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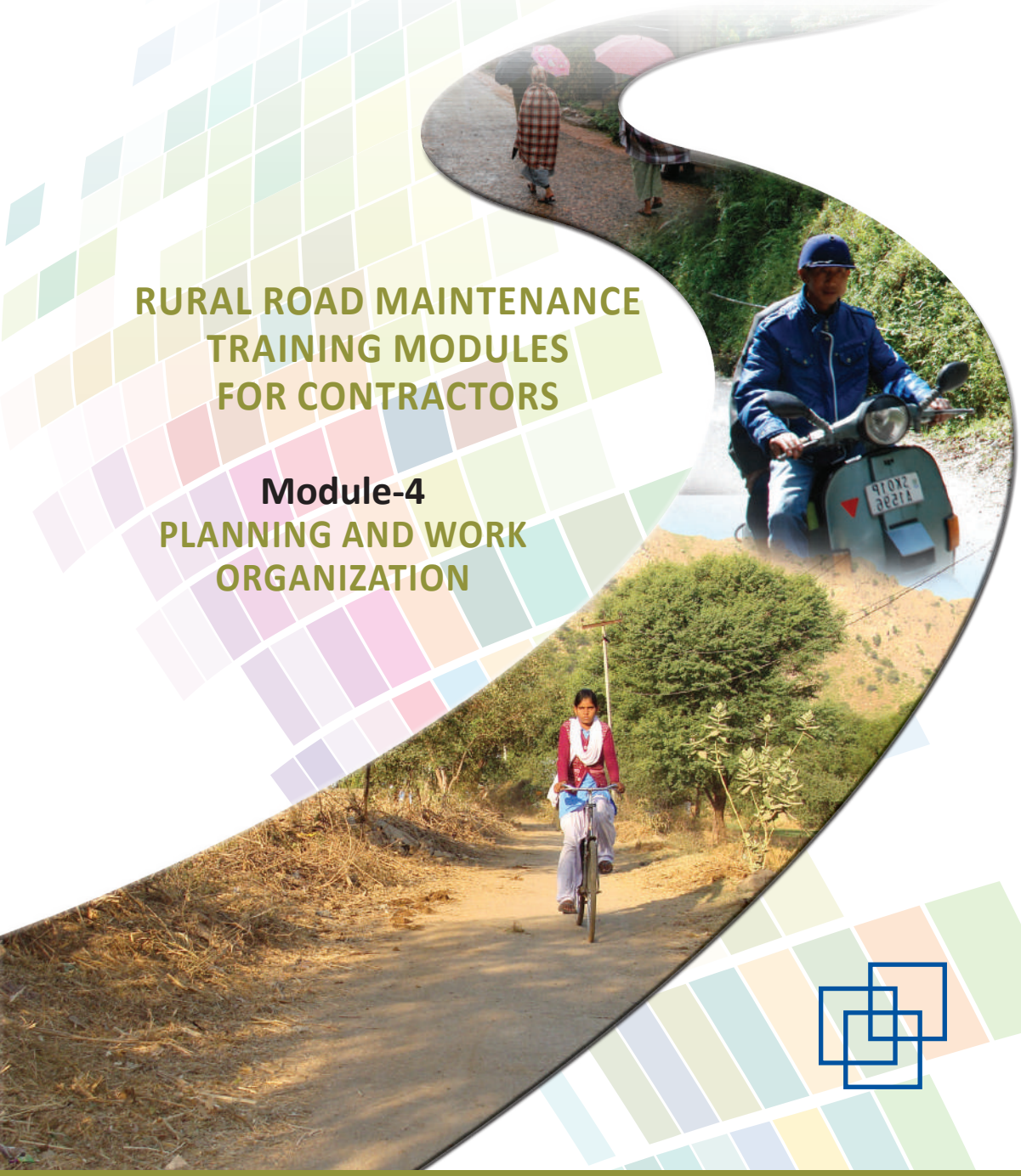
MINISTRY OF RURAL DEVELOPMENT



RURAL ROAD MAINTENANCE TRAINING MODULES FOR CONTRACTORS

Module-4

PLANNING AND WORK ORGANIZATION

Ministry of Rural Development

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Module-4

Planning and Work Organization

This training module is produced through a collaborative effort between the International Labour Organization and the National Rural Road Development Agency under the technical assistance component of the World Bank supported Rural Roads Project-II of Pradhan Mantri Gram Sadak Yojana Project (PMGSY).

Contents:

- Task system
- Work schedule
- Recruitment of labour
- Roles and responsibilities
- Work organization at site
- Monitoring

Learning Objective:

At the end of this Module you are expected:

- To be able to assess the impact of planning
- To be able to develop tools for planning, reporting and control of maintenance works
- To be able to plan and organize their maintenance works in a systematic and efficient manner

Acknowledgement

The following publications were also used as reference materials:

- Managing Maintenance of Rural Roads in India, ILO/NRRDA, January 2015
- A Practitioner's Guide to Rural Roads Improvement and Maintenance, International Labour Organization and Government of Ghana, 2014
- Guide: Employment-Intensive Infrastructure Programmes: Labour policies and practices, David Tajgman and Jan de Veen, Geneva, International Labour Office, 2000
- Guide: Employment-Intensive Infrastructure Programmes: Capacity Building for Contracting in the Construction Sector, Peter Bentall, Andreas Beusch and Jan de Veen, Geneva, International Labour Office, 2000

Foreword

Pradhan Mantri Gram Sadak Yojana (PMGSY), was launched in December, 2000 as a special intervention of the Government of India with the broad objective of ensuring sustainable poverty reduction. The scheme aims to provide good quality all-weather single connectivity to every eligible habitation. Rural roads are a state subject under the Constitution and as such are the basic responsibility of the states. However under the PMGSY, the construction of good quality and well-engineered roads are fully funded by the central government. Maintenance of these roads is the responsibility of the states. The year 2013 saw the launch of PMGSY-II with the objectives of consolidating the existing rural road network and upgrading existing rural roads that provide connectivity to rural growth centres. PMGSY-II envisages sharing of construction costs between the Centre and the states with maintenance costs continuing to be funded fully by the states.

Over the last 14 years, the PMGSY has carved out a place for itself as a programme characterised by creation of good quality assets, effective management and technical proficiency by the National Rural Road Development Agency (NRRDA), along with capable state road agencies. For implementation and operations, the involved agencies have been supported with detailed documentation in the form of programme guidelines, an operations manual, standard bidding documents, specifications, a standard data book, a procurement and contracts management manual and the Quality Assurance Hand Book with support from the Indian Roads Congress. These documents have also contributed significantly towards effective implementation of PMGSY and even for mainstreaming good practices in other rural roads programmes being executed by the states from their own resources.

An area of concern has been lack of regular maintenance as per the “Programme Guidelines”. However, in recent years, there has been increased awareness and commitment to maintenance by the states. The tempo needs to be sustained and further accelerated.

Under the technical assistance component of the World Bank supported Rural Roads Project-II, the International Labour Organization (ILO), in collaboration with NRRDA has prepared a manual “Managing Maintenance of Rural Roads in India”. This initiated the execution of maintenance works and the development of these training modules for engineers and contractors associated with rural road maintenance works. To strengthen such activities in the participating states of RRP-II, a series of training of trainers workshops were arranged at national and state level based on the course material developed.

