	15000/R	740	32	724	688	393	157	93	61	452	269	101	113	182	194	189
1	6.001	"S6	15500/L	795	32	641	621	359	163	104	69	829	326	120	132	189	186	179
1	6.001	"S6	16000/R	1004	32	731	463	429	203	119	80	40	362	204	140	191	206	195
1	6.001	"S6	16500/L	762	32	490	395	328	180	112	72	145	409	181	139	164	166	165
1	6.001	"S6	17000/R	866	32	524	357	292	120	76	49	70	435	228	177	279	278	275
1	6.001	"S6	17500/L	788	32	378	304	201	90	67	48	186	549	244	235	339	287	255
1	6.001	"S6	18000/R	756	32	660	628	476	212	120	80	509	302	113	95	138	154	147
1	6.001	"S6	18500/L	895	32	778	743	426	160	95	62	467	303	113	126	217	230	224
1	6.001	"S6	19000/R	827	32	402	358	303	120	75	51	346	542	217	163	267	269	252
1	6.001	"S6	19500/L	783	32	358	333	246	127	70	40	637	576	221	190	239	273	304
1	6.001	"S6	20000/R	762	32	1013	874	484	132	69	46	106	198	82	94	223	269	258
1	6.001	"S6	20500/L	795	32	316	311	200	108	65	41	3368	662	240	238	285	298	301
1	6.001	"S6	21000/R	824	32	1666	1494	660	180	89	61	89	130	52	75	177	226	210
1	6.001	"S6	21500/L	778	32	325	258	221	112	74	47	203	630	284	211	269	256	257
1	6.001	"S6	22000/R	764	32	660	457	327	121	67	43	58	305	157	140	244	278	276
1	6.001	"S6	22500/L	756	32	735	603	413	172	109	60	106	271	118	110	170	169	196
1	6.001	"S6	23000/R	791	32	1343	761	425	140	79	49	17	155	98	111	219	244	251
1	6.001	"S6	23500/L	814	32	1208	917	716	267	123	69	45	177	83	68	118	161	183

1	6.001	"S6	24000/R	750	32	337	265	184	70	46	35	187	586	266	244	415	397	333
1	6.001	"S6	24500/L	839	32	710	690	402	143	76	60	832	311	114	125	227	269	217
1	6.001	"S6	25000/R	815	32	326	266	232	131	76	44	233	658	288	210	241	261	288
1	6.001	"S6	25500/L	762	32	557	405	307	119	59	30	82	360	177	149	248	315	395
1	6.001	"S6	26000/R	805	32	491	316	193	30	11	7	63	432	240	250	1039	1784	1788
1	6.001	"S6	26500/L	858	32	687	493	417	196	114	64	63	329	164	123	169	183	208
1	6.001	"S6	27000/R	803	32	485	479	248	95	51	28	2817	436	158	194	327	384	446
1	6.001	"S6	27500/L	773	32	1160	816	610	198	99	58	35	175	89	76	151	190	207
1	6.001	"S6	28000/R	818	32	696	563	405	187	101	59	104	309	137	121	169	197	216
1	6.001	"S6	28500/R	723	32	1140	859	621	198	82	37	46	167	79	70	141	215	304
1	6.001	"S6	29000/R	760	32	589	530	371	187	110	62	261	340	135	123	157	168	191
1	6.001	"S6	29500/L	702	32	873	840	485	213	125	77	499	212	79	87	128	137	142
1	6.001	"S6	30000/R	705	32	888	600	509	172	100	66	40	209	110	83	159	172	166
1	6.001	"S6	30500/L	722	32	607	419	337	110	59	34	63	313	162	128	254	298	330
1	6.001	"S6	31000/R	764	32	662	505	371	129	64	35	83	304	142	123	229	291	339
1	6.001	"S6	31500/L	764	32	539	420	262	96	59	38	112	373	171	174	308	316	313
1	6.001	"S6	32000/R	748	32	371	279	212	82	45	27	140	531	252	211	353	405	431
1	6.001	"S6	32500/L	790	32	588	536	319	136	69	35	300	354	139	148	225	279	351
1	6.001	"S6	33000/R	753	32	494	413	293	138	76	41	177	401	171	154	211	242	286
1	6.001	"S6	33500/L	745	32	680	492	425	164	80	47	66	288	142	105	176	227	246
1	6.001	"S6	34000/R	790	32	618	596	397	154	82	52	750	337	125	119	199	235	236
1	6.001	"S6	34500/L	699	32	1180	760	571	221	125	80	26	156	86	73	122	136	136
1	6.001	"S6	35000/R	742	32	728	560	463	210	115	69	78	268	125	96	137	157	167
1	6.001	"S6	35500/L	723	32	815	679	481	209	112	67	105	234	100	90	134	157	168
1	6.001	"S6	36000/R	790	32	477	281	250	110	79	52	51	436	264	189	278	244	236
1	6.001	"S6	36500/L	841	32	726	460	422	183	100	60	41	305	172	119	178	205	218
1	6.001	"S6	37000/R	773	32	970	424	254	92	52	33	14	210	171	182	325	362	364
1	6.001	"S6	37500/L	767	32	796	671	427	191	114	73	115	254	107	107	155	164	163
1	6.001	"S6	38000/R	736	32	1020	804	608	234	122	75	62	190	86	72	122	147	153
1	6.001	"S6	38500/L	773	32	636	448	360	161	93	58	64	320	162	128	186	203	207
1	6.001	"S6	39000/R	810	32	785	573	419	171	103	72	59	272	133	116	183	192	175
1	6.001	"S6	39500/L	773	32	715	630	429	197	112	70	177	285	115	108	152	168	172
1	6.001	"S6	40000/R	745	32	846	719	428	115	45	27	115	232	97	104	251	404	429
1	6.001	"S6	40500/L	760	32	801	736	473	197	106	61	242	250	97	96	149	175	194
1	6.001	"S6	41000/R	750	32	667	536	388	134	82	56	105	296	132	116	217	223	208
1	6.001	"S6	41500/L	838	32	388	290	196	101	66	42	131	569	272	256	321	309	310
1	6.001	"S6	42000/R	776	0	794	554	456	190	97	54	50	257	132	102	158	195	223
1	6.001	"S6	42500/L	757	32	722	623	447	202	125	85	149	276	114	101	145	148	138
1	6.001	"S6	43000/R	951	32	498	299	295	150	87	55	52	503	299	193	245	266	269
1	6.001	"S6	43500/L	757	32	836	642	463	162	88	57	68	238	111	98	181	210	206
1	6.001	"S6	44000/R	725	32	1150	899	637	254	129	77	53	166	76	68	111	137	146
1	6.001	"S6	44500/L	757	32	1640	1370	903	131	95	64	53	122	52	50	224	194	184
1	6.001	"S6	45000/R	837	32	703	639	356	168	96	55	243	313	123	141	193	213	237
1	6.001	"S6	45500/L	745	32	1020	720	508	143	64	36	40	192	97	88	202	284	322
1	6.001	"S6	46000/R	841	32	847	482	326	45	21	14	27	261	164	154	724	976	934
1	6.001	"S6	46500/L	760	32	371	342	245	110	64	42	544	539	209	186	267	289	281
1	6.001	"S6	47000/R	777	32	327	253	195	79	46	30	179	626	289	238	381	412	403
1	6.001	"S6	47500/L	770	32	417	267	253	126	82	53	73	486	271	182	237	229	226

1	6.001	"S6	48000/R	805	32	986	697	513	174	103	67	42	215	109	94	179	191	187
1	6.001	"S6	48500/L	789	32	285	280	172	74	41	24	3362	729	265	274	413	469	511
1	6.001	"S6	49000/R	825	32	756	642	411	157	87	53	127	287	121	120	203	231	242
1	6.001	"S6	49500/L	769	32	892	604	394	104	61	40	40	227	120	117	286	307	299
1	6.001	"S6	50000/R	928	32	612	386	286	119	71	50	48	399	226	194	302	319	289
1	6.001	"S6	50500/L	815	32	535	390	309	129	75	48	86	401	196	158	245	265	264
1	6.001	"S6	51000/R	783	32	454	242	229	97	62	43	43	454	304	205	312	308	283
1	6.001	"S6	51500/L	773	32	1000	966	424	115	70	52	486	203	75	109	260	269	231
1	6.001	"S6	52000/R	813	32	754	586	398	192	113	65	79	284	130	122	164	175	194
1	6.001	"S6	52500/L	793	32	608	462	310	132	77	47	89	343	161	153	233	251	262
1	6.001	"S6	53000/R	793	32	564	497	303	125	69	38	225	370	150	157	246	280	324
1	6.001	"S6	53500/L	764	32	744	669	433	184	105	66	205	270	107	106	161	177	180
1	6.001	"S6	54000/R	789	32	936	600	502	142	71	42	33	222	124	94	215	271	292
1	6.001	"S6	54500/L	773	32	541	399	240	109	65	43	89	376	182	193	275	290	279
1	6.001	"S6	55000/R	760	32	719	637	406	128	58	31	185	278	112	112	230	319	381
1	6.001	"S6	55500/L	760	32	776	758	447	151	84	55	929	258	94	102	195	221	215
1	6.001	"S6	56000/R	757	32	1440	999	618	131	75	55	27	138	71	73	224	246	214
1	6.001	"S6	56500/L	890	32	552	353	302	130	77	51	55	424	237	176	265	282	271
1	6.001	"S6	57000/R	801	32	667	521	418	169	98	64	92	316	145	115	183	199	195
1	6.001	"S6	57500/L	725	32	964	638	454	161	86	53	35	198	107	96	174	205	213
1	6.001	"S6	58000/R	800	32	1020	799	637	214	128	84	61	206	94	75	145	152	148
1	6.001	"S6	58500/L	725	32	865	592	414	154	82	44	43	221	115	105	182	216	256
1	6.001	"S6	59000/R	801	32	710	623	409	199	119	71	173	297	121	117	156	164	175
1	6.001	"S6	59500/L	780	32	805	670	463	174	93	58	106	255	109	101	174	204	209
1	6.001	"S6	60000/R	789	32	913	754	468	141	80	51	89	227	98	101	217	240	241
1	6.001	"S6	60500/L	723	32	1530	893	874	317	170	106	16	124	76	49	88	104	106
1	6.001	"S6	61000/R	793	32	532	506	285	116	70	45	626	392	147	166	265	276	274
1	6.001	"S6	61500/L	735	32	1890	1480	958	304	157	94	33	102	47	46	94	114	122
1	6.001	"S6	62000/R	748	32	1090	998	552	168	83	51	170	181	70	81	172	220	228
1	6.001	"S6	62500/L	773	32	698	574	343	95	56	38	113	292	127	135	315	336	316
1	6.001	"S6	63000/R	755	32	922	849	433	141	76	49	216	216	84	104	207	242	240
1	6.001	"S6	63500/L	745	32	701	692	371	142	74	43	1877	280	101	120	203	245	269
1	6.001	"S6	64000/R	854	32	799	427	297	86	47	27	25	281	188	172	384	443	492
1	6.001	"S6	64500/L	851	32	910	719	464	170	100	65	71	246	111	110	194	207	204
1	6.001	"S6	65000/R	787	32	585	369	198	57	30	16	50	354	201	238	535	639	765
1	6.001	"S6	65500/L	790	32	1090	870	378	90	55	36	62	191	85	125	340	350	341
1	6.001	"S6	66000/R	755	32	844	644	437	142	79	51	65	235	110	103	206	233	230
1	6.001	"S6	66500/L	773	32	649	444	357	127	65	37	57	314	164	130	236	290	325
1	6.001	"S6	67000/R	813	32	632	422	346	145	83	47	54	339	181	141	217	239	269
1	6.001	"S6	67500/L	755	32	519	380	215	45	16	6	90	383	187	210	650	1150	1956
1	6.001	"S6	68000/R	760	32	545	499	267	97	53	31	341	367	143	170	303	350	381
1	6.001	"S6	68500/L	825	25	620	529	286	93	51	29	160	350	147	173	343	394	442
1	6.001	"S6	69000/R	738	25	1350	988	633	143	57	29	35	144	70	70	200	316	396
1	6.001	"S6	69500/L	841	25	646	308	175	31	12	4	24	343	257	288	1050	1708	3269
1	6.001	"S6	70000/R	760	25	1070	824	519	178	91	49	54	187	87	88	165	204	241
1	6.001	"S6	70500/L	790	25	652	560	235	79	50	34	160	319	133	201	387	385	361
1	6.001	"S6	71000/R	892	25	634	484	274	103	61	37	87	370	173	195	335	356	375
1	6.001	"S6	71500/L	790	25	970	929	409	113	72	51	400	214	80	116	271	267	241

1	6.001	"S6	72000/R	699	25	1500	1040	667	230	122	72	26	123	63	63	118	140	151
1	6.001	"S6	72500/L	738	25	1540	1030	501	149	71	42	22	126	67	88	192	253	273
1	6.001	"S6	73000/R	880	25	466	377	290	91	51	36	156	497	219	182	374	421	380
1	6.001	"S6	73500/L	838	25	454	297	233	69	34	20	71	486	265	215	470	601	651
1	6.001	"S6	74000/R	848	25	588	263	234	84	36	15	24	380	303	217	391	574	879
1	6.001	"S6	74500/L	789	25	444	304	208	35	19	12	84	468	244	227	873	1012	1022
1	6.001	"S6	75000/R	757	25	957	881	452	160	92	57	207	208	81	100	183	201	206
1	6.001	"S6	75500/L	773	25	690	532	328	93	43	22	84	295	137	141	322	438	546
1	6.001	"S6	76000/R	742	25	716	640	357	127	67	44	201	273	109	124	226	270	262
1	6.001	"S6	76500/L	755	25	551	536	321	143	83	48	1110	361	132	141	204	222	245
1	6.001	"S6	77000/R	777	25	300	209	154	63	45	22	131	682	350	302	477	421	549
1	6.001	"S6	77500/L	687	25	1650	1350	724	138	49	26	47	110	48	57	193	342	411
1	6.001	"S6	78000/R	760	25	644	506	319	97	52	32	97	311	141	143	303	356	369
1	6.001	"S6	78500/L	813	25	644	591	561	232	129	78	296	332	129	87	136	154	162
1	6.001	"S6	79000/R	773	25	1150	1010	423	117	64	40	107	177	72	109	256	294	300
1	6.001	"S6	79500/L	738	25	1510	1040	655	126	76	53	25	129	67	67	227	237	216
1	6.001	"S6	80000/R	787	25	662	542	296	87	43	27	117	313	137	159	350	446	453
1	6.001	"S6	80500/L	773	25	1020	537	295	39	23	16	19	200	135	157	767	819	751
1	6.001	"S6	81000/R	770	25	585	379	205	29	6	3	54	347	191	225	1028	3128	3990
1	6.001	"S6	81500/L	825	25	412	291	218	69	36	21	100	527	267	226	463	559	611
1	6.001	"S6	82000/R	750	25	495	299	169	41	22	13	53	399	236	266	708	831	897
1	6.001	"S6	82500/L	742	25	387	244	171	49	22	10	75	505	286	260	586	822	1154
1	6.001	"S6	83000/R	813	25	584	332	256	62	32	19	39	366	230	190	508	619	665
1	6.001	"S6	83500/L	725	25	1180	811	546	184	89	45	32	162	84	79	153	199	250
1	6.001	"S6	84000/R	863	25	601	306	154	35	12	5	30	378	265	335	955	1753	2683
1	6.001	"S6	84500/L	814	25	536	333	192	52	31	20	52	400	230	254	606	640	633
1	6.001	"S6	85000/R	742	25	1490	947	366	93	48	32	20	131	74	121	309	377	360
1	6.001	"S6	85500/L	772	25	792	624	319	102	53	31	80	257	116	145	293	355	387
1	6.001	"S6	86000/R	796	25	723	576	402	97	29	13	93	290	130	118	318	669	952
1	6.001	"S6	86500/L	811	25	755	389	314	59	21	11	24	283	196	155	532	941	1146
1	6.001	"S6	87000/R	804	25	913	675	409	126	69	43	53	232	112	118	247	284	291
1	6.001	"S6	87500/L	773	25	860	509	349	84	31	7	29	237	143	133	356	608	1717
1	6.001	"S6	88000/R	796	25	848	694	399	94	39	18	91	247	108	119	328	498	687
1	6.001	"S6	88500/L	913	25	450	202	156	25	13	6	31	534	425	350	1414	1712	2366
1	6.001	"S6	89000/R	876	25	909	604	378	91	39	15	37	254	136	139	373	547	908
1	6.001	"S6	89500/L	709	25	1340	889	771	264	118	61	25	139	75	55	104	146	181
1	6.001	"S6	90000/R	862	25	628	352	200	40	23	12	35	361	230	258	834	914	1117
1	6.001	"S6	90500/L	810	25	832	532	334	108	61	51	36	256	143	145	290	324	247
1	6.001	"S6	91000/R	772	25	762	498	339	130	75	47	42	267	146	136	230	251	255
1	6.001	"S6	91500/L	757	25	891	792	511	208	111	62	154	224	90	89	141	166	190
1	6.001	"S6	92000/R	760	25	791	642	391	120	65	40	93	253	111	116	245	285	295
1	6.001	"S6	92500/L	789	25	722	658	337	95	57	29	244	288	113	140	322	337	423
1	6.001	"S6	93000/R	841	25	620	556	290	107	54	27	240	357	142	174	304	380	484
1	6.001	"S6	93500/L	777	25	1000	875	541	156	85	59	120	205	83	86	193	223	205
1	6.001	"S6	94000/R	810	25	458	407	319	160	91	52	298	466	187	152	196	217	242
1	7.001	"S7	0/R	933	18	286	256	206	112	73	49	511	859	343	271	322	312	296
1	7.001	"S7	500/L	929	18	432	399	284	163	108	72	479	566	219	196	221	210	201
1	7.001	"S7	1000/R	798	24	420	282	179	92	64	46	83	500	266	267	336	304	270

1	7.001	"S7	1500/L	901	24	280	221	175	97	67	47	229	847	383	308	360	328	298
1	7.001	"S7	2000/R	774	24	669	460	337	151	95	63	56	305	158	137	198	199	191
1	7.001	"S7	2500/L	830	24	398	286	241	114	73	48	110	549	273	206	282	277	269
1	7.001	"S7	3000/R	828	24	541	410	364	159	93	61	99	403	190	136	202	217	211
1	7.001	"S7	3500/L	791	24	432	339	282	134	86	56	144	482	219	168	229	224	220
1	7.001	"S7	4000/R	759	24	1543	1036	364	152	93	63	23	129	69	125	193	199	187
1	7.001	"S7	4500/L	757	24	1369	1041	452	154	82	56	40	146	68	100	190	225	210
1	7.001	"S7	5000/R	795	24	607	582	344	145	84	58	656	345	128	138	212	231	213
1	7.001	"S7	5500/L	782	24	691	653	393	154	85	56	426	298	113	119	197	224	217
1	7.001	"S7	6000/R	875	24	484	346	299	141	86	64	89	476	238	175	240	248	213
1	7.001	"S7	6500/L	762	24	1446	893	437	150	80	58	19	139	80	104	197	232	204
1	7.001	"S7	7000/R	785	24	504	329	295	136	84	59	64	410	224	159	223	228	207
1	7.001	"S7	7500/L	725	24	1071	940	584	152	81	69	115	178	73	74	185	218	163
1	7.001	"S7	8000/R	878	24	550	512	301	141	89	55	419	420	161	175	241	240	248
1	7.001	"S7	8500/L	798	24	625	442	341	131	79	51	66	336	170	140	236	246	243
1	7.001	"S7	9000/R	775	24	530	514	323	130	67	46	1037	385	142	144	231	282	262
1	7.001	"S7	9500/L	804	24	714	551	422	151	76	54	81	296	137	114	206	258	231
1	7.001	"S7	10000/RR	778	24	314	254	195	84	47	30	231	652	288	239	359	403	403
1	7.001	"S7	10500/L	917	24	517	339	306	147	87	54	63	467	254	179	241	257	264
1	7.001	"S7	11000/R	762	24	624	592	469	193	112	75	507	321	121	97	153	166	158
1	7.001	"S7	11500/L	759	24	1435	1046	779	241	126	83	32	139	68	58	122	147	142
1	7.001	"S7	12000/R	740	24	874	803	433	155	92	63	221	223	87	102	185	196	183
1	7.001	"S7	12500/L	740	24	895	829	618	286	125	55	240	218	84	72	100	144	209
1	7.001	"S7	13000/R	756	24	649	551	384	148	80	52	148	307	129	118	198	230	226
1	7.001	"S7	13500/L	778	24	1211	746	628	261	134	81	23	169	98	74	115	142	149
1	7.001	"S7	14000/R	814	24	970	963	525	170	84	56	2427	221	79	93	185	236	226
1	7.001	"S7	14500/L	740	24	897	851	534	209	118	80	353	217	82	83	137	153	144
1	7.001	"S7	15000/R	778	24	453	388	257	110	58	33	225	452	189	181	274	327	367
1	7.001	"S7	15500/L	759	24	1342	1298	681	218	118	70	376	149	55	67	135	157	169
1	7.001	"S7	16000/R	753	24	901	833	440	129	75	52	233	220	85	102	226	245	225
1	7.001	"S7	16500/L	753	24	1266	949	489	148	92	33	40	157	75	92	197	200	355
1	7.001	"S7	17000/R	725	24	856	733	410	162	89	56	119	223	93	106	173	199	201
1	7.001	"S7	17500/L	775	24	874	734	493	192	108	70	103	233	99	94	156	175	172
1	7.001	"S7	18000/R	775	24	2176	1545	834	114	80	56	19	94	47	56	263	236	215
1	7.001	"S7	18500/L	778	24	944	712	431	136	77	48	56	217	103	108	221	246	252
1	7.001	"S7	19000/R	725	24	2005	1366	926	260	135	85	18	95	50	47	108	131	133
1	7.001	"S7	19500/L	753	24	959	678	474	180	101	59	43	207	104	95	162	182	198
1	7.001	"S7	20000/R	725	24	1704	1578	1191	254	129	77	126	112	43	36	111	137	146
1	7.001	"S7	20500/L	759	24	1123	994	488	124	67	43	117	178	72	93	237	276	274
1	7.001	"S7	21000/R	727	24	1374	1025	662	215	116	75	37	139	67	66	131	153	151
1	7.001	"S7	21500/L	753	24	1105	868	525	153	78	52	57	179	82	86	191	235	225
1	7.001	"S7	22000/R	736	24	1203	947	573	178	100	67	53	161	73	77	160	179	171
1	7.001	"S7	22500/L	759	24	1592	1100	612	168	87	53	24	126	65	74	175	213	223
1	7.001	"S7	23000/R	743	24	1496	1062	683	180	109	79	28	131	66	65	160	166	146
1	7.001	"S7	23500/L	795	24	678	551	344	120	65	40	110	309	136	138	256	298	309
1	7.001	"S7	24000/R	754	24	1229	945	607	172	88	56	46	162	75	74	170	209	209
1	7.001	"S7	24500/L	723	24	1819	1114	875	201	96	64	15	105	61	49	139	184	176
1	7.001	"S7	25000/R	723	24	1216	910	706	245	119	75	42	157	75	61	114	148	150

1	7.001	"S7	25500/L	814	24	1387	850	455	88	52	36	20	154	90	107	358	382	352
1	7.001	"S7	26000/R	740	24	1488	1161	649	159	80	52	41	131	60	68	180	225	221
1	7.001	"S7	26500/L	753	24	1697	1366	736	147	71	47	42	117	52	61	198	259	249
1	7.001	"S7	27000/R	698	24	1465	1290	726	230	121	76	86	125	51	58	117	141	143
1	7.001	"S7	27500/L	720	24	1674	1511	716	182	98	69	95	113	45	60	153	179	162
1	7.001	"S7	28000/R	777	24	995	778	539	164	86	57	62	206	94	86	183	220	212
1	7.001	"S7	28500/L	706	24	2178	1129	747	201	96	58	8	85	59	57	136	179	189
1	7.001	"S7	29000/R	736	24	865	820	477	200	120	80	360	224	84	92	142	150	143
1	7.001	"S7	29500/L	748	24	701	596	379	166	95	64	139	281	118	118	174	192	182
1	7.001	"S7	30000/R	778	24	771	632	367	139	81	49	101	266	116	127	217	234	247
1	7.001	"S7	30500/L	864	24	566	493	304	127	77	51	204	402	165	170	263	274	263
1	7.001	"S7	31000/R	880	24	490	356	291	136	82	56	93	473	232	181	250	262	244
1	7.001	"S7	31500/L	827	24	763	669	424	161	95	67	160	285	116	117	199	212	192
1	7.001	"S7	32000/R	795	24	728	494	446	244	159	105	50	287	151	107	126	122	118
1	7.001	"S7	32500/L	727	24	1086	867	541	201	121	79	62	176	79	80	140	146	143
1	7.001	"S7	33000/R	762	24	740	682	350	122	79	55	272	271	105	130	242	235	215
1	7.001	"S7	33500/L	738	24	1235	987	674	207	135	100	55	157	70	66	138	133	115
1	7.001	"S7	34000/R	795	24	1364	1252	724	207	103	58	140	153	60	66	149	188	213
1	9.001	"S9	500/L	759	17	357	347	251	103	51	36	1663	560	206	181	285	363	328
1	9.001	"S9 BYPA	1000/R	851	34	203	175	151	93	58	37	527	1104	457	337	354	358	358
1	9.001	"S9	1500/L	830	17	208	189	158	97	61	38	818	1050	413	314	331	332	340
1	9.001	"S9 BYPA	2000/R	985	34	236	205	179	129	81	58	480	1099	452	329	296	296	264
1	9.001	"S9	2500/L	875	17	279	219	165	79	49	33	224	826	376	317	429	435	412
1	9.001	"S9 BYPA	3000/R	795	34	352	235	222	111	75	51	98	595	318	214	277	258	242
1	9.001	"S9	3500/L	785	17	658	482	229	61	48	34	71	314	153	205	498	399	359
1	9.001	"S9 BYPA	4000/R	738	34	411	351	216	60	33	25	244	473	198	204	476	545	459
1	9.001	"S9	4500/L	740	17	699	597	313	83	56	41	143	279	117	141	345	322	281
1	9.001	"S9 BYPA	5000/R	727	34	1594	1194	653	127	68	44	32	120	57	67	222	261	257
1	9.001	"S9	5500/L	756	17	718	713	435	164	88	59	3399	277	100	104	178	209	199
1	9.001	"S9 BYPA	6000/R	688	34	2035	1088	543	63	61	56	10	89	59	76	423	275	191
1	9.001	"S9	6500/L	774	17	432	427	287	123	64	40	3383	472	170	161	244	295	301
1	9.001	"S9 BYPA	7000/R	762	34	380	316	237	94	42	20	222	528	227	192	314	442	592
1	9.001	"S9	8500/L	959	17	335	281	222	107	51	26	266	754	321	258	347	458	573
1	9.001	"S9 BYPA	9000/R	854	34	394	298	233	83	39	20	135	571	269	219	398	534	664
1	9.001	"S9	9500/L	878	17	996	475	291	65	42	28	16	232	174	181	523	510	487
1	9.001	"S9 BYPA	10000/R	833	34	527	354	313	118	64	51	66	416	221	159	273	317	254
1	9.001	"S9	10500/L	866	17	894	680	457	107	61	46	61	255	120	113	313	346	293
1	9.001	"S9 BYPA	11000/R	725	34	1399	1219	546	134	82	61	83	136	56	79	209	216	185
1	9.001	"S9	11500/L	982	17	606	416	372	158	98	62	62	427	222	158	241	244	246
1	9.001	"S9 BYPA	12000/R	853	34	466	408	303	139	82	55	258	482	197	168	238	254	241
1	9.001	"S9	12500/L	736	17	1689	1077	824	277	150	12	18	115	64	53	103	120	954
1	9.001	"S9 BYPA	13000/R	962	34	271	220	196	138	103	71	272	934	411	294	270	228	211
1	9.001	"S9	13500/L	743	17	1259	934	878	278	110	61	39	155	75	51	103	165	189
1	9.001	"S9 BYPA	14000/R	830	34	613	553	465	253	148	94	257	356	141	107	127	137	137
1	9.001	"S9 BYPA	15000/R	804	34	915	815	424	123	65	46	152	231	93	113	253	302	272
1	9.001	"S9	15500/L	782	17	674	593	522	273	152	103	186	305	124	90	111	125	118
1	9.001	"S9 BYPA	16000/R	727	34	1255	1059	602	149	78	54	74	152	65	72	189	227	209
1	9.001	"S9	16500/L	775	17	1066	880	683	257	135	85	76	191	83	68	117	140	142

1	9.001	"S9 BYPA	17000/R	769	34	539	457	359	176	98	59	177	376	158	128	169	191	203
1	9.001	"S9	17500/L	753	17	445	392	327	158	95	67	284	445	181	138	185	193	175
1	9.001	"S9 BYPA	18000/R	807	34	339	278	247	136	90	63	230	627	273	195	230	219	199
1	9.001	"S9	18500/L	762	17	648	545	463	204	113	80	140	310	131	98	145	164	148
1	9.001	"S9 BYPA	19000/R	795	34	620	559	447	208	116	80	253	338	134	106	148	167	154
1	9.001	"S9	19500/L	711	17	1826	1102	1052	349	198	131	14	103	61	40	79	88	84
1	9.001	"S9 BYPA	20000/R	709	34	815	618	537	246	141	95	66	229	108	79	112	123	116
1	9.001	"S9	20500/L	777	17	892	664	428	110	68	47	56	229	110	109	273	279	257
1	9.001	"S9 BYPA	21000/R	778	34	648	449	443	205	108	71	60	316	163	105	147	176	170
1	9.001	"S9	21500/L	853	17	683	555	410	166	82	54	109	329	144	124	199	254	246
1	9.001	"S9 BYPA	22000/R	753	34	616	497	423	180	89	58	116	322	142	107	162	206	202
1	9.001	"S9	22500/L	854	17	663	518	388	170	103	70	92	339	155	132	194	202	190
1	9.001	"S9 BYPA	23000/R	775	34	655	344	304	120	79	60	29	311	212	153	250	239	201
1	9.001	"S9	23500/L	882	17	179	157	127	61	34	21	682	1297	528	416	560	632	653
1	9.001	"S9 BYPA	24000/R	888	34	473	444	343	160	76	42	554	494	188	155	215	285	329
1	9.001	"S9	24500/L	778	17	320	268	205	82	42	26	276	640	273	227	367	452	465
1	9.001	"S9 BYPA	25000/R	775	34	423	337	259	50	25	20	159	482	216	179	600	756	602
1	9.001	"S9	25500/L	791	17	356	197	171	38	17	12	60	585	378	277	806	1134	1025
1	9.001	"S9 BYPA	26000/R	788	34	628	394	379	177	105	71	46	330	188	124	172	183	173
1	9.001	"S9	26500/L	788	17	363	209	201	46	20	14	64	571	354	235	663	960	875
1	9.001	"S9 BYPA	27000/R	846	34	194	159	136	73	44	27	401	1148	500	372	449	469	487
1	9.001	"S9	27500/L	837	17	265	255	221	112	50	25	1647	831	309	227	289	408	520
1	9.001	"S9 BYPA	28000/R	749	34	778	687	498	166	64	27	166	253	103	90	175	285	431
1	9.001	"S9	28500/L	804	17	566	481	374	149	72	39	171	374	157	129	209	272	320
1	9.001	"S9 BYPA	29000/R	814	34	628	338	291	48	21	16	32	341	226	167	657	945	791
1	9.001	"S9	29500/L	795	17	666	658	382	128	75	50	2113	314	114	125	240	258	247
1	9.001	"S9 BYPA	30000/R	851	34	388	323	224	96	59	41	219	577	248	227	343	352	323
1	9.001	"S9	30500/L	778	17	321	250	222	112	55	26	188	638	293	210	269	345	465
1	9.001	"S9 BYPA	31000/R	807	34	335	260	215	96	56	33	177	634	292	225	325	351	380
1	9.001	"S9	31500/L	811	17	726	540	381	76	37	25	68	294	141	127	413	534	504
1	9.001	"S9 BYPA	32000/R	749	34	415	371	228	52	26	16	348	475	190	197	558	702	728
1	9.001	"S9	32500/L	904	17	544	535	332	119	51	28	1870	437	159	163	294	432	502
1	9.001	"S9 BYPA	33000/R	762	34	395	380	229	75	32	18	1098	508	189	199	393	580	658
1	9.001	"S9	33500/L	859	17	56	47	30	25	22	17	1596	4038	1718	1713	1330	952	786
1	9.001	"S9 BYPA	34000/R	748	34	277	197	151	51	22	13	152	711	357	296	568	829	895
1	9.001	"S9	34500/L	830	17	224	179	144	51	23	14	304	975	436	345	630	880	922
1	9.001	"S9	35000/R	811	17	732	499	372	97	50	28	50	292	153	130	324	395	450
1	9.001	"S9	35500/L	772	17	377	267	210	72	40	22	110	539	272	220	415	470	546
1	9.001	"S9	36000/R	795	17	697	523	480	178	71	37	74	300	143	99	173	273	334
1	9.001	"S9	36500/L	759	17	195	175	153	72	34	20	768	1025	408	297	408	544	590
1	9.001	"S9	37000/R	774	17	123	109	90	56	28	17	1083	1657	668	515	535	674	708
1	9.001	"S9	37500/L	756	17	308	249	204	88	44	23	234	646	285	222	333	419	511
1	9.001	"S9	38000/R	759	17	268	201	195	109	63	39	192	746	355	233	270	294	303
1	9.001	"S9	38500/L	746	17	283	208	185	62	33	20	168	694	337	241	466	551	580
1	9.001	"S9	39000/R	746	17	513	473	301	106	49	26	394	383	148	148	272	371	446
1	9.001	"S9	39500/L	761	17	706	510	334	102	54	39	63	284	140	136	289	344	303
1	9.001	"S9	40000/R	774	17	362	265	245	113	64	40	129	563	275	189	265	295	301
1	9.001	"S9	40500/L	746	17	849	815	440	125	61	38	483	231	86	101	231	298	305

1	9.001	"S9	41000/R	804	17	395	322	258	114	58	35	191	536	235	186	273	338	357
1	9.001	"S9	41500/L	775	17	868	640	392	85	36	25	55	235	114	118	353	525	482
1	9.001	"S9	42000/R	775	17	475	375	351	194	124	78	135	430	194	132	155	152	154
1	9.001	"S9	42500/L	825	17	407	253	177	67	40	23	69	534	307	279	477	503	558
1	9.001	"S9	43000/R	849	17	336	204	159	32	23	18	79	665	391	319	1027	900	733
1	9.001	"S9	43500/L	795	17	380	243	185	38	14	8	80	551	308	257	810	1384	1545
1	9.001	"S9	44000/R	772	17	481	447	357	198	114	67	468	423	162	129	151	165	179
1	9.001	"S9	44500/L	759	17	508	457	353	183	107	69	302	393	156	129	161	173	171
1	9.001	"S9	45000/R	757	17	710	587	452	164	79	55	115	281	121	100	179	234	214
1	9.001	"S9	45500/L	772	17	335	287	263	159	103	67	305	607	253	176	188	183	179
1	9.001	"S9	46000/R	751	17	291	245	208	99	64	47	313	679	288	216	294	286	248
1	9.001	"S9	46500/L	777	17	304	251	190	76	35	19	267	673	291	245	396	541	636
1	9.001	"S9	47000/R	759	17	613	540	453	233	137	88	207	326	132	100	126	135	134
1	9.001	"S9	47500/L	777	17	276	244	197	118	80	60	473	741	299	236	255	237	201
1	9.001	"S9	48000/R	827	17	607	486	481	263	151	93	113	359	160	103	122	133	138
1	9.001	"S9	48500/L	830	17	468	339	277	98	70	55	96	467	230	179	328	289	235
1	12.001	"S12	0/R	772	12	347	258	210	118	78	51	143	586	281	220	253	241	235
1	12.001	"S12	1000/R	756	12	512	344	273	130	87	60	68	389	207	166	225	212	196
1	12.001	"S12	1500/L	727	15	1045	972	732	250	139	119	218	183	70	59	113	127	95
1	12.001	"S12	2000/R	759	12	522	366	279	119	70	50	77	383	195	163	247	264	236
1	12.001	"S12	2500/L	827	15	474	422	364	201	112	65	293	459	184	136	159	180	198
1	12.001	"S12	3000/R	756	12	658	522	375	159	100	64	100	302	136	121	184	184	184
1	12.001	"S12	3500/L	736	15	1115	860	728	317	159	96	52	174	80	60	90	113	119
1	12.001	"S12	4000/R	759	12	460	386	350	193	95	52	194	434	185	130	152	195	227
1	12.001	"S12	4500/L	749	15	875	624	568	177	77	52	49	225	113	79	164	237	224
1	12.001	"S12	5000/R	862	12	485	358	290	155	102	68	99	468	226	178	215	206	197
1	12.001	"S12	5500/L	866	15	357	242	165	74	48	43	101	639	336	314	453	440	313
1	12.001	"S12	6000/R'	759	12	273	245	216	129	81	54	548	732	291	210	228	228	219
1	12.001	"S12	6500/L	882	15	621	449	322	124	82	56	72	374	185	164	275	262	245
1	12.001	"S12	7000/R	824	12	625	442	401	188	113	66	66	347	175	123	170	178	194
1	12.001	"S12	7500/L	777	15	713	624	364	97	53	40	168	287	117	128	310	357	302
1	12.001	"S12	8000/R	736	12	381	333	254	126	76	49	312	509	208	173	226	236	234
1	12.001	"S12	8500/L	753	15	585	479	360	142	84	59	132	339	148	125	205	219	198
1	12.001	"S12	9000/R	722	12	318	236	162	67	48	38	155	598	288	267	417	367	295
1	12.001	"S12	9500/L	824	15	720	429	381	226	137	93	35	301	181	129	141	147	138
1	12.001	"S12	10000/R	786	12	1065	548	472	180	126	74	17	194	135	100	169	152	165
1	12.001	"S12	10500/L	811	15	779	537	361	81	44	32	49	274	142	134	388	449	394
1	12.001	"S12	11000/R	772	12	661	480	435	213	127	83	69	307	151	106	140	148	145
1	12.001	"S12	11500/L	814	15	671	500	410	154	92	66	75	319	153	119	205	216	192
1	12.001	"S12	12000/R	853	12	995	642	551	192	110	75	31	226	125	93	172	189	177
1	12.001	"S12	12500/L	759	15	637	536	393	168	107	72	143	314	133	116	175	173	164
1	12.001	"S12	13000/R	785	12	888	484	406	155	98	71	23	233	152	116	196	195	172
1	12.001	"S12	13500/L	777	15	869	698	492	172	91	61	80	235	105	94	175	208	198
1	12.001	"S12	14000/R	837	12	766	574	389	148	90	65	67	288	137	129	219	227	200
1	12.001	"S12	14500/L	720	15	910	625	456	138	69	50	41	208	108	94	202	254	224
1	12.001	"S12	15000/R	824	12	903	487	344	110	69	49	22	240	159	143	290	291	261
1	12.001	"S12	15500/L	733	15	555	489	265	87	50	34	228	348	141	165	326	357	335
1	12.001	"S12	16000/R	736	12	422	368	244	120	64	40	276	459	188	180	237	280	286

1	12.001	"S12	16500/L	740	15	607	430	349	129	66	46	68	321	162	127	222	273	250
1	12.001	"S12	17000/R	733	12	787	498	381	150	88	63	37	245	138	115	189	203	181
1	12.001	"S12	17500/L	725	15	630	621	367	144	76	49	1874	303	110	118	195	233	230
1	12.001	"S12	18000/R	772	12	1508	1043	632	210	139	98	25	135	70	73	142	135	122
1	12.001	"S12	18500/L	788	15	811	476	377	113	69	45	30	256	156	125	270	278	272
1	12.001	"S12	19000/R	743	12	478	436	308	147	77	42	372	409	160	144	196	235	275
1	12.001	"S12	19500/L	843	15	716	404	381	107	51	30	31	310	196	132	305	403	437
1	12.001	"S12	20000/R	720	12	647	422	327	121	69	46	50	293	160	132	230	254	243
1	12.001	"S12	20500/L	738	15	869	569	492	181	100	62	37	224	122	90	158	180	185
1	12.001	"S12	21000/R	723	12	1086	799	637	221	109	65	44	175	85	68	127	162	173
1	12.001	"S12	21500/L	811	15	581	391	259	88	54	35	61	367	195	187	357	366	360
1	12.001	"S12	22000/R	723	12	478	351	255	110	71	53	99	398	194	170	254	248	212
1	12.001	"S12	22500/L	778	15	639	374	364	145	89	57	38	321	196	128	208	213	212
1	12.001	"S12	23000/R	775	12	972	876	442	141	61	44	161	210	83	105	213	310	274
1	12.001	"S12	23500/L	762	15	642	361	292	109	62	38	34	312	198	156	271	300	312
1	12.001	"S12	24000/R	751	12	550	412	297	100	56	39	93	359	171	151	291	327	299
1	12.001	"S12	24500/L	727	15	748	576	381	156	89	51	77	256	119	114	180	199	222
1	12.001	"S12	25000/R	754	12	527	478	280	92	46	34	317	377	148	161	317	400	345
1	12.001	"S12	25500/L	759	15	485	303	246	97	54	35	59	412	236	185	303	343	337
1	12.001	"S12	26000/R	799	12	559	325	269	102	59	38	43	376	231	178	303	330	327
1	12.001	"S12	26500/L	788	15	358	276	182	78	49	34	161	579	268	259	391	392	360
1	12.001	"S12	27000/R	788	12	532	437	332	118	54	35	148	390	170	142	259	356	350
1	12.001	"S12	27500/L	825	15	405	317	233	95	48	35	152	536	245	212	336	419	366
1	12.001	"S12	28000/R	801	12	511	314	251	96	59	43	53	413	240	191	323	331	290
1	12.001	"S12	28500/L	908	15	598	452	357	330	69	42	89	400	189	152	107	321	336
1	12.001	"S12	29000/R	878	12	631	462	323	115	66	49	74	366	179	163	296	324	279
1	12.001	"S12	29500/L	827	15	404	360	234	90	46	30	347	539	216	211	356	438	429
1	12.001	"S12	30000/R	878	12	526	386	297	116	61	37	90	439	214	177	293	351	369
1	12.001	"S12	30500/L	811	15	350	283	270	151	72	39	207	610	269	180	208	275	323
1	12.001	"S12	31000/R	853	12	226	189	157	91	52	30	387	994	424	325	363	400	442
1	12.001	"S12	31500/L	875	15	337	299	277	93	54	37	400	684	275	189	364	395	368
1	12.001	"S12	32000/R	799	12	540	356	257	151	106	74	61	390	211	186	205	184	168
1	12.001	"S12	32500/L	859	15	424	356	236	109	69	48	211	533	227	218	305	303	278
1	12.001	"S12	33000/R	736	12	659	396	363	154	92	69	39	294	175	121	185	195	166
1	12.001	"S12	33500/L	807	15	1296	746	476	177	112	82	18	164	102	101	177	176	153
1	12.001	"S12	34000/R	798	12	507	318	284	121	75	51	57	414	236	168	255	259	243
1	12.001	"S12	34500/L	774	15	566	490	398	195	99	58	195	360	149	116	154	191	207
1	12.001	"S12	35000/R	846	12	639	431	362	143	92	64	55	349	185	140	229	224	206
1	12.001	"S12	35500/L	849	15	664	594	342	169	111	81	219	337	134	149	194	186	163
1	12.001	"S12	36000/R	877	12	665	397	377	164	108	75	38	347	208	139	207	198	182
1	12.001	"S12	36500/L	772	15	498	425	351	188	120	80	200	408	171	132	159	157	150
1	12.001	"S12	37000/R	762	12	490	394	308	138	82	53	143	409	182	148	214	227	224
1	12.001	"S12	37500/L	754	15	696	573	402	169	94	58	115	285	124	112	173	196	202
1	12.001	"S12	38000/R	759	12	1136	537	485	160	102	80	14	176	133	94	184	181	147
1	12.001	"S12	38500/L	759	15	641	444	331	121	87	65	60	312	161	137	243	213	182
1	12.001	"S12	39000/R	738	12	654	499	389	174	114	83	84	297	139	114	164	158	138
1	12.001	"S12	39500/L	788	15	392	331	300	188	129	89	237	529	224	157	162	149	138
1	12.001	"S12	40000/R	720	12	769	506	422	180	110	84	43	246	134	102	155	160	133

1	12.001	"S12	40500/L	774	15	348	253	246	143	99	69	131	586	288	188	210	191	174
1	12.001	"S12	41000/R	736	12	636	462	386	174	101	64	71	305	150	114	164	178	179
1	12.001	"S12	41500/L	759	15	477	355	233	87	51	36	104	419	201	195	338	363	328
1	12.001	"S12	42000/R	736	12	514	350	316	136	90	64	71	377	198	139	210	199	179
1	12.001	"S12	42500/L	749	15	566	360	285	124	83	62	53	348	196	157	234	220	188
1	12.001	"S12	43000/R	740	12	438	330	195	64	38	27	119	445	211	227	448	475	426
1	12.001	"S12	43500/L	851	15	516	242	239	101	76	61	29	434	331	213	326	273	217
1	12.001	"S12	44000/R	804	12	486	299	277	120	84	62	56	436	253	174	259	233	202
1	12.001	"S12	44500/L	828	15	742	433	426	316	233	85	32	294	180	116	101	87	151
1	12.001	"S12	45000/R	757	12	356	187	151	49	35	26	53	560	381	300	598	527	453
1	12.001	"S12	45500/L	778	15	609	489	255	89	58	46	115	336	150	183	338	327	263
1	12.001	"S12	46000/R	801	12	468	287	206	86	60	45	58	451	262	233	361	325	277
1	12.001	"S12	46500/L	775	15	808	690	496	194	111	72	124	252	106	93	155	170	167
1	12.001	"S12	47000/R	798	12	877	500	476	174	98	69	26	240	150	100	178	198	180
1	12.001	"S12	47500/L	775	15	853	548	524	212	124	80	36	239	133	88	142	152	151
1	12.001	"S12	48000/R	738	12	845	555	498	170	92	64	39	230	125	89	168	196	179
1	12.001	"S12	48500/L	795	15	610	393	343	139	94	67	51	343	190	139	221	206	184
1	12.001	"S12	49000/R	811	12	479	421	366	173	94	63	259	446	181	133	181	210	200
1	12.001	"S12	49500/L	795	15	470	356	292	121	83	67	114	445	210	163	254	233	184
1	12.001	"S12	50000/R	791	12	706	532	448	232	155	110	74	295	140	106	132	124	112
1	12.001	"S12	50500/L	927	15	307	283	238	141	95	74	657	795	308	233	255	238	195
1	12.001	"S12	51000/R	788	12	498	420	326	168	119	86	185	417	176	145	182	161	142
1	12.001	"S12	51500/L	788	15	461	361	220	69	48	37	134	450	205	214	442	400	331
1	12.001	"S12	52000/R	762	15	652	478	428	217	141	101	72	308	150	107	136	132	117
1	12.001	"S12	52500/L	762	15	548	394	298	146	108	85	80	366	182	153	202	172	139
1	12.001	"S12	53000/R	827	15	760	510	351	167	121	93	46	286	152	141	192	167	138
1	12.001	"S12	53500/L	849	15	500	413	283	142	102	74	162	447	193	179	231	203	178
1	12.001	"S12	54000/R	753	15	471	399	314	148	101	75	201	421	177	143	197	182	156
1	12.001	"S12	54500/L	762	15	548	493	298	132	90	68	280	366	145	153	223	206	174
1	12.001	"S12	55000/R	778	15	538	511	273	97	57	39	602	381	143	171	311	333	310
1	12.001	"S12	55500/L	798	15	650	587	380	150	80	51	245	323	128	126	206	243	243
1	12.001	"S12	56000/R	762	15	720	534	331	113	64	42	68	279	134	138	261	290	282

ROAD EVALUATION REPORT

A/S PHØNIX
P. P. C

Client: turk
Sec. no.: 0001
Link no.: 0001

Design date: 04-03-1997

Link ref.: m75
Start at: ask
Surface: asf

Mea. date: 970123 2

Calculation parameters:

Load radius	150 mm
Contact pressure	0.70 MPa
Poisson's ratio	0.35
Annual traf. growth	.01 %
Design temperature	30 C
Design period	15 years
S. kor. factor	1.00

Signature index:

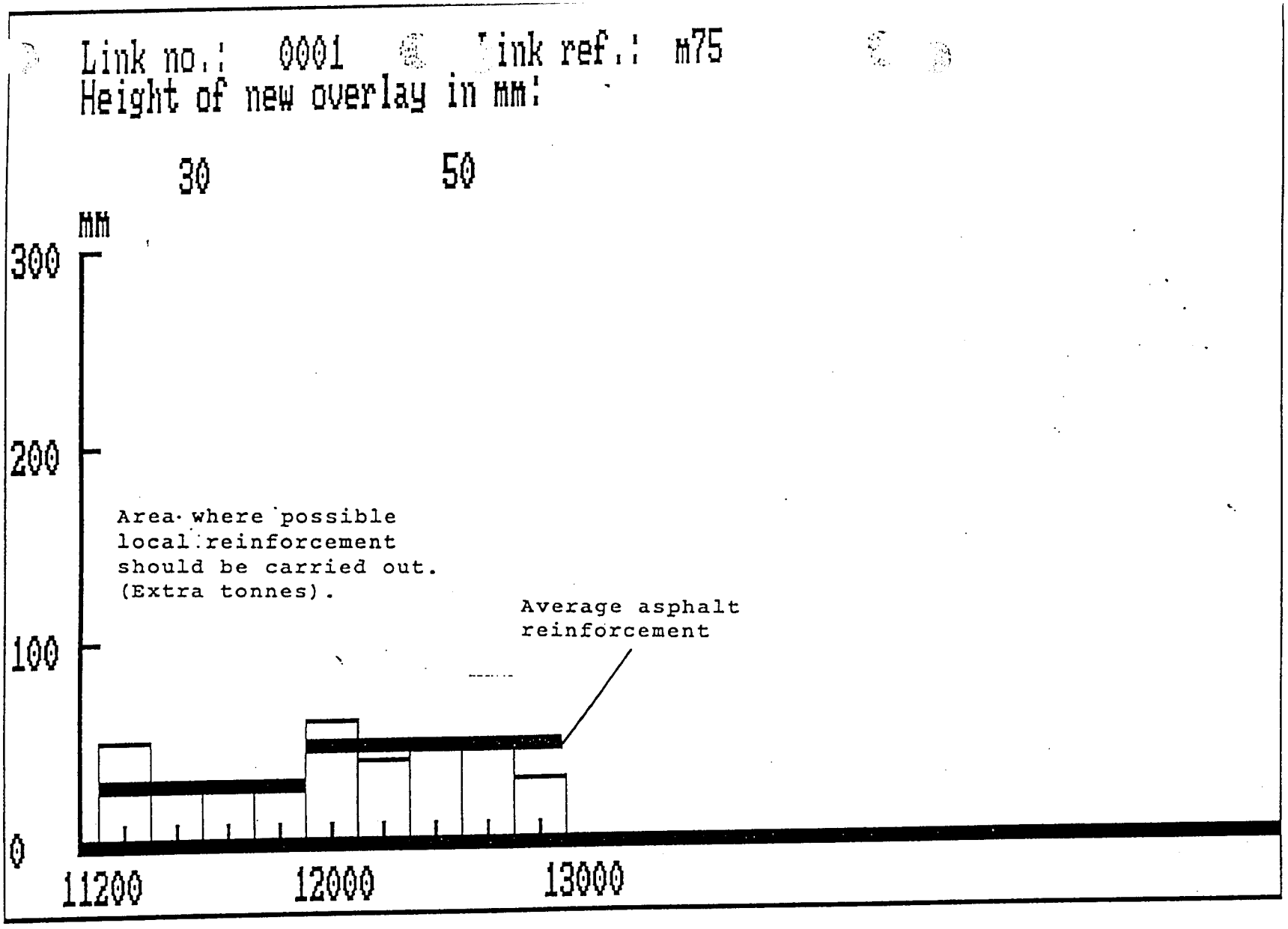
B=Block cracking	R=Rutting
A=Alligator cracking	O=No remarks
C=other cracking	S=Surface defect
P=Potholes	H=Future design
D=Deformation	X=Local def. only
Y=General defect	Z=Reconstruction area
T=Temperature taken	

* - after remarks indicates that the point has been calculated as a 2-layer system and that the thickness and E-values of 1st and 2nd layer are the same when calculating the new overlay needed in the actual point, the calculation is done for a 3-layer system

E-value of new asphalt layer < 100 mm MPa: 3000
E-value of new asphalt layer > 100 mm MPa: 3000

Point	Remarks	E1	E2	E3	Esub	Critical layer	Estimated life	Ex.layer			Estimated traffic	New overlay
		MPa	Mpa	MPa	MPa		years	H1 mm	H2 mm	H3 mm	8.16 t	mm
11300/l		1191	216	0	85	1	2	170	250	0	4005100	50
11500/r		5179	660	0	125	3	20	170	250	0	4005100	0
11700/l		1417	313	0	124	2	6	170	250	0	4005100	25
11900/r		290	584	0	135	2	4	170	250	0	4005100	30
12100/r		1007	209	0	85	1	1	170	250	0	4005100	60
12300/l		1246	273	0	114	2	4	170	250	0	4005100	40
12500/r		1244	211	0	87	1	2	170	250	0	4005100	50
12700/l		1366	199	0	117	1	2	170	250	0	4005100	50
12900/r		1406	282	0	106	2	5	170	250	0	4005100	30

E-value asphalt
E-value gravel
E-value sand
E-value subbase
Thickness asphalt
Thickness gravel
Thickness sand


Link no.: 0001
Link ref.: M75
Height of new overlay in mm:
30
50
mm
300
200
100
0
Area where possible local reinforcement should be carried out. (Extra tonnes).
Average asphalt reinforcement
11200
12000
13000

BEARING CAPACITY OF EQUAL SECTIONS

A/S PHØNIX
P. P. C

Client: turk

Sec. no.: 0001

Link no.: 0001

Design date: 04-03-1997

Link ref.: m75

Mea. date: 970116 2

The classification is based on sections => 4 measurements.
For each section the overlay thickness is calculated as
average + 33% of the standard deviation.
The stated layer thickness must be considered as instructive, as there might be material or technical reasons why another layer thickness than the here stated should be carried out, especially in connection with thin overlay thicknesses.

Section	Overlay Thickness in mm	<--------Life--------> before years	after years	extra tons
11200 - 12000	30	5	15	30
12000 - 13000	50	2	15	0

APPENDIX 6.5

SURFACE DEFICIENCIES

S 1, Tbilisi - Khashuri

KOCKS
INGENIEURE

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
Subsection: Tbilisi - Junction S 3 (km 15+000 - km 26+940)																			
27	0	15,000	15,560	560	7,932	100	1.3	50	0.6	39	0.5	57	0.7	0	0.0	0	0.0	40	0.5
27	0	15,560	16,000	440	4,330	30	0.7	4	0.1	14	0.3	0	0.0	0	0.0	0	0.0	0	0.0
27	0	16,000	18,614	2,614	27,870	58	0.2	650	2.3	74	0.3	0	0.0	0	0.0	0	0.0	0	0.0
27	0	18,614	19,787	1,173	10,557	20	0.2	350	3.3	7	0.1	0	0.0	0	0.0	0	0.0	0	0.0
9	0	19,787	20,755	968	9,312	25	0.3	350	3.8	8	0.1	0	0.0	0	0.0	0	0.0	0	0.0
9	0	20,755	22,666	1,911	17,439	28	0.2	150	0.9	15	0.1	615	3.5	0	0.0	40	0.2	0	0.0
9	0	22,666	23,980	1,314	13,026	17	0.1	220	1.7	0	0.0	0	0.0	0	0.0	100	0.8	0	0.0
9	0	23,980	25,532	1,552	13,968	10	0.1	150	1.1	25	0.2	200	1.4	0	0.0	0	0.0	0	0.0
9	0	25,532	26,940	1,408	14,558	15	0.1	200	1.4	60	0.4	130	0.9	0	0.0	70	0.5	0	0.0
2. Carrigeway																			
27	1	15,000	15,170	170	2,465	50	2.0	600	24.3	10	0.4	0	0.0	0	0.0	0	0.0	30	1.2
27	1	15,170	15,320	150	4,330	50	1.2	600	13.9	10	0.2	0	0.0	0	0.0	0	0.0	30	0.7
27	1	15,320	15,500	180	2,970	50	1.7	600	20.2	10	0.3	0	0.0	0	0.0	0	0.0	30	1.0
27	1	15,500	15,762	262	4,752	100	2.1	100	2.1	7	0.1	0	0.0	0	0.0	0	0.0	0	0.0
27	1	15,762	15,904	142	1,846	100	5.4	100	5.4	7	0.4	0	0.0	0	0.0	0	0.0	0	0.0
27	1	15,904	16,030	126	1,546	100	6.5	100	6.5	7	0.5	0	0.0	0	0.0	0	0.0	0	0.0
27	1	16,030	16,128	98	931	100	10.7	350	37.6	10	1.1	0	0.0	0	0.0	0	0.0	0	0.0
27	1	16,128	16,994	866	8,227	100	1.2	350	4.3	10	0.1	0	0.0	0	0.0	0	0.0	0	0.0
27	1	16,994	17,340	346	3,287	100	3.0	350	10.6	10	0.3	0	0.0	0	0.0	0	0.0	0	0.0
27	1	17,340	19,835	2,495	22,455	100	0.4	350	1.6	90	0.4	0	0.0	0	0.0	0	0.0	0	0.0
9	1	19,835	20,755	920	8,280	20	0.2	350	4.2	7	0.1	0	0.0	0	0.0	0	0.0	0	0.0
9	1	20,755	23,850	3,095	27,855	45	0.2	370	1.3	30	0.1	615	2.2	0	0.0	140	0.5	0	0.0
9	1	23,850	25,532	1,682	15,938	10	0.1	150	0.9	25	0.2	200	1.3	0	0.0	0	0.0	0	0.0
9	1	25,532	26,759	1,227	11,843	15	0.1	200	1.7	60	0.5	130	1.1	70	0.6	0	0.0	0	0.0
TOTAL					235,717	1,243	0.5	6,694	2.8	535	0.2	1,947	0.8	70	0.0	350	0.1	130	0.1
Subsection: Junction S 3 - Gori junction (km 26+940 - km 84+700)																			
10	0	26,940	28,398	1,458	13,122	22	0.2	150	1.1	80	0.6	0	0.0	0	0.0	0	0.0	0	0.0
10	0	28,398	31,190	2,792	25,188	0	0.0	300	1.2	248	1.0	100	0.4	0	0.0	570	2.3	0	0.0
10	0	31,190	37,370	6,180	55,680	120	0.2	3250	5.8	1854	3.3	120	0.2	0	0.0	2050	3.7	0	0.0
10	0	37,370	40,040	2,670	24,030	8	0.0	3230	13.4	37	0.2	150	0.6	0	0.0	1400	5.8	0	0.0
10	0	40,040	41,910	1,870	16,830	0	0.0	80	0.5	0	0.0	70	0.4	0	0.0	350	2.1	0	0.0
10	0	41,910	45,070	3,160	28,560	30	0.1	2000	7.0	14	0.0	2360	8.3	0	0.0	3800	13.3	0	0.0
10	0	45,070	50,009	4,939	44,511	69	0.2	5750	12.9	264	0.6	580	1.3	0	0.0	2930	6.6	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
10	0	50,009	55,216	5,207	46,863	48	0.1	1190	2.5	55	0.1	1170	2.5	0	0.0	3230	6.9	0	0.0
10	0	55,216	57,565	2,349	21,241	47	0.2	780	3.7	44	0.2	0	0.0	0	0.0	680	3.2	0	0.0
11	0	57,565	60,383	2,818	25,362	54	0.2	1530	6.0	27	0.1	120	0.5	0	0.0	1730	6.8	0	0.0
11	0	60,383	63,009	2,626	23,634	120	0.5	1800	7.6	12	0.1	0	0.0	0	0.0	0	0.0	120	0.5
11	0	63,009	67,120	4,111	36,999	60	0.2	280	0.8	77	0.2	800	2.2	0	0.0	2600	7.0	0	0.0
11	0	67,120	71,642	4,522	40,938	50	0.1	290	0.7	44	0.1	1500	3.7	0	0.0	3000	7.3	0	0.0
11	0	71,642	74,073	2,431	22,059	36	0.2	510	2.3	146	0.7	310	1.4	0	0.0	180	0.8	0	0.0
11	0	74,073	77,325	3,252	29,268	38	0.1	200	0.7	0	0.0	50	0.2	0	0.0	0	0.0	0	0.0
11	0	77,325	79,634	2,309	21,281	47	0.2	350	1.6	23	0.1	280	1.3	0	0.0	1840	8.6	0	0.0
11	0	79,634	81,415	1,781	16,529	8	0.0	60	0.4	0	0.0	0	0.0	0	0.0	100	0.6	0	0.0
11	0	81,415	83,080	1,665	14,985	37	0.2	400	2.7	4072	27.2	100	0.7	0	0.0	170	1.1	0	0.0
11	0	83,080	84,700	1,620	17,681	45	0.3	250	1.4	10	0.1	250	1.4	0	0.0	450	2.5	0	0.0
TOTAL					524,761	839	0.2	22,400	4.3	7,007	1.3	7,960	1.5	0	0.0	25,080	4.8	120	0.0
Subsection: Gori junction - Khashuri (km 84 + 700 - km 126 + 670)																			
12	0	84,700	85,240	540	7,590	15	0.2	90	1.2	5	0.1	90	1.2	0	0.0	120	1.6	0	0.0
12	0	85,240	87,906	2,666	27,149	52	0.2	1200	4.4	52	0.2	140	0.5	0	0.0	700	2.6	0	0.0
12	0	87,906	90,345	2,439	21,951	17	0.1	130	0.6	24	0.1	620	2.8	0	0.0	560	2.6	0	0.0
12	0	90,345	93,632	3,287	29,665	192	0.6	236	0.8	68	0.2	62	0.2	0	0.0	280	0.9	0	0.0
12	0	93,632	97,092	3,460	33,756	82	0.2	300	0.9	971	2.9	70	0.2	0	0.0	160	0.5	0	0.0
12	0	97,092	101,004	3,912	35,388	65	0.2	300	0.8	60	0.2	40	0.1	0	0.0	1600	4.5	0	0.0
12	0	101,004	104,551	3,547	32,103	114	0.4	560	1.7	1286	4.0	80	0.2	440	1.4	0	0.0	0	0.0
12	0	104,551	108,037	3,486	31,434	30	0.1	120	0.4	1856	5.9	36	0.1	0	0.0	370	1.2	0	0.0
12	0	108,037	111,830	3,793	34,137	20	0.1	100	0.3	311	0.9	30	0.1	0	0.0	0	0.0	0	0.0
12	0	111,830	118,697	6,867	61,863	130	0.2	640	1.0	1065	1.7	310	0.5	0	0.0	460	0.7	0	0.0
12	0	118,697	121,793	3,096	27,864	25	0.1	450	1.6	428	1.5	570	2.0	0	0.0	950	3.4	0	0.0
12	0	121,793	125,556	3,763	34,287	0	0.0	4730	13.8	5607	16.4	500	1.5	0	0.0	430	1.3	0	0.0
12	0	125,556	127,670	2,114	19,026	20	0.1	1900	10.0	3630	19.1	0	0.0	0	0.0	500	2.6	0	0.0
TOTAL					396,213	762	0.2	10,756	2.7	15,363	3.9	2,548	0.6	440	0.1	6,130	1.5	0	0.0

S 4, Tbilisi - Red Bridge

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
15	0	11,000	11,655	655	10,652	120	1.1	2250	21.1	60	0.6	0	0.0	0	0.0	0	0.0	600	5.6
15	0	11,655	12,860	1,205	15,953	1500	9.4	90	0.6	4060	25.4	0	0.0	0	0.0	0	0.0	0	0.0
15	0	12,860	15,360	2,500	29,740	610	2.1	7500	25.2	3086	10.4	0	0.0	0	0.0	0	0.0	0	0.0
15	0	15,360	18,440	3,080	30,800	700	2.3	1600	5.2	6032	19.6	0	0.0	0	0.0	0	0.0	0	0.0
31	0	18,440	21,140	2,700	31,365	195	0.6	4500	14.3	3	0.0	2185	7.0	400	1.3	0	0.0	0	0.0
31	0	21,140	22,139	999	11,641	47	0.4	0	0.0	0	0.0	1000	8.6	0	0.0	0	0.0	0	0.0
31	0	22,139	23,603	1,464	12,241	5	0.0	2620	21.4	5	0.0	2440	19.9	0	0.0	1050	8.6	0	0.0
31	0	23,603	25,705	2,102	17,443	53	0.3	800	4.6	8	0.0	5640	32.3	0	0.0	1260	7.2	0	0.0
31	0	25,705	26,352	647	4,729	5	0.1	300	6.3	18	0.4	600	12.7	0	0.0	60	1.3	0	0.0
31	0	26,352	26,595	243	2,309	2	0.1	100	4.3	6	0.3	200	8.7	0	0.0	20	0.9	0	0.0
31	0	26,595	27,732	1,137	9,096	8	0.1	620	6.8	40	0.4	1510	16.6	0	0.0	120	1.3	0	0.0
31	0	27,732	29,560	1,828	13,364	108	0.8	2100	15.7	22	0.2	1860	13.9	0	0.0	140	1.0	0	0.0
31	0	29,560	32,638	3,078	21,546	85	0.4	3440	16.0	27	0.1	0	0.0	0	0.0	40	0.2	0	0.0
31	0	32,638	34,190	1,552	10,864	36	0.3	1530	14.1	43	0.4	80	0.7	0	0.0	80	0.7	0	0.0
31	0	34,190	35,910	1,720	12,040	23	0.2	1200	10.0	25	0.2	160	1.3	0	0.0	440	3.7	0	0.0
31	0	35,910	37,960	2,050	14,350	26	0.2	3350	23.3	41	0.3	100	0.7	0	0.0	290	2.0	0	0.0
31	0	37,960	39,247	1,287	9,631	6	0.1	310	3.2	10	0.1	40	0.4	0	0.0	150	1.6	0	0.0
31	0	39,247	42,065	2,818	21,135	25	0.1	3400	16.1	33	0.2	0	0.0	0	0.0	360	1.7	0	0.0
31	0	42,065	45,100	3,035	22,763	28	0.1	2050	9.0	38	0.2	270	1.2	0	0.0	560	2.5	0	0.0
31	0	45,100	47,975	2,875	21,563	141	0.7	8660	40.2	24	0.1	16	0.1	0	0.0	300	1.4	0	0.0
31	0	47,975	49,592	1,617	12,228	20	0.2	6400	52.3	670	5.5	100	0.8	0	0.0	0	0.0	0	0.0
31	0	49,592	51,892	2,300	17,350	101	0.6	10000	57.6	80	0.5	0	0.0	0	0.0	0	0.0	0	0.0
31	0	51,892	56,180	4,288	32,160	611	1.9	9700	30.2	2768	8.6	375	1.2	2500	7.8	0	0.0	0	0.0
31	0	56,180	57,170	990	7,558	103	1.4	3000	39.7	1563	20.7	0	0.0	0	0.0	0	0.0	0	0.0
2. Carrigeway																			
31	1	26,352	26,595	243	1,701	100	5.9	100	5.9	6	0.4	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL					394,222	4,658	1.2	75,620	19.2	18,668	4.7	16,576	4.2	2,900	0.7	4,870	1.2	600	0.2

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
Subsection: Tbilisi - Marneuli (km 0+000 - km 28+840)																			
17	0	3,000	6,027	3,027	31,236	256	0.8	690	2.2	16	0.1	250	0.8	0	0.0	0	0.0	0	0.0
17	0	6,027	8,311	2,284	20,676	79	0.4	1110	5.4	34	0.2	0	0.0	0	0.0	50	0.2	0	0.0
17	0	8,311	9,900	1,589	15,021	135	0.9	3450	23.0	41	0.3	150	1.0	0	0.0	0	0.0	0	0.0
17	0	9,900	10,995	1,095	9,968	85	0.9	2940	29.5	32	0.3	0	0.0	0	0.0	0	0.0	0	0.0
17	0	10,995	12,987	1,992	19,665	65	0.3	40	0.2	10	0.1	500	2.5	0	0.0	1000	5.1	0	0.0
17	0	12,987	14,535	1,548	13,727	32	0.2	20	0.1	10	0.1	0	0.0	500	3.6	0	0.0	0	0.0
17	0	14,535	16,046	1,511	12,110	0	0.0	0	0.0	12000	99.1	0	0.0	0	0.0	0	0.0	0	0.0
17	0	16,046	17,230	1,184	9,240	0	0.0	0	0.0	0	0.0	450	4.9	0	0.0	0	0.0	0	0.0
17	0	17,230	17,630	400	3,025	0	0.0	0	0.0	3000	99.2	0	0.0	0	0.0	0	0.0	0	0.0
17	0	17,630	21,167	3,537	25,995	0	0.0	40	0.2	102	0.4	12	0.0	0	0.0	10	0.0	0	0.0
17	0	21,167	23,493	2,326	20,605	23	0.1	600	2.9	425	2.1	0	0.0	0	0.0	0	0.0	0	0.0
17	0	23,493	23,930	437	3,437	0	0.0	0	0.0	3400	98.9	0	0.0	0	0.0	0	0.0	0	0.0
17	0	23,930	27,690	3,760	34,486	36	0.1	580	1.7	4538	13.2	10	0.0	0	0.0	0	0.0	0	0.0
17	0	27,690	28,303	613	9,984	1600	16.0	3200	32.1	10	0.1	1620	16.2	0	0.0	0	0.0	0	0.0
17	0	28,303	28,840	537	11,160	26	0.2	568	5.1	3	0.0	533	4.8	0	0.0	0	0.0	0	0.0
TOTAL					240,335	2,337	1.0	13,238	5.5	23,621	9.8	3,525	1.5	500	0.2	1,060	0.4	0	0.0
Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)																			
18	0	28,840	29,059	219	4,088	10	0.2	232	5.7	0	0.0	217	5.3	0	0.0	0	0.0	0	0.0
18	0	29,059	30,010	951	11,412	4	0.0	0	0.0	7	0.1	500	4.4	0	0.0	0	0.0	0	0.0
18	0	30,010	30,720	710	6,333	38	0.6	0	0.0	47	0.7	400	6.3	0	0.0	0	0.0	0	0.0
18	0	30,720	30,888	168	1,176	0	0.0	0	0.0	1150	97.8	0	0.0	0	0.0	0	0.0	0	0.0
18	0	30,888	31,401	513	3,591	15	0.4	200	5.6	30	0.8	0	0.0	0	0.0	0	0.0	0	0.0
18	0	31,401	31,642	241	1,687	0	0.0	0	0.0	1640	97.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	31,642	32,377	735	5,145	20	0.4	1070	20.8	60	1.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	32,377	32,638	261	1,827	36	2.0	80	4.4	56	3.1	20	1.1	0	0.0	0	0.0	0	0.0
18	0	32,638	32,910	272	1,904	0	0.0	0	0.0	1850	97.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	32,910	33,976	1,066	7,463	106	1.4	220	2.9	142	1.9	30	0.4	0	0.0	0	0.0	0	0.0
18	0	33,976	35,241	1,265	8,855	24	0.3	60	0.7	230	2.6	440	5.0	0	0.0	60	0.7	0	0.0
18	0	35,241	36,649	1,408	10,225	112	1.1	160	1.6	572	5.6	100	1.0	0	0.0	0	0.0	0	0.0
18	0	36,649	37,685	1,036	8,041	20	0.2	2080	25.9	38	0.5	100	1.2	0	0.0	0	0.0	0	0.0
18	0	37,685	39,919	2,234	14,634	264	1.8	1000	6.8	1087	7.4	0	0.0	0	0.0	0	0.0	0	0.0
18	0	39,919	41,239	1,320	7,920	179	2.3	3200	40.4	95	1.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	41,239	42,278	1,039	6,021	119	2.0	1700	28.2	131	2.2	0	0.0	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
18	0	42,278	42,365	87	445	0	0.0	0	0.0	440	98.9	0	0.0	0	0.0	0	0.0	0	0.0
18	0	42,365	44,896	2,531	15,507	45	0.3	2050	13.2	336	2.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	44,896	47,551	2,655	18,868	0	0.0	550	2.9	100	0.5	1100	5.8	0	0.0	0	0.0	0	0.0
18	0	47,551	48,488	937	7,135	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
18	0	48,488	50,269	1,781	14,561	0	0.0	0	0.0	41	0.3	0	0.0	0	0.0	30	0.2	0	0.0
18	0	50,269	50,848	579	4,220	20	0.5	900	21.3	420	10.0	0	0.0	0	0.0	0	0.0	0	0.0
18	0	50,848	51,757	909	7,029	80	1.1	3500	49.8	520	7.4	0	0.0	0	0.0	0	0.0	0	0.0
18	0	51,757	52,444	687	9,115	34	0.4	600	6.6	60	0.7	0	0.0	0	0.0	0	0.0	0	0.0
18	0	52,444	52,814	370	5,052	7	0.1	0	0.0	60	1.2	0	0.0	0	0.0	0	0.0	0	0.0
18	0	52,814	53,367	553	6,117	10	0.2	0	0.0	1840	30.1	0	0.0	0	0.0	0	0.0	0	0.0
18	0	53,367	53,880	513	3,591	0	0.0	0	0.0	1800	50.1	0	0.0	0	0.0	0	0.0	0	0.0
2. Carrigeway																			
18	1	50,064	51,683	1,619	11,333	50	0.4	2500	22.1	650	5.7	0	0.0	0	0.0	0	0.0	0	0.0
18	1	53,207	53,880	673	5,384	50	0.9	400	7.4	250	4.6	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL					155,198	990	0.6	18,640	12.0	8,440	5.4	1,300	0.8	0	0.0	30	0.0	0	0.0
Subsection: Bolnisi - Guguti / Armenian border (km 53+880 - km 99+127)																			
19	0	53,880	54,773	893	6,271	0	0.0	0	0.0	800	12.8	150	2.4	0	0.0	0	0.0	0	0.0
19	0	54,773	55,034	261	2,079	0	0.0	0	0.0	900	43.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	55,034	55,740	706	6,023	15	0.2	650	10.8	150	2.5	0	0.0	0	0.0	0	0.0	0	0.0
19	0	55,740	56,467	727	6,166	10	0.2	1300	21.1	360	5.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	56,467	59,198	2,731	19,117	0	0.0	0	0.0	6550	34.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	59,198	62,418	3,220	22,091	20	0.1	400	1.8	960	4.3	30	0.1	30	0.1	0	0.0	0	0.0
19	0	62,418	63,446	1,028	6,168	108	1.8	1450	23.5	700	11.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	63,446	63,586	140	840	0	0.0	0	0.0	800	95.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	63,586	65,005	1,419	8,514	300	3.5	0	0.0	3400	39.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	65,005	65,075	70	420	0	0.0	0	0.0	400	95.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	65,075	67,050	1,975	11,850	40	0.3	1800	15.2	2360	19.9	600	5.1	0	0.0	0	0.0	0	0.0
19	0	67,050	67,170	120	720	0	0.0	0	0.0	700	97.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	67,170	67,579	409	2,454	0	0.0	270	11.0	357	14.5	100	4.1	0	0.0	0	0.0	0	0.0
19	0	67,579	70,160	2,581	15,486	360	2.3	6300	40.7	705	4.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	70,160	70,270	110	660	0	0.0	0	0.0	640	97.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	70,270	70,655	385	2,310	20	0.9	1100	47.6	10	0.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	70,655	71,000	345	2,070	0	0.0	0	0.0	2000	96.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	71,000	71,355	355	2,130	20	0.9	1100	51.6	8	0.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	71,355	73,286	1,931	11,586	0	0.0	6600	57.0	60	0.5	500	4.3	0	0.0	0	0.0	0	0.0
19	0	73,286	75,005	1,719	10,314	0	0.0	5600	54.3	440	4.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	75,005	75,854	849	5,079	18	0.4	2000	39.4	20	0.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	75,854	76,390	536	2,680	0	0.0	800	29.9	10	0.4	0	0.0	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
19	0	76,390	76,592	202	1,010	0	0.0	0	0.0	960	95.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	76,592	76,750	158	790	0	0.0	200	25.3	8	1.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	76,750	77,360	610	3,050	0	0.0	0	0.0	3000	98.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	77,360	77,659	299	1,495	0	0.0	800	53.5	400	26.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	77,659	78,455	796	3,980	0	0.0	700	17.6	0	0.0	800	20.1	0	0.0	0	0.0	0	0.0
19	0	78,455	78,888	433	2,917	0	0.0	0	0.0	2800	96.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	78,888	79,984	1,096	5,673	0	0.0	1200	21.2	12	0.2	900	15.9	0	0.0	400	7.1	0	0.0
19	0	79,984	81,198	1,214	6,070	0	0.0	3800	62.6	411	6.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	81,198	83,493	2,295	11,475	0	0.0	0	0.0	8655	75.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	83,493	83,580	87	435	0	0.0	0	0.0	430	98.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	83,580	84,562	982	4,990	0	0.0	0	0.0	4900	98.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	84,562	84,970	408	2,040	0	0.0	0	0.0	2000	98.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	84,970	85,765	795	3,975	0	0.0	0	0.0	2450	61.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	85,765	85,845	80	400	0	0.0	0	0.0	390	97.5	0	0.0	0	0.0	0	0.0	0	0.0
19	0	85,845	86,054	209	1,045	0	0.0	0	0.0	890	85.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	86,054	87,595	1,541	7,705	0	0.0	0	0.0	5710	74.1	0	0.0	0	0.0	0	0.0	0	0.0
19	0	87,595	87,970	375	1,875	0	0.0	0	0.0	1850	98.7	0	0.0	0	0.0	0	0.0	0	0.0
19	0	87,970	88,030	60	300	0	0.0	0	0.0	170	56.7	0	0.0	0	0.0	0	0.0	0	0.0
19	0	88,030	88,163	133	665	0	0.0	0	0.0	290	43.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	88,163	88,272	109	545	0	0.0	0	0.0	540	99.1	0	0.0	0	0.0	0	0.0	0	0.0
19	0	88,272	88,826	554	2,770	0	0.0	0	0.0	2150	77.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	88,826	89,020	194	970	0	0.0	0	0.0	950	97.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,020	89,150	130	650	0	0.0	0	0.0	280	43.1	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,150	89,195	45	225	0	0.0	0	0.0	220	97.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,195	89,480	285	1,425	0	0.0	0	0.0	1060	74.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,480	89,598	118	590	0	0.0	0	0.0	570	96.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,598	89,762	164	820	0	0.0	0	0.0	510	62.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	89,762	90,115	353	1,765	0	0.0	0	0.0	1750	99.2	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,115	90,348	233	1,165	0	0.0	0	0.0	500	42.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,348	90,487	139	695	0	0.0	0	0.0	690	99.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,487	90,587	100	500	0	0.0	0	0.0	300	60.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,587	90,745	158	790	0	0.0	0	0.0	780	98.7	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,745	90,951	206	1,030	0	0.0	0	0.0	800	77.7	0	0.0	0	0.0	0	0.0	0	0.0
19	0	90,951	91,200	249	1,245	0	0.0	0	0.0	1230	98.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	91,200	92,511	1,311	6,555	0	0.0	0	0.0	3700	56.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	92,511	92,763	252	1,320	0	0.0	0	0.0	1240	93.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	92,763	93,047	284	1,420	0	0.0	0	0.0	1400	98.6	0	0.0	0	0.0	0	0.0	0	0.0
19	0	93,047	93,188	141	705	0	0.0	0	0.0	690	97.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	93,188	93,372	184	920	0	0.0	0	0.0	617	67.1	0	0.0	0	0.0	0	0.0	0	0.0
19	0	93,372	94,142	770	3,850	0	0.0	0	0.0	3830	99.5	0	0.0	0	0.0	0	0.0	0	0.0
19	0	94,142	94,506	364	1,820	0	0.0	0	0.0	1200	65.9	0	0.0	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
19	0	94,506	94,606	100	500	0	0.0	0	0.0	490	98.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	94,606	94,735	129	645	0	0.0	0	0.0	350	54.3	0	0.0	0	0.0	0	0.0	0	0.0
19	0	94,735	95,212	477	2,385	0	0.0	0	0.0	2370	99.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	95,212	95,383	171	855	0	0.0	0	0.0	260	30.4	0	0.0	0	0.0	0	0.0	0	0.0
19	0	95,383	95,500	117	585	0	0.0	0	0.0	420	71.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	95,500	95,853	353	1,816	0	0.0	0	0.0	1760	96.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	95,853	96,400	547	3,829	0	0.0	0	0.0	2290	59.8	0	0.0	0	0.0	0	0.0	0	0.0
19	0	96,400	98,700	2,300	20,931	0	0.0	0	0.0	20900	99.9	0	0.0	0	0.0	0	0.0	0	0.0
19	0	98,700	98,966	266	2,128	0	0.0	600	28.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	0	98,966	99,127	161	1,288	0	0.0	0	0.0	1270	98.6	0	0.0	0	0.0	0	0.0	0	0.0
2. Carrigeway																			
19	1	53,880	54,211	331	2,648	25	0.9	200	7.6	150	5.7	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,211	54,321	110	940	10	1.1	70	7.4	50	5.3	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,321	54,326	5	65	0	0.0	0	0.0	60	92.3	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,326	54,441	115	2,070	0	0.0	0	0.0	2040	98.6	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,441	54,506	65	1,030	0	0.0	200	19.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,506	54,738	232	2,320	0	0.0	200	8.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	1	54,738	54,746	8	84	4	4.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	1	55,002	55,088	86	817	0	0.0	200	24.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	1	55,088	55,957	869	6,952	20	0.3	1200	17.3	300	4.3	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL					288,581	970	0.3	38,740	13.4	115,373	40.0	3,080	1.1	30	0.0	400	0.1	0	0.0

S 7, Marneuli - Sadakhlo - Armenian border

KOCKS
INGENIEURE

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
21	0	0	480	480	5,321	0	0.0	0	0.0	5100	95.8	0	0.0	0	0.0	0	0.0	0	0.0
21	0	480	968	488	4,462	0	0.0	0	0.0	120	2.7	0	0.0	0	0.0	0	0.0	0	0.0
21	0	968	1,600	632	5,820	0	0.0	0	0.0	5600	96.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	1,600	1,750	150	1,050	0	0.0	100	9.5	400	38.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	1,750	1,935	185	1,295	0	0.0	0	0.0	1285	99.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	1,935	3,737	1,802	13,052	73	0.6	2000	15.3	2040	15.6	0	0.0	0	0.0	0	0.0	0	0.0
21	0	3,737	8,904	5,167	36,295	22	0.1	14400	39.7	495	1.4	0	0.0	0	0.0	0	0.0	0	0.0
21	0	8,904	10,521	1,617	10,998	0	0.0	1800	16.4	450	4.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	10,521	12,767	2,246	13,476	0	0.0	4900	36.4	115	0.9	0	0.0	0	0.0	0	0.0	0	0.0
21	0	12,767	14,928	2,161	13,476	0	0.0	4400	32.7	168	1.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	14,928	15,912	984	5,904	0	0.0	3000	50.8	60	1.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	15,912	18,106	2,194	13,164	0	0.0	9600	72.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	18,106	20,778	2,672	16,232	0	0.0	7900	48.7	218	1.3	0	0.0	0	0.0	0	0.0	0	0.0
21	0	20,778	21,917	1,139	6,834	0	0.0	1300	19.0	400	5.9	0	0.0	0	0.0	0	0.0	0	0.0
21	0	21,917	22,060	143	1,008	0	0.0	300	29.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,060	22,140	80	480	0	0.0	0	0.0	470	97.9	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,140	22,370	230	1,380	0	0.0	400	29.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,370	22,690	320	1,920	0	0.0	0	0.0	1900	99.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,690	22,900	210	1,260	0	0.0	800	63.5	16	1.3	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,900	22,990	90	540	0	0.0	0	0.0	530	98.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	22,990	23,212	222	1,332	0	0.0	400	30.0	210	15.8	0	0.0	0	0.0	0	0.0	0	0.0
21	0	23,212	23,540	328	1,968	0	0.0	900	45.7	150	7.6	0	0.0	0	0.0	0	0.0	0	0.0
21	0	23,540	24,132	592	3,552	0	0.0	0	0.0	3530	99.4	0	0.0	0	0.0	0	0.0	0	0.0
21	0	24,132	24,416	284	1,704	0	0.0	1200	70.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	24,416	24,500	84	504	0	0.0	0	0.0	495	98.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	24,500	25,694	1,194	7,164	0	0.0	1600	22.3	350	4.9	0	0.0	0	0.0	0	0.0	0	0.0
21	0	25,694	26,192	498	2,988	0	0.0	1300	43.5	90	3.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	26,192	26,700	508	3,048	0	0.0	0	0.0	3030	99.4	0	0.0	0	0.0	0	0.0	0	0.0
21	0	26,700	27,090	390	2,340	0	0.0	1500	64.1	180	7.7	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,090	27,265	175	1,050	0	0.0	0	0.0	1030	98.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,265	27,427	162	972	0	0.0	650	66.9	140	14.4	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,427	27,585	158	948	0	0.0	100	10.5	5	0.5	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,585	27,770	185	1,110	0	0.0	0	0.0	1100	99.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,770	27,834	64	384	0	0.0	50	13.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	27,834	27,945	111	666	0	0.0	0	0.0	655	98.3	0	0.0	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
21	0	27,945	28,065	120	720	0	0.0	100	13.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,065	28,290	225	1,350	0	0.0	0	0.0	1320	97.8	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,290	28,390	100	600	0	0.0	200	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,390	28,430	40	240	0	0.0	0	0.0	235	97.9	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,430	28,700	270	1,620	0	0.0	300	18.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,700	28,920	220	1,320	0	0.0	0	0.0	1310	99.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	28,920	29,109	189	1,134	0	0.0	200	17.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	29,109	29,300	191	1,266	0	0.0	0	0.0	1250	98.7	0	0.0	0	0.0	0	0.0	0	0.0
21	0	29,300	29,440	140	840	0	0.0	0	0.0	35	4.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	29,440	30,215	775	4,650	0	0.0	0	0.0	4620	99.4	0	0.0	0	0.0	0	0.0	0	0.0
21	0	30,215	30,348	133	798	0	0.0	0	0.0	105	13.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	30,348	30,426	78	468	0	0.0	0	0.0	460	98.3	0	0.0	0	0.0	0	0.0	0	0.0
21	0	30,426	30,700	274	1,644	0	0.0	1200	73.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	30,700	31,430	730	4,380	0	0.0	0	0.0	4350	99.3	0	0.0	0	0.0	0	0.0	0	0.0
21	0	31,430	31,750	320	1,920	0	0.0	600	31.3	80	4.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	31,750	32,090	340	2,040	0	0.0	0	0.0	2020	99.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	32,090	32,930	840	5,040	0	0.0	2400	47.6	157	3.1	0	0.0	0	0.0	0	0.0	0	0.0
21	0	32,930	33,140	210	1,260	0	0.0	0	0.0	1250	99.2	0	0.0	0	0.0	0	0.0	0	0.0
21	0	33,140	34,072	932	6,320	0	0.0	3500	55.4	220	3.5	0	0.0	0	0.0	0	0.0	0	0.0
21	0	34,072	34,152	80	910	0	0.0	0	0.0	900	98.9	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL				34,152	222,217	95	0.0	67,100	30.2	48,644	21.9	0	0.0	0	0.0	0	0.0	0	0.0

