Ministry of Surface Transport
(Roads Wing)

3

ADDENDUM TO MINISTRY'S TECHNICAL CIRCULARS AND DIRECTIVES ON NATIONAL HIGHWAYS AND CENTRALLY SPONSORED ROAD & BRIDGE PROJECTS (January 1993 to December 1994)

Published by the
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Ministry of Surface Transport (Roads Wing)

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FOREWORD

Technical Circulars, guidelines, directives issued by the Ministry for National Highway Works and other Centrally Sponsored Schemes from time to time, were compiled and published in Two Volumes (Vol. I & II) in July, 1986 covering Circulars upto August, 1985. Subsequently, two Addendums to Ministry's Technical Circulars on Projects were published in September, 1989 and December, 1993 covering the Circulars issued by Ministry from August 1985 to July, 1988 and August, 1988 to December 1992 respectively.

Since December 1992 a number of Circulars and guidelines have been issued. These have been compiled upto December, 1994 and are being published as the 3rd Addendum to Ministry's Technical Circulars and Directives on National Highways and Centrally sponsored Road and Bridge projects.

The compilation of this Addendum, would not have been possible without the active involvement of officers of Roads Standards & Research Zone in general and Shri A.K. Sharma, Superintending Engineer (R) S&R in particular.

The compendium have served useful purpose for making the Government policies in highway sector widely known to all concerned. It is expected that this addendum will afford an opportunity to the officers of Roads Wing as well as various State PWDs to keep abreast with the policy changes since the issue of the last addendum.

It will be our endeavour to keep updating these volumes as and when new Circulars are issued by the Ministry and bring them out in the form of Addendum for the benefit of the users. Any feedback from the State PWDs as well as technical officers of the Roads Wing to effect improvements in the future editions of the Addendum would be welcome.

(A.D. Narain)
Director General (Road Development) &
Additional Secretary to the Govt. of India
Ministry of Surface Transport

New Delhi,
Dated : October, 1996

TABLE OF CONTENTS

112.4

Dated, the 19th January, 1993

NATIONAL HIGHWAYS (AMENDMENT) ACT 1992

An Act further to amend the National Highways Act, 1956.

Be it enacted by Parliament in the Forty-third Year of the Republic of India as follows:-

1. (1) This Act may be called the National Highways (Amendment) Act, 1992.

(2) It shall be deemed to have come into force on the 23rd of October, 1992.

2. In section 7 of the National Highways Act, 1956 (hereinafter referred to as the principal Act), in sub-section (1), after the words "on national highways", the words "and the use of sections of national highways" shall be inserted.

3. In section 9 of the principal Act, in sub-section (2), in clause (b), after the words "national highway", the words "and the use of sections of any national highway" shall be inserted.

4. (1) The National Highways (Amendment) Ordinance, 1992 is hereby repealed.

(2) Notwithstanding such repeal, anything done or any action taken under the principal Act, as amended by the said Ordinance, shall be deemed to have been done or taken under the principal Act, as amended by this Act.

114.8

No.NH-11052/4/91-DO I *Dated, the 17th Sept., 1993*

PUBLISHED IN THE GAZETTE OF INDIA, EXTRA ORDINARY, PART II, SECTION 3, SUB-SECTION (ii)

NOTIFICATION

S.O. 699(E) In exercise of the powers conferred by section 7 of the National Highways Act, 1956 (48 of 1956), the Central Government hereby makes the following rules to further amend the National Highways Rules, 1957, namely:-

(1) These rules may be called the National Highways (Amendment) Rules, 1993.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the National Highways Rules, 1957, the following new rule shall be added at the end after rule 9, namely:-

"10. Utilisation of space beneath the Road Overbridges or Flyovers:

The Central Government, where it deems fit, may accord permission to the State Government or the Government of a Union Territory, as the case may be, for utilisation of space beneath the Road Overbridges or Flyovers on National Highways for which an yearly licence fee which shall be either-

(i) a percentage of capital cost: consisting of the cost of land and the cost, if any, incurred by the Central Government for covering or enclosing the space beneath the approach spans of Road Overbridges or Flyovers and for providing sanitary, water supply and electric installations, equal to such rate of interest as may from time to time be fixed by the President under F.R. 45 A plus an addition for house or property tax, if any, payable by Government in respect of the covered space and for maintenance and repairs of the covered structure, or

(ii) six per cent per annum of such capital cost, whichever is less, shall be fixed and levied on the terms and conditions as may be laid down by the Central Government in this respect. The rate of licence fee to be levied as above, shall be subject to revision after every five years to take into account any change in the market value of the land.

Notes:- The Principal rules were published in the Gazette of India vide notification No.SRO 1182 dt. 4.4.1957 and were subsequently amended vide Gazette notifications

(1) No.SO-680E dt. 15.10.1976
(2) No.SO-496E dt. 20.08.1986
(F. No. NH-11052/4/91-DOI)

114.9

No.RW/NH-11012/1/92-DO I *Dated, the 5th November, 1993*

PUBLISHED IN THE GAZETTE OF INDIA, EXTRAORDINARY PART II, SECTION 3 SUB-SECTION (ii)

NOTIFICATION

S.O. 855(E) In exercise of the powers conferred by section 9 of the National Highways Act, 1956 (48 of

1956), the Central Government hereby makes the following rules further to amend the National Highways Rules, 1957, namely:-

(1) These rules may be called the National Highways (Amendment) Rules, 1993.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the National Highways Rules, 1957 (hereinafter referred to as the said rules), in rule 3-

(a) in sub-rule (1) for the words, letters and figures "Rs.25 lakhs", the words, letters and figures "Rs.50 lakhs" shall be substituted

(b) in sub-rule (2) for the words, letters and figures "Rs.25 lakhs", the words, letters and figures "Rs.50 lakhs" shall be substituted

(c) in sub-rule (6) in clause (b), for the words "two years", the words "one year" shall be substituted.

3. In rule 5 of the said rules, for the words "rupees twenty five lakhs", wherever they occur, the words "rupees fifty lakhs" shall be substituted.

4. In the Schedule to the said rules -

(a) In the first paragraph, for the words and figures "Rs.25 lakhs", the words and figures "Rs.50 lakhs" shall be substituted

(b) for condition (1) the following condition shall be substituted, namely:-

"The executing agency shall prepare detailed estimate and working drawings but forward to the Central Government for approval only the general abstract of cost in respect of the works contained in the approved annual programme of works costing upto Rs.50 lakhs for a particular year. However, for projects involving surveys and investigations and land acquisitions the detailed estimate and drawings in the form specified by the Central Government shall be forwarded for approval. The executing agency shall accord technical approval and financial sanction to the detailed estimate already prepared in advance within three months from the date of according administrative approval by the Central Government and shall commence execution of the work within one year from the date of according administrative approval failing which, the administrative approval accorded by the Central Government shall stand cancelled automatically and the executing agency shall approach the Central Government for fresh administrative approval for the said works;

(c) in clause (b) of condition (2), after the words "in the case of items", the words "in the Annual Plan" shall be inserted;

(d) in condition (4), for the words "rupees twenty five lakhs", the words "rupees fifty lakhs" shall be substituted;

(e) conditions (8) and (9) shall be omitted;

(f) condition (10) shall be renumbered as (8) and in the condition (8) as so renumbered,

(i) for clause 9 (ii), the following clause shall be substituted, namely:-

"(ii) where for any work, the deviations from approved standards, specifications, instructions and guidelines issued by the Central Government have to be made due to the local conditions, no work shall be sanctioned by any executing agency unless a complete copy of the estimate is furnished to the Regional Officer concerned of the Ministry in the Central Government dealing with National Highways, who shall forward the same to the Central Government with his comments thereon for approval. Technical approval and financial sanction may be issued by the executing agency only after such approval.";

(ii) Clause (iii) shall be omitted and clause (iv) shall be renumbered as clause (iii).

Notes: The principal rules were published in the Gazette of India, Part II, Section 3, sub-section (ii), dated 13/04/1957, vide Government Notification, Ministry of Transport (Roads Wing) No.S.R.O. 1182, dated 04/04/1957 and were subsequently amended by:-

(i) Government Notification No. S.O. 680(E) dated 18/10/1976 published in the Gazette of India Part II, section 3, sub-section (ii).

(ii) Government Notification No.S.O.496(E) dated 20/08/1986 published in the Gazette of India, Part II, Section 3, sub-section (ii).

(iii) Government Notification No.S.O. 699(E) dated 17/09/1993 published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii).

121.2 DIRECTIONS ON PROJECT PREPARATION AND CO-ORDINATION BETWEEN ROADS AND BRIDGES

Code No.	*Circular No. & Date*	*Brief Subject*	*Page No.*
121.2.49 1100	RW/NH-11052/7/93-DO I dt.24-3-93	Need for coordination between the construction of bridges and their approaches for the completion of both the components simultanesouly.	121.2/36
121.2.50	RW/NH-11060/1/93-DO I dt. 27-1-94	Preparation of projects requiring EFC/PIB clearance.	121.2/36

121.3 AGENCY, OTHER CHARGES AND RECEIPTS

121.3.14	RW/NH-11052/10/93-DO I dt.13-4-93.	Project preparation provision on account of quality control, work charged establishment and contingencies for NH works.	121.3/7

121.4 PROCEDURE FOR SUBMISSION OF CASES TO MINISTER, MOF, PIB, EFC & WORLD BANK

121.4.30	RW/NH-11065/16/92-DO I dt. 16-12-92	Permission from the Forest Department for construction of temporary diversion road for NH works passing through forest land-Advance action thereof	121.4/35

121.5 REVISED ESTIMATES, PERMISSIBLE EXCESS AND CHANGE OF SCOPE

121.5.21	RW/NH-11026/1/94-DO I dt. 27-1-94.	Procedure for submission of revised estimates requiring approval of Expenditure Finance Committee	121.5/18

121.6 DELEGATED POWERS TO STATES AND SPLITTING OF WORKS

121.6.18	RW/NH-11052/8/93-DO I dt. 30-3-93	Splitting of National Highway works-regarding	121.6/19

121.2.49
1100

No.RW/NH-11052/7/93-DO I *Dated, the 24th March, 1993*

To

The Chief Engineers of all States/UTs (dealing with NHs and other Centrally sponsored works); Director General, CPWD; Director General Border Roads

Subject: Need for coordination between the construction of bridges and their approaches for the completion of both the components simultaneously.

I am directed to invite your attention to this Ministry's letter No.NH-III/P/30/77 dated 19th October, 1977 wherein the need for maintaining close coordination between the construction of bridges and their approaches has been emphasised in order to see that there is no time gap between the construction of the two components.

2. However, it appears that the guidelines indicated in the above and other earlier letters issued by this Ministry are not being followed by some of the State Govts. It has recently come to the notice of this Ministry that the construction of a bridge on one of the National Highways was completed in December, 1989 but it could not be opened for traffic because of non-completion of approach roads.

3. It may be stated that if the instructions contained in the various circulars issued by the Ministry are followed, it should be possible to ensure simultaneously construction of the bridges and their approaches. It is, therefore, reiterated that the instructions relating to the construction of bridges and their approaches simultaneously, issued by this Ministry from time to time may please be complied with strictly. Efforts may also be made to entrust the construction of bridge and its approaches to a single agency, wherever possible, with a view to facilitate their coordinated completion.

121.2.50

No.RW/NH-11060/1/93-DO I *Dated, the 27th Jan., 1994*

To

The Secretaries, Public Works Departments of States/UTs. (dealing with National Highways Works); Director General (Works), Central Public Works Department; Secretary, Border Roads Development Board; Engineer-in-Chiefs/Chief Engineers (dealing with National Highways), Public Works Departments of States/UTs.

Subject: Preparation of projects requiring EFC/PIB clearance.

Instructions have already been issued for preparation of detailed projects for NH works only after conducting proper surveys and investigations vide Ministry's letter No.NH-III/P/31/77 dated 31.5.1978 following the IRC guidelines and clarifications given by the Ministry from time to time to avoid subsequent large scale variations in the scope and the cost of the works.

2. It has been noticed that in some cases where the clearance of EFC/PIB was obtained based on the preliminary estimates, substantial variations in the scope and the cost were noticed later at the time of preparing detailed estimates. This has been viewed seriously. It has, therefore, been decided that in future, the project estimates shall be considered only after thorough and detailed surveys/soil investigations are carried out and the proposals are prepared based on the data so collected and adopting the latest schedule of Rates.

3. The above instructions may kindly be brought to the notice of all concerned for strict compliance.

121.4.30

No.RW/NH-11065/16/92-DO I ***Dated, the 16th Dec., 1992***

To

The Secretaries of States/Union Territories, Public Works Departments

Subject: Permission from the Forest Department for construction of temporary diversion road for NH works passing through Forest Land- Advance action thereof.

I am directed to say that it has come to the notice of this Ministry that in the case of construction of a minor bridge on a National Highway, the contractor entrusted with the job had sought closure of the contract due to delay in forming the diversion road by the State Public Works Department. The delay had occurred as the State Public Works Department could not obtain the permission from the Forest Department for constructing the temporary diversion road passing through the forest land and involving cutting of some trees. Later, the alignment of the diversion road had to be changed to avoid cutting of trees. The State Public Works Department subsequently had to get the bridge work executed through another agency resulting in delay and consequent increase in cost of the work.

2. To avoid recurrence of such a situation in future, it is requested that wherever a temporary diversion road passes through forest land, advance clearance from the Forest Department should be obtained before finalising the detailed estimate for the N.H. works so as to avoid any changes in the scope of work at a later date and consequent delay. Wherever the diversion road is required to be provided by the Department, the same should be done before the award of work so that the contractor is able to start the work immediately after the award of work.

3. The contents of this letter may please be brought to the notice of all concerned in your State for strict compliance in future.

121.4.30

No.RW/NH-11065/16/92-DO I *Dated, the 16th Dec., 1992*

To

The Secretaries of States/Union Territories, Public Works Departments

Subject: Permission from the Forest Department for construction of temporary diversion road for NH works passing through Forest Land- Advance action thereof.

I am directed to say that it has come to the notice of this Ministry that in the case of construction of a minor bridge on a National Highway, the contractor entrusted with the job had sought closure of the contract due to delay in forming the diversion road by the State Public Works Department. The delay had occurred as the State Public Works Department could not obtain the permission from the Forest Department for constructing the temporary diversion road passing through the forest land and involving cutting of some trees. Later, the alignment of the diversion road had to be changed to avoid cutting of trees. The State Public Works Department subsequently had to get the bridge work executed through another agency resulting in delay and consequent increase in cost of the work.

2. To avoid recurrence of such a situation in future, it is requested that wherever a temporary diversion road passes through forest land, advance clearance from the Forest Department should be obtained before finalising the detailed estimate for the N.H. works so as to avoid any changes in the scope of work at a later date and consequent delay. Wherever the diversion road is required to be provided by the Department, the same should be done before the award of work so that the contractor is able to start the work immediately after the award of work.

3. The contents of this letter may please be brought to the notice of all concerned in your State for strict compliance in future.

121.5.21

F.NO.RW/NH-11026/1/94-DO I *Dated, the 27th Jan., 1994*

To

The Secretaries (dealing with National Highways), Public Works Departments of all States and UTs; Director General (Works), Central Public Works Department; Secretary, Border Roads Development Board

Subject: Procedure for submission of Revised Estimates requiring approval of Expenditure Finance Committee

I am directed to state that in one of the meetings of the Expenditure Finance Committee held recently under the Chairmanship of Secretary (SFT) to consider a Revised Cost Estimate in respect of NH work, it was felt that the EFC Note is not being properly projected, with the result that the members of EFC cannot make proper appraisal of the case. It was, therefore, decided as under:-

(i) The cost break-up for the Revised Cost Estimate proposals should not only be compared with the detailed sanctioned cost but also with the original administratively approved cost.

(ii) While carrying out economic analysis of the projects, the cost of land should be included in the total cost of the project.

(iii) There is a need to compress the time taken in detailed engineering, preparation of detailed project report and finalisation of tenders.

2. It is requested that, in future the above directives of the Expenditure Finance Committee may please be kept in view while submitting proposals in respect of Revised Cost Estimates to this Ministry. Steps may also be taken to cut down delays in detailed engineering, preparation of project report and finanlisation of tenders. These requirements may kindly be brought to the notice of all field officers in your Department for compliance.

121.6.18

No.RW/NH-11052/8/93-DO I *Dated, the 30th March, 1993*

OFFICE MEMORANDUM

Subject: Splitting up of National Highway works-regarding

The undersigned is directed to refer to this Ministry's letter No.RW/NH-11063/1/87-DOI(Pt) dated 24-7-1990 addressed to the State PWDs and copy endorsed to all technical officers of Roads Wing, etc., reiterating the Policy guidelines that in order to encourage well qualified contracting firms or cooperatives of small contractors and in the interest of quality construction, splitting of NH works may not be resorted to. It may be stated that in a recent meeting held under the Chairmanship of AS &FA, it was pointed out that there have been instances where projects have been split by Roads Wing without due approval from the competent authority approving the projects. It was felt that the project must be executed strictly in accordance with the packages mentioned in the original proposal (EFC/Finance Proforma) and except in special circumstances splitting of works should not be allowed.

2. It has, therefore, been decided that the N.H. projects must be executed strictly in accordance with the packages mentioned in the original proposal (EFC/Finance Proforma). In case the splitting of work is considered to be permitted, the file may be submitted to the competent authority, who has approved the project, with full justification for the same.

3. It is requested that henceforth the above instructions may strictly be adhered to.

130.44

No.RW/NH-11024/2/90-DO I *Dated, the 16th Sept., 1991*

To

The Secretary, Public Works Departments of all States/UTs; Director General (Works), Central Public Works Department; Director General, Border Road Development Board

Subject: Tender Documents for Local Competitive Bidding for the execution of Road and Bridge work on National Highways and Centrally Sponsored Schemes - Mobilisation-Advance to Contractors

This Ministry has been receiving requests from contractors from time to time that on the pattern of LCB projects, an interest-free mobilisation advance of 10% may be paid to the contractors in respect of LCB works as well.

2. After careful consideration, it has been decided that the facility of 10% interest-free mobilisation advance may be allowed on all projects costing Rs.2 crores or higher for which bidding has been conducted after prequalification as per prescribed procedure of the Ministry. For this purpose, standard clauses about the payment of advance and its recovery have been prepared by the Ministry (see Enclosure).

3. It is requested that in future the tender documents for all Road and Bridge works on National Highways and other Centrally sponsored schemes should contain the above mentioned clauses.

4. At present, the prequalification of contractors is mandatory in respect of works costing Rs.2 crores or more. In case this threshold for prequalification is revised at a subsequent date, the applicability of this circular will get automatically modified to correspond to the revised threshold for prequalification of contractors.

5. It is requested that the contents of this circular may be brought to the notice of all the field offices of the Public Works Department.

6. This issues with the concurrence of Internal Finance of this Ministry.

Enclosure to Letter No. RW/NH-11024/2/90-DOI dated 16.9.91

Clauses to be included in the Tender Documents of Road & Bridge works on National Highways and other Centrally sponsored schemes costing Rs.2 crores or more and for which prequalification of contractors has been carried out

1. **Mobilisation - Advance Payments**

The Employer will pay an interest-free mobilisation advance against key plant and machinery required for the work and brought to site or proposed to be purchased and brought to site, if so requested by the Contractor. The maximum of such advance shall be ten percent of the Contract amount. In case of new plant and equipment, the advance shall be limited to ninety per cent of the price of such new plant and equipment by the Contractor for which the Contractor shall produce satisfactory evidence of cost and of having purchased or having placed orders for purchase of the same. **In the case of used plant or equipment**, the amount of such advance shall be limited to ninety per cent of the depreciated value of plant and equipment as may be determined by the Engineer. This advance shall be further subject to the condition that-

(i) such plant and equipment are considered by the Engineer to be necessary for the works and are included in the list of essential equipment given as Annexure_____(1) of the tender document,

(ii) such plant and equipment are in working order,

(iii) such plant and equipment are hypothecated to the Government in the form given in Tender Document, or

(iv) the Contractor provides a bank guarantee acceptable to the Employer in an amount equal to the advance.

A form of bank guarantee acceptable to the Employer is indicated in Appendix_____(2). The advance will be paid only after execution of Form of Agreement by the parties thereto and provisions by the Contractor of the

Performance Security in accordance with Clause _____ (3). No advance shall be granted on any piece of plant or equipment with a value of less than Rs.50,000/-. No advance for plant and equipment shall be granted after eight months from the date of commencement, which period may be extended, if considered reasonable by the Engineer.

2. **Repayment of Mobilisation Advance**

Repayment of the mobilisation Advance shall commence at the time of the next Interim Certificate_____ (4) following that in which the total estimated value of the permanent works executed, as per Clause_____(5) hereof, has reached 10% of the Contract Price. The deduction shall be made at the rate of 15 (fifteen) per cent of the gross amount of subsequent Interim Payment Certificates, untill such time as the total mobilisation advance has been repaid by the contractors, always provided further that the repayment of advance shall be completed when 75% of the contract price of the work has been paid. Also further provided that irrespective of the total payment made to the Contractor, the repayment of the advance shall commence from the time of the Interim Payment Certificate subsequent to completion of one third of the period of completion after the commencement of the works pursuant to Clause_____(6) hereof,

Notes:

(1) Insert relevant Annexure No. of Volume III. The Ministry will indicate sample lists of equipment for this purpose in due course.

(2) A model form of bank guarantee is enclosed as Annexure to this Enclosure. This should be added in the tender document as an Appendix. Appropriate Appendix number of the form in a particular tender document should be inserted, here.

(3) Insert relevant clause number of the Conditions of Contract specifying 'Performance Security' or 'Security'.

(4) 'Interim Certificate' means monthly payment account of the Contractor.

(5) Insert clause number of the Conditions of Contract according to which the 'Interim Payment Certificate' or the monthly payment account is to be prepared.

(6) Insert clause number of the Conditions of Contract indicating period of completion of the work.

Annexure to Enclosure of letter No.NH-11024/2/90 DO I dated 16.9.91 (Ref. 130.48 dated 20.7.93)

MODIFIED BANK GUARANTEE*

To

The President of India/
The Governor of the State of
acting through

Subject: (Please state the name of the work)

In accordance with the provisions of the Conditions of Contract, in respect of (Mobilization Advance of the Contract Agreement for the abovenamed works, _____ _____**

(hereinafter called "the Contractor") shall deposit with (Name of Employer) _____

a bank guarantee in an amount of (Amount of Guarantee)_____

(in words)_____

_____

We, the (Bank) as instructed by the Contractor, agree unconditionally and irrevocably to guarantee, as primary obligator and not as Surety merely, the

payment to (Name of Employer) _____
on his first demand, without any right of objection on our part and without his first claim to the Contractor, in the amount not exceeding (Amount of Guarantee) _____
(in words) _____
in the event that the _____
obligations expressed in the said Clause of the above mentioned contract have not been fulfilled by the Contractor giving the right of claim to the Employer for recovery of the whole or part of the Mobilization Advance Loan from the Contractor under the Contract or the Contractor's employment has been terminated in accordance to the said Conditions of Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of works to be performed thereunder or of any of the Contract Documents which may be made between (Name of Employer) and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance loan payment to the Contractor under the Contract until (Name of Employer) _____ receives full repayment of the same amount from the Contractor.

Yours truly_____

SIGNATURE AND SEAL : _____

(Name and Designation)

Name of Bank/Financial Institution: _____

Address : _____

Date : _____

WITNESS 1.

2.

* Tenderers are NOT required to fill in this form at the time of tender submission

** Give names of all partners in case of a Joint Ventures.

130.45

No.RW/NH-11024/1/86-DO I ***Dated, the 15th Feb., 1993***

To

The Secretary, Public Works Departments of States and UTs (dealing with National Highways and other Centrally Financed Schemes); Director General (Works), Central Public Works Department; Director General Border Roads

Subject: Invitation of tenders for the execution of works on National Highways and other Centrally financed schemes- Need for adoption of uniform policy by the State PWDs relating to advertisements in newspapers/journals

I am directed to refer to the modified guidelines relating to advertisements for invitation of tenders for execution of works of National Highways and other Centrally financed schemes issued vide this Ministry's letter No.NH-11024/1/86-DOI dated 23rd May, 1989 which enjoins upon the State Public Works Departments to issue advertisements in newspapers or journals in the concerned languages depending upon the amount of work and to say that many times this policy is not being followed by the State Public Works Department. In some cases, advertisements have been issued only in local papers and at regional level only in one newspaper or so, which is contrary to the Ministry's policy. You are requested please to ensure that the Ministry's guidelines are followed strictly in future.

2. Furtheron, it has come to our notice that for works costing over Rs.2 crores where pre-qualification of contractors is being done, the documents are not being given to some contractors on the plea that they are not registered in a particular State. Since the pre-qualification is meant to be done on an all-India basis, it is requested that such documents be given to all contractors who evince interest and respond to the advertisement without any condition.

130.46

No.RW/NH-11052/14/93-DO I ***Dated, the 13th May, 1993***

To

The Secretaries/Chief Engineers of all States/UTs, PWDs (dealing with National Highways)

Subject: Constitution of an Apex Management Committee to ensure timely implementation of Major Projects on National Highways

I am directed to say that it has been decided to constitute an Apex Management Committee to ensure timely implementation of major projects relating to National Highways in the country. The composition of the Committee would be as under:-

1.	Secretary (SFT)	-	Chairman
2.	Director General (Road Development) & Addl. Secretary/Addl. Director General (Roads)/Addl. Director General(Bridges).	-	Members
3.	Financial Adviser & Addl. Secretary	-	Member
4.	Secretary, Public Works Department of the State concerned.	-	Member
5.	Concerned Chief Engineer(Roads)/Chief Engineer(Bridges)/Chief Engineer(PIC).	-	Member-Secretaries

Officials of other Ministeries/Departments/Authorities may be co-opted to attend meetings of the Committee as considered necessary.

2. **Functions of the Committee**

The functions of the Apex Committee would include, inter alia, a review of the progress of implementation of major NH projects, wherever considered appropriate by the Committee, in order to suggest measures/ action to accelerate their progress, co-ordination with concerned Ministries and Authorities to remove bottlenecks and impediments, wherever required, and to review the documents, action taken and to direct the State Public Works Departments regarding the action to be taken, as may be required, about the following:-

(i) All aspects relating to tender documents, its invitation and evaluation and ensuring action for early start of works;

(ii) All issues including those arising out of implementation of contractual conditions or on account of interpretation of contractual conditions;

(iii) Proposed variations in contract documents including those relating to contract conditions and variation in specification, quantum or quality of works; and

(iv) Any other matter related to contract execution and implementation of the project as may be considered necessary during the course of its execution.

3. The expenditure in respect of TA/DA of the Central and State Government Officers in relation to the work of the Committee would be borne by the respective Governments.

130.46.A

No.RW/NH-11024/2/91-DO I *Dated, the 18th May, 1993*

To

The Secretaries, Public Works Departments and Chief Engineers of State Public Works Departments, Union Territories (dealing with National Highways and other Centrally Financed Schemes); Director General (Works), Central Public Works Department; Director General Border Roads,

Subject: Guidelines regarding the procedures to be adopted for prequalification of tenderers for the execution of major Road and Bridge Works on National Highways and Centrally Financed Schemes - Modifications in the procedure

I am directed to refer to this Ministry's letter No.RW/NH- 11024/1/86-DOI dated 26th February, 1991 on the subject mentioned above and to say that the Ministry has framed a revised prequalification document for Central sector Road and Bridge projects under Local Competitive Bidding (LCB). This document contains three sections, i.e.

i) Instructions to Project Implementing Agency

ii) Prequalification document to be issued to intending bidders

iii) Summary particulars of applicants

A copy of Section I, i.e. instructions to implementing agencies is sent herewith for your information. Sections II and III are being published by the Indian Roads Congress, Jamnagar House, New Delhi and the same will be on sale after 1st June, 1993. A copy of the printed document will be sent to you in due course. The revised guidelines would be effective from 1.6.1993.

2. In this connection, it may be stated that the process of prequalification should be initiated, in respect of all anticipated works costing over Rs.200 lakhs and upto Rs.500 lakhs, in the beginning of the Calender Year with a view to complete the prequalification by the start of the next financial year. For works costing more than Rs.500 lakhs, the prequalification process may be initiated for individual work soon after EFC Memo is initially circulated to the appraising agencies.

3. Prequalification done on the above basis for works costing over Rs.200 lakhs and upto Rs.500 lakhs will remain valid upto the end of concerned financial year. If any of the proposed work is not taken up and slides into the next financial year, then fresh prequalification carried out for the anticipated works for the next financial year would have to be adopted.

4. This may please be brought to the notice of all concerned Officers for immediate compliance.

Enclosure of letter No.RW/NH-11024/2/91 DO I dated 18.5.93

PREQUALIFICATION FOR CENTRAL SECTOR ROAD AND BRIDGE PROJECTS UNDER LOCAL COMPETITIVE BIDDING (LCB)

INSTRUCTIONS TO PROJECT IMPLEMENTING AGENCY PREQUALIFICATION PROCEDURE

1. INTRODUCTION

1.1. Prequalification of contractors is undertaken for large or complex works so as to confine invitations of bids to firms with a demonstrated capability in executing satisfactorily works of like nature. Accordingly, in this procedure the ability of the firms is judged taking into account (i) experience and past performance, (ii) capability with respect to personnel, equipment & plants and (iii) financial position.

1.2. It is necessary to lay down a time schedule proposed to be followed for prequalification which precedes tendering action.

1.3. The project Implementing Agency is required to advertise prequalification notice in four national newspapers with wide circulation (two in English e.g. Times of India, Hindustan Times, Indian Express, Hindu, Statesman etc. and two in Hindi e.g. Hindustan, Nav Bharat, etc.), the Indian Trade Journal and two regional papers (one in English and the other in local language). In addition, it may also be published in 'Indian Highways' Journal.

1.4. Intending applicants can buy the prequalification document (priced at Rs.500/- only) from the Secretary, Indian Roads Congress, IDA Building, Shahjahan Road, New Delhi- 110 011. (Tel. No.3387140, 3384543 and 3381649).

1.5. The project Implementing Agency will prepare additional details about location, type, scope and magnitude of the proposed works, approximate cost estimate, essential equipment (suggested format in Appendix I) and supply the same to the applicants who desire to get additional data. Contractors who have been prequalified for the works will be entitled to bid for one or more contract packages depending upon their bid capacity.

2. IDENTIFICATION OF PROJECTS FOR PREQUALIFICATION

2.1. Tenders for execution of projects for which estimated cost of construction is Rs.200 lakhs and above (excluding centages but including cost of departmentally supplied materials) shall be invited only from those contractors who are prequalified under the procedure given herein.

2.2. Prequalification of contractors will be carried out under the following two categories:

i) **General Prequalification** - This will be carried out annually in respect of works costing over Rs.200 lakhs and upto Rs. 500 lakhs. Under this category, the project Implementing Agency will, identify such projects which are likely to be sanctioned in a particular financial year. The prequalification will however, be applicable to any similar project in the region costing over Rs.200 lakhs and upto Rs.500 lakhs, taken up during the year.

ii) **Works-wise Prequalification** - This will be carried out in respect of individual works costing more than Rs.500 lakhs. For this purpose, the Project Implementing Agency will start action for prequalification of contractors after the estimate for the work is in advanced stage of sanction i.e. when EFC memo has been initially circulated to the Appraising Agencies by the Ministry.

2.3. Contractor prequalification prior to invitation of bids may also be made in case of special projects involving complexity of design/construction and/or where deemed necessary for quality assurance even if the cost of construction is below Rs.200 lakhs.

2.4. The project Implementing Agency will clearly identify the projects for which tenders are to be invited from prequalified contractors only. The Technical Proposals/Project Report for such projects shall contain an assessment of equipment, personnel, experience, field of specialisation etc., expected from the prospective bidders for the execution of the project. The list of essential equipment required for the project, as mentioned in para 1.5 above, shall also be furnished alongwith the technical proposal.

2.5. Exemption from the prequalification requirement mentioned above shall be subject to specific approval of the Ministry after due scrutiny of reasons.

3. CALL FOR PREQUALIFICATION APPLICATIONS

3.1. The prequalification applications shall be invited by the Implementation Agency in the manner indicated below:

(a) For category (i) works mentioned in para 2.2, the applications shall be invited in the beginning of the calendar year with a view to complete the prequalification by the start of next financial year; and

(b) For category (ii) works, the applications may be invited by the Implementation Agency soon after EFC Memo is initially circulated to the Appraising Agencies.

3.2. A copy of the notice (draft for three possible situations enclosed as Appendices II, III & IV) inviting prequalification applications to be inserted as per para 1.3 above shall also be forwarded to the Ministry for information.

4. The prospective applicants should have satisfactorily completed during the last 5 years atleast one work of similar nature and having a magnitude of 40% (price updated @ 10% per annum compoundable) of the average value of work of a slab for which prequalification is sought, or he should be satisfactorily executing currently atleast one work of similar nature and having completed billing not less than 40% of the value of the work for which prequalification is sought. In the case of Joint Venture(s), atleast one of the constituent should conform to the above requirement.

5. The prospective applicants or any of their constituent partners should not have abandoned any National Highway work nor any of their contract for National Highway work should have been rescinded during the last five years.

6. EVALUATION OF PREQUALIFICATION APPLICATIONS

6.1. Evaluation of prequalification applications shall be carried out in the following three stages:

(i) Ist stage - General Scrutiny

(ii) IInd stage - Initial Scrutiny

(iii) IIIrd stage - Detailed Evaluation

6.2. General scrutiny - It will comprise general examination of applications by the project Implementing Agency. The following applications will be considered as invalid:

(i) bids received later than the specified date and time for their receipt;

(ii) bids not signed; and

(iii) proof of authorisation to the signatory not furnished.

Project Implementing Agency will prepare the lists of valid and invalid applications. In the case of invalid applications, reasons for invalidation shall be indicated.

6.3. Initial screening - It will comprise examination of applications by a Screening Committee with respect to certain minimum eligibility requirement of the contractors for prequalification. Applications of only those contractors, who pass the initial screening will be subjected to detailed evaluation.

6.4. Detailed evaluation - It will comprise evaluation of various factors determining the capability of a contractor for carrying out such works. The evaluation will be done by the same Screening Committee.

7. REFERRAL TO THE MINISTRY OF SURFACE TRANSPORT (ROADS WING)

The Chief Engineer of project Implementation Agency shall furnish the following documents to the Ministry of Surface Transport (Roads Wing):

a) **General Prequalification**

List of applicants separately valid as well invalid

b) **Work-wise Prequalification**

(i) One copy of the prequalification documents of each applicant;

(ii) Separate lists of applicants whose documents are found to be valid or invalid. In case of invalid documents, reasons for invalidation must be indicated.

8. SCREENING COMMITTEE

8.1. General Prequalification for works between Rs.200 lakhs and Rs.500 lakhs

The constitution of Screening Committee will be as under:

(i)	Chief Engineer (Roads) in the case of Road works and Chief Engineer (Bridges) in the case of Bridge works of MOST dealing with the State	-	Chairman
(ii)	Chief Engineer (National Highways) in the State concerned	-	Member
(iii)	Regional Officer, MOST of the concerned State	-	Member

8.2. Work-wise Prequalification for works costing more than Rs.500 lakhs

The constitution of Screening Committee will be as under:

(i)	Additional Director General (Roads) in the case of Road works and Additional Director General (Bridges) in the case of Bridge works	-	Chairman
(ii)	Chief Engineer (National Highway) of the concerned State	-	Member
(iii)	Chief Engineer (Roads), MOST dealing with concerned State	-	Member
(iv)	Chief Engineer (Bridges), MOST dealing with the concerned State	-	Member
(v)	Representative of Finance Wing (DFA)	-	Member
(vi)	Representative of Roads Wing [DS(P&B)]	-	Member

9. EVALUATION PROCEDURE

9.1. General Prequalification

General prequalification of Contractors shall be carried out for average value of works which will entitle a prequalified contractor to bid for corresponding value of the slabs as indicated below:

Applicable slab	Average Value
200-300	250
301-400	350
401-500	450

Average value of the slab shall be considered for determining capacity of Applicants.

9.2. Work-wise prequalification

Work-wise prequalification shall be carried out for amount of the estimated cost of the work.

9.3. **Initial Screening**

The initial screening shall be carried out as per the criteria laid down in the prequalification document to be issued to the intending applicants.

9.4. **Detailed Evaluation**

Detailed evaluation will be carried out in accordance with the criteria circulated confidentially separately to the members of the evaluation committee. The criteria is based on a scoring system with due weightage to various factors determining the capacity of a Contractor.

9.5. **Enhancement Factors**

(a) All financial figures will be enhanced and current value of completed works arrived at by applying following multiplying factors. The updated figures shall be considered for the purpose of evaluation.

Year before	Multiplying factor
One	1.10
Two	1.21
Three	1.33
Four	1.46
Five	1.61

(b) In case the financial figures and value of completed works are in foreign currency, current market conversion rate will be applied for the purpose of converting foreign currency into Indian rupees.