The training modules broadly cover the principles for maintenance management of rural roads, planning and execution of common maintenance interventions to ensure reliable transport services and safety to users and the local communities served by the rural roads, and arrangements for monitoring the performance of contractors engaged for the task.

I would like to acknowledge the support of all those associated with the development of these training modules, especially the ILO and its technical assistance team, Mr. Htun Hlaing, Mr. Bjorn Johannessen and the project's Rural Roads Maintenance Engineers. I would also place on record the valuable suggestions of my colleagues Ms. Manju Rajpal, IAS, (ex Director – RC), Mr. R. Basavaraja, Director NRRDA, Mr. S. S. Bhatia, Deputy Director, NRRDA, Mr. A. K. Sharma, Consultant World Bank and senior engineers as well as secretaries from State Governments in bringing the document to its present shape.

I sincerely believe, the training modules would be found useful for the states in their efforts to secure adequate maintenance of all rural roads, not merely the PMGSY roads and improve maintenance practices so that benefits of access continue to remain available for our rural people on a sustainable basis.

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JS (RC) & DG, NRRDA
Ministry of Rural Development
Government of India

October, 2015

Introduction to Training Modules

The purpose of this training manual is to provide technical management staff and contractors with appropriate guidelines for the effective management of road maintenance works. The training modules are based on the manual "Managing Maintenance of Rural Roads in India". These modules broadly cover the principles for maintenance management of rural roads, planning and execution of common maintenance interventions to ensure reliable transport services and safety to users and the local communities served by the rural roads. The arrangements for monitoring the performance of contractors engaged for the task are also covered in these modules.

This manual is broken down into the following categories composed of different modules:

Module 1: INTRODUCTION

Module 2: TECHNICAL CONSIDERATIONS AND IMPLEMENTATION ARRANGEMENTS

Module 3: CONSTRUCTION MEASUREMENT AND BASIC CALCULATIONS

Module 4: PLANNING AND WORK ORGANISATION

Module 5: APPROPRIATE SETTING OUT TECHNIQUES

Module 6: HAND TOOLS, EQUIPMENT & CONSTRUCTION MATERIALS

Module 7: ROUTINE MAINTENANCE WORK METHODS

Module 8: OCCUPATIONAL HEALTH & SAFETY, ENVIRONMENTAL ISSUES AND DECENT WORK

Module 9: COSTING AND TENDERING

The trainer may decide to conduct a full course consisting of all the nine modules or may selectively conduct specific modules depending on the needs of the target group.

As a general advice the trainer should:

- **Encourage active participation**

  There is sometimes a tendency of the trainer to act like a teacher in school and to read or lecture directly from the course material. This behaviour should be avoided. Trainees remember information better if they participate actively in discussions and if there is a free exchange of views and of questions between everyone participating in the course.

- **Guiding the discussion**

  There are times during a discussion when everyone wants to speak at the same time. When such situations arise, the trainer should insist that the group listen to one person at the time. If one speaker hijacks the floor too long, the trainer needs to interrupt, pointing out that other participants may also want to speak.

- **Listen attentively**

  Equal attention should be paid to each speaker. Listen attentively and let the speaker understand that ideas and opinions expressed are both interesting and relevant. It is sometimes useful to take a brief note of participants' suggestions while they are speaking, noting them down on a flipchart or blackboard. A summary of these notes may prove useful for later discussions.

- **Emphasise important points**

  Each time the participants make an important point or expresses an interesting opinion, the trainer should draw the group's attention to it by repeating the idea in simple terms which are understood by the majority of the trainees.

- **Preparing the sessions**

  When trainees only listen to a description of how a particular job should be done, they are likely to forget what they heard. If however, they actually carry out the task concerned, they will remember how to do it. For this reason, every effort should be made to include as many practical exercises and demonstrations as possible, be they carried out on the worksite or in the training room. Practical sessions should always be carefully planned in advance.

- **Recapping**

  A discussion is more than just a conversation. A subject is discussed with an aim in mind. It may occasionally be worthwhile recapping the topic considered and recalling the aim of the discussion by intervening from time to time to give a brief summary of the main points dealt with so far.

- **Questioning**

  An important role of the trainer is to ensure that the atmosphere during training is sufficiently relaxed to allow participants to feel at ease to speak freely. Questions set by the trainer should not be regarded by the trainees as tests. Often there is no strict "right or wrong" answer to a question, except for mathematics. Questions should simply give your trainees the opportunity to put forward their individual points of view.

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Planning and Work Organization

4.1 INTRODUCTION

Routine maintenance of low traffic rural roads is a widely dispersed activity, requiring small resource inputs over a large number of widely separated points.

Road maintenance offers considerable scope for increasing efficiency by adopting work methods and approaches relying to a large extent on locally available resources. This not only includes the introduction of labour-based works technology but also by involving local construction firms and communities in works implementation.

The amount of work needed to keep a length of road in good condition depends on several factors, such as type of road surface, traffic volume (number and size of vehicles), the severity of climatic conditions, especially rain fall, type of soil the susceptibility of the terrain and road gradients to erosion and the presence of bush and vegetation.

Before any maintenance work begins, the planning of work is required. Before you can make a work plan, you need to have certain information. Without it, it will not be possible to make a realistic work plan. It is important to remember that a good and realistic work plan is always required. Without it, you will not be able to estimate how much inputs (including labour) are required and when these inputs are needed. The absence of work plan will result in a disorganized workforce and it will prevent you from achieving your targets (both in terms of quality and quantity).

Information that will be need by the contractor to have in order to make a realistic work plan includes the following:

- Expected starting date and completion date of the works;
- Quantity and locations of the different types of work to be undertaken;
- Input requirements and/or availability of labour, construction materials, hand tools and equipment;
- Information about the usual start and end of the rainy season.

The number of labourers will depend upon the work load that is involved which should also be linked to the types and quantity of hand tools (and equipment if needed). It is also necessary to be able to plan in advance what, when and where the construction materials are required. Finally the work schedule will have to be drawn up for the implementation.

4.2 WORK ORGANIZATION

Different organisation methods are possible for the implementation of labour-based routine maintenance:

- **The lengthman system:** a worker is assigned to carry out all routine maintenance activities over a specific length of the road and throughout the year. He/she is solely responsible for his/her section and carries out all work as instructed. Sometimes a gang of labourers are assigned to carry out the maintenance work on a stretch of road. The work is restricted to off-carriageway maintenance and may include on-carriageway maintenance for only gravel roads.

- **Community contractors directly hired by the road agency:** a number of workers employed as a local "contractor" carry out all activities as a group, covering a longer road section. Each community contractor is responsible for a specific road section. The community road maintenance team/group leader of the community contractor is responsible for hiring and supervising its workers according to the instructions issued by the Client.

- **Community maintenance groups sub contracted by a commercial small scale maintenance contractor:** The client (road agency) enters into a contract with a local contractor who in turn sub-contracts off-carriageway maintenance works to Community Maintenance Groups (CMG's). The CMG is managed by the CMG Leader and the role of the CMG is similar to that of the community contractor above. This system places less burden on the client who only needs to manage the contractor.

