

Confidential

GOVERNMENT OF PUNJAB

PUBLIC WORKS DEPARTMENT

Buildings and Roads, Irrigation, Public Health  
Branches and Capital Project

EXPLANATORY MEMORANDUM

ON

THE COMMON SCHEDULE OF RATES

1962

(2ND EDITION, 1983)

(For Official use only)



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## PREFACE

In 1953, a Committee comprising of one Superintending Engineer each from the Buildings and Roads, Public Health, Irrigation and Electricity branches called "The Works Rates Committee" was appointed by the Punjab Government at the instance of Finance Department to prepare Common Schedule of Rates and also to give their recommendations regarding the method of execution of works in the various Branches of P.W.D. The Finance Secretary to Government, Punjab, convened a meeting of the Chief Engineers of all the branches and the Chief Accounts Officer and the Deputy Accountant-General, Bhakra-Nangal Project, to consider the report of the Works Rates Committee. In this meeting which was held at Chandigarh on 14th January, 1959, it was decided to create a cell consisting of a selected Superintending Engineer and one Executive Engineer from each of branches of the P.W.D. to prepare Common Schedule of Rates with detailed analysis of every item and also to draw the specifications for all the items included in this Schedule. As a result of this decision, the Schedule of Rates Cell was created under the administrative control of Chief Engineer, Buildings and Roads Branch, with headquarters at Patiala.

This cell has completed its work and the Common Schedule of Rates prepared by the Cell has been approved by the Committee of Direction of Chief Engineers of Buildings and Roads, Irrigation and Public Health Branches, the Chief Engineer, Capital Project and the General Manager of Bhakra and Beas Dam project and it is being published in four volumes.

The Common Schedule of Rates will be enforced in the field from 1st July, 1962. The works which have been let out on codal contracts on the basis of old schedule of a Department will continue on the same basis till their completion. But in case of works which are likely to commence near about 1st July, 1962, tenders will be invited on the basis of Common Schedule of Rates. The work orders which are in force on 1st July, 1962, should not be cancelled, but the works should be allowed to proceed on the old rates.

This explanatory memorandum should be studied carefully by all concerned as it explains all the salient features of the Common Schedule which has been prepared on a basis different from the previous schedules in many ways.

A Handbook of Specifications has also been prepared by the Schedule of Rates Cell, which will also be published shortly. The date of enforcement of the revised specifications will be decided after the publication of the Handbook. Meanwhile, the existing specifications of respective branches will continue to apply. The contractors should also be pressed to purchase and study a copy of the Handbook of Specifications.

All the labour and through rates given in the Common Schedule have been based on detailed analysis of each item of work. These analysis have also been printed separately for official use only. Care must be taken by the departmental officers to keep the analysis of rates strictly confidential and not to divulge the same to the contractors.

After the Common Schedule of Rates has been enforced, it may be necessary to issue some amendments or clarifications. This authority will rest finally with the Committee of Direction of the Chief Engineers.

The following whole-time officers worked in the Schedule of Rates Cell for periods noted against each :—

- (1) Shri H. C. Malhotra, P.S.E.I., Superintending Engineer, Buildings and Roads Branch, from 15th April, 1960 to 31st March, 1962.
- (2) Shri Ram Bilas, Executive Engineer, Buildings and Roads Branch, from 11th November, 1959 to 25th April, 1960.
- (3) Shri B. S. Mathur, Executive Engineer, Buildings and Roads Branch, from 25th April, 1960 to 31st March, 1962.
- (4) Shri Karta Krishan, Executive Engineer, Irrigation Branch, from 16th September, 1960 to 10th November, 1960.
- (5) Shri Saudagar Singh Beins, Executive Engineer, Irrigation Branch, from 11th November, 1960 to 30th April, 1961.
- (6) Shri H. K. Khosla, Executive Engineer, Irrigation Branch, from 30th April, 1961 to 31st March, 1962.

The following officers worked as part-time members of the Cell and helped the Cell in the finalisation of Schedule of Rates and Analysis :—

- (1) Shri T. C. Puri, Deputy Chief Accounts Officer, Bhakra Dam.
- (2) Shri L. M. Chaudhry, Executive Engineer, Public Health Branch, Patiala.
- (3) Shri N. S. Sodhi, Executive Engineer, Capital Project.
- (4) Shri L. R. Grover, Executive Electrical Engineer, Buildings and Roads Branch.

- (5) Shri M. L. Sharma, Executive Engineer, E. & M., Capital Project.
- (6) Shri S. B. Bhalla, Executive Electrical Engineer, Buildings and Roads Branch.
- (7) Shri H. S. Puri, Executive Engineer, Public Health, Capital Project.

Among other staff, the Schedule of Rates Cell was given valuable assistance by Shri Suraj Parkash, Head Draftsman, Class I (Buildings and Roads Branch).

While drawing up analysis of rates and the Schedule, reference has been made to Analysis and Schedules of Rates published by Central P.W.D., M.E.S., Northern Railways and other State P.W.Ds.

Issued by the authority of  
 of  
 The Committee of Direction  
 of  
 Chief Engineers,  
 Public Works Departments.

The following officers worked in the Schedule of Rates Cell for periods noted against their names:-

(1) Shri H. C. Mahapatra, P.S.A., Superintending Engineer, Buildings and Roads Branch, from 1st April, 1959 to 31st March, 1961.

(2) Shri K. M. Singh, Executive Engineer, Buildings and Roads Branch, from 1st November, 1959 to 31st April, 1960.

(3) Shri B. S. Mahapatra, Executive Engineer, Buildings and Roads Branch, from 15th April, 1960 to 31st March, 1961.

(4) Shri K. M. Krishna, Executive Engineer, Irrigation Branch, from 1st September, 1960 to 31st March, 1961.

(5) Shri S. S. Singh, Executive Engineer, Irrigation Branch, from 1st September, 1960 to 30th April, 1961.

(6) Shri K. K. Khosla, Executive Engineer, Irrigation Branch, from 30th April, 1961 to 31st March, 1962.

The following officers worked as part-time members of the Cell and helped the Cell in the preparation of Schedules of Rates and Analysis:-

(1) Shri Y. C. Pathy, Deputy Chief Accounts Officer, Bharat Dam.

(2) Shri M. M. Choudhary, Executive Engineer, Public Health Branch, Capital Project.

(3) Shri K. S. Singh, Executive Engineer, Capital Project.

(4) Shri L. K. Choudhary, Executive Electrical Engineer, Buildings and Roads Branch.

COMPOSITION OF THE COMMITTEE OF DIRECTION OF CHIEF ENGINEERS  
BUILDINGS AND ROADS BRANCH

1. Shri G. C. Khanna
  2. Shri D. C. Sharma
  - Capital Project**
  3. Sh. G. R. Nagea
  - Public Health Branch**
  4. Shri Balwant Singh
  - Irrigation Branch**
  5. Shri R. L. Khanna
  6. Shri C. L. Handa
  7. Shri M. R. Chopra
  8. Shri S. N. Ravikant
  9. Shri G. S. Sidhu
  10. Shri B. R. Palta
  11. Shri Jatindra Singh
  12. Shri K. L. Bhatia
  13. Shri R. S. Gill
  14. Shri V. P. Goel
-

## GENERAL REMARKS

The Schedule of Rates Cell was constituted as a result of decision taken in the meeting of Chief Engineers with Finance Department held at Chandigarh on 14th January, 1959. The relevant portion of the minutes is reproduced below :—

“It was further decided that a Committee of Direction of Chief Engineers should be formed to spot out from the Basic Schedule of Rates common item of work, which should then be passed on to the Superintending Engineers to prepare their own Schedule of Rates, circle-wise, for items with which they are concerned and also to decide what premia should be allowed over the rates specified in the Schedule after calling for tenders. The Schedule, so prepared should invariably be communicated to the Chief Engineers six monthly for review. It was further considered that a Cell consisting of a selected Superintending Engineer and one Executive Engineer from each Branch of the P. W. D. should be created to draw the specifications of common items of works and also to work out a comprehensive analysis of rates of such items. This Cell should work under the Chief Engineer, Buildings and Roads Branch”

According to this decision; the Schedule of Rates Cell was required to prepare the Schedule of Rates, Analysis of Rates and detailed specifications for only such items as are common to all the Branches of P. W. D. However, the Committee of Direction of the Chief Engineers decided in its meeting held on 1st July, 1960, that the Schedule should be comprehensive and should cover all the items that are met with in any Branch of the P.W.D. Although this increased the scope of work of the Schedule of Rates Cell, effort has been made to prepare as comprehensive a Schedule as possible.

The Schedule of Rates Cell has prepared not only the Common Schedule, but the Supporting Analysis of Rates and the Handbook of Specifications. All these three publications are co-related and should be referred to simultaneously for any item of work. While the Common Schedule of Rates and the Handbook of Specifications will be open for sale to public and contractors, the Analysis of Rates will be a confidential document which will be used by the departmental officers for reference purposes.

Originally it was envisaged that the Schedule of Rates Cell headed by a Superintending Engineer should be assisted in this task by one Executive Engineer from each Branch of P. W. D., while one Executive Engineer from Buildings and Roads and one from Irrigation Branch were posted in the Cell, no regular officer from the public Health Branch could be posted. One of the Executive Engineers from Public Health Branch was, however, co-opted as part-time member of the Cell. At the instance of Finance Department, the Accountant General, Punjab, and the Chief Accounts Officer, Bhakra-Nangal Project, were requested to depute one officer each to assist the Cell in this work. While the Chief Accounts Officer, Bhakra-Nangal, Project, deputed his Deputy Chief Accounts Officer, for this work, the Accountant-General, Punjab did not agree to nominate any representative as he did not want to be associated with the preparation of Schedule and Analysis of Rates. The Chief Engineer, Capital Project, however, deputed one of his Executive Engineers to assist the Cell in this work. The Schedule of Rates alongwith analysis were prepared chapter-wise and circulated among the members of the Cell, i. e. Deputy Chief Accounts Officer, Bhakra, Nangal Project, representative of Chief Engineer Punjab Public Health and representative of Chief Engineer, Capital Project. The Schedule and analysis were discussed in detail in the meetings of the Cell and finalised chapters of the schedule were put up for approval in the Committee of Direction of Chief Engineers.

Although the Irrigation Branch have been executing works at uniform rates throughout the State, the experience in the Buildings and Roads and the Public Health Branches was different. The Cell realised that the rates cannot be absolutely uniform throughout the State, as these depend upon the labour wages, the availability of labour and material and the local conditions. These factors vary from district to district and, therefore, the rates must also vary. The Schedule of Rates Cell found it impracticable to prepare separate Schedule of Rates for every zone along with detailed analysis of every item. It was, therefore, decided to have uniform rates for the plains throughout the State and to have separate rates for hilly areas. Even in plains; the rates for certain items like coarse aggregate, sand, etc. vary considerably from region to region. It was, therefore, decided to split up the area under plains in three different zones as described hereafter. Similarly in the hilly region, the rates varied considerably from place to place on account of longer carriage involved and non-availability of Labour and essential materials. The divisions of hilly region into further zones has also been described in succeeding paragraphs. The analysis of rates have been worked out for the minimum number of regions and further variation from place to place has been left to be taken care of by premium or abatement which will be fixed on the basis of tenders.

The Common Schedule of Rates is being published in four Volumes as follows :—

Volume No. I : Rates for Irrigation, Roads and Building Works for Plains.

Volume No. II : Rates for Irrigation, Roads and Building Works for hilly areas.

