His Majesty's Government of Nepal
Ministry of Works and Transportation
Department of Roads

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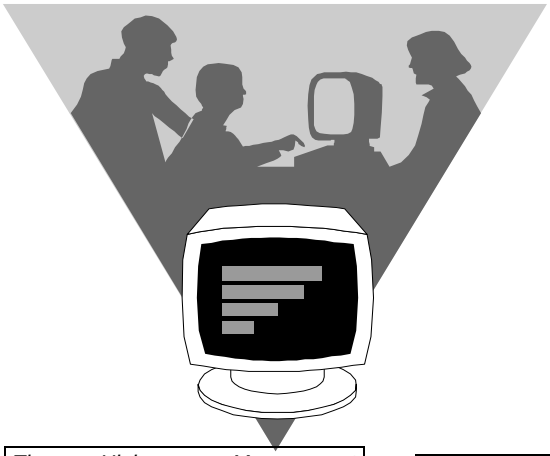
HMIS News

A NEWSLETTER FROM THE PLANNING BRANCH

EMG

Environment Management Guidelines For DoR

The Environmental policy of HMG was gazetted as National Environmental Impact Assessment Guidelines in 1993. The idea is to integrate the environmental concerns into the development process. The National Environmental Policy and Action Plan (NEPAP) was also issued by HMG in 1994 which called for formulation of sectoral EIA Guidelines for different line agencies of the HMG. The sectoral EIA Guidelines for Ministry of Industry and Ministry for forests and Soil Conservation is already gazetted whereas that of the Ministry of Works and Transport is in the form of final draft which needs HMG's approval for implementation. After the Road Sector EIA Guidelines is made effective and the road projects are environmentally assessed, there is a need of Environmental Management Guidelines to include environmental mitigation measures in the surveying, design, construction, and operation and maintenance of the projects.



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AHMP

Arniko Highway Project

rniko Raj Marg (ARM) with the total length of 114,5 km connects the capital city Kathmandu with the Tibet Autonomous Region of China. It was built in 1960's with the assistance of China. Being the only link for trade and transit to China this highway has its own importance both economically and politically.
The Arniko Highway Maintenance Project was formulated on 1992 with the main objectives of improving the condition of ARM through proper maintenance and rehabilitation, and also, to promote the local construction industry by providing opportunities to only local contractors and consultants. Swiss Government has contributed in the fiorm of grant assistnace 80% of the total rehabilitation cost and 100% for the Technical Assistance, Trainings and Equipment. The Technical Assistance from Swiss Government is realized through ITECO- CH the Foreign Consultant appointed for this project.
The project has been planned to be implimented on phasewise basis.
PHASE I (Oct 1992 to Dec 1995)
In the Phase I, rehabilitation works of Dhulikhel(CH:30+000 km) -Dolalghat(CH:57+000 km) sector has been completed:

1. Road Pavement Works

Consultant	Silt/Mulit/Soil Test JV (Design/Supervision)
Contractor	Gaura/Nepal Singa JV.
Pavement width	5.50 m to 6.00 m
Sub base	Crusher Run Material
Base	Crushed Stone Base\Emulsion Aggregate Mix.
Surface	DBST/SBST

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AHP Project ..... (*cont'd from page 1)*

2. Road Corridor Works

Consultant - Iteco-Nepal/Cemat/Geoce JV
Contractor - Shrama & Company.

The road corridor works mainly included construction of roadside drains of 24 km length, road side structures, landslide stabilisation works, river training works along the bank of Cha Khola. The bio-engineering works were also carried out engaging small village based contractors.

3. *Maintenance*

The Routine, Recurrent, Preventive, Periodic and Emergency maintenance in ARM were carried out through the Division Road Offices (DROs) viz. Charikot and Bhaktapur. Engineers from DROs were involved in all maintenance activities of the Project. Besides the conventional force account methods, lengthmen and lengthmen contract were used to carryout the routine maintenance works.