Under average conditions, one full time worker should be able to cover the off-carriageway routine maintenance works each year of 1 to 2 km. This work is most effectively performed when workers are recruited from communities located in the vicinity of the roads. Local workers are also under social pressure from their neighbours to do the job well.

A Community Maintenance Group for routine road maintenance works can cover road sections of 5 to 7 km. The contractor's supervisor can manage several CMG's and may cover up to 30km of roads. Should the contract include a greater length of road, it is recommended that the contractor add supervisors to manage the works.

For routine maintenance works it is organized in such a way that all the labourers will know how to execute every activity involved in the maintenance work.

4.3 ROLE AND RESPONSIBILITIES

The Road Agency is responsible for:

- Prepare contract documentation;
- Carrying out physical road condition survey;
- Based on road condition survey, prepare BoQ and Cost Estimate;
- Issue contracts;
- Prepare annual routine maintenance work plan jointly with the Contractor/ Community Road Maintenance Team (CRMT) Leader;
- Monitor contractor performance;
- Approve works and authorize payment.

The Community Road Maintenance Team Leader is responsible for:

- To direct the CRMT (who is selected from the member of the labour force of the team) in implementing the agreed routine maintenance tasks according to the maintenance plan and quantities attached to the Routine Maintenance Agreement;
- Prepare monthly maintenance schedule jointly with the Engineer from the department;
- To physically participate in implementing the routine maintenance activities;
- To ensure that the work is implemented according to the standards described in the routine maintenance Job Cards, which has been received by from the District;
- To maintain a muster roll (the attendance) as issued by the community contractor / CMG, and pay all CRMT members according to the tasks completed;
- To have the attendance roll available for inspection at all times;
- To prepare together with the Junior Engineer, the interim and final payment certificates for the agreement;
- To be responsible of keeping record of hand tools issued out to the workers for the works in the hand tool issue form and/or to buy the required tools according to the agreement;
- To return the tools over to the village leader for safe keeping;
- To alert the District supervisor if there is any need for urgent unforeseen work.

Community Road Maintenance Team Members will be responsible for:

- To implement routine maintenance activities according to the instructions of the CRMT team leader;

- To receive hand tools from the team leader for the routine maintenance works;
- To return all issued tools at the end of the contract to the team leader;
- To implement the routine maintenance according to the standards described in the routine maintenance Job Cards, which the team leader received by from the District.

4.4 RECRUITMENT OF LABOUR

Before the maintenance teams can start carrying out the maintenance activities they first have to be formed. This entails the selection of the team members, the registration of the team and their training.

Before starting with the selection of the team members, the size of the team should be determined. The total number of labourers required will be based on the amount of work that is required. This can be derived from the Bill of Quantity (BoQ) and the work plan. It is recommended that there should be a fixed team to carry out the routine maintenance work. However, there should be a reserved list of labourers to carry out unforeseen work such as landslides.

Selection criteria should be used to ensure the selection of the most suitable candidates. Suitability in this sense refers to both the ability of the candidates to perform the job well as to the objectives of the implementing agency to provide jobs and income to the vulnerable groups in society. It is recommended to use the following criteria which were applied successfully in the maintenance pilots in other countries, although these may be amended to attain specific objectives of the contracting agency.

- The selected maintenance workers must be between 18 and 50 years of age
- The selected maintenance workers must be physically and mentally fit
- The selected maintenance workers must live near the road to be maintained
- The selected maintenance workers must be unemployed
- The selected maintenance workers must be from the poorest people of the community along the section of the road to be maintained
- At least 30% of selected maintenance workers must be women
- Preference should be given to unemployed youth

The recruitment of unskilled workers should be carried out openly preferably in a public meeting a week or two before commencement of actual site works. It is recommended to use a ballot system to recruit the labour force where more labourers apply for jobs than the number required.

The following procedures should be followed to ensure good dissemination of information about recruitment and actual recruitment:

1. Announcement of labour requirements and recruitment meeting including relevant location to be made in good time with specific encouragement to women (preferably two weeks in advance). The meeting location should be close to the site.
2. A standard notice of recruitment should be filled in and handed out to the Local Administrative, local political leaders, women group leaders, other local group leaders and youth leaders among others.
3. Standard notices should be posted in public places such as schools, markets, trading centres.
4. Casual labour force must be recruited from the population living in the locality of the project.
5. In all cases, it must be stressed that both men and women are equally eligible for employment. Efforts should be made to involve female representatives during the recruitment process e.g. women secretaries and councillors.

> It's an infringement on human rights to discriminate against women in:
>
> - Selection procedures
> - Terms on which employment is offered
> - Access to opportunities for training or promotion
> - Fringe benefits
> - Deciding on which workers shall be made redundant.

6. The recruitment of casual labourers for each section of the road should be carried out at a public meeting, a week or two before the start of the actual site work.
7. At the recruitment meeting the contractor or the district engineer's representative should clearly explain the following:
   - Nature and type of work for which recruitment is being sought.
   - Explaining the Task System for workers to understand and accept the working conditions.
   - Anticipated employment duration.
   - Number of labourers to be recruited.
   - Terms and conditions of employment.
   - Wage rates, timing and arrangements for payment in case of contractor defaults on payment of his workers.
   - Contractors obligations e.g. Provision of shelters for breast feeding women, provision of separate sanitary facilities for women and men, etc.
   - Who is eligible for work.
   - Women and men are equally eligible for work and will be paid at equal rates for their tasks.

- In case a situation of more job seekers than available vacancies arises, then the secret ballot system should be used to avoid possible accusations of favouritism or corruption.

BALLOTING
Step 1: The number of workers needed is determined (A).
Step 2: The number of job seekers present is counted (B). Ballot papers are prepared as follows: "YES" papers equal to the number of jobs (A) and "NO" papers equal to (B - A). These papers are folded and placed in a container.
Step 3: Each person who wants a job draws a ballot.
Step 4: Note down the names of people who draw ballot papers marked "YES". These people will be recruited for the job. Draw up a reserve list from those who draw ballot papers marked "NO".
Step 5: Tell each group when they are to report for work.

8. Discussions will follow as a reaction from those attending the meeting and clarification to issues raised by the contractor or the district engineer's representative.
9. The jobseekers are then invited to forward and form orderly queues.
10. In all cases the quota system of 50% shall be applied in the recruitment to allow for a ratio of 1 : 1 for men and women. If this quota system ratio does not apply, and that there is a minimum requirement to be achieved for special interest group, then an affirmative action in line with relevant national policies be applied provided such a policy is acceptable and fair. Care should be taken when implementing such a policy so that it does not impose a maximum limit on the participation of such groups.
11. If there are more applicants for job than what is required, a ballot system can be used to make sure that the recruitment is fair and gives an equal chance for all applicants. (*A rotation system can also be used so that every job seeker will get the chance of getting employed. In such case the duration for employment will have to spread out equally to all the job seekers.*)
12. Each recruit should sign a casual employment contract form where the conditions of employment are clearly stated. (See sample employment form under Annex 1). The Worker will also be recorded and given an employment code so that every worker has a unique employment code.
13. The recruitment has to be witnessed by the responsible community-based organisation and, if possible, the local village leader.
14. When recruiting casual labourers, make it clear that they are being employed on a temporary basis and will be made redundant when maintenance work on the road is complete.
15. The conditions for employment must be made clear before the employees are made to participate in the recruitment exercise.