Volume No. III : Rates for water-supply, Drainage, Sewerage and Sanitary Installations-both for plains and hills.

Volume No. IV : Rates for Electric Installations-both for plains and hills.

The area under “Plains” has been sub-divided into the following three zones depending upon the availability of the material :—

Zone “A” : Districts of Ambala, Gurdaspur (except Dalhousie Tehsil) Hoshiarpur and Gurgaon.

Zone “B” : Districts of Amritsar, Patiala, Jullundur, Karnal, Sangrur, Ludhiana, Rohtak and Mohindergarh.

Zone “C” : Districts of Hissar, Bhatinda and Ferozepur.

The area under "Hills" has been sub-divided into the following two regions depending upon the availability of materials and labour :—

Region "A"	..	Kangra, Dalhousie.
Region "B"	..	Simla, Kulu and Mandi.

The boundaries of these areas shall be as per revenue boundaries given below :—

Kangra	..	Kangra District, excluding Kulu Civil Sub-Division.
Dalhousie	..	Dalhousie Tehsil of Gurdaspur District.
Simla	..	Simla District.
Kulu	..	Kulu Civil Sub-Division.
Mandi	..	Mandi District of H'machal Pradesh.

Preface para-page	As existing	To be read as
(i)	<p>The area under "Hills" has been sub-divided into the following two regions depending upon the availability of materials and labour-Region 'A' Kangra, Dalhousie.</p> <p>Region 'D' Simla Kulu and Mandi.</p>	<p>The area under 'Hills'/Sub-mountainous' has been sub-divided into the following three regions depending upon the availability of materials and labour :—</p> <p>(1) Region 'A' Kangra, Dalhousie.</p> <p>(2) Region 'B' Simla, Kulu and Mandi.</p> <p>(3) Region 'C' Submountainous area. "All the works in areas lying beyond the road boundary on the North Eastern side of Ropar-Balachaur-Garhshankar- Hoshiarpur/Dasuya-Mukerian- Pathankot Road upto the border of Jammu and Kashmir except area included in Regions A &amp; B as above.</p> <p><i>Note</i> :—The above noted additional Region 'C' has been created purposes of fixing ceiling premium for this region separately by the Zonal Committees. However basic rates to be adopted in this region will be the same as mentioned for region 'A' in C.S.R. Vol. II.</p>
(ii)	<p>Zone 'A' District of Ambala, Gurdaspur (except Dalhousie Tehsil) Hoshiarpur, Gurgaon, Delhi.</p>	<p>Zone 'A' Districts of (i) Ambala</p> <p>(i) Ropar (except area as lying beyond the road boundary on the North-Eastern side of Ropar-Balachaur, Garhshankar, Hoshiarpur Dasuya-Mukerian, Pathankot Road upto the border of Jammu and Kashmir State).</p> <p>(ii) Gurdaspur (except Dalhousie Tehsil and areas lying beyond the road boundary on the North-Eastern side of Ropar, Balachaur, Garhshankar, Hoshiarpur- Dasuya- Mukerian Pathankot road upto the border of Jammu and Kashmir State).</p> <p>(iv) Hoshiarpur (except area lying beyond the road boundary on the North-Eastern side of Ropar, Balachaur-Garhshankar, Hoshiarpur, Dasuya-Mukerian Patnankot, Road upto the border of Jammu and Kashmir State).</p> <p>(v) Gurgaon.</p> <p>(vi) Delhi.</p>

The Common Schedule of Rates does not cover the area of Lahaul and spiti district.

The Common Schedule of Rates takes into account the current market prices of labour and material. However, there can always be variations in the market prices of materials and the wages of labour can also fluctuate with time and with locality. The Common Schedule of Rates will, therefore, work with either premium or abatement depending upon the working conditions and the locality. The power to fix premium abatement over the Common Schedule of Rates for a particular zone will vest in the Committee of Superintending Engineers of all the branches of that zone. One of the Superintending Engineers of the Buildings and Roads Branch in a zone, nominated by Chief Engineers, Buildings and Roads Branch, will act as the convenor of such a Committee. These Zonal Committees will meet every six months to review the position on the basis of actual tenders received in the previous six months. The first review after the enforcement of the Common Schedule shall be made by the Committee of Direction of Chief Engineers on the recommendations of the zonal committees of Superintending Engineers but all the subsequent review shall be made by the zonal committees.

In case of following special areas, premia at the rates given below will be allowed over and above the premium or abatement fixed for the zone mentioned against each area :—

(a) Hamirpur Tehsil	..	5 per cent above Kangra rates.
(b) Manali-Naggar-Banjar area on left bank of river Beas.	..	5 per cent above Kulu rates.
(c) Ani and Outer Seraj area	..	15 per cent above Kulu rates.
(d) Manali to Rahla	..	Ditto
(e) Rahla to Rohtang Pass	..	20 per cent above Kulu rates.

The Common Schedule of Rates is applicable to the normal construction and maintenance works to be executed by the various Branches of the State P. W. D. The rates given in this Schedule are for normal construction and maintenance works. For concentrated works, big projects, specialised and emergent works, separate rates may be determined by the Chief Engineer of the Department concerned.

In Volumes I and II labour rates as well as through rates have been shown against each item so that the Schedule can be used without difficulty both by Irrigation and Buildings and Roads Branches. The through rates given in these volumes are not applicable to Irrigation Branch where the distances for carriage of materials vary considerably and the average lead of three miles does not hold good. For Irrigation Branch through rates will be worked out in each individual estimate, for items of work given in the estimate on the basis of actual distance of carriage involved. To facilitate the preparation of Analysis of Rates and to enforce uniformity in this respect, the analysis of all the items included in the Common Schedule of Rates have been prepared both for labour and through rates and these have been printed separately for reference by the departmental officers.

In Volume III, which pertains to Public Health Branch, only through rates have been given as the Public Health Branch executes work on through rate basis. In Volume IV, which pertains to electrical works, mostly through rates have been given, but for certain items which are normally executed on labour rate basis, only labour rates have been given.

The labour rates for various items of work include handling of materials within three chains, while the through rates include all rehandling of materials at the site of work and no payment, is due to contractors on this account. The through rates also include the wastage or breakage of various materials during construction. Unless specified to the contrary, the labour rates include the cost of water, tools and plant, labour and material for scaffolding and cost of good earth for mud mortar, wherever required.

The through rates given in the common Schedule include the entire carriage irrespective of the lead of materials like timber, bajri, stone, sand, etc., which have to be arranged by the contractor. Nothing is payable over and above the Schedule Rates for carriage of such materials, the only exception being the building stone. In case of plains stone masonry will be specified only in such areas where stone is available. If stone masonry has to be done, for architectural reasons in areas, where stone is not available extra payment for carriage will have to be made. In case of hilly areas, the through rates include cost of stone within a lead of one mile. In case the lead is more than one mile, payment for carriage of subsequent miles will be made. Rates of dry stone masonry in retaining walls, etc. include carriage less than one mile even and these item should be studied carefully along with relevant notes. For such materials like cement, steel, etc., which are issued from Government stores and for bricks the through rates include all carriage from kilns or from Government stores to the site of work, irrespective of the distance when work is situated within municipal limits or within one mile periphery of municipal limits. If the work is situated in rural areas or is away from the towns or outside one mile periphery of municipal limits, the through rates include the carriage of bricks, cement, steel etc., within a radius of 3 miles of the site of work, and in case of extra lead beyond this limit, carriage is payable at the rate provided in the schedule for the corresponding subsequent miles.

The through rates include all octroi charges, toll tax, sales tax and other local taxes, etc., paid by the contractors in bringing the materials to the site of work.

For the execution of works in villages and other isolated works not on main roads and involving the use of skilled labour and costing up to Rs. 1,00,000/- premium of 10 per-cent may be allowed over and above the premium or abatement and fixed for the zone concerned.

Where the description of any item is too long, the essential portion has been printed in either capital letters or in antique (thick) letters. Only such essential portion need to be written in estimates, tenders contracts and measurement books, although it will deem to cover the entire item as described fully in the Schedule of Rates. Where the description is only in one type of letters, it should be repeated as a whole.

## CHAPTER No. 1—Daily wages

Daily wages of labour have been provided according to present day prevailing rates. All classes of labour which are likely to be employed in any branch of the Public Works Department have been included in this chapter. In cases of certain categories, daily labour wages have been increased so as to be in conformity with the latest notification No. 1153-3-LAB-II-60/5706, dated 1st March, 1960, issued by the Labour and Employment Department under the Minimum Wages Act. The rates given in this chapter are primarily for the analysis of rates and take into account one paid holiday allowed to labour under the Minimum Wages Act and no additional cost on this account is to be provided over and above these rates. For employment of departmental labour on muster rolls, the rates given in this chapter may be considered as maximum rates up to which the Executive Engineer can authorise employment of labour. If the prevailing rates in a certain locality are lower than the ones given in this chapter, the Executive Engineer will authorise employment at the prevalent and not at the Schedule rates. On the other hand if in a certain locality prevailing conditions necessitate payment on higher rates the Superintending Engineer shall increase the rates suitably up to a maximum of 50 per cent above the schedule rates. This increase in rates shall be for a specific period not exceeding six months after which the rates shall be reviewed and revised downwards, if the conditions so warrant. The Chief Engineer of a branch shall have full powers to authorise any increase in the labour wages for departmental work for any length of time in any particular locality. In case of departmental labour, if weekly paid holiday is to be allowed to labour, the schedule rate for each class of labour shall be reduced by 1/7th.

## CHAPTER No. 2—Monthly Wages

All classes of work-charged establishment which are likely to be employed in any Branch of the Public Works Department have been included in this chapter except some special type of staff which is needed for specialised projects like Bhakra Dam and Beas Dam. For these projects separate schedules for the employment of work-charged establishment on monthly wages shall be issued by the project authorities concerned. This chapter has been sub-divided into parts according to nature of work, i.e., mechanical, electrical, civil engineering etc. The grades of pay provided are according to sanctions issued by Government from time to time in case of Public Works Department or in case of Bhakra Dam Project. The monthly wages for the work-charged staff have been revised in certain cases in view of increase notified by the Labour and Employment Department under the Minimum Wages Act. For each class of establishment fixed rates of pay have also been given for the employment of apprentices or assistants who can with experience take over independent charge of duties. The grades of pay given in this chapter are exclusive of the dearness allowance and other special allowances which will be admissible over and above these rates according to Government orders issued from time to time.

These Scales of pay have been provisionally approved by the Finance Department and are subject to such further Government orders as are issued from time to time.

## CHAPTER No. 3—Materials

In this chapter rates have been given for such classes of material which appear in the Analysis of Rates for the Common Schedule of Rates. These rates are shown for the purposes of analysis and not for the obtaining supplies from the market. The supplies will be obtained either by placing orders with the Controller of Stores or by calling tenders as may be required under the rules and orders in force.

In case of bricks and tiles, the rates for supply shall not be more than the Controlled rate fixed by the Deputy Commissioner of the respective districts. The rates for these items as given in the Schedule include the cost of land and water. Sometimes land and water are given free of cost as in case of canal lining works in Irrigation Branch. In such cases the rates shall be suitably reduced.

The rates of various items have been provided in this chapter after ascertaining the same from the market or from various Executive Engineers in the State and in certain cases even from suppliers. The rates as provided are according to the existing market conditions except in case of cement, the rate of which has gone up while the Schedule was under print. This increase in the cost of cement will be reflected in the premium over the Schedule rates. Wherever items of stores are on rate contract issued by the Controller of Stores or D. G. S. & D., the same has been adopted in this chapter.

