

PD-ABK-918  
93572

**UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT**

(CONTRACT No. 391-0480-C-00-8246-00)

**ROAD RESOURCES MANAGEMENT PROJECT**

**PAKISTAN**

**PROJECT DOCUMENTATION**

**(KA-6)**

**EXPERIENCES AND LESSONS LEARNED**

**JUNE 1991**

**CONSTRUCTION CONTROL SERVICES CORPORATION**

USAID CONSULTANTS FOR ROAD RESOURCES MANAGEMENT PROJECT

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EAST ORANGE, NEW JERSEY 07019

**&**

**ASSOCIATED CONSULTING ENGINEERS**  
KARACHI-8, PAKISTAN



PROJECT DOCUMENTATION  
(KA-6)  
EXPERIENCES AND LESSONS LEARNED

JUNE 1991

## INTRODUCTION

## INTRODUCTION

Every rehabilitation project in the Road Resources Management Project presents its own unique technical and management problems, but they all have one thing in common. Each project is a learning experience and a new opportunity to improve the technical supervisory skills of District sub engineers and the planning, scheduling and contract management skills of the District Engineers. Training of District Staff and institutional strengthening of the office of the District Engineer can be extremely effective and personally rewarding in the on-the-job experiences developed during the execution of the projects. Lessons learned are put into practice immediately with positive results that produce effective training reinforcement. Such immediate feedback and practical application increases the likelihood of long-term improvement of institutional and personal performance. The net result is implementation of improved construction, rehabilitation and maintenance management practices at the district level that will foster sustainable district growth through:

- 1) better planning;
- 2) improved quality control during construction;
- 3) more technically responsive rehabilitation and upgrading programs; and
- 4) maintenance intervention techniques that will minimize life-cycle cost per kilometer of roads.

The purpose of this report is to briefly indicate the history of one project (KA-6) and some of the lessons learned, using excerpts from the construction files, project memos, inspection reports and field photos.

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PROJECT SUMMARY

## PROJECT SUMMARY

### PROJECT SELECTION AND DESIGN

Project KA-6 is a short village road with inadequate original drainage design and substandard right-of-way passing through a residential village. Traversing total length of only 0.6 km, it connects two C&W roads.

Because of high traffic volume, the economic analysis carried out by the consultant clearly demonstrated that the project provided a positive economic rate of return and was more than justified by objective benefit/cost analysis. This was considered a high priority project by the East Karachi District Council. It was approved by the Divisional Coordinating Committee with concurrence of the Consultant, who had previously noted certain inconvenient aspects of the project during preliminary discussions regarding RRMP project selection criteria. Negative aspects included:

- The road, passing through a village, was not a rural road and the unique nature of the design and cross sections did not conform to project purpose of developing the typical standards desirable in a pilot project.
- The existing drainage characteristics were inadequate and the drainage improvements necessary were beyond the scope of the RRMP.

- The narrow right-of-way and existing construction almost contiguous to the carriage-way create construction difficulties not typical of Sindh district road projects.

Construction began on 15 February 91 during the period of evacuation of the expatriate technical assistance team. The expatriate team established guidelines for local project management, which was the responsibility of the District Engineer, with technical support and advice from the engineers of the CCSC Karachi Office. The District Engineer designated a sub-engineer as his representative to supervise and take responsibility for the construction management of the project.

CCSC staff guided the sub-engineer in quality control procedures and compliance with all USAID/RRMP administrative and testing requirements. Daily communication and special emphasis on materials testing and compaction requirements provided many opportunities for on-the-job training in inspection and quality control techniques.

The expatriate team established a weekly reporting system via fax communication to facilitate a reasonable level of project monitoring and technical guidance. The need for photographic documentation of each phase of the project and critical project activities was stressed in order to permit post evaluation and technical observations regarding construction techniques. These inputs are required to permit analysis of training needs as well as to illustrate important technical points during future



training sessions, workshops and seminars. The expatriate team provided general guidance as required for this and other projects by fax. Analysis of the weekly project reports in the United States revealed areas where the RRMP Field Manual could be expanded and clarified. These clarifications were faxed to Karachi for immediate action and subsequently incorporated in the manual draft to improve standard operating procedures on all future district projects. Construction photos on pages III-1 thru 7 are captioned to emphasize important technical and training points.

#### MAINTENANCE PERIOD

Construction formally ended on March 3 and the Chief of Party returned permanently from the evacuation on April 18. A routine maintenance period windscreen inspection was performed on May 20 by the Chief of Party, accompanied by an invited official of MLGRD, with follow up by the Road Planner and Design Engineer. Observations made during that inspection were duly reported (see pages IV-1 thru 3) and deficiencies were brought to the attention of the District Engineer and USAID.

A final inspection was performed on June 02 by the Chief of Party, the Construction Specialist and the CCSC Maintenance Engineer (see pages IV-4 thru 5). The punch list was forwarded to the District Engineer and the Contractor was instructed to take all remedial action so that final payment may be released. A photographic record of this inspection is presented at the end of this report.

STATUS OF REHABILITATION WORK  
MARCH 19, 1991

PROJECT NAME	DESCRIPTION	VALUES
KA-6	Length	0.6 Km
Internal Road Ibrahim Hyderi	Estimated Cost	Rs. 213,680/-
	Work order issued on	January 24, 1991
	Work started on	February 15, 1991
	Percentage of Completion	Full - 100%
	Planned completion date	March 24, 1991
	Actual completion date	March 03, 1991
	End of Maintenance Period	June 05, 1991

Payment Record:

Certification Date: 19-03-91

Amount Paid = Rs.163,568

Refund of security deposits repairs  
and final inspection.

Bill	=	183,785
Security Deposit	=	(14,703)
Income Tax	=	(5,514)
Total	=	163,568

REMARKS

1. Work was carried out by sub-contractor and not the main contractor. Name of sub-contractor = Mr. M.S. Jahangir Shah. Permission of District Council Engineer was duly granted.
2. Traffic was not adequately controlled during construction period.
3. People in the vicinity interfered with construction progress.
4. Waste water from surrounding houses and shops was not adequately controlled prior to construction and was flowing during the work.