Phase II

The Phase II of the Project has started from January 1996 and will be completed by the end of 1998. In this phase the maintenance and rehabilitation works of *Dolalghat*(CH:57+000 km) - *Barabise* (CH:88+861 km) Sector including *bridge* at Dolalghat will be carried out.

The project has appointed two local consultants for the road rehabilitation works as :

1. Geoce/Cemat/Iteco-Nepal JV as Design Consultant
2. Silt/Soil Test/Multi Jv as Engineer for supervision of works.

Rehabilitation works are divided into two contract packages - one for Road Pavement Works including road side structures, and the other for Off-Road Works including rivertraining works. Both of the contracts were awarded on 20th May, 1996 :

1. *Contract AHP 02/01: Road Pavement Works* to M/s Amar / Prakash / Super Sherpa JV
2. *Contract AHP 02/02: Off Road Works* to M/s Rasuwa Construction Company

Both the contractors have already commenced the works. The total works of the contracts are scheduled to be completed by *September, 1998*.

ENVIRONMENT MANAGEMENT*(cont'd from page1)*

Road Maintenance and Rehabilitation Project (RMRP) has a component on Strengthening of Environmental Unit of the DOR. As a part of this program, to enhance the capacity of the DOR, Environmental Management Guidelines (EMG) for DOR is recently prepared. The preliminary draft of these guidelines was presented in a seminar on June 24, 1996 jointly organized by GEU/DOR , National Planning Commission and the IUCN. The preliminary draft was thoroughly discussed by a number of representatives from different line agencies of the HMG and draft EMG is now prepared by incorporating the useful comments raised and proposed in that seminar. Since, the EMG was prepared under RMRP's Environmental Unit Strengthening Program, it is now sent for the World Bank's formal comment.

The EMG has pointed out procedures for incorporating environmental mitigation measures suggested by the Environmental Screening which may be just a preliminary project specific environmental screening, or an IEE (Initial Environmental Examination) or a full EIA. The EMG consists of type of activity and its anticipated environmental issues, suggestions for mitigation measures, contract clauses where this mitigation measure could be included, and indicators for monitoring of construction as well as post construction environmental issues pertaining to the type of activity and its anticipated environmental issues.

The EMG is actually a step-by-step working procedures for incorporating environmental concerns into the implementation of the project. However, it needs approval of the HMG before it goes into the general conditions of contract for road projects.

The copies of the EMG are available in the GEU for reference.

WHAT IS THE RSSDU DOING ?

Although many colleagues have directly benefited already from participating in all sorts of training activities organized or coordinated by the ROAD SECTOR SKILLS DEVELOPMENT UNIT (RSSDU) since it became fully operational in late 1994, not everybody in the DOR may be aware of the Unit's actual twofold mandate:

- Improving the DoR staffs capabilities through organized training activities both in country and out- of- country(HRD)
- Contributing to improvements of the working environment

As a first step towards systematic Human Resources Development the RSSDU has started to collect data on formal qualification, areas of specialization, previous postings, in-service training already completed, etc. of all DoR employees. A substantial number of the record cards from officer level staff had already been returned, duly filled. With no response from an estimated 1200 employees, data collection is far from complete. However available data have already been entered into the RSSDU's data base and can be processed and interpreted in various ways with the help of a dedicated software.

All colleagues are welcome to visit the RSSDU for a demonstration of the system's capabilities. This will also give them an opportunity to check, approve or, if necessary, correct and update the information which is stored about them.

A major day to day activity of the RSSDU is the co-ordination and administration of all training activities which includes the following aspects:

- Training needs analysis
- Identification of courses and training providers
- Ranking of potential recipients of training awards for the purpose of selection by the authorities concerned
- Nomination of the employees selected
- Monitoring of the progress in the course of programme
- Evaluation of the programme

In order to make the selection for overseas training awards as fair and transparent as possible RSSDU has drafted detailed selection criteria. The draft provides guidelines on aspects like eligibility for nomination, types of training programmes for different target groups, the returnee's commitment to work in the sections or projects where the knowhow gained from the training can be applied and others.