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
Subsection: Tbilisi bypass west (km 0+000 - km 34+800)																			
13	0	0	241	241	2,382	12	0.5	100	4.2	0	0.0	110	4.6	0	0.0	0	0.0	0	0.0
13	0	241	1,000	759	6,752	10	0.1	130	1.9	6	0.1	0	0.0	0	0.0	0	0.0	1	0.0
13	0	1,000	2,000	1,000	12,914	40	0.3	2400	18.6	62	0.5	0	0.0	0	0.0	0	0.0	0	0.0
13	0	2,000	3,300	1,300	16,965	49	0.3	0	0.0	10600	62.5	1845	10.9	0	0.0	0	0.0	0	0.0
13	0	3,300	4,245	945	10,290	100	1.0	0	0.0	1000	9.7	2000	19.4	0	0.0	0	0.0	0	0.0
13	0	4,245	5,929	1,684	16,465	0	0.0	2900	17.6	810	4.9	1250	7.6	0	0.0	0	0.0	10	0.1
13	0	5,929	6,919	990	9,511	75	0.8	0	0.0	20	0.2	710	7.5	0	0.0	0	0.0	20	0.2
13	0	6,919	8,009	1,090	10,012	6	0.1	50	0.5	50	0.5	2900	29.0	0	0.0	0	0.0	0	0.0
13	0	8,009	9,977	1,968	17,466	440	2.5	500	2.9	470	2.7	2100	12.0	0	0.0	0	0.0	0	0.0
13	0	9,977	12,978	3,001	30,543	56	0.2	1260	4.1	0	0.0	1220	4.0	0	0.0	0	0.0	202	0.7
13	0	12,978	13,000	22	226	20	8.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	0	13,000	13,200	200	2,035	0	0.0	0	0.0	2000	98.3	0	0.0	0	0.0	0	0.0	0	0.0
13	0	13,200	13,570	370	3,619	0	0.0	800	22.1	0	0.0	1500	41.4	0	0.0	0	0.0	0	0.0
13	0	13,570	13,670	100	908	0	0.0	0	0.0	900	99.1	0	0.0	0	0.0	0	0.0	0	0.0
13	0	13,670	14,460	790	6,450	0	0.0	700	10.9	0	0.0	3500	54.3	0	0.0	0	0.0	0	0.0
13	0	14,460	14,520	60	480	0	0.0	0	0.0	475	99.0	0	0.0	0	0.0	0	0.0	0	0.0
13	0	14,520	15,740	1,220	9,760	0	0.0	1000	10.2	50	0.5	5000	51.2	0	0.0	0	0.0	0	0.0
13	0	15,740	15,820	80	640	0	0.0	0	0.0	635	99.2	0	0.0	0	0.0	0	0.0	0	0.0
13	0	15,820	19,510	3,690	41,203	32	0.1	4030	9.8	22	0.1	2080	5.0	0	0.0	0	0.0	140	0.3
13	0	19,510	19,838	328	3,936	0	0.0	0	0.0	3900	99.1	0	0.0	0	0.0	0	0.0	0	0.0
13	0	19,838	23,726	3,888	41,747	1130	2.7	3200	7.7	0	0.0	8500	20.4	0	0.0	0	0.0	800	1.9
13	0	23,726	26,215	2,489	22,401	10	0.0	1000	4.5	20	0.1	2900	12.9	0	0.0	0	0.0	0	0.0
13	0	26,215	27,659	1,444	12,996	0	0.0	500	3.8	100	0.8	3330	25.6	0	0.0	0	0.0	0	0.0
13	0	27,659	30,592	2,933	26,397	180	0.7	3150	11.9	10	0.0	500	1.9	0	0.0	0	0.0	0	0.0
13	0	30,592	32,935	2,343	22,095	120	0.5	5000	22.6	0	0.0	220	1.0	0	0.0	0	0.0	0	0.0
13	0	32,935	34,800	1,865	17,028	40	0.2	825	4.8	75	0.4	1000	5.9	0	0.0	0	0.0	0	0.0
2. Carrigeway																			
13	1	0	130	130	2,115	18	0.9	30	1.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13	1	130	480	350	3,150	50	1.6	50	1.6	0	0.0	0	0.0	0	0.0	0	0.0	20	0.6
13	1	480	880	400	3,900	60	1.5	60	1.5	0	0.0	0	0.0	0	0.0	0	0.0	80	2.1
13	1	3,300	3,327	27	243	5	2.1	0	0.0	3	1.2	30	12.3	0	0.0	0	0.0	0	0.0
13	1	3,327	3,512	185	1,943	30	1.5	0	0.0	15	0.8	200	10.3	0	0.0	0	0.0	0	0.0
13	1	3,512	3,590	78	936	15	1.6	0	0.0	7	0.7	100	10.7	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
TOTAL					357,508	2,498	0.7	27,685	7.7	21,230	5.9	40,995	11.5	0	0.0	0	0.0	1,273	0.4
Subsection: Tbilisi bypass east (km 34+800 - km 49+008)																			
14	0	34,800	36,616	1,816	15,644	40	0.3	825	5.3	75	0.5	1000	6.4	0	0.0	0	0.0	0	0.0
14	0	36,616	41,545	4,929	48,219	1616	3.4	5600	11.6	562	1.2	4970	10.3	0	0.0	0	0.0	500	1.0
14	0	41,545	44,922	3,377	33,950	190	0.6	2870	8.5	0	0.0	1720	5.1	0	0.0	0	0.0	195	0.6
14	0	44,922	47,301	2,379	25,641	22	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
14	0	47,301	49,008	1,707	16,003	0	0.0	540	3.4	91	0.6	1680	10.5	0	0.0	0	0.0	5	0.0
2. Carrigeway																			
14	1	40,900	41,367	467	4,437	40	0.9	1200	27.0	12	0.3	0	0.0	0	0.0	0	0.0	0	0.0
14	1	48,664	48,900	236	1,416	0	0.0	300	21.2	0	0.0	200	14.1	0	0.0	0	0.0	0	0.0
TOTAL					145,310	1,908	1.3	11,335	7.8	740	0.5	9,570	6.6	0	0.0	0	0.0	700	0.5

S 12, Samtredia - Ureki

Damages

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
20	0	0	1,243	1,243	12,831	10	0.1	0	0.0	4670	36.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	1,243	3,791	2,548	22,932	90	0.4	6300	27.5	3588	15.6	0	0.0	0	0.0	0	0.0	0	0.0
		3,791	4,019	228	Bridge														
20	0	4,019	5,065	1,046	9,414	50	0.5	1800	19.1	1510	16.0	30	0.3	0	0.0	0	0.0	0	0.0
20	0	5,065	5,210	145	1,755	0	0.0	0	0.0	1305	74.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	5,210	5,360	150	1,350	30	2.2	150	11.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	5,360	5,490	130	1,170	0	0.0	0	0.0	1150	98.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	5,490	5,545	55	495	6	1.2	300	60.6	30	6.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	5,545	6,550	1,005	9,045	0	0.0	0	0.0	8850	97.8	0	0.0	0	0.0	0	0.0	0	0.0
20	0	6,550	7,050	500	4,500	42	0.9	1500	33.3	25	0.6	0	0.0	0	0.0	0	0.0	0	0.0
20	0	7,050	7,245	195	1,755	0	0.0	0	0.0	1730	98.6	0	0.0	0	0.0	0	0.0	0	0.0
20	0	7,245	7,650	405	3,588	0	0.0	3500	97.5	45	1.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	7,650	8,174	524	3,964	0	0.0	0	0.0	3900	98.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	8,174	10,100	1,926	13,482	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	10,100	10,590	490	3,430	0	0.0	0	0.0	3400	99.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	10,590	11,517	927	6,489	0	0.0	1000	15.4	2800	43.1	300	4.6	0	0.0	0	0.0	0	0.0
20	0	11,517	12,300	783	5,481	0	0.0	0	0.0	5430	99.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	12,300	14,360	2,060	14,450	0	0.0	7600	52.6	182	1.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	14,360	15,285	925	6,971	0	0.0	0	0.0	6920	99.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	15,285	17,170	1,885	15,080	78	0.5	12	0.1	105	0.7	210	1.4	0	0.0	0	0.0	0	0.0
20	0	17,170	19,066	1,896	15,168	187	1.2	2550	16.8	205	1.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	19,066	21,297	2,231	17,267	53	0.3	1250	7.2	3268	18.9	0	0.0	0	0.0	0	0.0	0	0.0
20	0	21,297	22,868	1,571	10,997	22	0.2	280	2.5	1810	16.5	10	0.1	0	0.0	0	0.0	0	0.0
20	0	22,868	23,075	207	1,449	0	0.0	0	0.0	1430	98.7	0	0.0	0	0.0	0	0.0	0	0.0
20	0	23,075	23,556	481	3,367	22	0.7	140	4.2	470	14.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	23,556	26,072	2,516	17,612	38	0.2	4400	25.0	2493	14.2	0	0.0	0	0.0	0	0.0	0	0.0
20	0	26,072	28,682	2,610	18,669	3050	16.3	420	2.2	10220	54.7	0	0.0	0	0.0	0	0.0	0	0.0
20	0	28,682	29,119	437	3,931	0	0.0	0	0.0	3480	88.5	0	0.0	0	0.0	0	0.0	0	0.0
20	0	29,119	29,265	146	1,507	0	0.0	800	53.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	29,265	30,410	1,145	13,542	0	0.0	0	0.0	12595	93.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	30,410	30,609	199	2,388	0	0.0	2000	83.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	30,609	31,620	1,011	12,074	0	0.0	8000	66.3	130	1.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	31,620	32,131	511	5,089	30	0.6	200	3.9	20	0.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	32,131	32,443	312	2,184	0	0.0	0	0.0	2170	99.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	32,443	35,624	3,181	22,267	0	0.0	15000	67.4	422	1.9	0	0.0	0	0.0	0	0.0	0	0.0

ID Road	Lane	Chainage		Length	Area	Cracks		Alligator cracks		Potholes		Settlements		Rutting < = 10mm		Rutting > 10mm		Patched Area	
		From	To	m	m²	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%	m²	%
20	0	35,624	35,700	76	532	0	0.0	0	0.0	2	0.4	5	0.9	0	0.0	0	0.0	0	0.0
20	0	35,700	36,056	356	2,492	0	0.0	0	0.0	2470	99.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	36,056	36,130	74	518	5	1.0	0	0.0	5	1.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	36,130	37,050	920	6,620	0	0.0	0	0.0	6440	97.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	37,050	37,875	825	5,775	20	0.3	0	0.0	25	0.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	37,875	40,665	2,790	19,560	0	0.0	0	0.0	356	1.8	100	0.5	0	0.0	80	0.4	0	0.0
20	0	40,665	43,187	2,522	17,654	0	0.0	0	0.0	21	0.1	0	0.0	0	0.0	2635	14.9	0	0.0
20	0	43,187	43,790	603	4,221	0	0.0	30	0.7	7	0.2	0	0.0	0	0.0	0	0.0	0	0.0
20	0	43,790	43,852	62	434	0	0.0	0	0.0	430	99.1	0	0.0	0	0.0	0	0.0	0	0.0
20	0	43,852	44,047	195	1,365	0	0.0	30	2.2	7	0.5	0	0.0	0	0.0	0	0.0	0	0.0
20	0	44,047	44,318	271	1,897	0	0.0	0	0.0	1757	92.6	0	0.0	0	0.0	0	0.0	0	0.0
20	0	44,318	44,472	154	1,108	0	0.0	40	3.6	8	0.7	0	0.0	0	0.0	0	0.0	0	0.0
20	0	44,472	45,128	656	4,592	0	0.0	0	0.0	4565	99.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	45,128	46,313	1,185	8,295	0	0.0	710	8.6	68	0.8	0	0.0	0	0.0	0	0.0	0	0.0
20	0	46,313	46,385	72	504	0	0.0	0	0.0	500	99.2	0	0.0	0	0.0	0	0.0	0	0.0
20	0	46,385	46,455	70	490	0	0.0	50	10.2	5	1.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	46,455	46,680	225	1,575	0	0.0	0	0.0	1560	99.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	46,680	46,829	149	1,043	0	0.0	150	14.4	15	1.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	46,829	47,200	371	2,597	0	0.0	0	0.0	2580	99.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	47,200	47,930	730	5,110	0	0.0	0	0.0	2400	47.0	15	0.3	0	0.0	0	0.0	0	0.0
20	0	47,930	48,170	240	1,680	0	0.0	0	0.0	1670	99.4	0	0.0	0	0.0	0	0.0	0	0.0
20	0	48,170	48,280	110	770	0	0.0	0	0.0	300	39.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	48,280	48,420	140	980	0	0.0	0	0.0	970	99.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	48,420	48,470	50	350	0	0.0	0	0.0	100	28.6	0	0.0	0	0.0	0	0.0	0	0.0
20	0	48,470	48,727	257	1,829	0	0.0	0	0.0	1789	97.8	0	0.0	0	0.0	0	0.0	0	0.0
20	0	48,727	50,024	1,297	9,079	0	0.0	0	0.0	6900	76.0	35	0.4	0	0.0	0	0.0	0	0.0
20	0	50,024	50,881	857	5,999	0	0.0	0	0.0	2400	40.0	0	0.0	0	0.0	0	0.0	0	0.0
20	0	50,881	51,070	189	1,323	0	0.0	0	0.0	1313	99.2	0	0.0	0	0.0	0	0.0	0	0.0
20	0	51,070	53,490	2,420	17,583	55	0.3	3000	17.1	457	2.6	0	0.0	0	0.0	0	0.0	0	0.0
20	0	53,490	53,811	321	2,247	0	0.0	0	0.0	2230	99.2	0	0.0	0	0.0	0	0.0	0	0.0
20	0	53,811	54,315	504	3,528	60	1.7	1500	42.5	10	0.3	0	0.0	0	0.0	0	0.0	0	0.0
20	0	54,315	54,546	231	1,617	0	0.0	0	0.0	1600	98.9	0	0.0	0	0.0	0	0.0	0	0.0
20	0	54,546	55,668	1,122	7,854	120	1.5	1200	15.3	423	5.4	0	0.0	0	0.0	70	0.9	0	0.0
20	0	55,668	56,430	762	5,334	0	0.0	3000	56.2	3	0.1	100	1.9	0	0.0	0	0.0	0	0.0
20	0	56,430	56,484	54	378	0	0.0	0	0.0	370	97.9	0	0.0	0	0.0	0	0.0	0	0.0
20	0	56,484	56,528	44	308	0	0.0	100	32.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL				56,528	432,934	3,968	0.9	67,012	15.5	128,109	29.6	805	0.2	0	0.0	2,785	0.6	0	0.0

APPENDIX 6.6

STRAIGHT LINE DIAGRAMS

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS INGENIEURE

Section: S 1; km 15+000 to km 20+000

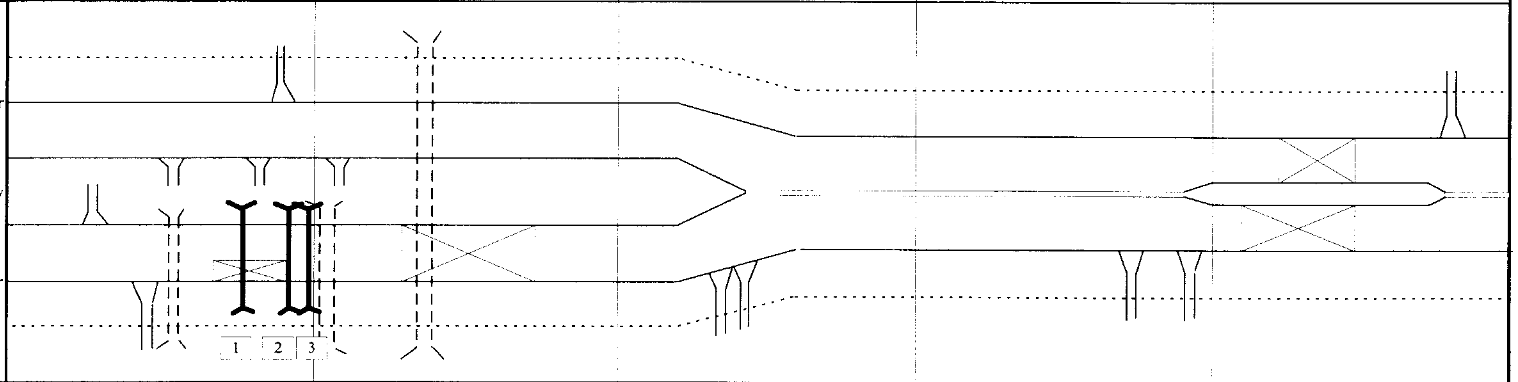
Location

Junction km 15,300; Junction km 15,460; Bridge over S1 km 15,560; Culvert km 15,763; Begining of balcony km 15,685; Culvert km 15,986; Culvert km 15,900; End of balcony km 15,890; Bridge over S1 km 16,029; Bridge over S1 km 16,365; Bridge km 16,500; Junction km 17,418; Junction km 17,342; Junction km 18,720; Junction km 18,937; Bridge km 19,269; Junction km 19,800

Chainage (km)

15 +000, 15 +200, 15 +400, 15 +600, 15 +800, 16 +000, 16 +200, 16 +400, 16 +600, 16 +800, 17 +000, 17 +200, 17 +400, 17 +600, 17 +800, 18 +000, 18 +200, 18 +400, 18 +600, 18 +800, 19 +000, 19 +200, 19 +400, 19 +600, 19 +800

Layout



Width of Carriageway (m)

14 / 1; 12,5; 15 / 14,5; 13,0; 18 /; 9,0; 10,0; 10,0; 14 / 1; 12 / 10; 10 / 9; 9 / -; 12,00; 10 / -; 9 / -; 9 + 14; 9 + 9; 9 + 9; 9 + 9

Width of Shoulders

L (m): 2.0; 0.0; 2.00; 2.0; 2.0; 2.0; 2.0; 2.0; 2.0; 2,00; 2,50; 1,00; 0,00; 1,00; 3,00; 3,00; 3,00; 3,00; 3,00

R (m): 1.5; 2.0; 3.50; 2.0; 5.0; 1.0; 1.0; 1.0; 1.5; 2,00; 2,00; 0,00; 3,00; 3,00; 3,00; 3,00

Rise/Fall +/- (%)

-0,9; -2,6; -3,5; 0; 2,6; 0,9; -1,8; 2,6; 0,9; 1,8; 4,4; 2,6; 0

Roughness (IRI)

< 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition

	%	km 15+000	km 15+400	km 16+000	km 18+800	km 19+800
Cracks	%	1,3/1,6	0,7/4,6	0,2/3,8	0,2/0,2	0,3/0,2
Alligator Cracks	%	0,6/24,3	0,1/4,7	2,3/13,5	3,3/0,8	3,8/4,2
Potholes	%	0,5/0,3	0,3/0,3	0,3/0,5	0,1/0,2	0,1/0,1
Settlement	%	0,7/0,0	0,0/0,0	0,0/0,0	0,0/0,0	0,0/0,0
Rutting	%		0,0/0,0	0,0/0,0	0,0/0,0	0,0/0,0

Pavement Structure

New (mm): Overlay 40 mm; Overlay 100 mm

Existing (mm)

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 20+000 to km 25+000

Location			Junction km 20,030 / Junction with S9 km 20,157 / Culvert km 21,110 / Culvert km 21,380 / Bridge km 21,415 / Culvert km 21,640 / Junction km 21,770 / Culvert km 22,239 / Culvert km 22,605 / Junction km 22,630 / Bridge km 22,823 / Junction km 22,902 / Junction km 23,030 / Culvert km 23,424 / Culvert km 23,600 / Bridge km 23,686 / Culvert km 23,850 / Junction km 23,980 / Culvert km 24,204 / Junction km 24,430 / Bridge km 24,892
Chainage		km	20 +000 / 20 +200 / 20 +400 / 20 +600 / 20 +800 / 21 +000 / 21 +200 / 21 +400 / 21 +600 / 21 +800 / 22 +000 / 22 +200 / 22 +400 / 22 +600 / 22 +800 / 23 +000 / 23 +200 / 23 +400 / 23 +600 / 23 +800 / 24 +000 / 24 +200 / 24 +400 / 24 +600 / 24 +800
Layout			Shoulder / Carriageway / Shoulder; 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12
Width of Carriageway		m	9+9 / 9+9 / 9+9 / 9+9
Width of Shoulders	L	m	3,00 / 3,00 / 3,00 / 3,00
	R	m	3,00 / 3,00 / 3,00 / 3,00
Rise/Fall +/-		%	-2,6 / -1,8 / -0,9 / 0,9 / 0,9 / -0,9 / -2,6 / -4,4
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,2/0,2 / 0,1/0,2 / 0,1/0,1
	Alligator Cracks	%	0,9/1,3 / 1,7/1,3 / 1,1/0,9
	Potholes	%	0,1/0,1 / 0,0/0,1 / 0,2/0,2
	Settlement	%	3,5/2,2 / 0,0/2,2 / 1,4/1,3
	Rutting	%	0,0/0,0 / 0,0/0,0 / 0,0/0,0
Pavement Structure	**New**	mm	Overlay 100 mm / Overlay 75 mm
	Existing	mm	40 Wearing course 60 Binder course 130 Granular base couse 550 Granulas sub-base Sub-grade - clay yellow of mod. plasticity

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 25+000 to km 30+000

Location			Junction km 25,090 / Culvert km 25,322 / Junction km 25,278 / Junction km 25,630 / Pedestrian tunnel km 25,737 / Junction km 25,840 / Junction km 26,180 / Junction km 26,230 / Culvert km 26,472 / Junction km 26,423 / Junction km 26,640 / Junction km 26,940 / Culvert km 27,088 / Bridge over S1 km 27,190 / Junction km 27,250 / Culvert km 27,596 / Junction km 27,450 / Junctions km 27,790 / Junction km 27,618 / Bridge km 27,856 / Culvert km 28,100 / Junction km 29,120
Chainage		km	25 +000 … 25 +800 / 26 +000 … 26 +800 / 27 +000 … 27 +800 / 28 +000 … 28 +800 / 29 +000 … 29 +800
Layout			Shoulder / Carriageway / Shoulder; 13 / 14 / 15 / 16 / 17 / 18
Width of Carriageway		m	9+9 / 9,00 / 9,00 / 9,00 / 9,00
Width of Shoulders	L	m	3,00 / 3,00 / 3,00 / 3,00 / 2,00
	R	m	3,00 / 3,00 / 3,00 / 3,00 / 2,00
Rise/Fall +/-		%	2,6 / 0,9 / -0,9 / -2,6 / 0 / 0,9 / 0,0 / 4,4 / 1,8 / 1,8
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,1/0,1 / 0,2 / 0,0
	Alligator Cracks	%	1,4/1,7 / 1,1 / 1,2
	Potholes	%	0,4/0,5 / 0,6 / 1,0
	Settlement	%	0,9/1,1 / 0 / 0,4
	Rutting	%	0,0/0,6 / 0 / 2,3
Pavement Structure	**New**	mm	Overlay 75 mm / Reconstruction
	Existing	mm	60 Wearing course 90 Binder coure 300 Granular base course - partly crushed Sub-grade - conglomerate

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 30+000 to km 35+000

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Location			Junction km 30,000 · Junction km 30,251 · Junction km 30,385 · Junction km 30,535 · Junction km 30,640 · Culvert km 30,745 · Junction km 30,752 · Junction km 30,860 · Culvert km 30,944 · Junction km 30,970 · Junction km 31,088 · Junction km 31,190 · Culvert km 31,251 · Junction km 31,730 · Culvert km 32,203 · Culvert km 32,552 · Junctions km 33,085 · Culvert km 33,078 · Culvert km 33,570 · Culvert km 34,280
Chainage		km	30 +000 · 30 +200 · 30 +400 · 30 +600 · 30 +800 · 31 +000 · 31 +200 · 31 +400 · 31 +600 · 31 +800 · 32 +000 · 32 +200 · 32 +400 · 32 +600 · 32 +800 · 33 +000 · 33 +200 · 33 +400 · 33 +600 · 33 +800 · 34 +000 · 34 +200 · 34 +400 · 34 +600 · 34 +800
Layout			Shoulder · Carriageway · Shoulder; 19 · 20 · 21 · 22 · 23 · 24 · 25 · 26
Width of Carriageway		m	9,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	-0,9 · 0,9 · 0,0 · 0,0
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,2
	Alligator Cracks	%	5,8
	Potholes	%	3,3
	Settlement	%	0,2
	Rutting	%	3,7
Pavement Structure	New	mm	Reconstruction · Overlay 100 mm
	Existing	mm	70 Wearing course 130 Binder coure 350 Granular base course - partly crushed Sub-grade - clay yellowish

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 35+000 to km 40+000

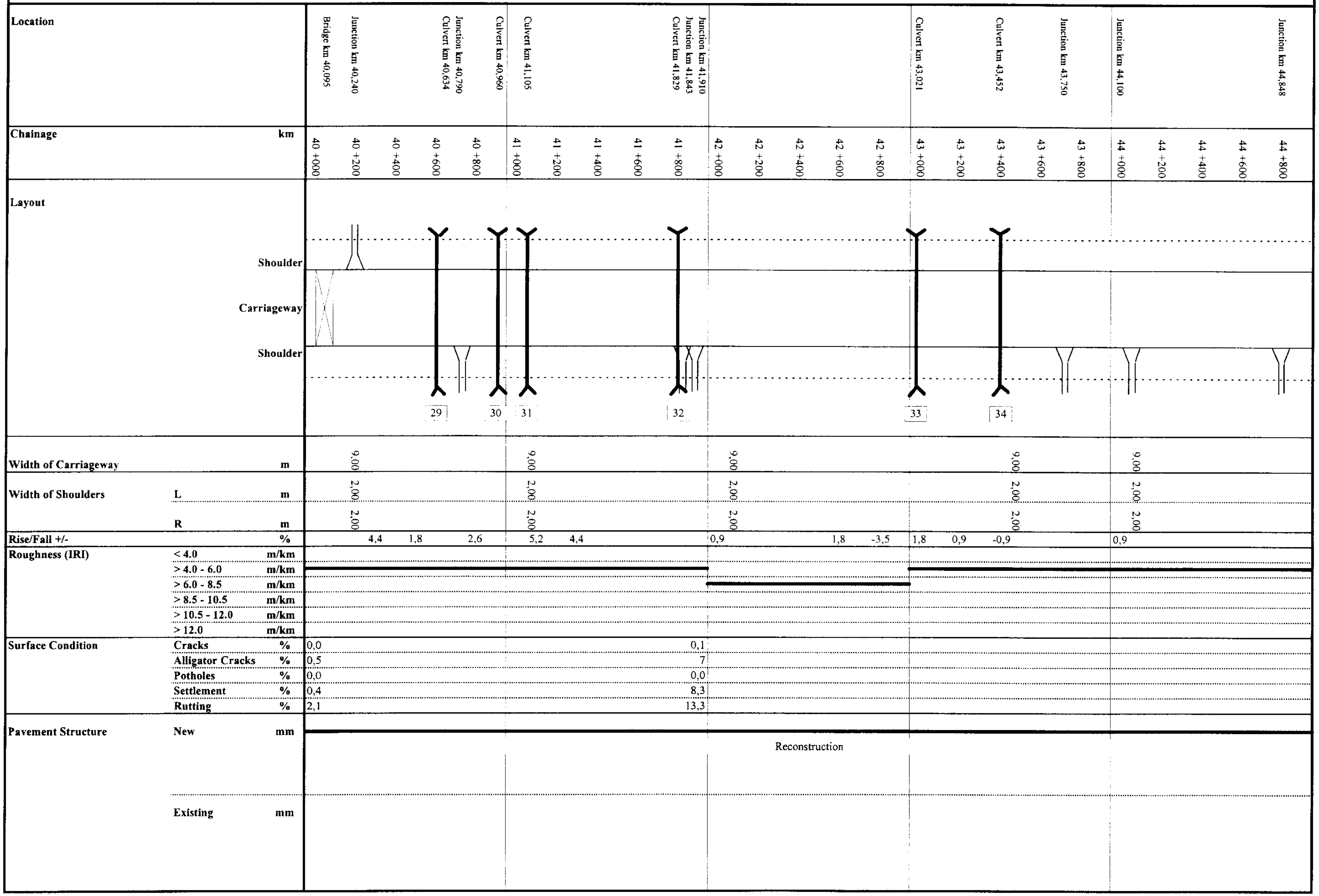
Location			Junction km 36,230; Culvert km 36,965; Junction km 37,370; Junction km 37,635; Junction km 37,870; Junction km 37,990; Junction km 38,310; Junction km 38,360; Bridge km 38,390; Junction km 39,132; Junction km 39,425; Culvert km 39,787
Chainage		km	35 +000; 35 +200; 35 +400; 35 +600; 35 +800; 36 +000; 36 +200; 36 +400; 36 +600; 36 +800; 37 +000; 37 +200; 37 +400; 37 +600; 37 +800; 38 +000; 38 +200; 38 +400; 38 +600; 38 +800; 39 +000; 39 +200; 39 +400; 39 +600; 39 +800
Layout			Shoulder; Carriageway; Shoulder; 27; 28
Width of Carriageway		m	9,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	-0,9; -2,6; 0,0; 0,9; -0,9; 0,0
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,2 / 0,0
	Alligator Cracks	%	5,8 / 13,4
	Potholes	%	3,3 / 0,2
	Settlement	%	0,2 / 0,6
	Rutting	%	3,7 / 5,8
Pavement Structure	**New**	mm	Overlay 100 mm; Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 40+000 to km 45+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 45+000 to km 50+000

KOCKS
INGENIEURE

Location			Culvert km 45,610; Culvert km 45,908; Culvert km 46,788; Culvert km 46,870; Junction km 47,165; Culvert km 47,920; Culvert km 48,375; Culvert km 48,458; Culvert km 49,089; Culvert km 49,629
Chainage		km	45 +000; 45 +200; 45 +400; 45 +600; 45 +800; 46 +000; 46 +200; 46 +400; 46 +600; 46 +800; 47 +000; 47 +200; 47 +400; 47 +600; 47 +800; 48 +000; 48 +200; 48 +400; 48 +600; 48 +800; 49 +000; 49 +200; 49 +400; 49 +600; 49 +800
Layout			Shoulder / Carriageway / Shoulder; 35; 36; 37; 38; 39; 40; 41; 42; 43
Width of Carriageway		m	9,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	2,6; 3,5; 2,6; 0,9; -3,5; 0,0; -0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,2
	Alligator Cracks	%	12,9
	Potholes	%	0,6
	Settlement	%	1,3
	Rutting	%	6,6
Pavement Structure	New	mm	Reconstruction; Overlay 75 mm; Overlay 100 mm
	Existing	mm	30 Wearing course 40 Binder coure 380 Granular base course - partly crushed Sub-grade - clay gravely, yellowish

Feasibility Study for Road Rehabilitation in Georgia

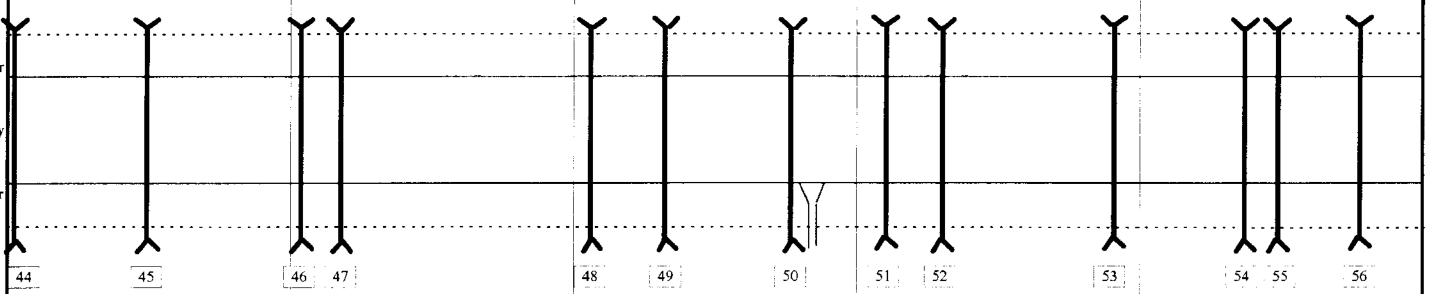
Tbilisi - Khashuri (S 1)

Section: S 1; km 50+000 to km 55+000

KOCKS INGENIEURE

	km 50+000 – 51+000	km 51+000 – 52+000	km 52+000 – 53+000	km 53+000 – 54+000	km 54+000 – 55+000
Location	Culvert km 50,009; Culvert km 50,490	Culvert km 51,017; Culvert km 51,197	Culvert km 52,038; Culvert km 52,323; Culvert km 52,788; Junction km 52,839	Culvert km 53,091; Culvert km 53,301; Culvert km 53,911	Culvert km 54,285; Culvert km 54,477; Culvert km 54,789
Chainage (km)	50 +000, 50 +200, 50 +400, 50 +600, 50 +800	51 +000, 51 +200, 51 +400, 51 +600, 51 +800	52 +000, 52 +200, 52 +400, 52 +600, 52 +800	53 +000, 53 +200, 53 +400, 53 +600, 53 +800	54 +000, 54 +200, 54 +400, 54 +600, 54 +800

Layout

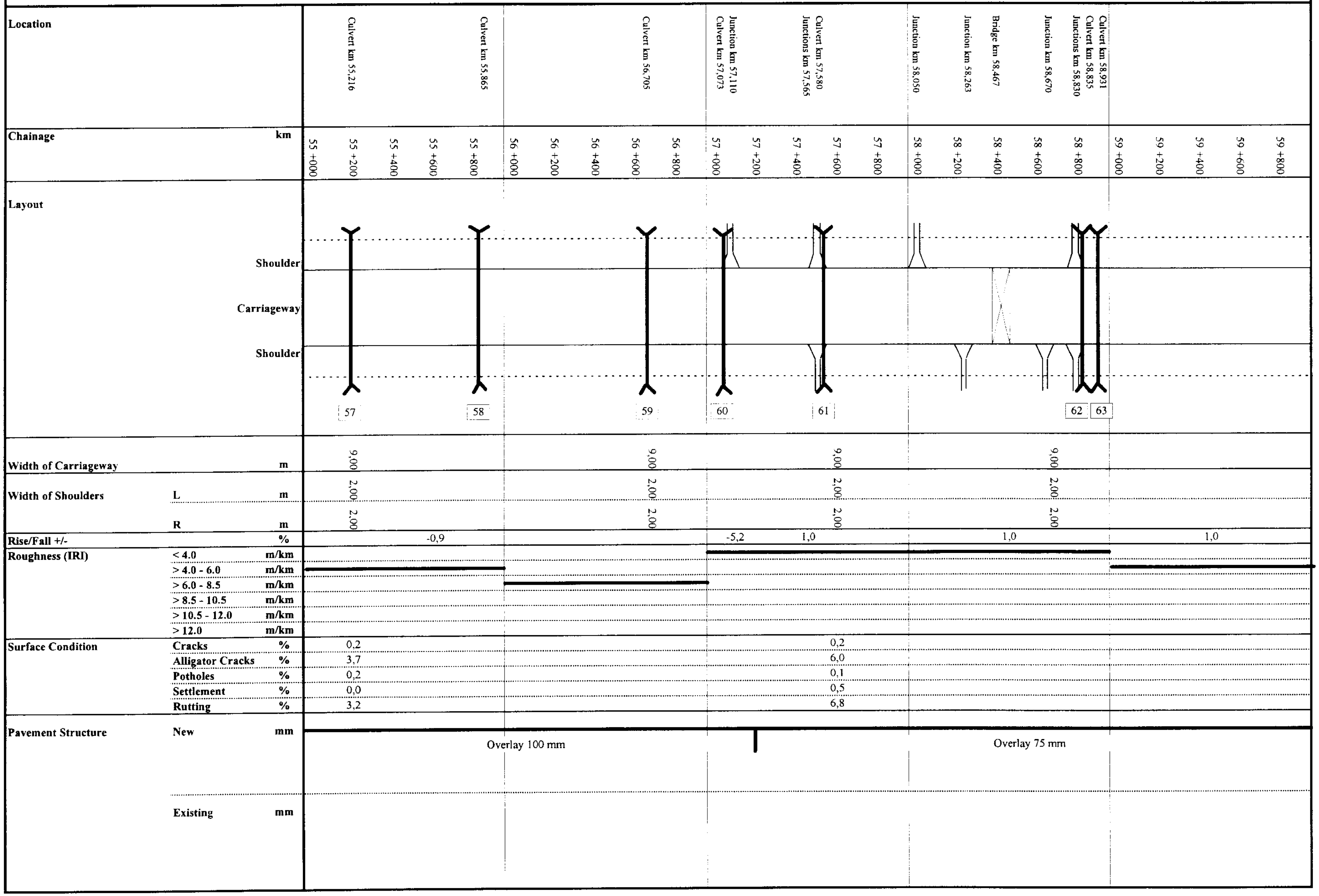


		Unit	km 50–51	km 51–52	km 52–53	km 53–54	km 54–55
Width of Carriageway		m	9,00	9,00	9,00	9,00	9,00
Width of Shoulders	L	m	2,00	2,00	2,00	2,00	2,00
	R	m	2,00	2,00	2,00	2,00	2,00
Rise/Fall +/-		%	0,0		0,9	-0,9; 2,6; 1,8	2,6
Roughness (IRI)	< 4.0	m/km					
	> 4.0 - 6.0	m/km					
	> 6.0 - 8.5	m/km					
	> 8.5 - 10.5	m/km					
	> 10.5 - 12.0	m/km					
	> 12.0	m/km					
Surface Condition	Cracks	%	0,1				
	Alligator Cracks	%	2,5				
	Potholes	%	0,1				
	Settlement	%	2,5				
	Rutting	%	6,9				
Pavement Structure	New	mm	Overlay 100 mm				
	Existing	mm					

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 55+000 to km 60+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

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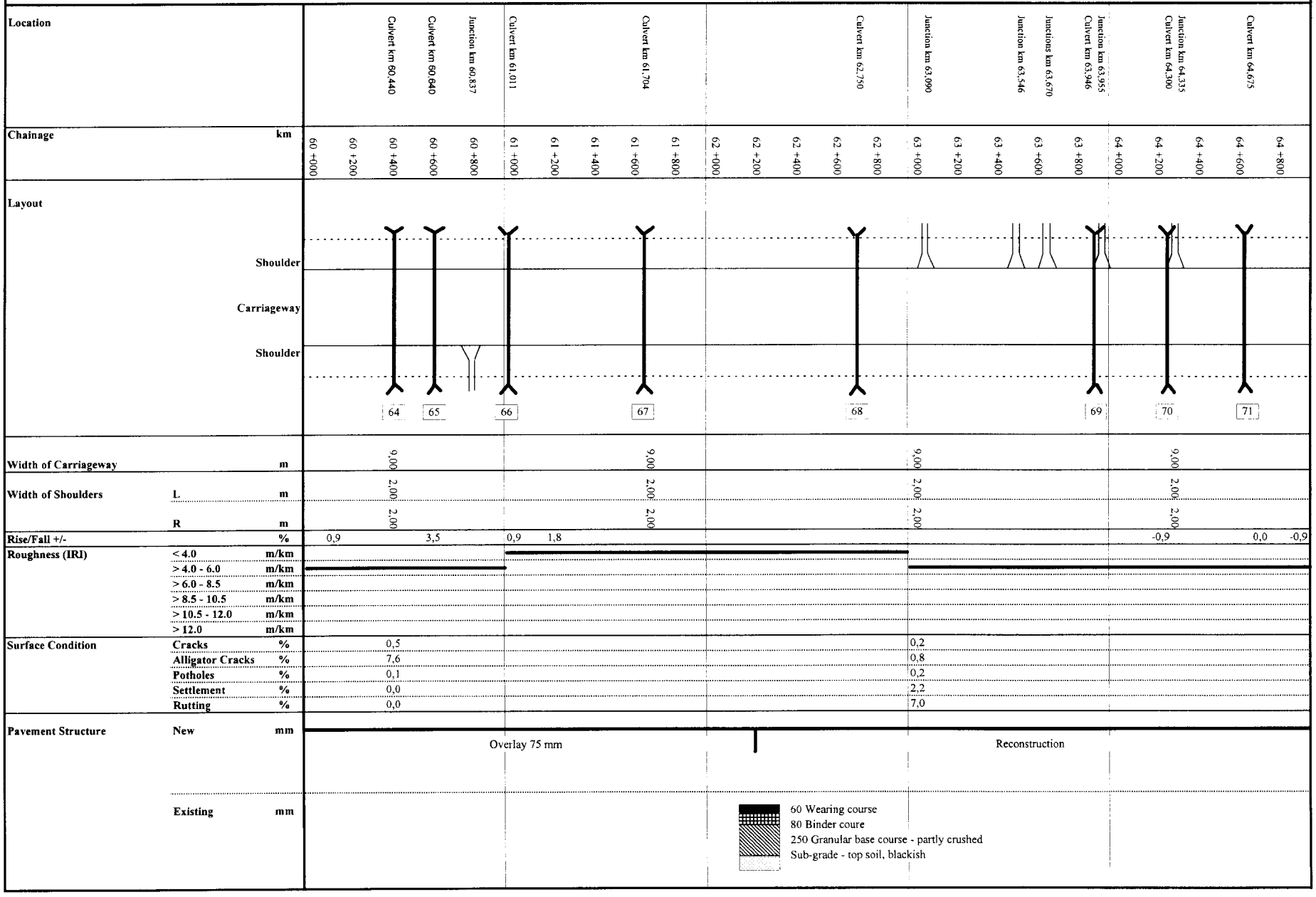
INGENIEURE

Section: S 1; km 60+000 to km 65+000



Feasibility Study for Road Rehabilitation in Georgia

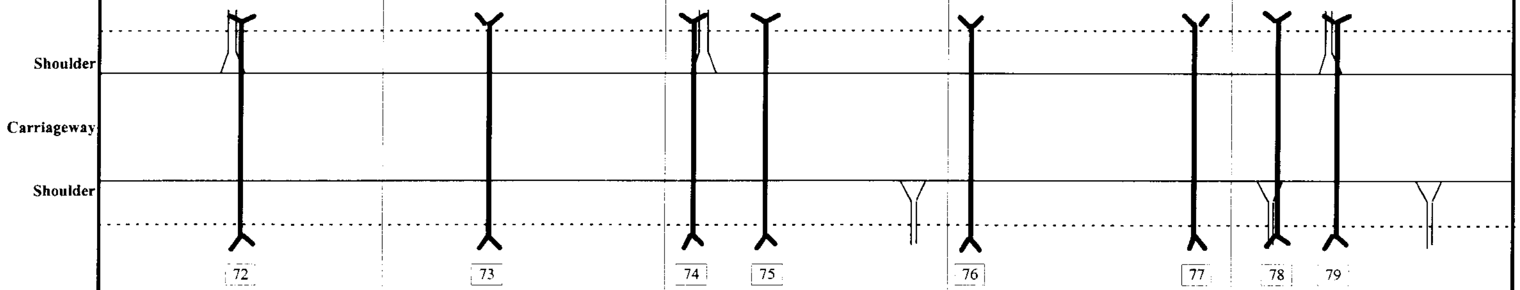
Tbilisi - Khashuri (S 1)

KOCKS INGENIEURE

Section: S 1; km 65+000 to km 70+000

			65 +000 to 66 +000	66 +000 to 67 +000	67 +000 to 68 +000	68 +000 to 69 +000	69 +000 to 70 +000
Location			Culvert km 65,495 Junction km 65,460	Culvert km 66,389	Junction km 67,120 Culvert km 67,105 Culvert km 67,383 Junction km 67,890	Culvert km 68,083 Culvert km 68+863	Culvert km 69,170 Junction km 69,149 Culvert km 69,355 Junction km 69,345 Junction km 69,700
Chainage		km	65 +000, 65 +200, 65 +400, 65 +600, 65 +800	66 +000, 66 +200, 66 +400, 66 +600, 66 +800	67 +000, 67 +200, 67 +400, 67 +600, 67 +800	68 +000, 68 +200, 68 +400, 68 +600, 68 +800	69 +000, 69 +200, 69 +400, 69 +600, 69 +800
Width of Carriageway		m	9,00	9,00	9,00	9,00	9,00
Width of Shoulders	L	m	2,00	2,00	2,00	2,00	2,00
	R	m	2,00	2,00	2,00	2,00	2,00
Rise/Fall +/-		%	0,9 / 0,0	-0,9	0,9	0,0 / 0,9	0,0
Roughness (IRI)	< 4.0	m/km	▬	▬		▬	▬
	> 4.0 - 6.0	m/km			▬		
	> 6.0 - 8.5	m/km					
	> 8.5 - 10.5	m/km					
	> 10.5 - 12.0	m/km					
	> 12.0	m/km					
Surface Condition	Cracks	%			0,1		
	Alligator Cracks	%			0,7		
	Potholes	%			0,1		
	Settlement	%			3,7		
	Rutting	%			7,3		
Pavement Structure	New	mm	Reconstruction / Overlay 75 mm	Overlay 75 mm	Overlay 75 mm	Overlay 75 mm / Overlay 40 mm	Overlay 40 mm
	Existing	mm					

Layout

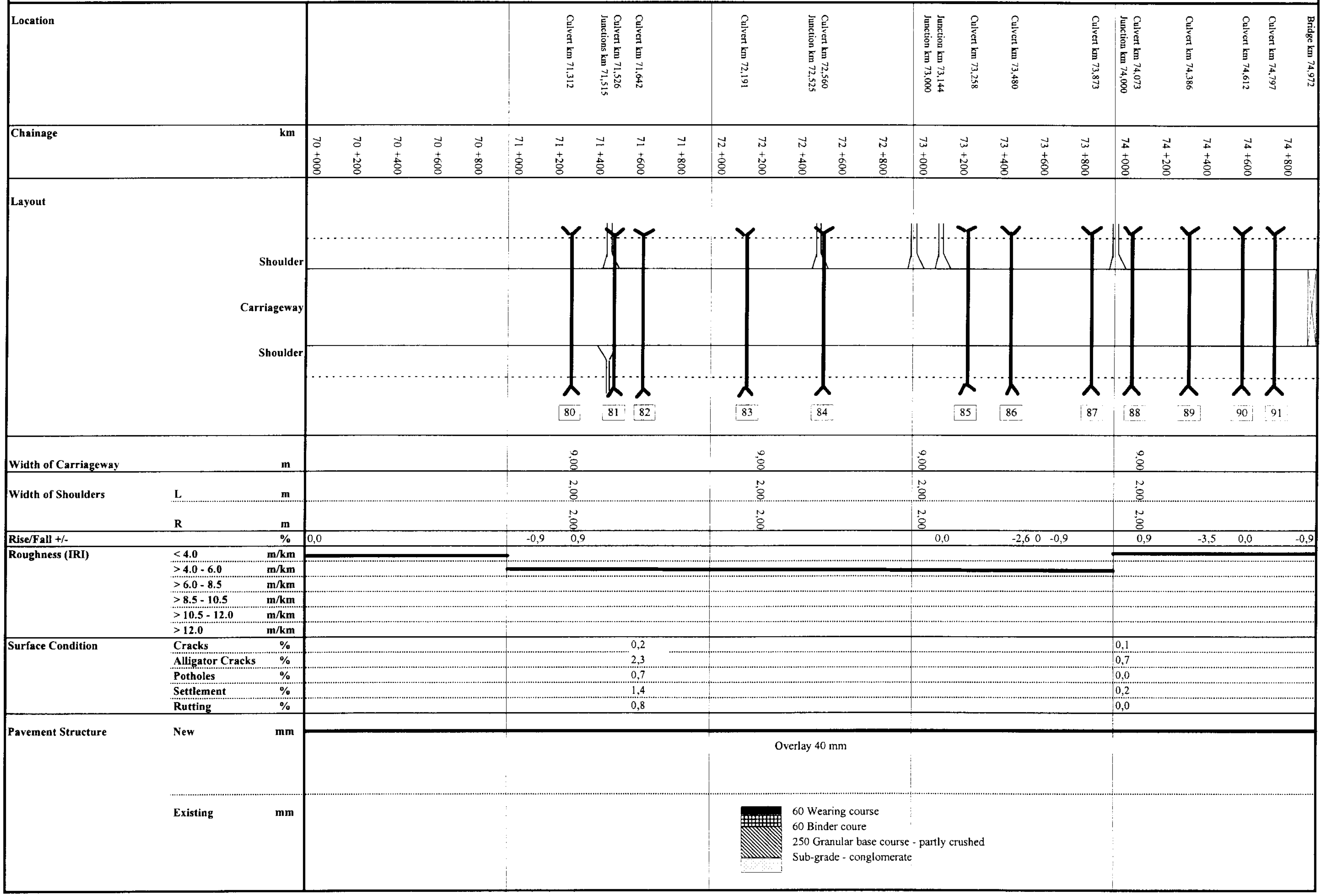


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 70+000 to km 75+000

KOCKS
INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS INGENIEURE

Section: S 1; km 75+000 to km 80+000

Location			Culvert km 75,410 · Culvert km 75,690 · Culvert km 75,789 · Culvert km 76,210 · Junction km 76,680 Culvert km 76,654 · Junction km 77,360 Culvert km 77,234 · Junction km 77,558 · Culvert km 77,704 · Culvert km 77,907 · Culvert km 78,039 · Culvert km 78,677 · Culvert km 79,176 · Culvert km 79,505 · Culvert km 79,634
Chainage		km	75 +000 · 75 +200 · 75 +400 · 75 +600 · 75 +800 · 76 +000 · 76 +200 · 76 +400 · 76 +600 · 76 +800 · 77 +000 · 77 +200 · 77 +400 · 77 +600 · 77 +800 · 78 +000 · 78 +200 · 78 +400 · 78 +600 · 78 +800 · 79 +000 · 79 +200 · 79 +400 · 79 +600 · 79 +800
Layout			Shoulder / Carriageway / Shoulder; 92 · 93 · 94 · 95 · 96 · 97 · 98 · 99 · 10 · 101 · 102 · 103 · 104
Width of Carriageway		m	9,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	-2,6 · -1,8 · -3,5 · -0,9 · 0,9 · -0,9 · -2,6 · -0,9 · -2,6 · 0,0 · -0,9 · 0,0 · 0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,2 · 0,0
	Alligator Cracks	%	1,6 · 0,4
	Potholes	%	0,1 · 0,0
	Settlement	%	1,3 · 0,0
	Rutting	%	8,6 · 0,6
Pavement Structure	**New**	mm	Overlay 40 mm · Reconstruction · Overlay 40 mm · Reconstruction · Overlay 40 mm
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

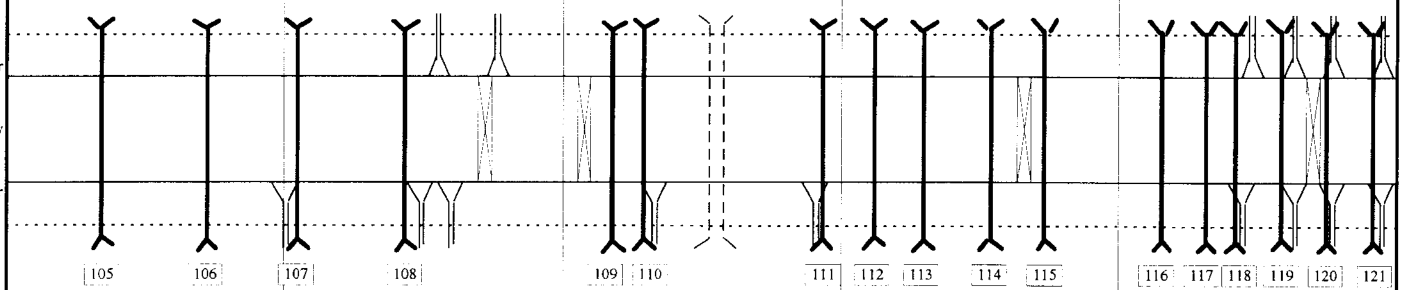
Tbilisi - Khashuri (S 1)

Section: S 1; km 80+000 to km 85+000

KOCKS
INGENIEURE

	km 80+000 – 81+000	km 81+000 – 82+000	km 82+000 – 83+000	km 83+000 – 84+000	km 84+000 – 85+000
Location	Culvert km 80,344 Culvert km 80,718	Junction km 81,000 Culvert km 81,040 Culvert km 81,415 Junction km 81,490 Junction km 81,560 Junction km 81,608 Bridge km 81,729 Junction km 81,758	Bridge km 82,080 Culvert km 82,190 Culvert km 82,313 Junction km 82,333 Bridge over S1 km 82,556 Junction km 82,915 Culvert km 82,921	Culvert km 83,120 Culvert km 83,300 Culvert km 83,555 Bridge km 83,652 Culvert km 83,926	Culvert km 84,176 Culvert km 84,338 Culvert km 84,408 Junction km 84,430 Junction km 84,470 Culvert km 84,590 Junctions km 84,630 Bridge km 84,693 Culvert km 84,725 Junctions km 84,760 Culvert km 84,918 Junctions km 84,952
Chainage (km)	80 +000, 80 +200, 80 +400, 80 +600, 80 +800	81 +000, 81 +200, 81 +400, 81 +600, 81 +800	82 +000, 82 +200, 82 +400, 82 +600, 82 +800	83 +000, 83 +200, 83 +400, 83 +600, 83 +800	84 +000, 84 +200, 84 +400, 84 +600, 84 +800

Layout (Shoulder / Carriageway / Shoulder)



	km 80+000 – 81+000	km 81+000 – 82+000	km 82+000 – 83+000	km 83+000 – 84+000	km 84+000 – 85+000
Width of Carriageway (m)	9,00	9,00	9,00	9,00	16,00 / 9,00
Width of Shoulders L (m)	2,00	2,00	2,00	2,00	1,00 / 2,00
Width of Shoulders R (m)	2,00	2,00	2,00	2,00	1,00 / 2,00
Rise/Fall +/- (%)	-0,9	0,0	-0,9	0,0	1,0
Roughness (IRI) < 4.0 m/km					
> 4.0 - 6.0 m/km					
> 6.0 - 8.5 m/km					
> 8.5 - 10.5 m/km					
> 10.5 - 12.0 m/km					
> 12.0 m/km					
Surface Condition Cracks (%)		0,2		0,3 / 0,2	
Alligator Cracks (%)		2,7		1,4 / 1,2	
Potholes (%)		27,2		0,1 / 0,1	
Settlement (%)		0,7		1,4 / 1,2	
Rutting (%)		1,1		2,5 / 1,6	
Pavement Structure New (mm)	Overlay 40 mm / Overlay 100 mm	Overlay 100 mm / Reconstruction	Reconstruction	Overlay 100 mm / Resealing	Resealing

Existing (mm):

- 60 Wearing course
- 110 Binder coure
- 300 Granular base course - partly crushed
- Sub-grade - clay & conglomerate

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 85+000 to km 90+000

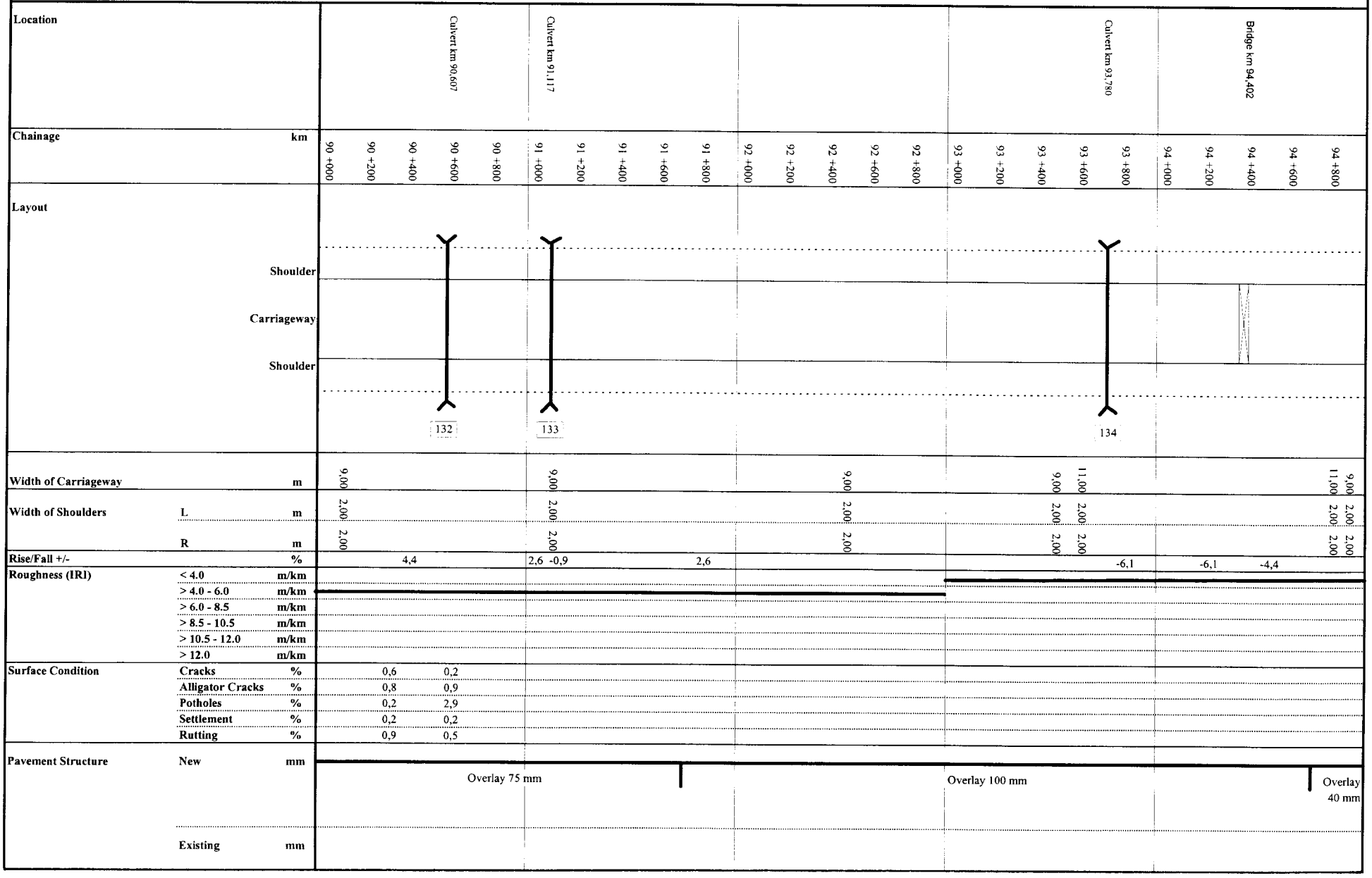
Location			Culvert km 85,042 · Culvert km 85,240 · Culvert km 85,479 · Culvert km 85,579 · Bridge km 85,981 · Bridge km 86,312 · Bridge km 86,658 · Culvert km 86,890 · Junction km 86,918 · Culvert km 88,440 · Culvert km 88,452 · Junction km 88,600 · Culvert km 89,153 · Culvert km 89,688 · Culvert km 89,960
Chainage		km	85 +000 · 85 +200 · 85 +400 · 85 +600 · 85 +800 · 86 +000 · 86 +200 · 86 +400 · 86 +600 · 86 +800 · 87 +000 · 87 +200 · 87 +400 · 87 +600 · 87 +800 · 88 +000 · 88 +200 · 88 +400 · 88 +600 · 88 +800 · 89 +000 · 89 +200 · 89 +400 · 89 +600 · 89 +800
Layout			Shoulder · Carriageway · Shoulder; 122 · 123 · 124 · 125 · 126 · 127 · 128 · 129 · 130 · 131
Width of Carriageway		m	16,00 · 9,00 · 9,00 · 12,00 · 12,00 · 9,00 · 9,00 · 9,00
Width of Shoulders	L	m	1,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00
	R	m	1,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00
Rise/Fall +/-		%	-0,9 · 1,8 · 4,4 · 7,0 · 4,4 · 2,6 · 0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,2 · 0,1
	Alligator Cracks	%	4,4 · 0,6
	Potholes	%	0,2 · 0,1
	Settlement	%	0,5 · 2,8
	Rutting	%	2,6 · 2,6
Pavement Structure	**New**	mm	Resealing · Overlay 75 mm · Reconstr. · Overlay 75 mm
	Existing	mm	100 Wearing course 100 Binder coure 600 Crushed stones Sub-grade - clay of high plasticity yellowish

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 90+000 to km 95+000

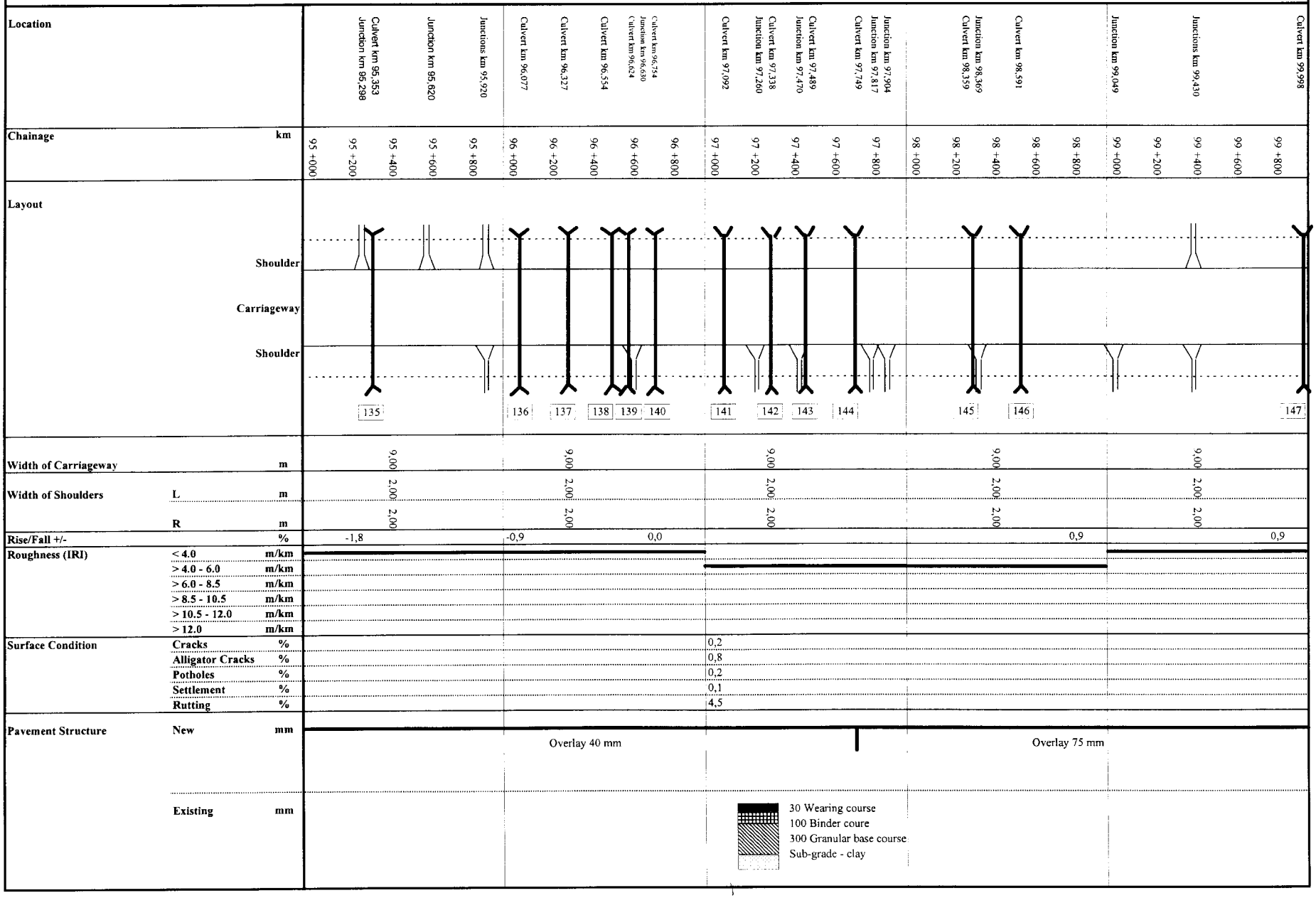


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 95+000 to km 100+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 100+000 to km 105+000

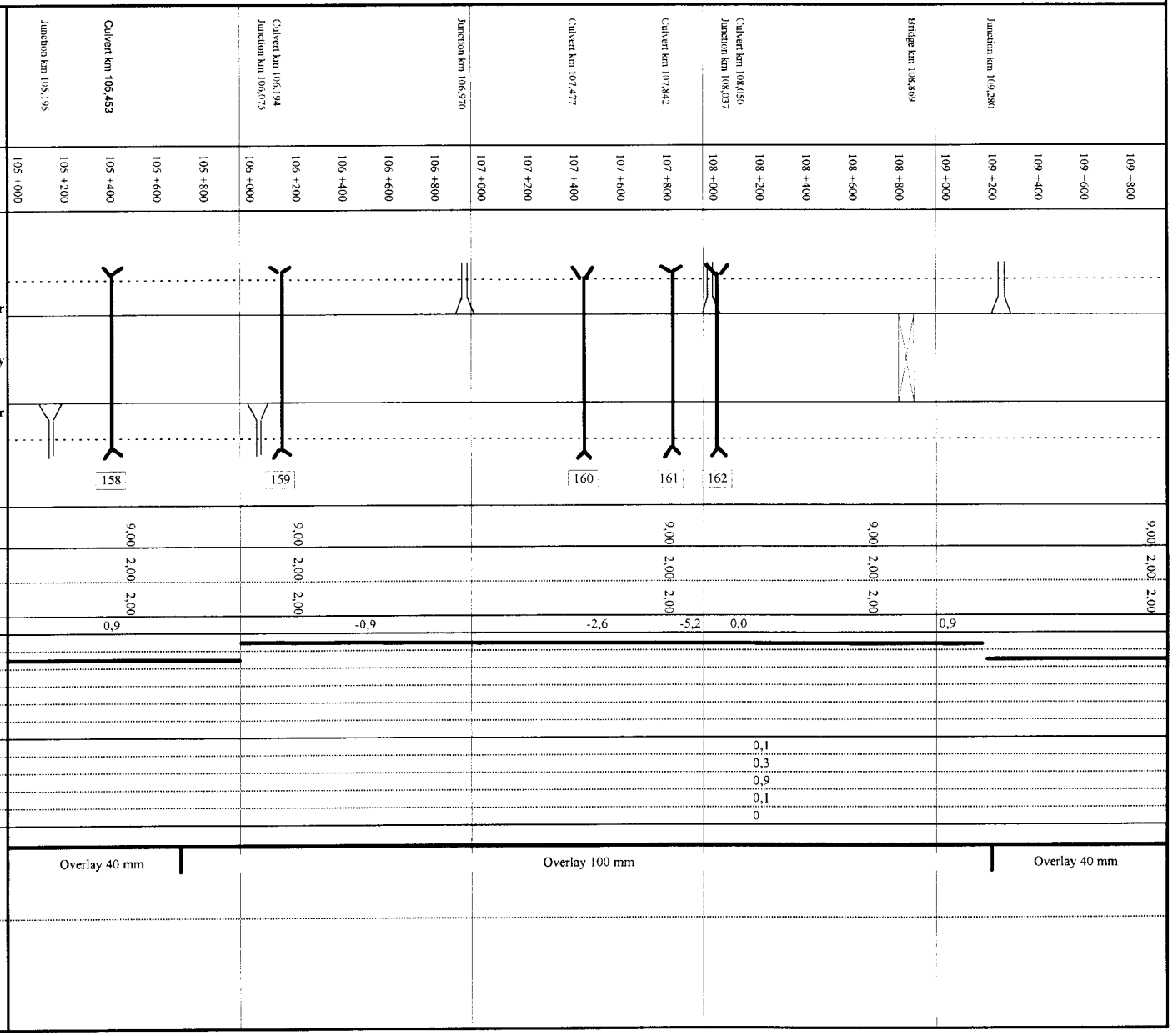
Location			Culvert km 100,194 · Culvert km 100,591 · Culvert km 100,989 · Culvert km 101,064 · Culvert km 101,781 · Junctions km 102,780 · Culvert km 102,835 · Culvert km 103,611 · Junction km 103,910 · Culvert km 104,053 · Culvert km 104,263 · Culvert km 104,551 · Bridge km 104,965
Chainage		km	100 +000 · 100 +200 · 100 +400 · 100 +600 · 100 +800 · 101 +000 · 101 +200 · 101 +400 · 101 +600 · 101 +800 · 102 +000 · 102 +200 · 102 +400 · 102 +600 · 102 +800 · 103 +000 · 103 +200 · 103 +400 · 103 +600 · 103 +800 · 104 +000 · 104 +200 · 104 +400 · 104 +600 · 104 +800
Layout			Shoulder · Carriageway · Shoulder 148 · 149 · 150 · 151 · 152 · 153 · 154 · 155 · 156 · 157
Width of Carriageway		m	9,00 · 9,00 · 9,00 · 9,00 · 9,00
Width of Shoulders	L	m	2,00 · 2,00 · 2,00 · 2,00 · 2,00
	R	m	2,00 · 2,00 · 2,00 · 2,00 · 2,00
Rise/Fall +/-		%	0,0 · -0,9 · 0,9 · -0,9 · -1,8
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,4 · 0,1
	Alligator Cracks	%	1,7 · 0,4
	Potholes	%	4 · 5,9
	Settlement	%	0,2 · 0,1
	Rutting	%	1,4 · 1,2
Pavement Structure	New	mm	Overlay 75 mm · Overlay 100 mm · Overlay 40 mm
	Existing	mm	60 Wearing course 100 Binder coure 600 Granular base course Sub-grade - clay yellow

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 105+000 to km 110+000

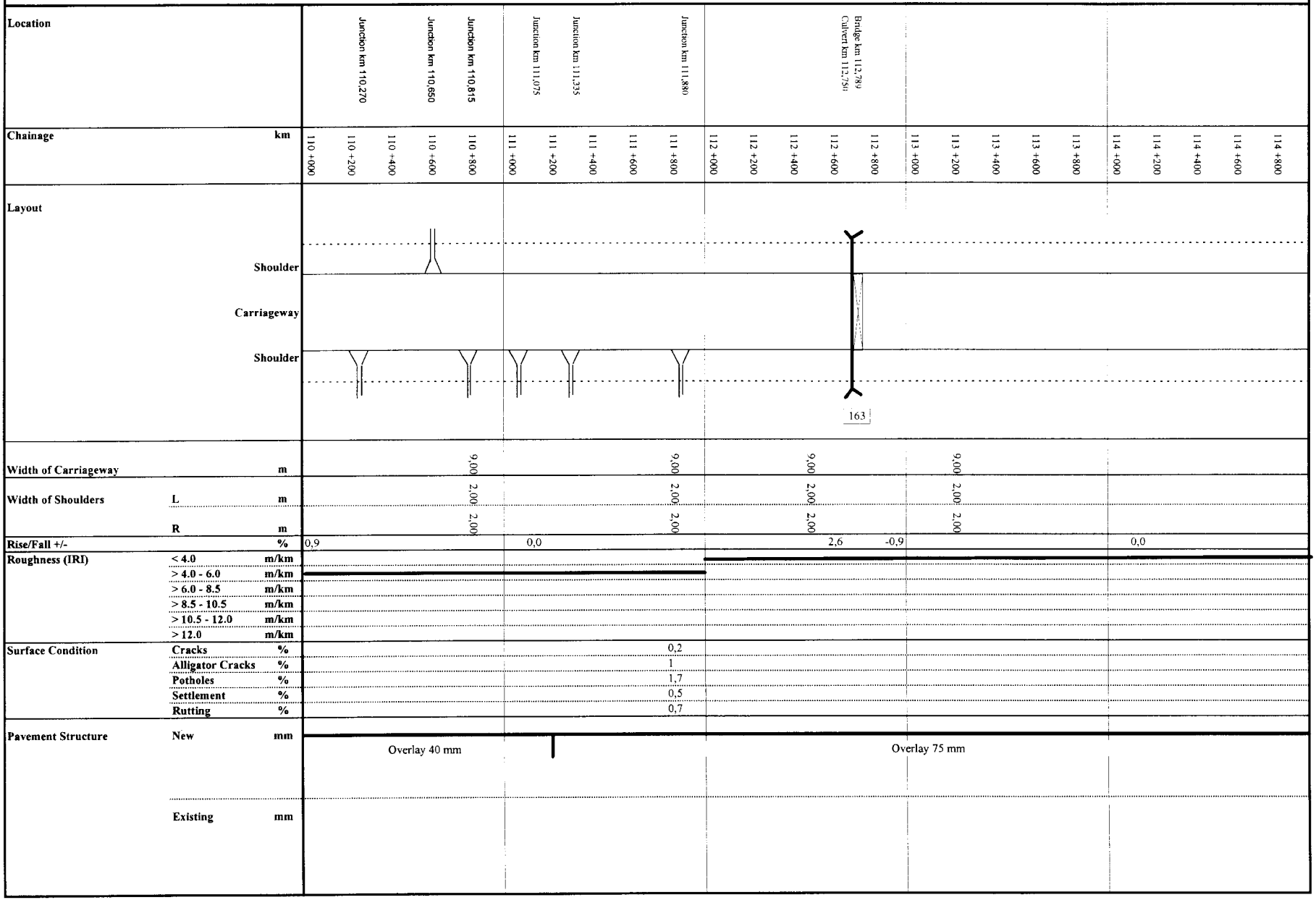


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 110+000 to km 115+000

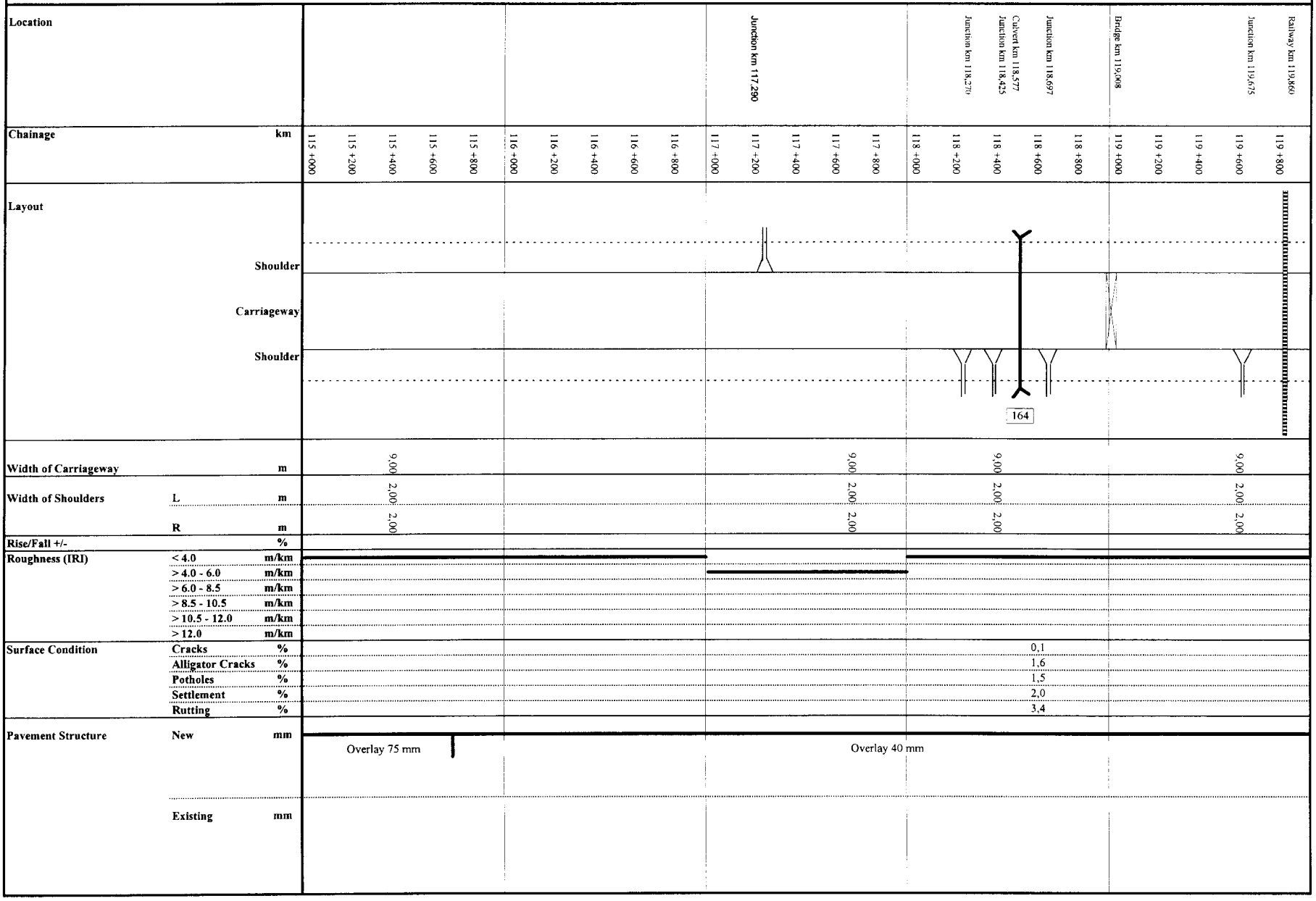


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

KOCKS
INGENIEURE

Section: S 1; km 115+000 to km 120+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Khashuri (S 1)

Section: S 1; km 120+000 to km 125+000

KOCKS
INGENIEURE

Location			Junction km 120,800; Junction km 121,290; Junction km 122,464; Junction km 124,740
Chainage		km	120 +000; 120 +200; 120 +400; 120 +600; 120 +800; 121 +000; 121 +200; 121 +400; 121 +600; 121 +800; 122 +000; 122 +200; 122 +400; 122 +600; 122 +800; 123 +000; 123 +200; 123 +400; 123 +600; 123 +800; 124 +000; 124 +200; 124 +400; 124 +600; 124 +800
Layout			Shoulder / Carriageway / Shoulder
Width of Carriageway		m	9,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,0
	Alligator Cracks	%	13,8
	Potholes	%	16,4
	Settlement	%	1,5
	Rutting	%	1,3
Pavement Structure	New	mm	Overlay 40 mm; Overlay 75 mm; Reconstruction
	Existing	mm	40 Wearing course 60 Binder coure 100 Binder coure 500 Granular base course Sub-grade - clay brownich

Feasibility Study for Road Rehabilitation in Georgia

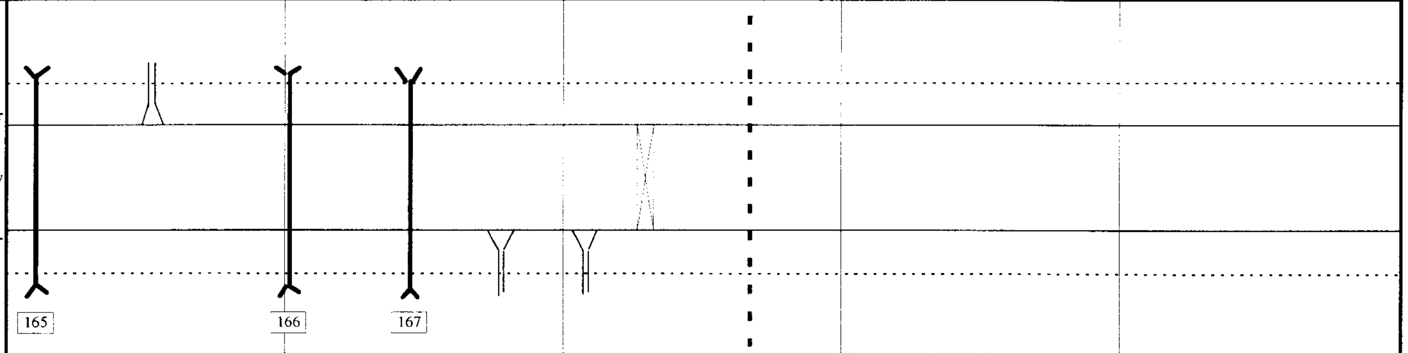
Tbilisi - Khashuri (S 1)

Section: S 1; km 125+000 to km 130+000

KOCKS INGENIEURE

Location			Culvert km 125,105	Junction km 125,525	Culvert km 126,010	Culvert km 126,428	Junction km 126,794	Junction km 127,086	Bridge km 127,297	Border of Khashuri km 127,670
Chainage		km	125 +000 / 125 +200	125 +400 / 125 +600 / 125 +800	126 +000 / 126 +200	126 +400 / 126 +600	126 +800	127 +000	127 +200 / 127 +400	127 +600

Layout (Shoulder / Carriageway / Shoulder)



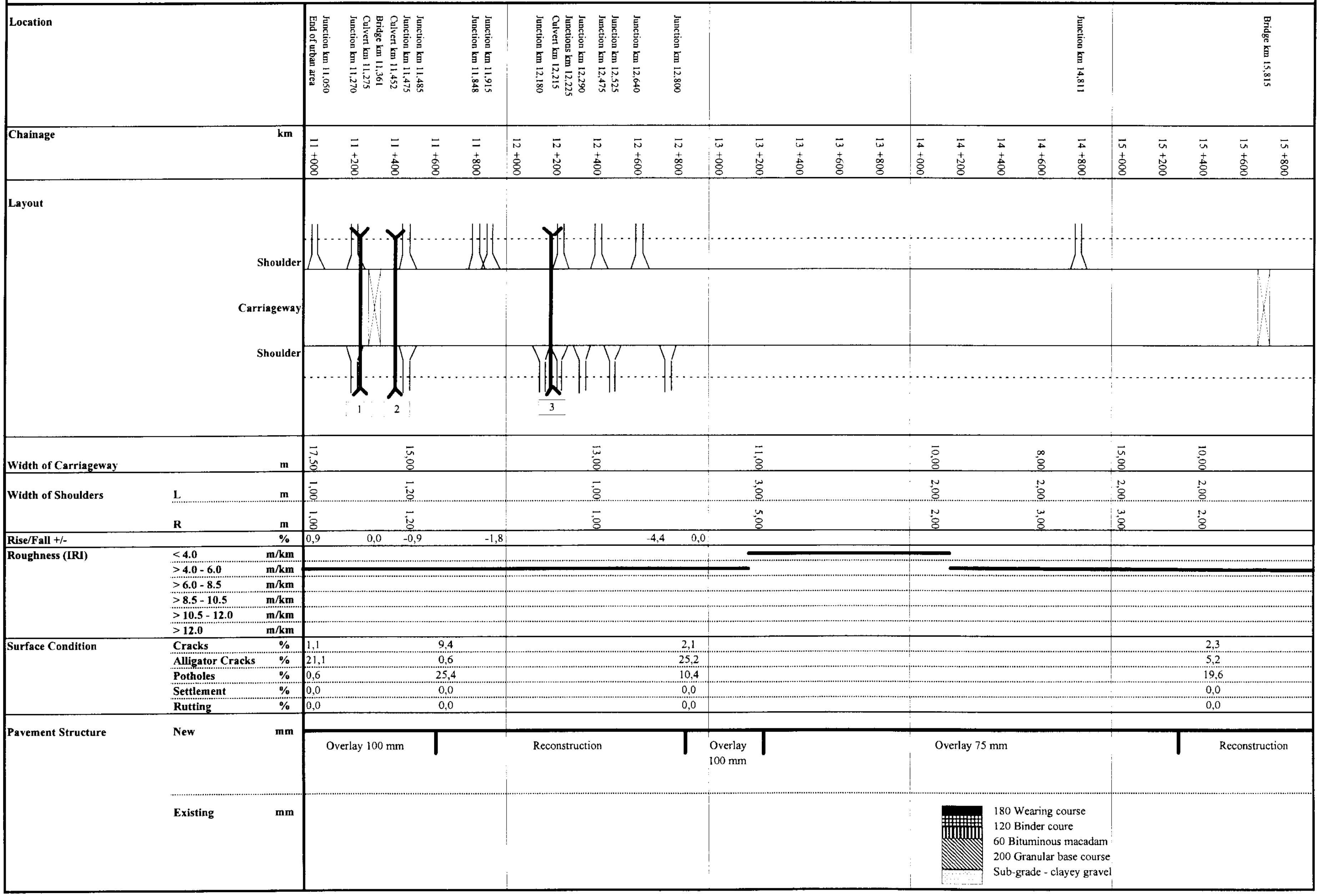
Parameter		Unit	km 125+000 – 126+000	km 126+000 – 127+670	km 127+670
Width of Carriageway		m	9,00	9,00	9,00
Width of Shoulders	L	m	2,00	2,00	2,00
	R	m	2,00	2,00	2,00
Rise/Fall +/-		%			
Roughness (IRI)	< 4.0	m/km	▬	▬	
	> 4.0 - 6.0	m/km			
	> 6.0 - 8.5	m/km			
	> 8.5 - 10.5	m/km			
	> 10.5 - 12.0	m/km			
	> 12.0	m/km			
Surface Condition	Cracks	%	0,1		
	Alligator Cracks	%	10,0		
	Potholes	%	19,1		
	Settlement	%	0,0		
	Rutting	%	2,6		
Pavement Structure	New	mm	Reconstruction	Reconstruction	
	Existing	mm			

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

KOCKS INGENIEURE

Section: S 4; km 11+000 to km 16+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

