RECOMMENDATIONS OF THE SCHEDULE OF RATES COMMITTEE ON THE TERMS OF REFERENCE

1.0 The Government of Karnataka in order No.ID 5 PAC 2000 dated 24.3.2000 constituted Schedule of Rates Committee (S.R.C) under the Chairmanship of Capt. S. Raja Rao, to review the existing procedure and formulate standard data for the preparation of Schedule of Rates (S.R.) on a scientific basis and submit report to Government within six months. The term of office of this committee has been extended and the committee has to submit its report by 30th June 2003. Copy of the Government Order can be seen at Annexure-1.

2.0 TERMS OF REFERENCE:

The Terms of Reference stipulated to this committee are as follows:

1. To incorporate uniform specifications in the Schedule of Rates of all Circles coming under Water Resources Department of the State.

2. To standardise items in the Schedule of Rates of all zones under Water Resources Department.

3. To prescribe procedure to be adopted in the preparation of Rate Analysis for all the items in Schedule of Rates.

4. To formulate Guidelines for the regulations of rates of Store Materials in all the circles of Water Resources Department.

5. To study the labour rates of all circles of Water Resources Department and suggest further action to be taken.

6. Procedure to be followed to identify new quarries in lieu of abandoned old quarries.

7. Action to be taken to solve the disputes arising out of deficiencies in Schedule of Rates.

8. Other Associated issues.
3.0 The Schedule of Rates Committee has 55 sittings from 15.5.2000 to 29.6.2003. The following members participated in the deliberations of the committee at its meetings scheduled on various dates:

1. Capt. S. Raja Rao Retd Secretary / GOK : Chairman
2. Sri H. V. Eshwaraiah Retd Technical Director / KPCL : Member
3. Sri V. H. Patil Retd Engineer-in-chief / GOK : Member
4. Sri V. G. Kajagar Retd Chief Engineer / GOK : Member
5. Sri R. Chandrashekhar Retd Engineer-in-chief / GOK : Member
6. Sri G. A. Meti Retd Chief Engineer, BWSSB : Member
7. Dr B. R. Srinivasa Murthy Professor IISc : Member
8. Sri C. M. Shirol Controller of State Accounts : Member
9. Sri K. K. Malpani Secretary Contractor's Association : Member
10. Superintending Engineer (M & E) / WRDO : Member Secretary

4.0 The committee co-opted Sri B.S. Mallapur, Retired Chief Engineer, Karnataka Power Corporation Limited (K.P.L.C) as Special Invitee considering his experience in the preparation of mechanised data rates for major works. Sri B.S. Mallapur was also requested to computerise all data rates to facilitate quick revision of Schedule of Rates.

5.0 DOCUMENTS, LITERATURES STUDIED:

5.1 To examine the Terms of References, the S.R. Committee obtained the schedule of rates and data rate from various circles of Water Resources Department, Public Works Department, Karnataka Urban Water Supply & Drainage Board, Karnataka Power Corporation Limited (K.P.L.C.) and Rural Development and Engineering Department. To further understand how the neighboring State have considered this issue, the S.R. Committee obtained schedule of rates in vogue, in Andhra Pradesh, Maharashtra, Gujarat, Tamilnadu and Kerala States. The committee examined Bombay PWD hand book, Madras PWD hand book, Central PWD hand book and Nabhi's Compilation of Analysis of Rates - Civil Works – 2000 Volume 1 & 2.

5.2 The committee examined the report on Schedule of Rates submitted to Secretary, Public Works Department by the committee headed by Sri Radhakrishna. The committee studied the report of the committee on “Cost Control of the River Valley Projects”, (Volume I to V) published by Government of India, Ministry of Irrigation during January 1981 and subsequent revisions. The committee examined indepth, the report of sub-committee of the Chief Engineers set up, to finalise standards for the schedule of rates pertaining to irrigation zones which was accepted by Government in its Order No. PWD 72 NPC 99 dated 8.10.1990 . The list of important documents referred by the S.R. Committee is indicated in Annexure 2.
5.3 The committee perused all the existing Circulars and Guidelines issued by Government from time to time on various issues concerning the preparation of schedule of rates. Important circulars/guidelines referred by S.R. Committee is compiled.

5.4. The committee examined the relevant Bureau of Indian Standards (B.I.S.) codes pertaining to the items involved in the execution of Water Resource Projects. The committee examined the advanced technologies available, latest equipment and machinery used in executing Water Resource Projects. The committee studied the literature available on these machinery and equipments.

6.0 PHILOSOPHY ADOPTED:

After perusing the above documents, the committee observed, that the recommendations made by the previous S.R. Committee based on which the schedule of rates are prepared in the Water Resource Department are, all based on manual labour with minimum use of machinery, adoption of higher initial lead and lifts, assumption of higher percentage for providing hidden charges, etc. The committee deliberated at length on these issues. The committee observed that, while the schedule of rates are based on manual labour, in practice the executing agencies are using heavy machinery. The committee also noted that none of the neighboring states and other departments within the states are making provision towards “Hidden charges” to the extent it is being done for projects in Water Resource Department. After detailed study and interaction with all the members, the committee unanimously decided, to recommend the use of “State of Art Technology in vogue, use of heavy machinery wherever possible” and “bring down the component of manual labour”.

7.0 EXPERTS AND INSTITUTIONS INTERACTED WITH:

To formulate correct specifications, to adopt latest equipment and technology, to prepare the data rates and draft detailed specifications on a scientific basis, the committee interacted with number of subject experts, academicians, equipment manufactures, explosive manufacturers, producers of new material used in the construction, cement manufacturers, manufacturers of admixtures and curing compounds, manufacturers of gates and hoists and manufacturers of paints, etc. The list of persons/Institutions/Firms interacted with, is furnished in Annexure 3.
8.0 THE DISCREPANCY BETWEEN THE RECOMMENDATIONS OF THE PREVIOUS S.R. COMMITTEE AND SCHEDULE OF RATES IN VOUGE IN VARIOUS CIRCLES:

8.1 It is noted that, as per the recommendations of the previous S.R. Committee, the number of items under each chapter are as follows:

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Name of the Chapter</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dam &amp; Allied works</td>
<td>56</td>
</tr>
<tr>
<td>2.</td>
<td>Canal &amp; Allied Works</td>
<td>76</td>
</tr>
<tr>
<td>3.</td>
<td>Tunnel &amp; Allied Works</td>
<td>17</td>
</tr>
<tr>
<td>4.</td>
<td>Canal &amp; CD Works</td>
<td>54</td>
</tr>
</tbody>
</table>

8.2 As seen from the schedule of rates in use in different circles, the number of items included under the above 4 chapters are much more. For the new items included in the schedule of rates by different circles, there is no standardisation of either specification or data rate. This issue was discussed at the Board of Chief Engineers meeting held on 29.11.96. No definite conclusions were reached.

8.3 In the same meeting, a discussion was also held on reducing the percentage of Hidden cost and certain decisions were taken to categories certain items based on Discharging capacity. This decision of Board of Chief Engineers is not sent to Government for acceptance. However, based on the decision of Board of Chief Engineers, several circles have incorporated the 3 categories in their schedule of rates and they are following the same ever-since. However, for this decision of Board of Chief Engineers, there is no approval from Government.

8.4 Due to the above two developments for which specific Government approval is not available, there is wide discrepancy in the number of item under each chapter presently being followed by different circles of the Water Resources Department. The discrepancy is more pronounced in the Northern circles than in South. Since the data rate for the new items are not approved by any “Competent Authority” the same is not uniform and the rates derived at is also varying.
8.5 It is observed by the S.R. Committee that, Board of Chief Engineers has not pursued with the Government, to seek approval for its recommendations. Further, the Board of Chief Engineers should not have allowed the Superintending Engineers to incorporate in the schedule of rates such changes, for which Government approval is not available. To avoid repetition of such lapses, the S.R. Committee recommend that strict and clear cut directions may have to be issued by the Government directing all the Chief Engineers not to incorporate any “New items” in the schedule of rates without the approval of the “Competent Authority and without concurrence from the Government.

8.6 To ensure that all the items presently in use in the Schedule of Rates of all the circles are put to use, the S.R. Committee has prepared “Detailed Specification” and also prepared “Data Rate” for all items to maintain uniformity in the specifications and data rate to be followed by all circles of Water Resources Department.

9.0 INTERIM AND FINAL REPORT ON “HIDDEN CHARGES:

In response to the request made by the State Government in its letter No. ID 19 PAC 2000 dated 24.8.2000, the committee submitted an Interim report on “Hidden charges” which was accepted by the State Government and issued circular vide No. NEE 3 MUEEMA 2000 dated 20.12.2000 for implementation. Subsequently the committee after indepth discussion made final recommendation to Government on the subject of “Hidden charges”. State Government accepted this recommendation and issued circular vide No. WRD 03 MUEEMA 2000 dated 28.2.2003. The said order can be seen at Annexure 4 & Annexure 4A.

10.0 COMMON SCHEDULE OF RATES FOR THE WATER RESOURCES DEPARTMENT:

10.1 The committee deliberated at length to consider whether the schedule of rates should be for each circle or a common schedule of rates should be proposed to cover the entire State. The committee noted that the rates for labour are uniform through out the State. The Variable Dearness Allowance (VDA) to be paid to the labour community is also uniform as it is approved by the state Labour Department.
10.2 The committee noted that the basic cost of machinery and equipment manufactured by reputed concerns is generally uniform throughout the State. The procedure followed for fixing the hire charges based on the guidelines issued by the CWC and BIS is applicable for the entire state. The variation in the fuel charges within the states does not show wide variations. As observed from the rates quoted by cement and steel manufacturers for supplies made to various units of Karnataka Land Army Corporation (K.L.A.C.) in the State, does not vary significantly. A clause is always provided in the contract document to adjust the difference in the cost of cement if there is any fluctuation in rates.

10.3 The S.R.Committee has suggested procedures for arriving at the “Unit Cost” of different sizes of “Coarse aggregate” using mechanical crushing and processing system and collection of sand at Quarry sites so that the basic cost of these material will be uniform. Wherever material rates are not indicated by the S.R. Committee, it is mentioned that the prevailing rate as finalised by Public Works and other Departments applicable to that area should be adopted. It is also observed by the S.R. Committee that in K.P.C and in Public Works Department, the schedule of rates is made applicable for the Entire State.

10.4 During deliberations, the committee noted that in terms of the Transparency Act, all works costing more than Rs.5 lakhs are to be entrusted after inviting tenders. In the tender clause, there is a specific provision that the prospective tenderer should acquaint himself with the local conditions where the projects is to be executed and quote his “Workable Rates”. The tender premium quoted by the tenderer is suppose to take care of local conditions and all exigencies involved.

10.5 In the background of what is stated above, the S.R. committee came to an unanimous conclusion, that the schedule of rates recommended by it, should be uniform throughout the State as being done in P.W.D and K.P.C. Accordingly the S.R. Committee recommend that the schedule of rates proposed by it, should be made applicable to all Water Resource Projects undertaken in the State and the Water Resources Department should have one S.R. for the entire State.

11.0 The S.R.C. during its deliberations discussed thread bear all the Terms of References made to it. The recommendations of the S.R.C. on each of the Terms of Reference is discussed below.
11.1 TERMS OF REFERENCE 1, 2 AND 3:

1. To incorporate uniform specifications in the Schedule of Rates of all Circles coming under Water Resources Department of the State.

2. To standardise items in the Schedule of Rates of all zones under Water Resources Department.

3. To prescribed procedure to be adopted in the preparation of Rate Analysis for the items in Schedule of Rates.

11.2 The S.R. Committee after perusing the above three Terms of References, discussed each one of the Terms of Reference in detail. The committee decided that these three references are inter-related. Therefore, the committee decided to club these three references and give its recommendations.

11.3 Rates quoted by Executing Agency is not a guiding factor for Revising the Schedule of Rates:

11.3.1 River Valley Projects involve use of large quantities of materials, machinery, labour and other inputs for execution of various components works of the project. Preparation of estimate for any work requires estimation of quantities and rates for individual items of work. While the quantities are mostly dependant on planning and design requirements, the estimated rates are dependant on the basic rates provided in the schedule of rates and other inputs which are not covered in the basic rates. The basic rates in the schedule of rates in turn, depend on the data assessed / assumed in the data rate analysis for computing the quantities and rates of various materials, machinery, labour and other ancillary / enabling works.

11.3.2 The rates quoted by the contractors is another important factor that ultimately determines the final cost of the work. The rates quoted by the contractors may be less or more compared to the estimated rates. For the same item, the quoted rates generally differ from one agency to another agency, due to each agency adopting his own system or method for computation of rate for various items of work. Factors other than work inputs, may also influence quoted rates to some extent. Thus the rates quoted by the contractors may or may
not be representative of probable cost and as such, need not always be considered as any guiding factor for revising the rates provided in the schedule of rates. This aspect has also been highlighted in the report of the committee on cost control of River Valley Projects published by Central Water Commission (CWC). However, consistently low or high rate quoted by majority of the contractors for any particular item of work, certainly suggests the need for reviewing the standard data adopted for preparing the rate analysis.

11.4 CWC and Bureau of Indian Standards (BIS) have published standard data for working out the hire charges of machinery and rate analysis for major items of work used in the construction of River Valley Projects for guidance. These guidelines also include the provisions to be considered judiciously towards the “hidden costs on labour”, “wastage of materials in handling”, “small T & P”, “profit and overheads of contractor” etc., on percentage basis. Appropriate percentage provisions for these shall be determined by the Schedule of Rates Committee duly considering the local conditions, nature of work, statutory requirements, provisions already included in the wage structure and other relevant features.