16. The recruits should be advised on which days they will report for work.
17. It is also advisable to have a few workers on standby in case some workers need to be replaced so that another recruitment process is not required. They will not require to sign a contract but should be available to start work on short notice when required.

The cost of the recruitment of labourers should be budgeted in the project cost.

Redundancy

Redundancy simply means that the organization or firm's need for employees to do the work of a particular kind has ceased or diminished, so that someone has to lose their job. The criteria used to select individuals for redundancy must be fair and reasonable.

Wrongful as opposed to unfair dismissal occurs when insufficient notice is given. It may give rise to civil action for damages equivalent to the actual loss incurred. Wrongful dismissal may be claimed by a worker regardless of the length of service with the organization.

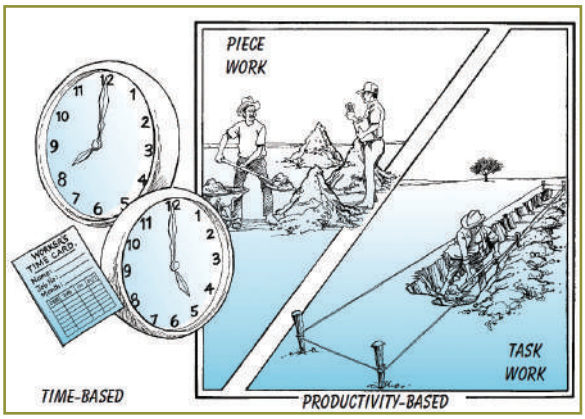
Disciplinary procedures should be made in writing easy to understand and made known to employees and their representatives.

Employers should be able to forecast their human resource needs in advance such that workers have good notice of when they are likely to be declared redundant such that they can seek other alternative sources of income and controlled expenditures in advance to ensure continued welfare of their homesteads. Cases where workers are not given adequate notice of retrenchment may tantamount to wrongful dismissal.

4.5 REMUNERATION OF LABOURERS

Depending on the nature of the works, there are several methods of organising the workforce and securing continued high levels of production. There are two fundamental work systems of remuneration when employing workers which are (i) Time based system and (ii) Productivity based system. In addition it should be in concurrence to the Minimum Wages Act in force in State.

Figure 1: *Remuneration of workers*



4.5.1 Time Based System

In construction industry the time based system is expressed as daywork.

In the Time Based System the worker is paid on daily attendance/fixed hours for work at fixed wage rate, regardless of what they produce. The working hours, breaks, start and closing time are established in advance.

This work system is not directly dependent on output and therefore it can increase the labour cost which the project management needs to guard against. Absent workers can be marked as present on the muster roll or by adding invented names to the roll.

4.5.2 Productivity Based System

The productivity based system is divided into two sub-systems each having its pros and cons.

In the **Piece Work System** the workers are paid for quantity of completed work at an agreed unit rate. The total quantities of work and unit rate for payment are established in advance.

In the **Task Work System** the workers are paid for completion of standard quantity of work each day at a fixed rate. The task rate (i.e. quantity of work to be completed) and wage rate are established in advance.

Task Work System is a system of work whereby a fixed daily wage is paid to a worker in return for completing a clearly defined quantity of work (task rate) to specified quality in a day.

A Fair Task Rate is the amount of work a worker can accomplish within 75% of normal working hour.

Task Rate is the quantity of work a worker should complete to specified quality in a day in return for an agreed wage.

The incentive for the workforce when using task work system is the early completion of their allocated tasks whereby they can leave the work site on approval of completed work by the supervisor. In a properly designed and operating productivity-based system, workers benefit from working time flexibility and income maximization.

However a fundamental concern of the ILO is in preventing labour exploitation. Productivity-based remuneration has a reputation for being exploitative. Depending on the way the remuneration system is set up, workers may be tempted to work very long hours so they can earn more money. This is the problem of self-exploitation. The problem cannot exist where there are limits placed on the number of hours a person can work. The problem may not even exist where there is no limit on hours, provided that the workers have obligations elsewhere to take care of, e.g., tending their agricultural holdings. In these situations, the workers will naturally stop work when they feel it is

necessary to move to their other activities. A self-exploitation problem exists where there is great demand for income among poor people and little or no other wage employment (or subsistence farming) opportunity. This is true in the situation within the communities where we are dealing with labourers from the poorest of the poor community because they are really in need of cash to supplement during the dry season.

Therefore, to prevent self-exploitation, time limits must be imposed, particularly where work is undertaken on a piece work basis.

Where productivity-based remuneration is used, steps should be taken to protect against abuse under different implementation strategies.

- Workers and their representatives should understand what their remuneration is based on. They should also understand how the payment of wages is organized. If they do not, steps should be taken to make sure that they understand both. Experience shows that workers with such an understanding can more easily make productivity gains, benefiting both themselves and the employer.
- To gain workers' and community confidence, work norms can be established with their participation. This will require information about workers' productivity, i.e., the size of different tasks in different circumstances. This information too should be gathered with the workers' cooperation.
- Establishing task rates centrally and publicizing them (e.g., on notice boards) can help to ensure that workers receive what they are entitled to.
- The remuneration system must be understandable and related to the way work is actually organized.
- Where contractors are competing among themselves for a limited number of contracts, pressure is often put on the workers to produce more, effectively bringing down the labour costs for any particular project. In such situation the Labour Officers can play a role in preventing the abuse of contractors to the workers i.e. over tasking of workers.

In the labour based/intensive projects, the Taskwork system is to be the basic method of organising the work. It does not mean that other system such as day work or piece work system cannot be used. A combination of different system may also be used depending on the work situation. Tasks should be set in accordance with accepted standards, modified to take full account of local conditions.

An average experienced labourer working well should finish a task in 6 hours (i.e. about 75% of a normal day work hours). Particularly good hard working workers should be able to complete their task in as little as 5 hours.

If the work has been satisfactorily completed, the group or individual may be released for the day. If the work is not complete to the specification required, it should be corrected before the group or individual worker is allowed to leave the site.

If the task is not completed before the end of the normal working day, the supervisor needs to find out what caused the delay - whether the fault lies with the workers or with his/her own setting of the task.

If the reason for non-completion is one of the following, the workers should be released:

- major difficulties not considered when the task was set (i.e. heavy roots, big rocks, etc.),
- incorrect measurement or calculation of the task,
- smaller workforce was assigned to complete the work (if a group task was set),
- workers were issued wrong or poor quality tools,
- bad weather conditions during parts of the day.

In such case as explained above, the workers will be paid according to daywork system.

However, if the reason for non-completion lies with the workers, they should complete the task before being released, even if it is after the end of the normal working day. Alternatively, the workers may return to the work site the following day to complete their task. The workers should only be recorded in the muster roll when they have fully completed their daily tasks.

Task work is the most common method used for labour-intensive works. When using task work the worker is given a task to complete and he/she is free to leave the site when his/her work has been approved by the supervisor. This is then counted as a full day's work in the payroll.

