



HIS MAJESTY'S GOVERNMENT OF NEPAL
Ministry of Local Development
TECHNICAL DIVISION

Work Norms

for Agricultural and Rural Roads

February 1998



Prepared with the assistance from
NEP/96/01/ADB (TA No.2556) : "Institutional Strengthening for Rural Infrastructure Development"
Project
funded by **Asian Development Bank** and executed by **International Labour Organisation**

For the use of proposed
DEPARTMENT OF LOCAL INFRASTRUCTURE DEVELOPMENT (DoLID)

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Preface

These work norms are prepared for the use of the development of Agricultural and Rural Roads in Nepal. They broadly cover FIVE different areas for which separate volumes are prepared as follows:

- Volume I - Norms for Survey Works;
- Volume II - Norms for Design Works;
- Volume III - Norms for Rural Roads (Construction, Rehabilitation and Maintenance);
- Volume IV - Norms for Rural Roads (Transportation or Carriage of Materials by Truck/Tractor/Bullock or Buffalo Cart/Porters);
- Volume V - Norms for Rural Roads (Bio-engineering Works).

As far as possible, the items which normally come across in the works of Agricultural and Rural Roads have been identified and suitable norms have been worked out accordingly. Despite all these endeavours, it is always likely that more new items may come up as per the necessity of rural roads in future, and thus, work norms for those items may have to be incorporated. Similarly, it may be required to make amendments periodically, specially when it is felt at the time of application that the existing norms are neither covering a particular item nor are compatible to the prevailing conditions. In line with the assigned responsibility, the amendments to these norms will be done by the Designs and Technology Promotion Section of DoLIDAR, on the basis of interactions with the field technicians or/and the research carried out separately at the field-level.

While preparing these norms, due consideration is given to the experience gained from the existing HMGN work norms, particularly when applying to the works carried out by the users' groups. Basically, the construction, rehabilitation and maintenance of agricultural and rural roads are planned to be implemented through local participation by the users' groups and local-based contractors. Furthermore, these low-cost, local resource-based roads are supposed to be built through labour-based, environmental-friendly construction modalities. Therefore, some of the norms developed discourage the involvement of outside large-scale contractors, thereby leaving more opportunity for users' groups and local-based contractors.

Wherever possible, two separate norms for Hills and Terai/Plain areas have been developed by considering the availability of labour and materials as well as the locality-based skills and practices. For example, a gabion weaver in Terai is less efficient than a weaver in Hills.

Volume I - Norms for Survey Works and Volume II - Norms for Design Works

The following code is used for these volumes for easy reference. The norms given in Volume II is applicable only when consultants are supposed to be hired for design works. When the designs are prepared by the HMGN or DDC officials, the cost required for stationery, drawing equipment and others shall be covered by the contingencies of project cost.

First Letter

S.....denotes SURVEY

D.....denotes DESIGN

Second Letter

H.....denotes HILL

T.....denotes TERA

Third Letter

R.....denotes ROAD

C.....denotes CULVERT/CAUSEWAYS

B.....denotes BRIDGE

Fourth Letter

'A'.....denotes CLASS of Transport Linkage

Volume III - Norms for Rural Roads (Construction, Rehabilitation and Maintenance)

It should be noted that the figures given in the second column refer to the corresponding clauses of the **Technical Specifications**.

The materials, tools and equipment given in the respective columns are not included in the labour component unless otherwise mentioned in the description. Therefore, the materials are required to be procured separately while the tools and equipment are either procured or hired. The provision for the latter should be laid down in the cost-estimate. Necessary royalties, local tax and tolls for various materials are given separately under the respective column. The labour required for transportation of materials are also excluded from the labour component unless otherwise specified. While analysing a particular rate, necessary components (labour, material, tools & equipment and royalties) shall be added up according to the implementation modality (labour-based or labour-intensive) which is planned to be used in the construction, rehabilitation or maintenance.

The work norms given for routine maintenance are applicable only when labour-based methods are used. When the routine maintenance of a road stretch is supposed to be contracted to an individual or a group of users/labourers, these norms could be used to prepare the cost-estimate which defines the job rather than making provisions for days physically spent at work site.

Volume IV - Norms for Rural Roads (Transportation or Carriage of Materials by Truck/Tractor/Bullock or Buffalo Cart/Porters)

The norms for transportation of various materials by bullock or buffalo carts are applicable only for Terai and other plain areas (valleys) where such carts are in use.

Volume V - Norms for Rural Roads (Bio-engineering Works)

These norms should be used with reference to the specifications provided in the **"BIO-ENGINEERING INFORMATION"** published by the Geo-environmental Unit of Department of Roads.

Sample Format for the Analysis of Rate for Items of Work

Cost for Labour.....(X)

Cost for Materials.....(Y)

Basic Rate (X+Y) = (Z)

Note:

- When works are carried out under forced account system or contract with user's group or local labour group, the rate shall be the basic rate as of above, i.e. (Z). The tools and equipment will be provided by the office or otherwise, 3% of the total item rate cost will be paid to the users' group or local labour group in order to compensate for the use of their own tools and equipment.
- When the work is to be undertaken by a local contractor then the basic rate will remain unchanged but the net total of the cost estimate shall include the provisions for
 - ⇒ tools, plants and equipment
 - ⇒ contractor's overhead expenses
 - ⇒ contract tax
 - ⇒ contingencies.

Sample Format for Cost-estimating

Items	Unit	Basic (or unified) rate of the Item	Total quantity of the Item	Total amount of the Item
1		a_1	b_1	$a_1 \times b_1$
2		a_2	b_2	$a_2 \times b_2$
3		a_3	b_3	$a_3 \times b_3$
.....				

Total of the item rate cost, $AB = (a_1b_1 + a_2b_2 + a_3b_3 + \dots)$

First Provision

Provision for tools, plants and equipment at the rate of 3%, $C = (AB \times 0.03)$

sub-total, $I = (AB + C)$

a. In case of local contractor

Provision for contractor's overhead expenses at the rate of 15%, $D = (I \times 0.15)$

sub-total, $II = (I + D)$

Provision for Value Added Tax (VAT) at the rate of 10%, $E = (II \times 0.10)$

sub-total, $III = (II + E)$

Provision for contingencies at the rate of 5%, $F = (III \times 0.05)$

sub-total, $IV = (III + F)$

b. In case of users' group/local labour group

Provision for operational expenses at the rate of 5%, $D = (I \times 0.05)$

sub-total, $II = (I + D)$

Provision for contingencies at the rate of 5%, $F = (II \times 0.05)$

sub-total, $III = (II + F)$

Second Provision

Provision for Construction Management and Quality Control,
Group

Contractor Users'

- | | | |
|---|----------|-----------|
| • laboratory facilities at the rate of
(apparatus, laboratory charges, etc.) | 1% of IV | 1% of III |
| • quality control support at the rate of
(personnel or services from private consultants or private parties) | 2% of IV | 2% of III |

Total of second provision at the rate of 3% of IV (or 3% of III), $G = \frac{(IV \times 0.03)}{(III \times 0.03)}$

Grand Total of the Work = $(IV + G)$ $(III + G)$

Volume I

**Norms for
Survey Works**

Part I - Roads and Trails

Activities covered by the norms for roads and trails:

- Fixing of road alignment by setting out the Intersection Points (IP) and Intermediate Points.
- Establishment of Bench Marks (BM) and other reference points.
- Taking the Longitudinal Section (LS) and Cross Sections (CS) :
 - For LS, at 10-25 m interval along the alignment depending upon the terrain;
 - For CS, at 2-5 m interval across the alignment from the centre line.
- Conducting survey for road-side and cross-drainage structures.
- Final lay out survey including setting out of curves (This should be done at a later stage after completing the designs.).

Note: Whenever, any of the above five activities are excluded from the planned job, the overall cost-estimate shall be reduced proportionately. For example, if final lay out survey is excluded then the overall cost estimate shall be reduced by 20%.

SHR 'A' In Hills, per 1 km of District Road
SHR 'B' In Hills, per 1 km of Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out the survey work by using the required survey equipment like theodolite, level instrument, tape, etc. - Overall management of the survey task. - Environment survey.	2.5	per day rate of basic salary [#] x 1.5 (in case of hiring consultants) OR Survey Allowance* (in case of HMGN officials)	
2	Overseer/Surveyor - Supervises the preparatory work such as clearing the area of survey. - Assists the Engineer in every matter that is necessary. - Environment survey.	4	per day rate of basic salary [#] x 1.5 OR Survey Allowance* (in case of HMGN officials)	
3	Sub-overseer/Survey Assistant - Carries out the survey work by taking bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	4	per day rate of basic salary [#] x 1.5 OR Survey Allowance* (in case of HMGN officials)	
4	Staff Men - Hold level staff. - Erect ranging rods.	6	district rate	
5	Tape/Chain Men Measure distances by tape/chain.	6	district rate	
6	Unskilled Labourers/Survey Helpers - Pegging work. - Clearing off the bushes and obstacles as necessary.	12	district rate	
7	Porters/Camp Workers Carry and shift the survey equipment and accessories.	8	district rate	
Sub-total				
8	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
9	stationery, caps, shoes, umbrellas, camping and survey equipment, etc. (lump sum at the rate of 25% of the sub-total)			
10	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

[#].....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

^{*}.....Survey Allowance per day = $\frac{(\text{Basic monthly salary} + \text{Monthly remote area allowance})}{30} \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-10 above.

STR 'A' In Terai or similar plain areas, per 1 km of District Road

STR 'B' In Terai or similar plain areas, per 1 km of Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out the survey work by using the required survey equipment like theodolite, level instrument, tape, etc. - Overall management of the survey task. - Environment survey.	1.5	per day rate of basic salary [#] x 1.5 (in case of hiring consultants) OR Survey Allowance * (in case of HMGN officials)	
2	Overseer - Supervises the preparatory work such as clearing the area of survey. - Assists the Engineer in every matter that is necessary. - Environment survey.	3	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Sub-overseer/Survey Assistant - Carries out the survey work by taking bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	3	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
4	Staff Men - Hold level staff. - Erect ranging rods.	3	district rate	
5	Tape/Chain Men Measure distances by tape/chain.	6	district rate	
6	Unskilled Labourers/Survey Helpers - Pegging work. - Clearing off the bushes and obstacles as necessary.	9	district rate	
7	Porters/Camp Workers Carry and shift the survey equipment and accessories.	6	district rate	
Sub-total				
8	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
9	stationery, caps, shoes, umbrellas, camping and survey equipment, etc. (lump sum at the rate of 25% of the sub-total)			
10	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

^{*}Survey Allowance per day = $(\text{Basic monthly salary} + \text{Monthly remote area allowance}) \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-10 above.

SHR 'C'/'D' In Hills, per 1 km of Main/Village Trail

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Overseer/Surveyor - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out the survey work by using the required survey equipment like prismatic compass, abney level, and other simple instrument. - Environment survey.	1	per day rate of basic salary [#] x 1.5 (in case of hiring consultants) OR Survey Allowance * (in case of HMGN officials)	
2	Sub-overseer/Survey Assistant/Supervisor - Carries out the survey work by taking the bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	3	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Staff Men - Hold level staff. - Erect ranging rods.	3	district rate	
4	Tape/Chain Men Measure distances by tape/chain.	6	district rate	
5	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	6	district rate	
6	Porters Carry and shift the survey equipment and accessories.	6	district rate	
Sub-total				
7	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
8	stationery, caps, shoes, umbrellas, camping and survey equipment, etc. (lump sum at the rate of 25% of the sub-total)			
9	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

[#].....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

^{*}.....Survey Allowance per day = $\frac{\text{Basic monthly salary} + \text{Monthly remote area allowance}}{30} \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-9 above.

STR 'C'/'D' In Terai or similar plain areas, per 1 km of Main/Village Trail
(Generally, these types of transport linkages are not in use in Terai. However, they exist in the plain terrain of Hill areas.)

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Overseer/Surveyor - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out the survey work by using the required survey equipment like prismatic compass, abney level, and other simple instrument. - Environment survey.	1	per day rate of basic salary [#] x 1.5 (in case of hiring consultants) OR Survey Allowance * (in case of HMGN officials)	
2	Sub-overseer/Survey Assistant/Supervisor - Carries out the survey work by taking the bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	2	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Staff Men - Hold level staff. - Erect ranging rods.	2	district rate	
4	Tape/Chain Men Measure distances by tape/chain.	2	district rate	
5	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	4	district rate	
6	Porters Carry and shift the survey equipment and accessories.	4	district rate	
Sub-total				
7	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
8	stationery, caps, shoes, umbrellas, etc. (lump sum at the rate of 25% of the sub-total)			
9	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

^{*}Survey Allowance per day = $\frac{\text{Basic monthly salary} + \text{Monthly remote area allowance}}{30} \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-9 above.

Part II - Cross-drainage Structures

Activities covered by the norms for **cross-drainage structures**:

- Establishment of Bench Marks (BM) and other reference points.
- Taking the spot levels of grid points at the interval of 2-5 m.
- Taking levels along the streams and rivers which cross the road alignment.
- Take notes on geographical details of all gullies and depressions.
- Take notes on hydrological details of streams and rivers.
- Carry out soil investigations (in case of bridges).
- Take necessary measurements as per the type of structure proposed.
- Sketch the catchment area.
- Final setting out of structure (This should be done at a later stage after completing the designs.).

Note 1 : Whenever, any of the above nine activities are excluded from the planned job, the overall cost-estimate shall be reduced proportionately. For example, if final setting out of structure is excluded then the overall cost estimate shall be reduced by 11%.

Note 2 : Use of Part II will only be applicable when the surveys are required to be carried out especially for isolated cross-drainage structures. Such instances are usually encountered in rehabilitation and reconstruction work. For new construction, work norms for surveying of cross-drainage structures are already included in the norms given in Part I.

SHC 'A'/'B' In Hills, per unit structure of culvert/causeway of District Road or Village (Agricultural) Road

STC 'A'/'B' In Terai, per unit structure of culvert/causeway of District Road or Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise.	0.5	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
2	Overseer/Surveyor Carries out the survey work by using the required survey equipment like theodolite and level instrument.	1	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Sub-overseer/Surveyor Assistant/Supervisor - Carries out the survey work by taking bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	1	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
4	Staff Men - Hold level staff. - Erect ranging rods.	1	district rate	
5	Tape/Chain Men Measure distances by tape/chain	1	district rate	
6	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	1	district rate	
7	Porters Carry and shift the survey equipment and accessories.	1	district rate	
Sub-total				
8	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
9	stationery, caps, shoes, umbrellas, etc. (lump sum at the rate of 15% of the sub-total)			
10	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

^{*}Survey Allowance per day = $(\text{Basic monthly salary} + \text{Monthly remote area allowance}) \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of hume pipe culverts, only 50% of the above estimate shall apply.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-10 above.

SHC 'C'/'D' In Hills, per unit structure of culvert/causeway of Main/Village Trail
STC 'C'/'D' In Terai, per unit structure of culvert/causeway of Main/Village Trail

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Overseer/Surveyor - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out the survey work by using the required survey equipment like theodolite and level instrument. - Environmental survey.	0.25	per day rate of basic salary # x 1.5 OR Survey Allowance * (in case of HMGN officials)	
2	Sub-overseer/Surveyor Assistant/Supervisor - Carries out the survey work by taking bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	0.50	per day rate of basic salary # x 1.5 OR Survey Allowance (in case of HMGN officials)	
3	Staff Men - Hold level staff. - Erect ranging rods.	0.50	district rate	
4	Tape/Chain Men Measure distances by tape/chain	0.50	district rate	
5	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	0.50	district rate	
6	Porters Carry and shift the survey equipment and accessories.	0.50	district rate	
Sub-total				
7	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)			
8	stationery, caps, shoes, umbrellas, etc. (lump sum at the rate of 15% of the sub-total)			
9	sundries (lump sum at the rate of 5% of the sub-total)			
Total				

.....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

*Survey Allowance per day = $(\text{Basic monthly salary} + \text{Monthly remote area allowance}) \times 1.5$

30

Note :

- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of hume pipe culverts, only 50% of the above estimate shall apply.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-9 above.

SHB 'A'/'B' In Hills, per bridge of District Road or Village (Agricultural) Road
STB 'A'/'B' In Terai, per bridge of District Road or Village (Agricultural) Road

S. No.	Description	Labour required per Bridge (person days)		Rate	Amount
		Minor	Medium	(NRs.)	(NRs.)
1	Engineer - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out soil investigation and other field tests.	3	5	per day rate of basic salary [#] x 1.5 (in case of hiring consultants) OR Survey Allowance * (in case of HMGN officials)	
2	Overseer/Surveyor - Carries out the survey work by using theodolite/level instrument. - Involves in soil investigation and other field tests.	6	10	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Sub-overseer/Surveyor Assistant/Supervisor - Carries out the survey work by taking bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	3	5	per day rate of basic salary [#] x 1.5 OR Survey Allowance * (in case of HMGN officials)	
4	Staff Men - Hold level staff. - Erect ranging rods.	3	5	district rate	
5	Tape/Chain Men/Field Workers - Measure distances by tape/chain. - Involve in soil investigation.	6	10	district rate	
6	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	6	10	district rate	
7	Porters - Carry and shift the survey equipment and accessories. - Help in soil investigation.	6	10	district rate	
Sub-total					
8	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)				
9	stationery, caps, shoes, umbrellas, camping and survey equipment, etc. (lump sum at the rate of 25% of the sub-total)				
10	sundries (lump sum at the rate of 5% of the sub-total)				
Total					

[#].....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

*..... Survey Allowance per day = $\frac{\text{Basic monthly salary} + \text{Monthly remote area allowance}}{30} \times 1.5$

Note :

- The cost for soil investigation is not included in this norm.
- Minor bridge is that if $6 \text{ m} < L \leq 20 \text{ m}$.
- Medium bridge is that if $L > 20 \text{ m}$ with each span $\leq 20 \text{ m}$.
- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing consultants, the overhead cost should be considered as covered under Serial No. 1-10 above.

SHB 'C'/'D' In Hills, per bridge of Main/Village Trail
STB 'C'/'D' In Terai, per bridge of Main/Village Trail

S. No.	Description	Labour required per Bridge (person days)		Rate	Amount
		Minor	Medium	(NRs.)	(NRs.)
1	Engineer - Provides leadership to the team. - Visualises the task. - Identifies the steps of survey work and organise. - Carries out soil investigation and other field tests.	1	2	per day rate of basic salary # x 1.5 (in case of hiring consultants) OR Survey Allowance * (in case of HMGN officials)	
2	Overseer/Surveyor - Carries out the survey work by using theodolite/level instrument. - Involves in soil investigation and other field tests.	3	5	per day rate of basic salary # x 1.5 OR Survey Allowance * (in case of HMGN officials)	
3	Sub-overseer/Surveyor Assistant/ Supervisor - Carries out the survey work by taking the bearings and levels. - Maintains proper recordings of the survey details. - Establishment of benchmarks.	3	5	per day rate of basic salary # x 1.5 OR Survey Allowance * (in case of HMGN officials)	
4	Staff Men - Hold level staff. - Erect ranging rods.	3	5	district rate	
5	Tape/Chain Men/Field Workers - Measure distances by tape/ chain. - Involve in soil investigation.	3	5	district rate	
6	Unskilled Labourers - Pegging work. - Clearing off the bushes and obstacles as necessary.	3	5	district rate	
7	Porters - Carry and shift the survey equipment and accessories. - Help in soil investigation.	3	5	district rate	
Sub-total					
8	pegs, hammers, nails, tools and ropes, etc. (lump sum at the rate of 10% of the sub-total)				
9	stationery, caps, shoes, umbrellas, camping and survey equipment, etc. (lump sum at the rate of 25% of the sub-total)				
10	sundries (lump sum at the rate of 5% of the sub-total)				
Total					

#.....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

*.....Survey Allowance per day = $\frac{\text{Basic monthly salary} + \text{Monthly remote area allowance}}{30} \times 1.5$

Note :

- The cost for soil investigation is not included in this norm.
- Minor bridge is that if $6 \text{ m} < L \leq 20 \text{ m}$.
- Medium bridge is that if $L > 20 \text{ m}$ with each span $\leq 20 \text{ m}$.
- Add lump sum at the rate of 50% for all the items above when the work is in high mountain areas (snow falling areas).
- In the case of employing consultants, the overhead cost should be considered as covered under Serial No. 1-10 above.

Volume II

**Norms for
Design Works**

Part I - Roads and Trails

Activities covered by the norms for roads and trails :

- Calculate and plot the reduced ground levels of longitudinal section;
- Calculate and plot the reduced ground levels of cross sections;
- Design the most economical road profile by balancing the volumes of cut and fill to the nearest possible (indicate the design gradients of various stretches of road);
- Design the horizontal and vertical curves;
- As per the engineering design, prepare the drawings of road's plan (indicating the co-ordinates of IPs) and profile (longitudinal);
- Prepare the road's typical cross sections with the pavement details;
- Design and prepare drawings for the retaining walls, breast walls, side drains and other road side structures;
- Design and prepare drawings for the cross-drainage structures;
- Prepare the locality map (site plan);
- Prepare the land acquisition plans;
- Prepare the Bill of Quantities;
- Analyse the rates;
- Prepare the cost estimate;
- Prepare the Abstract of Cost, Material and Labour Schedules, etc.;
- Prepare the project report : **Section I** by including the documents (designs, drawings, BoQs, cost estimates and others) prepared for road.