Section: S 4; km 16+000 to km 21+000

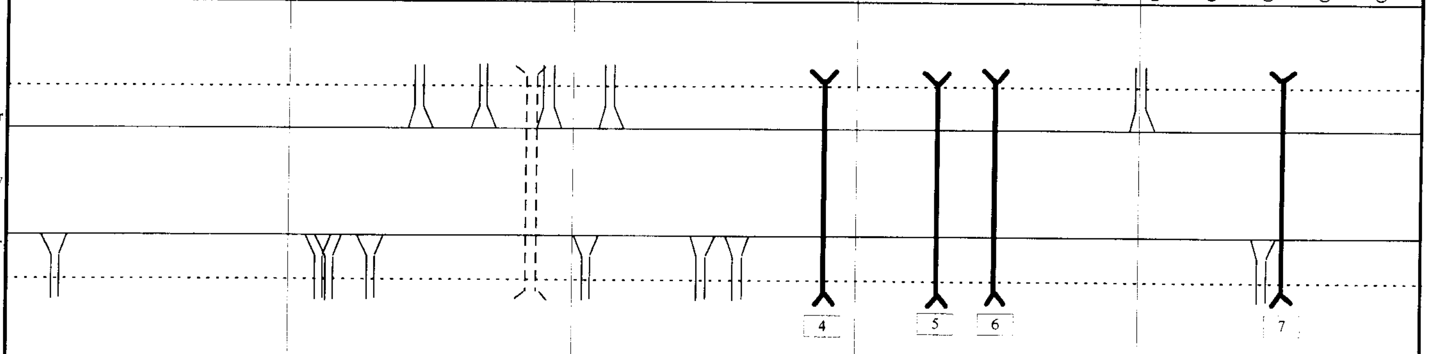
KOCKS INGENIEURE

Location

- Junction km 16,190
- Junction km 17,110
- Junction km 17,165
- Junction km 17,280
- Junction km 17,450
- Junction km 17,670
- Fly-over over S-4 km 17,840
- Junction km 17,865
- Junction km 18,060
- Junction km 18,140
- Junction km 18,440
- Junction km 18,590
- Culvert km 18,880
- Culvert km 19,280
- Culvert km 19,477
- Junction km 20,000
- Junction km 20,434
- Culvert km 20,508

Chainage (km): 16 +000, 16 +200, 16 +400, 16 +600, 16 +800, 17 +000, 17 +200, 17 +400, 17 +600, 17 +800, 18 +000, 18 +200, 18 +400, 18 +600, 18 +800, 19 +000, 19 +200, 19 +400, 19 +600, 19 +800, 20 +000, 20 +200, 20 +400, 20 +600, 20 +800

Layout



Width of Carriageway (m): 10,00 (km 16+000); 10,00 (km 17+000); 10,00 (km 18+000); 10,00 (km 18+800); 10,00 (km 19+600); 10,00 (km 20+200); 9,00 (km 20+400)

Width of Shoulders (m)

- L: 2,00; 2,00; 2,00; 2,00; 0,00; 0,00 / 3,00; 3,00
- R: 2,00; 2,00; 2,00; 2,00; 0,00; 0,00 / 3,00; 3,00

Rise/Fall +/- (%): 0,9; 5,2; 0,9; 0,0; -0,9; 0,0; 0,9; -0,9; 0,9

Roughness (IRI): < 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition

	%
Cracks	0,6
Alligator Cracks	14,3
Potholes	0,0
Settlement	7,0
Rutting	1,3

Pavement Structure

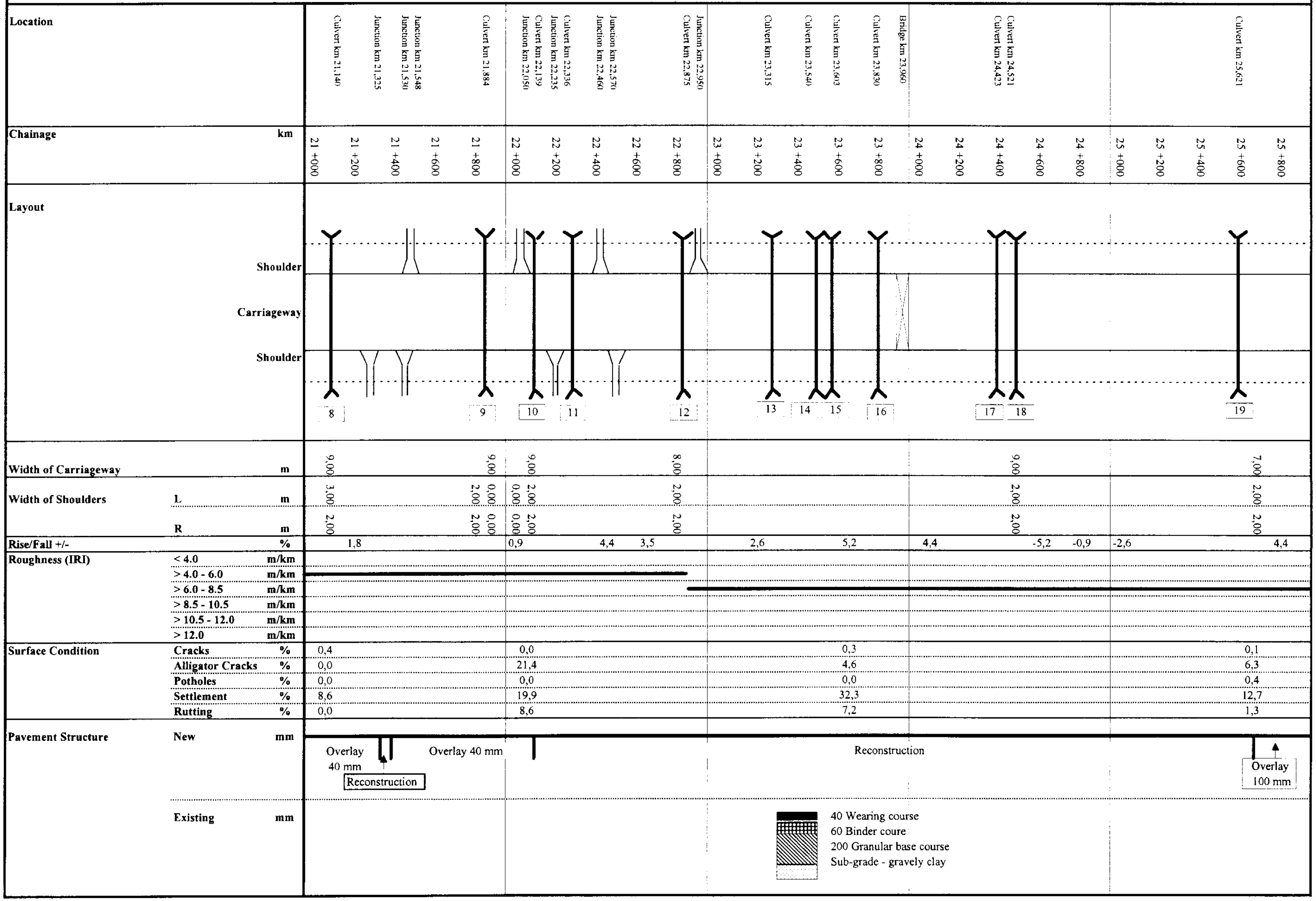
- New (mm): Reconstruction; Overlay 40 mm
- Existing (mm):
  - 60 Wearing course
  - 80 Binder coure
  - 100 Bituminous macadam
  - 500 Granular base course
  - Sub-grade - clayey saturated

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

Section: S 4; km 21+000 to km 26+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

KOCKS
INGENIEURE

Section: S 4; km 26+000 to km 31+000

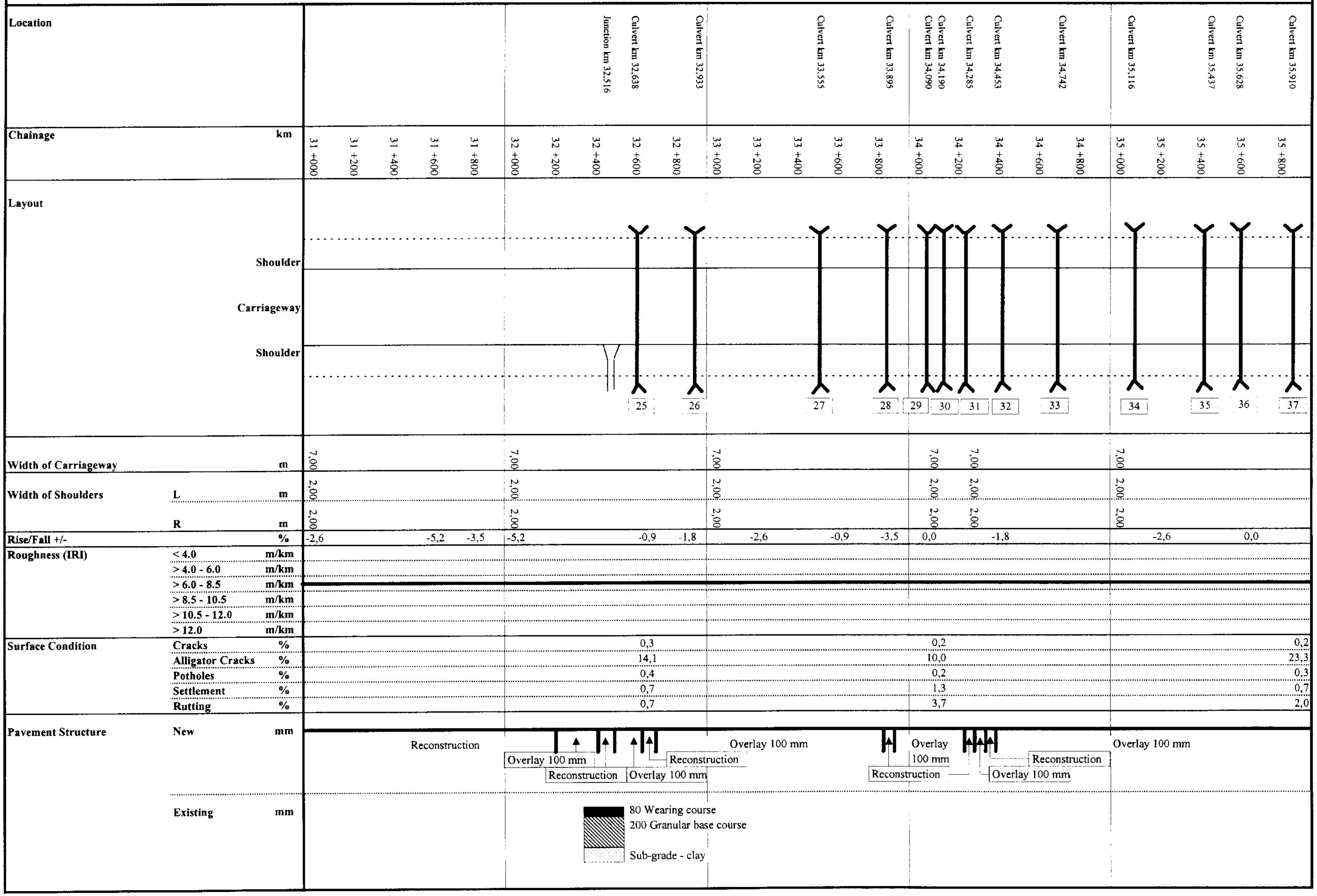
Location			Culvert km 26,633 · Culvert km 27,732 · Culvert km 27,937 · Culvert km 29,120 · Junction km 29,325 · Culvert km 29,560 · Junction km 29,945 · Junction km 29,842 · Junction km 30,854
Chainage		km	26 +000 · 26 +200 · 26 +400 · 26 +600 · 26 +800 · 27 +000 · 27 +200 · 27 +400 · 27 +600 · 27 +800 · 28 +000 · 28 +200 · 28 +400 · 28 +600 · 28 +800 · 29 +000 · 29 +200 · 29 +400 · 29 +600 · 29 +800 · 30 +000 · 30 +200 · 30 +400 · 30 +600 · 30 +800
Layout			Shoulder / Carriageway / Shoulder; 20 · 21 · 22 · 23 · 24
Width of Carriageway		m	7,00 · 17,00 · 18,00 · 8,00 · 8,00 · 7,00 · 7,00
Width of Shoulders	**L**	m	2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00 · 2,00
	R	m	2,00 · 1,00 · 1,00 · 2,00 · 2,00 · 2,00 · 2,00
Rise/Fall +/-		%	5,2 · 4,4 · 0,9 · 6,1 · -0,9 · 1,8 · 0,9 · 2,6 · 0,9
Roughness (IRI)	**< 4.0**	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0.1/5.9 · 0,1 · 0,8 · 0,4
	Alligator Cracks	%	4.3/5.9 · 6,8 · 15,7 · 16,0
	Potholes	%	0.3/0.4 · 0,4 · 0,2 · 0,1
	Settlement	%	8.7/0.0 · 16,6 · 13,9 · 0,0
	Rutting	%	0.9/0.0 · 1,3 · 1,0 · 0,2
Pavement Structure	**New**	mm	Overla 100 m · Overlay 40 mm · Reconstruction · Overlay 40 mm · Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

Section: S 4; km 31+000 to km 36+000

KOCKS INGENIEURE

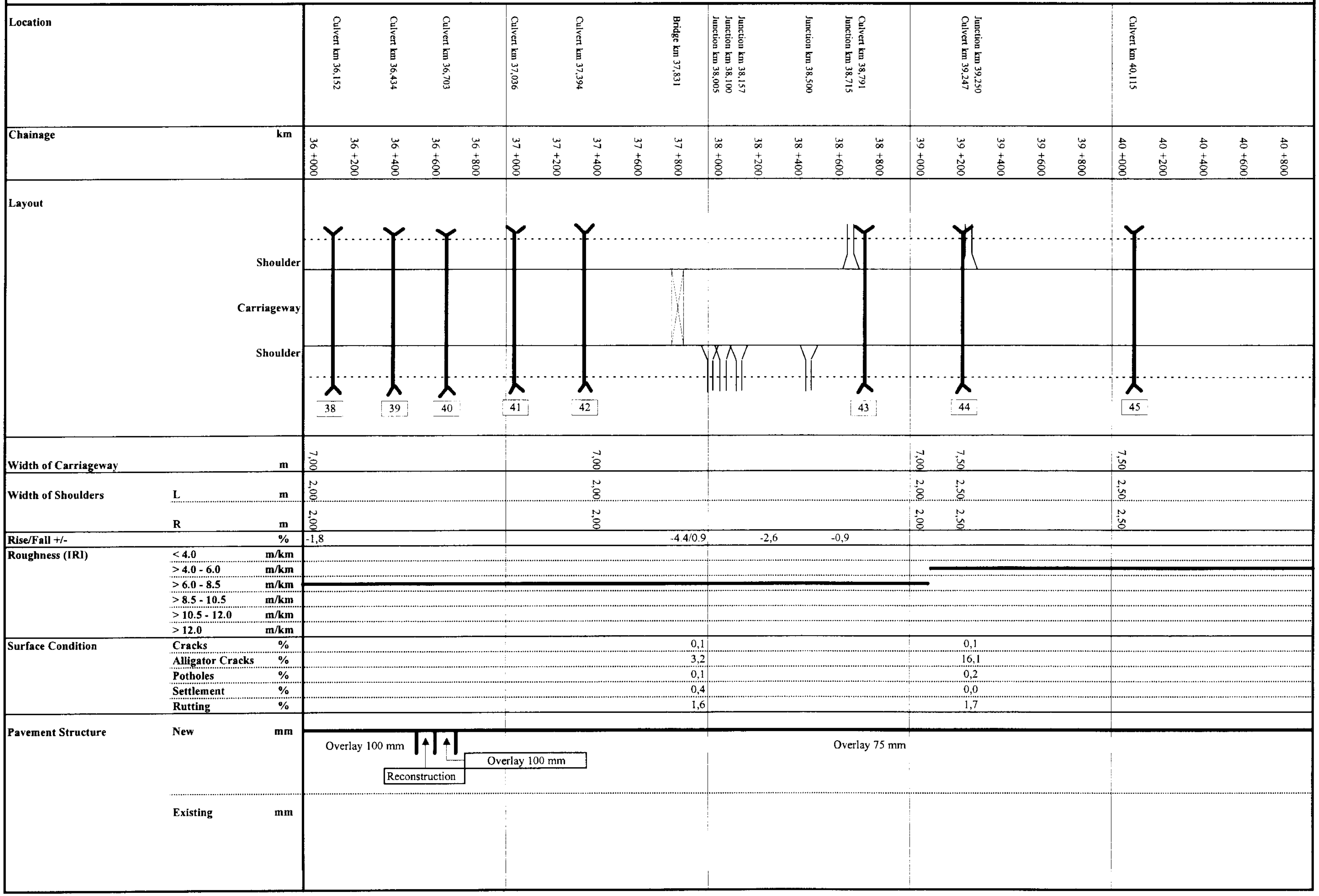


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

Section: S 4; km 36+000 to km 41+000

KOCKS INGENIEURE

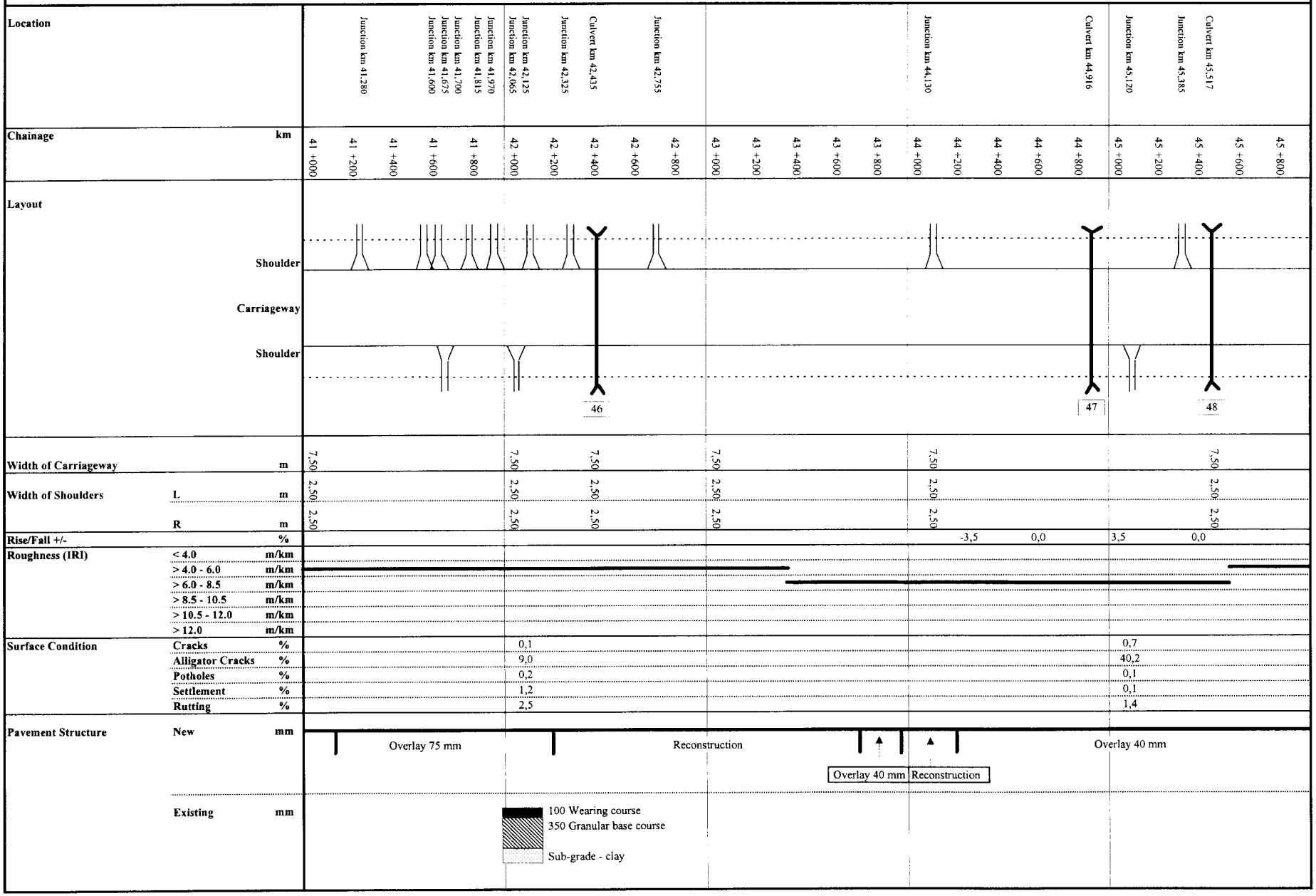


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

KOCKS
INGENIEURE

Section: S 4; km 41+000 to km 46+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

KOCKS
INGENIEURE

Section: S 4; km 46+000 to km 51+000

Location			Culvert km 46,156 · Culvert km 46,740 · Culvert km 47,050 · Culvert km 47,297 · Junction km 47,975 · Junction km 48,110 · Junction km 48,300 · Junction km 48,318 · Culvert km 48,325 · Junction km 48,585 · Junction km 48,522 · Culvert km 48,715 · Bridge km 49,088 Algeti River · Junction km 49,970 · Culvert km 50,146 · Junction km 50,190 · Culvert km 50,244 · Culvert km 50,712
Chainage		km	46 +000 · 46 +200 · 46 +400 · 46 +600 · 46 +800 · 47 +000 · 47 +200 · 47 +400 · 47 +600 · 47 +800 · 48 +000 · 48 +200 · 48 +400 · 48 +600 · 48 +800 · 49 +000 · 49 +200 · 49 +400 · 49 +600 · 49 +800 · 50 +000 · 50 +200 · 50 +400 · 50 +600 · 50 +800
Layout			Shoulder / Carriageway / Shoulder; 49 · 50 · 51 · 52 · 53 · 54 · 55 · 56 · 57
Width of Carriageway		m	7,50 · 7,50 · 7,50 · 7,50
Width of Shoulders	L	m	2,50 · 2,50 · 2,50 · 2,50
	R	m	2,50 · 2,50 · 2,50 · 2,50
Rise/Fall +/-		%	-0,9 · -5,2 · 1,8 · 2,6 · -0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,2 · 0,6
	Alligator Cracks	%	52,3 · 57,6
	Potholes	%	5,5 · 0,5
	Settlement	%	0,8 · 0,0
	Rutting	%	0,0 · 0,0
Pavement Structure	New	mm	Overlay 40 mm · Overlay 75 mm · Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

Section: S 4; km 51+000 to km 56+000

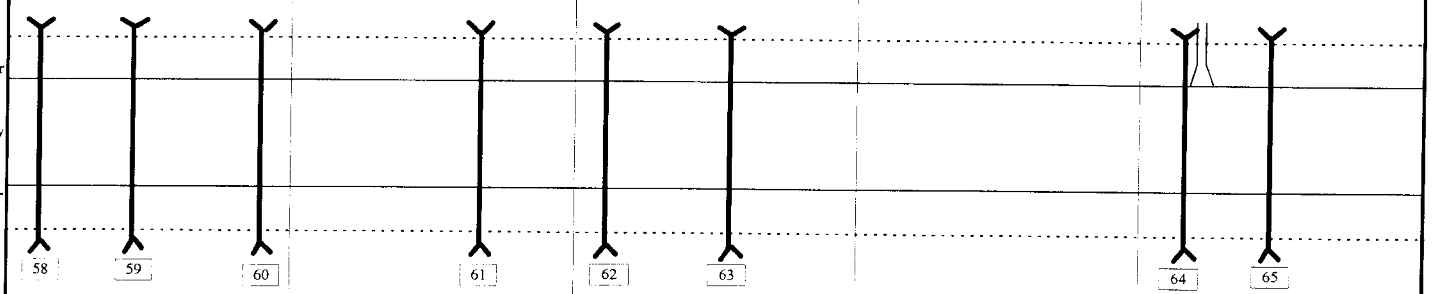
KOCKS
INGENIEURE

Location

- Culvert km 51,125
- Culvert km 51,425
- Culvert km 51,892
- Culvert km 52,646
- Culvert km 53,109
- Culvert km 53,555
- Culvert km 55,175
- Junction km 55,200
- Culvert km 55,450

Chainage (km): 51 +000, 51 +200, 51 +400, 51 +600, 51 +800, 52 +000, 52 +200, 52 +400, 52 +600, 52 +800, 53 +000, 53 +200, 53 +400, 53 +600, 53 +800, 54 +000, 54 +200, 54 +400, 54 +600, 54 +800, 55 +000, 55 +200, 55 +400, 55 +600, 55 +800

Layout



Item		Unit	km 51+000	km 52+000	km 53+000	km 54+000	km 54+800
Width of Carriageway		m	7,50	7,50	7,50	7,50	7,50
Width of Shoulders	L	m	3,00	3,00	3,00	3,00	2,00
	R	m	3,00	3,00	3,00	3,00	2,00

Rise/Fall +/- (%): 0,0; 1,8; 0,0; -4,4; -5,2; -2,6

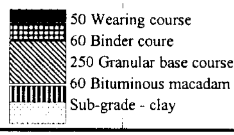
Roughness (IRI) (m/km): < 4.0; > 4.0 - 6.0; > 6.0 - 8.5; > 8.5 - 10.5; > 10.5 - 12.0; > 12.0

Surface Condition	%	
Cracks	%	1,9
Alligator Cracks	%	30,2
Potholes	%	8,6
Settlement	%	1,2
Rutting	%	7,8

Pavement Structure

New (mm): Reconstruction | Overlay 40 mm | Overlay 75 mm | Reconstr. | Overlay 75 mm

Existing (mm):



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Red Bridge / Azerbaijan Border (S 4)

KOCKS
INGENIEURE

Section: S 4; km 56+000 to km 57+113

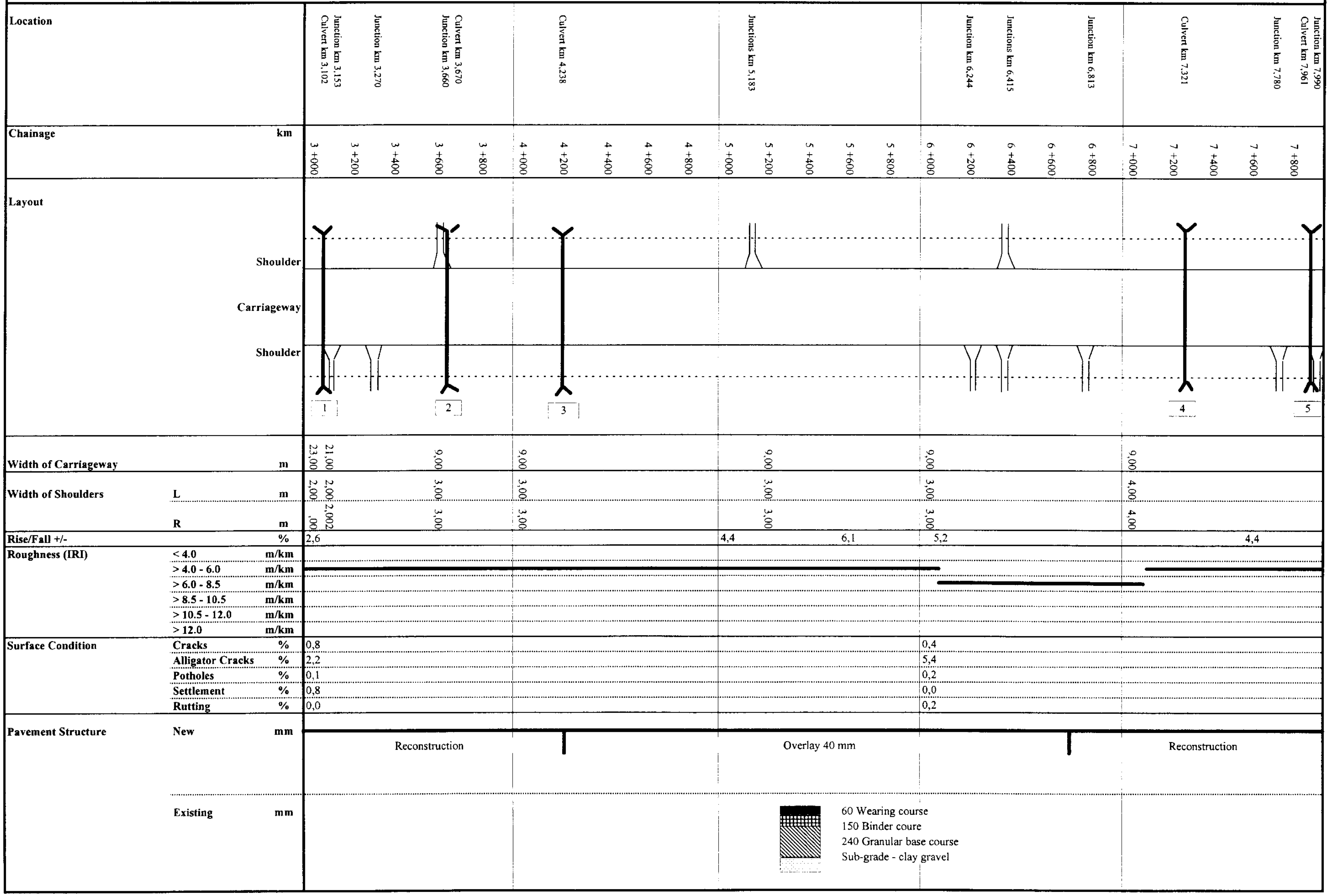
Location			Culvert km 56.180; Junction km 56.290; Junction km 56.665; Culvert km 56.780; Border line km 57.113; Red Bridge km 57.252
Chainage		km	56 +000; 56 +200; 56 +400; 56 +600; 56 +800; 57 +000; 57 +200
Layout			Shoulder; Carriageway; Shoulder; 66; 67
Width of Carriageway		m	7,50; 7,50; 8,50; 8,50
Width of Shoulders	L	m	1,00; 2,00; 2,00; 2,00
	R	m	1,00; 2,00; 2,00; 2,00
Rise/Fall +/-		%	0,0; -2,6; -1.8/0.9; 0,0
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	1,4
	Alligator Cracks	%	39,7
	Potholes	%	20,7
	Settlement	%	0,0
	Rutting	%	0,0
Pavement Structure	New	mm	Overlay 75 mm; Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS INGENIEURE

Section: S 6; km 3+000 to km 8+000

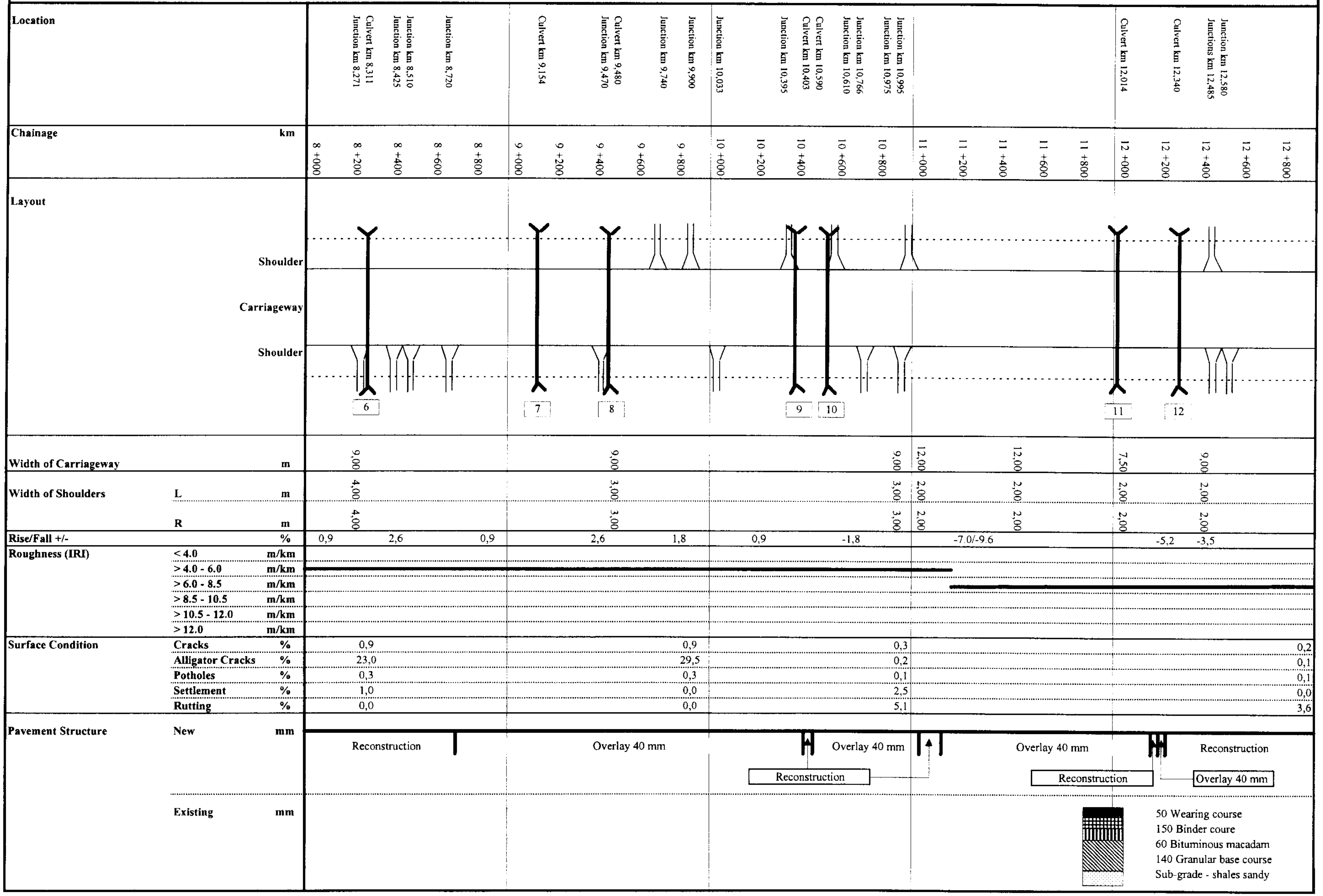


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 8+000 to km 13+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS
INGENIEURE

Section: S 6; km 13+000 to km 18+000

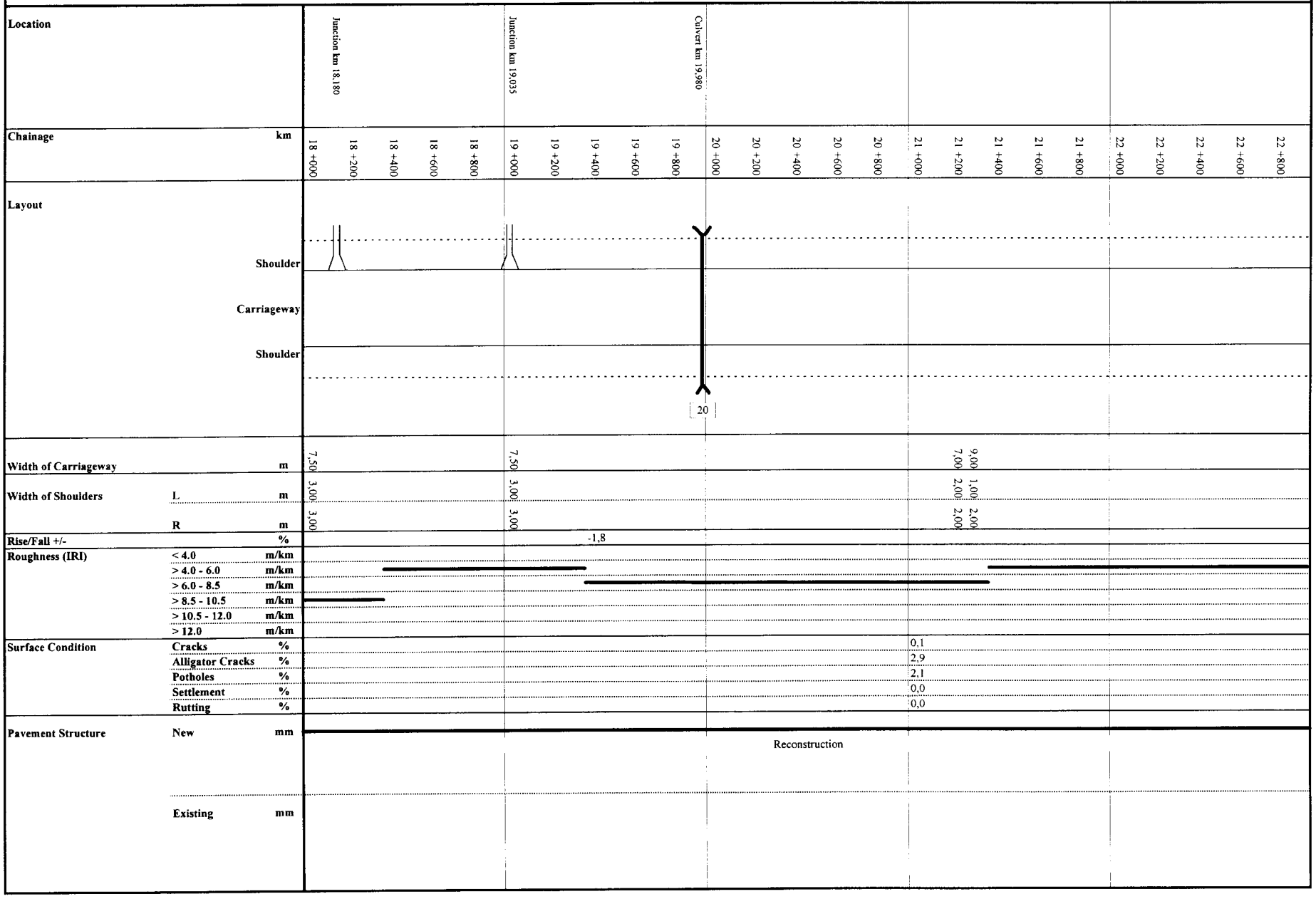
Location			Culvert km 13,050 / Culvert km 13,082 / Junction km 13,306 / Culvert km 13,600 / Junction km 13,650 / Culvert km 13,990 / Junction km 14,010 / Junction km 14,335 / Culvert km 14,417 / Junction km 14,495 / Culvert km 15,620 / Junction km 13,200 / Junctions km 16,900 / Junctions km 17,340 / Culvert km 17,490 / Junction km 17,498 / Junction km 17,560
Chainage		km	13 +000 / 13 +200 / 13 +400 / 13 +600 / 13 +800 / 14 +000 / 14 +200 / 14 +400 / 14 +600 / 14 +800 / 15 +000 / 15 +200 / 15 +400 / 15 +600 / 15 +800 / 16 +000 / 16 +200 / 16 +400 / 16 +600 / 16 +800 / 17 +000 / 17 +200 / 17 +400 / 17 +600 / 17 +800
Layout			Shoulder / Carriageway / Shoulder; 13, 14, 15, 16, 17, 18, 19
Width of Carriageway		m	9,00 / 8,00 / 8,00 / 7,50
Width of Shoulders	L	m	2,00 / 1,00 / 1,00 / 3,00
	R	m	2,00 / 1,00 / 1,00 / 3,00
Rise/Fall +/-		%	-1,8 / 1,8 / 7,0 / 4,4 / 6,1 / -2,6
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,0 / 0,0 / 0,0 / 0,0
	Alligator Cracks	%	0,0 / 0,0 / 0,0 / 0,2
	Potholes	%	99,1 / 0,0 / 99,2 / 0,4
	Settlement	%	0,0 / 4,9 / 0,0 / 0,0
	Rutting	%	0,0 / 0,0 / 0,0 / 0,0
Pavement Structure	New	mm	Reconstruction; Overlay 75 mm; Reconstruction; Overlay 75 mm; Reconstruction
	Existing	mm	60 Wearing course 70 Bituminous macadam 100 Granular base course Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS
INGENIEURE

Section: S 6; km 18+000 to km 23+000

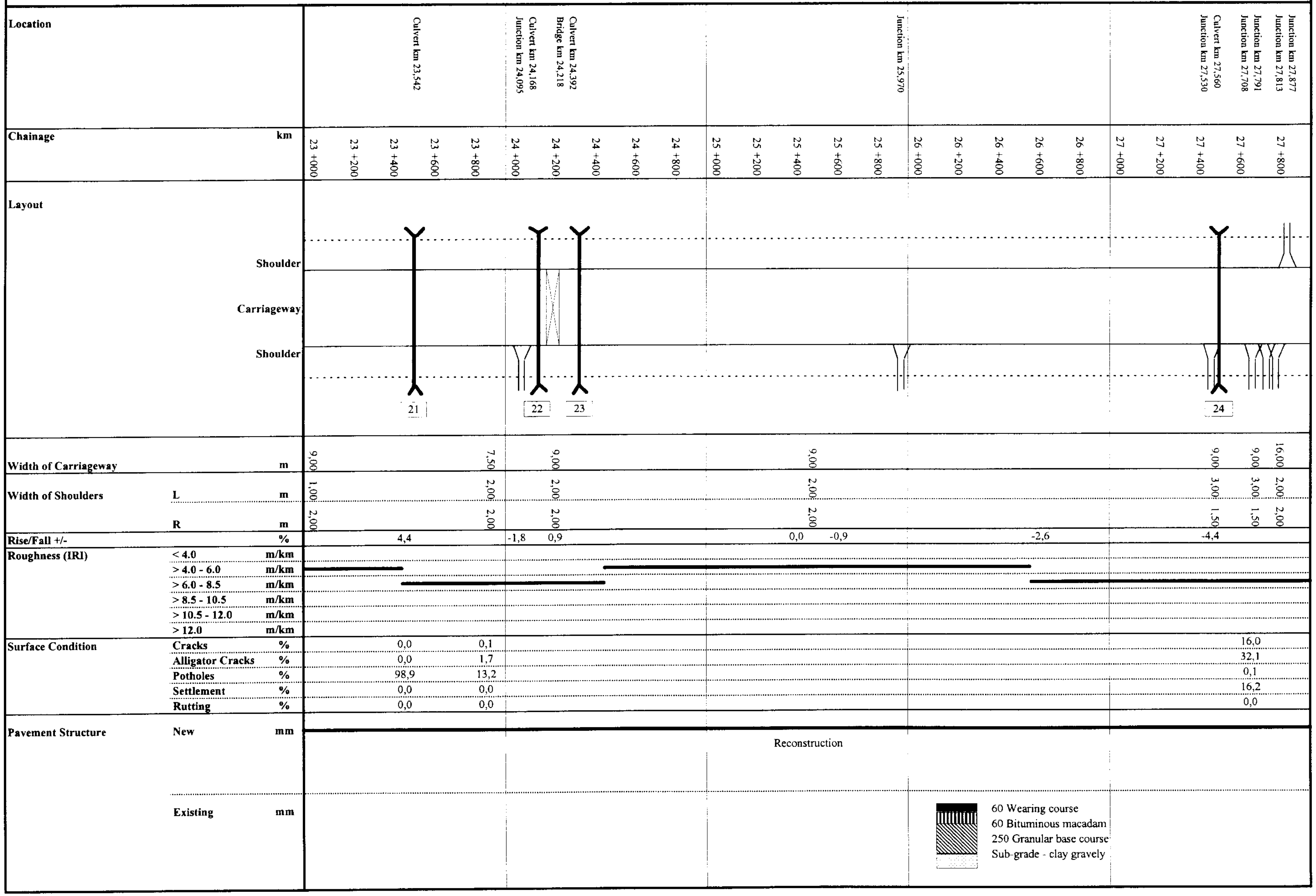


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 23+000 to km 28+000

KOCKS INGENIEURE

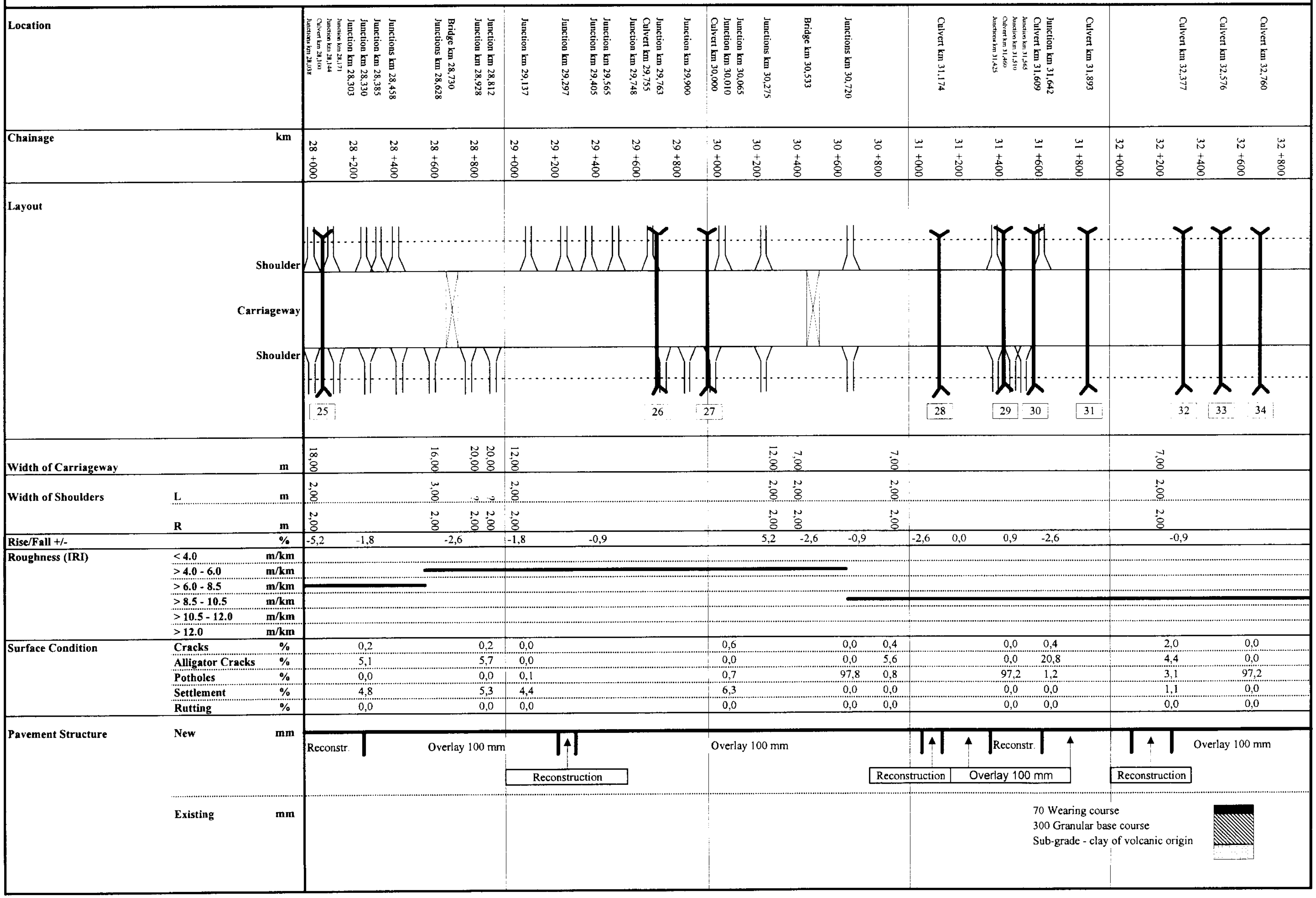


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 28+000 to km 33+000

KOCKS
INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 33+000 to km 38+000

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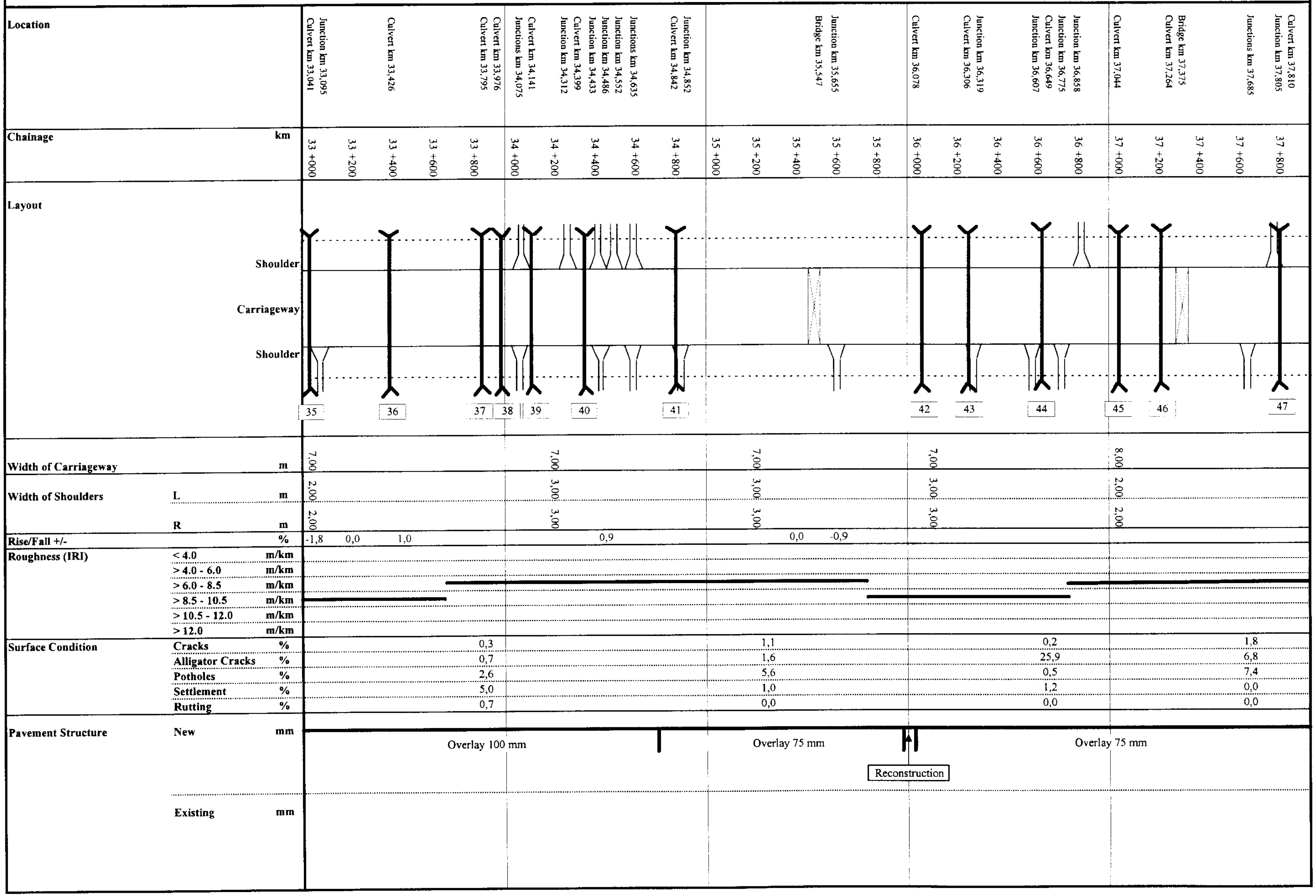


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS
INGENIEURE

Section: S 6; km 38+000 to km 43+000

Location			Culvert km 38,000 / Junction km 38,185 / Culvert km 38,284 / Junction km 38,438 / Culvert km 38,794 / Junctions km 38,798 / Culvert km 39,261 / Culvert km 39,720 / Culvert km 39,919 / Junction km 40,100 / Junction km 40,416 / Culvert km 40,421 / Junction km 40,580 / Junction km 41,045 / Culvert km 41,081 / Junction km 41,180 / Culvert km 41,239 / Junction km 41,353 / Culvert km 41,450 / Junction km 41,675 / Culvert km 41,755 / Junction km 41,955 / Culvert km 42,017 / Junction km 42,055 / Culvert km 42,128 / Culvert km 42,323 / Culvert km 42,779
Chainage		km	38 +000 / 38 +200 / 38 +400 / 38 +600 / 38 +800 / 39 +000 / 39 +200 / 39 +400 / 39 +600 / 39 +800 / 40 +000 / 40 +200 / 40 +400 / 40 +600 / 40 +800 / 41 +000 / 41 +200 / 41 +400 / 41 +600 / 41 +800 / 42 +000 / 42 +200 / 42 +400 / 42 +600 / 42 +800
Layout			Shoulder / Carriageway / Shoulder 48 / 49 / 50 / 51 / 52 / 53 / 54 / 55 / 56 / 57 / 58 / 59 / 60 / 61 / 62
Width of Carriageway		m	7,00 / 6,00 / 6,00 / 6,00 / 6,00 / 5,00 / 5,00
Width of Shoulders	L	m	2,00 / 2,50 / 2,00 / 2,00 / 2,00 / 2,00 / 2,00
	R	m	2,00 / 2,50 / 2,00 / 2,00 / 2,00 / 2,00 / 2,00
Rise/Fall +/-		%	0,0 / -1,8 / 0,0 / 1,8 / 0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	2,3 / 2,0 / 0.0/0.3
	Alligator Cracks	%	40,4 / 28,2 / 0.0/13.2
	Potholes	%	1,2 / 2,2 / 98.9/2.2
	Settlement	%	0,0 / 0,0 / 0.0/0.0
	Rutting	%	0,0 / 0,0 / 0.0/0.0
Pavement Structure	**New**	mm	Overlay 75 mm / Overlay 100 mm / Overlay 100 mm / Reconstruction / Reconstruction / Reconstruction / Overlay 100 mm / Overlay 100 mm
	Existing	mm	70 Wearing course 330 Granular base course Sub-grade - clay, gravely & cobbles

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

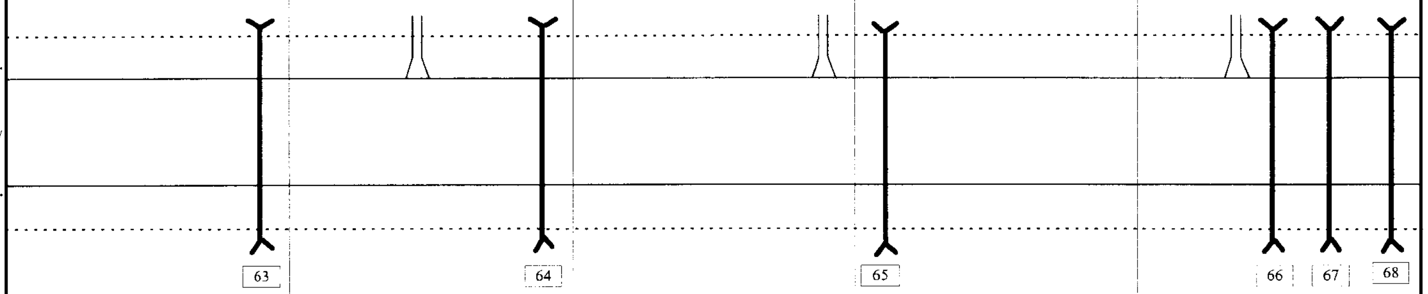
KOCKS INGENIEURE

Section: S 6; km 43+000 to km 48+000

Location
Culvert km 43,902
Junction km 44,442
Culvert km 44,896
Junction km 45,882
Culvert km 46,113
Junction km 47,350
Culvert km 47,470
Culvert km 47,687
Culvert km 47,908

Chainage (km)
43 +000, 43 +200, 43 +400, 43 +600, 43 +800, 44 +000, 44 +200, 44 +400, 44 +600, 44 +800, 45 +000, 45 +200, 45 +400, 45 +600, 45 +800, 46 +000, 46 +200, 46 +400, 46 +600, 46 +800, 47 +000, 47 +200, 47 +400, 47 +600, 47 +800

Layout
Shoulder
Carriageway
Shoulder



Width of Carriageway (m)
6,00; 7,00; 7,00; 7,00; 7,00; 8,00

Width of Shoulders
L (m): 2,00; 2,00; 2,00; 2,00; 2,00; 3,00
R (m): 2,00; 2,00; 2,00; 2,00; 2,00; 3,00

Rise/Fall +/- (%)
0,0; 0,9; 4,4; -0,9; 0,9; 4,4; -2,6; -4,4; -6,1; 2,6; 1.8/2.6

Roughness (IRI)
< 4.0 m/km
> 4.0 - 6.0 m/km
> 6.0 - 8.5 m/km
> 8.5 - 10.5 m/km
> 10.5 - 12.0 m/km
> 12.0 m/km

Surface Condition

		km 44+800	km 47+400
Cracks	%	0,0	0,0
Alligator Cracks	%	2,9	0,0
Potholes	%	0,5	0,0
Settlement	%	5,8	0,0
Rutting	%	0,0	0,0

Pavement Structure
New (mm): Overlay 100 mm; Reconstruction
Existing (mm):
40 Wearing course
60 Bituminous macadam
250 Granular base course
Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 48+000 to km 53+000

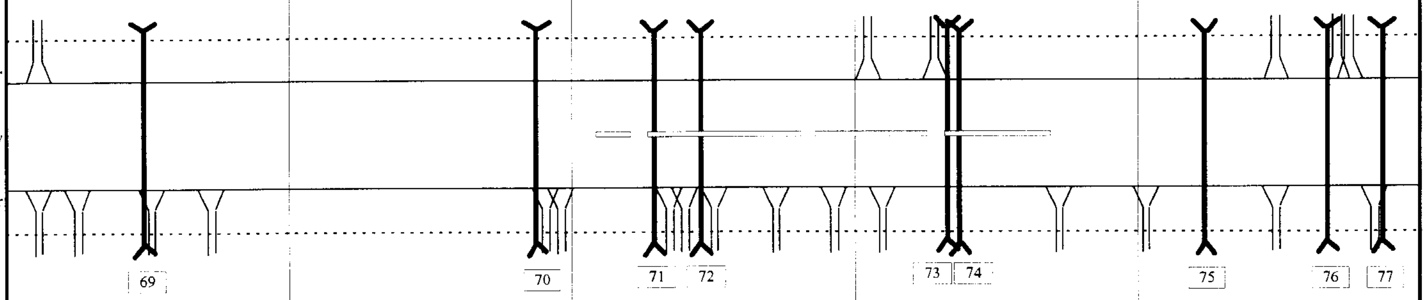
KOCKS INGENIEURE

Location

km	Location
48	Junctions km 48,110
	Junction km 48,245
	Junction km 48,512
	Culvert km 48,488
	Junction km 48,742
49	Junction km 49,958
	Junction km 49,949
	Culvert km 49,934
50	Junction km 50,345
	Culvert km 50,284
	Junction km 50,493
	Culvert km 50,435
	Junction km 50,400
	Junction km 50,715
	Junction km 50,927
51	Junction km 51,100
	Junction km 51,058
	Culvert km 51,382
	Culvert km 51,359
	Juinction km 51,316
	Junction km 51,720
52	Junction km 52,019
	Culvert km 52,220
	Junctions km 52,485
	Junction km 52,700
	Junction km 52,676
	Culvert km 52,671
	Culvert km 52,838
	Junction km 52,814

Chainage (km): 48 +000, 48 +200, 48 +400, 48 +600, 48 +800, 49 +000, 49 +200, 49 +400, 49 +600, 49 +800, 50 +000, 50 +200, 50 +400, 50 +600, 50 +800, 51 +000, 51 +200, 51 +400, 51 +600, 51 +800, 52 +000, 52 +200, 52 +400, 52 +600, 52 +800

Layout



Item	Unit	km 48	km 49	km 50	km 51	km 52
Width of Carriageway	m	7,00; 7,00		7 - 16,0 2,0	7 + 7; 16,00; 15,00	12,00; 12,00; 16,00; 16,00
Width of Shoulders L	m	3,00; 3,00		2,0; 2,0; 2,0	2,00; 2,00; 2,00	2,00; 2,00; 3,00
Width of Shoulders R	m	3,00; 3,00		2,0; 2,0; 2,0	2,00; 2,00; 0,50	0,50; 0,50; 2,00; 3,00
Rise/Fall +/-	%	4,4; 1,8	4,4; 5,2; 0,0	-0.9/-3.5/4.4	0,0; 1,8	-3,5; 1,8; 2,6; 3,5; 8,8

Roughness (IRI): < 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition	Unit	km 48	km 50		km 50 (cont.)	km 51	km 52	
Cracks	%	0,0	0.0/0.4	0.5/0.4	1.1/0.4	0.4/0.4	0,1	0,2
Alligator Cracks	%	0,0	0.0/22.1	21.3/22.1	49.8/22.1	6.6/22.1	0,0	0,0
Potholes	%	0,3	0.3/5.7	10.0/5.7	7.4/5.7	0.7/5.7	1,2	30,1
Settlement	%	0,0	0.0/0.0	0.0/0.0	0.0/0.0	0.0/0.0	0,0	0,0
Rutting	%	0,2	0.0/0.0	0.0/0.0	0.0/0.0	0.0/0.0	0,0	0,0

Pavement Structure

	Unit	km 48+000 – 49+250	km 49+250 – 52+250	km 52+250 – 53+000
New	mm	Reconstruction	Overlay 75 mm	Reconstruction
Existing	mm			

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 53+000 to km 58+000

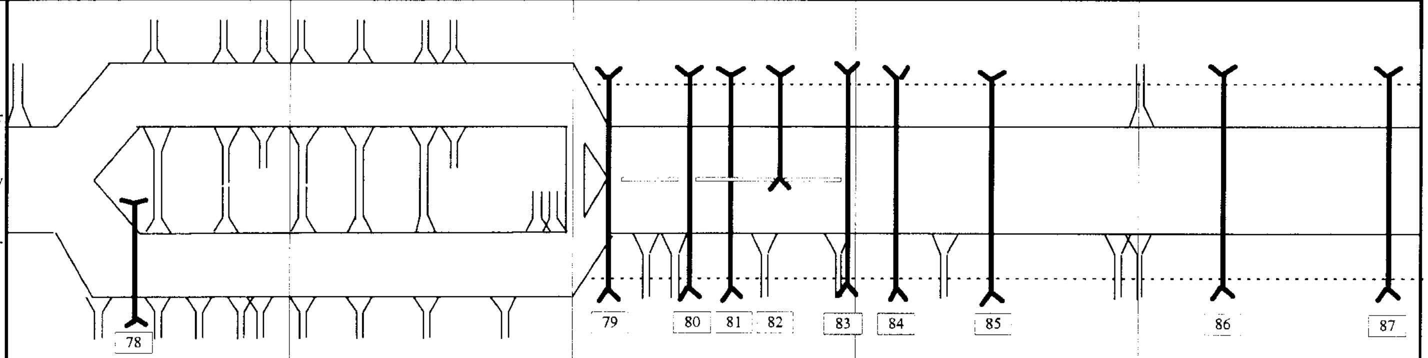
KOCKS INGENIEURE

Location

- Junction km 53,051
- Junction km 53,207
- Junction km 53,343
- Culvert km 53,440
- Junctions km 53,537
- Junction km 53,695
- Junction km 53,786
- Junction km 53,815
- Junction km 53,894
- Junctions km 54,045
- Junctions km 54,237
- Junctions km 54,475
- Junctions km 54,760
- Junction km 54,869
- Junction km 54,937
- Junction km 55,002
- Culvert km 55,130
- Junction km 55,262
- Junction km 55,390
- Culvert km 55,400
- Culvert km 55,560
- Junction km 55,672
- Culvert km 55,725
- Junction km 55,957
- Culvert km 55,963
- Culvert km 56,152
- Junction km 56,310
- Culvert km 56,467
- Junction km 56,928
- Junctions km 57,000
- Culvert km 57,304
- Culvert km 57,886

Chainage (km): 53 +000, 53 +200, 53 +400, 53 +600, 53 +800, 54 +000, 54 +200, 54 +400, 54 +600, 54 +800, 55 +000, 55 +200, 55 +400, 55 +600, 55 +800, 56 +000, 56 +200, 56 +400, 56 +600, 56 +800, 57 +000, 57 +200, 57 +400, 57 +600, 57 +800

Layout



Width of Carriageway (m): 10,00; 11,00; 11,00; 7,00; 7,00; 8 + / 8 + 1 / 11 + 1; 8 + 8; 7,00; 7,00

Width of Shoulders

- L (m): 3,00; 3,00; 2,00; 2,00; 2,0 / 2,0 / 2,0; 2,00; 2,00; 2,00
- R (m): 3,00; 2,50; 2,00; 2,00; 0,5 / 2,0 / 2,0; 2,00; 2,00; 2,00

Rise/Fall +/- (%): -1,8; 3,5 -7.0/0.9/-6 1/2.6; 0,9; -7,0; -2,6; -0.9/0.0; -0,9; 1,8; -0,9; 0,9; -0,9

Roughness (IRI)

- < 4.0 m/km
- > 4.0 - 6.0 m/km
- > 6.0 - 8.5 m/km
- > 8.5 - 10.5 m/km
- > 10.5 - 12.0 m/km
- > 12.0 m/km

Surface Condition

Cracks (%)	0.0/0.9	0.0/0.9	1.1/0.0	0,0	0.0/0.4	0.2/0.0	0,2	0,0
Alligator Cracks (%)	0.0/7.4	0.0/7.6	7.4/0.0	0,0	0.0/0.0	10.8/24.5	21,1	0,0
Potholes (%)	50.1/4.6	12.8/5.7	5.3/92.	98,6	43.3/0.0	2.5/0.0	5,8	34,3
Settlement (%)	0.0/0.0	2.4/0.0	0.0/0.0	0,0	0.0/0.0	0.0/0.0	0,0	0,0
Rutting (%)	0.0/0.0	0.0/0.0	0.0/0.0	0,0	0.0/0.0	0.0/0.0	0,0	0,0

Pavement Structure

- New (mm): Reconstruction; Overlay 100 mm; Reconstruction
- Existing (mm)

50 Wearing course
60 Bituminous macadam
280 Granular base course
Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS
INGENIEURE

Section: S 6; km 58+000 to km 63+000

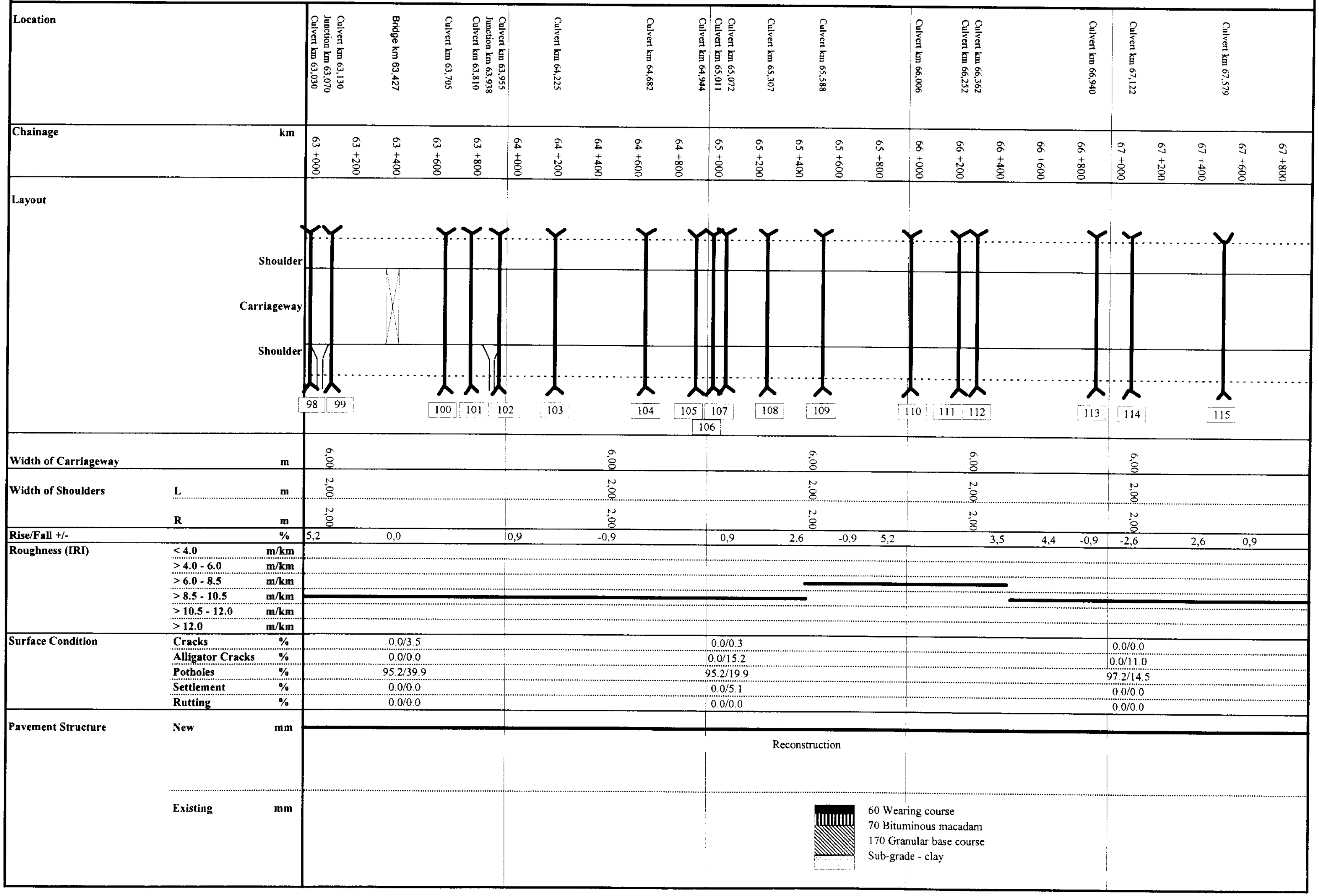
Location			Junctions km 58,370 / Culvert km 58,356; Culvert km 58,738; Culvert km 59,508; Culvert km 59,783; Culvert km 60,095; Junction km 60,377; Culvert km 61,728; Culvert km 62,098; Junctions km 62,372; Culvert km 62,418; Junction km 62,525; Junction km 62,602; Junction km 62,685; Culvert km 62,738; Culvert km 62,859; Junction km 62,890
Chainage		km	58 +000; 58 +200; 58 +400; 58 +600; 58 +800; 59 +000; 59 +200; 59 +400; 59 +600; 59 +800; 60 +000; 60 +200; 60 +400; 60 +600; 60 +800; 61 +000; 61 +200; 61 +400; 61 +600; 61 +800; 62 +000; 62 +200; 62 +400; 62 +600; 62 +800
Layout			Shoulder / Carriageway / Shoulder; 88; 89; 90; 91; 92; 93; 94; 95; 96; 97
Width of Carriageway		m	7,00; 7,00; 7,00; 7,00; 6,00
Width of Shoulders	L	m	2,00; 2,00; 2,00; 2,00; 2,00
	R	m	2,00; 2,00; 2,00; 2,00; 2,00
Rise/Fall +/-		%	0,9; -0,9; 3,5; 0,9; 1,8; 0,9; 0,0; 0,9; 2,6; 0,0; -4,4
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,1; 1,8
	Alligator Cracks	%	1,8; 23,5
	Potholes	%	4,3; 11,3
	Settlement	%	0,1; 0,0
	Rutting	%	0,1; 0,0
Pavement Structure	New	mm	Reconstruction; Overlay 100 mm; Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 63+000 to km 68+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 68+000 to km 73+000

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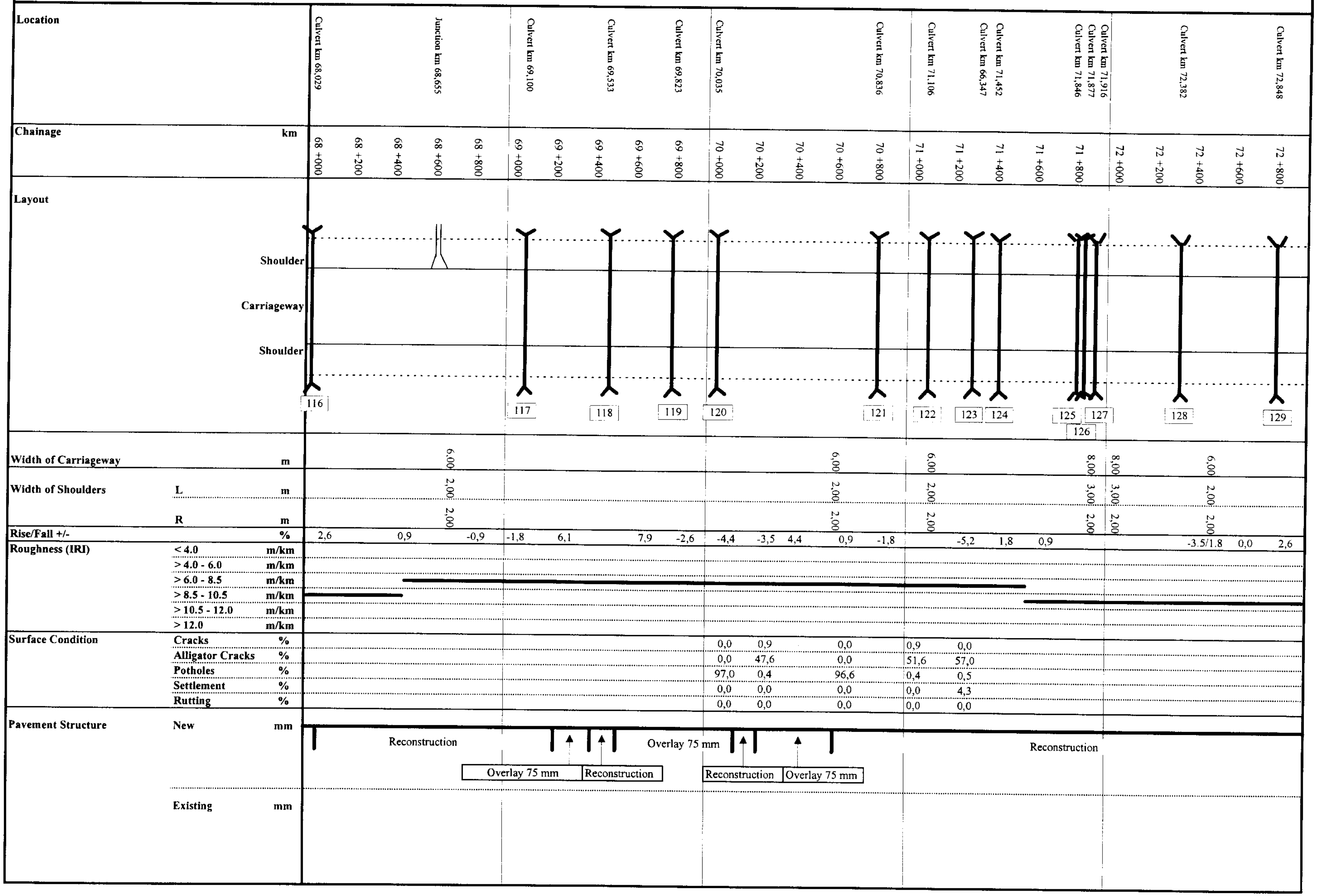


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 73+000 to km 78+000

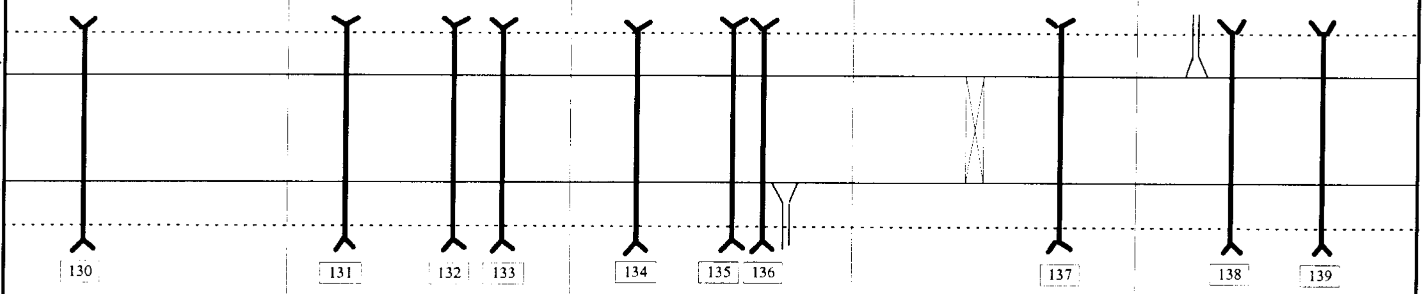
KOCKS INGENIEURE

Location

Location	Chainage (km)	Structure no.
Culvert km 73,286	73+286	130
Culvert km 74,200	74+200	131
Culvert km 74,598	74+598	132
Culvert km 74,776	74+776	133
Culvert km 75,215	75+215	134
Culvert km 75,586	75+586	135
Culvert km 75,680	75+680	136
Junction km 75,780	75+780	
Bridge km 76.438	76+438	
Culvert km 76,735	76+735	137
Junction km 77,200	77+200	
Culvert km 77,340	77+340	138
Culvert km 77,659	77+659	139

Chainage (km): 73 +000, 73 +200, 73 +400, 73 +600, 73 +800, 74 +000, 74 +200, 74 +400, 74 +600, 74 +800, 75 +000, 75 +200, 75 +400, 75 +600, 75 +800, 76 +000, 76 +200, 76 +400, 76 +600, 76 +800, 77 +000, 77 +200, 77 +400, 77 +600, 77 +800

Layout



Width of Carriageway / Width of Shoulders

Section	Width of Carriageway (m)	Width of Shoulders L (m)	Width of Shoulders R (m)
km 73+000 – 74+000	6,00	1,00	1,00
km 74+000 – 75+000	6,00	1,00	1,00
km 75+000 – 75+700	6,00	1,00	1,00
km 75+700 – 76+000	5,00	1,00	1,00
km 76+000 – 77+000	5,00	1,00	1,00
km 77+000 – 78+000	5,00	1,00	1,00

Rise/Fall +/- (%): 3,5 | 4,4 | 5.2/3.5 | 0,9 | 0,0 | -2,6 | 3,5 | 6,1 | 4,4 | 2,6 | -2,6

Roughness (IRI) (m/km): classes < 4.0; > 4.0 - 6.0; > 6.0 - 8.5; > 8.5 - 10.5; > 10.5 - 12.0; > 12.0

Surface Condition

	%							
Cracks	%	0,0	0,4	0,0	0,0	0,0	0,0	0,0	0,0
Alligator Cracks	%	54,3	39,4	29,9	0,0	25,3	0,0	53,5	17,6
Potholes	%	4,3	0,4	0,4	95,0	1,0	98,4	26,8	0,0
Settlement	%	0,0	0,0	0,0	0,0	0,0	0,0	0,0	20,1
Rutting	%	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Pavement Structure

New (mm): Reconstruction

Existing (mm):

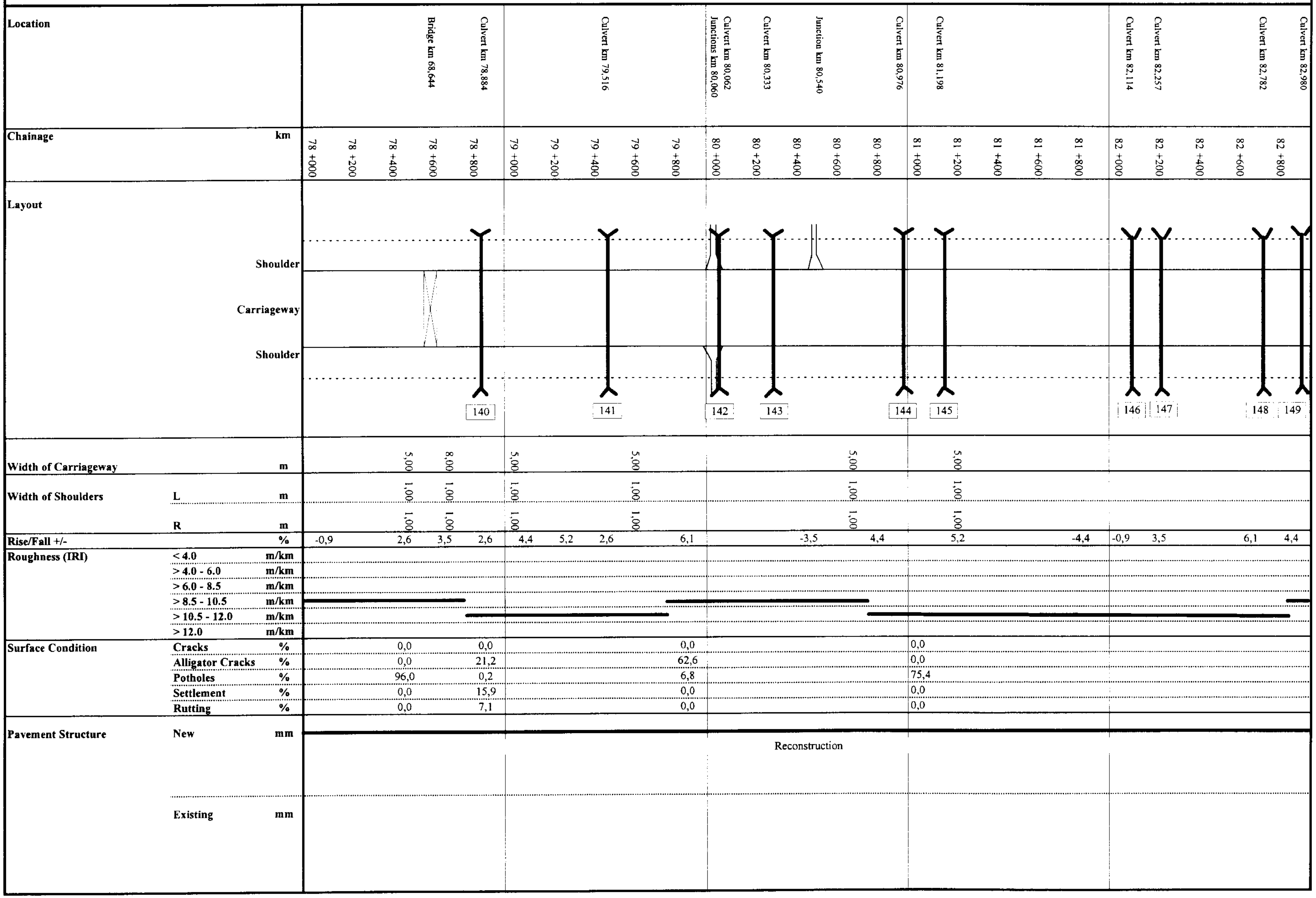
50 Wearing course
70 Binder coure
100 Granular base course
Sub-grade - clay (weathered basalt)

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 78+000 to km 83+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 83+000 to km 88+000

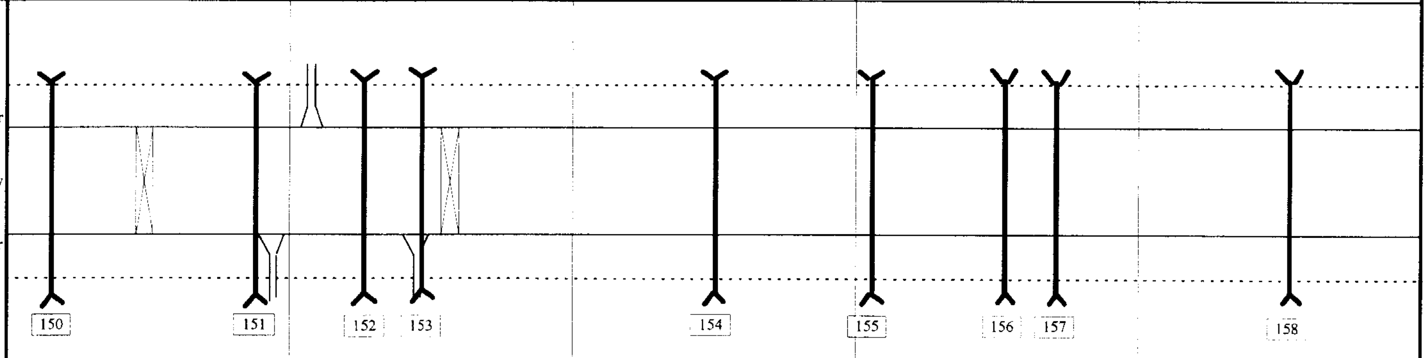
KOCKS INGENIEURE

Location

Location	Chainage (km)
Culvert km 83,175	83+175
Bridge km 83,493	83+493
Culvert km 83,880	83+880
Junction km 83,927	83+927
Junction km 84,087	84+087
Culvert km 84,240	84+240
Junction km 84,434	84+434
Culvert km 84,443	84+443
Bridge km 84,553	84+553
Culvert km 85,494	85+494
Culvert km 86,054	86+054
Culvert km 86,518	86+518
Culvert km 86,718	86+718
Culvert km 87,540	87+540

Chainage (km): 83 +000, 83 +200, 83 +400, 83 +600, 83 +800, 84 +000, 84 +200, 84 +400, 84 +600, 84 +800, 85 +000, 85 +200, 85 +400, 85 +600, 85 +800, 86 +000, 86 +200, 86 +400, 86 +600, 86 +800, 87 +000, 87 +200, 87 +400, 87 +600, 87 +800

Layout



Chainage	Width of Carriageway (m)	Width of Shoulders L (m)	Width of Shoulders R (m)
83+000	5,00	1,00	1,00
83+800	5,00	1,00	1,00
84+200	5,00	1,00	1,00
85+400	5,00	1,00	1,00
86+600	5,00	1,00	1,00

Rise/Fall +/- (%): -0.9/4.4, -2,6, 3.5/4.4, -1,8, 0,9, 0.0/1.8, 6,1, -2,6, 3,5, 1,8, 5.2/4.4, 2,6, 3,5, 1,8, 0,0

Roughness (IRI) (m/km): < 4.0; > 4.0 - 6.0; > 6.0 - 8.5; > 8.5 - 10.5; > 10.5 - 12.0; > 12.0

Surface Condition

	km 83	km 84	km 84	km 85	km 85	km 86	km 87	km 87
Cracks %	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Alligator Cracks %	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Potholes %	98.9/98.2	98,0	61,6	97,5	85,2	74,1	98,7	56,7
Settlement %	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Rutting %	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Pavement Structure

New (mm): Reconstruction

Existing (mm)

- 40 Wearing course
- 50 Binder coure
- 100 Granular base course
- Sub-grade - weathered lava