Most of rates given in this chapter are at the source of supply and do not include carriage to the site of work or Public Works Department Stores. Wherever any departure from this practice has been made, it has been specifically mentioned in the description of the item.

The rate of cement provided in this chapter is for the purposes of analysis and not for fixing issue rate which may be fixed by the Executive Engineer after taking into account the actual lead from the railway station and the bill suppliers. During the course of fixing rates of materials, the Schedule of Rates Cell discovered that the issue rates as fixed in the various divisions are very much on the high side. There is a tendency to work out the cost of material and then to add a substantial factor to cover any possible losses on stock. In actual practice such losses do not take place and the rates of materials are unnecessarily inflated. These inflated issue rates result in profit on stock which goes to general revenue and the cost of works executed by Public Works Department increases unnecessarily. It is suggested that the Executive Engineer may personally check the actual cost of important materials in their stores and should fix realistic issue rates.



The rates for stone, bajri, concrete, sand, etc., include royalty and malkana and nothing extra is payable over and above the rates for these items. The Finance Department and Audit were of the view that the royalty and malkana should not be included in the rates of materials as contractors usually do not pay anything to the owners but receive payment therefor. They suggested that the royalty and malkana should be excluded from the rates payable to contractors and it should be stipulated that payment for these should be made on the production of receipts by the contractors. After a good deal of deliberations the Cell decided to include the royalty and malkana in the rates for these materials because of the following considerations:—

In most of the cases the quarries for stone, bajri, sand, etc., are taken on lease by quarrying contractors who pay the royalty and malkana. These contractors sell the collected materials to the construction contractors as a finished product for use on buildings, roads and other engineering works. When the contractors do not operate the quarries themselves, but purchase the materials as a finished product from quarrying contractors, they cannot be expected to produce the receipts for royalty, etc., although the same has been included in the rate charged by the quarrying contractors. The rates of royalty as provided in the Schedule are according to the latest rates fixed by Revenue Department under the Mines and Minerals (Regulation and Development) Act, 1957.

The rates for structural steel provided in this chapter are for untested steel. In case of tested steel the rates are to be increased by Rs. 2.25 per cwt.

*Paints:*—In case of paints, two classes of rates have been provided—firstly for special quality paints and secondly for ordinary quality paints. The paints which are available on the rate contract of the Controller of Stores, Punjab, come in the ordinary quality. The Special quality paints will be those which have been approved as such by the Chief Engineer of the Branch concerned. Normally in this category will be included specialty paints which have been manufactured by firms of long standing and repute whose products have proved to be of special quality by actual use on some works. Special quality paints shall be used only when these are specially provided in the technically sanctioned estimates.

*Measurements of materials:*—While making measurements for supply of materials like boulder, aggregate, etc., suitable deduction shall be made to account for voids in loose stacking as mentioned in the relevant specifications of materials given in chapter No. 3 of the Handbook of Specifications.

#### CHAPTER No. 4—Rates for Loading and Unloading of Materials

The rates for loading and unloading of materials have been based after taking into consideration the following factors:—

- (a) The rates which are actually being charged by the labour for loading and unloading in the field.
- (b) Time spent in loading or unloading of a particular material.
- (c) Unloading of material is easier than loading because in the latter case the labour has to work against the gravity; while unloading of materials—like mild steel, timber, stone, etc., they have just to be thrown down from the wagons or trucks and in case of materials—like sand, bajri, stone, metal, etc., they have just to be pushed with rakes. It is, therefore essential that in case of such materials the rate for unloading should be lower than the one for loading.

The bricks and tiles shall be properly stacked in vehicles while loading and when unloading, these shall be directly placed in stacks and not dumped on the ground and then stacked. In case of bricks and tiles, nominal sizes have been mentioned in the Schedule of Rates. In the book of specifications certain tolerances have been provided for these materials. Variation in sizes within these tolerances will be ignored for the purposes of loading, unloading and carriage of these materials.

In case of loading and unloading of shuttering materials, the rate has been provided per truck or per wagon load and not by measurement of actual cubical contents of measurements of every piece of timber in case of shuttering will involve considerable labour.

Lead for loading into wagons or lorries or boats has been specified as 50 feet. If the lead involved is more than 50 feet, additional lead will be paid for at carriage rates. For unloading, provisions has been made for clearing the materials 5 feet away from the rails or 20 feet away from wateredge.

Rates for stacking of certain class of materials have also been provided in the chapter. These rates include the maximum lead of 50 feet. If greater lead is involved, carriage rates will be paid for additional lead. The rates for stacking bricks and tiles are only to be paid when dumped materials are to be stacked. This rate of stacking is not payable over and above the rate for loading, unloading or for carriage because the latter rates include the provision for stacking as well.

While recording measurements for loading, unloading or stacking, suitable deduction shall be made to account for voids in loose stacking according to factors mentioned in the relevant specifications of materials as given in Chapter No. 3 of the Hand book of Specifications.

## CHAPTER No. 5—Carriage

The materials have been divided into certain groups which have been formed on the basis of units of measurement, time and labour involved in loading and unloading. Such materials as are measurable in the same units and which require the same labour and time for loading and unloading have been grouped together. The rates for carriage include the labour for loading, unloading and stacking for the purposes of measurement. Where material is unloaded from wagons and then carried, separate payment shall be made for unloading the material from wagons.

Provision for extra payment of 23 per cent over and above the basic rates of the mile concerned has been made for carriage of materials on river/choe beds. This extra payment will be made for the actual length involved in river or choe bed. For example, if stone boulder is being carried and there is a river or choe bed half a mile wide in the 4th mile, an additional rate of 23 per cent will be allowed on Re (11.30—9.75) or on Re. 0.78 n.p.

For carriage of materials on unmetalled roads, 20 per cent extra will be paid on the basic rates of the mile/miles concerned for the actual length of unmetalled road. If some material is being carried and the whole of mile 4 and half of mile 5 is unmetalled, 20 per cent extra will be allowed on the carriage rate for mile 4 and on half the carriage rate for mile 5. This additional rate for unmetalled roads will not be payable on items 5.2, 5.3 and 5.4 which are for carriage of small consignments or carriage by mazdoors, donkeys, mules, camels or carts.

In case of carriage of materials by road transport, the cost of carriage for the initial miles is comparatively much higher than the subsequent miles. For very long leads, the rate for subsequent miles decrease very much. It will, therefore, be incorrect to apply the rate of 6th or 7th mile for the carriage of 100 miles or so. In order to obviate the chances of any over-payment in case of carriage by road transport for very long leads, the applicability of the rate for subsequent miles has been limited to the 40th mile. This limit has been fixed after comparing the cost of carriage by road transport with the cost of carriage by rail. The railways charge the same rate for all leads below 25 miles. Some extra expenditure is then incurred on carriage of material from source to the despatching railway station and from receiving railway station to the site of work or godown. Extra expenditure has also to be incurred for loading into wagons and unloading from the same. In case of carriage by road transport, the material is loaded from the source and it is unloaded at the site of work or at godown and it does not require rehandling. Taking all these factors into account it has been found that on the whole carriage by road is cheaper than carriage by rail when the lead involved is about 40 miles. The purpose of note (IV) in the beginning of chapter No. 5 on "Carriage" is not to prohibit the carriage of material by road transport for leads greater than 40 miles, but to prohibit the applicability of rates for subsequent miles given in the Schedule to leads longer than 40 miles. In certain cases it should be cheaper, more expedient and convenient to carry materials by road transport than by rail. This is specially so when the private carriers on their return journey can get some other commodity from the market to carry back. The carriage by road transport beyond 40 miles should not, therefore, be prohibited, but it should be allowed only on competitive rates which should be fixed by calling tenders in individual cases. It will be found, in many cases, cheaper to carry materials by road than by rail. Where, however, carriage rates by road are costlier than carriage by rail, such a course should be resorted to only in the following cases :—

- (a) When materials like machinery or fittings are to be carried which are likely to be damaged if handled roughly during transit by rail.
- (b) When special materials classified by the Superintending Engineer as being of fragile nature are to be carried.
- (c) When due to urgency of work and anticipated delay in arranging wagons, it is considered essential to resort to carriage by rail with the prior approval of Superintending Engineer.

Note :—Wherever Government transport is available, the carriage of materials should not be done through contractors unless it is found that—

- (i) Government transport cannot be employed on account of terrain or the locality,
- (ii) it is uneconomical to use Government transport or
- (iii) Government transport is not adequately available.

In case of carriage by boats, same rates shall be paid as for carriage by road.

The rates for carriage of materials also include the carriage of containers in which the materials are contained. For instance, if 100 tons of bitumen are carried in 45 gallon drums, the net weight of bitumen will be 100 tons and the weight of the drums will be over and above this weight. Nothing extra will be paid for the weight of bitumen drums which are supposed to be carried in addition to the bitumen within the same rate.

In case of carriage of steel, sometimes the length of sections is more than 20 feet which cannot be easily accommodated in the body of a truck. If the material is mild steel bars, the same should be bent so as to accommodate them in the truck. The rate of Rs. 2.50 per ton for such bending has been provided as per item No. 5.8. In the past this item of work has been paid in some Sub-Divisions on the rates

for bending of steel re-inforcement for R. C. C. works. This wrong practice has been objected to by the Audit and should be avoided by all concerned. In case of steel sections like R. S. Joists, rails, which cannot be easily bent, the same may be carried by making special arrangements like trailers, etc., in which case the rates for carriage as given in the Common Schedule of Rates may be increased by 50 per cent.

Where a river is to be crossed by ferry or boat bridge, the loaded trucks cannot be carried across and they have to be unloaded to some extent before crossing the river. The unloaded material has to be carried by manual or animal labour across the river and then reloaded into the trucks. This not only involves additional expenditure, but also extra time. In order to compensate for this, additional rate has been allowed in Note No. 9 of Common Schedule of Rates, Volume II.

Rates for carriage in plains have been kept uniform throughout the State. The hill areas have been divided into three zones depending upon the maximum permissible laden weight of trucks allowed on the bridges in a certain section. Every Executive Engineer in his division will divide roads and routes into such zones after ascertaining the load carrying capacity of the bridges in that section.

In case of carriage by donkeys or mules, one donkey-man or mule-man has to be allowed for 6 donkeys/mules or less. In case of carriage by camel loads, one camel-man may be allowed for 3 camels or less. In case of carriage by carts, nothing extra is to be paid for the cartman. These rates are applicable where materials cannot be carried by road transport or quantities are so small that they do not constitute full truck loads. In case of employment of donkeys/mules/camels on muster rolls, the scale for donkey/mule/camel-man will be on the scale as detailed above. Separate rates have been provided for carriage of small consignments outside the railway premises or for short distance beyond the railway station. Separate rates for the carriage of light machinery have also been provided both by manual labour or by mechanical transport.

Rate for carriage of light machinery has been provided only for 10 miles. Beyond 10 miles the carriage rates for light machinery may vary considerably depending upon various factors such as availability of transport and the size and weight of machinery. In certain cases the machinery may not constitute full truck load but it is to be carted in full truck in order to safeguard it against damage. It is, therefore, left to the Superintending Engineer to decide such rates in individual cases depending upon the circumstances. The carriage rates of machinery have been given in two parts—firstly where carriage is to be done by manual labour for small loads and secondly for carriage of machinery by mechanical transport. When the weight of individual piece of machinery is from 4 to 10 maunds and the same is not mounted on wheels, carriage should be done by manual labour provided the lead is within 1,000 feet. If the weight of individual pieces exceeds 10 maunds and is up to one ton, or if the lead in case of smaller consignments is more than 1,000 feet carriage will be done by mechanical transport. In case the individual pieces weigh more than a ton, special rates will be fixed by the Superintending Engineer depending upon the requirement of special arrangements like crane, trailers, etc. It would be better if transportation of heavier machinery of this type is got done departmentally.