A decisive aspect of the selection process is the ranking of potential candidates, which of necessity has to be based on the information made available in the form of bio-data record cards. Those colleagues who have, for one reason or another, not yet submitted the cards to the RSSDU could, some time, be excluded from the list of potential candidates due to lack of information needed about them.

The RSSDU has also developed "Training Needs Specification and Performance Appraisal" forms and distributed them to all the sections of the Department and also to the field offices with the request to complete the forms and return them to the RSSDU within the month of Shrawan 2053. Only few of these forms have been received back duly filled till now with respose from many units still awaited.

Another aspect RSSDU is addressing is the improvement of the working environment of the DoR. Towrds this end a workshop was held in January 1996 at Kurintar. The workshop realized that there exist many factors which negatively influence the working environment but are beyond the reach of the DoR to rectify. However, there are also many aspects which, if addressedproperly, could contribute to improving the working environment and consequently output of the Department.

The participants analysed only those problems and causes which seemed internal to the department and possible to address. Even these are not as easy to solve as it seems. Appropriate strategy and pragmatic actions with in a time frame was suggested. High emphasis were given to the institutionalization of periodic meetings to facilitate cooperation and coordination. All colleagues are welcome at the RSSDU to study the

recommendations of the workshop and contribute suggestions of their own.

STRENGTHENED MAINTENANCE DIVISIONS

One of the key objectives of the DoR strategy is **"Improved Maintenance Operations".** Various policy options were chosen to meet this objective including the improvement of routine, recurrent, and emergency maintenance and roadside support in the divisions. In order to implement this policy option the main efforts of the DoR are concentrated on the Strengthened Maintenance Division (SMD) process.

Many in DoR are very much aware of what SMD entails. However, there are others who may be somewhat confused about what the process means and what is involved. Therefore in this article we shall first explain the SMD concept and then take a brief look at its implementation.

The SMD concept adopts the process approach to institutional strengthening, working entirely within the DoR institutional framework. The immediate objective is to develop a planned maintenance capacity in a few divisions, called SMDs, and to gradually increase the number of division involved in the process, at DoR,s own pace, until all divisions are covered. Establishing planned maintenance in the SMDs is part of the change management process in the DoR which is moving from a response type management style to **management for control** which involves planning at all levels within the department including division level.

Planned maintenance leads to more effective and efficient use of divisional resources of labour, materials, and plant and vehicles, prolongs road life and gives a better service to the road user. Planned maintenance entails deciding beforehand on :

- **What** is to be maintained ;
- **How** it is to be maintained ;
- **When** it is to be maintained ;
- **Who** is to maintain it ;and
- **Evaluating** the effectiveness of the maintenance once completed.

In order to carry out these planning steps each SMD will need the necessary information to make decisions. Therefore each SMD must establish a divisional road inventory, be aware of road condition and traffic levels, must be familiar with maintenance costs, and must divide the division's roads into control sections, with definite priority for funding, which are assigned to individual overseers for maintenance purposes. Record keeping and costing assume far more importance as they are essential for the preparation of a "needs based budget" which is a central part of the SMD process.

It should not be forgotten that the SMD is a process and not a project. The division chief and his staff will establish the most suitable planned maintenance system themselves with support from DoR HQ and from Swiss Development Cooperation (SDC). It is vital that the SMD process is **sustainable** and that it is not developed in an artificial project environment but rather in the normal DoR working environment and within the framework of existing HMG and DoR rules and regulations. No shortcuts through normal procedures are allowed in order to improve short term progress.

SDC supplies to each SMD some tangible support to improve the working environment, improve moral, and facilitate movement around and division and so improve supervision. This support includes :

- Repair or supply of Supervision vehicles e.g. pick-up and motor cycles.
- Repairs and decoration of divisional offices and some repairs of residential quarters.
- Refurbishment of divisional offices.
- Repair and/or supply of equipment and plant e.g. wheelbarrows, rollers, tractors and trailers.

SDC has allocated between four and five million rupees for expending on each SMD in its first year of existence. Funds are also available for the repair and refurnishment of regional offices. After receiving the initial logistical support from SDC in their first year the SMDs are expected to maintain buildings, vehicles, plant, and equipment as best they can using existing DOR funding and facilities.