9.6. Based on the above evaluation procedure, the Committee shall make an assessment and finalise its recommendations of firms indicating the firms which are considered suitable for prequalification and capacity. The minutes of meeting(s) of the Screening Committee shall be forwarded to the Project Implementation Agency by Ministry of Surface Transport (Roads Wing) for appropriate action.

9.7. The entire Prequalification process including the proceedings of the Screening Committee shall be kept confidential.

10. **TIME SCHEDULE FOR PREQUALIFICATION**

The following time schedule for Prequalification of Contractors is suggested from the time the Ministry gives clearance to the Technical Proposal/Project Report. It should be ensured that a period of 45 days is available to the prospective applicants from the date of advertisement in the paper.

(i)	Activities for Insertion of Advertisement in Papers	:	15 days
(ii)	Advertisement by Project Implementing Agency and Response from Contractors (This includes advertisement in newspapers, request for prequalification document, mailing of document to bidders, preparation of response by bidder and receipt of response by Project Implementing Agency).	:	45 days
(iii)	Compilation of Response by Project Implementing Agency and Referral to Ministry of Surface Transport.	:	15 days
(iv)	Preparation of chart and preliminary documentation for Screening Committee.	:	15 days
(v)	Finalisation by Screening Committee	:	15 days

Appendix-I

Enclosure to Ministry's Circular No.RW/NH-11024/2/91-DO I datd 18.5.93

Details of Work

1. Name of work (here all the contract sub-section with their nomenclature of improvement may be listed)

Contract package No.	Description*	Approx. length(km)	Estd. cost (Rs. million)
I	Widening to 4 lanes in section _____ to _____(km) ____ to (km)_____ of National Highway No._____		
II	Strengthening existing 2 lane pavement and section _____ to _____km_____ to km_____ of National Highway No._____		
III	Construction of Major Minor bridge across river _____ with its approaches on National Highway No._____etc.		

2. **LOCATION OF WORK AND GENERAL SITE INFORMATION**

(under this para, information relating to exact location of site of work, nearest city/town, nearest Rail Head and general information regarding terrain/soil conditions should be indicated).

3.	Broad Scope of works	Contract Package I	Contract Package II etc.
	i) Present condition of Road:		
	a) Roadway width:		
	b) Carriageway width:		
	c) Number of substandard curves:		
	- Horizontal:		
	- Vertical:		
	d) Existing structures No. of culverts:		
	No. of minor bridges (less than 6M waterway)		

* The works mentioned here are only examples

e) Number of existing road crossings:

- Unimproved
- Improved

f) Present traffic on the road:

- Cars
- Buses
- Trucks
- Two-wheelers
- Slow moving vehicles

ii) Major item of improvement envisaged through this work:

a) Roadway width after improvement:

b) Carriageway width after improvement:

c) Strengthening of existing pavement: Approx. thickness (mm)

a) Granular
b) Bitumen-bound layers

d) New pavement in the case of new carriageway:

a) Granular
b) Bitumen-bound layers

e) No. of curves to be improved:

a) Horizontal
b) Vertical

f) No. of structures to be widened:

a) Minor bridges
b) Major bridges

g) No. of structures to be rebuilt/ newly built:

Culverts:
Minor bridges:
Major bridges:
Railway over Bridge:
Under/Over passes:
Interchanges.

3. SALIENT FEATURES OF PROPOSED MAJOR BRIDGE:
(to be given separately for each major bridge).

1. Name:
2. Location:
3. Length:
4. Span arrangement proposed:
5. Type:
   i) Superstructure
   ii) Substructure
   iii) Foundations
6. Protection works, if any:
7. High Flood level:
8. Design discharge:
9. Width of Roadway:
10. Footpaths:
11. Design loading:

The firm will be/will not be * required to prepare detailed design for bridge works. The firms will be/will not be * permitted to quote on the basis of their alternative design. (In the case of alternative design, the minimum span length will be _____metres) *

4. LIST OF ESSENTIAL PLANTS AND EQUIPMENT

This is a suggested list of plants and equipment required for the work. The equipment which are essential for different items, as per requirements of work have to be available for execution.

I. Equipment for road works:

1. General requirement

a) Generator
b) Trucks
c) Dumper/Tippers
d) Jeeps
e) Compressor
f) Survey equipment
g) Tractor and trailor
h) Water tanker
i) Water pump

II. Earth work

a)	Motor grader	- E
b)	Vibratory roller	- E
c)	Smooth wheeled roller	
d)	Sheep foot roller	
e)	Pneumatic tyred roller	
f)	Scraper	
g)	Dozer	
h)	Water tanker/sprinkler	- E
i)	Dumper/Tippers	
j)	Excavator	
k)	Small vibratory roller/ plate compactor/power rammer	

* To be incorporated as required.

III. Granular Construction

a)	Vibratory roller	- E
b)	Motor grader/Paver	- E
c)	Smooth wheeled roller	
d)	Water tanker/sprinkler	- E
e)	Tippers	
f)	Loader	
g)	Aggregate crushing and/or screening plant	- E
h)	Mixing equipment for wet mix macadam	- E
i)	IIME/Cement stabilizer	
j)	Small vibratory roller/plate compactor/power rammer	- E

IV. Bituminous Construction

a)	Smooth wheeled roller	- E
b)	Vibratory/Pneumatic tyred roller	- E
c)	Tandon roller	- E
d)	Hot mix plant of minimum 60 TPH capacity	- E
e)	Paver finisher with electronic sensor device	- E
f)	Chip spreader	
g)	Bitumen sprayer	- E
h)	Mechanical sweaper	- E
i)	Aggregate crushing and/or screening plant	- E
j)	Tippers	
k)	Small vibratory roller/plate compaction/power rammer	- E

V. Concrete Road Construction

a)	Central batching and mixing plant	- E
b)	Tipping trucks/transit trucks	- E
c)	Paving equipment with accessories	- E
d)	Equipment for applying curing compound	- E
e)	Joint Cutting equipment	- E
f)	Joint sealing equipment	- E

VI. Structures

a)	Concrete mixer with integral weigh batching facility	- E
b)	Concrete vibrators	- E
c)	Dewatering pump	

VII. Bridges

a)	Cranes	- E
b)	Grab (For well foundation)	-E
c)	Excavator	
d)	Concrete batching and mixing plant (IS:4925 (fully automatic): minimum capacity. 15 cu.m/hour) (for bridges having lengths more than 200 metres).	-E
e)	Concrete vibrators	- E
f)	Compressor	
g)	Aggregate crusing and/or screening plant	- E
h)	Dewatering pumps	
i)	Tippers	
j)	Water tanker	
k)	Equipment	
l)	Welding equipment	
m)	Prestressing equipment (for prestressed concreet)	- E

n)	Pile driving equipment - power operated(for pile foundation)	- E
o)	Gantry crane	
p)	Launching truss	
q)	Bridge builder - equipment for cantilever construction	
r)	Steel formwork for foundations and substructure	- E
s)	Steel formwork for superstructure	- E
t)	Concrete pump	
u)	Transit Truck Mixer	
v)	Loader	
w)	Concrete mixer with integral weigh batching facilities (for major bridges having lengths upto 200 metres)	- E

VIII. Workshop

i)	Plant
ii)	Motor Vehicle
iii)	Electrical

Appendix-II

Enclosure to Ministry's Circular No.RW/NH-11024/2/91- DO I dated 18.5.93

Draft Advertisement for both Road and Bridge Projects

GENERAL PREQUALIFICATION OF CONTRACTORS

Applications for prequalification are invited from experienced and competent Indian Contractors for execution of the road and bridge project (s) under three slabs:

1) Works costing above Rs.200 lakhs and upto Rs.300 lakhs

2) Works costing above Rs.300 Lakhs and upto Rs. 400 lakhs

3) Works costing above Rs.400 lakhs and upto Rs.500 lakhs

The prequalification finalised on the basis of this advertisement shall remain valid upto March .....199 (mention year as applicable). A tentative list of projects which may be taken up during the year is given below. However, the list may be modified to add or delete any work of similar nature and value located within the State/Union Territory. Further details about the work (s) may be obtained from the office of the undersigned:

Sr. No.	Name of work	Approximate value	Completion period in months	Name of consultant for project preparation, if any

---

2. The prospective applicants should have satisfactorily completed during the last 5 years atleast one work of similar nature and having a magnitude of 40% (price updated @ 10% per annum compoundable) of the average value of work of a slab for which prequalification is sought, or he should be satisfactorily executing currently atleast one work of similar nature and having completed billing not less than 40% of the value of the work for which prequalification is sought. In the case of Joint Venture(s), atleast one of the constituent should conform to the above requirement.

3. The prospective applicants or any of their constituent partners should not have abandoned any National Highway work nor any of their contract for National Highway work should have been rescinded during the last five years.

4. The consultant engaged for preparation of the project should not be engaged as consultant by the contractor.

5. Intending applicants, who have experience construction of similar works, may obtain in prequalification documents (price at Rs.500/-) from the Secretary, Indian Roads Congress, Jamnagar House, Shahjahan Road, New Delhi-110 011, Tel No.3381649,3387140, 3384543 on any working day. The Government will not accept any responsibility regarding non-receipt, loss or delay in receipt or blank prequalification document sent through post.

6. The completed prequalification document (one original and three copies) and details, duly filled, in all respects, should reach at the address given below upto 15.00 hrs. on _____ . The Government will not accept any responsibility regarding non- receipt or delay in receipt of applications sent through post.

7. The prequalification shall be based on an objective evaluation of details regarding past performance, technical and financial capabilities and resourcefullness of the applicants. The Employer/Engineer reserves the right to reject any or all prequalification applications without assigning any reason. Only those firms/Joint Ventures, who are prequalified under this procedure will be invited to bid for execution of the projects costing over Rs.200 lakhs and up to Rs.500 lakhs.

_____
(Name)

_____
(Designation)

Address: _____

_____

Dated: _____

Appendix-III

Enclosure of Ministry's Circular No.RW/NH- 11024/2/91 - DO I dated 18.5.93

Draft Advertisement for Work-Wise Road Projects

WORK-WISE PREQUALIFICATION

Applications Bids for prequalification are invited from experienced and competent contractors for execution of the project of construction/reconstruction/rehabilitation of about _____Kms. of road work from Km _____ to Km _____ of section _____on _____ in the State of _____ in connection with four laning of road/(and) strengthening of bridge/road section/(and) repairs of damaged/weak bridges. (Delete whichever are not applicable).

2. The project includes the following principal items of work:-

i)	Earthwork	...	cu m.
ii)	Pavement structure	...	cu m.
	a) Sub-base of	...	cu m.
	b) Base course of	...	cu m.
	c) Binder course of	...	cu m.
	d) Wearing course of	...	cu m.
iii)	Cross drainage works:		
	a) Pipe culverts	...	Lin.m.
	b) R.C.C. slab culverts	...	Lin.m.
	c) Minor bridges	...	Lin.m.
	d) Type of foundation of bridges		

3. The work is proposed to be executed in _____ packages as detailed below:-

Contract package	Short descri-ption	Estimated cost (Rs. in lakhs)	Period of completion (months)	Probable date of call of tenders
1	2	3	4	5

4. The period of completion of the project is _____ months.

5. The prospective applicants should have satisfactorily completed during the last 5 years atleast one work of similar nature and having a magnitude of 40% (price updated @ 10% per annum compoundable) of the average value of work of a slab for which prequalification is sought, or he should be satisfactorily executing currently atleast one work of similar nature and having completed billing not less than 40% of the value of the work for which prequalification is sought. In the case of Joint Venture(s), atleast one of the constituent should conform to the above requirement.

6. The prospective applicants or any of their constituent partners should not have abandoned any National Highway work nor any of their contract for National Highway work should have been rescinded during the last five years.

7. M/s_____consultants, has been engaged for preparation of the project. The said firm should not be engaged as consultant to the contractor on this project.

8. Intending applicants, who have experience in construction of similar works, may obtain prequalification documents (priced at Rs.500/-) from the Secretary, Indian Roads Congress, Jamnagar House, Shahjahan Road, New Delhi-110 011, Tel No.3381649,3387140, 3384543 on any working day. The Government will not accept any responsibility regarding non-receipt, loss or delay in receipt of blank prequalification document sent through post.

9. The completed prequalification document and details, (one original and three copies) duly filled in all respects, should reach at the address given below upto 15.00 hrs. on _____. The Government will not accept any responsibility regarding non- receipt or delay in receipt of applications sent through post.

10. The prequalification shall be based on an objective evaluation of details regarding past performance, technical and financial capabilities and resourcefullness of the applicants. The Employer/Engineer reserves the right to reject any or all prequalification applications without assigning any reason. Only those firms/Joint Ventures, who are prequalified under this procedure will be invited to tender for execution of the project.

_____
(Name)

_____
(Designation)

Address: _____

_____

Dated: _____

Appendix-IV

Enclosure to Ministry's Circular No.RW/NH- 11024/2/91 - DO I dated 18.5.93

Draft Advertisement for Bridge Projects

WORK-WISE PREQUALIFICATION

Applications for prequalification are invited from experienced and competent Indian Contractors for execution of the project of construction/reconstruction/rehabilitation of ----------metres of Bridge works of section ---------- on ----------in the State of---------- in connection with four laning of road section/(and) providing bypass to ---------- city/(and) strengthening of bridges/road section/(and) repairs of damaged/weak bridges, (delete whichever are not applicable).

2. The project includes the following principal items of works:-

i) No. of bridges _____

ii) Name of major crossing, if any _____

iii) Length of bridges _____

iv) Type of superstructure _____

v) Type of substructure _____

vi) Type of foundations _____

vii) Depth of foundations _____

viii) Type of protective works _____

ix) Minimum span length _____

x) Approach roads _____

3. The work is proposed to be executed in ---------- packages as detailed below:-

Contract package	Short descri-ption	Estimated cost (Rs. in lakhs)	Period of completion (months)	Probable date of call of tenders
1	2	3	4	5

4. The period of completion of the project is _____ months.

5. The prospective applicants should have satisfactorily completed during the last 5 years atleast one work of similar nature and having a magnitude of 40% (price updated @ 10% per annum compoundable) of the average value of work of a slab for which prequalification is sought, or he should be satisfactorily executing currently atleast one work of similar nature and having completed billing not less than 40% of the value of the work for which prequalification is sought. In the case of Joint Venture(s), atleast one of the constituent should conform to the above requirement.

6. The prospective applicants or any of their constituent partners should not have abandoned any National Highway work nor any of their contract for National Highway work should have been rescinded during the last five years.

7. M/s_____consultant, has been engaged for preparation of the project. The said firm should not be engaged as consultant to the contractor on this project.

8. Intending contractors, who have experience in construction of similar works, may obtain prequalification documents (priced at Rs.500/-) from the Secretary, Indian Roads Congress, Jamnagar House, Shahjahan Road, New Delhi-110 011, Tel No.3381649,3387140, 3384543 on any working day. The Employer/Engineer will not accept any responsibility regarding non-receipt, loss or delay in receipt of blank prequalification document sent through post.

9. The completed prequalification document and details, (one original and three copies) duly filled, in all respects, should reach at the address given below upto 15.00 hrs. on _____. The Employer/Engineer will not accept any responsibility regarding non- receipt or delay in receipt of applications sent through post.

10. The prequalification shall be based on an objective evaluation of details regarding past performance, technical and financial capabilities and resourcefullness of the contractor. The Employer/Engineer reserves the right to reject any or all prequalification applications without assigning any reason. Only those firms/Joint Ventures, who are prequalified under this procedure will be invited to tender for execution of the project.

_____

(Name)

_____

(Designation)

Address: _____

_____

Dated: _____

130.47

No.RW/NH-11024/2/91-DO.I ***Dated, the 20th July, 1993***

To

The Secretaries/Chief Engineers of all States/Union Territories, PWD (dealing with National Highways and other Centrally Finance Schemes), The Director General (Works), CPWD, The Director General, Border Roads Development Board, New Delhi

Subject : Guidelines regarding the procedure to be adopted for prequalification of tenderers for the execution of major Road and Bridge works on National Highways and Centrally Financed Schemes - Modifications in the procedure

I am directed to refer to this Ministry's letter of even number dated 18th May, 1993 on the subject mentioned above and to send herewith a copy of the Prequalification Document for Central Sector Road and Bridge Projects (Under Local Competitive Bidding) containing Part I - General Conditions, and Part II - Prequalification Questionnaire Forms, for information and necessary action. The Document has been got published by the Secretary, Indian Roads Congress, Jamnagar House, Shahjahan Road, New Delhi-110011 (Tel. Nos. 3387140, 3384543 and 3381649) and is priced at Rs.500/-. It is requested that applicants for prequalification should be directed to obtain prequalification documents from the above address for submission of their proposals as mentioned in the Notices for prequalification enclosed as Appendices II, III and IV to the enclosure forwarded with Ministry's letter of even number dated 18th May, 1993.

130.48

No.RW/NH-11024/2/90-DO I *Dated, the 20th July, 1993*

To

The Secretary, Public Works Departments of all States/Union Territories; Director General (Works), Central Public Works Department; Director General, Border Roads Development Board

Subject: Tender Documents for Local Competitive Bidding for the execution of Road and Bridge work on National Highways and Centrally sponsored schemes - Mobilisation Advance to Contractors

I am directed to refer to this Ministry's letter of even no. dated 16th September, 1991 on the subject mentioned above and to say that the word "OR" may please be substituted in place of the word "and" after the sub-para (iii) of para 1 of the enclosure to the above mentioned letter.

2. The Bank Guarantee for mobilisation advance enclosed as annexure to the letter dated 16th September, 1991, mentioned above, has been modified and a copy of the same is enclosed herewith.

3. It may be ensured that the plant and equipment, considered necessary by the Engineer for the work and included in the list of essential equipment given in the annexure of the tender document, are brought to the site and continue to be used. The Engineer-in-charge of the work should ensure that no plant and equipment required for the work are taken away from the site by the contractor without his prior permission.

4. It is requested that the contents of this letter may be brought to the notice of all the field officers of the Public Works Department.

Enclosure to Ministry's letter No.RW/NH-11024/2/90 - DO I dated 20.7.93

BANK GUARANTEE

To

The President of India/
The Governor of the State of _____acting
through_____.

Subject: (Please state the name of the work)

In consideration of (the name of the Employer) acting through_____ (hereinafter referred to as "Employer") releasing advance payment amounting to Rs. _____ to _____ (hereinafter referred to as "Contractor") in terms of the provisions of the contract dated _____ entered into by and between the Employer and Contractor (hereinafter referred to as 'Contract') on submission by the Contractor, a Bank Guarantee for an amount of _____ (in words) for a period of _____ _____(please state period in months), we, the _____ (please state here the name and other particulars of Bank) (hereinafter referred to as 'Bank'), unconditionally and irrevocably guarantee, as primary obliger and not merely as surety, due payment to the Employer and undertake to pay immediately on demand without any demur, an amount not exceeding _____(please state the amount of Bank Guarantee) (in words) _____ into the account of the Employer as may be indicated in the Demand letter.

2. We further agree that no change or addition to or other modification of the terms of the Agreement or of works to be performed thereunder or of any of the Agreement which may be made between the Employer and the Contractor, shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

3. This guarantee shall remain valid and in full effect from the date of the advance loan payment to the Contractor under the Agreement until the Employer receives full repayment under the terms of the contract as well as under those present from the contractor.

4. Any demand made as such by the Employer to the Bank shall be conclusive evidence of Bank's liability hereunder and prior to making any such demand, the Employer shall not be required to take any steps, exercise any remedies against or give notice to the Contractor.

5. While this Guarantee continues, the Bank shall not exercise any rights to claim any sum from the Contractor's insolvency until full satisfaction of the Employer's claim to the extent of the Bank's liability hereunder.

6. The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the Contractor or of the Bank.

7. Notwithstanding anything contained hereinafter, our liability under this bond is restricted to Rs * _____ (Rupees _____ only) and interest thereon at the rate of ** _____ for the period of delay in payment beyond 15 days from the date of receipt of demand by the Employer. It will remain in force till ***_____ unless an action to enforce a claim under this guarantee is filed, on or before _____, all the rights of the Employer under the said guarantee shall be forfeited and the Bank shall be relieved and discharged from all liability thereunder.

IN WITNESS Whereof, we, the Bank, through our authorised representative have executed and put our seal on this _____ _____ day of _____199 .

Signature of
Authorised-
Representative(s)
of the Bank.

Witness: 1.
Address:

Witness: 2.
Address:

---

* Same amount as that of Bank Guarantee in para 1 above.

** Rate as applicable to the working capital loans by the Central Government to be filled up.

*** One month later than period mentioned in para 1 above.

130.49

No. RW/NH-11052/18/93-DO I ***Dated, the 7th Sept., 1993***

To

The Chief Engineers of all the State/UTs PWDs (dealing with NHs); Director General(Works) Central Public Works Department; Director General Border Roads

Subject: Tenders for Road and Bridge works on National Highways

I am directed to say that instructions have been issued by the Ministry from time to time that in all cases of Road and Bridge works where the designs or specifications are required to be changed while finalising the tender for the work, prior approval of this Ministry should invariably be obtained. However, it has come to the notice of this Ministry that in some cases tenders for the National Highway work have been invited based on specifications at variance with the

specifications without approval of the Ministry. Also it has come to the notice of the Ministry that the guidelines of the Ministry relating to advertisement of Notice inviting tenders have not been strictly followed.

2. It is, therefore, reiterated once again that prior approval of the Ministry shall invariably be obtained for any deviation in designs and/or specifications for the work from those technically approved and guidelines regarding the procedure to be adopted for pre-qualification of tenderers for execution of NH works circulated vide Ministry's letter No.RW/NH-11024/2/91-DOI dated 18 May, 1993 shall be strictly complied with in future, so that such infirmities/irregularities are avoided.

130.50

No.RW/NH-33045/3/90-D III ***Dated, the 26th August, 1993***

To

Secretary State PWDs; Chief Engineers dealing with National Highways of State PWDs

Subject: Engagement of Consultants for carrying out services in respect of National Highway works

I am directed to enclose herewith a copy of the standard format of 'contract agreement' for entering into agreement with consultants. The document has been got approved by the Union Ministry of Law and Ministry's Internal Finance. It is requested that the said format may henceforth be adopted for entering into agreements with consultants for carrying out services in respect of all National Highway Works.

2. The contents of this letter may please be brought to the notice of all concerned officers in your State.

3. Please acknowledge receipt.

Enclosure to Ministry's letter No.RW/NH-33045/3/90 - D III dated 26.8.93

CONTRACT AGREEMENT FOR CONSULTANCY SERVICES

THIS AGREEMENT made on the _____ day of 199 between (*the President of India acting through the _____ of the Ministry of Surface Transport, Government of India, Transport Bhavan, Parliament Street, New Delhi-110 001/ the Governor State of _____ acting through the _____ of Public Works Deptt._____) (hereinafter called the "Employer" which expression shall unless excluded by or repugnant to the context be deemed to include his successors in office and assign) of the ONE PART and _____.

(For Proprietary Concern)

and Shri _____son of _____ resident of _____ and (2) Shri _____ son of _____ resident of _____(Add other names here if there are more partners) carrying on business in co-partnership under the name and style of _____ at _____ _____(called the said "Consultant" which expression shall unless the context requires otherwise include each of them and their respective heirs, executors, administrators and legal representatives) OF THE OTHER PART.

(For Companies)

and M/s _____ a company incorporated under the Companies Act 1956 and having its registered office at _____ in the State of _____ (through its Managing Director Shri _____ (hereinafter called the said "Consultant" which expression shall unless the context requires otherwise include its successors and assigns)OF THE OTHER PART.

(For Associated/Joint Consultants)

and M/s _____in association with M/s _____ _____(both jointly and severally hereinafter called the Consultant the other part. Notwithstanding such association, the Consultant will be represented hereinunder at all times by M/s _____ which will retain full and undivided responsibility for

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(*Note: Alternatives : use appropriate wordings)

performance of obligations hereunder and for the satisfactory completion of consultancy services to be performed hereunder.

WHEREAS the Employer has invited the Consultant to provide consultancy services (hereinafter called the "services" and as fully described in Terms of reference for consultancy appended as Appendix-I and clarificatory letter Nos. _____ dated _____ & _____ collectively enclosed as Appendix-II. AND WHEREAS the Consultants has agreed to provide services on the terms & conditions set forth in this contract.

NOW THIS PRESENT WITNESSES THAT THE PARTIES HAVE HEREBY A HERETO AS FOLLOWS

ARTICLE 1 - GENERAL

1.1. For the purpose of the Agreement, the following expression shall have the meaning hereby assigned to it except where the context otherwise requires:

a) Employer's representative means "Contract Manager" (refer para 7.1).

b) The Consultant's Representative for purposes of the work shall mean The Team Leader Shri _____ or any one duly authorised by him in writing.

1.2. Date of start shall be reckoned as 30 days from the date of issue of notice to start or the actual date of start of services whichever is earlier.

1.3. Words importing the singular shall also include the plural and vice versa where the context so requires.

1.4. The headings or marginal notes in this Agreement shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.

ARTICLE 2 : SCOPE OF WORK

2.1. **Scope of Work**

The Consultant shall perform the services under this agreement in accordance with the Terms of Reference set forth in Appendix I, and clarificatory letters No. _____ dated _____ and _____ and minutes of the contract negotiations collectively appended as Appendix-II hereto. The bid submitted by the Consultant together with letter Nos. _____ dated _____ and _____ appended collectively as Appendix-III shall be deemed as part of this contract agreement. In case of any conflict between the provisions mentioned in the Terms of Reference and the provisions of the contract agreement, the decision of Contract Manager shall be final and binding on the Consultant.

*ARTICLE 3 - TIME SCHEDULE**

Time Schedule

The Consultants will commence the services as soon as possible but not later than 15 days after the Employer has given to the Consultant notice to proceed with the services. Each stage of the work will be completed as per Schedule given.

SCHEDULE OF SERVICE

1.	a)	Date of Start of Services	...	15 days after issue of notice to start or actual commencement whichever is earlier.
	b)	Submission of inception	...	Within (15 to 35) days of start of services.

* The Article 3 is indicative and will be substituted as given in TOR.

2.	Completion of 1st stage of services i.e. _____	...	_____days from date of start i.e. _____19 _____
3.	Completion of 2nd stage service i.e._____and	...	_____days from date of start i.e._____ 19_____.
4.	Completion of 3rd stage of services i.e._____	...	_____days from date of start i.e.____19__
5.	Submission of draft final	...	_____days from date of start i.e.____19__
6.	Submission of approved final	...	_____days from date of start i.e.___19___

3.2. Time and dates stipulated above shall be deemed to be the essence of the Contract.

PROGRESS OF WORK

3.3. If for any reason, which in the opinion of the employer's representative does not entitle the Consultant to an extension of time or the rate of progress of the works of any section is, at any time, too slow to make it impossible for the Consultant to complete the study by the prescribed time or extended time, the Employer may notify the delay to the Consultant in writing and the Consultant shall thereupon, with the approval of the Employer, which shall not be unreasonably withheld, take such steps as are necessary to expedite progress so as to complete the works or such sections by the prescribed time or extended time. The Consultant shall not be entitled to any additional payment for taking such steps. Such extention shall be without prejudice to the right of Employees to terminate the contract.

ARTICLE 4 - PAYMENTS OF REMUNERATION **

4.1. **Payments of Remuneration to the Consultant**

Payment of remuneration for the performance of all services related to this Agreement shall amount to Rs._____ (Rupees _____only) and shall become payable in stages as mentioned below:

SCHEDULE OF PAYMENTS

1.	On mobilisation	-	15 per cent i.e. Rs._____
2.	On receipt of strip plan	-	10 per cent i.e. Rs._____
3.	On receipt of draft feasibility	-	15 per cent i.e. Rs._____
4.	On receipt of final feasibility report	-	15 per cent i.e. Rs._____
5.	On submission of interim report of detail design	-	15 per cent i.e. Rs._____
6.	On receipt of final report of detail design	-	15 per cent i.e. Rs._____
7.	On receipt of final report	-	15 per cent i.e. Rs._____

** The Article 4 is indicative and will be substituted as given in TOR and the Minutes of Contract Negotiations, if any.

4.2. The advance paid shall be deductable from the bills of works in proportion to that the claim amount has to be total remuneration. The Consultant shall be required to submit an irrevocable " Bank Guarantee " from a bank in India accepted to the Employer for the full value of advance in the specified form (see Proforma attached) and valid for the period of contract. In the event of an extension being granted to the Consultant, the Consultant shall be entitled to further payments only after he presents the agreement of the Bank to extension of Bank Guarantee for the period of extension.

4.3. **Escalation**

In the event the contract is extended for reasons not attributable to as fault of consultant beyond one year for the stipulated completion date, the consultant shall be entitled to cost escalation on the balance amount due in direct proportion to the increase in costs based on the average "Cost Index" for the period from the due date of completion to the extended date of completion. The Cost Index shall be General Consumer Price Index for Industrial Workers on all India basis (Base 1960=100) released by the Labour Bureau, Ministry of Labour, Government of India.

ARTICLE 5 - PERSONNEL & SUB-LETTING

5.1. **Personnel**

a) The Services shall be carried out by the Consultant through the Personnel specified in Appendix IV hereof (hereinafter called the Personnel). The consultant may, with the prior approval of the Employer, make minor adjustments in such periods may be appropriate to ensure efficient perfonnance of the Services, but such adjustments will not entitle payments made under the Contract to exceed the cost estimates.

b) Except as the Employer may otherwise agree, no changes shall be made in the Personnel. If for any reason beyond the reasonable control of the Consultant it becomes necessary to replace any of the Personnel, the Consultant shall forthwith provide as a replacement, person of equivalent or better qualifications after obtaining prior approval of the Employer.

c) In the event that any person specified in Appendix-IV is found by the Employer to be incompetent to discharging his assigned duties, the Employer may request the Consultant to forthwith provide as replacement a person with qualifications and experience acceptable to the Employer. The Consultant shall bear all additional costs arising out of or incidental to any replacement.

5.2. Except where otherwise provided elsewhere in the Contract, the Consultant shall not assign or sublet the services or any part thereof nor engage any independent consultant or sub- contractor to perform any part of the service without the prior written consent of the Employer. In the event of sub-contracting of services, the Consultant shall submit to the Employer the text of the proposed sub-contract between the Consultant and others relating to the services and any proposed amendment thereof, in detail for approval of Employer.

5.3. The approval of the Employer to the arrangement of any part of the contract or to the engagement by the Consultant of an independent Consultant or sub-contractor to perform any part of the services shall not relieve the Consultant of any of its obligations under the contract.

5.4. **Authorised Representative**

Any action required or permitted to be taken, and any document required or permitted to be executed, under this contract, may be taken or executed on behalf of the Consultant by the Team leader or his designated representative and on behalf of the Employer by _____.

5.5. **Notice or Requests**

Any notice or request required or permitted to be given or made under this Contract shall be in writing. Such notice or request shall be deemed to be duly given or made when it shall have been sent/mailed by Registered post or hand delivered, telexed or cabled to the party to which it is required to be given or made at such party's address specified below, or at such other address as either party may specify in writing.

For the Employer

Name :

Address :

Cable :

Telex :

For the Consultant

Name :

Address :

Cable :

Telex :

ARTICLE 6 - CONSULTANT'S RESPONSIBILITIES

6.1. The Consultant shall carry out the services with the due diligence and efficiency and in conformity with sound engineering, administrative and financial practices. He shall execute and complete the work in all respects to the satisfaction of the Employer and do all other things required to be done for such execution and completion.

6.2. The Consultant shall act at all times so as to protect the interest of the Employer and will take all reasonable steps to keep all expenses to the minimum consistent with sound economic and engineering practices.

6.3. The Consultant shall prepare all specifications and designs using the metric system and the latest design criteria.

6.4. **Quality Assurance**

The Consultant shall prepare an In- house quality assurance plan for the 'Services' and get it approved from the Employer so as to ensure satisfactory quality of the consultancy services in conformity with the assigned Terms of Reference. The Consultant shall ensure to the satisfaction of the Employer that quality assurance is duly exercised within their organisation.

6.5. The Consultant shall ensure that the specifications and design and all documents relating to the project are prepared on an impartial basis and no particular product or company or trade name is given advantage. The remuneration of the consultant charged to the Employer according to this agreement shall constitute his only remuneration in connection with the Agreement and neither he nor his personnel shall accept any trade commission, discount, allowance or any other considerations in connection with or in relation to the Agreement or to the discharge of his obligations thereunder.

The consultant shall not have the benefit either directly or indirectly of any royality or of any gratuity or commission in respect of any patented or protected article or process used on or for the purpose of the Agreement unless it is mutually agreed in writing that he may do so.

6.6. The Consultant shall promptly furnish to the Employer such information relating to the services and the project as the Employer may from time to time reasonably request.

6.7. **Indeminifications**

The Consultant agrees to indemnify, protect and defend at his own expense the Employer and their agents from and against all actions, claims and liabilities arising out of acts done by the Consultants or the Personnel in the performance of this Contract including the use or violation of any copyright works of literacy or intellectual property or patented invention, article or appliance.

6.8. **Confidentiality**

Except with the prior written consent of the Employer, the Consultant and the Personnel shall not at any time communicate to any person or entity any confidential information disclosed to them for the purpose of any Services or

discovered by them in the course of the Services, nor shall the Consultant or his Personnel make public any information as to their recommendations formulated in the course of or as a result of the Service.

6.9. **Prohibition on Association**

The Consultant agrees that during and after the conclusion or termination of this Contract's the Consultant limits its role under the Project to the provision of the Services and hereby disqualifies itself and other contractor, consulting engineer or manufacturer with which the Consultant is associated or affiliated from the Provision of goods or services in any capacity for the Project including bidding for any part of the Project except as the Employer may otherwise expressly agree.

6.10. **Prohibition on Conflicting Activities**

No member of the personnel assigned to the contract shall engage directly or indirectly, either in his name or through Consultant, in any other business or professional activities other than the performance of his duties or assignment under this Agreement.

6.11. **Proprietary Right of the Employer in Equipment**

a) Equipment supplied by the Employer for the Project shall remain at all times the property of the Employer and shall be returned by the Consultant in accordance with procedures to be determined by the Employer.

b) Equipment purchased by the Employer or by the Consultant for the Employer for the purposes of the project shall be the property of the Employer.

6.12. **Proprietary Rights of the Employer in Reports & Records**

Interim/Final version of the design/report submitted to the Employer and all reports and relevant data such as maps, diagrams, plans, statistics and supporting records or material compiled or prepared in the course of the Services shall be confidential and shall be the absolute property of the Employer. The Consultant shall sort out and index all such material and deliver all these materials to the Employer upon completion of this Contract. The Consultant may retain a copy of such data but shall not use the same for purposes unrelated to this Contract without prior written approval of the Employer.

6.13. **Insurance**

a) The Consultant shall at their costs take out and maintain adequate insurance against all claims relating to third party liability.

b) The Employer undertakes no responsibility in respect of any life, health, accident, travel and other insurance which may be necessary or desirable for the personnel of or sub-contractors and specialists associated with the consultants for the purposes of the Services, nor for such members of the family of any such person.

6.14. **Review of Progress**

The Consultant shall be required to attend the office of the Employer to review progress and receive instructions as and when required by the Employer at his own costs which will not normally be more than once a month.

6.15. **Errors in Services**

The Consultant shall be responsible for any inaccuracy/omission in data used for the services (e.g. field levels for detailed engineering and if any errors are noticed (e.g. at the time of setting out of projects), the consultant shall verify the same at his risk and cost including preparation of fresh drawings/records as called for.

ARTICLE 7 - EMPLOYER'S RESPONSIBILITY

7.1. The Employer shall appoint a "Contract Manager" for the purpose of the contract who shall be fully authorised to give clearance to all reports and make payments for the services and facilities as detailed in Terms of Reference.

7.2. The "Contract Manager" shall accord approval or ask for clarifications to each stage of the services within 15 days of submission of report or the clarification thereof. In the event the "Contract Manager" does not offer any comments and/or suggest improvements or modifications within the stipulated time, the implicit approval of the Employer shall be assumed.

7.3. Employer shall ensure payment to the consultant within one month of the due date of payment as per schedule of payments (Article 4.10) to conform to T.D.R. and the Minutes of Contract Negotiation if any. In the event of delay in payment beyond this period, the consultant shall be entitled to claim of 15 per cent interest for this period beyond one month from the date the payment became due.

7.4. The Employer, while given extension of time, shall also issue a variation order stating the reasons for extension and the amount which the consultant will be entitled to an account of extension.

ARTICLE 8 - VARIATIONS

8.1. **Variation of Contract**

The Contract may be varied by agreement between the parties. All such variations, including variations in scope the time and cost estimate shall be in writing signed by the daily authorised representatives of the parties. Variations which are natural extension of services or are essential for completion of services shall not be refused by the Consultant.

The Contract may be varied by agreement between the parties. All such variations, including variations in scope in the time and cost estimate shall be in writing signed by the duly authorised representatives of the parties. Variations which are natural extension of services or are essential for completion of services shall not be refused by the Consultant.

8.2. The Consultant wherever required shall submit a detailed break-up of cost of the contract amounts into various components of the work from the start of the work and the variation shall be priced on the basis of this break-up.

