
# Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan

# Project Progress Report

JULY 2001

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**CONSORTIUM composed of**

**KOCKS CONSULT GMBH**
**Germany**

**BCEOM**
**France**

**FINNROAD LTD.**
**Finland**

**represented by KOCKS CONSULT GMBH**

**REPORT COVER PAGES**

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| Project Title | : | Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan |
| Project Number | : | SCR-E/110579/C/SV/WW |
| Country | : | Armenia, Azerbaijan and Georgia |

| | Local Operator | EC Consultant |
|---|---|---|
| Name : | **Road Department of Armenia** | KOCKS CONSULT GMBH<br>Consulting Engineers |
| Address : | 21 Koriun St.<br>Yerevan 375009<br>ARMENIA | Stegemannstraße 32 - 38<br>56068 Koblenz<br>GERMANY |
| Tel. number : | (+37 42) 582712 or 583106 | (+49 261) 1302-0 (operat.)<br>(+49 261) 1302-143 (direct) |
| Fax number : | (+37 42) 151830 | (+49 261) 1302 - 152 |
| Telex number : | | 862807 |
| E-mail : | ahpiu@netsys.am | transport.ko@kocks-ing.de |
| Contact person : | Hakob Petrosyan,<br>Head of Planning Department | Werner P. Weiler,<br>Project Manager |
| Signatures | | |

| | | |
|---|---|---|
| Name | : | State Concern **AZERAVTOYOL** |
| Address | : | 72 A, Hadjihekov Street<br>370010 Baku<br>AZERBAIJAN |
| Tel. number | : | (+994 12) 933556 |
| Fax number | : | (+994 12) 930045 |
| Telex number | : | 142272 YOL |
| E-mail | : | |
| Contact person | : | Nizami Garaisayev, Vice President |
| Signatures | : | |

KOCKS CONSULT GMBH
Consulting Engineers

| | Local Operator | EC Consultant |
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| | | | |
|---|---|---|---|
| Name | : | **State Department of Roads** | KOCKS CONSULT GMBH<br>Consulting Engineers |
| Address | : | 29a Gagarin Street<br>380060 Tbilisi<br>GEORGIA | |
| Tel. number | : | (+995 32) 370666 | |
| Fax number | : | (+995 32) 931177 or 942618 | |
| Telex number | : | 212189 | |
| E-mail | : | | |
| Contact person | : | Tamaz Shaishmelashvili, Vice Chairman | |
| Signatures | : | | |

Date of report : 30. June 2001

Reporting period : March 2001 until June 2001

Author of report: Werner P. Weiler / Carsten Griese (Kocks Consult GmbH)

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|---|---|---|---|
| EC M & E Team | | | |
| | (name) | (signature) | (date) |
| EC Delegation | | | |
| | (name) | (signature) | (date) |
| TACIS Bureau<br>(Task Manager) | | | |
| | (name) | (signature) | (date) |

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## 1. PROJECT SYNOPSIS

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|---|---|---|
| Project Title | : | Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan |
| Project Number | : | SCR-E/110579/C/SV/WW |
| Country | : | Armenia, Azerbaijan and Georgia |

Overall objective[s]: Improvement of the road link between Baku, Tbilisi and Yerevan

Project objective[s]: The objective of the project in **Azerbaijan** is to prepare detailed designs with bills of quantities and cost estimates, economic appraisal, environmental impact assessment and preparation of tender documents for the Ujar to Georgian border road section.

In **Armenia** and **Georgia** the objective of the project is to prepare a feasibility study and tender documents for the rehabilitation and reconstruction of deteriorated sections of the road Tbilisi – Yerevan, Tbilisi – Red Bridge, Tbilisi – Marneuli and Tbilisi by-pass, in order to prepare loans by International Financial Institutions.

Planned outputs :

- topographical maps and information on terrain
- assessment of existing road and structure condition
- traffic forecast
- geotechnical evaluation
- environmental impact assessment
- definitions of technical solutions for improvements and rehabilitation
- preliminary cost estimates
- economic appraisal
- detailed engineering designs
- quantity and cost estimates
- pre-qualification and tender documents
- procurement services

Project activities :

- arrangement of logistics (accommodation, office, transport)
- commencement meetings with the recipient institutes
- preparation of contract for co-operation
- study of existing reports and analysing of available materials
- road and bridge condition surveys
- traffic surveys, data analysis and traffic forecast
- topographical surveys, data evaluation and mapping
- geotechnical and material investigations, incl. laboratory testing
- preparation of feasibility studies describing the technical as well as economic requirements and recommendation for the rehabilitation and reconstruction of the project roads
- preparation of detailed engineering designs and tender documents
- presentation of designs, pre-qualification and tender documents
- assistance with tendering
- reporting

Project starting date: 13. December 2000

Project duration: 12 months

# 2. SUMMARY OF THE PROJECT SINCE THE START

## 2.1 Commencement of services

The contract for the 'Feasibility Study for Rehabilitation and the Reconstruction of the Road Link between Baku, Tbilisi and Yerevan' was signed on 13th December 2000. Following the signing of the contract, a consortium agreement and a working programme was agreed between the consortium members.

The first activities included the arrangement of the logistics (accommodation, office, transportation, apparatus and instrumentation) of the project. Project offices, within the premises of our local associates, were assigned to the team. Simultaneously, personnel arrangements were made for both the foreign and the local teams, to commence concurrently in the three project countries. Communication links between the project offices, the project coordinator, and the respective Consultant's head offices were established (address, telephone, fax, e-mail).

Commencement meetings with the beneficiaries have been conducted by the Consultant. The general purpose of the meetings were consultation, facilitation, coordination and management of the project. The major particular purpose was to obtain the requirements of the Recipient Institutions, so that the needs of the Beneficiaries could be considered by adapting the work plan, taking into account the activities of other projects, and the requirements of prospective International Financing Institutions (IfI's).

## 2.2 Activities and project progress since the beginning

The major achievements of the project are:

**Armenia**

**Traffic surveys and forecasts** were carried out mainly during February and March. The Consultant noticed that there exists quite a remarkable record of previous & up to date traffic counting results. The Road Authorities are implementing certain traffic counting on monthly basis on 4th and 19th day of every month. There are also records of traffic accidents that have come to the knowledge of the police.

**Desk studies** for field surveys were carried out during February and March. **Several field reconnaissance visits** have been made starting from January. Specialist and experts have made field reconnaissance visits after commenced their services in the Project.

**Topographic surveys** were commenced in January.

**Road pavement studies** such as roughness, surface distress and deflection were mainly carried out during February – March. Pavement structure investigations such as trial pitting, coring and laboratory testing were mainly carried out during February – March.

The **Dynamic Cone Penetration Testing (DCPT**) was decided not to carry out, because the existing alignment will be kept. For measurements of the existing pavement strength FWD testing is adequate. This has been discussed and agreed by the Project Management Meeting with Armenian Roads.

**Roughness survey** was carried out for the whole length of the road sections involved the Project by using Roadman device in February.

**Deflection survey** was commenced during March. The survey was carried out only in those sections that are included in the Project and have not been rehabilitated under the WB Loan No. 1. Also the sections Km 127+650 – 135+160 and 136+960 – 152+900 of the Ashtarak – Vanadzor – Stepananvan – Tashir road that already have been designed were not included, anyhow the designs of this section have been revised and updated.

**Geotechnical** and **construction material** surveys and studies were commenced during February.

The Project and the Consultant have also maintained close co-operation with World Bank's new Task Manager. The Country Team Leader, during his visits Tbilisi has also visited and introduced Project activities in Traceca and Tacis offices in Tbilisi.

Project Management Meetings (6 times) have been arranged regularly on monthly basis. The partner organisation Armenian Roads Department SSCC and other actors involved in this Project are very much committed to the Project.

## Azerbaijan

The **traffic survey** programme consisted of manual and automatic traffic counts, and origin – destination surveys by roadside interviews. All surveys have been conducted in February and March 2001. **Traffic predictions** have been made and predicted AADT figures were given for the period 2001 – 2030, by type of vehicle. The traffic study report has been submitted to Azeravtoyol for review and comments.

The **surface distress** survey were carried out in March by visual inspection and the distress data were recorded. Evaluation of the distress data were completed in April.

The programme for the **geotechnical fieldwork** was determined and the activities started accordingly with excavation of trial pits, core drillings and execution of dynamic penetration tests. The geotechnical field works were completed end of June. **Laboratory testing** of soils and material samples are ongoing and will be completed end of July.