When organizing of works setting out tasks needs to take place before the workforce arrives on site - usually the day before. This forces the supervisors to carry out proper work planning and as part of this exercise, provides the supervisors a good opportunity to assess the overall distribution of workers on site.

Task work can be given to individuals (e.g. bush clearing, grubbing, ditching, etc.) or to groups as group task (especially suitable for large quantities of excavation or where it is difficult to measure the work). If task work is given to a group of workers, care should be taken that the workers are not in each other's way and have enough room to work (safe working distance).

Working as Group tasks have a number of advantages:

- They are easier and quicker to set out and control than individual tasks;
- When organizing earthworks such as cuts on hill sides or uneven terrain, it is more difficult to set out individual tasks and therefore group task is preferred;
- Unforeseen difficulties are shared among several workers instead of becoming the burden of one or two workers.

However not every activity is suited for task work, since it is necessary that the quantity of work can be reliably measured and the degree of difficulty of the work can be determined. Some activities is best carried out using day work system.

Table 1: *Comparison of different work system*

	DAYWORK	PIECEWORK	TASKWORK
Description	• The workers are paid a fixed wage for every day of work. • The worker is paid for attendance as opposed to output.	• The workers are paid for whatever the quantity of work they produce in a day. • This allows workers to earn more than the standard rate by producing more.	• Each worker is given a fixed quantity of work to do for the day and gets paid for the day. • The quantity of work to be done is standard for a given activity under the same conditions.
Advantages and Disadvantages	• It discourages workers who work harder because they get paid at the same rate as those who don't work as hard. • The level of supervision is intense since workers have to be constantly monitored to ensure they are working. • Administratively, it's easier to handle since workers are simply paid on the basis of being present or absent.	• The administration is very difficult since each individual will earn a different wage based on production. • The measuring is extremely intensive since it has to be done for each individual at the end of the working day. • Higher productivity is achieved as hard working individuals take the opportunity to earn more.	• Planning of the work and controlling the rate of production is simple since outputs are known precisely. • A high output coupled with efficiency can be achieved since workers know their task and value the extra free time they can get if they work diligently. • The system can be unfair to workers or employers where task rates are over-estimated or under-estimated, respectively.
Why and Where to Use the System	• This system is more suitable for highly skilled operations where a specialized workmanship is required. • Also used where standard outputs are difficult to fix due to a large number of variables involved. • Some suitable activities include boulder removal, peg cutting, water carrying and other supporting activities.	• This system is more suitable for highly skilled operations where a specialized workmanship is required. • Also used where standard outputs are difficult to fix due to a large number of variables involved. • Some suitable activities include masonry work, concrete work and gabions.	• This system is more suitable for activities where standard outputs are easy to determine. • Also used where standard outputs are difficult to fix due to a large number of variables involved. • Most labour-intensive road works are easily done under this system. • Some activities are better undertaken as group tasks as opposed to individual tasks.

Establishing Task Rates

To help the Maintenance Team Leader/Gang Leader to balance his/her inputs and outputs, standard task rates have been developed for each activity. The correct task rates, (i.e. the quantity of work a labourer has to finish in one work day) have to be found by detailed measurements of productivity under various conditions.

The correct task rate, i.e. the quantity of work assigned to each worker, is first established on the basis of detailed monitoring of productivity rates under various conditions. This should be done with the assistance of, and close monitoring by, senior site management at the beginning of the project. Setting up an effective monitoring system at the start of the project will help in obtaining the necessary data.

The standard task rates are worked out for average conditions and have been tried out during normal construction work. You will find that the labourers will complete the standard task rate on different time from day to day. A labourer will be lucky to finish the task early one day and unlucky on another, but over a period the work load will be fair and equal for all the labourers.

Task rates for each activity can be established through: Literature from other projects, Works study, Previous records and Experience of the supervisor.

Procedures for Conducting Works Study

If no task rate is available for an activity, a Works Study can be performed to establish task rate for the activity. The purpose of works study is to establish factual data to assist in making decisions and to enable them to utilize with the maximum of efficiency all available resources by applying a systematic approach to problems instead of using intuitive guess work.

Follow the steps below to establish new task rate through conducting a Works Study.

Note that the study should be done at least 3 to 5 days and then calculating the average. Repeat this exercise as and when necessary. (*e.g. yearly or when the workers are not able to complete their task within the stipulated time or when they are completing their task too early*).

Step 1 Select a group of workers consisting of: males and females; strong and weaker workers; older and younger group of workers.

Step 2 Organize the workers on a daywork basis (time based) on the activity (without letting them know your intention).

Step 3 Supervise the workers closely so that they work hard for the stipulated daily working hours (reasonable rest periods and lunch break should be allowed).

Step 4 Stop work after the stipulated daily working hours and measure the quantity of work completed (repeat this exercise for at least 3 to 5 days).

Step 5 Add all the completed work output and dividing by the numbers of days will give you the average output per day

Step 6 Dividing the average output per day by the number of workers per day will give the task rate for that activity.

$$\text{Task Rate} = \frac{\text{total quantity of work completed in a day}}{\text{Number of workers on the activity}}$$

Repeat this exercise as and when necessary and adjust the Task Rate so that all workers are completing their daily task work around 75% of normal working hours.

Adjusting Task Rates

From time to time, Task rates may need to be adjusted according to the conditions on the ground. The contractor cannot change the task rate on his own unless there is a written approval by the supervising engineer or the client because there might be cost implications in the final contract sum.

There can be circumstances when the average rates given cannot be applied because of special conditions on a site. In such cases, the task rates should be adjusted but the written approval of the Client must be obtained. Whenever a new labour force or new activity is introduced, it is suggested that ordinary daily work be applied. This will allow the labour force to get used to the tools and the new activity. Also, during the first few days, the workers and conditions can be studied so that a correct task rate can be found.

It is extremely important that tasks be correctly estimated. When task rates are changed for reasons that are not clearly understood and appreciated by the workers, discontent and other difficulties can be expected. However, if, for three consecutive days, a group of workers finishes its daily task too soon (say, in half the time of the normal working hours), then the task rate should be adjusted. Similarly, if a task has not been completed in the normal working time for three consecutive days, the cause has to be found.

Factors Affecting the Productivity of Worker

There are various reasons that can cause low productivity of a worker when working.

- **Hand Tools**
  - Using wrong tool that is not suitable for the work (*e.g. using hoe to dig in hard gravel, pick to slope ditches*)

  - Condition of the hand tool (*e.g. blunt or worn out tool*)
  - Quality or design of the hand tool
- **Local Conditions**
  - Unforeseen soil condition (*e.g. where soil condition changes below the surface*)
  - Climate condition (*e.g. unexpected downpour of rain*)
- **Task**
  - Wrong task rate applied (*e.g. applied soft soil condition task rate while the soil was actually hard*)
  - Understanding of the task system by the worker that he/she can go home on completion of the task
  - Task wrongly set out on the ground by the responsible supervisor (*human error during setting out task*)
- **Human Factor**
  - Psychological needs (*e.g. How much quantity of work is the worker willing to work for to earn the wage*)
  - Motivation
  - Skill and experience
  - Health condition of the worker

Indicative Task Rates

The amount of work a maintenance team is able to carry out in a month will depend on the amount of work that can be carried out in one workday for each activity (the task rate) and the team size (which determines the number of available workdays). In defining the amount of work in the workplan, account should therefore be taken of the task rates for the different activities planned, in order that the estimated requirement of workdays is equal to the available monthly number of workdays. Table 2 gives some indicative task rates for the different activities, based on experiences from the maintenance pilots from other similar programmes, and complemented by the Indian Roads Congress work norms. It is important to note that these task rates are average values and are not absolutes. The actual productivity achieved will depend on the soil type, climatic conditions, etc.