11.5 “Standard data” shall be formulated for each item of work included in the schedule of rates to facilitate revision of rates each year on the basis of cost escalation or rise in the rates of materials, machinery and labour compared to previous year. Though, no known method of rate analysis can give exact cost under all operating conditions, a data rate prepared judiciously duly accounting for all probable direct and indirect work inputs, is expected to reflect the cost to a close approximation of the final cost.

11.6 The S.R. Committee after detailed discussions formulated General Guidelines to be followed in the Preparation of Schedule of Rates. The important issues covered in the guidelines are summarised below:

11.7 The object of these guidelines is to streamline the procedures, provisions, formats and other related matters for the preparation of schedule of rates pertaining to irrigation project works. As the deployment of plant and equipments is becoming more and more common in these days even for small works emphasis has been laid on use of plant / equipment in data rates wherever possible. At present, no rates are available in the schedule of rates being used in the department for Gate/Hoist and Allied Works. Based on case studies, standard formats for rate analysis for Gate / Hoist & Allied Works are to be prepared for inclusion in the schedule of rates for the first time.
11.8 The Schedule of Rates (SR) shall essentially consist of “Basic Data”, “General notes on SR”, “Material Rates”, “Wages of workers”, “Hire charges of machinery”, “Lead charges”, “Lift charges”, “Loading and unloading charges”, “Royalty charges” and “item rates” with supplementary information for various works. The item rates with supplementary information for various works shall be prepared making use of the rates in the basic data to finalise the schedule of rates for the year.

11.9 GENERAL NOTES:

The schedule of rates shall include “General notes and Specific Note” applicable to all sections in the SR to the extent they are relevant. These notes shall reflect the various provisions already included in the basic rates and the additional provisions to be included to the basic rates while preparing the work estimates.

11.10 THE PREPARATION OF SCHEDULE OF RATES BROADLY INVOLVES FOLLOWING STEPS:

• Fixing unit rates for various construction materials.
• Fixing daily / hourly hire charges of machinery including Fuel (DPOL) / Energy charges and operating crew charges.

• Fixing daily wages for various categories of workers duly ensuring compliance with minimum wages and other requirements.

• Fixing extent of hidden costs on labour duly considering various statutory provisions.

• Fixing extent of provision for small T & P materials, loss on stock, de-watering, de-silting, site clearance etc.

• Fixing extent of contractor’s profit and overheads.

• Fixing rates for lead, lift, loading and un-loading of materials.

• Assessing quantities of materials per unit quantity of work item including extent of wastage in handling and requirement for incidentals such as mortar layer, finishing etc., forming part of the item rate.
• Assessing requirement of various construction plant and machinery in hours / days per unit quantity of work under each item.

• Assessing extent of skilled / semi-skilled / un-skilled work force required per unit quantity of work under each item.

• Assessing the extent of enabling works and making provision for these either on cost basis or on percentage basis in the rates.

• Assessing extent of lump-sum provisions (for minor work inputs not quantified) and making suitable provisions for the same in the rate analysis in the form of sundries.

• Preparing general / specific notes on use of rates and data based rate analysis for various items included in the Schedule of Rates.

11.11 RATES OF MATERIALS:

Prevailing market rates shall be the criteria for fixing the material rates for inclusion in schedule of rates. Prevailing material rates shall be obtained through quotations or through local inquiries from major commercial centers near the project area. Average of the rates, ignoring freak rates, shall be reckoned as the prevailing market rate for inclusion in the schedule of rates for the year. For cement, steel and explosives, the current price list shall be obtained from the leading suppliers and also from bulk consumers like Karnataka Land Army Corporation. Unless otherwise specified, all material rates shall be inclusive of all taxes, duties, levies, royalty, transportation and handling costs upto project area. For sand / coarse aggregate / stone, the basic rates shall be at quarry and shall include royalty charges. For earth / soil, used for embankment works which is not included in the material list, royalty charges shall be added separately under material component in the data rate analysis. For gate and hoist works, apart from structural steel, other materials such as alloy steel, bronze alloy, cast steel etc., are required for various component parts. For these materials, basic material rate shall be worked out including cost of casting and machining charges.
The list of materials in the Schedule of Rates shall include all the materials used in the data rate for work items.

11.12 WAGES OF WORKERS:

Wages of workers to be included in the Schedule of Rates shall be the prevailing daily wage in the project area which shall not be less than the minimum wages fixed by the Government from time to time. The daily wages shall consist of “The Basic Wage” and “Living Allowance” which shall include the wages of four weekly holidays in a month. While the “Basic wages” are reviewed, when the minimum wages to be paid are revised by Government, the “Living Allowance” is revised every year based on the State average increase in the “Consumer Price Index” (CPI) for industrial worker over and above the “Base Index” notified by Government at the time of revising the minimum wages.

The workers shall be grouped into four categories namely:

1. Skilled
2. Semi-skilled
3. Un-skilled
4. Others

11.13 HIRE CHARGES OF MACHINERY:

The hire charge of machinery / equipment shall comprise of “Basic Hire charge”, “Fuel / energy charge” and “Operating crew charge”. These components shall be worked out separately and included in the schedule of rates.

11.13.1 Basic Hire charge:

The basic machinery hire charge shall include depreciation, interest on average capital cost or profit, repair charges and miscellaneous charges. The practice in the preparation of schedule of rates is to consider interest on average capital cost. The capital cost of the machinery / equipment shall be, the current market price inclusive of all taxes, duties and freight charges. Guidelines published by CWC / BIS based on the report of committee on Cost Control of River Valley Projects shall, be the basis for working out the machinery hire charges. The rate of interest for working out the interest on average capital cost shall be as fixed by the competent authority. The salvage value shall be 10 percent of the capital cost.
The life of machinery in years / in hours and repair provisions shall be, as per the guidelines published by CWC / BIS. The miscellaneous charges shall be at 10 percent of the repair charges. The hire charges shall not include accessories like air line, water line, drill rods, drill bits etc. The “Use rate” for these accessories shall be worked out separately and the requirement of these shall be included under material component in the rate analysis. The hourly “Use Rate” of tyres including tubes shall be worked out separately and added to hourly hire charges of machinery wherever applicable. The “Use rate” is the ratio of cost of accessory to its working life.

11.13.2 Fuel (DPOL) / Energy charge:

The hourly consumption of diesel / petrol and electric energy shall be based on the guidelines published by CWC / BIS. The unit rates of diesel / petrol shall be the prevailing rates at the retail fuel outlets in the project area. Energy charges shall be as per the prevailing power supply tariff applicable to HT-2B or other relevant category. Oil and lubricant charges shall be taken at 20 percent of energy charges for electrically operated machinery / equipment and at 25 percent of diesel / petrol charges for diesel / petrol operated machinery / equipment.

11.13.3 Crew charge:

Machinery / equipment operating crew charges shall be on hourly basis as per the guidelines of CWC. The daily wages of operators and helpers provided in schedule of rates shall be converted to yearly wages considering 26 working days in a month and then divided by yearly usage of machinery in hours. Yearly usage of machinery in hours is the ratio of life of machinery in hours to life of machinery in years. The number of Operators and Helpers shall be on the basis of type of equipment.

11.14 LEAD, LIFT, LOADING & UNLOADING CHARGES:

11.14.1 The estimated cost of the work shall be inclusive of cost of conveyance of materials from source of supply upto work site and cost of further rehandling, if any, at work site. The basic rates for materials considered in preparation of schedule of rates may be inclusive of cost of conveyance upto site or may be at the source of their supply depending on the prevailing practice for their supply. It is the general practice to provide for the material rates in the schedule of rates
inclusive of cost of conveyance and handling up to work site for all materials except for **Earth** / **Sand** / **Gravel** / **Murum** / **Lime** / **Surki** / **Wood** / **Stones of all types** / **Coarse aggregate** / **Stone and Concrete slabs** / **Cement** / **Steel** / **Pipes** / **AC sheets** / **GI sheets** / **RCC poles**. The material rates provided in the schedule of rates for **sand** / **gravel** / **murum** / **stones** / **aggregates** shall be at quarry. For **steel**, **cement**, **AC sheets**, **GI sheets**, **hume pipes**, **wood** and **stone slabs** the rates provided shall be the rate prevailing at the major commercial centre near project area or the departmental stores in case if these materials are to be supplied departmentally. In certain cases it may be necessary to transport water also to work site. The basic item rates provided in the schedule of rates do not include conveyance and handling charges from source of supply to work site for these materials.

11.14.2 Conveyance of materials can be by head load or by mechanical means. In case of conveyance by mechanical means loading and unloading of materials also shall be considered separately if the same is not covered by the working cycle of the machinery deployed.

11.14.3 Generally conveyance by head load shall be considered for total lead up to 150 m and by mechanical means for total lead exceeding 150 m. The basic item rates provided in the schedule of rates include 50 m or 1 km as initial lead and no lead charges shall be allowed where the source of material is within the initial lead specified in item rate. Additional lead charges shall be allowed for the lead exceeding initial lead specified in the item rate.

11.14.4 The lead charges per unit quantity for conveyance of these materials shall be worked out and included in the schedule of rates in increment of 50 m for head load and in increment of 1 km for mechanical mode. The rates for lead charges by head load and up to 5 km by any mode shall be cumulative and inclusive of lead charges for preceding lead. For lead beyond 5 km the lead charges shall be worked out on per km basis.

11.14.5 **Conveyance by head load:**

Lead charges for conveyance of materials by head load shall be allowed up to 150 m. The lead charges by head load per unit quantity shall be worked out and included in the schedule of rates in increment of 50 m. The rates for lead charges by head load shall be cumulative and inclusive of lead charges for preceding lead. The rates shall be inclusive of provisions for contractor's profit, overheads, hidden cost on labour etc.
11.14.6 For the purpose of working out lead charges by head load the materials shall be grouped into three categories as under based on type of material, unit for measurement, mode of handling etc.

**Category – I:** Earth / Sand / Gravel / Murum / Lime / Surki / Stones/Aggregates.

**Category – II:** Cement / Steel.

**Category – III:** Stone slabs / PCC slabs / Laterite blocks / Wood

11.14.7 For earth / sand / gravel / murum / lime / surki / size stone / cut stone / rubble / coarse aggregates the lead charges by head load shall be worked out on per cum basis for loose volume. For cement / steel / pipes / AC sheets / GI sheets / RCC poles the lead charges shall be worked out on per tonne basis. For shahabad slabs / PCC slabs / BS slabs / CC blocks / Laterite blocks / Wood the lead charges shall be worked out on per cum basis for stacked volume.

Data rates shall be prepared for each category of material and rate per unit quantity shall be included in the schedule of rates

11.14.8 Conveyance by any mode:

Lead charges for conveyance of materials by any mode shall be allowed for total lead exceeding 150 m. The lead charges per unit quantity shall be worked out and included in the schedule of rates in increment of 1 km. The rates for lead charges by any mode upto 5 km shall be cumulative and inclusive of lead charges for preceding lead. The rates shall be inclusive of provisions for contractor’s profit, overheads, hidden cost on crew etc.

11.14.9 For the purpose of working out lead charges by any mode the materials shall be classified into five categories as under based on type of material, unit for measurement, mode of handling etc.

**Category – I:** Earth / Sand / Murum / Gravel / Lime / Surki.

**Category – II:** Rubble / Size stones / Cut stones / Coarse aggregates.

**Category – III:** Cement/ Steel/Pipes/ AC sheets / GI sheets / RCC Poles
Category – IV: Shahabad slab/PCC slab/BS slab/CC lock/Laterite block/Wood.

Category – V: Water.

11.14.10 For earth/sand/gravel/murum/lime/surki/size stone/cut stone/rubble/coarse aggregates the lead charges shall be worked out per cum on the basis of loose volume. For cement/steel/pipes/AC sheets/GI sheets/RCC poles the lead charges shall be worked out on per tonne basis. For shahabad slabs/PCC slabs/BS slabs/CC blocks/Laterite blocks the lead charges shall be worked out on per cum basis for stacked volume. For water the lead charges shall be worked out per 1000 ltr basis. In case of conveyance by mechanical means idle hire charges shall be considered for waiting period (loading and unloading time) and full hire charges including fuel charges shall be considered for running time. The rates shall be inclusive of provisions for contractor’s profit, overheads, hidden cost on crew etc. The rates for conveyance charges and loading/unloading shall be furnished separately. Wherever, tipper is considered for conveyance, unloading of material can be by mechanical tipping. For water unloading can be by gravity flow.

11.15 LIFT CHARGES:

11.15.1 Lift charges for materials shall be allowed wherever the total lift exceeds the initial lift specified in the item description. Lift charges shall be worked out in increment of 1.5 m lift. Where the conveyance/lifting of material is by mechanical means lift charges shall not be considered as the cycle time of operation of the machine includes lift involved.

11.15.2 For the purpose of working out lift charges by head load the materials shall be grouped into three categories as under based on type of material, unit for measurement, mode of handling etc.

Category – I: Earth/Sand/Gravel/Murum/Lime/Surki/Stones/Aggregates.

Category – II: Cement/Steel.

Category – III: Stone slabs/PCC slabs/Laterite blocks/Wood.
11.15.3 For earth / sand / gravel / murum / lime / surki / size stone / cut stone / rubble / coarse aggregates the lift charges by head load shall be worked out on per cum basis for loose volume. For cement / steel / pipes / AC sheets / GI sheets / RCC poles the lift charges shall be worked out on per tonne basis. For shahabad slabs / PCC slabs / BS slabs / CC blocks / Laterite blocks the lift charges shall be worked out on per cum basis for stacked volume.

11.16 ROYALTY CHARGES:

Government of Karnataka has levied royalty charges on certain construction materials. Therefore, the item rates provided in the schedule of rates shall be inclusive of royalty charges payable to Government of Karnataka. The schedule of rates book, shall include extract of latest copy of Government notification on royalty charges for reference.