Quarries and borrow pits as **construction material** source were investigated and samples have been taken and tested. Random bitumen samples from the manufacturer were tested.

**Topographical surveys** were commenced in January and for about 200 km of the project road traverse points along the road corridor were established and the detailed survey for the full 4-lane width were carried out. The measurement and data evaluation of the remaining road section will be completed in August.

**Falling Weight Deflectometer (FWD) measurements** were carried out and the calculation of the residual lifetime and the necessary strengthening of the pavement has been completed.

Available data concerning the existing bridges have been studied and a comprehensive **bridge inspection** were carried out. The assessment of the condition of the existing structures were completed in April.

**Hydrological and drainage studies** have commenced with the calculation of catchment areas and required run-off capacity. Existing culverts were inspected and records were taken for geometrical data, material of culverts, general structural and hydrological condition.

The **environmental investigation** were carried out with the objective to determine the potential impact of the project. Project related key concerns with regards to impacts of the natural environment, human health and safety were identified. A concept of mandatory and additional measures for impact avoidance and mitigation has been developed.

**Preliminary designs** for the rehabilitation of the existing carriageway under consideration of an eventual expansion to four lane have been prepared. Quantities were calculated and **cost estimates** have been prepared to the suitable for preliminary design.

**Detailed design** and **bidding document** has been prepared for the Ganja – Shemkir / Delilier road section according to the World Bank Standard Bidding Document for Smaller Works. (1995). The draft bidding documents have been submitted to Azeravtoyol and World Bank for review.

## Georgia

**Traffic surveys and forecasts** were carried out mainly in February and March. The traffic counts were done on 4 selected stations of the study roads.

**Road pavement condition surveys** were commenced in March and completed in June.

**Bridge condition surveys** were completed in April, a comprehensive inventory of works to be done and their classification has been prepared.

Special attention was given to the **Algeti bridge.** The Algeti bridge is located on the road between Tbilisi and the Red Bridge over the river Algeti. This bridge does not correspond to actual load norms and is too narrow. The approach has a steep section of about 10 %. It should be reconstructed.

Saksakhgzaproekti prepared a preliminary study with ideal alignment, that includes about 1 200 m of a new road, a bridge of 139 m length, constructed on the terrain – the river should be than deviated on a length of some 450 m with very large earthworks of more than 500.000 m3.

The Consultant analysed the situation and proposes another variant with the construction of a new bridges close to the actual, that would be about the half of the proposed variant and a total deviation of some 600 m, including correction of two curves. This variant avoids the deviation of the river bed and the volume of the earthworks will be about 10 % of the volume of the preliminary conception of Saksakhgzaproekti.

**Topographic works** were initiated in March, and will be fully completed at the beginning of July.

**Geotechnical surveys** with drilling each km and deep drilling in land slide zones were commenced in March and completed in June. The evaluation of field data in the office and **testing of soil samples** in the geotechnical laboratory are ongoing.

The consultant made the research of **material resources**.

The **environmental assessment study** commenced in May and a draft version of the Environmental report has been completed at the end of June.

All field measurements and investigations are completed to 90 % till end of June. All field works data are actually in stage of evaluation - introduced in computer programs and in design stage. Evaluations of field data are proceeding in laboratory and in office.

## 3. SUMMARY OF THE PROJECT PLANNING FOR THE REMAINDER OF THE PROJECT

Field works and data collection will be completed for the study roads in Armenia, Azerbaijan and Georgia respectively. For the feasibility studies the engineering/technical solutions for rehabilitation and upgrading will be studied and determined and their economic feasibility will be evaluated.

Draft economic evaluation reports for both Azerbaijan and Armenia are due to be completed in early July. The economic evaluation in Georgia will be carried out in late July and August, once all necessary survey data is available.

Detailed engineering design and tender documents for rehabilitation and improvement of the study road section will be completed and submitted.

Procurement services will be provided for pre-qualification and tendering.

After finalising of the engineering designs and tender documents the project completion report will be prepared, which is planned for end of 2001.

## 4. PROJECT PROGRESS IN REPORTING PERIOD

The project progress is overall proceeding according to the work programme presented in the Inception Report. However, some postponements occurred because of unexpected incidents.

The project activities in Georgia were overshadowed by an attack on the Country Team Leader Yves Atlan. He was injured and robbed on his way home. He spend two days in a hospital in Tbilisi before he repatriated to France for medical cares.

In Azerbaijan the World Bank requested tender documents of the Ganja to Shemkir road section by end of April, which was contingent of the availability of IDA financing for the Ganja to Gazakh road. Substantial re-arrangements of the work programme and time schedule have been made, and this section was given overall priority.

The project achievements so far are largely up to the planned results, but the completion of the feasibility reports are slightly delated.

### 4.1 Activities during reporting period March to June 2001

At the time of reporting project work is proceeding well and smoothly. All activities were carried out with the local experts of the respective recipient states as on-the-job training.

**Field works and data collection** for the project roads continued and were completed respectively including:

Armenia
- Collection and evaluation of road surface distress data
- Traffic survey and forecast
- Topographic survey and mapping
- FWD survey and evaluation

- Roughness measurements
- Pavement structure investigation
- Construction material investigation
- Hydrological and drainage survey
- Bridge inspection and assessment
- Environmental assessment

Azerbaijan
- Collection and evaluation of road surface distress data
- Traffic survey and forecast
- Topographic survey and mapping
- FWD survey and evaluation
- Roughness measurements
- Pavement structure investigation
- Construction material investigation
- Hydrological and drainage survey
- Bridge inspection and assessment
- Environmental assessment

Georgia
- Collection and evaluation of road surface distress data
- Traffic survey and forecast
- Topographic survey and mapping
- Pavement structure investigation
- Construction material investigation
- Drainage survey
- Bridge inspection and assessment
- Environmental assessment

The **surface distress survey** was carried out by visual inspection and measurement during spring 2001. The HDM III Manager method was applied. The field team measured the distress data for every one km section in the field, and recorded the data for the following:

- cracks <= 3 mm in m
- cracks > 3 mm in m
- alligator cracks in m²
- potholes in m²
- patched area in m²
- settlements/deformations in m²
- ravelling in m²
- bleeding in m²
- rutting in m² incl. rut depth average and rut depth deviation

Existing **traffic data** was analysed to deduce additional data required for the study and to design a corresponding survey programme in order to obtain the future average daily flow, which must be accommodated in all involved sections. **Traffic counts** were then executed in February and March 2001 over a short period as a basis for obtaining average daily volumes by vehicle type (two days manual counts in 10 locations). As flows can have weekly variations, seven days automatic directional counts were also carried out. Furthermore, to take account of seasonal variations and obtain a reliable estimate of Annual Average Daily Traffic (AADT) for “Normal” traffic, seasonal adjustment factors were applied.

Forecast increases to this basic data were then carried out, based on projections of the economic activity and taking into account the chosen design period, as well as the effects of diverted and generated traffic from other road and routes.

Possible traffic diversion from parallel roads on the Baku-Tbilisi-Yerevan project required additional investigations. For this purpose, origin-destination surveys were carried out. Estimates of traffic diversion from railways were obtained from the forecasting model prepared within the "Traffic Forecasting and Feasibility Studies project".

**Traffic forecasts** were carried out taken account of the responsiveness of traffic to a change in transport costs following road rehabilitation. The road network data and transport costs used within the Traffic Forecasting and Feasibility Studies project have been used for this purpose.

The investigation of the condition of the existing **bridges** was carried out by a comprehensive and detailed inspection of the structures. Further to the bridge condition survey, the repair and/or rehabilitation and new construction measures has been defined and the costs for the proposed measures were estimated.

**Topographic surveys** were commenced and the existing road centreline, cross sections of the existing carriageway are measured. The survey also included topographical details like existing roads, tracks, drainage structures, buildings etc.

Investigations of **pavement thickness**, sampling and testing of various layers and the consequent evaluation of test results were executed to provide the necessary basic input data for technical and economic analysis and design.

In addition local **material sources** for road construction materials, as aggregates and bitumen have been located, sampled and quality and availability for the utilisation in the project works investigated.

The **Environmental Impact Assessments** have been carried out to evaluate the potential impacts of rehabilitation/reconstruction of the different roads and of the associated mitigation measures. The assessments were conducted in compliance with the local legislation and in accordance with the World Bank's requirements.