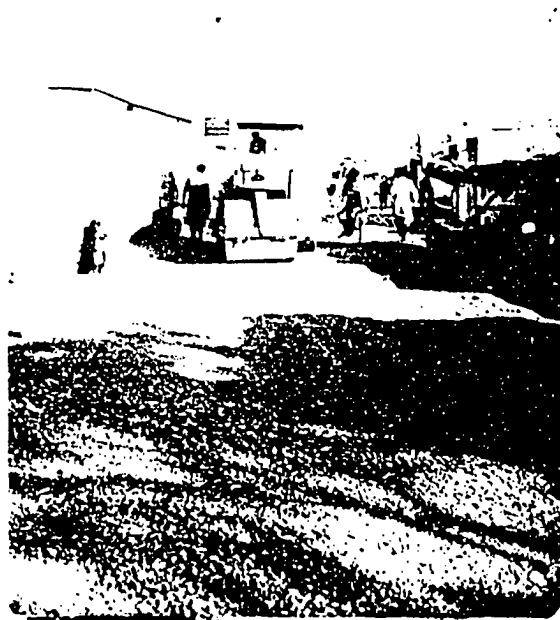
TRAINING POINTS AND REVISION  
OF THE  
FIELD MANUAL

## TRAINING POINTS AND REVISION OF THE FIELD MANUAL

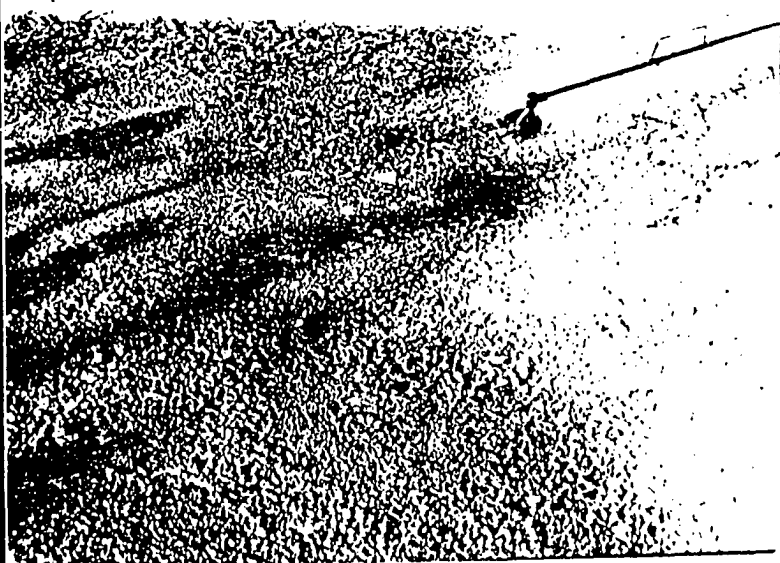
During the execution of this project every opportunity was exploited to develop training material and detect common problems which can be avoided by proper supervisory, managerial or quality control techniques. Many of these training points are highlighted in the captions to pictures on pages. These are being compiled for inspectors checklists and are being incorporated in the field manual which should be in final form by September, when results of the 1990-91 construction program has been properly analyzed. Among the points being developed are:

- 1) Modification of traffic control procedures for village roads.
- 2) Emphasis on need for District Engineer involvement in preconstruction management.
- 3) Need for improved community awareness of construction schedule requirements.
- 4) Daily equipment inspection, with emphasis on maintaining quality control and compliance with contract specification.
- 5) Documentation of ancillary project requirements. In this case, setting a time limit for the District to construct appropriate drainage facilities would have been appropriate to guarantee structural integrity and serviceability of the pavement over the design life.
- 6) Documentation of corrective actions taken in response to inspectors memoranda regarding observed deficiencies.
- 7) Improved techniques for controlling rate of materials application.
- 8) Improved techniques for controlling temperature limitations during surface treatment.
- 9) Importance of strictly controlling materials size and integrity of each surface treatment application.

CONSTRUCTION PHOTOS AND  
FIELD OBSERVATIONS



CONSTRUCTION PHOTOS INDICATE THAT COMPACTION PROCEEDED IN ACCORDANCE WITH SPECIFICATIONS. LABORATORY TESTS CONFIRMED THAT COMPACTION WAS ADEQUATE. THE SMOOTHNESS OF THE ROAD THREE MONTHS AFTER PROJECT COMPLETION IS TESTIMONY OF THE HIGH STANDARDS MET IN EXECUTING THE BASE PREPARATION AND COMPACTION.



CONSTRUCTION PHOTOS TAKEN BY FIELD ENGINEERS INDICATE THAT THE CONTRACTOR OCCASIONALLY MOVED TOO FAR AHEAD OF THE AGGREGATE DISTRIBUTORS, RESULTING IN THE ASPHALT TEMPERATURE CONTROL BEING DEFICIENT. THIS PROBLEM WAS ISOLATED, AS INDICATED BY THE FINAL INSPECTION OF THE PROJECT. THE CCSC CONSTRUCTION MANUAL POINTS OUT THE IMPORTANCE OF TEMPERATURE CONTROL AND PLANNED CONTRACTOR TRAINING WILL EMPHASIZE THIS.



THESE PHOTOS ALSO SHOW EVIDENCE OF EXCESSIVE DUST IN THE AGGREGATE. THIS WOULD NORMALLY CONTRIBUTE TO SURFACE RAVELLING, RESULTING, BUT WAS COMPENSATED FOR BY RICHER ASPHALT APPLICATION IN SOME AREAS. THE QUANTITY NOTES OF THE MEASUREMENT BOOK. INDICATED CONSISTENT COMPLIANCE WITH THE AVERAGE REQUIRED SPREAD RATES. HIGH QUALITY STANDARDS WERE MAINTAINED, EXCEPT IN ISOLATED AREAS WHERE DEFICIENCIES WERE OBSERVED DURING THE MAINTENANCE PERIOD.





OCCASIONAL DIFFICULTIES IN CONTROLLING THE TEMPERATURE OF THE LIQUID ASPHALT AND THE FAILURE TO SCREEN THE AGGREGATE ARE EVIDENCED BY THIS PHOTO. AGAIN, THE RICHNESS OF THE MIX COMPENSATED FOR THIS DEFICIENCY AND THE STRUCTURAL VALUE OF THE PAVEMENT WAS NOT COMPROMISED.



TRAFFIC WAS NOT CONTROLLABLE DURING BASE PREPARATION AND COMPACTION. DISTRICT ENGINEER FAILED TO PROVIDE ADEQUATE SUPPORT.

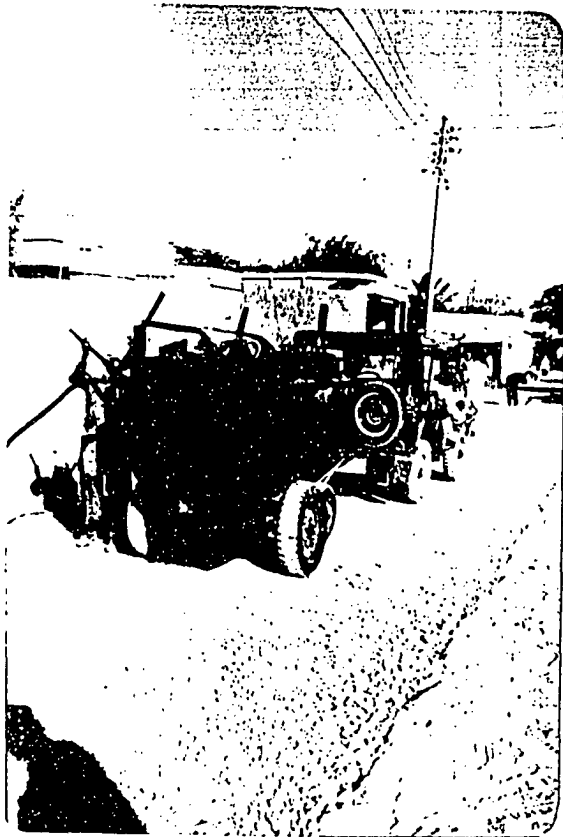




TRAFFIC WAS ALLOWED TO PASS OVER THE COMPACTED BASE PRIOR TO SURFACE DRESSING DUE TO THE HIGH COMPECTION STANDARDS THAT WERE MET, THE BASE MATERIAL WAS NOT DISTURBED.