The following notes shall be added under the notification on royalty charges:

1. The royalty charges on materials, wherever applicable, shall be recovered as per the following guide-lines:

   a. Where the land, from where the materials are extracted by the contractor for use on departmental work, belongs to the department / corporation the royalty charges included in the rates for materials extracted from such land shall be recovered from the contractor as per the statement of royalty charges included in each section of schedule of rates and the amount shall be credited to the specified revenue head of account of the department / corporation.

   b. Where the land, from where the materials are extracted by the contractor for use on work, belongs to other department and is taken on lease by the Department / Corporation, the royalty charges included in the rates for the materials extracted from such land shall be recovered from the contractor as per the statement of royalty charges included in each section of schedule of rates and the amount shall be credited to the specified revenue head of account of the other department.
c. Where the land, from where the materials are extracted by the contractor for use on work, is neither owned nor taken on lease by Department / Corporation then the payment of royalty charges on materials extracted from such land, shall be the responsibility of the contractor or his sub-contractor. The contractor shall give an undertaking to the effect that the royalty charges are being paid by him / his sub-contractor / supplier directly to the concerned department and no deductions shall be made from his work bills towards royalty charges.

2. Royalty charges as applicable to murum shall be made applicable to earth / soil also.

3. Royalty charges as applicable to ordinary building stones shall be made applicable to coarse aggregate also.

4. Royalty charges as applicable to ordinary sand shall be made applicable to fine aggregate.

5. Royalty charges as applicable to Shahabad stone slabs shall be made applicable to similar slabs from other sources also.

11.17 RATE SCHEDULE FOR WORK ITEMS:

The rate schedule for work items in the schedule of rates shall be furnished separately for Dam & Allied Works, Canal & Allied Works, Canal & CD Works, Tunnel and Allied Works, Gates & Hoists and Preliminary & Maintenance Works. Each section shall include:

- Notes on rates for the work;
- Statement of requirement of materials for unit quantity of work under each item;
- Statement of royalty charges included in each item rate; and
- Item rate schedule.

The item rate schedule shall include item number, brief description of item, unit and rate per unit quantity. The rate per unit quantity shall be based on the data rate analysis for the item.
11.17.1 The data rate analysis for any item of work shall consist of the following three major components.

1. **Brief description of item of work.**
2. **Data for assessing the quantities of various in-puts.**
3. **Rate analysis.**

11.17.2 **Brief description of item of work:**

The description of the item of work in the schedule of rates shall be short but cover all important aspects of the work included in the Basic Rate. On reading the item description one should be in a position to assess the various cost components involved in the work.

11.17.2.2 **Data for assessing quantities:**

The data shall reflect the various assessments / assumptions made in arriving at the quantities of materials, machinery, labour and other in-puts. In case of plants and equipments, the output of main plant shall be worked out and the requirement of all other in-puts shall be assessed to match the output of the main plant. Cycle time of operations, shall be the criteria for assessing the output of equipment. Generally the equipment manufacturers furnish the output of machinery under ideal conditions of working. Suitable job and management efficiency factors, shall be considered while working out the average output of machinery under field conditions. In case of combination of machinery and manpower, the assessment of manpower shall match the output of machinery.

11.17.2.3 Though cycle time of operations is the criteria for hourly / daily out-put of machinery / work-force, the actual progress of work depends on several other factors such as power interruptions, minor break-downs, time for meals and other needs of work-force, stray rains etc. Therefore, it is the general practice to consider 50 minutes as the actual working time per hour for working out the hourly / daily out-put of machinery / work-force. Further, where the work is to be carried out in more than one shift, there will be further reduction in daily production hours due to time required for change in shift for work-force and for daily maintenance of plant / machinery such as cleaning, oiling, greasing, minor repairs etc. Considering all these aspects CWC / BIS guide-lines stipulate the following actual working hours for the purpose of equipment planning and utilisation.
<table>
<thead>
<tr>
<th>No. of shifts</th>
<th>Total available time</th>
<th>Actual available time</th>
</tr>
</thead>
<tbody>
<tr>
<td>One shift</td>
<td>8.00 hours</td>
<td>7.00 hours</td>
</tr>
<tr>
<td>Two shifts</td>
<td>16.00 hours</td>
<td>12.50 hours</td>
</tr>
<tr>
<td>Three shifts</td>
<td>24.00 hours</td>
<td>16.50 hours</td>
</tr>
</tbody>
</table>

The daily output shall be computed duly considering the actual available working time.

11.7.2.4 For “Gate and Hoist works” it is the general practice to specify the quantity of work in terms of number of sets of embedded parts / gates. In such cases, naturally, the estimated rates shall be per set for embedded parts and per gate / hoist for gates and hoists. However, as the rate per set or per number depends on the tonnage per set / number and varies from work to work depending on the size of gate and other design considerations, it is not practicable to workout the unit rate on per set / number basis. Therefore, the basic rates for gate / hoist works to be included in the SR shall be, on per **Tonne Basis** for each item. The rate per set / number for the purpose of estimation shall be computed based on the rate per tonne provided in the SR and the estimated weight per set / number of the embedded part / gate / hoist. For rate analysis the data to be considered shall be for one set of embedded parts or one number of gate / hoist. The material requirement shall be based on either empirical rules or based on actual fabrication details for the typical gate / hoist / embedded parts. The requirement of machinery and work-force for cutting, bending, fabrication, erection, painting etc., shall be assessed commensurate with the task involved.

17.7.2.5 **Rate analysis** : Rate analysis shall be prepared as far as possible, considering the output of main plant or group of work force and shall consist of three major cost components namely:

(A) Material  (B) Machinery  (C) Labour

11.17.3.2 The above components shall include profit, overheads, small T & P and hidden costs on labour. In case of major works, in addition to material, machinery and labour components there will be other ancillary components such as work shop / stores / parking sheds, transportation / erection / dismantling of plant & machinery, electric sub-station & distribution lines, air lines, water supply arrangements, ventilation arrangements, portable magazine etc. For these ancillary or enabling works of common utility for execution of several items of work, provision shall be generally made in the data rate either by working out the details or on appropriate percentage basis.
11.17.4 MATERIAL COMPONENT:

Material component shall include description of material, quantity, unit rate and cost for each material. The quantities shall be for the quantity of work considered for analysis and shall include wastage and requirements for incidentals such as finishing, mortar layer at lift joints etc. For minor materials, not quantified but generally required for the work, appropriate lump-sum provision shall be made in the form of “Sundries”. The material component shall include provisions for small T & P materials, contractor’s profit, overheads on percentage basis. The profit on materials shall be excluding cost of any materials supplied departmentally. The material component shall also include royalty charges if the same is not included in the basic rate of materials.

11.17.4.1 Wastage and incidentals:

CWC guidelines provide for wastage of 5 percent for cement and 2.5 percent for reinforcement and structural steel. The wastage of 5 percent considered for cement in the CWC guidelines includes, requirement for incidental works like finishing and other minor associated jobs forming part of the item. As cement for incidental works is not a regular requirement, it is proposed to make provision for wastage of cement at 1 percent for all items involving use of cement. For incidentals such as finishing, mortar layer for lift joints etc., wherever required, specific provisions may be considered for additional cement for such items in the rate analysis. For steel wastage at 2.5 percent as per CWC guidelines may be considered. For other construction materials like stone, rubble, coarse and fine aggregates etc., wastage upto 2 percent may be considered in the data rates.

11.17.4.2 Quantity of Materials:

The quantities of materials to be considered in the rate analysis shall be commensurate with the quantity of finished work considered for working out rate and shall include wastage and requirement for incidentals if any.

11.17.4.3 The material constants for concrete items shall be based on theoretical mix computations for average conditions of placement. For structural concrete durability requirements shall also be considered while fixing the cement content of particular grade of concrete. Minimum cement content and maximum water to cement ratio to be considered for the concrete mix from durability
requirements are furnished in **IS: 456-2000** both for plain and reinforced concrete. The gradation of coarse aggregate for concrete shall be average of the range furnished in **IS:383**. For the purpose of preparing data rate for concrete items the following grading limits shall be adopted for working out the quantity of coarse aggregate in different size ranges:

<table>
<thead>
<tr>
<th>Size Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 mm and down size:</td>
<td></td>
</tr>
<tr>
<td>80 to 40 mm size range</td>
<td>40 %</td>
</tr>
<tr>
<td>40 to 20 mm size range</td>
<td>30 %</td>
</tr>
<tr>
<td>20 to 10 mm size range</td>
<td>20 %</td>
</tr>
<tr>
<td>10 to 4.75 mm size range</td>
<td>10 %</td>
</tr>
<tr>
<td>40 mm and down size:</td>
<td></td>
</tr>
<tr>
<td>40 to 20 mm size range</td>
<td>50 %</td>
</tr>
<tr>
<td>20 to 10 mm size range</td>
<td>30 %</td>
</tr>
<tr>
<td>10 to 4.75 mm size range</td>
<td>20 %</td>
</tr>
<tr>
<td>20 mm and down size:</td>
<td></td>
</tr>
<tr>
<td>20 to 10 mm size range</td>
<td>65 %</td>
</tr>
<tr>
<td>10 to 4.75 mm size range</td>
<td>35 %</td>
</tr>
</tbody>
</table>

**11.17.4.4** All concrete mix proportions shall be on weight basis. Equivalent volume batching may be permitted for batching of fine and coarse aggregates. Batching of cement shall be on weight basis only. Nominal concrete mixes on volumetric basis such as 1:2:4 / 1:1.5:3 etc., are not recommended for inclusion in SR as fixed cement content for these mixes results in un-economical use of cement where maximum size of coarse aggregate is more than 20 mm.

**11.17.4.5** The gradation of coarse aggregate for filter shall satisfy the filter criteria. For the purpose of determining quantities of filter aggregates for rate analysis following gradation limits satisfying the filter criteria shall be adopted:

<table>
<thead>
<tr>
<th>Size Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 mm down filter aggregate:</td>
<td></td>
</tr>
<tr>
<td>80 to 40 mm</td>
<td>90 %</td>
</tr>
<tr>
<td>40 to 20 mm</td>
<td>10 %</td>
</tr>
<tr>
<td>40 mm down filter aggregate:</td>
<td></td>
</tr>
<tr>
<td>40 to 20 mm</td>
<td>85 %</td>
</tr>
<tr>
<td>20 to 10 mm</td>
<td>15 %</td>
</tr>
<tr>
<td>20 mm down filter aggregate:</td>
<td></td>
</tr>
<tr>
<td>20 to 10 mm</td>
<td>75 %</td>
</tr>
<tr>
<td>Below 10 mm</td>
<td>25 %</td>
</tr>
</tbody>
</table>
11.17.4.6 Material constants for masonry items shall be computed based on type of masonry and mortar content. Suitable provision shall be made for stone chips as percentage of quantity of stone for wedging and packing. For other items, material constants shall be computed as per the requirement.

11.17.4.7 A statement showing the requirement of materials per unit quantity, including wastage and requirements for incidentals based on the data rates shall be included in the schedule of rates for reference for computing the lead charges.

11.17.4.8 Material Rates:

The rates for materials included in the rate analysis shall be as per the unit rate provided under the statement of rates for materials. Certain materials such as air hose, water hose, gas cutting torch, welding accessories, drilling accessories, form work / centering / scaffolding materials etc., which contribute to the cost of work are used for several unit quantities of work till they become scrap or absolute. The rate to be considered for such materials under the material component shall be the use rate which is the ratio of cost to life. The life for such material may be in hours / years / Rm / number of uses etc., depending on the type of material.

11.17.4.9 Royalty charges:

The item rates provided in the schedule of rates shall be inclusive of royalty charges payable to Government of Karnataka. The schedule of rates book shall include a statement of royalty charges included in the basic rate for various items of work under each section to facilitate recovery of royalty charges accordingly. The recovery of royalty charges, wherever applicable, per unit quantity of work shall be as per the provisions under this statement.

11.17.5 MACHINERY COMPONENT:

11.17.5.1 Machinery component shall include description of machinery, hours of usage, hire charges per hour, fuel charges per hour to work out the cost. The crew charges shall be considered under labour component. The machinery component shall include, all plant and machinery considered in the data and the number of hours of usage shall be commensurate with quantity of work considered for rate analysis. For any unforeseen or minor machinery requirements, suitable lump-sum provision shall be made in the form of “Sundries”.
11.17.5.2 Hours of machinery usage:

The provision for machinery in data rates shall be, for actual hours of usage of machinery. The hourly output of any particular machine depends on the capacity, task to be performed, cycle time of operation, efficiency of working etc., and may vary depending on the nature of work. Out-put of machinery shall be computed considering 50 minutes working per hour. For working out the data rates out-put of major plant shall be taken as the “Task”.

11.17.5.3 Hire charges:

The hire charges of plant and machinery to be considered in the rate analysis shall be as per the statement of hire charges included in the schedule of rates. “Basic Hire Charge” and “Fuel charge” shall be furnished for each machinery separately to facilitate computation of profit only on fuel charges.

11.17.6 LABOUR COMPONENT:

Labour component shall consist of number of workers of various category and operating crew, as per data and wages per day or per hour to work out the cost. Requirement of number of workers of various category for particular type of work shall be commensurate with the task considered for data rate and daily / hourly output of worker / group of workers. In addition to operating crew, provision may be made for other category of skilled / semi-skilled workers such as foreman, mechanic, welder, electrician, etc., wherever required for routine daily maintenance of plant and machinery. Suitable provision shall be included in the data rate for these maintenance staff apportioning the requirement to various major items of work depending on the number of plant / machinery considered in the item.