Table 2: *Indicative task rates for road maintenance activities*

	Activity	Recommended Task Rate	Job
1.1	Removal of loose debris such as boulders, branches, etc.	1.5 m^3/wd	Clearing debris at bridges and causeways
1.2	Excavation and removal of clay and silt	2.5 m^3/wd	
2.0	Cleaning of side drains and mitre drains		Clearing, cleaning, reshaping, deepening and erosion repairs to side drains, mitre drains and catch-water drains
	- for moist and loose soils	2.5 m^3/wd	
	- for average soil condition	2.0 m^3/wd	
	- for hard and dry soils	1.75 m^3/wd	
	Note: Task related to drained ditches without any standing water		
3.1	Repair of drain lining Stone masonry work including preparation of stone and mortar but excluding collection of stones	4.0 m^2/wd	Repair of damaged drain lining (1 mason + 1 beldar)
4.1	Construction of scour checks only Excluding stone/ stakes collection	4 ~ 8 Nos/wd	Repair and replace scour checks
4.2	Stone collection	2 ~ 3 m^3/wd	
4.3	Cutting of stakes for scour checks	80 Nos/wd	
5.0	Fill suitable soil and compact in layers in		Repair rain cuts and minor slips on embankment side slopes
	- moist and loose soils	2.5 m^3/wd	
	- average soil condition	2.0 m^3/wd	
	- hard and dry soils	1.75 m^3/wd	
6.1	Fill suitable soil and compact in layers in		Earthen shoulder repair
	- moist and loose soils	2.5 m^3/wd	
	- average soil condition	2.0 m^3/wd	
	- hard and dry soils	1.75 m^3/wd	
6.2	Maintenance of the shoulders	75 m^2/wd	
7.1	Fill suitable soil and compact in layers in		Reshape earthen shoulder
	- moist and loose soils	2.5 m^3/wd	
	- average soil condition	2.0 m^3/wd	
	- hard and dry soils	1.75 m^3/wd	
7.2	Maintenance of the shoulders		
	- in area of shoulder	75 m^2/wd	
8.0	Cutting of tree branches and shrubs		Cutting of tree branches and shrubs
	- for medium vegetation	150 m^2/wd	
	- for thick vegetation	100 m^2/wd	
	Note: Medium = needs bush knife and bow saw; Thick = needs axe or chainsaw		
9.0	Trimming of grass and weeds		Trimming of grass and weeds
	- for light vegetation	200 m^2/wd	
	- for dense vegetation	150 m^2/wd	

Activity		Recommended Task Rate	Job
10.0	Grass planting	20 m^2/wd	Planting grass for erosion protection
11.0	Removal of corrugations / reshaping gravel rd.	75 m^2/wd	Light grading of unsealed roads
12.1	Pothole filling (WBM)	4.0 m^2/wd	Bituminous Pavement repair including filling of potholes and patch repairs
12.2	Pot hole filling (BM)	4.0 m^2/wd	
12.3	20MM PMC patching	10.0 m^2/wd	
13.0	Repair and filling of ruts with approved gravel inclusive of excavation and hauling		Repair of ruts and depressions on gravel roads
	- haul up to 100m	1.7 m^3/wd	
	- haul 100m – 300m	1.5 m^3/wd	
	- haul more than 300m	1.3 m^3/wd	
14.1	Type A sealing	40 m^2/wd	Local sealing / Surface patching (Bituminous)
14.2	Type B sealing	75 m^2/wd	
15.1	Crack sealing using emulsion	800 m^2/wd	Pavement surface crack sealing
15.2	Crack sealing using emulsion and sand	300 m^2/wd	
16.0	Spreading of sand/chipping	400 m^2/wd	Improvement of bitu. surface texture

Payment of Wages

Workers must be paid on time if they are to be expected to continue to work. Contractors are particularly vulnerable to work stoppages and labour problems resulting from late payment. Measures should always be taken to streamline payment procedures and remedy payment difficulties when they occur.

Workers should be paid on time and in concurrence with the minimum wages act and minimum wages in force in State. The progress of work is threatened when the contractor or force account programme does not do this.

Resolution of a payment problem starts with the identification of its source. There can be many, for example:

- Delay in determining amounts due to workers.
- Delay in communicating the amounts due to the provider of funds.
- Delay in accessing funds to pay wages.
- Delay in moving cash to the worksite or to transfer to their Bank Accounts.
- Contractor has insufficient funds to pay labours.

When payment to workers is delayed because of late or insufficient funds received by the contractor, a number of solutions can be suggested:

- Arrangements can be made with financial institutions to set up a revolving fund or provide soft loans guaranteed by the client.
- The client can provide an advance on the contract or monthly advances deductible from work certificates to cover wages.
- The workers should be informed on recruitment day about the timing and regularity of their payments. Where possible, a revolving fund could be established at a decentralized level to minimize delays.
- Workers should be paid in conditions that ensure that they receive remuneration to which they are entitled. They should also be in a position to freely dispose of their remuneration as they choose.
- Attendance and/or output records should be kept so that the worker can know the amount which he or she will be paid and the basis upon which the remuneration has been calculated, i.e., the number of days worked or the production accomplished.
- Work norms (expected productivity and outputs) and wage rates should be made known to the workers, preferably in a simple manner and in the local language.

The labourers should be informed, well in advance, about the place and date of payment. Once the time and place of payment is agreed, it is very important to stick to your plans. The morale will quickly deteriorate if payment is delayed or incorrect. To make sure payment is correct, you must keep a muster roll on site where the site supervisors records labour attendance every day and notes the tasks achieved.

Remember that a lot of preparations are required before pay-day, for example to prepare the payment-slips and arrange with the bank and with security personnel. Some of this can be done well in advance but the payment-slips must be prepared right before payment. To avoid mistakes, and the following disputes, sufficient time must be set aside for these preparations. The labourers should also be made aware of the arrangement. Thereby they will understand why they are paid for work done up until the week before payment, not the last week so that at the end of the first month, they only receive payment for 3 weeks.

4.5.3 Estimating Resources/Output

The benefit of using task system is that it is easy to predict the output of the workers. There are various formulas that can be used for calculating resource or output.

$$\text{total workerdays required} = \frac{\text{total quantity of work}}{\text{task rate}}$$

$$\text{total workers required per day} = \frac{\text{total workerdays}}{\text{duration needed to completed the work}}$$

$$\text{total duration to complete the work} = \frac{\text{total quantity of work}}{\text{task rate} \times \text{no. of workers}}$$

$$\text{total duration to complete the work} = \frac{\text{total quantity of work}}{\text{equipment productivity} \times \text{no. of equipment}}$$

total quantity of output = numbers of workers × task rate × duration

quantity of output = no. of equipments × equipment productivity × duration

4.6 PLANNING AND PRIORITIZING OF ACTIVITIES

The planning of the maintenance work refers to the preparation of a workplan for a certain period, which needs to be completed by the maintenance team by the end of that period. It defines the activities to be undertaken and identifies the road sections in which these activities need to be carried out, and as such determines the quantity of work to be carried out.