Note 1 : These norms are applicable only for hiring consultants. When the designs are prepared by the HMGN officials, the cost required for stationery, drawing equipment and others shall be covered by the contingencies of project cost.

Note 2 : Whenever, any of the above fifteen activities are excluded from the planned job, the overall cost-estimate shall be reduced proportionately.

DHR 'A' In Hills, per 1 km of District Road

DHR 'B' In Hills, per 1 km of Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	4	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	8	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	8	per day rate of basic salary [#] of the consultant	
Sub-total 'A'				
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')			
Sub-total 'B'				
5	sundries (lump sum at the rate of 5% of the sub-total 'B')			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

DTR 'A' In Terai, per 1 km of District Road
DTR 'B' In Terai, per 1 km of Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	3	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	5	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	5	per day rate of basic salary [#] of the consultant	
Sub-total 'A'				
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')			
Sub-total 'B'				
5	sundries (lump sum at the rate of 5% of the sub-total 'B')			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

DHR 'C'/'D' In Hills, per 1 km of Main/Village Trail
DTR 'C'/'D' In Terai, per 1 km of Main/Village Trail

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	1	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	2	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	2	per day rate of basic salary [#] of the consultant	
Sub-total 'A'				
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')			
Sub-total 'B'				
5	sundries (lump sum at the rate of 5% of the sub-total 'B')			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

Part II - Cross-drainage Structures

Activities covered by the norms for **cross-drainage structures** :

- Calculate and plot the reduced ground levels of grid survey;
- Draw the contours;
- Design the most economical structure which serves the purpose;
- As per the engineering design, prepare the construction drawings by indicating all dimensions and details;
- Prepare the reinforcement drawings and bar bending schedules;
- Prepare the locality map (site plan) - *applicable only for bridges*;
- Prepare the Bill of Quantities;
- Analyse the rates;
- Prepare the cost estimate;
- Prepare the Abstract of Cost, Material and Labour Schedules, etc.;
- Prepare the project report : **Section II** by including the documents (designs, drawings, BoQs, cost estimates and others) prepared for structures.

Note 1 : These norms are applicable only for hiring consultants. When the designs are prepared by the HMGN officials, the cost required for stationery, drawing equipment and others shall be covered by the contingencies of project cost.

Note 2 : Whenever, any of the above eleven activities are excluded from the planned job, the overall cost-estimate shall be reduced proportionately.

Note 3 : Use of Part II will only be applicable when the design works are required to be carried out especially for isolated cross-drainage structures. Such instances are usually encountered in rehabilitation and reconstruction work. For new construction, work norms for designing of cross-drainage structures are already included in the norms given in Part I.

DHC 'A'/'B' In Hills, per unit structure of culvert/causeway of District Road or Village (Agricultural) Road

DTC 'A'/'B' In Terai, per unit structure of culvert/causeway of District Road or Village (Agricultural) Road

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	1	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	2	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	2	per day rate of basic salary [#] of the consultant	
Sub-total 'A'				
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')			
Sub-total 'B'				
5	sundries (lump sum at the rate of 5% of the sub-total 'B')			
Total				

[#].....Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of hume pipe culverts, only 50% of the above estimate shall apply.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

DHC 'C'/'D' In Hills, per unit structure of culvert/causeway of Main/Village Trail
DTC 'C'/'D' In Terai, per unit structure of culvert/causeway of Main/Village Trail

S. No.	Description	Labour Required (person days)	Rate (NRs.)	Amount (NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	0.5	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	1	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	1	per day rate of basic salary [#] of the consultant	
Sub-total 'A'				
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')			
Sub-total 'B'				
5	sundries (lump sum at the rate of 5% of the sub-total 'B')			
Total				

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of hume pipe culverts, only 50% of the above estimate shall apply.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

DHB 'A'/'B' In Hills, per bridge of District Road or Village (Agricultural) Road
DTB 'A'/'B' In Terai, per bridge of District Road or Village (Agricultural) Road

S. No.	Description	Labour Required per Bridge (person days)		Rate	Amount
		Minor	Medium	(NRs.)	(NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	10	20	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	10	20	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	10	20	per day rate of basic salary [#] of the consultant	
Sub-total 'A'					
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')				
Sub-total 'B'					
5	sundries (lump sum at the rate of 5% of the sub-total 'B')				
Total					

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

DHB 'C'/'D' In Hills, per bridge of Main/Village Trail
DTB 'C'/'D' In Terai, per bridge of Main/Village Trail

S. No.	Description	Labour Required per Bridge (person days)		Rate	Amount
		Minor	Medium	(NRs.)	(NRs.)
1	Engineer - Works on or supervises on plotting work. - Works on design work. - Works on or supervises on drawing work. - Supervises on the work of estimating and costing. - Prepares project documents (BoQ, cost-estimate, drawings, schedules of labour and material, tender document, etc.). - Prepares the project report.	3	6	per day rate of basic salary [#] of the consultant	
2	Overseer/Draftsperson - Works on plotting. - Works on drawing. - Works on estimating and costing. - Assists the Engineer in preparing the project documents and project report.	3	6	per day rate of basic salary [#] of the consultant	
3	Tracer/Computer Operator Assists Engineer and Overseer in the preparation of drawings and other documents.	3	6	per day rate of basic salary [#] of the consultant	
Sub-total 'A'					
4	stationery and drawing equipment, etc. (lump sum at the rate of 20% of sub-total 'A')				
Sub-total 'B'					
5	sundries (lump sum at the rate of 5% of the sub-total 'B')				
Total					

[#]Consultant's basic salary per day (generally considered as 2.7 times the salary of equivalent HMGN official)

Note :

- Preparation of reports (up to 3 copies) should be covered within this estimate.
- In the case of employing private consultants, the overhead cost should be considered as covered under Serial No. 1-5 above.

Volume III

**Norms for
Rural Roads**

Construction,
Rehabilitation and
Maintenance

Work Norms

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials and Tools/Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)	
1.	1-1.5(a), 1-1.5(b), and 1-1.6	Site Clearance Clearing and grubbing including the cutting of trees (only if necessary) having girth of less than 30 cm when measured at 1 m above the ground.	1 m ²	0.4		0.4		1. Picks 2. Kodalo 3. Shovels 4. Doko/Baskets
2.	1-1.5(c) and 1-1.6	Cutting of trees having girth of above 30 cm when measured at 1 m above the ground including the removal of trunk, branches and stumps up to a lead of 100 m along the lead route for trees of size : I. above 30 cm to 60 cm girth II. above 60 cm to 90 cm girth III. above 90 cm to 180 cm girth IV. above 180 cm to 270 cm girth V. above 270 cm to 450 cm girth VI. above 450 cm girth	Each	0.30		0.30		1. Axes 2. Khukuri 3. Saws 4. Crowbars 5. Wheel barrows or bullock carts
			Each	0.40		0.40		
			Each	1.50		1.50		
			Each	3.00		3.00		
			Each	10.00		10.00		
			Each	extrapolate		extrapolate		
3.	1-2	Dismantling of culverts, bridges, pavements and other structures. The operations covered are : - dismantling - excavation - back filling - stacking - disposing - handling and - haulage up to a lead of 100 m along the lead route. The activity includes safety precautions and incidentals.						1. Pickaxes 2. Spades 3. Crowbars 4. Shovels 5. Hammers and chisels 6. Doko/Baskets 7. Wheel barrows or bullock carts
		a) Dismantling brick masonry	1 m ³	1.50		1.50		
		stone masonry	1 m ³	2.00		2.00		
		concrete(plane and reinforced) masonry	1 m ³	3.00		3.00		
		b) Dismantling flexible and cement concrete pavement	1 m ³	4.00	2.00	4.00	2.00	
		c) Dismantling steel structures	1 tonne	5.00	0.50	5.00	0.50	

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials and Tools/Equipment
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)	
		d) Dismantling timber structures e) Dismantling pipes, guard-rails, kerbs, gutters, fencing f) Dismantling utility poles g) Dismantling masonry in mud mortar or in dry	1 m ³ 1 m each 1 m ³	1.00 0.10 0.20 0.16		1.00 0.10 0.20 0.16		
4.	2-1.3.2, 2-1.8 and 2-1.9.5	Stripping of top soil for a minimum depth of 150 mm including storing or reapplication within a lead up to 100 m along the lead route.	1 m ³	0.80		0.80		1. Picks 2. Shovels 3. Kodalo 4. Doko/Baskets 5. Wheel barrows or Bullock carts
5.	2-1.2.2, 2-1.8 and 2-1.9	Excavation in roadway and drain including removal and satisfactory disposal of all materials up to a lead of 50 m along the lead route. This includes handling and stacking or hauling (to sites of embankment construction) of suitable cut materials as required and also the disposal of unsuitable cut materials in specified manner. This further covers trimming and finishing of the road way. For, a) Ordinary soil b) Hard soil c) Ordinary rock d) Medium rock e) Hard rock (requiring blasting) f) Hard rock (chiselling, wedging, tempering, etc.) g) Marshy soil	1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³	0.50 0.60 2.00 4.00 2.00 17.00 1.00	0.05 (blaster)	0.60 0.70 2.00 4.00 2.00 17.00 1.00	0.05 (blaster)	1. Picks 2. Shovels 3. Kodalo 4. Doko/Baskets 5. Wheel barrows 6. Crowbars 7. Drilling machines 8. Petrol for plants 9. Blasting materials required for (d): – gelatine = 0.25 kg – detonator = 2 nos. – fuse wire = 2 m
6.	2-1.6, 2-1.7, 2-1.8 and 2-1.9	Works in the preparation of cut formation , as required are : a) Loosening and re-compacting at sub-grade level including breaking of clods, spreading in layers, watering and compacting. b) Removal of unsuitable materials (same as in S. No.5). c) Replacement with suitable materials in lieu of removed unsuitable materials. d) Preparing road formation in rocky sub-grade. e) Stripping of top soil including storing or stacking within a lead of 100 m along the lead route. f) Reapplication of top soil materials (stored earlier) up to a depth of 150 mm with light compaction within a lead of 50 m along the lead route. For additional haulage beyond the specified initial lead, S. No. 7 shall apply.	1 m ² 1 m ³ 1 m ³ 1 m ² 1 m ³ 1 m ²	0.10 1.00 1.00 0.80 0.04		0.10 1.00 1.00 0.80 0.04		1. Picks 2. Shovels 3. Kodalo 4. Doko/Baskets/Wheel barrows 5. Roller 8-10 ton; 1.5 ton vibrator roller; animal drawn or tractor drawn concrete roller; or hand tampers, as available.
7.	G-13.2, 2-1.3.10, 2-1.9.6 and 2-5.7.2	Transporting material from roadway and drain excavation including all incidentals beyond the specified initial lead distance for every additional haulage of a) 50 m, for distances up to and including 200 m	1 m ³ 1 m ³	0.50 1.50		0.40 1.20		1. Shovel 2. Doko/Baskets/Wheel barrows 3. Picks

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials and Tools/Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)	
		b) 200 m, for distances exceeding 200 m but not exceeding 1 km						
8.	2-3	Pre-splitting work a) For the establishment of a specified excavation slope in rock by employing the pre-splitting technique (with a blaster as skilled labour). b) Additional work for extracting the quantity of rock material through the pre-splitting operation (with a blaster as skilled labour).	1 m ² 1 m ³	0.50 2.00	0.02 0.05	0.02 2.00	0.01 0.05	Required blasting materials : For (a) For (b) Gelatine = 0.01 kg 0.25 kg Detonator = 2 nos. 2 nos. Fuse = 2 m 2 m
9.	2-4	Excavation for structures including cutting of slopes, shoring, shuttering, planking, ordinary sealing and disposal of materials up to a lead of 50 m along the lead route in: a) ordinary soil b) hard soil c) ordinary rock d) medium rock e) hard rock (requiring blasting) f) hard rock (chiselling, wedging, tempering, etc.) g) special provision for preparation of rock foundation h) marshy soil	1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ² 1 m ³ 1 m ³	1.00 2.00 4.00 8.00 6.00 30.00 0.50 3.00	0.10 (blaster)	1.00 2.00 4.00 8.00 6.00 30.00 0.50 3.00	0.10 (blaster)	Blasting material for (d) : Gelatine = 0.50 kg Detonator = 4 nos. Fuse = 4 m 1. Picks 2. Shovels 3. Kodalo 4. Crowbars 5. Doko/Baskets and/or Wheel barrows 6. Drilling rods
10.	2-5	Construction of roadway in embankments and miscellaneous backfilling areas with approved material obtained either from ⇒ excavation for road construction or ⇒ borrow pits or ⇒ other sources excluding the excavation (which shall be covered separately under S. No. 5) and transportation (which shall be covered under S. No. 6 or 11) components. In this case, initial lead is 50 m.	1 m ³	0.25		0.25		1. Picks 2. Shovels 3. Doko/Baskets 4. Wheel barrows 5. Rollers as specified in S. No. 6.
11.	2-5.7.2	Transporting material required for embankment and sub-grade construction including all incidentals for every additional haulage of 50 m beyond the specified initial lead distance (same as S. No. 7).	1 m ³	0.50		0.40		1. Picks 2. Shovels 3. Doko/Baskets 4. Wheel barrows
12.	2-5.7.3	Works in the preparation of embankment and sub-grade construction , as required : a) Stripping of top soil including storing or stacking within a lead of 100 m along the lead route. b) Stripping and re-application of top soil within a lead of 100 m. c) Reapplication of top soil materials (stored earlier) up to a depth of 150 mm with light compaction within a lead of 50 m along the lead route.	1 m ³ 1 m ³ 1 m ²	0.80 0.80 0.04		0.80 0.80 0.04		1. Picks 2. Kodalo 3. Shovels 4. Doko/Baskets 5. Wheel barrows

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials and Tools/Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)	
		For additional haulage beyond the specified initial lead, S. No. 11 shall apply.						
13.	2-5.3.3, 2-5.3.5 and 2-5.7.4	Loosening and re-compacting the embankment foundation. (same as S. No. 6.a)	1 m ²	0.10		0.10		1. Picks 2. Kodalo 3. Shovels 4. Doko/Baskets 5. Wheel barrows
14.	2-5.7.5	Removal of unsuitable materials and replacement with suitable materials (same as S. No. 5) For, a) Ordinary soil b) Hard soil c) Ordinary rock d) Medium rock e) Hard rock (requiring blasting) f) Hard rock (chiselling, wedging, tempering, etc.) g) Marshy soil	1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³ 1 m ³	0.50 0.60 2.00 4.00 2.00 17.00 1.00		0.60 0.70 2.00 4.00 2.00 17.00 1.00	0.05 0.05 (blaster)	1. Picks 2. Kodalo 3. Shovels 4. Doko/Baskets 5. Wheel barrows
15.	2-5.7.6 and 2-5.4.3	Scarifying existing granular/bituminous road surface for carrying out the required operations necessary to complete the work. This includes handling, salvaging, stacking and disposing of scarified material up to a lead of 100 m along the lead route.	1 m ²	0.20		0.20		1. Harrows 2. Picks 3. Shovels 4. Doko/Baskets 5. Wheel barrows or Bullock carts or Tractor trailer
16.	2-5.7.7	Dismantling and removal of existing cement concrete pavement (same as S. No. 3.a)	1 m ³	3.00		3.00		1. Harrows 2. Pickaxes 3. Shovels 4. Doko/Baskets 5. Wheel barrows or Bullock carts or Tractor trailer
17.	2-5.7.8	Providing and laying filter material adjacent to abutments and other structures including all other operations required to complete the work as per the Specifications.	1 m ³	2.00		2.00		1. Graded aggregates as specified in the Specifications 2. Shovels 3. Picks 4. Doko/Baskets 5. Wheel barrows

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
18.	2-7	Planting grass cuttings on site or turfing with sods by carrying out all operations explained in the Specifications including full compensation for furnishing sod materials to be incorporated in the works with all leads along the lead route.	1 m ²	0.05		0.05		Royalties for the turf materials	1. Picks 2. Kodalo 3. Shovels 4. Doko/baskets 5. Wheel barrows and/or bullock carts
19.	2-8	Seeding and mulching by carrying out all the required operations explained in the specifications including full compensation for the transportation of materials. a. Broadcasting grass seeds on slopes <40° at a seeding rate of 25 g per m ² . b. Broadcasting grass seeds on slopes <40°, including the covering with long mulch, at a seeding rate of 25 g per m ² . c. Broadcasting grass seeds on slopes of 40° -45°, including the covering with long mulch and jute netting having mesh size of 300 mm x 500 mm. Seeding @ 25 g per m ² . Operation includes pegging with suitable live pegs or hardwood cuttings (e.g. simali) at a spacing of 1 m. The size of each jute net is 6.75 m x 1 m.	100m ² 100m ² 100m ²	0.17 5.00 6.25		0.17 5.00 6.25		Seed = 2.5 kg Seed = 2.5 kg Mulch = 5 m ³ Seed = 2.5 kg Mulch = 5 m ³ Jute net = 100 m ² Live pegs = 128 nos.	1. Shovels 2. Doko/baskets 1. Shovels 2. Doko/baskets 1. Khukuri 2. Mallet (wooden hammer)
20.	2-9.2 and 2-9.5.1	Excavation of surface drains (same as roadway and drainage excavation, S. No. 5 shall apply).							
21.	2-9.4	Dressing of bed and sides of surface drains and providing lining with dry stones for a minimum thickness of 100 mm. This includes full compensation for all labour, materials and incidentals required to complete the work as per the Specifications and is applicable for all leads along the lead route.	1 m ²	1.00		1.00			1. Shovel 2. Picks 3. Kodalo 4. Hammer - 1 kg 5. Shovel
22.	2-9.3, 2-9.4 and 2-9.5.2	Removal of unsuitable material and its replacement with suitable material in the trench bed for sub-surface drains shall be paid as a single item in terms of volume of suitable material laid in position. This includes full compensation for all materials, labour and incidentals required to complete the work as per the Specifications and is applicable for a lead up to 50 m along the lead route (S. No. 10 shall apply).						Royalties for suitable soil materials, if required	1. Picks 2. Shovels 3. Kodalo 4. Doko/baskets 5. Wheel barrows
23.	2-9.3.3, 2-9.4 and 2-9.5.2	Excavation of trench for sub-surface drains (same as excavation for structures, S. No. 9 shall apply).							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
24.	2-9.3.4, 2-9.4 and 2-9.5.2	Laying and jointing the pipes for sub-surface drains. This includes full compensation for all labour and incidentals required to complete the work as per the Specifications and is applicable for all leads along the lead route.	10m	0.50	0.10	0.50	0.10	- Sub-surface drain pipe of required size - Hessian (jute)	1. Picks 2. Shovels 3. Kodalo 4. Crowbars
25.	2-9.3.2, 2-9.3.4, 2-9.3.6, 2-9.4 and 2-9.5.2	Back filling and bedding of the sub-surface drain pipe (or the construction of aggregate drains) with the specified back fill or filter materials of sand and gravel aggregates having specified grading (50 mm down to 75 micron) including the works such as providing, laying and compacting the material to the requirements of the Specifications with all leads along the lead route.							
		i. with filter material of aggregate having the sizes 10 mm down to 75 micron as per the Specifications for Class I Grading.	1 m ³	26.00	0.50	29.00	0.50	- Royalties, local tax and tolls. - Transportation by tractor/bullock cart and labourers as required.	1. Harrows 2. Shovels 3. Picks 4. Doko/Baskets 5. Screens for the sizes from 10 mm down to 75 micron.
		— procuring broken stone aggregates at quarry (refer Annex II)	1 m ³	25.00		28.00			
		— laying and compacting filter materials	1 m ³	1.00	0.50	1.00	0.50		
		ii. with filter material of aggregate having sizes 25 mm down to 75 micron as per the Specifications for Class II Grading.	1 m ³	25.00	0.50	27.00	0.50	- Royalties, local tax and tolls. - Transportation by tractor/bullock cart and labourers as required.	1. Harrows 2. Shovels 3. Picks 4. Doko/Baskets 5. Screens for the sizes from 25 mm down to 75 micron.
		— procuring broken stone aggregates at quarry (refer Annex II)	1 m ³	24.00		26.00			
		— laying and compacting filter materials	1 m ³	1.00	0.50	1.00	0.50		
		iii. with filter material of aggregate having sizes 50 mm down to 75 micron as per the Specifications for Class III Grading.	1 m ³	24.00	0.50	26.00	0.50	- Royalties, local tax and tolls. - Transportation by tractor/bullock cart and labourers as required.	1. Harrows 2. Shovels 3. Picks 4. Doko/Baskets 5. Screens for the sizes from 50 mm down to 75 micron.
		— procuring broken stone aggregates at quarry (refer Annex II)	1 m ³	23.00		25.00			
		— laying and compacting filter materials	1 m ³	1.00	0.50	1.00	0.50		
26.	3-1	Carrying out the construction operations of granular sub-base including full compensation for — making arrangements for traffic in accordance with Clause G- 12 of the Specifications except for initial treatment to shoulders and construction of diversions; — furnishing all materials to be incorporated in the work including all							
		royalties, fees, rents wherever necessary and all leads along the lead route;							
		— all labour and incidentals to complete the work to the							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		Specifications; and – carrying out the work in part widths of roadway where directed.							
		A. With naturally found deposits of sand/gravel aggregates conforming to the Specifications for							
		a) Class I Grading (when CBR = 30%)	1.00m³	4.48	0.25	4.48	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		<u>break up</u> – Procuring sieved river gravel aggregates having sizes of (refer Annex I)							
		– 63-80 mm	0.45m ³	0.68		0.68			
		– 4.75-63 mm	0.55m ³	1.65		1.65			
		– 75 microns-4.75 mm	0.10m ³	0.10		0.10			
		– Preparation of the sub-grade that was finished earlier	LS	0.05		0.05			
		– For laying of aggregate including compaction and the incidentals	LS	2.00	0.25	2.00	0.25		
		b) Class II Grading (when CBR = 25%)	1.00m³	4.60	0.25	4.60	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		<u>break up</u> – Procuring sieved river gravel aggregates having sizes of (refer Annex I)							
		– 63-80 mm	0.30m ³	0.45		0.45			
		– 4.75-63 mm	0.65m ³	1.95		1.95			
		– 75 microns-4.75 mm	0.15m ³	0.15		0.15			
		– Preparation of the sub-grade that was finished earlier	LS	0.05		0.05			
		– For laying of aggregate including compaction and the incidentals	LS	2.00	0.25	2.00	0.25		
		c) Class III Grading (when CBR = 20%)	1.00m³	4.73	0.25	4.73	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		<u>break up</u> – Procuring sieved river gravel aggregates having sizes of (refer Annex I)							
		– 63-80 mm	0.15m ³	0.23		0.23			
		– 4.75-63 mm	0.75m ³	2.25		2.25			
		– 75 microns-4.75 mm	0.20m ³	0.20		0.20			
		– Preparation of the sub-grade that was finished earlier	LS	0.05		0.05			
		– For laying of aggregate including compaction and the incidentals	LS	2.00	0.25	2.00	0.25		
		B. With broken stone aggregates conforming to the Specifications for							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		a) Class I Grading (when CBR = 30%) <u>break up</u> – Procuring broken stone aggregates having sizes of (refer Annex II) – 63-80 mm – 4.75-63 mm – 75 microns-4.75 mm – Collection of rubble for breaking aggregates – Preparation of sub-grade that was finished earlier – For laying of aggregate including compaction and the incidentals	1.00m ³	16.25	0.25	17.49	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		b) Class II Grading (when CBR = 25%) <u>break up</u> – Procuring broken stone aggregates having sizes of (refer Annex II) – 63-80 mm – 4.75-63 mm – 75 microns-4.75 mm – Collection of rubble for breaking aggregates – Preparation of sub-grade that was finished earlier – For laying of aggregate including compaction and the incidentals	1.00m ³	18.30	0.25	19.72	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		c) Class III Grading (when CBR = 20%) <u>break up</u> – Procuring broken stone aggregates having sizes of (refer Annex II) – 63-80 mm – 4.75-63 mm – 75 microns-4.75 mm – Collection of rubble for breaking aggregates – Preparation of sub-grade that was finished earlier – For laying of aggregate including compaction and the incidentals	1.00m ³	20.35	0.25	21.95	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
27.	3- 2	Carrying out the construction operations of water bound macadam, sub-base/base course including full compensation for all components listed in S. No. 26 above.							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		a) Grading No. I (restricted to use for sub-base only) - For sub-base <u>break up</u> – Breaking stones for aggregates sizes: (refer Annex II) – 20 mm down (i.e. 10-20 mm) – 20-40 mm – 40-63 mm – 63-80 mm – 80-100 mm – Collection of rubble for aggregates – Laying of sub-base – Incidentals	1.00m ³	10.495	0.25	11.195	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		b) Grading No. II - For base <u>break up</u> – Breaking stones for aggregates sizes: (refer Annex II) – 20 mm down (i.e. 10-20 mm) – 20-40 mm – 40-50 mm – 50-63 mm – 63-80 mm – For screenings – 150 micron down – 150 micron-4.75 mm – 4.75-10 mm – 10-12.5 mm – Collection of rubble for aggregates – Laying of base – Spreading screenings – Incidentals	1.00m ³	17.820	0.25	19.310	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller
		c) Grading No. III - For base <u>break up</u> – Breaking stones for aggregates sizes: (refer Annex II) – 10 mm down (75 micron-10mm) – 10-20 mm – 20-40 mm – 40-50 mm	1.00m ³	21.220	0.25	23.180	0.25	- Royalties, local tax and tolls. - Transport of materials from the quarry by tractors, bullock carts, labourers or other means.	1. Sieving screens 2. Harrows 3. Shovels 4. Picks 5. Doko/Baskets 6. Rollers : 8-10 T roller (0.09 hrs) or 1.5T vibrating roller or animal drawn concrete roller