RESIDENTS INTERFERED WITH NORMAL PROGRESS OF THE CONSTRUCTION. NEVERTHELESS, THE INSPECTION TEAM AND THE CONTRACTOR WERE ABLE TO PROGRESS AT A SATISFACTORY RATE, AND WITH FEW EXCEPTIONS, THE QUALITY WAS MAINTAINED THROUGHOUT THE PROJECT. IMPORTANT LESSONS LEARNED BY THE DISTRICT INSPECTORS ARE BEING INCORPORATED IN CCSC TRAINING PROGRAMS TO STRESS THE NEED FOR THE DISTRICT ENGINEER TO IMPROVE TRAFFIC CONTROL AND INCREASE THE AWARENESS AND INVOLVEMENT OF RESIDENTS DURING CONSTRUCTION WORK. PERFORMANCE STANDARDS WILL BE MODIFIED TO SUGGEST USE OF STANDARDIZED WARNING DEVICES AND PERHAPS TRAFFIC POLICE IN CONGESTED AREAS.



ASPHALT DISTRIBUTION  
EQUIPMENT IS SATISFACTORY  
AND PROVIDES FOR RELATIVELY  
UNIFORM DISTRIBUTION OF  
BITUMINOUS MATERIAL IN  
CONFORMANCE WITH  
SPECIFICATIONS.



TRAFFIC INTERFERENCE DELAYED  
APPLICATION OF AGGREGATE  
AGAIN RESULTING IN DEFICIENT  
TEMPERATURE CONTROL.  
REMARKABLY, THE QUALITY OF  
THE SURFACE TREATMENT WAS  
NOT VISIBLY AFFECTED.



PROPER CLEANING AND MAINTENANCE OF THE DISTRIBUTOR ARM AND SPRAY NOZZLES WAS SUPERVISED BY THE FIELD INSPECTORS. THIS

IS A SIMPLE, BUT VERY IMPORTANT MEASURE THAT MUST BE OBSERVED TO ASSURE PROPER DISTRIBUTION AND COMPLIANCE WITH CONTRACT SPECIFICATIONS. THESE TECHNIQUES ARE BEING INCORPORATED IN THE TRAINING EFFORT AND, AS SUPERVISING DEFICIENCIES IN DISTRICT INSPECTORS ARE UNCOVERED, CHECKLISTS ARE BEING PREPARED SO THAT THE MOST COMMON PROBLEMS CAN EASILY BE RECTIFIED.





RATE OF DISTRIBUTION OF AS-  
PHALT WAS PROPERLY  
CONTROLLED THROUGHOUT THE  
PROJECT. PHOTOS OF CRITICAL  
ACTIVITIES THROUGHOUT THE  
MANY PROJECTS ARE BEING  
COMPILED FOR TRAINING  
PURPOSES.



MATERIALS TESTING ON SITE  
AND IN THE LAB BY SOIL  
ENGINEER PROVIDED  
SATISFACTORY QUALITY CONTROL  
OF MATERIALS AND COMPACTION  
PROCEDURES. ON THE JOB  
TRAINING OPPORTUNITIES FOR  
DISTRICT INSPECTION STAFF  
WERE ALSO PROVIDED SO THAT  
FUTURE DISTRICT LEVEL  
PROJECT MANAGEMENT WILL BE  
IMPROVED.

SAMPLE FIELD INSTRUCTIONS

## FIELD INSTRUCTIONS



CONSTRUCTION CONTROL SERVICES CORPORATION  
R.R.M. Project

District Engineer  
KARACHI.

Book No. 92

Page No. 4651

Date 6/2/91 Time 11 AM

Name of Road Internal Road in Ibrahim Hyderi Road No. KA-6 District Karachi

Chief of Party (A) accompanied by C.C.S.C Engineer Mr. Munami visited the site of the project KA-6 on February 4, 1991.

The stone metal was being spread. Except a few Labourers, there was no responsible representative from the Contractor at site nor was there any overseer or sub-Engineer from the District Council.

It was observed that the size of the stone being spread was large. The specified size as you know is  $1\frac{1}{2}$  inch but the stone was mostly 4 inch to 5 inch size.

You are requested to please get the stone broken to the specified size. Also please depute a sub-Engineer at site so that the work is done as per specifications.

You will appreciate that this will be a show piece road and we can not afford any laxity in specification.

Final Copy  
Received By.

AMMAD

Date \_\_\_\_\_ Time \_\_\_\_\_

6/2/91

P.A for D.E (Karachi)

Signature

SAEED AHMAD

Name

SAEED AHMAD

Designation

C.O.P (A)

FIELD INSTRUCTIONS

Book No. 94



**CONSTRUCTION CONTROL SERVICES CORPORATION**  
R.R.M. Project

Page No. 4654

Date 7-3-91 Time 2:30

INTERNAL ROAD

Name of Road IBRAHIM HYDERI Road No. KA-6 District Karachi

TO:  
District Engineer  
District Council  
Karachi.

Sub: Rectification of defect on Internal Road  
Ibrahim Hyderi

During visit of the above road to-day on March 7, 91  
it has been observed at the chainage 0+300 km  
that the road is defective. Berm has no slope.  
Stone metal not compacted properly and loose.

You are therefore requested to instruct  
the Contractor m/s Mohd. Shah Khan Mandokhel to  
rectify the above defects at the earliest.

*Recd  
A.S.  
7/3/91 2:55 P.M.*

al Copy  
ed By. \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Signature [Signature]  
Name Engt. S. JAWAID NOOR

nal Office Copy  
ed By. \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Designation JDF

REPORT OF MAINTENANCE INSPECTION  
(KA-6)

MAY 20, 1991



Report of Maintenance Inspection - KA - 6 (20 May 1991)

- I. Preliminary inspection - Robert E. Katz, COP; Jawaid Noor, Design Engineer; Altaf Hussain, Section Officer, MLGRD.