8.3. Should the amount of extra or additional work of any kind or any cause of delay referred to in these conditions, or exceptional adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Consultant to an extension of time for the completion of the works, the Employer on application from the Consultant determine the amount of such extension and shall notify the Consultant accordingly provided that the Employer is not bound to take into account any extra or additional work or other special circumstances unless the Consultant has within _____days after such work has been commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the Employer's Representative full and detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at that time.

ARTICLE 9 - GENERAL PROVISIONS

9.1. **Suspension**

If any of the following events shall have happened and be continuing, the Client may be written notice to the Consultant suspend in whole or in part payments to the Consultant under the Contract:

a) A default shall have occurred in the execution of the terms under the Contract on the part of the Consultant.

b) Any other condition which has arisen while, in the reasonable opinion of the Client, interferes, or threatens to interfere, with the successful carrying out of the Project or the accomplishment of the purposes of the Contract.

9.2. **Termination of the Contract by the Client**

a) If any of the following events shall have happened and be continuing, the client may by written notice to the Consultant terminate the Contract:

(1) Any of the conditions referred to in Article 9.1 shall continue for a period of fourteen (14) days after the Client shall have given written notice to the Consultant of suspension of payments to the Consultant under the contract.

(2) In the event of Consultant(s) fails to complete the services, or d (b) abondons the services in between, or d(cs) without reasonable excuse, fails to commence the services or suspend the services or (d) sub-let the services without prior approval, the Employer may after giving fifteen days notice in writing to terminate the Contract.

b) In any event, the Client, may terminate the Contract at anytime by giving not less than thirty (30) days' written notice to the Consultant.

9.3. **Termination of the Contract by the Consultant**

The Consultant shall promptly notify the Client in writing of any situation or of the occurrence of any event beyond the reasonable control of the Consultant which makes it impossible for the Consultant to carry out its obligations hereunder. Upon confirmation in writing by the Client of the existence of any such situation or event, or upon failure of the Client to respond to such notice within fifteen (15) days of receipt thereof, the Consultant shall be relieved from all further liability from the date of such receipt for failure to carry out such obligations, and the Consultant may thereupon terminate the Contract by giving not less than thirty (30) days written notice thereof.

9.4. **Termination Procedure**

a) Upon termination of the Contract under Section 9.2 receipt of notice of termination under section 9.2 or the giving of notice of termination under section 9.3, the Consultant shall take immediate steps to terminate the Services in a prompt and orderly manner and to reduce losses and to keep further expenditure to a minimum.

b) Upon termination of the Contract (unless such termination shall have been occasioned by the default of the Consultant), Consultant shall be entitled to the reimbursed in full for such costs as shall have been duly incurred prior to the date of such termination and for reasonable costs incident to the orderly termination of the Services, the return travel of the Personnel and the reshipment of the personal effect and equipment of the Consultant, but shall be entitled to receive no other or further payment.

9.5. **Settlement of Disputes**

If any dispute or differences of any kind whatever (the decision whereof is not herein otherwise provided ford) shall arise between the Employer and the Consultant in connection with or arising out of the contract of services whether during the progress of the works or after their completion and whether before or after the termination, abandonment or breach of the Contract, it shall, in the first place, be referred to and settled by the Employer who shall within a period of sixty days after being requested in writing by the Consultant to do so, give written notice of his decision to the Consultant. Subject to arbitration, as hereunder provided, such decision in respect of every matter so referred shall be final and binding upon the Employer and the Consultant and shall forthwith be given effect to by the consultant who shall proceed with the execution of the services with all due diligence, whether he or the Employer requires arbitration, as hereinafter provided, or not. If the Employer has given written notice of his decision to the Consultant and no claim to arbitration has been communicated to him by the Consultant within a period of sixty days from receipt of such notice, the said decision shall remain final and binding upon the consultant. If the employer shall fail to give notice of his decision, as aforesaid, within a period of sixty days after being requested as aforesaid or if either the Employer or the Consultant be dissatisfied with any such decision, then and in any such case, either the Employer or the Consultant may within sixty days of receiving notice of such decision as the case may be, require that the matter or matters in dispute be referred to arbitration as hereinafter provided. All disputes or differences in respect of which the decision, if any, of the Employer has not become binding as aforesaid shall, on the initiative of either party be referred to the adjudication of a committee of three arbitrators. The Committee shall be composed of one arbitrator to be nominated by the Employer, one to be nominated by the Contractor and the third, who will also act as the Chairman of the Committee will be nominated by the Director General (Road Development), Government of India. In case either the Consultant or the Employer or both fail to nominate an arbitration within 60 days of the date of issue notice for arbitration, then the Director General (Road Development) shall nominate arbitration on behalf of the Consultants or the Employer or both as the case may be, and arbitration shall proceed forthwith. Save as otherwise provided in the Contract, the arbitration shall be conducted in accordance with the provision of the Indian Arbitration Act, 1940, or any statutory modification or enactment thereof and shall be held at such place and time in India as the Committee of arbitrators may determine. The decision of the majority of the Arbitrators shall be final and binding as may be determined by the Arbitrators. Performance under the Contract shall continue during the arbitration proceedings and payments due to the Consultant by the Employer shall not be the subject matter of all the arbitration proceedings.

All awards shall be in writing and such awards shall state reasons for the amounts awarded. No decision given by the Employer in accordance with the foregoing provisions shall disqualify him from being called as a witness and giving evidence before the arbitrators as aforesaid and neither party will be limited in the proceedings before such arbitrations to the evidence of arguments put before the Employer for the purpose of obtaining his said decisions.

Force majeure

a) If either party is temporarily unable by reason of force majeure or the laws or regulations of the Govt. of India to meet any of its obligations under the Contract, and if such party gives to the other party written notice of the event within fourteen (14) days after its occurrence, such obligations of the party as it is unable to perform by reason of the even shall be suspended for as long as the inability continues.

b) Neither party shall be liable to the other party for loss or damage sustained by such other party arising from any event referred to in Section 6.06 (a) or delays arising from such event.

c) The term "force majeure", as employed herein shall mean acts of God, strikes, lock-outs or other industrial disturbances, acts of the public enemy, wars, blockades, insurrection, riots, epidemics, landslides, earthquakes, storms, lightening, floods, wash outs, civil disturbances, explosions, and any other similar events, not within the control of either party and which by the exercise of due diligence neither party is able to overcome.

ARTICLE 10 - COMPLETION

10.1. The contract shall become effective upon the date notice given to proceed with the services and shall be in full force until the services and all payments therefor have been completed and at such time a "Completion certificate" shall be issued by the Employer and the parties hereto shall be mutually released from all obligations of providing further services, unless otherwise specified in this agreement.

IN WITNESS WHEREOF, the parties hereto through their duly authorised representatives have set their hands and seal the day and year first above written at _____.

SIGNED BY THE SAID ON BEHALF
OF THE EMPLOYER

SIGNED BY

IN THE PRESENCE OF :

1.

2.

SIGNED BY THE AFORESAID CONSULTANTS
UNDER THE COMMON SEAL OF _____

SIGNED BY

"Affixed in pursuance of the provision of _____ Rule _____Rules of the Articles of Association and/or Resolution resolved in the Extra/Ordinary General/Board Meeting of the Consultants held on _____ (whichever is applicable)".

(Note: Person signing for the Consultant shall be required to give evidence of fact that he is authorised to sign on behalf of the firm, company etc. as required).

130/81

PROFORMA FOR BANK GUARANTEE

To

The Governor of the State of _____
acting through_____

Subject: (Please state the name of the work)

Sir,

In consideration of (the name of the Employer) acting through_____ _____(hereinafter referred to as "Employer") releasing advance payment amounting to _____(Amount of advance to be stated) to M/s _____ (hereinafter referred to as "Consultant") in terms of the provisions of the contract dated _____ entered into by and between the Employer and Consultant (hereinafter referred to as 'Contract'), on submission by the Consultant, a Bank Guarantee for an amount of _____ (same amount as that of Advance) (amount in words) for a period of _____ (Please state period in months), We, the _____(please state here the name and other particulars of Bank) (hereinafter referred to as Bank), unconditionally and irrevocably guarantee, as primary obliger and not merely as surety, due payment to the Employer and undertake to pay immediately on demand without any demur, an amount not exceeding _____(please state the amount of Bank Guarantee) (in words) _____ into the account of the Employer as may be indicated in the Demand letter.

2. We further agree that no change or addition to or other modification of the terms of the Agreement or of works to be performed thereunder or of any of the Agreement which may be made between the Employer and the Consultant, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

3. This guarantee shall remain valid and in full effect from the date of the advance loan payment to the Consultant under the Agreement until the Employer receives full repayment under the terms of the Contract as well as under these presents from the Consultant.

4. Any demand made as such by the Employer to the Bank shall be conclusive evidence of Bank's liability hereunder and prior to make any demand, the Employer shall not be required to take any steps, exercise any remedies against or give notice to the Consultant.

5. While this Guarantee continues, the Bank shall not exercise any rights to claim any sum from the Consultant's insolvency until full satisfaction of the Employer's claim to the extent of the Bank's liability hereunder.

6. The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the Consultant or of the Bank.

7. Notwithstanding anything contained hereinafter, our liability under this bond is restricted to Rs * _____ (Rupees _____only) and interest thereon at the rate of & ** _____for the period of delay in payment beyond 15 days from the date of receipt of demand by the Employer. It will remain in force till *** _____ unless an action to enforce a claim under this guarantee is filed, on or before _____, all the rights of the Employer under the said guarantee shall be forefeited and the Bank shall be relieved and discharged from all liability thereunder.

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* Same amount as that of Bank Guarantee in para 1 above.

** Rate as applicable to the working capital loans by the Central Govt. to be filled up.

*** One month later than period mentioned in para 1 above.

IN WITNESS Whereof we, the Bank, through our authorised representative have executed and put our seal on this _____ day of _____199 .

Signature of
Authorised Representative(s)
of the Bank.

Witness : 1.

Address :

Witness : 2.

Address :

130.51

No. RW/NH-33045/3/90-D III ***Dated, the 22nd Dec., 1993***

To

The Secretaries, State PWDs/Chief Engineers dealing with National Highways of State PWDs

Subject: Engagement of Consultants for carrying out services in respect of National Highway works.

I am directed to refer to the circular of even number dated 26th August, 1993 on the above subject and to say that the first sentence of Clause 7.3 may be modified as under, alongwith a foot note given below;

"Employer shall ensure payment to the consultant within one month of the due date of payment as per the Schedule of Payments (Article 4.1)* _____."

" (* To conform to TOR and minutes of Contract Negotiations, if any)"

130.52

No.RW/NH-11052/17/93-DO I ***Dated, the 26th July, 1993***

To

The Secretaries of the Public Works Departments of all States/Union Territories

Subject: Award of Arbitration in respect of National Highway works- acceptance regarding

I am directed to say that it has come to the notice of this Ministry that one of the State Public Works Departments has filed an appeal in the High Court against the award of arbitration in respect of a World Bank Project without the knowledge of the Ministry. As the legal proceedings take a considerable time leading to increase in interest liability of the Government, the State Government was asked to arrive at an out of Court negotiated settlement.

2. In order to avoid such situations, it has been decided that whenever any arbitration award is made in respect of a National Highway work, this Ministry must be informed of the position immediately. As a general rule, an arbitration award should be accepted by the State Government concerned unless there is a ground for setting aside the award as specified in Section 30 of the Arbitration Act, 1940. However, if the State Government considers it necessary to go in for appeal against the arbitration award, it should be done only after due consultation and obtaining approval of this Ministry giving adequate and valid reasons. This is particularly important in respect of the World Bank/ADB Projects,

in view of the unambiguous wording in the contract conditions that "the decision of the arbitrators shall be final and binding as may be determined by the arbitrators".

3. The above policy guidelines may please be brought to the notice of all concerned in your Department for strict compliance and responsibility may be fixed on the erring officials, in case of non-compliance of the above instructions.

130.53

No.RW/NH-11052/17/93-DO I ***Dated, the 23rd March, 1994***

To

The Secretaries of all States & Union Territories (dealing with National Highways)

Subject: Award of Arbitration in respect of National Highway works - acceptance regarding

I am directed to refer to this Ministry's policy guidelines circular of even number dated 26th July, 1993 regarding prior approval of this Ministry in filing of an appeal in the High Court against the Award of Arbitration in respect of National Highway works. Government of Tamil Nadu have now pointed out that filing of an appeal to set aside an Arbitration Award has to be done within a period of sixty days from the date of the award. A consultation with the Government advocate, the State Government and this Ministry may take considerable time, this would leave very little time to brief the Government advocate and prepare papers for filing the appeal in the High Court. It has also been suggested that the earlier practice of allowing the Superintending Engineer of the State PWD to finally decide on the issue of filing an appeal may be continued.

2. The matter has been examined and it has been decided that there is no need to change the policy guidelines dated 26.7.93. Infact, an appeal against an Arbitration Award should be filed only in exceptional circumstances and if there are sufficient valid grounds for doing so under Section 30 of the Arbitration Act, 1940. The State PWD, after consulting the Government advocate, should, therefore, invariably refer the matter to the State Government as well as to this Ministry simultaneously within ten days from the date of Award of Arbitration, in case sufficient grounds are established for challenging the Arbitration Award. The State Government as also the Ministry would convey their opinion within the next 25 days i.e. 35 days from the date of Arbitration Award, leaving 25 days for preparation and filing of the petition.

3. The State PWDs should also intimate this Ministry whenever the State Government proposes to accept the Award of Arbitration.

4. The above policy guidelines may please be brought to the notice of all concerned in your Department for strict compliance and responsibility may be fixed on the erring officials in case of non-compliance of the above instructions.

130.54

No.RW/NH-11024/1/94-DO I ***Dated, the 15th June, 1994***

To

The Secretaries, Public Works Departments and Engineers-in- Chief/Chief Engineers of State Public Works Departments, Union Territories (dealing with National Highways and other Centrally Financed Schemes); Director General (Works), Central Public Works Department; Director General Border Roads

Subject: Guidelines regarding the procedures to be adopted for prequalification of Contractors for the execution of Road and Bridge works on National Highways and Centrally Financed Schemes- Modifications in the procedures

I am directed to say that this Ministry has reviewed the procedure for selection of Contractors for execution of works on National Highway and centrally financed schemes. In supersession of all earlier guidelines in the matter, the procedure given in the succeeding paragraphs may be followed with immediate effect.

2. **Works costing upto Rs.5 crore**

Prequalification of Contractors is not considered necessary for the works in this category. Open bids may be invited from all the eligible Contractors as per the prevalent system in the State PWD.

3. **Works costing above Rs.5 crore and upto Rs.20 crore**

3.1. The bids may be invited from all eligible contractors under two covers:

(i) Technical Proposal: and
(ii) Financial Offer

3.2. The technical proposal should be in the format prescribed by this Ministry for the work-wise prequalification vide Ministry's Circular No.NH-11024/2/91-DO I dated 18.5.93, printed copies of the format can be purchased from the Indian Roads Congress. It should be made clear to the intending bidders that they should not state any condition in the technical proposal.

3.3. The technical offer shall be evaluated by a Screening Committee with the following composition:

(i)	Chief Engineer (Roads) in the case of Road works and Chief Engineer (Bridges) in the case of Bridge works of MOST dealing with the state	-	Chairman
(ii)	Chief Engineer (National Highways) in the State concerned	-	Member
(iii)	Superintending Engineer MOST dealing with the concerned state	-	Member-Secretary

3.4. The evaluation criteria as prescribed in this Ministry's circular dated 18.5.93 shall be followed for the evaluation of the technical proposals. However, it would be kept secret from the intending bidders.

3.5. The financial offer should be in the form of item rates.

3.6. Financial offer of those firms who are found technically suitable will be opened and further considered for award of the work. The financial offer of the firms who are not found technically suitable would be returned unopened.

4. **Works costing more than Rs.20 crore**

4.1. The usual procedure for Prequalification of the Contractors will be followed. Prequalification offers and the bids for the works in this category will be received by this Ministry on behalf of the State Government concerned.

4.2. The Prequalification application shall be invited in the already prescribed format for the work-wise prequalification, printed copies of which can be purchased from the Indian Roads Congress. The offer shall be evaluated by a Committee to be constituted for each project.

5. The above instructions may be brought to the notice of all concerned for immediate compliance.

130.55

No.RW/NH-11024/2/94-DO. I ***Dated, the 11th July, 1994***

To

The Secretaries of States/Union Territories, Public Works Departments (Dealing with National Highways)

Subject : Tenders for Road and Bridge works on NHs

I am directed to refer to this Ministry's letter No.PL-30(62)/76 dated 26.6.1976 wherein detailed guidelines for handling tenders for National Highway works have been laid down. It has been indicated therein that the State Govts. may themselves accept tenders, if the excess over the sanctioned estimate does not go beyond the value determined on

130/85

the basis of current schedule of rates by 15% subject to certain conditions. The State Govts. have also been empowered to delegate these powers to officers not below the rank of Chief Engineer, if they so desire.

2. Since the State Govts. are taking a long time to award contracts for NH Projects after sanction by the Ministry, which results in increasing the cost of the projects and the projects not being implemented in reasonable time, this Ministry vide letter No.RW/NH-11060/1/87-DO I dated 28.8.92 has decided that the award of contract/commencement of work should be done maximum within one year from the date of sanction, the projects costing less than Rs.50 lakhs should be completed within a maximum period of 3 years from the date of sanction, and all other projects within a maximum period of 5 years from the date of sanction. It has also been indicated that sanctions of projects which have not been started within one year from the date of sanction will automatically lapse after one year, unless specifically agreed to by the Ministry due to any extenuating circumstances.

3. Inspite of the above detailed instructions, it has come to the notice of the Ministry that due to non-acceptance of tenders called by the State Govt. repeatedly, after getting the revised estimates sanctioned by the Ministry, for a NH work in Tamil Nadu, the work could not be started by the State PWD for more than 8 years and the work was desanctioned. Reasons for non-acceptance of the tenders were also not properly explained by the State Govt. The Ministry has taken a serious view of the matter.

4. It is, therefore, emphasised that the State PWDs may streamline the process of award of NH works and amend their existing procedures whenever necessary for complying with the guidelines mentioned above. The time schedule prescribed vide this Ministry's letter dated 28.8.92 will be strictly applied in future.

5. It is requested that the contents of this letter may please be brought to the notice of all Officers in PWD dealing with NH works.

130.56

No.RW/NH-34041/3/94-DO-III *Dated, the 28th September, 1994*

OFFICE MEMORANDUM

Subject : Addition to the list of Arbitrators for Arbitration of cases relating to National Highways arising from Domestic Funded Schemes

The undersigned is directed to say that it has been decided to prepare a panel from amongst the serving Technical Officers of Roads Wing/PWDs and other organisations dealing with National Highways who have atleast 5 years experience of the National Highway works in the capacity of Executive Engineer and above for empanelment as Arbitrators for domestic funded schemes. Roads Wing Engineers with 15 years Group 'A' service will be straightaway taken on the panel.

2. Applications are, therefore, invited from the interested and eligible officers latest by 31st October, 1994 for considering their names for empanelment as Arbitrator. The applications, so received, will be evaluated/scrutinised by the competent authority.

3. Retired persons may also be considered in exceptional cases. Applications may be sent to Desk Officer (III), Ministry of Surface Transport (Roads Wing), New Delhi.

To

All CEs/SEs of Roads Wing, New Delhi and Regional Offices of Ministry of Surface Transport, All CEs/SEs of State PWDs and U.Ts., Director General (Works), Central Public Works Department, Director General Border Roads

Enclosure to letter No.RW/NH-34041/3/94-DO-III dated 28.9.94

Subject : Procedure for appointment of Arbitrators for domestic funded National Highway Works

A standard contract clause prescribing therein procedure to be followed for appointment of Arbitrators has been finalised by this Ministry and a copy thereof is enclosed (for enclosure see code No.130.57) for incorporation in the bidding conditions for the National Highway Works. It may be ensured that the clause is compulsorily made a part of the bidding conditions for the National Highway works in your State for which Invitation of Tender Notices are to be finalised by the States henceforth after receipt of this letter.

2. The Ministry has standardised the fees and remuneration payable to the Arbitrators, (see Code 130.57). State Government may like to follow this for the cases where amount in dispute involved is upto Rs. 5 lakhs, in which cases Arbitrator will be nominated by the States themselves.

130.57

No.RW/NH-34041/3/94 - DO III *Dated, the 28th September, 1994*

OFFICE MEMORANDUM

Subject: Procedure and terms of appointment of Arbitrators for National Highway normal works and delegation of powers for the purpose within Ministry of Surface Transport

Nomination of Arbitrators shall be made from amongst the Panel of Arbitrators maintained by the Ministry as per the following delegation of powers :

	Amount in Dispute	**Authority in MOST to nominate Arbitrator(s)**
(i)	Above Rs. 5 lakhs and upto Rs. 10 lakhs	Concerned Project Chief Engineer
(ii)	Above Rs. 10 lakhs and upto Rs. 25 lakhs	Concerned Addl. Director General
(iii)	Above Rs. 25 lakhs	Director General (Road Development)

2. The arbitrator(s) shall be informed of the nature of dispute and the procedure laid down in the contract. Before accepting his/their nomination, the prospective arbitrator(s) shall be asked to disclose any circumstances such as financial or personal interest in the outcome of the award which may disqualify him/them as impartial arbitrator(s). No person, who has dealt with the case earlier in his official capacity, shall be appointed as an arbitrator in the case.

3. The arbitrator(s) shall be entitled to the remuneration for his/their services as given in the Annexure (attached).

4. A copy of the standard clause finalised by the Ministry for incorporation in the bidding conditions for the NH works already sent to the States and Union Territories, is enclosed for information of all concerned.

To

All Technical Officers in Roads Wing, Regional Officers of Ministry of Surface Transport, US(NH-I)/US(NH-II)

130/87

ANNEXURE

Enclosure to Circular No.RW/NH-34041/3/94-DO III dated 28th September, 1994

Fee Structure and other Remmneration for Arbitrators for the Externally Aided and wholly Domestic Funded projects

1. The basic fee payable to the Arbitrator will be linked to the amount in dispute as given below

Amount in Dispute		Fee Payable (Rs)
Upto Rs. 5 lakh	...	Rs. 2000/-
From Rs. 5 lakh one to 25 lakh	...	Rs. 2000/- plus Rs. 200/- per lakh of the amount exceeding Rs. 5 lakh.
From Rs. 25 lakh one to 1 crore	...	Rs. 6000/- plus Rs. 100/- per lakh of the amount exceeding Rs. 25 lakh.
From Rs. 1 crore one to 5 crore	...	Rs. 13,500/- plus Rs. 4000/- per crore of the amount exceeding Rs. 1 crore
From Rs. 5 crore one to 10 crore	..	Rs. 29,500/- plus Rs. 1000/- per crore of the amount exceeding Rs. 5 crore
Over Rs. 10 crore	...	Rs. 42,000/- plus Rs. 1000/- per crore of the amount exceeding Rs. 10 crore

2. If a case is concluded in upto 10 effective hearings, the Arbitrator's Fee will be fixed as per 1 above. In any arbitration matter where the proceedings continue for more than ten effective hearings, the Arbitrator may be entitled to an additional amount of 5% of the relevant Fee payable under 1 above for each hearing. However, the total Arbitrator's Fee should not exceed the double of the prescribed amount as per 1 above.

3. **In addition to the above**

(i) Each Arbitrator will be entitled to receive a Special Fee for study of the pleadings, case material, writing of the award etc. with regard to the amount in dispute in each case as under :

Upto Rs. 5 lakh (Rs. 5,00,000)	...	Rs. 1000/- lumpsum
From Rs. 5 lakh one to Rs. 5 crore (Rs. 5,00,001 to Rs.5,00,00,000)	...	Rs. 2000/- lumpsum
Rs. 5 crore one and above (Rs. 5,00,00,001 and above)	...	Rs. 5000/- lumpsum

4. The Arbitrator's Fee will be paid after the Award is made. However, in appropriate cases, part fee upto 50% of the estimated total fee payable as above may be paid with the consent of the Parties after 10 hearings have taken place, in any matter.

5. **Other Expenses**

The arbitrator may be paid an amount of Rs. 200/- towards local conveyance for attending each arbitration hearing in the city of his residence. In respect of joint trial, the hearing will be treated as one irrespective of the number of cases. Any travelling and other expenses incurred by the arbitrator for attending the arbitration hearings in a city other than the place of residence, shall also be reimbursed to him as provided hereinafter. All the above expenses shall form part of the arbitration costs.

6. An arbitrator who has to travel shall be paid travelling expenses by air or rail (air conditioned wherever available) or car (when neither air nor rail transport is available) at actuals. In addition, he may be paid out-of-pocket

expenses at actuals for boarding, lodging and local transport subject to a maximum of Rs. 3000/- (Rs. 2000/- for stay, Rs. 500/- for food and Rs. 500/- for local transport) per day in metropolitan towns, Rs. 2000/- (Rs. 1200/- for stay, Rs. 400/- for food and Rs. 400/- for local transport) in class A cities and Rs. 1000/- (Rs. 500/- for stay, Rs. 250/- for food and Rs. 250/- for local transport) in other cities. An arbitrator who makes his own arrangements for boarding, lodging, local transport, etc., may be paid out of pocket expenses at the rate of Rs. 500/- per day, without production of vouchers.

7. The cost to be incurred on payment of T.A./D.A. to the arbitrator/s nominated by a party will be borne and paid by the Party nominating the arbitrator. However, if an appointed arbitrator changes his residence after his nomination by a Party, he will not be entitled to reimbursement of T.A./D.A. etc., for attending the arbitration hearing, unless the party nominating him agrees to reimburse to him.

8. The amount of the claim shall be stated in the application by the Party applying for arbitration. If the amount is stated in a currency other than the Rupee, it shall be converted into Rupees, at the current official rate of exchange.

Annexure to Circular No. RW/NH-34041/3/94-DO III dated 28.9. 1994

CONTRACT CLAUSE FOR INCLUSION IN BIDDING CONDITIONS FOR WHOLLY DOMESTIC FUNDED NH WORKS

Settlement of Disputes

1. If any dispute or difference of any kind whatsoever (the decision whereof is not herein otherwise provided for) shall arise between the Employer and the Contractor in connection with the, or arising out of the contract, or the execution of the works, whether during the progress of the works or after their completion and whether before or after the termination, abandonment or breach of the contract, it shall, in the first place, within six months of occurrence of the said event(s), be referred to and be settled by the Engineer who shall, within a period of sixty days after being requested in writing by the Contractor or Employer to do so give written notice of his decision to the Contractor/Employer. Subject to arbitration, as hereinafter provided, such decision in respect of every matter so referred shall be final and binding upon the Employer and the Contractor and shall forthwith be given effect to by the Contractor, who shall proceed with the execution of the work with all due diligence whether he or the Employer requires arbitration, as hereinafter provided, or not. If the Engineer has given written notice of his decision to the party(ies) and no claim to arbitration has been communicated to him by the concerned party within a period of 90 days from receipt of such notice, the said decision shall remain final and binding upon the party concerned. If the Engineer shall fail to give notice of his decision, as aforesaid, within a period of 60 days after being requested as aforesaid, or if either the Employer or the Contractor be dissatisfied with any such decision, then and in any such case either the Employer or the Contractor may within 180 days after the expiration of the first-named period of 60 days on receiving notice of such decision, as the case may be, require that the matter or matters in dispute be referred to arbitration as hereinafter provided.

2. **Arbitration**

All disputes or differences in respect of which the decision, if any, of the Engineer has not become binding as aforesaid and amicable settlement has not been reached, shall, on the initiative of either party, be referred to the adjudication. The sole Arbitrator for claims upto Rs.5.00 lakhs shall be appointed by the State Chief Engineer. Such appointed Arbitrator shall be a person not below the rank of Executive Engineer and not connected with the Contract. The claims above Rs.5.00 lakhs and upto Rs.25.00 lakhs shall be settled by a sole arbitrator to be nominated by the Director General (Road Development), Ministry of Surface Transport, Government of India, New Delhi. A copy of the order shall be supplied to both the parties. The claims of more than Rs.25.00 lakhs shall be referred to the adjudication of a Committee of three arbitrators. The Committee shall be composed of one arbitrator to be nominated by the employer, one to be nominated by the Contractor and the third, who will also act as the Chairman of the Committee, to be nominated by the Director General (Road Development), Ministry of Surface Transport (Roads Wing), Government of India, New Delhi. If either of the parties abstain or fail to appoint his arbitrator, within 60 days after receipt of notice for the appointment of such arbitrator, then the Director General (Road Development), Ministry of Surface Transport (Roads Wing), Government of India shall also appoint such arbitrator(s). A certified copy of the appointment made by the Director General (Road Development), Ministry of Surface Transport (Roads Wing), Government of India shall be furnished to

both parties. The decision about the appointment of the arbitrators by the Ministry of Surface Transport shall be final and binding on both the parties. Any person appointed as Arbitrator shall not be connected with the work.

3. Save as otherwise provided in the Contract, the Arbitration shall be conducted in accordance with the provisions of the Indian Arbitration Act, 1940 or any statutory modifications or enactment thereof and shall be held at such place and time in India as the arbitrator or the Committee of Arbitrators may determine. The decision of the Arbitrator(s) shall be final and binding as may be determined by the Arbitrator(s).

4. Performance under the contract shall continue during the abritration proceedings and payments due to the Contractor by the Employer shall not withheld, unless they are the subject matter of the abitration proceedings.

5. All awards shall be in writing and such awards shall state reasons for the amounts awarded. No decision given by the Engineer in accordance with the foregoing provisions shall disqualify him from being called as a witness and giving evidence before the arbitrators as aforesaid and neither party will be limited in the proceedings before such arbitrators to the evidence of arguments put before the Engineer for the purpose of obtaining his said decisions.

130.58

No.RW/NH-34041/3/94-DO III ***Dated, the 28th September, 1994***

To

All Secretaries, State Public Works Departments (All States and Union Territories dealing with National Highways); Engineers-in-Chief/Chief Engineers (National Highways) (All States and Union Territories dealing with National Highways)

Subject: Procedure for appointment of Arbitrators for domestic funded National Highway works

A standard contract clause prescribing therein procedure to be followed for appointment of Arbitrators has been finalised by this Ministry and a copy thereof is enclosed for incorporation in the bidding conditions for the National Highway works. It may be ensured that the clause is compulsorily made a part of the bidding conditions for the National Highway works in your State for which Invitation of Tender Notices are to be finalised by the States henceforth after receipt of this letter.

2. The Ministry has standardised the fees and remuneration payable to the Arbitrators, (see Code 130.57). State Government may like to follow this for the cases where amount in dispute involved is upto Rs. 5 lakhs, in which cases Arbitrator will be nominated by the States themselves.

130.59

No.RW/NH-11024/3/94-DO I ***Dated, the 17th October, 1994***

To

The Secretaries, Public Works Departments of States/Union Territories, (Dealing with National Highways); Director General (Works), Central Public Works Department; Director General Border Roads

Subject: Evaluation of tenders for externally aided National Highway Projects

I am directed to say that for quick implementation of externally aided National Highway Projects, it has been decided that tenders after their receipt by the State Govts. will be forwarded immediately by them to this Ministry for evaluation and finalisation. The evaluation of the tenders will be done by a Committee consisting of Officers of Roads Wing and Finance Wing of this Ministry and Chief Engineer (NH) of the concerned State P.W.D. After evaluation, the tenders will be sent to the State Government for preparation of the revised estimate. On receipt of the revised estimate from the State Government, the same will be processed by the Ministry for technical approval and financial sanction.

2. The above procedure may please be brought to the notice of all concerned in your Department for immediate compliance.

143.1 URBAN LINKS

143.1.7

No.RW/NH-11015/13/87-DO I ***Dated, the 19th Sept., 1994***

To

The Secretaries/Chief Engineers (dealing with National Highways) Public Works Departments of States/UTs of Andhra Pradesh, Assam, Bihar, Gujarat, Goa, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Pondicherry, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal

Subject: Enhancement of Central Financial Liability for the development/maintenance or urban road links of National Highways

I am directed to refer to this Ministry's letter No.RW/NHIII/P/13/75-Vol.II dated 9th April, 1987 enhancing the financial assistance for maintenance of urban road links of National Highways in municipal areas with a population of 20,000 or more from Rs.8000/- to Rs.16000/- per KM per year and to state that this Ministry has received representations from various State Governments for enhancement of the financial assistance on account of the increase in the cost of material and wages of the labour. After careful consideration of the matter, it has been decided that with effect from 1st October, 1994 the financial assistance for maintenance of the urban road links of National Highways in municipal areas with a population of 20,000 or more will, subject to terms and conditions indicated in the National Highway Urban Links Agreement with your state and also subject to the signing of a supplementary agreement to this effect, be admissible at the rate of Rs.60000/- per KM per year (inclusive of agency charges) or the actual expenditure whichever is less. In this connection, Supplementary National Highway Urban Link Agreement is being finalised in consultation with the Ministry of Law & Justice and the same will be sent to you for signatures shortly.

2. These orders issue with the concurrence of the Finance Wing vide their U.O.No.1620/FA(T)/94 dated 12.9.94.

143.1.8

No.RW/NH-11015/1/94-DO I ***Dated, the 2nd Nov., 1994***

Subject: Inclusion of all eligible National Highway urban links in the urban link agreement with the State Governments

I am directed to say that, as you are aware, the Central Government is providing financial assistance to the State Governments for the proper development/maintenance of National Highway urban links situated in towns having a population of 20 thousand or more. For this purpose, urban link agreements have to be entered into between the State Govts. and this Ministry. Even though almost all State Govts. have entered into urban link agreements, it has been observed that all the eligible urban links have not been included in these agreements. This may perhaps be due to the reason that the Central Government is already spending on development/maintenance of such stretches without taking into consideration that such stretches are no longer part of National Highways.

2. In view of the position explained above, it is felt that all the eligible National Highway urban road links situated in towns with a population of 20 thousand or more should be brought under the urban link agreement. The State Govts. are, therefore, requested to identify such National Highway urban links and send necessary proposals to this Ministry alongwith the required details, at an early date.

144.11 A

No.RW/NH/34041/3/93-S&R *Dated, the 24th Aug., 1993*

To

The Chief Engineers of all PWDs/UTs dealing with roads

Subject: Guidelines for preparation authenticated land records for National Highways

In continuation of the various instructions on the above mentioned subject earlier issued from time to time by this Ministry, it is stated that the land plans for National Highways need to be prepared keeping in view the following guidelines:

a) Size of Drawing Sheet: To avoid folding of sheet the land plans for National Highways shall be drawn on sheet of size 594 mm x 420 mm (Length x Breadth), corresponding to the size A-2 of IS:696-1960.

b) Scale: Unless scale is specified by the local Revenue Authority for acceptance of the plans the land plans may be prepared on existing village maps or settlement maps provided the scale of plans are in the range of 1:2000 to 1:5000.

The scale of plans for urban locations or other specific situations like junction/intersection etc. may be increased if considered necessary by local field officers.

c) Details to be marked on land plan: The plans shall clearly demarcate the right of way limits of NH land. Various structures coming within the right of way shall be indicated by conventional signs, symbols, numerical figures etc. followed by an explanatory legend. Use of different colours is not recommended. Type of land or area on the boundary outside the right of the way may be suitably indicated (such as built-up area, agriculture land etc.).

d) Survey and khasra number as available with revenue department shall be indicated as whown on the typical land plan.

e) The land plans shall be authenticated by signature and seal of the competent authority of the local Revenue Department and the original copy kept in safe custody of a responsible officer not below the rank of Executive Engineer. Authenticated copies may be made and issued to subordinate offices for day to day use.

2. It is requested that the above instructions may please be brought to the notice of all concerned officers for strict compliance in preparation of the land plans.

144.12

No.RW/NH-11052/12/93-DO I *Dated, the 11th May, 1993*

To

The Chief Engineers (dealing with NHs), PWDs of all States/UTs.

Subject: Encroachment on National Highways land and action taken to remove the same - Annual Report thereon

I am directed to refer to this Ministry's letter No.NH-III/ 72/76 dated 13th January, 1977 wherein the State Governments were impressed upon the need to remove the existing encroachments on the National Highways, in order to eleminate nuisance and ensure safe and free flow of traffic by taking necessary action under various sections of the Indian Penal Code, Criminal Procedure Code and such of the Police Acts as are applicable. However, it has been observed that encroachments on the National Highways are taking place on a large scale and vigorous action need to be taken by the State Governments for the prevention/removal of encroachments. It is emphasised once again that the State Governments may like to take recourse to the various methods mentioned above to have the encroachments on NHs removed and also by making use of various provisions of Public Premised (Eviction of Unauthorised Occupants) Act, 1971.

2. It is requested that an Annual Statement (in the proforma enclosed) regarding the encroachments on the National Highways and action taken by the State Government for the removal of the same may please be sent to this

Ministry, by 31st January of the following year to which the Statement relates. The Statement in respect of year 1992 may please be sent to this Ministry by 31st August, 1993.