11.17.6.1 Requirement of work force:

The labour constants to be considered in the data rate for any particular item of work, depend on the type of work force, site conditions, nature of work, cycle time of operations and job / management efficiency in organizing the work-force. The requirement of work-force shall be assessed, duly considering the various work requirements and standard published data / experience on out-put of particular type of labour. Provision may be made for Maistry / Work Inspector, wherever required, for organising and supervising the activities of work-force. The requirement of work-force shall be commensurate with the quantity of work considered for rate analysis.
11.18 USE OF ADMIXTURES AND CURING COMPOUNDS:

11.19.1 Concrete admixtures such as Air-entraining agent (AEA) Water reducing agent can be used advantageously for better quality concrete. Dosing of such chemical admixtures for concrete shall be as recommended by the suppliers or as specified by the project Quality Control unit on the basis of trial studies. Similarly, Curing compound can be used for curing of canal concrete lining works where there is scarcity of water in the work area. Suitable provision shall be made in the SR data rates under material component towards the cost of admixtures / curing compounds. A note on “Chemical Admixtures for Concrete” is furnished at Annexure-4 of the volume titled “General Guidelines for preparation of Schedule of Rates”

11. OTHER PROVISIONS:

11.19.1 Other provisions to be considered in the data rate analysis are:

1. Small Tools and Plants:
2. Contractor’s profit and overheads.
3. Hidden cost on labour.
4. Enabling works.
5. Excise duty on supplies (for gate works)
6. Rehandling lead.

11.19.2 Small Tools and Plants:

Small Tools and Plants are necessary for routine maintenance of plant / equipment and for work force in day to day work. For machinery / Equipment, the repair charges as per Clause : 2.2.6 of IS: 11590 include cost of spare parts and wages for all major repairs but do not include normal / routine maintenance. It is difficult to quantify and make provision in the rate analysis for all small tools and plants required in the execution of work. Therefore, it is the general practice to make provision towards small T & P on percentage basis in
the rate analysis. In the CWC guide lines for preparation of project estimates, a provision of 1 percent of cost of works is suggested for small tools and plants. In the proforma for estimation of unit rates published by BIS for various work items, small tools and plants is included as data rate component. Based on CWC guidelines a provision of 1 percent of basic cost of materials, machinery and labour components is proposed in the data rates towards small T & P and loss on stocks etc.

11.19.3 Contractor's profit and overheads:

In the CWC guidelines 20 percent of the cost of materials, machinery and labour is proposed towards contractor's profit and overheads together. It is also indicated in the guidelines that for large jobs a lesser percentage of profit may be adequate. Considering the above provisions in the CWC guidelines and also the present practice being followed for preparation of schedule of rates, it is proposed to retain the provision towards the contractor's profit at 10 percent of cost of materials (excluding departmental supplies), machinery (excluding machinery hire charges in view of inclusion of interest on average capital cost ) and labour in the data rate. In addition to profit, overhead costs at 5 percent of the cost of material (including departmental supplies), machinery (including hire charges) and labour components is proposed in the data rates.

11.19.4 Hidden cost on labour:

Labour component shall also include certain indirect expenses on labour such as provident fund, workmen compensation, wages for leave period / paid holidays, retrenchment compensation, gratuity, travelling expenses, providing housing / medical / canteen / dresses / gum-boots facilities etc., to comply with the various statutory and other local requirements. CWC guide-lines provide for hidden costs on labour as percent of labour cost. The provisions vary upto 80 percent for skilled category and upto 55 percent for semi-skilled and un-skilled category and are subject to modification depending on the local conditions of working, availability of local work-force, duration of work, geographical location of work etc. From the break-up of various provisions listed out in the CWC guide-lines, it can be observed, that the major contributing factors to hidden costs are housing, idle wages during monsoon period and provident fund. Generally, the minimum wages fixed by the Government include some of the amenities to be provided to the work force. Hidden cost on labour shall be for such amenities that are not covered / included in the wages. During non-working monsoon period most of the operating
crew will be deployed for over-hauling of plant and machinery and the wages are covered under repair charges. Further, as the hourly wages of operating crew are worked out on the basis of annual pay and yearly working hours of machinery, there is no need to consider hidden cost on operating crew for non-working monsoon period. None of the States like Andhra Pradesh, Tamilnadu, Maharashtra, Gujarat, Kerala and none of the Department in the State i.e., PWD, KPC, KUWS & D.B., BWSSB, RDED are providing for Hidden charges to the extent recommended in CWC Guidelines. Considering all such cases, where the hidden cost is already covered in the wage structure, the provisions suggested in the CWC guidelines are reviewed and finally, it is proposed to fix the provision for hidden cost at 15 percent of the labour cost for all works.

11.19.5 Additional hidden cost on labour:

For Dam & Allied Works, Tunnel and Allied Works and Gate & Hoists Works where certain risks / hazards such as working during night time, working under partial reservoir condition working at heights, gas cutting and welding hazards, dusty and humid conditions etc., are unavoidable, additional hidden cost at 5 percent for Dam & Allied Works and 10 percent for Tunnel & Allied Works and 15% for Gate and Hoists Works on the cost of labour component may be considered.

The details of provisions to be considered towards “Hidden costs” and “Additional Hidden Costs” have been discussed in detail in Annexure 2 of the chapter “General Guidelines for the preparation of Schedule of Rates” in Volume-I.

11.19.6 ENABLING WORKS:

11.19.6.1 Construction of major project works involves transportation, erection and dismantling of plant / equipment, construction of fuel depots / stores / sheds / haul roads / water tanks / trestle structures / minor protective works, establishing electric sub-station/ portable explosive magazines, laying water / power supply lines etc. Suitable provision for these enabling works either by assessing the probable costs or on percentage basis shall be included in the rate analysis of work items. Monthly demand charges per KVA of sanctioned power is also a major cost input and needs to be considered as part of establishing electric sub-station.
11.19.6.2 In the CWC guide-lines *transportation / erection / commissioning cost is included in the capital cost of equipment*. In this system the cost of transportation / erection / dismantling gets distributed to entire working life of equipment. However, in practice, use of equipment is only for few years in a project. When the equipment is transferred to another project the cost of transportation / erection / dismantling is again involved. Therefore, considering this cost separately for each work is more rational. Provisions made in the CWC rate analysis data are as under:

Construction and maintenance of haul roads 5 %  
Electricity 2 %

Lump-sum provisions are made for *electricity / work shop / track charges / compressed air / small tools etc.*, for concrete items.

11.19.6.3 In the proforma for estimation of unit rate published by BIS for various work items, provision for enabling works including carriage and freight of machinery is included under field set-up and field charges.

11.19.6.4 In case of gate and hoist works the item rates are inclusive of cost of designs and drawings and also cost of transportation of component parts from place of fabrication to work site. The basic rates to be included in the SR shall include suitable provision for these enabling works. Separate data rates for specific and general “Enabling Works” are included under each chapter as Annexures.

11.19.6.5 Based on the data prepared for enabling works the following provisions may be included in the data rates as percentage of total cost of material, machinery and labour components.

1. Dam and allied works:

   - Electric sub-station & demand charges ( for concrete items ) 2.50 %  
   - Trestle bridge for moving tower cranes( for concrete items ) 4.00 %  
   - Aggregate conveyor system( for concrete items only ) 3.00 %  
   - General enabling works ( for all items ) 2.00 %

2. Canal and allied works:

   - General enabling works ( for all items ) 1.00 %
3. Canal cross drainage works:

- General enabling works (for all items) 1.00%

4. Tunnel and allied works:

- Electric sub-station & demand charges (all items) 5.00%
- Lighting inside tunnel (all items) 1.50%
- Air and water lines (all items) 1.00%
- Ventilation arrangements (only for excavation items) 5.00%
- General enabling works (for all items) 2.00%

5. Gate / Hoist and allied works:

- Designs and drawings 2.50%
- Zigs / supports / winches / chain & pulley etc 2.50%
- Power supply arrangements 2.50%
- Insurance charges 1.00%
- General enabling works 2.00%
- Transportation upto worksite 3.00%

6. Preliminary and Maintenance works:

- General enabling works (only for drilling & breached embankment section works) 1.00%

General Enabling Works include ancillary works such as stores / work shop / garage / fuel depot / machinery sheds / storage water tanks / air & water supply lines / haul roads / transportation, erection & dismantling of machinery etc., which are common to all items of work.

11.20 EXCISE DUTY ON SUPPLIES:

In respect of Gates, Hoists and Allied works excise duty is applicable on the value of fabricated components supplied to site. Suitable provision shall be made in the rate analysis towards excise duty on the supply value of gate and hoist parts. Excise duty is not applicable on erection charges. Further, the excise duty shall not be considered in the rate analysis on material component as basic material rates are inclusive of excise duty. Therefore, excise duty to be considered in the rate analysis shall be only on machinery and labour components required for fabrication of gates and hoists at the central fabrication yard. It is difficult to determine the machinery and labour
components separately for fabrication and erection. For the purpose of computation of excise duty to be included in the rate analysis, the machinery and labour components may be apportioned at **75 % for central fabrication yard and 25 % for field erection and commissioning.** Therefore, 75 % of the machinery and labour components may be considered for assessing the extent of excise duty to be added in the rate analysis.

11.21 REHANDLING LEAD CHARGES:

11.21.1 In case of major works requirement of cement and steel will be large and generally these materials will be purchased in bulk quantities. Cement will be stored in site stores and steel will be stored in fabrication yard. These materials will be conveyed to batching plant / work area subsequently to the extent required at a time. Therefore, conveyance of cement and steel from source of supply to work spot involves re-handling from site store / fabrication yard. As site stores / fabrication yards will be generally located beyond 150 m from work spot, rehandling lead of 1 km including loading and unloading shall be considered for cement and steel for major works. **While working out additional lead charges for cement and steel the 1 km rehandling lead shall be deducted from total lead.**

11.21.2 In respect of gate and hoist works, rehandling is involved both at fabrication site and at erection site. At the fabrication site, materials are rehandled from stores to fabrication site for cutting, bending and fabrication of parts. At the work site, the fabricated parts are rehandled from site yard to erection spots for assembly and erection. Therefore, **for Gate and Hoists works two rehandling charges shall be considered in the rate analysis.**

12.0 FORMAT FOR RATE ANALYSIS:

12.1 The data rate analysis for items to be included in the schedule of rates shall be furnished in suitable format duly making appropriate provisions for all the requirements as explained in the above paragraphs. An abstract of cost of materials, machinery and labour components shall be prepared at the end and other provisions such as power supply arrangements, ventilation arrangements, transportation / erection / dismantling costs, enabling works, excise duty on supplies, rehandling charges etc., to the extent they are relevant for particular item shall be added to the total cost on cost / percentage basis as the case may be to finalise the unit rate to be included in the schedule of rates. Typical Format for Rate Analysis have been formulated and the same can be seen in the **Volume IV part II to VII.**
12.2 “ROUNDING OFF” OF THE UNIT RATE :

The final unit rate may be rounded off suitably as under :

| Rate less than Rs:10 nearest | to be rounded off to nearest Rs:0.05 |
| Rate more than Rs:10 upto Rs:100 nearest | to be rounded off to nearest Rs:0.10 |
| Rate more than Rs:100 upto Rs:1000 nearest | to be rounded off to nearest Rs.0.50 |
| Rate more than Rs:1000 nearest | to be rounded off to nearest Rs:1.00 |

The rates worked out on the basis of approved standard data and rounded off to the nearest value as suggested above for inclusion in the Schedule of Rates shall not be increased or decreased further for any reason.

13.0 ADDITIONAL LEAD, LOADING & UNLOADING CHARGES:

13.1 The conveyance of materials from source of supply to final placement may be in single stage or in multi stage depending on the nature of work. The conveyance of materials within the site area is reckoned as “initial lead” and is generally included in the basic rate provided in the schedule of rates. The lead upto site is reckoned as “additional lead” and is added to the basic rate at the stage of preparation of estimate for the work. The quantities of materials to be considered for the purpose of working out “additional lead” charges shall be computed and a statement to this effect shall be included in the schedule of rates under each section. For work items involving use of materials not listed in the statement of lead charges the basic rates in the schedule of rates shall be with all leads.

13.2 For certain works such as Dam & Allied Works / Canal & Allied Works / Tunnel & Allied works where it may not be possible / feasible to stack steel and cement within 50 m distance ( initial lead by head load ) from the work area the initial lead shall be 1 km and shall be considered as re-handling lead. In such cases the additional lead charges for lead exceeding 1 km shall be computed by deducting the initial lead of 1 km from the total lead.
13.3 For sand, coarse aggregate and stone required for concrete / masonry works the materials to the extent of daily requirement can be stacked near the work place and as such re-handling lead can be avoided. Additional lead charges for these materials shall be computed as deference of total lead charges and initial 1 km lead charges included in basic rate. No loading and unloading charges shall be allowed.

13.4 For earth / rock-fill works of dam and canal generally borrow areas will not be permitted close to embankment. Therefore, the initial lead for embankment items shall be 1 km. For these works where the actual lead exceeds initial lead of 1 km additional lead charges shall be computed as deference of total lead charges and 1 km initial lead charges included in basic rate. No loading and un-loading charges shall be added to the basic rate as soil / rock is conveyed directly from borrow area / quarry to embankment area without re-handling in between.

13.5 Where the basic rates (other than excavation items) provided in the schedule of rates include initial lead of 50 m, the additional lead charges for mechanical conveyance shall be computed for the total lead involved and both loading and un-loading charges shall be added.

13.6 For excavation items, where the basic rates provided in the schedule of rates include initial lead of 50 m, the additional lead charges by mechanical conveyance shall be for the total lead and only un-loading charges shall be added.