A brief maintenance inspection of the above road was performed at 11:00 A.M. Traveling the road at a speed of approximately 20 KPH, the smoothness and comfort of the road was considered satisfactory. The following deficiencies were noted:

1. Two medium sized potholes, several small potholes
2. Several small depressions
3. A section of road evidencing moderate undulation, approximately 10 meters in length, in the last 100 meters of the project
4. Two sections of about 15m each near the middle of the project where raveling or superficial surface disintegration appeared to be occurring.

- II. Evaluation - John W. Hewett, Road Planner; Muhammad Tufail, Maintenance Engineer; Jawaid Noor, Design Engineer.

At approximately 2:00 P.M, under instruction of COP, the above team conducted a pavement evaluation for the purpose of quantifying deficiencies to be remedied by the contractor. The evaluation indicated the following:

- 1) Potholes:

Potholes were minor and did not indicate base failure. Surface patching (P-1) should be scheduled promptly to avoid further deterioration due to impact loads of heavy traffic.

- 2) Minor Depressions:

Minor depressions were barely noticeable at the low speeds permitted by the heavy traffic on this road. Traffic impact on these depressions should not be sufficient to cause further deterioration. Therefore, repair of these items should not be scheduled until after final maintenance inspection.

3) Moderate Undulation:

The 10m section of moderate undulation was visually evaluated and it was determined that there was no indication of base failure, i.e. failure was functional, not structural. The deficiency is considered minor and may be repaired by simple skin patch.

4) Surface Raveling:

One section where it was believed that surface raveling was occurring turned out, on closer inspection, to be nothing more than loose gravel and surface debris of traffic covering sound pavement with no defects. One section of pavement did evidence superficial raveling over a length of about 15 meters. This should be remedied by simple seal coat, after final maintenance inspection.

III. Conclusions:

The project was determined to be structurally sound with no evidence of significant deficiency in the performance of the contractor or the overall construction. Minor deficiencies were found which appear to have been caused by the limitations of the scope of the project, which were pointed out prior to and during the course of the constructions.

Specifically, the original drainage design of the old pavement structure was significantly deficient. This was discussed as an objection to accepting the project initially, since major drainage structure modification or new structural design and construction are beyond the scope of a normal rehabilitation project. The project was undertaken with the prior knowledge that these drainage deficiencies would cause localized pavement distress. The District Council adopted this project with full knowledge of this obstacle.

The surface raveling was probably caused by cooling of the bitumen over a very small area, between the first and second treatments, as the intensity of the distress is relatively minor, although it physically detracts from the appearance of the pavement, and, overtime, could lead to serious water penetration.

During the construction, work was frequently halted by residents and the District Engineer was unable to provide satisfactory traffic control, as documented in the CCSC construction file. Overall, this did not have a significant impact on the road quality except in the isolated instances noted above.

#### IV. Recommendations:

- 1) Traffic control requirements should be more strictly observed in future projects.
- 2) Construction in villages and on heavily traveled residential/commercial roads should be more forcefully discouraged when significant drainage deficiencies are apparent.
- 3) The potholes should be repaired immediately to prevent further deterioration.
- 4) The raveling and undulation repairs should be delayed until final maintenance inspection.
- 5) The quantity standard for pothole patching activities (P1 and P2) should be doubled for this road when preparing the estimated BOQ for the maintenance contract (1991-92 program).

REPORT OF ROAD INSPECTION  
(KA-6)

JUNE 02, 1991

25

June 02, 1991

REPORT OF ROAD INSPECTION (KA-6)

On 2 June, 1991, at approximately 2 P.M. a walk through inspection of KA-6 was undertaken. The following documentation, information, photographs of project during construction, photographs of walk through inspection, deficiencies noted and recommendations for remedial work are included.

1. INSPECTION TEAM

Robert E. Katz, COP; Jerry Dye, Construction Specialist; Mohammad Tufail, Senior Maintenance Engineer.

2. REPORT OF MAINTENANCE INSPECTION KA-6 (20 MAY 1991)

See attached 3 page report and CCSC cover letter to Mr. Hasan Masood, dated 21 May 91 (CCSC.ENG.0591-69)

3. PROJECT RECAP (02 JUNE 1991)

See attached file folder which includes a brief project historical and project progress photographs.

4. ROAD INSPECTION (02 JUNE 1991) PHOTOGRAPHS OF KA-6

See attached file folder.

5. COMMENTS

In general, the preliminary inspection (Report of Maintenance Inspection - KA-6, 20 May 1991), findings are concurred with except for the reference to surface raveling in paragraph 3 under III, Conclusions: After a detailed inspection, it was determined that either there was no second treatment of bitumen, or it was so lightly applied and covered with oversized material so that the road has an open first coat bitumen appearance. Superficial raveling was noted, but this is easily remedied.

6. CONCLUSIONS:

A detailed study of this project points to several areas of concern that were either totally overlooked or not addressed.

- a. Why did USAID allow the contract to be given or even considered, when there was prior knowledge of major deficiencies such as drainage which would cause permanent pavement distress?
- b. Why was the prime contractor allowed to subcontract 100% of his contract with the district engineer's approval as is the case of KA-6.
- c. Why was there an almost total absence of the district engineer or his designee from the project site during construction?
- d. The disappointing quality of work by the subcontractor and the monitoring of the project by ACE. In retrospect, maybe the project should have been placed on hold until the return of the expatriates.
- e. The insistence of proceeding with a project without regard to the traffic control requirements/problems.

RECOMMENDATIONS FOR REMEDIAL WORK:

- A) Areas having or displaying surplus bitumen should be burnt off with a propane torch and sand coated while still hot.
- B) All potholes should be patched immediately in accordance to the district engineer's instructions and specifications.
- C) Funds should be made available by the district council to correct the surface drainage of sewage water. It is advised that adequate under road drainage be utilized and completed prior to pothole patching, thus avoiding future traffic problems, improper repair of the existing road and shoulders.
- D) The entire length and width of the new road should be given the second bitumen treatment in accordance to the existing specifications, and extreme care be taken that the surface dressing aggregate is of proper size and designated coverage.

While the KA-6 project has presented many unique problems, i.e.; traffic, drainage, subcontracting, lack of supervision, etc., the project itself is structurally sound. However, remedial work must be complied with immediately not only to correct existing deficiencies, but also to bring the project up to the full standards and specifications for which it was contractually committed.