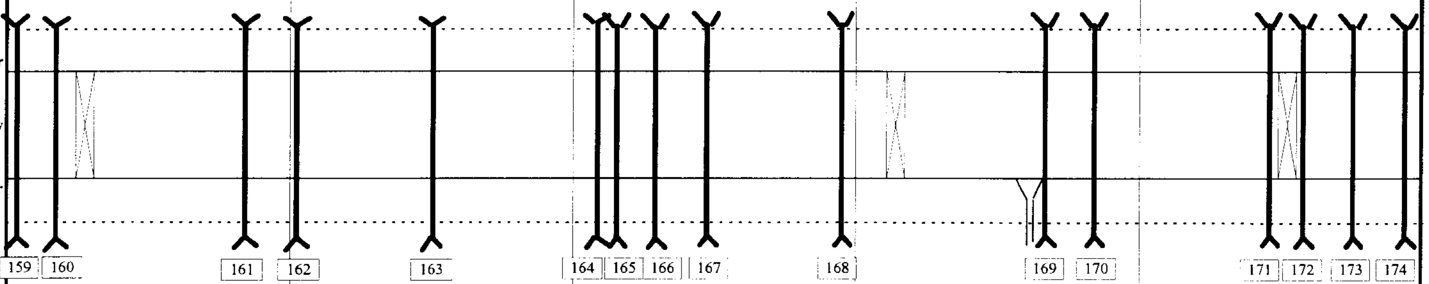
Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

Section: S 6; km 88+000 to km 93+000

KOCKS INGENIEURE

Location			km 88	km 89	km 90	km 91	km 92
Location			Culvert km 88,030; Culvert km 88,180; Bridge km 88,270; Culvert km 88,826	Culvert km 89,020; Culvert km 89,500	Culvert km 90,082; Culvert km 90,156; Culvert km 90,292; Culvert km 90,468; Culvert km 90,951	Bridge km 91,144; Junction km 91,610; Culvert km 91,620; Culvert km 91,836	Culvert km 92,446; Bridge km 92,508; Culvert km 92,593; Culvert km 92,772; Culvert km 92,961
Chainage		km	88 +000; 88 +200; 88 +400; 88 +600; 88 +800	89 +000; 89 +200; 89 +400; 89 +600; 89 +800	90 +000; 90 +200; 90 +400; 90 +600; 90 +800	91 +000; 91 +200; 91 +400; 91 +600; 91 +800	92 +000; 92 +200; 92 +400; 92 +600; 92 +800
Layout			159; 160; 161	162; 163	164; 165; 166; 167; 168	169; 170	171; 172; 173; 174
Width of Carriageway		m	5,00	5,00	5,00	5,00; 5,00	5,00
Width of Shoulders	L	m	1,00	1,00	1,00	1,00; 1,00	1,00
	R	m	1,00	1,00	1,00	1,00; 1,00	1,00
Rise/Fall +/-		%	1.8/5.2 4,4 2.6/1.8 4.4/-1.8 2,6	4.4/3.5	4,4 -1,8	5,2 6,1 0,9	2.6/4.4 2,6 3,5
Roughness (IRI)	< 4.0	m/km					
	> 4.0 - 6.0	m/km					
	> 6.0 - 8.5	m/km					
	> 8.5 - 10.5	m/km					
	> 10.5 - 12.0	m/km					
	> 12.0	m/km					
Surface Condition	Cracks	%	0.0/0.0 0,0 0,0	0.0/0.0/0.0 0.0/0.0 0,0	0,0 0,0 0.0/0.0 0,0 0,0	0,0	0,0 0,0
	Alligator Cracks	%	0.0/0.0 0,0 0,0	0.0/0.0/0.0 0.0/0.0 0,0	0,0 0,0 0.0/0.0 0,0 0,0	0,0	0,0 0,0
	Potholes	%	43.6/99.1 77.6 97,9	43.1/97.8/74.4 96.6/62.2 99.2	42,9 99,3 60.0/98.7 77.7 98,8	56,4	93,9 98,6
	Settlement	%	0.0/0.0 0,0 0,0	0.0/0.0/0.0 0.0/0.0 0,0	0,0 0,0 0.0/0.0 0,0 0,0	0,0	0,0 0,0
	Rutting	%	0.0/0.0 0,0 0,0	0.0/0.0/0.0 0.0/0.0 0,0	0,0 0,0 0.0/0.0 0,0 0,0	0,0	0,0 0,0
Pavement Structure	New	mm	Reconstruction				
	Existing	mm					



Feasibility Study for Road Rehabilitation in Georgia

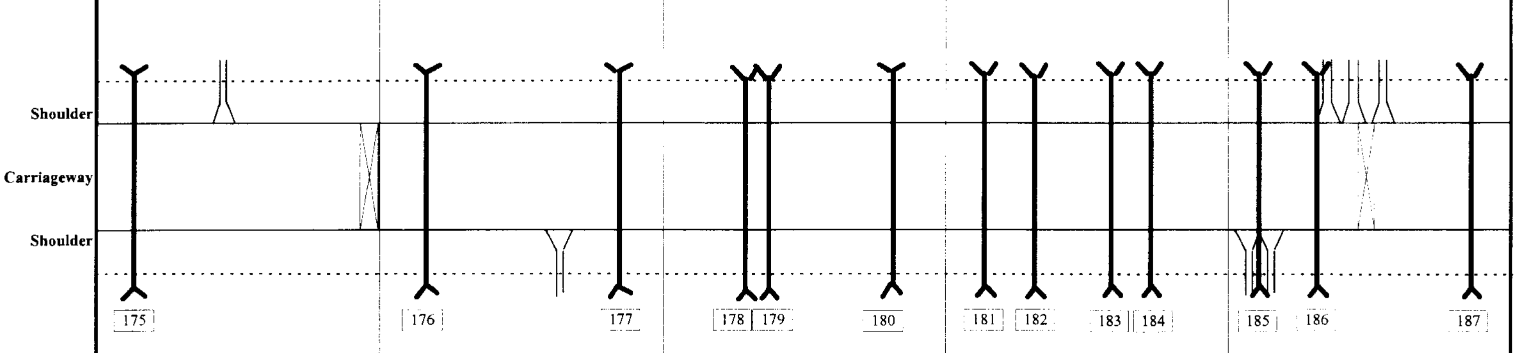
Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS INGENIEURE

Section: S 6; km 93+000 to km 98+000

			km 93	km 94	km 95	km 96	km 97
Location			Culvert km 93,132; Junction km 93,437; Bridge km 93,959	Culvert km 94,188; Junction km 94,628; Culvert km 94,838	Culvert km 95,306; Culvert km 95,383; Culvert km 95,802	Culvert km 96,146; Culvert km 96,320; Culvert km 96,598; Culvert km 96,728	Junction km 97,077; Culvert km 97,105; Junction km 97,146; Culvert km 97,323; Junction km 97,367; Junction km 97,431; Bridge km 97,463; Junction km 97,545; Culvert km 97,855
Chainage		km	93 +000; 93 +200; 93 +400; 93 +600; 93 +800	94 +000; 94 +200; 94 +400; 94 +600; 94 +800	95 +000; 95 +200; 95 +400; 95 +600; 95 +800	96 +000; 96 +200; 96 +400; 96 +600; 96 +800	97 +000; 97 +200; 97 +400; 97 +600; 97 +800
Width of Carriageway		m	5,00	5,00	7,00 / 5,00	7,00	12,00; 9,50
Width of Shoulders	L	m	1,00	1,00	2,00 / 1,00	2,00	1,50; 1,50
	R	m	1,00	1,00	2,00 / 1,00	2,00	1,50; 1,50
Rise/Fall +/-		%	4,4; 0,9	2,6; 5,2; 2.6/4.4; 2,6	4,4	2,6	1,8; 3,5; 4,4; 2,6
Roughness (IRI)	< 4.0	m/km					
	> 4.0 - 6.0	m/km					
	> 6.0 - 8.5	m/km					
	> 8.5 - 10.5	m/km					
	> 10.5 - 12.0	m/km					
	> 12.0	m/km					
Surface Condition	Cracks	%	0.0/0.0	0,0; 0,0; 0.0/0.0	0.0/0.0; 0,0; 0,0	0,0	
	Alligator Cracks	%	0.0/0.0	0,0; 0,0; 0.0/0.0	0.0/0.0; 0,0; 0,0	0,0	
	Potholes	%	97.9/67.1 99.5	65,9; 98,0; 54.3/99.4	30.4/71.8 96.9; 59,8	99,9	
	Settlement	%	0.0/0.0	0,0; 0,0; 0.0/0.0	0.0/0.0; 0,0; 0,0	0,0	
	Rutting	%	0.0/0.0	0,0; 0,0; 0.0/0.0	0.0/0.0; 0,0; 0,0	0,0	
Pavement Structure	New	mm	Reconstruction				
	Existing	mm	60 Wearing course; 100 Granular base course; Sub-grade - weathered volcanic				

Layout



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi - Marneuli - Guguti (Armenian Border) (S 6)

KOCKS
INGENIEURE

Section: S 6; km 98+000 to km 99+090

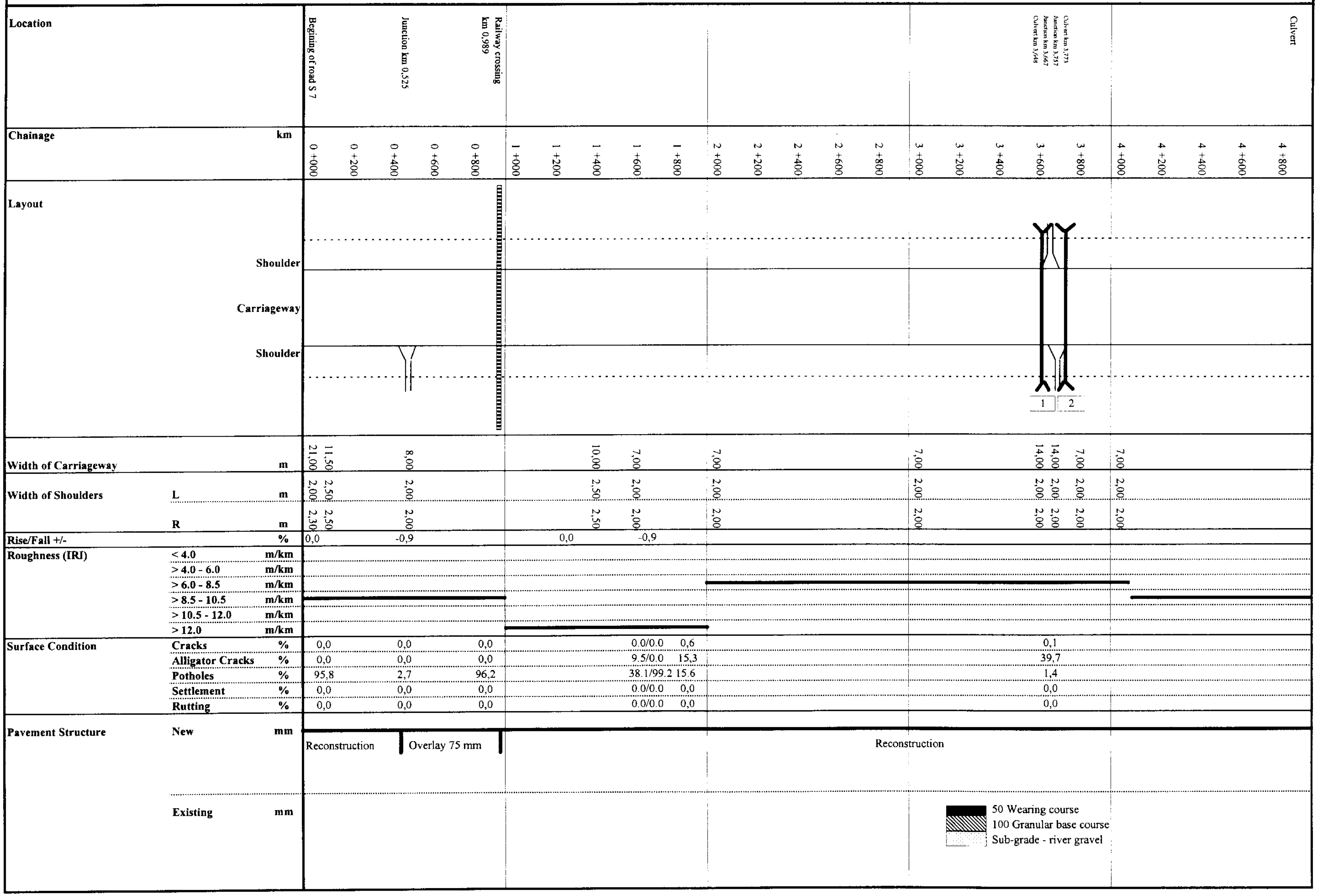
Location			Bridge km 98,195	Junction km 98,312 Bridge km 98,334			Culvert km 99,079 End of road km 99,090	
Chainage		km	98 +000	98 +200	98 +400	98 +600	98 +800	99 +000
Layout								
	Shoulder							
	Carriageway							
	Shoulder							
								188
Width of Carriageway		m		9,50	8,00			8,00
Width of Shoulders	L	m		2,00	1,50			2,00
	R	m		2,00	1,50			2,00
Rise/Fall +/-		%	6,1		4,4	2,6		
Roughness (IRI)	< 4.0	m/km						
	> 4.0 - 6.0	m/km						
	> 6.0 - 8.5	m/km						
	> 8.5 - 10.5	m/km						
	> 10.5 - 12.0	m/km						
	> 12.0	m/km						
Surface Condition	Cracks	%				0,0	0,0	
	Alligator Cracks	%				28,2	0,0	
	Potholes	%				0,0	98,6	
	Settlement	%				0,0	0,0	
	Rutting	%				0,0	0,0	
Pavement Structure	New	mm						
						Reconstruction		
	Existing	mm						

Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS INGENIEURE

Section: S 7; km 0+000 to km 5+000

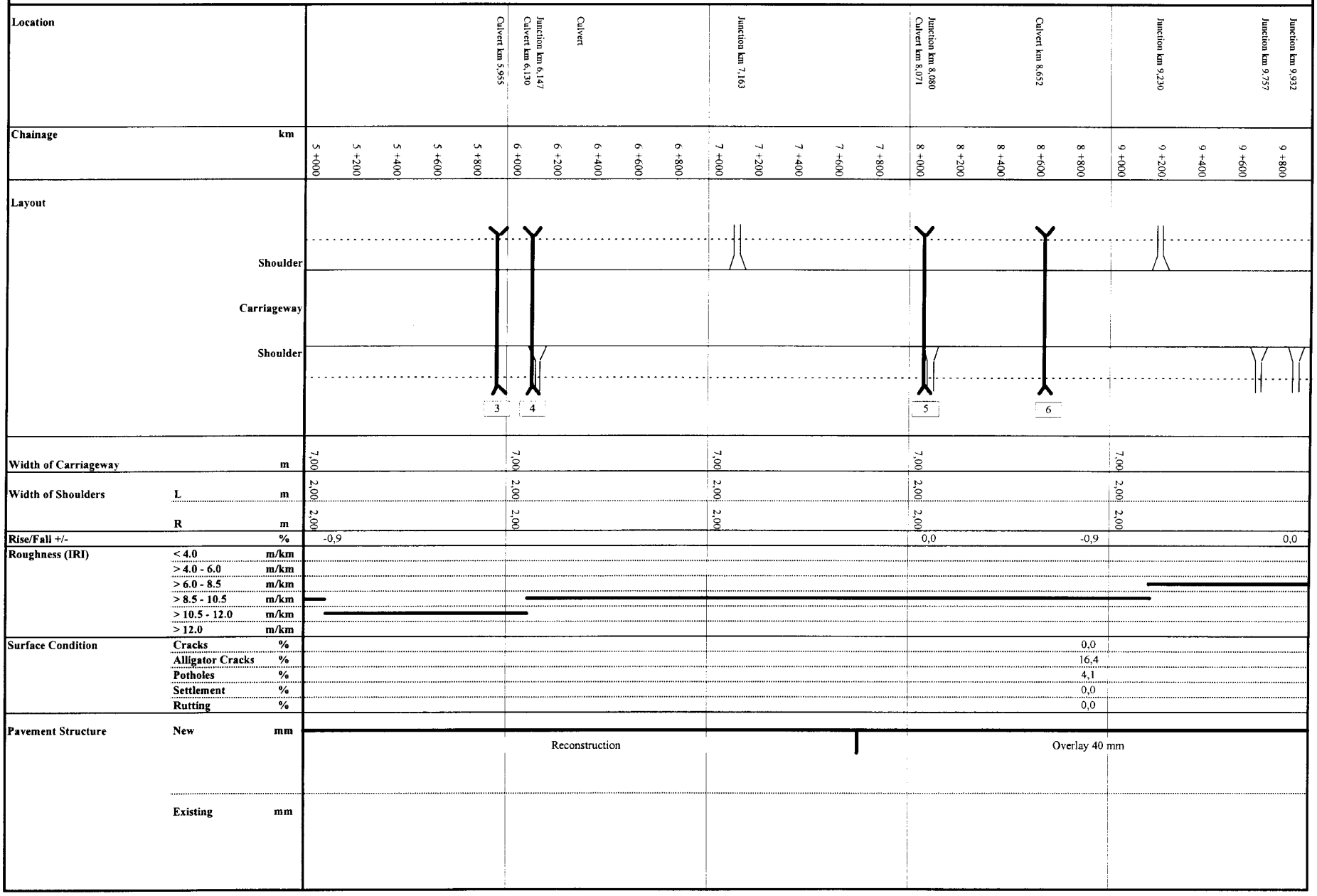


Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS
INGENIEURE

Section: S 7; km 5+000 to km 10+000



Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS
INGENIEURE

Section: S 7; km 10+000 to km 15+000

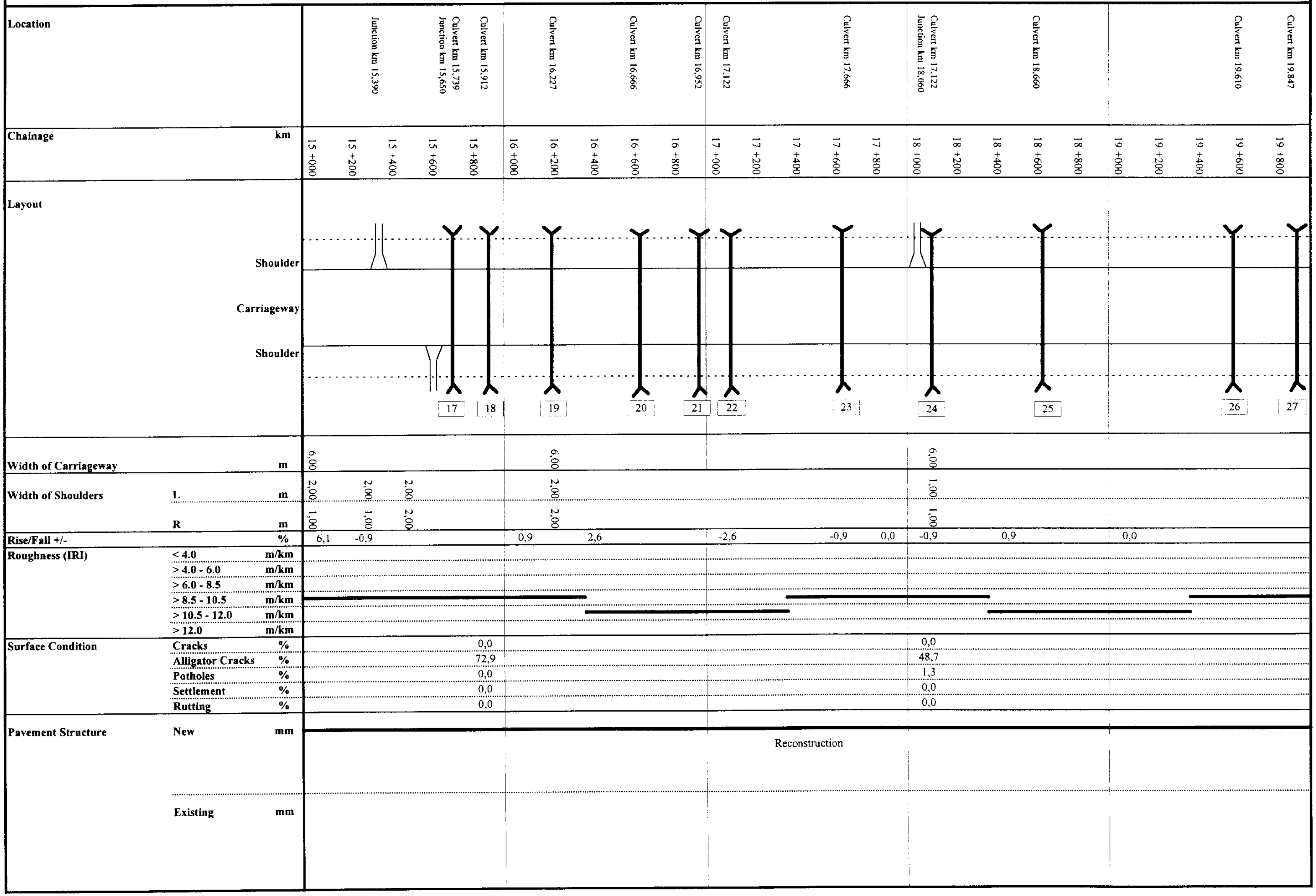
Location			Bridge km 10,149 / Culvert km 10,300 / Junction km 10,390 / Br. over km 10,366 / Junction km 10,502 / Culvert km 10,521 / Culvert km 10,583 / Culvert / Junction km 10,817 / Culvert km 10,821 / Junction km 10,900 / Junction km 11,000 / Culvert km 11,081 / Bridge 11,563 / Culvert km 12,584 / Culvert km 12,767 / Culvert km 13,680 / Junctions km 13,720 / Culvert km 13,797 / Junction km 13,840 / Junction km 14,232 / Junction km 14,500 / Junction km 14,758 / Junction km 14,990 / Culvert km 14,928
Chainage		km	10 +000 / 10 +200 / 10 +400 / 10 +600 / 10 +800 / 11 +000 / 11 +200 / 11 +400 / 11 +600 / 11 +800 / 12 +000 / 12 +200 / 12 +400 / 12 +600 / 12 +800 / 13 +000 / 13 +200 / 13 +400 / 13 +600 / 13 +800 / 14 +000 / 14 +200 / 14 +400 / 14 +600 / 14 +800
Layout			Shoulder / Carriageway / Shoulder; 7	8	9	10	11	12	13	14	15	16
Width of Carriageway		m	7,00 / 6,00 / 6,00 / 6,00 / 6,00 / 6,00 / 6,00
Width of Shoulders	L	m	2,00 / 2,00 / 2,00 / 2,00 / 1,00 / 1,00 / 1,00
	R	m	2,00 / 2,00 / 1,20 / 1,20 / 1,00 / 1,00 / 1,00
Rise/Fall +/-		%	1,8 / -0,9 / 0,9 / -0,9 / 0,0 / 4,4 / -0,9 / 0,0 / -4,4 / 1,8
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	Cracks	%	0,0 / 0,0 / 0,0
	Alligator Cracks	%	36,4 / 32,7 / 50,8
	Potholes	%	0,9 / 1,2 / 1,0
	Settlement	%	0,0 / 0,0 / 0,0
	Rutting	%	0,0 / 0,0 / 0,0
Pavement Structure	New	mm	Overlay 40 mm / Reconstruction
	Existing	mm	60 Wearing course; 200 Granular base course; Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS INGENIEURE

Section: S 7; km 15+000 to km 20+000

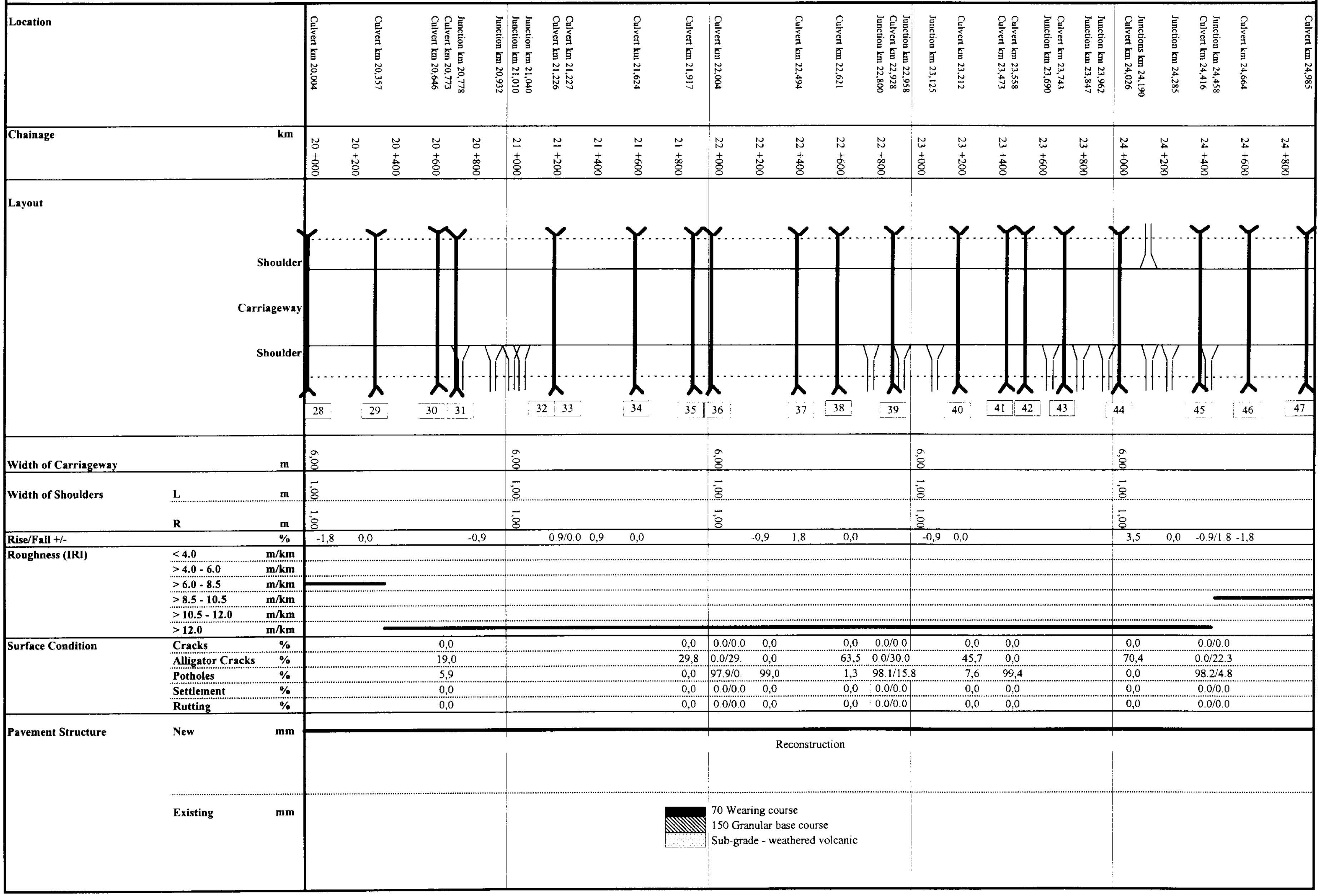


Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS INGENIEURE

Section: S 7; km 20+000 to km 25+000



Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

Section: S 7; km 25+000 to km 30+000

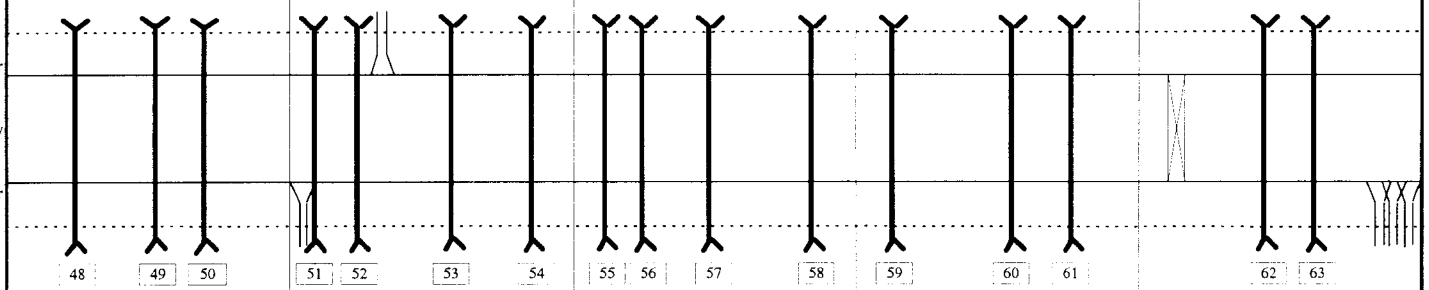
KOCKS
INGENIEURE

Location

Location
Culvert km 25,238
Culvert km 25,519
Culvert km 25,694
Junction km 26,055
Culvert km 26,076
Culvert km 26,226
Junctions km 26,322
Culvert km 26,578
Culvert km 26,852
Culvert km 27,104
Culvert km 27,234
Culvert km 27,472
Culvert km 27,834
Culvert km 28,134
Culvert km 28,566
Culvert km 28,757
Bridge km 29,142
Culvert km 29,388
Culvert km 29,607
Junction km 29,840
Junction km 29,883
Junction km 29,964

Chainage (km): 25 +000, 25 +200, 25 +400, 25 +600, 25 +800, 26 +000, 26 +200, 26 +400, 26 +600, 26 +800, 27 +000, 27 +200, 27 +400, 27 +600, 27 +800, 28 +000, 28 +200, 28 +400, 28 +600, 28 +800, 29 +000, 29 +200, 29 +400, 29 +600, 29 +800

Layout



Segment	km 25	km 26	km 27	km 28	km 29
Width of Carriageway (m)	6,00	6,00	6,00	6,00	6,00
Width of Shoulders L (m)	1,00	2,00	2,00	2,00	2,00
Width of Shoulders R (m)	1,00	2,00	2,00	2,00	2,00

Rise/Fall +/- (%): 3,5; -2.6/2.6; -1,8; 0,9; 0,0; 0,9; 0,0; -0,9; 0,0; -0,9; 0,9

Roughness (IRI): < 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition

	%															
Cracks	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0
Alligator Cracks	43,5	0,0	64,1	0,0	66,9	10.5/0.	13,0	0.0/13.	0,0	33.3/0.	18,5	0,0	17,6	0,0	0,0	0,0
Potholes	3,0	99,4	7,7	98,1	14,4	0.5/99.	0,0	98.3/0.	97,8	0.0/97.	0,0	99,2	0,0	98,7	4,2	99,4
Settlement	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0
Rutting	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0

Pavement Structure

New (mm): Reconstruction; Overlay 100 mm; Reconstruction; Overlay 100 mm; Reconstruction

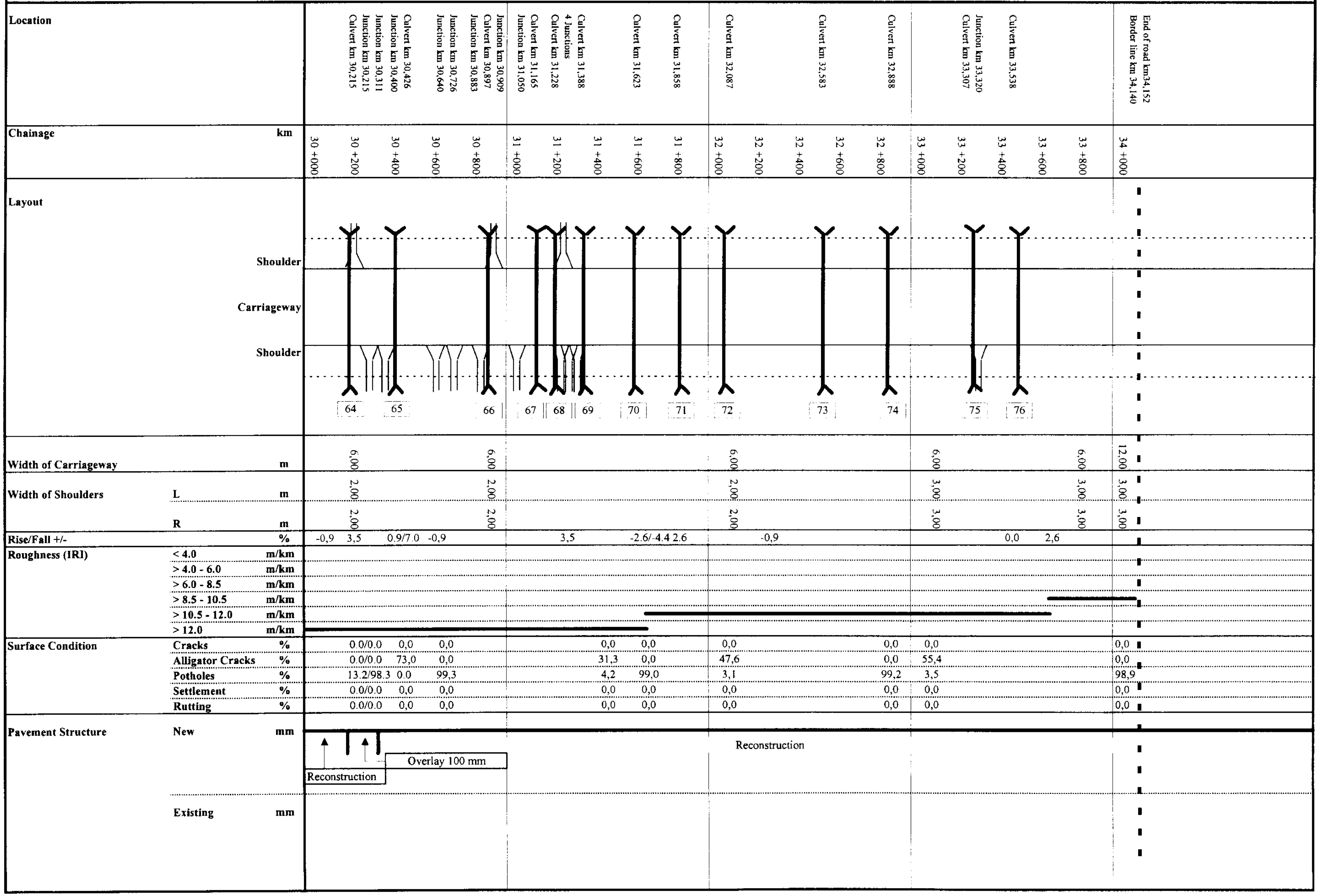
Existing (mm):
70 Wearing course
230 Granular base course
Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Marnauli - Sadakhlo / Armenian Border (S 7)

KOCKS INGENIEURE

Section: S 7; km 30+000 to km 35+000



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

KOCKS INGENIEURE

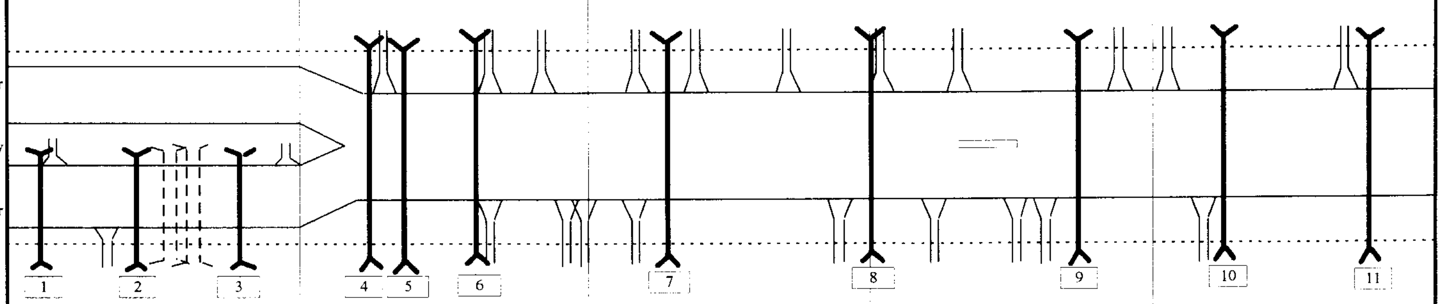
Section: S 9; km 0+000 to km 5+000

Location

- Junction km 0,178
- Culvert km 0,141
- Junction km 0,285
- Bridge over S9 km 0,572
- Culvert km 0,452
- Culvert km 0,796
- Bridge over, km 0,652
- Junction km 0,980
- Junction km 1,188
- Culvert km 1,236
- Junction km 1,260
- Culvert km 1,323
- Junctions km 1,635
- Culvert km 1,601
- Junction km 1,840
- Junction km 1,940
- Junction km 1,974
- Junctions km 2,169
- Culvert km 2,283
- Junction km 2,385
- Junction km 2,700
- Junction km 2,897
- Culvert km 3,000
- Junction km 3,020
- Junction km 3.218
- Junction km 3,327
- Junction km 3,522
- Junction km 3,608
- Culvert km 3,734
- Junction km 3,881
- Junction km 4,038
- Junction km 4,194
- Culvert km 4,245
- Junction km 4,675
- Culvert km 4,775

Chainage (km): 0 +000, 0 +200, 0 +400, 0 +600, 0 +800, 1 +000, 1 +200, 1 +400, 1 +600, 1 +800, 2 +000, 2 +200, 2 +400, 2 +600, 2 +800, 3 +000, 3 +200, 3 +400, 3 +600, 3 +800, 4 +000, 4 +200, 4 +400, 4 +600, 4 +800

Layout



Width of Carriageway (m) / **Width of Shoulders** L (m), R (m)

Approx. chainage	Width of Carriageway (m)	Shoulder L (m)	Shoulder R (m)
0+000	9,00	4,00	2,00
0+200	8,20	3,00	3,20
1+000	9,50	2,00	2,00
1+200	12,70		
1+900	14,00	2,00	2,00
2+000	14,50	2,00	2,50
2+900	9,80	3,00	3,30
3+050	15,00	2,25	2,80
3+200	15,00		
3+300	9 + 9	2,25	3,30
3+450	12 + 15	2,25	3,30
3+600	37,00	2,25	5,00
3+700	15,00	2,00	3,00
3+850	9,20	1,00	4,30
4+000	9,00	3,00	3,00
4+050	8,50	5,00	3,90
4+700	8,70	2,20	2,00

Rise/Fall +/- (%): -5,2 (0+000); 5,2 (1+000); 4,4; 1,8 (2+000); -0,9 (3+000); -5,2; 0.9/-2.6 -6.1; 0,0; 2,6

Roughness (IRI) (m/km): < 4.0; > 4.0 - 6.0; > 6.0 - 8.5; > 8.5 - 10.5; > 10.5 - 12.0; > 12.0
- km 0+000 – approx. 2+100: > 4.0 - 6.0
- approx. km 2+050 – 3+100: > 6.0 - 8.5
- approx. km 3+100 – 5+000: > 4.0 - 6.0

Surface Condition

	%	km 0+000–1+000			km 1+000–2+000	km 2+000–3+000	km 3+000–4+000		km 4+000–5+000
Cracks	%	0.5/0.9	0.1/1.6	0.1/1.5	0,3	0,3	1.0/1.5	1.0/1.6	0,0
Alligator Cracks	%	4.2/1.4	1.9/1.6	1.9/1.5	18,6	0,0	0.0/0.0	0.0/0.0	17,6
Potholes	%	0.0/0.0	0.1/0.0	0.1/0.0	0,5	62,5	9.7/0.8	9.7/0.7	4,9
Settlement	%	4.6/0.0	0.0/0.0	0.0/0.0	0,0	10,9	19.4/10.3	19.4/10.7	7,6
Rutting	%	0.0/0.0	0.0/0.0	0.0/0.0	0,0	0,0	0.0/0.0	0.0/0.0	0,0

Pavement Structure

New (mm): Overlay 40 mm (km 0+000 – 2+000); Reconstruction (km 2+000 – 5+000)

Existing (mm):
- 60 Wearing course
- 180 Binder coure
- 100 Granular base course
- 500 Sub-base
- Sub-grade - clay of moderate plasticity

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 5+000 to km 10+000

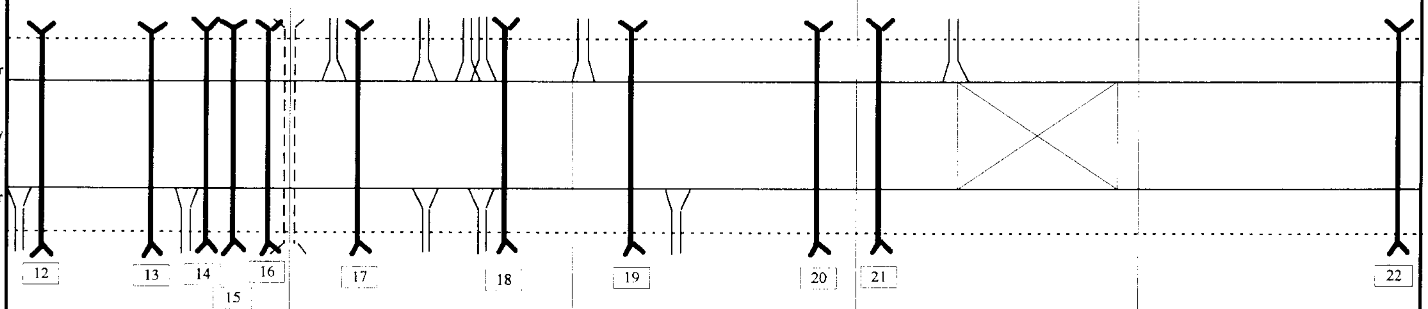
KOCKS INGENIEURE

Location

- Culvert km 5,130
- Junction km 5,059
- Culvert km 5,499
- Junction km 5,624
- Culvert km 5,700
- Culvert km 5,800
- Culvert km 5,929
- Pedestr.br.over 5,996
- Junction km 6,160
- Culvert km 6,227
- Junction km 6,462
- Junction km 6,481
- Junction km 6,629
- Junction km 6,657
- Culvert km 6,740
- Junction km 7,035
- Culvert km 7,200
- Junction km 7,390
- Culvert km 7,863
- Culvert km 8,073
- Junction km 8,352
- Bridge km 8,660
- Culvert km 9,914

Chainage (km): 5+000, 5+200, 5+400, 5+600, 5+800, 6+000, 6+200, 6+400, 6+600, 6+800, 7+000, 7+200, 7+400, 7+600, 7+800, 8+000, 8+200, 8+400, 8+600, 8+800, 9+000, 9+200, 9+400, 9+600, 9+800

Layout



Width of Carriageway (m)	Width of Shoulders L (m)	Width of Shoulders R (m)	at approx.
11,20	1,30	1,30	5+000
10,25	1,35	3,20	5+500
9,60	2,00	2,20	5+800
9,70	2,60	3,65	6+000
9,50	4,75	3,30	6+900
9,10	3,50	3,50	7+500
9,00	3,00	3,00	8+000

Rise/Fall +/- (%): 2,6; 7,0; 1,8; 0,0; 3,5; -1,8; 2,6; 1,8; 0,0; -1,8; 5,2; 0,0

Roughness (IRI): < 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition	km 5+000–6+000	km 6+000–7+000	near 8+000	km 9+000–10+000
Cracks %	0,8	0,1	2,5	0,2
Alligator Cracks %	0,0	0,5	2,9	4,1
Potholes %	0,2	0,5	2,7	0,0
Settlement %	7,5	29,0	12,0	4,0
Rutting %	0,0	0,0	0,0	0,0

Pavement Structure

New (mm): Reconstruction | Overlay 40 mm | Reconstruction | Overlay 40 mm | Reconstruction | Overlay 40 mm | Reconstruction

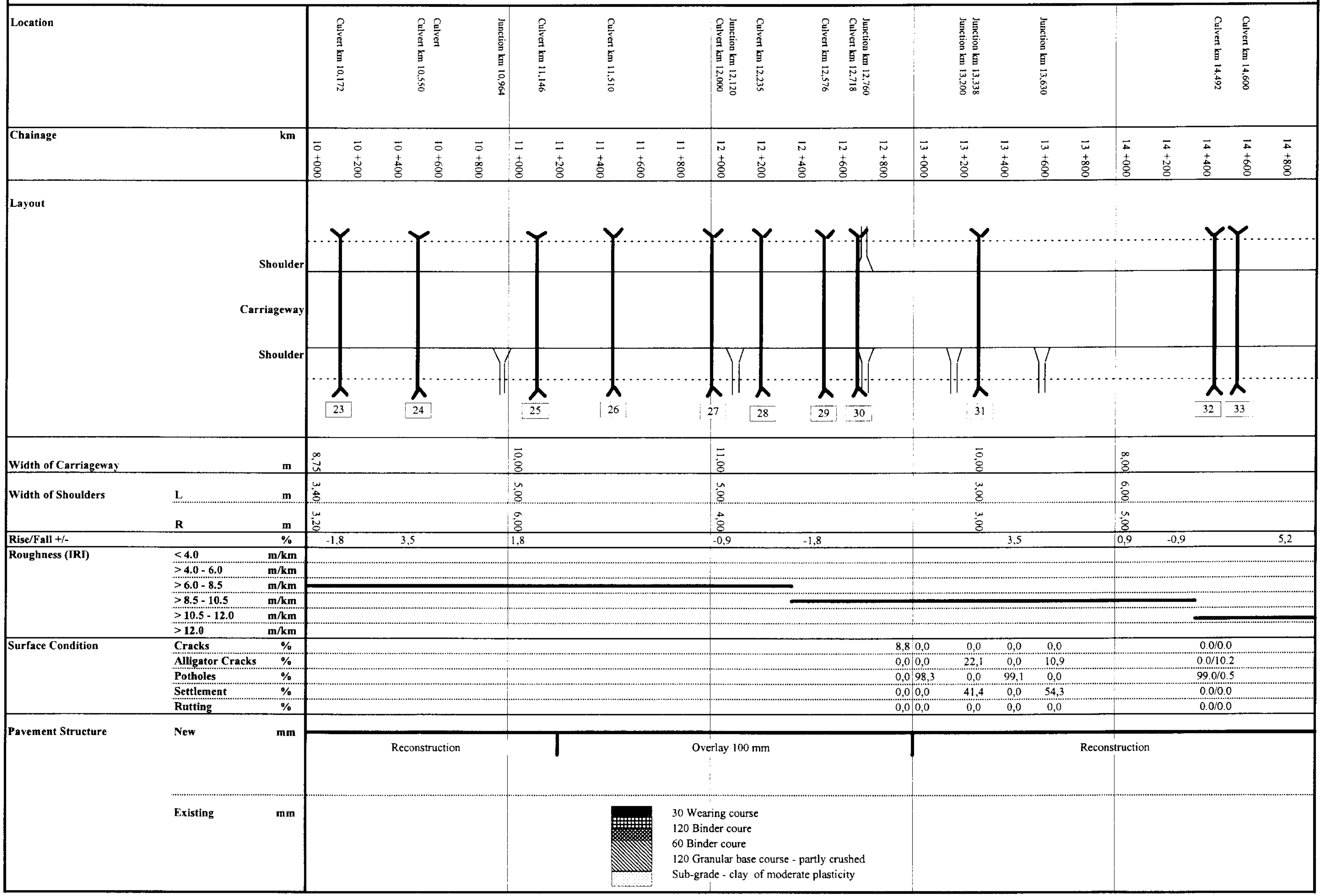
Existing (mm):

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 10+000 to km 15+000

KOCKS INGENIEURE

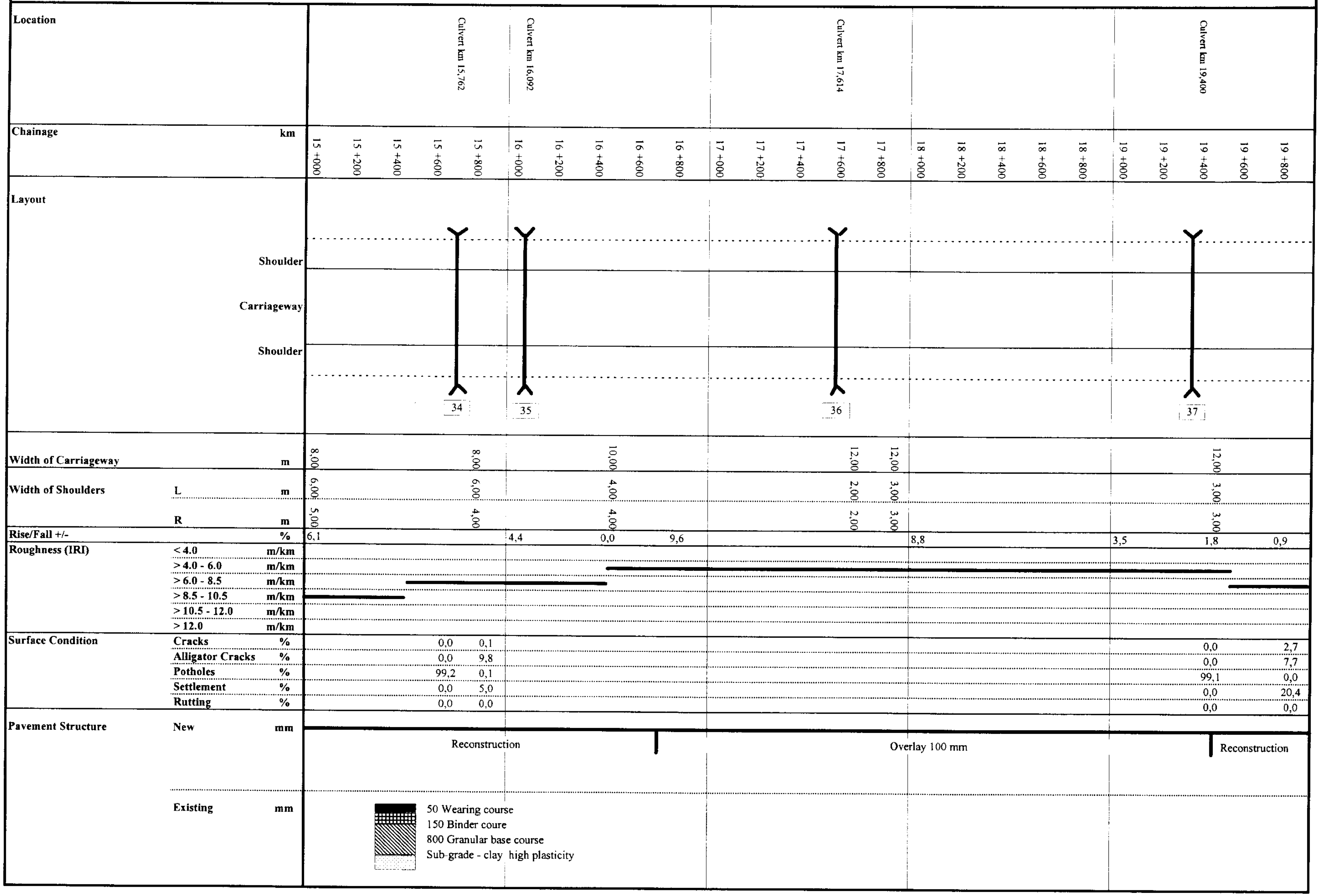


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 15+000 to km 20+000

KOCKS INGENIEURE

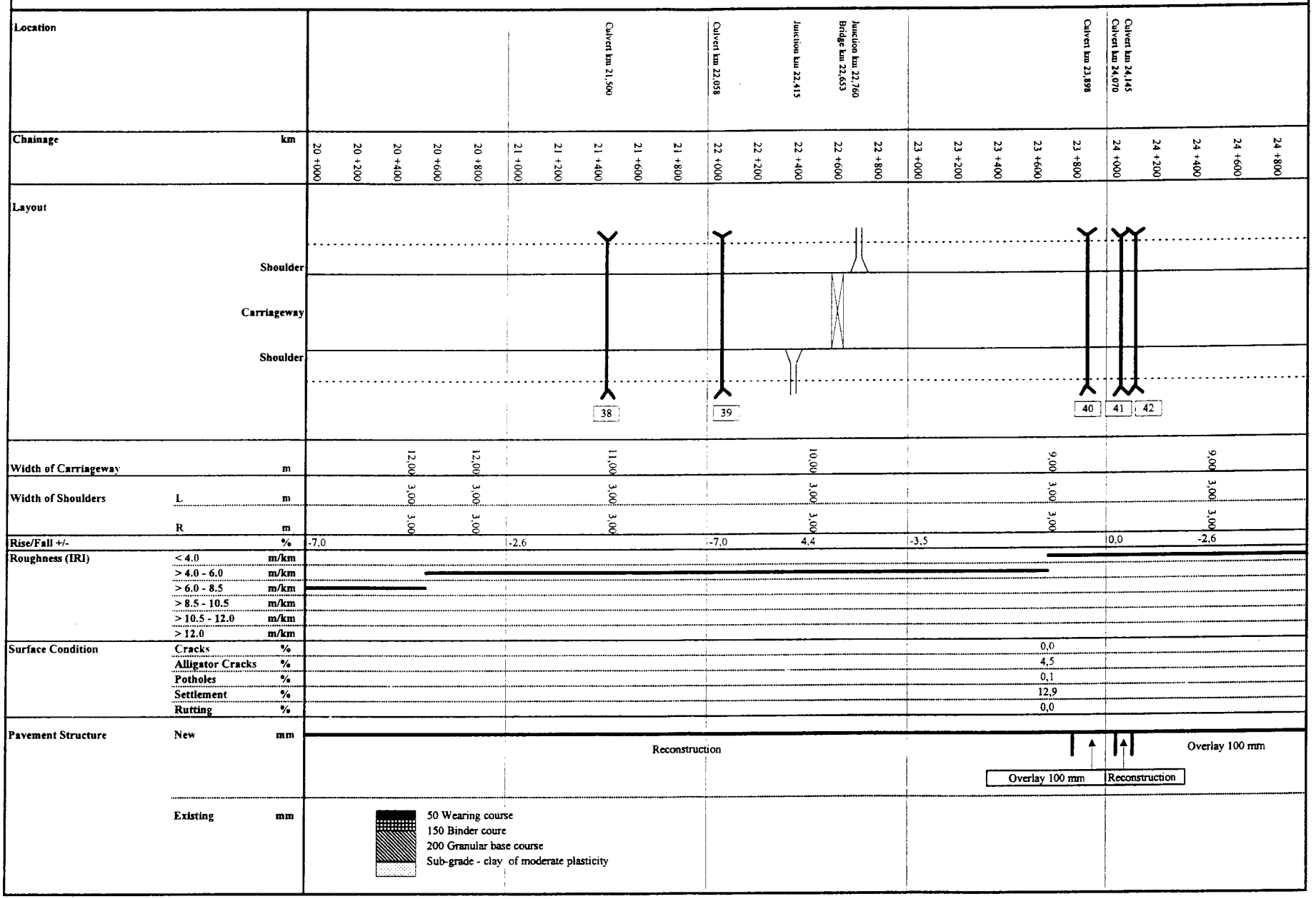


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 20+000 to km 25+000

KOCKS
INGENIEURE

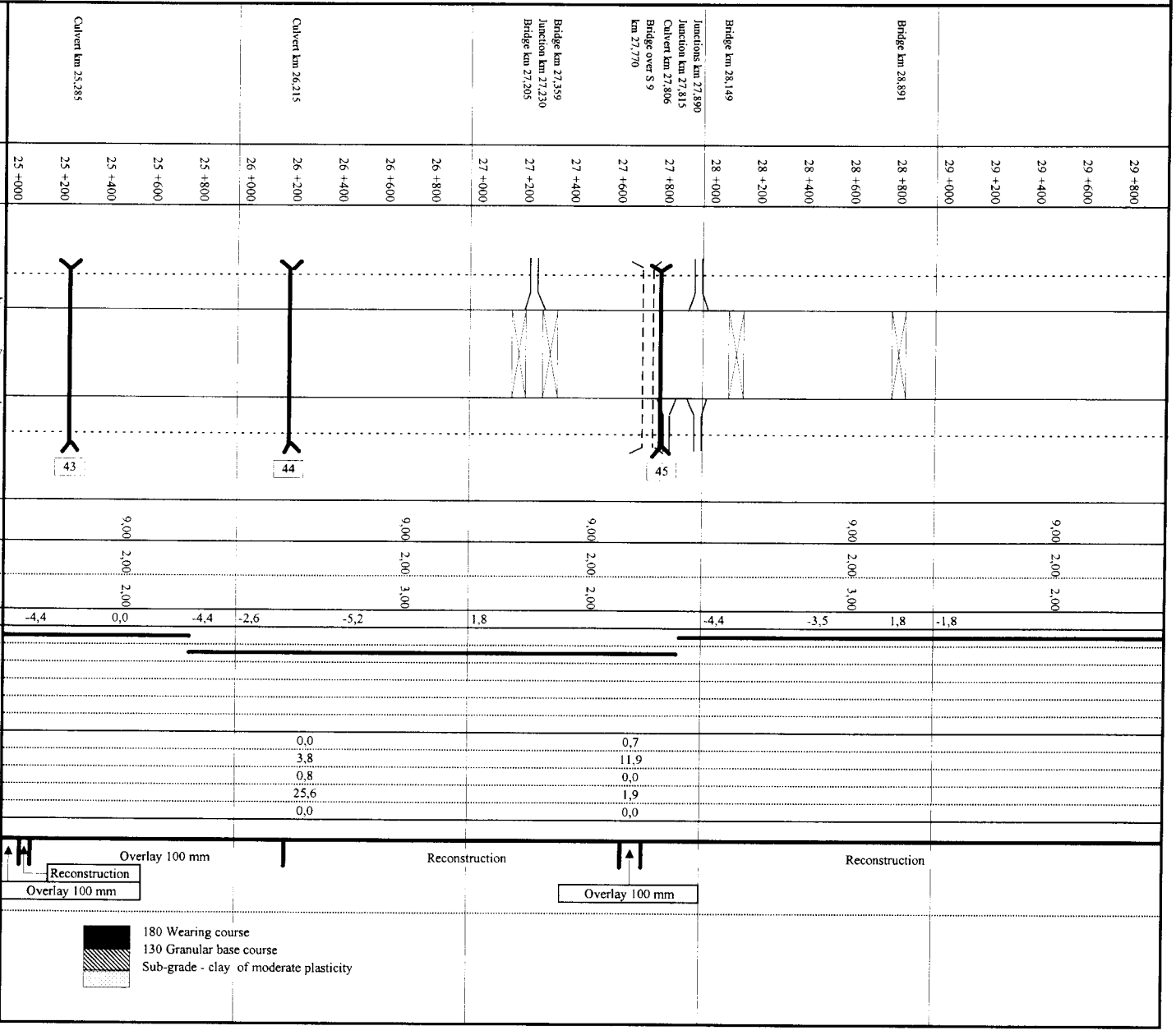


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 25+000 to km 30+000

KOCKS
INGENIEURE

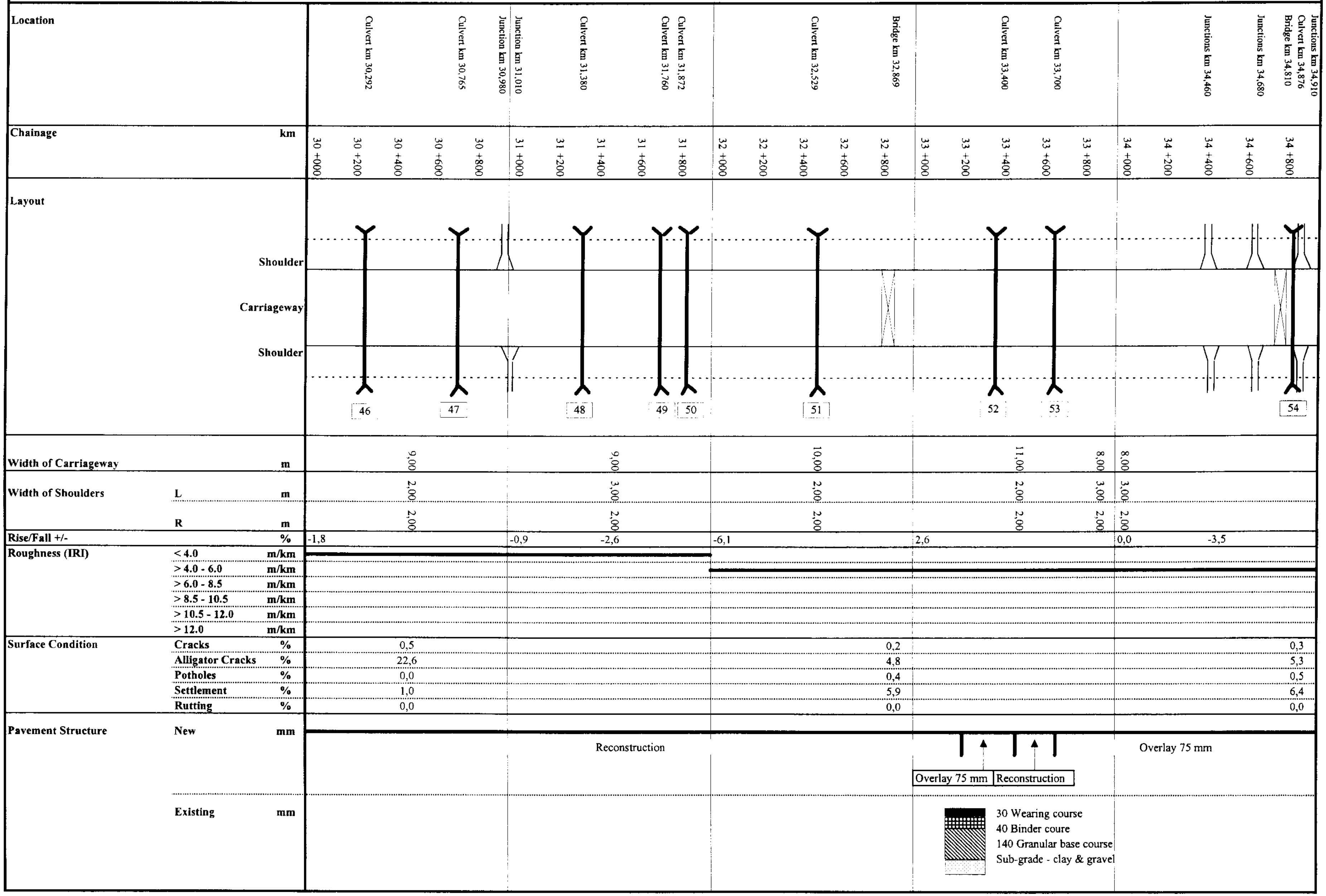


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 30+000 to km 35+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

KOCKS
INGENIEURE

Section: S 9; km 35+000 to km 40+000

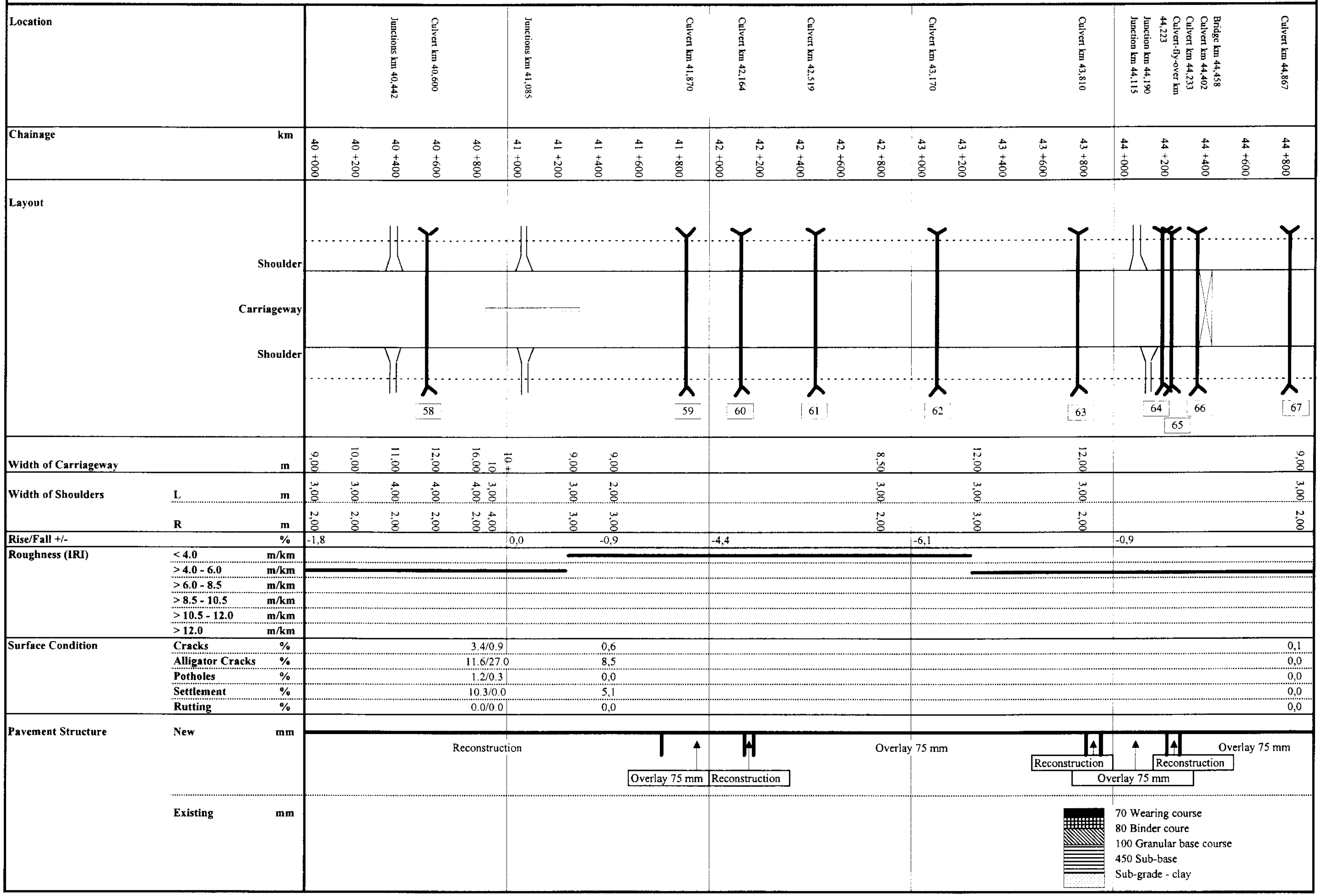
Location			Junctions km 35,160 · Junction km 36,731 Bridge km 36,705 · Culvert km 36,823 · Culvert km 37,894 · Culvert km 38,750 · Junction km 39,840
Chainage		km	35 +000 · 35 +200 · 35 +400 · 35 +600 · 35 +800 · 36 +000 · 36 +200 · 36 +400 · 36 +600 · 36 +800 · 37 +000 · 37 +200 · 37 +400 · 37 +600 · 37 +800 · 38 +000 · 38 +200 · 38 +400 · 38 +600 · 38 +800 · 39 +000 · 39 +200 · 39 +400 · 39 +600 · 39 +800
Layout			Shoulder · Carriageway · Shoulder; 55 · 56 · 57
Width of Carriageway		m	8,00 · 9,00 · 9,00 · 9,00 · 9,00 · 9,00
Width of Shoulders	**L**	m	3,00 · 3,00 · 3,00 · 3,00 · 3,00 · 3,00
	R	m	2,00 · 3,00 · 3,00 · 3,00 · 3,00 · 3,00
Rise/Fall +/-		%	-1,8
Roughness (IRI)	**< 4.0**	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	3,4
	Alligator Cracks	%	11,6
	Potholes	%	1,2
	Settlement	%	10,3
	Rutting	%	0,0
Pavement Structure	**New**	mm	Overlay 75 mm · Overlay 40 mm · Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

KOCKS INGENIEURE

Section: S 9; km 40+000 to km 45+000

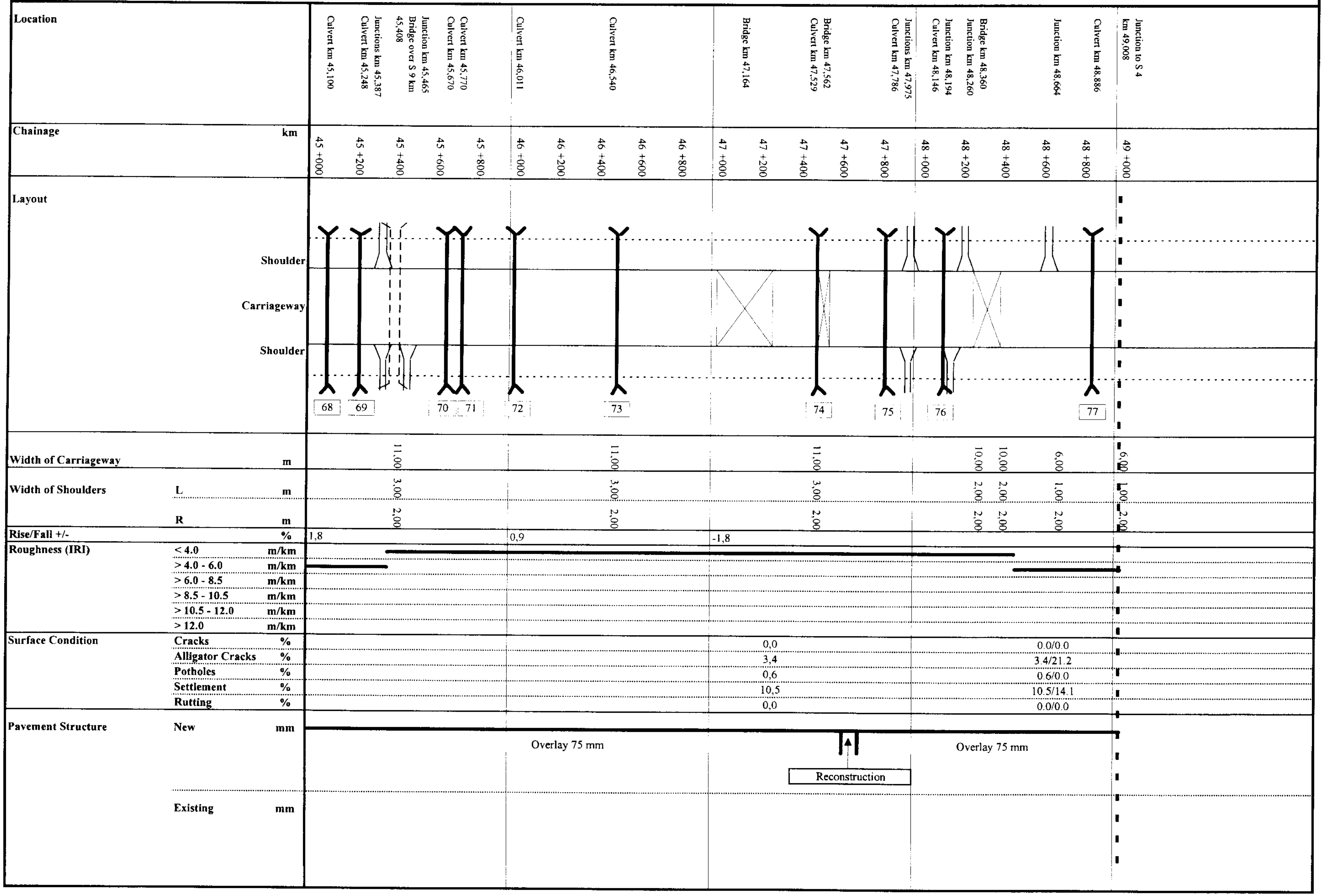


Feasibility Study for Road Rehabilitation in Georgia

Tbilisi By-pass (S 9)

Section: S 9; km 45+000 to km 50+000

KOCKS INGENIEURE

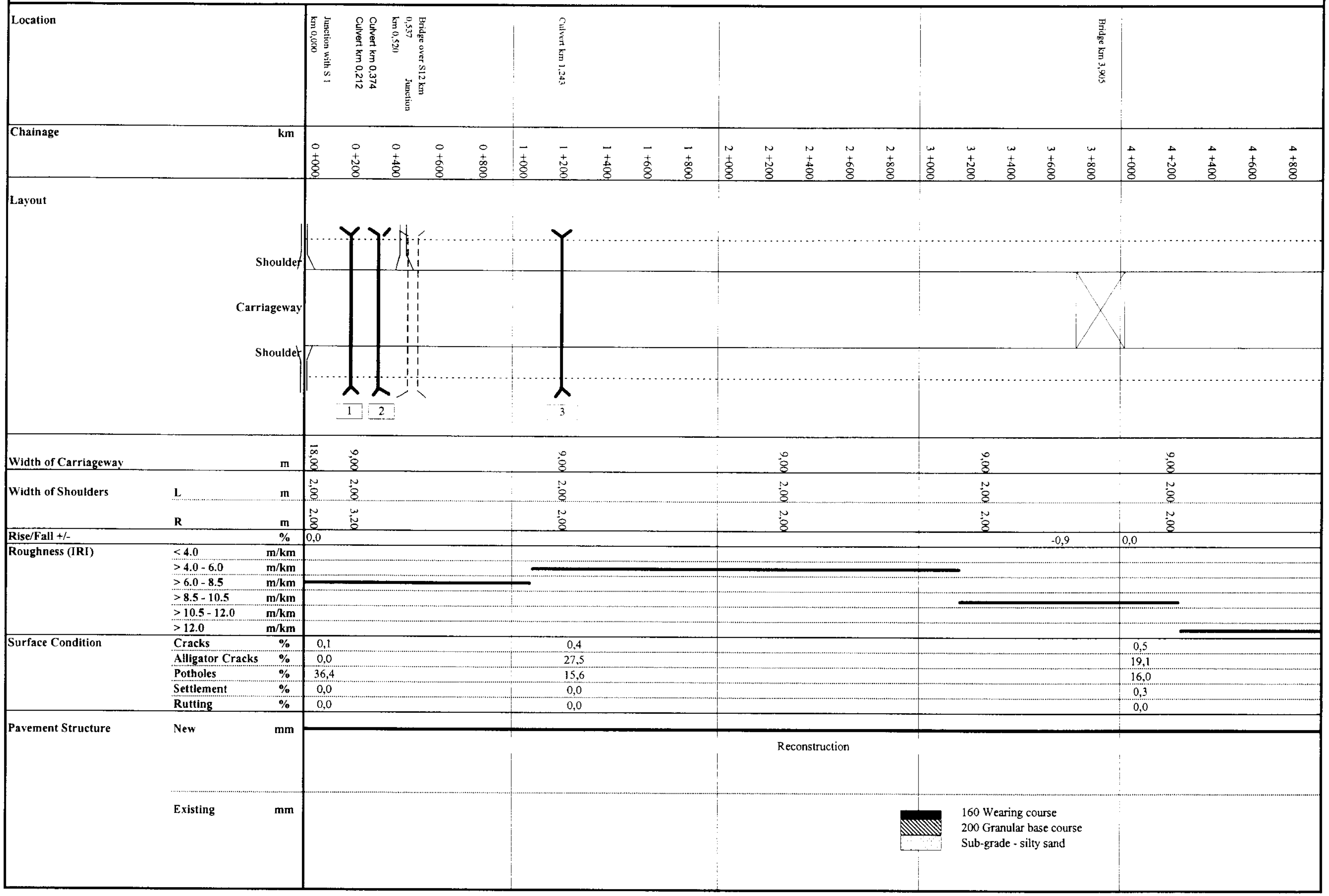


Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS INGENIEURE

Section: S 12; km 0+000 to km 5+000

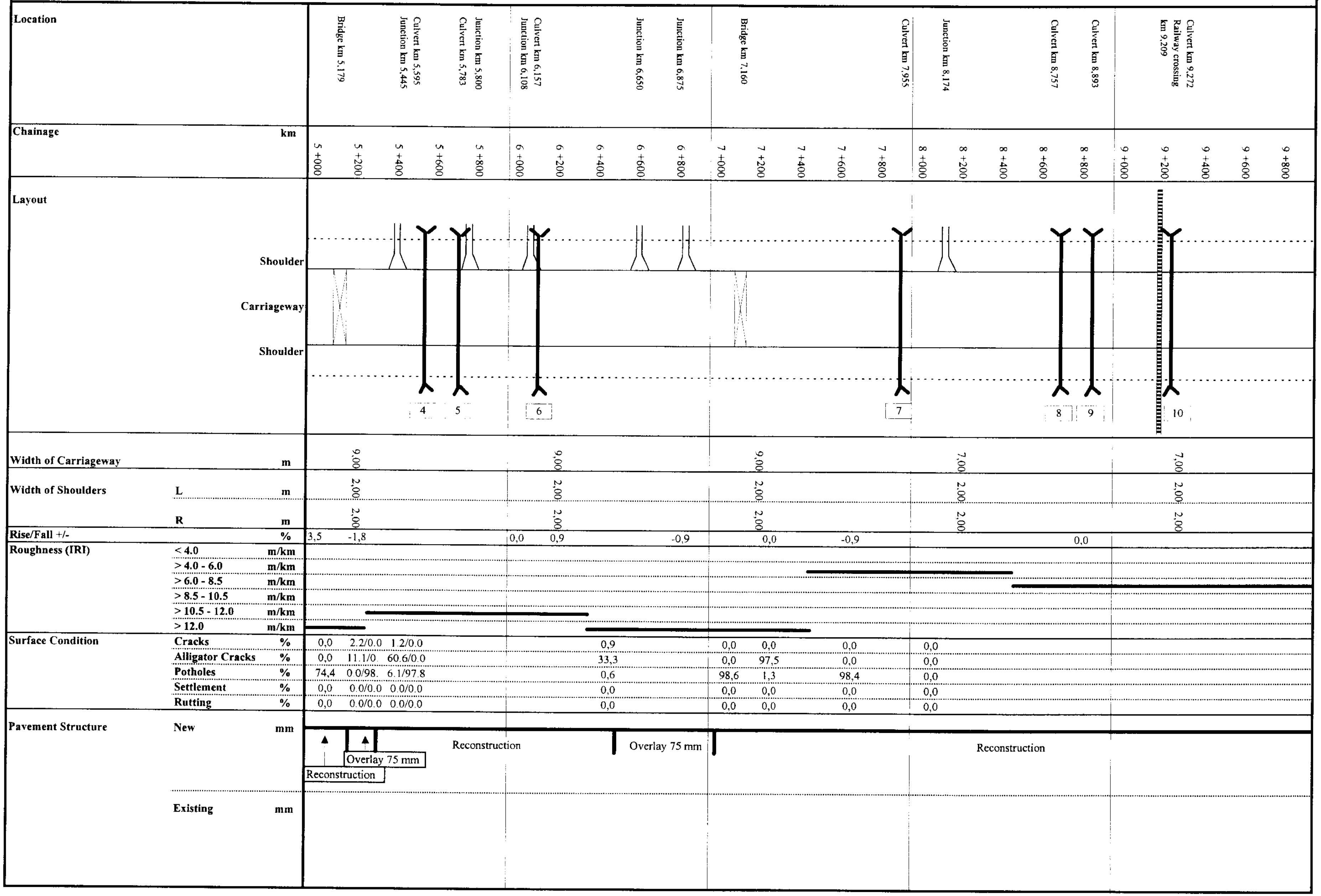


Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

Section: S 12; km 5+000 to km 10+000

KOCKS
INGENIEURE

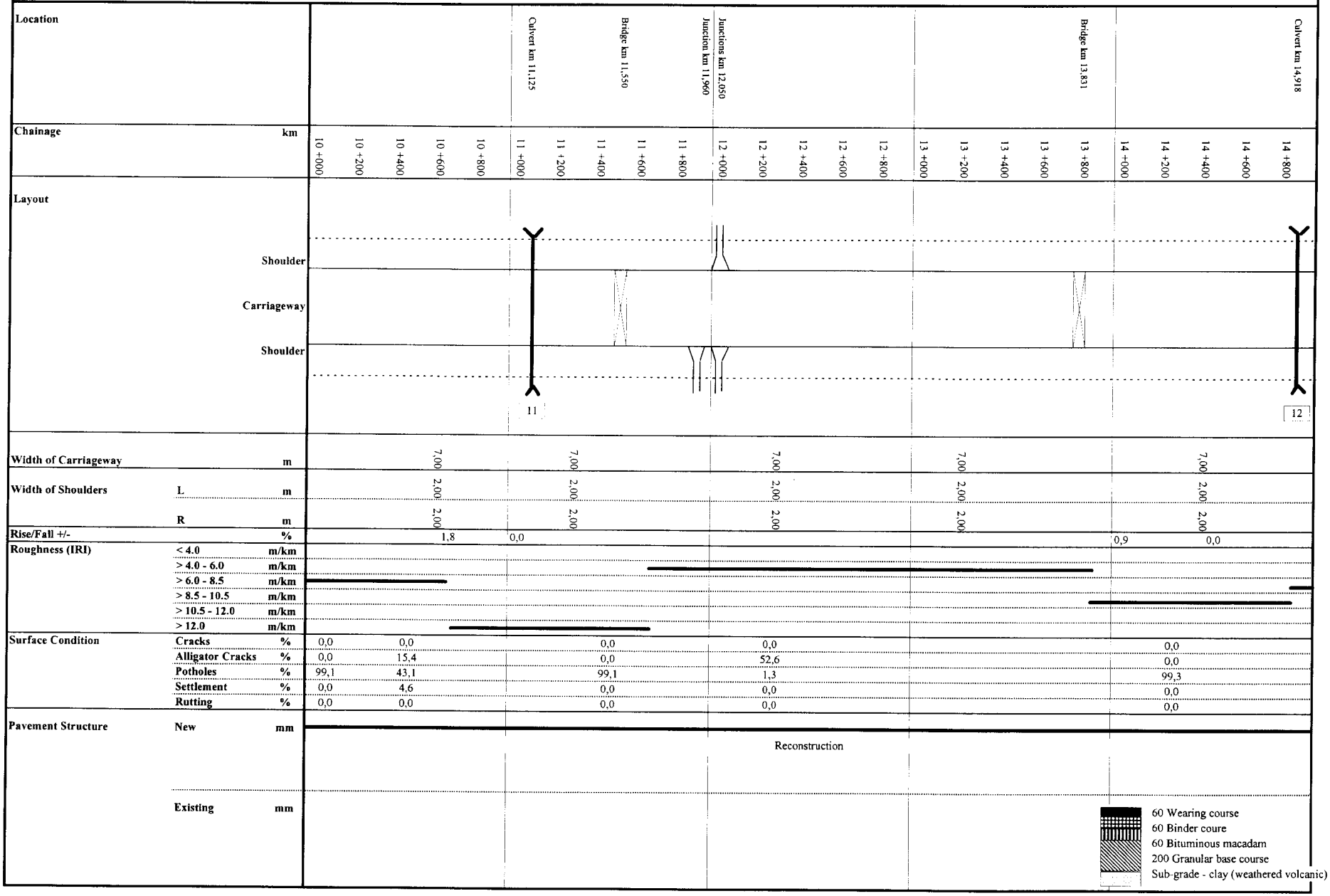


Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS
INGENIEURE

Section: S 12; km 10+000 to km 15+000

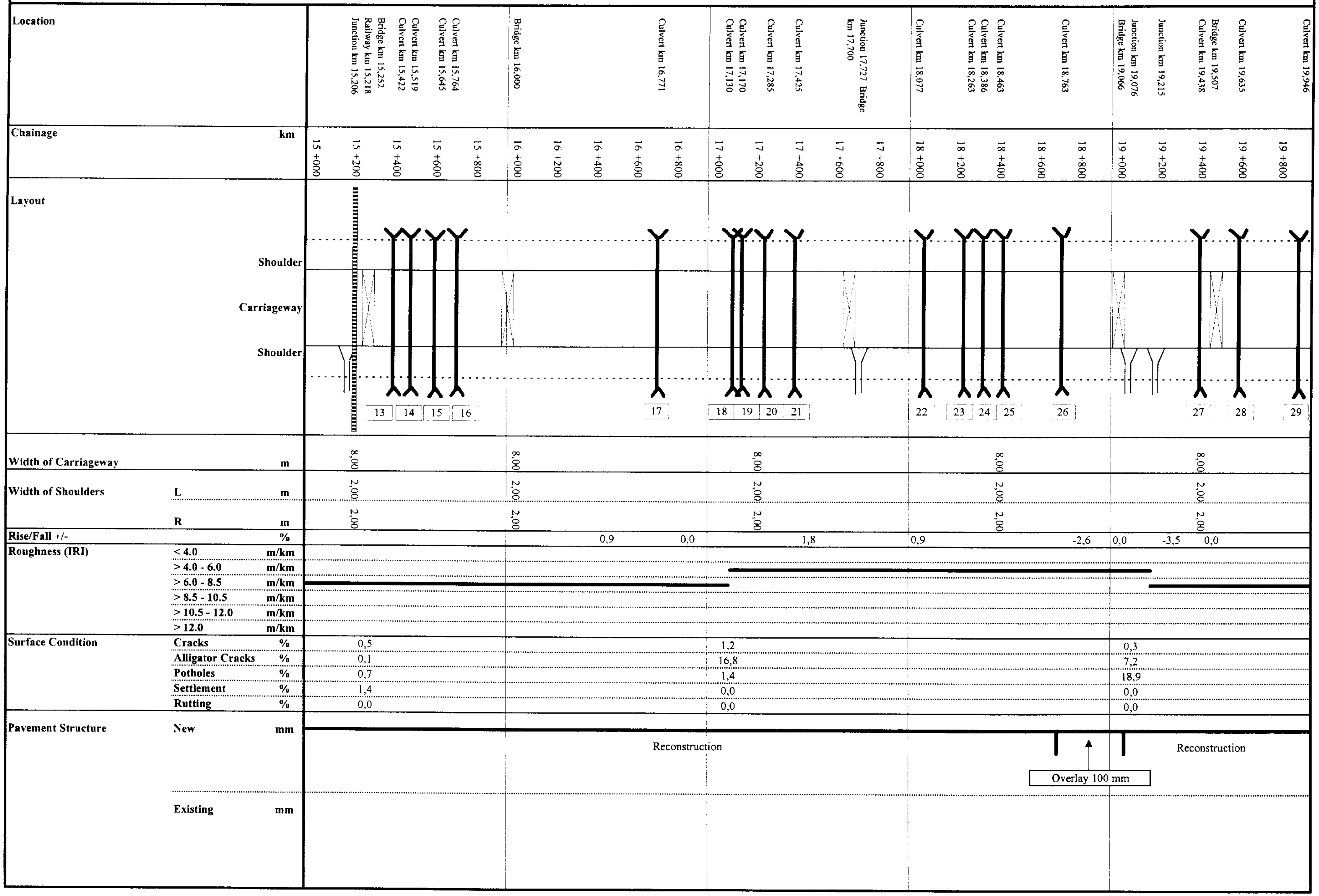


Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

Section: S 12; km 15+000 to km 20+000

KOCKS INGENIEURE



Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

Section: S 12; km 20+000 to km 25+000

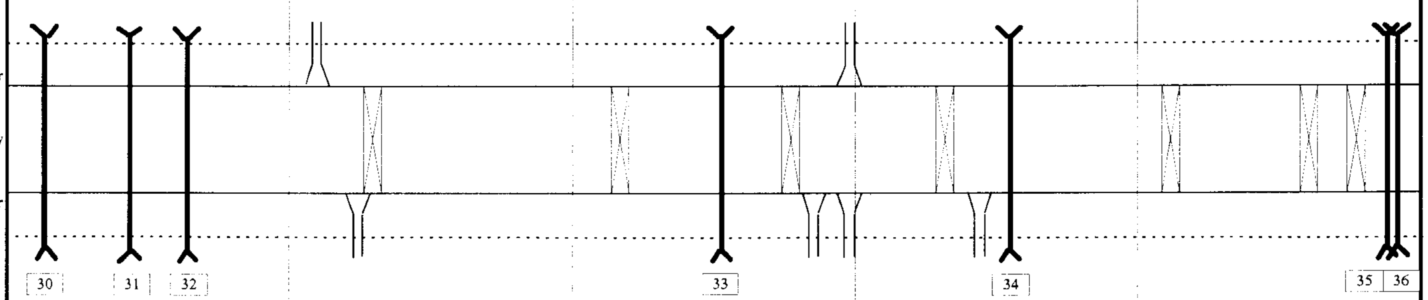
KOCKS INGENIEURE

Location

Chainage (km)	Location
20 +000 – 20 +200	Culvert km 20,135
20 +400	Culvert km 20,423
20 +600	Culvert km 20,625
21 +000 – 21 +200	Junction km 21,100
21 +200	Junction km 21,252
21 +200 – 21 +400	Bridge km 21,297
22 +200	Bridge km 22,188
22 +400 – 22 +600	Culvert km 22,540
22 +600 – 22 +800	Bridge km 22,786
22 +800 – 23 +000	Junction km 22,868
23 +000	Junctions km 22,980
23 +200 – 23 +400	Bridge km 23,306
23 +400 – 23 +600	Junction km 23,454
23 +600	Culvert km 23,556
24 +000 – 24 +200	Bridge km 24,113
24 +600	Bridge km 24,602
24 +800	Bridge km 24,778
24 +800 – 25 +000	Culvert km 24,880
24 +800 – 25 +000	Culvert km 24,900