In case of Hill Schedule, carriage of material on bridle roads has been provided by mules and by mazdoors. Carriage should be resorted to by manual labour on bridle roads only in case of unwieldy items which cannot be easily loaded on mules.

While making measurements of materials for the purposes of payment for carriage, suitable deduction shall be made to account for voids in loose stacking. This factor will be different with different materials and may be ascertained from the relevant specification of that material as given in Chapter No. 5 of Hand Book of Specifications.

The lead for carriage of materials has been divided into suitable slabs. When the actual lead exceeds one slab and falls into the next slab, full rate for the next slab will be paid. For instance the carriage rates are given for leads of 2 miles to  $3\frac{1}{2}$  miles. When actual distance exceeds 2 miles, full rate of  $2\frac{1}{2}$  miles will be given. After initial 5 miles, the rates are in slabs of one mile each. Thus if the lead is  $4\frac{1}{4}$  miles the full lead for 5 miles will be paid.

#### CHAPTER No. 6—Earth Work

The basic rate of earth work in excavation has been given without dressing and without compensation of earth taken from private land and with a combined lead of 50 feet. The combined lead includes horizontal lead plus the vertical lift converted into lead. Items for dressing and payment for compensation have been provided for separately. Suitable notes have been provided in the beginning of the Chapter indicating how the lift is to be measured and how it is to be converted into horizontal lead. The conversion factor has been based on the recommendation of Rates and Costs Committee set up by the Government of India. Separation of the item of dressing is necessary as in certain cases the contractors leave the work incomplete and the balance work has so been got done departmentally or through other contractual agency. The exclusion of payment for compensation for borrowing earth from private landowners has been necessitated as in certain cases earth is borrowed from Government land and no compensation is payable; while in other cases, the contractors do not pay any compensation and the land owners put up their claims against Government. Since Government has, in such cases, already paid for compensation to the contractors, they are unable to meet the claims of private cultivators. Payment for compensation should only be made on the production to certificate from revenue authority that the contractor has paid compensation to the landowners.

Separate rate has been provided for dressing of new work and for repair work. The rate for dressing in case of repair work is higher as the quantity of earthwork involved is much less while the cost of dressing is comparatively high. A lower rate for dressing has been provided in case of soils consisting of sand only. Rates for extra lead, over the initial 50 feet combined lead has been

provided in two slabs—firstly for first 1,000 feet and secondly for 1,000 to 2,500 feet. In case lead involved is more than 2,500 feet, the earthwork shall be supposed to have been carried by mechanical transport and the carriage rates for sand, ballast, etc., as given in the chapter on 'Carriage' shall be applicable. These carriage rates shall be supposed to include the excavation and all other allowances and nothing over and above these rates will be payable.

The basic rate has been fixed for soils having dry bulk density up to 1.6. For dry bulk density higher than 1.6, additional rates have been provided. Hardness allowance shall be paid with the approval of Superintending Engineer. For dry bulk densities more than 1.8, suitable rates shall be fixed by the Superintending Engineer which shall not exceed Rs. 8 per 1,000 cft over and above basic rate.

Additional rates have been provided for wet earthwork. These rates, will, however, be payable after obtaining written approval of the Superintending Engineer. If pumping is required in wet earthwork, the same shall be done departmentally. Similarly for making payments for slush or daldal, approval of Superintending Engineer will be obtained.

Rate has been provided for compaction of the earthwork in embankments. This rate has been divided into three portions :—

- (a) For laying earthwork in 9 inches layers and dressing each layer.
- (b) For watering every 9 inches layer of the earthwork.
- (c) For rolling each layer of earthwork with proper type of rollers.

Watering and rolling should normally be done departmentally and the contractor should only be paid Rs. 2 per thousand cft. for dressing earthwork in 9 inch layers. Where watering is also entrusted to contractors, he may be paid another Rs 2 per thousand cft. Even in normal earthwork the contractor is supposed to lay it in layers and not to dump the same but where mechanical compaction is to be done, he is to prepare a certain length of the bank for such watering and rolling and has to withdraw his labour to other reaches temporarily. This does involve extra expenditure and it is on this account that additional rate of Rs 2 per thousand cft. has been provided where mechanical compaction has to be done. Where, however, watering and mechanical compaction is not to be resorted to the contractor has to lay the earthwork in layers without any extra payment.

*Re-handling of earthwork and gravel works.*—Where rehandling of recently deposited earthwork and gravel work is done, payment shall be made at the normal rates of earthwork less 20 per cent. Earthwork which is deposited before monsoon season and which has had the full monsoon on it, will be considered as normal earthwork in excavation.

*Earthwork in excavation and foundations.*—Separate rate has been provided for this item which includes all kinds of soils and no hardness or wetness allowance has to be paid. The rate includes refilling the sides of trenches in 6 inch layers watering and ramming and disposal of surplus soil.

*Earthwork filling under floors.*—For earth filling under floors, two rates have been provided—firstly for filling the surplus soil that has been excavated from foundations and secondly the earthwork which is actually excavated and then filled in. Separate rates have also been provided for earthwork over roofs for which special good earth is to be brought from outside.

*Other Rates.*—Separate rates have been provided for items like earthwork by boats, earthwork by tramways or rails, dressing dows, restoring boundary road drains, covering boundary road with sarkanda, ploughing and levelling borrow pits, berm trimming, etc.

*Turfing and planting hedges.*—In this chapter items have been provided for turfing slopes, making lawns and planting hedges, etc. The rates are divided into two parts—firstly for preparing the surface and actual planting; and secondly for maintaining the same for a period of one year. Normally the work of planting may be got done from the contractors and maintenance work may be entrusted to departmental labour.

*Hill Schedule.*—In case of Hill Schedule, the number of items has been reduced and the item of earthwork in foundations has been divided into seven items depending upon the nature of soil and other conditions of wetness, etc.

*Progress bonus.*—Provision has been made for progress bonus as per present practice in the Irrigation Branch. This progress bonus will be applicable to Buildings and Roads Branch only for earthwork relating to river training works and approaches to major bridges which are to be constructed with good speed in the interest of the safety of works. Sanction of Superintending Engineer will be obtained when bonus is to be paid.

Rates for additional lead have been provided in slabs of 25 feet each of additional lead. If the lead exceeds any slab, the rate for the next slab will be paid irrespective of the additional lead over the previous slab. In the basic Schedule of Rates of Irrigation Branch (1933) a note has been given as follows:—

“No payment for extra lead up to 12 feet and full payment for 25 feet at the existing rates of the extra lead ranging between 12 feet to 25 feet.”

After good deal of deliberations, the Schedule of Rates Cell decided not to provide such a note as its provision is not logical. Thus if the lead exceeds a slab by 5 feet or so, full payment for 25 feet lead will be paid.

## CHAPTER No. 7—Rock Cutting

The rates provided for rock cutting are uniform both in the plains and hills because the nature of the work is exactly the same. The method of measurement of lift and converting lift into lead is the same as for earthwork. The definitions of various types of rock cutting may be made in the Book of Specifications may be referred to before applying the rate for any item.

## CHAPTER No. 8—Demolition

The old Irrigation Branch Schedule contained separate rates for dismantling hydraulic and non-hydraulic works. The rate given in this chapter of Common Schedule are for non-hydraulic works and a note has been added that for hydraulic works, rates will be enhanced by 50 per cent. Definition of hydraulic works has also been given. Where stone pitching, or stone or bajri filling, etc., has to be dismantled while under water, rates in the Schedule may be increased by 60 per cent. Rates for removing doors and windows are of two types—firstly where walls are not to be dismantled and the doors and windows are to be removed with chowkats by making recesses in the walls; secondly where doors and windows are to be removed together with dismantling of walls. In latter case the rates have to be lower as the work becomes easier. The chapter has been made comprehensive by including the dismantling of nearly every type of material.

## CHAPTER No. 9—Centring and Shuttering

This chapter has been provided on the basis of Irrigation Branch Schedule of Rates, but the method of classification for various items of centring and shuttering has been completely changed. In Irrigation Branch Schedule there were two broad classifications—firstly for slabs and lintels, and secondly for R. C. C. work other than slabs. In the second classification there was further division into simple R. C. C. work and intricate R. C. C. work, which was further sub-divided into two categories, i. e. horizontal members and vertical members. As the terminology of simple and intricate work is likely to be misunderstood or misinterpreted, the Schedule of Rates Cell has not followed this classification. Instead the classification has been given separately according to the item of work like slabs, walls, sides and soffits of beams, girders, bressumers, stairs, columns, facias, etc. Separate rates have been provided for centring and shuttering of doors and verandah openings on the basis of running feet and clear span. In case of centring and shuttering for slab culverts up to 20 feet span, rates have been given on the superficial area of the centring and shuttering. No rebate has been provided for centring and shuttering for major bridges, as in these cases the centring will vary with the height and design of the bridges and load coming thereon. In all such cases the centring and shuttering should be properly designed and analysed according to local conditions.

The rates for centring and shuttering are considered to be for a normal storey height of 13 feet (4 metres). Whenever any storey height exceeds 13 feet (4 metres), the rates for centring and shuttering will be increased as per note (iii) given in chapter No. 9. No additional rate has been provided for centring and shuttering in subsequent storeys because in such cases the centring has to be supported on to the roof of the storey below and practically no extra expenditure is involved. Wherever smooth exposed concrete finish is desired which is not to be touched but is to be left as it involves out of the shuttering, extra smooth shuttering or proper steel shuttering has to be used. As it involves more expenditure than the ordinary shuttering, an additional rate of 33.33 per cent has been provided on the items of labour rate where such finish is desired. The through rates shall also be increased correspondingly. For example, item No. 9.4 provides a labour rate of Rs 24 per 100 Sft. for centring and shuttering for sides and soffits of beams, etc. In case of exposed untouched concrete finish, the labour rates shall be increased by Rs 8.00 per 100 Sft. (33.33 per cent). Similar through rate of Rs. 46.00 per 100 Sft. shall be increased by Rs. 8.00 per 100 Sft. and not by 33.33 per cent of the through rate. Sometimes in architectural work shuttering pattern is specified to get an impression of shuttering lines in a certain pattern. In such cases the shuttering has to be specially manufactured in panels so that their joints give the lines in the specified over pattern on concrete face. For such cases a separate rate on the superficial area has to be allowed and above the basic rate of centring and shuttering; but the increase of 33.33 per cent will not be allowed in addition to this rate. Payment for shuttering patterns will only be allowed if a definite pattern has been specified in the architectural drawings and not otherwise.

## CHAPTER NO. 10—Concrete

The method of measurement of concrete and R. C. C. work varies in different departments. While in Buildings and Roads and Public Health Branches, through rate is generally paid and it covers the cost of centring, shuttering, bending, binding and placing in position of reinforcement and all labour and cost of concrete; in Irrigation Branch the practice is to measure and pay separately and these items. Both these systems of payment have advantages and disadvantages. separate payment of these items is advantageous in case of framed structures, but there is no advantage if this system is followed in case of small buildings where it will result only in the increase of labour in making measurements. The schedule of Rates Cell has, therefore, provided the items of R.C.C. work in such a way that either of the above methods can be followed according to the practice in vogue in a particular department or according to the special orders of any Chief Engineer.