Besides improving the physical working environment, SDC also gives continuing technical advice and training to each SMD for up to four years (or longer if required) after it is chosen as an SMD. The support can take the form of overseas training courses, or "on the job" training at all levels. MRCU has appointed a local consultant as a Maintenance Management Adviser to work full time with the SMDs to help them improve their management practices. The DoR is committed to giving preferential treatment to the SMDs as regards maintenance funding and general support.

PROGRESS TO DATE :

Two divisions i.e. Bharatpur and Lalitpur were chosen as the first SMDs in financial year 1993/94. Four more divisions i.e. Butwal, Lahan, Nepalgunj, and Pokhara were included in the SMD process in Financial year 1994/'95. The next year was a year of consolidation when no extra divisions were added but this financial year 1996/'97 has seen the entry of three new SMDs i.e. Charikot, Shivpur and Tribhuvan Nagar.

Although there is still some way to go before planned maintenance can be said to be established in the existing SMDs there are obvious improvement to be seen in the level of maintenance on the roads. Routine maintenance in particular is very much improved and lengthmen, who are responsible for 3 km of road in hilly areas and for 4 km to 5 km of road in the Terai, have made a noticeable contribution and can be seen working effectively in all SMDs apart from the three new ones. Substantial backlog maintenance works have been carried out and now efforts are being concentrated on planning and implementing on the basis of the records of land slides and road closures which occurred in the last monsoon.

It is expected that a few more divisions, including Bardibas and Hetauda, can be included in the SMD process next year. The main criterion for the inclusion of divisions in the process is the length of maintainable road i.e. road in "good" or "fair" condition according to the results of the SDI road condition survey, which each division has. The rate of expansion of the SMD process depends on the rate of progress in existing SMDs and capacity of DoR to expend more time and effort on the programme.

As we are aware, the capacity of the DoR is very stretched at the present time. The department is committed to supply staff and staff time to numerous projects and the divisions are somewhat overloaded with construction projects, many of which are on district roads, this unfortunately, is not the ideal environment of increasing our commitment to implementing planned maintenance on the strategic road network. Nevertheless we must not lose sight of our main goal which is to maintain the strategic road network so as to **reduce total road transport costs** (which include construction, maintenance and road user costs).

It is also worth nothing that the toll road policy is linked closely to the SMD process. It is planned to increase the length of toll road on the strategic network to over km 600 during the next four years. It is our intention to charge the road user a toll fee and in return provide a better level of road maintenance. If it is to be sustainable, we can only provide the better level of service through the SMD process.

MORE LATEST NEWS

1. Eight engineers from DoR have completed customized Bio-Engineering training course. Next course starts in September.
2. GEU has already completed Standard Specifications for Bio-engg. works which is going to be distributed soon.
3. A seminar was organized for the presentation of Interim report of the PIP project. Concerns were raised about the methodology used for the 10 years Priority Investment Plan being prepared.
4. PIP has arranged a training programme to train engineers from DoR, MLD and NPC on using GIS in road network planning.

MAINTENANCE BUDGET ALLOCATIONS

1. **Budget Allocation Rationale**
   This year the DoR budget allocations to the maintenance divisions has been decided on the basis of a rationale which takes the following criteria into account :
   - Traffic levels
   - Road condition
   - Terrain type
   - Road length to be maintained
   - The budget allocation to DoR from central government.

2. **Budget Headings**
   The allocations are made under five broad headings :
   - Routine Maintenance (Regular budget)
   - Recurrent Maintenance
   - Road-side Support
   - Emergency Maintenance
   - Flood damazed Maintenance

2.1 Routine Maintenance

The routine maintenance allocations are generally made according to strategic road lengths in the divisions. Priority is given to SMD in fund allocation

2.2 Recurrent Maintenance

Heavily trafficked roads have been given priority in the recurrent maintenance allocation since there is a higher economic return from maintaining those roads than from maintaining lightly trafficked roads.
The results of the most recent road condition surveys carried out on the strategic road network have been used to classify road sections into "good", "fair", and "poor" road condition. Roads in "good" or "fair" condition have generally been given priority of funding over roads in "poor" condition on the basis that it is important to prevent roads in "good" or "fair" condition deteriorating to "poor" condition through lack of maintenance and thus avoid the high cost of rehabilitation. Roads in "poor" condition are generally in need of rehabilitation or even reconstruction and there is little return from spending recurrent maintenance funds on them unless they are heavily trafficked.