Chainage (km): 20 +000, 20 +200, 20 +400, 20 +600, 20 +800, 21 +000, 21 +200, 21 +400, 21 +600, 21 +800, 22 +000, 22 +200, 22 +400, 22 +600, 22 +800, 23 +000, 23 +200, 23 +400, 23 +600, 23 +800, 24 +000, 24 +200, 24 +400, 24 +600, 24 +800

Layout



Section	Width of Carriageway (m)	Width of Shoulders L (m)	Width of Shoulders R (m)
km 20	8,00	2,00	2,00
km 21	7,00	2,00	2,00
km 22	7,00	2,00	2,00
km 23	7,00	2,00	2,00
km 24	7,00	2,00	2,00

Rise/Fall +/- (%)

Section	Values (in order of chainage)
km 20	-0,9
km 21	0,9; 1,8
km 22	0,0; 0,9
km 23	-1,8; 0,0; 0,9
km 24	-0,9; 0,0

Roughness (IRI): < 4.0 m/km; > 4.0 - 6.0 m/km; > 6.0 - 8.5 m/km; > 8.5 - 10.5 m/km; > 10.5 - 12.0 m/km; > 12.0 m/km

Surface Condition

	Unit	km 21	km 22 (end)	km 23 (start)	km 23
Cracks	%	0,2	0,0	0,7	0,2
Alligator Cracks	%	2,5	0,0	4,2	25,0
Potholes	%	16,5	98,7	14,0	14,2
Settlement	%	0,1	0,0	0,0	0,0
Rutting	%	0,0	0,0	0,0	0,0

Pavement Structure

	Unit	
New	mm	Reconstruction
Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS
INGENIEURE

Section: S 12; km 25+000 to km 30+000

Location			Bridge km 25,167 · Junctions km 25,510 · Culvert km 25,811 · Culvert km 25,820 · Culvert km 26,155 · Culvert km 26,072 · Bridge km 26,711 · Culvert km 26,907 · Culvert km 27,087 · Bridge km 27,348 · Culvert km 27,885 · Bridge km 27,892 · Culvert km 27,897 · Culvert km 31,174 · Junction km 28,410 · Culvert km 28,682 · Junction km 28,735 · Junction km 28,932 · Culvert km 29,119 · Culvert km 29,265 · Culvert km 29,417 · Junction km 29,480 · Bridge km 29,560 · Culvert km 29,930
Chainage		km	25 +000 · 25 +200 · 25 +400 · 25 +600 · 25 +800 · 26 +000 · 26 +200 · 26 +400 · 26 +600 · 26 +800 · 27 +000 · 27 +200 · 27 +400 · 27 +600 · 27 +800 · 28 +000 · 28 +200 · 28 +400 · 28 +600 · 28 +800 · 29 +000 · 29 +200 · 29 +400 · 29 +600 · 29 +800
Layout			Shoulder · Carriageway · Shoulder; 37 · 38 · 39 · 40 · 41 · 42 · 43 · 44 · 45 · 46 · 47 · 48 · 49
Width of Carriageway		m	7,00 · 7,00 · 7,00 · 8,00 · 12,00
Width of Shoulders	L	m	2,00 · 2,00 · 2,00 · 2,00 · 2,00
	R	m	2,00 · 2,00 · 2,00 · 2,00 · 2,00
Rise/Fall +/-		%	0,9 · 0,0 · -1,8 · 1,8 · -0,9 · 0,0 · 1,8 · 0,0
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	16,3 · 0,0 · 0,0 · 0,0
	Alligator Cracks	%	2,2 · 0,0 · 53,1 · 0,0
	Potholes	%	54,7 · 88,5 · 0,0 · 93,0
	Settlement	%	0,0 · 0,0 · 0,0 · 0,0
	Rutting	%	0,0 · 0,0 · 0,0 · 0,0
Pavement Structure	**New**	mm	Overlay 75 mm · Reconstruction · Overlay 75 mm; Reconstruction
	Existing	mm	70 Wearing course; 120 Binder coure; 320 Granular base course; Sub-grade - clay (weathered volcsanic)

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS
INGENIEURE

Section: S 12; km 30+000 to km 35+000

Location			Bridge km 30,086 / Junction km 30,202 / Junction km 30,283 / Bridge km 30,464 / Junction km 30,902 / Junctions km 31,560 / Bridge km 31,620 / Junction km 31,858 / Junction km 31,887 / Bridge km 32,126 / Junction km 32,155 / Junction km 32,166 / Culvert km 32,366 / Culvert km 32,374 / Junction km 32,398 / Culvert km 32,443 / Junction km 32,450 / Junction km 32,655 / Junctions km 32,951 / Bridge km 33,556 / Bridge km 33,996 / Culvert km 34,274 / Bridge km 34,670 / Culvert km 34,815
Chainage		km	30 +000 / 30 +200 / 30 +400 / 30 +600 / 30 +800 / 31 +000 / 31 +200 / 31 +400 / 31 +600 / 31 +800 / 32 +000 / 32 +200 / 32 +400 / 32 +600 / 32 +800 / 33 +000 / 33 +200 / 33 +400 / 33 +600 / 33 +800 / 34 +000 / 34 +200 / 34 +400 / 34 +600 / 34 +800
Layout			Shoulder / Carriageway / Shoulder; 50, 51, 52, 53, 54
Width of Carriageway		m	12,00 / 12,00 / 12,00 / 10,00 / 7,00 / 7,00 / 7,00
Width of Shoulders	L	m	2,00 / 2,50 / 2,50 / 0,60 / 2,00 / 2,00 / 2,00
	R	m	2,00 / 2,50 / 4,00 / 0,40 / 2,00 / 2,00 / 2,00
Rise/Fall +/-		%	0,9 / -0,9 / 0,0 / 0,9 / 0,0 / 0,9 / -0,9
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0,0 / 0,0 / 0,6 / 0,0 / 0,0
	Alligator Cracks	%	83.8 / 66,3 / 3,9 / 0,0 / 67,4
	Potholes	%	0,0 / 1,1 / 0,4 / 99,4 / 1,9
	Settlement	%	0,0 / 0,0 / 0,0 / 0,0 / 0,0
	Rutting	%	0,0 / 0,0 / 0,0 / 0,0 / 0,0
Pavement Structure	**New**	mm	Overlay 75 mm / Reconstruction / Overlay 75 mm / Reconstruction
	Existing	mm	

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS
INGENIEURE

Section: S 12; km 35+000 to km 40+000

Location			Junctions km 35,040 Culvert km 35,021 · Culvert km 35,217 · Junction km 35,588 · Bridge km 35,717 · Junctions km 35,805 · Culvert km 36,647 · Culvert km 36,851 · Junction km 37,050 · Junction km 37,780 · Culvert km 37,807 · Junction km 37,875 · Culvert km 38,302 · Junction km 38,318 · Culvert km 38,328 · Railway km 38,815 · Culvert km 39,115 · Bridge km 39,337
Chainage		km	35 +000 · 35 +200 · 35 +400 · 35 +600 · 35 +800 · 36 +000 · 36 +200 · 36 +400 · 36 +600 · 36 +800 · 37 +000 · 37 +200 · 37 +400 · 37 +600 · 37 +800 · 38 +000 · 38 +200 · 38 +400 · 38 +600 · 38 +800 · 39 +000 · 39 +200 · 39 +400 · 39 +600 · 39 +800
Layout			Shoulder · Carriageway · Shoulder; 55 · 56 · 57 · 58 · 59 · 60 · 61 · 62
Width of Carriageway		m	7,00
Width of Shoulders	L	m	2,00
	R	m	2,00
Rise/Fall +/-		%	0.0/0.9 · 0,0
Roughness (IRI)	< 4.0	m/km	
	> 4.0 - 6.0	m/km	
	> 6.0 - 8.5	m/km	
	> 8.5 - 10.5	m/km	
	> 10.5 - 12.0	m/km	
	> 12.0	m/km	
Surface Condition	**Cracks**	%	0.0/0.0 · 1.0/0.0 · 0,3 · 0,0
	Alligator Cracks	%	0.0/0.0 · 0.0/0.0 · 0,0 · 0,0
	Potholes	%	0.4/99.1 · 1.0/97.3 · 0,4 · 1,8
	Settlement	%	0.9/0.0 · 0.0/0.0 · 0,0 · 0,5
	Rutting	%	0.0/0.0 · 0.0/0.0 · 0,0 · 0,4
Pavement Structure	**New**	mm	Reconstruction · Overlay 75 mm · Overlay 100 mm
	Existing	mm	60 Wearing course 160 Binder coure 350 Granular base course Sub-grade - clay

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

Section: S 12; km 40+000 to km 45+000

KOCKS
INGENIEURE

Location			Culvert km 40,327	Junction km 40,456	Junction km 40,680 / Bridge km 40,665	Bridge km 41,090	Bridge km 41,740	Junction km 41,990	Culvert km 42,416	Culvert km 42,625	Junction km 42,805	Bridge km 43,187	Bridge km 43,500 / Culvert km 43,442	Junction km 43,666 / Junction km 43,656	Culvert km 43,847	Bridge km 44,057	Junction km 44,472 / Junction km 44,425	Culvert km 44,727 / Junction km 44,666
Chainage		km	40 +000	40 +200	40 +400	40 +600	40 +800	41 +000	41 +200	41 +400	41 +600	41 +800	42 +000	42 +200	42 +400	42 +600	42 +800	43 +000	43 +200	43 +400	43 +600	43 +800	44 +000	44 +200	44 +400	44 +600	44 +800
Layout	Shoulder																										
	Carriageway																										
	Shoulder																										
			63												64	65				66		67					68
Width of Carriageway		m	7,00			7,00							7,00					7,00							7,00		
Width of Shoulders	L	m	2,00			2,00							2,00					2,00							2,00		
	R	m	2,00			2,00							2,00					2,00							2,00		
Rise/Fall +/-		%	0,0																				-1,8	0,9			
Roughness (IRI)	< 4.0	m/km																									
	> 4.0 - 6.0	m/km																									
	> 6.0 - 8.5	m/km																									
	> 8.5 - 10.5	m/km																									
	> 10.5 - 12.0	m/km																									
	> 12.0	m/km																									
Surface Condition	Cracks	%			0,0													0,0			0,0	0,0	0,0	0,0	0,0	0,0	
	Alligator Cracks	%			0,0													0,7			0,7	2,2	0,0	3,6	0,0		
	Potholes	%			0,1													0,2			0,2	0,5	92,6	0,7	99,4		
	Settlement	%			0,0													0,0			0,0	0,0	0,0	0,0	0,0	0,0	
	Rutting	%			14,9													0,0			0,0	0,0	0,0	0,0	0,0	0,0	
Pavement Structure	New	mm				Overlay 100 mm							Overlay 100 mm												Overlay 75 mm		
							Reconstruction																				
	Existing	mm																									

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

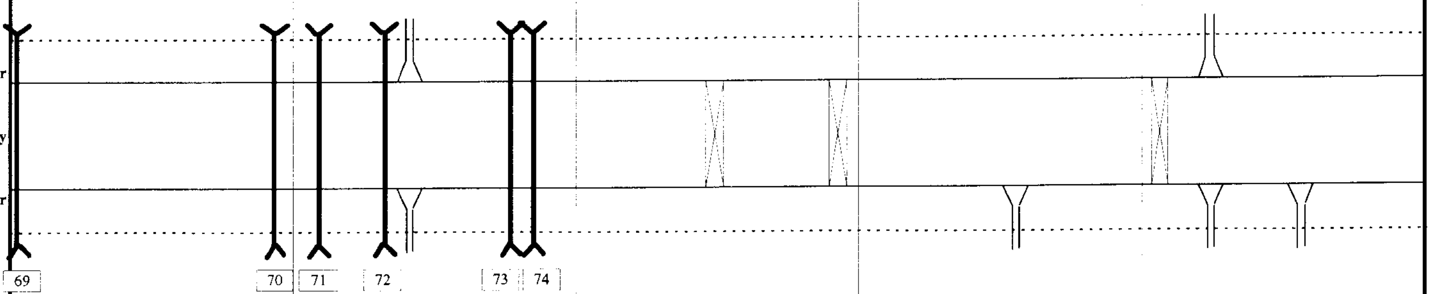
KOCKS INGENIEURE

Section: S 12; km 45+000 to km 50+000

Location

Location	Chainage (km)
Culvert km 45,005	45 +000
	45 +200
	45 +400
	45 +600
	45 +800
Culvert km 45,927	
Culvert km 46,086	46 +000
Culvert km 46,343	46 +200
Junctions km 46,400	46 +400
	46 +600
Culvert km 46,785	
Culvert km 46,829	46 +800
	47 +000
	47 +200
Bridge km 47,480	47 +400
	47 +600
	47 +800
Bridge km 47,930	
Junction km 51,058	48 +000
Junction km 51,100	
Culvert km 51,359	48 +200
Culvert km 51,382	
Junction km 48,568	48 +400
	48 +600
	48 +800
Bridge km 49,068	49 +000
Junctions km 49,231	49 +200
	49 +400
Junctions km 49,578	49 +600
	49 +800

Layout



	Unit	from km 45+000	from km 46+343	from km 47+480	from km 48+568	from km 49+068
Width of Carriageway	m	7,00	7,00	7,00	7,00	7,00
Width of Shoulders L	m	2,00	2,00	2,00	2,00	2,00
Width of Shoulders R	m	2,00	2,00	2,00	2,00	2,00

Rise/Fall +/- (%): -0,9 | 0,0 | -0,9 | 0,9 | 0,0 | -1,8 | 0,0

Roughness (IRI)

Class	Unit
< 4.0	m/km
> 4.0 - 6.0	m/km
> 6.0 - 8.5	m/km
> 8.5 - 10.5	m/km
> 10.5 - 12.0	m/km
> 12.0	m/km

Surface Condition

	Unit												
Cracks	%	0,0	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0
Alligator Cracks	%	8,6	0.0/10.	0,0	14,4	0,0	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0
Potholes	%	0,8	99.2/1.	99,0	1,4	99,3	47,0	99,4	39,0	99,0	28.6/97.8	76.0	
Settlement	%	0,0	0.0/0.0	0,0	0,0	0,0	0,3	0,0	0,0	0,0	0.0/0.0	0,4	
Rutting	%	0,0	0.0/0.0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0.0/0.0	0,0	

Pavement Structure

New (mm): Overlay 75 mm; Reconstruction

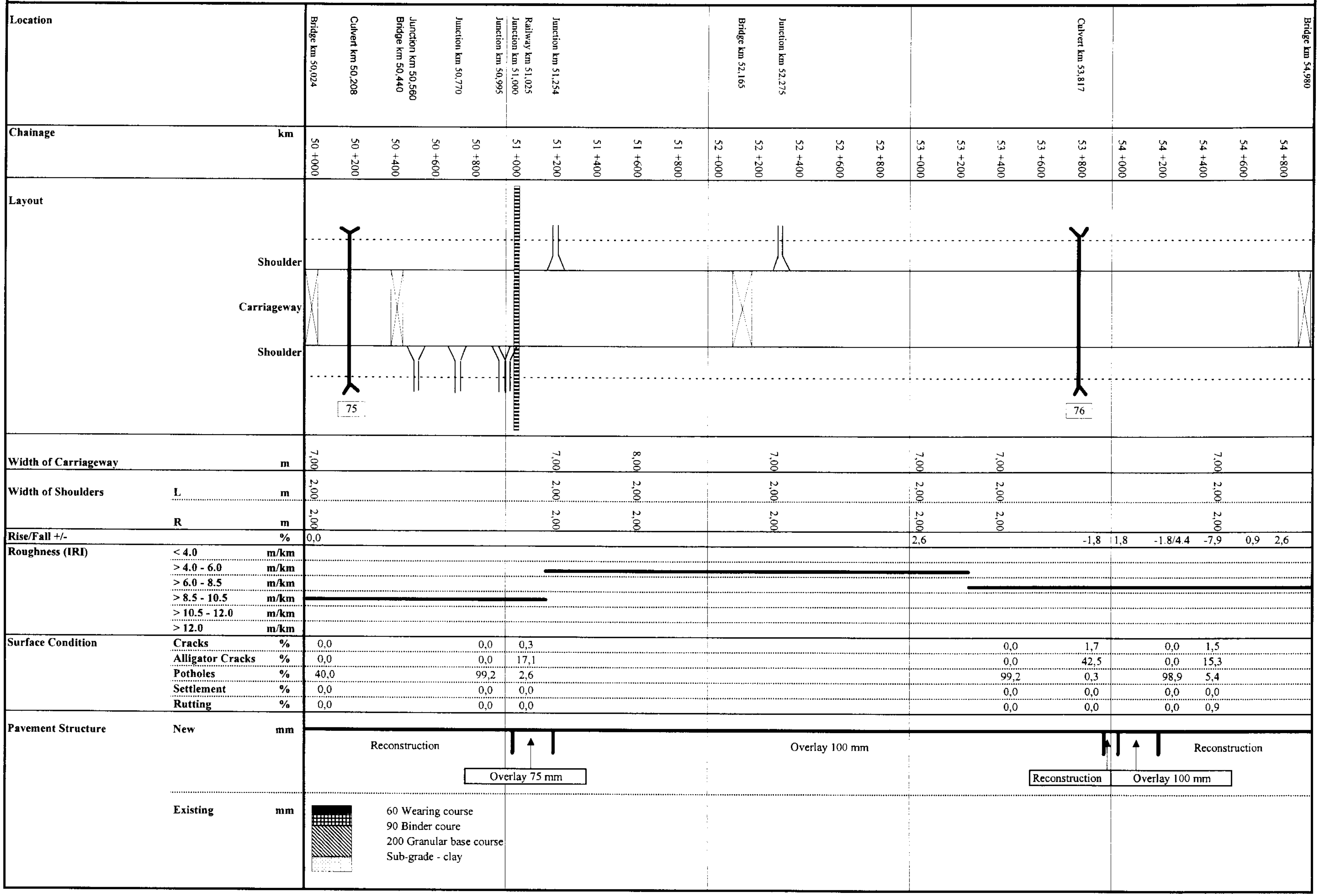
Existing (mm)

Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

KOCKS INGENIEURE

Section: S 12; km 50+000 to km 55+000

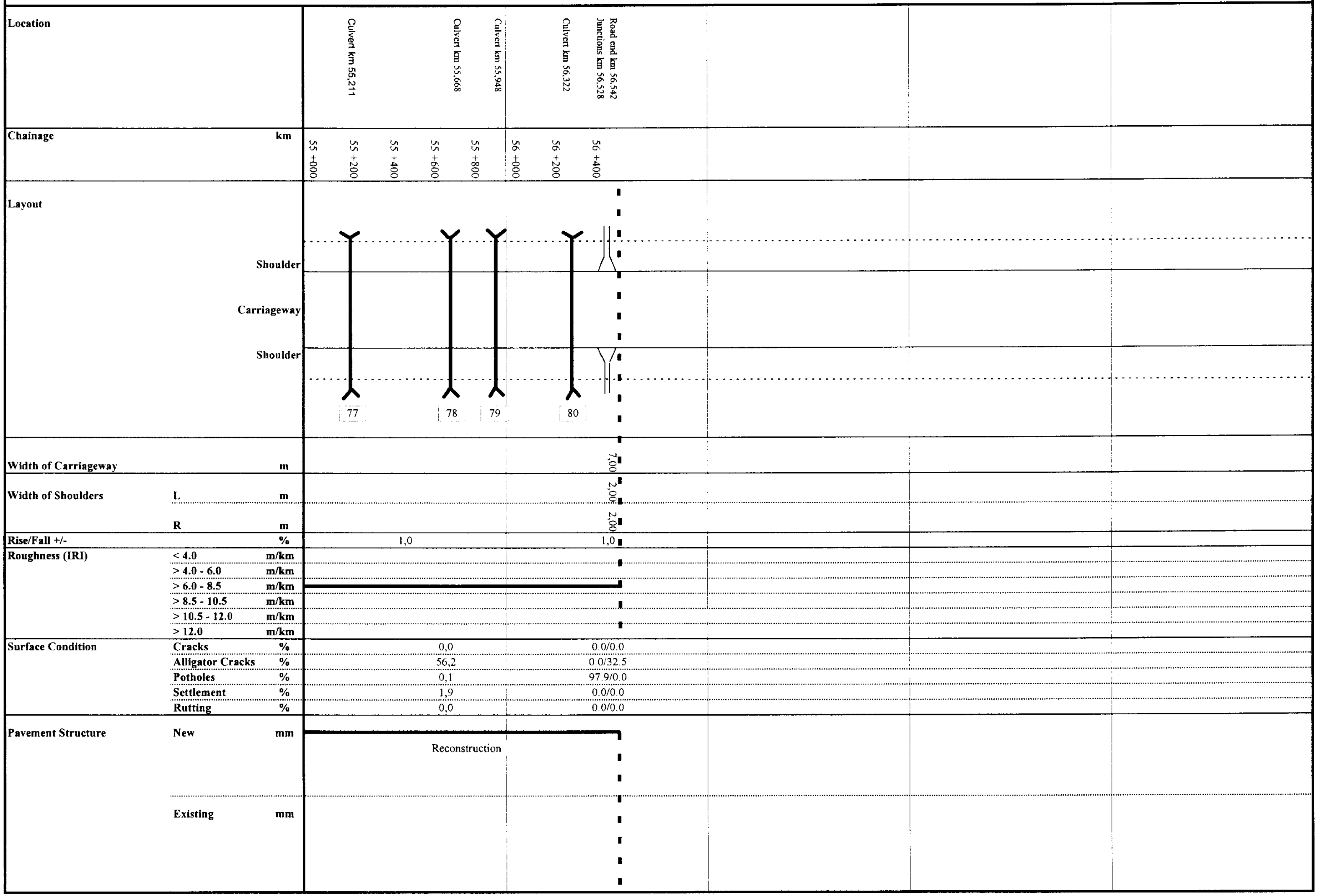


Feasibility Study for Road Rehabilitation in Georgia

Samtredia - Lanchkhuti - Ureki (S 12)

Section: S 12; km 55+000 to km 60+000

KOCKS INGENIEURE



APPENDIX 6.7.

RISE AND FALL

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

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INGENIEURE

S 1, Tbilisi - Kashuri

Chainage from (m)	Chainage to (m)	Rise and Fall %
Subsection: Tbilisi - Junction S 3		
15,000	15,300	-0.9
15,300	15,800	-2.6
15,800	16,000	-3.5
16,000	16,500	0.0
16,500	17,100	0.0
17,100	17,400	2.6
17,400	18,000	0.9
18,000	18,300	-1.8
18,300	18,600	2.6
18,600	18,900	0.9
18,900	19,000	1.8
19,000	19,400	4.4
19,400	19,900	2.6
19,900	20,200	0.0
20,200	20,600	-2.6
20,600	20,900	-1.8
20,900	21,300	-0.9
21,300	21,900	0.9
21,900	23,600	4.4
23,600	23,800	0.9
23,800	24,300	-0.9
24,300	24,500	-2.6
24,500	25,000	-4.4
25,000	25,800	2.6
25,800	26,000	0.9
26,000	26,400	-0.9
26,400	26,600	-2.6
26,600	26,940	0.0
Subsection: Junction S 3 - Gori junction		
26,940	27,200	0.0
27,200	27,500	0.9
27,500	27,700	0.0
27,700	28,400	4.4
28,400	29,400	1.8
29,400	30,200	1.8
30,200	31,000	-0.9
31,000	31,500	0.9
31,500	33,000	0.0
33,000	36,000	0.0
36,000	36,500	-0.9
36,500	37,200	-0.9
37,200	37,700	-2.6
37,700	38,300	-2.6
38,300	38,600	0.0
38,600	38,900	0.9
38,900	39,400	-0.9
39,400	39,900	0.0

Chainage from (m)	Chainage to (m)	Rise and Fall %
39,900	40,300	0.9
40,300	40,500	4.4
40,500	40,800	1.8
40,800	41,100	2.6
41,100	41,300	5.2
41,300	42,000	4.4
42,000	42,600	0.9
42,600	42,800	1.8
42,800	43,000	-3.5
43,000	43,200	1.8
43,200	43,400	0.9
43,400	44,200	-0.9
44,200	45,300	0.9
45,300	45,600	2.6
45,600	46,100	3.5
46,100	46,500	2.6
46,500	47,400	2.6
47,400	47,700	2.6
47,700	48,900	0.9
48,900	49,100	-3.5
49,100	49,300	0.0
49,300	49,500	0.0
49,500	50,500	-0.9
50,500	52,600	0.0
52,600	53,000	0.9
53,000	53,300	-0.9
53,300	53,900	2.6
53,900	48,600	1.8
48,600	55,600	2.6
55,600	56,200	-0.9
56,200	57,100	-0.9
57,100	57,700	-5.2
57,700	58,000	0.0
58,000	58,500	2.6
58,500	58,600	-1.8
58,600	58,800	-2.6
58,800	59,000	-0.9
59,000	59,500	3.5
59,500	60,100	1.8
60,100	60,600	0.9
60,600	61,000	3.5
61,000	61,200	0.9
61,200	61,500	1.8
61,500	62,800	1.8
62,800	64,200	1.8
64,200	64,600	-0.9
64,600	64,900	0.0
64,900	65,300	-0.9

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 1, Tbilisi - Kashuri

Chainage from (m)	Chainage to (m)	Rise and Fall %
65,300	65,700	0.9
65,700	66,300	0.0
66,300	66,700	0.0
66,700	67,600	-0.9
67,600	68,000	0.9
68,000	68,600	0.0
68,600	69,000	0.9
69,000	70,000	0.0
70,000	71,000	0.0
71,000	71,300	-0.9
71,300	72,300	0.9
72,300	73,100	0.9
73,100	73,500	0.0
73,500	73,600	-2.6
73,600	73,700	0
73,700	74,100	-0.9
74,100	74,400	0.9
74,400	74,500	-3.5
74,500	74,800	0
74,800	75,100	-0.9
75,100	75,400	-2.6
75,400	76,200	-1.8
76,200	76,400	-3.5
76,400	76,900	-0.9
76,900	77,200	0.9
77,200	77,500	-0.9
77,500	77,800	-2.6
77,800	78,700	-0.9
78,700	78,900	-2.6
78,900	79,100	-2.6
79,100	79,400	0.0
79,400	79,600	-0.9
79,600	79,900	0.0
79,900	80,300	0.9
80,300	81,100	-0.9
81,100	81,300	-0.9
81,300	81,800	-0.9
81,800	82,000	0.0
82,000	83,200	-0.9
83,200	83,900	-0.9
83,900	84,700	0.0
Subsection: Gori junction - Kashuri		
84,700	85,200	0.0
85,200	86,400	-0.9
86,400	87,000	1.8
87,000	87,400	4.4
87,400	88,100	7.0
88,100	88,600	4.4

Chainage from (m)	Chainage to (m)	Rise and Fall %
88,600	89,500	2.6
89,500	90,400	0.9
90,400	91,000	4.4
91,000	91,100	2.6
91,100	91,800	-0.9
91,800	92,100	-2.6
92,100	92,900	-2.6
92,900	93,800	-2.6
93,800	94,200	-6.1
94,200	94,500	-6.1
94,500	95,200	-4.4
95,200	96,000	-1.8
96,000	96,700	-0.9
96,700	97,700	0.0
97,700	98,800	0.0
98,800	99,800	0.9
99,800	100,800	0.0
100,800	101,200	0.0
101,200	101,800	-0.9
101,800	102,900	0.9
102,900	103,900	0.9
103,900	104,900	-0.9
104,900	105,400	-1.8
105,400	106,000	0.9
106,000	106,500	0.9
106,500	107,000	-0.9
107,000	107,500	-0.9
107,500	107,900	-2.6
107,900	108,100	-5.2
108,100	109,000	0.0
109,000	110,000	0.9
110,000	111,100	0.9
111,100	112,100	0.0
112,100	112,600	0.0
112,600	112,900	2.6
112,900	113,300	-0.9
113,300	114,100	-0.9
114,100	126,670	0.0

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 4, Tbilisi - Red Bridge / Azerbaijan border

Chainage from (m)	Chainage to (m)	Rise and Fall %
11,000	11,300	0.9
11,300	11,500	0.0
11,500	11,700	-0.9
11,700	11,900	-0.9
11,900	12,700	-1.8
12,700	12,900	-4.4
12,900	16,000	0.0
16,000	16,200	0.9
16,200	16,400	5.2
16,400	16,600	0.9
16,600	17,400	0.0
17,400	17,600	0.0
17,600	19,100	-0.9
19,100	19,600	0.0
19,600	20,100	0.9
20,100	20,500	-0.9
20,500	20,900	0.9
20,900	21,200	0.9
21,200	22,000	1.8
22,000	22,500	0.9
22,500	22,700	4.4
22,700	23,200	3.5
23,200	23,700	2.6
23,700	24,100	5.2
24,100	24,600	4.4
24,600	24,800	-5.2
24,800	25,000	-0.9
25,000	25,800	-2.6
25,800	26,400	4.4
26,400	26,900	5.2
26,900	27,900	4.4
27,900	28,100	0.9
28,100	28,400	6.1
28,400	28,600	-0.9
28,600	28,900	1.8
28,900	29,500	0.9
29,500	30,200	2.6
30,200	31,000	0.9
31,000	31,600	-2.6
31,600	31,800	-5.2
31,800	32,000	-3.5
32,000	32,700	-5.2
32,700	32,900	-0.9
32,900	33,200	-1.8
33,200	33,600	-2.6
33,600	33,900	-0.9
33,900	34,100	-3.5

Chainage from (m)	Chainage to (m)	Rise and Fall %
34,100	34,400	0.0
34,400	35,200	-1.8
35,200	35,400	-2.6
35,400	35,700	-2.6
35,700	36,000	0.0
36,000	37,800	-1.8
37,800	37,900	-4.4
37,900	38,300	0.9
38,300	38,600	-2.6
38,600	39,000	-0.9
39,000	39,900	-0.9
39,900	44,300	-0.9
44,300	44,600	-3.5
44,600	45,000	0.0
45,000	45,400	3.5
45,400	47,600	0.0
47,600	48,900	-0.9
48,900	49,100	-5.2
49,100	49,400	1.8
49,400	50,200	2.6
50,200	52,300	-0.9
52,300	52,800	0.0
52,800	53,400	1.8
53,400	54,900	0.0
54,900	55,200	-4.4
55,200	55,400	-4.4
55,400	55,700	-5.2
55,700	56,100	-2.6
56,100	56,400	0.0
56,400	56,700	0.0
56,700	56,800	-2.6
56,800	56,900	-1.8
56,900	57,000	0.9
57,000	57,170	0.0

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 6, Tbilisi - Marneuli - Guguti / Armenian Border

Chainage from (m)	Chainage to (m)	Rise and Fall %
Subsection: Tbilisi - Marneuli		
3,000	5,000	2.6
5,000	5,600	4.4
5,600	6,100	6.1
6,100	7,600	5.2
7,600	8,100	4.4
8,100	8,400	0.9
8,400	8,900	2.6
8,900	9,400	0.9
9,400	9,800	2.6
9,800	10,200	1.8
10,200	10,700	0.9
10,700	11,200	-1.8
11,200	11,300	-7.0
11,300	12,200	-9.6
12,200	12,400	-5.2
12,400	13,100	-3.5
13,100	14,100	-1.8
14,100	14,700	1.8
14,700	15,100	7.0
15,100	15,600	4.4
15,600	15,900	6.1
15,900	19,400	-2.6
19,400	23,500	-1.8
23,500	24,000	4.4
24,000	24,200	-1.8
24,200	25,400	0.9
25,400	25,600	0.0
25,600	26,600	-0.9
26,600	27,500	-2.6
27,500	28,000	-4.4
28,000	28,300	-5.2
28,300	28,745	-1.8
28,745	28,840	-2.6
Subsection: Marneuli - Bolnisi		
28,840	29,000	-2.6
29,000	29,400	-1.8
29,400	30,300	-0.9
30,300	30,500	5.2
30,500	30,700	-2.6
30,700	31,000	-0.9
31,000	31,200	-2.6
31,200	31,500	0.0
31,500	31,700	0.9
31,700	32,300	-2.6
32,300	32,500	-0.9
32,500	33,000	-0.9
33,000	33,200	-1.8
33,200	34,000	0.0

Chainage from (m)	Chainage to (m)	Rise and Fall %
34,000	34,500	0.0
34,500	35,400	0.9
35,400	35,600	0.0
35,600	38,600	-0.9
38,600	41,000	0.0
41,000	41,300	-1.8
41,300	42,100	0.0
42,100	42,800	1.8
42,800	43,100	0.9
43,100	43,300	0.0
43,300	43,700	0.0
43,700	44,000	0.9
44,000	44,200	4.4
44,200	44,500	-0.9
44,500	46,000	0.9
46,000	46,500	4.4
46,500	46,700	-2.6
46,700	47,000	-4.4
47,000	47,400	-6.1
47,400	47,800	2.6
47,800	47,900	1.8
47,900	48,300	2.6
48,300	48,400	4.4
48,400	49,200	1.8
49,200	49,400	4.4
49,400	49,900	5.2
49,900	50,800	0.0
50,800	50,900	-0.9
50,900	51,000	-3.5
51,000	51,500	4.4
51,500	51,900	0.0
51,900	52,100	1.8
52,100	52,300	-3.5
52,300	52,400	1.8
52,400	52,600	2.6
52,600	52,800	3.5
52,800	53,000	8.8
53,000	53,200	-1.8
53,200	53,400	3.5
53,400	53,500	-7.0
53,500	53,600	0.9
53,600	53,700	-6.1
53,700	53,880	2.6
Subsection: Bolnisi - Guguti		
53,880	54,100	2.6
54,100	54,500	0.9
54,500	54,700	-7.0
54,700	54,800	-2.6
54,800	54,900	-0.9

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 6, Tbilisi - Marneuli - Guguti / Armenian Border

Chainage		Rise and Fall
from (m)	to (m)	%
54,900	55,400	0.0
55,400	56,200	-0.9
56,200	56,400	1.8
56,400	57,100	-0.9
57,100	57,900	0.9
57,900	58,400	-0.9
58,400	59,100	0.9
59,100	59,800	-0.9
59,800	60,000	3.5
60,000	61,300	0.9
61,300	61,700	1.8
61,700	61,800	0.9
61,800	62,000	0.0
62,000	62,300	0.9
62,300	62,500	2.6
62,500	62,800	0.0
62,800	63,000	-4.4
63,000	63,400	5.2
63,400	63,500	0.0
63,500	64,000	0.0
64,000	64,500	0.9
64,500	65,100	-0.9
65,100	65,400	0.9
65,400	65,700	2.6
65,700	65,900	-0.9
65,900	66,400	5.2
66,400	66,700	3.5
66,700	66,900	4.4
66,900	67,100	-0.9
67,100	67,400	-2.6
67,400	67,700	2.6
67,700	68,100	0.9
68,100	68,500	2.6
68,500	68,800	0.9
68,800	69,000	-0.9
69,000	69,300	-1.8
69,300	69,500	6.1
69,500	69,700	6.1
69,700	69,900	7.9
69,900	70,100	-2.6
70,100	70,300	-4.4
70,300	70,400	-3.5
70,400	70,700	4.4
70,700	70,900	0.9
70,900	71,300	-1.8
71,300	71,500	-5.2
71,500	71,700	1.8

Chainage		Rise and Fall
from (m)	to (m)	%
71,700	72,200	0.9
72,200	72,400	0.9
72,400	72,500	-3.5
72,500	72,700	1.8
72,700	72,900	0.0
72,900	73,300	2.6
73,300	73,900	2.6
73,900	74,300	3.5
74,300	74,400	4.4
74,400	74,500	5.2
74,500	74,900	3.5
74,900	75,300	0.9
75,300	75,400	0.9
75,400	75,500	0.0
75,500	75,600	0.0
75,600	75,800	0.0
75,800	76,000	0.0
76,000	76,200	0.0
76,200	76,400	-2.6
76,400	76,800	3.5
76,800	77,000	6.1
77,000	77,300	4.4
77,300	77,800	2.6
77,800	78,100	-2.6
78,100	78,300	-0.9
78,300	78,500	-0.9
78,500	78,700	2.6
78,700	78,900	3.5
78,900	79,100	2.6
79,100	79,300	4.4
79,300	79,500	5.2
79,500	79,900	2.6
79,900	80,500	6.1
80,500	80,800	-3.5
80,800	81,200	4.4
81,200	81,300	5.2
81,300	81,800	5.2
81,800	82,000	-4.4
82,000	82,200	-0.9
82,200	82,700	3.5
82,700	82,900	6.1
82,900	83,000	4.4
83,000	83,100	-0.9
83,100	83,300	4.4
83,300	83,400	-2.6
83,400	83,500	3.5
83,500	83,900	4.4

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

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INGENIEURE

S 6, Tbilisi - Marneuli - Guguti / Armenian Border

Chainage		Rise and Fall
from (m)	to (m)	%
83,900	84,100	-1.8
84,100	84,400	0.9
84,400	84,500	0.0
84,500	84,700	1.8
84,700	85,000	6.1
85,000	85,400	-2.6
85,400	85,600	3.5
85,600	85,800	1.8
85,800	85,900	5.2
85,900	86,200	4.4
86,200	86,400	4.4
86,400	86,600	2.6
86,600	86,800	2.6
86,800	87,000	3.5
87,000	87,400	1.8
87,400	87,900	1.8
87,900	88,000	0
88,000	88,100	1.8
88,100	88,200	5.2
88,200	88,400	4.4
88,400	88,500	2.6
88,500	88,600	1.8
88,600	88,700	4.4
88,700	88,800	-1.8
88,800	88,900	2.6
88,900	89,300	2.6
89,300	89,600	2.6
89,600	89,700	4.4
89,700	90,000	3.5
90,000	90,700	4.4
90,700	90,900	4.4
90,900	91,100	-1.8
91,100	91,200	5.2
91,200	91,400	6.1
91,400	91,700	6.1
91,700	92,200	0.9
92,200	92,300	2.6
92,300	92,400	4.4
92,400	92,600	2.6
92,600	93,300	3.5
93,300	93,700	4.4
93,700	93,900	4.4
93,900	94,100	0.9
94,100	94,300	2.6
94,300	94,400	5.2
94,400	94,500	2.6
94,500	94,600	4.4

Chainage		Rise and Fall
from (m)	to (m)	%
94,600	94,800	2.6
94,800	95,000	2.6
95,000	95,200	4.4
95,200	95,600	4.4
95,600	95,700	4.4
95,700	96,300	4.4
96,300	96,600	4.4
96,600	97,100	2.6
97,100	97,300	1.8
97,300	97,600	3.5
97,600	97,900	4.4
97,900	98,000	2.6
98,000	98,100	2.6
98,100	98,400	6.1
98,400	98,700	4.4
98,700	98,900	2.6
98,900	99,127	2.6

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 7, Marneuli - Sadakhlo / Armenian border

Chainage from (m)	Chainage to (m)	Rise and Fall %
0	500	0.0
500	1,300	-0.9
1,300	1,700	0.0
1,700	3,800	-0.9
3,800	8,100	-0.9
8,100	8,900	0.0
8,900	9,900	-0.9
9,900	10,400	0.0
10,400	11,000	1.8
11,000	11,800	-0.9
11,800	13,000	0.9
13,000	13,600	-0.9
13,600	13,800	0.0
13,800	14,000	4.4
14,000	14,200	-0.9
14,200	14,500	0.0
14,500	14,800	-4.4
14,800	15,100	1.8
15,100	15,300	6.1
15,300	16,100	-0.9
16,100	16,400	0.9
16,400	17,100	2.6
17,100	17,600	-2.6
17,600	17,900	-0.9
17,900	18,100	0.0
18,100	18,500	-0.9
18,500	19,100	0.9
19,100	20,100	0.0
20,100	20,300	-1.8
20,300	20,800	0.0
20,800	21,200	-0.9
21,200	21,300	0.9
21,300	24,400	0.0
24,400	21,600	0.9
21,600	22,200	0.0
22,200	22,400	-0.9
22,400	22,700	1.8
22,700	23,100	0.0
23,100	23,200	-0.9
23,200	24,100	0.0
24,100	24,300	3.5
24,300	24,400	0.0
24,400	24,500	-0.9
24,500	24,600	1.8
24,600	25,300	-1.8
25,300	25,400	3.5
25,400	25,500	-2.6

Chainage from (m)	Chainage to (m)	Rise and Fall %
25,500	25,800	2.6
25,800	26,300	-1.8
26,300	26,500	0.9
26,500	27,100	0.9
27,100	27,600	0.0
27,600	28,000	0.9
28,000	28,400	0.0
28,400	28,600	-0.9
28,600	28,800	0.0
28,800	29,400	0.0
29,400	29,700	-0.9
29,700	30,100	0.9
30,100	30,200	-0.9
30,200	30,400	3.5
30,400	30,500	0.9
30,500	30,600	7.0
30,600	31,300	-0.9
31,300	31,500	3.5
31,500	31,600	3.5
31,600	31,700	-2.6
31,700	31,900	-4.4
31,900	32,300	2.6
32,300	33,500	-0.9
33,500	33,700	0.0
33,700	34,140	2.6

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 9, Tbilisi Bypass

Chainage from (m)	Chainage to (m)	Rise and Fall %
Subsection: bypass west		
0	1,000	-5.2
1,000	1,500	5.2
1,500	2,000	4.4
2,000	2,500	1.8
2,500	3,000	1.8
3,000	3,300	-0.9
3,300	3,800	-5.2
3,800	3,900	0.9
3,900	4,000	-2.6
4,000	4,500	-6.1
4,500	4,800	0.0
4,800	5,000	2.6
5,000	5,500	2.6
5,500	6,000	7.0
6,000	6,500	1.8
6,500	6,800	0.0
6,800	7,000	3.5
7,000	7,500	-1.8
7,500	8,000	2.6
8,000	8,500	1.8
8,500	8,800	0
8,800	9,000	-1.8
9,000	9,900	5.2
9,900	10,000	0.0
10,000	10,500	-1.8
10,500	11,000	3.5
11,000	12,000	1.8
12,000	12,500	-0.9
12,500	13,000	-1.8
13,000	13,500	-1.8
13,500	14,000	3.5
14,000	14,300	0.9
14,300	14,800	-0.9
14,800	15,000	5.2
15,000	15,500	6.1
15,500	16,000	6.1
16,000	16,500	4.4
16,500	16,800	0.0
16,800	16,900	9.6
16,900	18,000	9.6
18,000	19,000	8.8
19,000	19,500	3.5
19,500	19,800	1.8
19,800	20,000	0.9
20,000	21,000	-7.0
21,000	22,000	-2.6

Chainage from (m)	Chainage to (m)	Rise and Fall %
22,000	22,500	-7.0
22,500	23,000	4.4
23,000	24,000	-3.5
24,000	24,500	0.0
24,500	25,000	-2.6
25,000	25,500	-4.4
25,500	25,800	0.0
25,800	26,000	-4.4
26,000	26,500	-2.6
26,500	27,000	-5.2
27,000	28,000	1.8
28,000	28,500	-4.4
28,500	28,800	-3.5
28,800	29,000	1.8
29,000	30,000	-1.8
30,000	31,000	-1.8
31,000	31,500	-0.9
31,500	32,000	-2.6
32,000	33,000	-6.1
33,000	34,000	2.6
34,000	34,500	0.0
34,500	34,800	-3.5
Subsection: bypass east		
34,800	35,000	-3.5
34,800	35,500	-1.8
35,500	36,000	-1.8
36,000	39,000	-1.8
39,000	40,000	-1.8
40,000	41,000	-1.8
41,000	41,500	0.0
41,500	42,000	-0.9
42,000	43,000	-4.4
43,000	43,500	-6.1
43,500	44,000	-6.1
44,000	44,500	-0.9
44,500	45,000	-0.9
45,000	46,000	1.8
46,000	47,000	0.9
47,000	48,000	-1.8
48,000	48,800	-1.8

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

- Rise and Fall -

KOCKS
INGENIEURE

S 12, Samtredia - Ureki

Chainage from (m)	Chainage to (m)	Rise and Fall %
0	1,000	0.0
1,000	2,000	0.0
2,000	3,700	0.0
3,700	4,000	-0.9
4,000	5,000	0.0
5,000	5,200	3.5
5,200	6,000	-1.8
6,000	6,200	0.0
6,200	6,800	0.9
6,800	7,300	-0.9
7,300	7,700	0.0
7,700	8,800	-0.9
8,800	10,700	0.0
10,700	11,000	1.8
11,000	13,000	0.0
13,000	14,000	0.0
14,000	14,500	0.9
14,500	15,000	0.0
15,000	16,500	0.0
16,500	16,900	0.9
16,900	17,500	0.0
17,500	18,000	1.8
18,000	18,800	0.9
18,800	19,000	-2.6
19,000	19,300	0.0
19,300	19,500	-3.5
19,500	20,600	0.0
20,600	20,800	-0.9
20,800	21,200	-0.9
21,200	21,400	0.9
21,400	22,000	1.8
22,000	22,300	0.0
22,300	23,000	0.9
23,000	23,300	0.9
23,300	23,500	-1.8
23,500	23,800	0.0
23,800	24,500	0.9
24,500	24,800	-0.9
24,800	25,300	0.0
25,300	25,800	0.9
25,800	26,500	0.0
26,500	26,800	-1.8
26,800	27,800	1.8
27,800	28,000	-0.9
28,000	29,000	0.0
29,000	29,500	1.8
29,500	30,800	0.0

Chainage from (m)	Chainage to (m)	Rise and Fall %
30,800	31,000	0.9
31,000	31,800	-0.9
31,800	32,000	0.0
32,000	32,400	0.9
32,400	33,000	0.0
33,000	33,500	0.9
33,500	34,000	0.9
34,000	34,600	0.9
34,600	35,800	-0.9
35,800	35,900	0.0
35,900	36,300	0.9
36,300	36,600	0.9
36,600	37,500	0.0
37,500	40,000	0.0
40,000	41,500	0.0
41,500	43,000	0.0
43,000	44,000	0.0
44,000	44,200	-1.8
44,200	45,000	0.9
45,000	45,200	-0.9
45,200	45,600	0.0
45,600	45,800	-0.9
45,800	46,300	0.9
46,300	47,300	0.0
47,300	47,500	-1.8
47,500	49,000	0.0
49,000	52,000	0.0
52,000	53,000	0.0
53,000	53,900	2.6
53,900	54,000	-1.8
54,000	54,200	1.8
54,200	54,300	-1.8
54,300	54,500	4.4
54,500	54,700	-7.9
54,700	54,800	0.9
54,800	56,528	2.6

APPENDIX 6.8

ROAD ROUGHNESS

Road Chainage Tbilisi - Khashuri		IRI	Road Chainage Khashuri - Tbilisi		IRI	Delta	Average IRI
from km	to km	(m/km)	from km	to km	(m/km)		(m/km)
71.0	72.0	4.6	72.0	71.0	4.3	-0.3	**4.5**
72.0	73.0	3.6	73.0	72.0	5.5	2.0	**4.5**
73.0	74.0	4.8	74.0	73.0	4.1	-0.7	**4.5**
74.0	75.0	3.9	75.0	74.0	4.0	0.1	**3.9**
75.0	76.0	3.2	76.0	75.0	4.6	1.4	**3.9**
76.0	77.0	3.8	77.0	76.0	4.0	0.2	**3.9**
77.0	78.0	3.7	78.0	77.0	4.4	0.8	**4.0**
78.0	79.0	5.1	79.0	78.0	5.9	0.8	**5.5**
79.0	80.0	5.4	80.0	79.0	6.1	0.7	**5.7**
80.0	81.0	4.7	81.0	80.0	4.8	0.2	**4.8**
81.0	82.0	5.1	82.0	81.0	5.0	-0.1	**5.1**
82.0	83.0	4.1	83.0	82.0	5.0	0.9	**4.5**
83.0	84.0	3.9	84.0	83.0	4.3	0.4	**4.1**
84.0	85.0	3.8	85.0	84.0	5.5	1.7	**4.7**
85.0	86.0	4.6	86.0	85.0	5.5	0.9	**5.1**
86.0	87.0	5.5	87.0	86.0	5.4	-0.1	**5.4**
87.0	88.0	5.6	88.0	87.0	5.0	-0.6	**5.3**
88.0	89.0	4.0	89.0	88.0	5.5	1.5	**4.8**
89.0	90.0	4.5	90.0	89.0	5.1	0.6	**4.8**
			91.0	90.0	4.8		
90.0	92.0	4.2	92.0	91.0	4.2	0.0	**4.2**
92.0	93.0	4.0	93.0	92.0	4.0	-0.1	**4.0**
93.0	94.0	3.7	94.0	93.0	3.8	0.2	**3.7**
			95.0	94.0	3.5		
94.0	96.0	3.4	96.0	95.0	4.0	0.6	**3.7**
96.0	97.0	3.3	97.0	96.0	3.7	0.4	**3.5**
97.0	98.0	4.7	98.0	97.0	4.5	-0.2	**4.6**
98.0	99.0	3.9	99.0	98.0	4.5	0.5	**4.2**
99.0	100.0	3.9	100.0	99.0	3.5	-0.4	**3.7**
100.0	100.5	6.6					
			101.0	100.0	5.0		
100.5	101.5	3.4					
101.5	102.0	6.7	102.0	101.0	4.7	-2.1	**5.7**
102.0	103.0	3.8	103.0	102.0	3.9	0.0	**3.8**
103.0	104.0	3.7	104.0	103.0	4.2	0.5	**4.0**
104.0	105.0	4.1	105.0	104.0	5.7	1.6	**4.9**
105.0	106.0	4.6	106.0	105.0	5.0	0.4	**4.8**
106.0	107.0	3.5	107.0	106.0	3.5	0.0	**3.5**
107.0	108.0	3.8	108.0	107.0	4.0	0.2	**3.9**
108.0	109.0	3.9	109.0	108.0	3.9	0.0	**3.9**
109.0	110.0	4.4	110.0	109.0	4.5	0.0	**4.5**
110.0	111.0	4.5	111.0	110.0	3.9	-0.5	**4.2**
111.0	112.0	4.4	112.0	111.0	4.6	0.3	**4.5**
			113.0	112.0	4.3		
112.0	114.0	3.9	114.0	113.0	3.9	0.0	**3.9**
114.0	115.0	3.5	115.0	114.0	3.7	0.2	**3.6**
115.0	116.0	3.4	116.0	115.0	2.9	-0.5	**3.2**
116.0	117.0	3.8	117.0	116.0	4.0	0.2	**3.9**
117.0	118.0	4.2	118.0	117.0	4.8	0.6	**4.5**
118.0	119.0	4.0	119.0	118.0	3.2	-0.8	**3.6**
119.0	120.0	3.6	120.0	119.0	3.6	0.0	**3.6**
120.0	121.0	3.6	121.0	120.0	3.8	0.2	**3.7**
121.0	122.0	4.8	122.0	121.0	4.0	-0.8	**4.4**
122.0	123.0	4.4	123.0	122.0	4.6	0.2	**4.5**
123.0	124.0	3.8	124.0	123.0	5.0	1.2	**4.4**
124.0	125.0	5.2	125.0	124.0	5.2	0.0	**5.2**
125.0	126.0	2.9	126.0	125.0	3.3	0.4	**3.1**
126.0	126.7	3.0	126.7	126.0	3.4	0.4	**3.2**

Road Roughness

S 4, Tbilisi - Red Bridge (Azerbaijan Border)

Road Chainage Tbilisi - Red Bridge		IRI	Road Chainage Red Bridge - Tbilisi		IRI	Delta	**Average**
from km	to km	(m/km)	from km	to km	(m/km)		IRI (m/km)
11.0	12.1	6.1	12.1	11.0	4.6	-1.5	**5.4**
12.1	13.2	6.7	13.2	12.1	4.3	-2.4	**5.5**
13.2	14.2	3.6	14.2	13.2	3.7	0.1	**3.6**
14.2	15.3	4.4	15.3	14.2	5.3	0.9	**4.9**
15.3	16.4	4.0	16.4	15.3	4.3	0.3	**4.1**
16.4	17.5	4.4	17.5	16.4	6.5	2.1	**5.5**
17.5	18.6	4.5	18.6	17.5	4.5	0.0	**4.5**
18.6	19.6	5.2	19.6	18.6	4.9	-0.3	**5.1**
19.6	20.7	5.4	20.7	19.6	4.7	-0.7	**5.1**
20.7	21.8	4.4	21.8	20.7	5.4	1.0	**4.9**
21.8	22.9	4.1	22.9	21.8	7.3	3.2	**5.7**
22.9	24.0	6.2	24.0	22.9	8.6	2.4	**7.4**
24.0	25.0	6.9					
25.0	26.1	6.2	26.1	24.0	6.9	0.7	**6.5**
26.1	27.2	6.5	27.2	26.1	6.8	0.3	**6.6**
27.2	28.3	7.0	28.3	27.2	8.5	1.4	**7.7**
28.3	29.4	7.9	29.4	28.3	8.4	0.4	**8.1**
			30.4	28.3	8.4		
29.4	31.5	7.4	31.5	30.4	8.7	1.2	**8.1**
31.5	32.6	6.6	32.6	31.5	6.5	-0.1	**6.5**
32.6	33.7	6.0	33.7	32.6	7.4	1.5	**6.7**
33.7	34.8	7.4	34.8	33.7	7.2	-0.1	**7.3**
34.8	35.8	5.7	35.8	34.8	7.0	1.4	**6.3**
35.8	36.9	5.8	36.9	35.8	7.2	1.4	**6.5**
36.9	38.0	5.7	38.0	36.9	7.9	2.2	**6.8**
38.0	39.1	7.6	39.1	38.0	5.1	-2.5	**6.3**
39.1	40.2	5.6	40.2	39.1	5.6	0.0	**5.6**
40.2	41.2	4.5	41.2	40.2	5.6	1.1	**5.1**
41.2	42.3	5.8	42.3	41.2	5.2	-0.6	**5.5**
42.3	43.4	5.5	43.4	42.3	5.9	0.4	**5.7**
43.4	44.5	6.3	44.5	43.4	6.9	0.6	**6.6**
44.5	45.6	7.6	45.6	44.5	5.2	-2.5	**6.4**
45.6	46.6	5.7	46.6	45.6	5.0	-0.7	**5.3**
46.6	47.7	4.6					
47.7	48.8	4.1	48.8	46.6	4.5	0.4	**4.3**
48.8	49.9	5.7	49.9	48.8	7.0	1.3	**6.3**
49.9	51.0	7.6	51.0	49.9	5.2	-2.4	**6.4**
51.0	52.0	5.2	52.0	51.0	4.8	-0.3	**5.0**
52.0	53.1	5.2	53.1	52.0	4.8	-0.4	**5.0**
53.1	54.2	4.4	54.2	53.1	7.2	2.7	**5.8**
54.2	55.3	7.0	55.3	54.2	5.2	-1.8	**6.1**
55.3	56.4	5.9	56.4	55.3	4.4	-1.5	**5.2**
56.4	57.1	4.7	57.1	56.4	4.8	0.1	**4.7**

Road Roughness

S 6, Tbilisi - Guguti

Road Chainage Tbilisi - Guguti from km	to km	IRI (m/km)	Road Chainage Guguti - Tbilisi from km	to km	IRI (m/km)	Delta	**Average IRI (m/km)**
3.0	4.0	4.0	4.0	3.0	4.7	0.6	**4.4**
4.0	5.0	3.8	5.0	4.0	5.5	1.7	**4.6**
5.0	6.1	5.0	6.1	5.0	3.6	-1.4	**4.3**
6.1	7.1	7.2	7.1	6.1	5.8	-1.4	**6.5**
7.1	8.1	3.5	8.1	7.1	5.6	2.2	**4.6**
8.1	9.1	4.1	9.1	8.1	5.2	1.1	**4.6**
9.1	10.2	5.1	10.2	9.1	5.0	-0.1	**5.0**
10.2	11.2	4.5	11.2	10.2	5.8	1.4	**5.1**
11.2	12.2	7.4	12.2	11.2	6.9	-0.5	**7.1**
12.2	13.2	6.5	13.2	12.2	5.7	-0.8	**6.1**
13.2	14.3	3.4	14.3	13.2	5.7	2.3	**4.6**
14.3	14.7	6.0					
14.7	15.2						
			15.3	14.3	6.2		
15.2	15.5	8.1					
15.5	16.0						
16.0	16.3	8.7	16.3	15.3	14.3		
16.3	17.2	8.6					
			17.3	16.3	13.0		
17.2	17.6						
17.6	18.4	7.5	18.4	17.3	12.1		
18.4	19.4	5.9	19.4	18.4	5.7	-0.2	**5.8**
19.4	20.4	7.7	20.4	19.4	8.5	0.8	**8.1**
20.4	21.4	7.4	21.4	20.4	9.4	2.0	**8.4**
21.4	22.5	4.2	22.5	21.4	4.9	0.7	**4.6**
22.5	23.5	4.0	23.5	22.5	4.2	0.2	**4.1**
23.5	23.8						
23.8	24.5	6.9	24.5	23.5	8.9	1.9	**7.9**
24.5	25.5	4.0	25.5	24.5	5.5	1.4	**4.8**
25.5	26.6	5.7	26.6	25.5	5.0	-0.7	**5.3**
26.6	27.6	5.4	27.6	26.6	7.0	1.6	**6.2**
27.6	28.6	6.8	28.6	27.6	8.8	2.0	**7.8**
28.6	29.6	6.0	29.6	28.6	6.1	0.2	**6.0**
29.6	30.7	5.6	30.7	29.6	4.1	-1.5	**4.8**
30.7	31.7	10.9	31.7	30.7	7.3	-3.6	**9.1**
31.7	32.6	8.4					
			32.7	31.7	10.8	10.8	**5.4**
32.6	32.9						
32.9	33.7	7.4	33.7	32.7	12.9	5.5	**10.2**
			34.8	33.7	8.5		
33.7	35.8	8.3	35.8	34.8	7.1	-1.2	**7.7**
35.8	36.8	8.4	36.8	35.8	9.6	1.1	**9.0**
36.8	37.8	6.4	37.8	36.8	6.9	0.4	**6.6**
37.8	38.8	8.1	38.8	37.8	7.6	-0.5	**7.8**
38.8	39.9	8.6	39.9	38.8	9.2	0.6	**8.9**
39.9	40.9	8.9	40.9	39.9	10.5	1.6	**9.7**
40.9	41.9	8.5	41.9	40.9	9.5	1.0	**9.0**
41.9	42.2	8.7					
42.2	42.3						
42.3	42.9	9.8	42.9	41.9	9.7	-0.2	**9.8**
42.9	44.0	7.7	44.0	42.9	8.1	0.4	**7.9**
44.0	45.0	8.3	45.0	44.0	8.5	0.2	**8.4**
45.0	46.0	8.5	46.0	45.0	8.2	-0.3	**8.3**
46.0	47.0	7.7	47.0	46.0	8.2	0.4	**8.0**

Road Chainage Tbilisi - Guguti		IRI	Road Chainage Guguti - Tbilisi		IRI	Delta	**Average** IRI
from km	to km	(m/km)	from km	to km	(m/km)		(m/km)
47.0	48.1	7.2	48.1	47.0	6.9	-0.3	**7.1**
48.1	49.1	4.0	49.1	48.1	3.7	-0.3	**3.9**
49.1	50.1	6.0	50.1	49.1	4.9	-1.2	**5.5**
50.1	51.1	8.1	51.1	50.1	9.1	1.0	**8.6**
51.1	52.2	8.0	52.2	51.1	7.4	-0.6	**7.7**
52.2	53.2	7.5	53.2	52.2	6.0	-1.5	**6.8**
53.2	54.2	8.7	54.2	53.2	7.0	-1.7	**7.8**
54.2	55.2	8.4	55.2	54.2	8.1	-0.3	**8.3**
55.2	56.3	8.4	56.3	55.2	6.8	-1.6	**7.6**
56.3	57.3	9.4	57.3	56.3	8.2	-1.2	**8.8**
57.3	58.3	8.4	58.3	57.3	9.5	1.1	**9.0**
58.3	59.3	7.4	59.3	58.3	7.8	0.4	**7.6**
59.3	60.4	8.3	60.4	59.3	8.5	0.2	**8.4**
60.4	61.4	7.8	61.4	60.4	8.3	0.5	**8.0**
61.4	62.4	7.7	62.4	61.4	7.6	-0.1	**7.6**
62.4	63.4	10.2	63.4	62.4	8.8	-1.5	**9.5**
63.4	64.5	8.5	64.5	63.4	10.1	1.6	**9.3**
64.5	65.5	8.9	65.5	64.5	9.6	0.7	**9.2**
65.5	66.5	6.5	66.5	65.5	7.1	0.6	**6.8**
66.5	67.5	9.7	67.5	66.5	8.7	-1.0	**9.2**
67.5	68.5	8.1	68.5	67.5	9.8	1.7	**8.9**
68.5	69.6	7.5	69.6	68.5	8.0	0.6	**7.7**
69.6	70.6	11.8					
70.6	70.9						
70.9	71.6	8.1	71.6	69.6	6.2	-2.0	**7.2**
71.6	72.6	9.7	72.6	71.6	8.8	-0.9	**9.3**
72.6	73.7	8.4	73.7	72.6	8.9	0.5	**8.7**
73.7	74.7	7.6	74.7	73.7	8.4	0.9	**8.0**
74.7	75.7	9.7	75.7	74.7	9.4	-0.4	**9.5**
75.7	76.2	7.0					
76.2	77.2						
77.2	77.8	7.3	77.8	75.7	6.2	-1.1	**6.8**
77.8	78.8	12.0	78.8	77.8	8.8	-3.1	**10.4**
78.8	79.8	12.0	79.8	78.8	11.9	-0.1	**12.0**
79.8	80.8	10.6	80.8	79.8	9.8	-0.8	**10.2**
80.8	81.9	11.3	81.9	80.8	11.3	0.0	**11.3**
81.9	82.9	11.6	82.9	81.9	12.0	0.4	**11.8**
82.9	83.9	9.7	83.9	82.9	9.0	-0.7	**9.4**
83.9	84.9	10.5	84.9	83.9	10.5	0.0	**10.5**
84.9	86.0	8.2	86.0	84.9	8.3	0.1	**8.3**
86.0	87.0	8.7					
87.0	88.0	8.8	88.0	86.0	9.2	0.5	**9.0**
88.0	89.0	9.8	89.0	88.0	11.6	1.8	**10.7**
89.0	90.1	13.7	90.1	89.0	13.8	0.1	**13.8**
90.1	91.1	13.9	91.1	90.1	14.8	0.9	**14.4**
			92.1	91.1	14.6		
91.1	92.1	13.6	92.5	92.1	15.1	1.5	**14.3**
92.1	93.1	15.6	93.1	92.5	17.6	1.9	**16.6**
93.1	94.2	16.3	94.2	93.1	18.1	1.8	**17.2**
94.2	95.2	11.9	95.2	94.2	13.2	1.4	**12.5**
95.2	96.2	12.7	96.2	95.2	14.6	1.9	**13.6**
96.2	97.2	15.5	97.2	96.2	13.0	-2.5	**14.2**
97.2	98.3	15.0					
			98.3	97.2	15.3		
98.3	99.1	9.8	99.1	98.3	11.3		

Road Roughness

S 7, Marneuli - Sadakhlo

Road Chainage Marneuli - Sadakhlo from km	to km	IRI (m/km)	Road Chainage Sadakhlo - Marneuli from km	to km	IRI (m/km)	Delta	**Average IRI (m/km)**
0.0	1.0	10.0	1.0	0.0	9.4	-0.6	**9.7**
1.0	2.0	11.9	2.0	1.0	12.4	0.6	**12.1**
2.0	3.1	7.5	3.1	2.0	8.0	0.5	**7.8**
3.1	4.1	8.5	4.1	3.1	8.0	-0.5	**8.2**
4.1	5.1	9.5	5.1	4.1	9.0	-0.5	**9.3**
5.1	6.1	10.9	6.1	5.1	11.2	0.4	**11.1**
6.1	7.2	9.5	7.2	6.1	8.9	-0.6	**9.2**
7.2	8.2	9.8	8.2	7.2	10.1	0.3	**9.9**
8.2	9.2	9.4	9.2	8.2	9.9	0.5	**9.6**
9.2	10.2	6.7	10.2	9.2	7.0	0.3	**6.9**
10.2	11.2	7.4	11.2	10.2	7.2	-0.2	**7.3**
11.2	12.3	11.1	12.3	11.2	11.8	0.7	**11.5**
12.3	13.3	10.0	13.3	12.3	10.5	0.5	**10.3**
13.3	14.3	10.3	14.3	13.3	10.7	0.5	**10.5**
14.3	15.3	9.1	15.3	14.3	10.5	1.4	**9.8**
15.3	16.4	9.7	16.4	15.3	9.6	0.0	**9.7**
16.4	17.4	10.1	17.4	16.4	11.1	1.1	**10.6**
17.4	18.4	8.3	18.4	17.4	8.4	0.1	**8.4**
18.4	19.4	8.8	19.4	18.4	8.5	-0.3	**8.7**
19.4	20.4	6.8	20.4	19.4	7.8	1.0	**7.3**
20.4	21.5	14.0	21.5	20.4	15.1	1.1	**14.6**
21.5	22.5	11.7	22.5	21.5	12.5	0.8	**12.1**
22.5	23.5	14.2	23.5	22.5	16.8	2.6	**15.5**
23.5	24.5	13.6	24.5	23.5	15.8	2.2	**14.7**
24.5	25.6	9.3	25.6	24.5	8.7	-0.7	**9.0**
25.6	26.6	16.1	26.6	25.6	14.1	-1.9	**15.1**
26.6	27.6	13.5	27.6	26.6	14.5	1.1	**14.0**
27.6	28.6	11.6	28.6	27.6	15.0	3.5	**13.3**
28.6	29.6	13.5	29.6	28.6	15.1	1.6	**14.3**
29.6	30.7	16.8	30.7	29.6	17.1	0.3	**17.0**
30.7	31.7	18.9	31.7	30.7	18.6	-0.3	**18.8**
31.7	32.7	10.3	32.7	31.7	11.0	0.6	**10.7**
32.7	33.7	11.6					
			33.7	32.7	11.1		
33.7	34.2	9.6	34.2	33.7	10.6	0.9	**10.1**

Road Roughness

S 9, Tbilisi - Bypass

Road Chainage		IRI	Road Chainage		IRI	Delta	**Average**
from km	to km	(m/km)	from km	to km	(m/km)		IRI (m/km)
0.0	1.0	4.3	1.0	0.0	4.6	0.3	**4.5**
1.0	2.1	4.5	2.1	1.0	4.3	-0.2	**4.4**
2.1	3.1	6.6	3.1	2.1	7.3	0.7	**6.9**
3.1	4.1	5.3	4.1	3.1	5.0	-0.3	**5.1**
4.1	5.2	3.9	5.2	4.1	4.6	0.7	**4.2**
5.2	6.2	5.6	6.2	5.2	5.2	-0.4	**5.4**
6.2	7.2	4.2	7.2	6.2	4.2	0.0	**4.2**
7.2	8.3	4.6	8.3	7.2	6.1	1.5	**5.4**
			9.3	8.3	5.0		
8.3	10.3	4.3	10.3	9.3	4.1	-0.2	**4.2**
10.3	11.4	3.9	11.4	10.3	4.3	0.4	**4.1**
11.4	12.4	4.2	12.4	11.4	4.4	0.2	**4.3**
12.4	13.4	6.8	13.4	12.4	7.2	0.4	**7.0**
13.4	14.4	5.6	14.4	13.4	6.9	1.3	**6.2**
14.4	15.5	10.1	15.5	14.4	9.6	-0.5	**9.8**
15.5	16.5	6.7	16.5	15.5	7.8	1.1	**7.3**
			17.5	16.5	4.7		
16.5	18.6	4.2	18.6	16.5	4.7	0.5	**4.5**
18.6	19.6	4.6	19.6	18.6	3.7	-0.9	**4.1**
19.6	20.6	7.8	20.6	19.6	5.7	-2.1	**6.8**
20.6	21.7	5.4	21.7	20.6	5.5	0.0	**5.4**
21.7	22.7	5.2	22.7	21.7	4.9	-0.3	**5.0**
22.7	23.7	3.8	23.7	22.7	4.5	0.7	**4.1**
23.7	24.8	3.8	24.8	23.7	4.2	0.3	**4.0**
24.8	25.8	3.7	25.8	24.8	3.8	0.1	**3.8**
25.8	26.8	5.0	26.8	25.8	5.2	0.2	**5.1**
26.8	27.9	4.8	27.9	26.8	5.0	0.2	**4.9**
27.9	28.9	4.1	28.9	27.9	3.4	-0.7	**3.8**
28.9	29.9	4.2	29.9	28.9	3.7	-0.5	**4.0**
29.9	31.0	3.7	31.0	29.9	3.9	0.2	**3.8**
31.0	32.0	3.5	32.0	31.0	3.5	0.0	**3.5**
32.0	33.0	4.7	33.0	32.0	4.1	-0.6	**4.4**
33.0	34.1	4.8	34.1	33.0	5.4	0.6	**5.1**
34.1	35.1	3.8	35.1	34.1	4.3	0.5	**4.1**
35.1	36.1	6.4	36.1	35.1	5.9	-0.6	**6.2**
36.1	37.2	4.3	37.2	36.1	5.0	0.7	**4.7**
37.2	38.2	4.1	38.2	37.2	4.9	0.8	**4.5**
38.2	39.2	5.1	39.2	38.2	4.8	-0.3	**5.0**
39.2	40.2	6.0	40.2	39.2	5.8	-0.2	**5.9**
40.2	41.3	5.3	41.3	40.2	6.7	1.4	**6.0**
41.3	42.3	3.5	42.3	41.3	3.7	0.1	**3.6**
42.3	43.3	3.7	43.3	42.3	3.4	-0.3	**3.5**
43.3	44.4	4.8	44.4	43.3	3.9	-0.9	**4.4**
44.4	45.4	4.2	45.4	44.4	4.7	0.5	**4.4**
45.4	46.4	2.8	46.4	45.4	3.3	0.5	**3.1**
46.4	47.5	3.7	47.5	46.4	3.9	0.3	**3.8**
47.5	48.5	3.4	48.5	47.5	3.9	0.5	**3.6**
48.5	49.0	5.7	49.0	48.5	4.3	-1.4	**5.0**

Road Roughness

S 12, Samtredia - Ureki

Road Chainage Samtredia - Ureki		IRI	Road Chainage Ureki - Samtredia		IRI	Delta	**Average** IRI
from km	to km	(m/km)	from km	to km	(m/km)		(m/km)
0.0	1.1	6.7	1.1	0.0	6.3	-0.4	**6.5**
1.1	2.1	6.3	2.1	1.1	5.7	-0.6	**6.0**
2.1	3.2	5.8	3.2	2.1	5.7	-0.1	**5.7**
3.2	4.3	6.9	4.3	3.2	7.3	0.4	**7.1**
4.3	5.3	13.6	5.3	4.3	11.0	-2.7	**12.3**
5.3	6.4	11.7	6.4	5.3	12.0	0.3	**11.8**
6.4	7.5	12.8	7.5	6.4	12.3	-0.5	**12.5**
7.5	8.5	4.4	8.5	7.5	3.9	-0.4	**4.1**
8.5	9.6	5.8	9.6	8.5	7.2	1.5	**6.5**
9.6	10.7	7.3	10.7	9.6	6.2	-1.1	**6.8**
10.7	11.7	11.7	11.7	10.7	13.0	1.2	**12.3**
11.7	12.8	5.9	12.8	11.7	5.5	-0.3	**5.7**
12.8	13.9	5.3	13.9	12.8	5.8	0.5	**5.6**
13.9	14.9	8.9	14.9	13.9	8.6	-0.2	**8.7**
14.9	16.0	5.9	16.0	14.9	6.2	0.4	**6.1**
16.0	17.1	6.4	17.1	16.0	6.7	0.3	**6.5**
17.1	18.1	5.2					
18.1	19.2	4.8	19.2	17.1	5.6	0.8	**5.2**
19.2	20.3	7.3	20.3	19.2	6.6	-0.6	**6.9**
20.3	21.3	5.1	21.3	20.3	7.0	1.9	**6.1**
		0.0	22.4	21.3	6.5		
21.3	23.5	7.0	23.5	22.4	5.7	-1.3	**6.4**
23.5	24.5	5.8	24.5	23.5	6.2	0.5	**6.0**
24.5	25.6	5.6	25.6	24.5	7.8	2.2	**6.7**
25.6	26.7	11.8	26.7	25.6	10.9	-0.8	**11.3**
26.7	27.7	9.1	27.7	26.7	7.7	-1.4	**8.4**
27.7	28.8	13.8	28.8	27.7	11.2	-2.6	**12.5**
28.8	29.9	14.0	29.9	28.8	11.1	-2.9	**12.6**
29.9	30.9	7.5	30.9	29.9	8.6	1.1	**8.1**
30.9	32.0	9.0	32.0	30.9	11.6	2.6	**10.3**
32.0	33.1	8.7	33.1	32.0	10.8	2.1	**9.8**
33.1	34.1	8.6	34.1	33.1	9.0	0.3	**8.8**
34.1	35.2	10.2	35.2	34.1	10.4	0.2	**10.3**
35.2	36.3	13.4	36.3	35.2	13.0	-0.4	**13.2**
36.3	37.3	6.9	37.3	36.3	8.2	1.3	**7.6**
37.3	38.4	4.7	38.4	37.3	5.3	0.6	**5.0**
38.4	39.5	5.2	39.5	38.4	4.8	-0.3	**5.0**
39.5	40.5	4.1	40.5	39.5	4.8	0.6	**4.5**
40.5	41.6	5.1	41.6	40.5	5.7	0.6	**5.4**
41.6	42.7	4.3	42.7	41.6	5.2	0.8	**4.8**
42.7	43.7	5.7	43.7	42.7	6.9	1.2	**6.3**
43.7	44.8	9.1	44.8	43.7	11.0	2.0	**10.1**
44.8	45.9	5.8	45.9	44.8	6.3	0.6	**6.1**
45.9	46.9	8.8	46.9	45.9	9.1	0.2	**8.9**
46.9	48.0	9.6	48.0	46.9	9.1	-0.6	**9.4**
48.0	49.1	9.6	49.1	48.0	9.1	-0.6	**9.3**
49.1	50.1	10.7	50.1	49.1	10.3	-0.4	**10.5**
50.1	51.2	8.8	51.2	50.1	8.3	-0.5	**8.6**
51.2	52.3	5.2	52.3	51.2	5.1	-0.1	**5.1**
52.3	53.3	4.8	53.3	52.3	4.8	0.0	**4.8**
53.3	54.4	7.4	54.4	53.3	7.2	-0.1	**7.3**
54.4	55.5	7.1	55.5	54.4	6.9	-0.2	**7.0**
55.5	56.5	6.7	56.5	55.5	6.2	-0.5	**6.4**

APPENDIX 6.9

DRAINAGE STRUCTURES LIST

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Othe
1	15+763	P	RC	20.0	1500	●												
2	15+900	P	RC	20.0	1000	●												
3	15+986	P	RC	18.0	1500	●												
4	21+110	P	RC	34.0	1000	●												
5	21+380	P	RC	34.0	1000													
6	21+640	P	RC	30.0	1300													
7	22+239	B	RC	75.0	3000x3000													
8	22+605	P	RC	90.0	1500 (2)													
9	23+424	P	RC	36.0	1200													
10	23+600	P	RC	35.0	750													
11	23+980	P	RC	50.0	1500													
12	24+204	P	RC	68.0	1500													
13	25+322	P	RC	32.0	1500	●												
14	25+737	B	RC	40.0	3000x3000													
15	26+472	B	RC	56.0	5200x3800													
16	27+088	B	RC	15.0	2600x800													
17	27+596	B	RC	25.0	8000x4000													
18	28+100	P	RC	266.0	1500													
19	30+745	P	RC	13.0	400	●●												
20	30+944	P	RC	14.0	750	●●												
21	31+251	P	RC	12.0	400	●●												
22	32+203	B	RC	15.0	500x500	●●												
23	32+552	P	RC	12.0	750	●●												
24	33+078	P	RC	18.0	750													
25	33+570	P	RC	17.0	750	●●												
26	34+280	P	RC	24.0	1100	●●												
27	36+965	P	RC	12.0	500													
28	39+787	P	RC	11.0	1000													
29	40+634	B	RC	10.5	1000x1000	●●												
30	40+960	P	RC	12.0	500	●●												
31	41+105	P	RC	17.0	1000	●												
32	41+829	B	RC	11.0	1800x2000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	43+021	P	RC	12.0	500	●												
34	43+452	P	RC	15.0	500	●●												
35	45+610	P	RC	14.0	1000													
36	45+908	P	RC	14.0	750													
37	46+788	B	RC	14.0	1000x1000													
38	46+870	P	RC	25.0	1000													
39	47+920	B	RC	14.0	1000x1000													
40	48+375	B	RC	11.0	1000x1000													
41	48+458	B	RC	13.0	1200x1000													
42	49+089	P	RC	12.0	1000													
43	49+629	P	RC	13.0	1000													
44	50+009	P	RC	11.0	750													
45	50+490	P	RC	11.0	1000													
46	51+017	P	RC	12.0	1000													
47	51+197	B	RC	13.0	1300x1000													
48	52+038	P	RC	13.0	1000													
49	52+323	P	RC	12.0	750													
50	52+788	P	RC	12.0	750	●												
51	53+091	P	RC	11.0	750													
52	53+301	P	RC	12.0	750													
53	53+911	B	RC	12.0	1000x1000													
54	54+285	P	RC	12.0	750													
55	54+477	B	RC	15.0	1000x1000													
56	54+789	P	RC	12.0	750													
57	55+216	B	RC	40.0	4500x2500													
58	55+865	P	RC	11.0	750	●●												
59	56+705	P	RC	20.0	1000													
60	57+073	B	RC	14.0	2000x1000													
61	57+580	P	RC	47.0	1000 (2)													
62	58+835	P	RC	12.0	750	●●												
63	58+931	B	RC	12.0	3000x2000													
64	60+440	B	RC	80.0	4000x3000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
	(km)			(m)	(mm)													
65	60+640	P	RC	25.0	1000													
66	61+011	P	RC	26.0	1000													
67	61+704	P	RC	13.0	1000													
68	62+750	P	RC	13.0	750 (2)													
69	63+946	B	RC	12.0	2500x2500													
70	64+300	P	RC	11.0	750	●●												
71	64+675	P	RC	12.0	1000													
72	65+495	P	RC	14.0	1000	●●												
73	66+389	P	RC	16.0	1000													
74	67+105	P	RC	22.0	1000	●●												
75	67+383	P	RC	16.0	1000													
76	68+083	P	RC	20.0	1000													
77	68+863	P	RC	14.0	1000													
78	69+170	P	RC	20.0	1000	●●												
79	69+355	P	RC	15.0	1000													
80	71+312	P	RC	18.0	750	●●												
81	71+526	P	RC	16.0	750	●●												
82	71+642	P	RC	13.0	1000	●												
83	72+191	P	RC	16.0	1000													
84	72+560	B	RC	16.0	4000x2500													
85	73+258	P	RC	14.0	1000	●												
86	73+480	P	RC	14.0	1000	●●												
87	73+873	P	RC	14.0	1000	●●												
88	74+073	P	RC	12.0	750	●●												
89	74+386	P	RC	16.0	1000	●●												
90	74+612	P	RC	12.0	800	●●												
91	74+797	P	RC	14.0	1000	●●												
92	75+410	P	RC	20.0	1000													
93	75+690	P	RC	13.0	800													
94	75+789	P	RC	14.0	1000													
95	76+210	P	RC	14.0	1000													
96	76+654	P	RC	17.0	750	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
97	77+234	P	RC	17.0	1200	●●												
98	77+704	P	RC	16.0	1500													
99	77+907	P	RC	16.0	1000													
100	78+039	P	RC	16.0	750													
101	78+677	P	RC	16.0	750	●●												
102	79+176	P	RC	16.0	750													
103	79+505	P	RC	16.0	1000													
104	79+634	P	RC	14.0	500	●												
105	80+344	P	RC	13.0	1000													
106	80+718	P	RC	16.0	1500													
107	81+040	P	RC	25.0	1000													
108	81+415	P	RC	15.0	1000													
109	82+190	P	RC	45.0	1500													
110	82+313	P	RC	45.0	1500													
111	82+921	P	RC	26.0	1000	●●												
112	83+120	B	RC	53.0	3000x2500													
113	83+300	P	RC	48.0	1500													
114	83+555	P	RC	110.0	1500													
115	83+926	P	RC	45.0	1500													
116	84+176	P	RC	45.0	1500													
117	84+338	P	RC	36.0	1500													
118	84+408	B	RC	37.0	2500x6000													
119	84+590	P	RC	60.0	1500													
120	84+725	B	RC	35.0	2000x3000													
121	84+918	P	RC	63.0	1500													
122	85+042	P	RC	14.0	1000													
123	85+240	P	RC	30.0	1500													
124	85+479	P	RC	30.0	1500													
125	85+579	P	RC	40.0	1500													
126	86+918	P	RC	19.0	1500													
127	88+440	P	RC	80.0	1500													
128	88+452	B	RC	60.0	5000x4000													

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Materiai	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
129	89+153	B	RC	14.0	7000x6000													
130	89+688	P	RC	16.0	1000													
131	89+960	P	RC	20.0	1000	●●												
132	90+607	P	RC	20.0	1000	●●												
133	91+117	P	RC	45.0	1500													
134	93+780	P	RC	30.0	1500													
135	95+353	P	RC	12.0	750													
136	96+077	P	RC	13.0	750													
137	96+327	P	RC	13.0	750	●												
138	96+554	P	RC	13.0	750													
139	96+624	P	RC	13.0	1000													
140	96+754	P	RC	12.0	500													
141	97+092	P	RC	12.0	500													
142	97+338	P	RC	12.0	500													
143	97+489	P	RC	13.0	1000													
144	97+749	P	RC	12.0	500	●●												
145	98+359	P	RC	13.0	1000	●												
146	98+591	P	RC	12.0	500													
147	99+998	P	RC	28.0	1000													
148	100+194	P	RC	15.0	750													
149	100+591	P	RC	34.0	1000													
150	100+989	P	RC	13.0	1000													
151	101+004	P	RC	13.0	1500													
152	101+781	P	RC	28.0	750 (2)													
153	102+835	P	RC	39.0	1000													
154	103+611	P	RC	95.0	1000													
155	104+053	P	RC	32.0	1000	●												
156	104+363	P	RC	15.0	1000	●												
157	104+551	P	RC	25.0	1000													
158	105+453	P	RC	29.0	1000	●●												
159	106+194	B	RC	25.0	1000x1000													
160	107+477	P	RC	32.0	1000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
161	107+842	P	RC	17.0	1000													
162	108+050	P	RC	12.0	750	●												
163	112+750	P	RC	32.0	1000													
164	118+577	P	RC	14.0	1000	●●												
165	125+105	B	RC	12.0	5000x1500													
166	126+010	P	RC	13.0	1000													
167	126+428	P	RC	14.0	1500	●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Oth
1	11+275	P	RC	22.0	300	●●												
2	11+452	P	RC	19.5	500	●												
3	12+215	B	RC	18.0	1000x500													
4	18+880	B/P	RC	13.6	1400x1400 - 1200	●												
5	19+280	B	RC	13.6	1200x1500	●												
6	19+477	P	RC	15.0	1000	●												
7	20+508	P	RC	14.0	1000	●●												
8	21+140	B	RC	15.0	1100x1500	●●												
9	21+884	B	RC	13.0	1500x1000	●●												
10	22+139	P	RC	16.0	1000	●●												
11	22+336	P	RC	21.0	1000	●												
12	22+875	B	RC	27.0	4500x2000													
13	23+315	P	RC	52.0	1000	●												
14	23+540	B	RC	23.0	1000x2000	●												
15	23+603	P	RC	20.0	1000	●												
16	23+830	B	RC	13.5	2000x1000													
17	24+423	P	RC	20.0	1500													
18	24+521	P	RC	13.0	1000													
19	24+621	P	RC	14.0	1000	●●												
20	26+633	P	RC	46.0	700													
21	27+732	P	RC	30.0	1000													
22	27+937	P	RC	20.0	1000													
23	29+120	P	RC	30.0	1500													
24	29+560	P	RC	12.0	750													
25	32+638	P	RC	38.0	1500 (2)													
26	32+933	B	RC	12.0	1000x1000													
27	33+555	P	RC	38.0	1000	●●												
28	33+895	P	RC	20.0	1500													
29	34+090	P	RC	23.0	1500													
30	34+190	B	RC	20.0	1000x1000	●												
31	34+285	P	RC	15.0	750													
32	34+453	P	RC	18.0	1500	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	34+742	P	RC	12.0	1500													
34	35+116	P	RC	14.0	750													
35	35+437	P	RC	13.0	750	●●												
36	35+628	P	RC	18.0	750	●												
37	35+910	P	RC	20.0	1500													
38	36+152	P	RC	18.0	750													
39	36+434	P	RC	19.0	1500													
40	36+703	B	RC	12.0	2500x1500													
41	37+036	P/B	RC	18.0	1500 (2) / 2500x1600													
42	37+394	B	RC	13.0	2000x1000													
43	38+791	P	RC	13.0	400	●												
44	39+247	B	RC	13.0	2000x1000	●												
45	40+115	P	RC	18.0	800	●												
46	42+435	P	RC	14.0	750													
47	44+916	P	RC	14.0	1500	●												
48	45+517	B	RC	15.0	1000x1000	●												
49	46+156	B	RC	13.0	1500x1000	●												
50	46+740	B	RC	15.0	1000x1500	●												
51	47+050	P	RC	15.0	750	●												
52	47+297	B	RC	12.0	1000x1500	●												
53	48+325	B	RC	14.0	1000x500	●●												
54	48+715	P	RC	23.0	750	●●												
55	50+146	B	RC	14.0	1000x500	●												
56	50+244	B	RC	14.0	1500x500	●												
57	50+712	P	RC	15.0	750	●												
58	51+125	B	RC	14.0	1500x500	●												
59	51+425	B	RC	15.0	1000x1000	●												
60	51+892	B	RC	15.0	1000x1000	●●												
61	52+646	B	RC	15.0	1000x1000	●												
62	53+109	B	RC	15.0	1500x1000	●												
63	53+555	B	RC	13.0	1000x1000	●●												
64	55+175	P	RC	16.0	1000	●●												