13.7 The quantity for the purpose of lead by mechanical means, loading and un-loading charges shall be the bulk volume without deduction for voids.

The allowance for bulkage to account for voids / increase in voids in the excavated materials shall be as under:

- All kinds of soil: 20 percent.
- All kinds of soft rock: 30 percent.
- Hard rock: 40 percent.

13.8 The quantities of materials required for each item for working out the additional lead charges shall be computed and a statement to this effect shall be included in each section of schedule of rates.
14.0 ADDITIONAL LIFT CHARGES:

Lifting of materials to point of final placement can be by deploying manual labour or by mechanical means. In case of use of machinery the cycle time for round trip operation includes lifting of the materials vertically or along the specified gradient in case of haulage. In case of manual labour also, generally material storage and handling is managed by creating working platforms at convenient elevations along the valley slopes to minimise the lifting efforts. Such arrangement also ensures better progress of work. The cycle time considered in working out the daily output of labour includes conveying materials along such ramp ways. Therefore the basic rates to be included in the schedule of rates for Dam & Allied Works/Canal & Allied Works / Tunnel and Allied works/Gates and Hoists works shall be for all lifts.

15.0 DEWATERING & DESILTING:

15.1 De-watering and De-silting are need based requirements and as such the rates provided in the schedule of rates for individual items shall be exclusive of de-watering and de-silting. Provision for de-watering may be made under separate item in the estimate / contract or by including the cost of de-watering in various items of work on percentage basis while preparing estimates / tenders. Though provision of separate item for de-watering is more rational as it allows payment for actual quantity of water pumped out, the monitoring is difficult, particularly for dams / canals and allied works in view of de-watering at various places and use of diesel pumps also. There are also some other lacunae in this system, leading to possible disproportionate increase in de-watering costs for dams / canal works. However, for tunnel works, where diesel operated pumps are not allowed, better monitoring is possible by arranging separate power supply line with metering arrangement for de-watering and as such provision may be made for separate item of de-watering. In the CWC guide-lines an out-lay of 3 to 5 percent is proposed for de-watering. For properly constructed / maintained diversion arrangements and considering the local conditions of rainfall / seepage, a 2 percent provision is considered reasonable for de-watering and de-silting.

15.2 For dam and allied works 2 percent provision may be made on the basic rates provided in the schedule of rates for all items towards de-watering and de-silting. A note to this effect shall be added in the schedule of rates.
15.3 For canal works including CD works, 2 percent provision may be made on the basic rates provided in the schedule of rates for all items towards de-watering and de-silting only for the reaches, where De-watering and De-silting are anticipated. A note to this effect shall be added in the schedule of rates.

15.4 For Tunnel & Allied Works separate item rate with “Kwhr as the Unit of Measurement” shall be included in the schedule of rates.

15.5 A binding clause limiting the cost of de-watering to 5 percent of the cost of work shall be included in the contract to keep control over payment and to avoid disproportionate extra cost of de-watering. A note to this effect shall be included in the schedule of rates.

16.0 AREA WEIGHTAGE:

The Schedule of Rates are generally prepared duly considering the average market rates collected from major commercial centers nearer to project area for materials and the wages of workers prevailing in the project area at the time of preparation of schedule of rates. The machinery hire charges mainly depend on the capital cost and not on the area where the work to be carried out is located. The rates are also prepared separately for each type of work such as Dam & Allied Works, Canal & Allied Works, Canal & CD Work, Tunnel & Allied Works, etc., considering the nature of work and average conditions of working duly making appropriate provisions for cycle time of working, re-handling of materials, hidden costs on labour, enabling works etc. Therefore, the rates provided in the schedule of rates prepared on scientific basis with provisions for additionalities such as additional lead / lift / loading and unloading charges, dewatering and desilting charges etc., are to be considered reasonable and representative for all works irrespective of their geographical location within the project area. However, certain works such as investigation works in interior locations not connected by road, emergent repair works requiring mobilization of men and machinery in very short period for short duration of work etc., may cost little extra compared to similar works under normal situation. It is considered more rational to identify major items for such works and include suitable rates for the same in the schedule of rates rather than making provisions of area weightage. It is pertinent to point out that the committee constituted by P.W.D. under the chairmanship of Sri Radhakrishna has recommended “not to provide Area Based
Weightages” for all works in P.W.D. This S.R. Committee is in full agreement with the recommendations of Sri Radhakrishna. In view of the above, no area weightage shall be allowed in the schedule of rates formulated for irrigation works.

17.0 PREPARATION & ISSUE OF SCHEDULE OF RATES THROUGH A CENTRAL AGENCY:

17.1 Schedule of rates shall be prepared and issued each year. Wages of workers shall be revised with effect from the date notified by the state labour department. Generally, the material rates, plant / equipment costs change after Central / State budgets. Schedule of rates shall be revised duly considering the prevailing rates for materials, machinery and labour after the Central / State budgets. In view of the above, the S.R. Committee recommends the revision of schedule of rates to be effective from 1st July every year.

17.2 All the data / Rate analysis shall be in standard format. Standard data adopted in the preparation of rate analysis for various items included in the schedule of rates shall not be modified without the approval of competent authority. Any changes / modifications considered necessary shall be referred to the Competent Authority / Schedule of Rates Review Committee to be established by Water Resources Department. S.R. Committee recommends to Government to constitute a “Schedule of Rates Review Committee” for the Water Resources Department.

17.3 The system of each circle preparing and issuing Schedule of Rates is likely to result in non-uniform item rates for similar work items, inspite of adopting of common standard data and formats for preparation of SR, if the material rates / capital cost of machinery and other related basic data differ from circle to circle, due to each circle collecting the basic data independently. In view of extensive mechanization and standardisation of data, preparing data rates for work item the rates to be included in the Schedule of Rates has to be common to all circles in the Department/ Corporation. Therefore, the S. R. Committee recommends that the preparation and issue of Schedule of Rates shall be centralised under the Department / Corporation to ensure uniformity in rates for similar works in all circles under the Department / Corporation.
18. REVIEW OF SR DATA:

In view of the continuous developments in the field of construction the Schedule of Rates Committee recommends that the Schedule of Rates Data shall be reviewed and updated periodically, say once in five years, for the existing items as well as for inclusion of new items in the Schedule of Rates.

19.0 GENERAL GUIDELINES FOR THE PREPARATION OF SCHEDULE OF RATES:

The S.R. Committee has formulated the General Guidelines for the preparation of Schedule of Rates. The same can be seen vide Volume – II.

20.0 TERMS OF REFERENCE NO.4:

20.1 TO FORMULATE GUIDELINES FOR THE REGULATIONS OF RATES OF STORES MATERIALS IN ALL THE CIRCLES OF WATER RESOURCES DEPARTMENT.

20.1.1 Based on the recommendations of the Board of Chief Engineers, Government in its Order PWD 82 CRM 91 dated 29.10.91 has fixed the responsibility on contractors executing the work on tender basis, to procure all the required materials like steel, cement, Hume pipes, water supply, sanitary and electrical materials strictly conforming to relevant B.I.S, standards and the specifications prescribed by the Department with a condition, that the contractor shall furnish the test certificate and receipt for the purchase of materials to the Department. The Government has also stipulated and fixed the responsibility on the concerned Executive Engineer to verify, all such materials brought by the tendered contractor to work spot and ensure that these materials strictly conform to the B.I.S. standards and detailed specifications of the Department. The Executive Engineers are also directed to verify the test certificates and receipts issued by the reputed firms and test check the materials, to ensure that the materials strictly conform to B.I.S. standards before allowing such materials to be used on the works.
20.1.2 After the issue of the above circular, the Departments are not procuring and any construction materials to be issued to the contractors. In view of this position, a decision has been taken at the Government level to do away with certain posts required to handle purchase and issue of store materials.

20.1.3 Water Resource Department in order ID 26 MV 2000 dated 23.3.2000 has issued detailed guidelines, prescribing procedure and policies to be followed for the purchase of store materials in Water Resource Department and in all its CADA. The Circulars instructions are exhaustive and are very clear.

20.1.4 The circular stipulates to identity and list out all the store items available in the stores of all the Divisions within the Zone as on 1.4.2000 and also indicate its value. As and when any store materials is required, such list will have to be examined by the Superintending Engineer and he should approve such lists for purchase in the month of May every year. **A Purchase Committee under the Chairmanship of Chief Engineer/Administrative Officer with Superintending Engineer/L.D.O. as Member and one Store Officer as Convenor has to be constituted for each zone.** This committee has to meet once in three months and has to approve the purchase of store material required for a particular division. In case of emergency and if such material is not intended for purchase earlier, the same is to be recommended by the committee and sent to Government and with the approval of the Chief Engineer such materials should be purchased. It is also stipulated that before recommending the purchase of store material, the availability of the same in the list of materials prepared for all division of the Zones as on 1.4.2000 should be compared and only when the materials is not found in that list the purchases should be ordered after certifying that the required material is not available in the said list.

20.1.5 For any violation of these instructions, disciplinary action is also suggested against the erring officers. It is also stipulated that at every MMR meeting, Superintending Engineer and Chief Engineer should examine the purchase of store material and any violation should be promptly reported to Government. The circular also stipulates that the Chief Engineer and Superintending Engineer should inspect the stores frequently and report to Government any violations. Non reporting by Chief Engineer and Superintending Engineer has been made an offence. These instructions are also applicable for the purchase of store materials required for the maintenance of staff quarters coming in the jurisdiction of irrigation.
projects and CADA areas. As could be seen from the Circular, the instructions are very exhaustive and violations will attract disciplinary action.

20.1.6 Recently the state Government has passed the **Karnataka Transparency in Public Procurement Act 1999** and the same has been published in the Government Gazette dated 19.2.2001. Necessary Rules are also published in Order No. **PWD 154 FC – III 2000 dated 24.10.2000**. Government have also issued amendments and circular instructions to the said Act and Rules from time to time. These Acts and Rules make is mandatory for every one in the Water Resource Department to follow, failing which the Acts itself stipulates penal action.

20.1.6.1 In view of the two circulars dated 29.10.91 and 23.3.2000 and the transparency Act and Rules framed under it, the S.R. Committee felt that the provisions in these documents provide ample guidelines for procurement of materials required in the Water Resource Department for its various work.

20.2 Need for an Exception:

However the committee examined a particular issue of the present practice of allowing the successful tenderer to procure “Explosive Material” required for blasting wherever blasting is involved. The committee deliberated this particular issue very seriously. In the present context of increasing terrorist activity through out the country, blasting incidences taking place frequently, capturing RDX now and then by the Police Authorities, the increased activity of Naxelities, terrorist and other banned organisation and in the over all interest of the security and safety of the country and the water resource project of the State, the committee would like to request the Government to reconsider the existing practice of giving total freedom to the contractors to procure the materials required for blasting operations. **The committee therefore, was unanimous in recommending and suggesting to the Government to revert back to the earlier system of procuring and supplying materials required for blasting operations by the Department itself.** As far as guidelines for procuring blasting materials are concerned, they are governed by Explosive Acts and Rules. No separate guidelines are required for this purpose.
20.3 Concluding the S.R. committee recommends that no separate guidelines are required for procuring store materials required for Irrigation work and suggest to insist on the departmental officers to follow the existing circular dated 29.10.91, 23.3.2000 and provisions of Transparency Act & Rules and other circulars issued from time to time. The S.R. Committee further recommends to revert to the earlier system of procuring and supplying explosive materials required for blasting operations by the Department wherever it is required duly following the provisions of The Explosive Act and Rules framed under it.
21.0 TERMS OF REFERENCE NO.5

21.1 TO STUDY THE LABOUR RATES OF ALL CIRCLES OF WATER RESOURCES DEPARTMENT AND SUGGEST FURTHER ACTION TO BE TAKEN.

21.1.1 The S.R. Committee examined the details furnished by each circle in their respective schedule of rates on the classification of labour and the labour rates fixed by them. The Committee also examined such lists in vogue in Public Works Department. The Labour Department is responsible for fixing wages for different class of labour in terms of The Minimum Wage Act and therefore, the list published by Labour Department in their Notification No. Sakaka 25 LMW 88 dated 27.11.93 was also examined. The Labour Department has not notified the list of all the labours deployed in the execution of water resource projects.

21.1.2 As per Minimum Wages Act, the Labour Department regulates the minimum wages and Variable Dearness Allowance (VDA) for different classes of labourers deployed for different types of work carried out by various Government Departments. They also fix VDA rates based on the cost of living index published from time to time. The revised VDA will be effective from 1st of April every year and the Labour Department issues a Notification fixing the revised VDA in the month of March every year.

21.1.3 The Labour Department in their Notification No.Sakaka 25 LMW 88 dated 27.11.93 have listed all types of labourers broadly classifying them as “Skilled”, “Semiskilled”, “Unskilled” and “others”. They have also published list of labourers generally deployed by each department and accordingly published such lists concerning Public Works Department under the heading “Construction or Maintenance of Roads or building operations”. The Labour Department has divided the State into two Zones. Zone-1 covers Bangalore City Agglomeration Area and District Head Quarters Agglomeration area and Zone- 2 covers places other than those mentioned in Zone - 1. For details vide Annexure- V his Annexure describes 98 class of labourers.

21.1.4 On perusal of the lists presently being used in different circles of Water Resource Department, it is observed that the Superintending Engineers have not classified the labourers as done by the Labour Department .For example, they have designated them as “Class-1”.
“Class-2”, “Heavy” and “Light”. A consolidated list has been prepared which shows that the existing class of labourers have been classified into 119 categories. If the labour class is considered individually, the total number of class of labourers presently in-vogue in different circles lists to about 156. The details can be seen in Annexure- VI.