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		– 50-63 mm	0.05m³	0.300		0.325			
		– For screenings – 150 micron down – 150 micron-4.75 mm – 4.75-10 mm – Collection of rubble for aggregates – Laying of base – Spreading screenings – Incidentals	0.04m³ 0.16m³ 0.03m³ 1.60m³ 1.00m³ 0.15m³ LS	1.280 4.000 0.690 1.600 1.000 0.150 1.000	0.25	1.360 4.480 0.750 1.600 1.000 0.150 1.000	0.25		
28.	4-1.1, 4-1.2.1 and 4-1.3.1	Preparing base for bituminous macadam by carrying out the preparatory work of scarifying and relaying the aggregate base course (WBM) including full compensation for components listed in S. No. 31. This item is same as S. No. 26 but with due deduction for the procurement of quantity received from the scarifying of receiving surface.							
29.	4-1.2.3 and 4-1.3.3	Laying of the levelling course as the preparation for bituminous course including full compensation for - making arrangements for traffic as per clause G- 12 of the Specifications except the initial treatment to shoulders and construction of diversions; - providing all materials to be incorporated in the work including any royalties, fees, rents as applicable and all leads unless excluded in the contract; - preparation of base including filling of potholes, all cleaning operations and application of tack coat; - all labour and incidentals required to complete the work as per the Specifications; - carrying out the work in part widths of roadway as directed. This item is same as bituminous macadam (refer S. No. 31.1 or 31.2 as per the need) except that the binder content in this case is not more than 2.5% by weight of the total mix.							
30.	4- 2	Carrying out the required operation for the application of tack							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		coat including full compensation for – making arrangements for traffic as per clause G- 12 of the Specifications except the initial treatment to shoulders and construction of diversions;							
		– providing all materials to be incorporated in the work including all royalties, fees rents where necessary and all leads along the lead route; – all labour and incidentals necessary to complete the work as per the Specifications; – carrying out the work in part widths of roadway as directed.							
		a) When the application is upon existing bituminous treated surface	10m ²	0.15		0.10		a) To be procured 1. Bitumen = 5 kg 2. Fire wood – in open oven = 8 kg – in boiler plant = 2 kg b) Any royalty or tax c) Transportation charge of bitumen and fire wood as required.	1. Boiler plant (0.04 hr.) 2. Bitumen heating drums 3. Metal buckets and mugs 4. Wheel barrows/ baskets 5. Sprayer (0.04 hr.) or hand sprayer 6. Wire brushes 7. Brooms 8. Rubber boots 9. Rubber gloves 10. Safety hats
		b) When the application is upon existing water bound macadam	10m ²	0.20		0.15		a) To be procured 1. Bitumen = 10 kg 2. Fire wood – in open oven = 16 kg – in boiler plant = 4 kg b) Any royalty or tax c) Transportation charge of bitumen and fire wood as required.	1. Boiler plant (0.04 hr.) 2. Bitumen heating drums 3. Metal buckets and mugs 4. Wheel barrows/ baskets 5. Sprayer (0.04 hr.) or hand sprayer 6. Wire brushes 7. Brooms 8. Rubber boots 9. Rubber gloves 10. Safety hats

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		– 75 micron – 2.36 mm – 4.75 mm – 10 mm – 20 mm – 25 mm	0.028m ³ 0.137m ³ 0.175m ³ 0.279m ³ 0.486m ³ 0.195m ³	0.896 3.425 4.900 6.138 5.832 2.340		0.952 3.836 5.250 6.696 6.318 2.535		= 22 kg b) Transportation of 1.30 m ³ stone aggregates. c) Royalties/tax for 1.30 m ³ stone aggregates	4. Metal sheets for aggregate drying 5. Metal sheets for mixing of bitumen and aggregates 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.12 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
32.	4- 5	Laying of seal coat by carrying out the required operations including full compensation for all the components listed in S. No. 31 above. 1. (a) Type A seal coat with broken stone chippings Laying and compacting work Procuring broken stone chippings of 6 mm standard size (passing through 10 mm sieve and retaining on 2.36 mm sieve)	10.00 m² 10.00m ² 0.09m ³	2.52 0.45 2.07		2.60 0.35 2.25		a) To be procured 1. 80/100 grade bitumen = 9.8 kg 2. Fire wood – in open oven = 16 kg – in boiler plant = 4 kg b) Transportation of 0.09 m ³ stone chippings c) Royalties/tax for 0.09 m ³ stone chippings	1. Boiler plant (0.04 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Metal sheets for aggregate drying 5. Metal sheets for mixing of bitumen and aggregates 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.04 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
		1. (b) Type A seal coat with river gravel (grits) Laying and compacting work Procuring river gravel (grits) of 6 mm standard size (passing through 10 mm sieve and retaining on 2.36 mm sieve)	10.00 m² 10.00m ² 0.09m ³	1.08 0.45 0.63		0.98 0.35 0.63		a) To be procured 1. 80/100 grade bitumen = 9.8 kg 2. Fire wood – in open oven = 16 kg – in boiler plant = 4 kg	1. Boiler plant (0.04 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Metal sheets for aggregate drying 5. Metal sheets for mixing of
								– in boiler plant = 4 kg	

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
								b) Transportation of 0.09 m ³ stone chippings c) Royalties/tax for 0.09 m ³ stone chippings	bitumen and aggregates 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.04 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
		2. (a) Type B seal coat with broken stone chippings Laying and compacting work Procuring broken stone chippings (passing through 1.7 mm sieve and retaining on 180 micron sieve)	10.00 m² 10.00m ² 0.06m ³	2.25 0.45 1.80		2.27 0.35 1.92		a) To be procured 1. 80/100 grade bitumen = 6.8 kg 2. Fire wood – in open oven = 10 kg – in boiler plant = 2.5 kg b) Transportation of 0.06 m ³ stone chippings c) Royalties/tax for 0.06 m ³ stone chippings	1. Boiler plant (0.04 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Metal sheets for aggregate drying 5. Metal sheets for mixing of bitumen and aggregates 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.04 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
		2. (b) Type B seal coat with fine river grits or coarse sand Laying and compacting work Procuring river gravel (grits) or coarse sand (passing through 1.7 mm sieve and retaining on 180 micron sieve)	10.00 m² 10.00m ² 0.06m ³	0.51 0.45 0.06		0.41 0.35 0.06		a) To be procured 1. 80/100 grade bitumen = 6.8 kg 2. Fire wood – in open oven = 10 kg – in boiler plant = 2.5 kg b) Transportation of	1. Boiler plant (0.04 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Metal sheets for aggregate drying 5. Metal sheets for mixing of bitumen and aggregates

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
								0.06 m ³ stone chippings c) Royalties/tax for 0.06 m ³ stone chippings	6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.04 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
33.	4- 4	Laying of single coat surface dressing (single bitumen surface treatment - SBST) or laying of first coat of the two coat surface dressing (double bitumen surface treatment - DBST) by using broken stone chippings and by carrying out all operations stated in S. No. 31. Laying and compacting work Procuring broken stone chippings of 12 mm standard size (passing through 20 mm sieve and retaining on 10 mm sieve)	10.00 m² 10.00m ² 0.15m ³	2.70 0.45 2.25		2.83 0.35 2.48		a) To be procured 1. 80/100 grade bitumen = 18 kg 2. Fire wood – in open oven = 22 kg – in boiler plant = 5.5 kg b) Transportation of 0.15 m ³ stone chippings c) Royalties/tax for 0.15 m ³ stone chippings	1. Boiler plant (0.10 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Sprayer (0.10 hr.) 5. Wire brushes 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.10 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
34.	4- 4	Laying of single coat surface dressing (single bitumen surface treatment - SBST) or laying of first coat of the two coat surface dressing (double bitumen surface treatment - DBST) by using river gravel (grits) or shingles and by carrying out the operations stated in S. No.31. Laying and compacting work Procuring river gravel (grits) of 12 mm standard size (passing through 20 mm sieve and retaining on 10 mm sieve)	10.00 m² 10.00m ² 0.15m ³	1.20 0.45 0.75		1.10 0.35 0.75		a) To be procured 1. 80/100 grade bitumen = 18 kg 2. Fire wood – in open oven = 22 kg – in boiler plant = 5.5 kg b) Transportation of 0.15 m ³ stone chippings c) Royalties/tax for 0.15 m ³ stone chippings	1. Boiler plant (0.10 hr.) or bitumen heating drums 2. Metal buckets and mugs 3. Wheel barrows/ baskets 4. Sprayer (0.10 hr.) 5. Wire brushes 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.10 hr.) 9. Rubber boots 10. Rubber gloves

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
									11. Safety hats
35.	4-4	Laying of second coat of the two coat surface dressing (double bitumen surface treatment - DBST) by using broken stone chippings and by carrying out the operations stated in S. No. 31. Laying and compacting work Procuring broken stone chippings of 10 mm standard size (passing through 12.5 mm sieve and retaining on 6.3 mm sieve)	10.00 m² 10.00m² 0.10m³	2.55 0.35 2.20		2.65 0.25 2.40		a) To be procured 1. 80/100 grade bitumen = 11 kg 2. Fire wood – in open oven = 20 kg – in boiler plant = 5 kg b) Transportation of 0.10 m³ stone chippings c) Royalties/tax for 0.10 m³ stone chippings	1. Boiler plant (0.10 hr.) or bitumen heating drums 2. Buckets and mugs 3. Wheel barrows/ baskets 4. Sprayer (0.10 hr.) 5. Wire brushes 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.10 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
36.	4-4	Laying of second coat of the two coat surface dressing (double bitumen surface treatment - DBST) by using river gravel (grits) or shingles and by carrying out the operations stated in S. No. 31. Laying and compacting work Procuring river gravel grits of 10 mm standard size (passing through 12.5 mm and retaining on 6.3 mm sieve)	10.00 m² 10.00m² 0.10m³	1.05 0.35 0.70		0.95 0.25 0.70		a) To be procured 1. 80/100 grade bitumen = 11 kg 2. Fire wood – in open oven = 20 kg – in boiler plant = 5 kg b) Transportation of 0.10 m³ stone chippings c) Royalties/tax for 0.10 m³ stone chippings	1. Boiler plant (0.10 hr.) or bitumen heating drums 2. Buckets and mugs 3. Wheel barrows/ baskets 4. Sprayer (0.10 hr.) 5. Wire brushes 6. Forked harrows 7. Shovels 8. Road roller 8-10ton or 1.5 ton vibrator roller (0.10 hr.) 9. Rubber boots 10. Rubber gloves 11. Safety hats
37.	7	A. Brick masonry with all necessary operations including full compensation for all labour, materials, scaffolding and other incidentals required to complete the work as per the Specifications and as shown on the drawings. It includes full compensation for using specially moulded bricks on the face of walls with batter and provision of weep holes jointed with cement sand mortar:							
		a) In 1:3 mix ratio	1.00m ³	4.97	1.50	3.97	1.00	To be procured	1. Iron pan

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		<u>break up</u> - brick masonry - providing of prepared cement mortar: (refer Annex III) - incidentals for curing, soaking and scaffolding	1.00m ³ 0.30m ³ LS	4.00 0.72 0.25	1.50	3.00 0.72 0.25	1.00	– bamboo = 2 nos. – ropes = 1 kg – bricks = 530 nos. (224x108x57mm) – cement = 130 kg Transportation & Royalty – sand = 0.33 m ³	2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		b) In 1:4 mix ratio <u>break up</u> - brick masonry - providing of prepared cement mortar: (refer Annex III) - incidentals for curing, soaking and scaffolding	1.00m³ 1.00m ³ 0.30m ³ LS	4.99 4.00 0.74 0.25	1.50 1.50	3.99 3.00 0.74 0.25	1.00 1.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – bricks = 530 nos. (224x108x57mm) – cement = 100 kg Transportation & Royalty – sand = 0.35 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		c) In 1:6 mix ratio <u>break up</u> - brick masonry - providing of prepared cement mortar: (refer Annex III) - incidentals for curing, soaking and scaffolding	1.00m³ 1.00m ³ 0.30m ³ LS	5.02 4.00 0.77 0.25	1.50 1.50	4.02 3.00 0.77 0.25	1.00 1.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – bricks = 530 nos. (224x108x57mm) – cement = 70 kg Transportation & Royalty – sand = 0.38 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
	7-9.4, 7-12 and 7-13.2	B. 12.5 mm thick plastering with cement sand mortar on brick walls or concrete surfaces with all necessary operations including full compensation for all labour, materials, scaffolding and other incidentals required to complete the work as per the Specifications.							
		a) In 1:2 mix ratio <u>break up</u> - providing of prepared cement mortar: (refer Annex III) - plastering - incidentals for curing, soaking and scaffolding	100m² 1.25m ³ 100m ² LS	13.44 2.94 10.00 0.50	15.00 15.00	11.44 2.94 8.00 0.50	12.00 12.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – cement = 588 kg Transportation & Royalty – sand = 1.25 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		b) In 1:3 mix ratio	100m²	13.50	15.00	11.50	12.00	To be procured – bamboo = 2 nos.	1. Iron pan 2. Mason's tools

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		<u>break up</u> - providing of prepared cement mortar: (refer Annex III) - plastering - incidentals for curing, soaking and scaffolding	1.25m ³ 100m ² LS	3.00 10.00 0.50	15.00	3.00 8.00 0.50	12.00	– ropes = 1 kg – cement = 463 kg Transportation & Royalty – sand = 1.38 m ³	3. Bucket 4. Shovel 5. Basket
		c) In 1:4 mix ratio	100m²	13.59	15.00	11.59	12.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – cement = 363 kg Transportation & Royalty – sand = 1.46 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		<u>break up</u> - providing of prepared cement mortar: (refer Annex III) - plastering - incidentals for curing, soaking and scaffolding	1.25m ³ 100m ² LS	3.09 10.00 0.50	15.00	3.09 8.00 0.50	12.00	– ropes = 1 kg – cement = 363 kg Transportation & Royalty – sand = 1.46 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		d) In 1:6 mix ratio	100m²	13.70	15.00	11.70	12.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – cement = 288 kg Transportation & Royalty – sand = 1.58 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		<u>break up</u> - providing of prepared cement mortar: (refer Annex III) - plastering - incidentals for curing, soaking and scaffolding	1.25m ³ 100m ² LS	3.20 10.00 0.50	15.00	3.20 8.00 0.50	12.00	– ropes = 1 kg – cement = 288 kg Transportation & Royalty – sand = 1.58 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		C. Pointing work with cement sand mortar on brick wall with all required operations including full compensation for all labour, materials and other incidentals necessary to complete the work as per the Specifications.							
		a) In 1:1 mix ratio	100m²	8.81	8.00	6.81	6.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – cement = 156 kg Transportation & Royalty – sand = 0.22 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		- providing the prepared cement mortar (refer Annex - III) - pointing work - incidentals for curing, erecting scaffolding	0.26m ³ 100m ² LS	0.56 8.00 0.25	8.00	0.56 6.00 0.25	6.00	– ropes = 1 kg – cement = 156 kg Transportation & Royalty – sand = 0.22 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		b) In 1:2 mix ratio	100m²	8.86	8.00	6.86	6.00	To be procured – bamboo = 2 nos. – ropes = 1 kg – cement = 122 kg Transportation & Royalty – sand = 0.26 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		- providing the prepared cement mortar (refer Annex - III) - pointing work - incidentals for curing, erecting scaffolding	0.26m ³ 100m ² LS	0.61 8.00 0.25	8.00	0.61 6.00 0.25	6.00	– ropes = 1 kg – cement = 122 kg Transportation & Royalty – sand = 0.26 m ³	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		c) In 1:3 mix ratio	100m²	8.88	8.00	6.88	6.00	To be procured – bamboo = 2 nos. – ropes = 1 kg	1. Iron pan 2. Mason's tools 3. Bucket
		providing the prepared cement mortar (refer Annex - III)	0.26m ³	0.63		0.63			