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
65	55+450	B	RC	12.0	1000	●●												
66	56+180	B	RC	12.0	1500x1000	●												
67	56+780	B	RC	10.0	1300x1000	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Materiai	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Othe
1	3+102	B	RC	28.0	6000x4500													
2	3+670	B	RC	24.5	4000x2500													
3	4+238	B	RC	30.0	3700x4000	●												
4	7+321	B	RC	21.0	3000x1000	●												
5	7+961	P	RC	21.0	1200	●●												
6	8+311	B	RC	19.0	6000x4000													
7	9+154	P/B	RC	21.0	1000 - 1000x800	●●												
8	9+480	P	RC	20.0	1500	●●												
9	10+403	P	RC	16.0	1500	●												
10	10+590	B	RC	25.0	2300x2000	●												
11	12+014	B	RC	36.0	2000x2000	●												
12	13+340	B	RC	42.0	5300x3500													
13	13+050	B	RC	12.0	1000x1000	●●												
14	13+082	P	RC	12.0	1000													
15	13+600	P	RC	20.0	1000	●												
16	13+990	P	RC	20.0	1000	●●												
17	14+417	B	RC	19.0	5000x2000	●												
18	15+620	B	RC	40.0	2000x3500	●												
19	17+490	B	RC	11.0	1000x1000	●												
20	19+980	P	RC	17.5	500													
21	23+542	B	RC	20.0	3000x1500													
22	24+168	P	RC	26.0	1000	●												
23	24+392	P	RC	28.0	1000	●●												
24	27+560	P	RC	48.0	1000	●●												
25	28+100	B	RC	57.0	3000x1000	●												
26	29+755	P	RC	14.0	750	●●												
27	30+000	P	RC	15.0	750													
28	31+174	P	RC	16.0	750	●●												
29	31+460	B	RC	14.5	2200x2000													
30	31+609	B	RC	13.0	4000x1500													
31	31+893	A	S	15.0	4000x1000	●●												
32	32+377	P	RC	13.0	1000	●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	32+576	B/P	RC	15.0	1000x1000 - 1000	●												
34	32+760	B/P	RC	15.0	1000x1000 - 1000	●●												
35	33+041	P	RC	13.0	1000	●●												
36	33+426	B/P	RC	13.0	1000x1000 - 1000	●●												
37	33+795	B/P	RC	12.0	600x600 - 500	●●												
38	33+976	B	RC	12.0	1000x1000	●●												
39	34+141	P/B	RC	12.0	450 - 500x500	●												
40	34+399	P	RC	12.0	750	●●												
41	34+842	P	RC	14.0	750													
42	36+078	B	RC	12.0	1500x1000	●												
43	36+306	B	RC	12.0	1000x1000	●●												
44	36+649	B	RC	12.0	1000x1000	●●												
45	37+044	B	RC	20.0	4000x3000													
46	37+264	P	RC	23.0	1500													
47	37+810	B	RC	13.0	1000x1000	●●												
48	38+000	B	RC	11.0	1000x500	●●												
49	38+284	B	RC	11.0	500x500													
50	38+798	P	RC	15.0	500													
51	39+261	B	RC	12.0	700x700	●												
52	39+720	P	RC	50.0	500													
53	39+919	B	RC	11.0	700x700	●												
54	40+421	P	RC	18.0	900													
55	41+081	B	RC	11.0	1300x1000	●												
56	41+239	B	RC	11.0	1300x1000													
57	41+450	B	RC	32.0	1200x1000													
58	41+755	P	RC	11.0	750	●●												
59	42+017	B	RC	12.0	1000x1000	●												
60	42+128	B	RC	11.0	1500x1000	●												
61	42+323	B	RC	11.0	1000x1000	●●												
62	42+779	B	RC	12.0	3800x2000	●												
63	43+902	B	RC	12.0	1000x1000	●												
64	44+896	B/B	RC	13.0	1300x1000 - 1000x1000													

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
65	46+113	B/B	RC	13.0	500x1000 - 1000x1000	●												
66	47+470	P	RC	32.0	1000	●												
67	47+687	B	RC	50.0	1000x1000	●●												
68	47+908	P/B	RC	17.0	750 - 1000x1000													
69	48+488	P	RC	35.0	1000	●												
70	49+934	P/P	RC	64.0	700 -1000													
71	50+284	P	RC	75.0	1000	●●												
72	50+435	P	RC	37.0	750	●●												
73	51+359	B/P	RC	81.0	3000x2000 - 1000	●												
74	51+382	P	RC	100.0	1000 (2)													
75	52+220	B	RC	17.0	1000x1000	●												
76	52+671	P	RC	13.0	750	●●												
77	52+838	B/A	RC/S	25.0	3000x3800 - 3000x2000													
78	53+440	B	RC	11.0	500x500	●●												
79	55+130	P/P	RC	152.0	750 (2) - 1000	●												
80	55+400	B	RC	32.0	1200x2200	●												
81	55+560	P	RC	20.0	750	●●												
82	55+725	P	RC	13.0	1000													
83	55+963	B/B	RC	25.0	5000x2000 - 2300x2400	●												
84	56+152	B	RC	22.0	2000x2000	●												
85	56+467	B/P	RC	20.0	1000x1000 - 750													
86	57+304	B	RC	25.0	3000x2500													
87	57+886	B	RC	13.0	1000x1000	●												
88	58+356	B	RC	24.0	800x800	●												
89	58+738	B	RC	19.0	1000x1000													
90	59+508	B	RC	24.0	800x800	●												
91	59+783	B	RC	23.0	1000x1000	●●												
92	60+095	B	RC	21.0	2000x4000													
93	61+728	B	RC	12.0	1000x1000													
94	62+098	P	RC	17.0	500	●												
95	62+418	B	RC	15.0	1000x1000	●												
96	62+738	P	RC	11.0	500	●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
97	62+859	B	RC	12.0	1000x1000	●												
98	63+030	P	RC	14.0	750	●●												
99	63+130	P	RC	12.0	750													
100	63+705	B	RC	10.0	1000x1000	●												
101	63+810	B	RC	10.0	3000x1000													
102	63+955	P	RC	16.0	1000	●												
103	64+225	B	RC	13.0	1000x1000	●												
104	64+682	P	RC	12.0	1000													
105	64+944	P	RC	24.0	1000													
106	65+011	B	RC	12.0	1000x1000													
107	65+072	P	RC	12.0	1000													
108	65+307	P	RC	12.0	1000	●												
109	65+588	B	RC	12.0	1000x1000													
110	66+006	P	RC	12.0	750	●●												
111	66+252	B	RC	29.0	4000x4000													
112	66+362	B	RC	13.0	1000x1000													
113	66+940	B	RC	12.0	1000x1000													
114	67+122	B	RC	26.0	800x500	●												
115	67+579	P/B	RC	18.0	750 - 1000x2000													
116	68+029	B	RC	12.0	1000x1000	●												
117	69+100	P	RC	13.0	750	●												
118	69+533	P	RC	12.0	1000	●												
119	69+823	B	RC	47.0	3000x3000	●												
120	70+035	B	RC	15.0	1000x1000	●												
121	70+836	B	RC	70.0	2000x2000	●												
122	71+106	P	RC	15.0	1000													
123	71+347	B	RC	15.0	1000x1000	●												
124	71+452	P	RC	18.0	750	●												
125	71+846	B	RC	12.0	2000x1000													
126	71+877	B	RC	70.0	4000x4000													
127	71+916	B	RC	12.0	2000x1000	●												
128	72+382	P	RC	12.0	750	●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
129	72+848	B	RC	11.0	800x800	●												
130	73+286	P	RC	10.0	1000	●												
131	74+200	B	RC	10.0	1000x500	●												
132	74+598	P	RC	9.0	1000	●												
133	74+776	P	RC	15.0	1000	●												
134	75+215	P	RC	10.0	750	●												
135	75+586	P	RC	10.0	1000	●												
136	75+680	A	S	10.0	2000x3000	●												
137	76+735	P	RC	9.0	1000	●												
138	77+340	B	RC	12.0	1000x1000	●●												
139	77+659	P	RC	12.0	1000	●												
140	78+884	P	RC	9.0	750	●●												
141	79+516	P	RC	8.0	750	●●												
142	80+062	P	RC	30.0	750	●●												
143	80+333	P	RC	16.0	750	●												
144	80+976	B	RC	10.0	1000x1000	●●												
145	81+198	B	RC	11.0	2000x2000													
146	82+114	A	S	10.0	1000x1000													
147	82+257	B	RC	9.0	500x750													
148	82+782	A	S	8.0	1000x1000													
149	82+980	A	S	9.0	1000x1000													
150	83+175	P	RC	8.0	750													
151	83+880	B/A	RC/S	10.0	500x3400 - 1000x1000													
152	84+240	B	RC	8.5	500x1000													
153	84+443	B	RC	9.0	500x1000	●●												
154	85+494	B	RC	9.0	1000x1000													
155	86+054	B	RC	10.0	1000x1000	●●												
156	86+518	P	RC	10.0	750	●●												
157	86+718	B	RC	10.0	1000x1000													
158	87+540	B/P	RC	10.0	1000x500 - 1000													
159	88+030	B/B	RC	14.0	1000x1500 - 1000x1000													
160	88+180	B	RC	10.0	750x2500	●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Materiai	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Othe
161	88+826	B	RC	10.0	1300x1300	●●												
162	89+020	A	S	10.0	500x1000	●●												
163	89+500	P	RC	16.0	1500													
164	90+082	B	RC	7.0	3000x5000													
165	90+156	P	RC	7.0	1000													
166	90+292	B	RC	8.0	1000x1300	●												
167	90+468	B	RC	8.0	1000x1000	●												
168	90+951	P	RC	9.0	750													
169	91+620	B	RC	18.0	2500x3500													
170	91+836	P	RC	9.0	750	●●												
171	92+446	B	RC	12.0	2000x4000	●●												
172	92+593	P	RC	9.0	1000	●●												
173	92+772	P	RC	9.0	500	●●												
174	92+961	B/B	RC	9.0	1500x1500 - 1000x4000													
175	93+132	B	RC	11.0	500x1000													
176	94+188	B	RC	8.0	1000x1000	●●												
177	94+838	P	RC	9.0	1000	●●												
178	95+306	P	RC	20.0	1500	●●												
179	95+383	P	RC	16.0	750	●												
180	95+802	B	RC	14.0	2000x2000													
181	96+146	B/B	RC	14.0	2000x2000 - 1000x3000													
182	96+320	B/B	RC	13.0	2000x2000 - 2000x3000													
183	96+598	P	RC	22.0	1500													
184	96+728	B/B	RC	12.0	2000x2000 - 2000x4000													
185	97+105	P	RC	16.0	1500													
186	97+323	P	RC	15.0	1000	●●												
187	97+855	B/B	RC	14.0	2000x3000 - 2000x2000													
188	99+079	P	RC	18.0	1000	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
1	3+648	P	RC	11.0	750	●												
2	3+773	B	RC	11.0	600x600	●												
3	5+955	B	RC	12.0	6000x2500													
4	6+130	B	RC	11.0	1000x1000	●												
5	8+071	B	RC	9.0	3000x2000	●												
6	8+652	B	RC	10.0	1000x500	●												
7	10+300	P	M	38.0	1500 (2)													
8	10+521	P	RC	10.0	750	●												
9	10+583	P	RC	12.0	1200													
10	10+817	P	RC	14.0	700													
11	11+081	P	RC	10.0	750													
12	12+584	P	RC	12.0	1100													
13	12+767	P	RC	10.0	750	●												
14	13+680	P	M	12.0	250													
15	13+797	P	RC	11.0	750													
16	14+928	P	RC	12.0	750	●●												
17	15+739	P	RC	10.0	750													
18	15+912	P	RC	10.0	750													
19	16+227	B/P	RC	10.0	1000x1000 / 750	●												
20	16+666	P	RC	10.0	750	●												
21	16+952	P	RC	10.0	750	●												
22	17+122	P	RC	20.0	1200													
23	17+666	P	RC	10.0	750	●												
24	18+106	P	RC	14.0	750													
25	18+660	P	RC	11.0	750	●												
26	19+610	P	RC	12.0	750	●●												
27	19+847	P	RC	12.0	750	●												
28	20+004	P	RC	16.0	750	●●												
29	20+357	P	RC	14.0	1200	●												
30	20+646	P	RC	10.0	750	●●												
31	20+773	P	RC	22.0	1000	●●												
32	21+226	P	RC	10.0	750													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

		EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
No	Chainage (km)	Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	21+227	P	RC	12.0	600													
34	21+624	P	RC	10.0	750	●												
35	21+917	P	RC	9.0	750													
36	22+004	P	RC	8.0	750													
37	22+494	P	RC	10.0	750													
38	22+621	P	RC	12.0	750	●												
39	22+928	P	RC	10.0	750	●												
40	23+212	P	RC	11.0	750	●												
41	23+473	B/P	RC	30.0	2800x1300 / 1500 (3)	●												
42	23+558	P	RC	10.0	750	●●												
43	23+743	P	RC	10.0	750	●●												
44	24+026	P	RC	9.0	750	●												
45	24+416	P	RC	9.0	750	●●												
46	24+664	B	RC	12.0	1000x1000													
47	24+985	P	RC	9.0	750	●												
48	25+238	P	RC	11.0	750	●●												
49	25+519	P	RC	13.0	750	●●												
50	25+694	P	RC	11.0	750	●●												
51	26+076	B	RC	13.0	1700x1500													
52	26+226	P	RC	11.0	500	●●												
53	26+578	P	RC	13.0	750	●●												
54	26+852	P	RC	11.0	750													
55	27+104	P	RC	11.0	750	●												
56	27+234	P	RC	10.0	750	●												
57	27+472	P	RC	17.0	1000	●												
58	27+834	P	RC	10.0	750	●												
59	28+134	P	RC	10.0	750	●●												
60	28+566	P	RC	10.0	750	●												
61	28+757	P	RC	10.0	750													
62	29+388	P	RC	10.0	750	●●												
63	29+607	P	RC	10.0	750	●												
64	30+215	P	RC	14.0	750	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
65	30+426	P	RC	12.0	750	●												
66	30+897	P	RC	11.0	1000	●●												
67	31+165	P	RC	10.0	1000	●●												
68	31+228	P	RC	12.0	750	●●												
69	31+388	P	RC	12.0	750	●●												
70	31+623	P	RC	10.0	1000	●												
71	31+858	B	RC	120.0	4000x3000													
72	32+087	P	RC	12.0	750	●												
73	32+583	P	RC	19.0	750													
74	32+888	P	RC	22.0	750	●●												
75	33+307	P	RC	16.0	750													
76	33+538	P	RC	16.0	750	●●												

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 9, Tbilisi By-pass

No	Chainage	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
	(km)			(m)	(mm)													
1	0+141	P	RC	18.0	1000			●										
2	0+452	P	RC	29.0	1000			●										
3	0+796	P	RC	25.0	1000	●		●										
4	1+236	P	RC	35.0	1000			●										
5	1+323	P	RC	30.0	1500	●		●										
6	1+607	P	RC	32.0	1500	●		●										
7	2+283	P	RC	16.0	1000	●●		●										
8	3+000	P	RC	16.0	1500	●●		●										
9	3+734	P	RC	19.0	1000	●		●										
10	4+245	P	RC	100.0	1500	●		●										
11	4+775	P	RC	54.0	1200	●		●										
12	5+130	B	RC	91.0	3000x2500	●												
13	5+499	P	RC	30.0	400	●		●										
14	5+700	P	RC	25.0	500	●●												
15	5+800	P	RC	50.0	1200	●●												
16	5+929	B	RC	88.5	4000x2500	●		●										
17	6+227	P	RC	20.0	1200	●		●										
18	6+740	P	RC	24.0	1000	●●												
19	7+200	B	RC	60.0	6000x4000	●												
20	7+863	B	RC	24.0	4000x2000	●		●										
21	8+073	P	RC	26.0	1000	●		●										
22	9+914	P	RC	40.0	1500	●		●										
23	10+172	P	RC	46.0	1500													
24	10+550	P	RC	28.0	1000													
25	11+146	P	RC	20.0	1500													
26	11+510	P	RC	25.0	1000													
27	12+000	P	RC	34.0	1500													
28	12+235	P	RC	25.0	1500													
29	12+576	P	RC	25.0	1500													
30	12+718	P	RC	33.0	1500													
31	13+338	B	RC	150.0	3000x3000													
32	14+492	B	RC	135.0	4000x2500													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 9, Tbilisi By-pass

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	14+600	P	RC	40.0	1000	●●												
34	15+762	P	RC	22.0	1000	●●												
35	16+092	P	RC	22.0	1000													
36	17+614	P	RC	60.0	1500													
37	19+400	P	RC	23.0	1000													
38	21+500	P	RC	23.0	1000	●●												
39	22+058	P	RC	17.0	1000	●												
40	23+898	P	RC	104.0	1500													
41	24+070	B	RC	35.0	3000x2000													
42	24+145	P	RC	85.0	1500													
43	25+285	P	RC	66.0	1500													
44	26+215	P	RC	70.0	1500													
45	27+806	P	RC	16.0	1000													
46	30+292	P	RC	20.0	1000													
47	30+765	B	RC	36.5	2000x2000													
48	31+380	P	RC	26.0	1000													
49	31+760	P	RC	60.0	1500													
50	31+872	P	RC	37.0	1000													
51	32+529	P	RC	22.0	1000													
52	33+400	P	RC	73.0	1500													
53	33+700	B	RC	105.0	(6000x3300) x 2													
54	34+876	P	RC	41.0	1000													
55	36+823	P	RC	20.0	500	●●												
56	37+894	P	RC	26.0	500	●●												
57	38+750	P	RC	33.0	1000	●●												
58	40+600	P	RC	20.0	1000													
59	41+870	P	RC	22.0	1000													
60	42+164	P	RC	32.0	1000	●												
61	42+519	P	RC	55.0	1500													
62	43+170	P	RC	23.0	500	●●												
63	43+810	P	RC	25.0	1000													
64	44+223	B	RC	56.0	5000x5000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 9, Tbilisi By-pass

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
65	44+233	P	RC	68.0	1500													
66	44+402	P	RC	65.0	1500													
67	44+867	P	RC	37.0	1000	●●												
68	45+100	P	RC	23.0	500													
69	45+248	P	RC	31.0	2400													
70	45+670	P	RC	25.0	1000													
71	45+770	P	RC	18.0	750													
72	46+011	P	RC	24.0	1000													
73	46+540	P	RC	24.0	1000	●●												
74	47+529	P	RC	23.0	1000													
75	47+786	P	RC	48.0	1500													
76	48+146	P	RC	40.0	1000													
77	48+886	P	RC	24.0	1000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
1	0+212	P	RC	13.0	1000	●●												
2	0+374	P	RC	15.0	750	●●												
3	1+243	P	RC	14.0	750	●●												
4	5+595	B	RC	13.0	2500x1000													
5	5+783	P	RC	13.0	1000													
6	6+157	P	RC	14.0	1000													
7	7+955	P	RC	15.0	1000	●												
8	8+757	P	RC	11.0	1200	●												
9	8+893	P	RC	14.0	750	●●												
10	9+272	P	RC	33.0	750	●●												
11	11+125	P	RC	14.0	1000													
12	14+918	P	RC	10.0	1000	●												
13	15+422	P	RC	12.0	1000													
14	15+519	P	RC	12.0	750													
15	15+645	P	RC	12.0	750													
16	15+764	B	RC	12.0	1000x1000													
17	16+771	P	RC	11.0	1000	●	●											
18	17+130	P	RC	12.0	750		●											
19	17+170	P	RC	12.0	750													
20	17+285	P	RC	12.0	750													
21	17+425	P	RC	12.0	750													
22	18+077	P	RC	15.0	500													
23	18+263	P	RC	13.0	1000													
24	18+386	P	RC	14.0	1000	●●												
25	18+463	P	RC	14.0	1200													
26	18+763	P	RC	11.0	1000													
27	19+438	B	RC	12.0	1000x1000													
28	19+635	P	RC	13.0	1000													
29	19+946	B	RC	12.0	1000x1000													
30	20+135	P	RC	12.0	1000													
31	20+423	B	RC	13.0	1000x1000													
32	20+625	P	RC	12.0	750													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
33	22+540	B	RC	11.0	1000x1000													
34	23+556	B	RC	9.0	1000x1000													
35	24+880	B	RC	9.0	3000x1000													
36	24+900	P	RC	9.0	1000													
37	25+820	B	RC	9.0	1000x1000													
38	25+911	B	RC	9.0	1000x1000													
39	26+072	P	RC	9.0	1000													
40	26+155	P	RC	13.0	1000													
41	26+907	B/P	RC	11.0	1000x1000 - 1500 (2)													
42	27+087	B	RC	13.0	1000x1000													
43	27+885	B/P	RC	9.0	2500x1000 - 1500 (3)													
44	27+897	P	RC	14.0	1000													
45	28+682	B	RC	9.0	3500x4500													
46	29+119	P	RC	12.0	1300													
47	29+265	B	RC	11.0	1000x1000													
48	29+417	P	RC	11.0	750	●												
49	29+930	P	RC	14.0	750													
50	32+366	B	RC	12.0	3000x1800													
51	32+374	P	RC	12.0	500													
52	32+443	P	RC	11.0	500													
53	34+274	P	RC	11.0	500	●												
54	34+815	B	RC	10.0	1000x500													
55	35+021	B	RC	10.0	2000x1500													
56	35+217	B	RC	10.0	2000x1500													
57	36+647	B	RC	13.0	3000x3000													
58	36+851	B	RC	13.0	3000x3000													
59	37+807	P	RC	12.0	1000													
60	38+302	P	RC	13.0	1000													
61	38+328	B	RC	13.0	1000x2000													
62	39+115	P	RC	12.0	750	●												
63	40+327	P	RC	10.0	750	●												
64	42+416	B	RC	9.0	3000x1800													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

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- DRAINAGE STRUCTURES LIST -

Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage (km)	EXISTING STRUCTURE				DEFICIENCIES			MAINTENANCE ACTIVITY				REQUIRED CULVERT LENGTH (m)					
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	500 mm Dia.	750 mm Dia.	1000 mm Dia.	1250 mm Dia.	1500 mm Dia.	Other
65	42+625	P	RC	12.0	750													
66	43+492	P	RC	13.0	750													
67	43+847	B	RC	11.0	1000x500													
68	44+727	B	RC	9.0	4000x2000													
69	45+005	B	RC	9.0	4000x2000													
70	45+927	P	RC	10.0	1500 (2)													
71	46+086	P	RC	13.0	750													
72	46+343	P	RC	13.0	750													
73	46+785	B	RC	65.0	2500x3000													
74	46+829	P	RC	10.0	750													
75	50+208	P	RC	11.0	500	●												
76	53+817	B	RC	12.5	4000x2000 (2)													
77	55+211	P	RC	10.0	1000	●												
78	55+668	P	RC	12.0	1000	●												
79	55+948	P	RC	12.0	1000													
80	56+322	P	RC	10.0	1000													

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

APPENDIX 6.10.

BRIDGE CONDITION

Road Section: S-1 Tbilisi-Senaki-Khashuri

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-1 Br.: 1	16+029	Railway bridge across road S-1		Continuous beam 3 Spans	doublewebed cross section steel beams, solid webs Bridge deck: precast reinforced concrete slabs				inside width of the main span: 35,00 m	clear height:15,00 m		*1)
S-1 Br.: 2	16+365	Railway bridge across road S-1		Arch bridge 4 Spans	reinforced concrete				inside width of the main span: 30,00 m	clear height: 8,00 m		
S-1 Br.: 3	16+500	Bridge along the River Mtkvari	1982	simply supported 28 Spans	14 slabs precast elements reinforced concrete	435.50	14.00	6097,00 Class C	28 x 15,00	12,35 + 1 x 1,65	H - 30 HK - 80	2
S-1 Br.: 4a	19+269	Bridge across River Mtkvari	1972	Span 1-3;8: simply supported Span 4-7: continuos steel beam	Spans 1-3,8: multiwebed cross section 6 webs without cross beams precast prestressed T-beams Spans 4-7: doublewebed cross section steel beams, solid web Bridge deck: precast reinforced concrete slabs	351.00	15.05	5282,55 Class C	3 x 24,00 + 4 x 63,00 + 24,00	11,50 + 2 x 1,60	H - 30 HK - 80	2
S-1 Br.: 4b	19+269	Bridge across River Mtkvari	1965	Span1-4: continuos beam Span 5: simply supported	Spans 1-4: doublewebed cross section steel beams, solid web Bridge deck: precast reinforced concrete slabs Span 5: multiwebed cross section 6 webs without cross beams precast prestressed T-beams	232.00	12.40	2876,80 Class C	42,00 + 2 x 63,00 + 42,00 + 21,60	9,10 + 2 x 1,65	H - 30 HK - 80	3
S-1 Br.: 5	21+415	Bridge across road		simply supported 1 Span	slab 48 precast elements reinforced concrete	6.60	48.35	319,11 Class B	6.60	3,00 + 8,50 + 4,00 + 9,40 + 4,00 without sidewalks	H - 30 HK - 80	3
S-1 Br.: 6a	22+823	Bridge across road	1982	simply supported 3 Spans	slab 17 precast elements reinforced concrete	36.60	17.00	622,20 Class C	3 x 12,00	15,40 + 1 x 1,60	H - 30 HK - 80	2
S-1 Br.: 6b	22+823	Bridge across road	1982	simply supported 3 Spans	multiwebed cross section 8 webs without cross beams precast T-beams reinforced concrete	36.60	13.10	479,46 Class B	3 x 12,00	11,50 + 1 x 1,60	H - 30 HK - 80	3
S-1 Br.: 7a	23+686	Bridge across River Tsitsamuris Hevi	1978	simply supported 5 Spans	multiwebed cross section 7 webs without cross beams precast prestressed T-beams	108.70	13.50	1460,45 Class C	5 x 21,60	11,90 + 1 x 1,60	H - 30 HK - 80	2

Road Section: S-1 Tbilisi-Senaki-Khashuri

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-1 Br.: 7b	23+686	Bridge across River Tsitsamuris Hevi	1966	simply supported 5 Spans	multiwebed cross section 7 webs without cross beams precast prestressed T-beams	108.70	12.90	1402,23 Class C	5 x 21,60	9,70 + 2 x 1,60	H - 30 HK - 80	3
S-1 Br.: 8a	24+892	Bridge across River Aragvi	1984	continuous beam 3 Spans	doublewebed cross section steel beams, solid webs Bridge deck: precast reinforced concrete slabs	189.70	13.60	2579,92 Class C	3 x 63,00	12,00 + 1,65	H - 30 HK - 80	3
S-1 Br.: 8b	24+892	Bridge across River Aragvi	1962	Span 1: simply supported Span 2-4: continuous beam	Span 1: multiwebed cross section 8 webs without cross beams precast T-beams reinforced concrete Spans 2-4: doublewebed cross section steel beams, solid web Bridge deck: precast reinforced concrete slabs	159.20	12.30	1958,16 Class C	9,00 + 42,00 + 63,00 + 42,00	9,10 + 2 x 1,60	H - 30 HK - 80	2
S-1 Br.: 9	27+190	Road bridge across the Road S-1	1980	simply supported 3 Spans	multiwebed cross section 6 webs without cross beams precast prestressed T-beams				inside width of the main span: 20,00 m	clear height: 4,00 m	H - 30 HK - 80	*1)
S-1 Br.: 10	27+596	Bridge across Road	1986	simply supported 1 Span	slab 27 precast elements reinforced concrete	12.00	28.50	342,00 Class B	12.00	25,50 + 2 x 1,00	H - 30 HK - 80	3
S-1 Br.: 11	27+856	Bridge across dry river	1965	simply supported 1 Span	multiwebed cross section 3 webs cast in place beams reinforced concrete	10.20	10.20	104,04 Class B	10.20	8,70 + 2 x 0,75	H - 30 HK - 80	2
S-1 Br.: 12	40+095	Bridge across River Khsani	1952	simply supported 6 Spans	doublewebed cross section 2 webs with cross beams cast in place beams reinforced concrete	104.40	8.70	908,28 Class C	6 x 17,40	7,10 + 2 x 0,80	H - 13 НГ - 60	3
S-1 Br.: 13	43+467	Bridge across River Lekhura	1973	simply supported 5 Spans	multiwebed cross section Spans 1, 5: 8 webs without cross beams precast T-beams reinforced concrete Spans 2-4: 7 webs without cross beams precast prestressed T-beams	87.00	13.80	1200,60 Class C	11,40 + 3 x 21,00 + 11,40	11,60 + 2 x 1,10	H - 30 HK - 80	2

Road Section: S-1 Tbilisi-Senaki-Khashuri

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-1 Br.: 14	74+972	Bridge across River	1973	simply supported 1 Span	slab 12 precast elements reinforced concrete	5.90	12.90	86,73 Class A	5.90	10,50 + 2 x 1,20	H - 10 НГ - 30	4
S-1 Br.: 15	81+729	Bridge across Road to Gori	1981	simply supported 1 Span	multiwebed cross section 7 webs without cross beams precast T-beams reinforced concrete	21.60	14.70	317.52 Class B	21.60	11,50 + 2 x 1,60	H - 30 HK - 80	2
S-1 Br.: 16	82+080	Bridge across River Tortla	1981	simply supported 1 Span	multiwebed cross section 7 webs without cross beams precast prestressed T-beams reinforced concrete	21.60	14.60	315,36 Class B	21.60	11,50 + 2 x 1,55	H - 30 HK - 80	3
S-1 Br.: 17	82+556	Road bridge across Road S-1	1979	simply supported 3 Spans	multiwebed cross section 5 webs without cross beams precast prestressed T-beams reinforced concrete				inside width of the main span: 21,50 m	clear height: 4,60 m	H - 30 HK - 80	*1)
S-1 Br.: 18	83+652	Bridge across River	1979	simply supported 2 Spans	multiwebed cross section 7 webs without cross beams precast prestressed T-beams reinforced concrete	44.35	14.90	660,82 Class C	2 x 21,60	11,50 + 2 x 1,60	H - 30 HK - 80	2
S-1 Br.: 19	84+693	Bridge across Road Gori - Tskhinvali	1981	simply supported 3 Spans	multiwebed cross section 9 webs without cross beams precast prestressed T-beams reinforced concrete	54.25	17.40	934,95 Class C	16 + 21,6 + 16	15,40 + 2 x 1,00	H - 30 HK - 80	3
S-1 Br.: 20	85+981	Bridge across River Lakhvi	1980	simply supported 7 Spans	multiwebed cross section 6 webs without cross beams precast prestressed T-beams reinforced concrete	157.10	13.65	2144,42 Class C	7 x 21,60	11,20 + 2 x 1,10	H - 30 HK - 80	3
S-1 Br.: 21	86+312	Bridge across Railway Gori - Tskhinvali	1978	simply supported 2 Spans	multiwebed cross section 6 webs without cross beams precast prestressed T-beams reinforced concrete	43.70	13.55	592,14 Class C	2 x 21,60	11,10 + 2 x 1,05	H - 30 HK - 80	2
S-1 Br.: 22	86+658	Bridge across Railway and road	1972	simply supported 4 Spans	multiwebed cross section 6 webs without cross beams precast prestressed T-beams reinforced concrete	86.80	13.80	1197,84 Class C	4 x 21,60	11,50 + 2 x 1,15	H - 30 HK - 80	2
S-1 Br.: 23	89+153	Bridge across chanal	1970	simply supported 1 Span	slab precast elements reinforced concrete	5.80	14.90	86,42 Class A	5.80	12,20 + 2 x 1,30	H - 30 HK - 80	2

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Road Section: S-1 Tbilisi-Senaki-Khashuri

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-1 Br.: 24	104+965	Bridge across River Prone	1976	simply supported 5 Spans	multiwebed cross section 7 webs without cross beams precast prestressed T-beams reinforced concrete	108.40	13.80	1495,92 Class C	5 x 21,60	11,50 + 2 x 1,15	H - 30 НК - 80	**2**
S-1 Br.: 25	107+869	Bridge across River Ptsa	1968	simply supported 3 Spans	multiwebed cross section 6 webs without cross beams precast prestressed T-beams reinforced concrete	72.30	15.30	1106,19 Class C	3 x 24,00	11,70 + 2 x 1,6	H - 30 НК - 80	**2**
S-1 Br.: 26	112+789	Bridge across Railway Tbilisi - Samtredia	1952	simply supported 3 Spans	multiwebed cross section Spans 1,3: 5 webs without cross beams cast in place T-beams reinforced concrete Span 2: 6 webs with cross beams precast prestressed T-beams	44.70	8.90	397,83 Class B	11,2 + 22,16 + 11,2	7,00 + 2 x 0,6	H - 13 НГ - 60	**4**
S-1 Br.: 27	119+008	Bridge across chanal	1980	simply supported 1 Span	cast in place slab reinforced concrete	5.60	12.50	70,00 Class A	5.60	12,50 without sidewalks	H - 13 НГ - 60	**2**
S-1 Br.: 28	127+297	Bridge across chanal	1976	simply supported 2 Spans	multiwebed cross section 7 webs without cross beams precast T-beams reinforced concrete	21.30	11.90	253,47 Class B	2 x 10,60	9,85 + 2 x 0,9	H - 30 НК - 80	**3**
S-1 Br.: 29	129+136	Bridge across dry chanal	1972	simply supported 1 Span	cast in place slab reinforced concrete	3.00	11.20	33,60 Class A	3.00	11,20 without sidewalks	H - 13 НГ - 60	**2**

*1) Bridge was not inspected. It don´t belongs to the S 1.The inside width of the main span is according the requirements of the S 1.

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Road Section: S-4 Tbilisi - Red Bridge (Azerbaijan Border)

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-4 Br.: 1	11+361	Bridge across River	1948	Arch bridge 1 Span	Arc of natural stone Extended to both sides with cast in place reinforced concrete slabs	5.00	14.70	73,50 Class A	5.00	12,10 + 2 x 1,30	H - 13 HG - 60	3
S-4 Br.: 2	15+815	Bridge across chanal	1963	simply supported 2 Spans	slab precast elements reinforced concrete	10.60	12.50	132,50 Class B	2 x 5,3	10,50 + 2 x 1,00	H - 13 HG - 60	3
S-4 Br.: 3	18+140	Bridge across Road S-4 (Tbilisi by-pass connection)	1987	simply supported 4 Spans	multiwebed cross section precast prestressed T-beams Span 1+4: 8 webs without cross beams Span 2+3: 7 webs without cross beams				inside width of the main span: 30,00 m	clear height: 5,00 m	H - 30 HK - 80	*1)
S-4 Br.: 4	23+960	Bridge across dry river	1962	simply supported 1 Span	slab precast elements reinforced concrete	3.50	23.20	81,20 Class A	3.50	23,20 without sidewalks	H - 30 HK - 80	3
S-4 Br.: 5	37+831	Bridge across dry river	1978	simply supported 1 Span	cast in place slab reinforced concrete, extension to both sides with 2 precast culvert blocks 2,4 x 4 m	6.00	15.00	90,00 Class A	6.00	12,80 + 2 x 1,10	H - 30 HK - 80	2
S-4 Br.: 6	49+088	Bridge across River Algeti	1965	simply supported 4 Spans	multiwebed cross section 6 webs with cross beams precast beams reinforced concrete	78.00	8.34	650,52 Class C	17 + 2 x 22,00 + 17,00	7,24 + 1 x 1,10	H - 13 НГ - 60	4
S-4 Br.: 7	57+170	Red Bridge across River Khrami	1640	Arch 3 Span	Artifical stone masonry	175.00	5.20	910,00 Class C		4,00 without sidewalks		*2)

*1) Bridge was not inspected. It don´t belongs to the S 4.The inside width of the main span is according the requirements of the S 4.

*2) Bridge was not inspected. A new bridge under construction.

Road Section: S-6 Tbilisi - Marnauli - Guguti - Armenian Border

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-6 Br.: 1	24+218	Bridge across Railway	1982	simply supported 3 Spans	multiwebed cross section 8 webs without cross beams precast T-beams	48.00	15.10	724,80 Class C	15,00 + 18,00 + 15,00	11,60 + 2 x 1,60	H - 30 HK - 80	**2**
S-6 Br.: 2	28+730	Bridge across River Algeti	1940 1957	simply supported 2 Spans	Right side: multiwebed cross section 5 webs without cross beams reinforced concrete precast T-beams Left side: double webed with crossbeams cast in place concrete reinforced concrete	28.40	15.90	451,56 Class B	2 x 14,00	0,20 + 14,10 + 1 x 1,60	H - 30 HK - 80	**3**
S-6 Br.: 3	30+533	Bridge across Railway	1972	simply supported 4 Spans	multiwebed cross section 6 webs without cross beams precast T-beams reinforced concrete	67.10	10.20	684,42 Class C	4 x 16,60	8,10 + 2 x 0,90	H - 13 НГ - 60	**3**
S-6 Br.: 4	35+547	Bridge across irrigation chanal	1957	simply supported 1 Span	slab cast in place concrete reinforced concrete	7.80	11.30	88,14 Class A	7.80	11,30 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 5	37+375	Bridge across River Ktsia	1985	simply supported 5 Spans	Spans 1-4: multiwebed cross section 8 webs without cross beams precast prestressed T-beams Span 5: slab precast elements reinforced concrete	102.00	15.60	1591,20 Class C	4 x 22,16 + 12,00	12,10 + 2 x 1,65	H - 30 HK - 80	**3**
S-6 Br.: 6	63+427	Bridge across Black River	1957	simply supported 3 Spans	multiwebed cross section 6 webs with cross beams precast T-beams reinforced concrete	39.40	8.90	350,66 Class B	8,80 + 21,60 + 8,80	7,20 + 2 x 0,80	H - 10 НГ - 30	**4**
S-6 Br.: 7	76+438	Bridge across valley (ravine)	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.10	8.40	34,44 Class A	4.10	8,40 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 8	78+644	Bridge across River Mashovera	1984	simply supported 1 Span	multiwebed cross section 6 webs without cross beams precast T-beams prestressed concrete	21.60	13.45	290,52 Class B	21.60	10,80 + 2 x 1,10	H - 30 HK - 80	**3**

Road Section: S-6 Tbilisi - Marnauli - Guguti - Armenian Border

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-6 Br.: 9	83+493	Bridge across valley (ravine)	1945	Arch extended both sides with simply supported beams 1 Span	Arch: natural stone masonry, widening: slab cast in place concrete reinforced concrete	6.40	10.00	64,00 Class A	6.40	10,00 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 10	84+553	Bridge across River Saparlos Hevi	1932	Arch 1 Span	Arch: natural stone masonry	27.70	7.60	210,52 Class B	27.70	6,30 + 2 x 0,65	H - 10 НГ - 30	**4**
S-6 Br.: 11	88+270	Bridge across dry river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	6.70	9.80	65,66 Class A	6.70	9,80 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 12	91+144	Bridge across dry river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	6.90	9.90	68,31 Class A	6.90	9,90 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 13	92+508	Bridge across River Tera	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	7.65	10.20	78,03 Class A	7.65	10,20 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 14	93+959	Bridge across dry river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	7.00	7.10	49,70 Class A	7.00	7,10 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 15	97+463	Bridge across River Tera	1974	simply supported 1 Span	multiwebed cross section 7 webs without cross beams precast T-beams reinforced concrete	11.10	11.90	132,09 Class B	11.10	9,30 + 2 x 1,30	H - 30 НК - 80	**3**
S-6 Br.: 16	98+195	Bridge across River Tera	1952	Arch 1 Span	Arch - natural stone masonry	28.80	8.50	244,80 Class B	28.80	8,50 without sidewalks	H - 10 НГ - 30	**4**
S-6 Br.: 17	98+334	Bridge across River Tera	1952	Arch 1 Span	Arch - natural stone masonry	28.20	8.50	239,70 Class B	28.20	8,50 without sidewalks	H - 10 НГ - 30	**4**

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Road Section: S-7 Marnauli - Sadakhlo - Armenian Border **Bridge Condition Survey**

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-7 Br.: 1	0+600	Bridge across Road and Railway	1980	simply supported 19 Spans	Spans 1-8 and 10-19: slab precast elements reinforced concrete Span 9: 6 webs without cross beams precast T-beams prestressed concrete	300.20	13.70	4112,74 Class C	8 x 15,00 + 28,30 + 10 x 15,00	10,20 + 2 x 1,50	H - 30 HK - 80	**2**
S-7 Br.: 2	10+149	Bridge across River Khrami	1961	simply supported 4 Spans	multiwebed cross section 5 webs without cross beams precast T-beams reinforced concrete	97.40	10.80	1051,92 Class C	4 x 24,00	8,30 + 2 x 1,10	H - 30 HK - 80	**3**
S-7 Br.: 3	10+178	Railway bridge across S-7	1948	simply supported 1 Span	double webed cross section precast T-beams reinforced concrete				inside width of the main span: 15,00 m	clear height: 4,50 m	-	*1)
S-7 Br.: 4	11+563	Bridge across River	1958	simply supported 1 Span	multiwebed cross section 6 webs without cross beams precast T-beams reinforced concrete	8.10	10.30	83,43 Class A	8.10	8,20 + 2 x 1,10	H - 30 HK - 80	**3**
S-7 Br.: 5	29+142	Bridge across River Banosha	1955	simply supported 3 Span	multiwebed cross section 5 webs with cross beams cast in place concrete reinforced concrete	66.20	7.40	489,88 Class B	3 x 21,60	6,00 + 2 x 0,70	H - 13 НГ - 60	**4**

*1) Bridge was not inspected. It don´t belongs to the S 7. The inside width of the main span is according the requirements of the S 7.

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Road Section: S-9 Tbilisi Bypass

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-9 Br.: 1	5+996	Pedestrian bridge across road S-9	1979	simply supported 3 Spans	doublewebed cross section without cross beams precast T-beams prestressed concrete				inside width of the main span: 15,00 m	clear height: 12,00 m		*1)
S-9 Br.: 2	8+660	Bridge across River Gldanis Hevi	1983	simply supported 21 Spans	multiwebed cross section 6 webs without cross beams precast T-beams prestressed concrete	528.90	13.00	6875,70 Class C	19 x 25,00 + 28,00 + 25,00	11,60 + 2 x 1,00	H - 30 HK - 80	2
S-9Br.: 3	22+653	Bridge across River Lochini	1985	simply supported 3 Spans	multiwebed cross section 7 webs without cross beams precast T-beams prestressed concrete	65.10	14.30	930,93 Class C	3 x 21,60	11,90 + 2 x 1,00	H - 30 HK - 80	2
S-9 Br.: 4	27+205	Bridge across Road to Norio	1985	simply supported 1 Span	slab 14 precast elements reinforced concrete	12.00	14.00	168,00 Class A	12.00	12,00 + 2 x 1,00	H - 30 HK - 80	2
S-9 Br.: 5	27+359	Bridge across River Norios Hevi	1984	simply supported 3 Spans	multiwebed cross section 7 webs without cross beams precast T-beams prestressed cocncrete	84.10	14.10	1185,81 Class C	3 x 28,00	11,50 + 2 x 1,15	H - 30 HK - 80	3
S-9 Br.: 6	27+777	Road bridge across road S-9	1985	simply supported 3 Spans	multiwebed cross section 7 webs without cross beams precast T-beams prestressed concrete				inside width of the main span: 20,00 m	clear height: 5,40 m	H - 30 HK - 80	*1)
S-9 Br.: 7	28+149	Bridge across chanal	1985	simply supported 1 Span	multiwebed cross section 7 webs without cross beams precast T-beams prestressed concrete	22.00	14.20	312,4 Class B	22.00	11,60 + 2 x 1,00	H - 30 HK - 80	2
S-9 Br.: 8	28+891	Bridge across River Alis Hevi	1985	simply supported 6 Spans	multiwebed cross section 7 webs without cross beams precast T-beams prestressed concrete	127.70	14.10	1800,57 Class C	6 x 21,40	11,50 + 2 x 1,10	H - 30 HK - 80	3
S-9 Br.: 9	32+869	Bridge across Railway	1984	simply supported 1 Span	doublewebed cross section steel beams, solid web Bridge deck: precast reinforced concrete slab	42.80	14.00	599,20 Class C	42.80	11,60 + 2 x 1,10	H - 30 HK - 80	2

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Bridge Condition Survey

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Road Section: S-9 Tbilisi Bypass

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-9 Br.: 10	34+810	Bridge across Road Tbilisi - Telavi	1985	simply supported 4 Spans	Spans 2,3: multiwebed cross section 10 webs without cross beams precast T-beams prestressed concrete Spans 1,4: slab 23 precast elements reinforced concrete	72.30	23.80	1720,74 Class C	12,00 + 2 x 24,00 + 12,00	21,00 + 2 x 1,20	H - 30 HK - 80	**2**
S-9 Br.: 11	36+705	Bridge across irrigation chanal	1985	simply supported 1 Span	slab 14 precast elements reinforced concrete	12.00	14.80	177,60 Class B	12.00	12,60 + 2 x 1,10	H - 30 HK - 80	**2**
S-9 Br.: 12	44+223	Culvert	1983	simply supported 1 Span	slab 54 precast elements reinforced concrete	6.60	42.50	280,50 Class B	6.60	2,50 + 11,40 + 2,50	H - 30 HK - 80	**4**
S-9 Br.: 13	44+458	Bridge across Railway Tbilisi - Telavi	1985	simply supported 3 Spans	multiwebed cross section 6 webs without cross beams precast T-beams prestressed concrete	72.50	14.40	1044,00 Class C	3 x 24,00	12,10 + 2 x 1,10	H - 30 HK - 80	**2**
S-9 Br.: 14	45+408	Road bridge across road S-9	1985	simply supported 2 Spans	multiwebed cross section 6 webs without cross beams precast T-beams prestressed concrete				inside width of the main span: 20,00 m	clear height: 5,00 m	H - 30 HK - 80	*[1)]
S-9 Br.: 15	47+164	Bridge across River Mtkvari	1985	continuous beam 5 Spans	doublewebed cross section steel beams, solid web Bridge deck: precast reinforced concrete slab	273.50	15.30	4184,55 Class C	5 x 54,80	11,80 + 2 x 1,70	H - 30 HK - 80	**1**
S-9 Br.: 16	47+562	Bridge across dry chanal	1985	simply supported 1 Span	multiwebed cross section 8 webs without cross beams precast T-beams prestressed concrete	21.60	14.70	317,52 Class B	21.60	12,40 + 2 x 1,10	H - 30 HK - 80	**2**

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Bridge Condition Survey

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Road Section: S-9 Tbilisi Bypass

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Bridgearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-9 Br.: 17	48+360	Bridge across Road S-4	1987	simply supported 4 Spans	Spans 1+4: multiwebed cross section 8 webs without cross beams, precast T-beams prestressed concrete Spans 2+3: multiwebed cross section 7 webs without cross beams, precast T-beams prestressed concrete	110.80	16.80	1861,44 Class C	22,00 + 2 x 32,80 + 22,00	14,40 + 2 x 1,00	H - 30 HK - 80	**2**

*[1)] Bridge was not inspected. It don´t belongs to the S 9. The inside width of the main span is according the requirements of the S 9.

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Brigdearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-12 Br.: 1	0+537	Bridge across the road S-12	1982	simply supported 4 Spans	multiwebed cross section 6 webs without cross beams precast T-beams prestressed concrete				inside width of the main span: 23,00 m	clear height: 4,50 m	H - 30 HK - 80	*1)
S-12 Br.: 2	3+905	Bridge across River Rioni	1948	simply supported 7 Spans	multiwebed cross section 5 webs without cross beams precast T-beams prestressed concrete	227.15	15.15	3441,32 Class C	7 x 43,40	9,00 + 2 x 1,60	H - 30 HK - 80	2
S-12 Br.: 3	5+179	Bridge across chanal	1958	simply supported 1 Span	multiwebed cross section 7 webs without cross beams precast T-beams reinforced concrete	11.40	11.20	127,68 Class B	11.40	9,00 + 2 x 1,00	H - 13 HG - 60	3
S-12 Br.: 4	7+160	Bridge across valley (ravine)	1955	simply supported beam with cantilevers 1 Span	double-webed cross section with 1stringer and 5 cross beams, cast in place reinforced concrete	27.00	8.50	229,50 Class B	3,70 + 19,60 + 3,70	7,00 + 2 x 0,60	H - 13 НГ - 60	3
S-12 Br.: 5	11+550	Bridge across river	1972	simply supported 3 Spans	multiwebed cross section 5 webs without cross beams precast T-beams prestressed concrete	72.50	10.10	732,25 Class C	3 x 24,00	8,00 + 2 x 1,00	H - 30 HK - 80	3
S-12 Br.: 6	13+831	Bridge across river	1953	simply supported 1 Span	slab 12 precast elements reinforced concrete	6.50	11.50	74,75 Class A	6.50	11,50 without sidewalks	H - 30 HK - 80	2
S-12 Br.: 7	15+252	Bridge across river	1953	simply supported 1 Span	slab cast in place concrete widening on left side: slab 3 precast elements reinforced concrete	5.20	13.00	67,60 Class A	5.20	13,00 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 8	16+000	Bridge across river Pechori	1953	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.70	11.00	51,70 Class A	4.70	11,00 without sidewalks	H - 13 НГ - 60	4
S-12 Br.: 9	17+700	Bridge across river	1955	simply supported 1 Span	slab cast in place concrete reinforced concrete	5.20	11.00	57,20 Class A	5.20	11,00 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 10	19+066	Bridge across river	1955	simply supported 1 Span	slab cast in place concrete reinforced concrete	7.50	11.50	86,25 Class A	7.50	11,50 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 11	19+507	Bridge across river	1955	simply supported 1 Span	slab cast in place concrete reinforced concrete	7.00	9.20	64,40 Class A	7.00	9,20 without sidewalks	H - 13 НГ - 60	2

Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Brigdearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-12 Br.: 12	21+297	Bridge across river (behind Cholobargi)	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.60	9.60	44,16 Class A	4.60	9,60 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 13	22+188	Bridge across river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	8.60	34,40 Class A	4.00	8,60 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 14	22+786	Bridge across river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	3.80	9.00	34,20 Class A	3.80	9,00 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 15	23+306	Bridge across river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	6.20	8.30	51,46 Class A	6.20	8,30 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 16	24+113	Bridge across river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.60	9.80	45,08 Class A	4.60	9,80 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 17	24+602	Bridge across river	1957	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	8.50	34,00 Class A	4.00	8,50 without sidewalks	H - 13 НГ - 60	3
S-12 Br.: 18	24+778	Bridge across river	1957	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.60	8.50	39,10 Class A	4.60	8,50 without sidewalks	H - 13 НГ - 60	3
S-12 Br.: 19	25+167	Bridge across river	1957	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	8.50	34,00 Class A	4.00	8,50 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 20	26+711	Bridge across river	1959	simply supported 1 Span	slab cast in place concrete reinforced concrete	3.80	8.80	33,44 Class A	3.80	8,80 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 21	27+348	Bridge across river	1970	simply supported 1 Span	slab precast elements reinforced concrete	4.60	9.80	45,08 Class A	4.60	9,80 without sidewalks	H - 30 НК - 80	3
S-12 Br.: 22	27+892	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete	5.60	8.75	49,00 Class A	5.60	8,75 without sidewalks	H - 13 НГ - 60	2
S-12 Br.: 23	29+560	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.20	8.70	36,54 Class A	4.20	8,70 without sidewalks	H - 13 НГ - 60	3

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Bridge Condition Survey

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Brigdearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-12 Br.: 24	30+086	Bridge across river	1960	simply supported 1 Span	slab cast in place concrete reinforced concrete widening: on left side slab 3 precast elements reinforced concrete on right side one precast element reinforced concrete	5.20	12.80	66,56 Class A	5.20	12,80 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 25	30+464	Bridge across river	1968	simply supported 2 Spans	slab precast elements reinforced concrete	11.60	15.00	174,00 Class B	2 x 5,60	12,70 + 2 x 1,10	H - 30 НК - 80	**3**
S-12 Br.: 26	31+620	Bridge across chanal	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete widening on right side: 4 precast elements reinforced concrete	4.00	13.70	54,80 Class A	4.00	10,10 + 1 x 3,20 on right side	H - 13 НГ - 60	**2**
S-12 Br.: 27	32+126	Bridge across river	1964	simply supported 1 Span	multiwebed cross section 8 webs without cross beams precast T-beams reinforced concrete	12.00	12.30	147,60 Class B	12.00	10,12 + 2 x 0,85	H - 13 НГ - 60	**2**
S-12 Br.: 28	33+556	Bridge across river	1974	simply supported 1 Span	slab precast elements reinforced concrete	6.60	13.40	88,44 Class A	6.60	13,40 without sidewalks	H - 30 НК - 80	**2**
S-12 Br.: 29	33+996	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete widening: slab 3 precast elements reinforced concrete	3.30	11.00	36,30 Class A	3.30	11,00 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 30	34+670	Bridge across river	1956	simply supported 1 Span	slab cast in place concrete reinforced concrete widening: slab 3 precast elements reinforced concrete	4.60	10.50	48,30 Class A	4.60	10,50 without sidewalks	H - 13 НГ - 60	**2**

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Bridge Condition Survey

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Brigdearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-12 Br.: 31	35+717	Bridge across river	1964	simply supported 1 Span	multiwebed cross section 6 webs without cross beams cast in place concrete reinforced concrete	14.10	10.10	142,41 Class B	14.10	7,90 + 2 x 1,10	H - 13 НГ - 60	**2**
S-12 Br.: 32	39+337	Bridge across river	1964	simply supported 1 Span	multiwebed cross section 6 webs without cross beams cast in place concrete reinforced concrete	16.50	10.10	166,65 Class B	16.50	7,80 + 2 x 1,20	H - 13 НГ - 60	**3**
S-12 Br.: 33	40+665	Bridge across river	1959	simply supported 1 Span	slab precast elements reinforced concrete widening: slab 5 precast elements reinforced concrete	5.40	10.30	55,62 Class A	5.40	10,30 without sidewalks	H - 30 НК - 80	**4**
S-12 Br.: 34	41+090	Bridge across river	1959	simply supported 1 Span	slab cast in place concrete reinforced concrete	3.70	8.30	30,71 Class A	3.70	8,30 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 35	41+740	Bridge across river	1965	simply supported 1 Span	multiwebed cross section 6 webs without cross beams cast in place concrete reinforced concrete	14.40	8.60	123,84 Class B	14.40	6,80 + 2 x 0,80	H - 13 НГ - 60	**3**
S-12 Br.: 36	43+187	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	10.40	41.60 Class A	4.00	10,40 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 37	43+500	Bridge across river	1964	simply supported 1 Span	slab precast elements reinforced concrete	4.50	11.60	52,20 Class A	4.50	11,60 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 38	44+057	Bridge across river	1958	simply supported 1 Span	multiwebed cross section 6 webs without cross beams cast in place concrete reinforced concrete	13.70	9.50	130,15 Class B	13.70	7,80 + 2 x 0,70	H - 13 НГ - 60	**3**
S-12 Br.: 39	47+480	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	8.90	35,60 Class A	4.00	8,90 without sidewalks	H - 13 НГ - 60	**3**
S-12 Br.: 40	47+930	Bridge across river	1958	simply supported 1 Span	slab cast in place concrete reinforced concrete	3.80	8.10	30,78 Class A	3.80	8,10 without sidewalks	H - 13 НГ - 60	**3**
S-12 Br.: 41	49+068	Bridge across river	1965	simply supported 1 Span	slab precast elements reinforced concrete	5.20	10.50	54,60 Class A	5.20	10,50 without sidewalks	H - 13 НГ - 60	**4**

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Bridge Condition Survey

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	km	Bridge Name	Year of Constr.	Statical System Number of Spans	Typ of Cross Section	Bridge-Length [m]	Bridge-Width [m]	Brigdearea and Sizeclass [m²]	Length of Spans [m]	Width of Carriageway and Sidewalks [m]	Bearing Capacity according Design Loads	Mark of Condition
S-12 Br.: 42	50+024	Bridge across river	1959	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.00	8.10	32,40 Class A	4.00	8,10 without sidewalks	H - 13 НГ - 60	**4**
S-12 Br.: 43	50+440	Bridge across river	1959	simply supported 1 Span	slab cast in place concrete reinforced concrete	4.60	10.00	46,00 Class A	4.60	10,00 without sidewalks	H - 13 НГ - 60	**2**
S-12 Br.: 44	52+165	Bridge across River Supsa	1860	simply supported 5 Spans	Spans 1-3: double webed cross section steel truss Span 4: 5 steel H-beams Span 5: 2 steel beams with solid web, Bridge deck: cast in place reinforced concrete slab	92.50	4.60	425,5 Class B	3 x 21,00 + 5 + 16,70	4.60	H - 13 НГ - 60	**4**
S-12 Br.: 45	54+980	Bridge across river	1972	simply supported 2 Spans	slab precast elements reinforced concrete	12.00	14.00	168,00 Class B	2 x 6,00	12,30 + 2 x 0,80	H - 13 НГ - 60	**2**

*[1)] Bridge was not inspected. It don´t belongs to the S 12. The inside width of the main span is according the requirements of the S 12.

APPENDIX 6.11.

CUMULATIVE NUMBER OF STANDARD AXLES

Feasibility Study for Road Rehabilitation in Georgia

S 1, Tbilisi - Kashuri; Section: Tbilisi - Junction S 3 (km 15+000 - km 26+940)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	1,676	1,760	1,848	1,941	2,038	2,139	2,246	2,359	2,477	2,601	2,731	2,867	3,010	3,161	3,366	3,585
Utility	0.0011	150	156	164	171	179	187	195	204	213	223	233	243	254	265	282	300
Bus	2.4005	1,086,466	1,129,925	1,175,122	1,222,127	1,271,012	1,321,852	1,374,726	1,429,716	1,486,904	1,546,380	1,608,236	1,672,565	1,739,468	1,809,046	1,906,735	2,009,698
Truck 2-axle	0.9062	68,137	70,181	72,287	74,455	76,689	78,990	81,359	83,800	86,314	88,904	91,571	94,318	97,147	100,062	105,065	110,318
Truck 3-axle	2.5238	478,096	499,610	522,093	545,587	570,138	595,795	622,605	650,623	679,901	710,496	742,469	775,880	810,794	847,280	898,117	952,004
Truck > 3-axle	2.1385	163,135	172,108	181,574	191,560	202,096	213,212	224,938	237,310	250,362	264,132	278,659	293,985	310,154	327,213	350,118	374,626
TOTAL		**1,797,661**	**1,873,741**	**1,953,087**	**2,035,841**	**2,122,152**	**2,212,174**	**2,306,071**	**2,404,011**	**2,506,170**	**2,612,735**	**2,723,897**	**2,839,858**	**2,960,828**	**3,087,027**	**3,263,683**	**3,450,531**
CUMULATIVE			**3,671,402**	**5,624,489**	**7,660,330**	**9,782,482**	**11,994,657**	**14,300,727**	**16,704,738**	**19,210,909**	**21,823,644**	**24,547,540**	**27,387,398**	**30,348,226**	**33,435,253**	**36,698,936**	**40,149,467**

S 1, Tbilisi - Kashuri; Section: Junction S 3 - Gori junction (km 26+940 - km 84+700)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	1,060	1,113	1,168	1,227	1,288	1,352	1,420	1,491	1,565	1,644	1,726	1,812	1,903	1,998	2,128	2,266
Utility	0.0011	82	86	89	93	98	102	107	111	116	122	127	133	139	145	154	164
Bus	2.4005	656,261	682,511	709,812	738,204	767,732	798,441	830,379	863,594	898,138	934,064	971,426	1,010,283	1,050,695	1,092,722	1,151,729	1,213,923
Truck 2-axle	0.9062	40,684	41,904	43,161	44,456	45,790	47,164	48,579	50,036	51,537	53,083	54,676	56,316	58,005	59,746	62,733	65,870
Truck 3-axle	2.5238	314,125	328,260	343,032	358,469	374,600	391,457	409,072	427,480	446,717	466,819	487,826	509,778	532,718	556,691	590,092	625,498
Truck > 3-axle	2.1385	116,302	122,699	129,447	136,567	144,078	152,002	160,363	169,183	178,488	188,304	198,661	209,588	221,115	233,276	249,605	267,078
TOTAL		**1,128,513**	**1,176,573**	**1,226,710**	**1,279,016**	**1,333,586**	**1,390,519**	**1,449,919**	**1,511,896**	**1,576,562**	**1,644,036**	**1,714,442**	**1,787,910**	**1,864,575**	**1,944,578**	**2,056,442**	**2,174,798**
CUMULATIVE			**2,305,086**	**3,531,796**	**4,810,812**	**6,144,398**	**7,534,916**	**8,984,836**	**10,496,731**	**12,073,293**	**13,717,329**	**15,431,771**	**17,219,681**	**19,084,256**	**21,028,834**	**23,085,276**	**25,260,074**

Feasibility Study for Road Rehabilitation in Georgia

S 1, Tbilisi - Khashuri; Section: Gori junction - Khashuri (km 84+700 - km 126+670)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	1,084	1,139	1,195	1,255	1,318	1,384	1,453	1,526	1,602	1,682	1,766	1,855	1,947	2,045	2,178	2,319
Utility	0.0011	112	117	122	127	133	139	145	152	159	166	173	181	189	198	210	224
Bus	2.4005	772,793	803,705	835,853	869,287	904,058	940,221	977,830	1,016,943	1,057,621	1,099,925	1,143,922	1,189,679	1,237,266	1,286,757	1,356,242	1,429,479
Truck 2-axle	0.9062	46,638	48,037	49,478	50,962	52,491	54,066	55,688	57,358	59,079	60,851	62,677	64,557	66,494	68,489	71,913	75,509
Truck 3-axle	2.5238	393,347	411,047	429,545	448,874	469,073	490,182	512,240	535,291	559,379	584,551	610,856	638,344	667,070	697,088	738,913	783,248
Truck > 3-axle	2.1385	208,408	219,870	231,963	244,721	258,180	272,380	287,361	303,166	319,840	337,431	355,990	375,570	396,226	418,018	447,280	478,589
TOTAL		**1,422,381**	**1,483,914**	**1,548,155**	**1,615,227**	**1,685,254**	**1,758,372**	**1,834,717**	**1,914,436**	**1,997,679**	**2,084,607**	**2,175,385**	**2,270,186**	**2,369,193**	**2,472,595**	**2,616,736**	**2,769,368**
CUMULATIVE			**2,906,295**	**4,454,450**	**6,069,677**	**7,754,931**	**9,513,303**	**11,348,020**	**13,262,455**	**15,260,135**	**17,344,742**	**19,520,127**	**21,790,313**	**24,159,505**	**26,632,100**	**29,248,836**	**32,018,204**

S 4, Tbilisi - Red Bridge / Azerbaijan border (km 11+000 - km 56+113)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	274	287	302	317	333	349	367	385	404	425	446	468	491	516	550	585
Utility	0.0011	22	23	24	25	26	27	28	30	31	32	34	35	37	38	41	43
Bus	2.4005	65,714	68,342	71,076	73,919	76,876	79,951	83,149	86,475	89,934	93,531	97,272	101,163	105,210	109,418	115,327	121,554
Truck 2-axle	0.9062	24,146	24,870	25,616	26,385	27,176	27,991	28,831	29,696	30,587	31,505	32,450	33,423	34,426	35,459	37,232	39,093
Truck 3-axle	2.5238	50,665	52,945	55,328	57,818	60,419	63,138	65,979	68,948	72,051	75,293	78,682	82,222	85,922	89,789	95,176	100,887
Truck > 3-axle	2.1385	24,978	26,351	27,801	29,330	30,943	32,645	34,440	36,335	38,333	40,441	42,665	45,012	47,488	50,100	53,607	57,359
TOTAL		**165,798**	**172,819**	**180,146**	**187,792**	**195,773**	**204,101**	**212,795**	**221,868**	**231,340**	**241,227**	**251,549**	**262,324**	**273,574**	**285,320**	**301,931**	**319,522**
CUMULATIVE			**338,617**	**518,763**	**706,555**	**902,328**	**1,106,429**	**1,319,224**	**1,541,092**	**1,772,432**	**2,013,659**	**2,265,208**	**2,527,532**	**2,801,106**	**3,086,426**	**3,388,357**	**3,707,879**

Feasibility Study for Road Rehabilitation in Georgia

S 6, Tbilisi - Marneuli - Guguti / Armenian border;Section: Tbilisi - Marneuli (km 3+000 - km 28+840)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	874	917	963	1,011	1,062	1,115	1,171	1,229	1,291	1,355	1,423	1,494	1,569	1,647	1,754	1,868
Utility	0.0011	84	88	92	96	101	105	110	115	120	125	131	137	143	149	159	169
Bus	2.4005	326,816	339,889	353,484	367,624	382,329	397,622	413,527	430,068	447,270	465,161	483,768	503,118	523,243	544,173	573,558	604,530
Truck 2-axle	0.9062	33,738	34,750	35,792	36,866	37,972	39,111	40,285	41,493	42,738	44,020	45,341	46,701	48,102	49,545	52,022	54,624
Truck 3-axle	2.5238	140,942	147,284	153,912	160,838	168,075	175,639	183,543	191,802	200,433	209,453	218,878	228,728	239,020	249,776	264,763	280,649
Truck > 3-axle	2.1385	21,855	23,058	24,326	25,664	27,075	28,564	30,135	31,793	33,541	35,386	37,332	39,386	41,552	43,837	46,906	50,189
TOTAL		**524,309**	**545,986**	**568,569**	**592,099**	**616,614**	**642,156**	**668,770**	**696,500**	**725,393**	**755,501**	**786,873**	**819,563**	**853,629**	**889,128**	**939,162**	**992,029**
CUMULATIVE			**1,070,294**	**1,638,864**	**2,230,962**	**2,847,576**	**3,489,732**	**4,158,502**	**4,855,002**	**5,580,395**	**6,335,896**	**7,122,768**	**7,942,332**	**8,795,961**	**9,685,088**	**10,624,251**	**11,616,279**

S 6, Tbilisi - Marneuli - Guguti / Armenian border; Section Marneuli - Bolnisi (km 28+840 - km 53+000)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	582	611	641	673	707	742	779	818	859	902	947	995	1,044	1,097	1,168	1,244
Utility	0.0011	43	45	47	49	52	54	56	59	62	64	67	70	74	77	82	87
Bus	2.4005	218,169	226,896	235,972	245,411	255,227	265,436	276,054	287,096	298,580	310,523	322,944	335,862	349,296	363,268	382,885	403,560
Truck 2-axle	0.9062	13,561	13,968	14,387	14,819	15,263	15,721	16,193	16,679	17,179	17,694	18,225	18,772	19,335	19,915	20,911	21,957
Truck 3-axle	2.5238	40,532	42,356	44,262	46,254	48,335	50,511	52,784	55,159	57,641	60,235	62,945	65,778	68,738	71,831	76,141	80,709
Truck > 3-axle	2.1385	3,903	4,117	4,344	4,583	4,835	5,101	5,381	5,677	5,990	6,319	6,666	7,033	7,420	7,828	8,376	8,962
TOTAL		**276,791**	**287,994**	**299,654**	**311,789**	**324,420**	**337,565**	**351,247**	**365,488**	**380,310**	**395,738**	**411,796**	**428,510**	**445,907**	**464,016**	**489,562**	**516,519**
CUMULATIVE			**564,784**	**864,438**	**1,176,227**	**1,500,647**	**1,838,212**	**2,189,460**	**2,554,948**	**2,935,258**	**3,330,996**	**3,742,791**	**4,171,301**	**4,617,208**	**5,081,224**	**5,570,786**	**6,087,305**

S 6, Tbilisi - Marneuli - Guguti / Armenian border; Section Bolnisi - Guguti / Armenian border (km 53+000 - km 99+127)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	144	151	159	167	175	184	193	202	213	223	234	246	258	271	289	308
Utility	0.0011	13	13	14	15	15	16	17	17	18	19	20	21	22	23	24	26
Bus	2.4005	83,237	86,567	90,030	93,631	97,376	101,271	105,322	109,535	113,916	118,473	123,212	128,140	133,266	138,596	146,080	153,969
Truck 2-axle	0.9062	10,915	11,243	11,580	11,927	12,285	12,654	13,033	13,424	13,827	14,242	14,669	15,109	15,562	16,029	16,831	17,672
Truck 3-axle	2.5238	34,084	35,618	37,220	38,895	40,646	42,475	44,386	46,384	48,471	50,652	52,931	55,313	57,802	60,403	64,028	67,869
Truck > 3-axle	2.1385	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**128,393**	**133,592**	**139,003**	**144,635**	**150,497**	**156,599**	**162,951**	**169,562**	**176,445**	**183,609**	**191,066**	**198,829**	**206,910**	**215,323**	**227,252**	**239,844**
CUMULATIVE			**261,985**	**400,987**	**545,622**	**696,119**	**852,718**	**1,015,668**	**1,185,231**	**1,361,675**	**1,545,284**	**1,736,350**	**1,935,180**	**2,142,090**	**2,357,413**	**2,584,665**	**2,824,509**

S 7, Marneuli - Sadakhlo / Armenian border (km 0+000 - km 34+152)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	373	391	411	431	453	475	499	524	550	578	607	637	669	702	748	797
Utility	0.0011	16	17	18	18	19	20	21	22	23	24	25	26	27	28	30	32
Bus	2.4005	201,522	209,583	217,966	226,685	235,752	245,182	254,990	265,189	275,797	286,829	298,302	310,234	322,643	335,549	353,669	372,767
Truck 2-axle	0.9062	14,223	14,649	15,089	15,542	16,008	16,488	16,983	17,492	18,017	18,558	19,114	19,688	20,278	20,887	21,931	23,028
Truck 3-axle	2.5238	39,611	41,394	43,256	45,203	47,237	49,363	51,584	53,905	56,331	58,866	61,515	64,283	67,176	70,199	74,410	78,875
Truck > 3-axle	2.1385	15,611	16,470	17,375	18,331	19,339	20,403	21,525	22,709	23,958	25,276	26,666	28,133	29,680	31,312	33,504	35,849
TOTAL		**271,355**	**282,503**	**294,115**	**306,210**	**318,808**	**331,931**	**345,602**	**359,842**	**374,676**	**390,129**	**406,228**	**423,000**	**440,473**	**458,677**	**484,292**	**511,348**
CUMULATIVE			**553,859**	**847,974**	**1,154,184**	**1,472,992**	**1,804,924**	**2,150,525**	**2,510,367**	**2,885,043**	**3,275,172**	**3,681,401**	**4,104,401**	**4,544,874**	**5,003,551**	**5,487,844**	**5,999,191**

S 9, Tbilisi bypass [west] (km 0+000 - km 34+800)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	53	56	59	62	65	68	72	75	79	83	87	91	96	101	107	114
Utility	0.0011	22	23	24	25	26	28	29	30	31	33	34	36	37	39	42	44
Bus	2.4005	175,237	182,246	189,536	197,117	205,002	213,202	221,730	230,599	239,823	249,416	259,393	269,769	280,559	291,782	307,538	324,145
Truck 2-axle	0.9062	46,307	47,696	49,127	50,601	52,119	53,682	55,293	56,952	58,660	60,420	62,232	64,099	66,022	68,003	71,403	74,973
Truck 3-axle	2.5238	93,961	98,189	102,608	107,225	112,050	117,093	122,362	127,868	133,622	139,635	145,919	152,485	159,347	166,517	176,508	187,099
Truck > 3-axle	2.1385	167,038	176,225	185,918	196,143	206,931	218,312	230,319	242,987	256,351	270,451	285,325	301,018	317,574	335,041	358,494	383,588
TOTAL		**482,618**	**504,436**	**527,271**	**551,173**	**576,193**	**602,385**	**629,804**	**658,511**	**688,567**	**720,037**	**752,991**	**787,499**	**823,636**	**861,483**	**914,092**	**969,964**
CUMULATIVE			**987,054**	**1,514,325**	**2,065,499**	**2,641,692**	**3,244,077**	**3,873,881**	**4,532,392**	**5,220,959**	**5,940,997**	**6,693,987**	**7,481,486**	**8,305,122**	**9,166,605**	**10,080,697**	**11,050,662**

S 9, Tbilisi bypass [east] (km 34+800 - km 49+008)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	540	567	595	625	656	689	723	759	797	837	879	923	969	1,018	1,084	1,154
Utility	0.0011	36	38	39	41	43	45	47	49	51	54	56	59	61	64	68	72
Bus	2.4005	224,303	233,275	242,606	252,310	262,402	272,899	283,814	295,167	306,974	319,253	332,023	345,304	359,116	373,481	393,648	414,905
Truck 2-axle	0.9062	40,684	41,904	43,161	44,456	45,790	47,164	48,579	50,036	51,537	53,083	54,676	56,316	58,005	59,746	62,733	65,870
Truck 3-axle	2.5238	249,642	260,876	272,615	284,883	297,702	311,099	325,098	339,728	355,016	370,991	387,686	405,132	423,363	442,414	468,959	497,096
Truck > 3-axle	2.1385	53,858	56,820	59,945	63,242	66,721	70,390	74,262	78,346	82,655	87,201	91,997	97,057	102,395	108,027	115,589	123,680
TOTAL		**569,062**	**593,479**	**618,962**	**645,557**	**673,315**	**702,285**	**732,524**	**764,086**	**797,030**	**831,419**	**867,317**	**904,790**	**943,910**	**984,749**	**1,042,081**	**1,102,778**
CUMULATIVE			**1,162,542**	**1,781,504**	**2,427,061**	**3,100,376**	**3,802,661**	**4,535,185**	**5,299,270**	**6,096,301**	**6,927,720**	**7,795,037**	**8,699,827**	**9,643,737**	**10,628,486**	**11,670,567**	**12,773,345**

Feasibility Study for Road Rehabilitation in Georgia

S 12, Samtredia - Ureki (km 0+000 - km 56+528)

CUMULATIVE NUMBER OF STANDARD AXLES

Vehicle Category	Equivalence Factor	ESA 1997	ESA 1998	ESA 1999	ESA 2000	ESA 2001	ESA 2002	ESA 2003	ESA 2004	ESA 2005	ESA 2006	ESA 2007	ESA 2008	ESA 2009	ESA 2010	ESA 2011	ESA 2012
Car	0.0007	206	216	227	238	250	263	276	290	304	319	335	352	370	388	414	440
Utility	0.0011	21	22	23	24	25	27	28	29	30	32	33	35	36	38	40	43
Bus	2.4005	183,998	191,358	199,013	206,973	215,252	223,862	232,817	242,129	251,814	261,887	272,362	283,257	294,587	306,371	322,915	340,352
Truck 2-axle	0.9062	17,200	17,716	18,247	18,795	19,358	19,939	20,537	21,153	21,788	22,442	23,115	23,808	24,523	25,258	26,521	27,847
Truck 3-axle	2.5238	71,853	75,086	78,465	81,996	85,686	89,541	93,571	97,781	102,182	106,780	111,585	116,606	121,853	127,337	134,977	143,076
Truck > 3-axle	2.1385	64,786	68,349	72,108	76,074	80,258	84,673	89,330	94,243	99,426	104,894	110,664	116,750	123,171	129,946	139,042	148,775
TOTAL		**338,064**	**352,747**	**368,083**	**384,100**	**400,830**	**418,305**	**436,558**	**455,625**	**475,545**	**496,354**	**518,094**	**540,808**	**564,541**	**589,338**	**623,909**	**660,533**
CUMULATIVE			**690,811**	**1,058,894**	**1,442,994**	**1,843,824**	**2,262,129**	**2,698,687**	**3,154,312**	**3,629,857**	**4,126,211**	**4,644,305**	**5,185,113**	**5,749,654**	**6,338,992**	**6,962,901**	**7,623,434**

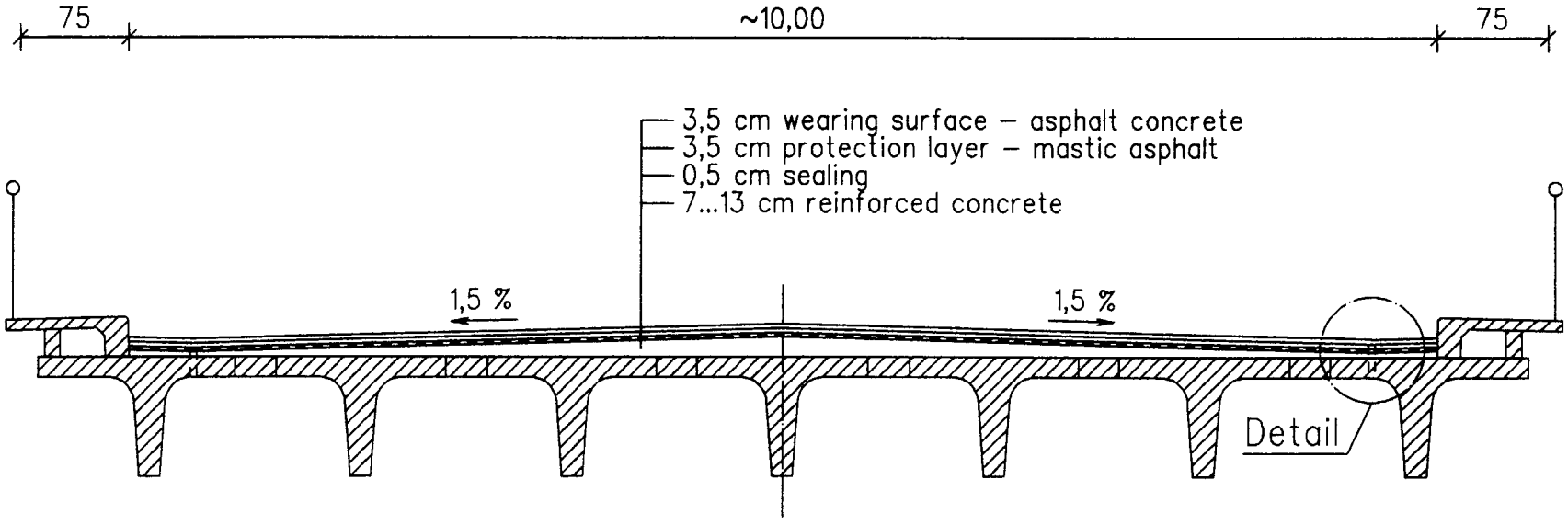
APPENDIX 6.12.