Enclosure to Ministry's letter No. RW/NH-11052/12/93-DO I dated 11.5.93

Annual Statement regarding encroachment on National Highways and the action taken to remove the same for the year ending 31st December, 19 _____

Name of the State/U.T.	National Highway No.	Location of encroachment District		Details of encroachment	Details of action taken to remove the encroachment	Remarks
		From km.	To km.			
(1)	(2)	(3)		(4)	(5)	(6)

Signature:

Name of the Officer :

PWD-NH Circle :

144.13

No.RW/NH-11052/12/93-DO I *Dated, the 28th Jan., 1994*

To

The Chief Engineers, Public Works Departments of all States/UTs (dealing with National Highways)

Subject: Encroachment on National Highways land and action taken to remove the same - Annual Report thereon

I am directed to refer to this Ministry's letter of even number dated 11th May, 1993 requesting to send an Annual Statement regarding the encroachments on the National Highways and action taken by the State Government for the removal of the same by 31st January of the following year to which the Statement relates. It was also requested that the Statement in respect of 1992 may be sent to the Ministry by 31st August, 1993. The above Annual Statement has not been received from the State Governments so far.

2. It is requested that the Annual Statement for the year 1992 may please be sent to this Ministry by 28th February, 1994 and the Statement for the year 1993 may also please be sent by 31st March, 1994.

144.14

No.RW/NH-11052/12/93-DO I ***Dated, the 6th April, 1994***

To

The Chief Engineers, Public Works Departments of all States/Union Territories (dealing with National Highways)

Subject: Encroachment on National Highways land and action taken to remove the same- Annual Report thereon

I am directed to refer to this Ministry's letter of even number dated 11th May, 1993 and subsequent reminder dated 28.1.1994 requesting to send the annual statement regarding the encroachments on the National Highways land and action taken by the State Governments for the removal of the same, for the year 1992 by 28.2.1994 and for the year 1993 by 31.3.1994.

2. However, it is regretted that even after a lapse of more than one year, the State Governments have not sent the above statements so far. It is, therefore, again requested that a consolidated statement for the year 1992 and 1993 may please be sent to the Ministry by 31st May, 1994 at the latest.

144.15

No.RW/NH-11052/12/93-DO I ***Dated, the 18th July, 1994***

To

The Chief Engineers, Public Works Departments of all States (except Tamil Nadu)/Union Territories (dealing with National Highways)

Subject: Encroachment on National Highway land and action taken to remove the same - Annual Report thereon

I am directed to refer to this Ministry's letter of even number dated 11th May, 1993 and subsequent reminders dated 28.1.1994 and 6.4.1994 requesting to send the annual statement regarding the encroachments on the National Highways land and action taken by the State Governments for the removal of the same, for the year 1992 by 28.2.1994 and for the year 1993 by 31.3.1994.

2. However, it is regretted that even after a lapse of more than one year, the State Governments have not sent the above statements so far. It is, therefore, again requested that a consolidated statement for the year 1992 and 1993 may please be sent to the Ministry by 31st August 1994 at the latest, without further delay.

ENCLOSURE TO MINISTRY'S LETTER No. RW/NH/36041/3/93 S&R DATED 24-8-93

TYPICAL LAND PLAN

.....N.H.....

VILLAGE.....

TALUKA.....

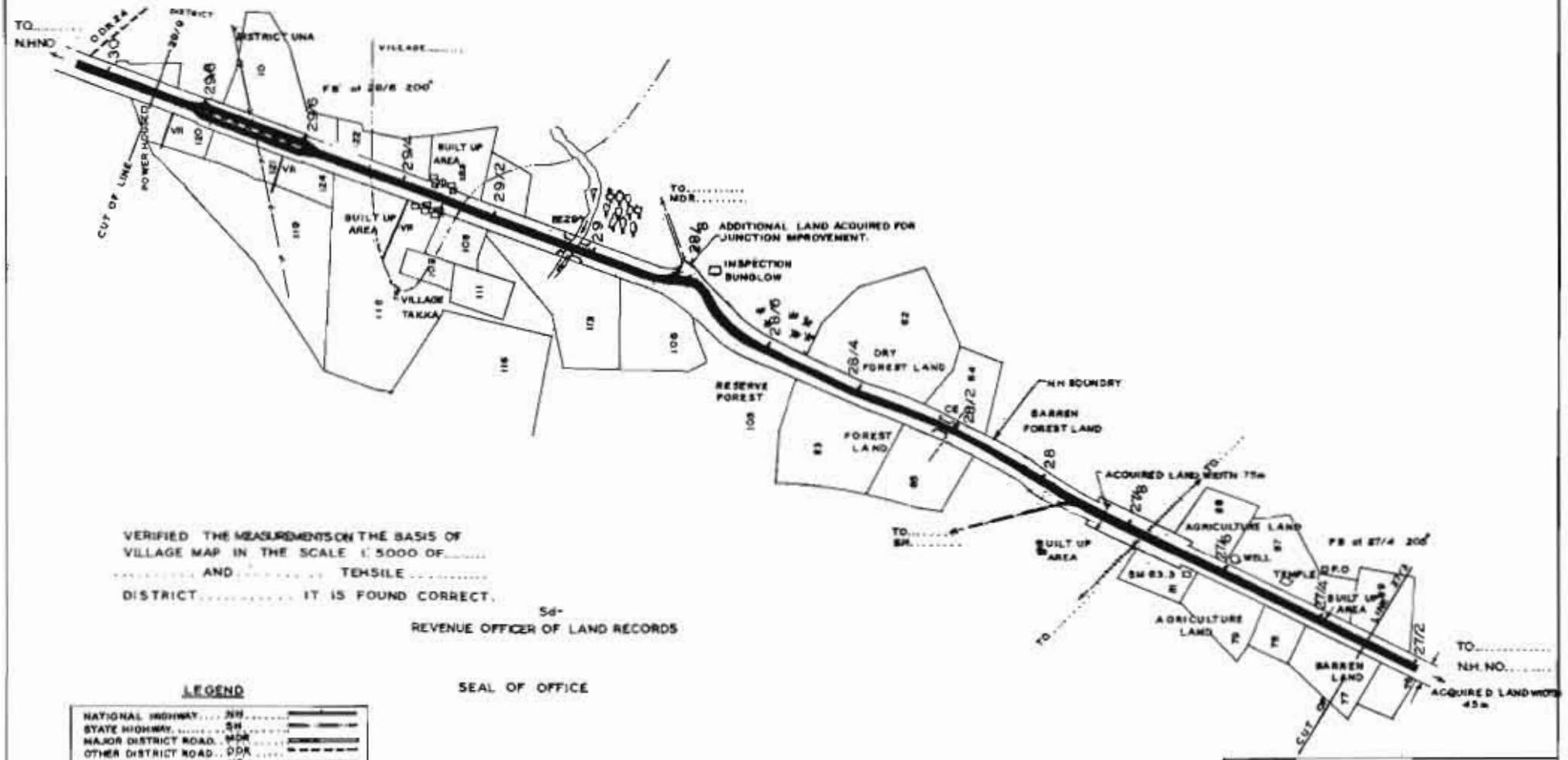
DISTRICT.....

FROM KM. STONE NO.....TO.....

SHEET NO.....

N

Part of survey of INDIA sheet No. 55 L/13



VERIFIED THE MEASUREMENTS ON THE BASIS OF VILLAGE MAP IN THE SCALE 1" 5000 OF.....
..... AND ..... TEHSILE .....
DISTRICT..... IT IS FOUND CORRECT.

Sd-
REVENUE OFFICER OF LAND RECORDS

SEAL OF OFFICE

LEGEND

NATIONAL HIGHWAY	NH
STATE HIGHWAY	SH
MAJOR DISTRICT ROAD	MDR
OTHER DISTRICT ROAD	ODR
VILLAGE ROAD	VR
CART TRACK	CT
FOOT PATH	FP
RIGHT-OF-WAY LINE	
EXISTING ROADWAY	
EXISTING CULVERT/BRIDGE	CE / BE
ROAD JUNCTION	
ORCHARD	
MARSH	
BUILDING	
POST OFFICE, TELEGRAPH OFFICE	P.O, T.G
KHASRA BOUNDRY	
VILLAGE BOUNDRY	
DISTRICT BOUNDRY	

1: 5,000

Metres 100 50 0 100 200 300 400 500 600 700 800 900 Metres

GOVERNMENT OF .....
PUBLIC WORKS REGION.....

Drg. No

Chief Engineer PWD Region.....	Suptdg. Engineer Special Project Circle.....	Executive Engineer N.H. DN.....

S. KALIA.

145.12

No.RW/NH-11037/1/86-DOI (i) *Dated, the 28th July, 1993*

To

The Chief Engineers of State PWD and Union Territories (dealing with National Highways and other Centrally Financed Schemes), Director General (Works), CPWD, Director General (Border Roads), Chairman, National Highway Authority, New Delhi.

Subject : Accommodation of utility services like cables and pipelines for water/gas/petroleum products within National Highway right-of-way - Responsibility for ensuring conformity with approved plans

In continuation of this Ministry's letter No.NH-III/P/66/76 dated 19th November, 1976 it is reiterated that other authorities incharge of utility services like cables and pipelines for water/gas/petroleum products, should invariably obtain prior approval of the State PWD's/Highway Authority before undertaking any work of installation, shifting, repairs or additions/alterations to the utility lines located within the National Highway right-of-way. It has further been decided that it shall be the responsibility of the State PWD/Highway Authority to ensure that no work without such prior approval is carried out and that the execution conforms to the approved plans.

2. It is requested that the contents of this letter may be brought to the notice of all officers in your department dealing with National Highway works.

3. Kindly acknowledge receipt of this letter.

145.13

No.RW/NH-11037/1/86-DOI(ii) *Dated the 28th July, 1993*

To

The Chief Engineers of State PWD and Union Territories (dealing with National Highways and other Centrally Financed Schemes), Director General (Works), CPWD, Director General (Border Roads), Chairman, National Highway Authority, Engineer-in-Chief, Municipal Corporation of Delhi, Delhi.

Subject : Bridges on National Highways and under other Centrally Sponsored Scheme - provision of utility services thereon

It has been decided that provision of utility services such as water mains, gas pipes and sewage pipes on the main bridge structures on National Highways and under other centrally sponsored schemes, should be avoided as far as possible.

2. In cases, where the carrying of watermains or sewage pipes on the bridge becomes inescapable, the following instructions may be carefully followed so as to avoid possibility of any damage to the bridge and its approaches :-

(i) The pipeline may be supported on the substructure of the bridge. In no case it should be laid on the superstructure.

(ii) Only seamless pipes with welded joints should be permitted. C.I. pipes with S&S joints should not be allowed.

(iii) Location of pipeline on the substructures should be so fixed that it is easily accessible for carrying out its inspection, maintenance and repairs and it may not in any way hinder the inspection, maintenance and repairs of the superstructure bearings and substructure of the bridge.

(iv) The pipeline should be so aligned that it is taken out of the approach embankment as quickly as possible with minimum embedment into it. The thrust block at the bends in the pipeline required for taking it out of the embankment must be placed inside a culvert so as to facilitate easy maintenance and ensure its functioning independent of that of the embankment.

(v) Where there is any change in the elevation of the pipeline while traversing the bridge length, air valves may be provided.

(vi) In order to take care of the effects of surge force, pressure relief valves on the pipelines may be provided near the two ends of the bridge, as a measure of abundant caution, even though a surge arrester may have been provided at the pumping station.

2. Where pipelines, carried out the bridges, are already embedded into approach embankments, action may be taken to provide culverts exclusively for housing the pipes as outlined above. Till such time, as this is done constant vigilance on such stretches of embankments should be maintained, so as to detect any signs of leakage and to close the same well in time to avoid any mishap to the embankment.

3. The above instructions may please be communicated to all officers dealing with National Highways and other Centrally Sponsored Schemes for strict compliance.

4. The receipt of this letter may kindly be acknowledged.

145.14

No.RW/NH-11037/1/86-DO I ***Dated, the 19th January, 1995***

To

The Secretaries, Public Works Departments of State/UTs (dealing with National Highways)

Subject: Accommodation of underground utility services like electric cables and pipelines for water/gas petroleum products along and across National Highways

I am directed to refer to this Ministry's letter No. NH-III/P/66/76 dated 19th November, 1976 (refer Vol.I - page 145/3) wherein it was intimated that utility services like electric cables and pipelines for water etc. should normally not be located longitudinally within the National Highway right-of-way. However, exception to this rule may be made where it is demonstrated to the satisfaction of the State Chief Engineer that any other utility location would be extremely difficult and unreasonably costly and that the installation within the right-of-way will not adversely affect the design, stability and traffic safety of the highway nor the likely future improvements such as widening of the carriageway, easing of curves, etc. It was also intimated therein that for such cases, the State Chief Engineers may themselves accord permission for the laying of utility services provided that the conditions set out in the Annexure enclosed with the above letter are satisfied, and if it is considered necessary to relax any condition, prior approval of the Ministry should be obtained.

2. In this connection, it may be stated that the above permission was intended to be granted to the Government Departments of public utility services. However, it has been observed that some of the State Govts. have given permission for laying water supply pipelines to the private parties. Such permission to private parties for laying pipelines for water supply along and across the National Highways may result in a number of parallel pipelines coming up on National Highway land, which will hamper future development works of National Highways. The State Chief Engineers are, therefore, requested to be judicious in applying the exceptional situation for granting permission for laying underground utility services like electric cables and pipelines for water etc. particularly to the private parties.

150.17
604.13

No.RW/NH-11064/1/91-DO 1 ***Dated, the 26th Oct., 1993***

To

The Secretaries, PWDs of all State Govts./UTAs (Departments dealing with roads)

Subject: Provision of safety measures at Approaches to Railway Level Crossings

I am directed to refer to this Ministry's letter of even number dated 10th February, 1993 regarding the need for expeditious removal of speed breakers on National Highways. It has also been mentioned therein that, on approaches to railway crossings or weak/narrow bridges, rumble strips should be provided instead of speed breakers.

2. In the interest of traffic safety, it is again reiterated that rumble strips, as per the design and locational details, communicated to the State Chief Engineers vide this Ministry's letter No.RW/NH-III/P/31/84 dated 9th January, 1987, may be provided on approaches to railway level crossings. These rumble strips should be provided over the total width of the road, i.e. from edge to edge of the berm and marked with reflective paint and supplemented by warning/speed limit signs, as per the Ministry's design. It may also be ensured that these are maintained properly and do not lose their effectiveness over time.

3. In a recent meeting with the Ministry of Railways, it was jointly agreed that henceforth rumble strips only will be provided on approaches to railway level crossings. As such, installation of any new speed breakers at these locations should not be permitted. Any speed breaker already provided by the Railways as a temporary measure at these locations should be removed concurrently with the provision of rumble strips, for which Railways are being suitably informed.

4. It is requested that urgent instructions may be issued to all concerned in your Department for implementing the above mentioned safety measures on priority and in a time-bound manner so that the installation of rumble strips on approaches to all railway level crossings is completed latest by 31st January, 1994.

5. It is also requested that, from public safety angle, similar instructions may be issued for providing safety measures at approaches to railway level crossings falling on State roads.

150.18

F.No. RW/NH-11052/4/91-DO 1 ***Dated, the 13th Dec., 1993***

To

The Secretaries of States/UTs, PWDs dealing with NHs; Director General (Works), Central Public Works Department; Director General Border Roads

Subject: Guidelines for utilisation of space beneath the ROBs/Flyovers on National Highways

I am directed to refer to this Ministry's endt. of even number dated 17/9/93 forwarding therewith a copy of the National Highways (Amendment) Rules, 1993 regarding utilisation of space beneath the Road Overbridges/Flyovers. In this connection, it may be mentioned that this Ministry has drawn up guidelines indicating the manner in which permission may be accorded by the State Governments to the concerned Departments of State/Union Territory Governments for utilisation of space beneath the ROBs/ Flyovers on National Highways, a copy of which is enclosed for your information and guidance. It is requested that these guidelines may please be followed by the State Governments strictly while granting permission to the Department of State/ Union Territory Governments for utilisation of space beneath the ROBs/Flyovers on NHs. Necessary instructions in this regard, may be issued to all the Officers under your control.

Enclosure to Ministry's Circular No.RW/NH-11052/4/91-DO I dated 13.12.1993

GUIDELINES FOR UTILISATION OF SPACE BENEATH ROBs/FLYOVERS ON NATIONAL HIGHWAYS

1. In non-urban locations no structures should be allowed in the space beneath the superstructure of approach spans of ROBs/Flyovers. Suitable landscaping may be done for improvement of environment.

2. In urban/semi-urban locations, normally the same policy may be followed but in case there is apprehension of encroachment, the space beneath approach spans of ROBs/Flyovers may be enclosed. Public Works Department of State Governments who act as agencies for National Highways works would have the first preference for utilisation of this space.

3. In case the Public Works Department has no plans to utilise this space, other Govt. agencies may be permitted to utilise this space for warehousing purpose. First priority shall, however, be given to a Central Government Department Undertaking in this regard.

4. While planning for utilisation of space beneath ROBs/ Flyovers on National Highways, it must be ensured that the safety, stability and serviceability of the structure are not impaired in any way by such utilisation.

5. Suitable precautions shall be taken to ensure that there are no chances of fire hazard for the enclosing structure and the premises. Further no surface treatment for beautification etc. shall be applied to any part of the structure.

6. Storage of foodgrains should only be allowed. For storage of any other type of material, prior approval of the Central Government should be obtained.

7. Suitable arrangement for ventilation below the soffit of superstructure has to be made in these enclosing structures.

8. Clear-cut passage has to be kept within the enclosing structure for access of maintenance personnel, whenever necessary, for inspection of all parts of ROB/flyover structures.

9. In case of any requirement of carrying out minor repairs to the ROB/flyover structure, necessary access and working facilities are to be given to maintenance personnel for carrying out the necessary repairs.

10. In case of any requirement of major repairs of the ROB/ flyover needing special facilities below them, the concerned agencies permitted to utilise the space for storage would be required to vacate the space so that the same is available for carrying out the necessary repairs.

11. The concerned Govt. agency, permitted for utilising the space for storage, would have to bear the full cost of construction of the storage facility. The work will be carried out as deposit work to be executed by PWD. In no circumstances should the PWD carry out the work as a part of construction of ROB/flyover and charge the cost of the same to the main project.

12. The concerned Governmental agency would also have to bear the maintenance and repair cost of the storage structure and provide the same, whenever required, to the State Public Works Department.

13. The concerned Governmental agency would have to take prior permission of State PWD before making any fittings in any part of the main ROB/Flyover structure.

14. If at any time, the Govt. of India decides to withdraw the permission, the structure for storage shall be dismantled by the concerned Govt. agency within the specified period without preferring any claim against the Government.

15. Proprietory rights for the space below the ROB/ flyover structures should remain with Govt. of India and under no circumstances, should any lease be granted to the storing agency which can give any legal right to the latter.

16. A memorandum of understanding duly vetted by the Central Govt. has to be executed between State PWD as the agency of Govt. of India and the Govt. Agency to whom permission for storage is proposed to be given. The MOU would clearly stipulate the licence fee to be levied which will be as per the National Highway (Amendment)Rules dated 17th Sept., 1993.

150.18 A
604.14

No.RW/NH-11064/1/91-DO I *Dated, the 6th June, 1994*

To

The Secretaries, Public Works Departments of all State Governments/Union Territory Administrations (Departments dealing with roads)

Subject: Provision of safety measures at Approaches to Railway Level Crossings

I am directed to refer to this Ministry's letter of even number dated 26th October, 1993 regarding installation of rumble strips, on the approaches to all the railway level crossings instead of speed breakers. It has been requested therein that urgent instructions may be issued to all concerned in your Department for implementing the above safety measures on priority and in a time bound manner so that the installation of rumble strips on approaches to all railway level crossings is completed by 31st January, 1994.

2. It is presumed that the above work must have been completed by the target date. It is, therefore, requested that an implementation report, in this connection, may please be sent to this Ministry immediately.

150.19
604.16

No.RW/NH-11064/1/91-DO I *Dated, the 1st Nov., 1994*

To

The Secretaries, Public Works Departments of all State Govts./UTs (Dealing with National Highways)

Subject: Provision of safety measures at approaches to Railway Level Crossings

I am directed to say that this Ministry has been issuing instructions, from time to time, regarding provision of safety measures at Railway Level Crossings falling on National Highways including specifications for provision of rumble strips on the approaches. The recommended measures therein are:-

(i) Installation of IRC Road Signs (Specified in IRC: 67-1977, "Code of Practice for Road Signs") whether the railway crossing is manned or unmanned;

(ii) Imposition of speed limits for approaching traffic and installation of relevant road signs, and

(iii) Provision of rumble strips on both sides of the railway crossings. Speed breakers of hump type shall not, however, be permitted.

2. Specifications for rumble strips were circulated among all State Governments vide this Ministry's letter No.PL-50(8)/72 dated 4th June, 1976. It was also reiterated that rumble strips as per the design and locational details communicated to the State Chief Engineers, vide this Ministry's letter dated 9th January, 1987 may be provided on approaches to railway level crossings. It was also mentioned therein that the speed breakers already provided by the Railways as a temporary measure at these locations should be removed concurrently with the provision of rumble strips.

3. In a recent communication to the Transport Secretaries of all States/Union Territory Administrations, this Ministry vide letter No.RT-25035/40/94-RSC dated 23rd September, 1994, has suggested, among other safety measures, that State PWD authorities should ensure complete road warning signs on approaches of the level crossings as per IRC Code and at prescribed distance.

4. It is requested that urgent instructions may be issued to all concerned in your Department, engaged in National Highways and other Centrally financed road works for implementing the above mentioned safety measures on a priority and time bound basis.

5. It is also requested that from public safety angle, similar instruction may be issued for providing these safety measures as approaches to railway level crossings falling on State roads.

6. This Ministry may please be informed of the action taken in the matter.

150.20

No. RW/NH-11033/2/87-DO I *Dated, the 22nd Nov., 1994*

To

The Secretaries, PWDs of all States/Union Territories (dealing with National Highways)

Subject: Privatisation of construction of ROBs on National Highways under the Build, Operate and Transfer (BOT) Scheme

I am directed to say that the policy on private participation in road sector and amendment of rules is in hand. It is hoped that this will be finalised shortly.

2. In the meantime, a paragraph duly approved by the Railways for incorporating the same suitably in the Memorandum of Understanding/Agreement to be executed with the private parties, by the Central/State Governments for the proposed construction of ROBs on National Highways under the BOT Scheme, is enclosed herewith, for your information and necessary action.

3. The policy in this respect as and when decided will be circulated to the State Governments separately.

Enclosure to letter No.RW/NH-11033/2/87-DOI dated 22.11.94

PARAGRAPH TO BE INCLUDED IN THE MEMORANDUM OF UNDERSTANDING/AGREEMENT TO BE EXECUTED BETWEEN THE CENTRAL GOVERNMENT/STATE GOVT. AND PRIVATE PARTIES FOR CONSTRUCTION OF ROBs ON THE NATIONAL HIGHWAYS, UNDER THE 'BOT SCHEME'

The work of ROB proper and other works as authorised and required by the Railways as per extant rules shall be carried out by the Private Entrepreneur under the supervision of Railways. The Entrepreneur shall get the plan drawings and specifications of the bridge proper and other works approved by the Railways in advance. During execution the contractor shall carry out such modifications/changes as required by the Railways. In proof of the work having been done to approved specifications and to the satisfaction of the Railways, the contractor shall have to produce a completion certificate from the former. For this, Railways may charge a fee. The special works, required to be handled only by the Railways from the consideration of technical and railway safety requirements, shall be carried out by the Railways themselves. However, the amount needed for these and as estimated by the Railways as also the supervision charges as applicable shall be deposited with the Railways. Any increase in cost required to be incurred for completion of work shall also be borne by the entrepreneur and shall be deposited in advance as and when demanded by the Railway. Such cost as per completion estimate shall be added to the cost of project and recovered through levy of fee. However, pedestrians and cyclists shall be allowed free passage over the bridge.

2. During the period of operation of bridge by the contractor, the cost of maintenance as per Railway rules shall be deposited annually with the Railways.

206.3A

No.RW/NH-33044/1/93-D III *Dated, the 5th September, 1992*

To

State Govts./UTs dealing with NHs only; Chief Engineers of States/UTs, PWD (Dealing with the NHs and other centrally sponsored schemes); Director General (Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority

Subject: Empanelment of Consultants for National Highways and other Centrally Sponsored Projects in the field of "Highway Project Preparation and Traffic & Transportation Engg./ Planning"

In continuation of this Ministry's letter No.NH-33044/4/90 DO.II dated 7th April, 1992, on the above subject, it is stated that following consultants have also been empanelled under the category indicated against each:-

1.	M/s. KAM ENGINEERING (India) Pvt. Ltd. A-1/13, Shakti Nagar Extension, Delhi-110052	General Highway Projects including Minor Bridges
2.	M/s. SPAN TRAVERSE MORGAN INTERNATIONAL LIMITED Flats 3-5, Second Floor Local Shopping Centre, 'J' Block, SAKET, NEW DELHI-110017.	Specialised Stu- dies/Projects related to Traffic & Transportation Engineering/Planning

2. The empanelment shall be valid upto 30th June, 1994.

3. All other stipulations as conveyed earlier in this Ministry's letter of 7th April, 1992, referred to above, shall hold good for these cases also.

206.3 B

No.RW/NH-11052/16/93-DOI. *Dated, the 7th September, 1993*

To

All Project Chief Engineers Chief Engineer (Roads) North/South/East/West/Central Chief Engineer (Bridges)North/South/East/West/Central.

Subject: Direct Engagement of Consultant by the Ministry

It has been decided that the consultants are to be engaged directly by the Ministry for carrying out services in respect of N.H. works. A framework of the procedure for such engagement is described below:

I. Consultants to be engaged by the Ministry directly

For this, the Chief Engineer concerned of the Ministry will be the nodel Executive authority. Letters would be sent to the Consultants empanelled by the Ministry requesting for data for short-listing for the selected project. Evaluation of applications will be made by a Committee headed by the concerned Chief Engineer of the Ministry, Chief Engineer (Public Works Department) of concerned State, one another Chief Engineer of the Ministry, one Representative of Finance Wing and Deputy Secretary (P&B). After finalisation of short-list, Letters of invitation will be issued to short-listed consultants for furnishing of their Technical and Financial proposals. Evaluation of proposals will be made by the same Committee as constituted for short- listing. The Committee will make recommendations to the Ministry for engagement of suitable consultant. The Ministry will thereafter enter into agreement with the consultant directly. All payments to the consultant will be made by the concerned Chief Engineer of the Ministry.

II. Carrying out of services by the Consultant and Supervision

Consultant will carry out services as per the requirement of the Terms of Reference and submit reports/ design/date directly to the Ministry. These will be processed in the Ministry for comments and approval. Consultations may be carried out with State PWD wherever necessary.

The work in the field will be supervised from time to time by the concerned Regional Officer/Engineer-Liaison-Officer and Ministry's officers.

III. Involvement of State Public Works Department required for the work

State Public Works Departments would need to be involved in following specific areas:

(i) Furnishing of previous records/data/maps to the Consultant, as required;

(ii) Rendering assistance to Consultants in respect of availability of socio-economic data of the State;

(iii) Rendering assistance in respect of administration/ police help in carrying out services, as required;

(iv) Advising the Ministry on any local problems such as land acquisition, suitability of alignment, raising of road/ bridge extent on flood planes, etc;

(v) Reporting to the Ministry on activities of the Consultant.

For this, the State Public Works Department may be paid agency charges @ 3% as already decided in the case of Project Preparation for the 3rd ADB Project.

2. Project Chief Engineers may kindly identify possible cases for engagement of Consultants and intimate the same to ADG(R)/ADG(B) for consideration, so that the above procedure may be adopted in a few cases in the first instance as a trial measure.

206.4

No.RW/NH-34044/1/94-DO III ***Dated, the 15th June, 1994***

To

Chief Engineers, PWD of all States/UTs (dealing with National Highways and other Centrally sponsored schemes); Director General (Works), Central Public Works Department; National Highway Authority; Director General Border Roads

Subject: Selection of Consultants for Road/Bridge Projects on National Highways- Supplementary Guidelines

With a view to streamlining the process of selection of Consultants, the "Interim Guidelines for engaging consultants for preparation of Highway Projects" were circulated among the State Chief Engineers and other concerned organisations vide this Ministry's letter No.RW/NH-34011/62/89-DO II dated 12th January, 1990. In addition to prescribing an evaluation criteria for prequalification of consultants, these guidelines have laid down the procedure for selection of consultants based on composite evaluation of the technical and financial proposals with appropriate weightages assigned to each.

2. Subsequent to the issue of the above guidelines, a large number of consultancy projects in respect of National Highways have been got carried out by this Ministry. Based on the experience gained therefrom and the views expressed by professionals involved in selection and implementation process, the existing procedures for selection of consultants have been reviewed. In respect of domestic consultancy services, it is felt that apart from other needed modifications in the selection process, the adoption of an alternative procedure comprising selection of the consultant with the lowest financial bid out of the technically acceptable consultants in substitution of the existing procedure based on technical-cum-financial weightage, merits consideration.

3. Accordingly, the following supplementary guidelines for engaging domestic consultants are being communicated for adoption:-

(i) The terms of Reference(TOR) should be carefully drawn. These should indicate specifically the minimum qualification of personnel, their man-months, scope of survey and investigation, quality control checks to be exercised during project implementation and the requirement of specific recommendations/advice regarding type and details of construction equipment appropriate to the project together with their upkeep. The TOR should also stipulate that the overall responsibility for the quality of the project will rest with the consultant.

(ii) In addition to the details of price break-down to be included in the financial proposal, as indicated in para 8 of the "Sample Letter of Invitation to Pre-qualified Consultants" (Annexure III of the Interim Guidelines for engaging consultants, circulated vide this Ministry's letter referred to in para 1 above), the cost for survey and investigation should also be included in the price break-down.

(iii) The evaluation criteria for the technical proposals, together with the minimum acceptable threshold technical score, should be decided on a case-by-case basis.

(iv) Financial bids of only those firms who secure the minimum acceptable technical score need be opened. The work should be awarded to the lowest financial bidder provided his offer is found to be reasonable.

4. Under emergent situations, the prequalification step could be omitted and proposals invited from select list of consultants in consultation with this Ministry. However, this will be done only exceptionally. In addition, this Ministry may, if so deemed appropriate, directly engage the consultancy services for a specific project/study.

5. The empanelment of consultants will be a continuous process for which applications, as and when received by this Ministry from the prospective consultants, will be considered appropriately. The panel would be kept up-to-date at least on a yearly basis. An empanelled consultant could be taken out if his performance is not found satisfactory.

6. It is considered that performance evaluation of the projects already handled by the empanelled consultants should be inbuilt in the selection procedures for engaging consultants. Accordingly, the criteria for performance evaluation of the consultants are presently under this Ministry's consideration and the same will be circulated on finalisation, for being suitably incorporated in the selection process.

7. The above guidelines may please be circulated among the concerned officers of your department for information and adoption in respect of consultancy services to be engaged in future in respect of domestically funded projects.

302.14 A

No.RW/NH-33048/2/87-S&R *Dated, the 12th Feb., 1993*

To

State Governments/UTs dealing with National Highway works; Chief Engineers of States/UTs PWD (dealing with NHs and other Centrally sponsored schemes); Director General(Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority

Subject: Type Designs for Intersections on National Highways

It is well known that road intersections, if not properly designed, act as potential accident spots. Their poor layouts also affect smooth traffic flow and cause delays to vehicles. As such, scientific design of intersections can go a long way towards improved safety and better flow conditions on the National Highway system. Practising engineers have been handicapped upto now to adopt suitable intersection designs for want of proper guidelines and standard designs. Recognising this requirement, this Ministry had developed a compendium of type designs covering different types of crossing situations and a number of copies of this publication are enclosed for your use as explained further in para 5.

2. The designs presented include at grade intersections for 4- lane/2-Lane/Single Lane National Highway with intersection roads of varying width which could be a National Highway, State Highway, Major District Road or other District Road/Village Road. Usual T/Y intersections, 4 armed intersections, rotaries and intersection layouts at starting and end points of byepasses have been covered. Details of traffic signs, road markings, islands and drainage for intersections are also given. In addition, some typical designs of grade-separated intersections, i.e., diamond, trumpet, At-grade Rotary and at-grade controlled intersection with NH flying over have been developed for general guidance. The type of designs are based on the recently finalised IRC "Guidelines for the Design of At-Grade intersections in Rural and Urban Areas" which is expected to be printed soon. Main parameters which form the basis of design are explained in the general guidelines preceding the type drawings.

3. The type designs can be adopted with minor modifications at most of the intersections on National Highways. With appropriate modifications, the intersection designs will also prove useful for the State Roads. Complicated intersections would, however, need to be individually designed, although the type designs can act as useful guide even in those cases. As such, complex cases of design may continue to be referred to the Ministry together with traffic data site details, as stipulated in this Ministry's letter No.PL-30(49)/79 dated 28.7.84, for evolving appropriate designs.

4. Careful attention also needs to be given to proper layout and setting out of the intersections at site in accordance with the type designs. For this purpose guidance may be obtained from the IRC:38-1988 "Guidelines for Design of Horizontal Curves for Highways and Design Tables" for facilitating correct layouts at site and also "IRC Guidelines of Design of At-grade Intersections" (under print). In order to institute a system of Quality assurance it is requested that AE/AEE in-charge of the work should get the intersection laid down at site himself and this should be cross-checked by EE concerned. For every case a certificate about correct setting out should be countersigned by both AE/EE.

5. Several copies of the compendium of Type Designs are enclosed for adoption in respect of intersection improvement in future. All the State Governments/UTs PWDs and other concerned road organisations are requested to bring the above guidelines and the type designs to the notice of field/design engineers as SE/EE level for implementation. In case more copies of the compendium are required, the same may be obtained from Indian Roads Congress on payment of Rs.300/- per copy.*

* Type design not printed in this adendum as the same can be purchased from IRC on payment of Rs.300/-.

302.15

No.NH-33054/7/92-S&R *Dated, the 16 February, 1993*

To

The Chief Engineers of all States & Union Territories (dealing with National Highways); Chairman, National Highways Authority of India; Director General Border Roads; Director General (Works), Central Public Works Department

Subject: Setting out of horizontal/vertical curves and junctions

It has been observed during the inspection that adequate care is not exercised while setting out horizontal/vertical curves and junction layouts for National Highway works.

2. It appears that proper methodology for this purpose, as contained in the guidelines in IRC:38 and IRC Special Publication No.23 is not being followed. It will be appreciated that this will not only defeat the purpose of geometric design for highways but also cause inconvenience and discomfort to read users and may lend to accidents. The importance of adhering to the provisions already indicated in these publications therefore needs to be reiterated.

3. It is also felt that the layout of the horizontal/ vertical curves and junctions should be set out under the direct supervision of a responsible officer preferably by the Polar Deflection Method and the layout not approved by a senior technical officer before commencing work. The Ministry would like to suggest that a dependable Quality Assurance mechanism must be instituted for the purpose. For all curves, particularly at junctions, each P.W.D. should make it mandatory that the layouts will be demarcated minimum at the level of Assistant Engineer with cross checking by one higher level namely Executive Engineer. Both the officers should be required to record a certificate in writing about varification of the layouts in person before the implementation proceeds further.

4. It is requested that these instructions be brought to the notice of all officers dealing with National Highway works.

304.8

No.RW/NH-33017/2/89-S&R *Dated, the 7/13th January, 1994*

To

The Chief Engineers of State PWDs/UTs (dealing with National Highways and other centrally financed projects); Director General Border Roads; Director General (Works), Central Public Works Department; Secretary, Indian Roads Congress; Director, NITHE

Subject: Ministry's Research Scheme R-52 "Computer aided design system for high embankment problems"

Under the above mentioned research scheme, the Ministry has developed a user friendly programme for slope stability analysis, settlement analysis and wedge stability analysis for design of high embankment. This computer package which will be of great help to highway engineers, is now available with the Indian Roads Congress.

2. It is requested that in future high embankment cases may be analysed with the help of this computer package.

Code No.	*Circular No. & Date*	*Brief Subject*	*Page No.*
407.12	RW/33045/1/90-S&R dt. 1-3-93	MOST Specification for Road and Bridge Works (second revision 1988) Specifications of Paver Finishers for use on bituminous works.	407/23
407.13	RW/NH-33054/32/89-S&R dt. 7-6-93	Specifications for use of Slurry Seal on Road Surfaces	407/23

407.12

No. RW/33045/1/90-S&R *Dated, the 1st March, 1993*

To

The Chief Engineers of all State PWD/UTs dealing with NHs and Centrally aided road works; Director(Works), Central Public Works Department; Director General Border Roads

Subject: Ministry of Surface Transport Specifications for Road & Bridge Works (second revision 1988) Specifications of Paver Finishers for use on bituminous works

Please refer to this Ministry's letter of even number dated 6-4-1990 on the above subject (see Code 407.11) extending the relation in the Specifications of Paver Finishers upto 31st March, 1993. The position regarding availability of Paver Finishers as per clause 504.3.5 of the Ministry's Specifications was reviewed again during the Chief Engineer's meeting held on 2.12.1992 at Patna. The general feeling was that the availability position has not yet reached a satisfactory level, so that full-scale change-over can be made. In view of the same, it has been decided that the relaxation for use of Paver Finishers as already allowed under para 2a of the Ministry's letter dated 6-4-1990 be extended, for the last time, upto 31st March, 1994. It may, however, be noted that the stipulations as made in para 2(b), 2(c) and 3 of the above mentioned circular shall not be relaxed in any manner. It may also be noted that this is the final-extension in the matter.