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		- pointing work - incidentals for curing, erecting scaffolding	100m ² LS	8.00 0.25	8.00	6.00 0.25	6.00	– cement = 96 kg Transportation & Royalty – sand = 0.29 m ³	4. Shovel 5. Basket
	7- 11, 7- 12 and 7-13.4	D. Architectural coping work (additional labour to be added to that of B above)	10m	0.25	0.50	0.20	0.40	as necessary	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
		E. Ruled pointing - two times that of C above						as necessary	1. Iron pan 2. Mason's tools 3. Bucket 4. Shovel 5. Basket
38.	8	Stone masonry work including full compensation for all labour, materials and other incidentals required to complete the work as per the Specifications and drawings. It includes full compensation for using specially dressed stones on the face of walls with batter and makes provision for weep holes as necessary.							
		A. Un-coursed Rubble Masonry							
		a. In dry - collection of rubble at quarry (refer Annex II) - dry masonry with rubble stone - incidentals including erecting/dismantling scaffolding	1.00m³ 1.10m ³ 0.40m ³ 1.00m ³ LS	2.85 1.10 1.50 0.25	0.50 0.50	3.10 1.10 1.75 0.25	0.50 0.75	To be procured – bamboo = 1 no. – rope = ½ kg Transportation & Royalty – rubble = 1.1 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		b. In 1:3 cement sand mortar - collection of rubble at quarry (refer Annex II) - providing prepared cement mortar (refer Annex III) - stone masonry with rubble stone - incidentals including erecting/dismantling scaffolding	1.00m³ 1.10m ³ 0.40m ³ 1.00m ³ LS	4.31 1.10 0.96 2.00 0.25	1.50 1.50	4.56 1.10 0.96 2.25 0.25	1.75 1.75	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 148 kg Transportation & Royalty – rubble = 1.1 m ³ – sand = 0.44 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		c. In 1:4 cement sand mortar	1.00m³	4.34	1.50	4.59	1.75	To be procured	1. Mallet

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		- collection of rubble at quarry (refer Annex II) - providing prepared cement mortar (refer Annex III) - stone masonry with rubble stone - incidentals including erecting/dismantling scaffolding	1.10m ³ 0.40m ³ 1.00m ³ LS	1.10 0.99 2.00 0.25	1.50	1.10 0.99 2.25 0.25	1.75	– bamboo = 1 no. – rope = ½ kg – cement = 116 kg Transportation & Royalty – rubble = 1.1 m ³ – sand = 0.47 m ³	2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		d. In 1:6 cement sand mortar	1.00m³	4.39	1.50	4.64	1.75	To be procured	1. Mallet
		- collection of rubble at quarry (refer Annex II) - providing prepared cement mortar (refer Annex III) - stone masonry with rubble stone - incidentals including erecting/dismantling scaffolding	1.10m ³ 0.40m ³ 1.00m ³ LS	1.10 1.04 2.00 0.25	1.50	1.10 1.04 2.25 0.25	1.75	– bamboo = 1 no. – rope = ½ kg – cement = 92 kg Transportation & Royalty – rubble = 1.1 m ³ – sand = 0.50 m ³	2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		B. Square Rubble - Coursed Rubble Masonry (First sort)	1.00m³	5.30	1.50	5.80	1.75	To be procured	1. Mallet
		a. In dry	1.30m ³ 0.30m ³ 1.00m ³ LS	1.30 2.00 1.75 0.25	1.50	1.30 2.25 2.00 0.25	1.75	– bamboo = 1 no. – rope = ½ kg Transportation & Royalty – rubble = 1.3 m ³	2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		b. In 1:3 cement sand mortar	1.00m³	7.01	2.50	7.51	2.75	To be procured	1. Mallet
		- collection of rubble at quarry (refer Annex II) - dressing the face stones with hammer	1.30m ³ 0.30m ³	1.30 2.00		1.30 2.25		– bamboo = 1 no. – rope = ½ kg – cement = 148 kg	2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		- providing prepared cement mortar (refer Annex III) - laying of coursed masonry with hammer dressed rubble at faces and undressed elsewhere with cement mortar at joints - incidentals including erecting/dismantling scaffolding	0.40m ³ 1.00m ³ LS	0.96 2.50 0.25	2.50	0.96 2.75 0.25	2.75	Transportation & Royalty – rubble = 1.3 m ³ – sand = 0.44 m ³	
		c. In 1:4 cement sand mortar	1.00m³	7.04	2.50	7.54	2.75	To be procured	1. Mallet
		collection of rubble at quarry (refer Annex II)	1.30m ³	1.30		1.30		– bamboo = 1 no. – rope = ½ kg	2. Doko/Basket 3. Hammer 3 kg

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		- dressing the face stones with hammer - providing prepared cement mortar (refer Annex III) - laying of coursed masonry with hammer dressed rubble at faces and undressed elsewhere with cement mortar at joints - incidentals including erecting/dismantling scaffolding	0.30m ³ 0.40m ³ 1.00m ³ LS	2.00 0.99 2.50 0.25	 2.50 	2.25 0.99 2.75 0.25	 2.75 	– cement = 116 kg Transportation & Royalty – rubble = 1.3 m ³ – sand = 0.47 m ³	4. Hammer 1 kg
		d. In 1:6 cement sand mortar - collection of rubble at quarry (refer Annex II) - dressing the face stones with hammer - providing prepared cement mortar (refer Annex III) - laying of coursed masonry with hammer dressed rubble at faces and undressed elsewhere with cement mortar at joints - incidentals including erecting/dismantling scaffolding	1.00m ³ 1.30m ³ 0.30m ³ 0.40m ³ 1.00m ³ LS	7.09 1.30 2.00 1.04 2.50 0.25	2.50 2.50 	7.59 1.30 2.25 1.04 2.75 0.25	2.75 2.75 	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 92 kg Transportation & Royalty – rubble = 1.3 m ³ – sand = 0.50 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		C. Square Rubble - Coursed Rubble Masonry (Second sort) a. In dry - collection of rubble at quarry (refer Annex II) - dressing the face stone with hammer - laying of dry coursed stone masonry with hammer dressed rubble at faces and undressed elsewhere - incidentals including erecting/dismantling scaffolding	1.00m ³ 1.30m ³ 0.30m ³ 1.00m ³ LS	5.05 1.30 1.75 1.75 0.25	1.25 1.25 	5.55 1.30 2.00 2.00 0.25	1.50 1.50 	To be procured – bamboo = 1 no. – rope = ½ kg Transportation & Royalty – rubble = 1.3 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		b. In 1:3 cement sand mortar - collection of rubble at quarry (refer Annex II) - dressing the face stones with hammer - providing prepared cement mortar (refer Annex III) - laying of coursed masonry with hammer dressed rubble at faces and undressed elsewhere with cement mortar at joints - incidentals including erecting/dismantling scaffolding	1.00m ³ 1.30m ³ 0.30m ³ 0.40m ³ 1.00m ³ LS	6.76 1.30 1.75 0.96 2.50 0.25	2.25 2.25 	7.26 1.30 2.00 0.96 2.75 0.25	2.50 2.50 	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 148 kg Transportation & Royalty – rubble = 1.3 m ³ – sand = 0.44 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		c. In 1:4 cement sand mortar - collection of rubble at quarry (refer Annex II) - dressing the face stones with hammer - providing prepared cement mortar (refer Annex III) - laying of coursed masonry with hammer dressed rubble at faces	1.00m ³ 1.30m ³ 0.30m ³ 0.40m ³ 1.00m ³	6.79 1.30 1.75 0.99 2.50	2.25 2.25 	7.29 1.30 2.00 0.99 2.75	2.50 2.50 	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 116 kg Transportation & Royalty – rubble = 1.3 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		and undressed elsewhere with cement mortar at joints • incidentals including erecting/dismantling scaffolding	LS	0.25		0.25		– sand = 0.47 m ³	
		d. In 1:6 cement sand mortar	1.00m³	6.84	2.25	7.34	2.50	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 92 kg Transportation & Royalty – rubble = 1.3 m ³ – sand = 0.50 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		• collection of rubble at quarry (refer Annex II)	1.30m ³	1.30		1.30			
		• dressing the face stones with hammer	0.30m ³	1.75		2.00			
		• providing prepared cement mortar (refer Annex III)	0.40m ³	1.04		1.04			
		• laying of coursed masonry with hammer dressed rubble at faces and undressed elsewhere with cement mortar at joints	1.00m ³	2.50	2.25	2.75	2.50		
		• incidentals including erecting/dismantling scaffolding	LS	0.25		0.25			
		D. Ashlar Masonry (Plain Ashlar)							
		a. In dry	1.00m³	15.50	3.00	17.75	3.25	To be procured – bamboo = 1 no. – rope = ½ kg Transportation & Royalty – rubble = 1.5 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		• collection of rubble at quarry (refer Annex II)	1.50m ³	1.50		1.50			
		• chisel dressing to every stone block	1.10m ³	11.00		13.00			
		• laying of chisel dressed stone blocks with proper bonds	1.00m ³	2.75	3.00	3.00	3.25		
		• incidentals including erecting/dismantling scaffolding	LS	0.25		0.25			
		b. In 1:3 cement sand mortar	1.00m³	16.71	3.50	18.96	3.75	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 148 kg Transportation & Royalty – rubble = 1.5 m ³ – sand = 0.44 m ³	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		• collection of rubble at quarry (refer Annex II)	1.50m ³	1.50		1.50			
		• chisel dressing to every stone block	1.10m ³	11.00		13.00			
		• providing prepared cement mortar (refer Annex III)	0.40m ³	0.96		0.96			
		• laying of chisel dressed stone blocks with proper bonds	1.00m ³	3.00	3.50	3.25	3.75		
		• incidentals including erecting/dismantling scaffolding	LS	0.25		0.25			
		c. In 1:4 cement sand mortar	1.00m³	16.74	3.50	18.99	3.75	To be procured – bamboo = 1 no. – rope = ½ kg – cement = 116 kg Transportation & Royalty	1. Mallet 2. Doko/Basket 3. Hammer 3 kg 4. Hammer 1 kg
		• collection of rubble at quarry (refer Annex II)	1.50m ³	1.50		1.50			
		• chisel dressing to every stone block	1.10m ³	11.00		13.00			
		• providing prepared cement mortar (refer Annex III)	0.40m ³	0.99		0.99			
		• laying of chisel dressed stone blocks with proper bond	1.00m ³	3.00	3.50	3.25	3.75		
		• incidentals including erecting/dismantling scaffolding	LS	0.25		0.25		– rubble = 1.5 m ³ – sand = 0.47 m ³	
		d. In 1:6 cement sand mortar	1.00m³	16.79	3.50	19.04	3.75	To be procured – bamboo = 1 no.	1. Mallet 2. Doko/Basket

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		- collection of rubble at quarry (refer Annex II) - chisel dressing to every stone block - providing prepared cement mortar (refer Annex III) - laying of chisel dressed stone blocks with proper bonds - incidentals including erecting/dismantling scaffolding	1.50m ³ 1.10m ³ 0.40m ³ 1.00m ³ LS	1.50 11.00 1.04 3.00 0.25	3.50	1.50 13.00 1.04 3.25 0.25	3.75	– rope = ½ kg – cement = 92 kg Transportation & Royalty – rubble = 1.5 m ³ – sand = 0.50 m ³	3. Hammer 3 kg 4. Hammer 1 kg
39.	9	Formwork where it is provided as separate item with timber as material. It includes all labour, materials and other incidentals required for the construction and removal of forms as described in the Specifications. It further covers the framing work that is required for properly supporting the members until the concrete is sufficiently cured, set and hardened.							
		a. For beam or slab – formwork and framework when the height is 4-8 m (i.e. above 4 m)	10m ²	2.00	1.50	1.75	1.25	Formwork – timber planks/board = 0.75 m ³ – nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.5 m ³ – nails = 1 kg	1. Hammer 1 kg 2. Hand saw 3. Khukuri
		b. For walls or vertical structures with a height not exceeding 4 m	10m ²	1.50	0.75	1.25	0.50	Formwork – timber planks/board = 0.75 m ³ – nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.25 m ³ – nails = 1 kg	1. Hammer 1 kg 2. Hand saw 3. Khukuri
		c. For walls or vertical structures with the height of 4-8 m (i.e. above 4 m)	10m ²	1.50	0.75	1.25	0.50	Formwork – timber planks/board = 1 m ³ – nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.5 m ³	1. Hammer 1 kg 2. Hand saw 3. Khukuri
								– nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.5 m ³	

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		d. Formwork for arch including framework to erect	10m ²	3.00	2.00	2.75	1.75	– nails = 2 kg Formwork – timber planks/board = 1 m ³ – nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.75 m ³ – nails = 1.25 kg	1. Hammer 1 kg 2. Hand saw 3. Khukuri
		e. Formwork for column including framework to erect	10m ²	2.75	1.75	2.50	1.50	Formwork – timber planks/board = 1 m ³ – nails = 2.5 kg Framework – post, batten and un-sawn timber = 0.5 m ³ – nails = 1 kg	1. Hammer 1 kg 2. Hand saw 3. Khukuri
40.	10	Reinforcement for RCC work. It includes procuring steel, its bending, placing, binding and fixing in position as shown on the drawings and as directed by the Engineer. It also includes all devices for keeping reinforcement in approved position and jointing as per approved method with due allowances for wastage, overlaps, spacer bars and annealed steel wire for binding. This applies for general bending requirements. When the above provision is not adequate or in other words, for specific type of bending the following norms are applicable. A. Type 'a' 	1.00 Metric ton	7.00	7.00	7.00	7.00	Procuring and delivery of steel bars up to site.	1. Bending tools 2. Hammer 3. Bar bending bench
		1. 6 mm diameter size	100m	0.250	0.250	0.250	0.250		In order to establish the rate per metric ton, the length of steel bars shall be converted to weight and the required labour shall be summed up accordingly during rate analysis.
		2. 8 mm	100m	0.375	0.375	0.375	0.375		
		3. 10 mm	100m	0.500	0.500	0.500	0.500		
		4. 12 mm	100m	0.625	0.625	0.625	0.625		
		5. 14 mm	100m	0.750	0.750	0.750	0.750		

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		6. 16 mm	100m	0.875	0.875	0.875	0.875		
		7. 18 mm	100m	1.000	1.000	1.000	1.000		
		8. 20 mm	100m	1.125	1.125	1.125	1.125		
		9. 22 mm	100m	1.250	1.250	1.250	1.250		
		10. 25 mm	100m	1.375	1.375	1.375	1.375		
		11. 26 mm	100m	1.375	1.375	1.375	1.375		
		12. 28 mm	100m	1.500	1.500	1.500	1.500		
		13. 30 mm	100m	1.625	1.625	1.625	1.625		
		14. 32 mm	100m	1.750	1.750	1.750	1.750		
		15. 34 mm	100m	1.850	1.850	1.850	1.850		
		16. 36 mm or 37 mm	100m	2.000	2.000	2.000	2.000		
		B. Type 'b'							
		Labour for all sizes (50% of Type 'a')							
		C. Type 'c'							
		Labour for all sizes (75% of Type 'a')							
		D. Type 'd' - Stirrups							
		Labour for all sizes (200% of Type 'a')							
41.	11	Cement concrete work. It includes all labour and material required for mixing, placing in position, vibrating, compacting, finishing, curing and all other incidentals required to produce concrete of specified strength as per the Specifications. The rate includes the work of making, fixing and removing of all centres and forms required for the							

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		work.							
		A. Work in foundation							
		a. M 10 Grade (1:3:6 mix by volume)	1.00m³	14.65	1.00	15.21	0.66	• Procuring cement at site = 220 kg • Transportation of aggregate & sand to site = 1.36 m³. • Royalties for stone (1.45 m³) & sand (0.47 m³) • Procuring timber at 1/6th price = 0.33 m³ (use for six times)	1. Shovels 2. Pans of iron 3. Buckets 4. Vibrator/iron rods 5. Wooden tampers 6. Trowels
		– Collection of rubble for the aggregates at quarry (refer Annex I)	1.45m ³	1.45		1.45			
		– Breaking of stone at quarry for aggregate sizes (refer Annex II)							
		– 40 mm	0.65m ³	5.85		6.50			
		– 20 mm	0.24m ³	2.88		3.12			
		– Collection and screening of sand at quarry (refer Annex I)	0.47m ³	0.47		0.47			
		– Mixing of concrete and its placing with compaction and finishing	1.00m ³	3.00	0.75	2.75	0.50		
		– Water carrying for mixing concrete	150litres	0.25		0.25			
		– Formwork with framing and its removal	LS	0.50	0.25	0.42	0.16		
		– Curing and other incidentals	LS	0.25		0.25			
		b. M 15 Grade (1:2:4 mix by volume)	1.00m³	15.69	1.00	16.32	0.66	• Procuring cement at site = 320 kg • Transportation of aggregate & sand to site = 1.29 m³. • Royalties for stone (1.45 m³) & sand (0.44 m³) • Procuring timber at 1/6th price = 0.33 m³ (use for six times)	1. Shovels 2. Pans of iron 3. Buckets 4. Vibrator/iron rods 5. Wooden tampers 6. Trowels
		– Collecting of rubble for the aggregates at quarry (refer Annex I)	1.45m ³	1.45		1.45			
		– Breaking of stone at quarry for aggregate sizes (refer Annex II)							
		– 40 mm	0.52m ³	4.68		5.20			
		– 20 mm	0.22m ³	2.64		2.86			
		– 10 mm	0.11m ³	2.42		2.64			
		– Collection and screening of sand at quarry (refer Annex I)	0.44m ³	0.44		0.44			
		– Mixing and placing of concrete with compaction and finishing	1.00m ³	3.00	0.75	2.75	0.50		
		– Water carrying for concrete mixing	205litres	0.31		0.31			
		– Formwork with framing and its removal	LS	0.50	0.25	0.42	0.16		
		– Curing and other incidentals	LS	0.25		0.25			
		B. Work in super structural components (beams, slabs, abutment caps, etc.)							
		a. M 15 Grade (1:2:4 mix by volume)	1.00m³	16.69	1.00	17.32	0.66	• Procuring cement at site = 320 kg • Transportation of aggregate & sand to site = 1.29 m³. • Royalties for stone (1.45 m³) & sand (0.44 m³)	1. Shovels 2. Pans of iron 3. Buckets 4. Vibrator/iron rods 5. Wooden tampers 6. Trowels
		– Collection of rubble for the aggregates at quarry (refer Annex I)	1.45m ³	1.45		1.45			
		– Breaking of stone at quarry for aggregate sizes (refer Annex II)							
		– 40 mm	0.52m ³	4.68		5.20			
		– 20 mm	0.22m ³	2.64		2.86			
		– 10 mm	0.11m ³	2.42		2.64			
		– Collection and screening of sand at quarry (refer Annex I)	0.44m ³	0.44		0.44			

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		ii. In tees, angles, flats and channels	Metric ton 1.00 Metric ton	14.00	4.00	12.00	3.00	- steel members = 1 ton - oil = 2.5 kg - paint = 5 kg Procuring - steel members = 1 ton - oil = 5 kg - paint = 10 kg	and painters Conventional tools of steel workers and painters
43.		Structural timber work for structures. It includes the cost of all labour, materials required for fabrication, connection, oiling, painting, temporary erection, inspection, tests and complete final erection as shown on the drawings. i. Fixing timber beams/pillars for timber bridges ii. Providing and fixing timber trusses in position iii. Providing and fixing timber decks in position	1.00m ³ 1.00m ³ 1.00m ²	5.00 5.40 0.50	3.50 10.80 1.66	4.00 5.00 0.50	3.00 10.00 1.50	Procuring - timber = 1.1 m³ - oil = 2.5 kg - paint = 5 kg - nails = 4 kg Procuring - timber = 1.1 m³ - oil = 5 kg - paint = 10 kg - nails = 16 kg Procuring - timber = 0.05 m³ - oil = 0.25 kg - paint = 0.5 kg - nails = 0.8 kg	Conventional tools of carpenters and painters Conventional tools of carpenters and painters Conventional tools of carpenters and painters
44.1	17-1.4, 17-5 and 17-6	Fabrication of gabion boxes including rolling, cutting and weaving A. Hexagonal Mesh Size - 80 mm x 100 mm							