**Environmental impacts** relating to the rehabilitation of the existing road will the direct physical intrusion on the land within the immediate construction corridor, to health and safety conditions within the works-related human settlements, construction camps and work sites and finally to the extraction, the handling and transport of construction materials.

The analysis of the environmental impacts focused on the following:

- Identification of project-related key concerns with regard to
  - impacts on the natural environment
  - human health
  - human safety
- Compilation of key environmental, health and safety regulations that will be relevant to the proposed project
- Development of a concept of mandatory and additional measures for impact avoidance and impact mitigation
- Identification of additional measures for environmental enhancement

The environmental study are completed for the study roads in Azerbaijan and Georgia, while the study in Armenia will be finalised in July.

Work on the **economic evaluation** tasks of the project commenced in early April. Background data relating to economic evaluation has been collected as well as relevant project documentation, particularly in respect of vehicle operating costs.

The economist Mr Worthington arrived in Baku on 25 April 2001, with the initial task of reviewing the overall approach and programme for the economic evaluation activities. It was decided that he would have overall responsibility for the coordination of the economic evaluation work and for the training aspects. In view of the unfortunate delays in Georgia, it was decided that Mr Arlidge would be responsible for the economic evaluation in Armenia. His specialist knowledge and involvement in the development of HDM 4, which is already being used in Armenia, was also a strong point in favour of this decision. Mr Worthington would be responsible for the economic evaluation in Azerbaijan and as a result of the deferred start to the work in Georgia, it was decided that he would also be responsible for the economic evaluation work in Georgia.

Mr Worthington attended a coordination meeting in Tbilisi During this time he was able to visit the full length of the project sections in Azerbaijan and also the road section Tbilisi-Red Bridge. Meetings were also held with representatives of Saksakhgzaproekti, including the Director, Mr Taliashvili, concerning the data needs for the HDM analysis.

In Armenia initial meetings with Mr Samvel Badalyan, Director of Dorproject Institute, and Mr Hakob Petrosyan, Head of the Planning Department at Armenian Roads SSCC were held to discuss the extent of economic evaluation already carried out on the project sections and the availability of necessary input data. It was agreed that the Consultants would carry out the analysis using HDM III, consistent with the Terms of Reference and in order to achieve overall consistency with economic evaluation carried out in Azerbaijan and Georgia, whereas Mr Petrosyan would carry out the evaluation using HDM 4 and taking account of the Consultants recommendations as appropriate. This would enable a comparison to be made of the output results from the two models.

The Consultants economic evaluation team also met with Mr Robert Nooter from the World Bank Mission on 8 June in Yerevan to discuss issues relating to economic evaluation. Finance was available from the World Bank for the project sections and the detailed design of these sections was needed for the loan to be implemented.

**Project Implementation Unit in Azerbaijan**

The World Bank's *Azerbaijan Highway Project* aims to provide financing for a first road section from Ganja to the Georgian border road from IDA financial sources. One precondition set by the World Bank is an operational Project Implementation Unit (PIU) prior to the approval of the IDA credit scheduled in June 2001. This condition shall be facilitated in a first phase by the provision of services, training and supplies from the present project, until financing for the PIU becomes available for the further phases under the IDA credit.

In the present reporting period the organisation and structure of the PIU has been set-up with clearly defined lines of responsibilities. Administrative support for the PIU has been provided in the form of office renovation and re-furbishment, salaries and payroll cost, office equipment, supplies and running costs, training, and transport.

**Seminars**

The relevant expatriate staff members and local experts have commenced and carried out the training concerning engineering and designs, cost estimates and specifications as on the job training during the relevant survey and design activities.

Before the beginning of traffic counts, extensive training was prepared by the traffic expert. A survey manual was prepared and handed over to the enumerators. The training of the enumerators attached importance to the realisation of survey operation and filling the forms.

A seminar on the use of the HDM model was held in Armenia for the staff of Dorproject on Tuesday 12 June.

The seminar comprised a presentation of general concepts of economic evaluation and a comparison of the differences between economic and financial evaluation. Demonstration of the inputs, outputs and operation of the HDM model was presented using a Russian version of HDM Manager. Supporting training information was made available to the participants at the seminar.

## 4.2. Utilisation of the study personnel

The Consultant's personnel during the reporting period comprised the professional team and assistants in the field and in the office. The study teams are closely instructed and monitored, and controlled by the Country Team Leaders and individual experts of the Consultant.

The Consultant's personnel during the reporting period included:

| Name | Assignment | Country |
|---|---|---|
| Werner P. Weiler | Project Manager | Study countries |
| Paul-Marie Ringwald | BCEOM Project Manager | Home office support |
| Matti Manonnen | Finnroad Project Manager | Home office support |
| Carsten Griese | Project Coordinator<br>Country Team Leader | Study countries<br>Azerbaijan |
| John Worthington | Transport Economist | Study countries |
| Hans Ulrich Zimmermann | Geotechnical and Material Engineer | Azerbaijan |
| Franz Dieter Klasen | Bridge Engineer | Azerbaijan |
| Jose Caceras | Economist | Azerbaijan |
| Erja Vallila | Environmentalist | Armenia, Azerbaijan |
| Pentti Ruohonen | Country Team Leader<br>Geotechnical and Materials Engineer | Armenia<br>Georgia |
| Heikki Rautakorpi, | Bridge Engineer | Armenia |
| Chris Mills | Traffic Engineer | Armenia |
| Mats Reihe | Pavement Specialist | Armenia |
| Peter Arlidge | Transport Economist | Armenia |
| Kalevi Kyllonen | Pavement Specialist | Armenia, Georgia |
| Yves Atlan | Country Team Leader | Georgia |
| Tonis Tagger | Bridge Engineer | Georgia |
| Eric Lancelot | Traffic Engineer | Georgia |
| Thomas Gros | Environmentalist, Temporary BCEOM representative | Georgia |
| Marian Kurlanda | Highway Engineer, Acting Country Team Leader | Georgia |

The actual working-days are mentioned in the table 'Resource Utilisation Report' of this report.

The following local experts have worked with the Project:

**Armenia**
Mr. Sevak Afrikyan, Engineer - Road Roughness
Ms. Lucia Avagyan, Computer Expert
Mr. Aram Avetisyan, Survey Group Leader
Mr. Benik Avetisyan, Design Engineers Group Leader
Mr. Samvel Badalyan, Director of Dorproject and Deputy Country Team Leader
Mr. Yuri Badalyan, Project Chief Engineer
Mr. Sergej Chillingaryan, CREDO Software Designer
Ms. Sveta Davtyan, Design Engineer
Mr. Miasnik Ghazaryan, Design Engineer
Ms. Bela Ghoukasyan, Economist – Cost Estimation
Mr. Valerij Hairapetyan, Design Engineer
Mr. Henzel Hakobyan, Surveyor
Ms. Klara Hakobyan, Design Engineer - Artificial constructions
Mr. Stepan Hakobyan, Design Engineer
Mr. Davit Hovsepyan, Expert in Road Roughness-Roadman, Hardness-FWD, HDM
Mr. Ashot Karapetyan, Design Engineer
Mr. Pavel Makinyan, Geologist Engineer
Mr. Hrant Martirosyan, Surveyor
Mr. Rudik Martirosyan, Surveyor
Mr. Vigen Matnishyan, Bridge and Structure Engineer
Mr. Robert Melkonyan, Design Engineer
Mr. Armen Mouradyan, Computer Designer
Ms. Siranush Muradyan, Environmentalist – flora and fauna Specialist
Ms. Natela Petrosyan, Traffic and Accident Expert
Mr. Avag Matevasyan, Core Drilling Team Leader
Mr. Anania Safaryan, Engineer – Economist

**Azerbaijan**
Mr. Hajiali Tahmazov, Director SRC
Mr. Hijan Valehov, Senior Highway Engineer and Local Team Leader
Mr. Sabir Safarov, Senior Bridge Engineer
Mr. Nizami Gasimov, Bridge Engineer
Mr. Ruslan Mamedov, Surveyor
Mr. Mohubbat Yusifov, Surveyor
Mr. Adalad Amirov, Surveyor Assistant
Mr. Tofig Kazimov, Surveyor Assistant
Mr. Kasai Najafov, Surveyor Assistant
Mr. Azer Gasimov, Surveyor Assistant
Mr. Isa Baharchinov, Senior Geotechnical and Material Engineer
Mr. Safar Pashayev, Geotechnical and Material Engineer
Mr. Musa Baharchinov, Geotechnical Engineer
Mr. Tengiz Orugov, Geotechnical Engineer
Mr. Yusif Yusifov, Laboratory Engineer
Mr. Majnun Valiyev, Laboratory Engineer
Mr. Gunduz Mehtiyev, Highway Engineer (Road Condition Survey)
Mr. Malik Nurullayev, Traffic Engineer
Mr. Sadig Mutallimov, Highway and Traffic Engineer
Mr. Aliaga Dibirov, Drainage Engineer