MAINTENANCE INSPECTION PHOTOS

JUNE 02, 1991



BEGINNING OF THE ROAD

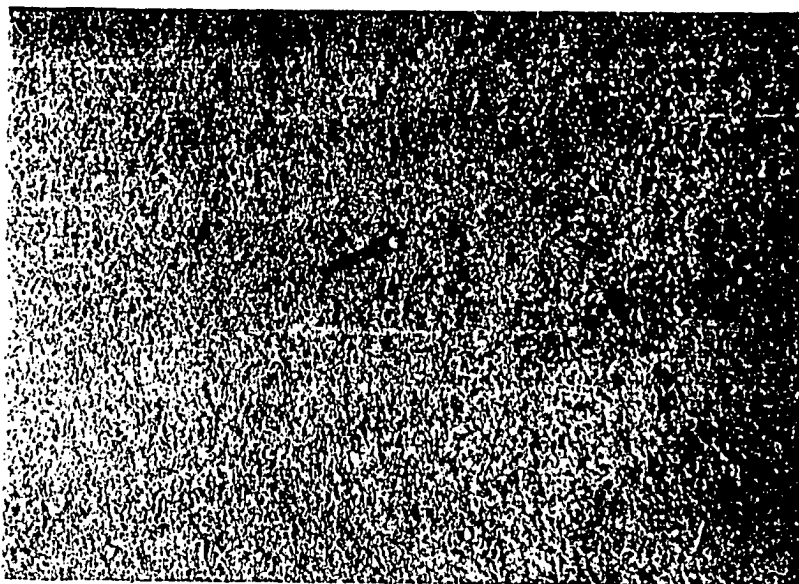


BEGINNING OF THE ROAD

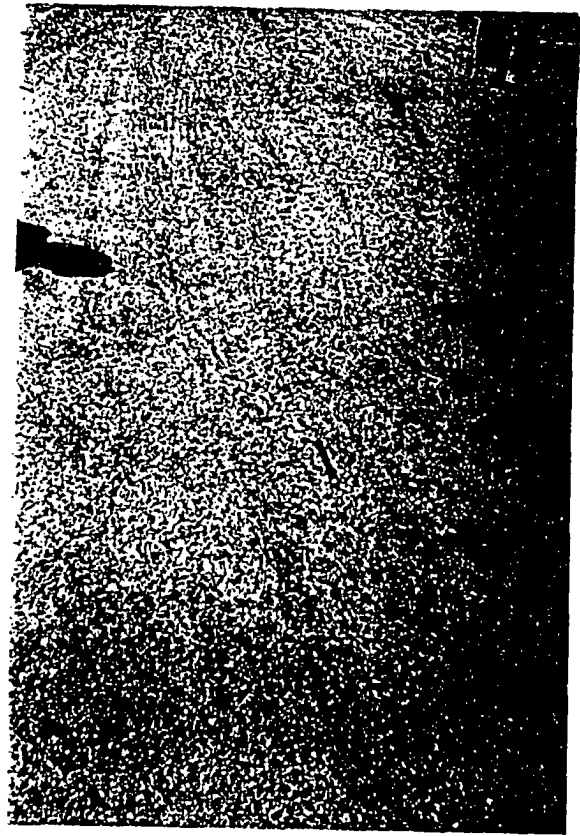




ROAD INSPECTION BY CONSTRUCTION SPECIALIST



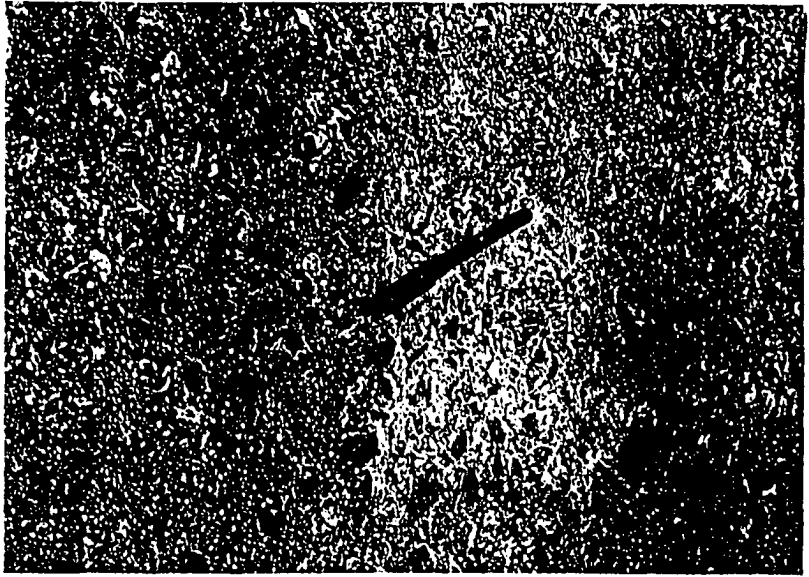
SURFACE OF THE ROAD (FIRST POINT)



SURFACE OF THE ROAD (FIRST POINT)



EXCESS BITUMEN ON THE SURFACE



SURFACE OF THE ROAD (2ND POINT)



SURFACE OF THE ROAD (3RD POINT)