2.3 Road-side Support Maintenance

The road-side support allocations are made on the basis of traffic levels and terrain type. Roads in hilly areas are given more funding than roads in the Terai and in keeping with the DoR policy of "Affordable Risk Management", more funds have been allocated to heavily trafficked roads than to lightly trafficked roads.

2.4 Emergency Maintenance & Flood damazed Maintenance

The allocations were made on the basis of flood damaged assessment done by maintenance branch.

3. **Use of the Budget Allocations by the Divisions**
   The budget allocations were made on rational basis as set out above. It is therefore vitally important that the expenditure is also made on the same rational basis. In a nutshell, the division chiefs should concentrate therefore efforts on the most heavily trafficked roads which are in "good" and "fair" condition.

   Traffic density and road condition information is available from the Planning Branch.

RECOMMENDED ACTIVITIES TO BE CARRIED OUT UNDER PAVEMENT RECURRENT MAINTENANCE BUDGET

The main objective of the recurrent maintenance to make the service life of the pavement longer and to keep the road in proper condition so that VOC could be minimum

Various types of treatment are carried out while performing maintenance activities, and the better results could be achieved only in proper selection and prioritisation of various maintenance activities in the given road.

As during the distribution of the budget great importance was given to various preventive types of treatment to be carried out in the pavement in good and fair condition, while for the roads in poor condition the budget required for making the roads in reasonable motorable condition was considered. So if the budget allocated will only be spent on pothole patching of the poor roads, the planned result will not be achieved. Its more cheaper and economical in long term to seal 6 sq.m. of roads with minor cracks than to spend on 1 sq.m. of potholes in the road which will need reconstruction . So the recommended types of maintenance activities is listed below in priority basis.

Treating Bleeding

1. Coarse sand / chipping over 6 mm size scattered over effected surface preferable during sunny hot afternoon or after preheating sand/chipping to 600C.
2. Coarse sand/chipping is spread by a broom so that surface is evenly covered.

Local Sealing

1. Sweep the area. The surface must be clean and dry
2. Mark the area to be repaired by a brick piece or chalk
3. Spread bitume(cut-back/emulsion) using watering either at the rate of 1.5 kg/sq.m. of bitumen emulsion or 1 kg/sq.m of cut-back bitumen
4. Distribute aggregate
5. Chipping (6-10 mm size) when dealing with local surface repairs. Chipping should be compacted

Crack sealing using Slurry

Closely spread cracks

1. 1.Sweep the area clean and dry
2. Mark the area to be repaired
3. Slurry is prepared by mixing bitumen emulsion with sand in a wheel barrow
4. Sand - 20 lt. Emulsion - 6 lt.
5. Material may be spread approx.5 mm thick over the whole of the marked out area and not in a thin layer

Treatment of Isolated line cracks

Filling cracks with hot bitumen/cutback bitumen

1. Sweep the area
2. Distribute bitumen to follow line of crack
3. Distribute sand using shovel

Patching is used to repair

- mesh cracking
- Ruts and depressions
- Edge, subsidence and rutting
- Pot holes
- Edges surface failures
- shoving

Four steps are involved

1. Marking of the area to be repaired
2. Excavation area to be repaired
   These steps are necessary to
   a) remove all material from the marked out area
   b) increase the depth of hole until firm material is found then dress the walls of the hole so that they are vertical
   c) dress the bottom of hole such that it is flat and horizontal and then compact it
3. Back filling the hole with selected well graded material of base layer to be repaired
4. Completion and Removal of temporary sign

Please note that the quantity of material given Is only approximate and it is recommended to follow the norms to finalize the specifications for the given work.