S. No.	Respective Clause of Specificati ons	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/ Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		i. Mesh wire - 9 SWG Selvedge wire - 6 SWG Box size (m x m x m) a) 2 x 1 x 1 b) 3 x 1 x 1 c) 2 x 1 x 0.5 d) 3 x 1 x 0.5 e) 2 x 1 x 0.3 f) 3 x 1 x 0.3	1 box 1 box 1 box 1 box 1 box 1 box	0.30 0.44 0.20 0.30 0.17 0.25	0.60 0.88 0.40 0.60 0.34 0.50	0.30 0.44 0.20 0.30 0.17 0.25	0.60 0.88 0.40 0.60 0.34 0.50	Procuring, Mesh wire (kg) Selvedge wire (kg) 36.00 3.75 52.35 4.82 24.55 3.00 36.00 3.90 19.95 2.65 29.44 3.55	1. Iron bar for twisting 2. Beam and spikes for weaving 3. Scissors for cutting wires 4. 12 SWG wire for tying
		ii. Mesh wire - 10 SWG Selvedge wire - 7 SWG Box size (m x m x m) a) 2 x 1 x 1 b) 3 x 1 x 1 c) 2 x 1 x 0.5 d) 3 x 1 x 0.5 e) 2 x 1 x 0.3 f) 3 x 1 x 0.3	1 box 1 box 1 box 1 box 1 box 1 box	0.23 0.33 0.16 0.23 0.13 0.19	0.46 0.66 0.32 0.46 0.26 0.38	0.23 0.33 0.16 0.23 0.13 0.19	0.46 0.66 0.32 0.46 0.26 0.38	Procuring, Mesh wire (kg) Selvedge wire (kg) 27.50 2.80 40.00 4.03 18.75 2.45 27.50 3.46 15.25 2.25 22.50 3.23	1. Iron bar for twisting 2. Beam and spikes for weaving 3. Scissors for cutting wires 4. 13 SWG wire for tying
		iii. Mesh wire - 11 SWG Selvedge wire - 8 SWG Box size (m x m x m) a) 2 x 1 x 1 b) 3 x 1 x 1 c) 2 x 1 x 0.5 d) 3 x 1 x 0.5 e) 2 x 1 x 0.3 f) 3 x 1 x 0.3	1 box 1 box 1 box 1 box 1 box 1 box	0.19 0.28 0.13 0.19 0.11 0.16	0.38 0.56 0.26 0.38 0.22 0.32	0.19 0.28 0.13 0.19 0.11 0.16	0.38 0.56 0.26 0.38 0.22 0.32	Procuring, Mesh wire (kg) Selvedge wire (kg) 23.10 2.40 33.60 3.36 15.75 2.04 23.10 2.88 12.81 1.90 18.90 2.69	1. Iron bar for twisting 2. Beam and spikes for weaving 3. Scissors for cutting wires 4. 13 SWG wire for tying
		B. Hexagonal Mesh Size - 100 mm x 120 mm							
		i. Mesh wire - 9 SWG Selvedge wire - 6 SWG Box size (m x m x m) a) 2 x 1 x 1 b) 3 x 1 x 1 c) 2 x 1 x 0.5	1 box 1 box 1 box	0.23 0.34 0.16	0.46 0.68 0.32	0.23 0.34 0.16	0.46 0.68 0.32	Procuring, Mesh wire (kg) Selvedge wire (kg) 28.05 3.42 40.80 4.79 19.13 2.91	1. Iron bar for twisting 2. Beam and spikes for weaving 3. Scissors for cutting wires 4. 12 SWG wire for tying

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/ Royalties		Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)			
44.2		d) 3 x 1 x 0.5	1 box	0.23	0.46	0.23	0.46	28.05	4.10	1. Iron bar for twisting 2. Beam and spikes for weaving 3. Scissors for cutting wires 4. 13 SWG wire for tying
		e) 2 x 1 x 0.3	1 box	0.13	0.26	0.13	0.26	15.55	2.70	
		f) 3 x 1 x 0.3	1 box	0.19	0.38	0.19	0.38	22.95	3.83	
		ii. Mesh wire - 10 SWG Selvedge wire - 7 SWG						Procuring, Mesh Selvedge wire (kg) wire (kg)		
		Box size (m x m x m)								
		a) 2 x 1 x 1	1 box	0.20	0.39	0.20	0.39	23.43	2.88	
		b) 3 x 1 x 1	1 box	0.28	0.57	0.28	0.57	34.08	4.03	
		c) 2 x 1 x 0.5	1 box	0.13	0.27	0.13	0.27	15.97	2.45	
		d) 3 x 1 x 0.5	1 box	0.20	0.39	0.20	0.39	23.43	3.46	
		e) 2 x 1 x 0.3	1 box	0.11	0.22	0.11	0.22	13.00	2.28	
		f) 3 x 1 x 0.3	1 box	0.16	0.32	0.16	0.32	19.17	3.23	
		Assembling of wire crates/gabion/revetment and placing them in position including stretching, binding them together and tying down lids.								
		i. Binding wire - 12 SWG								
		Box size (m x m x m)						Binding wire		
		a) 2 x 1 x 1	1 box	0.09		0.09		0.95 kg	1. Iron bar for twisting	
b) 3 x 1 x 1	1 box	0.13		0.13		1.30 kg	2. Scissors for cutting wires			
c) 2 x 1 x 0.5	1 box	0.07		0.07		0.70 kg				
d) 3 x 1 x 0.5	1 box	0.09		0.09		0.95 kg				
e) 2 x 1 x 0.3	1 box	0.06		0.06		0.65 kg				
f) 3 x 1 x 0.3	1 box	0.09		0.09		0.90 kg				
ii. Binding wire - 13 SWG										
Box size (m x m x m)						Binding wire				
a) 2 x 1 x 1	1 box	0.07		0.07		0.75 kg	1. Iron bar for twisting			
b) 3 x 1 x 1	1 box	0.10		0.10		1.00 kg	2. Scissors for cutting wires			
c) 2 x 1 x 0.5	1 box	0.05		0.05		0.55 kg				
d) 3 x 1 x 0.5	1 box	0.07		0.07		0.75 kg				
e) 2 x 1 x 0.3	1 box	0.05		0.05		0.50 kg				
f) 3 x 1 x 0.3	1 box	0.07		0.07		0.70 kg				
45.	17-1.4, 17- 5 and 17- 6	Packing and filling of gabion crates with rubble stones - same as dry stone masonry: refer to S. No. 38 A (a).	1 m³	2.85	0.50	3.10	0.50	Transportation and Royalties Rubble stone = 1.1m³		

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/ Royalties	Equipment/Tools Remarks	
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)			
46.	15- 4	Preparation of bedding for pipe with granular material. It includes all labour, material and incidentals. – Collection of well graded granular material passing 4.75 mm sieve and down – spreading and ramming/rolling to full compaction including spray of adequate quantity of water – Incidentals	1.00m³ 1.10m ³ 1.00m ³ LS	2.00 1.00 0.50 0.50		2.00 1.00 0.50 0.50		Transportation and Royalties – granular material = 1.1 m ³ – water = 100 litres	1. Rammers 2. Buckets 3. Picks 4. Shovels 5. Baskets	
47.	15- 5 and 15- 6	Laying, fitting and fixing of hume pipe having a length of 1 m or more. It includes all operations required to complete the work up to a trench depth of 2.2 m below the ground level and the jointing of pipes with 1:2 cement sand mortar. a. For one or first pipe Pipe having 150 mm diameter Pipe having 200 mm diameter Pipe having 300 mm diameter Pipe having 600 mm diameter Pipe having 750 mm diameter Pipe having 900 mm diameter Pipe having 1200 mm diameter b. For every subsequent pipe having a length of minimum 1 m. Pipe having 150 mm diameter – laying of pipe – collecting sand at quarry site (negligible) ----- Pipe having 200 mm diameter – laying of pipe – collecting sand at quarry site (negligible)	 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m 1.00m	 0.075 0.100 0.150 0.250 0.300 0.350 0.500 0.020 0.020 0.05 0.05	 0.005 0.005 0.01 0.01		 0.075 0.100 0.150 0.250 0.300 0.350 0.500 0.020 0.020 0.05 0.05	 0.005 0.005 0.01 0.01	Procurement of hume pipe = 1 m Procuring – cement = 0.5 kg – hume pipe = 1 m – jute = 0.5 kg – bitumen = 0.1 kg Transportation and Royalties – sand = 0.001 m ³ Procuring – cement = 0.75 kg – hume pipe = 1 m – jute = 0.75 kg – bitumen = 0.15 kg Transportation and Royalties	1. Crowbars 2. Picks 3. Shovels 1. Crowbars 2. Picks 3. Shovels

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		Pipe having 300 mm diameter	1.00m	0.10	0.02	0.10	0.02	– sand = 0.001 m ³ Procuring – cement = 1 kg – hume pipe = 1 m – jute = 1 kg – bitumen = 0.2 kg Transportation and Royalties – sand = 0.002 m ³	1. Crowbars 2. Picks 3. Shovels
		– laying of pipe	1.00m	0.10	0.02	0.10	0.02		
		– collecting sand at quarry site (negligible)							
		Pipe having 600 mm diameter	1.00m	0.21	0.05	0.21	0.05	Procuring – cement = 3 kg – hume pipe = 1 m – jute = 2.5 kg – bitumen = 0.5 kg Transportation and Royalties – sand = 0.004 m ³	1. Crowbars 2. Picks 3. Shovels
		– laying of pipe	1.00m	0.20	0.05	0.20	0.05		
		– collecting sand at quarry site	0.01m ³	0.01		0.01			
		Pipe having 750 mm diameter	1.00m	0.31	0.10	0.31	0.10	Procuring – cement = 4 kg – hume pipe = 1 m – jute = 3 kg – bitumen = 0.75 kg Transportation and Royalties – sand = 0.006 m ³	1. Crowbars 2. Picks 3. Shovels
		– laying of pipe	1.00m	0.30	0.10	0.30	0.10		
		– collection of sand at quarry site	0.01m ³	0.01		0.01			
		Pipe having 900 mm diameter	1.00m	0.60	0.15	0.60	0.15	Procuring – cement = 6 kg – hume pipe = 1 m – jute = 4 kg – bitumen = 1 kg Transportation and Royalties – sand = 0.01 m ³	1. Crowbars 2. Picks 3. Shovels
		– laying of pipe	1.00m	0.50	0.15	0.50	0.15		
		– collection of sand at quarry site	0.01m ³	0.10		0.10			

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)		
		Pipe having 1200 mm diameter	1.00m	1.15	0.25	1.15	0.25	Procuring – cement = 10 kg	1. Crowbars 2. Pick
		– laying of pipe – collection of sand at quarry site	1.00m 0.01m ³	1.00 0.15	0.25	1.00 0.15	0.25	– hume pipe = 1 m – jute = 6 kg – bitumen = 1.5 kg Transportation and Royalties – sand = 0.015 m ³	3. Shovels
48.	17-2.2, 17-2.3, 17-5 and 17-6	Bedding for stone pitching with granular material. It includes all labour, material and incidentals required to complete the work as per the Specifications. – quarry collection and screening of granular material – watering and ramming to full compaction – incidentals	1.00m ³ 1.10m ³ 1.00m ³ LS	2.00 1.00 0.50 0.50		2.00 1.00 0.50 0.50		– Transport of granular material (sand = 1.1 m ³) – Royalties for granular material (sand) as required	1. Rammers 2. Buckets
49.	17-2, 17-5 and 17-6	Stone pitching work on the prepared granular bedding. – collection of rubble (40 kg or bigger) at quarry – packing of rubble stone – filling of voids with spalls having minimum size of 25 mm – collection of spalls at quarry	1.00m ³ 1.10m ³ 1.00m ³ 0.25 m ³ 0.25m ³	3.35 1.10 1.00 0.25 1.00		3.35 1.10 1.00 0.25 1.00		Transportation and Royalties – Rubble stone = 1.1m ³ – River gravel (spalls) = 0.25 m ³	1. Baskets 2. Hammers 3. Iron rods
50.	17-4	Dry rubble flooring on the prepared granular bedding (same as S. No. 49)	1.00m ³	3.35		3.35		Transportation and Royalties – Rubble stone = 1.1m ³ – River gravel (spalls) = 0.25 m ³	1. Baskets 2. Hammers 3. Iron rods

Annex - I

51. Collection of natural sand, gravel including screening and stacking at site

S.No.	Standard Size	Sieve Range		Unit	Unskilled Labour		Materials/ Royalties	Equipment/Tools Remarks
		Passing	Retainin g		For Hill Area	For Terai/ Plain Area		
1.	75 micron down	-	75 micron	1 m ³	1.00	1.00		1. Screens
2.	150 micron down	150 micron	75 micron	1 m ³	1.00	1.00		2. Shovels
3.	300 micron down	300 micron	150 micron	1 m ³	1.00	1.00		3. Doko
4.	600 micron down	600 micron	300 micron	1 m ³	1.00	1.00		4. Thuntse
5.	2.36 mm down	2.36 mm	75 micron	1 m ³	2.00	2.00		5. Baskets
6.	4.75 mm down	4.36 mm	75 micron	1 m ³	1.00	1.00		6. Picks
7.	10 mm down	10 mm	75 micron	1 m ³	1.00	1.00		
8.	25 mm down	25 mm	75 micron	1 m ³	1.00	1.00		
9.	50 mm down	50 mm	75 micron	1 m ³	1.00	1.00		
10.	coarse sand	1.70 mm	180 micron	1 m ³	1.00	1.00		
11.	2.36 mm	4.75 mm	2.36 mm	1 m ³	10.00	10.00		
12.	6 mm	10 mm	2.36 mm	1 m ³	7.00	7.00		
13.	10 mm	12.5 mm	4.75 mm	1 m ³	7.00	7.00		
14.		12 mm	9 mm	1 m ³	6.00	6.00		
15.		12.5 mm	10 mm	1 m ³	6.00	6.00		
16.	12.5 mm	20 mm	10 mm	1 m ³	5.00	5.00		
17.		19 mm	12 mm	1 m ³	5.00	5.00		
18.		20 mm	12 mm	1 m ³	5.00	5.00		
19.	20 mm	25 mm	19 mm	1 m ³	4.00	4.00		
20.	25 mm	25 mm	20 mm	1 m ³	4.00	4.00		
21.	30 mm	40 mm	20 mm	1 m ³	3.00	3.00		
22.		38 mm	25 mm	1 m ³	3.00	3.00		
23.		40 mm	25 mm	1 m ³	3.00	3.00		
24.	40 mm	50 mm	25 mm	1 m ³	3.00	3.00		
25.		50 mm	38 mm	1 m ³	2.50	2.50		
26.		50 mm	40 mm	1 m ³	2.50	2.50		
27.	50 mm	63 mm	40 mm	1 m ³	2.00	2.00		
28.		63 mm	50 mm	1 m ³	2.00	2.00		
29.		80 mm	63 mm	1 m ³	1.50	1.50		
30.	63 mm down	63 mm	4.75 mm	1 m ³	3.00	3.00		
31.		90 mm	80 mm	1 m ³	1.50	1.50		
32.		100 mm	80 mm	1 m ³	1.50	1.50		
33.	95 mm	100 mm	90 mm	1 m ³	1.50	1.50		
34.	Rubble		100 mm	1 m ³	1.00	1.00		
35.	River sand	un-sieved	un-sieved	1 m ³	1.00	1.00		
36.	Rock sand (quarrying from rock)	un-sieved	un-sieved	1 m ³	1.00	1.00		

Annex - II

52. Production of aggregates by breaking of stones manually and stacking
(excluding collection of stone materials)

S.No.	Standard Size	Sieve Range		Unit	Unskilled Labour		Materials/ Royalties	Equipment/Tools Remarks
		Passing	Retaining		For Hill Area	For Teral/Plain Area		
1.	75 micron down	75 micron	-	1 m ³	32.00	34.00		1. Hammers
2.	75 micron	150 micron	75 micron	1 m ³	32.00	34.00		2. Doko
3.	Fine grit	1.70 mm	180 micron	1 m ³	30.00	32.00		3. Thuntse
4.	2.36 mm down	2.36 mm	75 micron	1 m ³	30.00	33.00		4. Baskets
5.	4.75 mm down	4.75 mm	75 micron	1 m ³	28.00	30.00		5. Shovels
6.	2.36 mm	4.75 mm	2.36 mm	1 m ³	25.00	28.00		6. Harrows
7.	10 mm down	10 mm	75 micron	1 m ³	25.00	28.00		
8.	25 mm down	25 mm	75 micron	1 m ³	24.00	26.00		
9.	50 mm down	50 mm	75 micron	1 m ³	23.00	25.00		
10.	6 mm	10 mm	2.36 mm	1 m ³	23.00	25.00		
11.	10 mm	12.5 mm	4.75 mm	1 m ³	22.00	24.00		
12.		12 mm	9 mm	1 m ³	18.00	21.00		
13.		12.5 mm	10 mm	1 m ³	17.00	19.00		
14.	12.5 mm	20 mm	10 mm	1 m ³	15.00	16.50		
15.		19 mm	12 mm	1 m ³	15.00	16.50		
16.		20 mm	12.5 mm	1 m ³	14.00	15.50		
17.	20 mm	25 mm	20 mm	1 m ³	12.00	13.00		
18.	25 mm	25 mm	19 mm	1 m ³	12.00	13.00		
19.	30 mm	40 mm	20 mm	1 m ³	10.00	11.00		
20.		38 mm	20 mm	1 m ³	10.00	11.00		
21.		40 mm	25 mm	1 m ³	10.00	11.00		
22.	40 mm	50 mm	25 mm	1 m ³	9.00	10.00		
23.		50 mm	25 mm	1 m ³	7.00	8.00		
24.		50 mm	38 mm	1 m ³	7.00	8.00		
25.	50 mm	63 mm	40 mm	1 m ³	6.50	7.00		
26.		63 mm	50 mm	1 m ³	6.00	6.50		
27.		80 mm	50 mm	1 m ³	5.00	5.50		
28.	63 mm down	63 mm	4.75 mm	1 m ³	14.00	15.50		
29.		90 mm	80 mm	1 m ³	4.00	4.50		
30.		100 mm	90 mm	1 m ³	3.50	4.00		
31.	Rubble for production of aggregate		100 mm	1 m ³	1.00	1.00		

Annex - III

53. Preparation of cement sand mortar with haulage up to a lead of 50 m along the lead route

S.No.	Standard Size	Unit	Unskilled Labour		Materials/ Royalties	Equipment/Tools Remarks
			For Hill Area	For Terai/ Plain Area		
2.	1:8 mix ratio	1.00m³	2.60	2.60	Procuring cement (190 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	1.30m ³	1.30	1.30	Transportation and	
	– handling of sand at quarry site	1.30m ³	0.20	0.20	Royalties for sand	
	– handling cement at site	190kg	0.05	0.05	(1.30 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		
3.	1:6 mix ratio	1.00m³	2.56	2.56	Procuring cement (230 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	1.26m ³	1.26	1.26	Transportation and	
	– handling of sand at quarry site	1.26m ³	0.19	0.19	Royalties for sand	
	– handling of cement at site	230kg	0.06	0.06	(1.26 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		
4.	1:4 mix ratio	1.00m³	2.47	2.47	Procuring cement (290 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	1.17m ³	1.17	1.17	Transportation and	
	– handling of sand at quarry site	1.17m ³	0.18	0.18	Royalties for sand	
	– handling of cement at site	290kg	0.07	0.07	(1.17 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		
5.	1:3 mix ratio	1.00m³	2.40	2.40	Procuring cement (370 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	1.10m ³	1.10	1.10	Transportation and	
	– handling of sand at quarry site	1.10m ³	0.17	0.17	Royalties for sand	
	– handling of cement at site	370kg	0.08	0.08	(1.10 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		
6.	1:2 mix ratio	1.00m³	2.30	2.30	Procuring cement (470 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	1.00m ³	1.00	1.00	Transportation and	
	– handling of sand at quarry site	1.00m ³	0.16	0.16	Royalties for sand	
	– handling of cement at site	470kg	0.09	0.09	(1.00 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		
6.	1:1 mix ratio	1.00m³	2.15	2.15	Procuring cement (600 kg) at site.	1. Baskets 2. Shovels 3. Water buckets 4. Carrying pans 5. Wooden boxes to measure cement and sand.
	<u>break up</u>					
	– collection of sand	0.85m ³	0.85	0.85	Transportation and	
	– handling of sand at quarry site	0.85m ³	0.15	0.15	Royalties for sand	
	– handling of cement at site	600kg	0.10	0.10	(0.85 m ³).	
	– carrying of water and pouring in the mix	LS	0.05	0.05		
	– mixing of mortar	1.00m ³	1.00	1.00		

Work Norms for Routine Maintenance (using Labour-based Methods) of Rural Roads

Each maintenance worker is called a '**Length man**' for routine maintenance purposes

S. No.	Description	Unit	Annual Consumption Rate per km				Remarks
			District Road Rural Road Class 'A'	Village Road Rural Road Class 'B'	Main Trail Rural Road Class 'C'	Village Trail Rural Road Class 'D'	
54.1	<u>Unskilled Labour</u> Estimated working days of maintenance worker (Length man) - Assuming that each worker takes charge of routine maintenance work of 2 km road stretch and works ⇒ 12 days per month for Class 'A' road ⇒ 6 days per month for Class 'B' road ⇒ 3 days per month for Class 'C' road ⇒ 1½ day per month for Class D road	person/day	72	36	18	9	
54.2	<u>Technical Supervision</u> Estimated working days of work supervisors who supervises length men Assuming that each supervisor takes charge of supervising the work of 25 maintenance workers.	person/day	2.88	1.44	0.72	0.36	
54.3	<u>Construction/Maintenance Tools</u> 1. Effective use of Shovel with its expected life span of 12 months. 2. Effective use of Pickaxe with its expected life span of 12 months. 3. Effective use of Kodalo with its expected life span of 12 months. 4. Effective use of Forked Harrow with its expected life span of 12 months. 5. Effective use of Crow Bar with its expected life span of 12 months. 6. Effective use of Khukuri with its expected life span of 12 months. 7. Effective use of Hammer/Chisel with their expected life span of 24 months. 8. Effective use of Sickle with its expected life span of 12 months. 9. Effective use of Bucket with its expected life span of 6 months. 10. Effective use of Doko/Basket with their expected life span of 3 months. 11. Effective use of Wheel Barrow with its expected life span of 24 months.	no.	0.200	0.100	0.050	0.025	20% of the purchased cost shall be allocated annually for the maintenance of these tools.
		no.	0.200	0.100	0.050	0.025	
		no.	0.200	0.100	0.050	0.025	
		no.	0.200	0.100	0.050	0.025	
		no.	0.200	0.100	0.050	0.025	
		no.	0.100	0.050	0.025	0.012	
		no.	0.200	0.100	0.050	0.025	
		no.	0.400	0.200	0.100	0.050	
		no.	0.800	0.400	0.200	0.100	
		no.	0.100	0.050	0.025	0.012	

Volume IV

Norms for Rural Roads

Transportation or Carriage
of Material by Truck/
Tractor/Bullock or Buffalo
Cart/Porters

Work Norms for Transportation or Carriage of Material by Truck/Tractor/Bullock or Buffalo Cart/Porters

55. **Carriage of material by Truck or Tractor (10 kmph)** including loading, unloading and stacking by manpower

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of truck/tractor given here is only the gross working time including the idle time but does not include the time taken by the truck/tractor from its night parked place to site and back.
- b) Average speed of truck/tractor = 10.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.75 hour per trip
- d) Capacity of truck*/tractor = 3 to 5 Metric ton (Mt)
- e) Haulage distance = up to 20 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

* Here 'truck' refers to mini truck having the capacity of 3 Mt to 5Mt.