32

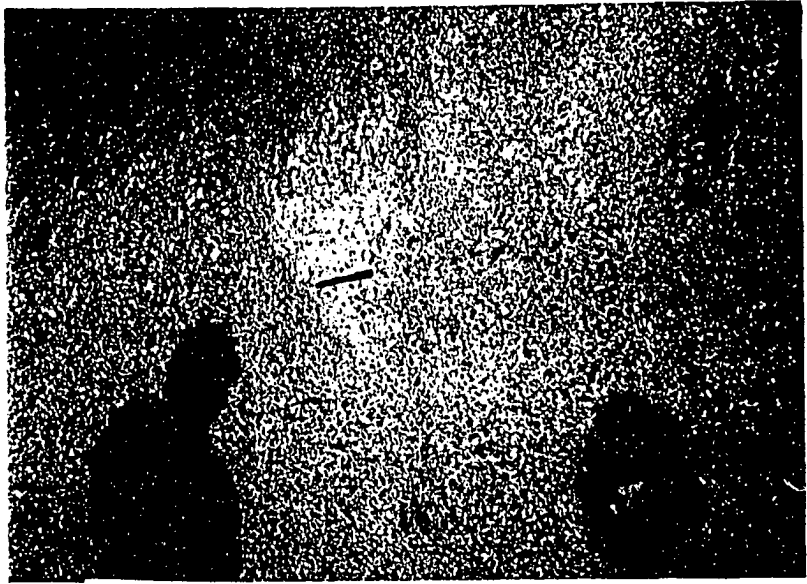


STONE EDGING

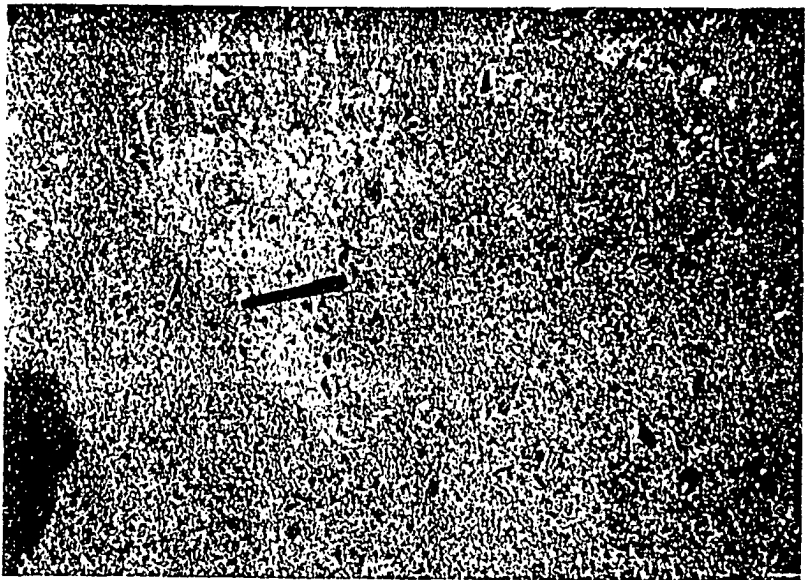


CONSTRUCTION SPECIALIST NOTING INSPECTION POINT

11



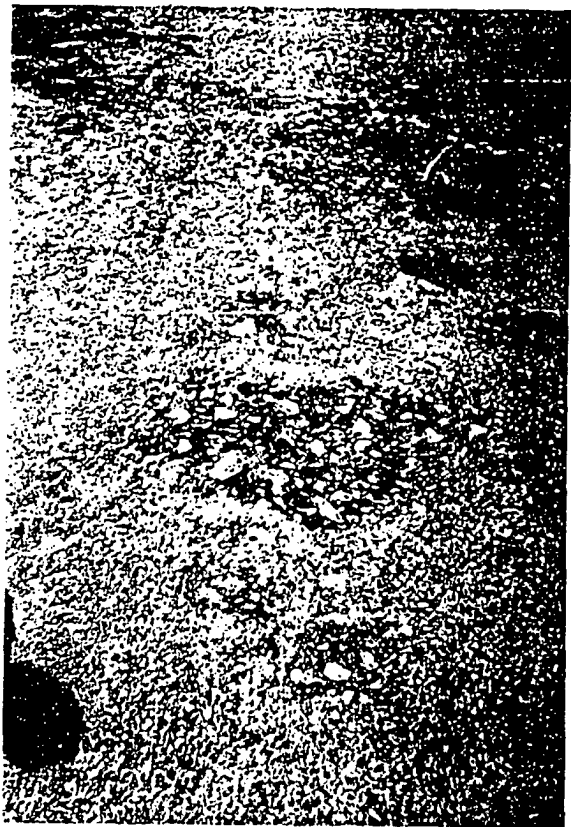
SURFACE OF THE ROAD (4TH POINT)



SURFACE OF THE ROAD (4TH POINT) (CLOSURE VIEW)



POTHOLES DEVELOPING DUE TO SEWERAGE WATER (CLOSE VIEW)