In case of through rates of R.C.C. work which are followed in Buildings and Roads Branch, separate items have been provided according to average quantity of steel required to be used. For instance, R.C.C. shelves require only 5 lbs. reinforcement per Cft. while ordinary roof slabs require generally 5.5 lbs. of reinforcement per Cft. and items like beams and girders require re-inforcement at the rate of 6.75 lbs. per Cft. These items have to be measured separately and may, therefore, be provided for separately in the

estimates and contracts. Any additional quantity of steel used over and above these limits, should be measured and paid for separately. Detailed procedure regarding measurement of extra steel has been given in the relevant Chapter of Hand Book of Specifications which may be referred to. The rate for extra reinforcement is given in Chapter No. 18 on Iron and Steel work.

These days we are constructing a number of architectural buildings where thin vertical sections like fascias are provided by the architects. These items of work cannot be executed at the normal rates for R.C.C. as the cost of centring and shuttering is proportionately high as compared to the quantity of concrete used. Separate item for fascias has, therefore, been provided.

Similarly cost of centring and shuttering will be proportionately higher in case of thin R.C.C. walls than in case of walls of thicker sections. Therefore, a separate through rate has been provided for R.C.C. walls 4 to 8 inches in thickness. Walls having a thickness greater than 8 inches are covered by the rate of general item of R.C.C. work like beams, girders, square or rectangular columns with reinforcement up to 6.75 lbs. per Cft. R.C.C. walls having thickness less than 4 inches are covered by the item of fascias and other thin vertical sections like parapets, etc. Separate rate has also been provided for circular or curved columns as additional cost is involved in their case for labour and material for shuttering than what is required for square and rectangular columns.

Provision has been made for additional rate of 25 naira Paise per Cft. where 1 : 1½ : 3 mix is used instead of 1 : 2 : 4. An item for brick plumbing in R.C.C. slabs has also been provided to economise on the use of concrete. Rate for R.B. work has been given in the Chapter II for Brick Work.

In case of lean mixes up to 1 : 4 : 8 ordinary sand can be used. But for richer mixes like 1 : 3 : 6, 1 : 2 : 4 and 1 : 1½ : 3 where proper strength is required, coarse sand (fine aggregate) has to be used. In Punjab, coarse sand which is fit for good concrete work is not available locally everywhere except in the hilly regions. It is available mainly at three sources in the plains, i.e., Pathankot, Chandigarh and Badarpur (Delhi). The cost of coarse sand and similarly for coarse aggregate varies with the distance from any of these sources. Taking these three sources into account, the whole State has been divided into three Zones—Zone A, Zone B and Zone C. In zone A, these materials are available at a short distance and are quite cheap. In zone C, the source of aggregate is at a very long distance and, therefore, the cost of these materials is the highest; while zone B is the middle one. The through rates for concrete and R.C.C. work in this chapter have, therefore, been given separately for each zone, while the labour rate has been kept the same throughout. The note above item No. 10-10 of volume I, regarding use of coarse sand in concrete may be kept in view for works in the plains.

The rates given in this chapter are for hand-mixed concrete. Where mechanical mixer is employed the labour as well as through rates shall be increased by Rs. 3.00 per 100 Cft. It has to be admitted that under the existing conditions in India, where cheap manual labour is available, machine-mixed concrete cannot be cheaper than hand-mixed concrete. It has, however, been analysed that working expenses for concrete mixer come to Rs. 5.00 per 100 Cft. on the average. It has, therefore, been provided that a recovery of Rs. 5.00 per 100 Cft. of concrete should be made where the concrete mixture is provided by Government at contractor's cost. When concrete mixer is run at Government expense, as is normally done in the Irrigation Branch, the contractor's rate will be reduced by Rs. 2 (Rs. 5.00—Rs. 3.00) per 100 Cft.

It has been established from practical observations that vibrated concrete consumes greater quantity of materials specially cement due to greater density. Vibrated concrete, therefore, cost more than ordinary concrete. An increase of Rs. 10 per 100 Cft. on through rates has, therefore, been provided in the Common Schedule of Rates for mechanical vibration. Since vibrated concrete is denser and stronger, it is suggested that working stressed for vibrated concrete may be increased by about 10 per cent over and above those for ordinary concrete.

The Schedule of Rates Cell considered very carefully the audit objection received by the Capital Project authorities regarding deduction of volume of steel from the volume of concrete in case of some R.C.C. framed structures constructed at Chandigarh where concrete and reinforcement had been measured and paid for separately. The Cell found that at the rate of 6.75 lbs. per Cft. of concrete, the volume of steel work out to even less than 1 per cent of the volume of concrete. It is, therefore, not considered worthwhile introducing lengthy calculations and measurements for the deduction of this volume which is of a very small magnitude. Accordingly no such provision has been made for the deduction of volume of steel from the volume of concrete.

Items like skipping of concrete in wells, laying damp proof courses in cement concrete, etc., have also been provided in this chapter. Where exposed concrete finish or shuttering pattern is specified additional payment over the through rate of R.C.C. work will be allowed as per provision in the Chapter for Centring and Shuttering.

#### CHAPTER NO. 11—Brickwork

This chapter has been made comprehensive and in addition to normal items of brickwork, rate for the following items have also been provided :—

- (1) Sun-dried brickwork;
- (2) Jibi work;
- (3) Gilafi work;

- (4) Gilafi work with Jibi face;
- (5) Brick tile masonry;
- (6) Brick tile facing;
- (7) Reinforced brickwork;
- (8) Brick and tile jali work;
- (9) Specially moulded brickwork for sewers and well shafts. It may not be possible to understand exactly the requirement of brick and tile jali work as given in the schedule of Rates. Detailed sketches of different types of jali work have, therefore, been given in the Handbook of P. W. D. Specifications which may be referred to for execution of work in the field.

The main item of brickwork has been divided into two broad classifications—firstly, building works and small engineering works; and secondly, large engineering works. In building works and small engineering works either the quantity of brick work is small or the walls are of thin sections and therefore the out-turn per mason is less. On the other hand in case of large engineering works like piers of bridges, etc., the sections are so thick that each mason can give greater out-turn per day, and the expenditure on scaffolding per 100 Cft. is much less. It is, therefore, reasonable that rate in case of such large engineering works should be less than the one allowed for building works. Keeping this in view the rates given in this chapter for general brickwork are for small engineering works and for building works and a reduction of 10 per cent in the labour charges for large engineering works has been provided. An engineering work shall be considered as small if the total quantity of brickwork involved does not exceed 500 Cft. The example given below will illustrate this procedure clearly.

*Example.*—The rate for first class B. B. in cement sand mortar 1 : 6 in first storey is Rs. 25 per 100 Cft. for labour and Rs. 101 for complete work. In case of large engineering works, the labour rate for this item will be reduced by 10 per cent and will work out to Rs. 22.50 per 100 Cft. Similarly the through rate will be reduced by same amount and will work out to Rs. 98.50 (Rs 101 — Rs 2.50).

In case of building work it is easy to define the work in foundations and plinth, but in case of engineering works and also in case of boundary walls, there is no plinth level. It has, therefore, been laid down that in such cases the rate for brickwork up to 4½ feet (1.5 metres) above the top of foundation concrete shall be considered as work in foundations and plinth.

For rates of brickwork in superstructure, the storey height of 13 feet (4 metres) has been fixed. If the height of any storey is less than 13 feet, the same rate will be applicable, but in any individual case where the storey height is more than 13 feet (4 metres), the rate of brickwork for that storey will be increased as per note given under item No. 11.20. The height of the storey will be measured from the finished ground floor level in case of first storey and from the top of structural roof of the lower storey in case of subsequent storeys.

Extra rate has been provided for brickwork in square or rectangular pillars in buildings. The quantity of brickwork in the pillars in building work is very small, but the expense on keeping all the four faces in plumb and in making corners true and the surface even, proportionately more labour cost is involved. This extra rate, however, is not payable in case of bridges and other engineering works where the sections are quite thick and do not justify any additional labour. For circular pillars constructed with dressed-bricks, additional rate has been provided to cover the cost of dressing each and every brick. Additional rate provided for brickwork in arches has been split up according to the span of arch because the cost of centring goes on increasing with the span of the arch.

Extra rate has been provided for profile walls and flared out walls of syphons and super-passages, etc., because this involves greater amount of labour. These items are for Irrigation Branch only.

The item of tile masonry should be differentiated from the item of tile facing. While tile facing will be provided in a single layer on edge in front of brick or stone wall, the tile masonry will be constructed in the entire thickness with brick tiles.

In case it is proposed to use second class brickwork on account of non-availability of first class bricks or on account of temporary nature of the structure, through rates of corresponding items shall be reduced by Rs. 4.50 per 100 Cft.; the labour rates will, however, remain the same.

It has been a practice to provide lump sum rates for making fire places. The Schedule of Rates Cell, however, feels, that due to variations in the design of fire places, no lump sum rate can be provided to apply in each and every case. No rate for this item has, therefore, been provided in the Common Schedule of Rates. It would be better that standard designs are prepared by various departments and the cost of the same is analysed on the basis of the rates given in the Common Schedule and lump sum rates worked out for each standard design for making provision in the estimates and also for the purposes of payment to contractors.

#### CHAPTER No. 12—Stonework

The definition of various types of stone masonry as in vogue in the Buildings and Roads and Irrigation Branches differs from each other. New specifications for stone masonry have, therefore, been drafted and included in the Handbook of Specifications and the stone masonry has been classified into

proper types keeping in view the definition and description given by the standard text-books written by various Indian and English authors. As the definition is different from the previous definitions given in the Schedule and Specifications, it is suggested that a reference should be made to the Handbook of Specifications in order to understand each type of work.

The rates given in this chapter have been worked out assuming the use of quarried stone. Quarried stone is normally softer than the boulder and is easy to dress. The boulder is not only harder, but requires lot of dressing to bring the stone into roughly rectangular shape.

Provision has been made to increase the rates for items of stone masonry by Rs. 15.00 per 100 Cft. where stone masonry is constructed with small boulders or with stones obtained by breaking large boulders. This additional rate is not applicable in case of ashlar masonry because the dressing required is very fine and the cost of dressing is so high that it does not matter whether stone is obtained from quarries or from boulders. In case of Schedule of Rates for hilly areas, provision has been made for dhajji walling of different specifications.

The storey height for stonework in superstructure has been kept as 20 feet in case of ashlar masonry and 13 feet in case of other types of masonry. In ashlar work the building will be normally quite high and the ordinary height of 13 feet will not be applicable. Definition for work in foundations and plinth for engineering works will be the same as given in the chapter on Brickwork. In case of ashlar and block-in-course masonry, no rate has been provided for work in foundations and plinth as this type of work is normally done in superstructure. If need be, rates for foundation and plinth can be worked out by reducing the rates for superstructure by Rs 10.00 per 100 Cft.

Provision has been made for dry stone masonry in squared rubble and random rubble as items Nos. 12.20 and 12.30 of volume I and item Nos. 12.20 and 12.30 of volume II. This item is provided for making retaining and breast walls in case of road work and the same rate applies both for foundations and superstructure. Items No. 20.40 of volume I and 20.42 of volume II are not applicable to stone breast or retaining walls which require greater stability but these apply only to works of purely temporary nature like small huts made at the site of work, for the storage of cement, etc.