Mr. Zahid Nazarov, CAD Engineer
Mr. Rufad Guliyev, CAD Engineer
Ms. Zenab Zakiyeva, Quantity Surveyor
Mr. Elchin Sultanov, Environmental Expert

**Georgia**
Mr. Tali Taliashvili, Director Saksakhzaproekti Ltd (Design Institute)
Mr. Nodar Nozadze, Surveyor
Mr. Demari Chichinadze, Traffic Engineer
Mr. Vladimir Jikia; Senior Highway Engineer
Mr. Revaz Chikovani; Senior Bridge Engineer
Mr. Shota Utmelidze; Senior Surveyor
Mr. Tengiz Butkhuzi, Senior Surveyor
Mr. Irakli Tsertsvadze, Material Engineer.
Mr. Ramaz Nebieridze, Geotechnical Engineer
Mr. Boris Ivasenko, Bridge Engineer
Mr. Jemal Kartozia; Bridge Engineer
Mr. Dodo Goderdzishvili, CAD Bridge Engineer
Mr. Dima Loginov, CAD Bridge Engineer
Ms. Tamara Samkharadze; CAD Bridge Engineer
Mr. Robinzon Bochorishvili Highway Engineer
Mr. Abeli Chachua, Highway Engineer
Mr. Besik Andrazashvili, Highway Engineer
Ms. Natela Kvartskhava, CAD Highway Engineer
Ms. Viktoria Bojadze, CAD Highway Engineer
Ms. Manana Tabatadze, CAD Highway Engineer
Mr. Besik Geliashvili, Surveyor
Mr. David Goglidze, Surveyor
Mr. Nugzar Getsadze, Surveyor
Mr. Demuri Chichinadze Surveyor
Mr. Nodar Sakhvadze, Surveyor
Mr. Levan Khukhunaishvili, Surveyor
Mr. Vaja Salakaia, Surveyor
Mr. Roin Siradze, Drilling Foreman
Mr. Leri Papuashvili, Drilling Foreman
Mr. Otari Hugashvili, Drilling Foreman
Mr. Roin Kavelashvili, Laboratory Engineer
Mr. Juri Kherkeulidze; Drainage Engineer

### 4.3 Equipment utilised

The equipment listed was utilised for the study during the reporting phase of the project:

**Topographical survey equipment**
3 nos. Total Stations, Leica/Wild T 1000 and Nikon
Fielddata storage, wireless communication, Notebooks
El. Zeiss Teodolite
Zeiss Level

**Traffic survey equipment**
Automatic Traffic Counters (ATC), Numetric Hi-star 97

**Roughness measurement equipment**

TRL Bump Integrator
Merlin Calibration Frame, according TRL
Microwave Trip Meter, Datron M 2 and LCD terminal DAVID
Roadman, Road Surface Monitoring System

**Pavement strength survey equipment**
Falling Weight Deflectometer (FWD), Phonix MLY 1000
Benkelman Beam

**Geotechnical field equipment**
TRL Dynamic Cone Penetrometer
Dynamic Cone Penetrometer, version DPL-5 according German standard DIN 4094
Static and dynamic cone penetrometer on GAZ chassis
Core drilling equipment
Drilling machine 1 BC on GAZ chassis
Drilling machine URB 2a/2d on Kamaz chassis
Sampling equipment

**Bridge survey and assessment equipment**
Concrete strength test apparatus
Reinforcement bar thickness tester
Reinforcement cover thickness tester
Deflection measurement dial gauges

**Geotechnical laboratory equipment**
Laboratory equipment comprises among others:
CBR compressing test machine according ASTM
Proctor test apparatus
Field ballon-density device (Haas)
Sieve set complete with base pan and top (0,063-63,0) mm
Speedy moisture tester
Automatic cassagrande apparatus
Complete testing equipment to FSU standard

**Office equipment**
Computers, Printers, Copiers, Fax machines

## 4.4 PROJECT PROGRESS REPORT

| Project title: Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country: : Armenia, Azerbaijan and Georgia | Form 2.2, Page: |
|---|---|---|---|
| Planning period: 01/2001 – 06/2001 | Prepared on: 29. June 2001 | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |
| Project objectives: Produce bankable feasibility study and tender documents for certain sections between Yerevan – Georgian border | | | |

| **Armenia** | | TIME FRAME 2001 (for the project period January 2001 to June 2001) Months | | | | | | INPUTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | PERSONNEL EC Consultant | | PERSONNEL Counterpart | | EQUIPMENT AND MATERIAL | | OTHER | |
| No | ACTIVITIES IMPLEMENTED | 1 | 2 | 3 | 4 | 5 | 6 | Planned | Utilised | Planned | Utilised | Planned | Utilised | Planned | Utilised |
| | **Project Management** | X X X X | X X X X | X X X X | X X X X | X X X X | X X X X | | | | | | | | |
| **A.** | **Feasibility Study Stage** | | | | | | | | | | | | | | |
| **1.** | **Data collection / Review of previous studies** | X X X X | X X X X | X X | | | | 3 weeks | 4 weeks | 4 weeks | 4 weeks | -- | -- | 1 flight | 1 flight |
| **2.** | **Topographical survey / Pavement cross section survey** | XXXX | X X X X | X X X X | X X X | X X X | X X X X | 2 weeks | 3 weeks | 60 weeks | 65 weeks | 1 Total station, PC, software | 1 Total station, PC, software | 1 flight | -- |
| **3.** | **Road condition and deflection survey** | | XXXXX | X X X X | X X X X | | | 4 weeks | 4 weeks | 40 weeks | 40 weeks | 1 Roadman, 1 FWD, laboratory equipment | 1 Roadman, 1 FWD, laboratory equipment. | 1 flight | 1 flight |
| 4. | Bridge survey | | X X X | X X X | | X X | | 4 weeks | 4 weeks | 4 weeks | 6 weeks | Computers | Computers | 1 flight | 1 flight |
| 5. | Traffic surveys and forecasts | | X X | X X X X | X X | X X | | 8 weeks | 12 weeks | 25 weeks | 25 weeks | Computers | Computers | 3 flight | 1 flight |
| 6. | Soils and materials investigation | | | X X X X | X X X X | X X X X | | 6 weeks | 5 weeks | 34 weeks | 30 weeks | Laboratory equipment & PC | Laboratory equipment & PC | 1 flight | 1 flight |
| **7.** | **Environmental assessment** | | | | X | X X X X | X X X X | 5 weeks | 8 weeks | 8 weeks | 8 weeks | Computers | Computers | 1 flight | 1 flight |
| **8.** | Preliminary designs and drawings | | | X X X X | X X X X | X X X X | X X X X | 8 weeks | 9 weeks | 43 weeks | 40 weeks | Computers & soft | Computers & soft | -- | |
| **9.** | **Preliminary cost estimates** | | | | X X | X X X X | | 3 weeks | 4 weeks | 8 weeks | 10 weeks | Computers | Computers | -- | |
| **10.** | **Economic analysis** | | | | | | X X X X | 9 weeks | 10 weeks | 20 weeks | 4 weeks | Computers & soft | Computer & soft | 1 flight | 2 flights |
| **B.** | **Detailed design stage** | | | | | | | | | | | | | | |
| **11.** | **Detailed planning and engineering design** | | | | | X X | X X X X | 10 weeks | 1 weeks | 59 weeks | 6 weeks | Computers & soft | Computers & soft | 2 flights | -- |
| **12.** | **Quantity calculation and cost estimates** | | | | | | | -- | -- | -- | -- | Computers & soft | Computer & soft | 1 flight | -- |
| 13. | Pre – qualification documents | | | | | | | -- | -- | -- | -- | Computers | Computers | -- | -- |
| 14. | Technical specifications & tender documents | | | | | | | -- | -- | -- | -- | | | 1 flight | -- |
| **15.** | **Quality assurance issues in Technical specification & tender documents** | | | | | ---------- | ---------- | -- | 2 weeks | -- | 3 weeks | -- | Computers | | |
| **16.** | **Assistance with tendering** | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 5 weeks | 1 week | 25 weeks | 2 weeks | -- | Computers | -- | -- |
| ---------- part time | | | | | | TOTAL | | 75 weeks | 67 weeks | 380 wks. | 243 wks. | | | 14 flights | 8 flights |

| Project title: Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country: : Armenia, Azerbaijan and Georgia | Form 2.2, Page: |
|---|---|---|---|
| Planning period: 01/2001 - 06/2001 | Prepared on: 29. June 2001 | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |

Project objectives: Detailed designs with bill of quantities and cost estimates, economic appraisal, environmental impact assessment and preparation of tender documents for the Ujar to Georgian border road

| **Azerbaijan** | | TIME FRAME 2001 (for the project period January 2001 to June 2001) Months | | | | | | INPUTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | PERSONNEL EC Consultant | | PERSONNEL Counterpart | | EQUIPMENT AND MATERIAL | | OTHER | |
| No | ACTIVITIES IMPLEMENTED | 1 | 2 | 3 | 4 | 5 | 6 | Planned | Utilised | Planned | Utilised | Planned | Utilised | Planned | Utilised |
| | **Project Management / Co-ordination** | X X X X | X X X X | X X X X | X X X X | X X X X | X X X X | 2 weeks | 2 weeks | 16 weeks | 16 weeks | | | 2 flights | 4 flights |
| **A.** | **FEASIBILITY STUDY STAGE** | | | | | | | | | | | | | | |
| **1.** | **Data collection / Review of previous studies** | X X X X | | | | | | 4 weeks | 4 weeks | 8 weeks | 8 weeks | | | | |
| **2.** | **Topographical survey** | X X X X | X X X X | X X X X | X X X X | X X X X | X X X X | - | - | 104 wks. | 104 wks. | 2 Total stations, 2 Notebooks | 2 Total stations, 2 Notebooks | | |
| **3.** | **Road condition & deflection survey** | | X X X X | X X | X X X X | | | 12 weeks | 12 weeks | 40 weeks | 40 weeks | 1 FWD, 1 Bump Integrator, Trip-meter | 1 FWD, 1 Bump Integrator, Trip-meter | | |
| **4.** | **Traffic surveys and forecast** | | | | | | | 8 weeks | 8 weeks | 9 weeks | 9 weeks | ATC, Axle weight bridge | ATC | 2 flights | 4 flights |
| **5.** | **Geotechnical investigations** | X X | X X X X | X X X X | X X X X | X X X X | | 18 weeks | 18 weeks | 107 wks | 107 wks | Drilling Equip-ment, DCP, Laboratory equip | Drilling Equip-ment, DCP, Laboratory equip | | |
| **6.** | **Hydrological and drainage studies** | | | X X X X | X X X X | X X X X | | 2 weeks | 2 weeks | 21 weeks | 21 weeks | PC, CAD Prog. | PC, CAD Prog. | | |
| **7.** | **Environmental assessment** | | | X X X X | | | | 4 weeks | 5 weeks | 13 weeks | 10 weeks | | | | |
| **8.** | **Preliminary designs & drawings** | | | X X X X | X X X X | X X X X | X X X X | 16 weeks | 16 weeks | 36 weeks | 36 weeks | | | | |
| **9.** | **Preliminary cost estimates** | | | | X X | X X X X | X X | 2 weeks | 2 weeks | 8 weeks | 8 weeks | | | | |
| **10.** | **Economic appraisal** | | | | X X | X X X X | X X X X | 8 weeks | 6 weeks | 13 weeks | - | | | 1 flight | 1 flights |
| **B.** | **DETAILED DESIGN STAGE** | | | | | | | | | | | | | | |
| **11.** | **Additional soil and material surveys** | | | | | | X X X X | 4 weeks | 4 weeks | 24 weeks | 24 weeks | | | | |
| **12.** | **Detailed engineering design** | | | X X X X | X X X X | X X X X | X X X X | 4 weeks | 8 weeks | 4 weeks | 16 weeks | PC, CAD Prog. | PC, CAD Prog. | | |
| **13.** | **Quantity calculation and cost estimates** | | | | X X | | | 2 weeks | 2 week | 3 weeks | 3 weeks | PC | PC | | |
| **14.** | **Pre-qualification documents** | | | | | | | - | - | - | - | | | | |
| **15.** | **Technical specifications & tender documents** | | | | X X X | | | 3 weeks | 3 weeks | 6 weeks | 6 weeks | | | 1 flights | 1 flights |
| **16.** | **Assistance with tendering** | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | | | | | | | | |
| | | | | | | TOTAL | | 89 weeks | 92 weeks | 408 wks. | 408 wks. | | | | |

---------- part time

| Project title: Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country: : Armenia, Azerbaijan and Georgia | Form 2.2, Page: |
|---|---|---|---|
| Planning period: 01/2001 - 06/2001 | Prepared on: 29. June 2001 | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |

Project objectives: Produce bankable feasibility study and tender documents for the Tbilisi bypass, Tbilisi – Marneuli and Tbilisi – Georgian border (Red Bridge) road

| **GEORGIA** | | **TIME FRAME 2001** (for the project period January 2001 to June 2001) Months | | | | | | **INPUTS** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **PERSONNEL EC Consultant** | | **PERSONNEL Counterpart** | | **EQUIPMENT AND MATERIAL** | | **OTHER** | |
| **No** | **ACTIVITIES IMPLEMENTED** | **1** | **2** | **3** | **4** | **5** | **6** | **Planned** | **Utilised** | **Planned** | **Utilised** | **Planned** | **Utilised** | **Planned** | **Utilised** |
| | **Project management** | **X X X X** | **X X X X** | **X X X X** | **X X X X** | **X X X X** | **X X X X** | **--** | **--** | 10 weeks | 10 weeks | **Computers** | **Computers** | | |
| **A.** | **FEASIBILITY STUDY STAGE** | | | | | | | | | | | | | | |
| **1.** | **Data collection / Review of previous studies** | | | | | | | **3 weeks** | **3 weeks** | 4 weeks | 4 weeks | | | | |
| **2** | **Topographic field survey and data evaluation** | | | **X X X X** | **X X X X** | **X X X X** | **X X X X** | **1 week** | **1 week** | 40 weeks | 93 weeks | **Cars, topographical equi.ment** | **Cars, topographical equi.ment** | | |
| **3a** | **Geotechnical field survey** | | | **X X X X** | **X X X X** | | | **2 weeks** | **1 week** | 15 weeks | 29 weeks | **Drilling machines, cars** | **Drilling machines, cars** | | |
| **3b** | **Geotechnical data evaluation and laboratory testing** | | | **X X X X** | **X X X X** | **X X X X** | **X X X X** | **4 weeks** | **1 week** | 15 weeks | 15 weeks | **Laboratory** | **Laboratory** | | |
| **4a** | **Road condition survey** | | | | **X X X X** | **X X X X** | | **4 weeks** | **1 week** | 6 weeks | 6 weeks | **Cars, dig. Camera** | **Cars, dig. Camera** | | |
| **5** | **Material sources survey** | | | | **X X X X** | **X X X X** | | **1 week** | **1 week** | 5 weeks | 5 weeks | **Cars, computers** | **Cars, computers** | | |
| **6** | **Traffic survey and forecast** | | **X X X X** | **X X X X** | | | | **8 weeks** | **8 weeks** | 25 weeks | 25 weeks | **Cars, computers** | **Cars, computers** | | |
| **7** | **Bridge and structure survey** | | | | **X X X X** | **X X X X** | | **3 weeks** | **2 weeks** | 15 weeks | 15 weeks | **Car, computer** | **Car, computer** | | |
| **8** | **Environmental assessment** | | | | | **X X X X** | **X X X X** | **4 weeks** | **6 weeks** | 8 weeks | 8 weeks | **Computers, off. Equipment** | **Computers, off. Equipment** | | |
| **9** | **Preliminary design and drawings, cost estimates** | | | | | **X** | **X X X X** | 13 weeks | **1 week** | 53 weeks | 14 weeks | **Computers, off. Equipment** | **Computers, off. Equipment** | | |
| **10** | **Economic analysis** | | | | | **X** | | **9 weeks** | **0.2 week** | 20 weeks | 1 week | **Computer** | **Computer** | | |
| **B.** | **Detailed design stage** | | | | | | | | | | | | | | |
| **11.** | **Detailed planning and engineering design** | | | | | | | **2 weeks** | **--** | 12 weeks | -- | **Computers** | **Computers** | | |
| **12.** | **Quantity calculation and cost estimates** | | | | | | | **--** | **--** | -- | -- | | | | |
| 13. | Pre – qualification documents | | | | | | | **--** | **--** | -- | -- | | | | |
| 14. | Technical specifications & tender documents | | | | | | | **--** | **--** | -- | -- | | | | |
| **15.** | **Assistance with tendering** | | | | | | | **1 week-** | **--** | 2 weeks | -- | | | | |
| ---------- part time | | | | | | **TOTAL** | | 55 weeks | 25 weeks | **230 wks.** | **215 wks** | | | | |