ROAD SURFACE IS BEING DAMAGED DUE TO SEWERAGE WATER



POTHOLE DEVELOPED DUE TO SEWERAGE WATER



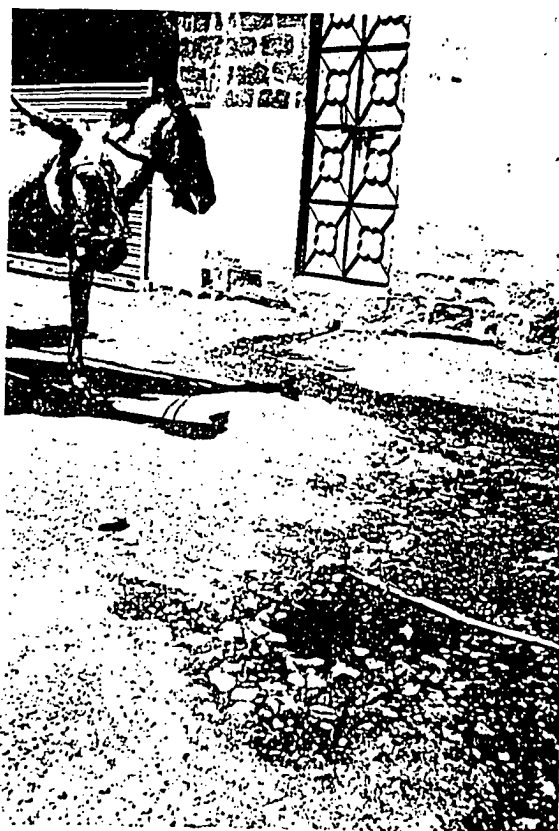
SEWERAGE WATER COMING ON SURFACE OF  
THE ROAD DUE TO NON-EXISTENCE OF DRAINAGE

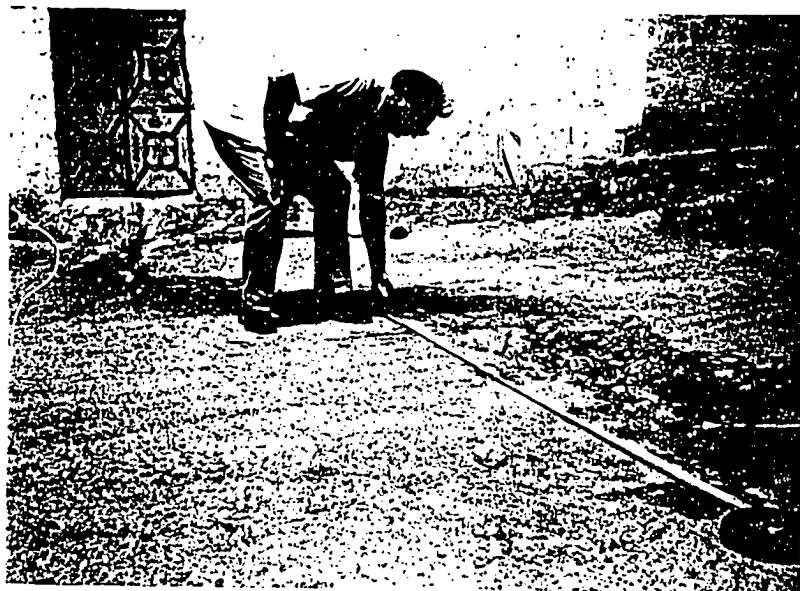




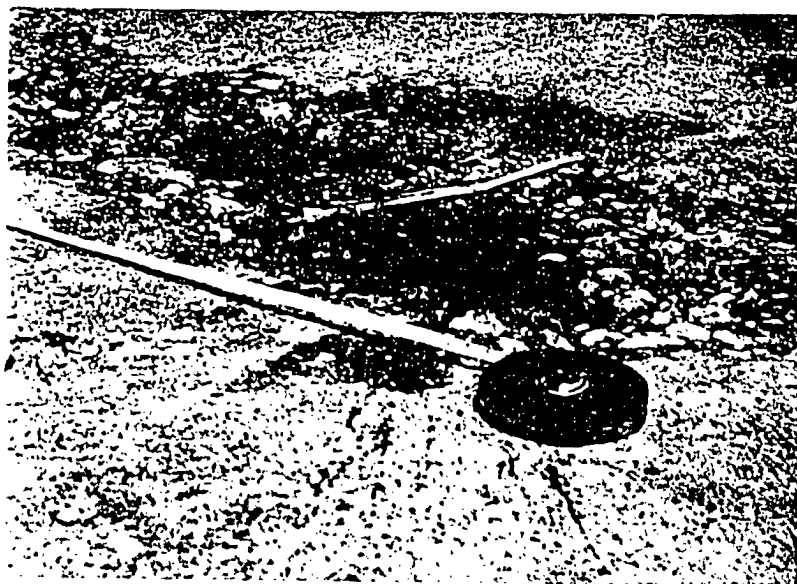


POTHOLE DEVELOPED DUE TO SEWERAGE WATER





ROAD SURFACE DAMAGED DUE TO SEWERAGE WATER





SURFACE OF ROAD IN GOOD CONDITION



IV - 17 STONE EDGING OF THE ROAD

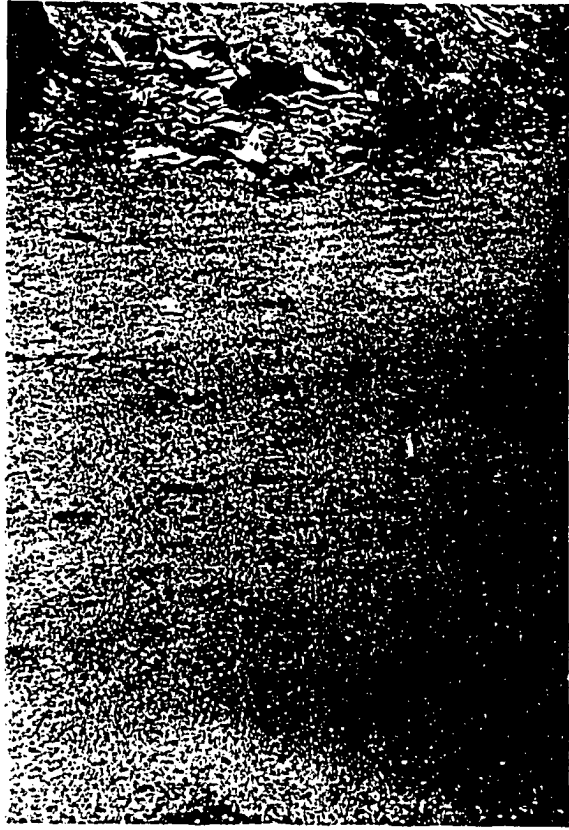
4/10



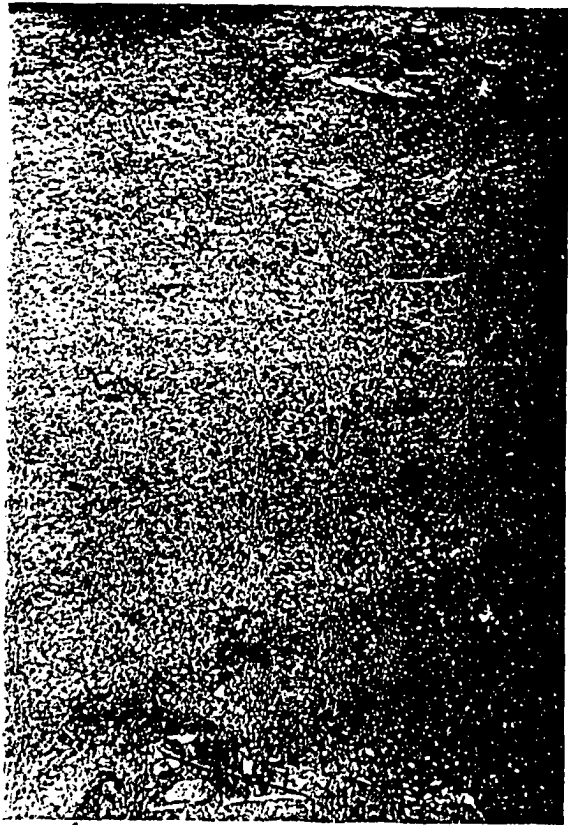
STONE EDGING OF THE ROAD



ROAD IS BEING DAMAGED DUE TO WASTE  
WATER COMING OUT OF HOTEL



ROAD SURFACE WITH EXCESS BITUMEN



420



SMALL POTHOLE ON ROAD SURFACE



STONE EDGING OF THE ROAD



CONSTRUCTION SPECIALIST INSPECTING  
SURFACE AT THE END OF ROAD

FINAL CORRESPONDENCE  
AND PUNCH LIST  
AT  
PROJECT COMPLETION

11/1





**CONSTRUCTION CONTROL SERVICES CORPORATION**

USAID CONSULTANTS FOR ROAD RESOURCES MANAGEMENT PROJECT

CONTRACT NO : 391-0480-C-00-8246-00

June 13, 1991

E.0691.

Mr. Dur Mohammad Mullah  
District Engineer  
District Council Karachi East  
Karachi.

Sub: END OF MAINTENANCE PERIOD REHABILITATION PROJECT KA-6-  
CONTRACTOR PUNCH LIST

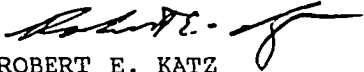
Ref: Meeting at CCSC office, 21 May 1991

Dear Mr. Mullah:

At the above referenced meeting, you stated that the contractor would perform all maintenance repairs required for release of final payment on this project and did not agree to bring the contractor to meet with us to discuss the deficiencies.

Attached is a copy of the punch list for this project, which I presume concurs with your independent observations.

Very truly yours,  
CONSTRUCTION CONTROL SERVICES CORPORATION

  
ROBERT E. KATZ  
Chief of Party

1/6



## CONSTRUCTION CONTROL SERVICES CORPORATION

USAID CONSULTANTS FOR ROAD RESOURCES MANAGEMENT PROJECT

CONTRACT NO: 391-0480-C-00-8246-00

### PUNCH LIST - KA- 6 RECOMMENDED REMEDIAL WORK

- A) Areas having or displaying surplus bitumen should be burnt off with a propane torch and sand coated while still hot.
- B) All potholes should be patched immediately in accordance with the District Engineer instructions and specifications, referring to RRMP maintenance manual.
- C) The entire length and width of the new road should be given the second bitumenous treatment in accordance with the contract specifications. Extreme care should be taken that the surface dressing aggregate conforms to the specification and application rate is controlled in accordance with designated coverage.