In case of plains schedule (volume I) the through rates for stone masonry include the cost of stone at the site of work irrespective of the distance from the source, but in plains stone masonry will normally be constructed in such areas where stone is available locally or in the vicinity of the site of work. Variations in actual lead in such cases will be taken care of by premium/abatement over the scheduled rates. Where, however, stone is not available near at hand but has to be brought from long distances, item of stone masonry should not be specified and if some work has to be constructed in stone due to very special reasons, extra provision for carriage of stone should be made in the estimates.

In case of hilly areas, stone is available very near the sites of works. The through rates in case of hills, therefore, include the cost of carriage for one mile from the source, except in case of retaining and breast walls and parapets of roads where shorter leads have been provided. Where the total lead of one mile has been taken into account, the lead for first half mile is by mules and the rest by road transport. Where the lead is less than half a mile, the entire carriage is by mules. This has been done as the quarries are normally not on roads and carriage has to be done for about half a mile on tracks from river or choe beds. Wherever longer leads than those provided in the Schedule are involved, payment for extra lead will be made by road transport at the rates for miles subsequent to first mile.

### CHAPTER No. 13—Hoisting and Roofing

Separate rates have been provided for hoisting and placing in position R.C.C. lintels, battens shelves, bed-plates, wooden battens, wooden beams, wooden trusses, R.S joists and steel roof trusses. These rates are for hoisting up to 13 feet (4 metres) height above plinth level. For every additional height of 13 feet (4 metres) or part thereof, 20 per cent will be added in case of beams, trusses, R.S. Joists, etc. For other items like wooden battens, R.C.C. shelves, etc., only 10 per cent increase will be provided. Two different rates have been given because hoisting of lintels, shelves, bed plates and wooden battens is easier while that of beams and trusses is rather difficult for greater heights. The item for hoisting of roof trusses and plate girders is applicable to buildings of any spans, but for bridges up to 50 feet span/only. For bridge girders having spans more than 50 feet, special rates will be worked out and paid for on the merits of each case.

In case of through rates of items like lintels, battens, shelves, bed-plates, beams, trusses, R.S. Joists, etc., the cost of hoisting is already included and is not payable over and above. Rates have been provided for different types of roofing—like first class mud-roofing, 2nd class mud-roofing, 3rd class mud-roofing, thatch roofing, roofing of cement concrete tiles, corrugated G.I. sheet roofing and asbestos sheet roofing. Effort has been made to include all ancillary items like gutters, ridges, rain water pipes, apron pieces for C.G. and cement asbestos sheet roofing. In case of cement asbestos rain water pipes, two rates have been provided—firstly for fixing the pipes on wall face and secondly for embedding the pipes in masonry work. The rates for cast iron pipes have been provided for fixing on wall face; if these are embedded in the masonry the labour rate will be reduced in the same proportion as cement asbestos rain water pipes.

Miscellaneous items have been provided like top and bottom khurras, khassi, parnalas, etc.

Provision has been made for ceiling of deodar and kail wood planking, dasuti cloth and hessian cloth ceiling, plywood ceiling, asbestos ceiling, celotex and treetex ceiling and plaster of paris ceiling. The rates for ceiling do not include cost of beading and framework. While framework shall be paid for



at the rate of woodwork, separate rates for beading of different sections have been provided. The design of beading and framework may be different in different cases and, therefore, it has been considered essential to separate out this item from the item of ceiling work.

#### CHAPTER No. 14—Flooring and Dados

This chapter has been made very comprehensive to include every type of flooring which is required to be done these days. The through rates for flooring have been given zonewise because the flooring mostly involves concrete work, the rate for which varies from zone to zone. Terrazo flooring has been broadly divided into two types—firstly terrazo laid in-situ and secondly precast terrazo tiles. Terrazo work is then subdivided into four classes according to the use of ordinary or white cement and the pigments to be added to cement. In first category, ordinary cement without addition of any pigment is used. In second category, white cement manufactured in India is used instead of ordinary cement. In third category, such shades are provided as can be obtained by adding pigments to ordinary grey cement. In the fourth category are provided such shades of terrazo which require addition of pigments like orange, buff, yellow to white cement. Pigments for blue or green terrazo are even costlier and, therefore, these items have been further separated. All the rates of above categories are for the use of white marble chips. If marble chips of different colours are to be used, the rates have to be increased as coloured marble chips are costlier than the white chips. Similarly the rates for dados and skirting have been subdivided into various classes on the above consideration.

Rates for high-class flooring like marble tile flooring, kotah stone flooring, teak-wood flooring and paraquet flooring have also been provided as well as the rates for linoleum covering on floors.

The rates given in the schedule are for flooring on ground floor. For every additional storey, the rates may be increased as per note (iii) at the beginning of the chapter.

For terrazo work in-situ on columns, extra rate has been provided to cover the extra expenditure on laying and rubbing as per Note under No. 14.35 of Plains Schedule and item No. 14.27 of Hills Schedule.

The note regarding use of coarse sand in flooring work at the end of this chapter should be kept in view.

#### CHAPTER No. 15—Plastering, painting, whitewashing and distempering

*Plastering.*—This item of work has been divided into three categories, i.e., plastering on walls, plastering on floors and plastering on underside of ceiling. Plastering on floors is the easiest as it does not require any scaffolding. Moreover, there is no wastage of material and a mason can give comparatively more out-turn. The plastering on walls is more difficult than that on floors; scaffolding is required and there is wastage of material and the out-turn per mason becomes less as compared to plastering on floors. Plastering on the underside of the slabs or on ceiling is even more difficult. In this case the quantity of scaffolding required is much more than in case of plastering on walls; the wastage of material is also much more and the out-turn per mason is much less as compared to plastering on walls. Therefore separate rates have been provided for these different classes of work. In every class of work, rates have been provided for various thicknesses of plaster and various mortar mixes. Similarly provision for mud-plaster has been made separately for walls and floors.

The rates for plastering on walls and ceilings are for storey heights of 13 feet (4 metres) whether in first storey or in subsequent storeys. This uniformity has been kept as the quantity of material required to be hauled up is very small and additional lift does not matter much. Where any single-storey height exceeds 13 feet (as in case of overhead reservoirs and in case of external walls of multi storey buildings), the labour and through rates shall be increased by 25 NP. per 100 sq. ft. of plaster for every additional height of 13 feet or part thereof.

*Distempering.*—Rates for distempering with dry distemper and oil bound distemper have been provided. Rates have been based on superior quality distempers manufactured by standard firms like Shalimar, Jenson and Nicholson, British Paints, etc. The use of inferior distempers and country frisco has been prohibited and they never give proper quality of lasting surface. The use of proper distempers may be insisted upon in the field while allowing these rates. The practice of mixing pigments and glue with chalk as a substitute for distemper may be guarded against.

#### CHAPTER No. 16—Painting and Varnishing

Painting work has been broadly classified according to the nature of surface to be painted—namely, woodwork, metallic surfaces and plastered or concrete surfaces. This has been done because each type of surface requires different treatment of different quality of paints. For wood-work ready mixed or synthetic enamel paints are to be used and the surface has to be properly treated for knotting and stopping. In case of metallic surface specially prepared paints which are suitable for metallic surface are to be used. The priming coat is also specially prepared for metallic surfaces. There are separately paints for roofing only which are called "roofing paints". In case of certain metallic surfaces like water tanks, anticorrosive bitumastic paints are to be used. For painting on plastered and concrete surfaces different varieties of paints are manufactured which are not affected by the chemical action of free lime in the cement. Special priming coats are also available to counteract such chemical actions. Special flooring paints are manufactured for painting floors and this item needs less labour than painting on walls etc. Separate rates have been provided for all these items of work. However, an important point to be noted is that synthetic enamel paint is suitable for all types of surfaces whether wooden, metallic, plastered or concrete.

*Ordinary and special paints.*—While only one labour rate has been given in this chapter for all items of painting, two separate through rates have been provided—one for ordinary quality paints and the other for special quality paints. Under the ordinary quality paints will come the paints which are on rate contract of the Controller of Stores; under the special quality paints come the paints manufactured by reputed and tried firms like Shalimar, Jenson and Nicholson, Gillander Arbuthnot, British Paints, etc. The paints manufactured by these firms are special paints and are of even higher specifications than those given by the I. S. I. However, their specifications are secret and are not disclosed. These firms do not like to be on the rate contract as they cannot import material for greater manufacture than their present capacity. Paints from such firms can be obtained by putting in a special demand with the Controller of Stores. However, the use of special paints will be got approved from the competent authority and in all such cases paints will be treated as special paints which have been approved by the Chief Engineer of a branch as such.

*Aluminium primer.*—According to the latest practice aluminium primer is used for priming coal on woodwork. This primer has excellent sealing qualities and has got better covering capacity than an ordinary priming paint. Use of this Primer has, therefore, been adopted in the Schedule of Rates. This priming paint should be preferred over ordinary priming paints.

#### CHAPTER No. 17—Woodwork

In this chapter rates have been provided for woodwork wrought, planed and fixed in position for different species commonly used in the State. Provision has also been made for planking of different types of timber and of different thicknesses. The item on woodwork comprises of two type of work—firstly beams and battens which require only sawing to sizes, planing and fixing in position and secondly such items as roof trusses and built-in-fixtures which require making of joints. The rates for woodwork apply to such items of work as do not involve jointing and a suitable increase has been provided for works where jointing is involved.

Wooden boundary gates shall be paid at the rates of roof trusses.

*Doors and windows.*—Rates have been provided for different types of doors and windows in different thicknesses for deodar, kail and teak woods. In case of deodar and kail wood doors and windows through rate includes the cost of iron fittings except tower bolts, sliding bolts and handles and although it includes the cost of fixing the same. These items have been omitted from the rate because in certain cases tower bolts, handles, etc., of brass are specified, while in other cases even iron fittings of good manufacture are supplied by the Department itself. However, for estimating purposes the cost for these items to be added to the rates is given in Note above item No. 17.14 of Volume I and No. 17.8 of Volume II.

In case of teak-wood doors and windows, the through rate includes the cost of holdfasts, corners straps, brass hinges for the shutters and brass screws, chocks, stops and cords along with brass hinges for the chocks, but it does not include the cost of brass tower bolts and brass handles although it includes the cost of fixing the same. This has been done because the number of size of tower bolts varies and these items are normally supplied by the Department. The design and cost of handles also vary. For estimating purposes, the through rate for brass fittings has been given which should be added to the normal rate of teak-wood doors and windows while preparing estimates. However, the brass fittings should be arranged departmentally and supplied to the contractor for fixing the same. The fixing charges are included in the rate for joinery.

Charges for fixing tower bolts to wire gauze shutters whether of deodar, kail or teak wood are included in the rate, but the cost and labour for fixing springs is not included and has to be paid for separately.

Item Nos. 17.22 and 17.30 of Volume I have been provided for such situations where either flush shutters or shutters already manufactured by some other agency are got fixed. The contractor is only to make the chowkhats along with holdfasts, etc., fix the same in position and also to fix the shutters along with the fittings supplied by the Department. The through rate of the contractor, however, includes the cost of wood for chowkhats, holdfasts, iron/brass hinges, corner straps, cleats, stops, etc. The shutters and fittings like tower bolts, sliding bolts and handles shall be supplied free of cost by the Department. For similar items of work for cupboards, the rates shall be reduced as the frame for cupboards will be of thinner sections and there will be saving on timber. Separate labour rates have been provided for fixing mortice or rim locks or latches and for fixing helical door springs or double action spring hinges or sliding bolts. These items will be supplied free of cost by the Department.