When planning road maintenance works, it should be noted that some activities are required throughout the year while some have priority to when they should be done. For each maintenance operation (routine, periodic and urgent/emergency) priority lists are established. They may differ from area to area according to the prevailing conditions.

First priority is usually given to urgent maintenance activities (i) to ensure that the road network remains passable and basic access is provided and (ii) to limit the extent of damage exerted to a road section. Critical elements of the drainage system, such as culverts and drains need particular attention and first priority should be given to the removal of obstacles blocking water passage. Small erosion channels should be repaired before the next rains deepen and widen them. Both these tasks require regular inspection.

Lowest priority should be given to those tasks requiring significant inputs and which produce limited results in terms of prolonging the lifetime of the road (i.e. grass cutting and bush clearing).

When priorities are set, the climatic conditions must be considered. For example, grass cutting during the rainy season does not make sense when at the same time the ditches and culverts are left untouched and are becoming seriously silted. Table 3 provides a list of priorities for routine maintenance according to the climatic seasons.

In planning routine maintenance works of roads, there are three major stages of road maintenance plans.

The first stage of the planning is done by the respective Engineer responsible for maintenance of rural roads and approved by the relevant district authorities. On the basis of regular road condition surveys the maintenance requirements

are determined for each road. Depending on the available funding, it is then possible to prepare an overall maintenance plan and budget. With the data from the road condition surveys, it is possible to forecast and plan the works according to the actual demand for maintenance.

The second stage are the operational plans prepared prior to the execution of any specific works carried out on a road section. These plans are based on a detailed inspection of the road condition, thereby ensuring that the assessment of work requirements are accurate and that deviations from the work plan would be minor during work implementation.

The third stage of the plan may include monthly plans, which also provides the basis for the activities to be carried out by the contractors or communities and the basis for payment at the end of the planning period. This planning is carried out during the course of the works to ensure good work organisation and ensuring that priority is given to the most important maintenance activities.

In this module, we shall discuss the third stage of the maintenance planning.

Table 3: *Guide to routine maintenance priority according to seasons*

Season	Priority	Activity
Before rains	1	Clean culverts and causeways
	2	Clean side drains and mitre drains
	3	Repair side drains erosion and scour checks
	4	Fill potholes
During rains	1	Inspect and remove obstacles
	2	Clean culverts and causeways
	3	Clean side drains and mitre drains
	4	Repair side drains erosion and scour checks
End of rains	1	Fill potholes, ruts and depressions
	2	Repair erosion on shoulders, side slopes and in drains
	3	Reinstate scour checks
	4	Reshape shoulders and carriageway
	5	Cut grass
Dry season	1	Repair structures
	2	Reshape/repair carriageway
	3	Clear bush

4.6.1 Scheduling of Planning Activities

Execution of Maintenance Programme

The execution of the maintenance programme shall commence by 10th April. However, for areas subjected to heavy snowfall such as the tribal areas where the working season normally starts in May end / June, the commencement of the maintenance plan shall take place accordingly.

Annual Maintenance Calendar

The Annual Calendar of Road Maintenance Activities shall be as shown in Annex 2.

The calendar shown in the table for road maintenance shall be modified taking into consideration the topography, climatic conditions or any other features peculiar to a particular region.

Preparation of Work Schedule

Before you can start with the construction activities, a planning of the work is required. This includes a plan for the required labour inputs, the procurement of hand tools required for the maintenance work (and equipment if needed) and securing the necessary construction materials.

Before you can make a work plan, you need to have certain information. Without it, it will not be possible to make a realistic work plan. It is important to remember that a good and realistic work plan is always required. Without it, you will not be able to estimate how much inputs (including labour) are required and when these inputs are needed. The absence of work plan will result in a disorganized (and unhappy) workforce and it will prevent you from achieving your targets (both in terms of quality and quantity). Information that you need to have in order to be able make a work plan includes the following:

- Expected starting date and completion date of the works;
- Volumes and locations of the different types of work to be undertaken;
- Input requirements for labour, construction materials, equipment, tools;
- Availability of labour, equipment, tools and construction materials;
- Information about the usual start and end of the rainy season.

These workplans/work schedule should be prepared by the contracting agency in coordination with the maintenance teams. To facilitate the planning, a simple workplan format should be used in which the maintenance activities and road sections to be covered can be easily indicated. An example of workplan template is given in Annex 3. The workplan lists the different maintenance activities as stipulated in the contract document, and covers the total road length in 200m sections. The general location of the road sections to be worked in are indicated in the workplan, whereas the actual location will be indicated in the field.

In preparing the workplan, account should be taken of the timing of activities throughout the year. The proposed priority of the different maintenance activities for the different times of the year is shown in Annex 2. Depending on the season, different maintenance activities should therefore be indicated in the workplan.

In addition, it may be necessary to adapt the workplan to unforeseen needs, such as the clearing of landslides. The principal issue is that the required workdays for the completion of the work are approximately equal to the available workdays from the team, whereby flexibility from both the maintenance team and the contracting agency is required to ensure fairness in the consideration of the workplan at the time of inspection.

4.7 HAND TOOLS AND MATERIALS REQUIRED

Routine maintenance activities will be carried out by locally based labours using basic hand tools. The most commonly used hand tools by the maintenance teams are covered under Module 6 and also listed below however, the tools and quantity needed for each tool will depend on the type and quantity of work load or the size of the maintenance team.

- Wheelbarrow
- Hoe
- Pickaxe
- Mattock
- Spade
- Pulling rope
- Shovel
- Long handled shovel
- Rake
- Bush knife
- Machete
- Large crowbar
- Sledgehammer
- Chisel
- Watering can
- Earth rammer

Apart from these hand tools, the maintenance teams also require basic safety equipment to ensure their safety and health. These safety items are listed below.

- Warning flags
- Mask
- First-aid kit
- Safety vest
- Boots
- Hat
- Raincoat

For certain activities materials are required (stones, gravel, gabion wire). In certain cases these can be obtained locally, but in other cases these will have to be provided to the maintenance teams (this generally involves the transport of materials from suitable locations to the road in question). It is recommended that these materials be provided directly by the client/contracting agency on a need by need basis, to avoid problems in the estimation of the required materials at the beginning of the maintenance contract.

4.8 MONITORING AND INSPECTION OF WORKS

As a Road Maintenance Team Leader / Supervisor, monitoring and inspection of work done is part of his/her daily work. Without inspecting the work, you cannot enforce quality and standard. Checking or inspecting is important that after giving instructions to see if your instruction is being understood and

followed by the labourers. Before the gangs are released for the day, their work must be inspected and approved by the Maintenance Team Leader.