It is requested that the above policy may be brought to the notice of all concerned in your State.

407.13

No.RW/NH-33054/32/89-S&R *Dated, the 7th June, 1993*

To

The Chief Engineers of all State PWD/UTs dealing with NHs and Centrally aided road works; Director General (Works), Central Public Works Department; Director General Border Roads

Subject: Specifications for use of slurry seal on road surfaces

Although newly laid dense bituminous surfaces are generally impervious, in due course of time they start showing signs of distresses like cracking etc., due to oxidation, and hardening of binder. The continuous exposure to environment and resultant ageing gradually leads to ravelling and failure of pavements. In such situations it is essential that the surface is resealed with an appropriate sealing material without much interruption to the moving traffic. Slurry seal is widely accepted as a suitable material for sealing of such bituminous surfaces.

2. Slurry seal is a mixture of well graded fine aggregate, mineral filler, emulsified asphalt and water applied on the pavement as a surface treatment by means of a special slurry sealing equipment. This can be used in both preventive as well as corrective maintenance of pavement surfaces. Slurry seal application is not intended to increase the structural strength of a pavement section. Any surface irregularities like ruts, humps, crown deficiencies, waves etc., which affect the riding quality should be corrected before placing the slurry seal.

3. Besides effectively sealing the surface cracks and preventing ravelling and improving the skid resistance, the slurry seal is also having various other advantages as listed below,

(i) Rapid application
(ii) No need for adjustment to manhole and other structures
(iii) Minimum loss of kerb height
(iv) No loose aggregate cover
(v) Ability to correct minor surface irregularities
(vi) Relatively low cost of treatment
(vii) Fine surface texture ideal for application of surface paint

4. Considering the above, it has been felt that introduction of slurry seal application in this country would be advantageous in many ways. With a view to aquaint the field Engineers with this new technique, efforts are being made for procurement of a slurry sealing equipment by the Ministry. A set of specifications for using this technique has also been framed in the Ministry, a copy of which is enclosed with this letter.

5. Keeping in view the above, presently there is a need for identifying suitable sections on National Highways which are ideal for slurry seal application. Proposals for applications of slurry seal on such sections shall be considered by the Ministry for introducing this technique in this country. In the long run this might also give a fillip to the industry to facilitate manufacture of the necessary equipment indigenously.

6. The Ministry will wellcome suggestions of improvement/ modifications based on past experience, if any on slurry seal specification and also feedback reports after actual application in field.

It is also requested that suitable proposals as suggested in the foregoing para may please be furnished to the Ministry for consideration.

Enclosure to Ministry's Circular letter No.RW/NH-33054/32/89-S&R dated 7-6-93

SPECIFICATIONS FOR SLURRY SEAL

Scope : The work shall consist of preparation of Bituminous Slurry Seal using design proportions of bitumen emulsion, stone aggregates, mineral filler, water and additives where required, and applying the same over a prepared bituminous surface by means of approved slurry seal machine in accordance with these specifications.

Slurry seals are primarily used on bituminous surface showing signs of excessive oxidation and hardening. They are used to seal the voids on an existing surface which is starting to show signs of cracking/ ravelling and to positively protect them from water penetration and to provide a wearing surface with wet weather skid resistance.

The Slurry seal shall not be used over an existing bituminous surface which has deteriorated badly or needing rehabilitation of pavement.

2. Materials

2.1. **Binder :** The binder shall be cationic bitumen emulsion of suitable grade complying with IS: 8887-1978 having a minimum residual bitumen content of 60% by weight.

2.2. Aggregates

2.2.1. **Physical requirements :** The aggregates shall comply with the physical requirements in accordance to Clause 504.2.2.1 of MOST specifications except that the water absorption shall be restricted to 1 per cent. The fine aggregate shall be manufactured sand/crusher run fines or other mineral aggregates. It shall be hard, angular, free from dirt, etc., and having a sand equivalency not less than 45 when tested in accordance with ASTM D-2419. The combined aggregates shall have a smooth grading within the limits recommended for the specified range of gradings as shown in Table 1. The appropriate type of grading shall be selected depending upon the type and condition of the existing surface.

2.2.2. Type 1 grading is suitable to seal cracks, fill voids and correct surface erosion condition. This type may be used on heavy duty pavement surfaces where sealing and skid resistance are the primary need. It shall be applied at a rate of 3.3 to 5.4 Kgs/Sq.m. based on dry aggregate weight.

2.2.3. Type 2 grading is suitable to fill surface voids, correct severe surface erosion condition and provide a minimum wearing surface. This type is used on pavement surface which is severely eroded or with numerous cracks. It shall be applied at a rate of 5.4 to 8.2 Kgs/Sq.m. based on dry aggregate weight.

2.2.4. Type 3 is suitable to provide a new wearing surface or to build up a crown. It shall be applied at a rate of 8.2 Kgs/Sq.m. or more based on dry aggregate weight.

Table-1 - Aggregate grading

Sieve Size	Per cent Passing by weight		
	Type 1	Type 2	Type 3
9.5 mm	100	100	100
4.75 mm	100	90-100	70-90
2.36 mm	90-100	65- 90	45-70
1.18 mm	65- 90	45- 70	28-50
600 micron	40- 60	30- 50	19-34
300 micron	25- 42	18- 30	12-25
150 micron	15- 30	10- 21	7-18
75 micron	10- 20	5- 15	5-15
Residual bitumen content in percent of dry weight of aggregate	10- 16	7.5- 13.5	6.5-12

2.3. **Mineral Fillers**

2.3.1. Mineral fillers which shall be considered as part of dry aggregate are of two types, chemically active and chemically inactive. At the time of use, the mineral filler shall be sufficiently dry to flow freely and be essentially free from lumps and shall conform to the following grading as given in Table 2, below :

Table-2 - Filler's Grading

Sieve size	Per cent passing by weight
600 Micron	100
300 Micron	95-100
75 Micron	70-100

2.3.2. Chemically active mineral filler such as portland cement,hydrated lime, ammonium sulphate etc. are used to improve the workability, regulate setting time and, in some cases, to alter the aggregate gradation.

2.3.3. Chemically inactive mineral filler such as lime- stone dust, flyash and rock dust are used mainly to alter the aggregate gradation.

2.4. **Water**

Water used shall be potable and free from harmful soluble salts.

2.5. **Additives**

Additives of approved quantity may be used to accelerate or retard the break set of the slurry seal or to improve the resulting finish of the surface. The use of additives in the slurry mix shall be made in quantities pre-determined by the mix design and any field adjustments, in case required, shall be as approved by the Engineer.

3. Mix Design

3.1. The mix materials shall comprise of bitumen emulsion, aggregates including mineral filler and additives where necessary. The quantity of emulsion to be used shall be guided by the specification limits indicated under Table 1. All materials to be used shall be pre-tested for their suitability in the mixture as described in the Clause 2.

3.2. The mix design shall be done in such a way that the mixture attains an initial set in not less than 15 minutes and in not more than 12 hours. The setting time may be regulated by addition of mineral filler or chemical agents (additives). Where chemically active mineral fillers as per Clause 2.4.2 is used, their proportion shall not exceed 2 per cent by weight of the dry aggregates.

3.3. The precise proportions of each constituent shall be fixed through laboratory test as well as through trial runs conducted prior to the work using the same aggregate and gradation as proposed for the project. The consistency of the mix shall be tested as per ASTM D-8910 and the optimum flow value arrived at. A properly designed slurry mix should get completely cured at the end of 24 hours after placement.

3.4. Slurry seal mixes shall be of proper consistency at all times so as to provide the amount of mixture required by the surface condition. The average application rate shall be within a tolerance of ± 15% based on dry aggregates.

3.5. The tolerances for individual materials as well as the slurry seal mixture shall be as follows:

(a) The permitted tolerance for the design residual bitumen in the mix shall be ± 1% by dry weight of aggregate.

(b) The percentage of aggregate passing each sieve shall not vary more than ± 4% from job mix formula.

(c) The percentage of aggregate passing shall not go from the high end to the low end of the specified range of any two successive sieves.

(d) The slurry consistency shall not vary more than ± 0.5cm from the job mix formula after field adjustments.

3.6. Before the commencement of the work a detailed mix design including the properties of the constituent materials, consistency of slurry seal etc. shall be got approved. The supporting laboratory test results for the design mix shall also clearly laid down the proportion of aggregates, mineral filler (minimum and maximum), water (minimum and maximum), additives (usage) and residual bitumen based on dry aggregate weight. This information shall be the final guideline for slurry seal construction.

4. Equipment

4.1. Slurry Mixing Equipment

The slurry seal mixing equipment shall be continuous flow mixing units (pugmill type) capable of delivering accurately predetermined, properly proportioned amounts of aggregate, mineral filler, water and emulsified asphalt to an approved mixing unit and to discharge the thoroughly mixed product on a continuous flow basis. The machine shall have sufficient storage capacity for all constituents to maintain adequate supply to the proportioning controls. The machine shall be capable of prewetting the aggregate immediately prior to mixing with emulsion. Also the fines feeder shall be approved type to provide a uniform and accurately metered quantity of mineral filler simultaneously. The mixing machine shall be equiped with a water pressure system to facilitate fogging as indicated in para 5.1.1. The emulsion pump shall be of positive deplacement type with necessary devices to determine the quantity of emulsion any time. The mixer shall thoroughly blend all materials to form a homogeneous mass. All feeding mechanism shall be continuous feed with facilities to set the proportions constant while on operation. The unit shall be equipped with approved devices for accurate calibration of the machine and estimation of quantities of used materials during any one period.

4.2. Slurry Spreading Equipment

The mixture shall be spread uniformly by means of a conventional spreader box, a mechanical type squeegee distributor, attached to the mixer and equipped to agitate and spread the material evenly throughout the box. The front seal shall be provided to ensure no loss of the mixture at the road contact point. The rear seal shall act as final strike off and shall be adjustable in width. The spreader box and rear strike off shall be so designed and operated that a uniform consistancy is achieved to produce the free flow of material to the rear strike off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometrics. A burlap drag or other approved screed may be attached to the rear of the spreader box to provide a uniformly highly textured mat.

4.3. Auxiliary Equipment

Suitable crack and surface cleaning equipment, rolling equipment, barricading equipment, hand tools and other support equipment shall be used as necessary to perform the work.

4.4. Machine Calibration and Mix Trials

The slurry mixing unit shall be calibrated for the materials to be used prior to construction. Previous calibration documents covering exactly the same materials shall be accepted only if they were made during the same calender year. The documents shall include individual calibration for each material at various settings which can be related to the machines metering devices. No machine shall be allowed to work until the calibration has been completed and accepted.

After calibration and prior to construction, test strips shall be made using the same machine and sampling of slurry seal for verification of the mix consistency and proportion. Verification of rate of application shall also be made. No machine failing to pass the test after the third trial shall be permitted for the work.

5. Construction

5.1. Preparation of Surface

5.1.1. Prior to placing the slurry seal, all dirt, mud, trash, vegetation or other loose materials shall be cleaned off by suitable power brooms, power blowers, air compressors, water flushing equipment and hand broom as warranted by site condition. Flushing with water shall not be permitted in areas where the surface is severely cracked. However, the surface receiving the slurry treatment shall be fogged adequately during hot season using water pressure system and fog spray being provided with the mixing machine immediately ahead of spreader box. Patching of the road surface shall be completed wherever necessary. All manhole covers, inspection chamber covers, gully gratings etc., shall be masked. At junctions or at places where the surface treatment is to be stopped, cleanlines shall be defined by masking.

5.1.2. Tack Coat

Normally tack coat is not required unless the surface to be covered is extremely dry and ravelled or is of concrete or brick. Tack coat where considered essential by the Engineer shall be applied using a mixture of one part bitumen emulsion, three parts of water using the same type and grade of emulsion as specified for the slurry. Tack coat shall be applied by pressure distributor at a normal application rate of 0.15 to 0.3 litre of diluted emulsion per square metre of bituminous surface and 0.4 to 0.6 litre per square metre for concrete surface.

5.2. Application

5.2.1. The slurry seal shall not be applied if either the pavement or the air temperature is below 15 ^{o}C and falling or where the surface contains standing water. The slurry may, however, be applied if the temperatures are above 7^{o}C and rising. Also the slurry seal shall not be laid if high relative humidity prolongs the curing period beyond 24 hours.

5.2.2. The slurry mixture shall be of the desired consistency upon leaving the mixer and no additional materials shall be added thereafter. Total time of mixing shall not exceed 4 minutes. Sufficient quantity of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained. The spreader shall not be overloaded. No lumping, balling or unmixed aggregate shall be permitted. No streaks such as caused by over-sized aggregates shall be left on the finished surface. If segregation leading to excess oversize are observed in pockets, the job shall be stopped for appropriate remedial action. The rate of application shall be in accordance with Clause 2.2 & 3.4. The mixture shall be uniform and homogeneous after spreading and shall not show separation of emulsion and aggregates after setting. As far as possible the longitudinal joints shall be placed on lane lines. Half passes and odd width passes shall be avoided.

5.2.3. The areas which cannot be reached by the machine shall be surfaced using hand squeegees to provide complete and uniform slurry seal coverage. The finish, tolerances, etc., shall, however, be the same as when applied by the spreader box. Hand work shall be completed alongwith machine applying process.

5.3. Rolling

5.3.1. Rolling is usually not necessary for slurry seal surfacing on road ways. However, where rolling is considered essential by the Engineer, it shall be done by a self-propelled 10 Tonne pneumatic roller with smooth tyres at a tyre pressure of 3.45 kg/sq cm and equipped with a water spray system. The surface shall be given atleast 5 passes.

Rolling shall not commence before the slurry has set sufficiently to ensure that rutting or excessive movement or sticking of slurry seal to the tyres of the roller is prevented.

5.3.2. The finished surface shall be free from blow holes and surface irregularities due to scraping, scabbing, dragging, dropping, excess overlapping or badly aligned longitudinal/ transverse joints, damages by rain or other defects. Any slurry sealing which does not comply with these specifications or is non-uniform in surface texture or colour 24 hours after laying shall be made good by removal and replacement by fresh material laid to specifications or if this is considered impracticable, by having fresh material laid to specification with the approval of the Engineer. Any area so treated shall not be less than 5 metres in length in a single stretch.

6. Quality Control

6.1. Quality control shall be exercised for all constituent materials as well as for slurry seal by taking samples at the frequency specified in Table 3. The quantity of emulsion used and the rate of spread of the mixed material (in kgs per sq. m.) shall be recorded for each load of aggregate.

A copy of the test results as also the rate of spread data shall be submitted to the Engineer.

Table 3 - Control Tests

Sl. No.	Test	Frequency
1.	Wet track abrasion (ASTM D-3910)	Every second run
2.	Grading of each separate stockpile of sand and crusher run fine aggregate	Every 20 tonnes of each material
3.	Grading of samples of blended aggregates	4 times daily
4.	Percentage of bitumen in the cured seal	4 times daily
5.	Slurry Consistency Test (ASTM D-3910)	4 times daily
6.	Slurry stability test (as per Cl. 6.2)	Daily or once for each load of emulsion delivered.

6.2. Slurry Stability Test

A sample of 75 gm of the blended aggregate shall be weighed in a glass beaker or similar container and the corresponding quantities of water and emulsion in the slurry mix added. The slurry shall be stirred with a slow deliberate action (about 60 rpm) for 15-30 seconds, after which a specimen of about half the mixture shall be cast upon an impervious surface.

The test specimen shall exhibit cohesive properties in not more than 10 minutes and when set and drenched in water shall be waterfast as demonstrated by the absence of brown colour in the wash water.

7. Curing and Opening to Traffic

No traffic shall be allowed on the newly laid surface until the slurry seal is sufficiently cured to support the traffic without damage. The time for curing shall depend on the type of emulsified asphalt, mixture characteristics and weather conditions and fixed with the written approval of the Engineer.

8. Measurement and Payment

8.1. Quantities of slurry seal to be paid for shall be measured in square metres. Measurement shall be taken along the surface of the actual area sealed in square metres.

8.2. The contract unit rate paid per sq. m. of accepted quantities of slurry seal coat shall include full compensation for provision of labour, materials, tools, equipment and incidentals for doing all the work involved in preparing and laying the slurry seal in place complete in all respect including cleaning of the surface, providing water for dampening the pavement and protecting the seal until it is set, as in these specifications and as directed by Engineer.

500.19

No.RW/NH-33019/1/91 *Dated, the 10th March, 1993*

To

The Chief Engineers of all State PWDs and Union Territories dealing with Roads; Chairman, National Highway Authority of India; Director General (Works), Central Public Works Department; Director General, Border Roads Development Board

Subject: Ensuring proper pavement drainage on National Highways

As practising Highway Engineers are aware, provision of adequate drainage is a primary requirement of protecting and maintaining the embankment and shoulders of a road and ensuring the functional efficiency at all times. The protection of the pavement and the subgrade against damage due to water forms a very important part of the above. If the threat to road pavement from moisture-related damage is not recognised in time and corrective measures taken, the improvement work done for any highway may soon be wasted by recurrence of such damage. In view of this, at the time of framing proposals for improvement of any National Highway, the entire drainage aspects of the road pavement must be studied in detail and necessary measures for ensuring proper drainage incorporated in the technical proposals/estimates without fail. The general misconception that all aspects of drainage have been taken care of with the provision of routine C.D. structures along the route has to be avoided.

2. In order to ensure compliance with the above, it has been decided that following requirements must be satisfied for any road improvement proposal submitted to the Ministry for approval. A check list giving detailed information on the following points should invariably accompany the proposal.

A. FOR NEW CONSTRUCTION

(i) A general description of the road drainage plan and provision proposed alongwith locations of cross drainage works.

(ii) Broad hydraulic calculations to fix number, waterway, deck level etc.

(iii) Information regarding highest ground water table and highest flood level on longitudinal section of the road.

(iv) A certificate to the effect that :

a) Proposed subgrade level is kept generally one meter above the design HFL at all places so that no part of the road will get submerged or overtopped due to flood waters; and

b) Where waterlogging conditions prevail, it has to be certified that after careful examination of all the involved factors, the top of the embankment has been kept at a level adequately above the ground water table so that the subgrade does not get saturated due to capillary action and other measures such as deep drains, capillary cutoffs etc. as per the guidelines in IRC:34-1970 "Recommendation for Road Construction in Water-logged Areas" have been provided.

(v) In fixing design HFL, care must be taken for possible rise in water level due to such factors as the embankment of the road itself, provision of the waterway at bridges and culverts and gradual rise in water level because of subsequent siltation of the drainage courses.

(vi) Details of drainage arrangement proposed at special locations like junctions, superelevations etc.

(vii) Details about proposed road side drains such as detailed plan showing exact locations and levels vis- a-vis the centre line of highway, discharge points at nallahs/water courses, gradients, outfall levels at discharge points, cross section lining etc.

(viii) Information regarding suitable measures proposed for surface drainage of pavement, central median, shoulders and high embankments.

B. STRENGTHENING/WIDENING

(i) A general description of the existing drainage condition of the road.

(ii) Information regarding existing cross drainage structures such as locations, waterway, HFL, deck level condition (weather weak or narrow), adequacy of waterway etc.

(iii) Proposal for reconstruction/widening of weak/narrow culverts.

(iv) Details of stretches of existing road which are getting submerged or overtopped and necessary proposal for raising of the road/provision of additional cross drainage structures.

(v) Details of stretches having water-logged condition and necessary proposals for improvement.

(vi) A certificate to the effect that the entire road drainage aspect has been considered in detail during preparation of the project proposal. It shall also be certified that the road stretches where strengthening has been proposed are not subject to overtopping by flood waters and where it is not so, adequate provisions have been made to ensure prevention of overtopping, waterlogging and damage to embankment, subgrade, shoulder, pavement and CD stretches due to insufficient drainage provisions.

(vii) Details of drainage arrangement proposed at special locations like junctions, superelevations etc.

(viii) Details about proposed roadside drains such as detailed plan showing exact locations and level vis- a-vis centre line of the highway, discharge points at nallahs/water course, gradients, outfall levels at discharge points cross section, lining etc.

(ix) Information regarding suitable measures proposed for surface drainage of pavement, central median, shoulders and high embankments.

3. It is requested that the contents of this letter may please be brought to the notice of all concerned officers in your organisation for strict compliance, in respect of all NH works.

500.20

No.RW/NH/33015/1/93-S&R ***Dated, the 30th December, 1993***

To

The Chief Engineers of all State PWDs and Union Territories (dealing with Roads)

Subject: Drainage of dual carriageway on curves

The drainage of road surface is an important requirement, more so when road sections having divided carriageway negotiate horizontal curves. Different practices are followed for providing drainage arrangement. Therefore, there has been felt need for bringing out guidelines for this situation. After considering the various practices for drainage arrangement, a suitable scheme has been evolved and is shown in the attached sketch. The salient features are :

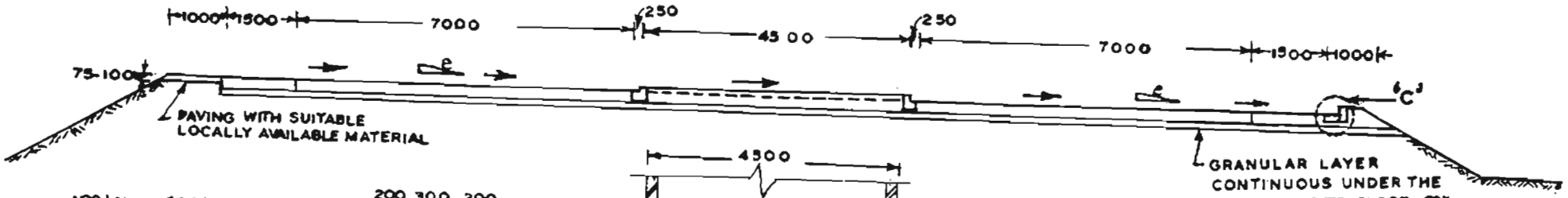
a) The outer edge is super-elevated and a uniform slope from the outer edge to the inner edge of the roadway is provided as worked out with the established formulae subject to maximum permissible limits.

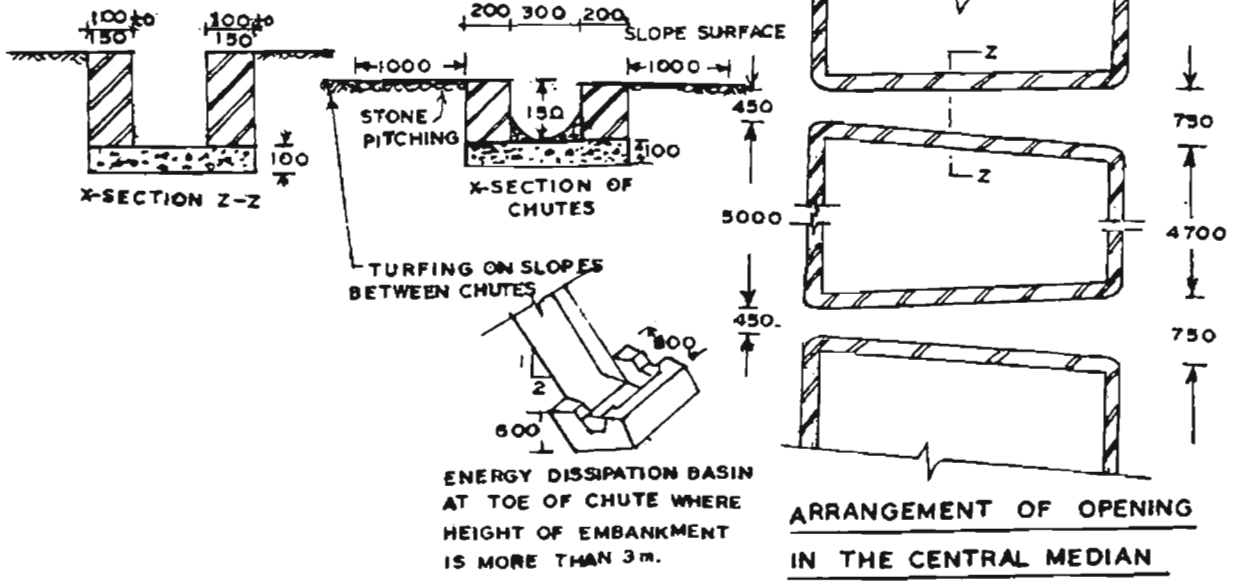
b) Openings in the central median are provided as shown in the sketch.

c) Paved shoulder is provided in 1.5 m width of the berm on either side. The remaining 1.0m width of the berm on the outer side is suitably paved.

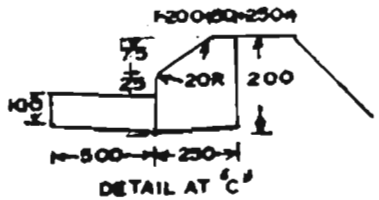
d) For proper drainage of water collected from the road surface in the longitudinal drain, chutes are provided in the inner side slope of the embankment. Energy dissipator basin is provided at the toe of the chute.

2. It is requested that the above guidelines may please be brought to the notice of all officers concerned with the preparation of highway projects.





1. SPACING FOR MEDIAN CROSS DRAINS MAY BE SUITABLY INCREASED FOR LOW INTENSITY RAINFALL AREAS.
2. CROSS SLOPE IS EQUAL TO SUPERELEVATION OR CAMBER WHICH EVER IS HIGHER.
3. DELINEATORS, KERBS, GUARD STONES AND RAILINGS ETC MAY BE PROVIDED AS PER RELEVANT IRC STANDARDS, WHEREEVER NECESSARY.
4. CHUTES TO BE PROVIDED AT 10-15 mc/c. ON INNER SIDE OF CURVE. THE SPACING MAY BE SUITABLY INCREASED FOR LOW INTENSITY RAINFALL AREAS.
5. DIRECTION OF FLOW OF WATER. → → →



DRAINAGE ARRANGEMENT ON SUPER-ELEVATED STRETCHES ON DUAL CARRIAGEWAY.

SKETCH NOT TO SCALE
(ALL DIMENSIONS IN mm)

602.19

No.RW/NH-11047/1/87-DO I *Dated, the 11th March, 1993*

To

The Chief Engineers of all States/UTs dealing with National Highways

Subject: Road Signs on National Highways using Retro-reflective sheeting

With a view to provide an adequate and effective system for distance informatory/destination signs along National Highways, detailed guidelines were issued to State/Union Territory Chief Engineers vide this Ministry's letters of even number dated 8.9.1988 and 21.12.1988.

2. On further consideration of the matter in this Ministry, it is felt that there is an urgent need to rationalise and streamline the overall process of procurement of these signs as also other signs using retro-reflective sheeting, so that the rates are reasonable, there is fair competition and specificational requirements are met with. Accordingly, the following instructions may please be followed in respect of future procurement of these signs:-

(i) The tender notice may be widely circulated through press/ other media with coverage in atleast two National dailies so that the information is disseminated amongst all the eligible sign suppliers. As per present information, the following are the known manufacturers of retro-reflective sheetings being imported in India for use in road signs. These sheetings are available through their authorised representatives/agents.

(a) M/s KIWA Chemical Industries Co, Ltd., JAPAN

(b) M/s 3M SCOTHLITE Sheeting, USA

(c) M/s SEIBULITE, JAPAN

(ii) For ensuring the supply of sign boards conforming to the specifications, the necessary 7 years warranty for satisfactory performance of the retro-reflective sheeting to be used for the proposed work should be obtained from the sheeting manufacturer or its representative/agent authorised by the parent company (sheeting manufacturer)to give such warranty. In addition a 7 year warranty for satisfactory performance of finished signs, inclusive of screen printed or cut-out messages/legends etc. and their bonding to the retro-relective sheeting should be obtained from the sign supplier. Both the warranties should be in original and work specific and drawn in favour of the engineer-in-charge.

(iii) Before the bidder's offer is considered by the engineer- in-charge, it must be ensured that the bid meets the following specific requirements, besides any other criteria as deemed appropriate:-

(a) A certificate from the sheeting manufacturer or its representative/agent so authorised by the manufacturer, to the effect that the bidder is their authorised fabricator/convertor for such signs;

(b) Necessary warranties from the sheeting manufacturer or its authorised representative/agent and from the bidder, for satisfactory performance of the sheeting material and the finished sign boards as per sub-para (ii) above and this Ministry's Specifications;

(c) Adequacy of sign fabrication facilities available in- house with the bidder.

Only those bidders who satisfy the specificational requirements and have satisfactory in-house fabrication facilities should be deemed eligible.

(iv) The bidders should also be asked to furnish, in support of their financial bid, a complete break down of the cost of various items of sign fabrication. Based thereon and other checks, the reasonableness of the cost of the sign boards should be ensured, so that the interest of the Government is fully safeguarded.

3. It is requested that the above guidelines may be communicated amongst all the PWD Officers for compliance with immediate effect.

602.20

No.RW/NH-33023/31/88-DO III *Dated, the 2nd May, 1994*

To

The Secretaries, PWDs of all States/UT Governments; Chief Engineers of States/UTs, PWD (dealing with NHs and other Centrally sponsored schemes); Director General Border Roads; Director General (Works), Central Public Works Department; Chairman, National Highway Authority

Subject: Policy regarding installation of Road Signs using retro-reflective sheetings on National Highways

Guidelines regarding augmentation of Distance Informatory/ Destination Signs along National Highways were issued to Chief Engineers of all States and Union Territories dealing with National Highways vide this Ministry's letter No.NH-11047/1/87- DO.I dated 8th September, 1988. Additional clarifications/ guidelines on their procurement/installation, use of language, and warranty for satisfactory performance of these signs were subsequently issued vide this Ministry's letters No.NH- 11047/1/87-DO.I dated 21st December 1988, 7th July, 1980 and 11th March, 1993.

2. These guidelines inter-alia stipulated the use of retro- reflective sheeting of High Intensity Grade for use of road signs, satisfying Clause 801.3 on "Reflective Sheeting" of the Ministry's Specifications for Road and Bridge Works. Considering the overall needs of traffic guidance and regulation in relation to the type and importance of National Highways vis-a-vis the cost economics in use of retro-reflective sheetings, it has been decided to introduce retro-reflective sheeting of "Engineering Grade", in addition to the "High Intensity Grade" sheeting already in use for road signs. Appropriate specifications for "Engineering Grade" sheeting, as formulated in the Ministry, have been incorporated in the revised version of Clause 801.3 of this Ministry's Specifications for Road and Bridge Works (1988). A copy of the same is enclosed as Annexure-I for information and guidance in procurement and installation of road signs along National Highways.

3. With a view to facilitating and streamlining the process of installation of road signs using retro-reflective sheeting (both High Intensity and Engineering Grade) and making signing system more effective in traffic guidance and regulation, guidelines for the use of the type of retro-reflective sheeting, colour scheme for different signs and their transportation/storage, inspection and upkeep have been formulated by this Ministry. A copy of the same is enclosed as Annexure-II for guidance and adoption. It may be noted that these guidelines stipulate use of retro- reflective sheeting for mandatory/regulatory and cautionary/ warning signs, besides those already in use for informatory signs, on 2-lane and 4-lane NH sections. These also provide for a changed colour scheme for direction, destination, and place identification signs, keeping in view the international practices and the provisions contained in Vienna Convention on Road Traffic and Road Signs and Signals. This change has been made to render these signs more conspicuous, recognisable and readable and thereby attract better attention of the drivers both during day and night.

4. It is requested that the provision of road signs with retro-reflective sheeting, in accordance with the above guidelines, may be taken up so as to complete the installation process latest by December, 1996. Suitable proposals in this regard may be furnished to this Ministry early. It may be noted that the above guidelines cover installation of road signs on 2- lane and 4-lane sections of National Highways. The road signs on single lane/intermediate lane NH section shall, however continue to be provided as per the existing practice and conforming to IRC:67-1977.

5. The State/UT Governments may also like to consider introduction of retro-reflective sheeting in accordance with the above guidelines, for improving the road signing system on State Highways and other important State roads.

ANNEXURE-I

Enclosure to letter No.RW/NH-33023/31/88-DO III dated the 2nd May, 1994

801.3 TRAFFIC SIGNS HAVING RETRO-REFLECTIVE SHEETING

801.3.1. GENERAL REQUIREMENTS

The retro-reflective sheeting used on the sign shall consist of a white or coloured sheeting having a smooth outer surface which has the property of retro-reflection over its entire surface. It shall be weather-resistant and show

colour fastness. It shall be new and unused and shall show no evidence of cracking, scaling, pitting, blistering, edge lifting or curling and shall have negligible shrinkage or expansion. A certificate of having tested the sheeting for these properties in an unprotected outdoor exposure facing the sun for two years and its having passed these tests shall be obtained from a reputed laboratory, by the manufacturer of the sheeting. The reflective sheeting shall be either of Engineering Grade material with enclosed lens or of High Intensity Grade with encapsulated lens. The type of the sheeting to be used would depend upon the type, functional hierarchy and importance of the road.

801.3.2. HIGH INTENSITY GRADE SHEETING

This sheeting shall be of encapsulated lens type consisting of spherical glass lens elements adhered to a synthetic resin and encapsulated by a flexible, transparent water proof plastic having a smooth surface. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM standard E:810) as indicated in Table 800-1.

Table 800-1 - Acceptable Minimum Coefficient of Retro-reflection for High Intensity Grade (Candelas Per Lux Per Square Metre)

Observation Angle (in degrees)	Entrance Angle (in degrees)	White	Yellow	Orange	Green Red	Blue
0.2	-4	250	170	100	45	20
0.2	+30	150	100	60	25	11
0.5	-4	95	62	30	15	7.5
0.5	+30	65	45	25	10	5.0

When totally wet, the sheeting shall not show less than 90% of the values of retro-reflectance indicated in Table 800-1. At the end of 7 years, the sheeting shall retain at least 75% of its original retro-reflectance.

801.3.3. ENGINEERING GRADE SHEETING

This sheeting shall be of enclosed lens type consisting of microscopic lens elements embedded beneath the surface of a smooth flexible, transparent water proof plastic, resulting in a non-exposed lens optical reflecting system. The retro-reflective surface after cleaning with soap and water and retro-reflection (determined in accordance with ASTM standard: E-810) as indicated in Table 800-2.

Table 800-2 - Acceptable Minimum Coefficient of Retro-Reflection for Engg. Grade (Candelas Per Lux Per Square Metre)

Observation Angle (in degrees)	Entrance Angle (in degrees)	White	Yellow	Orange	Green	Red	Blue
0.2	-4	70	50	25.0	9.0	14.5	4.0
0.2	+30	30	22	7.0	3.5	6.0	1.7
0.5	-4	30	25	13.5	4.5	7.5	2.0
0.5	+30	15	13	4.0	2.2	3.0	0.8

When totally wet, the sheeting shall not show less than 90% of the values, of retro-reflection indicated in Table 800-2. At the end of 5 years, the sheeting shall retain at least 50% of its original retro-reflectance.

801.3.4. MESSAGES/BORDERS

The messages (legends, letters, numerals etc.) and borders shall either be screen-printed or of cut-outs. Screen printing shall be processed and finished with materials and in a manner specified by the sheeting manufacturer.

801.3.5. For screen-printed transparent coloured areas on white sheeting, the co-efficient of retro-reflection shall not be less than 50% of the values of corresponding colour in Tables 800-1 and 800-2, as applicable.

801.3.6. Cut out messages and borders, wherever used, shall be made out of retro-reflective sheeting (as per clause 801.3.2 or 801.3.3 as applicable), except those in black which shall be of non-reflective sheeting as specified by the manufacturer. The cutouts shall be bonded properly with the base sheeting in the manner specified by the manufacturer.

801.3.7. **COLOUR**

Unless specified otherwise, the general colour scheme shall be in accordance with IRC:67-1977, the colours shall be as stipulated in BIS Code 13:5-1961 "colour for Ready Mixed Plaints" viz.

Blue	-	IS colour No.166	:	French Blue.
Red	-	IS colour No.537	:	Signal Red.
Green	-	IS colour No.284	:	India Green.
Orange	-	IS colour No.591	:	Deep Orange.

The colours shall be durable and uniform in acceptable hue when viewed in daylight or under normal headlights at night.

801.3.8. **ADHESIVES**

The sheeting shall either have a pressure-sensitive adhesive of the aggressive-tack type requiring no heat, solvent or other preparation for adhesion to a smooth clean surface, or a tack free adhesive activated by heat, applied in a heat-vacuum applicator, in a manner recommended by the sheeting manufacturer. The adhesive shall be protected by an easily removable liner (removable by peeling without soaking in water or other solvent) and shall be suitable for the type of material of the base plate used for the sign. The adhesive shall form a durable bond to smooth, corrosion and weather resistant surface of the base plate such that it shall not be possible to remove the sheeting from the sign base in one piece by use of sharp instrument. In case of pressure-sensitive adhesive sheeting, the sheeting shall be applied in accordance with the manufacturer's specifications. Sheeting with adhesives requiring use of solvents or other preparation for adhesive shall be applied strictly in accordance with the manufacturer's instructions.