*Glazing.*—Two types of items for fixed glazing have been provided. In the first type, door or window chowkhats are made and fixed in position and a glazed shutter with styles and rails is then made and screwed into the rebate into the chowkhat. In the second type of fixed glazing, no shutter is made, but the glazing is fixed directly into the door or window chowkhat as the case may be. These two items should, therefore, be differentiated. The through rate, however, includes cost of timber, labour for making chowkhats and shutter where required, fixing the same, glazing, etc.

In certain cases the single door or a single window may be partly fixed and partly openable. In such cases the entire unit will be measured under the general item of glazed doors and windows, if the area of fixed glazing is less than 25 per cent of the openable area. If the area of fixed glazing exceeds 25 per cent of openable area the two will be measured separately, the measurement in each case being up to the centre line of mullion.

*Frosted glass panes.*—Where in case of glazed doors and windows of fixed glazing frosted glass panes are used instead of ordinary panes, the through rate shall be increased by 10 np. per sq. ft. of the actual area of frosted glass pane.

*Fixing glass panes.*—Separate rate has been provided for fixing glass panes. This item can be useful in maintenance work, for replacing the broken glass panes.

*Flush doors.*—The labour and through rates have also been provided as per item No. 17.37 of Volume I for fixing factory manufactured solid flush doors. The rate has been provided for various thicknesses of flush shutters with—(a) elm or gurjan facing of both sides; (b) elm or gurjan facing on one side and teak facing on the other side; and (c) teak facing on both the sides. The labour rates include the labour only for making and fixing chowkhats and fixing shutters and fittings. The through rate, however, includes the complete cost of chowkhats and shutters, etc. The rate of this item provides for the use of teak-wood chowkhats. Sometimes deodar wood chowkhat may be used with flush shutters; for such shutters the labour rate will be reduced by 25 np. per sft. and through rate by 85 np. per sft.

In case of Schedule for Hilly areas, the items of teak-wood joinery, teak-wood planking and flush shutters have been omitted. In hilly areas deodar is mostly available locally at cheaper rates and therefore, teak is seldom used. Wherever in high class work either teak or flush shutters have to be used, the rates given in the plains Schedule can be followed with little variation.

#### CHAPTER No. 18—Steel and Iron Work

The items of steel work have been divided into two broad categories—firstly, steel work ordinary and second structural steel work. Ordinary steel work has been further subdivided into two classes—firstly work which is fixed independently without connecting plates like R. S. joists flats, tees, angles, etc. In the second category are taken items like hip and jack rafters, common rafters, purlins, etc. which are fixed with angle cleats and other connecting plates. In case of structural steel work, different items have been provided like roof trusses, plate girders, steel ladders, frame grill gratings, iron grated doors and stanchions. Trusses and girders have been divided into two categories: firstly, trussed girders for any span for buildings and for 50 ft. spans for bridges; and secondly, plate or trussed girders of bridges from 50 to 100 feet span. In these items there may be little difference in fabrication, but hoisting becomes more and more difficult with the increase of span. Labour rate including the cost of hoisting has therefore, to vary with the span. No rates have been provided for bridge girders of span greater than 100 feet and in these cases special rates will be worked out and paid for depending upon the local conditions.

Rates for boundary gates shall be the same as for roof trusses.

*Built-up girders and stanchions.*—This item has been split up into two parts. Item No. 18.6 provides for built up girders of stanchions consisting of single joists or channel section while item No. 18.7 applies to compound girders or compound stanchions built up from two or more R. S. joists or channels. Cost of fabrication and hoisting will be different in these two cases.

*Mild steel reinforcement.*—Labour and through rates have been provided for bending, binding, placing in position of mild steel reinforcement for R. C. C. work. Item has been divided into two classes—(a) 3/4 inch dia bars and below. (b) above 3/4 inch dia bars. Labour rate for bigger size bars have been reduced because the work involved in bending, binding and placing in position is less for bigger diameter bars weight for weight. The through rate is still lower because the bars of large diameters are cheaper than those of small diameters.

*Steel windows.*—Rates for the supply of steel windows have been provided according to the existing market rates. The rates decrease as the size of windows increases. In case of fixed steel windows the rate is much less because no shutter is required. These rates are only for the purposes of estimating and analysis and not for actual purchase which will be made on the basis of actual tenders. This provision has been made because there are quite a few manufacturers in the market and their rates vary a little from each other. Labour rates have been provided separately for fixing steel windows. Fixing of glass panes is not included in the item of fixing steel windows as this item requires special metal sash, putty and, therefore, special rate for supplying and fixing glass panes in steel windows have been provided.

*Miscellaneous.*—Through rates in this chapter are for untested steel. The increase for tested steel has been given on the basis of difference in the cost of two categories of steel. In case of structural steel works the rates are based on riveting and not welding. Where electrical welding plant is available, welding is cheaper than riveting and the rate may be reduced by Rs. 3.00 per cwt. Items have been provided in this chapter like G. I. sheets, garage doors, sliding G. I. sheet doors, making and fixing of fan clamps and hooks and fixing iron bars in windows.

#### CHAPTER No. 19—Lining

This chapter has been framed after closely observing the work of canal lining being executed on Rajasthan Canal. The banks of canals are made up in layers which are compacted to the required density with sheep-foot rollers at optimum moisture content. To achieve greater compaction, the sections of the bank, etc., are kept wider than the designed ones. The extra width is removed later on and this item is termed as Lip Cutting. Separate rate has been provided for lip cutting which includes all allowances like hardness, lead etc. This rate has been provided in slabs of five feet vertical height. After

lip, cutting the dressing of bed and preparation of sub-grade is to be done for which separate rates have been provided for the bed and sides and for different classes of soils. This item includes fine dressing to exact level and preparation of sub-grade only. All basket earthwork is to be paid as per rates for lip cutting. Items have been provided for double layer of tile lining as well as for single layer. Concrete lining in canal has also been provided. Separate items have been provided for curring and providing templates scaffolding and form work etc. These items are paid for separately in the Irrigation Branch. Some lining works for water storage tanks is required to be done in Public Health Branch where work is done on through rate basis. The rates of double layer of tile lining and concrete lining for water storage tanks are complete and through, rates which include cost of all operations line preparations of sub-grade, providing templates, scaffolding, curring, etc.

#### CHAPTER No. 20—Outlets

This chapter has been based on the corresponding chapter of the basic schedule of Irrigation Branch but the various items have been split up to cover the different classes of work under different local conditions. In the Irrigation Branch Schedule the earthwork for excavation and refilling of outlets has been given for the discharge of the channels alone. No. separate rate is given for different types of outlets or for dismantling or constructing the new outlets. In the Common Schedule the rates for earthwork for dismantling or constructing pipe outlets have been given separately according to the discharge of the channel. For earthwork for dismantling open flumes, A.P.M. or O.S.M type outlets, rates have been given according to H of the outlet. Separate rates for these outlets have been given for earthwork required for adjusting of outlets and earthwork required for constructing new outlets. In all these cases the earthwork involved is different and a uniform rate cannot be provided as has been done in the I. B. Schedule.

The existing I. B. Schedule provides single rate for dismantling pipe or barrel type outlets irrespective of the discharge of the channels. This is not rational as the bank width generally increases with increased of the channel and, therefore, the length of pipe or masonry barrel will also increase and so will be the cost of dismantling. The rate for this item has now been provided separately for different capacities of the channels in which outlet is fixed. For dismantling other type of outlets, two rates have been given one for complete dismantling including foundation concrete and the other for dismantling outlet up to crest level. These rates have been provided according to H of the outlet. Separate rates have been provided for complete and partial dismantling of tail clusters for bifurcation, trifurcation and quardrification.

Separate rates have been provided for different types of adjustments which are required in masonry outlets and APM outlets. The adjustment of Y or B involves different operations and different rates have been provided for these. Again the rates will vary according to the H of the outlet. Provision for these items has been made to make the chapter comprehensive and to cover all items regarding new construction, adjustment or dismantling of outlets.

In the existing I. B. Schedule only two items for constructing, watching and removing of earthen bund for outlets in running water have been provided—one up to three feet depth and the other above three feet depth. The expenditure on constructing or watching of bunds varies with the various situations for which the bund is constructed. For instance, for pipe outlets only a very small bund can serve the purpose. But for constructing APM or open flume type outlet, the bund required is much bigger. For adjustment, to be carried out in running water, the rate will again depend upon the type of adjustment required to be done and the type of the outlet and discharge of the channel. Separate rates for all these items/situations have, therefore, been provided after detailed analysis.

#### CHAPTER No. 21—Pile Driving

The rates given in this chapter for sheet piling have been adopted only as a guide and for estimating purposes. No. firm rates in this type of work can be adopted in any Schedule of Rates because the work varies according to the local conditions and nature of the soil. The sheet piling work was last done in the Irrigation Branch in 1950 for construction of Hafike works. Similarly labour rates for driving precast R.C.C. piles have been given as rough guide. The cost of driving piles will vary considerably with the nature of the soil,

#### CHAPTER No. 22—Well Sinking

*Dry Sinking.*—Before well curb is placed in position, open excavation of the well has to be restored to. This varies with the depth of spring level and the nature of soil. This excavation has to be up to the spring level if the soil conditions permit. But in sandy soils, it will not be possible to resort to open excavation beyond 15 feet, while in firm and clayey soil it may be possible to go up to 30—40 feet from ground level. The rate for opening excavation has, therefore, been provided for various depths up to 40 feet from ground level. These rates have to be higher than the ordinary earthwork rates because of the risk involved to the labour and restricted working area.

In case of sandy soils where excavation cannot be resorted to beyond 14 feet, dry sinking will have to be done. Therefore, separate rates for dry sinking of wells have been provided up to 4 feet depth from ground level and beyond.

*Wet sinking.*—Where the sinking of well is involved below spring level, it will be termed as wet sinking. The reference level for measurement of the wet sinking shall be the spring level and not the ground level. The cost of wet sinking will, however, depend upon the depth of spring level from the ground level. In case the spring level is very near the ground, the cost of well sinking will be much less than that it would be when the spring level is 50 feet below ground level. With greater depth of spring level the working becomes difficult and the haulage of soil from below the well becomes costlier.

The rates of wet well sinking have to bear a relation with the depth of spring level. The rates given in the Schedule apply to wet well sinking when the depth of spring level is up to 25 feet below ground level. When the depth of spring level is from 25 to 50 feet, the rate of wet well sinking will be increased by 50 per cent. If the depth of spring level is 50 to 100 feet below ground level, the rates for wet well sinking will be increased by 100 per cent.

In certain areas near the foothills of the mountains, boulders are met with during well sinking. In such cases well sinking is likely to be more difficult and costlier. Special rates will be framed by the Superintending Engineer keeping in view the results of trial bores in all such cases.

The Public Health Branch have met a special type of soil in Gurgaon and Rohtak Districts which comprises of very fine clay. They found that dredger does not work in such soils and well sinking has to be done by bailing out water and then removing the soil from under the curb. They have experienced that if the well sinking is stopped at the end of the day, there is an inflow of fine silt and clay into the well which has to be cleared out against the next day. A note has been given that in such unusual conditions the Superintending Engineer will allow increase over the basic rates depending upon the amount of inflow.

#### CHAPTER No. 23 River and Canal Protection Works

The rate of item No. 23.5 for making pilchhi, frash or sarkanda rolls exclude supply of materials. This item is only to be paid if pilchhi, frash and sarkanda is supplied in loose form according to item No. 23.1. When supply of this material is taken as compacted in rolls of required diameter and length, no payment over and above item No. 23.1 (b) shall be made. Items 23.8, 23.9 and 23.10 involve the use of pilchhi, frash and sarkanda made into rolls of six inches diameters and five feet long. These rates include the cost of making rolls of pilchhi, frash and sarkanda. No payment for making rolls shall be made over and above the rates of these items as given in the schedule.