During the inspection by the District Engineer, both the amount and the quality of work are evaluated. During the inspection the road sections indicated in the workplan are inspected with respect to the maintenance activities agreed upon. The amount of work is defined in the workplan, whereas the required quality of the work is defined in the maintenance contract through the performance indicators. The inspection is carried out on a monthly basis and coincides with the workplan period. At the same time that the inspection is carried out, the new workplan can also be discussed and agreed upon.

Attendance Rolls

The attendance roll is an attendance record, which forms the basis for the wage calculations and the payroll. It is a ledger in which the presence/absence or record of the task completed of individual workers are noted on a daily basis. The attendance roll is used as the main supporting document for accounting labour expenditure.

The attendance roll should be maintained on site every day and be readily available for inspection. Every week or at the end of each month, depending on how frequent the project carries out wage payments, the attendance roll is reconciled to calculate the wages for the workers. This exercise determines the exact amount of payments required at each site and for each worker.

Daily Site Record

The daily site record forms the basis for the reporting and control of physical work progress on site. It records the “input” (number of workers, materials and use of equipment) used for each work activity. The site record is filled in at the end of each workday when the supervisor inspects the work of the individual workers or gangs.

Monthly Progress Report

Monthly summaries of performance, based on the weekly totals of the daily reports, are prepared by the site office. The main purpose of this exercise is to enable the management to monitor progress against planned targets. Together with the daily and weekly progress reports, this information also provides the basis for the invoicing of completed works.

The summary reports contain output and productivity data for the current month and for the total period so far since the project commenced. This enables management to review performance for the last month and the average performance during the year so far, against planned outputs and productivity.

ANNEX 1: SAMPLE EMPLOYMENT FORM

CASUAL EMPLOYMENT FORM (to be completed in duplicate)	*Original to Employee* *Duplicate to Employer*
EMPLOYER (CONTRACTING COMPANY):	
PROJECT:	**EMPLOYMENT NO.:**
REF. NO.:	**DATE:**
Name:	**Gender:**

1. You are hereby offered employment with casual conditions as a ..... (labour category) with effect from ..... (date)
2. The terms and conditions of employment are as follows:
   a. You will be paid Rupies. ..... per working day or an equivalent task rate. You will not be paid for public holidays or any day not worked regardless of the reason. When injured at site during working hours, medical bills will be paid for by the employer named above.
   b. You will be paid your wages every .....
   c. You are not entitled to annual leave, housing, transport or any allowances.
   d. Your employment will be determined by any of the following:
      - At the end of the work programme or works for which you have been engaged
      - At any time at the discretion of the employer
      - Absenteeism without good reason
      - When you do not follow instructions from your supervisors
      - After a period of ..... days.
   e. You are responsible for any loss or deliberate damage of tools issued to you and the cost of such will be deducted from your pay.
3. By signing this employment form indicated that you agree with the terms and conditions of employment set out above.

Employers representative:	**Date:**

Acceptance of offer:

I have read and understood the terms of employment offered to me and hereby accept to abide by the terms and conditions set therein.

Name: .....

Signature: .....

ANNEX 2: ANNUAL CALENDAR FOR ROAD MAINTENANCE ACTIVITIES

Sr. No.	Item of Work	Intervention Standard	Response Time	Frequency	Remarks
A	B	C	D	E	F
1	**Cleaning/desilting of road side drain/gutter**				
	Water diverted out of drain onto roadway	Causing a hazard to traffic	Immediate	Thrice i) February ii) May and June iii) August and September and as and when required i.e. blockade more than one-fourth	
	Obstruction or Siltation impeding flow	Blocked by more than one-fourth of the size of the drain	14 days and prior to monsoon		
2	**Pothole Filling**				
	Collection of patch repair material for Bituminous roads			i) January and February ii) July and September	
	Collection of patch repair material for WBM repair			i) January and February ii) July & August	
	Pothole filling in Bituminous and rigid pavement with maximum dimension more than 200mm, cracks, edge breaks, ruts and depressions	All potholes ≤75mm depth	21 days	Immediate on their occurrence	
		Cracks >5mm in width			
		Edge Breaks >150mm in width			
		Ruts >50mm in depth			
		Depressions >50mm in depth			
	Pothole filling in WBM with maximum dimension >200mm	Depth > 75mm	21 days		
	Pothole filling in Gravel/ Katcha surface	Depth >50mm	45 days		
		Width >300mm			
3	Filling edges of bituminous surfaces and replenishing/ lowering earthen/ hard shoulders	Difference more than (-) 50mm/ (+) 0mm		Before and after monsoons and as and when required i.e. when the requirements as specified are exceeded as per Column C	
4	Dressing of berms			Before and after monsoon and once in between i.e. February/ March, June, August and September	
5	Restoration of rain cuts and side slopes			September and as and when required	
6	Cleaning of Cross-Drainages				
	Debris and silt reducing effectiveness of structure, broken or cracked structure causing instability, under mining or not functioning properly	Blocked by more than one-fourth of the size of the culvert opening	14 days	Twice (May and October) and as and when required i.e. blockade more than one-fourth of the opening	
	Deformation of culvert, its invert and alignment		45 days and prior to monsoon		
7	While washing of Parapets, Guide Stones, Tree Trunks etc.			Twice (April and October)	
8	Re-fixing disturbed caution boards, other signage etc.			Once and as and when required	
9	Re-fixing displaced Km. stones, 200m stones, guard stones, guard rails			Once and as and when required	
10	Cutting of branches of trees, pruning shrubs			Once (October)	
11	Removing wild seasonal growth on berms and from road side structures			Twice (March and September)	
12	Painting of Km. stones, Numbering of culverts, Road markings etc. including history of road on Km. stones			Once (April/ November)	
13	Maintenance of T & P	All round the year			
14	Removal of encroachment	All round the year			

ANNEX 3: SAMPLE WORKPLAN

Workplan - Routine Road Maintenance

District: ……..…….. Division: …….…… Road Name: ……..……. Total Length: ……..…. km Page …..... of …...

	ACTIVITIES	Unit	Qty	Task Rate	Work days	1+000 1	2	3	4	5	6	7	8	9	2+000
Left side	Bush clearing (width)	m^2													
	Clear side drains (depth)	m													
	Clear miter drains (depth)	m													
	Lower berm (width)	m^2													
	Shoulder repair	m													
	Shoulder regravelling	m^3													
	Side slope repair	m													
Carryageway	Debris removal	m^2													
	Pothole patching	m^2													
	Crack sealing	m													
	Seal coat (width)	m^2													
	Thin overlay (carpeting) 20mm (w)	m^2													
	Leveling course (width)	m^2													
	Base course repair	m^3													
	Camber reshaping	m^3													
Right side	Bush clearing (width)	m^2													
	Clear side drains (depth)	m													
	Clear miter drains (depth)	m													
	Lower berm (width)	m^2													
	Shoulder repair	m													
	Shoulder regravelling	m^3													
	Side slope repair	m													
Structures	Clear culvert/small bridge	m^3													
	Clear inlets & outlets of culverts	m^3													
	Clear inlets & outlets of drifts	m^3													
	Install new culvert(s)	no.													
	Repair road signs	no.													
Total															

Prepared by: Date:

Notes

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