While the KA-6 project has presented many unique problems, i.e; traffic, drainage, sub-contracting, lack of supervision, etc., the project itself is structural sound. The remedial work, however, must be performed immediately not only to correct existing deficiencies, but to bring the project up to the full standards and specifications contractually committed to.

To assure that the road provides satisfactory service throughout its design life, it is recommended that the District Council immediately undertake the construction of adequate underground drainage in the areas where drainage outlets are impinging on the road surface. The Consultant stands ready at any time to provide technical advice in this regard. Immediate attention to remedying these drainage deficiencies will safeguard this important infrastructure investment.

LETTER OF MAY 27, 1991  
FROM COL. SHAHID HAMEED KHAN

REPORT OF ROAD INSPECTION  
(KA-6)

JUNE 19, 1991

IMMEDIATE

Tele: 811741 (0)

D. O. No. F.5-16/FRDEC/86.  
GOVERNMENT OF PAKISTAN  
Ministry of Local Government & Rural Development  
Federal Rural Development Engineering Cell



Project Director

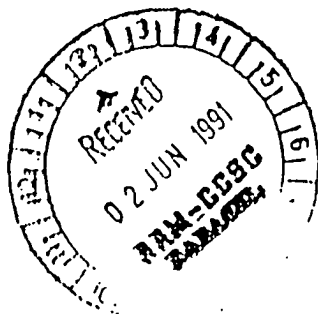
Islamabad, the 27th May, 1991

Subject: USAID ROAD RESOURCES MANAGEMENT PROJECT (RRMP).

Dear Mr. Gene V. George,

Lately, Mr. Altaf Hussain, an official of MGRD was deputed by Mr. Farouk Khan, Joint Secretary (R), to visit road No. KA-6 which has since been completed in Karachi East. The subject road was inspected by the said official alongwith Mr. Robert E. Katz and Mr. Javaid Noor. A report in this context has been received vide Project Office's letter No.ENG/RRM-120/91 dated 23rd May, 1991 a copy of which is also endorsed to you.

2. A scrutiny of the report reveals, that certain remedial measures are required which may be effected at the earliest so that the good quality of construction is maintained in the case of KA-6 also.



With regards,

Yours sincerely,

*Shahid Hameed Khan*


(Colonel Shahid Hameed Khan)

Mr. Gene V. George,  
Chief,  
Engineering Office,  
USAID, ISLAMABAD.

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Copy for information to:

1. The Joint Secretary (R), Ministry of Local Government and Rural Development, Islamabad.
2. The Director General, Rural Development Department, Government of Sind, Block No.89, Sind Secretariat (Opposite Assembly Building) Karachi.
3. Mr. Hasan Masood, Project Officer, USAID (RRMP), 1, Sindhi Muslim Housing Society, Karachi.
4. ✓ Mr. Robert. E. Katz, Chief of Party, CCSC, House No.43/10/F, P.E.C.H Society, Block-6, Karachi-29.

  
(Colonel Shahid Hameed Khan)  
Project Director



## CONSTRUCTION CONTROL SERVICES CORPORATION

USAID CONSULTANTS FOR ROAD RESOURCES MANAGEMENT PROJECT

CONTRACT NO: 391-0480-C-00-8246-00

June 19, 1991

E.0691.

Mr. Alvin Newman  
Chief, Engineering Department  
USAID, ISLAMABAD.

Sub: REPORT OF ROAD INSPECTIONS OF KA-6

Ref: D.O. NO. F. 5-16/FRDEC/86, LETTER DATED 27 MAY 91 FROM COLONEL SHAHID HAMEED KHAN

Dear Mr. Newman:

Enclosed are copies of reports of detailed inspection of KA-6 performed by the CCSC expatriate technical assistance team, along with pertinent excerpts from the construction file.

It is important to observe that, in the meeting of May 21, with Mr. Waseem Jilani and District Engineer Mullah in the CCSC Karachi office, the District Engineer stated that he did not supervise the project and he refuses to supervise construction of the rehabilitation projects that are designed and constructed under the RRMP. Neither USAID nor the consultant has been able to obtain the cooperation of the District Engineer. Our construction file, however, indicates that the District Engineer deputed an inspector to the site during construction.

Numerous instances of local interference with the project during construction forced the contractor to work under very difficult conditions without the support of the District Engineer. Since the construction took place without expatriate supervision (due to the evacuation), this project was supervised by the ACE staff stationed in Karachi.

Adequate testing was done during the construction, but without expatriate supervision and District Engineer support, the actual number of hours of direct inspection supervision during construction was less than optimal.

The final road construction, including base material, compaction, aggregate and bituminous material upto the completion of the first surface treatment met specification in all respects. The material brought to site for the second treatment was slightly oversize, but was accepted and, if properly applied, would provide satisfactory performance, although it would have been rejected by the expatriate staff because of its negative impact on the riding quality of the road and the difficulty that oversize aggregate creates for part-time inspectors who must determine the area covered by each bituminous surface treatment during construction.

### Conclusions

The road is structurally sound and, with the recommended remedial action, should provide satisfactory service throughout its design life, despite poor traffic control during construction and frequent work stoppages due to residents interference with the work.

The original drainage design of the old pavement structure was seriously deficient, but new drainage structures of the type necessary for a narrow village road like KA-6 are beyond the scope of RRMP rehabilitation projects. The project was undertaken with prior knowledge (over CCSC negative recommendation) recognizing that these deficiencies would cause localized pavement distress.

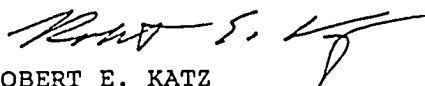
Inspection of failed pavement structure at potholes revealed that, at least in these areas, the second bituminous surface treatment had not been applied. Due to use of slightly oversize material, it is impossible (without destructive testing) to determine the exact pavement area that did not receive the second application. The observations of the ACE Engineers during construction, however, indicate that a second coat was applied and the deficient area is not typical of the construction as a whole. Nevertheless, excessive voids exist and the present distribution of material indicates that the net effect of the second application was to replace lost aggregate from first application. Probable cause is a combination of poor technique in filling voids in the base course, excessive dust in the granular material and excessive cooling of bitumen prior to each application of granular material.

Raveling previously noted is minor and easily repaired. The apparent cause was excessive dust in the material and over extension of asphalt in cold weather, which allowed the asphalt to cool excessively prior to application of granular cover.



The District Engineer, during the May 21 meeting, stated that the contractor would remedy all deficiencies. The recommended remedial actions have been supplied to the District Engineer on the standard punch list (copy attached), which is prepared prior to termination of the maintenance period at the close of each project.

Yours truly,  
CONSTRUCTION CONTROL SERVICES CORPORATION



ROBERT E. KATZ  
Chief of Party

C.C. Mr. Hasan Masood  
Project Officer  
RRM Project  
USAID, Karachi.