#### CHAPTER No. 24 Road Work

The rates for laying and consolidation of soling and wearing coats are for labour only although they include the cost of water and cost of working, washing out and establishment charges of road-roller. The rates for collection of materials like kankar, stone metal, bajri etc., have not been given in this chapter, as the rates for these materials vary from place to place. There are a number of sources from where these materials are obtained and their rates even at source vary according to the location of the site, availability of the labour and hardness of the stone. These materials are invariably obtained by calling item rate tenders and the rates as provided in chapter No. 3 for "Material" can serve as a rough guide in the field for estimating.

Separate labour rates have been provided for brick soling, stone soling, stone metal wearing coat, kankar or brick ballast soling and wearing coats. Water allowance is payable where water is not available within half a mile of the nearest point of the mile and it is to be paid in slabs of half furlong leads in excess of half a mile distance per mile of 12 feet wide road. The rate for water allowance for stone soling is lower than the rate for water allowance for wearing coat. The rate for water allowance is per mile per 12 feet width or part thereof. If the width of road is less than 12 feet, full rate is paid and if the width is more than 12 feet, but is equal to or less than 24 feet, double the rate is to be allowed. In case of hill schedule, the following provision for water allowance has been made.

"Water allowance is payable in miles where water is not available within one furlong of the nearest point of the mile or where water cannot be brought by gravity from kuhls. The water allowance is payable per mile per 12 feet width or part thereof in slabs for every half furlong lead in excess of one furlong. Where water can be brought by gravity from kuhls, no water allowance is to be paid even though the lead may be more than one furlong. The limit of half a mile has been reduced to one furlong in case of hilly areas, as water is to be brought mostly by manual labour up the slopes and requires greater cost."

Rates for surface painting have been provided separately for bitumen and tar and for first coat, second coat and subsequent coats. The rates have also been provided for premixed carpet 3/4 inch thick and one inch thick. Other rates provided are for making road structures like mile-stones, furlong posts, boundary pillars, etc. Rates have also been provided for concrete roads separately for zones A, B and C and for making and filling expansion joints and providing and fixing pre-moulded bituminous joint fillers. The rate for road structures and concrete and pavements are both labour and through rates.

#### CHAPTER No. 25—Maintenance of Furniture

Rates for spirit or wax polishing of items like tables, side boards, almirahs, book-shelves etc. have been based on superficial area of top or front elevation. These items can vary considerably in sizes and, therefore, rates have to be provided according to the area. Other items like chairs, peg tables, cane sofas, hat and coat stands, etc., where there is no variation in the surface area, rates have been provided for each article of furniture without reference to surface area. For caning work, rates have been provided only for local Bareilly cane. Singapore cane is not available in market and, therefore, this item has not been provided for. A substitute for cane has been prepared from plastic. Rates for this item have also been provided under head "Recaning with artificial (plastic) cane". Rates for polishing and recaning of seats, etc., have been provided on the basis of through rates as the cost of material is approximately small as compared to labour involved. In case of upholstering or recovering

of sofas and sofa chairs, both labour and through rates have been given but the through rates do not include the cost of cloth which has to be purchased and supplied by the department, as a number of varieties of cloth are available in the market and it is not proper to specify any one of them in the Schedule of Rates.

#### CHAPTER No. 26—Miscellaneous Items

In this chapter rates have been provided for such items as are of miscellaneous nature and can not be grouped under any other chapter. One of the important items is cutting of trees and removal thereof from Government land. The rate for this item depends upon the girth of the tree which is to be measured four feet above ground level. If the stumps are also to be grubbed in addition to felling of tree, the rates are to be doubled in case of plains schedule and multiplied by 2.5 in case of hill schedule. The trees and stumps which are got cut and removed will be the property of Government and a note to this effect has been given in this chapter. Although these rates have been given, it is suggested that cutting and removing of trees should not normally be done through contractors. Such trees should be sold by auction and the purchase price should include the purchaser's liability to get the trees cut and grubbed and to remove them from government land. However, where it is not considered feasible to do so the trees may be got cut on contract basis but the timber thus obtained will remain the property of Government.

*Jungle clearance.*—Two types of rates have been provided for jungle clearance—firstly for new areas acquired for the construction of roads, buildings, new canals or extension of channels. The rate for these items vary from Rs. 4.00 to Rs. 20.00 per acre depending upon the intensity of jungle. The actual rates are to be fixed by the Executive Engineer according to local conditions and the amount of work involved. Separate rates have been provided for jungle clearance along the running canals, branches, distributaries and minors depending upon the discharge of the channel. This jungle clearance normally involves cutting away of bushes and other wild growth on the canal banks or boundary roads. Since it is not possible to assess the exact rate for jungle clearance very correctly, it has been specified that the item of jungle clearance should be got done through departmental labour and the rates provided in the Schedule may be utilised for estimating purposes only.

*Water allowance.*—Provision has been made for water allowance for concrete, bricks and stone masonry, plastering, pointing, flooring, etc., depending upon the lead from which water is actually brought. These rates are only for extraordinary water arrangements. For ordinary and normal water arrangements the cost is included in the respective items of the schedule. These additional rates are payable in case of plains when water is not available locally and fixing of hand pumps at the site of work is neither feasible nor practically possible due to small amount of works or due to depth of spring level and where water is actually carried by carts or by mechanical transport from a lead greater than half a mile. In case of hilly areas water allowance is payable only where water cannot be brought by gravity in kuhls from a reasonable distance and where it is not available locally within one furlong of the site of work and where water is actually to be carried by manual labour or by mechanical transport from a distance exceeding one furlong.

#### CHAPTER No. 27—Quantities of Materials

The detailed analysis of rates for the entire Common Schedule have been printed separately in two volumes for the use of departmental officers and the quantities of materials required for each item have been indicated therein. However, important items which are very common in practice have been given in the Schedule itself in chapter No. 27 for ready reference and for preparing the consumption statements on the completion of works. Consumption of materials for such items which have not been given in this chapter can be obtained from the analysis of rates.

While working out the quantity of sand required for various items of work, 15 per cent wastage has been allowed as sand is normally wasted partially by getting mixed with soil and partially by blowing away with the wind.

These consumption factors are for average conditions and are for the purposes of estimates and for preparing consumption accounts. However, in actual practice variation up to five per cent above or below can take place due to different grading of materials, tolerances in sizes of materials and due to greater or lesser wastage in handling and construction. It is, therefore, recommended that variations to this extent may not be taken serious notice of.

#### CHAPTER No. 28—Water-supply

Carriage for some of the items like cast iron pipes, stone ware pipes, hume pipes, etc., could not be included in chapter No. 5 on "Carriage". These items have now been provided in the chapter for Water-supply. The relevant notes on carriage chapter which apply in case of these items have been reproduced in this chapter. Similarly, rates for loading and unloading of these materials have also been given. Rates for both the plains and hilly regions have been given in the same chapter. In case of excavation for laying of pipelines, the rates have been based on chapter No. 6 for "Earth-work" with some addition for items like timbering, shoring, dewatering, diversion of traffic fixing caution, boards providing crossings over trenches and removal of surplus spoil outside or inside the town. Rates for excavation have been divided broadly under two heads—firstly for excavation inside the town requiring disposal of surplus soil away from the site of work, and secondly for excavation in open areas where disposal of surplus soil can be done along the alignment. These rates have been further sub-divided into two classes—firstly for excavation requiring timbering and secondly for excavation not requiring timbering. In all the four cases mentioned above, the rates will be different. Extra rates have been provided for disposal of surplus soil beyond one mile lead in case of works inside the towns. A number of notes have been provided in the body of the chapter which are self-explanatory and may be carefully studied by all concerned.

### CHAPTER No. 29—Sewerage and Drainage

As in case of water-supply the rates for excavation for drains, sewers, etc., in this chapter have been based on the basic rate of earthwork as given in chapter No. 6 and adding provision for special items which are peculiar to the Public Health Works. The rates have been broadly divided into two classes—firstly such excavations where no timbering is required and secondly excavation for sewers and manholes where timbering is definitely required. In the first category, are included items for excavation of intramural sullage drains, extramural intercepting drains and storm water channels. These excavations are not more than six feet in depth and normally do not require any timbering. The rates for the excavation of sewerage and sedimentation tanks, high level tanks, filter beds, reservoirs, pump-houses, sumps, screening chambers and other similar works have been separately provided. In such cases no timbering is required and the area for excavation is more open than in the first category, however, provision has been made for extra rate if timbering in any special circumstances is required to be done.

The rates for excavation of sewers and manholes have been given separately from the one for connection to ventilating shafts. The excavation for connection to ventilating shafts is normally four to five feet in depth and requires less amount of timbering and shoring and less expenditure on disposal of surplus soil. Additional rates have been provided for greater depths and for works extending below sub soil water level. Detailed notes have been added under this item as well as under other items in this chapter which are very detailed and self-explanatory. All these notes may be read carefully by all concerned.

Regarding painting of ventilating shafts, separate rates have been given for ordinary paints and special quality paints. In this connection reference may be made to the explanations given for the items of painting under chapter No. 16.

In case of constructing brick or concrete sewers, the rates are for 13 feet depth below ground level. Where depth is greater, additional rate is to be provided in slabs of  $6\frac{1}{2}$  feet additional depth or part thereof.

### CHAPTER No. 30—Sanitary Installations

Provision has been made for sanitary fittings of good Indian manufacture like Bombay Potteries and Parry's. Sanitary fittings of other equally good Indian manufactures may be used, if approved by the Engineer incharge. In this connection the Superintending Engineer will circulate from time to time the list of fittings of good Indian manufactures which may be considered to be on the approved list and which may be allowed to be used on works. Separate rates have been provided for different types of fittings, pipes and specials for different sizes.

### CHAPTER No. 31—Electric Installations in Government Buildings

The rates in this chapter have been based on the new schedule of rates which was enforced in the Capital Project in 1956 and in the B. & R. Branch in 1957. Detailed analyses of every item have been prepared and the current market rates for various items have been provided in the analyses. The price of various materials have been based on the lowest quotation where the quality of manufacture is considered to be of proper specifications. Quotations for such articles of Indian manufacture which do not come up to specifications or which have been found defective as a result of practical experience have been ignored. A list of approved manufactures for various articles has been compiled and is being attached with the Analysis of Rates. This list will be amended from time to time with the approval of Chief Engineer, Buildings and Roads.

While working out the composite rates for light points, etc., the following lengths of wiring have been taken into account :—

- |   |                         |
|---|-------------------------|
| (a) Light, fan or call-bell point with single control   | .. 25 feet              |
| (b) Light point without control (this will apply when two lights are provided which are operated with one switch only. One of these points will be paid for as light point with single control and the other will be paid for as light point without control) | .. $12\frac{1}{2}$ feet |
| (c) Light point with double control (this item covers light point in stairs or in entrance-halls where one light is to be controlled by two switches on opposite directions)  | .. 35 feet              |
| (d) Wall sockets 5 AMP  | .. 20 feet              |

The rates and the lengths of wiring mentioned above apply to old buildings or new buildings in plains or hills irrespective of type of construction, height of roof and local conditions. Any variation in these items will be reflected in premium/abatement over the schedule rates. The rates of premia/abatement will be fixed for various zones after the Schedule has been worked out for about six months.