## 4.5 RESOURCE UTILISATION REPORT

| Project title: Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number : SCR-E/110579/C/SV/WW | Country : : Armenia, Azerbaijan and Georgia | Form 2.3, Page: |
|---|---|---|---|
| Planning period : 01/2001 - 07/2001 | Prepared on : 29. June 2001 | EC Consultant : Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |
| Project objectives: Produce bankable feasibility study and tender documents for certain sections between Yerevan – Georgian border, Tbilisi bypass, Tbilisi – Marneuli and Tbilisi – Georgian border (Red Bridge) road, and Detailed designs with bill of quantities and cost estimates, economic appraisal, environmental impact assessment and preparation of tender documents for the Ujar to Georgian border road | | | |

| RESOURCES/INPUTS | TOTAL PLANNED | PERIOD PLANNED | PERIOD REALISED | TOTAL REALISED | AVAILABLE FOR REMAINDER |
|---|---|---|---|---|---|
| **PERSONNEL** | | | | | |
| Project Director/Manager, Kocks Consult | 44 working-days | 25 working-days | 25 working-days | 25 working days | 19 working-days |
| Project Manager/Home Office Support, BCEOM | 11 working-days | 5 working-days | 5 working-days | 5 working-days | 6 working-days |
| Project Manager/Home Office Support, Finnroad | 11 working-days | 5 working-days | 5 working-days | 5 working-days | 6 working-days |
| Project Coordinator/Team Leader Azerbaijan | 229 working-days | 132 working-days | 132 working-days | 132 working-days | 103 working-days |
| Country Team Leader Armenia/ Geo. & Mat. Eng. | 160 working-days | 96 working-days | 96 working-days | 96 working-days | 64 working-days |
| Country Team Leader Georgia | 130 working-days | 88 working-days | 27 working-days | 27 working-days | 103 working-days |
| Traffic Engineer Armenia | 44 working-days | 44 working-days | 44 working-days | 44 working-days | -- |
| Traffic Engineer Azerbaijan | 42 working-days | 42 working-days | 42 working-days | 42 working-days | -- |
| Traffic Engineer Georgia | 44 working-days | 44 working-days | 44 working-days | 44 working-days | -- |
| Bridge Engineer Armenia | 39 working-days | 22 working-days | 22 working-days | 22 working-days | 17 working-days |
| Bridge Engineer Azerbaijan | 88 working-days | 44 working-days | 44 working-days | 44 working-days | 44 working-days |
| Bridge Engineer Georgia | 44 working-days | 22 working-days | 11 working-days | 11 working-days | 33 working-days |
| Environmentalist Armenia/Azerbaijan | 44 working-days | 44 working-days | 44 working-days | 44 working-days | -- |
| Environmentalist Georgia/BCEOM respresent. | 22 working-days | 22 working-days | 30 working-days | 30 working-days | - 8 working-days |
| Pavement Specialist Armenia | 44 working-days | 22 working-days | 10 working-days | 10 working-days | 34 working-days |
| Pavement Specialist Azerbaijan | 51 working-days | 44 working-days | -- | -- | 51 working-days |
| Pavement Specialist Georgia | 39 working-days | 19 working-days | 1 working-day | 1 working-day | 38 working-days |
| Geotechnical and Materials Engineer Azerbaijan | 88 working-days | 44 working-days | 116 working-days | 116 working-days | - 28 working-days |
| Geotechnical and Materials Engineer Georgia | 44 working-days | 22 working-days | 22 working-days | 22 working-days | 22 working-days |
| Transport Economist Armenia | 33 working-days | 33 working-days | 28 working-days | 28 working-days | 5 working-days |
| Transport Economist Azerbaijan | 44 working-days | 44 working-days | 34 working-days | 34 working-days | 10 working-days |
| Transport Economist Georgia | 33 working-days | 33 working-days | 1 working-day | 1 working-day | 32 working days |
| Procurement Specialist Armenia | 22 working-days | -- | -- | -- | 22 working-days |
| Procurement Specialist Azerbaijan | 22 working-days | -- | -- | -- | 22 working-days |
| Procurement Specialist Georgia | 22 working-days | -- | -- | -- | 22 working-days |
| Local Experts Armenia | 1944 working-days | 1150 working-days | 1235 working-days | 1235 working-days | 709 working-days |
| Local Experts Azerbaijan | 3272 working-days | 1925 working-days | 1960 working-days | 1960 working-days | 1312 working-days |
| Local Experts Georgia | 2334 working-days | 1150 working-days | 1078 working-days | 1078 working-days | 1256 working-days |
| Sub-total | 1394 working-days / EU Exp.<br>7550 working-days/Local Exp | 896 working-days / EU Exp.<br>4225 working-days/Local Exp | 783 working-days / EU Exp.<br>4273 working-days/Local Exp | 783 working-days / EU Exp.<br>4273 working-days/Local Exp | 611 working-days / EU Exp.<br>3277 working-days/Local Experts |

| RESOURCES/INPUTS | TOTAL PLANNED | PERIOD PLANNED | PERIOD REALISED | TOTAL REALISED | AVAILABLE FOR REMAINDER |
|---|---|---|---|---|---|
| **EQUIPMENT AND MATERIAL** | | | | | |
| Total stations with accessories | 3 Total stations | 3 Total stations | 3 Total stations | 3 Total stations | Equipment is available for project |
| Automatic traffic counters | 1 ATC | 1 ATC | 1 ATC | 1 ATC | |
| Axle Weighbridge | 2 Axle Weighbridges | 2 Axle Weighbridges | -- | -- | |
| Roadman & Merlin calibration frame | 1 set | 1 set | 1 set | 1 set | Equipment is available for project |
| TRL Bump Integrator & Merlin calibration frame | 2 sets | 2 sets | 1 set | 1 set | Equipment is available for project |
| Falling Weight Deflectometer (FWD) | 2 FWD | 2 FDW | 2 FDW | 2 FDW | |
| Core drilling & sampling equipment | 3 sets | 3 sets | 3 sets | 3 sets | Equipment is available for project |
| Dynamic cone penetrometer | 3 DCP's | 3 DCP's | 2 DCP's | 2 DCP's | |
| Geotechnical laboratory equipment | 3 sets | 3 sets | 3 sets | 3 sets | Equipment is available for project |
| Office equipment | 3 sets | 3 sets | 3 sets | 3 sets | Equipment is available for project |
| | | | | | |
| Sub-total | | | | | |
| OTHER INPUTS | | | | | |
| | | | | | |
| Sub-total | | | | | |
| TOTAL | | | | | |

## 4.6 OUTPUT PERFORMANCE REPORT

## Armenia

| Project title : Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country : Armenia, Azerbaijan and Georgia | Form 2.4, Page: |
|---|---|---|---|
| Prepared on: 29. June 2001 | | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |

| Output results | Deviation original plan + or - % | Reason for deviation | Comment on constrains & assumptions |
|---|---|---|---|
| Topographical maps and information of terrain | - 10 % | There may be needed some extra mapping info during the detailed design phase | Reserved for detailed design phase |
| Assessment of existing road and structure condition – Reports on FWD, roughness, visual inspection and retaining walls | On schedule | | |
| Bridge survey – Bridge report | On schedule | | |
| Traffic forecast – Traffic survey report | - 10 % | Additional traffic counts necessary | The survey report will be revised |
| Axle load survey | -100 % | Axle Weighbrigde was broken, the Project Management Meeting decided to cancel this survey | The Consultant will utilise the existing axle load survey data and info from their earlier relevant projects in Caucasus. |
| Geotechnical evaluation | On schedule | | |
| DCPT tests | - 100 % | Because of the lack of the equipment, the survey was replaced by FWD testings | This survey is not needed because keeping in the existing alignment; FWD testing is adequate. |
| Environmental impact assessment | - 10 % | Because of postponed time schedule, the report has been delayed for some time | The study report has been received for the commenting and will be finalised |
| Definitions of technical solutions for improvements and rehabilitation | - 10 % | Time schedule of economic assessment has been delayed | Will be finalised in July |
| Preliminary cost estimates | On schedule | | |
| Economic appraisal | -10 % | Delayed completion of necessary input data | Will be finalised at the middle of July |
| **DETAILED DESIGN** | | | |
| Detailed engineering designs – Detailed design documents | On schedule | | Detailed design phase will be fully commenced after the feasibility study phase only |
| Quantity and cost estimates – Estimates to be used in preparing tender documents | On schedule | | |
| Pre-qualification and tender documents – Pre-qualification and Tender Documents | On schedule | | |
| Procurement services – Assistance to AR | On schedule | | |