801.3.9. **REFURBISHMENT**

Where existing signs are specified for refurbishment, the sheeting shall have a semi-rigid aluminium backing pre-coated with aggressive-tack pressure sensitive adhesive. The adhesive shall be suitable for the type of material used for the sign and should thoroughly bond with that material to prevent the reflective sheeting from shocking off.

801.3.10. **FABRICATION**

801.3.10.1. Surface to be reflectorised shall be effectively prepared to receive the retro-reflective sheeting. The aluminium sheeting shall be used as substrate rigid backing upon which the retro-reflection sheeting is attached.

It shall be degreased either by acid or hot alkaline etching and all scale/dust removed to obtain a smooth plain surface before the application of retro-reflective sheeting. If the surface is rough, approved surface primer may be used. After cleaning, metal shall not be except by device or clean canvas gloves, between all cleaning and preparation operations and application of reflective sheeting primer. There shall be no opportunity for metal to come in contact with grease, oil or other contaminants prior to the application of retro-reflective sheeting.

801.3.10.2. Complete sheets of the material shall be used on the signs except where it is unavoidable. At splices, sheeting with pressure sensitive adhesives shall be overlapped not less than 5 mm. Sheeting with heat-activated adhesives may be spliced with an overlap not less than 5 mm or butted with a gap not exceeding 0.75 mm. Where screen printing with transparent colours is proposed, only butt jointing shall be used. The material shall cover the sign surface evenly and shall be free from twists, cracks and folds. Cut outs to produce legends and borders shall be bonded with the sheeting in the manner specified by the manufacturer.

801.3.11. **WARRANTY**

The contractor shall obtain a seven years warranty from the sheeting manufacturer for satisfactory field performance including stipulated retro-reflectance of the retroreflective sheeting of high intensity grade and a five years warranty for the retroreflective sheeting of engineering grade and pass on the same to the Engineer for the used sheeting. In addition, a seven year and a five year warranty for satisfactory in-field performance of the finished sign, with retroreflective sheeting of high intensity grade and engineering grade respectively, inclusive of the screen printed or cut out letters/legends and their bonding to the retro-reflective sheeting shall be obtained from the contractor/supplier and passed on to the Engineer. The contractor/supplier shall also furnish a certification that the signs and materials supplied against the assigned work, meeting all the stipulated requirements and carry the stipulated warranty.

801.4. **INSTALLATION**

801.4.1. Sign posts, their foundations and sign mountings shall be so constructed as to hold these in a proper and permanent position against the normal storm wind loads or displacement by vandalism. Normally signs with an area upto 0.9 sq. m. shall be mounted on a single post, and for greater area two or more supports shall be provided. Sign supports may be of mild steel, reinforced concrete or galvanised iron (G.I), Post-end(s) shall be firmly fixed to the ground by means of properly designed foundation. The work of foundation shall conform to relevant specifications as specified.

801.4.2. All components of signs and supports, other than the reflective portion and G.I. posts shall be thoroughly descaled, cleaned, primed and painted with two coats of epoxy paint. Any part of mild steel (M.S.) post below ground shall be painted with three coats of red lead paint.

801.4.3. The signs shall be fixed to the posts by welding in the case of steel posts and by bolts and washers of suitable size in the case of reinforced concrete or G.I. Posts. After the nuts have been tightened, the tails of the bolts shall be furred over with a hammer to prevent removal.

801.5. **MEASUREMENTS FOR PAYMENT**

The measurement of standard cautionary, mandatory and information signs shall be in numbers of different types of signs supplied and fixed, while for direction and place identification signs, these shall be measured by area in square metres.

801.6. The contract unit rate shall be payment in full for the cost of making the road sign, including all materials, installing it at the site and incidentals to complete the work in accordance with the specifications.

ANNEXURE-II

Enclosure to letter No.RW/NH-33023/31/88-DO III dated the 2nd May, 1994

GUIDELINES ON THE USE OF RETRO-REFLECTIVE SHEETINGS FOR ROAD SIGNS ON 2-LANE AND 4-LANE NATIONAL HIGHWAY SECTIONS

1. Retro-reflective sheeting of "High Intensity Grade" shall be used for -

(i) All road signs (viz. regulatory/mandatory, cautionary/warning and informatory) on 4-lane National Highway (NH) sections;

(ii) Mandatory/regulatory and cautionary/warning signs on 2-lane NH sections;

(iii) Mandatory/regulatory, cautionary/warning and informatory signs on the existing 2-lane NH stretches which are to be widened to 4-lane carriageway in the next 2-3 years;

(iv) All overhead signs.

2. Retro-reflective sheeting of "Engineering Grade" shall be used for informatory signs for 2-lane NH sections.

3. COLOUR SCHEME

(i) Colour Scheme for mandatory/regulatory and cautionary/ warning signs shall conform to IRC:67-1977 "Code of Practice for Road Signs".

(ii) Direction, destination and place identification signs shall have green background, white messages (legends, letters, numerals, etc.) and borders, instead of white background, black messages and borders.

(iii) Colour scheme for facility information signs, other useful information signs and parking signs shall continue to conform to the provisions contained in IRC:67-1977 "Code of Practice for Road Signs".

4. In respect of informatory signs, the messages/ borders shall either be screen-printed or of cut-outs, while for warning and regulatory signs, these shall be screen-printed.

5. Clustering and proliferation of road signs shall be avoided for enhancing their effectiveness.

6. PRIORITY FOR REPLACEMENT

Existing road signs with retro-reflective sheetings, shall be replaced with signs adopting the above criteria, only if they are damaged, worn out or have outlived their useful service life.

7. TRANSPORTATION & STORAGE

(i) While transporting the road signs for field installation, they should be secured vertically in racks to prevent them from rubbing against one another.

(ii) All signs should be kept dry at all times and should not normally be stored in the open.

(iii) The finished signs, if required, shall be stored in an upright position with space in between for air circulation.

8. INSPECTION & UPKEEP

(i) Periodic inspection of road signs shall be carried out on a regular basis. During inspection, the following aspects shall be checked in particular and appropriate corrective measures adopted:-

(a) Condition of sign face - major cracking, blistering, missing message, etc.

(b) Orientation and structural stability of the post(s)

(c) Discolouration, streaking or fading of the sign

(d) Visibility of sign-roadside plantation or a structure may be hiding the sign

(e) Dirt or other substance on sign

(f) Damages/removal of the sign due to accident or vandalism

(g) Retro-reflectance properties

(ii) Sometimes, dirt, fungus or mildew can cause the signs to loose their retro-reflective properties. In case the dirt accumulation is severe and/or signs are in heavy industrial areas, washing of signs with a mild non-abrasive detergent free of solvents or alcohols should be carried out periodically.

(iii) Sometimes paper posters are pasted on the face of the road signs making them invisible. These should be immediately removed, apart from taking preventive action to avoid their recurrence.

602.21

No.RW/NH-11047/1/87-DOI-Vol.II *Dated, the 27th June, 1994*

To

Chief Engineers, PWDs of all States/UTs. (dealing with National Highways); Director General (Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority

Subject: Pavement markings-use of road marking machines

Road marking is an effective means for guiding and controlling traffic and thereby improving safety. Guidelines on application of road markings have been laid down in IRC:35-1970 "Code of Practice for Road Markings (with paints)". In this context attention is also drawn to this Ministry's letter No.PL- 80(2)/71-SP dated 27th July, 1971 wherein the need for providing proper road markings was emphasised. Subsequent to this, instructions regarding use of proper quality marking paints so as to enhance the performance and service life of road markings were communicated vide this Ministry's letter No.RW/NH-34016/1/88-DO II dated 28th November, 1990. It is hoped that the above directions are being followed in respect of road markings on National Highways in your State.

2. In India, the pavement markings at present are being laid generally by manual applications. This system has inherent shortcomings, such as lack of proper quality control leading to non-uniform and inadequate application thickness, short service life, slow progress and prolonged inconvenience to the traffic. Mechanised application using road marking machines on the other hand yields better uniform, longer-lasting and more conspicuous markings, which could be attributed to penetration of paint on to road surface and better adhesion due to pressurised application. In addition, laying process is much faster.

3. In view of the above advantages, it is recommended that wherever possible, road marking machines should be used, especially on all National Highways, for laying pavement markings. Concurrently, the feasibility of gradual switch over from manual to mechanised applications of road markings may be examined.

4. As per the present information, "WALK-BEHIND TYPE" road marking machines are being manufactured indigeneously, with the following known manufacturers:-

(i) AUTO MARK Traffic Systems (P) Ltd.
16, Benham Hall Lane, (Dr. D.D. Sathe Marg), Bombay-404 004

(ii) ULTRA Techno Inc.
Industrial Estate,G.T.Road,SONEPAT-131 001(Haryana)

It has been claimed that these machines can lay 1 km length of line marking, 15 cm wide and 0.2 mm thick in one hour. A demonstration of road marking machines manufactured by M/s. AUTO MARK Traffic Systems was held recently in this Ministry wherein the usefulness and suitability of the machine for application of road markings was successfully disseminated. The demonstration was also attended by officers from various organisations, such as NDMC, MCD, PWD, DG(BR), DDA, CRRI and Traffic Police.

5. Considering the need for switch-over to mechanised application of road marking, you may like to use such machines on experimental basis, monitor performance of the machines as also of the resultant markings, and furnish necessary feed back to this Ministry regarding their suitability.

6. It is requested that the contents of this letter may be brought to the notice of all concerned offieers of your department for their information and appropriate action.

604.14

D.O.No.RW/NH-11064/1/91-DO I *Dated, the 10th February, 1993*

To

Secretaries, PWD of all State Governments/Union Territory Administration

Subject: Speed Breakers on National Highways

In the interest of unimpeded traffic flow and road safety, the need for expeditious removal of speed breakers on National Highways has been communicated to the State/UT Governments by this Ministry from time to time. The gravity of the situation in this regard has also been reiterated in the past by the Minister for Surface Transport in letters to Chief Ministers/Lt. Governors of State/UTs.

2. A review of the status of removal of speed breakers has been conducted in this Ministry recently. This has revealed that although many States have initiated action in this direction, speed breakers have not been removed at a number of locations either due to public resistance or due to the prevailing site conditions (e.g. near the railway crossing or on approach to weak/narrow bridges). In such situation, following alternative measures could be adopted in substitution of speed breakers.

(i) On approaches to railway crossings or weak/narrow bridges, rumble strips should be provided instead of speed breakers. These are equally effective in controlling the approach speeds;

(ii) In respect of speed breakers provided on NH sections passing through villages/towns, or near schools etc., safety can be ensured by other measures like provision of pedestrian guard railing on either side of the road, zebra crossing marked with reflective thermoplastic paint or retro-reflective tapes, pedestrian crossing signs, flashing signals or retro-reflective indicators. As an alternative, rumble strips could be used for controlling vehicular speeds. Through these measures, the safety or local residents can be ensured without hampering traffic flow on the National Highways.

3. As regards the layout designs for the rumble strips, these have been communicated to the State Chief Engineers vide this Ministry's letter No. RW/NH-III/P/31/84 dated 9-1-1987 (copy enclosed). Rumble strips, where provided, should be marked with thermoplastic paint and supplemented by warning/speed limit signs on the approaches.

4. I will be grateful, if necessary instructions in this regard are issued to the concerned Departments including Police Department and filed others of the PWD so that all the speed breakers are removed and instead the aforesaid alternative safety measures adopted under a time bound programme. I am also to request that the latest factual position together with the action being taken in the matter may be sent to this Ministry by 31st March, 1993.

Enclosure to Ministry's Circular D.O. No.RW/NH-11064/1/91-DO I dated 10th February, 1993

No.RW/NH-III/P-131/84 *Dated, the 9th January, 1987*

Subject: Provision of safety measures at approaches to Railway Level Crossings

Railway level crossings have been the scene of recurring accidents which has become a cause of serious concern. Since these accidents are caused mostly because of the negligence on the part of the road users, it is essential that suitable safety measures should be taken at the approaches to railway level crossings to forewarn the road users of the hazard ahead.

2. In this connection, this Ministry had issued instructions to Chief Engineers of all States/UT PWDs for providing safety measures at level crossings falling on National Highways, vide letter No. RW/NHIII/P/31/84 dated 20th November, 1984. The measures recommended therein are :

(i) Installation of IRC Road Signs (specified in IRC:67-1977 "Code of Practice for Road Signs") whether the railway crossing is manned or unmanned.

(ii) Imposition of speed limits for approaching traffic and installation of relevant roads signs.

(iii) Provision of rumble strips on both sides of the railway crossings. Speed breakers of hump type shall not, however, be permitted.

3. Specifications for rumble strips have been circulated among all State Governments vide this Ministry's letter No. PL-50(8)/72 dated 4th June, 1976. In brief, application of rumble strips is the placement of intermittent raised bituminous overlay across the roadway. Raised sections can be 15-25 mm high, 200-300 mm wide and spaced about 1 m centre to centre. A series of such strips roughly 15-20 at one location can caution the motorist sufficiently through combination of vibration and rumbling noise. Since coarse textured overlays are more effective, the raised section should consist either or pre-mixed carpet or bituminous surface dressing. Further, it is important that the rumble strips should be placed not nearer than 40 m and not farther away than 60 m from the nearest railway track.

4. It is requested that urgent instructions be issued to all concerned in your Department engaged in National Highways and other Centrally financed road works for implementing the above mentioned safety measures on priority and time-bound basis. The cost for this may be met from against the M&R Grants for National Highways placed with the respective State Governments.

5. It is also requested that from public safety angle, similar instructions may be issued for providing safety measures at approaches to level crossings falling State roads.

6. This Ministry may please be informed of the action taken in the matter.

604.15

No.RW/NH/33022/1/94-DO III ***Dated, the 24th June, 1994***

To

Chief Engineers PWDs of all States/UTs; Director General (Works), Central Public Works Department; Director General Border Roads; National Highway Authority

Subject: Installation of Safety Barriers along the Indian road network

Available statistics on road accidents indicate that user behaviour is an important contributory factor in a majority of accidents. None-the-less proper road design can play a useful role towards in-building safety and reducing driver error thereby reducing the risk of accidents. The need for adoption of safety- conscious highway design process has therefore gained importance. Many road accidents involve run-off-the road vehicles colliding with hazardous obstacles, rolling down high embankments, veering off the carriageway on sharp curves or crossing over the median and colliding with an oncoming vehicle. Safety barriers are effective means to reduce the risk of and to mitigate the severity of such accidents. As such these barriers constitute an important safety furniture.

2. Keeping in view the contributory role played by the safety barriers in enhancing road safety at the warranted locations, guidelines for their installation have been prepared and are annexed for adoption in safer road design. The guidelines cover the warrants for provision of the safety barriers, their types, design aspects, dimensional and layout details and placement recommendations and include both the roadside and the median barriers.

3. It may be noted that adoption of semi-rigid steel barriers and rigid concrete barriers has been recommended depending upon the locational and site specific requirements. While steel barriers may be provided where normal shoulder and median widths are generally available, concrete barriers may be considered along narrow medians and/or shoulders. Considering the cost economics and the indigenous availability aspect, adoption of "W" section steel barriers should be preferred.

4. For accelerating the installation of safety barriers at need-based locations, it is suggested that a comprehensive field survey of the National Highway sections falling within your State/UT may be organised early. Based thereon, all the accident-prone and substandard sections needing barrier protection as per the warrants stipulated in the guidelines should be identified and proposals for provision of safety barriers to shield hazardous situations should be framed. Keeping in view the budgetary provisions, prioritisation of the safety barriers may be made with reference to safety requirements, economic and environmental factors.

5. Since the installation of steel barriers on the country's highway system is in an introductory stage, it is necessary that these meet the safety and structural requirements. It should, therefore, be ensured that the manufacturers of steel barriers possess adequate and proven technical know-how in terms of design, specifications and standards etc., which should be duly supported by necessary documentation. In addition the manufacturers/suppliers of the barriers should be asked to submit, alongwith their proposals, detailed design calculations for the structural components and foundations of the barriers. The proposed structures should meet the requirements of safety and structural adequacy as laid down in internationally accepted standards. The manufacturers/ suppliers should give details of their experience in supplying and installing such barriers. They should also be asked to undertake complete responsibility for safety, structural adequacy and satisfactory field performance of the barrier system.

6. Since the guidelines for installation of safety barriers on Indian roads have been framed for the first time, these may need revision in the light of the experience gained. In the meantime, suggestions for improvement of these guidelines will be appreciated.

Annexure

Enclosure to Ministry's Circular No.RW/NH-33022/1/94- DO III Dated 24th June, 1994

GUIDELINES FOR INSTALLATION OF TRAFFIC SAFETY BARRIERS

1. Introduction

1.1. Many road accidents involve run-off-the-road vehicles colliding with hazardous obstacles such as poles, trees, bridge supports, simply rolling down a high embankment or vehicles veering off the traveled way on sharp curves. Additionally, a vehicle crossing across the median of a dual carriageway runs the risk of collision with an oncoming vehicle. Incidence of accidents due to such potential hazards can be greatly mitigated by the use of safety barriers.

1.2. The main purpose of these guidelines is to bring out the design aspects of safety barriers and establish the warrants for their provision, to disseminate information on various types of safety barriers available alongwith their strength and safety characteristics, dimensional aspects and layout details for the barriers.

2. Requirements of a safety barrier

2.1. The basic criteria for determining the need for a safety barrier is that it should absorb the impact energy and reduce the SEVERITY of accidents involving vehicles leaving the travelled way. Since a safety barrier is in itself a hazard to traffic it should be installed only if the severity of accidents due to striking the barrier, which is shielding the hazard, is lower than what it will be without the barrier. Decision for installing the safety barrier should be dictated by the safety requirements duly considering the social, environmental and economic factors.

2.2. Safety and structural requirements of a safety barrier are :-

(i) It should contain and redirect the vehicle, not allowing it to penetrate or vault over the barrier.

(ii) It should not cause sudden deceleration or spin of the vehicle.

(iii) The vehicle should remain upright during and after the impact and there should not be any loose elements which can penetrate the vehicle.

(iv) After impact, the final stopping position of the errant vehicle should intrude only minimally into the adjacent traffic lanes.

(v) It should provide a good visual guide for the road users.

(vi) It should not deflect more than the space available for deflection.

2.3. The major factor to be considered for the selection of a particular barrier system is the matching dynamic lateral deflection characteristics of the system to the space available at site (including space for end treatment) so as to mitigate the severity of impact. Other factors needing consideration are initial cost, future maintenance costs and aesthetics. However, enhancement of vehicular safety and crashworthiness of the system should be given more weightage as compared to aesthetics.

3. Types of safety barriers

3.1. The safety barriers can be classified as flexible, semi-rigid, or rigid. The major difference between the various types is the amount of barrier deflection that takes place when the barrier is struck. The flexible system is the most yielding type and is more for containment than redirection of the vehicle and requires more lateral clearance from fixed objects due to deflection during impact. Semi-rigid barriers offer requisite resistance to control the deflection of longitudinal member to an acceptable limit and the errant vehicle is redirected along the travel path. The rigid system does not deflect on impact but causes the maximum severity of impact, amongst the three types. As the angle of impact increases this barrier becomes less forgiving. Installation of a rigid system should be considered where shallow impact angles are expected such as along narrow medians or shoulders which could be expected in urban situations. As the rigid system suffers little or no damage on impact, it requires the least maintenance efforts.

3.2. Safety barriers dealt in these guidelines are longitudinal roadside safety barriers, and median safety barriers. Steel barriers of semi-rigid type and rigid concrete barriers are described.

4. Roadside Safety Barriers

4.1. Warrants

4.1.1. The longitudinal roadside barriers are basically meant to shield two types of roadside hazards i.e. embankments and roadside obstacles and also for preventing the vehicles veering off the sharp curves. The warrants for a fill section, in terms of its height and slope, needing protection with roadside barriers are shown in Fig. 1. It may be noted that no barrier is warranted for embankment having a fill slope of 3:1 or flatter. The warrants for roadside objects are mainly dependent upon the type of obstacle and the probability of their being hit. A barrier should be installed only if the result of vehicle striking the barrier is likely to be less severe than the severity of accident resulting from the vehicle impacting the unshielded obstacle. Judgement of the Engineer-in-Charge should be applied to arrive at the necessity of providing a barrier to shield obstacles which cannot be removed. Some of the commonly encountered roadside obstacles are bridge piers, abutments and railing ends, roadside rock mass, culverts, pipes and headwalls, cut slopes, retaining walls, lighting supports, traffic sign and signal supports, trees, and utility poles.

4.2. Types of Roadside Safety Barriers

4.2.1. Types of longitudinal roadside safety barriers which could be used are :-

(i) "W" beam type steel barrier

(ii) Thrie beam type steel barrier

(iii) Concrete barriers

Both the steel barriers are of strong post type and usually remain functional after moderate collisions thereby eliminating the need for immediate repair.

4.3. Roadside Steel Barriers

4.3.1. Design Aspects

4.3.1.1. The "W" beam type safety barrier consists of a steel post and a 3 mm thick "W" beam rail element which is spaced away from the posts. The spacer minimises vehicular snagging and reduces the likelihood of a vehicle vaulting over the barrier. The steel post and the blocking out spacer shall both be channel section of 75 x 150 mm size 5 mm thick. The rail shall be 70 cm above the ground level and posts shall be spaced 2m center to center. Typical details are shown in Fig. 2.

4.3.1.2 The thrie beam safety barrier shall have posts and spacers similar to the ones mentioned above for "W" beam type. The rail shall be placed at 85 cm above the ground level. This barrier has a higher initial cost than the "W" beam type but is less prone to damages by vehicle collisions especially for shallow angle impacts. Typical details of thrie beam barrier are shown in Fig. 3.

4.3.1.3. The "W" beam, the thrie beam, the posts, spacers and fasteners for steel barriers shall be galvanized by hot dip process.

4.3.2. **End treatment for steel barrier**

4.3.2.1. An untreated end of the roadside barrier can be hazardous if hit because the barrier beam can penetrate the passenger compartment and cause the impact vehicle to stop abruptly. End treatments should therefore form an integral part of safety barriers. And end treatment should not spear, vault or roll a vehicle for head-on or angled impacts. The two end treatments recommended for steel barriers are "Turned-down- guardrail" and "Anchored in backslope".

4.3.2.2. Turned-down guardrails have the "W" or thrie section reduced from full height to ground level with a gentle slope over a distance of 8 to 9 meters. The turned down rail is intended to collapse on impact, allowing the vehicle to pass over it without becoming airborne or unstable. In order to locate the barrier terminal away from the travelled way and to minimise drivers' reaction to a hazard near the road by gradually introducing a parallel barrier installation or to transition a roadside barrier nearer the roadway such as a bridge parapet or a railing, the turned down rail should be flared away from the roadway. Suggested flare rates depending upon the design speed and type of barrier are as follows:-

Design speed in km per hr	Flare rates	
	Rigid barriers	Semi-rigid barriers
100	17:1	13:1
80	14:1	11:1
65	11:1	9:1
50	8:1	7:1

4.3.2.3. The posts in the end treatment should have the same cross section as provided in the main barrier.

4.3.2.4. At road cross sections in cutting or if the road transitions from cut to fill, the safety barriers can be anchored in backslopes. The backslope covering the anchored portion of the barrier should be graded flat, with side slopes preferably not steeper than 10:1. The anchored portion should develop a tensile strength in the rail element to prevent the rail from pulling out of the anchorage. The barrier can also be anchored in an earth berm specially constructed for this purpose provided the new berm itself is not a hazard to the traffic. The earth berm should be made impervious to erosion.

4.3.3. **Placement Recommendations**

4.3.3.1. Placement recommendations determine the exact layout of the barrier and should be made by the design engineer keeping in view the lateral offset of the barrier and flare rate. The final layout shall be a site specific combination of these factors. The barriers should be as far away from the traffic as possible and should preferably have uniform clearance between the traffic and the hazard.

4.3.3.2. As far as possible the safety barrier should be placed beyond 2.5m of the travelled way. For long and continuous stretches this offset is not critical. The distance between the barrier and the hazard should not be less than the deflection of the barrier by an impact of a full sized vehicle. In case of embankments, a minimum distance of 60 cm should be maintained between the barrier and the start of embankment slope or a hazard to prevent the wheels from dropping over the edge. Typical details are shown in Fig. 4.

4.3.3.3. Flatter flare rates may be used particularly where extensive grading would be required to ensure a flat approach from the travelled way subject to the availability of right-of- way.

4.4. Roadside Concrete Barriers

4.4.1. Design Aspects

4.4.1.1. Concrete roadside safety barriers are rigid barriers having a sloped front face and a vertical back face. The recommended designs of the cast-in-situ and precast barrier are shown in Figs. 5 and 6 respectively. Based on evaluation of vehicle direction, sight distance, structural stability and the psychological effect of barrier height on driver reaction, the most desirable height of the median barrier is 80 cm. Variations upto 50 mm in height of barrier can be made in the total height of the barrier to meet the site requirements. It is however important to maintain the height of lower slope between 20cm and 35cm so as to reduce the chances of overturning of the vehicles.

4.4.1.2. The concrete barrier may be precast in lengths of upto 6m depending upon the feasibility of transport and lifting arrangements. Concrete grade for the barriers should be M-200. The minimum thickness of foundation may be 25mm thick cement concrete or hot mix asphalt placed at the base of barrier to provide lateral restraint. Where more than 75 mm thick overlay on the road pavement is anticipated, the foundation step may be increased to 125 mm. However, longitudinal roadside concrete barrier should have elaborate footing design which is structurally safe unless sufficient earth support is available.

4.4.2. End Treatment

4.4.2.1. Safety barrier shall be provided with an end treatment, which shall be obtained by tapering the height of terminating end of the median barrier within a length of 8 m to 9 m.

4.4.3. Placement Recommendations

4.4.3.1. Placement recommendations for roadside steel barriers, mentioned in para 4.3.3. above, are applicable to concrete barriers as well.

5. Median Barriers

5.1. Head-on-collisions, especially on highways with narrow medians, caused by out-of-control vehicles jumping across the medians, are a major source of accidents. Fixed objects on medians also require shielding from the traffic flow. Provision of median safety barrier in such conditions is an important requirement.

5.2. Warrants

5.2.1. The requirement of a median barrier is a function of the width of the median and the traffic volume on the road. Fig.7 indicates the warrants for provision of median barriers in terms of the combination of median width and ADT in PCUs. At ADT less than 20000 PCUs and with medians wider than 9m, the probability of a vehicle crossing across the median is relatively low and median barriers in such cases are optional. Medians with width between 9 and 15m do not warrant a barrier unless there is an adverse history of median cross-overs.

5.2.2. Median barriers may be impractical where a road has a large number of closely spaced median openings since the barrier needs to be terminated with an end treatment at these points.

5.2.3. An evaluation of the number of median openings, accident history, alignment, sight distance, design speed, traffic volume and median width need to be made prior to taking a decision to install a median barrier.

5.2.4. Median barriers should also be provided to shield fixed objects in a narrow median. If necessary, median barriers should be flared to encompass a fixed object, which may be a lamp post, foundation of overhead signs, bridge pier etc.

5.3. Types of Median Barriers

5.3.1. Recommended types of median safety barriers are :-

(i) "W" beam type steel barrier (Strong post type)
(ii) Thrie beam type steel barrier (Strong post type)
(iii) Concrete barriers

5.4. Steel Median Barriers

5.4.1. Design Aspects

5.4.1.1. The "W" beam barrier shall be similar to the roadside barrier described in para 4.3 above except that the "W" beam shall be provided on both sides of the post with similar spacers. Typical details are indicated in Fig.8.

5.4.1.2. The thrie beam barrier shall be similar to the roadside barrier described in para 4.3 above except that the thrie beam shall be provided on both sides of the post with similar spacers. Typical details are shown in Fig.9.

5.4.2. End Treament

5.4.2.1. Steel median barriers shall be provided with a "Turned-down-guardrail" end treatment as described in para 4.3.2 above except that no flaring is to be provided.

5.4.3. Placement Recommendations

5.4.3.1. At locations, where the two adjacent carriageways are at the same level, the barrier shall be placed in the center of the median, duly taking into consideration, the drainage requirements. The placement of median barriers in cases where the two carriageways are at different levels is a function of the slopes between the two medians. Recommended placement for various combinations is indicated in Fig. 10. In case the median barriers need to be flared e.g. for the protection of supports to overhead signs, the flare rates mentioned in para 4.3.2.3 above shall be followed.

5.5. Concrete Median Barriers

5.5.1. Design Aspect

5.5.1.1. The design of cast-in-situ and precast median barriers is indicated in Figs. 11 and 12.

5.5.2.1. Median barrier shall be terminated sufficiently away from the median opening with the twin objectives of preventing impact by the turning traffic and providing adequate sight distance to the turning traffic. The terminating end of the median barrier shall be tapered in a length of 8 to 9 meters.

5.5.3. Placement Recommendations

5.5.3.1. Placement recommendations for steel median barriers mentioned in para 5.4.3 above apply to concrete median barriers also.

6. General

6.1. Raised curbs or drains should not be provided between the travelled way and the barriers. These destabilise the vehicle balance and disturb its equilibrium before it strikes the barrier, thus defeating the essential purpose of safety and redirection of the impacting vehicle.

6.2. In rural situations both the roadside and the median barriers should preferably be steel barriers. Concrete barriers should be preferred in urban situations.

6.3. A typical road cross section with barriers is shown in Fig. 13.

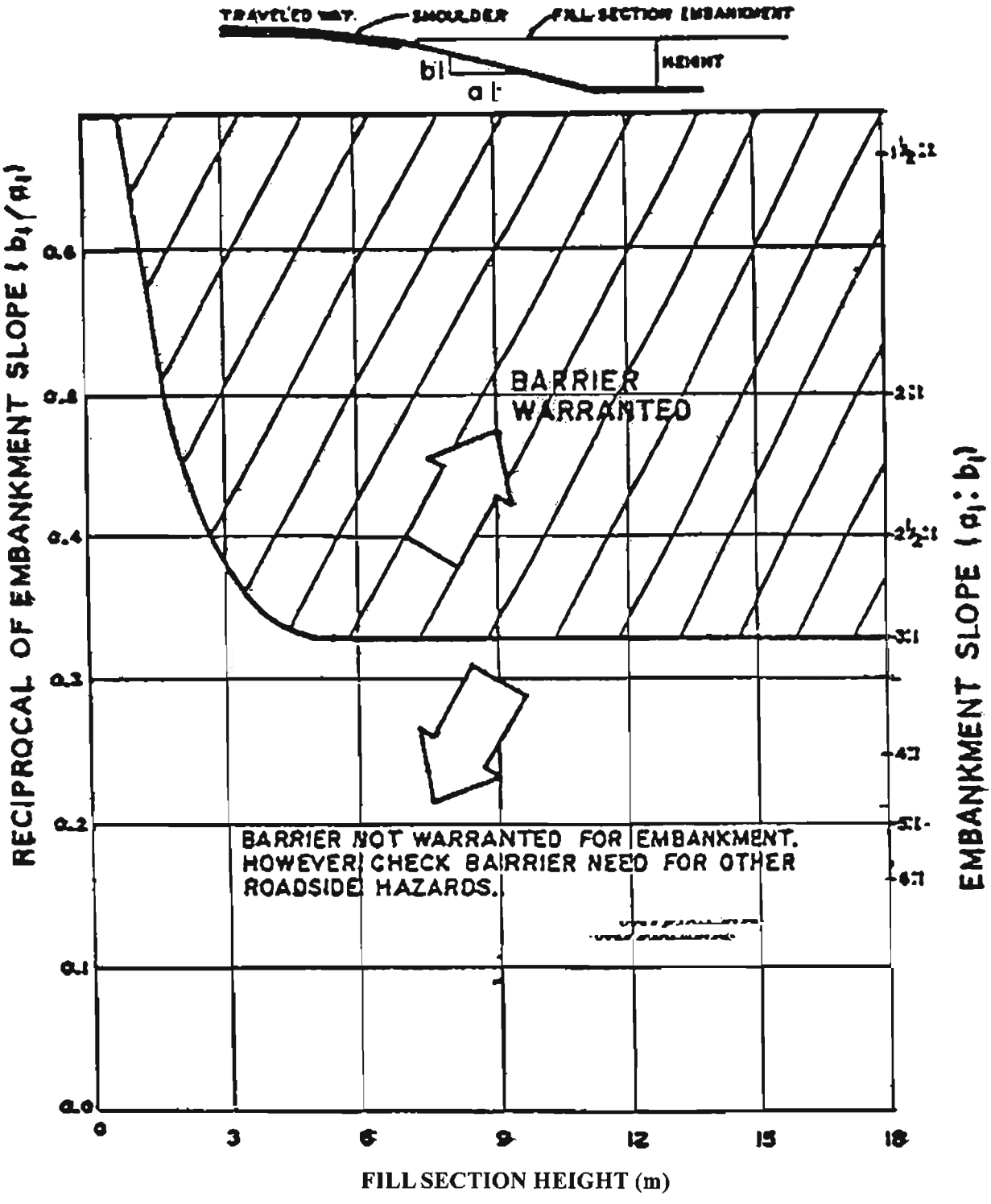


FIG. 1. WARRANTS FOR ROADSIDE BARRIERS ON EMBANKMENTS

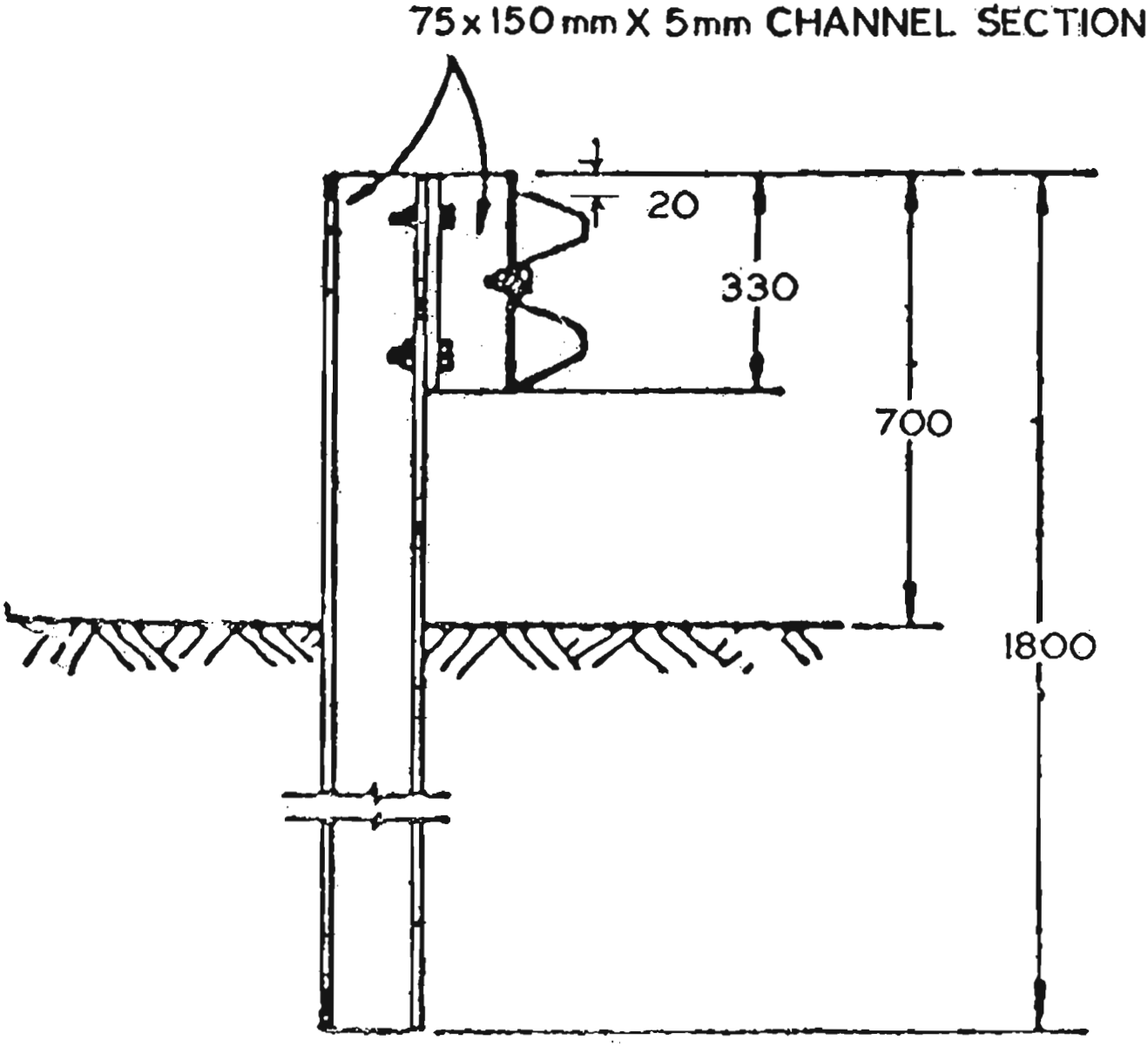


FIG. 2. TYPICAL DETAILS OF "W" BEAM SECTION

(ALL DIMENSIONS ARE IN mm)