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
55.1	G-13.2	Lime (or other similar material)								
		First one km	10m ³	1.18		1.06		Diesel = 1.88ltrs.	Truck/Tractor = 2.23hrs.	
		First two km	10m ³	1.42		1.28		“ = 3.76ltrs.	“ = 2.70hrs.	
		First three km	10m ³	1.67		1.50		“ = 5.65ltrs.	“ = 3.17hrs.	
		First four km	10m ³	1.92		1.73		“ = 7.53ltrs.	“ = 3.64hrs.	
		First five km	10m ³	2.16		1.95		“ = 9.41ltrs.	“ = 4.11hrs.	
		Beyond 5 km per km	10m ³	0.25		0.22		“ = 1.88ltrs.	“ = 0.47hrs.	
				IDLE TIME = 1.76hrs.						
55.2	G-13.2	Soil (or other similar material)								
		First one km	10m ³	1.47		1.32		Diesel = 2.35ltrs.	Truck/Tractor = 2.80hrs.	
		First two km	10m ³	1.78		1.60		“ = 4.70ltrs.	“ = 3.39hrs.	
		First three km	10m ³	2.09		1.88		“ = 7.06ltrs.	“ = 3.97hrs.	
		First four km	10m ³	2.39		2.15		“ = 9.41ltrs.	“ = 4.56hrs.	
		First five km	10m ³	2.20		2.43		“ =11.76ltrs.	“ = 5.15hrs.	
		Beyond 5 km per km	10m ³	0.31		0.28		“ = 2.35ltrs.	“ = 0.59hrs.	
				IDLE TIME = 2.21hrs.						
55.3	G-13.2	Stone aggregates/shingle (or other similar material) having size of 40 mm and above								
		First one km	10m ³	1.55		1.39		Diesel = 2.48ltrs.	Truck/Tractor = 2.94hrs.	
		First two km	10m ³	1.87		1.68		“ = 4.95ltrs.	“ = 3.56hrs.	
		First three km	10m ³	2.19		1.97		“ = 7.43ltrs.	“ = 4.18hrs.	
		First four km	10m ³	2.52		2.27		“ = 9.90ltrs.	“ = 4.80hrs.	
		First five km	10m ³	2.84		2.56		“ =12.38ltrs.	“ = 5.42hrs.	
		Beyond 5 km per km	10m ³	0.32		0.29		“ = 2.47ltrs.	“ = 0.62hrs.	
				IDLE TIME = 2.32hrs.						
55.4	G-13.2	Sand, stone aggregates/shingle (or other similar material) having size of less than 40 mm								
		First one km	10m ³	1.43		1.28		Diesel = 2.29ltrs.	Truck/Tractor = 3.71hrs.	
		First two km	10m ³	1.72		1.55		“ = 4.57ltrs.	“ = 3.28hrs.	
		First three km	10m ³	2.02		1.82		“ = 6.86ltrs.	“ = 3.86hrs.	
		First four km	10m ³	2.32		2.09		“ = 9.914trs.	“ = 4.43hrs.	
		First five km	10m ³	2.62		2.36		“ =11.43ltrs.	“ = 5.00hrs.	
		Beyond 5 km per km	10m ³	0.30		0.27		“ = 2.28ltrs.	“ = 0.57hrs.	
				IDLE TIME = 2.14hrs.						
55.5	G-13.2	Rubble stone or boulders (or other similar material) of regular shape								

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
		First one km	10m ³	1.66		1.49		Diesel = 2.67ltrs.	Truck/Tractor = 3.17hrs.	
		First two km	10m ³	2.01		1.81		“ = 5.33ltrs.	“ = 3.83hrs.	
		First three km	10m ³	2.36		2.12		“ = 8.00ltrs.	“ = 4.50hrs.	
		First four km	10m ³	2.72		2.44		“ =10.66trs.	“ = 5.16hrs.	
		First five km	10m ³	3.07		2.76		“ =13.33ltrs.	“ = 5.83hrs.	
		Beyond 5 km per km	10m ³	0.35		0.31		“ = 2.66ltrs.	“ = 0.66hrs.	
				IDLE TIME = 2.50hrs.						
55.6	G-13.2	Bricks (or other similar material)								
		First one km	1000nos.	0.25		0.23		Diesel = 0.40ltrs.	Truck/Tractor = 0.47hrs.	
		First two km	1000nos.	0.30		0.27		“ = 0.80ltrs.	“ = 0.57hrs.	
		First three km	1000nos.	0.36		0.32		“ = 1.20ltrs.	“ = 0.67hrs.	
		First four km	1000nos.	0.41		0.37		“ = 1.60ltrs.	“ = 0.77hrs.	
		First five km	1000nos.	0.46		0.42		“ = 2.00ltrs.	“ = 0.87hrs.	
		Beyond 5 km per km	1000nos.	0.05		0.04		“ = 0.40ltrs.	“ = 0.10hrs.	
				IDLE TIME = 0.375hrs.						
55.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than 100 mm diameter (or other similar material)								
		First one km	10Mt	0.99		0.89		Diesel = 1.60ltrs.	Truck/Tractor = 1.90hrs.	
		First two km	10Mt	1.20		1.08		“ = 3.20ltrs.	“ = 2.30hrs.	
		First three km	10Mt	1.41		1.27		“ = 4.80ltrs.	“ = 2.70hrs.	
		First four km	10Mt	1.63		1.47		“ = 6.40ltrs.	“ = 3.10hrs.	
		First five km	10Mt	1.84		1.66		“ = 8.00ltrs.	“ = 3.50hrs.	
		Beyond 5 km per km	10Mt	0.21		0.19		“ = 1.60ltrs.	“ = 0.40hrs.	
				IDLE TIME = 1.50hrs.						
55.8	G-13.2	Timber (or other similar material)								
		First one km	10m ³	1.33		1.20		Diesel = 2.13ltrs.	Truck/Tractor = 2.53hrs.	
		First two km	10m ³	1.61		1.45		“ = 4.27ltrs.	“ = 3.07hrs.	
		First three km	10m ³	1.89		1.70		“ = 6.40ltrs.	“ = 3.60hrs.	
		First four km	10m ³	2.17		1.95		“ = 8.54ltrs.	“ = 4.14hrs.	
		First five km	10m ³	2.45		2.20		“ =10.67ltrs.	“ = 4.67hrs.	
		Beyond 5 km per km	10m ³	0.28		0.25		“ = 2.13ltrs.	“ = 0.53hrs.	
				IDLE TIME = 2.00hrs.						
55.9	G-13.2	Bitumen (or other similar material)								
		First one km	10Mt	1.66		1.49		Diesel = 2.67ltrs.	Truck/Tractor = 3.17hrs.	
		First two km	10Mt	2.01		1.81		“ = 5.33ltrs.	“ = 3.83hrs.	
		First three km	10Mt	2.36		2.12		“ = 8.00ltrs.	“ = 4.50hrs.	

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment
				For Hill Area		For Terai/Plain Area			
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		First four km	10Mt	2.72		2.44		“ =10.66trs.	“ = 5.16hrs.
		First five km	10Mt	3.07		2.76		“ =13.33ltrs.	“ = 5.83hrs.
		Beyond 5 km per km	10Mt	0.35		0.31		“ = 2.66ltrs.	“ = 0.66hrs.
				IDLE TIME = 2.50hrs.					
55.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape							
		First one km	10m ³	2.34		2.11		Diesel =	Truck/Tractor= 4.46hrs.
		First two km	10m ³	2.83		2.55		3.76ltrs.	“ = 5.40hrs.
		First three km	10m ³	3.32		2.99		“ = 7.51ltrs.	“ = 6.33hrs.
		First four km	10m ³	3.82		3.44		“ =11.27ltrs.	“ = 7.27hrs.
		First five km	10m ³	4.31		3.88		“ =15.02trs.	“ = 8.21hrs.
		Beyond 5 km per km	10m ³	0.49		0.44		“ =18.78trs.	“ = 0.94hrs.
								“ = 3.75ltrs.	
				IDLE TIME = 3.52hrs.					

56. **Carriage of material by Truck or Tractor (15 kmph)** including loading, unloading and stacking by manpower

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of truck/tractor given here is only the gross working time including the idle time but does not include the time taken by the truck/tractor from its night parked place to site and back.
- b) Average speed of truck/tractor = 15.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.75 hour per trip
- d) Capacity of truck*/tractor = 3 to 5 Metric ton (Mt)
- e) Haulage distance = up to 20 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

* Here 'truck' refers to mini truck having the capacity of 3 Mt to 5Mt.

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
56.1	G-13.2	Lime (or other similar material)								
		First one km	10m ³	1.10		1.00		Diesel = 1.88ltrs.	Truck/Tractor = 2.88hrs.	
		First two km	10m ³	1.25		1.12		“ = 3.76ltrs.	“ = 2.39hrs.	
		First three km	10m ³	1.42		1.28		“ = 5.65ltrs.	“ = 2.71hrs.	
		First four km	10m ³	1.58		1.42		“ = 7.53ltrs.	“ = 3.02hrs.	
		First five km	10m ³	1.75		1.57		“ = 9.41ltrs.	“ = 3.30hrs.	
		Beyond 5 km per km	10m ³	0.17		0.15		“ = 1.88ltrs.	“ = 0.10hrs.	
				IDLE TIME = 1.76hrs.						
56.2	G-13.2	Soil (or other similar material)								
		First one km	10m ³	1.36		1.23		Diesel = 2.35ltrs.	Truck/Tractor = 2.60hrs.	
		First two km	10m ³	1.57		1.41		“ = 4.71ltrs.	“ = 2.99hrs.	
		First three km	10m ³	1.78		1.60		“ = 7.06ltrs.	“ = 3.38hrs.	
		First four km	10m ³	1.98		1.78		“ = 9.41ltrs.	“ = 3.77hrs.	
		First five km	10m ³	2.19		1.97		“ =11.76ltrs.	“ = 4.17hrs.	
		Beyond 5 km per km	10m ³	0.20		0.18		“ = 2.35ltrs.	“ = 0.39hrs.	
				IDLE TIME = 2.21hrs.						
56.3	G-13.2	Stone aggregates/shingles (or other similar material) having size of 40 mm and above								
		First one km	10m ³	1.43		1.29		Diesel = 2.48ltrs.	Truck/Tractor = 2.73hrs.	
		First two km	10m ³	1.65		1.49		“ = 4.95ltrs.	“ = 3.15hrs.	
		First three km	10m ³	1.87		1.68		“ = 7.43ltrs.	“ = 3.56hrs.	
		First four km	10m ³	2.09		1.87		“ = 9.91ltrs.	“ = 3.97hrs.	
		First five km	10m ³	2.30		2.07		“ =12.38ltrs.	“ = 4.39hrs.	
		Beyond 5 km per km	10m ³	0.21		0.19		“ = 2.48ltrs.	“ = 0.41hrs.	
				IDLE TIME = 2.32hrs.						
56.4	G-13.2	Sand, stone aggregates/shingles (or other similar material) having size of less than 40 mm								
		First one km	10m ³	1.32		1.19		Diesel = 2.29ltrs.	Truck/Tractor = 2.52hrs.	
		First two km	10m ³	1.53		1.37		“ = 4.57ltrs.	“ = 2.91hrs.	
		First three km	10m ³	1.72		1.55		“ = 6.86ltrs.	“ = 3.29hrs.	
		First four km	10m ³	1.92		1.73		“ = 9.14ltrs.	“ = 3.67hrs.	
		First five km	10m ³	2.13		1.91		“ =11.43ltrs.	“ = 4.05hrs.	
		Beyond 5 km per km	10m ³	0.20		0.18		“ = 2.28ltrs.	“ = 0.38hrs.	
				IDLE TIME = 2.14hrs.						
56.5	G-13.2	Rubble stone or boulders (or other similar material) of regular shape								

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment
				For Hill Area		For Terai/Plain Area			
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		First one km	10m³	1.55		1.39		Diesel = 2.67ltrs.	Truck/Tractor = 2.94hrs.
		First two km	10m³	1.78		1.60		“ = 5.33ltrs.	“ = 3.39hrs.
		First three km	10m³	2.01		1.81		“ = 8.00ltrs.	“ = 3.83hrs.
		First four km	10m³	2.25		2.02		“ =10.67ltrs.	“ = 4.28hrs.
		First five km	10m³	2.48		2.23		“ =13.33ltrs.	“ = 4.72hrs.
		Beyond 5 km per km	10m³	0.23		0.21		“ = 2.67ltrs.	“ = 0.44hrs
				IDLE TIME = 2.50hrs.					
56.6	G-13.2	Bricks (or other similar material)							
		First one km	1000nos.	0.23		0.21		Diesel = 0.40ltrs.	Truck/Tractor = 0.44hrs.
		First two km	1000nos.	0.27		0.24		“ = 0.80ltrs.	“ = 0.51hrs.
		First three km	1000nos.	0.30		0.27		“ = 1.20ltrs.	“ = 0.58hrs.
		First four km	1000nos.	0.34		0.30		“ = 1.60ltrs.	“ = 0.64hrs.
		First five km	1000nos.	0.37		0.33		“ = 2.00ltrs.	“ = 0.71hrs.
		Beyond 5 km per km	1000nos.	0.04		0.03		“ = 0.40ltrs.	“ = 0.06hrs
				IDLE TIME = 0.375hrs.					
56.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than100 mm diameter (or other similar material)							
		First one km	10Mt	0.92		0.83		Diesel = 1.60ltrs.	Truck/Tractor = 1.77hrs.
		First two km	10Mt	1.06		0.96		“ = 3.20ltrs.	“ = 2.03hrs.
		First three km	10Mt	1.20		1.08		“ = 4.80ltrs.	“ = 2.30hrs.
		First four km	10Mt	1.34		1.21		“ = 6.40ltrs.	“ = 2.57hrs.
		First five km	10Mt	1.48		1.33		“ = 8.00ltrs.	“ = 2.83hrs.
		Beyond 5 km per km	10Mt	0.14		0.13		“ = 1.60ltrs.	“ = 0.27hrs
				IDLE TIME = 1.50hrs.					
56.8	G-13.2	Timber (or other similar material)							
		First one km	10m³	1.24		1.11		Diesel = 2.13ltrs.	Truck/Tractor = 2.35hrs.
		First two km	10m³	1.42		1.28		“ = 4.27ltrs.	“ = 2.71hrs.
		First three km	10m³	1.61		1.45		“ = 6.40ltrs.	“ = 3.07hrs.
		First four km	10m³	1.80		1.62		“ = 8.53ltrs.	“ = 3.42hrs.
		First five km	10m³	1.98		1.78		“ =10.67ltrs.	“ = 3.78hrs.
		Beyond 5 km per km	10m³	0.19		0.17		“ = 2.13ltrs.	“ = 0.35hrs
				IDEL TIME = 2.00hrs.					
56.9	G-13.2	Bitumen (or other similar material)							
		First one km	10Mt	1.55		1.39		Diesel = 2.67ltrs.	Truck/Tractor = 2.94hrs.
		First two km	10Mt	1.78		1.60		“ = 5.33ltrs.	“ = 3.39hrs.

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment
				For Hill Area		For Terai/Plain Area			
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		First three km	10Mt	2.01		1.81		“ = 8.00ltrs.	“ = 3.83hrs.
		First four km	10Mt	2.25		2.02		“ =10.67ltrs.	“ = 4.28hrs.
		First five km	10Mt	2.48		2.23		“ =13.33ltrs.	“ = 4.72hrs.
		Beyond 5 km per km	10Mt	0.23		0.21		“ = 2.67ltrs.	“ = 0.44hrs
				IDLE TIME = 2.50hrs.					
56.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape							
		First one km	10m ³	2.18		1.96		Diesel = 3.76ltrs.	Truck/Tractor = 4.15hrs.
		First two km	10m ³	2.51		2.26		“ = 7.51ltrs.	“ = 4.77hrs.
		First three km	10m ³	2.84		2.55		“ =11.27ltrs.	“ = 5.40hrs.
		First four km	10m ³	3.16		2.85		“ =15.02ltrs.	“ = 6.02hrs.
		First five km	10m ³	3.49		3.14		“ =18.78ltrs.	“ = 6.65hrs.
		Beyond 5 km per km	10m ³	0.33		0.30		“ = 3.75ltrs.	“ = 0.63hrs
				IDLE TIME = 3.52hrs.					
56.11	G-13.2	Pre-cast reinforced concrete pipes (or other similar material)							
		First one km	10m ³	1.16		1.05		Diesel = 2.00ltrs.	Truck/Tractor = 2.20hrs.
		First two km	10m ³	1.34		1.20		“ = 4.00ltrs.	“ = 2.54hrs.
		First three km	10m ³	1.51		1.36		“ = 6.00ltrs.	“ = 2.87hrs.
		First four km	10m ³	1.69		1.52		“ = 8.00ltrs.	“ = 3.20hrs.
		First five km	10m ³	1.86		1.68		“ =10.00ltrs.	“ = 3.54hrs.
		Beyond 5 km per km	10m ³	0.18		0.16		“ = 2.00ltrs.	“ = 0.33hrs
				IDLE TIME = 1.87hrs.					

57. **Carriage of material by Truck or Tractor (30 kmph)** including loading, unloading and stacking by manpower

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of truck/tractor given here is only the gross working time including the idle time but does not include the time taken by the truck/tractor from its night parked place to site and back.
- b) Average speed of truck/tractor = 30.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.75 hour per trip
- d) Capacity of truck*/tractor = 3 to 5 Metric ton (Mt)
- e) Haulage distance = up to 20 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

* Here 'truck' refers to mini truck having the capacity of 3 Mt to 5Mt.