## Azerbaijan

| Project title : Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country : Armenia, Azerbaijan and Georgia | Form 2.4, Page: |
|---|---|---|---|
| Prepared on: 29. June 2001 | | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |

| Output results | Deviation original plan + or - % | Reason for deviation | Comment on constrains & assumptions |
|---|---|---|---|
| **FEASIBILITY STUDY** | | | |
| Topographical maps and survey data | -10 % | Detailed design of Ganja – Shemkir road was given overall priority | Precondition for World Bank loan |
| Assessment of road and structure condition | Completed | | |
| Assessment of traffic and traffic forecast | Completed | | |
| Geotechnical evaluation | On schedule | | |
| Environmental impact assessment | Completed | | |
| Definitions of technical solutions for improvements and rehabilitation | - 10 % | Detailed design of Ganja – Shemkir road was given overall priority | |
| Preliminary cost estimates | - 10 % | Detailed design of Ganja – Shemkir road was given overall priority | |
| Economic appraisal | - 10 % | Detailed design of Ganja – Shemkir road was given overall priority | |
| **DETAILED DESIGN** | | | |
| Engineering designs | + 10 % | Engineering designs for Ganja – Shemkir road section has been completed | |
| Quantity and cost estimates | + 10 % | Quantity and cost estimates for Ganja – Shemkir has been prepared | |
| Pre-qualification documents | On schedule | | |
| Draft tender documents | + 10 % | Draft tender documents of Ganja – Shemkir road section have been completed | |
| Procurement services – Assistance to Azeravtoyol | On schedule | | |

## Georgia

| Project title : Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country : Armenia, Azerbaijan and Georgia | Form 2.4, Page: |
|---|---|---|---|
| Prepared on: 29. June 2001 | | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |

| Output results | Deviation original plan + or - % | Reason for deviation | Comment on constrains & assumptions |
|---|---|---|---|
| **FEASIBILITY STUDY** | | | |
| Topographical maps and survey data | **- 8 %** | **Due to the attack and injury of the Team Leader field works are delayed** | **Unfortunate incident** |
| **Geotechnical works and material sources survey** | **- 29 %** | **Due to the attack and injury of the Team Leader field works are delayed** | |
| **Road condition survey** | **Completed** | | |
| Assessment of traffic and traffic forecast | **Completed** | | |
| **Bridge and structure survey** | **Completed** | | |
| **Environmental assessment** | **Completed** | | |
| **Preliminary design and drawings** | **- 56 %** | **Delay in field surveys** | |
| Preliminary cost estimates | **-95 %** | **Delay in field surveys** | |
| Economic appraisal | **-95 %** | **Delay in field surveys** | |
| **DETAILED DESIGN** | | | |
| Engineering designs | On schedule | | |
| Quantity and cost estimates | On schedule | | |
| Pre-qualification documents | On schedule | | |
| Draft tender documents | On schedule | | |
| Procurement services – Assistance to State Road Department | On schedule | | |

### 4.7 Constrains

Main constrains in Armenia have been approval of custom & duties and VAT exemption letters by the Tacis National Coordinator. The exemption letter concerning the Project vehicle took 2 months and it was needed lot of extra efforts to settle this issue. There are still 3 letters waiting for approval letters. The same has been also with Armenian visas. The Project staff should get Armenian entry visas free of charge but this system doesn't work at all.

## 5. PROJECT PLANNING FOR THE NEXT REPORTING PERIOD

### 5.1 Planned activities

Field surveys will be completed and survey data evaluated. Preliminary designs and cost estimates will be prepared.

The Feasibility Study report will be finalised and translated into Russian language for commenting. Upon final comments on the draft feasibility report the final study report will be prepared.

Detailed engineering designs and tender documents for the selected study roads will be completed and submitted. Technical assistance for procurement services will be provided.

After completion of the engineering designs and tender documents the Project completion report will be prepared.

The main activities for the next reporting period will be:

**Armenia**
The environmental assessment study and the economic assessment will be finalised and translated into Russian language at the very beginning of the next reporting period.

Minor modifications that may be needed for the Traffic study concerning Armenia will be done.

The retaining wall study will be finalised and translated into Russian language, whereas the visual inspection study and the hydrological study will be translated into English language.

Detailed design activities of the road sections will be continued and finalised. Existing technical specification and conditions of contract will be revised and missing sections will be added. Special attention will be taken to meet the new quality plan and quality issues of the Armenian Roads.

The draft contract documents will be finalised and translated into Russian language for commenting and will be discussed and revised accordingly.

The Consultant has and will participate into the beneficiary organisation's quality plan preparation and quality issues as much as possible from the other Project activities.

**Azerbaijan**
Continuation of geotechnical laboratory testing of soils and materials samples for the detailed design stage. Evaluation of the testing results.

Preparation of the detailed design for the rehabilitation and upgrading of the road remaining road sections of the Ujar to Georgian border road giving full consideration to environmental and road safety requirements.

Detailed design of new structures respectively for required widening or lengthening of existing bridges.

Calculation of quantities and preparation of cost estimates. Elaboration of tender and construction drawings.

Preparation of tender documents for international competitive bidding according to the procurement policies and rules of the World Bank for these sections

Preparation of separate tender documents for the Tacis financed Shemkir and Gasan Su bridges.

Assistance of Azeravtoyol in all steps of the tendering process.

**Georgia**

Field works and survey data evaluation will be completed. Preliminary designs will be prepared, quantities calculated and cost estimates will be prepared to the suitable level for preliminary design.

The economic analysis will be carried out and the feasibility study report will be finalised.

According the results of the feasibility study the detailed designs, cost estimates and technical specifications will be prepared.

Tender documents in accordance with the procurement guideline of the World Bank for open tendering will be prepared and submitted. Assistance in the tendering process will be provided.

**Seminars**

The Consultant will carry out and finalise the remaining training programmes as follows:

The relevant expatriate staff members and local experts will continue and finalise the training concerning engineering and designs, cost estimates and specifications as on the job training during the relevant design activities.

The relevant expatriate staff members and local experts will commence and finalise the training concerning pre-qualification and tender documents and procurement of works partly in the office and partly on the job training during the relevant project activities.

The seminar about the use of HDM is scheduled on 3rd August in Azerbaijan and late August in Georgia.

The proposed activities for the next period are shown for each of the recipient states in the tables below.

## 5.2 PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

| Project title: Feasibility Study for Rehabilitation and the Reconstruction of the Road Link Between Baku, Tbilisi and Yerevan | Project number: SCR-E/110579/C/SV/WW | Country: Armenia, Azerbaijan and Georgia | Page : |
|---|---|---|---|
| Planning period : 7/2001 – 12/2001 | Prepared on: 29. June 2001 | EC Consultant:: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD | |
| Project objectives : Produce bankable feasibility study and tender documents for certain road sections between Yerevan – Georgian border | | | |