TYPICAL CROSS SECTION

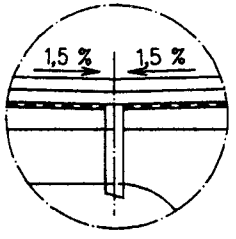
Rehabilitation with new carriageway

Cross section

M 1 : 50



Detail



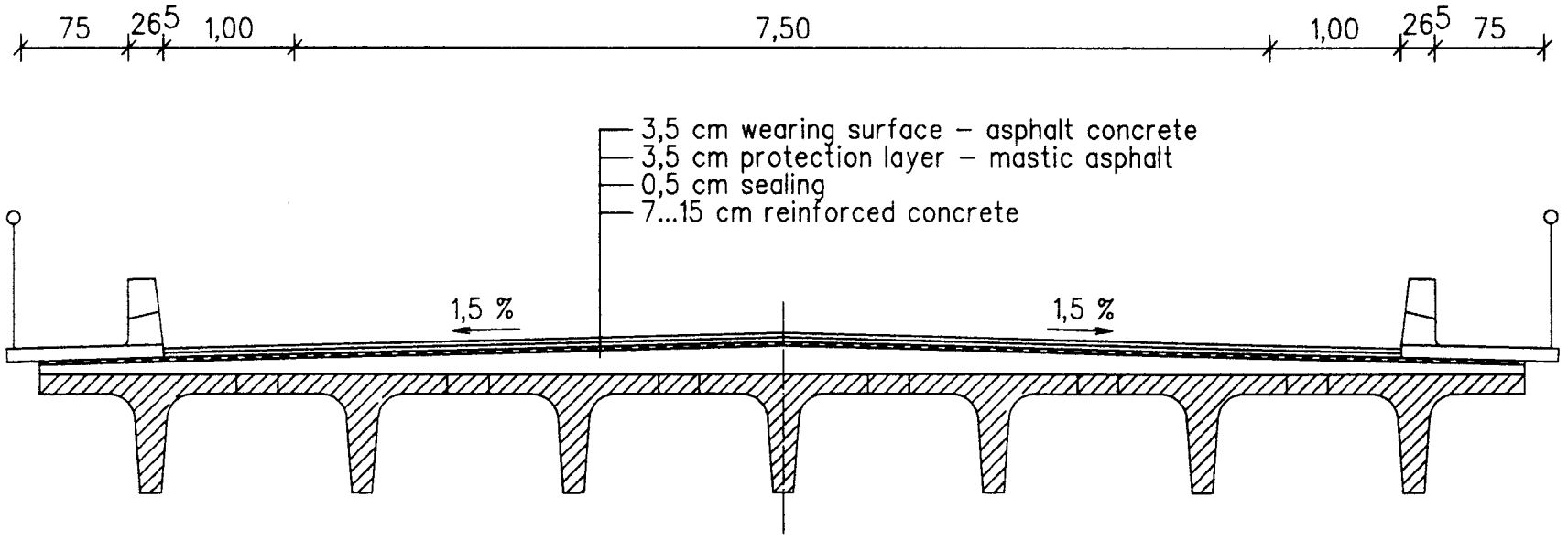
legend:

remainig parts of the structure

Rehabilitaton with new carriageway and new sidewalks

Cross section

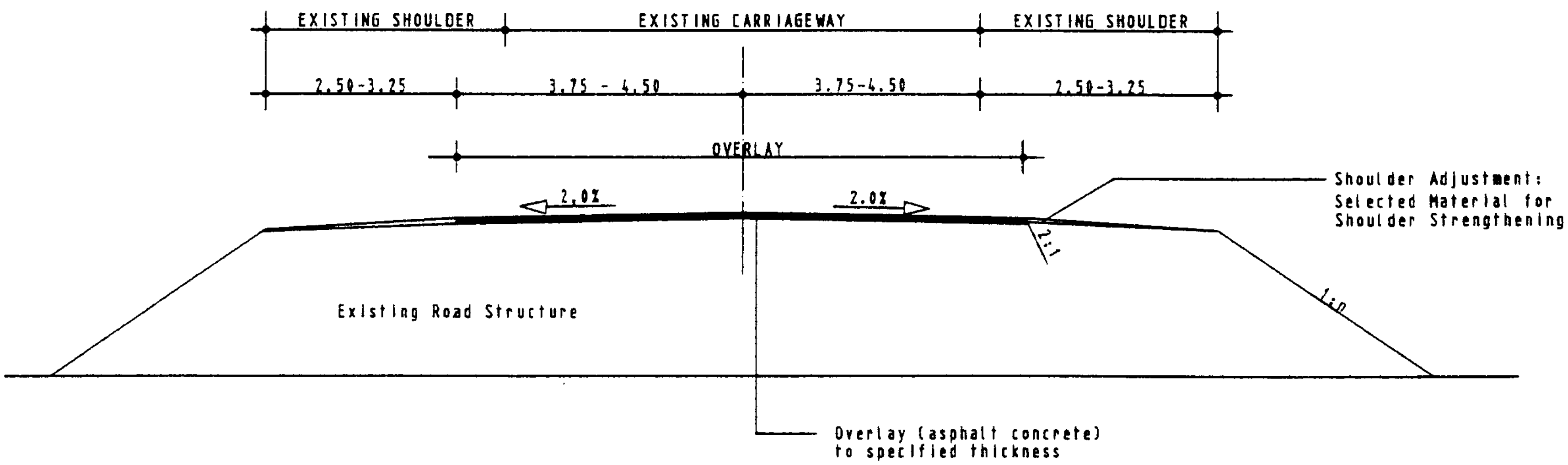
M 1 : 50



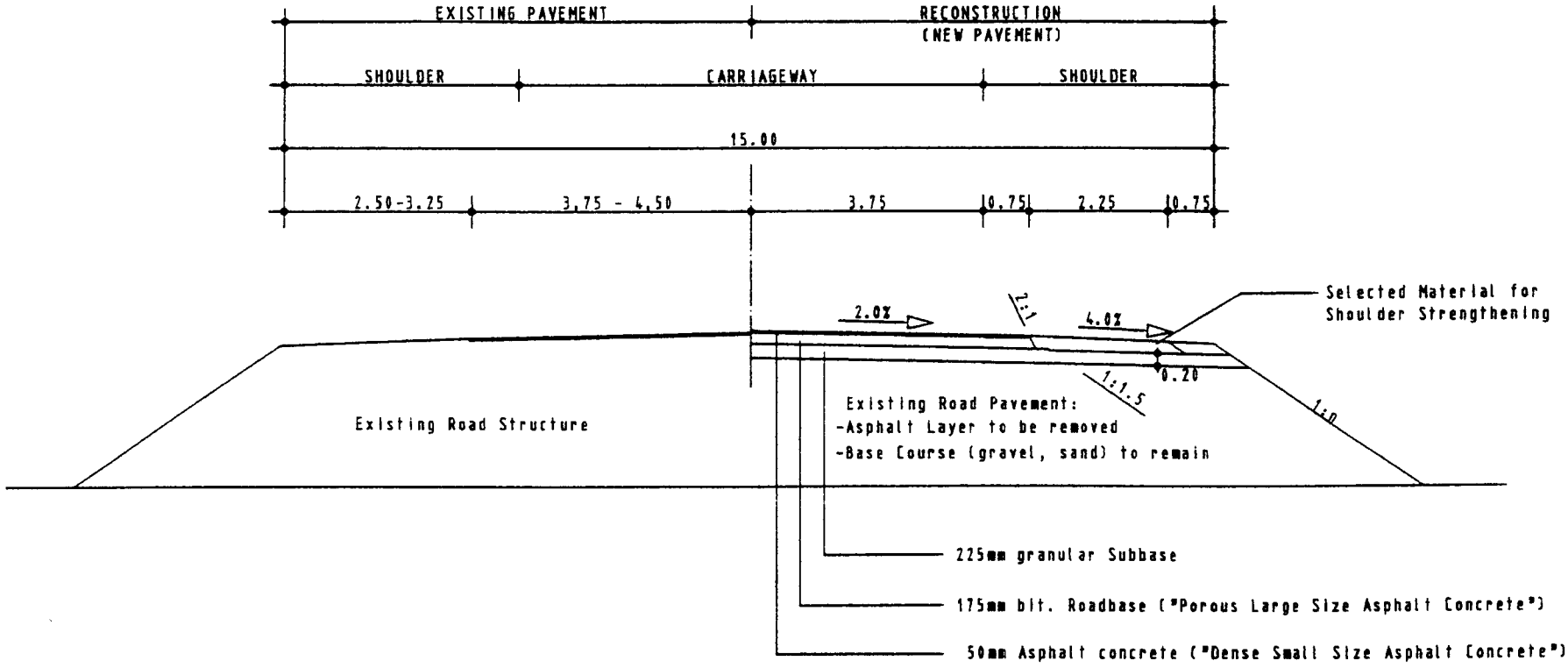
legend:

remainig parts of the structure

Preliminary Road Rehabilitation Design
Case: Overlay



Preliminary Road Relabilitation Design
Case: Reconstruction of Pavement (New Pavement)



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APPENDIX 7.1

UNIT OPERATING COSTS

A.7.1. UNIT OPERATING COSTS

A.7.2. ROAD MAINTENANCE UNIT COST

A.7.3. COST ESTIMATE

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Mixing

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Asphalt Plant	1	1,700,000	15	4.0	68,000
Loader	1	150,000	8	3.5	5,250
Total					**73,250**

Operating Costs per month:

Item		Unit Price US $	Costs per month US $
Fuel	130 t / month	125	16,250
Electricity			1,000
Labor costs	10 persons	400	4,000
50 % administrative costs			2,000
Total			**23,250**

Subtotal costs per month	**96,500**
Overhead (25 %)	24,125
Equipment and Labor Costs per month	**120,625**

Unit Costs per ton:

Estimated Output per month: 11500 ton/month

Costs per ton: **10.49**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Asphalt Laying

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Paver	1	200,000	8	7.0	14,000
Rollers	3	60,000	8	7.0	12,600
Spreader	1	30,000	8	7.0	2,100
Trucks	10	30,000	8	3.5	10,500
Miscellaneous	1	20,000	8	7.0	1,400
Tools					1,500
Total					**42,100**

Operating Costs per month:

Item			Unit Price US $	Costs per month US $
Fuel	1120 l / day	21 working days	0.33	7,762
Labor costs	30 persons		400	12,000
50 % administrative costs				6,000
				25,762

Subtotal costs per month	**67,862**
Overhead (30 %)	20,358
Equipment and Labor Costs per month	**88,220**

Unit Costs per m²:

Estimated Output per month: 95,000 m²/month

Costs per m²: **0.93**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Base Course Laying (granular)

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Grader	2	200,000	8	7.0	28,000
Rollers	2	60,000	8	7.0	8,400
Excavator	1	150,000	8	7.0	10,500
Trucks	8	30,000	8	3.5	8,400
Miscellaneous	1	30,000	8	7.0	2,100
Tools					1,500
Total					**58,900**

Operating Costs per month:

Item			Unit Price US $	Costs per month US $
Fuel	960 l / day	21 working days	0.33	6,653
Labor costs	40 persons		400	16,000
50 % administrative costs				8,000
Total				**30,653**

Subtotal costs per month	**89,553**
Overhead (30 %)	26,866
Equipment and Labor Costs per month	**116,419**

Unit Costs per m²:

Estimated Output per month: 16,000 m²/month (depense of the average output of reconstruction)

Costs per m²: 7.28

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Patching (replacing wearing course)

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Trucks	2	30,000	8	3.5	2,100
Compactor	1	15,000	8	7.0	1,050
Miscellaneous	1	30,000	8	7.0	2,100
Tools					2,000
Total					**7,250**
Subtotal costs per month					**17,325**
Overhead (30 %)					5,198
Equipment and Labor Costs per month					**22,523**

Operating Costs per month:

Item			Unit Price US $	Costs per month US $
Fuel	160 l / day	21 working days	0.32	1,075
Labor costs	15 persons		400	6,000
50 % administrative costs				3,000
Total				**10,075**

Unit Costs per m²:

Estimated Output per month: 3,800 m²/month

Costs per m²: 5.93

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Surface Dressing

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Bitumen Distributor	1	60,000	8	7.0	4,200
Chipping Spreader	1	30,000	8	7.0	2,100
Rollers	2	60,000	8	7.0	8,400
Loader	1	150,000	8	3.5	5,250
Trucks	6	30,000	8	3.5	6,300
Miscellaneous	1	5,000		7.0	350
Tools					500
Total					**27,100**

Operating Costs per month:

Item			Unit Price US $	Costs per month US $
Fuel	640 l / month	21 working days	0.33	4435
Labor costs	25 persons		400	10000
50 % administrative costs				5000
Total				**19,435**

Subtotal costs per month	**46,535**
Overhead (30 %)	13,961
Equipment and Labor Costs per month	**60,496**

Unit Costs per m²:

Estimated Output per month: 160000 m²

Costs per m² **0.38**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

UNIT OPERATING COSTS: Bitumen distribution

Equipment costs per month:

Item	No.	Price US $	Service life years	Interest Rate %	Costs per month US $
Bitumen Distributor	1	60,000	8	7.0	4,200
Miscellaneous	1	500		7.0	35
Tools					50
Total					**4,285**
Subtotal costs per month					**6,127**
Overhead (30 %)					1,838
Equipment and Labor Costs per month					**7,965**

Operating Costs per month:

Item			Unit Price US $	Costs per month US $
Fuel	20 l / day	21 working days	0.10	42
Labor costs	3 persons		400	1200
50 % administrative costs				600
Total				**1,842**

Unit Costs per m²:

Estimated Output per month: 16,000 m² (depense of the average output of reconstruction)

Costs per m² **0.50**

APPENDIX 7.2

ROAD MAINTENANCE UNIT COST

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

Material Costs: Asphalt concrete wearing course

Composition of wearing course		Unit price	Material densities	Unit price US $/t		Transport			
Bitumen	6 %			130.00				130.00 US $/t	7.80 US $/t
Filler	7 %			30.00	100 km a	0.20 US $ t/km =	20.00 US $/t	50.00 US $/t	3.50 US $/t
Sand	30 %	18.00 US $/m³	1.5 t/m³	12.00	30 km a	0.20 US $ t/km =	6.00 US $/t	18.00 US $/t	5.40 US $/t
Aggregate	57 %	23.80 US $/m³	1.7 t/m³	14.00	100 km a	0.20 US $ t/km =	20.00 US $/t	34.00 US $/t	19.38 US $/t
Material cost of asphalt concrete wearing course									**36.08 US $/t**
								=	**86.59 US $/m³**

Material Costs: Asphalt concrete road base

Composition of road base		Unit price	Material densities	Unit price US $/t		Transport			
Bitumen	6 %			130.00				130.00 US $/t	7.80 US $/t
Filler	5 %			30.00	100 km a	0.20 US $ t/km =	20.00 US $/t	50.00 US $/t	2.50 US $/t
Sand	35 %	18.00 US $/m³	1.5 t/m³	12.00	30 km a	0.20 US $ t/km =	6.00 US $/t	18.00 US $/t	6.30 US $/t
Aggregate	54 %	23.80 US $/m³	1.7 t/m³	14.00	100 km a	0.20 US $ t/km =	20.00 US $/t	34.00 US $/t	18.36 US $/t
Material cost of asphalt concrete road base									**34.96 US $/t**
								=	**83.90 US $/m³**

Material Costs: Surface Dressing

Composition of surface dressing		Unit price US $/t		Transport			
Bitumen	2 kg/m²	130.00				130.00 US $/t	0.26 US $/m²
Aggregate	18 kg/m²	14.00	100 km a	0.20 US $ t/km =	20.00 US $/t	34.00 US $/t	0.61 US $/m²
Material cost of asphalt concrete road base							**0.87 US $/m²**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

Unit Costs: Reconstruction / New Pavement

Road structure Road Note 29		Material costs		Mixing costs			Laying costs	**Total**
40 mm	Asphalt concrete wearing course	86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
190 mm	Asphalt concrete road base	83.90 US $/m³ =	15.94 US $/m²	10.49 US $/t =	25.17 US $/m³ =	4.78	0.93 US $/m²	**21.65 US $/m²**
170 mm	Granular subbase							
	(150 - 300 mm existing base + reinforcement, if its necessary)							
	remove the existing asphalt layer							**7.33 US $/m²**
	re-mixing and recompact						7.28 US $/m²	**7.28 US $/m²**
	Prime coat	1.00 kg/m²	130.00 US $/t =	0.13 US $/m²			0.50 US $/m²	**0.63 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²			0.50 US $/m²	**0.60 US $/m²**

Unit Costs for Reconstruction / New Pavement **42.89 US $/m²**

Road structure Road Note 29		Material costs		Mixing costs			Laying costs	**Total**
40 mm	Asphalt concrete wearing course	86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
160 mm	Asphalt concrete road base	83.90 US $/m³ =	13.42 US $/m²	10.49 US $/t =	25.17 US $/m³ =	4.03	0.93 US $/m²	**18.38 US $/m²**
210 mm	Granular subbase							
	(150 - 300 mm existing base + reinforcement, if its necessary)							
	remove the existing asphalt layer							**7.33 US $/m²**
	re-mixing and recompact						7.28 US $/m²	**7.28 US $/m²**
	Prime coat	1.00 kg/m²	130.00 US $/t =	0.13 US $/m²			0.50 US $/m²	**0.63 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²			0.50 US $/m²	**0.60 US $/m²**

Unit Costs for Reconstruction / New Pavement **39.62 US $/m²**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

Road structure Road Note 29		Material costs		Mixing costs			Laying costs	**Total**
40 mm Asphalt concrete wearing course		86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
140 mm Asphalt concrete road base		83.90 US $/m³ =	11.75 US $/m²	10.49 US $/t =	25.17 US $/m³ =	3.52	0.93 US $/m²	**16.20 US $/m²**
150 mm Granular subbase								
(150 - 300 mm existing base + reinforcement, if its necessary)								
remove the existing asphalt layer								**7.33 US $/m²**
re-mixing and recompact							7.28 US $/m²	**7.28 US $/m²**
Prime coat	1.00 kg/m²	130.00 US $/t =	0.13 US $/m²				0.50 US $/m²	**0.63 US $/m²**
Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**

Unit Costs for Reconstruction / New Pavement **37.43 US $/m²**

Road structure Road Note 29		Material costs		Mixing costs			Laying costs	**Total**
40 mm Asphalt concrete wearing course		86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
130 mm Asphalt concrete road base		83.90 US $/m³ =	10.91 US $/m²	10.49 US $/t =	25.17 US $/m³ =	3.27	0.93 US $/m²	**15.11 US $/m²**
150 mm Granular subbase								
(150 - 300 mm existing base + reinforcement, if its necessary)								
remove the existing asphalt layer								**7.33 US $/m²**
re-mixing and recompact							7.28 US $/m²	**7.28 US $/m²**
Prime coat	1.00 kg/m²	130.00 US $/t =	0.13 US $/m²				0.50 US $/m²	**0.63 US $/m²**
Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**

Unit Costs for Reconstruction / New Pavement **36.34 US $/m²**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia

Road structure Road Note 29			Material costs		Mixing costs			Laying costs	**Total**
40 mm	Asphalt concrete wearing course	86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
120 mm	Asphalt concrete road base	83.90 US $/m³ =	10.07 US $/m²	10.49 US $/t =	25.17 US $/m³ =	3.02	0.93 US $/m²	**14.02 US $/m²**
150 mm	Granular subbase							
	(150 - 300 mm existing base + reinforcement, if its necessary)							
	remove the existing asphalt layer							**7.33 US $/m²**
	re-mixing and recompact						7.28 US $/m²	**7.28 US $/m²**
	Prime coat	1.00 kg/m²	130.00 US $/t =	0.13 US $/m²			0.50 US $/m²	**0.63 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²			0.50 US $/m²	**0.60 US $/m²**

Unit Costs for Reconstruction / New Pavement **35.25 US $/m²**

Unit Costs: Overlay

			Material costs		Mixing costs			Laying costs	Total
40 mm Overlay									
40 mm	40 mm Overlay		86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**
Unit Costs									**6.00 US $/m²**
75 mm Overlay									
75 mm	Overlay		86.59 US $/m³ =	6.49 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.89	0.93 US $/m²	**9.31 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**
Unit Costs									**9.91 US $/m²**
100 mm Overlay									
40 mm	Wearing cource		86.59 US $/m³ =	3.46 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.01	0.93 US $/m²	**5.40 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**
60 mm	Second Layer & Regulating layer		83.90 US $/m³ =	5.03 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.51	0.93 US $/m²	**7.47 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**
Unit Costs									**14.08 US $/m²**

Unit Costs: Surface Dressing

		Material costs	Laying costs	Total
	Surface dressing	0.87 US $/m²	0.38 US $/m²	**1.25 US $/m²**
Unit Costs				**1.25 US $/m²**

Unit Costs: Patching

			Material costs		Mixing costs			Laying costs	Total
50 mm	50 mm patching wearing course		86.59 US $/m³ =	4.33 US $/m²	10.49 US $/t =	25.17 US $/m³ =	1.26	5.93 US $/m²	**11.52 US $/m²**
	Tack coat	0.80 kg/m²	130.00 US $/t =	0.10 US $/m²				0.50 US $/m²	**0.60 US $/m²**
Unit Costs									**12.12 US $/m²**

APPENDIX 7.3

COST ESTIMATE

S 1, Tbilisi - Khashuri
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	843,422
2	Earthworks	65,998
3	Drainage	26,028
4	Bridges	5,179,284
5	Pavement Maintenance & Rehabilitation	2,980,336
6	Marking & Safety Works	182,571
	Total	**9,277,639**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **777,022** US $/km.

S 1, Tbilisi - Khashuri
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
From	To	m	m	m	m²	m²	m²	m²	40 mm m²	75 mm m²	100 mm m²	m²
15,000	15,055	55	14.0	12.5	729	0	729		729			
15,055	15,195	140	12.5	20.0	2,275	0	2,275		2,275			
15,195	15,315	120	20.0	14.5	2,070	0	2,070		2,070			
15,315	15,418	103	14.5	13.0	1,416	0	1,416		1,416			
15,418	15,500	82	13.0	9.0	902	0	902		902			
15,500	15,555	55	9.0	9.0	495	0	495		495			
15,555	15,630	75	9.0	10.0	713	0	713		713			
15,630	15,926	296	10.0	10.0	2,960	0	2,960		2,960			
15,926	16,000	74	10.0	9.0	703	0	703		703			
16,000	16,800	800	9.0	12.0	8,400	0	8,400		8,400			
16,800	17,250	450	12.0	13.4	5,710	0	5,710		5,710			
17,250	17,454	204	13.4	14.0	2,792	0	2,792				2,792	
17,454	17,665	211	14.0	9.0	2,427	0	2,427				2,427	
17,665	19,787	2,122	9.0	9.0	19,098	0	19,098				19,098	
19,787	20,755	968	9.0	9.0	8,712	600	9,312				9,312	
20,755	21,640	885	9.0	9.0	7,965	0	7,965				7,965	
21,640	22,570	930	9.0	9.0	8,370	0	8,370				8,370	
22,570	22,750	180	9.0	9.0	1,620	240	1,860				1,860	
22,750	23,850	1,100	9.0	9.0	9,900	0	9,900			9,900		
23,850	25,532	1,682	9.0	9.0	15,138	1200	16,338			16,338		
25,532	26,250	718	9.0	9.0	6,462	800	7,262			7,262		
26,250	26,759	509	9.0	9.0	4,581	0	4,581					4,581
26,759	26,940	181	21.0	9.0	2,715	0	2,715					2,715
2. Carriageway												
15,000	15,170	170	14.0	15.0	2,465	0	2,465		2,465			
15,170	15,300	130	15.0	15.0	1,950	2080	4,030		4,030			
15,300	15,320	20	15.0	15.0	300	0	300		300			
15,320	15,500	180	15.0	18.0	2,970	0	2,970		2,970			
15,500	15,762	262	18.0	14.0	4,192	560	4,752		4,752			
15,762	15,904	142	14.0	12.0	1,846	0	1,846		1,846			
15,904	16,030	126	12.0	10.0	1,386	160	1,546		1,546			

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
16,030	16,128	98	10.0	9.0	931	0	931		931			
16,128	16,994	866	9.0	10.0	8,227	0	8,227		8,227			
16,994	17,250	256	10.0	9.3	2,465	0	2,465		2,465			
17,250	17,340	90	9.3	9.0	822	0	822				822	
17,340	19,835	2,495	9.0	9.0	22,455	0	22,455				22,455	
19,835	20,755	920	9.0	9.0	8,280	300	8,580				8,580	
20,755	22,750	1,995	9.0	9.0	17,955	0	17,955				17,955	
22,750	23,850	1,100	9.0	9.0	9,900	0	9,900			9,900		
23,850	25,532	1,682	9.0	9.0	15,138	800	15,938			15,938		
25,532	26,250	718	9.0	9.0	6,462	800	7,262			7,262		
26,250	26,759	509	9.0	9.0	4,581	0	4,581					4,581
					228,477	**7540**	**236,017**	**0**	**55,904**	**66,600**	**101,636**	**11,877**

Unit Rate (US $)	1.25	6.00	9.91	14.08	42.89
Subtotal	**0**	**335,427**	**660,006**	**1,431,029**	**509,405**

Spot Repair

Spot Repair in Areas with	Crack sealing	Pothole patching	Settlement patching	Rutting milling & patching
	m²	m²	m²	m²
Resealing or Overlay	7,818	507	1,879	389
Reconstruction	0	0	0	0

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**7,818**	**6,145**	**22,773**	**7,733**

Total Bill No. Pavement		
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)	**US $**	**2,980,336**

S 1, Tbilisi - Khashuri
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravelling m²
15,000	15,055	55				1.5	2.0	96.3	2				
15,055	15,295	240				2.0	1.0	360.0	7				
15,295	15,315	20				1.0	1.0	20.0	0				
15,315	15,418	103	0.0	2.5	128.8	1.0	2.0	154.5	6				
15,418	15,500	82	2.5	2.5	205.0	2.0	5.0	287.0	10				
15,500	15,555	55	2.5	2.5	137.5	5.0	1.0	165.0	6				
15,555	15,630	75	2.5	0.0	93.8	1.0	1.0	75.0	3				
15,630	15,685	55	0.0	1.5	41.3	1.0	0.0	27.5	1				
15,685	15,750	65	1.5	3.0	146.3	0.0	0.0	0.0	3				
15,750	15,890	140	3.0	3.0	420.0	0.0	0.0	0.0	8				
15,890	16,000	110	3.0	3.0	330.0	0.0	2.0	110.0	9				
16,000	16,283	283	3.0	3.0	849.0	2.0		283.0	23				
16,283	16,716	433	Bridge			Bridge			0				
16,716	17,250	534	0.0	0.0	0.0	0.0	0.0	0.0	0				
17,250	17,418	168	0.0	0.0	0.0	0.0	0.0	0.0			0		
17,418	17,454	36	0.0	1.5	27.0	0.0	3.0	54.0			4		
17,454	17,665	211	1.5	2.0	369.3	3.0	3.0	633.0			50		
17,665	18,614	949	2.0	2.0	1,898.0	3.0	3.0	2,847.0			237		
18,614	18,682	68	2.0	0.0	68.0	3.0	3.0	204.0			14		
18,682	18,824	142	0.0	3.0	213.0	3.0	3.0	426.0			32		
18,824	18,920	96	3.0	1.5	216.0	3.0	1.5	216.0			22		
18,920	19,093	173	1.5	0.0	129.8	1.5	0.0	129.8			13		
19,093	19,445	352	Bridge			Bridge					0		
19,445	19,787	342	0.0	1.5	256.5	0.0	3.0	513.0			38		
19,787	20,755	968	1.5	2.0	1,694.0	3.0	3.0	2,904.0			230		
20,755	22,570	1,815	2.0	2.0	3,630.0	3.0	3.0	5,445.0			454		
22,570	22,750	180	2.0	1.9	353.7	3.0	3.0	540.0			45		
22,750	23,850	1,100	1.9	1.5	1,886.3	3.0	3.0	3,300.0		194			
23,850	26,250	2,400	1.9	1.6	4,205.8	3.0	3.0	7,200.0		428			
26,250	26,759	509	1.6	1.5	782.6	3.0	3.0	1,527.0				231	
26,759	26,940	181	1.6	1.7	296.4	3.0	3.0	543.0				84	

2. Carriageway													
15,000	15,170	170	2.0	0.0	170.0			0.0	3				
15,170	15,300	130	0.0	2.0	130.0			0.0	3				
15,300	15,904	604	2.0	2.0	1,208.0			0.0	24				
15,904	16,030	126	2.0	2.5	283.5	0.0	2.5	157.5	9				
16,030	16,128	98	2.5	1.0	171.5	2.5	1.0	171.5	7				
16,128	16,994	866	1.0	2.0	1,299.0	1.0	0.0	433.0	35				
16,994	17,198	204	2.0	2.0	408.0	0.0	0.0	0.0	8				
17,198	17,198	0	2.0	3.0	0.0	0.0	0.0	0.0	0				
17,198	17,250	52	3.0	3.0	156.0	0.0	1.1	28.6	4				
17,250	17,340	90	3.0	3.0	270.0	1.1	3.0	184.4			23		
17,340	17,551	211	3.0	3.0	633.0	3.0	4.0	738.5			69		
17,551	18,500	949	3.0	3.0	2,847.0	4.0	4.0	3,796.0			332		
18,500	18,568	68	3.0	3.0	204.0	0.0	0.0	0.0			10		
18,568	18,710	142	3.0	3.0	426.0	3.0	3.0	426.0			43		
18,710	19,085	375	3.0	3.0	1,125.0	3.0	1.5	843.8			98		
19,085	19,280	195	3.0	0.0	292.5	1.5	0.0	146.3			22		
19,280	19,516	236	Bridge			Bridge					0		
19,516	19,835	319	0.0	3.0	478.5	0.0	3.0	478.5			48		
19,835	20,803	968	3.0	3.0	2,904.0	3.0	4.0	3,388.0			315		
20,803	22,618	1,815	3.0	3.0	5,445.0	4.0	4.0	7,260.0			635		
22,618	22,750	132	3.0	3.0	396.0	4.0	3.9	521.2			46		
22,750	23,898	1,148	3.0	3.0	3,444.0	3.9	3.0	3,958.8		278			
23,898	26,250	2,352	3.0	3.0	7,056.0	3.0	3.0	7,056.0		529			
26,250	26,807	557	3.0	3.0	1,671.0	3.0	3.0	1,671.0				334	
									171	**1,429**	**2,779**	**649**	**0**

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**2,222**	**18,577**	**36,121**	**8,438**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Cut of Embankment	m^3	1.28	500	640
Subtotal				**640**

Total Bill No. Earthwork			
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)		**US $**	**65,998**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 1, Tbilisi - Khashuri

Subsection: Tbilisi - Junction S 3 (km 15+000 - km 26+940)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	15+763	P	RC	20.0	1500	●			20.0				
2	15+900	P	RC	20.0	1000	●			20.0				
3	15+986	P	RC	18.0	1500	●			18.0				
4	21+110	P	RC	34.0	1000	●			34.0				
5	21+380	P	RC	34.0	1000								
6	21+640	P	RC	30.0	1300								
7	22+239	B	RC	75.0	3000x3000								
8	22+605	P	RC	90.0	1500 (2)								
9	23+424	P	RC	36.0	1200								
10	23+600	P	RC	35.0	750								
11	23+980	P	RC	50.0	1500								
12	24+204	P	RC	68.0	1500								
13	25+322	P	RC	32.0	1500	●			32.0				
14	25+737	B	RC	40.0	3000x3000								
15	26+472	B	RC	56.0	5200x3800								
Total									**124**	**0**	**0**	**0**	

Unit price				1.92	10.00	231.00	
Subtotal				**238**	**0**	**0**	

Improvement of side drains				
Section length :	11,940 m	x (2 x 1.08 US $/m) =	25,790	US $

Total Bill No. Drainage		
Subsection: Tbilisi - Junction S 3 (km 15+000 - km 26+940)	**26,028**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 1, Tbilisi - Khashuri
Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940)

Section length: 11,940 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	47760	121,310
Broken line, ratio 1:3	m	1.0	23880	23,880
Roadside marking post	no.	3.00	478	1,433
Km - post	no.	10.71	12	128
Road signing	km	1000	11.94	11,940
crash barrier & safety improvements	km	2000	11.94	23,880
Total				**182,571**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Quantity and Cost Estimate

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S 1, Tbilisi - Khashuri
Subsection: Junction S 3 - Gori junction (Km 26+940 - Km 84+700)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	1,515,305
2	Earthworks	145,641
3	Drainage	125,738
4	Bridges	2,501,296
5	Pavement Maintenance & Rehabilitation	11,848,368
6	Marking & Safety Works	532,011
	Total	**16,668,358**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **288,580** US $/km.

S 1, Tbilisi - Khashuri
Subsection: Junction S 3 - Gori junction (Km 26+940 - Km 84+700)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
26,940	27,493	553	9.00	9.00	4,977	300	5,277					5,277
27,493	30,440	2,947	9.00	9.00	26,523	60	26,583					26,583
30,440	30,745	305	9.00	9.00	2,745	0	2,745				2,745	
30,745	31,828	1,083	9.00	9.00	9,747	60	9,807				9,807	
31,828	33,570	1,742	9.00	9.00	15,678	60	15,738				15,738	
33,570	35,940	2,370	9.00	9.00	21,330	0	21,330				21,330	
35,940	36,965	1,025	9.00	9.00	9,225	0	9,225					9,225
36,965	37,370	405	9.00	9.00	3,645	0	3,645					3,645
37,370	38,310	940	9.00	9.00	8,460	0	8,460					8,460
38,310	39,462	1,152	9.00	9.00	10,368	80	10,448					10,448
39,462	44,100	4,638	9.00	9.00	41,742	0	41,742					41,742
44,100	44,440	340	9.00	9.00	3,060	120	3,180					3,180
44,440	45,610	1,170	9.00	9.00	10,530	0	10,530			10,530		
45,610	46,870	1,260	9.00	9.00	11,340	0	11,340			11,340		
46,870	46,940	70	9.00	9.00	630	0	630			630		
46,940	48,458	1,518	9.00	9.00	13,662	0	13,662				13,662	
48,458	49,480	1,022	9.00	9.00	9,198	60	9,258				9,258	
49,480	55,940	6,460	9.00	9.00	58,140	0	58,140				58,140	
55,940	56,705	765	9.00	9.00	6,885	0	6,885			6,885		
56,705	57,565	860	9.00	9.00	7,740	100	7,840			7,840		
57,565	57,640	75	9.00	9.00	675	0	675			675		
57,640	60,940	3,300	9.00	9.00	29,700	0	29,700			29,700		
60,940	63,009	2,069	9.00	9.00	18,621	0	18,621					18,621
63,009	64,300	1,291	9.00	9.00	11,619	60	11,679					11,679
64,300	64,440	140	9.00	9.00	1,260	0	1,260					1,260
64,440	66,940	2,500	9.00	9.00	22,500	0	22,500			22,500		

66,940	67,382	442	9.00	9.00	3,978	0	3,978		3,978			
67,382	68,083	701	9.00	9.00	6,309	60	6,369		6,369			
68,083	69,170	1,087	9.00	9.00	9,783	60	9,843		9,843			
69,170	71,312	2,142	9.00	9.00	19,278	60	19,338		19,338			
71,312	72,191	879	9.00	9.00	7,911	60	7,971		7,971			
72,191	73,025	834	9.00	9.00	7,506	120	7,626		7,626			
73,025	74,073	1,048	9.00	9.00	9,432	60	9,492		9,492			
74,073	75,750	1,677	9.00	9.00	15,093	0	15,093		15,093			
75,750	78,039	2,289	9.00	9.00	20,601	0	20,601					20,601
78,039	78,750	711	9.00	9.00	6,399	500	6,899					6,899
78,750	78,950	200	9.00	9.00	1,800	0	1,800		1,800			
78,950	79,050	100	9.00	9.00	900	0	900					900
79,050	79,176	126	9.00	9.00	1,134	0	1,134		1,134			
79,176	80,208	1,032	9.00	9.00	9,288	0	9,288		9,288			
80,208	80,750	542	9.00	9.00	4,878	500	5,378		5,378			
80,750	81,040	290	9.00	9.00	2,610	0	2,610				2,610	
81,040	81,415	375	9.00	9.00	3,375	0	3,375				3,375	
81,415	83,080	1,665	9.00	9.00	14,985	0	14,985					14,985
83,080	83,750	670	9.00	9.00	6,030	0	6,030				6,030	
83,750	84,176	426	9.00	9.00	3,834	0	3,834	3,834				
84,176	84,338	162	9.00	16.00	2,025	0	2,025	2,025				
84,338	84,700	362	16.00	16.00	5,792	0	5,792	5,792				
					522,941	**2,320**	**525,261**	**11,651**	**97,310**	**90,100**	**142,695**	**183,505**

Unit Rate (US $)	1.25	6.00	9.91	14.08	42.89
Subtotal	**14,564**	**583,860**	**892,891**	**2,009,146**	**7,870,529**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Reconstruction	0	0	0	0
Resealing or Overlay	16,204	2,461	5,540	18,320
	16,204	**2,461**	**5,540**	**18,320**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**16,204**	**29,827**	**67,145**	**364,202**

Total Bill No. Pavement		
Subsection: Junction S 3 - Gori junction (Km 26+940 - Km 84+700)	**US $**	**11,848,368**

S 1, Tbilisi - Khashuri
Subsection: Junction S 3 - Gori junction (Km 26+940 - Km 84+700)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
26,940	28,398	1,458	1.7	3.0	3,426.3	3.0	3.0	4,374.0				780.03	
28,398	29,850	1,452	1.7	2.0	2,686.2	3.0	2.0	3,630.0				631.62	
29,850	30,440	590	2.0	2.0	1,180.0	2.0	2.0	1,180.0				236	
30,440	35,940	5,500	2.0	2.0	11,000.0	2.0	2.0	11,000.0			110		
35,940	38,440	2,500	2.0	2.0	5,000.0	2.0	2.0	5,000.0				1000	
38,440	41,440	3,000	2.0	2.0	6,000.0	2.0	2.0	6,000.0				1200	
41,440	44,400	2,960	2.0	2.0	5,920.0	2.0	2.0	5,920.0				1184	
44,440	46,940	2,500	2.0	2.0	5,000.0	2.0	2.0	5,000.0		375			
46,940	55,940	9,000	2.0	2.0	18,000.0	2.0	2.0	18,000.0			180		
55,940	60,940	5,000	2.0	2.0	10,000.0	2.0	2.0	10,000.0		750			
60,940	64,440	3,500	2.0	2.0	7,000.0	2.0	2.0	7,000.0				1400	
64,440	66,940	2,500	2.0	2.0	5,000.0	2.0	2.0	5,000.0		375			
66,940	75,750	8,810	2.0	2.0	17,620.0	2.0	2.0	17,620.0	704.8				
75,750	78,750	3,000	2.0	2.0	6,000.0	2.0	2.0	6,000.0				1200	
78,750	78,950	200	2.0	2.0	400.0	2.0	2.0	400.0	16				
78,950	79,050	100	2.0	2.0	200.0	2.0	2.0	200.0				40	
79,050	80,750	1,700	2.0	2.0	3,400.0	2.0	2.0	3,400.0	136				
80,750	81,415	665	2.0	2.0	1,330.0	2.0	2.0	1,330.0			13.3		
81,450	83,080	1,630	2.0	2.0	3,260.0	2.0	2.0	3,260.0				652	

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
83,080	83,750	670	2.0	2.0	1,340.0	2.0	2.0	1,340.0			13.4		
83,750	84,176	426	2.0	2.0	852.0	2.0	2.0	852.0	34.08				
84,176	84,338	162	2.0	1.0	243.0	2.0	1.0	243.0	9.72				
84,338	84,700	362	1.0	1.0	362.0	1.0	1.0	362.0	14.48				
									915	**1,500**	**317**	**8,324**	
Unit Rate US $									13.00	13.00	13.00	13.00	0.75
Subtotal									**11,896**	**19,500**	**4,117**	**108,207**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Cut of Embankment	m³	1.28	1,500	1,920
Subtotal				**1,920**

Total Bill No. Earthwork		
Subsection: Junction S 3 - Gori junction (Km 29+940 - Km 84+700)	**US $**	**145,641**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

Subsection: Junction S 3 - Gori junction (km 26+940 - km 84+700)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
16	27+088	B	RC	15.0	2600x800								
17	27+596	B	RC	25.0	8000x4000								
18	28+100	P	RC	266.0	1500								
19	30+745	P	RC	13.0	400	●●			13.0				
20	30+944	P	RC	14.0	750	●●			14.0				
21	31+251	P	RC	12.0	400	●●			12.0				
22	32+203	B	RC	15.0	500x500	●●			15.0				
23	32+552	P	RC	12.0	750	●●			12.0				
24	33+078	P	RC	18.0	750								
25	33+570	P	RC	17.0	750	●●			17.0				
26	34+280	P	RC	24.0	1100	●●			24.0				
27	36+965	P	RC	12.0	500								
28	39+787	P	RC	11.0	1000								
29	40+634	B	RC	10.5	1000x1000	●●			10.5				
30	40+960	P	RC	12.0	500	●●			12.0				
31	41+105	P	RC	17.0	1000	●			17.0				
32	41+829	B	RC	11.0	1800x2000								
33	43+021	P	RC	12.0	500	●			12.0				
34	43+452	P	RC	15.0	500	●●			15.0				
35	45+610	P	RC	14.0	1000								
36	45+908	P	RC	14.0	750								
37	46+788	B	RC	14.0	1000x1000								
38	46+870	P	RC	25.0	1000								
39	47+920	B	RC	14.0	1000x1000								
40	48+375	B	RC	11.0	1000x1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
41	48+458	B	RC	13.0	1200x1000								
42	49+089	P	RC	12.0	1000								
43	49+629	P	RC	13.0	1000								
44	50+009	P	RC	11.0	750								
45	50+490	P	RC	11.0	1000								
46	51+017	P	RC	12.0	1000								
47	51+197	B	RC	13.0	1300x1000								
48	52+038	P	RC	13.0	1000								
49	52+323	P	RC	12.0	750								
50	52+788	P	RC	12.0	750	●			12.0				
51	53+091	P	RC	11.0	750								
52	53+301	P	RC	12.0	750								
53	53+911	B	RC	12.0	1000x1000								
54	54+285	P	RC	12.0	750								
55	54+477	B	RC	15.0	1000x1000								
56	54+789	P	RC	12.0	750								
57	55+216	B	RC	40.0	4500x2500								
58	55+865	P	RC	11.0	750	●●			11.0				
59	56+705	P	RC	20.0	1000								
60	57+073	B	RC	14.0	2000x1000								
61	57+580	P	RC	47.0	1000 (2)								
62	58+835	P	RC	12.0	750	●●			12.0				
63	58+931	B	RC	12.0	3000x2000								
64	60+440	B	RC	80.0	4000x3000								
65	60+640	P	RC	25.0	1000								
66	61+011	P	RC	26.0	1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
67	61+704	P	RC	13.0	1000								
68	62+750	P	RC	13.0	750 (2)								
69	63+946	B	RC	12.0	2500x2500								
70	64+300	P	RC	11.0	750	●●			11.0				
71	64+675	P	RC	12.0	1000								
72	65+495	P	RC	14.0	1000	●●			14.0				
73	66+389	P	RC	16.0	1000								
74	67+105	P	RC	22.0	1000	●●			22.0				
75	67+383	P	RC	16.0	1000								
76	68+083	P	RC	20.0	1000								
77	68+863	P	RC	14.0	1000								
78	69+170	P	RC	20.0	1000	●●			20.0				
79	69+355	P	RC	15.0	1000								
80	71+312	P	RC	18.0	750	●●			18.0				
81	71+526	P	RC	16.0	750	●●			16.0				
82	71+642	P	RC	13.0	1000	●			13.0				
83	72+191	P	RC	16.0	1000								
84	72+560	B	RC	16.0	4000x2500								
85	73+258	P	RC	14.0	1000	●			14.0				
86	73+480	P	RC	14.0	1000	●●			14.0				
87	73+873	P	RC	14.0	1000	●●			14.0				
88	74+073	P	RC	12.0	750	●●			12.0				
89	74+386	P	RC	16.0	1000	●●			16.0				
90	74+612	P	RC	12.0	800	●●			12.0				
91	74+797	P	RC	14.0	1000	●●			14.0				
92	75+410	P	RC	20.0	1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
93	75+690	P	RC	13.0	800								
94	75+789	P	RC	14.0	1000								
95	76+210	P	RC	14.0	1000								
96	76+654	P	RC	17.0	750	●●			17.0				
97	77+234	P	RC	17.0	1200	●●			17.0				
98	77+704	P	RC	16.0	1500								
99	77+907	P	RC	16.0	1000								
100	78+039	P	RC	16.0	750								
101	78+677	P	RC	16.0	750	●●			16.0				
102	79+176	P	RC	16.0	750								
103	79+505	P	RC	16.0	1000								
104	79+634	P	RC	14.0	500	●			14.0				
105	80+344	P	RC	13.0	1000								
106	80+718	P	RC	16.0	1500								
107	81+040	P	RC	25.0	1000								
108	81+415	P	RC	15.0	1000								
109	82+190	P	RC	45.0	1500								
110	82+313	P	RC	45.0	1500								
111	82+921	P	RC	26.0	1000	●●			26.0				
112	83+120	B	RC	53.0	3000x2500								
113	83+300	P	RC	48.0	1500								
114	83+555	P	RC	110.0	1500								
115	83+926	P	RC	45.0	1500								
116	84+176	P	RC	45.0	1500								
117	84+338	P	RC	36.0	1500								
118	84+408	B	RC	37.0	2500x6000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
119	84+590	P	RC	60.0	1500								
Total									**508.5**	**0.0**	**0.0**		
Unit price									1.92	10.00	231.00		
Subtotal									**976**	**0**	**0**		

Improvement of side drains				
Section length :	57,760 m	x (2 x 1.08 US $/m) =	124,762	US $

Total Bill No. Drainage		
Subsection: Junction S 3 - Gori junction (km 26+940 - km 84+700)	**125,738**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

S 1, Tbilisi - Khashuri
Subsection: Junction S 3 - Gori junction (Km 26+940 - Km 84+700)

Section length: 57,760 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	115520	293,421
Broken line, ratio 1:3	m	1.0	57,760	57,760
Roadside marking post	no.	3.00	2310	6,931
Km - post	no.	10.71	58	619
Road signing	km	1000	57.76	57,760
crash barrier & safety improvements	km	2000	57.76	115,520
Total				**532,011**

S 1, Tbilisi - Khashuri
Subsection: Gori junction - Khasuri (Km 84 + 700 - Km 126 + 670)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	850,947
2	Earthworks	575,970
3	Drainage	91,028
4	Bridges	1,921,677
5	Pavement Maintenance & Rehabilitation	5,534,222
6	Marking & Safety Works	386,573
	Total	**9,360,417**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **223,026** US $/km.

S 1, Tbilisi - Khashuri
Subsection: Gori junction - Khasuri (Km 84+700 - Km 126+670)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
From	To	m	m	m	m²	m²	m²	m²	40 mm m²	75 mm m²	100 mm m²	m²
84,700	85,040	340	16	16	5,440	0	5,440	5,440				
85,040	85,140	100	16	9	1,250	0	1,250	1,250				
85,140	86,250	1,110	9	9	9,990	0	9,990	9,990				
86,250	86,754	504	9	9	4,536	0	4,536			4,536		
86,754	86,823	69	9	12	725	0	725			725		
86,823	86,850	27	12	12	324	0	324			324		
86,850	87,150	300	12	12	3,600	0	3,600					3,600
87,150	87,790	640	12	12	7,680	0	7,680			7,680		
87,790	87,890	100	12	9	1,050	0	1,050			1,050		
87,890	91,750	3,860	9	9	34,740	0	34,740			34,740		
91,750	93,550	1,800	9	9	16,200	0	16,200				16,200	
93,550	93,632	82	9	11	820	0	820				820	
93,632	94,750	1,118	11	11	12,298	0	12,298				12,298	
94,750	94,790	40	11	11	440	0	440		440			
94,790	94,910	120	11	9	1,200	0	1,200		1,200			
94,910	95,353	443	9	9	3,987	60	4,047		4,047			
95,353	96,327	974	9	9	8,766	60	8,826		8,826			
96,327	97,260	933	9	9	8,397	60	8,457		8,457			
97,260	97,750	490	9	9	4,410	60	4,470		4,470			
97,750	98,359	609	9	9	5,481	0	5,481			5,481		
98,359	99,430	1,071	9	9	9,639	60	9,699			9,699		
99,430	100,591	1,161	9	9	10,449	60	10,509			10,509		
100,591	100,750	159	9	9	1,431	0	1,431			1,431		
100,750	101,618	868	9	9	7,812	0	7,812				7,812	
101,618	102,730	1,112	9	9	10,008	60	10,068				10,068	
102,730	103,250	520	9	9	4,680	60	4,740				4,740	

103,250	103,611	361	9	9	3,249	0	3,249		3,249			
103,611	104,363	752	9	9	6,768	0	6,768		6,768			
104,363	105,453	1,090	9	9	9,810	60	9,870		9,870			
105,453	105,750	297	9	9	2,673	0	2,673		2,673			
105,750	106,194	444	9	9	3,996	0	3,996				3,996	
106,194	107,842	1,648	9	9	14,832	60	14,892				14,892	
107,842	109,250	1,408	9	9	12,672	0	12,672				12,672	
109,250	111,250	2,000	9	9	18,000	0	18,000		18,000			
111,250	113,225	1,975	9	9	17,775	0	17,775			17,775		
113,225	115,410	2,185	9	9	19,665	60	19,725			19,725		
115,410	115,750	340	9	9	3,060	0	3,060			3,060		
115,750	120,750	5,000	9	9	45,000	0	45,000		45,000			
120,750	121,790	1,040	9	9	9,360	0	9,360			9,360		
121,790	122,405	615	9	9	5,535	0	5,535					5,535
122,405	123,035	630	9	9	5,670	60	5,730					5,730
123,035	124,526	1,491	9	9	13,419	0	13,419					13,419
124,526	125,320	794	9	9	7,146	300	7,446					7,446
125,320	126,010	690	9	9	6,210	60	6,270					6,270
126,010	126,670	660	9	9	5,940	0	5,940					5,940
					386,133	**1,080**	**387,213**	**16,680**	**113,000**	**126,095**	**83,498**	**47,940**

Unit Rate (US $)	1.25	6.00	9.91	14.08	42.89
Subtotal	**20,850**	**678,000**	**1,249,596**	**1,175,652**	**2,056,147**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Resealing or Overlay	11,048	15,343	2,503	6,370
Reconstruction	0	0	0	0
	11,048	**15,343**	**2,503**	**6,370**
Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**11,048**	**185,957**	**30,336**	**126,636**

Total Bill No. Pavement		
Subsection: Gori junction - Khasuri (Km 84+700 - Km 126+670)	**US $**	**5,534,222**

S 1, Tbilisi - Khashuri
Subsection: Gori Junction - Khasuri (Km 84+700 - Km 126+670)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
84,700	85,040	340	1.0	1.0	340.0	1.0	1.0	340.0					680
85,040	85,140	100	1.0	2.0	150.0	1.0	1.0	100.0					250
85,140	86,250	1,110	2.0	2.0	2,220.0	2.0	2.0	2,220.0					4,440
86,250	86,850	600	2.0	2.0	1,200.0	2.0	2.0	1,200.0		90			
86,850	87,150	300	2.0	2.0	600.0	2.0	2.0	600.0				120	
87,150	91,750	4,600	2.0	2.0	9,200.0	2.0	2.0	9,200.0		690			
91,750	94,750	3,000	2.0	2.0	6,000.0	2.0	2.0	6,000.0			600		
94,750	97,750	3,000	2.0	2.0	6,000.0	2.0	2.0	6,000.0	240				
97,750	100,750	3,000	2.0	2.0	6,000.0	2.0	2.0	6,000.0		450			
100,750	103,250	2,500	2.0	2.0	5,000.0	2.0	2.0	5,000.0			500		
103,250	105,750	2,500	2.0	2.0	5,000.0	2.0	2.0	5,000.0	200				
105,750	109,250	3,500	2.0	2.0	7,000.0	2.0	2.0	7,000.0			700		
109,250	111,250	2,000	2.0	2.0	4,000.0	2.0	2.0	4,000.0	160				
111,250	115,750	4,500	2.0	2.0	9,000.0	2.0	2.0	9,000.0		675			
115,750	120,750	5,000	2.0	2.0	10,000.0	2.0	2.0	10,000.0	400				
120,750	121,790	1,040	2.0	2.0	2,080.0	2.0	2.0	2,080.0		156			
121,790	126,670	4,880	2.0	2.0	9,760.0	1.0	2.0	7,320.0				1,708	
									1,000	2,061	1,800	1,828	5,370

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
			From Width	To Width	Area	From Width	To Width	Area	Overlay 40 mm	Overlay 75 mm	Overlay 100 mm	Reconst.	Regravel-ling
From	To	m	m	m	m²	m	m	m²	m³	m³	m³	m³	m²
Unit Rate US $									13.00	13.00	13.00	13.00	0.75
Subtotal									**13,000**	**26,793**	**23,400**	**23,764**	**4,028**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Cut of Embankment	m³	1.28	37,000	47,360
Fill of Embankment	m³	6.50	23,000	149,500
Sealing of Shoulder	m²	1.25	6,500	8,125
Retaining wall (1.50 m height)	m	100.00	2,800	280,000
Subtotal				**484,985**

Total Bill No. Earthwork

Subsection: Tbilisi - Junction S 3 (Km 15+000 - Km 26+940) US $ **575,970**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 1, Tbilisi - Khashuri

Subsection: Gori junction - Khasuri (km 84+700 - km 126+670)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
120	84+725	B	RC	35.0	2000x3000								
121	84+918	P	RC	63.0	1500								
122	85+042	P	RC	14.0	1000								
123	85+240	P	RC	30.0	1500								
124	85+479	P	RC	30.0	1500								
125	85+579	P	RC	40.0	1500								
126	86+918	P	RC	19.0	1500								
127	88+440	P	RC	80.0	1500								
128	88+452	B	RC	60.0	5000x4000								
129	89+153	B	RC	14.0	7000x6000								
130	89+688	P	RC	16.0	1000								
131	89+960	P	RC	20.0	1000	●●			20.0				
132	90+607	P	RC	20.0	1000	●●			20.0				
133	91+117	P	RC	45.0	1500								
134	93+780	P	RC	30.0	1500								
135	95+353	P	RC	12.0	750								
136	96+077	P	RC	13.0	750								
137	96+327	P	RC	13.0	750	●			13.0				
138	96+554	P	RC	13.0	750								
139	96+624	P	RC	13.0	1000								
140	96+754	P	RC	12.0	500								
141	97+092	P	RC	12.0	500								
142	97+338	P	RC	12.0	500								
143	97+489	P	RC	13.0	1000								
144	97+749	P	RC	12.0	500	●●			12.0				
145	98+359	P	RC	13.0	1000	●			13.0				
146	98+591	P	RC	12.0	500								
147	99+998	P	RC	28.0	1000								
148	100+194	P	RC	15.0	750								
149	100+591	P	RC	34.0	1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 1, Tbilisi - Khashuri

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
150	100+989	P	RC	13.0	1000								
151	101+004	P	RC	13.0	1500								
152	101+781	P	RC	28.0	750 (2)								
153	102+835	P	RC	39.0	1000								
154	103+611	P	RC	95.0	1000								
155	104+053	P	RC	32.0	1000	●			32.0				
156	104+363	P	RC	15.0	1000	●			15.0				
157	104+551	P	RC	25.0	1000								
158	105+453	P	RC	29.0	1000	●●			29.0				
159	106+194	B	RC	25.0	1000x1000								
160	107+477	P	RC	32.0	1000								
161	107+842	P	RC	17.0	1000								
162	108+050	P	RC	12.0	750	●			12.0				
163	112+750	P	RC	32.0	1000								
164	118+577	P	RC	14.0	1000	●●			14.0				
165	125+105	B	RC	12.0	5000x1500								
166	126+010	P	RC	13.0	1000								
167	126+428	P	RC	14.0	1500	●			14.0				
Total									**194.0**	**0.0**	**0.0**		
Unit price									1.92	10.00	231.00		
Subtotal									**372**	**0**	**0**		

Improvement of side drains				
Section length :	41,970 m	x (2 x 1.08 US $/m) =	90,655	US $

Total Bill No. Drainage		
Subsection: Gori junction - Khasuri (km 84+700 - km 126+670)	**91,028**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 1, Tbilisi - Khashuri
Subsection: Gori junction - Khasuri (Km 84 + 700 - Km 126 + 670)

Section length: 41,970 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	83940	213,208
Broken line, ratio 1:3	m	1.0	41,970	41,970
Roadside marking post	no.	3.00	1679	5,036
Km - post	no.	10.71	42	449
Road signing	km	1000	41.97	41,970
crash barrier & safety improvements	km	2000	41.97	83,940
Total				**386,573**

S 4, Tbilisi - Red Bridge

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	1,015,339
2	Earthworks	18,543
3	Drainage	100,595
4	Bridges	1,002,880
5	Pavement Maintenance & Rehabilitation	8,606,111
6	Marking & Safety Works	425,258
	Total	**11,168,727**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **241,904** US $/km.

S 4, Tbilisi - Red Bridge

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
11,000	11,532	532	17.5	15.0	8,645	0	8,645				8,645	
11,532	11,665	133	15.0	14.7	1,973	180	2,153				2,153	
11,665	12,350	685	14.7	13.0	9,479	0	9,479					9,479
12,350	12,860	510	13.0	11.8	6,328	0	6,328					6,328
12,860	13,210	350	11.8	11.0	3,992	0	3,992				3,992	
13,210	13,250	40	11.0	11.0	439	0	439				439	
13,250	14,115	865	11.0	10.0	9,063	0	9,063			9,063		
14,115	14,580	465	10.0	8.0	4,185	1400	5,585			5,585		
14,580	15,000	420	8.0	15.0	4,830	1330	6,160					
15,000	15,360	360	15.0	10.0	4,500	0	4,500					
15,360	18,440	3,080	10.0	10.0	30,800	0	30,800					30,800
18,440	18,750	310	10.0	10.0	3,100	0	3,100					3,100
18,750	19,610	860	10.0	10.0	8,600	0	8,600		8,600			
19,610	20,190	580	10.0	10.0	5,800	4840	10,640		10,640			
20,190	21,140	950	10.0	9.0	9,025	0	9,025		9,025			
21,140	21,385	245	9.0	9.0	2,205	150	2,355		2,355			
21,385	21,415	30	9.0	9.0	270	0	270					270
21,415	21,899	484	9.0	9.0	4,356	0	4,356		4,356			
21,899	22,140	241	9.0	9.0	2,169	2500	4,669		4,669			
22,140	22,826	686	9.0	8.0	5,831	0	5,831					5,831
22,826	24,250	1,424	8.0	8.9	12,016	0	12,016					12,016
24,250	24,451	201	8.9	9.0	1,797	0	1,797					1,797
24,451	25,705	1,254	9.0	7.0	10,032	0	10,032					10,032

25,705	26,250	545	7.0	7.0	3,815	0	3,815				3,815	
26,250	26,352	102	7.0	11.0	918	0	918		918			
26,352	26,595	243	11.0	8.0	2,309	0	2,309		2,309			
26,595	26,600	5	8.0	8.0	40	0	40		40			
26,600	27,730	1,130	8.0	8.0	9,040	0	9,040					9,040
27,730	27,775	45	8.0	8.0	360	0	360		360			
27,775	28,250	475	8.0	7.5	3,692	0	3,692		3,692			
28,250	28,824	574	7.5	7.0	4,175	0	4,175					4,175
28,824	32,250	3,426	7.0	7.0	23,982	0	23,982					23,982
32,250	32,470	220	7.0	7.0	1,540	0	1,540				1,540	
32,470	32,530	60	7.0	7.0	420	0	420					420
32,530	32,670	140	7.0	7.0	980	0	980				980	
32,670	32,730	60	7.0	7.0	420	0	420					420
32,730	33,885	1,155	7.0	7.0	8,085	0	8,085				8,085	
33,885	33,915	30	7.0	7.0	210	0	210					210
33,915	34,285	370	7.0	7.0	2,590	0	2,590				2,590	
34,285	34,315	30	7.0	7.0	210	0	210					210
34,315	34,385	70	7.0	7.0	490	0	490				490	
34,385	34,415	30	7.0	7.0	210	0	210					210
34,415	37,550	3,135	7.0	7.0	21,945	0	21,945				21,945	
37,550	37,650	100	7.0	7.0	700	0	700					700
37,650	37,750	100	7.0	7.0	700	0	700				700	
37,750	37,960	210	7.0	7.0	1,470	0	1,470			1,470		
37,960	39,247	1,287	7.0	7.5	9,331	300	9,631			9,631		
39,247	42,250	3,003	7.5	7.5	22,523	0	22,523			22,523		
42,250	43,750	1,500	7.5	7.5	11,250	0	11,250					11,250

43,750	43,950	200	7.5	7.5	1,500	0	1,500		1,500			
43,950	44,250	300	7.5	7.5	2,250	0	2,250					2,250
44,250	47,250	3,000	7.5	7.5	22,500	0	22,500		22,500			
47,250	47,795	545	7.5	7.5	4,088	0	4,088			4,088		
47,795	48,000	205	7.5	7.5	1,538	0	1,538					1,538
48,000	49,705	1,705	7.5	7.5	12,788	100	12,888					12,888
49,705	51,000	1,295	7.5	7.5	9,713	100	9,813					9,813
51,000	51,895	895	7.5	7.5	6,713	0	6,713					6,713
51,895	53,250	1,355	7.5	7.5	10,163	0	10,163		10,163			
53,250	54,360	1,110	7.5	7.5	8,325	0	8,325			8,325		
54,360	54,750	390	7.5	7.5	2,925	0	2,925					2,925
54,750	56,180	1,430	7.5	7.5	10,725	0	10,725			10,725		
56,180	56,904	724	7.5	7.5	5,430	0	5,430					5,430
56,904	57,170	266	7.5	8.5	2,128	0	2,128					2,128
2. Carriageway												
26,352	26,595	243	6.0	8.0	1,701	0	1,701		1,701			
					383,323	**10,900**	**394,223**	**0**	**82,827**	**71,409**	**55,375**	**173,952**

Unit Rate (US $)	1.25	6.00	9.91	14.08	36.34
Subtotal	**0**	**496,965**	**707,665**	**779,679**	**6,321,406**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Resealing or Overlay	46,422	7,867	5,492	4,631
Reconstruction	0	0	0	0
	46,422	**7,867**	**5,492**	**4,631**
Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**46,422**	**95,348**	**66,563**	**92,064**

Total Bill No. Pavement		
S 4, Tbilisi - Red Bridge	**US $**	**8,606,111**

S 4, Tbilisi - Red Bridge

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravelling m²
11,000	11,532	532	1.0	1.2	585.2	1.0	1.2	585.2			59		
11,532	11,655	123	1.2	1.0	135.3	1.2	1.0	135.3			14		
11,655	12,473	818	1.2	1.0	899.8	1.2	1.0	899.8				180	
12,476	12,860	384	1.0	1.0	384.0	1.0	1.0	384.0				77	
12,860	13,210	350	1.0	1.0	350.0	1.0	1.0	350.0			35		
13,210	13,250	40	1.0	2.0	60.0	1.0	2.0	60.0			6		
13,250	14,155	905	1.0	2.0	1,357.5	1.0	2.0	1,357.5		102			
14,115	14,580	465	2.0	0.0	465.0	2.0	3.0	1,162.5		61			
14,580	15,000	420	0.0	0.0	0.0	3.0	3.0	1,260.0		47			
15,000	15,360	360	0.0	2.0	360.0	3.0	2.0	900.0		47			
15,360	16,750	1,390	2.0	2.0	2,780.0	2.0	2.0	2,780.0	111				
16,750	18,750	2,000	2.0	2.0	4,000.0	2.0	2.0	4,000.0	160				
18,750	19,590	840	2.0	2.0	1,680.0	2.0	2.0	1,680.0	67				
19,590	19,610	20	2.0	0.0	20.0	2.0	0.0	20.0	1				
19,610	20,190	580	0.0	0.0	0.0	0.0	0.0	0.0	0				
20,190	20,210	20	0.0	3.0	30.0	0.0	3.0	30.0	1				
20,210	20,508	298	3.0	3.0	894.0	3.0	3.0	894.0	36				
20,508	21,140	632	3.0	2.0	1,580.0	3.0	2.0	1,580.0	63				
21,140	21,380	240	2.0	2.0	480.0	2.0	2.0	480.0	19				
21,380	21,415	35	2.0	2.0	70.0	2.0	2.0	70.0				14	
21,415	21,879	464	2.0	2.0	928.0	2.0	2.0	928.0	37				
21,879	21,899	20	2.0	0.0	20.0	2.0	0.0	20.0	1				
21,899	22,139	240	0.0	0.0	0.0	0.0	0.0	0.0	0				
22,139	22,150	11	0.0	2.0	11.0	0.0	2.0	11.0				2	

22,150	24,250	2,100	2.0	2.0	4,200.0	2.0	2.0	4,200.0				840	
24,250	25,705	1,455	2.0	2.0	2,910.0	2.0	1.0	2,182.5				509	
25,705	26,250	545	2.0	2.0	1,090.0	2.0	1.0	817.5			95		
26,250	26,352	102	2.0	2.0	204.0	2.0	1.0	153.0	7				
26,352	26,595	243	2.0	2.0	486.0	1.0	1.0	243.0	15				
26,595	26,600	5	2.0	2.0	10.0	1.0	2.0	7.5	0				
26,600	27,730	1,130	2.0	2.0	2,260.0	2.0	2.0	2,260.0				452	
27,730	28,250	520	2.0	2.0	1,040.0	2.0	2.0	1,040.0	42				
28,250	32,250	4,000	2.0	2.0	8,000.0	2.0	2.0	8,000.0				1,600	
32,250	32,470	220	2.0	2.0	440.0	2.0	2.0	440.0			44		
32,470	32,530	60	2.0	2.0	120.0	2.0	2.0	120.0				24	
32,530	32,670	140	2.0	2.0	280.0	2.0	2.0	280.0			28		
32,670	32,730	60	2.0	2.0	120.0	2.0	2.0	120.0				24	
32,730	33,885	1,155	2.0	2.0	2,310.0	2.0	2.0	2,310.0			231		
33,885	33,915	30	2.0	2.0	60.0	2.0	2.0	60.0				12	
33,915	34,285	370	2.0	2.0	740.0	2.0	2.0	740.0			74		
34,285	34,315	30	2.0	2.0	60.0	2.0	2.0	60.0				12	
34,315	34,385	70	2.0	2.0	140.0	2.0	2.0	140.0			14		
34,385	34,415	30	2.0	2.0	60.0	2.0	2.0	60.0				12	
34,415	37,550	3,135	2.0	2.0	6,270.0	2.0	2.0	6,270.0			627		
37,550	37,650	100	2.0	2.0	200.0	2.0	2.0	200.0				40	
37,650	37,750	100	2.0	2.0	200.0	2.0	2.0	200.0			20		
37,750	37,960	210	2.0	2.0	420.0	2.0	2.0	420.0		32			
37,960	42,250	4,290	2.5	2.0	9,652.5	2.0	2.5	9,652.5		724			

42,250	43,750	1,500	2.5	2.0	3,375.0	2.0	2.5	3,375.0				675	
43,750	43,950	200	2.5	2.0	450.0	2.0	2.5	450.0	18				
43,950	44,250	300	2.5	2.0	675.0	2.0	2.5	675.0				135	
44,250	47,250	3,000	2.5	2.0	6,750.0	2.0	2.5	6,750.0	270				
47,250	47,950	700	2.5	2.0	1,575.0	2.0	2.5	1,575.0		118			
47,950	51,000	3,050	2.5	3.0	8,387.5	2.5	3.0	8,387.5				1,678	
51,000	51,895	895	3.0	3.0	2,685.0	3.0	3.0	2,685.0				537	
51,895	53,250	1,355	2.5	3.0	3,726.3	2.0	3.0	3,387.5	142				
53,250	54,000	750	2.0	3.0	1,875.0	2.0	3.0	1,875.0		141			
54,000	54,360	360	3.0	2.0	900.0	3.0	2.0	900.0		68			
54360	54750	390	2.5	2.0	877.5	2.0	2.0	780.0				166	
54,750	56,180	1,430	2.0	1.0	2,145.0	2.0	1.0	2,145.0		161			
56,180	56,904	724	1.0	2.0	1,086.0	1.0	2.0	1,086.0				217	
56,904	57,170	266	2.0	2.0	532.0	2.0	2.0	532.0				106	

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**1,003**	**1,513**	**1,259**	**7,325**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Fill of Embankment	m^3	6.50	1,145	7,443
Subtotal				**7,443**

Total Bill No. Earthwork		
S 4, Tbilisi - Red Bridge	**US $**	**18,543**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	11+275	P	RC	22.0	300	●●			22.0				
2	11+452	P	RC	19.5	500	●			19.5				
3	12+215	B	RC	18.0	1000x500								
4	18+880	B/P	RC	13.6	1400x1400 - 1200	●			13.6				
5	19+280	B	RC	13.6	1200x1500	●			13.6				
6	19+477	P	RC	15.0	1000	●			15.0				
7	20+508	P	RC	14.0	1000	●●			14.0				
8	21+140	B	RC	15.0	1100x1500	●●			15.0				
9	21+884	B	RC	13.0	1500x1000	●●			13.0				
10	22+139	P	RC	16.0	1000	●●			16.0				
11	22+336	P	RC	21.0	1000	●			21.0				
12	22+875	B	RC	27.0	4500x2000								
13	23+315	P	RC	52.0	1000	●			52.0				
14	23+540	B	RC	23.0	1000x2000	●			23.0				
15	23+603	P	RC	20.0	1000	●			20.0				
16	23+830	B	RC	13.5	2000x1000								
17	24+423	P	RC	20.0	1500								
18	24+521	P	RC	13.0	1000								
19	24+621	P	RC	14.0	1000	●●			14.0				
20	26+633	P	RC	46.0	700								
21	27+732	P	RC	30.0	1000								
22	27+937	P	RC	20.0	1000								
23	29+120	P	RC	30.0	1500								
24	29+560	P	RC	12.0	750								
25	32+638	P	RC	38.0	1500 (2)								
26	32+933	B	RC	12.0	1000x1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
27	33+555	P	RC	38.0	1000	●●			38.0				
28	33+895	P	RC	20.0	1500								
29	34+090	P	RC	23.0	1500								
30	34+190	B	RC	20.0	1000x1000	●			20.0				
31	34+285	P	RC	15.0	750								
32	34+453	P	RC	18.0	1500	●●			18.0				
33	34+742	P	RC	12.0	1500								
34	35+116	P	RC	14.0	750								
35	35+437	P	RC	13.0	750	●●			13.0				
36	35+628	P	RC	18.0	750	●			18.0				
37	35+910	P	RC	20.0	1500								
38	36+152	P	RC	18.0	750								
39	36+434	P	RC	19.0	1500								
40	36+703	B	RC	12.0	2500x1500								
41	37+036	P/B	RC	18.0	1500 (2) / 2500x1600								
42	37+394	B	RC	13.0	2000x1000								
43	38+791	P	RC	13.0	400	●			13.0				
44	39+247	B	RC	13.0	2000x1000	●			13.0				
45	40+115	P	RC	18.0	800	●			18.0				
46	42+435	P	RC	14.0	750								
47	44+916	P	RC	14.0	1500	●			14.0				
48	45+517	B	RC	15.0	1000x1000	●			15.0				
49	46+156	B	RC	13.0	1500x1000	●			13.0				
50	46+740	B	RC	15.0	1000x1500	●			15.0				
51	47+050	P	RC	15.0	750	●			15.0				
52	47+297	B	RC	12.0	1000x1500	●			12.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
53	48+325	B	RC	14.0	1000x500	●●			14.0				
54	48+715	P	RC	23.0	750	●●			23.0				
55	50+146	B	RC	14.0	1000x500	●			14.0				
56	50+244	B	RC	14.0	1500x500	●			14.0				
57	50+712	P	RC	15.0	750	●			15.0				
58	51+125	B	RC	14.0	1500x500	●			14.0				
59	51+425	B	RC	15.0	1000x1000	●			15.0				
60	51+892	B	RC	15.0	1000x1000	●●			15.0				
61	52+646	B	RC	15.0	1000x1000	●			15.0				
62	53+109	B	RC	15.0	1500x1000	●			15.0				
63	53+555	B	RC	13.0	1000x1000	●●			13.0				
64	55+175	P	RC	16.0	1000	●●			16.0				
65	55+450	B	RC	12.0	1000	●●			12.0				
66	56+180	B	RC	12.0	1500x1000	●			12.0				
67	56+780	B	RC	10.0	1300x1000	●●			10.0				
Total									**452.0**	**0.0**	**0.0**		

Unit price			1.92	10.00	231.00	
Subtotal			**868**	**0**	**0**	

Improvement of side drains			
Section length :	46,170 m	x (2 x 1.08 US $/m) =	99,727 US $

Total Bill No. Drainage

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 4, Tbilisi - Red Bridge

No	Chainage (km)	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length (m)	Size/Dia (mm)	Silted/ Blocked	Scour	Structural Damage	Cleaning (m)	Backfill of scoured areas (m^3)	Repair (m^2)	Reconst. (m)	
Subsection: Gori junction - Khasuri (km 84+700 - km 126+670)						**100,595**	**US $**						

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

S 4, Tbilisi - Red Bridge

Section length: 46,170 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	92340	234,544
Broken line, ratio 1:3	m	1.0	46,170	46,170
Roadside marking post	no.	3.00	1847	5,540
Km - post	no.	10.71	46	494
Road signing	km	1000	46.17	46,170
crash barrier & safety improvements	km	2000	46.17	92,340
Total				**425,258**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Quantity and Cost Estimate

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S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	781,249
2	Earthworks	256,694
3	Drainage	56,719
4	Bridges	377,736
5	Pavement Maintenance & Rehabilitation	6,883,338
6	Marking & Safety Works	238,005
	Total	**8,593,742**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **332,575** US $/km.

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
3,000	3,099	99	23.0	21.0	2,178	0	2,178					2,178
3,099	3,550	451	21.0	9.0	6,765	0	6,765					6,765
3,550	4,250	700	9.0	9.0	6,300	0	6,300					6,300
4,250	6,750	2,500	9.0	9.0	22,500	0	22,500		22,500			
6,750	8,230	1,480	9.0	9.0	13,320	0	13,320					13,320
8,230	8,750	520	9.0	9.0	4,680	120	4,800					4,800
8,750	9,470	720	9.0	9.0	6,480	0	6,480		6,480			
9,470	10,475	1,005	9.0	9.0	9,045	720	9,765		9,765			
10,475	10,525	50	9.0	9.0	450	0	450					450
10,525	10,920	395	9.0	9.0	3,555	0	3,555		3,555			
10,920	10,995	75	9.0	12.0	788	0	788		788			
10,995	11,050	55	12.0	12.0	660	0	660		660			
11,050	11,150	100	12.0	12.0	1,200	0	1,200					1,200
11,150	11,460	310	12.0	12.0	3,720	0	3,720		3,720			
11,460	12,014	554	12.0	7.5	5,402	0	5,402		5,402			
12,014	12,190	176	7.5	8.5	1,407	0	1,407		1,407			
12,190	12,210	20	8.5	8.6	171	0	171					171
12,210	12,250	40	8.6	8.7	345	0	345		345			
12,250	12,379	129	8.7	9.0	1,139	0	1,139					1,139
12,379	13,990	1,611	9.0	9.0	14,499	200	14,699					14,699
13,990	14,250	260	9.0	8.6	2,288	0	2,288					2,288

14,250	14,535	285	8.6	8.2	2,397	0	2,397			2,397		
14,535	14,716	181	8.2	8.0	1,470	0	1,470					1,470
14,716	16,000	1,284	8.0	8.0	10,272	0	10,272					10,272
16,000	16,050	50	8.0	8.0	400	0	400					400
16,050	16,675	625	8.0	7.8	4,933	0	4,933			4,933		
16,675	17,630	955	7.8	7.5	7,303	0	7,303					7,303
17,630	19,035	1,405	7.5	7.5	10,538	0	10,538					10,538
19,035	21,167	2,132	7.5	7.0	15,457	0	15,457					15,457
21,167	21,320	153	7.0	9.0	1,224	0	1,224					1,224
21,320	23,034	1,714	9.0	9.0	15,426	0	15,426					15,426
23,034	23,930	896	9.0	7.5	7,392	0	7,392					7,392
23,930	24,242	312	7.5	9.0	2,574	0	2,574					2,574
24,242	27,530	3,288	9.0	9.0	29,592	0	29,592					29,592
27,530	27,690	160	9.0	9.0	1,440	880	2,320					2,320
27,690	27,823	133	9.0	16.0	1,663	0	1,663					1,663
27,823	28,000	177	16.0	18.0	3,009	0	3,009					3,009
28,000	28,300	300	18.0	17.1	5,265	0	5,265					5,265
28,300	28,648	348	17.1	16.0	5,755	0	5,755				5,755	
28,648	28,840	192	16.0	20.0	3,456	2000	5,456				5,456	
					236,455	**3,920**	**240,375**	**0**	**54,621**	**7,329**	**11,211**	**167,213**

Unit Rate (US $)	1.25	6.00	9.91	14.08	39.62
Subtotal	**0**	**327,727**	**72,635**	**157,849**	**6,624,995**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Reconstruction	0	0	0	0
Resealing or Overlay	6,672	84	1,257	635
	6,672	**84**	**1,257**	**635**
Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**6,672**	**1,018**	**15,235**	**12,624**

Total Bill No. Pavement		
Subsection: Tbilisi - Marneuli	**US $**	**6,883,338**

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
3,000	3,550	550	2.0	3.0	1,375.0	2.0	3.0	1,375.0				275	
3,550	4,250	700	3.0	3.0	2,100.0	3.0	3.0	2,100.0				420	
4,250	6,027	1,777	3.0	3.0	5,331.0	3.0	3.0	5,331.0	213				
6,027	6,750	723	3.0	3.7	2,437.6	3.0	3.7	2,437.6	98				
6,750	7,000	250	3.7	4.0	962.5	3.7	4.0	962.5				193	
7,000	8,230	1,230	4.0	4.0	4,920.0	4.0	4.0	4,920.0				984	
8,230	8,750	520	4.0	3.6	1,971.0	4.0	3.6	1,971.0				394	
8,750	9,470	720	3.6	3.0	2,376.0	3.6	3.0	2,376.0	95				
9,470	10,475	1,005	3.0	3.0	3,015.0	3.0	3.0	3,015.0	121				
10,475	10,525	50	3.0	3.0	150.0	3.0	3.0	150.0				30	
10,525	10,920	395	3.0	3.0	1,185.0	3.0	3.0	1,185.0	47				
10,920	10,995	75	3.0	2.0	187.5	3.0	2.0	187.5	8				
10,995	11,050	55	2.0	2.0	110.0	2.0	2.0	110.0	4				
11,050	11,150	100	2.0	2.0	200.0	2.0	2.0	200.0				40	
11,150	12,190	1,040	2.0	2.0	2,080.0	2.0	2.0	2,080.0	83				
12,190	12,210	20	2.0	2.0	40.0	2.0	2.0	40.0				8	
12,210	12,250	40	2.0	2.0	80.0	2.0	2.0	80.0	3				
12,250	13,990	1,740	2.0	2.0	3,480.0	2.0	2.0	3,480.0				696	
13,990	14,250	260	2.0	1.6	468.0	2.0	1.6	468.0				94	
14,250	14,535	285	1.6	1.2	403.7	1.6	1.2	403.7		30			
14,535	14,716	181	1.2	1.0	199.1	1.2	1.0	199.1				40	
14,716	16,000	1,284	1.0	1.0	1,284.0	1.0	1.0	1,284.0				257	

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
16,000	16,050	50	1.0	1.1	52.5	1.0	1.1	52.5				11	
16,050	16,675	625	1.1	1.9	922.4	1.1	1.9	922.4		69			
16,675	17,630	955	1.9	3.0	2,339.8	1.9	3.0	2,339.8				468	
17,630	19,035	1,405	3.0	3.0	4,215.0	3.0	3.0	4,215.0				843	
19,035	21,167	2,132	3.0	2.0	5,330.0	3.0	2.0	5,330.0				1,066	
21,167	21,320	153	2.0	1.0	229.5	2.0	1.0	229.5				46	
21,320	23,034	1,714	1.0	1.0	1,714.0	1.0	1.0	1,714.0				343	
23,034	23,930	896	1.0	2.0	1,344.0	1.0	2.0	1,344.0				269	
23,930	25,463	1,533	2.0	2.0	3,066.0	2.0	2.0	3,066.0				613	
25,463	27,530	2,067	2.0	3.0	5,167.5	2.0	3.0	5,167.5				1,034	
27,530	27,690	160	3.0	3.0	480.0	3.0	3.0	480.0				96	
27,690	27,823	133	3.0	2.0	332.5	3.0	2.0	332.5				67	
27,823	28,000	177	2.0	2.0	354.0	2.0	2.0	354.0				71	
28,000	28,300	300	2.0	2.5	670.3	2.0	2.0	600.0				127	
28,300	28,640	340	2.5	3.0	935.0	2.0	2.0	680.0			81		
28,640	28,840	200	junction			2.0	2.0	400.0			20		
									672	**99**	**101**	**8,482**	**0**

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**8,737**	**1,293**	**1,310**	**110,265**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Cut of Embankment	m³	1.28	3,000	3,840
Fill of Embankment	m³	6.50	20,000	130,000
Sealing of Shoulder	m²	1.25	1,000	1,250
Subtotal				**135,090**

Total Bill No. Earthwork
Subsection:Tbilisi - Marneuli (km 3+000 - km 28+840) **US $** **256,694**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	3+102	B	RC	28.0	6000x4500								
2	3+670	B	RC	24.5	4000x2500								
3	4+238	B	RC	30.0	3700x4000	●			30.0				
4	7+321	B	RC	21.0	3000x1000	●			21.0				
5	7+961	P	RC	21.0	1200	●●			21.0				
6	8+311	B	RC	19.0	6000x4000								
7	9+154	P/B	RC	21.0	1000 - 1000x800	●●			21.0				
8	9+480	P	RC	20.0	1500	●●			20.0				
9	10+403	P	RC	16.0	1500	●			16.0				
10	10+590	B	RC	25.0	2300x2000	●			25.0				
11	12+014	B	RC	36.0	2000x2000	●			36.0				
12	13+340	B	RC	42.0	5300x3500								
13	13+050	B	RC	12.0	1000x1000	●●			12.0				
14	13+082	P	RC	12.0	1000								
15	13+600	P	RC	20.0	1000	●			20.0				
16	13+990	P	RC	20.0	1000	●●			20.0				
17	14+417	B	RC	19.0	5000x2000	●			19.0				
18	15+620	B	RC	40.0	2000x3500	●			40.0				
19	17+490	B	RC	11.0	1000x1000	●			11.0				
20	19+980	P	RC	17.5	500								
21	23+542	B	RC	20.0	3000x1500								
22	24+168	P	RC	26.0	1000	●			26.0				
23	24+392	P	RC	28.0	1000	●●			28.0				
24	27+560	P	RC	48.0	1000	●●			48.0				
25	28+100	B	RC	57.0	3000x1000	●			57.0				
Total									**471.0**	**0.0**	**0.0**		

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

Unit price	1.92	10.00	231.00	
Subtotal	**904**	**0**	**0**	

Improvement of side drains				
Section length :	25,840 m	x (2 x 1.08 US $/m) =	55,814	US $

Total Bill No. Drainage		
Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)	**56,719**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

Section length: 25,840 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	51680	131,267
Broken line, ratio 1:3	m	1.0	25,840	25,840
Roadside marking post	no.	3.00	1034	3,101
Km - post	no.	10.71	26	277
Road signing	km	1000	25.84	25,840
crash barrier & safety improvements	km	2000	25.84	51,680
Total				**238,005**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Quantity and Cost Estimate

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S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Marneuli - Bolnisi (Km 28+840 - Km 53+880)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	497,265
2	Earthworks	85,081
3	Drainage	55,437
4	Bridges	904,792
5	Pavement Maintenance & Rehabilitation	3,696,702
6	Marking & Safety Works	230,636
	Total	**5,469,913**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **218,447** US $/km.

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Marneuli - Bolnisi (Km 28+840 - Km 53+880)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
From	To	m	m	m	m²	m²	m²	m²	40 mm m²	75 mm m²	100 mm m²	m²
28,840	28,986	146	20	20	2,920	0	2,920				2,920	
28,986	29,059	73	20	12	1,168	0	1,168				1,168	
29,059	30,265	1,206	12	12	14,472	0	14,472				14,472	
29,275	29,325	50	12	12	600	0	600					600
29,325	30,265	940	12	12	11,280	0	11,280				11,280	
30,265	30,300	35	12	7	333	0	333				333	
30,300	31,025	725	7	7	5,075	0	5,075					
31,025	31,175	150	7	7	1,050	0	1,050					1,050
31,175	31,400	225	7	7	1,575	0	1,575				1,575	
31,400	31,645	245	7	7	1,715	0	1,715					1,715
31,645	32,100	455	7	7	3,185	0	3,185				3,185	
32,100	32,300	200	7	7	1,400	0	1,400					1,400
32,300	34,750	2,450	7	7	17,150	0	17,150				17,150	
34,750	35,975	1,225	7	7	8,575	0	8,575			8,575		
35,975	36,025	50	7	7	350	0	350					350
36,025	36,078	53	7	7	371	0	371			371		
36,078	37,044	966	7	8	7,245	200	7,445			7,445		
37,044	38,282	1,238	8	7	9,285	0	9,285			9,285		
38,282	39,261	979	7	6	6,364	0	6,364			6,364		
39,261	39,750	489	6	6	2,934	0	2,934			2,934		
39,750	41,090	1,340	6	6	8,040	0	8,040				8,040	

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
41,090	41,110	20	6	6	120	0	120					120
41,110	41,755	645	6	6	3,870	0	3,870				3,870	
41,755	41,875	120	6	5.8	707	0	707				707	
41,875	41,925	50	5.8	5.7	287	0	287					287
41,925	42,280	355	5.7	5.2	1,938	0	1,938				1,938	
42,280	42,397	117	5.2	5	595	0	595					595
42,365	42,397	32	5.0	5	160	0	160				160	
42,397	42,779	382	5	5	1,910	0	1,910				1,910	
42,779	43,720	941	5	6	5,176	0	5,176				5,176	
43,720	43,902	182	6	7	1,183	0	1,183				1,183	
43,902	44,896	994	7	7	6,958	120	7,078				7,078	
44,896	46,250	1,354	7	7	9,478	0	9,478				9,478	
46,250	47,010	760	7	7	5,320	0	5,320					5,320
47,010	47,908	898	7	8	6,735	120	6,855					6,855
47,908	48,488	580	8	7	4,350	0	4,350					4,350
48,488	48,566	78	7	7	546	0	546					546
48,566	49,250	684	7	8.0	5,114	0	5,114					5,114
49,250	50,000	750	8.0	9	6,358	0	6,358			6,358		
50,000	50,064	64	9	16	800	0	800			800		
50,064	50,269	205	7	10	1,743	0	1,743			1,743		
50,269	50,380	111	10	7	944	0	944			944		
50,380	51,683	1,303	7	7	9,121	0	9,121			9,121		
51,683	51,780	97	16	16	1,552	0	1,552			1,552		
51,780	51,802	22	16	15	341	0	341			341		
51,802	52,250	448	15	12.1	6,077	0	6,077			6,077		
52,250	52,270	20	12.1	12	241	0	241					241
52,270	52,671	401	12	12	4,812	0	4,812					4,812
52,671	52,711	40	12	16	560	120	680					680
52,711	52,820	109	16	16	1,744	0	1,744					1,744
52,820	52,963	143	16	10	1,859	0	1,859					1,859
52,963	53,051	88	10	10	880	0	880					880
53,051	53,066	15	11	11	165	40	205					205
53,066	53,880	814	7	7	5,698	0	5,698					5,698

Chainage From	Chainage To	Length m	From Width m	To Width m	Area m²	Additional Area m²	Total Area m²	Resealing m²	Overlay 40 mm m²	Overlay 75 mm m²	Overlay 100 mm m²	Recon-struction m²
2. Carriageway												
50,064	51,683	1,619	7	7	11,333	0	11,333					
53,207	53,880	673	8	8	5,384	0	5,384					
					219,144	**600**	**219,744**	**0**	**0**	**61,908**	**91,622**	**44,422**

Unit Rate (US $)	1.25	6.00	9.91	14.08	37.43
Subtotal	**0**	**0**	**613,508**	**1,290,035**	**1,662,720**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Resealing or Overlay	16,450	6,978	2,427	0
Reconstruction	0	0	0	0
	16,450	**6,978**	**2,427**	**0**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**16,450**	**84,573**	**29,415**	**0**

Total Bill No. Pavement

Subsection: Marneuli - Bolnisi (Km 28+840 - Km 53+880) **US $** **3,696,702**

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
			From Width	To Width	Area	From Width	To Width	Area	Overlay 40 mm	Overlay 75 mm	Overlay 100 mm	Reconst.	Regravel-ling
From	To	m	m	m	m²	m	m	m²	m³	m³	m³	m³	m²
28,840	28,986	146	junction			2.0	2.0	292.0			15		
28,986	29,095	109	2.0	2.0	218.0	2.0	2.0	218.0			22		
29,095	29,275	180	2.0	2.0	360.0	2.0	2.0	360.0			36		
29,275	29,325	50	2.0	2.0	100.0	2.0	2.0	100.0				20	
29,325	30,265	940	2.0	2.0	1,880.0	2.0	2.0	1,880.0			188		
30,265	30,300	35	2.0	2.0	70.0	2.0	2.0	70.0			7		
30,300	31,025	725	2.0	2.0	1,450.0	2.0	2.0	1,450.0			145		
31,025	31,175	150	2.0	2.0	300.0	2.0	2.0	300.0				60	
31,175	31,400	225	2.0	2.0	450.0	2.0	2.0	450.0			45		
31,400	31,645	245	2.0	2.0	490.0	2.0	2.0	490.0				98	
31,645	32,100	455	2.0	2.0	910.0	2.0	2.0	910.0			91		
32,100	32,300	200	2.0	2.0	400.0	2.0	2.0	400.0				80	
32,300	33,041	741	2.0	2.0	1,482.0	2.0	2.0	1,482.0			148		
33,041	34,236	1,195	2.0	3.0	2,987.5	2.0	3.0	2,987.5			299		
34,236	34,750	514	3.0	3.0	1,542.0	3.0	3.0	1,542.0			154		
34,750	35,975	1,225	3.0	3.0	3,675.0	3.0	3.0	3,675.0		276			
35,975	36,025	50	3.0	3.0	150.0	3.0	3.0	150.0				30	
36,025	36,078	53	3.0	3.0	159.0	3.0	3.0	159.0		12			
36,078	37,044	966	3.0	2.0	2,415.0	3.0	2.0	2,415.0		181			
37,044	38,282	1,238	2.0	2.0	2,476.0	2.0	2.0	2,476.0		186			

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
38,282	39,261	979	2.0	2.5	2,202.8	2.0	2.5	2,202.8		165			
39,261	39,750	489	2.5	2.1	1,131.6	2.5	2.1	1,131.6		85			
39,750	39,919	169	2.1	2.0	346.5	2.1	2.0	346.5			35		
39,919	41,090	1,171	2.0	2.0	2,342.0	2.0	2.0	2,342.0			234		
41,090	41,110	20	2.0	2.0	40.0	2.0	2.0	40.0				8	
41,110	41,875	765	2.0	2.0	1,530.0	2.0	2.0	1,530.0			153		
41,875	41,925	50	2.0	2.0	100.0	2.0	2.0	100.0				20	
41,925	42,280	355	2.0	2.0	710.0	2.0	2.0	710.0			71		
42,280	42,365	85	2.0	2.0	170.0	2.0	2.0	170.0				34	
42,365	46,250	3,885	2.0	2.0	7,770.0	2.0	2.0	7,770.0			777		
46,250	47,010	760	2.0	2.0	1,520.0	2.0	2.0	1,520.0				304	
47,010	47,908	898	2.0	3.0	2,245.0	2.0	3.0	2,245.0				449	
47,908	48,566	658	3.0	3.0	1,974.0	3.0	3.0	1,974.0				395	
48,566	49,250	684	3.0	2.5	1,888.9	3.0	2.5	1,888.9				378	
49,250	50,000	750	2.5	2.0	1,687.5	2.5	2.0	1,687.5		127			
50,000	50,064	64	2.0	2.0	128.0	2.0	2.0	128.0		10			
50,064	51,683	1,619	2.0	2.0	3,238.0	2.0	2.0	3,238.0		243			
51,683	51,780	97	2.0	2.0	194.0	2.0	2.0	194.0		15			
51,780	52,250	470	2.0	2.0	940.0	2.0	0.6	601.9		58			
52,250	52,270	20	2.0	2.0	40.0	0.6	0.5	11.0				5	
52,270	52,671	401	fence			0.6	0.5	212.8				21	
52,671	52,711	40	2.0	2.0	80.0	0.5	2.0	50.0				13	
52,711	52,820	109	2.0	3.0	272.5	2.0	3.0	272.5				55	
52,820	53,066	246	3.0	3.0	738.0	3.0	2.0	615.0				135	
53,066	53,343	277	3.0	2.0	692.5	2.0	2.0	554.0				125	
53,343	53,880	537	2.0	2.0	1,074.0	2.0	1.6	966.6				204	
2.Carriageway													
53,207	53,880	673	2.0	2.5	1,514.3	2.0	2.0	1,346.0				286	
									0	**1,356**	**2,419**	**2,719**	**0**

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
			From Width	To Width	Area	From Width	To Width	Area	Overlay 40 mm	Overlay 75 mm	Overlay 100 mm	Reconst.	Regravel-ling
From	To	m	m	m	m²	m	m	m²	m³	m³	m³	m³	m²
Unit Rate US $									13.00	13.00	13.00	13.00	0.75
Subtotal									**0**	**17,626**	**31,452**	**35,353**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Fill of Embankment	m³	6.50	100	650
Subtotal				**650**

Total Bill No. Earthwork		
Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)	**US $**	**85,081**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
26	29+755	P	RC	14.0	750	●●			14.0				
27	30+000	P	RC	15.0	750								
28	31+174	P	RC	16.0	750	●●			16.0				
29	31+460	B	RC	14.5	2200x2000				14.5				
30	31+609	B	RC	13.0	4000x1500								
31	31+893	A	S	15.0	4000x1000	●●			15.0				
32	32+377	P	RC	13.0	1000	●			13.0				
33	32+576	B/P	RC	15.0	1000x1000 - 1000	●			15.0				
34	32+760	B/P	RC	15.0	1000x1000 - 1000	●●			15.0				
35	33+041	P	RC	13.0	1000	●●			13.0				
36	33+426	B/P	RC	13.0	1000x1000 - 1000	●●			13.0				
37	33+795	B/P	RC	12.0	600x600 - 500	●●			12.0				
38	33+976	B	RC	12.0	1000x1000	●●			12.0				
39	34+141	P/B	RC	12.0	450 - 500x500	●			12.0				
40	34+399	P	RC	12.0	750	●●			12.0				
41	34+842	P	RC	14.0	750								
42	36+078	B	RC	12.0	1500x1000	●			12.0				
43	36+306	B	RC	12.0	1000x1000	●●			12.0				
44	36+649	B	RC	12.0	1000x1000	●●			12.0				
45	37+044	B	RC	20.0	4000x3000								
46	37+264	P	RC	23.0	1500								
47	37+810	B	RC	13.0	1000x1000	●●			13.0				
48	38+000	B	RC	11.0	1000x500	●●			11.0				
49	38+284	B	RC	11.0	500x500								
50	38+798	P	RC	15.0	500								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
51	39+261	B	RC	12.0	700x700	●			12.0				
52	39+720	P	RC	50.0	500								
53	39+919	B	RC	11.0	700x700	●			11.0				
54	40+421	P	RC	18.0	900								
55	41+081	B	RC	11.0	1300x1000	●			11.0				
56	41+239	B	RC	11.0	1300x1000								
57	41+450	B	RC	32.0	1200x1000								
58	41+755	P	RC	11.0	750	●●			11.0				
59	42+017	B	RC	12.0	1000x1000	●			12.0				
60	42+128	B	RC	11.0	1500x1000	●			11.0				
61	42+323	B	RC	11.0	1000x1000	●●			11.0				
62	42+779	B	RC	12.0	3800x2000	●			12.0				
63	43+902	B	RC	12.0	1000x1000	●			12.0				
64	44+896	B/B	RC	13.0	1300x1000 - 1000x1000								
65	46+113	B/B	RC	13.0	500x1000 - 1000x1000	●			13.0				
66	47+470	P	RC	32.0	1000	●			32.0				
67	47+687	B	RC	50.0	1000x1000	●●			50.0				
68	47+908	P/B	RC	17.0	750 - 1000x1000								
69	48+488	P	RC	35.0	1000	●			35.0				
70	49+934	P/P	RC	64.0	700 -1000								
71	50+284	P	RC	75.0	1000	●●			75.0				
72	50+435	P	RC	37.0	750	●●			37.0				
73	51+359	B/P	RC	81.0	3000x2000 - 1000	●			81.0				
74	51+382	P	RC	100.0	1000 (2)								
75	52+220	B	RC	17.0	1000x1000	●			17.0				
76	52+671	P	RC	13.0	750	●●			13.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
77	52+838	B/A	RC/S	25.0	3000x3800 - 3000x2000								
78	53+440	B	RC	11.0	500x500	●●			11.0				
Total									**703.5**	**0.0**	**0.0**		

Unit price			1.92	10.00	231.00	
Subtotal			**1,351**	**0**	**0**	

Improvement of side drains				
Section length :	25,040 m	x (2 x 1.08 US $/m) =	54,086	US $

Total Bill No. Drainage		
Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)	**55,437**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Marneuli - Bolnisi (Km 28+840 - Km 53+880)

Section length: 25,040 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	50080	127,203
Broken line, ratio 1:3	m	1.0	25,040	25,040
Roadside marking post	no.	3.00	1002	3,005
Km - post	no.	10.71	25	268
Road signing	km	1000	25.04	25,040
crash barrier & safety improvements	km	2000	25.04	50,080
Total				**230,636**

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Bolnisi - Guguti / Armenian border (Km 53+880 - Km 99+127)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	1,092,172
2	Earthworks	178,917
3	Drainage	99,865
4	Bridges	414,922
5	Pavement Maintenance & Rehabilitation	9,811,265
6	Marking & Safety Works	416,757
	Total	**12,013,897**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **265,518** US $/km.