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
57.1	G-13.2	Lime (or other similar material)								
		First one km	10m ³	1.01		0.91		Diesel = 1.57ltrs.	Truck/Tractor = 1.92hrs.	
		First two km	10m ³	1.09		0.98		“ = 3.14ltrs.	“ = 2.07hrs.	
		First three km	10m ³	1.76		1.06		“ = 4.70ltrs.	“ = 2.23hrs.	
		First four km	10m ³	1.25		1.13		“ = 6.27ltrs.	“ = 2.38hrs.	
		First five km	10m ³	1.34		1.20		“ = 7.84ltrs.	“ = 2.54hrs.	
		Beyond 5 km per km	10m ³	0.08		0.07		“ = 1.57ltrs.	“ = 0.15hrs.	
				IDLE TIME = 1.76hrs.						
57.2	G-13.2	Soil (or other similar material)								
		First one km	10m ³	1.26		1.13		Diesel = 1.96ltrs.	Truck/Tractor = 2.41hrs.	
		First two km	10m ³	1.36		1.23		“ = 3.92ltrs.	“ = 2.60hrs.	
		First three km	10m ³	1.47		1.32		“ = 5.88ltrs.	“ = 2.80hrs.	
		First four km	10m ³	1.57		1.41		“ = 7.84ltrs.	“ = 2.99hrs.	
		First five km	10m ³	1.63		1.51		“ = 9.80ltrs.	“ = 3.19hrs.	
		Beyond 5 km per km	10m ³	0.11		0.09		“ = 1.98ltrs.	“ = 0.19hrs.	
				IDLE TIME = 2.21hrs.						
57.3	G-13.2	Stone aggregates/shingles (or other similar material) having size of 40 mm and above								
		First one km	10m ³	1.33		1.20		Diesel = 2.06ltrs.	Truck/Tractor = 2.53hrs.	
		First two km	10m ³	1.43		1.29		“ = 4.13ltrs.	“ = 2.73hrs.	
		First three km	10m ³	1.55		1.39		“ = 6.19ltrs.	“ = 2.94hrs.	
		First our km	10m ³	1.65		1.49		“ = 8.26ltrs.	“ = 3.14hrs.	
		First five km	10m ³	1.76		1.58		“ =10.32ltrs.	“ = 3.35hrs.	
		Beyond 5 km per km	10m ³	0.11		0.09		“ = 2.06ltrs.	“ = 0.20hrs.	
				IDLE TIME = 2.32hrs.						
57.4	G-13.2	Sand, stone aggregates/shingles (or other similar material) having size of less than 40 mm								
			10m ³	1.23		1.10		Diesel = 1.90ltrs.	Truck/Tractor = 2.33hrs.	
		First one km	10m ³	1.26		1.13		“ = 3.81ltrs.	“ = 2.52hrs.	
		First two km	10m ³	1.43		1.28		“ = 5.71ltrs.	“ = 2.72hrs.	
		First three km	10m ³	1.53		1.37		“ = 7.62ltrs.	“ = 2.90hrs.	
		First four km	10m ³	1.62		1.46		“ = 9.52ltrs.	“ = 3.09hrs.	
		First five km	10m ³	0.10		0.09		“ = 1.90ltrs.	“ = 0.19hrs.	
		Beyond 5 km per km		IDLE TIME = 2.14hrs.						
57.5	G-13.2	Rubble stone or boulders (or other similar material) of regular shape								

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (person/day)	Skilled Labour (person/day)	Unskilled Labour (person/day)	Skilled Labour (person/day)			
		First one km	10m³	1.43		1.28		Diesel = 2.22trs.	Truck/Tractor = 2.72hrs.	
		First two km	10m³	1.55		1.39		“ = 4.44ltrs.	“ = 2.94hrs.	
		First three km	10m³	1.67		1.50		“ = 6.67ltrs.	“ = 3.17hrs.	
		First four km	10m³	1.78		1.60		“ = 8.89ltrs.	“ = 3.39hrs.	
		First five km	10m³	1.90		1.71		“ =11.11ltrs.	“ = 3.61hrs.	
		Beyond 5 km per km	10m³	0.12		0.11		“ = 2.22ltrs.	“ = 0.22hrs.	
				IDLE TIME = 2.50hrs.						
57.6	G-13.2	Bricks (or other similar material)								
		First one km	1000nos.	0.22		0.20		Diesel = 0.33ltrs.	Truck/Tractor = 0.40hrs.	
		First two km	1000nos.	0.23		0.21		“ =	“ = 0.44hrs.	
		First three km	1000nos.	0.25		0.23		0.67ltrs.	“ = 0.47hrs.	
		First four km	1000nos.	0.27		0.24		“ =	“ = 0.51hrs.	
		First five km	1000nos.	0.29		0.26		1.00ltrs.	“ = 0.54hrs.	
		Beyond 5 km per km	1000nos.	0.01		0.01		“ =	“ = 0.03hrs.	
								1.34ltrs.		
								“ =		
								1.67ltrs.		
								“ =		
								0.33ltrs.		
				IDLE TIME = 0.375hrs.						
57.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than 100 mm diameter (or other similar material)								
		First one km	10Mt	0.86		0.77		Diesel = 1.33ltrs.	Truck/Tractor = 1.63hrs.	
		First two km	10Mt	0.92		0.83		“ = 2.67ltrs.	“ = 1.77hrs.	
		First three km	10Mt	1.00		0.90		“ = 4.00ltrs.	“ = 1.90hrs.	
		First four km	10Mt	1.07		0.96		“ = 5.34ltrs.	“ = 2.04hrs.	
		First five km	10Mt	1.13		1.02		“ = 6.67ltrs.	“ = 2.17hrs.	
		Beyond 5 km per km	10Mt	0.06		0.05		“ = 1.33ltrs.	“ = 0.13hrs.	
				IDLE TIME = 1.50hrs.						
57.8	G-13.2	Timber (or other similar material)								
		First one km	10m³	1.14		1.03		Diesel = 1.78ltrs.	Truck/Tractor = 2.18hrs.	
		First two km	10m³	1.24		1.11		“ = 3.56ltrs.	“ = 2.36hrs.	
		First three km	10m³	1.33		1.20		“ = 5.33ltrs.	“ = 2.53hrs.	
		First four km	10m³	1.42		1.28		“ = 7.11ltrs.	“ = 2.71hrs.	
		First five km	10m³	1.52		1.37		“ = 8.89ltrs.	“ = 2.89hrs.	
		Beyond 5 km per km	10m³	0.09		0.08		“ = 1.78ltrs.	“ = 0.18hrs.	

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment
				For Hill Area		For Terai/Plain Area			
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
				IDLE TIME = 2.00hrs.					
57.9	G-13.2	Bitumen (or other similar material)							
		First one km	10Mt	1.42		1.28		Diesel =2.22ltrs.	Truck/Tractor = 2.72hrs.
		First two km	10Mt	1.55		1.39		“ = 4.44ltrs.	“ = 2.94hrs.
		First three km	10Mt	1.67		1.50		“ = 6.67ltrs.	“ = 3.17hrs.
		First four km	10Mt	1.78		1.60		“ = 8.89ltrs.	“ = 3.39hrs.
		First five km	10Mt	1.90		1.71		“ =11.11ltrs.	“ = 3.61hrs.
		Beyond 5 km per km	10Mt	0.12		0.11		“ = 2.22ltrs.	“ = 0.22hrs.
				IDLE TIME = 2.50hrs.					
57.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape							
		First one km	10m ³	2.01		1.81		Diesel= 3.13ltrs.	Truck/Tractor = 3.83hrs.
		First two km	10m ³	2.18		1.96		“ = 6.26ltrs.	“ = 4.14hrs.
		First three km	10m ³	2.34		2.11		“ = 9.39ltrs.	“ = 4.46hrs.
		First four km	10m ³	2.51		2.26		“ =12.52ltrs.	“ = 4.77hrs.
		First five km	10m ³	2.67		2.40		“ =15.65ltrs.	“ = 5.08hrs.
		Beyond 5 km per km	10m ³	0.16		0.14		“ = 3.13ltrs.	“ = 0.31hrs.
				IDLE TIME = 3.52hrs.					

58. **Carriage of material by Truck or Tractor (45 kmph)** including loading, unloading and stacking by manpower

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of truck/tractor given here is only the gross working time including the idle time but does not include the time taken by the truck/tractor from its night parked place to site and back.
- b) Average speed of truck/tractor = 45.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.75 hour per trip
- d) Capacity of truck*/tractor = 3 to 5 Metric ton (Mt)
- e) Haulage distance = up to 20 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

* Here 'truck' refers to mini truck having the capacity of 3 Mt to 5Mt.

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
58.1	G-13.2	Lime (or other similar material)								
		First one km	10m ³	0.98		0.88		Diesel = 1.57ltrs.	Truck/Tractor = 1.86hrs.	
		First two km	10m ³	1.04		0.93		“ = 3.14ltrs.	“ = 1.97hrs.	
		First three km	10m ³	1.09		0.98		“ = 4.70ltrs.	“ = 2.07hrs.	
		First four km	10m ³	1.15		1.03		“ = 6.27ltrs.	“ = 2.18hrs.	
		First five km	10m ³	1.20		1.08		“ = 7.84ltrs.	“ = 2.28hrs.	
		Beyond 5 km per km	10m ³	0.06		0.05		“ = 1.57ltrs.	“ = 0.10hrs.	
				IDLE TIME = 1.76hrs.						
58.2	G-13.2	Soil (or other similar material)								
		First one km	10m ³	1.23		1.10		Diesel = 1.96ltrs.	Truck/Tractor = 2.34hrs.	
		First two km	10m ³	1.30		1.17		“ = 3.92ltrs.	“ = 2.47hrs.	
		First three km	10m ³	1.37		1.23		“ = 5.88ltrs.	“ = 2.60hrs.	
		First four km	10m ³	1.44		1.29		“ = 7.84ltrs.	“ = 2.73hrs.	
		First five km	10m ³	1.50		1.35		“ = 9.80ltrs.	“ = 2.86hrs.	
		Beyond 5 km per km	10m ³	0.07		0.06		“ = 1.96ltrs.	“ = 0.13hrs.	
				IDLE TIME = 2.21hrs.						
58.3		Stone aggregates/shingles (or other similar material) having size of 40 mm and above								
		First one km	10m ³	1.29		1.16		Diesel = 2.06ltrs.	Truck/Tractor = 2.46hrs.	
		First two km	10m ³	1.37		1.23		“ = 4.13ltrs.	“ = 2.04hrs.	
		First three km	10m ³	1.43		1.29		“ = 6.19ltrs.	“ = 2.73hrs.	
		First four km	10m ³	1.51		1.35		“ = 8.26ltrs.	“ = 2.87hrs.	
		First five km	10m ³	1.58		1.42		“ =10.32ltrs.	“ = 3.01hrs.	
		Beyond 5 km per km	10m ³	0.07		0.06		“ = 2.06ltrs.	“ = 0.16hrs	
				IDLE TIME = 2.32hrs.						
58.4	G-13.2	Sand, stone aggregates/shingles (or other similar material) having size of less than 40 mm								
		First one km	10m ³	1.19		1.07		Diesel = 1.90ltrs.	Truck/Tractor = 2.27hrs.	
		First two km	10m ³	1.26		1.13		“ = 3.81ltrs.	“ = 2.39hrs.	
		First three km	10m ³	1.32		1.19		“ = 5.71ltrs.	“ = 2.52hrs.	
		First four km	10m ³	1.39		1.25		“ = 7.62ltrs.	“ = 2.64hrs.	
		First five km	10m ³	1.46		1.31		“ = 9.52ltrs.	“ = 2.77hrs.	
		Beyond 5 km per km	10m ³	0.06		0.05		“ = 1.90ltrs.	“ = 0.12hrs.	
				IDLE TIME = 2.14hrs.						
58.5	G-13.2	Rubble stone or boulders (or other similar								

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
		material) of regular shape								
		First one km	10m ³	1.39		1.25		Diesel = 2.22ltrs.	Truck/Tractor = 2.65hrs.	
		First two km	10m ³	1.47		1.32		“ = 4.44ltrs.	“ = 2.80hrs.	
		First three km	10m ³	1.55		1.39		“ = 6.67ltrs.	“ = 2.94hrs.	
		First four km	10m ³	1.62		1.46		“ = 8.89ltrs.	“ = 3.09hrs.	
		First five km	10m ³	1.70		1.53		“ =11.11ltrs.	“ = 3.24hrs.	
		Beyond 5 km per km	10m ³	0.08		0.07		“ = 2.22ltrs.	“ = 0.15hrs	
				IDLE TIME = 2.50hrs.						
58.6	G-13.2	Bricks (or other similar material)								
		First one km	1000nos.	0.21		0.19		Diesel = 0.33ltrs.	Truck/Tractor = 0.39hrs.	
		First two km	1000nos.	0.22		0.20		“ = 0.67ltrs.	“ = 0.41hrs.	
		First three km	1000nos.	0.23		0.21		“ = 1.00ltrs.	“ = 0.44hrs.	
		First four km	1000nos.	0.24		0.22		“ = 1.34ltrs.	“ = 0.46hrs.	
		First five km	1000nos.	0.25		0.23		“ = 1.67ltrs.	“ = 0.48hrs.	
		Beyond 5 km per km	1000nos.	0.07		0.06		“ = 0.33ltrs.	“ = 0.02hrs	
				IDLE TIME = 0.375hrs.						
58.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than100 mm diameter (or other similar material)								
		First one km	10Mt	0.83		0.75		Diesel = 1.33ltrs.	Truck/Tractor = 1.59hrs.	
		First two km	10Mt	0.88		0.79		“ = 2.67ltrs.	“ = 1.68hrs.	
		First three km	10Mt	0.92		0.83		“ = 4.80ltrs.	“ = 1.76hrs.	
		First four km	10Mt	0.97		0.88		“ = 5.34ltrs.	“ = 1.85hrs.	
		First five km	10Mt	1.02		0.92		“ = 6.67ltrs.	“ = 1.94hrs.	
		Beyond 5 km per km	10Mt	0.05		0.04		“ = 1.33ltrs.	“ = 0.09hrs	
				IDLE TIME = 1.50hrs.						
58.8	G-13.2	Timber (or other similar material)								
		First one km	10m ³	1.10		1.00		Diesel = 1.78ltrs.	Truck/Tractor = 2.12hrs.	
		First two km	10m ³	1.18		1.06		“ = 3.56ltrs.	“ = 2.24hrs.	
		First three km	10m ³	1.24		1.12		“ = 5.33ltrs.	“ = 2.35hrs.	
		First four km	10m ³	1.30		1.17		“ = 7.11trs.	“ = 2.47hrs.	
		First five km	10m ³	1.36		1.22		“ = 8.89ltrs.	“ = 2.59hrs.	
		Beyond 5 km per km	10m ³	0.06		0.05		“ = 1.78ltrs.	“ = 0.12hrs	
				IDEL TIME = 2.00hrs.						
58.9	G-13.2	Bitumen (or other similar material)								

S. No.	Respective Clause of Specifications	Description	Unit	For Loading, Unloading and Stacking				Materials	Equipment	
				For Hill Area		For Terai/Plain Area				
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)			
		First one km	10Mt	1.39		1.25		Diesel = 2.22ltrs.	Truck/Tractor = 2.65hrs.	
		First two km	10Mt	1.47		1.32		“ = 4.44ltrs.	“ = 2.80hrs.	
		First three km	10Mt	1.55		1.39		“ = 6.67ltrs.	“ = 2.94hrs.	
		First four km	10Mt	1.62		1.46		“ = 8.89ltrs.	“ = 3.09hrs.	
		First five km	10Mt	1.70		1.53		“ =11.11ltrs.	“ = 3.24hrs.	
		Beyond 5 km per km	10Mt	0.08		0.07		“ = 2.22ltrs.	“ = 0.15hrs	
				IDLE TIME = 2.50hrs.						
58.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape								
		First one km	10m ³	1.96		1.76		Diesel = 3.13ltrs.	Truck/Tractor = 3.73hrs.	
		First two km	10m ³	2.07		1.86		“ = 6.26ltrs.	“ = 3.94hrs.	
		First three km	10m ³	2.18		1.96		“ = 9.39ltrs.	“ = 4.14hrs.	
		First four km	10m ³	2.29		2.06		“ =12.52ltrs.	“ = 4.35hrs.	
		First five km	10m ³	2.39		2.15		“ =15.65ltrs.	“ = 4.56hrs.	
		Beyond 5 km per km	10m ³	0.11		0.09		“ = 3.13ltrs.	“ = 0.21hrs	
				IDLE TIME = 3.52hrs.						

59. **Carriage of material by Bullock or Buffalo Cart (2 kmph)** including loading, unloading and stacking by manpower

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of bullock or buffalo cart given here is only the gross working time including the idle time but does not include the time taken by the cart from its night parked place to site and back.
- b) Average speed of cart = 2.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.50 hour per trip
- d) Capacity of bullock cart and buffalo cart = 1 and 1.5 Metric ton (Mt) respectively
- e) Haulage distance = up to 10 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

S. No.	Respective Clause of Specifications	Description	Unit	Unskilled Labour for Cart Driving, Loading, Unloading and Stacking (personday)	Utilisation of Cart including idle time (cart day)	Materials	Equipment
59.1	G-13.2	Lime (or other similar material) First one km First two km First three km First four km First five km Beyond 5 km per km	10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	1.48 1.78 2.09 2.40 2.70 0.31	1.48 1.78 2.09 2.40 2.70 0.31		Bullock cart or Buffalo cart
59.2	G-13.2	Soil (or other similar material) First one km First two km First three km First four km First five km Beyond 5 km per km	10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	1.84 2.23 2.61 2.99 3.38 0.39	1.84 2.23 2.61 2.99 3.38 0.39		Bullock cart or Buffalo cart
59.3	G-13.2	Stone aggregates/shingles (or other similar material) having size of 40 mm and above First one km First two km First three km First four km First five km Beyond 5 km per km	10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	1.94 2.34 2.74 3.15 3.55 0.40	1.94 2.34 2.74 3.15 3.55 0.40		Bullock cart or Buffalo cart
59.4	G-13.2	Sand, stone aggregates/shingles (or other similar material) having size of less than 40 mm First one km First two km First three km First four km First five km	10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	1.79 2.15 2.53 2.90 3.28 0.38	1.79 2.15 2.53 2.90 3.28 0.38		Bullock cart or Buffalo cart

S. No.	Respective Clause of Specifications	Description	Unit	Unskilled Labour for Cart Driving, Loading, Unloading and Stacking (person/day)	Utilisation of Cart including idle time (cart day)	Materials	Equipment
		Beyond 5 km per km					
59.5	G-13.2	Rubble stone or boulders (or other similar material) of regular shape					
		First one km	10m ³	2.08	2.08		Bullock cart or Buffalo cart
		First two km	10m ³	2.51	2.51		
		First three km	10m ³	2.95	2.95		
		First four km	10m ³	3.40	3.40		
		First five km	10m ³	3.84	3.84		
		Beyond 5 km per km	10m ³	0.44	0.44		
59.6	G-13.2	Bricks (or other similar material)					
		First one km	1000nos.	0.31	0.31		Bullock cart or Buffalo cart
		First two km	1000nos.	0.38	0.38		
		First three km	1000nos.	0.45	0.45		
		First four km	1000nos.	0.51	0.51		
		First five km	1000nos.	0.58	0.58		
		Beyond 5 km per km	1000nos.	0.06	0.06		
59.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than 100 mm diameter (or other similar material)					
		First one km	10Mt	1.24	1.24		Bullock cart or Buffalo cart
		First two km	10Mt	1.50	1.50		
		First three km	10Mt	1.76	1.76		
		First four km	10Mt	2.04	2.04		
		First five km	10Mt	2.30	2.30		
		Beyond 5 km per km	10Mt	0.26	0.26		
59.8	G-13.2	Timber (or other similar material)					
		First one km	10m ³	1.66	1.66		Bullock cart or Buffalo cart
		First two km	10m ³	2.01	2.01		
		First three km	10m ³	2.36	2.36		

S. No.	Respective Clause of Specifications	Description	Unit	Unskilled Labour for Cart Driving, Loading, Unloading and Stacking (person/day)	Utilisation of Cart including idle time (cart day)	Materials	Equipment
		First four km First five km Beyond 5 km per km	10m ³ 10m ³ 10m ³	2.71 3.06 0.35	2.71 3.06 0.35		
59.9	G-13.2	Bitumen (or other similar material) First one km First two km First three km First four km First five km Beyond 5 km per km	 10Mt 10Mt 10Mt 10Mt 10Mt 10Mt	 2.08 2.51 2.95 3.40 3.84 0.44	 2.08 2.51 2.95 3.40 3.84 0.44		Bullock cart or Buffalo cart
59.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape First one km First two km First three km First four km First five km Beyond 5 km per km	 10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	 2.92 3.54 4.15 4.78 5.39 0.61	 2.92 3.54 4.15 4.78 5.39 0.61		Bullock cart or Buffalo cart

60. **Carriage of material by Porters (2 kmph)** including loading, unloading and stacking

The computation is based on the following assumptions:

- a) Number of working hours per day = 8.00 hours
The working time of porters given here is only the gross working time including the intermediate resting time.
- b) Average walking speed with 40 kg load = 2.00 km per hour
- c) Time allowed for loading, unloading and stacking = 0.10 hour per trip
- d) Capacity of average load carrying porter = 40 kg
- e) Haulage distance = up to 6 km
- f) These norms are applicable to net quantities after deducting a percentage for voids from stack measurements. Respective percentages for different materials are as follows:
 - i. Lime and fine aggregates (or other similar material) having particle size of less than 6 mm
= 0%
 - ii. Soil (or other similar material) = 20% in loose stack
= 10% in consolidated fills
= 5% in fills consolidated by mechanical plants
 - iii. Stone aggregates (or other similar material) having particle size of 40 mm and above
= 12.5%
 - iv. Sand or stone aggregates (or other similar material) having particle size of less than 40 mm
= 10%
 - v. Rubble stone or boulders (or other similar material) of regular shape, having particle size of 100 mm and above = 15%
 - vi. Excavated rock boulders (or other similar material) of irregular shape
= 50%

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials	Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
60.1	G-13.2	Lime (or other similar material)							
		First one km	10m ³	24		22			1. Carrying Basket/Doko/Thuntse 2. Namlo
		First two km	10m ³	32		29			
		First three km	10m ³	41		37			
		First four km	10m ³	49		44			
		First five km	10m ³	57		51			
		Beyond 5 km per km	10m ³	08		07			
60.2	G-13.2	Soil (or other similar material)							
		First one km	10m ³	30		27			1. Carrying Basket/Doko/Thuntse 2. Namlo
		First two km	10m ³	40		36			
		First three km	10m ³	49		44			
		First four km	10m ³	58		52			
		First five km	10m ³	67		60			
		Beyond 5 km per km	10m ³	09		08			
60.3	G-13.2	Stone aggregates/shingles (or other similar material) having size of 40 mm and above							
		First one km	10m ³	31.0		28			1. Carrying Basket/Doko/Thuntse 2. Namlo
		First two km	10m ³	41.0		37			
		First three km	10m ³	51.0		46			
		First four km	10m ³	60.0		54			
		First five km	10m ³	70.0		63			
		Beyond 5 km per km	10m ³	9.5		09			
60.4	G-13.2	Sand, stone aggregates/shingles (or other similar material) having size of less than 40 mm							
		First one km	10m ³	29		26			1. Carrying Basket/Doko/Thuntse 2. Namlo
		First two km	10m ³	38		34			
		First three km	10m ³	47		42			
		First four km	10m ³	56		50			
		First five km	10m ³	65		59			
			10m ³	09		08			