21.1.5 The S.R. Committee has further rationalised the different classes of labourer carried out further exercise to re-group all classess of labour according to the nature of work involved, skills required and class of labour needed etc. Based on this criteria the labourer class have been re-grouped into 100 categories consisting of 188 class of labourers.

21.1.6 Incorporating the re-grouped designation and classifying different classes of labourers into four categories namely: (1) Skilled (2) Semiskilled (3) Unskilled and (4) Others, a list of 188 class of labourers have been finalised by the S.R. Committee. As per this recommendation, 41 (79) class of labourers are covered under “Skilled” category which generally include the labourers classified as “Class –1 or Grade-1” category. The semi-skilled category covers 41 (79) class of labour and this category generally includes “Class-2 or Grade-2” labourers. The “Unskilled” category covers 5 (6) class of labourer and the very names listed under this category is self-explanatory. 13 (24) categories of names are included under the list “Others”. The figures indicated in the bracket is the class of labourers identified by the Schedule of Rates Committee. For details please see Annexure VII.

21.1.7 By classifying the labourers into 4 headings and by giving a single designation, for group of classifications and limiting the number to 100 categories, it is hoped that there will be considerable rationalisation of labour class and this list is more or less in tune with the classification adopted by Labour Department. It is suggested that this list of 100 class of labour be sent to Labour Department with a request to incorporate this list in their Government Order No. Sakka 25 LMW 88 dated 27.11.93 and issue necessary notification to cover the different classification of labour currently being employed in the Water Resource Department.
21.1.8 NEED FOR RATIONALISATION OF WAGES AND CLASSIFICATION OF LABOURERS:

21.1.8.1 The Schedule of Rates Committee with its limited expertise available on this subject has rationalised the existing labour classification broadly into 4 categories (1) Skilled (2) Semi-skilled (3) Unskilled and (4) Others. The committee is not fully satisfied with the above rationalisation for the following reasons:

1. The basic wages fixed appears to be not on scientific basis, does not take into account the qualification required, the expertise needed to do a particular work meant to be carried by that category of labour

2. There is serious anomalies in the wage structure fixed for some of the class of labour

3. For certain class of labour lower wages are fixed while that class has to discharge its duties under difficult environmental conditions.

4. Though the nature of work carried out by certain designation are more or less similar the wages are different

21.1.8.2 Considering the inconsistencies existing in the designation, the wage structure, etc. the S.R. Committee strongly recommends to the Government the need to set up an Expert Group to look into these anomalies and fix the wage structure on scientific basis duly considering the educational qualification, the degree of skill required, the nature of environment where the work is to be carried out etc. The Government may consider this issue separately.
22.1 PROCEDURE TO BE FOLLOWED TO IDENTIFY NEW QUARRIES IN LIEU OF ABANDONED OLD QUARRIES.

22.1.1 The S.R. Committee studied the Terms of Reference carefully. The committee interacted with the representative from Mines & Geology Department on this subject. The committee acquainted itself with the existing procedure for grant of Lease either to a Stones quarry, sand quarry or Murram quarry. The committee learnt that the Mines & Geology Department has leased out all the sand quarries in the State to various agencies through public auction. Whoever needs sand has to procure it through such lessees. Therefore, the question of identifying new sand quarries is very limited.

22.1.2 As regards, quarries for rubble, metal, slabs, etc., the quarries which were in position of the Department have almost exhausted and there is hardly any scope to expect additional material. Such quarries located in the Forest Department are covered by The Forest Conservation Act 1981 and various Court Judgement which prohibit non-forest activities like quarrying in the forest area and therefore identification of such quarry in the forest area is ruled out. However, if any other quarry with useful material is available the committee suggested to Government to get such quarries reserved for Government work by Mines & Geology Department so that such quarries can only be leased out to private agencies after obtaining NO OBJECTION from the Government Department like Water Resource Department, P.W.D. In response to the recommendation made by the S.R. Committee, the Government has already acted by addressing the Secretary, Commerce and Industries Department which is the administrative Department for Mines & Geology in their letter No. NEE 5 MUEEMA 2001 dated 14.3.2000.

22.1.3 The committee further deliberated the subject in depth. The committee was informed that in the recent times, when works are tendered, the Department is neither enclosing a quarry map nor showing specific locations of quarries and instead, the specification stipulates that the contractor should visit the project site, acquaint himself with ground reality and assess the availability of the construction materials required for the work and quote his rate for the finished item of work which includes “All Leads and Lifts”. As per the tendered documents it is the responsibility of the “Successful Bidder” to procure the “Required Quantity” of material needed for the construction of the project and satisfy that the said quantity meets
“the quality” stipulated for the work. However, for the preparation of the estimate the department officials identify quarries, located nearby and prepare the estimate, assuming the leads from such quarries after satisfying the quality of available material from that quarry. It has now become the full responsibility of the contractor to bring the required “quantity and quality” of material and complete the work at his quoted rates. In view of these developments, the committee feels that there is no need to identify new quarries either for sand, jelly, rubble, B.C. soil, murram, gravel, etc.

22.1.4 Considering the present situation and the manner in which the executing agencies are procuring required quantity and quality of construction materials for Government works, the S.R. Committee suggests that, identification of new quarries be given up and the responsibility for procuring the required quantity and quality of material of the stipulated specification should be left to the individual contractor. The responsibility of accepting the material by the departmental officer should be based on the quality test and the testing of material should be made stricter and mandatory.
23.0 TERMS OF REFERENCE 7:

23.1 ACTION TO BE TAKEN TO SOLVE THE DISPUTES ARISING OUT OF DEFICIENCIES IN SCHEDULE OF RATES.

23.1.1 The S.R. Committee addressed all the Chief Engineers in the Water Resource Department to send such instances where disputes have arisen out of deficiencies in the Schedule of rates along with the action taken by them to solve such disputes. A letter was addressed on 5.12.2002 to all the Chief Engineer fixing 31.12.2002 as last date. As there was no proper response from the Chief Engineers, the Managing Directors of KBJNL and KNNL were addressed on 19.3.2003 to communicate any such instance before 1.4.2003. As there was no response even to this communication, this particular subject was raised at the meeting convened on 8.5.2003 wherein many Chief Engineers of the Water Resource Department were present. They were given one week time (i.e.15.5.2003) to send their reply. Inspite of all these efforts no reply has been received by the S.R. Committee from any of the Chief Engineers of the Water Resources Department.

23.1.2 As there was no response from the Chief Engineers, the S.R. Committee examined this issue. The committee realised that dewatering and desilting is not included hither-to in the schedule of rates. Consequently, disputes have occurred on this issue and the Committee decided to consider this item under the above terms of reference.

23.1.3 The committee felt that at present provisions for “Dewatering and Desilting” is vague. The Departmental officers are preparing a separate estimate and regulating the expenditure based on the Kilo watt hour/energy consumed basis. This methodology is being misused resulting in huge financial burden on the Department. Many times the executing Agency is questioning the basis of such payments. This particular issue was thoroughly examined by the S.R. Committee.

23.1.4 The committee was unanimous in its decision to provide for “Dewatering and Desilting” cost. The committee therefore recommended to make 2% provision to meet “Dewatering and Desilting” expenses. For Dam and Allied works. This percentage may be made on basic rates provided in schedule of rates for all items. For Canal & Allied works including CD works the said percentage may be made on the basic rate provided in the S.R. for all
items only for the reaches where “Dewatering and Desilting “ is anticipated. However, for Tunnel & Allied Works, separate item rate with KWhr as the unit of measurement shall be included in the Schedule of Rates.

23.1.5 The S.R. Committee also recommended a binding clause limiting the cost of Dewatering to 5 % of the cost of work and the same should be included in the contract to keep control over the payment and to avoid disproportionate extra cost of dewatering.

23.2 As there was no response from the Chief Engineers, based on the experience of the members, the S.R.Committee is making the above recommendation.
24.0 TERMS OF REFERENCE 8:

24.1 OTHER ASSOCIATED ISSUES:

24.1.1 SALES TAX ON WORKS CONTRACT:

Government of Karnataka has levied sales tax on works contracts which is to be deducted from the work bills at the rate prevailing at the time execution of work. The rates provided in the schedule of rates are exclusive of sales tax on works contracts since certain provisions such as de-watering / de-silting, additional lead / lift charges etc., forming part of cost of work are to be added at the time of preparation of estimate. Therefore, provision shall be made towards sales tax on works contracts at the time of preparation of estimate.

24.1.2 PRICE ESCALATION:

24.1.2.1 Generally, the rates provided in the schedule of rates are valid for one year and are the basis for preparation of estimates and tender schedules. In respect of execution of works on contract system, payments are regulated on the basis of rates quoted by the contractor at the time of tendering. The quoted rates are valid throughout the contract period. However, prices of material, hire charges of machinery and wages of workers fluctuate periodically due to increase / decrease in production costs, market conditions, seasonal variations, increase / decrease in taxes / duties / royalties etc. As a result of this, the construction costs also vary depending on the variations in prices of various work inputs. The rates for various work items provided in schedule of rates are reviewed / revised every year based on current market rates for materials, machinery, labour and other inputs to reflect the increase / decrease in current construction costs on annual basis. However, in the contracts there will be no provision for revision of quoted rates till the completion of contract period. As the fluctuation in market prices is beyond the control of both the Employer and the Contractor, contracts either provide for some mechanism for periodical price adjustment or allow the contractors to assess the probable cost escalations during the contract period and include the same in the quoted rates. As such, the quoted rates also include probable cost escalations during the contract period fully or partly depending upon the conditions of contract.
24.1.2.2 Generally, where the contract period is more, the contracts provide for price escalation clause applicable to value of work beyond the specified **no escalation payment period**. The trend in the fluctuation of market rates is the general guiding factor for assessing the future cost escalations. The cost escalation in the long duration contracts is generally regulated on formulae basis. Each formula includes extent of escalating component and source of cost indices. The extent of escalating component depends on the nature of work, extent of mechanisation and labour components, value of work carried out during no escalation period etc.

24.1.2.3 In view of extensive mechanisation of data rates and change in the policy of regulating the prices of fuel by Government of India the escalating components being adopted so far based on extensively labour oriented data rates may also require review. This can be done by analyzing the cost of major items included in the contract.

24.1.2.4 The various aspects involved in cost escalation and use of cost escalation formulae have been identified and furnished in **Annexure 3 of** the volume titled **"General Guidelines for the preparation of Schedule of Rates"**.

24.1.3 COMPUTERIZATION OF DATA:

24.1.3.1 In view of availability of computer facilities in the Department, all the data and data rates prepared in standard format shall be computerized to facilitate quick revision. A basic data file shall be created to include material rates, wages of workers, capital cost of machinery / equipment / accessories and other relevant information necessary for revision of schedule of rates. All data rate files shall be linked with the information in this basic data file so that by updating the basic data file it can be possible to revise hire charges, lead / lift / loading / unloading charges and the item rates in various files automatically. Each data rate file shall include reference data, notes, statement of requirement of materials, statement of royalty charges, rates schedule and data rates.

24.1.3.2 For revising the Schedule of Rates in the Computer programme, the files shall be opened in a particular order to incorporate the revised data. The procedure to be followed for revising the computerised Schedule of Rates has been formulated. A detailed **"Procedure for revising the computer data"** has been furnished in **Annexure 4 of** the volume titled **"General Guidelines for the preparation of Schedule of Rates."**
24.1.4 PRIVITISATION OF QUALITY CONTROL WORK:

The S.R. Committee would like to recommend to the Government to extend the policy of privitisation in the field of quality control and involve reputed agencies to carry out independently the quality test prescribing certain responsibility on them for ensuring the desired quality of construction. This new policy will imbibe a sense of responsibility and fear not only among the executing agency but also among the departmental staffs. Government is requested to seriously consider this recommendation for implementation.

24.1.5 NEED FOR TRAINING DEPARTMENTAL ENGINEERS:

24.1.5.1 For the first time “Schedule of Rates” and “Data Rate” is prepared using mechanical equipment for large number of items. The data rate and schedule of rates are amenable for computer programme. The methodology to be followed for the computerisation has been explained in the volume “General Guidelines for the preparation of Schedule of Rates”. The S.R. Committee recommends that a formal training for 2 – 3 days for each zone be organised to familiarise the Engineers on the use of computerised data.

24.1.5.2 During the course of inter-action with the Departmental Engineers, the S.R. Committee felt the need to train all the departmental officers on the subject of “Drilling, Blasting and Controlled Blasting Technology”. The Government is requested to get a training schedule drawn up through KERS for a duration of one week and impart the said training immediately to the Departmental Engineers. It is further recommended that, this training should be made compulsory.

25.0 NEED FOR EXECUTING CANAL LINING WORK SEPARATELY:

25.1 The S.R.Committee proposed mechanical lining using Pavers, batching plant and transit mixers. To understand the requirement of machinery, labour, etc. and to study the efficiency of mechanical lining, the committee visited Sri Ram Sagar Project in Andhra Pradesh. The committee studied in depth and interacted with the project authorities and the equipment manufacturers. The committee observed that, in Andhra Pradesh mechanical canal lining is adopted and the contractors possessing batching plant, transit mixers and mechanical concrete pavers are short listed for this type of work. For main canals, a canal slice between 5-10 km length is given to an Agency and for such magnitude of work, the contractors are ready to procure the equipment required for canal lining namely, mechanical
paver, transit mixers and batching plant. The S.R.Committee examined the issue carefully. With a view to economise the water resources and to produce more food per unit of water, the committee was unanimous in recommending that, in future in the State the canal lining should be made compulsory for all new canal works using combination of mechanical paver, transit mixers and batching plant.

25.2 The committee also recommends that a main canal reach of 10 kms long should be an appropriate length for fixing up an Agency for canal lining with mechanical pavers. For such a magnitude of work (10 Kms) the contractors will be in a position to procure the required machinery for mechanical paving. The Government may consider this recommendation for implementation.