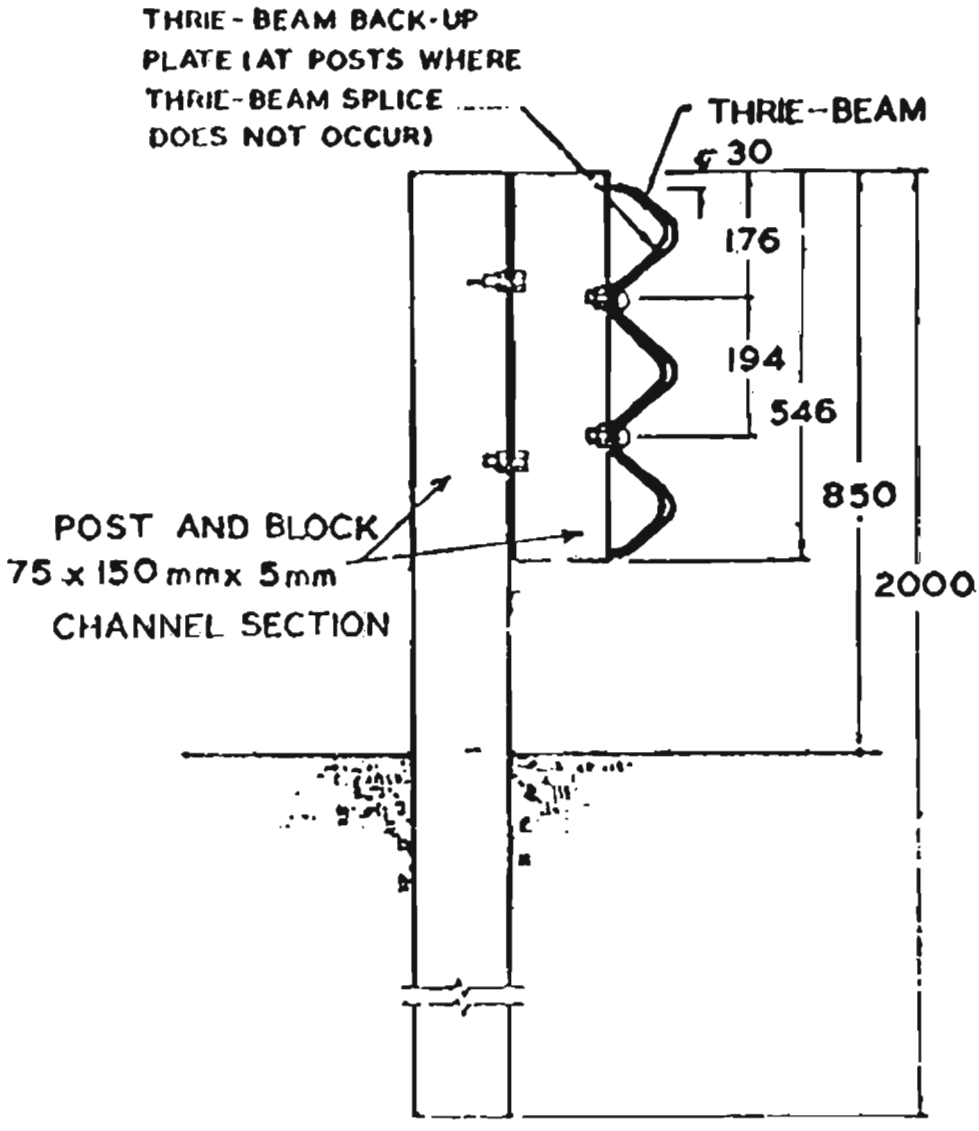


FIG. 3 TYPICAL DETAILS OF THRIE BEAM SECTION

(ALL DIMENSIONS ARE IN mm)

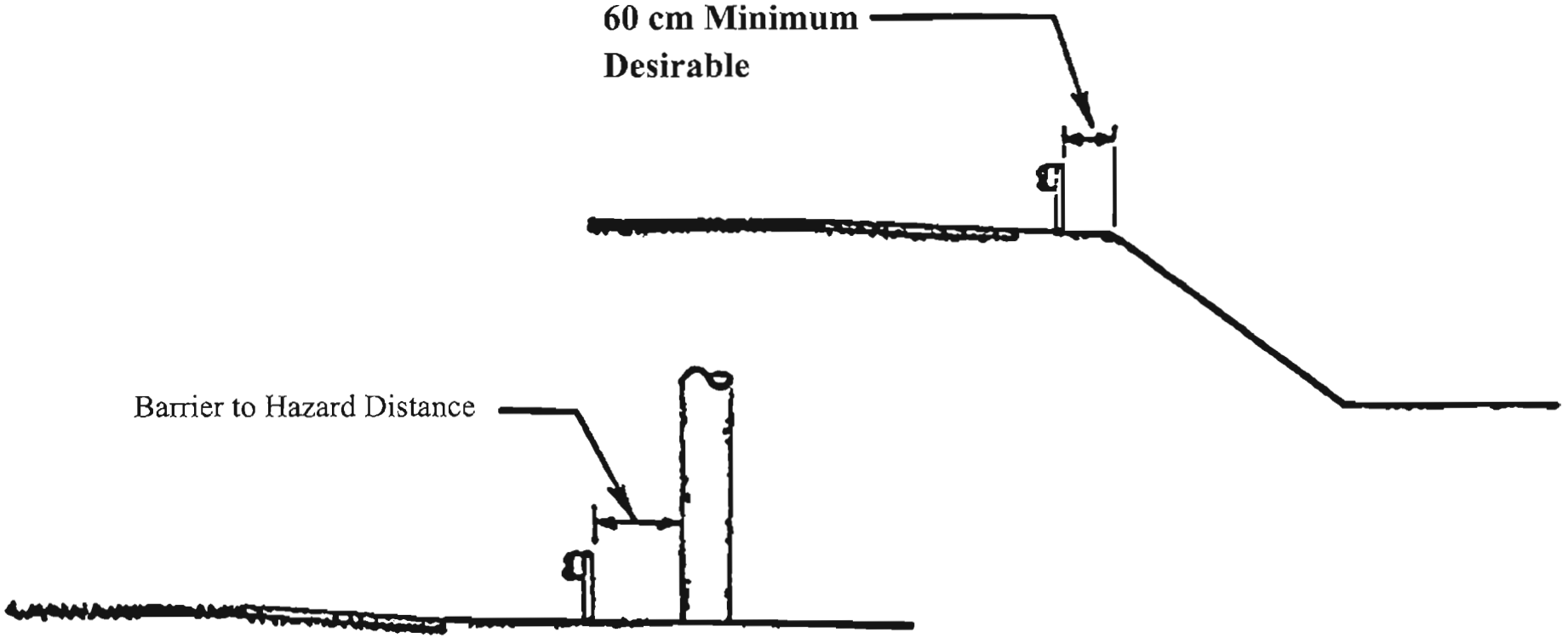
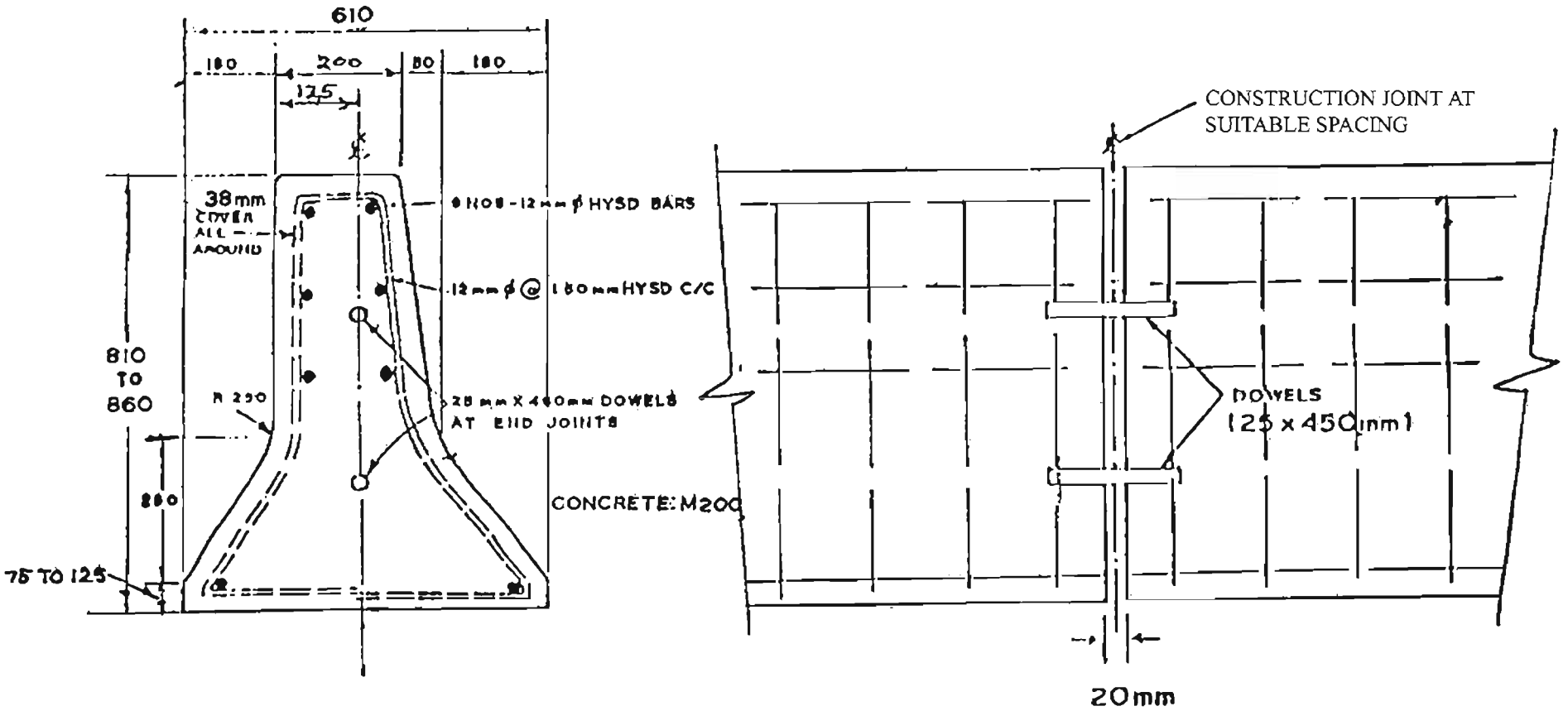


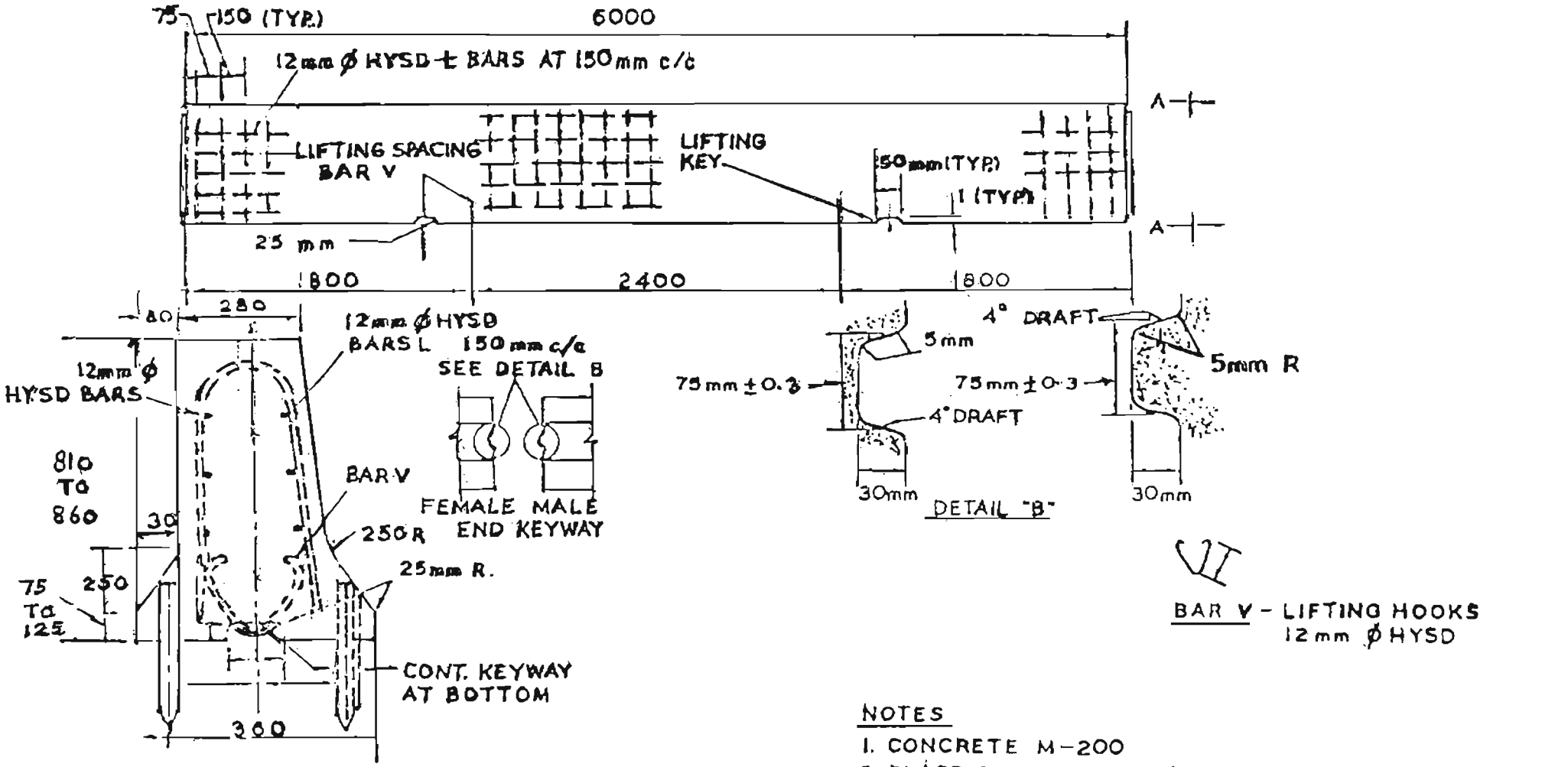
FIGURE 4. Recommended Barrier Placement



NOTE:- HYSD - HIGH YIELD STRENGTH DEFORMED REINFORCEMENT

FIG.5 ROADSIDE BARRIER CAST-IN-SITU DESIGN

(ALL DIMNSIONS ARE IN mm)



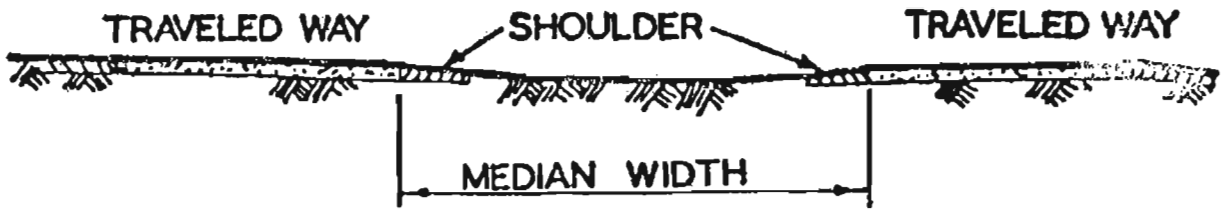
VIEW A-A

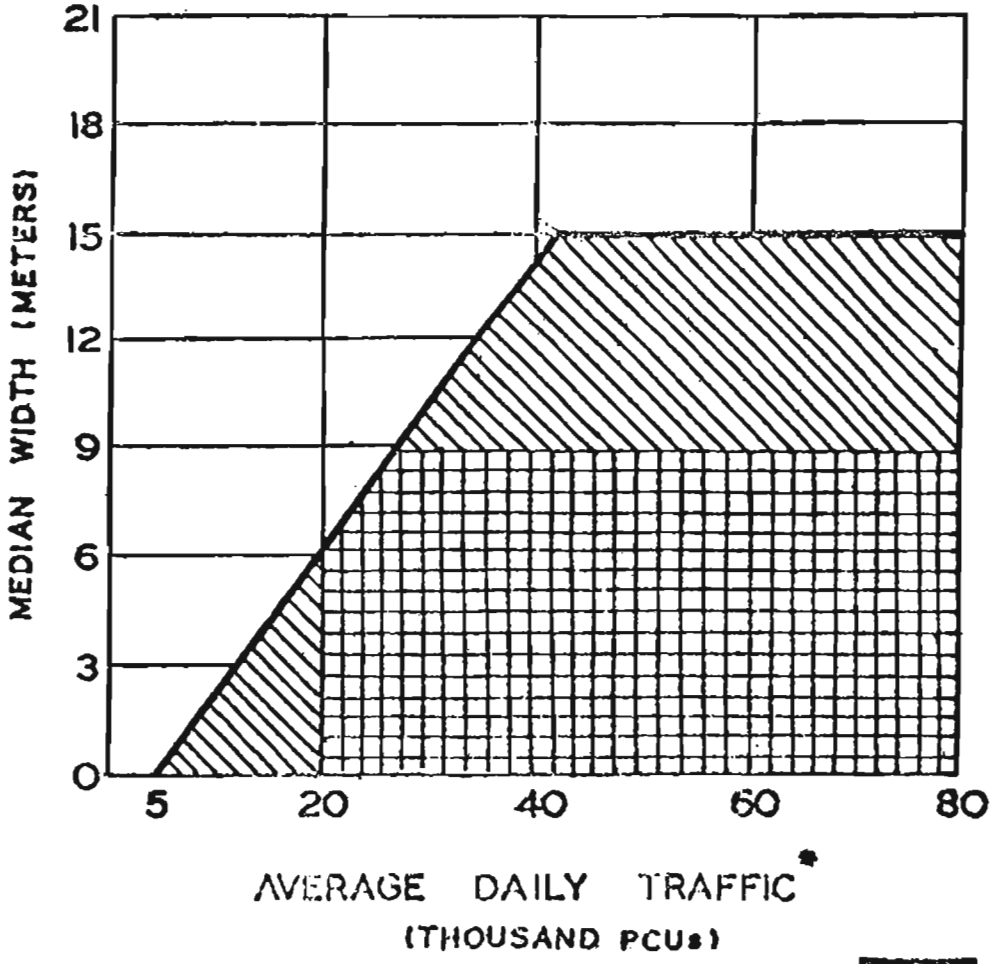
NOTES

1. CONCRETE M-200
2. PLACE ON 25mm GROUT BED
3. HYSD-HIGH YIELD STRENGTH DEFORMED REINFORCEMENT

FIG.6 ROADSIDE BARRIER PRECAST DESIGN

(ALL DIMENSIONS ARE IN mm)





* BASED ON A 5-YEAR PROJECTION

WARRANTED

OPTIONAL

FIG. 7 MEDIAN BARRIER WARRANTS

W-Beam (Strong Post)

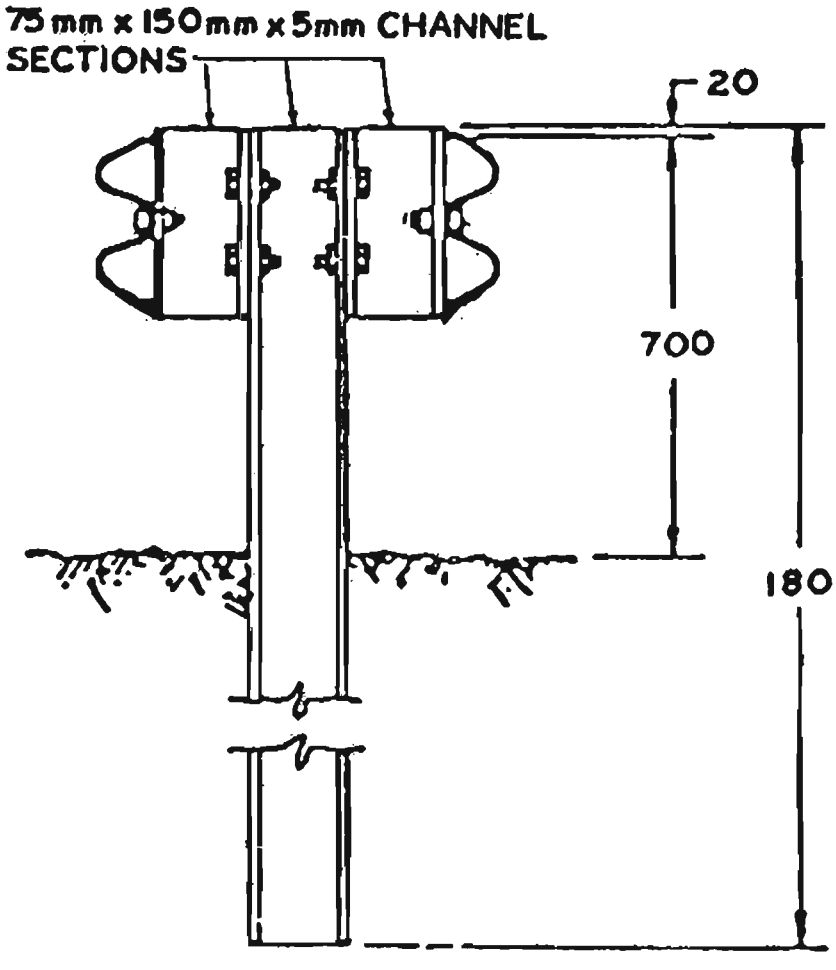


FIG. 8 TYPICAL DETAILS OF "W" BEAM MEDIAN BARRIER

(ALL DIMENSIONS ARE IN mm)

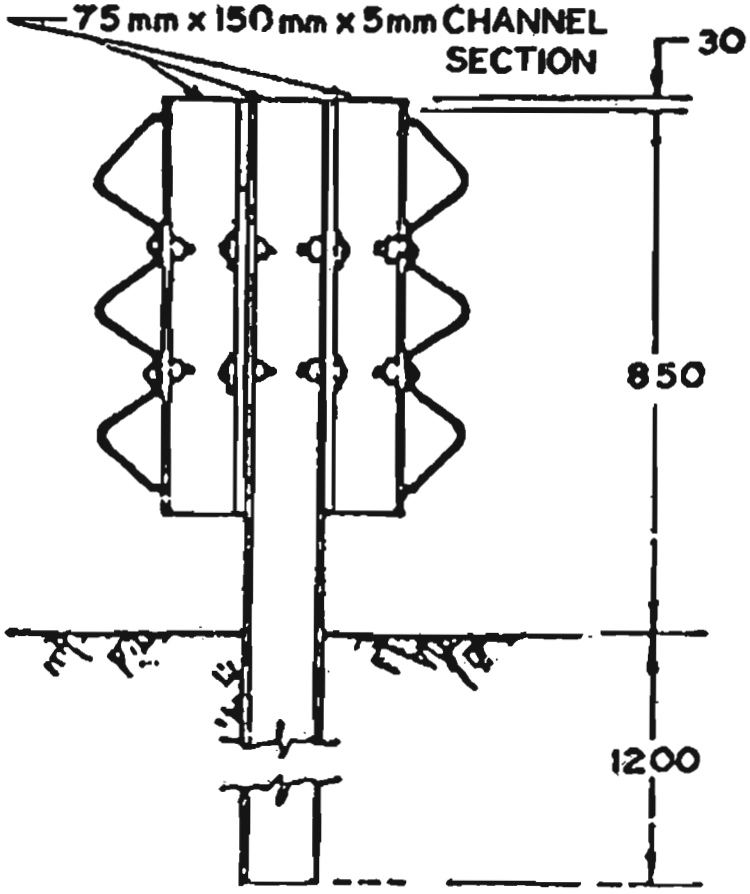


FIG. 9. TYPICAL DETAILS OF THRIE BEAM MEDIAN BARRIER

(ALL DIMENSIONS ARE IN mm)

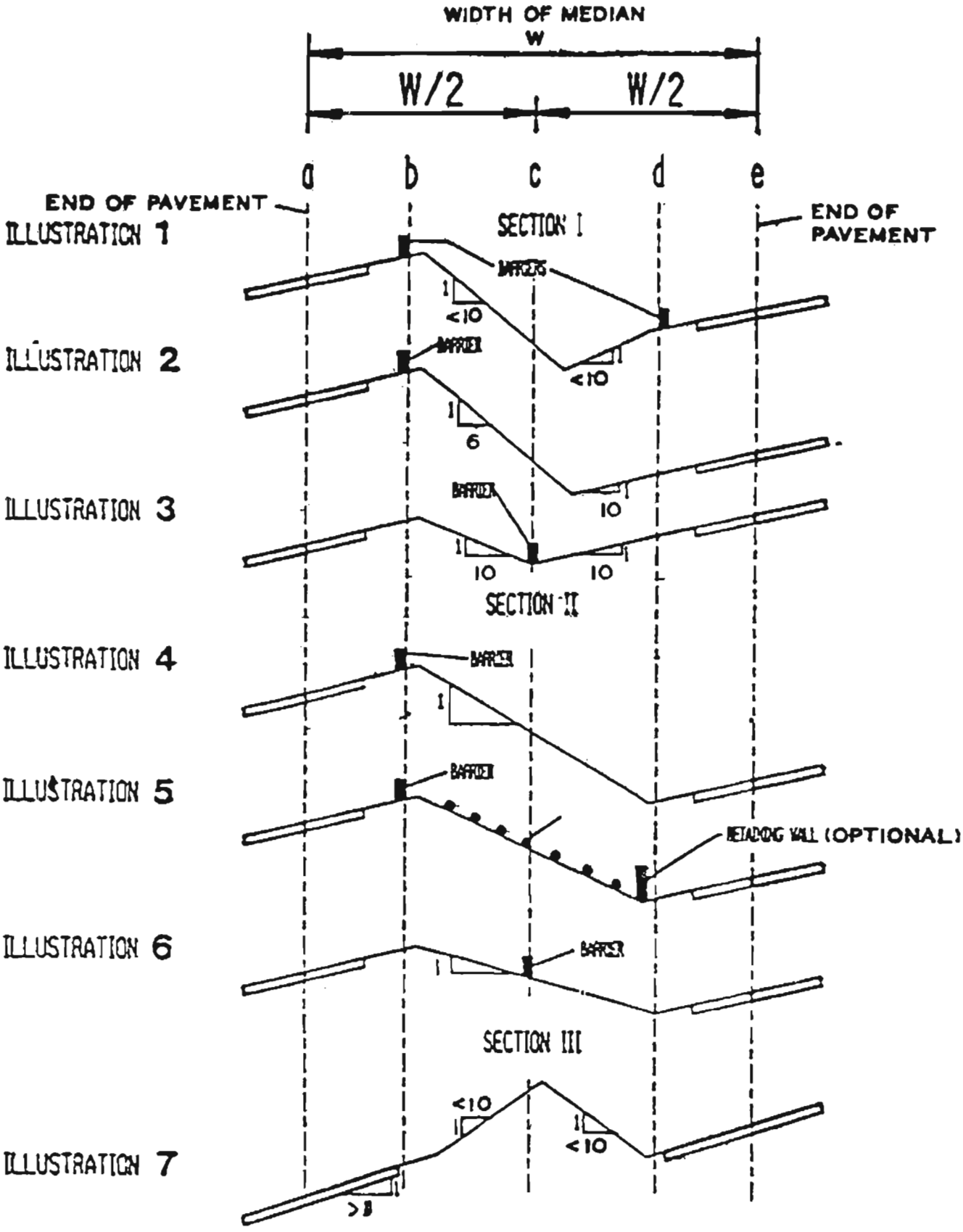


FIG-10 RECOMMENDED MEDIAN BARRIER PLACEMENT
IN NON-LEVEL MEDIANS

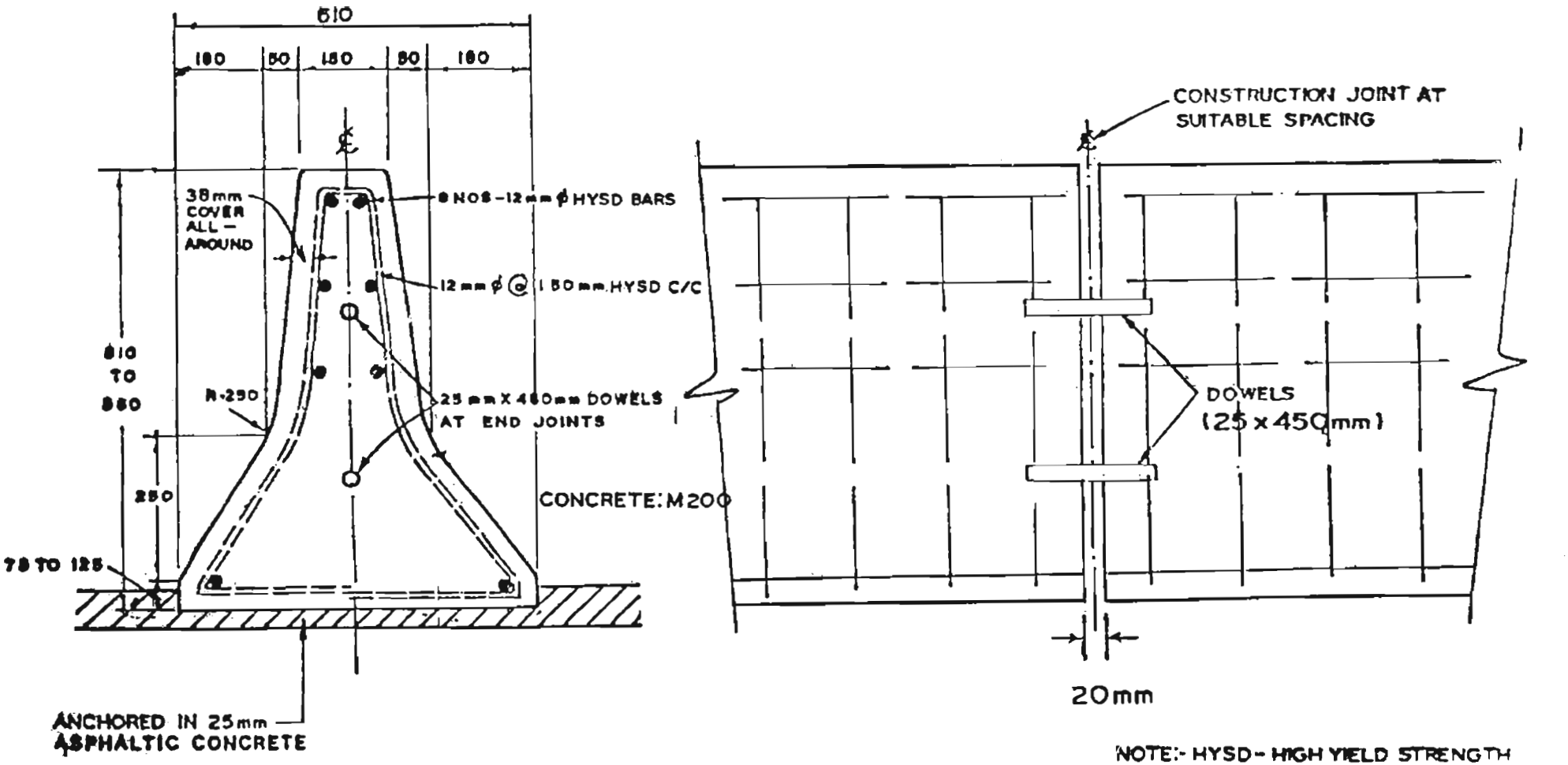
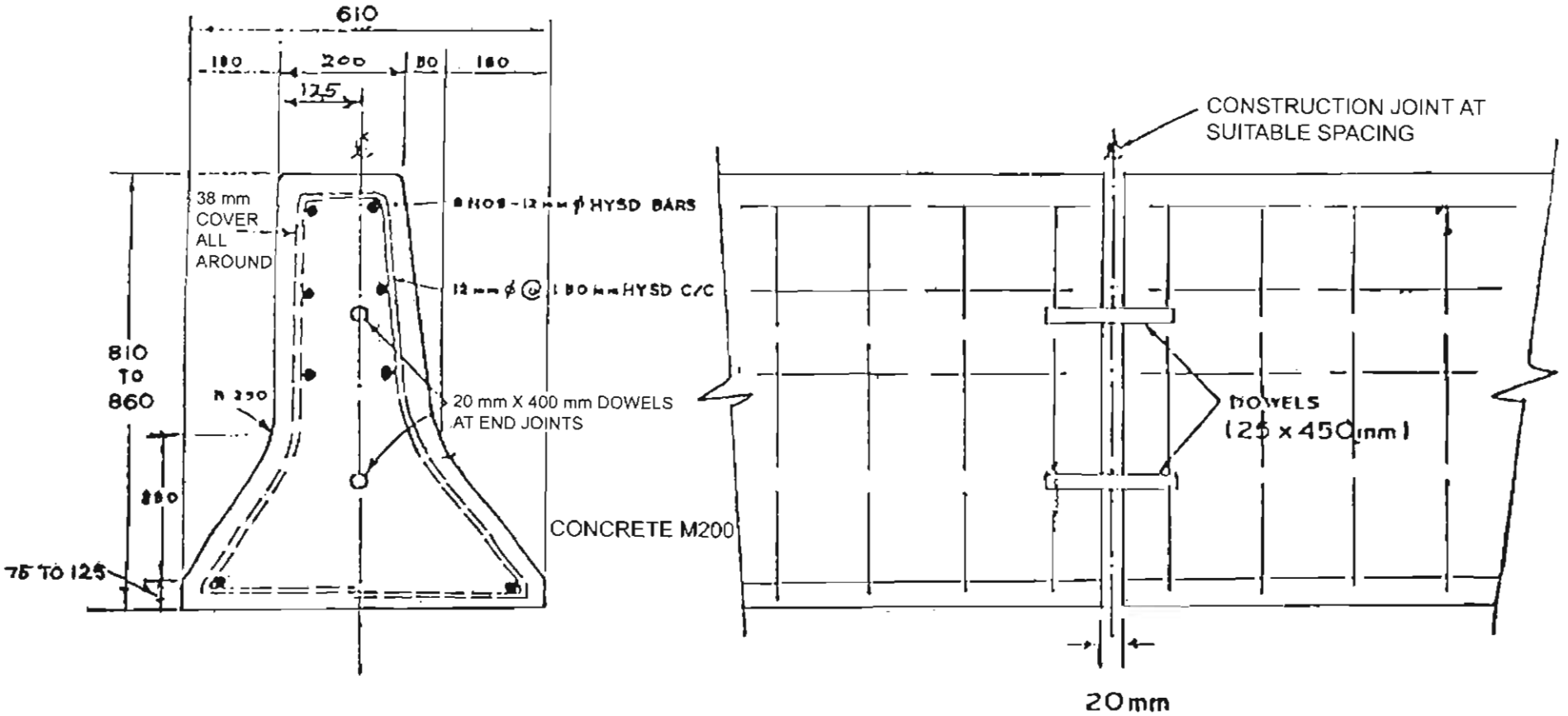


FIG.11 MEDIAN BARRIER CAST-IN-SITU DESIGN

(ALL DIMENSIONS ARE IN mm)



NOTE: HYSD - HIGH YIED STRENGTH DEFORMED REINFORCEMENT

FIG-5 ROADSIDE BARRIER CAST-IN-SITU DESIGN
(ALL DIMENSIONS ARE IN mm)

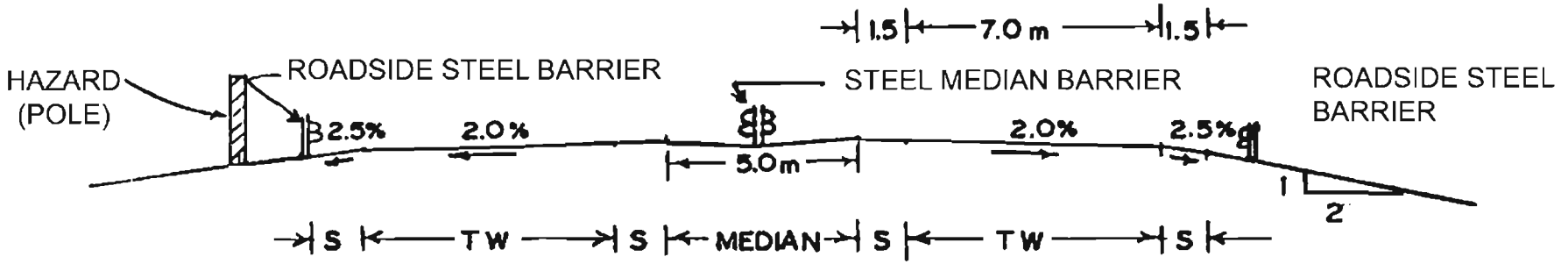


FIG-13 TYPICAL CROSS SECTION DETAILS

(RAISED CURBS OR DRAINS NOT TOBE PROVIDED BETWEEN TRAVEELD WAY AND BARRIER)

S – SHOULDER

TW – TRAVELED WAY

1740.3

No.RW/NH-34015/2/86-S&R *Dated, the 22nd June, 1994*

To

Chief Engineers of all State PWDs/UTs. (dealing with National Highways and other Centrally Sponsored Projects); Director General (Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority of India

Subject: Guidelines regarding approach slabs for bridges

Approach slabs are provided to attain a smooth transition for the traffic from the flexible road pavements supported on compressible earthfill to the rigid surface of the bridge. As per practice, these are generally 3.5m long in R.C.C. having width equal to the width of the bridge between the edge kerbs/ footpaths with one edge supported on the dirt wall of the abutment and the remaining portion resting on the compacted backfill. However, it is seen that a number of approach slabs constructed in the past had failed because the supporting fill behind the abutment settled excessively and non-uniformly after the construction of the approach slab. The main reason for this is inadequate compaction because the rollers as employed for compaction of the earthfill cannot go immediately behind the abutments/returns due to fear of damages to the structure. However, it is also seen that in a number of cases the fill behind the abutments has not settled excessively and the approach slab continues to serve the desired purpose without showing signs of distress. This Ministry has considered various aspects regarding this issue and the following comprehensive guidelines with regard to the approach slabs are circulated with the aim of evolving a reliable mechanism which will ensure that the fill behind the abutments/returns gets adequately compacted before the approach slab is laid and the stability of the approach slab is ensured.