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials	Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		Beyond 5 km per km							
60.5	G-13.2	Rubble stone or boulders (or other similar material) of regular shape							1. Carrying Basket/Doko/Thuntse 2. Namlo
		First one km	10m ³	33		30			
		First two km	10m ³	43		39			
		First three km	10m ³	53		48			
		First four km	10m ³	63		57			
		First five km	10m ³	73		66			
		Beyond 5 km per km	10m ³	10		09			
60.6	G-13.2	Bricks (or other similar material)							1. Carrying Basket/Doko/Thuntse 2. Namlo
		First one km	1000nos.	08		07.0			
		First two km	1000nos.	11		10.0			
		First three km	1000nos.	14		12.0			
		First four km	1000nos.	17		15.0			
		First five km	1000nos.	20		18.0			
		Beyond 5 km per km	1000nos.	03		2.5			
60.7	G-13.2	Cement, stone blocks, steel, GI pipes/CI pipes/CC pipes having less than 100 mm diameter (or other similar material)							1. Carrying Basket/Doko/Thuntse 2. Namlo
		First one km	10Mt	21.5		19			
		First two km	10Mt	29.0		26			
		First three km	10Mt	36.5		33			
		First four km	10Mt	44.0		40			
		First five km	10Mt	51.5		46			
		Beyond 5 km per km	10Mt	7.5		07			
60.8	G-13.2	Timber (or other similar material)							1. Carrying Basket/Doko/Thuntse 2. Namlo
		First one km	10m ³	27		24			
		First two km	10m ³	36		32			
		First three km	10m ³	45		40			

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials	Equipment
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		First four km First five km Beyond 5 km per km	10m ³ 10m ³ 10m ³	53 62 09		48 56 08			
60.9	G-13.2	Bitumen (or other similar material) First one km First two km First three km First four km First five km Beyond 5 km per km	 10Mt 10Mt 10Mt 10Mt 10Mt 10Mt	 33 43 53 63 73 10		 30 39 48 57 66 09			1. Carrying Basket/Doko/Thuntse 2. Namlo
60.10	G-13.2	Excavated rock boulders (or other similar material) of irregular shape First one km First two km First three km First four km First five km Beyond 5 km per km	 10m ³ 10m ³ 10m ³ 10m ³ 10m ³ 10m ³	 45.5 58.0 70.5 83.0 95.5 12.5		 41 52 63 75 86 11			1. Carrying Basket/Doko/Thuntse 2. Namlo

Volume V

**Norms for
Rural Roads**

Bio-engineering Works

Work Norms for Bio-engineering Works of Rural Roads

S. No.	Respective Clause of Specifications	Description	Unit	For Hill Area		For Terai/Plain Area		Materials/Royalties	Equipment/Tools Remarks
				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
61.	18-1	Collection and preparation of seeds							
		a. Collection of grass seeds from sources within 1 km of the road, including separating and preparing seed for storage, and drying seed in the sun.	1 kg	1.50		1.50		Sealed bag = 1 no.	Khukuri
		b. Collection of large shrub seeds (e.g. bhujetro) from sources within 1 km of the road including seed preparation for storage after drying.	1 kg	0.45		0.45			Khukuri
		c. Collection of medium-sized shrub seeds (e.g. kerakose) from sources within 1 km of the road, including seed preparation for storage after drying.	1 kg	0.75		0.75		Sealed bag = 1 no.	Nanglo
		d. Collection of medium-sized shrub and tree seeds (e.g. areri, khayer, ghobre and rani salla, sisau) from sources within 1 km of the road, including seed preparation for storage after drying.	1 kg	0.95		0.95		Sealed bag = 1 no.	Nanglo
		e. Collection of small shrub and tree seeds (e.g. dhanyero, dhusun, tilka, utis) from sources within 1 km of the road, including seed preparation for storage after drying.	1 kg	2.50		2.50		Sealed bag = 1 no.	Nanglo
62.	18-2	Collection of grass and hardwood cuttings for vegetative propagation							
		a. Collection of grass clumps (e.g. amliso, kans, khar) from sources within 1 km of the road, to make slips for multiplication in the nursery.	1000 slips	1.50		1.50		Adequate supply of appropriate clumps. Hessian jute = 5 m ²	Kodalo
		b. Collection of cuttings of small bamboos (e.g. padang bans, tite nigalo bans), suitable for traditional planting, from sources within 1 km of the road. Material minimum 10 cm of rooted rhizome and 90 cm of culm.	1000 nos.	3.00		3.00		Adequate supply of appropriate bamboos. Hessian jute = 10 m ²	Kodalo Khukuri

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		c. Collection of hardwood cuttings (e.g. assuro, bains, kanda phul, namdi phul, saruwa, simali) from sources within 1 km of the road. Material minimum 30 cm in length and 2 cm in diameter.	1000 nos.	0.85		0.85		Adequate supply of appropriate bushes. Hessian jute = 5 m ²	Khukuri
63.	18-3	Nursery operation and management (bed preparation)							
		a. Construction of seed beds for tree seedlings, including materials for beds and shades. Bed is 1 m wide x 17 cm high and made up of: 5 cm of washed gravel, 5 cm of unsieved forest soil, 5 cm of 1:3 mix of sieved forest soil and washed sand, 2 cm of washed, sieved and sterilised sand.	5 m ²	2.00	1.50	2.00	1.50	Bamboo = 9 nos. Polythene = 9 m ² Bricks = 96 nos. Gravel = 0.25 m ³ Unsieved soil = 0.10 m ³ Line string = 13 m Binding wire = 3 kg	Khanti Shovel Pick axe Screen mesh
		b. Construction of stand out beds for tree seedlings in polypots, including materials for beds and shades. Bed is 100 cm wide x 15 cm high, with a 5 cm layer of gravel placed above the compacted ground.	5 m ²	6.00		6.00		Bamboo = 15 nos. Bricks = 96 nos. Gravel = 0.25 m ³ Line string = 13 m Binding wire = 3 kg	Khanti Shovel Pick axe
		c. Construction of beds for grass seeds, grass slips (i.e. vegetative propagation) and tree stool cuttings, including materials and hessian cover. Bed is 100 cm wide x 25 cm high and made up of: 5 cm of washed gravel placed above the ground, 5 cm of 1:1 mix of sieved soil and compost, and topped with 15 cm of 3:1 mix of sieved forest topsoil and washed sand.	5 m ²	1.50	1.00	1.50	1.00	Gravel = 0.38 m ³ Forest soil = 1.46 m ³ Compost = 0.38 m ³ Washed sand = 0.46 m ³ Hessian cover = 10 m ²	Shovel Pick axe
		d. Construction of beds for propagation of bamboo culm cuttings, including materials and hessian cover. Bed is 100 cm wide x 30 cm high. The ground below the bed is dug to a depth of 30 cm. Bed is made with 10 cm unsieved soil and 20 cm sieved soil. A bund 10 cm high is formed around the edge.	5 m ²	2.00		2.00		Gravel = 0.38 m ³ Forest soil = 1.46 m ³ Compost = 0.38 m ³ Bamboo = 6 nos. Hessian cover = 25 m ²	Shovel Pick axe Khukuri Log saw
64.	18-4	Nursery operation and management (seed sowing and transplanting; planting hardwood cuttings)							
		a. Tree seed sowing @ 10 g per m ² (medium-sized seeds) or 2 g per m ² (very fine seeds) into seed beds including pre-sowing seed treatment.	5 m ²	0.04		0.04		Seed = 50 g	Bowl Trowel

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		b. Preparing potting mix and filling polypots, including all material for container seedlings. [Note 1 kg of 200 gauge polypots (4" x 7" laid flat) = 464 bags; 200 gauge black polythene is preferred.]	1000 nos.	10.00		10.00		Polypot = 1050 nos. Sand = 0.46 m ³	Sieve Shovel
		c. Direct sowing of tree seeds into polypots including seed treatment, by sowing one seed in half the pots and two seeds in the other half.	1000 nos.	0.62		0.62		Soil = 0.70 m ³ Compost = 0.23 m ³ Seed = 1500 nos. Wooden peg = 1 no.	
		d. Pricking out young seedlings and transplanting into polypots.	100 nos.	0.18		0.18		Wooden peg = 1 no.	Tray
		e. Pricking out tree seedlings and transplanting into beds.	1000 nos.	0.12		0.12		Wooden peg = 1 no.	
		f. Transplanting grass slips into beds, from clumps. Slips are planted at 10 cm centres in rows 25 cm apart.	m ²	0.12		0.12		Hessian jute = 0.30 m ²	Khukuri Shovel
		g. Planting of hardwood cuttings of minimum 30 cm length to 20 cm depth into prepared beds. Cuttings spaced at 5 cm centres within rows, with 20 cm between rows.	1000 nos.	0.60		0.60		Hardwood cuttings = 1000 nos.	Khanti
65.	18-4.5	Preparation of raised materials for extraction from the nursery							
		a. Grass culm cutting production from nursery stock; single or double node (e.g. napier).	1000 nos.	0.70		0.70		Hessian jute = 2.70 m ²	Khukuri
		b. Uprooting and preparing grass slips ready for site planting from nursery seedlings	1000 nos.	0.63		0.63		Hessian jute = 1.35 m ²	Fork Pickaxe Khukuri
		c. Uprooting and preparing grass slips ready for site planting from nursery grass clumps raised from slips by vegetative propagation.	1000 nos.	0.33		0.33		Hessian jute = 4.20 m ²	Shovel Khanti
66.	18-4.6	Compost and mulch production							
		a. Mulch production by collection and cutting of weeds and other vegetation such as tite pati, banmara, etc. within 1 km of the road, and stacking along roadside.	1 m ³	1.20		1.20			Hasiya Doko

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		b. Compost production by collection and cutting of weeds and other vegetation such as tite pati, banmara, etc. within 1 km of the road, including fine cutting and filling compost pit.	1 m ³	1.20		1.20			Doko
		c. Turning compost once per month.	1 m ³	0.10		0.10			Shovel
67.	18-6	Direct seeding on site (same as S. No. 19)							
		a. Broadcasting grass seeds on slopes < 40°, seeding rate 25 g/m ²	100 m ²	0.17		0.17		Seed = 2.50 kg	
		b. Broadcasting grass seeds on slopes < 40°, including cover with long mulch, seeding rate 25 g/m ²	100 m ²	5.00		5.00		Seed = 2.50 kg Mulch = 5.00 m ³	
		c. Broadcasting grass seeds on slopes < 40° - 45°, including cover with long mulch and jute netting of mesh size 300 mm x 500 mm. Seeding rate 25 g/m ² . Operation includes pegging with suitable live pegs or hardwood cuttings (e.g. simali) @ 1 m spacing, jute net of 6.75 m x 1 m size.	100 m ²	6.25		6.25		Seed = 2.50 kg Mulch = 5.00 m ³ Jute net = 105 m ² Live pegs = 128 nos.	Khukuri Mallet (wooden hammer)
		d. Sowing shrub or tree seeds on all slopes, at 25 cm intervals, including digging planting holes to 5 cm depth and covering with soil. Two seeds per planting hole.	100 m ²	1.00		1.00		Seeds = 3200 nos.	Mild steel rod of 50 cm length
68.	18-6	Planting grass cuttings on site							
		a. Planting single node culm cuttings of grass (e.g. napier) on fill slopes < 45° and embankment slopes in plain areas. Approximate length 15 - 20 cm, including digging planting hole 10 - 20 cm depth using a metal rod or hardwood peg.	100 nos.	0.20		0.20		Grass cuttings = 100 nos. Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length
		b. Planting single node culm cuttings of grass (e.g. napier) on hard cut slopes < 45°. Approximate length 15 - 20 cm, including digging planting hole 10 - 20 cm depth using a metal rod or hardwood peg.	100 nos.	0.35		0.35		Grass cuttings = 100 nos. Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length
		c. Planting single node culm cuttings of grass (e.g. napier) on hard cut slopes > 45°. Approximate length 15 - 20 cm, including digging planting hole 10 - 20 cm depth using a metal rod or hardwood peg.	100 nos.	0.50		0.50		Grass cuttings = 100 nos. Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length
		d. Planting rooted grass slips on embankment slopes in plain areas, at 10 cm spacing within the row. The first row is 0.75 m from the edge of the pavement and subsequent rows are spaced at 1 m	1 m	0.02		0.02		Grass slips = 11 nos. of drills Hessian jute = 0.14 m ²	Mild steel rod or hardwood peg of 50 cm length

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		intervals down the embankment.						Line string = 1 m	
		e. Planting rooted grass slips on slopes < 45° including preparation of slips on site. Operation includes digging planting holes to a maximum of 5 cm depth with metal rod or hardwood peg, depending on nature of soil. The planting drills should be spaced 10 cm apart.	1 m ²	0.20		0.20		Grass slips = 100 nos. of drills Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length Khukuri
		f. Planting rooted grass slips on slopes 45° - 60° including preparation of slips on site. Operation includes digging planting holes to a maximum of 5 cm depth with metal rod or hardwood peg, depending on nature of soil. The planting drills should be spaced 10 cm apart.	1 m ²	0.30		0.30		Grass slips = 100 nos. of drills Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length Khukuri
		g. Planting rooted grass slips on slopes > 60° including preparation of slips on site. Operation includes digging planting holes to a maximum of 5 cm depth with metal rod or hardwood peg, depending on nature of soil. The planting drills should be spaced 10 cm apart.	1 m ²	0.40		0.40		Grass slips = 100 nos. of drills Hessian jute = 0.27 m ²	Mild steel rod or hardwood peg of 50 cm length Khukuri
69.	18-6	Planting shrub and tree seedlings and cuttings on site							
		a. Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and placing tree guards, on toe of embankment slopes in plain areas, not less than 8 m from the road centre line. Pit size 30 cm diameter x 30 cm depth. Compost volume ¼ of the volume of the pit, mixed with original soil.	10 nos.	0.25		0.25		Container Seedlings = 10 nos. Compost = 0.05 m ³ Tree guard = 10 nos. Green mulch = 0.04 m ³	Khanti Mallet (wooden hammer) Doko
		b. Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and mulching, on slopes < 30°. Pit size 30 cm diameter x 30 cm depth. Mix compost with soil and backfill into pit, to ¼ of pit volume.	10 nos.	0.33		0.33		Seedlings = 10 nos. Compost = 0.05 m ³ Green mulch = 0.04 m ³	Khanti Doko
		c. Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and mulching, on slopes 30° - 45°. Pit size 30 cm diameter x 30 cm depth. Mix compost with soil and backfill into pit, to ¼ of pit volume.	10 nos.	0.40		0.40		Seedlings = 10 nos. Compost = 0.05 m ³ Green mulch = 0.04 m ³	Khanti Doko
		d. Planting rooted tree stump cuttings and bare root seedlings, including pitting, transplanting, composting and mulching, on slopes < 30°. Pit size 10 cm diameter x 20 cm depth. Compost	10 nos.	0.17		0.17		Seedlings = 10 nos. Compost = 0.03 m ³ Green mulch = 0.04 m ³	Khanti

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		volume ¼ of the volume of the pit, mixed with original soil.							
		e. Planting rooted tree stump cuttings and bare root seedlings, including pitting, transplanting, composting and mulching, on slopes 30° - 45°. Pit size 10 cm diameter x 20 cm depth. Compost volume ¼ of the volume of the pit, mixed with original soil.	10 nos.	0.25		0.25		Seedlings = 10 nos. Compost = 0.03 m³ Green mulch = 0.04 m³	Khanti
		f. Planting rooted tree stump cuttings and bare root seedlings, including pitting, transplanting, composting and mulching, on	10 nos.	0.33		0.33		Seedlings = 10 nos. Compost = 0.03 m³	Khanti
		slopes > 45°. Pit size 10 cm diameter x 20 cm depth. Compost volume ¼ of the volume of the pit, mixed with original soil.						Green mulch = 0.04 m³	
70.	18-6.7	Vegetative palisade construction, brush layering and fascines							
		a. Collection of hardwood cuttings for planting material (e.g. assuro, namdi phul, simali) from sources within 1 km of road. Material to be approx. 1 m in length and minimum 5 cm in diameter.	1000 nos.	0.85		0.85		Adequate supply of bushes.	Khukuri
		b. Preparation and planting of live pegs of selected species (e.g. assuro, namdi phul, simali) of minimum 1 m length to 0.5 m depth into hard ground. Pegs spaced at 5 cm centres within rows, with 5 - 20 cm between rows, and interwoven with vegetation.	1 m	0.17		0.17		Live pegs = 20 nos.	Crow bar
		c. Preparation and planting of live cuttings of selected species (e.g. assuro, namdi phul, simali) of minimum 1 m length to 0.5 m into soft debris. Pegs spaced at 5 cm centres within rows, with 5 - 20 cm between rows, and interwoven with vegetation.	1 m	0.12		0.12		Live pegs = 20 nos.	Crow bar
		d. Site preparation for fascine laying: earth works in excavation of trench to 20 cm depth.	1 m	0.06		0.06			Pick axe Shovel
		e. Laying of live fascines, using live hardwood cuttings of selected species (e.g. assuro, namdi phul, simali) of minimum 1 m length, placed in bundles to give 4 running metres of cuttings per metre of fascine, including backfilling of trench and careful compaction.	1 m	0.17		0.17		Hardwood cuttings of at least 1 m in length = 4 m	Khukuri Shovel
71.	18-7	Jute netting works							
		a. For bare slopes and under planting with slips. Spinning raw jute	1 m²		0.36		0.36	Raw jute = 1.25 kg	Khukuri

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		from 100% jute fibre into yarn and weaving the yarn into netting. Hand spun yarn 5 to 8 mm in diameter, width of net 1.20 m, warp strands 27 nos. per 100 cm, weft strands 20 - 24 nos. per 100 cm, mesh size 30 - 40 mm square and 1.25 kg/m weight at 1.20 m widths. [Note. A tosro is the weaving shuttle, normally made from a split large bamboo culm.]							Bamboo sticks (10nos.) Weaving frame Tosro
		b. For holding mulch on slopes. Spinning raw jute from 100% jute fibre into yarn and weaving the yarn into netting. Hand spun yarn 3 to 5 mm diameter 1.20 m side and 11.2 m long. Mesh size 150 mm x 500 mm rectangular mesh and 0.25 kg/m at 1.20 m width. [Note. A tosro is the weaving shuttle, normally made from a split large bamboo culm.]	1 m ²		0.15		0.15	Raw jute = 0.26 kg	Khukuri Bamboo sticks (10nos.) Weaving frame Tosro
		c. Placing 30 - 40 mm square mesh jute netting on bare slopes (for later underplanting with grass slips), including pegging with live hardwood cuttings or split bamboo pegs and loosening tension so that the net hugs the slope throughout.	1 m ²	0.15		0.15		Woven jute net = 1.00 m ² Hardwood cuttings or split bamboo pegs = 5.00 nos.	MS rod of 50 cm length Mallet (wooden hammer)
		d. Placing 150 x 500 mm mesh jute netting to hold mulch on slopes, including application of mulch and pegging with live hardwood cuttings or split bamboo pegs and loosening tension so that the net hugs the slope throughout.	1 m ²	0.10		0.10		Cut mulch = 0.05 m ³ Woven jute net = 1.00 m ² Hardwood cuttings or split bamboo pegs = 5.00 nos.	MS rod of 50 cm length Mallet (wooden hammer)
72.	18-8	Fabrication of gabion bolster cylinders							
		a. Site preparation for 30 cm diameter bolster: earth works in excavation of trench.	1 m	0.085		0.085			Pick axe Shovel
		b. Site preparation for 60 cm diameter bolster: earth works in excavation of trench.	1 m	0.360		0.360			Pick axe Shovel
		c. Manufacture of bolster panels: 70 x 100 mm hexagonal mesh wire construction (10 SWG frame and 12 SWG mesh).	1 m ²		0.100		0.100	GI wire = 2.00 kg	Gabion frame and tools
		d. Construction of 30 cm bolster cylinder: placing, stretching wire mesh, filling with boulders, closing and backfilling.	1 m	0.375		0.375		Boulders = 0.09 m ³	Gabion tools Doko
		e. Construction of 60 cm bolster cylinder: placing, stretching wire	1 m	0.750		0.750		Boulders = 0.36 m ³	Gabion tools

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				Unskilled Labour (personday)	Skilled Labour (personday)	Unskilled Labour (personday)	Skilled Labour (personday)		
		mesh, filling with boulders, closing and backfilling.							
		f. Construction of 30 cm bolster cylinder: placing, stretching wire mesh over 20 gauge black polythene sheeting, filling with boulders, closing and backfilling.	1 m	0.375		0.375		Black polythene = 0.40 m ² Boulders = 0.09 m ³	Doko Gabion tools Doko
		g. Construction of 60 cm bolster cylinder: placing, stretching wire mesh over 20 gauge black polythene sheeting, filling with boulders, closing and backfilling.	1 m	0.750		0.750		Black polythene = 0.80 m ² Boulders = 0.36 m ³	Gabion tools Doko
		h. Anchoring bolster: 12 mm diameter MS re-bar cut into 2 m lengths for anchorage and placed at 1 m intervals.	1 no.	0.050		0.050		MS rod = 2.00 m	Sledge hammer
		i. Laying of terram paper (geotextile).	1 m ²	0.050		0.050		Terram paper = 1.15 m ²	Khukuri
73.	18-9	Bamboo tree guards							
		a. Weaving bamboo tree guards using bamboo poles as uprights: 1.60 m in height; and weaving split bamboo with the outer wall intact around the posts. Dimensions of the guard are 0.60 m diameter x 1.30 m high.	1 no.	0.25		0.25		Bamboo = 2.20 nos.	Khukuri