25.3 The committee also recommends that canal lining should not be included alongwith the canal excavation work. The lining work should be taken up separately after the excavation work has been completed and a gap of one full year is allowed after completing the canal excavation work. The committee further recommends that while calling for tender for canal excavation, a provision to leave “Template” in masonry/concrete at every 30 m intervals to reflect the finished section of the canal as per the design at that location along the excavated portion should be insisted. Providing “Templates” as indicated above will eliminate the possibility of over or under breakages and also maintain the desired canal bed level. (CBL).

25.4 The committee also recommends, that a provision for “Proud cutting” of 10 cms thickness is to be included in the excavation item for canal lining. In all such cases where “proud cutting” is provided for, a corresponding reduction in payment is to be made to the Agency carrying out canal excavation.

26.0 ACCOUNTING AND DISPOSAL OF EXCAVATED HARD ROCK:

26.1 Government in Circular No.PWD 38 LLM 77 dated 19.9.78 and Circular No.PWD 64 MTZ 85 dated 4.12.86 has issued guidelines to Departmental Officers on the subject of recording sectional measurements, stacking and accounting for hard rock removed from the excavation, etc. The circular also suggest “Wherever it is difficult for the reasons such as non availability of stacking area etc” the Chief Engineer may accord special permission to dispense with the verification of the sectional measurements in specific cases after spot inspection”. These circulars were issued when the schedule of rates for rock excavation was based on manual labour.
26.2 The S.R. Committee prepared the data rate and schedule of rates using mechanical equipment wherever necessary and reduced the component of labour. In view of the above change in the policy, the guidelines indicated in the above circulars also needs revision and modification.

26.3 The S.R. Committee has analyzed this issue of “Accounting and Disposal of Excavated hardrock”. The question of “Non availability of land” is very remote, since the Department is the agency acquiring the required land. The initial lead now provided is 1 km and the availability of land will not be an issue any longer. The likelihood of, either the soil/hardrock getting mixed with hard rock during blasting operation and during mucking operation is also uncommon. At the most, a very smaller percentage of soil might get mixed with hard rock when blasting operation is carried out in the transitional zones separating soil layer and hardrock layer.

26.4 Therefore, the fear expressed, that when mechanical equipment are used for “Mucking Operation” the soil gets mixed up and without separation of soil, stacking of hard rock is not possible, cannot be accepted.

26.5 In the data rate prepared by the S.R. Committee, special provision is made for use of “Angle Dozer” for lavelling the dumped hardrock from the tippers. In view of the above procedure, the stacking of excavated hard rock becomes easy and is practicable. Therefore, the circulars giving “Discretionary Powers” to the Chief Engineer to do away with the stacking of hard rock under special circumstances needs to be withdrawn and the stacking of excavated hard rock using machinery should be insisted and made compulsory.

26.6 At present, the section officer is responsible to account the excavated hard rock in his “Material At Site” (MAS)” Account till it is disposed. In cases, where hard rock quantity is huge, section officers will find it immensely difficult to keep track of this material. In many instances, where the stacked hard rock is being used unauthorisely by the local villagers, contractors, etc. as it is not under continues “Watch and Ward” have come to the notice of the Department. The Departmental Officers are also lodging complaint with Police, whenever such instances are noticed. Keeping a “Regular watch and ward” is very expensive. Therefore, the committee examined the ways and means for the disposal of excavated hard rock and following suggestions are recommended for the consideration of Government.
1. Stacking of hard rock is to be made mandatory.

2. Required area for stacking is to be acquired while acquiring land.

3. Use excavated rock for all Governmental works in and around its origin (such as CD works, Service Road, Canal Lining, etc.) to the maximum extent.

4. Wherever, the hard rock quantity is very huge such disposal site should be declared as “New Quarries” to be used for all Governmental work by PWD, RDED, Z.P., M.I. and I.D., etc.

5. If the location of such departmental quarry site is close to an urban area, the excavated hard rock material stacked could be auctioned for the prospective user and convert the material into “value added product”.

26.7 While considering the above suggestions, it is necessary to amend the existing provisions and Codal Rules, to do away with bringing the hard rock obtained from the excavation into the MAS Account of the section officer. Provided, the section officer follows the Government Circular and stack the excavated hard rock and quantify it in the manner prescribed in the circular. While assessing the quantity, the present provision of 40% for voids, could be increased by another 5% to provide for the exigencies of hard rock mixing with soil. If the above action is taken by the Government, quantification of hard rock will become realistic and more scientific. The Government will get maximum revenue and the section officer will be relieved from unnecessary harassment and the observations from statutory audit like Accountant General, State Accounts Department and P.A.C., etc. can be avoided/minimised. The S.R. Committee therefore, suggest to the Government, to consider the above recommendations and issue suitable directions in this regard.

27.0 INCLUSION OF NEW ITEMS AND CHANGES MADE IN THE SCHEDULE OF RATES.

27.1 The philosophy adopted by the Schedule of Rates Committee in the formulation of detailed specifications, format for preparation of data rate on scientific basis is to use state of art technology, introduce mechanisation wherever practicable and reduce the component of labour to the extent possible. While doing so some of the existing items needed deletion or modification. Many new items are required to be
introduced. A new chapter dealing with “Gates & Allied Works” was found essential and hence new chapter was introduced. Similarly, A new chapter dealing with “Preliminary & Maintenance works” (P & M works) was also found essential and hence included in the schedule of rates. The changes brought about in the schedule of rates as well as in the data rate under each chapter is briefly described below.

27.2 DAM & ALLIED WORKS:

27.2.1 The previous S.R.Committee had finalised 56 items under this chapter. The present committee has recommended 63 items. Some of the old items have been either omitted or have been shifted to different appropriate chapter. A statement shown below indicates the changes incorporated in the present schedule of rates under this chapter.

27.2.2 Modification/Transfer of the Existing Items:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.in The previous S.R.C’s Report</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>Providing M 15 concrete......... with 40 mm down size metal for bridges, spillways, sluices, barrels, etc.</td>
<td>Incorporated as M20 Grade concrete</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>Drilling 75 mm dia boreholes by calyx drilling, ............ etc.complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>Drilling through rock to a maximum depth of 30 m with diamond drilling ......etc. complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>Drilling through a maximum depth of 30 m with diamond drilling for NX size coarse upto inclination of 10 degree........... etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>Drilling grout holes 47 mm dia by percussion method, vertical or incline........... etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>Re-drilling through partial set 47 mm dia grout holes ........ etc complete</td>
<td>Included in the main item No.7 of Dam &amp; Allied works.</td>
</tr>
<tr>
<td>7</td>
<td>44</td>
<td>Removal of filter mat below the rock toe and relaying ........ Etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>Removal and stacking of dry rubble rock toe ............ etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>9</td>
<td>46</td>
<td>Removal and stacking dry stone revetment 60 cms thick and graded filter 45 cms thick............ etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>10</td>
<td>53</td>
<td>Painting of gates/hoists/embedded parts with 2 codes of zinc chromite, allumimium primer... etc complete</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>1</td>
<td>54</td>
<td>Painting of gates/hoists/embedded parts</td>
<td>Shifted to P &amp; M chapter</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Item No.</td>
<td>Brief specification of the Item</td>
<td>Remarks</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>---------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>Excavation for foundation in soft rock requiring blasting....etc complete</td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>2</td>
<td>4 (b)</td>
<td>Excavation for foundation in hard rock by controlled blasting....etc complete</td>
<td>- do -</td>
</tr>
<tr>
<td>3</td>
<td>4 ©</td>
<td>Excavation for foundation in hard rock by line drilling &amp; smooth blasting &amp; controlled blasting........etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>Providing and laying insitu vibrated M 15 grade cement concrete using 40 mm down size metal and sinking plums of size 150 to 80 mm .... Etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>5</td>
<td>22(a) &amp; (b)</td>
<td>Proving and laying insitu vibrated M 20 grade cement concrete using 20 mm down size metal for RCC solid parapet/Ornaments..... Etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>7</td>
<td>23</td>
<td>Providing and laying insitu vibrated M 25 grade cement concrete using 20 mm downsise metal for wearing coat......etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>Pre-cooling to control placement temperature of cement concrete in the range of 18 to 21 degrees C .... ..etc. c</td>
<td>- do -</td>
</tr>
<tr>
<td>9</td>
<td>25</td>
<td>Conveying and fixing elastomeric bearings for spillway bridge.. etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>10</td>
<td>26</td>
<td>Proving and constructing 150 mm dia hume pipe weep holes for concrete/masonry walls etc.complete/</td>
<td>- do -</td>
</tr>
<tr>
<td>11</td>
<td>27</td>
<td>Providing and forming expansion joint for spillway bridge.... Etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>12</td>
<td>36</td>
<td>Providing 25 mm thick guniting to rock or masonry surface in cement mortar 1:3 proportion... etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>S.No</td>
<td>Quantity</td>
<td>Description</td>
<td>Notes</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>13</td>
<td>40</td>
<td>Proving and constructing contraction joints by fixing 23 cm wide central bulb PVC water strip in single line...etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>14</td>
<td>45</td>
<td>Providing homogeneous embankment using soil from approved borrow area .... Etc. complete</td>
<td>In order to use all the available material in embankment this item is introduced as New Item</td>
</tr>
<tr>
<td>15</td>
<td>50</td>
<td>Providing and laying 30 cm diameter open jointed hume pipes in rock-toe.... Etc. complete</td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>16</td>
<td>51</td>
<td>Providing and constructing 1.20 m internal diameter and average 3 m height RCC manhole with 60 cm dia top cover... etc. complete</td>
<td>- do -</td>
</tr>
<tr>
<td>17</td>
<td>55</td>
<td>Providing and laying filter media consisting of two layers of 250 gsm poly-propeline non-woven filter fabric etc... .......... complete</td>
<td>To introduce new material and new technology this item is introduced</td>
</tr>
</tbody>
</table>

### 27.2.4
While formulating the detailed specification and data rate under this chapter, following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

### 27.2.5 Type of Machinery considered:

- Angle Dozer - 90 Hp
- Batching plant 2 x 1.5 cum capacity
- Dumper/Tipper – 5 cum capacity
- Air compressors of different Capacity both electrical & diesel
- D.G. Set – 30 KVA capacity
- Ice plant with accessories 30 T/day capacity
- Shovel – 0.85 cum capacity
- Pneumatic Tamper
- Tower Crane – 5 T capacity
- Jack Hammer/wagondrill
- Grouting machine
- Guniting equipment
- Transformer – 250 KVA capacity
- Vibratory Pad foot roller
27.3 CANAL & ALLIED WORKS:

27.3.1 The previous S.R.C. had finalised 30 items under this chapter. The schedule of rates in vogue in the Department has 76 items under this chapter. The present committee has recommended 82 items. Some of the old items have been either omitted or have been shifted to different appropriate chapter. A statement shown below indicates the changes incorporated in the present schedule of rates under this chapter.

27.3.2 Modification/Transfer of the Existing Items:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>Providing CNS lining using soil from approved borrow area.....etc</td>
<td>Included under item 34 of P &amp; M works</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>Providing CNS lining using soil collected in heaps</td>
<td>Included under item 34 of P &amp; M works</td>
</tr>
</tbody>
</table>

27.3.3 NEW ITEMS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.</th>
<th>Brief specification of The Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>Excavation in <strong>softrock</strong> without blasting <strong>for field irrigation channels.</strong></td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>Excavation in softrock requiring blasting for canals</td>
<td>- do -</td>
</tr>
<tr>
<td>3</td>
<td>6 (b)</td>
<td>Excavation in hard rock of all <strong>toughness</strong> by approved controlled blasting</td>
<td>- do -</td>
</tr>
<tr>
<td>4</td>
<td>6©</td>
<td>Excavation in hard rock of all toughness for dressing canal sides by line drilling and smooth blasting</td>
<td>- do -</td>
</tr>
<tr>
<td>5</td>
<td>7 (b)</td>
<td>Excavation in hard rock of all toughness by approved controlled blasting including controlling flyrock by muffling</td>
<td>- do -</td>
</tr>
<tr>
<td>6</td>
<td>7©</td>
<td>Excavation in hard rock of all toughness for dressing canal sides and by line drilling and smooth blasting</td>
<td>- do -</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Details</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Providing heartening/casing embankment with homogenous soil with density</td>
<td>In order to use all the available material in embankment this item is</td>
<td></td>
</tr>
<tr>
<td></td>
<td>control of not less than 95%.</td>
<td>introduced as New Item</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Providing heating/casing embankment with homogeneous soils with density</td>
<td>In order to use all the available material in embankment this item is</td>
<td></td>
</tr>
<tr>
<td></td>
<td>control of not less than 90%.</td>
<td>introduced as New Item</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Providing heating/casing embankment with homogenous soil without watering to</td>
<td>In order to use all the available material in embankment this item is</td>
<td></td>
</tr>
<tr>
<td></td>
<td>density control of not less than 90%.</td>
<td>introduced as New Item</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Providing and laying filter media consisting filter fabric and 200 &amp; 250 mm</td>
<td>Included as a new item to meet field requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thick 20 mm down graded coarse aggregate, lead up to 50 m for aggregate and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>all lifts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Providing and constructing rockfill casing with graded stones and spalls</td>
<td>Included as a new item to meet field requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>available in dump yard.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Dismantling, shifting and re-erecting mechanical concrete paver and DG set</td>
<td>- do -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>etc complete with all leads and lifts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Drilling 32 mm dia pressure relief hole etc.. complete with all leads and</td>
<td>Included as a new item to meet field requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lifts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**27.3.4** While formulating the detailed specification and data rate under this chapter the following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

**27.3.5 Type of Machinery considered:**

- Air compressors of different capacity both electrical and Diesel
- Angle Dozer 90 hp capacity
- Batching Plant 2 X 1 cum capacity
- Diesel Generating set 30 KVA and 50 KVA
- Diesel Road Roller
- Concrete Paver
- Shovel of 0.5 and 0.85 cum capacity
- Transit mixer 2 cum capacity
- Vibratory Pad foot roller
- Tipper 5 cum capacity
- Water tanker 8000 ltrs.capacity

### 27.4 CANAL, CD WORKS:

#### 27.4.1
The previous S.R.C. had finalised 54 items under this chapter. The present committee has recommended 53 items. Some of the old items have been either omitted or have been shifted to different appropriate chapter. A statement shown below indicates the changes incorporated in the present schedule of rates under this chapter.