| | **Armenia** | TIME FRAME 2001 (months) | | | | | | INPUTS PERSONNEL | | EQUIPMENT AND MATERIAL | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No | ACTIVITIES | 7 | 8 | 9 | 10 | 11 | 12 | EC Consultant | Counterpart | | |
| **A.** | **FEASIBILITY STUDY STAGE** | | | | | | | | | | |
| **1.** | **Data collection / Review of previous studies** | | | | | | | | | Computer | 1 flight |
| **2.** | **Topographical survey / Pavement cross section survey** | | XXX | | | | | | 4 weeks | Total station, computers | |
| **3.** | **Road condition & deflection survey** | X | | | | | | 1 week | 1 week | FWD, laboratory | 1 flight |
| **4.** | **Bridge survey** | XX | | | | | | | 1 week | | 1 flight |
| **5.** | **Traffic surveys and forecast** | X | | | | | | 1 week | 2 weeks | Computers | 1 flight |
| **6.** | **Soils and material investigation** | XX | | | | | | 1 week | 3 weeks | Laboratory & computers | 1 flight |
| **7.** | **Environmental assessment** | XXXX | | | | | | 3 weeks | 1 weeks | Computers | 1 flight |
| **8.** | **Preliminary designs & drawings** | XXX | | | | | | 1 weeks | 8 weeks | Computers & softw | 1 flight |
| **9.** | **Preliminary cost estimates** | XXX | | | | | | 2 weeks | 5 weeks | Computers | 1 flight |
| **10.** | **Economic appraisal** | XXXXX | | | | | | 1 weeks | 2 weeks | Computers & sotw | 2 flights |
| **B.** | **DETAILED DESIGN STAGE** | | | | | | | | | | |
| **11.** | **Detailed planning and engineering design** | XXXXX | XXXXX | XXXXX | | | | 5 weeks | 55 weeks | Computers & softw | 3 flights |
| **12.** | **Quantity calculation and cost estimates** | | | XX | XXXX | | | 2 weeks | 15 weeks | Computers & sotw | 1 flight |
| **13.** | **Pre-qualification documents** | | | XXXXX | | | | 3 weeks | 8 weeks | Computers | |
| **14.** | **Technical specifications & tender documents** | | | XX | XXXXX | X | | 4 weeks | 20 weeks | Computers | 1 flight |
| **15.** | **Quality assurance issues in design, specification & tender documents** | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 4 weeks | 17 weeks | Computers | |
| **16.** | **Assistance with tendering** | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 3 week | 18 weeks | Computers | |
| ---------- part time | | | | | | TOTAL | | 31 weeks | 160 weeks | | 14 flights |

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|---|---|---|---|
| Planning period : 7/2001 – 12/2001 | Prepared on: 29. June 2001 | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD: | |

Project objectives: Detailed designs with bill of quantities and cost estimates, economic appraisal, environmental impact assessment and preparation of tender documents for the Ujar to Georgian border road

| **Azerbaijan** | | TIME FRAME 2001 (months) | | | | | | INPUTS PERSONNEL | | EQUIPMENT AND MATERIAL | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No | ACTIVITIES | 7 | 8 | 9 | 10 | 11 | 12 | EC Consultant | Counterpart | | |
| | Project management / co-ordination | X X X X | X X X X | X X X X | X X X X | X X X X | X X X X | 3 weeks | 48 weeks | | 2 flights |
| 2. | Topographical Survey | | | | | | | | | | |
| | - Field survey and data evaluation | X X X X | X X | | | | | | 64 weeks | Total stations, PC | |
| | - Mapping | X X X X | X X X X | | | | | | 12 weeks | PC | |
| 5. | Geotechnical Investigations | | | | | | | | | | |
| | - Laboratory testing & data evaluation | X X X X | | | | | | 4 weeks | 14 weeks | Laboratory equip. | 1 flight |
| 6. | Hydrological and drainage design | X X X X | X X X X | X | | | | 1 week | 9 weeks | PC, CAD Prog. | |
| 8. | Preliminary designs | X X X X | | | | | | 1 week | 8 weeks | PC, CAD Prog. | |
| 9. | Preliminary quantities & cost estimate | X X X X | | | | | | 1 weeks | 4 weeks | | |
| 10. | Economic appraisal | X X X X | X | | | | | 8 weeks | 13 weeks | | 1 flight |
| 11. | Bridge design | X X X X | X X X X | X X X X | | | | 8 weeks | 32 weeks | PC, CAD Prog. | 1 flight |
| 12. | Road and pavement design | X X X X | X X X X | X X X X | | | | 12 weeks | 32 weeks | PC, CAD Prog. | 1 flight |
| 13. | Quantity calculation and cost estimates | | X X | X X X X | | | | 3 week | 6 weeks | PC | |
| 14. | Pre-qualification documents | | X X X X | | | | | 4 week | 4 weeks | | |
| 15. | Tender documents | | | | X X X X | | | 4 weeks | 6 weeks | | 1 flight |
| 16. | Assistance with tendering | ---------- | ---------- | ---------- | ---------- | ---------- | ---------- | 6 weeks | 12 weeks | | 2 flight |
| | Assistance to the PIU | ---------- | ---------- | ---------- | ---------- | | | 6 weeks | 36 weeks | | 2 flight |
| ---------- part time | | | | | | TOTAL | | 61 weeks | 300 weeks | | 11 flights |

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|---|---|---|---|
| Planning period : 7/2001 – 12/2001 | Prepared on: 29. June 2001 | EC Consultant: Consortium KOCKS CONSULT GMBH – BCEOM – FINNROAD LTD: | |

Project objectives : Produce bankable feasibility study and tender documents for the Tbilisi bypass, Tbilisi – Marneuli and Tbilisi – Georgian border (Red Bridge) road

| **Georgia** | | TIME FRAME 2001 (months) | | | | | | INPUTS PERSONNEL | | EQUIPMENT AND MATERIAL | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No | ACTIVITIES | 7 | 8 | 9 | 10 | 11 | 12 | EC Consultant | Counterpart | | |
| **A.** | **FEASIBILITY STUDY STAGE** | | | | | | | | | | |
| **1.** | **Data collection / Review of previous studies** | **X X** | **X X** | **X X** | | | | **1 week** | **8 weeks** | | |
| **2.** | **Topographical survey / Pavement cross section survey** | **X X** | | | | | | **1 week** | **20 weeks** | **Topo instruments, computers, cars** | |
| **3.** | **Road condition & deflection survey** | **X X** | | | | | | **1 weeks** | **11 weeks** | **Digital camera, Benkelman beam, cars** | |
| **5.** | **Bridge & structure investigation** | **X X X X** | **X X X X** | **X X X X** | | | | **2 weeks** | **36 weeks** | **Computers** | |
| **6.** | **Soils and material investigation** | **X X X X** | | | | | | **1 weeks** | **7 weeks** | **Laboratory** | |
| **7.** | **Environmental assessment** | **X X** | | | | | | | | | |
| **8.** | **Preliminary designs & drawings** | **X X X X** | **X X X X** | | | | | **2 weeks** | **21 weeks** | **Computers** | |
| **9.** | **Preliminary cost estimates** | **X X X X** | **X X** | | | | | | **2 weeks** | **Computers** | |
| **10.** | **Economic appraisal** | **X X X X** | **X X** | | | | | **6 weeks** | **12 weeks** | **Computers** | |
| **B.** | **DETAILED DESIGN STAGE** | | | | | | | | | | |
| **11.** | **Detailed planning and engineering design** | | | **X X X X** | | | | **1 weeks** | **52 weeks** | **Computers** | |
| **12.** | **Quantity calculation and cost estimates** | | | **X X X X** | | | | **1 week** | **14 weeks** | **Computers** | |
| **13.** | **Pre-qualification documents** | | | **X X X X** | | | | **2 weeks** | **10 weeks** | | |
| **14.** | **Technical specifications & tender documents** | | | | **X X X X** | **X X X X** | | **2 weeks** | **8 weeks** | **Computers** | |
| **15.** | **Assistance with tendering** | | | | ---------- | ---------- | ---------- | **4 weeks** | **25 weeks** | | |
| ---------- part time | | | | | | TOTAL | | **24 weeks** | **226 weeks** | | **11 flights** |

# 6. ADDITIONAL BROADER PROPOSALS

The Consultant wants to raise the following additional proposals for future funding:

**Quality Plan in Armenia**
The Project has supported closely the development of the first Quality Plan for the Armenian Roads. The Armenian Roads is preparing its first Quality Plan on the support and request of the World Bank. The quality plan is very important tool for the Armenian Roads to upgrade quality of their design, construction, maintenance and contraction activities to reach better final product being rehabilitated / reconstructed / new constructed and properly maintained roads.

This has required and will require more time input from the Consultant. During the design work, more detailed topographic surveys are needed and more detailed design will be needed.

**Rainwater drainage systems in Stepanavan, Tashir and Vanadzor (Armenia)**
The drainage systems in towns Stepanavan, Tashir and Vanadzor towns will need extra survey and design work in case the beneficiary organisation will determine piped rainwater drainage systems. The Consultant has assumed that normal surface rainwater collection methods would be enough for the Client and no piping systems would be needed.