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Bolnisi - Guguti / Armenian border (Km 53+880 - Km 99+127)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
53,880	55,002	1,122	7	7	7,854	20	7,874					7,874
55,002	55,088	86	13	13	1,118	60	1,178					1,178
55,088	55,130	42	13	8	441	0	441					441
55,130	55,957	827	8	8	6,616	0	6,616					6,616
55,957	56,129	172	17	7	2,064	0	2,064					2,064
56,129	56,250	121	7	7	847	0	847					847
56,250	56,470	220	7	7	1,540	0	1,540				1,540	
56,470	59,200	2,730	7	7	19,110	0	19,110					19,110
59,200	60,250	1,050	7	7	7,350	0	7,350				7,350	
60,250	61,728	1,478	7	7	10,346	0	10,346					10,346
61,728	62,210	482	7	6	3,133	0	3,133					3,133
62,210	69,250	7,040	6	6	42,240	0	42,240					42,240
69,250	69,425	175	6	6	1,050	0	1,050			1,050		
69,425	69,575	150	6	6	900	0	900					900
69,575	70,160	585	6	6	3,510	0	3,510			3,510		
70,160	70,270	110	6	6	660	0	660					660
70,270	70,650	380	6	6	2,280	0	2,280			2,280		
70,650	75,463	4,813	6	6	28,878	0	28,878					28,878
75,463	75,854	391	6	5	2,151	180	2,331					2,331
75,854	78,455	2,601	5	5	13,005	0	13,005					13,005
78,455	78,655	200	5	8	1,300	0	1,300					1,300
78,655	78,985	330	8	5	2,145	0	2,145					2,145

78,985	79,606	621	5	5	3,105	0	3,105					3,105
79,606	80,680	1,074	5	5	5,370	150	5,520					5,520
80,680	83,774	3,094	5	5	15,470	0	15,470					15,470
83,774	84,240	466	5	5	2,330	80	2,410					2,410
84,240	92,586	8,346	5	5	41,730	0	41,730					41,730
92,586	93,629	1,043	5	5	5,215	60	5,275					5,275
93,629	95,802	2,173	5	5	10,865	0	10,865					10,865
95,802	95,853	51	5	7	306	0	306					306
95,853	96,698	845	7	7	5,915	0	5,915					5,915
96,698	96,991	293	7	12	2,784	0	2,784					2,784
96,991	97,323	332	12	9.5	3,569	0	3,569					3,569
97,323	98,175	852	9.5	9.5	8,094	60	8,154					8,154
98,175	98,360	185	9.5	8	1,619	0	1,619					1,619
98,360	99,127	767	8	8	6,136	0	6,136					6,136
2. Carriageway												
53,880	54,211	331	8	8	2,648	0	2,648					2,648
54,211	54,321	110	8	8	880	60	940					940
54,321	54,326	5	8	18	65	0	65					65
54,326	54,441	115	18	18	2,070	0	2,070					2,070
54,441	54,506	65	18	10	910	120	1,030					1,030
54,506	54,738	232	10	10	2,320	0	2,320					2,320
54,738	54,746	8	10	11	84	0	84					84
55,002	55,088	86	11	8	817	0	817					817
55,088	55,957	869	8	8	6,952	0	6,952					6,952
					287,791	**790**	**288,581**	**0**	**0**	**6,840**	**8,890**	**272,851**

Unit Rate (US $)	1.25	6.00	9.91	14.08	35.25
Subtotal	**0**	**0**	**67,784**	**125,171**	**9,617,989**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Reconstruction	0	0	0	0
Resealing or Overlay	3,650	647	10	10
	3,650	**647**	**10**	**10**
Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**3,650**	**7,842**	**121**	**199**

Total Bill No. Pavement		
Subsection: Bolnisi - Guguti (Km 53+880 - Km 99+127)	**US $**	**9,811,265**

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Bolnisi - Guguti /Armenian border (km 53+880 - km 99+127)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
53,880	54,780	900	2.0	2.0	1,800.0	1.6	1.0	1,170.0				297	
54,780	55,002	222	2.0	1.0	333.0	1.0	2.0	333.0				67	
55,002	55,088	86	1.0	2.0	129.0	2.0	2.0	172.0				30	
55,088	55,130	42	2.0	2.0	84.0	2.0	0.0	42.0				13	
55,130	55,957	827	2.0	2.0	1,654.0	0.0	2.0	827.0				248	
55,957	56,250	293	2.0	2.0	586.0	2.0	2.0	586.0				117	
56,250	56,470	220	2.0	2.0	440.0	2.0	2.0	440.0			44		
56,470	59,200	2,730	2.0	2.0	5,460.0	2.0	2.0	5,460.0				1,092	
59,200	60,250	1,050	2.0	2.0	2,100.0	2.0	2.0	2,100.0			210		
60,250	69,250	9,000	2.0	2.0	18,000.0	2.0	2.0	18,000.0				3,600	
69,250	69,425	175	2.0	2.0	350.0	2.0	2.0	350.0		26			
69,425	69,575	150	2.0	2.0	300.0	2.0	2.0	300.0				60	
69,575	70,160	585	2.0	2.0	1,170.0	2.0	2.0	1,170.0		88			
70,160	70,270	110	2.0	2.0	220.0	2.0	2.0	220.0				44	
70,270	70,650	380	2.0	2.0	760.0	2.0	2.0	760.0		57			
70,650	72,491	1,841	2.0	2.0	3,682.0	2.0	2.0	3,682.0				736	
72,491	73,653	1,162	2.0	1.0	1,743.0	2.0	1.0	1,743.0				349	
73,653	95,802	22,149	1.0	1.0	22,149.0	1.0	1.0	22,149.0				4,430	
95,802	95,853	51	1.0	2.0	76.5	1.0	2.0	76.5				15	
95,853	96,698	845	2.0	2.0	1,690.0	2.0	2.0	1,690.0				338	
96,698	96,991	293	2.0	1.5	512.8	2.0	1.5	512.8				103	

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
96,991	97,324	333	1.5	1.5	499.5	1.5	1.5	499.5				100	
97,324	98,175	851	1.5	2.0	1,489.3	1.5	2.0	1,489.3				298	
98,175	99,127	952	2.0	2.0	1,904.0	2.0	2.0	1,904.0				381	
2.Carriageway													
53,880	54,525	645	2.5	3.0	1,773.8	2.0	2.0	1,290.0				306	
54,525	55,002	477	3.0	2.0	1,192.5	2.0	2.0	954.0				215	
									0	**171**	**254**	**12,838**	**0**
Unit Rate US $									13.00	13.00	13.00	13.00	0.75
Subtotal									**0**	**2,223**	**3,302**	**166,892**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Fill of Embankment	m³	6.50	1,000	6,500
Subtotal				**6,500**

Total Bill No. Earthwork		
Subsection: Bolnisi - Guguti /Armenian border (km 53+880 - Km 99+127)	**US $**	**178,917**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

Subsection: Bolnisi - Guguti (km 53+880 - km 99+127)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
79	55+130	P/P	RC	152.0	750 (2) - 1000	●			152.0				
80	55+400	B	RC	32.0	1200x2200	●			32.0				
81	55+560	P	RC	20.0	750	●●			20.0				
82	55+725	P	RC	13.0	1000								
83	55+963	B/B	RC	25.0	5000x2000 - 2300x2400	●			25.0				
84	56+152	B	RC	22.0	2000x2000	●			22.0				
85	56+467	B/P	RC	20.0	1000x1000 - 750								
86	57+304	B	RC	25.0	3000x2500								
87	57+886	B	RC	13.0	1000x1000	●			13.0				
88	58+356	B	RC	24.0	800x800	●			24.0				
89	58+738	B	RC	19.0	1000x1000								
90	59+508	B	RC	24.0	800x800	●			24.0				
91	59+783	B	RC	23.0	1000x1000	●●			23.0				
92	60+095	B	RC	21.0	2000x4000								
93	61+728	B	RC	12.0	1000x1000								
94	62+098	P	RC	17.0	500	●			17.0				
95	62+418	B	RC	15.0	1000x1000	●			15.0				
96	62+738	P	RC	11.0	500	●			11.0				
97	62+859	B	RC	12.0	1000x1000	●			12.0				
98	63+030	P	RC	14.0	750	●●			14.0				
99	63+130	P	RC	12.0	750								
100	63+705	B	RC	10.0	1000x1000	●			10.0				
101	63+810	B	RC	10.0	3000x1000								
102	63+955	P	RC	16.0	1000	●			16.0				
103	64+225	B	RC	13.0	1000x1000	●			13.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
104	64+682	P	RC	12.0	1000								
105	64+944	P	RC	24.0	1000								
106	65+011	B	RC	12.0	1000x1000								
107	65+072	P	RC	12.0	1000								
108	65+307	P	RC	12.0	1000	●			12.0				
109	65+588	B	RC	12.0	1000x1000								
110	66+006	P	RC	12.0	750	●●			12.0				
111	66+252	B	RC	29.0	4000x4000								
112	66+362	B	RC	13.0	1000x1000								
113	66+940	B	RC	12.0	1000x1000								
114	67+122	B	RC	26.0	800x500	●			26.0				
115	67+579	P/B	RC	18.0	750 - 1000x2000								
116	68+029	B	RC	12.0	1000x1000	●			12.0				
117	69+100	P	RC	13.0	750	●			13.0				
118	69+533	P	RC	12.0	1000	●			12.0				
119	69+823	B	RC	47.0	3000x3000	●			47.0				
120	70+035	B	RC	15.0	1000x1000	●			15.0				
121	70+836	B	RC	70.0	2000x2000	●			70.0				
122	71+106	P	RC	15.0	1000								
123	71+347	B	RC	15.0	1000x1000	●			15.0				
124	71+452	P	RC	18.0	750	●			18.0				
125	71+846	B	RC	12.0	2000x1000								
126	71+877	B	RC	70.0	4000x4000								
127	71+916	B	RC	12.0	2000x1000	●			12.0				
128	72+382	P	RC	12.0	750	●			12.0				
129	72+848	B	RC	11.0	800x800	●			11.0				

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- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
130	73+286	P	RC	10.0	1000	●			10.0				
131	74+200	B	RC	10.0	1000x500	●			10.0				
132	74+598	P	RC	9.0	1000	●			9.0				
133	74+776	P	RC	15.0	1000	●			15.0				
134	75+215	P	RC	10.0	750	●			10.0				
135	75+586	P	RC	10.0	1000	●			10.0				
136	75+680	A	S	10.0	2000x3000	●			10.0				
137	76+735	P	RC	9.0	1000	●			9.0				
138	77+340	B	RC	12.0	1000x1000	●●			12.0				
139	77+659	P	RC	12.0	1000	●			12.0				
140	78+884	P	RC	9.0	750	●●			9.0				
141	79+516	P	RC	8.0	750	●●			8.0				
142	80+062	P	RC	30.0	750	●●			30.0				
143	80+333	P	RC	16.0	750	●			16.0				
144	80+976	B	RC	10.0	1000x1000	●●			10.0				
145	81+198	B	RC	11.0	2000x2000								
146	82+114	A	S	10.0	1000x1000								
147	82+257	B	RC	9.0	500x750								
148	82+782	A	S	8.0	1000x1000								
149	82+980	A	S	9.0	1000x1000								
150	83+175	P	RC	8.0	750								
151	83+880	B/A	RC/S	10.0	500x3400 - 1000x1000								
152	84+240	B	RC	8.5	500x1000								
153	84+443	B	RC	9.0	500x1000	●●			9.0				
154	85+494	B	RC	9.0	1000x1000								
155	86+054	B	RC	10.0	1000x1000	●●			10.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
156	86+518	P	RC	10.0	750	●●			10.0				
157	86+718	B	RC	10.0	1000x1000								
158	87+540	B/P	RC	10.0	1000x500 - 1000								
159	88+030	B/B	RC	14.0	1000x1500 - 1000x1000								
160	88+180	B	RC	10.0	750x2500	●			10.0				
161	88+826	B	RC	10.0	1300x1300	●●			10.0				
162	89+020	A	S	10.0	500x1000	●●			10.0				
163	89+500	P	RC	16.0	1500								
164	90+082	B	RC	7.0	3000x5000								
165	90+156	P	RC	7.0	1000								
166	90+292	B	RC	8.0	1000x1300	●			8.0				
167	90+468	B	RC	8.0	1000x1000	●			8.0				
168	90+951	P	RC	9.0	750								
169	91+620	B	RC	18.0	2500x3500								
170	91+836	P	RC	9.0	750	●●			9.0				
171	92+446	B	RC	12.0	2000x4000	●●			12.0				
172	92+593	P	RC	9.0	1000	●●			9.0				
173	92+772	P	RC	9.0	500	●●			9.0				
174	92+961	B/B	RC	9.0	1500x1500 - 1000x4000								
175	93+132	B	RC	11.0	500x1000								
176	94+188	B	RC	8.0	1000x1000	●●			8.0				
177	94+838	P	RC	9.0	1000	●●			9.0				
178	95+306	P	RC	20.0	1500	●●			20.0				
179	95+383	P	RC	16.0	750	●			16.0				
180	95+802	B	RC	14.0	2000x2000								
181	96+146	B/B	RC	14.0	2000x2000 - 1000x3000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

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TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
182	96+320	B/B	RC	13.0	2000x2000 - 2000x3000								
183	96+598	P	RC	22.0	1500								
184	96+728	B/B	RC	12.0	2000x2000 - 2000x4000								
185	97+105	P	RC	16.0	1500								
186	97+323	P	RC	15.0	1000	● ●			15.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 6, Tbilisi - Marneuli - Guguti (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
187	97+855	B/B	RC	14.0	2000x3000 - 2000x2000								
188	99+079	P	RC	18.0	1000	●●			18.0				
Total									**1,110.0**	**0.0**	**0.0**		
Unit price									1.92	10.00	231.00		
Subtotal									**2,131**	**0**	**0**		

Improvement of side drains				
Section length :	45,247 m	x (2 x 1.08 US $/m) =	97,734	US $

Total Bill No. Drainage		
Subsection: Bolnisi - Guguti (km 53+880 - km 99+127)	**99,865**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

S 6, Tbilisi - Marneuli - Bolnisi - Guguti - Armenian border
Subsection: Bolnisi - Guguti / Armenian border (Km 53+880 - Km 99+127)

Section length: 45,247 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	90494	229,855
Broken line, ratio 1:3	m	1.0	45,247	45,247
Roadside marking post	no.	3.00	1810	5,430
Km - post	no.	10.71	45	485
Road signing	km	1000	45.247	45,247
crash barrier & safety improvements	km	2000	45.247	90,494
Total				**416,757**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Quantity and Cost Estimate

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S 7, Marneuli - Sadakhlo - Armenian border

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	918,415
2	Earthworks	135,123
3	Drainage	74,957
4	Bridges	1,815,840
5	Pavement Maintenance & Rehabilitation	6,843,662
6	Marking & Safety Works	314,564
	Total	**10,102,561**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **295,812** US $/km.

S 7, Marneuli - Sadakhlo - Armenian border

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
0	57	57	21	21	1,197	0	1,197					1,197
57	480	423	11.5	8	4,124	0	4,124					4,124
480	970	490	8	9.1	4,180	300	4,480			4,480		
970	1,404	434	9.1	10	4,136	0	4,136					4,136
1,404	1,600	196	10	7	1,666	0	1,666					1,666
1,600	3,667	2,067	7	7	14,469	0	14,469					14,469
3,667	3,682	15	7	14	158	0	158					158
3,682	3,737	55	14	14	770	0	770					770
3,737	3,773	36	14	7	378	0	378					378
3,773	7,750	3,977	7	7	27,839	0	27,839					27,839
7,750	10,100	2,350	7	7	16,450	0	16,450		16,450			
10,100	10,300	200	7	6	1,300	0	1,300		1,300			
10,300	11,250	950	6	6	5,700	0	5,700		5,700			
11,250	13,000	1,750	6	6	10,500	0	10,500					10,500
13,000	14,000	1,000	6	6	6,000	110	6,110					6,110
14,000	15,480	1,480	6	6	8,880	400	9,280					9,280
15,480	20,004	4,524	6	6	27,144	0	27,144					27,144
20,004	21,000	996	6	6	5,976	200	6,176					6,176
21,000	21,917	917	6	6	5,502	0	5,502					5,502
21,917	23,000	1,083	6	6	6,498	150	6,648					6,648
23,000	28,920	5,920	6	6	35,520	0	35,520					35,520
28,920	29,200	280	6	6	1,680	0	1,680				1,680	
29,100	29,200	100	6	6	600	0	600					600
29,200	29,300	100	6	6	600	120	720					720
29,300	29,440	140	6	6	840	0	840				840	
29,440	30,185	745	6	6	4,470	0	4,470					4,470

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
30,185	30,215	30	6	6	180	0	180					180
30,215	30,350	135	6	6	810	0	810				810	
30,350	33,766	3,416	6	6	20,496	0	20,496					20,496
33,766	34,152	386	6	12	3,474	0	3,474					3,474
					221,537	**1,280**	**222,817**	**0**	**23,450**	**4,480**	**3,330**	**191,557**

Unit Rate (US $)	1.25	6.00	9.91	14.08	35.25
Subtotal	**0**	**140,700**	**44,395**	**46,886**	**6,752,381**

Spot Repair

Spot Repair in Areas with	Crack sealing	Pothole patching	Settlement patching	Rutting milling & patching
	m²	m²	m²	m²
Reconstruction	0	0	0	0
Resealing or Overlay	6,055	823	0	0
	6,055	**823**	**0**	**0**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**6,055**	**9,975**	**0**	**0**

Total Bill No. Pavement		
S 7, Marneuli - Sadakhlo - Armenian border	**US $**	**6,843,662**

S 7, Marneuli - Sadakhlo - Armenian border

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
0	57	57	2.0	2.5	128.3	2.3	2.5	136.8				27	
57	480	423	2.5	2.0	951.8	2.5	2.0	951.8				190	
480	970	490	2.0	2.3	1,045.0	2.0	2.3	1,045.0		78			
970	1,404	434	2.3	2.5	1,041.6	2.3	2.5	1,041.6				208	
1,404	1,600	196	2.3	2.0	418.0	2.3	2.0	418.0				84	
1,600	7,750	6,150	2.0	2.0	12,300.0	2.0	2.0	12,300.0				2,460	
7,750	10,300	2,550	2.0	2.0	5,100.0	2.0	2.0	5,100.0	204				
10,300	10,539	239	2.0	2.0	478.0	2.0	1.2	382.4	17				
10,539	11,000	461	2.0	2.0	922.0	1.2	1.2	553.2	30				
11,000	11,250	250	2.0	1.8	480.3	1.2	1.2	296.1	16				
11,250	12,584	1,334	1.8	1.0	1,867.6	1.2	1.0	1,467.4				334	
12,584	14,952	2,368	1.0	2.0	3,552.0	1.0	1.0	2,368.0				592	
14,952	15,296	344	2.0	2.0	688.0	1.0	1.0	344.0				103	
15,296	15,480	184	2.0	2.0	368.0	1.0	2.0	276.0				64	
15,480	16,227	747	2.0	2.0	1,494.0	2.0	2.0	1,494.0				299	
16,227	18,106	1,879	2.0	1.0	2,818.5	2.0	1.0	2,818.5				564	
18,106	25,147	7,041	1.0	1.0	7,041.0	1.0	1.0	7,041.0				1,408	
25,147	26,192	1,045	1.0	2.0	1,567.5	1.0	2.0	1,567.5				314	
26,192	28,920	2,728	2.0	2.0	5,456.0	2.0	2.0	5,456.0				1,091	
28,920	29,100	180	2.0	2.0	360.0	2.0	2.0	360.0			36		
29,100	29,300	200	2.0	2.0	400.0	2.0	2.0	400.0				80	
29,300	29,440	140	2.0	2.0	280.0	2.0	2.0	280.0			28		
29,440	30,215	775	2.0	2.0	1,550.0	2.0	2.0	1,550.0				310	
30,215	30,350	135	2.0	2.0	270.0	2.0	2.0	270.0			27		

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
30,350	32,090	1,740	2.0	2.0	3,480.0	2.0	2.0	3,480.0				696	
32,090	33,110	1,020	2.0	3.0	2,550.0	2.0	3.0	2,550.0				510	
33,110	34,140	1,030	3.0	3.0	3,090.0	3.0	3.0	3,090.0				618	
34,140	34,152	12	3.0	3.0	36.0	3.0	3.0	36.0				7	
									266	**78**	**91**	**9,958**	**0**
Unit Rate US $									13.00	13.00	13.00	13.00	0.75
Subtotal									**3,461**	**1,019**	**1,183**	**129,460**	**0**

Total Bill No. Earthwork

S 7,Marneuli - Sadakhlo / Armenian border (km 0+000 - km 34+152) **US $** **135,123**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	3+648	P	RC	11.0	750	●			11.0				
2	3+773	B	RC	11.0	600x600	●			11.0				
3	5+955	B	RC	12.0	6000x2500								
4	6+130	B	RC	11.0	1000x1000	●			11.0				
5	8+071	B	RC	9.0	3000x2000	●			9.0				
6	8+652	B	RC	10.0	1000x500	●			10.0				
7	10+300	P	M	38.0	1500 (2)								
8	10+521	P	RC	10.0	750	●			10.0				
9	10+583	P	RC	12.0	1200								
10	10+817	P	RC	14.0	700								
11	11+081	P	RC	10.0	750								
12	12+584	P	RC	12.0	1100								
13	12+767	P	RC	10.0	750	●			10.0				
14	13+680	P	M	12.0	250								
15	13+797	P	RC	11.0	750								
16	14+928	P	RC	12.0	750	●●			12.0				
17	15+739	P	RC	10.0	750								
18	15+912	P	RC	10.0	750								
19	16+227	B/P	RC	10.0	1000x1000 / 750	●			10.0				
20	16+666	P	RC	10.0	750	●			10.0				
21	16+952	P	RC	10.0	750	●			10.0				
22	17+122	P	RC	20.0	1200								
23	17+666	P	RC	10.0	750	●			10.0				
24	18+106	P	RC	14.0	750								
25	18+660	P	RC	11.0	750	●			11.0				
26	19+610	P	RC	12.0	750	●●			12.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
27	19+847	P	RC	12.0	750	●			12.0				
28	20+004	P	RC	16.0	750	●●			16.0				
29	20+357	P	RC	14.0	1200	●			14.0				
30	20+646	P	RC	10.0	750	●●			10.0				
31	20+773	P	RC	22.0	1000	●●			22.0				
32	21+226	P	RC	10.0	750								
33	21+227	P	RC	12.0	600								
34	21+624	P	RC	10.0	750	●			10.0				
35	21+917	P	RC	9.0	750								
36	22+004	P	RC	8.0	750								
37	22+494	P	RC	10.0	750								
38	22+621	P	RC	12.0	750	●			12.0				
39	22+928	P	RC	10.0	750	●			10.0				
40	23+212	P	RC	11.0	750	●			11.0				
41	23+473	B/P	RC	30.0	2800x1300 / 1500 (3)	●			30.0				
42	23+558	P	RC	10.0	750	●●			10.0				
43	23+743	P	RC	10.0	750	●●			10.0				
44	24+026	P	RC	9.0	750	●			9.0				
45	24+416	P	RC	9.0	750	●●			9.0				
46	24+664	B	RC	12.0	1000x1000								
47	24+985	P	RC	9.0	750	●			9.0				
48	25+238	P	RC	11.0	750	●●			11.0				
49	25+519	P	RC	13.0	750	●●			13.0				
50	25+694	P	RC	11.0	750	●●			11.0				
51	26+076	B	RC	13.0	1700x1500								
52	26+226	P	RC	11.0	500	●●			11.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
53	26+578	P	RC	13.0	750	●●			13.0				
54	26+852	P	RC	11.0	750								
55	27+104	P	RC	11.0	750	●			11.0				
56	27+234	P	RC	10.0	750	●			10.0				
57	27+472	P	RC	17.0	1000	●			17.0				
58	27+834	P	RC	10.0	750	●			10.0				
59	28+134	P	RC	10.0	750	●●			10.0				
60	28+566	P	RC	10.0	750	●			10.0				
61	28+757	P	RC	10.0	750								
62	29+388	P	RC	10.0	750	●●			10.0				
63	29+607	P	RC	10.0	750	●			10.0				
64	30+215	P	RC	14.0	750	●●			14.0				
65	30+426	P	RC	12.0	750	●			12.0				
66	30+897	P	RC	11.0	1000	●●			11.0				
67	31+165	P	RC	10.0	1000	●●			10.0				
68	31+228	P	RC	12.0	750	●●			12.0				
69	31+388	P	RC	12.0	750	●●			12.0				
70	31+623	P	RC	10.0	1000	●			10.0				
71	31+858	B	RC	120.0	4000x3000								
72	32+087	P	RC	12.0	750	●			12.0				
73	32+583	P	RC	19.0	750								
74	32+888	P	RC	22.0	750	●●			22.0				
75	33+307	P	RC	16.0	750								
76	33+538	P	RC	16.0	750	●●			16.0				
Total									**619.0**	**0.0**	**0.0**	**0.0**	

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 7, Marneuli - Sadakhlo (Armenian Border)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
Unit price									1.92	10.00	231.00		
Subtotal									**1,188**	**0**	**0**		

Improvement of side drains				
Section length :	34,152 m	x (2 x 1.08 US $/m) =	73,768	US $

Total Bill No. Drainage		
S 7, Marneuli - Sadakhlo	**74,957**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

S 7, Marneuli - Sadakhlo - Armenian border

Section length: 34,152 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	68304	173,492
Broken line, ratio 1:3	m	1.0	34,152	34,152
Roadside marking post	no.	3.00	1366	4,098
Km - post	no.	10.71	34	366
Road signing	km	1000	34.152	34,152
crash barrier & safety improvements	km	2000	34.152	68,304
Total				**314,564**

S 9, Tbilisi Bypass
Subsection: west (Km 0 + 000 - Km 34 + 800)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	1,581,861
2	Earthworks	1,821,125
3	Drainage	81,001
4	Bridges	3,145,054
5	Pavement Maintenance & Rehabilitation	10,450,900
6	Marking & Safety Works	320,533
	Total	**17,400,474**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **500,014** US $/km.

S 9, Tbilisi Bypass
Subsection: west (Km 0+000 - Km 34+800)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
0	184	184	9.0	8.2	1,582	330	1,912		1,912			
184	1,000	816	8.2	9.5	7,222	0	7,222		7,222			
1,000	1,242	242	9.5	12.7	2,686	0	2,686		2,686			
1,242	1,880	638	12.7	14.0	8,517	0	8,517		8,517			
1,880	2,000	120	14.0	14.5	1,710	0	1,710		1,710			
2,000	2,941	941	14.5	9.8	11,433	0	11,433					11,433
2,941	3,081	140	9.8	15.0	1,736	60	1,796					1,796
3,081	3,218	137	15.0	15.0	2,055	0	2,055					2,055
3,218	3,300	82	15.0	26.0	1,681	0	1,681					1,681
3,300	3,327	27	9.0	9.0	243	0	243					243
3,327	3,512	185	9.0	15.0	2,220	0	2,220					2,220
3,512	3,590	78	15.0	15.0	1,170	0	1,170					1,170
3,590	3,650	60	15.0	15.0	900	0	900					900
3,650	3,809	159	15.0	9.2	1,924	0	1,924					1,924
3,809	3,976	167	9.2	9.0	1,520	0	1,520					1,520
3,976	4,063	87	9.0	8.5	761	0	761					761
4,063	4,675	612	8.5	8.7	5,263	0	5,263					5,263
4,675	5,098	423	8.7	11.2	4,209	0	4,209					4,209
5,098	5,480	382	11.2	10.3	4,097	0	4,097					4,097
5,480	5,905	425	10.3	9.6	4,218	0	4,218					4,218
5,905	6,050	145	9.6	9.7	1,399	0	1,399					1,399
6,050	6,250	200	9.7	9.6	1,931	0	1,931					1,931
6,250	6,475	225	9.6	9.5	2,149	0	2,149		2,149			
6,475	6,525	50	9.5	9.5	475	0	475					475
6,525	6,919	394	9.5	9.5	3,746	0	3,746		3,746			
6,919	7,509	590	9.5	9.1	5,487	0	5,487					5,487
7,509	8,009	500	9.1	9.0	4,525	0	4,525					4,525
8,009	9,250	1241	9.0	8.8	11,071	0	11,071		11,071			

9,250	9,977	727	8.8	8.8	6,395	0	6,395					6,395
9,977	10,954	977	8.8	10.0	9,159	0	9,159					9,159
10,954	11,250	296	10.0	10.3	3,002	0	3,002					3,002
11,250	11,995	745	10.3	11.0	7,928	0	7,928				7,928	
11,995	13,000	1005	11.0	10.3	10,679	0	10,679				10,679	
13,000	13,338	338	10.3	10.0	3,423	0	3,423					3,423
13,338	13,952	614	10.0	8.0	5,526	0	5,526					5,526
13,952	15,812	1860	8.0	8.0	14,880	0	14,880					14,880
15,812	16,500	688	8.0	10.0	6,192	0	6,192					6,192
16,500	16,750	250	10.0	10.5	2,560	0	2,560					2,560
16,750	17,545	795	10.5	12.0	8,935	0	8,935				8,935	
17,545	19,510	1965	12.0	12.0	23,580	0	23,580				23,580	
19,510	20,812	1302	12.0	12.0	15,624	0	15,624					15,624
20,812	21,500	688	12.0	11.0	7,912	0	7,912					7,912
21,500	22,500	1000	11.0	10.0	10,500	0	10,500					10,500
22,500	23,726	1226	10.0	9.0	11,647	0	11,647					11,647
23,726	23,825	99	9.0	9.0	891	0	891					891
23,825	24,075	250	9.0	9.0	2,250	0	2,250				2,250	
24,075	24,125	50	9.0	9.0	450	0	450					450
24,125	25,085	960	9.0	9.0	8,640	0	8,640				8,640	
25,085	25,115	30	9.0	9.0	270	0	270					270
25,115	26,210	1095	9.0	9.0	9,855	0	9,855				9,855	
26,210	27,660	1450	9.0	9.0	13,050	0	13,050					13,050
27,660	27,750	90	9.0	9.0	810	0	810				810	
27,750	31,552	3802	9.0	9.0	34,218	0	34,218					34,218
31,552	32,500	948	9.0	10.0	9,006	0	9,006					9,006
32,500	33,250	750	10.0	10.8	7,795	0	7,795					7,795
33,250	33,455	205	10.8	11.0	2,233	0	2,233			2,233		
33,455	33,500	45	11.0	10.7	488	0	488			488		
33,500	33,700	200	10.7	9.4	2,011	0	2,011					2,011

33,700	33,915	215	9.4	8.0	1,871	0	1,871			1,871		
33,915	34,800	885	8.0	8.0	7,080	0	7,080			7,080		
2. Carriageway												
0	130	130	9.0	9.0	1,170	945	2,115		2,115			
130	480	350	9.0	9.0	3,150	0	3,150		3,150			
480	880	400	9.0	9.0	3,600	300	3,900		3,900			
3,300	3,327	27	9.0	9.0	243	0	243					243
3,327	3,512	185	9.0	12.0	1,943	0	1,943					1,943
3,512	3,590	78	12.0	12.0	936	0	936					936
					355,833	**1,635**	**357,468**	**0**	**48,179**	**11,672**	**72,678**	**224,939**

Unit Rate (US $)	1.25	6.00	9.91	14.08	39.62
Subtotal	**0**	**289,077**	**115,670**	**1,023,300**	**8,912,070**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Resealing or Overlay	9,216	468	7,912	0
Reconstruction	0	0	0	0
	9,216	**468**	**7,912**	**0**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**9,216**	**5,672**	**95,893**	**0**

Total Bill No. Pavement		
Subsection:Tbilisi bypass west (Km 0+000 - Km 34+800)	**US $**	**10,450,900**

S 9, Tbilisi Bypass
Subsection: bypass west (km 0+000 - km 34+800)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
			From Width	To Width	Area	From Width	To Width	Area	Overlay 40 mm	Overlay 75 mm	Overlay 100 mm	Reconst.	Regravel-ling
From	To	m	m	m	m²	m	m	m²	m³	m³	m³	m³	m²
0	184	184	4.0	3.0	644.0	2.0	3.0	460.0	22				
184	1,000	816	3.0	2.0	2,040.0	3.0	2.0	2,040.0	82				
1,000	1,880	880	2.0	2.0	1,760.0	2.0	2.0	1,760.0	70				
1,880	2,000	120	2.0	2.0	240.0	2.0	2.5	270.0	10				
2,000	2,390	390	2.0	2.0	780.0	2.5	2.5	975.0				176	
2,390	2,784	394	2.0	2.5	886.5	2.5	3.0	1,083.5				197	
2,784	2,894	110	2.5	3.0	302.5	3.0	3.0	330.0				63	
2,894	2,941	47	3.0	3.0	141.0	3.0	3.3	148.1				29	
2,941	3,037	96	3.0	3.0	288.0	3.3	3.0	302.4				59	
3,037	3,081	44	3.0	3.0	132.0	3.0	2.8	127.6				26	
3,081	3,200	119	3.0	2.3	312.4	2.8	2.8	333.2				65	
3,200	3,300	100	2.3	2.3	225.0	2.8	3.3	305.0				53	
3,300	3,327	27	2.3	2.3	60.8	3.3	3.3	89.1				15	
3,327	3,512	185	2.3	2.3	416.3	3.3	3.3	610.5				103	
3,512	3,590	78	2.3	2.5	185.3	3.3	5.0	323.7				51	
3,590	3,650	60	2.5	2.0	135.0	5.0	3.0	240.0				38	
3,650	3,809	159	2.0	1.0	238.5	3.0	4.3	580.4				82	
3,809	3,976	167	1.0	3.0	334.0	4.3	3.0	609.6				94	
3,976	4,063	87	3.0	5.0	348.0	3.0	3.9	300.2				65	
4,063	4,675	612	5.0	2.2	2,203.2	3.9	2.0	1,805.4				401	
4,675	5,098	423	2.2	1.3	740.3	2.0	1.3	698.0				144	
5,098	5,480	382	1.3	1.4	506.2	1.3	3.2	859.5				137	
5,480	5,905	425	1.4	2.0	711.9	3.2	2.2	1,147.5				186	
5,905	6,050	145	2.0	2.6	333.5	2.2	3.7	424.1				76	
6,050	6,250	200	2.6	3.1	571.2	3.7	3.6	730.6				130	
6,250	6,475	225	3.1	3.7	763.6	3.6	3.5	798.7	31				
6,475	6,525	50	3.7	3.8	187.9	3.5	3.5	174.4				36	
6,525	6,920	395	3.8	4.8	1,688.6	3.5	3.3	1,343.0	61				

6,920	7,509	589	4.8	3.5	2,444.4	3.3	3.5	2,002.6				445	
7,509	8,010	501	3.5	3.0	1,628.3	3.5	3.0	1,628.3				326	
8,010	9,250	1,240	3.0	3.3	3,876.3	3.0	3.1	3,798.2	153				
9,250	9,977	727	3.3	3.4	2,435.5	3.1	3.2	2,290.1				473	
9,977	10,954	977	3.4	5.0	4,103.4	3.2	6.0	4,494.2				860	
10,954	11,250	296	5.0	5.0	1,480.0	6.0	5.4	1,691.8				317	
11,250	11,995	745	5.0	5.0	3,725.0	5.4	4.0	3,501.5			361		
11,995	13,000	1,005	5.0	3.5	4,272.9	4.0	3.3	3,644.0			396		
13,000	13,338	338	3.5	3.0	1,098.5	3.3	3.0	1,064.7				216	
13,338	13,952	614	3.0	6.0	2,763.0	3.0	5.0	2,456.0				522	
13,952	15,812	1,860	6.0	6.0	11,160.0	5.0	4.0	8,370.0				1,953	
15,812	16,500	688	6.0	4.0	3,440.0	4.0	4.0	2,752.0				619	
16,500	16,750	250	4.0	3.5	940.2	4.0	3.5	940.2				188	
16,750	17,545	795	3.5	2.0	2,186.3	3.5	2.0	2,186.3			219		
17,545	17,912	367	2.0	3.0	917.5	2.0	3.0	917.5			92		
17,912	19,510	1,598	3.0	3.0	4,794.0	3.0	3.0	4,794.0			479		
19,510	22,500	2,990	3.0	3.0	8,970.0	3.0	3.0	8,970.0				1,794	
22,500	23,726	1,226	3.0	3.0	3,678.0	3.0	2.0	3,065.0				674	
23,726	23,825	99	3.0	3.0	297.0	2.0	2.1	203.7				50	
23,825	24,075	250	3.0	3.0	750.0	2.1	2.4	563.6			66		
24,075	24,125	50	3.0	3.0	150.0	2.4	2.5	121.8				27	
24,125	24,500	375	3.0	3.0	1,125.0	2.5	3.0	1,031.3			108		
24,500	25,085	585	3.0	2.4	1,580.0	3.0	2.4	1,580.0			158		
25,085	25,115	30	2.4	2.4	71.6	2.4	2.4	71.6				14	
25,115	25,500	385	2.4	2.0	847.0	2.4	2.0	847.0			85		
25,500	26,210	710	2.0	2.0	1,420.0	2.0	2.6	1,634.5			153		
26,210	26,675	465	2.0	2.0	930.0	2.6	3.0	1,302.0				223	
26,675	27,500	825	2.0	2.0	1,650.0	3.0	2.0	2,062.5				371	
27,500	27,660	160	2.0	2.0	320.0	2.0	2.1	329.3				65	
27,660	27,750	90	2.0	2.0	180.0	2.1	2.2	192.7			19		

27,750	28,648	898	2.0	2.0	1,796.0	2.2	3.0	2,334.8				413	
28,648	29,500	852	2.0	2.0	1,704.0	3.0	2.0	2,130.0				383	
29,500	30,500	1,000	2.0	2.0	2,000.0	2.0	2.0	2,000.0				400	
30,500	31,552	1,052	2.0	3.0	2,630.0	2.0	2.0	2,104.0				473	
31,552	32,500	948	3.0	2.0	2,370.0	2.0	2.0	1,896.0				427	
32,500	33,250	750	2.0	2.0	1,500.0	2.0	2.0	1,500.0				300	
33,250	33,455	205	2.0	2.0	410.0	2.0	2.0	410.0		31			
33,455	33,500	45	2.0	3.0	112.5	2.0	2.0	90.0		8			
33,500	33,700	200	2.0	3.0	500.0	2.0	2.0	400.0				90	
33,700	33,915	215	2.0	3.0	537.5	2.0	2.0	430.0		36			
33,915	34,800	885	3.0	3.0	2,655.0	2.0	2.0	1,770.0		166			
2. Carriageway													
0	130	130	2.5	2.5	325.0	2.5	2.5	325.0	13				
130	480	350	2.5	2.5	875.0	2.5	2.5	875.0	35				
480	880	400	2.5	2.5	1,000.0	2.5	2.5	1,000.0	40				
									518	**241**	**2,134**	**13,848**	**0**

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**6,729**	**3,127**	**27,748**	**180,020**	**0**

Required works of geotechnical reason

Description	Unit	Rate US $	Quantity	Amount US $
Cut of Embankment	m^3	1.28	125,000	160,000
Fill of Embankment	m^3	6.50	200,000	1,300,000
Sealing of Shoulder	m^2	1.25	2,800	3,500
Retaining wall (1.50 m height)	m	100.00	1,400	140,000
Subtotal				**1,603,500**

Total Bill No. Earthwork		
Subsection: Tbilisi bypass west (km 0+000 - km 34+800)	**US $**	**1,821,125**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 9, Tbilisi By-pass

Subsection: S 9, Tbilisi bypass west (km 0+000 - km 34+800)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	0+141	P	RC	18.0	1000			●			1.0		
2	0+452	P	RC	29.0	1000			●			1.0		
3	0+796	P	RC	25.0	1000	●		●	25.0		1.0		
4	1+236	P	RC	35.0	1000			●			1.0		
5	1+323	P	RC	30.0	1500	●		●	30.0		1.0		
6	1+607	P	RC	32.0	1500	●		●	32.0		1.0		
7	2+283	P	RC	16.0	1000	●●		●	16.0		1.0		
8	3+000	P	RC	16.0	1500	●●		●	16.0		1.0		
9	3+734	P	RC	19.0	1000	●		●	19.0		1.0		
10	4+245	P	RC	100.0	1500	●		●	100.0		1.0		
11	4+775	P	RC	54.0	1200	●		●	54.0		1.0		
12	5+130	B	RC	91.0	3000x2500	●			91.0				
13	5+499	P	RC	30.0	400	●		●	30.0		1.0		
14	5+700	P	RC	25.0	500	●●			25.0				
15	5+800	P	RC	50.0	1200	●●			50.0				
16	5+929	B	RC	88.5	4000x2500	●		●	88.5		2.0		
17	6+227	P	RC	20.0	1200	●		●	20.0		1.0		
18	6+740	P	RC	24.0	1000	●●			24.0				
19	7+200	B	RC	60.0	6000x4000	●			60.0				
20	7+863	B	RC	24.0	4000x2000	●		●	24.0		2.0		
21	8+073	P	RC	26.0	1000	●		●	26.0		1.0		
22	9+914	P	RC	40.0	1500	●		●	40.0		1.0		
23	10+172	P	RC	46.0	1500								
24	10+550	P	RC	28.0	1000								
25	11+146	P	RC	20.0	1500								
26	11+510	P	RC	25.0	1000								
27	12+000	P	RC	34.0	1500								
28	12+235	P	RC	25.0	1500								
29	12+576	P	RC	25.0	1500								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 9, Tbilisi By-pass

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
30	12+718	P	RC	33.0	1500								
31	13+338	B	RC	150.0	3000x3000								
32	14+492	B	RC	135.0	4000x2500								
33	14+600	P	RC	40.0	1000	●●			40.0				
34	15+762	P	RC	22.0	1000	●●			22.0				
35	16+092	P	RC	22.0	1000								
36	17+614	P	RC	60.0	1500								
37	19+400	P	RC	23.0	1000								
38	21+500	P	RC	23.0	1000	●●			23.0				
39	22+058	P	RC	17.0	1000	●			17.0				
40	23+898	P	RC	104.0	1500								
41	24+070	B	RC	35.0	3000x2000								
42	24+145	P	RC	85.0	1500								
43	25+285	P	RC	66.0	1500								
44	26+215	P	RC	70.0	1500								
45	27+806	P	RC	16.0	1000								
46	30+292	P	RC	20.0	1000								
47	30+765	B	RC	36.5	2000x2000								
48	31+380	P	RC	26.0	1000								
49	31+760	P	RC	60.0	1500								
50	31+872	P	RC	37.0	1000								
51	32+529	P	RC	22.0	1000								
52	33+400	P	RC	73.0	1500								
53	33+700	B	RC	105.0	(6000x3300) x 2								
Total									**872.5**	**0.0**	**18.0**	**0.0**	

Unit price	1.92	10.00	231.00	
Subtotal	**1,675**	**0**	**4,158**	

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 9, Tbilisi By-pass

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
Improvement of side drains													
Section length :			34,800 m		x (2 x 1.08 US $/m) =		75,168	US $					

Total Bill No. Drainage		
Subsection: S 9, Tbilisi bypass west (km 0+000 - km 34+800)	**81,001**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 9, Tbilisi Bypass
Subsection: west (Km 0+000 - Km 34+800)

Section length: 34,800 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	69600	176,784
Broken line, ratio 1:3	m	1.0	34,800	34,800
Roadside marking post	no.	3.00	1392	4,176
Km - post	no.	10.71	35	373
Road signing	km	1000	34.8	34,800
crash barrier & safety improvements	km	2000	34.8	69,600
Total				**320,533**

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Quantity and Cost Estimate

KOCKS
INGENIEURE

S 9, Tbilisi Bypass
Subsection: east (Km 34+800 - Km 49+008)

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	459,611
2	Earthworks	48,676
3	Drainage	31,064
4	Bridges	1,779,857
5	Pavement Maintenance & Rehabilitation	2,605,649
6	Marking & Safety Works	130,866
	Total	**5,055,723**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **355,836** US $/km.

S 9, Tbilisi Bypass
Subsection: east (Km 34+800 - Km 49+008)

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
34,800	35,000	200	8.0	8.0	1,600	0	1,600			1,600		
35,000	36,000	1000	8.0	9.0	8,500	0	8,500			8,500		
36,000	36,750	750	9.0	9.0	6,750	0	6,750			6,750		
36,750	38,750	2000	9.0	9.0	18,000	0	18,000		18,000			
38,750	40,000	1250	9.0	9.0	11,250	0	11,250					11,250
40,000	40,200	200	9.0	10.0	1,900	0	1,900					1,900
40,200	40,400	200	10.0	11.0	2,100	0	2,100					2,100
40,400	40,600	200	11.0	12.0	2,300	0	2,300					2,300
40,600	40,764	164	12.0	16.0	2,296	0	2,296					2,296
40,764	40,900	136	16.0	30.0	3,128	0	3,128					3,128
40,900	41,367	467	10.0	9.0	4,437	0	4,437					4,437
41,367	41,545	178	9.0	9.0	1,602	0	1,602					1,602
41,545	41,750	205	9.0	8.8	1,829	0	1,829					1,829
41,750	42,190	440	8.8	8.5	3,815	0	3,815			3,815		
42,190	42,210	20	8.5	8.5	170	0	170					170
42,210	42,840	630	8.5	8.5	5,360	0	5,360			5,360		
42,840	43,271	431	8.5	12.0	4,418	0	4,418			4,418		
43,271	43,848	577	12.0	12.0	6,924	0	6,924			6,924		
43,848	43,875	27	12.0	11.8	321	0	321			321		
43,875	43,925	50	11.8	11.5	583	0	583					583
43,925	44,275	350	11.5	10.2	3,798	0	3,798			3,798		
44,275	44,325	50	10.2	10.0	505	0	505					505
44,325	44,922	597	10.0	9.0	5,672	0	5,672			5,672		
44,922	45,540	618	9.0	11.0	6,180	0	6,180			6,180		
45,540	47,569	2029	11.0	11.0	22,319	0	22,319			22,319		

47,569	47,675	106	11.0	10.8	1,155	0	1,155			1,155		
47,675	47,725	50	10.8	10.7	537	0	537					537
47,725	48,350	625	10.7	10.0	6,480	0	6,480			6,480		
48,350	48,514	164	10.0	10.0	1,640	0	1,640			1,640		
48,514	48,774	260	10.0	6.0	2,080	0	2,080			2,080		
48,774	49,098	324	6.0	6.0	1,944	180	2,124			2,124		
2. Carriageway												
40,900	41,367	467	10.0	9.0	4,437	0	4,437					4,437
48,664	48,900	236	6.0	6.0	1,416	0	1,416					1,416
					145,444	**180**	**145,624**	**0**	**18,000**	**89,135**	**0**	**38,488**

Unit Rate (US $)	1.25	6.00	9.91	14.08	39.62
Subtotal	**0**	**108,000**	**883,330**	**0**	**1,524,912**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Resealing or Overlay	7,294	424	6,351	0
Reconstruction	0	0	0	0
	7,294	**424**	**6,351**	**0**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**7,294**	**5,139**	**76,974**	**0**

Total Bill No. Pavement		
Subsection: Tbilisi bypass east (Km 34+800 - Km 49+008)	**US $**	**2,605,649**

S 9, Tbilisi Bypass
Subsection: bypass east (km 34+800 - 49+008)

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
34,800	35,000	200	3.0	3.0	600.0	2.0	2.0	400.0		38			
35,000	36,000	1,000	3.0	3.0	3,000.0	2.0	3.0	2,500.0		206			
36,000	36,750	750	3.0	3.0	2,250.0	3.0	3.0	2,250.0		169			
36,750	38,750	2,000	3.0	3.0	6,000.0	3.0	3.0	6,000.0	240				
38,750	39,000	250	3.0	3.0	750.0	3.0	3.0	750.0				150	
39,000	40,000	1,000	3.0	3.0	3,000.0	3.0	2.0	2,500.0				550	
40,000	40,200	200	3.0	3.0	600.0	2.0	2.0	400.0				100	
40,200	40,400	200	3.0	4.0	700.0	2.0	2.0	400.0				110	
40,400	40,764	364	4.0	4.0	1,456.0	2.0	2.0	728.0				218	
40,764	40,900	136	4.0	3.0	476.0	2.0	4.0	408.0				88	
40,900	41,367	467	3.0	3.0	1,401.0	4.0	3.0	1,634.5				304	
41,367	41,545	178	3.0	2.0	445.0	3.0	3.0	534.0				98	
41,545	41,750	205	2.0	2.2	426.3	3.0	2.8	598.7				103	
41,750	42,190	440	2.2	2.5	1,034.4	2.8	2.5	1,165.6		83			
42,190	42,210	20	2.5	2.5	50.2	2.5	2.5	49.8				10	
42,210	42,840	630	2.5	3.0	1,732.5	2.5	2.0	1,417.5		118			
42,840	43,271	431	3.0	3.0	1,293.0	2.0	3.0	1,077.5		89			
43,271	43,848	577	3.0	3.0	1,731.0	3.0	2.0	1,442.5		119			
43,848	43,875	27	3.0	3.0	81.0	2.0	2.0	54.0		5			
43,875	43,925	50	3.0	3.0	150.0	2.0	2.0	100.0				25	
43,925	44,275	350	3.0	3.0	1,050.0	2.0	2.0	700.0		66			
44,275	44,325	50	3.0	3.0	150.0	2.0	2.0	100.0				25	
44,325	47,479	3,154	3.0	3.0	9,462.0	2.0	2.0	6,308.0		591			

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
47,479	47,675	196	3.0	2.7	559.9	2.0	2.0	392.0		36			
47,675	47,725	50	2.7	2.6	133.5	2.0	2.0	100.0				23	
47,725	48,260	535	2.6	2.0	1,230.5	2.0	2.0	1,070.0		86			
48,260	48,424	164	2.0	2.0	328.0	2.0	2.0	328.0		25			
48,424	48,684	260	2.0	1.0	390.0	2.0	2.0	520.0		34			
48,684	49,008	324	1.0	1.0	324.0	2.0	2.0	648.0		36			
									240	**1,700**	**0**	**1,804**	**0**

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**3,120**	**22,103**	**0**	**23,453**	**0**

Total Bill No. Earthwork

Subsection: Tbilisi bypass east (km 34+800 - km 49+008) **US $** **48,676**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia

- DRAINAGE STRUCTURES LIST -

Section: S 9, Tbilisi By-pass

Subsection: S 9, Tbilisi bypass east (km 34+800 - km 49+008)

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
54	34+876	P	RC	41.0	1000								
55	36+823	P	RC	20.0	500	●●			20.0				
56	37+894	P	RC	26.0	500	●●			26.0				
57	38+750	P	RC	33.0	1000	●●			33.0				
58	40+600	P	RC	20.0	1000								
59	41+870	P	RC	22.0	1000								
60	42+164	P	RC	32.0	1000	●			32.0				
61	42+519	P	RC	55.0	1500								
62	43+170	P	RC	23.0	500	●●			23.0				
63	43+810	P	RC	25.0	1000								
64	44+223	B	RC	56.0	5000x5000								
65	44+233	P	RC	68.0	1500								
66	44+402	P	RC	65.0	1500								
67	44+867	P	RC	37.0	1000	●●			37.0				
68	45+100	P	RC	23.0	500								
69	45+248	P	RC	31.0	2400								
70	45+670	P	RC	25.0	1000								
71	45+770	P	RC	18.0	750								
72	46+011	P	RC	24.0	1000								
73	46+540	P	RC	24.0	1000	●●			24.0				
74	47+529	P	RC	23.0	1000								
75	47+786	P	RC	48.0	1500								
76	48+146	P	RC	40.0	1000								
77	48+886	P	RC	24.0	1000								
Total									**195.0**	**0.0**	**0.0**	**0.0**	

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT

Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 9, Tbilisi By-pass

Unit price	1.92	10.00	231.00	
Subtotal	**374**	**0**	**0**	

Improvement of side drains				
Section length :	14,208 m	x (2 x 1.08 US $/m) =	30,689	US $

Total Bill No. Drainage		
Subsection: S 9, Tbilisi bypass east (km 34+800 - km 49+008)	**31,064**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 9, Tbilisi Bypass
Subsection: east (Km 34+800 - Km 49+008)

Section length: 14,208 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	28416	72,177
Broken line, ratio 1:3	m	1.0	14,208	14,208
Roadside marking post	no.	3.00	568	1,705
Km - post	no.	10.71	14	152
Road signing	km	1000	14.208	14,208
crash barrier & safety improvements	km	2000	14.208	28,416
Total				**130,866**

S 12, Samtredia - Ureki

Summary of Estimated Rehabilitation and Maintenance Costs

Bill No.	Description	Total US $
1	General Items (10 % of Bill Nos. 2 - 6)	1,617,064
2	Earthworks	246,382
3	Drainage	122,636
4	Bridges	1,820,339
5	Pavement Maintenance & Rehabilitation	13,460,618
6	Marking & Safety Works	520,663
	Total	**17,787,702**

Note: All costs at 1997 price level

The maintenance/rehabilitation costs per km: **314,671** US $/km.

S 12, Samtredia - Ureki

Chainage		Length	From Width	To Width	Area	Additional Area	Total Area	Resealing	Overlay			Recon-struction
									40 mm	75 mm	100 mm	
From	To	m	m	m	m²	m²	m²	m²	m²	m²	m²	m²
0	212	212	18	9	2,862	690	3,552					3,552
212	5,173	4,961	9	9	44,649	0	44,649					44,649
5,173	5,210	37	9	9	333	450	783					783
5,210	5,360	150	9	9	1,350	0	1,350			1,350		
5,360	6,175	815	9	9	7,335	0	7,335					7,335
6,175	6,550	375	9	9	3,375	0	3,375					3,375
6,550	7,050	500	9	9	4,500	0	4,500			4,500		
7,050	7,245	195	9	9	1,755	0	1,755					1,755
7,245	8,174	929	9	7	7,432	120	7,552					7,552
8,174	12,300	4,126	7	7	28,882	0	28,882					28,882
12,300	13,125	825	7	7	5,775	30	5,805					5,805
13,125	14,360	1,235	7	7	8,645	0	8,645					8,645
14,360	15,218	858	7	8	6,435	0	6,435					6,435
15,218	18,750	3,532	8	8	28,256	0	28,256					28,256
18,750	19,070	320	8	8	2,560	0	2,560				2,560	
19,070	20,135	1,065	8	8	8,520	0	8,520					8,520
20,135	21,297	1,162	8	7	8,715	0	8,715					8,715
21,297	25,250	3,953	7	7	27,671	0	27,671					27,671
25,250	26,070	820	7	7	5,740	0	5,740			5,740		
26,070	27,750	1,680	7	7	11,760	0	11,760					11,760
27,750	27,885	135	7	7	945	0	945			945		
27,885	28,682	797	7	8	5,978	0	5,978			5,978		
28,682	29,560	878	8	12	8,780	0	8,780			8,780		
29,560	30,750	1,190	12	12	14,280	0	14,280			14,280		
30,750	30,902	152	12	12	1,824	0	1,824					1,824

30,902	31,202	300	12	12	3,600	360	3,960					3,960
31,202	31,620	418	12	10	4,598	0	4,598					4,598
31,620	32,117	497	10	10	4,970	0	4,970			4,970		
32,117	32,131	14	10	7	119	0	119			119		
32,131	36,851	4,720	7	7	33,040	0	33,040					33,040
36,851	37,050	199	7	7	1,393	180	1,573					1,573
37,050	37,250	200	7	7	1,400	0	1,400			1,400		
37,250	37,875	625	7	7	4,375	0	4,375				4,375	
37,875	40,327	2,452	7	7	17,164	0	17,164				17,164	
40,327	40,925	598	7	7	4,186	30	4,216				4,216	
40,925	41,075	150	7	7	1,050	0	1,050					1,050
41,075	41,090	15	7	7	105	0	105				105	
41,090	43,250	2,160	7	7	15,120	0	15,120				15,120	
43,250	44,387	1,137	7	7	7,959	0	7,959			7,959		
44,387	45,128	741	7	7	5,187	30	5,217			5,217		
45,128	45,250	122	7	7	854	0	854			854		
45,250	48,250	3,000	7	7	21,000	0	21,000					21,000
48,250	48,470	220	7	7	1,540	0	1,540					1,540
48,470	49,068	598	7	7	4,186	30	4,216					4,216
49,068	51,070	2,002	7	7	14,014	0	14,014					14,014
51,070	51,245	175	7	7	1,225	0	1,225			1,225		
51,245	51,250	5	7	7	35	0	35			35		
51,250	51,565	315	7	8	2,363	0	2,363				2,363	
51,565	52,300	735	8	7	5,513	30	5,543				5,543	
52,300	53,960	1,660	7	7	11,620	85	11,705				11,705	
53,960	54,040	80	7	7	560	0	560					560
54,040	54,250	210	7	7	1,470	0	1,470				1,470	
54,250	56,528	2,278	7	7	15,946	0	15,946					15,946
					432,948	**2,035**	**434,983**	**0**	**0**	**63,352**	**64,620**	**307,011**

Unit Rate (US $)	1.25	6.00	9.91	14.08	37.43
Subtotal	**0**	**0**	**627,813**	**909,850**	**11,491,422**

Spot Repair

Spot Repair in Areas with	Crack sealing m²	Pothole patching m²	Settlement patching m²	Rutting milling & patching m²
Reconstruction	0	0	0	0
Resealing or Overlay	12,883	31,465	100	1,815
	12,883	**31,465**	**100**	**1,815**

Unit Rate (US $)	1.00	12.12	12.12	19.88
Subtotal	**12,883**	**381,356**	**1,212**	**36,082**

Total Bill No. Pavement		
S 12, Samtredia - Ureki	**US $**	**13,460,618**

S 12, Samtredia - Ureki

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
0	212	212	2.0	2.0	424.0	2.0	2.0	424.0				85	
212	5,210	4,998	2.0	2.0	9996.0	2.0	2.0	9996.0				1,999	
5,210	5,360	150	2.0	2.0	300.0	2.0	2.0	300.0		23			
5,360	6,550	1,190	2.0	2.0	2380.0	2.0	2.0	2380.0				476	
6,550	7,050	500	2.0	2.0	1000.0	2.0	2.0	1000.0		75			
7,050	18,750	11,700	2.0	2.0	23400.0	2.0	2.0	23400.0				4,680	
18,750	19,070	320	2.0	2.0	640.0	2.0	2.0	640.0			64		
19,070	25,250	6,180	2.0	2.0	12360.0	2.0	2.0	12360.0				2,472	
25,250	26,070	820	2.0	2.0	1640.0	2.0	2.0	1640.0		123			
26,070	27,750	1,680	2.0	2.0	3360.0	2.0	2.0	3360.0				672	
27,750	28,682	932	2.0	2.0	1864.0	2.0	2.0	1864.0		140			
28,682	29,560	878	2.0	2.0	1756.0	2.0	2.0	1756.0		132			
29,560	30,470	910	2.0	2.0	1820.0	2.0	2.0	1820.0		137			
30,470	30,750	280	2.0	2.3	605.4	2.0	2.0	560.0		44			
30,750	30,902	152	2.3	2.5	366.6	2.0	2.0	304.0				67	
30,902	31,202	300	2.5	2.5	750.0	2.0	4.0	900.0				165	
31,202	31,620	418	2.5	0.6	647.9	4.0	0.4	919.6				157	
31,620	32,117	497	0.6	2.0	646.1	0.4	0.4	198.8		32			
32,117	32,130	13	2.0	2.0	26.0	0.4	2.0	15.6		2			
32,130	37,050	4,920	2.0	2.0	9840.0	2.0	2.0	9840.0				1,968	

Chainage		Length	Shoulder Left			Shoulder Right			Shoulder Adjustment				Shoulder
From	To	m	From Width m	To Width m	Area m²	From Width m	To Width m	Area m²	Overlay 40 mm m³	Overlay 75 mm m³	Overlay 100 mm m³	Reconst. m³	Regravel-ling m²
37,050	37,250	200	2.0	2.0	400.0	2.0	2.0	400.0		30			
37,250	40,925	3,675	2.0	2.0	7350.0	2.0	2.0	7350.0			735		
40,925	41,075	150	2.0	2.0	300.0	2.0	2.0	300.0				60	
41,075	43,250	2,175	2.0	2.0	4350.0	2.0	2.0	4350.0			435		
43,250	45,250	2,000	2.0	2.0	4000.0	2.0	2.0	4000.0		300			
45,250	51,070	5,820	2.0	2.0	11640.0	2.0	2.0	11640.0				2,328	
51,070	51,250	180	2.0	2.0	360.0	2.0	2.0	360.0		27			
51,250	53,960	2,710	2.0	2.0	5420.0	2.0	2.0	5420.0			542		
53,960	54,040	80	2.0	2.0	160.0	2.0	2.0	160.0				32	
54,040	54,250	210	2.0	2.0	420.0	2.0	2.0	420.0			42		
54,250	56,528	2,278	2.0	2.0	4556.0	2.0	2.0	4556.0				911	
									0	**1,062**	**1,818**	**16,072**	**0**

Unit Rate US $	13.00	13.00	13.00	13.00	0.75
Subtotal	**0**	**13,812**	**23,634**	**208,936**	**0**

Total Bill No. Earthwork

S 12, Samtredia - Ureki (km 0+000 - km 56+528) **US $** **246,382**

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
1	0+212	P	RC	13.0	1000	●●			13.0				
2	0+374	P	RC	15.0	750	●●			15.0				
3	1+243	P	RC	14.0	750	●●			14.0				
4	5+595	B	RC	13.0	2500x1000								
5	5+783	P	RC	13.0	1000								
6	6+157	P	RC	14.0	1000								
7	7+955	P	RC	15.0	1000	●			15.0				
8	8+757	P	RC	11.0	1200	●			11.0				
9	8+893	P	RC	14.0	750	●●			14.0				
10	9+272	P	RC	33.0	750	●●			33.0				
11	11+125	P	RC	14.0	1000								
12	14+918	P	RC	10.0	1000	●			10.0				
13	15+422	P	RC	12.0	1000								
14	15+519	P	RC	12.0	750								
15	15+645	P	RC	12.0	750								
16	15+764	B	RC	12.0	1000x1000								
17	16+771	P	RC	11.0	1000	●	●		11.0	5.0			
18	17+130	P	RC	12.0	750		●			5.0			
19	17+170	P	RC	12.0	750								
20	17+285	P	RC	12.0	750								
21	17+425	P	RC	12.0	750								
22	18+077	P	RC	15.0	500								
23	18+263	P	RC	13.0	1000								
24	18+386	P	RC	14.0	1000	●●			14.0				
25	18+463	P	RC	14.0	1200								
26	18+763	P	RC	11.0	1000								
27	19+438	B	RC	12.0	1000x1000								
28	19+635	P	RC	13.0	1000								
29	19+946	B	RC	12.0	1000x1000								
30	20+135	P	RC	12.0	1000								
31	20+423	B	RC	13.0	1000x1000								

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
32	20+625	P	RC	12.0	750								
33	22+540	B	RC	11.0	1000x1000								
34	23+556	B	RC	9.0	1000x1000								
35	24+880	B	RC	9.0	3000x1000								
36	24+900	P	RC	9.0	1000								
37	25+820	B	RC	9.0	1000x1000								
38	25+911	B	RC	9.0	1000x1000								
39	26+072	P	RC	9.0	1000								
40	26+155	P	RC	13.0	1000								
41	26+907	B/P	RC	11.0	1000x1000 - 1500 (2)								
42	27+087	B	RC	13.0	1000x1000								
43	27+885	B/P	RC	9.0	2500x1000 - 1500 (3)								
44	27+897	P	RC	14.0	1000								
45	28+682	B	RC	9.0	3500x4500								
46	29+119	P	RC	12.0	1300								
47	29+265	B	RC	11.0	1000x1000								
48	29+417	P	RC	11.0	750	●			11.0				
49	29+930	P	RC	14.0	750								
50	32+366	B	RC	12.0	3000x1800								
51	32+374	P	RC	12.0	500								
52	32+443	P	RC	11.0	500								
53	34+274	P	RC	11.0	500	●			11.0				
54	34+815	B	RC	10.0	1000x500								
55	35+021	B	RC	10.0	2000x1500								
56	35+217	B	RC	10.0	2000x1500								
57	36+647	B	RC	13.0	3000x3000								
58	36+851	B	RC	13.0	3000x3000								
59	37+807	P	RC	12.0	1000								
60	38+302	P	RC	13.0	1000			✓					
61	38+328	B	RC	13.0	1000x2000								
62	39+115	P	RC	12.0	750	●			12.0				

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

TRACECA -Feasibility Study for Road Rehabilitation in Georgia
- DRAINAGE STRUCTURES LIST -
Section: S 12, Samtredia - Lanchkhuti - Ureki

No	Chainage	EXISTING STRUCTURE				EXISTING DAMAGE			MAINTENANCE ACTIVITY				REMARKS
		Type	Material	Length	Size/Dia	Silted/ Blocked	Scour	Structural Damage	Cleaning	Backfill of scoured areas	Repair	Reconst.	
	(km)			(m)	(mm)				(m)	(m^3)	(m^2)	(m)	
63	40+327	P	RC	10.0	750	●			10.0				
64	42+416	B	RC	9.0	3000x1800								
65	42+625	P	RC	12.0	750								
66	43+492	P	RC	13.0	750								
67	43+847	B	RC	11.0	1000x500								
68	44+727	B	RC	9.0	4000x2000								
69	45+005	B	RC	9.0	4000x2000								
70	45+927	P	RC	10.0	1500 (2)								
71	46+086	P	RC	13.0	750								
72	46+343	P	RC	13.0	750								
73	46+785	B	RC	65.0	2500x3000								
74	46+829	P	RC	10.0	750								
75	50+208	P	RC	11.0	500	●			11.0				
76	53+817	B	RC	12.5	4000x2000 (2)								
77	55+211	P	RC	10.0	1000	●			10.0				
78	55+668	P	RC	12.0	1000	●			12.0				
79	55+948	P	RC	12.0	1000								
80	56+322	P	RC	10.0	1000								
Total									**227.0**	**10.0**	**0.0**	**0.0**	

Unit price	1.92	10.00	231.00	
Subtotal	**436**	**100**	**0**	

Improvement of side drains				
Section length :	56,528 m	x (2 x 1.08 US $/m) =	122,100	US $

Total Bill No. Drainage		
S 12, Samtredia - Lanchkhuti - Ureki	**122,636**	**US $**

Structure: P= PIPE CULVERT B= BOX CULVERT S= SLAVINSKI CULVERT
Material: RC= REINFORCED CONCRETE M= METAL

S 12, Samtredia - Ureki

Section length: 56,528 m

Description	Unit	Rate US $	Quantity	Amount US $
Road marking				
Line passed through	m	2.54	113056	287,162
Broken line, ratio 1:3	m	1.0	56,528	56,528
Roadside marking post	no.	3.00	2261	6,783
Km - post	no.	10.71	57	605
Road signing	km	1000	56.528	56,528
crash barrier & safety improvements	km	2000	56.528	113,056
Total				**520,663**

Road Section: S-1 Tbilisi - Senaki - Khashuri

Subsection: Tbilisi - Junction S 3 (km 15+000 - km 26+940)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-1 Br.: 1	Railway bridge across road S-1			
S-1 Br.: 2	Railway bridge across road S-1			
S-1 Br.: 3	Bridge along the River Mtkvari [Sizeclass C]	2,321,240.00		
S-1 Br.: 4a	Bridge across River Mtkvari [Sizeclass C]	615,535.00		
S-1 Br.: 4b	Bridge across River Mtkvari [Sizeclass C]	495,502.50		
S-1 Br.: 5	Bridge across road [Sizeclass B]	321,000.00		
S-1 Br.: 6a	Bridge across road [Sizeclass C]	120,759.00		
S-1 Br.: 6b	Bridge across road [Sizeclass B]	155,461.00		
S-1 Br.: 7a	Bridge across River Tsitsamuris Hevi [Sizeclass C]	382,010.00		
S-1 Br.: 7b	Bridge across River Tsitsamuris Hevi [Sizeclass C]	322,640.00		
S-1 Br.: 8a	Bridge across River Aragvi [Sizeclass C]	445,137.00		

Total	5,179,284.50	0.00	0.00

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

KOCKS
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Road Section: S-1 Tbilisi - Senaki - Khashuri

Subsection: Junction S 3 - Gori Junction (km 26+940 - km 84+700)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-1 Br.: 8b	Bridge across River Aragvi [Sizeclass C]	531,645.00		
S-1 Br.: 9	Road bridge across the road S-1			
S-1 Br.: 10	Bridge across Road [Sizeclass B]	309,184.00		
S-1 Br.: 11	Bridge across dry river [Sizeclass B]	42,450.00		
S-1 Br.: 12	Bridge across River Khsani [Sizeclass C]	620,650.00		
S-1 Br.: 13	Bridge across River Lekhura [Sizeclass C]	348,924.00		
S-1 Br.: 14	Bridge across River [Sizeclass A]	15,500.00	152,662.50	
S-1 Br.: 15	Bridge across Road to Gori [Sizeclass B]	210,836.00		
S-1 Br.: 16	Bridge across River Tortla [Sizeclass B]	110,653.00		
S-1 Br.: 17	Road bridge across Road S-1			
S-1 Br.: 18	Bridge across River [Sizeclass C]	144,204.00		
S-1 Br.: 19	Bridge across Road Gori - Tskhinvali [Sizeclass C]	167,250.00		
Total		2,501,296.00	152,662.50	0.00

Road Section: S-1 Tbilisi - Senaki - Khashuri

Subsection: Gori Junction - Khashuri (km 84+700 - 126+670)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-1 Br.: 20	Bridge across River Lakhvi [Sizeclass C]	714,985.00		
S-1 Br.: 21	Bridge across Railway Gori - Tskhinvali [Sizeclass C]	214,605.00		
S-1 Br.: 22	Bridge across Railway and road [Sizeclass C]	365,560.00		
S-1 Br.: 23	Bridge across chanal [Sizeclass A]	15,150.00		
S-1 Br.: 24	Bridge across River Prone [Sizeclass C]	252,317.00		
S-1 Br.: 25	Bridge across River Ptsa [Sizeclass C]	258,560.00		
S-1 Br.: 26	Bridge across Railway Tbilisi - Samtredia [Sizeclass B]	21,500.00	642,500.00	
S-1 Br.: 27	Bridge across chanal [Sizeclass A]	12,000.00		
S-1 Br.: 28	Bridge across chanal [Sizeclass B]	59,470.00		
S-1 Br.: 29	Bridge across dry chanal [Sizeclass A]	7,530.00		
Total		1,921,677.00	642,500.00	0.00

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

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Road Section: S-4 Tbilisi - Red Bridge (Azerbaijan Border)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-4 Br.: 1	Bridge across River [Sizeclass A]	79,600.00		
S-4 Br.: 2	Bridge across chanal [Sizeclass B]	74,220.00		
S-4 Br.: 3	Bridge across Road S-4 (Tbilisi by-pass connection)			
S-4 Br.: 4	Bridge across dry river [Sizeclass A]	128,560.00		
S-4 Br.: 5	Bridge across dry river [Sizeclass A]	22,440.00		
S-4 Br.: 6	Bridge across river Algeti [Sizeclass C]	698,060.00		
S-4 Br.: 7	Red Bridge across River Khrami [Sizeclass C]			

Total	1,002,880.00	0.00	0.00

Road Section: S-6 Tbilisi-Marnauli-Guguti-Armenian Border

Subsection: Tbilisi - Marneuli (km 3+000 - km 28+840)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-6 Br.: 1	Bridge across Railway [Sizeclass C]	173,868.00		
S-6 Br.: 2	Bridge across River Algeti [Sizeclass B]	203,868.00		
Total		377,736.00	0.00	0.00

Road Section: S-6 Tbilisi-Marnauli-Guguti-Armenian Border

Subsection: Marneuli - Bolnisi (km 28+840 - km 53+880)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-6 Br.: 3	Bridge across Railway [Sizeclass C]	228,000.00		
S-6 Br.: 4	Bridge across irrigation chanal [Sizeclass A]	15,500.00	202,500.00	
S-6 Br.: 5	Bridge across River Ktsia [Sizeclass C]	661,292.00		
Total		904,792.00	202,500.00	0.00

Road Section: S-6 Tbilisi-Marnauli-Guguti-Armenian Border

Subsection: Bolnisi - Guguti/Armenian Border (km 53+880 - 99+127)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-6 Br.: 6	Bridge across Black River [Sizeclass B]	21,500.00	518,750.00	
S-6 Br.: 7	Bridge across valley (ravine) [Sizeclass A]	7,750.00		7,350.00
S-6 Br.: 8	Bridge across River Mashovera [Sizeclass B]	102,816.00		
S-6 Br.: 9	Bridge across valley (ravine) [Sizeclass A]	18,600.00	159,750.00	
S-6 Br.: 10	Bridge across River Saparlos Hevi [Sizeclass B]	43,000.00	381,250.00	
S-6 Br.: 11	Bridge across dry river [Sizeclass A]	17,050.00	166,500.00	
S-6 Br.: 12	Bridge across dry river [Sizeclass A]	17,050.00	171,000.00	
S-6 Br.: 13	Bridge across River Tera [Sizeclass A]	18,600.00	191,250.00	
S-6 Br.: 14	Bridge across dry river [Sizeclass A]	15,500.00	173,250.00	
S-6 Br.: 15	Bridge across River Tera [Sizeclass B]	67,056.00		
S-6 Br.: 16	Bridge across River Tera [Sizeclass B]	43,000.00	396,250.00	
S-6 Br.: 17	Bridge across River Tera [Sizeclass B]	43,000.00	387,500.00	
Total		414,922.00	2,545,500.00	7,350.00

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

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Road Section: S-7 Marnauli - Sadakhlo - Armenian Border

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-7 Br.: 1	Bridge across Road and Railway [Sizeclass C]	835,378.00		
S-7 Br.: 2	Bridge across River Khrami [Sizeclass C]	253,490.00		
S-7 Br.: 3	Railway bridge across S-7			
S-7 Br.: 4	Bridge across River [Sizeclass A]	22,890.00		
S-7 Br.: 5	Bridge across River Banosha [Sizeclass B]	704,082.00		
Total		1,815,840.00	0.00	0.00

Road Section: S-9 Tbilisi Bypass

Subsection: West (km 0+000 - km 34+800)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-9 Br.: 1	Pedestrain bridge across road S-9			
S-9 Br.: 2	Bridge across River Gldanis Hevi [Sizeclass C]	1,936,604.00		
S-9 Br.: 3	Bridge across River Lochini [Sizeclass C]	222,210.00		
S-9 Br.: 4	Bridge across Road to Norio [Sizeclass A]	97,950.00		
S-9 Br.: 5	Bridge across River Norios Hevi [Sizeclass C]	211,960.00		
S-9 Br.: 6	Road bridge across road S-9			
S-9 Br.: 7	Bridge across chanal [Sizeclass B]	109,926.00		
S-9 Br.: 8	Bridge across River Alis Hevi [Sizeclass C]	428,970.00		
S-9 Br.: 9	Bridge across Railway [Sizeclass C]	137,434.00		
Total		3,145,054.00	0.00	0.00

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

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Road Section: S-9 Tbilisi Bypass

Subsection: East (km 34+800 - km 49+008)

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-9 Br.: 10	Bridge across Road Tbilisi - Telavi [Sizeclass C]	313,512.00		
S-9 Br.: 11	Bridge across irrigation chanal [Sizeclass B]	73,984.00		
S-9 Br.: 12	Culvert [Sizeclass B]	215,580.00	350,000.00	
S-9 Br.: 13	Bridge across Railway Tbilisi - Telavi [Sizeclass C]	286,756.00		
S-9 Br.: 14	Road bridge across road S-9			
S-9 Br.: 15	Bridge across River Mtkvari [Sizeclass C]	115,999.00		
S-9 Br.: 16	Bridge across dry chanal [Sizeclass B]	52,456.00		
S-9 Br.: 17	Bridge across Road S-4 [Sizeclass C]	721,570.00		
Total		1,779,857.00	350,000.00	0.00

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-12 Br.: 1	Bridge across the Road S-12			
S-12 Br.: 2	Bridge across River Rioni [Sizeclass C]	386,670.00		
S-12 Br.: 3	Bridge across chanal [Sizeclass B]	65,206.00		
S-12 Br.: 4	Bridge across valley (ravine) [Sizeclass B]	80,240.00		
S-12 Br.: 5	Bridge across river [Sizeclass C]	169,100.00		
S-12 Br.: 6	Bridge across river [Sizeclass A]	20,200.00		
S-12 Br.: 7	Bridge across river [Sizeclass A]	19,800.00		
S-12 Br.: 8	Bridge across River Pechori [Sizeclass A]	11,060.00		49,000.00
S-12 Br.: 9	Bridge across river [Sizeclass A]	17,500.00		
S-12 Br.: 10	Bridge across river [Sizeclass A]	23,500.00		
S-12 Br.: 11	Bridge across river [Sizeclass A]	20,500.00		
S-12 Br.: 12	Bridge across river (behind Cholobargi) [Sizeclass A]	14,500.00		
S-12 Br.: 13	Bridge across river [Sizeclass A]	11,500.00		
S-12 Br.: 14	Bridge across river [Sizeclass A]	11,600.00		
S-12 Br.: 15	Bridge across river [Sizeclass A]	129,450.00		
S-12 Br.: 16	Bridge across river [Sizeclass A]	14,500.00		
S-12 Br.: 17	Bridge across river [Sizeclass A]	15,700.00		

Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-12 Br.: 18	Bridge across river [Sizeclass A]	18,800.00		
S-12 Br.: 19	Bridge across river [Sizeclass A]	11,500.00		
S-12 Br.: 20	Bridge across river [Sizeclass A]	9,575.00		
S-12 Br.: 21	Bridge across river [Sizeclass A]	19,900.00		
S-12 Br.: 22	Bridge across river [Sizeclass A]	14,250.00		
S-12 Br.: 23	Bridge across river [Sizeclass A]	11,920.00		
S-12 Br.: 24	Bridge across river [Sizeclass A]	18,500.00		
S-12 Br.: 25	Bridge across river [Sizeclass B]	86,510.00		
S-12 Br.: 26	Bridge across chanal [Sizeclass A]	6,760.00		
S-12 Br.: 27	Bridge across river [Sizeclass B]	45,664.00		
S-12 Br.: 28	Bridge across river [Sizeclass A]	33,800.00		
S-12 Br.: 29	Bridge across river [Sizeclass A]	12,700.00		
S-12 Br.: 30	Bridge across river [Sizeclass A]	15,000.00		
S-12 Br.: 31	Bridge across river [Sizeclass B]	50,953.00		
S-12 Br.: 32	Bridge across river [Sizeclass B]	48,108.00		
S-12 Br.: 33	Bridge across river [Sizeclass A]	13,530.00	135,000.00	
S-12 Br.: 34	Bridge across river [Sizeclass A]	44,120.00		

TRACECA - Feasibility Study for Road Rehabilitation in Georgia
Cost Estimate for Bridge Rehabilitation Works

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Road Section: S-12 Samtredia - Lanchkhuti - Ureki

Road-No. Bridge-No.	Bridge Name [Sizeclass]	Costs for the Rehabilitation	New bridge	New culvert
		$	$	$
S-12 Br.: 35	Bridge across river [Sizeclass B]	44,523.00		
S-12 Br.: 36	Bridge across river [Sizeclass A]	12,200.00		
S-12 Br.: 37	Bridge across river [Sizeclass A]	22,100.00		
S-12 Br.: 38	Bridge across river [Sizeclass B]	53,540.00		
S-12 Br.: 39	Bridge across river [Sizeclass A]	21,980.00		
S-12 Br.: 40	Bridge across river [Sizeclass A]	9,575.00		
S-12 Br.: 41	Bridge across river [Sizeclass A]	12,465.00	135,000.00	
S-12 Br.: 42	Bridge across river [Sizeclass A]	8,120.00		32,200.00
S-12 Br.: 43	Bridge across river [Sizeclass A]	12,070.00		
S-12 Br.: 44	Bridge across River Supsa [Sizeclass B]	73,230.00	1,375,000.00	
S-12 Br.: 45	Bridge across river [Sizeclass B]	77,920.00		
Total		1,820,339.00	1,645,000.00	81,200.00