#### 27.4.2 Modification/Transfer of the Existing Items:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.in The previous S.R.C’s Report</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (a) &amp; (b)</td>
<td>Cleaning and grubbing heavy jungle</td>
<td>Shifted to P &amp; M works vide item 1(b) &amp; 1 (a) respectively</td>
</tr>
<tr>
<td>2</td>
<td>2 (a, (b), (c) &amp; (d)</td>
<td>Grubbing of stumps</td>
<td>Shifted to P &amp; M works vide item 2 (a) 2 (b), 2c) &amp; 2 (d)</td>
</tr>
<tr>
<td>3</td>
<td>4 (f)</td>
<td>Cutting the trees for every point 5 M increase in girth beyond 3 M</td>
<td>Shifted to P &amp; M works vide Note under item No.5(f)</td>
</tr>
<tr>
<td>4</td>
<td>5 (b)</td>
<td>Excavation for foundation in ordinary soil with dewatering</td>
<td>Deleted due to inclusion of dewatering in the corresponding item in the new S.R.</td>
</tr>
<tr>
<td>5</td>
<td>53</td>
<td>Providing erecting, striking of centering and removing</td>
<td>Deleted since scaffolding and centering is now included in the Basic Data</td>
</tr>
<tr>
<td>6</td>
<td>53 (b)</td>
<td>Providing erecting striking of centering and removing the materials with country wood/plywood/planks</td>
<td>- do -</td>
</tr>
</tbody>
</table>
27.4.3 While formulating the detailed specification and data rate under each chapter the following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

27.4.4 Type of machinery considered:

- Aircompressor 8.5. cmm capacity (diesel)
- Bending machine
- Diesel Road Roller 8 –10 capacity
- Mobile Crane
- Shovel .5 cum capacity
- Water Tanker 8000 ltr capacity

27.5.0 TUNNEL & ALLIED WORKS:

27.5.1 The previous S.R.C. had finalised 17 items under this chapter. The present committee has recommended 21 items. Some of the old items have been either omitted or have been shifted to different appropriate chapter. A statement shown below indicates the changes incorporated in the present schedule of rates under this chapter.

27.5.2 Modification/Transfer of the Existing Items:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.in The previous S.R.C’s Report</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>Providing and filling CC 1:5:10</td>
<td>Deleted since minimum grade of concrete stipulated in IS is M 15</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>Clearing the grout holes with water under pressure</td>
<td>Deleted since the new item includes cleaning with water</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>Providing &amp; fixing rock holes</td>
<td>Incorporated as new item 9 &amp; 10 by modifying the specification</td>
</tr>
</tbody>
</table>
27.5.3 NEW ITEMS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Excavation for vertical/inclined shafts</td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>Dewatering tunnel by pumping out water collected by natural drainage</td>
<td>- do -</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>Providing 25 mm thick guniting to sides and arch of tunnel</td>
<td>- do -</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>Providing and fixing 25 mm dia steel rock bolt with resin bond cement etc...complete</td>
<td>- do -</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>Drilling 75 mm dia drainage holes</td>
<td>- do -</td>
</tr>
</tbody>
</table>

27.5.4 While formulating the detailed specification and data rate under this chapter the following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

27.5.5 Type of machinery Deployed:
- Agitator car truck mounted
- Air compressor 15 cmm/hour 8.5 cmm capacity (ele)
- Bending machine
- Batching plant 2x1 cum capacity
- Concrete placer pump
- Muck Conveyer
- DG set 30 KVA capacity
- Diesel loco 45 hp capacity
- Dumper/Tipper 5 cum capacity
- Grout pump
- Guniting equipment
- Pump 10 hp capacity (ele)
- Pump 20 hp capacity (ele)
- Pusher leg
- Tipper tub 1.5 cum capacity
- Transformer 250 KVA capacity
- Winch 35 hp capacity electric
- Drilling jumbo

27.6 GATE & ALLIED WORKS:

27.6.1 This is a new chapter included in the schedule of rates. The guidelines issued by C.W.C. has been followed in preparing detailed specifications. The Committee noted that the CWC guidelines provide for adopting different percentages on the weight of the gate in
respect of welding, transportation, cutting, turning, drilling, erection, etc. Estimates prepared on the basis of these guidelines when such work is tendered, the rates quoted by the firms are very much on the lower side. In order to prepare a realistic data rate on scientific basis, the help of Sri B.V. Ramakrishnaiah, a Design Experts on this subject and Sri Ramachandran, representing M/s. Kerala Electrical, Engineering and Allied works, a reputed gate manufacturing firm were availed by the S.R. Committee. The drawings for (Radial/Vertical gates) hoists, barrages, canal sluices, etc. manufactured and used in the on-going works were studied in detail. The empirical formula used for estimating the weight is also furnished in the data rate. Depending up on the size of gate, the weight component has to be arrived using the said formulae. For details, the data rates worked out for different items can be perused.

27.6.2 For the first time, the S.R. Committee has attempted to prepare detailed specifications and prepare data rate on scientific basis. There is room for improvement and for fine tuning the specifications and the data rates.

27.6.3 While formulating the detailed specification and data rate under each chapter the following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

27.6.4 Type of machinery Deployed:

- Tower Crane
- Mobile Derric Crane
- Stationary Derric Crane
- Bending Machine
- Planing Machine
- Shearing Machine
- Welding Transformer
- Pug Cutting Machine

27.7 PRELIMINARY & MAINTENANCE WORKS:

27.7.1 The previous S.R.C. had included items covered under this chapter under different chapters. The present committee has decided to have a separate chapter and accordingly recommended 36 items. A statement shown below indicates the new items incorporated in this chapter.
### NEW ITEMS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item No.</th>
<th>Brief specification of the Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (a)</td>
<td>Cutting &amp; removing jauliflora up to 1.50 m girth lead up to 50 m and all lifts</td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>2</td>
<td>4 (b)</td>
<td>Cutting and removing jauliflora above 1.50 m up to 3.00 m lead up to 50m and all lifts</td>
<td>- do -</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>Cutting and disposing off Apu/Jondu from marshy areas as directed with initial lead up to 50 m and all lifts</td>
<td>- do -</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>Excavation for trial pits/borrow pits in all kinds of soil including boulders up to 30 m lead up to 10 m and lift up to 1.50 m</td>
<td>- Included as a new item to meet field requirements of investigation works</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>Earthwork excavation for trial pits/borrow pits in soft rock with lead up to 10m and lift up to 1.50 m</td>
<td>- do -</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>Conducting geophysical investigation studies by electrical resistively …..etc. complete</td>
<td>To introduce new technology for correctly assessing the underground strata to facilitate correct classification of soil, this item is introduced</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>Drilling 80 mm dia hole through over burden …etc. for depth up to 30 m from surface</td>
<td>To correctly assess the soil classification for deeper excavations this item is introduced</td>
</tr>
<tr>
<td>8</td>
<td>23</td>
<td>Providing impervious hearting for breached/damaged portion of embankment with soil from approved borrow areas etc..complete with initial lead upto 1 km and all lifts.</td>
<td>To carry out emergency operations under breached conditions this item is introduced</td>
</tr>
<tr>
<td>9</td>
<td>24</td>
<td>Providing pervious/semi-pervious casing for breached/damaged portion of embankment with soil from approved borrow areas…etc complete with initial lead upto1 km and all lifts.</td>
<td>- do –</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>-----------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>25</td>
<td>Providing impervious hearting breached/damaged portion of embankment with soil from approved dump areas etc.. complete with initial lead up to 1 km and all lifts.</td>
<td>- do -</td>
</tr>
<tr>
<td>11</td>
<td>26</td>
<td>Providing pervious/semi-pervious casing for breached/damaged portions with soil from approved dump areas ....etc. complete lead up to 1 km and all lifts.</td>
<td>- do -</td>
</tr>
<tr>
<td>12</td>
<td>28</td>
<td>Cleaning drainage gallery, adits, instrumentation galleries, etc. complete with all leas and lifts.</td>
<td>Included as a new item to meet field requirements</td>
</tr>
<tr>
<td>13</td>
<td>29</td>
<td>Cleaning dam parapet inner face and top using oxalic acid… etc. complete</td>
<td>- do -</td>
</tr>
</tbody>
</table>

27.7.3 While formulating the detailed specification and data rate under this chapter the following machinery have been considered. To match the output of these machinery, the cycle time of supporting machinery, requirement of labour, etc. have been worked out on scientific basis. Full details are furnished in the data rate of the respective item.

27.7.4 Type of Machinery Deployed:

- Air compressor 7 cmm /hour capacity (diesel)
- Core drilling machine
- Diesel road roller
- Electric resistivity meter with accessories
- Sand blasting equipment

28.0 FINALISATION OF REPORT, FORMAT FOR RATE ANALYSIS AND DATA RATE:

28.1 Based on the guidelines recommended by the S.R. Committee for the preparation of the schedule of rates and data rate and based on the recommendations on the other Terms of References made to it, the S.R. committee has finalised its report. The report runs into IV Volumes under the below mentioned captions.

1. Executive Summary   }   : Vol. I
2. Recommendations on Terms of References   }   : Vol.II
4. Format for Schedule of Rates   : Vol.IV
5. Format for Data Rate   : Vol.IV
28.2 COMMON SCHEDULE OF RATES & DATA RATES FOR THE YEAR 2003-2004:

1. **Common Schedule of Rates** for the year **2003-2004** applicable for the **ENTIRE STATE**.

2. **Data rates** for the common Schedule of Rates of **2003-04**

   i) Basic Data, Hire charges and Lead charges : Part I  
   ii) Dam and Allied works : Part II  
   iii) Canal and Allied works : Part III  
   iv) Canal and CD works : Part IV  
   v) Tunnel and Allied works : Part V  
   vi) Gate and Allied works : Part VI  
   vii) Preliminary and Maintenance works : Part VII

28.3 OTHER USEFUL INFORMATION:

28.3.1 The S.R. Committee has consolidated all the proceedings of its 55 deliberations into two Volumes (Volume I contains proceedings of meeting 1 to 28 and Volume II contains the proceedings of the meetings 29 to 55).

28.3.2 A separate volume is compiled to include Government Orders, Circulars, Notifications, relevant Act and Rules issued by Government from time to time which are referred and used in the preparation of report by the S.R. Committee. This volume also contains the list of Experts, Organisations contacted, Equipment manufacturers, material suppliers, interacted by the S.R.Committee, the list of books and publications referred and used by S.R.C. etc. These documents are available in the office of the Superintending Engineer, Monitoring & Evaluation, Bangalore for future reference.

29.0 ROOM FOR IMPROVEMENT:

The S.R. Committee feels that the philosophy followed by the committee, the methodology adopted, the Guidelines formulated for the preparation of schedule of rates, the formats developed for schedule of rates and data rate will be useful to the Department. Since this is the first time such an exercise has been undertaken for preparing the schedule of rates using machinery there is always room for improvement.
30.0 ACKNOWLEDGEMENT

The S.R. Committee is grateful to Government of Karnataka and to Sri H.K. Patil, Hon’ble Minister for Water Resources and Sri S.J. Channabasappa, Secretary, Water Resources Department for constituting the Committee to Review and Standardise the Schedule of Rates pertaining to Irrigation Zone.

The Committee is very much thankful to Sri B.S. Mallapur, (Retd. Chief Engineer, Karnataka Power Corporation Limited), Special Invitee to the S.R. Committee for his invaluable contribution for analysing, preparing and computerising the data for the S.R. Committee.

The Committee is very much thankful to Dr. R.L. Gupta, Director, Dr. P.C. Jha, Scientist of N.I.R.M., K.G.F., and Prof. V.R. Sastry of K.R.E.C., Surathkal for their valuable suggestions to the S.R. Committee in finalising data for “Excavation Items”.

The Committee would like to thank very much to Sri B. V. Ramakrishnaiah of M/s. R.K. Engineers, Bangalore and Sri Ramachandran of Kerala Electrical & Allied Engg. Company, Cochin for valuable suggestions to the S.R. Committee in finalising data for “Gate/Hoists & Allied Works.”

The Committee would like to thank all the Subject Experts, Institutions, Industries associated in this mammoth work for giving full cooperation to the S.R. Committee.

The Committee would like to thank the Superintending Engineer, Monitoring & Evaluation and staff for giving full cooperation in arranging meeting and preparing the Committee Report.

(H.V. ESHWARAIAH) Retd. Technical Director, KPCL.

(Dr. B.R. SRINIVASA MURTHY) Professor, I.I.Sc., Bangalore

(V.H. PATIL) Retd. Engineer-in-Chief

(V.G. KAJAGAR) Retd. Chief Engineer

(G.A. METI) Retd. Chief Engineer

(K.K. MALPANI) Secretary, K.S.C.A.

(M.M. MANJUNATH) S.E., M & E (I/C) and Member Secretary

(CAPT. S. RAJA RAO) CHAIRMAN.