2.1. Filling behind the abutments should be done in stages to keep pace with the constructions of the abutments and return/wing walls and the operation of filling should not wait for the completion of the same. This may enable the roller to approach close to the abutments, returns and ensure better compaction of the fill. However, if it is found difficult for normal rollers to approach close to the abutments/returns, the use of small vibratory rollers/plate compactors/power rammers may be made.

2.2. The approach slab should be laid only after the passage of two rainy seasons after completion of the bridge and opening of the same to traffic so that the fill behind the abutments will get additional compaction due to the traffic and the rains and this will ensure that no large settlement will take place after the laying of the approach slab. During this period care may be taken to make up any settlement immediately behind the abutment so as to maintain a smooth profile.

2.3. The approach slab may not be a part of the bridge estimate. It is suggested that the provision of the approach slabs for a few bridges in a particular division of the PWD can be combined together and projected as a separate estimate or a special repair estimate.

2.4. The approach slab shall be 300 mm thick and have a minimum length of 3.5m constructed as a RCC slab having M25 concrete for moderate conditions and M30 for severe condition of exposure. One end of the approach slab should be resting on a rear projection (Bracket) from the ballast wall of the abutment. The approach slab shall be provided with HYSD bars of 12mm dia at 150mm centre to centre both ways at top and bottom. Typical details of the bracket may be seen in Fig. 3. As levelling course and base slab a 150 mm thick layer of M15 grade concrete may be provided under the approach slab as shown in Fig. 1.

2.5. The expansion joint to the bridge shall be provided between the ballast wall and the deck (Fig.1).

2.6. In the joint between the approach slab and the ballast wall bituminous joint filler with joint ceiling compound may be provided.

2.7. The wearing coat as provided over the bridge should be extended over the approach slab also (Fig.1.)

2.8. If the road approach is completed first then the embankment in approaches shall be finished as indicated in Fig.2a. On the contrary if the bridge construction is completed first then the immediate embankment behind the abutment shall be finished as indicated in Fig.2b.

2.9. Filling behind the abutment and proper compaction of the embankment below the approach slab should be carried out by the Bridge contractor and not the contractor for the approach roads if the two contractors are different. As a general policy the construction of the embankment for an average distance of "H+10"m (the hatched portion)behind the abutment shall form part of the bridge contract (see Fig.2a and 2b) where "H" denotes the height of the embankment.

2.10. The filling immediately behind the abutment shall be carried out with selected material as per the specifications given in IRC:78 (Appendix-6).

The above guidelines supersede all the previous instructions on the subject.

Enclosure to Ministry's Circular No. RW/NH/34015/2/86-S&R Dated 22nd June, 1994

Note :-

1. The fill behind abutments, wing/return walls shall conform to the specifications given in Appendix 6 of IRC:78.
2. Back filling shall synchronise with the construction of abutments, wing/return walls.
3. The backfill shall be properly compacted in layers as per specifications.
4. The width of approach slab shall cover the carriageway width between the kerbs/footpaths.
5. Grade of concrete :-

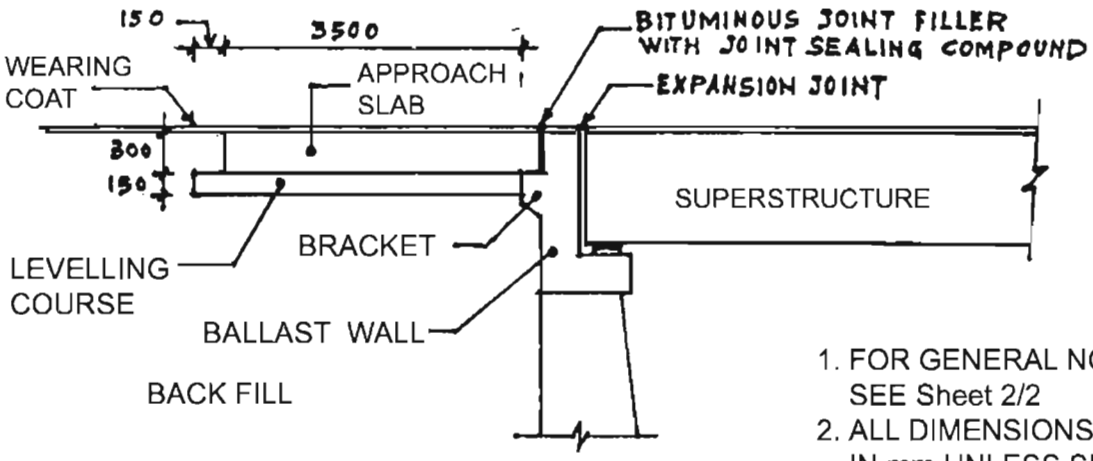
   (a) Approach slab :
   M25 grade for moderate exposure.
   M30 grade for severe exposure

   (b) Levelling course:
   M15 grade

   (c) Ballast wall including supporting corbel:
   as per design
6. Clear cover to any reinforcement 50 mm unless specified
7. While working out the thickness of ballast wall, care may also be taken to see that anchorages of expansion joints can be accommodated easily therein.
8. In Fig.3, the nominal design vertical reinforcement on the earthface of the ballast wall may be increased by 50% in the region 'X' to resist increased tensile forces due to non-linear stress pattern above the bracket.

SHEET 1/2

ENCL. TO MOST LETTER NO. R.W./NH 34015/2/86-S&R Dt. 22.6.94



1. FOR GENERAL NOTES SEE Sheet 2/2
2. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED

FIG. 1

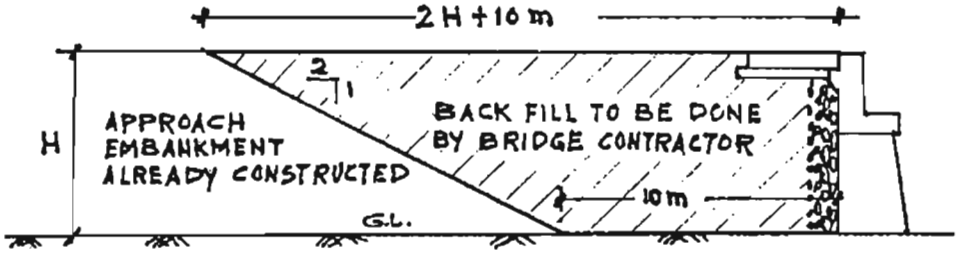


FIG. 2 (a) CASE-I APPROACH EMBANKMENT CONSTRUCTED PRIOR TO CONSTRUCTION OF ABUTMENT

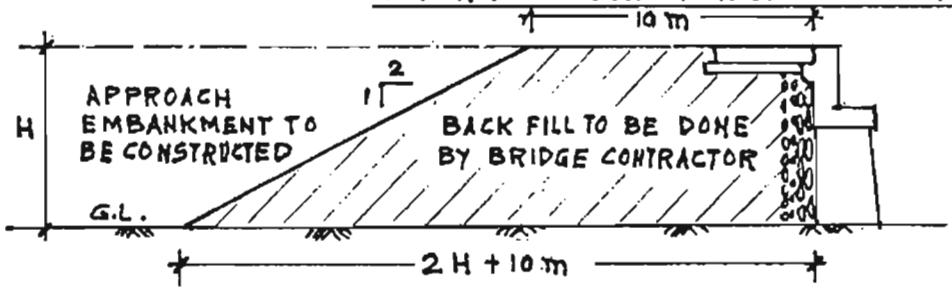


FIG. 2 (b) CASE-II ABUTMENT CONSTRUCTED PRIOR TO CONSTRUCTION OF APPROACH EMBANKMENT.

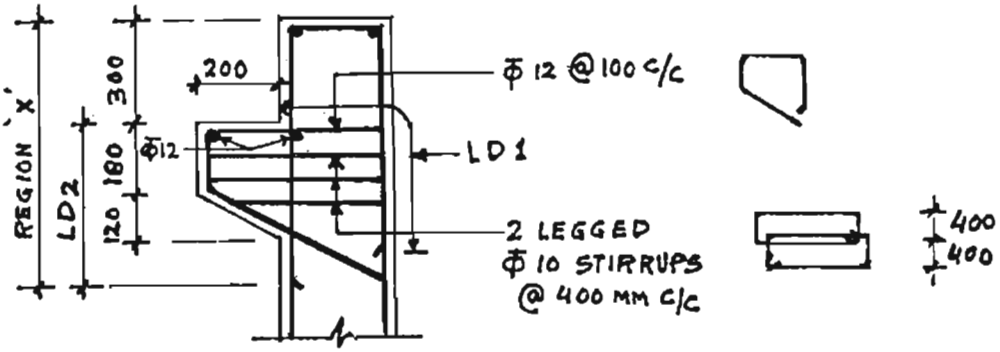


FIG-3 REINFORCEMENT IN BRACKET

LD_1 = BOND LENGTH FOR BRACKET REINFORCEMENT
LD_2 = BOND LENGTH FOR BALLAST WALL REINFORCEMENT

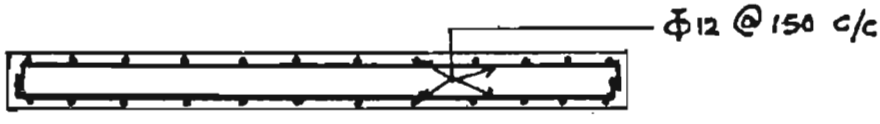


FIG-4 REINFORCEMENT ON APPROACH SLAB

1960.2

No.RW/NH-11052/11/93-DO 1 *Dated, the 31st March, 1993*

To

The Secretary, PWD's of all States/UTs (Departments dealing with National Highways); Director General Border Roads; Director General (Works), Central Public Works Department

Subject: Electrification of bridges on National Highways

I am directed to refer to this Ministry's Circular No.NH.III/P/1/75 dated 24th November 1975 (see Circular No. 1960.1) on the subject mentioned above and to state that it has come to our notice that some State Governments are not making necessary provision for electrification of bridge in the original estimate for bridge work but are requesting for sanction of the estimate for the same separately after completion of the bridge. This delays the provision of electrification and accordingly invites public criticism. It is, therefore reiterated that to avoid delay in taking up electrification, wherever necessary, provision for structural elements like light posts and cable ducts for electrification of new bridges of length 300 m or more should be made in the estimate for bridge works at the first instance itself and necessary certificate furnished from local authority agreeing to meet the cost of electric installations, their maintenance and running charges. The contents of the circular may be brought to the notice of all officers of your Department dealing with National Highways for compliance of the above directions.

Code No.	*Circular No. & Date*	*Brief Subject*	*Page No.*
1980.6	RW/NH-34041/18/93-S&R dt.15-3-94	Use of Fusion Bonded Epoxy Coated Reinforcement in Bridges on National Highways and other centrally sponsored bridge projects to be constructed in marine environment susceptible to severe corrosion	1980/22

1980.6

No.RW/NH-34041/18/93-S&R *Dated, the 15th March, 1994*

To

The Chief Engineers of State PWDs/UTs. (dealing with National Highways and other centrally sponsored projects); Director General(Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority

Subject: Use of Fusion Bonded Epxoy Coated Reinforcement in Bridges on National Highways and other centrally sponsored bridge projects to be constructed in marine environment susceptible to severe corrosion

A large number of R.C.C./Prestressed Concrete Bridges are located in marine environment on National Highways running parallel and close to the sea-shores in the country. Keeping in view the huge investment made in constructing these bridges as well as the difficulties and high cost involved in their rehabilitation due to corrosion related distresses, there is a need to adopt suitable measures to prevent or minimise corrosion of steel at the construction stage itself. Presently, four types of anti-corrosive treatments to reinforcement steel are available in the country viz. :-

a) Cement slurry/phosphate jelly technique (CECRI method);

b) Hot Dip Galvanisation;

c) Polymer Based Protective Coatings;

d) Fusion Bonded Epoxy Coated Reinforcement (FBECR).

2. The Ministry has recently taken up a Research Scheme on Critical Evaluation of Fusion Bonded Epoxy Coated Reinforcement and other protective coatings on reinforcements. Findings in the Preliminary Report on the Research done so far indicate that RCC structures by and large perform better with Fusion Bonded Epoxy Coated Reinforcement compared to other anti-corrosive coatings on rebars and countries like U.S.A. and Japan have been adopting such FBEC reinforcement since more than a decade. Accordingly, it is suggested that FBEC reinforcement may be adopted for major reinforced concrete bridges in the coastal regions subjected to severe corrosion keeping in consideration the production capacity and location of a Fusion Bonding Plant as well as the economics of transportation of coated rebars. The following guidelines are, however, suggested with regard to adoption of Fusion Bonded Epoxy Coated Reinforcement for major RCC bridges.

3. The reinforcements in major RCC bridges may be protected by Fusion Bonded Epoxy Coating in the following situations:-

a) In marine environment where the rate of corrosion is greater than 0.25 mm per year (corrosion map of the country enclosed). In locations where it is difficult to ascertain the rate of corrosion, coastal locations within 50 kms from the sea may be considered as areas subjected to severe corrosion.

b) In marine locations where the severity of corrosion is confirmed from the inspection of nearby structures (bridges/buildings).

4. The following pre-requisites shall be satisfied for adoption of Fusion Bonded Epoxy Coating to the reinforcement bars:-

a) A fusion bonded epoxy coating plant shall be available within a distance of 300 km from the bridge site.

b) Steel to be coated shall by HYSD bars conforming to IS:1786 produced by TISCO or SAIL.

c) The bridge shall be a R.C.C. bridge having a total length of 60m and above.

5. The fusion bonded epoxy coating shall be done conforming to IS:13620:1993. The following points may, however, also be kept in view:

5.1. Thickness of coating shall be 175±50 microns.

5.2. The coating shall be got done by an authorised firm approved by the Department.

5.3. PVC coated GI binding wires shall only be used for tying the reinforcement and the tender rates for fusion bonded epoxy coating shall include the cost of the same.

5.4. The Contractor shall produce certificate from the coating firm that the quality of powder epoxy material and other components of fusion bonded epoxy coating conform to the relevant IS Code. Such certificate shall accompany each consignment of delivery while leaving the plant.

5.5. The Coating firm shall furnish at the time of shipment, a certificate that the coated reinforcing bars meet the requirement of IS:13620:1993.

5.6. Inspite of the test certificates produced by the Coating Firm, the Department reserve the right to carry out independent tests at the plant site for sample cross- checking. The Contractor's agreement with the coating Firms shall include the provision for independent checking by the Department and that if the coating quality is not approved by the Department, the decision of the Department to reject or repair the coating shall be final and binding on all parties.

6. The following points need to be taken care in the field while using fusion bonded epoxy coated reinforcement:-

a) Bars shall be stacked on wooden battens separated from each other to protect them from rubbing;

b) Dragging the bars shall be avoided to prevent damage to the coating.

c) Cutting of bars shall be done by cutting machine or hacksaw.

d) While bending the bars, teflon covered pins shall be used at the bar bending bench. It is preferable to insist on the use of bar bending machine by incorporating suitable stipulation in the tender specifications.

e) While transporting the fusion bonded epoxy coated bars, there shall be wooden battens between the rows or bundles of bars. The number of bars in each bundle shall be such that 3 labourers could lift one such bundle from the trailor without opening it and stack the bundle intact at the yard over wooden battens.

f) The cut end of the bars shall be touched up with special touch up materials as prescribed by the coating firm satisfying IS:13620 specifications. There shall be a time gap of maximum 4 hours within which the repairs to the cut ends and damaged portions shall be carried out with touch up materials and failure to do so may cause complete rejection of the coated bars.

g) The coated steel shall not be directly exposed to sun and rains and shall be protected with opaque polyethylene sheets or such other approved materials.

7. It is requested that the contents of this letter may be given wide circulation and brought to the notice of all concerned. Further, while submitting the estimates for the bridges with fusion bonded epoxy coated reinforcement, necessary justifications for adopting it for a particular bridge shall be furnished along with appropriate rate analysis.

605.5

No.RW/NH-11065/19/94-DO I *Dated, the 6th June, 1994*

To

The Chief Engineers, PWDs of all States and Union Territories (dealing with National Highways)

Subject: Regulation of traffic in construction zones along National Highways

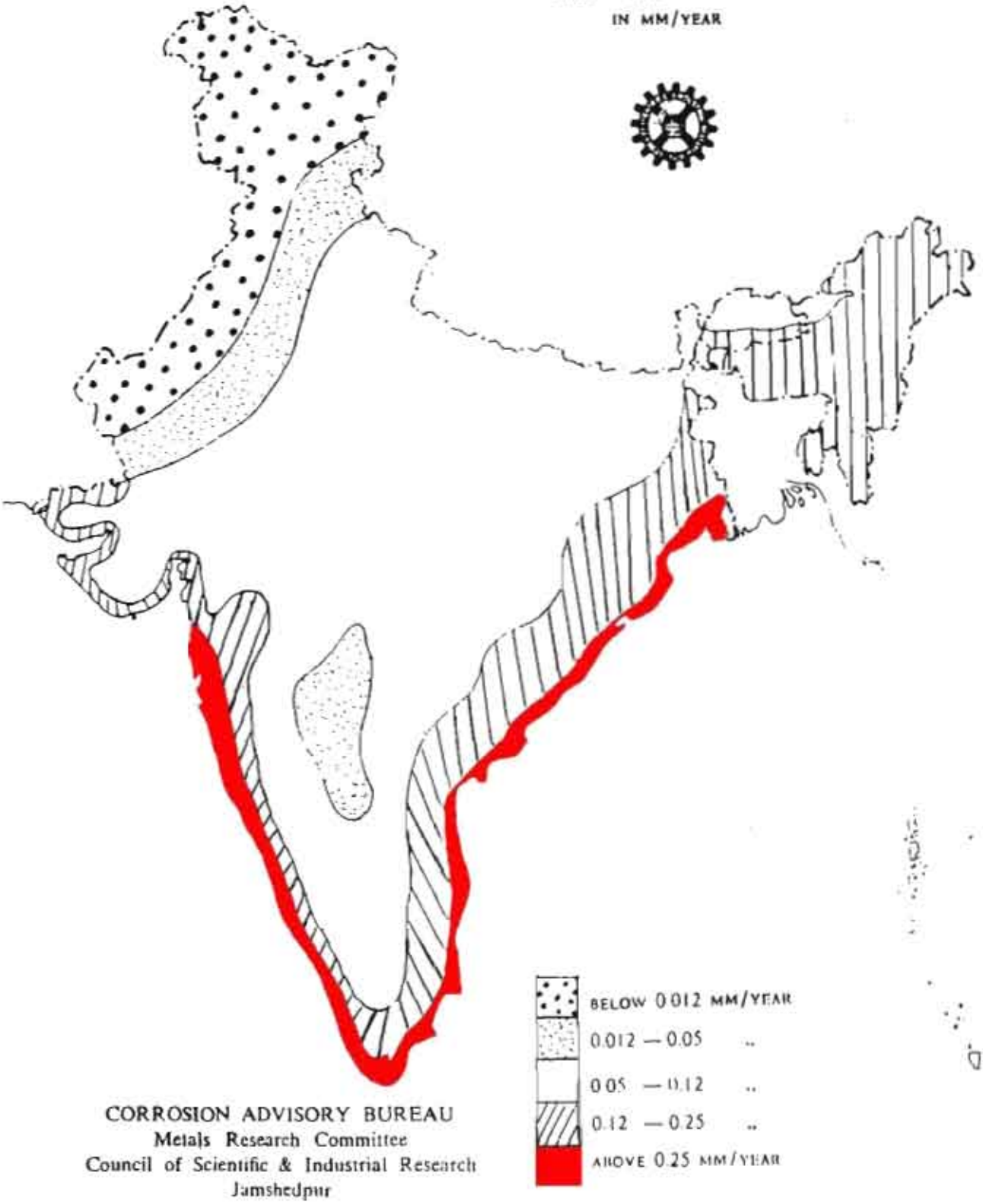
With the growing road transport demand, there has been a great boom in road construction activity in the country. In this context, the need for adopting proper measures for safety and guidance of traffic in the road construction zones has gained special significance. Detailed instructions regarding regulation of traffic for providing effective guidance and enhancing safety on National Highway stretches under construction or repair were issued vide this Ministry's letter No.NH.III/33(125)/72 dated 20th March 1973. These safety measures **inter alia** comprise installation of appropriate advance warning/informatory signs, barricading, delineation, pavement markings, red warning lights at night and traffic control and regulation, and have been highlighted in the above circular letter.

2. The above matter came up for discussion in the Chief Engineers meeting held at Bangalore on 24th November, 1993 when the need for adoption of appropriate safety and guidance measures for construction zones was recognised. Accordingly, it has been decided that henceforth itemwise specific provisions for effective control and regulation of traffic should be made, instead of being provided on lumpsum basis, in the project estimates for NH works.

3. It is requested that appropriate instructions in the above regard may be communicated to all concerned so that project proposals duly incorporating requisite safety features in construction phase are furnished to this Ministry.

CORROSION MAP OF INDIA

MAXM. CORROSION RATE
IN MM/YEAR



CORROSION ADVISORY BUREAU
Metals Research Committee
Council of Scientific & Industrial Research
Jamshedpur

2100.14

No.RW-14(1)/83-RMP *Dated, the 27th October, 1993*

To

All the State Chief Engineers dealing with National Highways

Subject: Revised Guidelines for the utilisation of Central Machines for National Highway works

Please refer to Ministry's letter of even number dated 23.6.88 (see Circular No. 2100.9) wherein guidelines were issued for the improvement of utilisation of Central machines. It has been observed that the utilisation of central machines is on the decline during the last 2 to 3 years due to one or other reasons.

Ministry feels, that the utilisation of central machines can be improved to achieve the norms laid by the Ministry if the state authorities give emphasis on paras 1 & 7 of guidelines contained in Ministry's letter referred to above, which are reiterated below:-

Para 1. The availability of central machines in State and necessity of their optimum utilisation on NH works should be kept in view right from the stage of preparation of Annual Plan. For this, the State PWDs should give priority to the works which require the utilisation of central machines while sending the proposals of works to be included in the Annual Plan.

Para 7. When the central machines are available, the State plants or those belonging to the contractors should not be used on NH works at the cost of central machines.

It is therefore again requested that all the concerned officers dealing with NH works in State may kindly be advised that technical proposals of National Highway works should be framed in such a manner so that all central machines can achieve the laid down norms of Annual utilisation fixed vide Ministry's letter RW-24011/1/88-RMP dated 5th May, 1988.

A line in reply indicating the action taken in this regard will be appreciated.

2100.15

No.RW-14(1)/83-RMP *Dated, the 28th October, 1993*

REVISED GUIDELINES FOR UTILISATION OF CENTRAL MACHINES

To improve the utilisation of Central machines, a revised guidelines were issued vide Ministry's letter of even number dated 7th June, 1988 (see Circular No. 2100.10) wherein it was stressed that all efforts should be made to achieve the Annual utilisation norms of Central machinery fixed vide Ministry's letter No. RW-24011/1/88-RMP dated 5th May 1988, by proper planning, execution of works and monitoring the same.

However, it has been observed that during the last 2-3 years, Annual utilisation has been on the decline due to one or other reasons. In order to improve the utilisation of Central machines available in States, concerned Project Officers are again requested to insist upon State Government authorities that at the time of submitting the Annual Plan or technical proposals/ estimates, utilisation of Central machines should be kept in view, so that machines are utilised to their optimum capacity.

2100.16

No.RW-24011/5/93-RMP *Dated, the 30th December, 1993*

To

The Secretaries, PWDs of all States and UTs (dealing with National Highways); Director General (Works), Central Public Works Department; Secretary, Border Road Development Board

Subject: Revision of norms of economic life of Road/Bridge construction machines belonging to this Ministry

I am directed to say that Ministry vide letter No.RM-21(3)/ 75 dated 4th June, 1976 had intimated to the States the calculation procedure of hire charges of Central machinery, under which the economic life of machine to be adopted for calculation purpose was enclosed. It has been experienced that the prescribed working life of road marking machines could not be achieved due to various reasons.

2. Subsequently matter was referred to the "Standing Committee of Senior Mechanical Engineers in the Highway Sector". The recommendations made by the members of Standing Committee were discussed in detail in the meeting held at Guwahati in May 1993 and economic life of various machines have been finalised.

The recommendations of the Standing Committee have been examined in this Ministry and it has been decided that for Ministry's machines available in the States, economic life for condemnation of Central machines will be as indicated below:-

a) The economic life of Road/Bridge construction machines may be adopted as per attached Appendix 'I'. The life achieved either in years or kms/hours whichever is later will be taken for condemnation purpose of central machines available in respective States/U.Ts.

b) The formula shown in Appendix II may only be adopted for exceptional cases for calculation of average life of machines, which are of obsolete model and for which spares are not readily available and if their further repairs are considered not economical.

c) The proposed revised life may be taken into account for working out hire charges of new equipment.

d) This circular takes effect from 1.1.1994.

Appendix-I

Ministry's Circular No. RW-24011/5/93-RMP dated 30.12. 1993

ECONOMIC LIFE OF ROAD/BRIDGE CONSTRUCTION EQUIPMENT

S.No.	Name of Machine	Years	Km/Hrs.
	I. BITUMINOUS CONSTRUCTION EQUIPMENT		
1.	Hot Mix Plants (below 20 TPH)	12	9000 hrs.
2.	Hot Mix Plants (above 20 TPH)	12	9000 hrs.
3.	Drum Mix Plants	12	9000 hrs.
4.	Paver Finisher	15	9000 hrs.
5.	Bitumen Boilers	10	-
6.	Bitumen Pressure Distributor/ Bitumen Transportation Tanker	12	9000 hrs.
7.	Bitumen Storage Tank	10	-
8.	Asphalt mixer	12	8000 hrs.

S.No.	Name of Machine	Years	Km/Hrs.
9.	Front End Loader (Wheeled)	15	9000 hrs.
10.	Tippers	12	2,40,000 km
11.	Chip Spreader	10	-
	II. HEAVY EARTH MOVING EQUIPMENT		
1.	Dozer wheeled	15	9000 hrs.
2.	Dozer Crawler	15	9000 hrs.
3.	Motorised scraper/Towed scraper	15	9000 hrs.
4.	Motor Grader	15	9000 hrs.
5.	Excavator upto 1 cum	12	1000 hrs.
6.	Mobile Crane	15	8000 hrs.
7.	Dumper (all size)	12	10000 hrs.
8.	Tractor (Wheeled)	12	10000 hrs.
9.	Grab Dredging Cranes	12	9000 hrs.
	III. COMPACTION EQUIPMENT		
1.	Road Roller 8-10 T	15	12000 hrs.
2.	Sheepfoot Roller	15	-
3.	Vibratory Rollers upto 2 tons WT	10	-
4.	Vibratory Rollers above 2 tons WT	12	10000 hrs.
5.	Tandem Vibratory Roller 8-10 T	12	10000 hrs.
6.	Pneumatic Tyred Rollers	12.	10000 hrs.
	IV. BRIDGE CONSTRUCTION EQUIPMENT		
1.	Bridge Inspection Unit		
	(a) Bucket type	15	-
	(b) Plateform type	18	-
2.	Power Winch	15	8000 hrs.
3.	Concrete Mixer	6	-
4.	Pile Driving Set	12	8000 hrs.
5.	Diamond Core Drill pm/c	12	8000 hrs.
6.	Vibrators (all types)	5	-
7.	Air Compressor	12	9000 hrs.
8.	Pumping Set Diesel (upto 10 HP)	8	-
9.	Pumping Set Diesel (above 10 HP)	12	10000 hrs.

S.No.	Name of Machine	Years	Km/Hrs.
10.	Weigh Bridges	12	-
	V. GENERAL PURPOSE		
1.	Truck	12	2,40,000 km
2.	Stone Crusher/Granulator (Electrical)	15	12000 hrs.
3.	Stone Crusher/Granulator (Diesel)	12	10000 hrs.
4.	Generator Set	12	10000 hrs.
5.	Diesel Welding Set	15	10000 hrs.
6.	Jeep/Car/StationWagon/Mini Bus	10	2,00,000 kms.
7.	Ferry-Boats-Steel -Wooden	15 10	- -
8.	Kerb Laying Machine	12	-
9.	Concrete Transit Mixer	12	10000
10.	Concrete Pump	10	-
11.	Concrete Batching & Mixing Plant	15	12000
12.	Concrete Paving Equipment	15	12000
13.	Stone Crushing & Screening Unit	10	10000
14.	Snow Cutter/Plougher	20	

Appendix-II

Ministry's Circular No. RW-24011/5/93-RMP dated 30.12. 1993

FORMULA TO BE ADOPTED FOR CONDEMNATION OF ROAD/BRIDGE CONSTRUCTION MACHINES

i) Recommended life of machine - X Hours/kms

ii) Cumulative life actually achieved by the machine - A Hours/kms

iii) Recommended life of machine in years - Y Years

iv) Number of years the machine is old (taking year of purchase into consideration) - B Years

Then life for condemnation $A/X + B/Y = /2 \times 100\%$

Say = - %

Note:- If life calculated as per above formula is more than 100% the machine may be considered for condemnation.

2200.16

No.RW-25012/1/87-RMP *Dated, the 31st March, 1993*

To

All the Secretaries of the State Governments dealing with National Highways

Subject: Rates of usage charges of new machinery procured during 1986-92 - regarding

The rates of hire charges of central machinery procured during the year 1987-89 were communicated vide Ministry's letter No.RW-25012/1/87-RMP dated 08.3.89. Thereafter, Ministry have procured some more machines during the years 1990-92. The rates of hire charges of these new machinery procured have been calculated and are enclosed at Appendix 'A' for adoption with immediate effect. The rates calculated include ownership charges, operational charges and overhead charges per hour. The running charges have not been included since these vary from State to State due to different pay scales of staff and prevailing rates of fuels and lubricants. The running charges may therefore be worked out by State PWDs themselves as per the guidelines communicated vide Ministry's letter No.RW/RMP-21(3)/75 dated 4.6.1976 and included while calculating the total usage charges for being incorporated in NIT and works estimates, wherever applicable.

2. Recovery, accounting and adjustment of hire charges for central machines may be carried out following Ministry's guidelines contained in letter No.RW/RMP-26(3)/80 dated 15.2.88.

3. Hire charges components i.e. ownership charges, operational charges, and overhead charges of central machines when used either by the department or by the contractor are to be credited to the "Major Head 1054-Roads and Bridges, Minor Head 800-other receipts, sub head- hire charges of machinery and equipment".

4. The above instructions may kindly be brought to the notice of all concerned in their department under intimation to the Ministry.

5. The receipt of the letter may kindly be acknowledged.

APPENDIX 'A'

Ministry's Circular No.RW-25012/1/87-RMP dated 31-3-93

HIRE CHARGES OF CENTRAL MACHINERY

S.No.	Description of Machinery	When used by the Department				When used by the contractor			
		Ownership charges per hour (in Rs.)	Operational charges per Hour (in Rs.)	Overhead charges per hour (in Rs.)	Total Usage charges excluding running charges per hour (in Rs.)	Ownership charges per hour (in Rs.)	Operational charges per hour (in Rs.)	Overhead charges per hour (in Rs.)	Total Usage charges excluding running charges per hour (in Rs.)
1.	Excavator Capacity 1M3 BEML Make model PC-220-3	250/-	371/-	31/-	652/-	459/-	371/-	42/-	872/-
2.	Bull Dozer BEML Make Model D 80A	272/-	403/-	34/-	709/-	99/-	403/-	45/-	947/-
3.	Motor grader BEML Make model 6 D 60SR2	210/-	312/-	26/-	548/-	430/-	312/-	37/-	779/-
4.	Bitumen Pressure Distributor	64/-	94/-	8/-	166/-	129/-	94/-	12/-	235/-

S.No.	Description of Machinery	When used by the Department				When used by the contractor			
		Ownership charges per hour (in Rs.)	Operational charges per-Hour (in Rs.)	Overhead charges per hour (in Rs.)	Total Usage charges excluding running charges per hour (in Rs.)	Ownership charges per hour (in Rs.)	Operational charges per hour (in Rs.)	Overhead charges per hour (in Rs.)	Total Usage charges excluding running charges per hour (in Rs.)
5.	Vibratory Roller Capacity 2 Tonnes	19/-	28/-	3/-	50/-	29/-	28/-	3/-	60/-
6.	Baby Rammer (Plate Compactor)	2/-	3/-	1/-	6/-	3/-	3/-	1/-	7/-
7.	Weigh Bridge	6/-	8/-	1/-	15/-	11/-	8/-	1/-	20/-
8.	Generating Set 160 KVA	15/-	21/-	2/-	38/-	34/-	21/-	3/-	58/-
9.	Generating Set 30 KVA	8/-	12/-	1/-	21/-	19/-	12/-	2/-	33/-
10.	Ferry Boat	24/-	36/-	3/-	63/-	41/-	36/-	4/-	81/-

2200-17

No.RW-20015/3/91-RMP *Dated, the 24th June, 1994*

To

The Secretaries of State PWDs and Union Territories (dealing with National Highways), Director General (Works), Central Public Works Department; Secretary, Border Road Development Board

Subject: Fixation of norms for working out hire charges of important road construction equipment

It is observed that norms for working out hire charges of various road construction equipment vary from one State to another. In order to have a uniform pattern for working out the hire charges of road construction equipment, the issue was discussed in the meeting of Standing Committee of senior Mechanical Engineers in the highway sector who had entrusted this work to a sub-committee. The sub-committee submitted a report to the main committee after examining the various details received from different States on this subject. The report of the sub- committee was again discussed in the 7th meeting of the Standing Committee held at Guwahati from 12-14 May, 93. The committee recommended that the norms for working out hire charges of the machines should be the same as adopted by the Ministry (Appendix IV* enclosed with the minutes of the meeting sent to you vide Ministry's letter of even number dated 27.7.93) with slight modifications as indicated below:

1. The operational (repair) charges should be 150% of the cost to be depreciated spread over the economic life of the equipment (which do not possess tyres/crawler).

2. The operational (repair) charges should be 175% of the cost to be depreciated spread over the economic life of the equipment (which possess tyres/crawlers).

3. Ownership and operational charges of all the equipment should be revised periodically say after 3 years.

In view of the above, it is suggested that all State Governments may adopt the same norms as recommended by the committee.

* Copy of Appendix-IV issued with letter of even number dated 27.7.93 is enclosed.

Enclosure to Circular No.RW/20015/3/91 RMP dated, 24th June, 1994

SAMPLE CALCULATION OF HIRE CHARGES/USAGE RATE OF MACHINERY

1. **For Equipments Used Departmentally**

I. **Ownership Charges**

(A)	Total investment at site of work (this includes A/T cost, sales tax, excise, custom and other duties, transport expenses consisting of freight (by ocean & rail), insurance loading/unloading charges and erection and commissioning on receipt.			Rs.
(B)	Deduct slavage value @ 15% of (A)			Rs.
(C)	Total investment to be depreciated = (A) - (B)			Rs.
(D)	Economic life of the machine in hours	=		hrs.
(E)	Depreciation per hour	=	$\frac{(C)}{(D)}$	Rs.
(F)	Storage charges per hour (1 per cent of 'C' spread over the economic life)	=	$0.01 \times \frac{(C)}{(D)}$	
		=	Rs.	
	Total Ownership charges	=	(E) + (F) = Rs.	I

II. **Operational Charges**

(G)	Repair charges per hour including maintenance and replacement of tyres (150 per cent of 'C' spread over economic life)	=	$1.5 \times \frac{(C)}{(D)}$	
		=	Rs.	II

III. **Overhead Charges**

@ 5 per cent of ownership and operational charges	=	$\frac{5}{100}$	(I+II)
Ownership charges per hour	=	Rs.	III
Operational charges per hour	=	Rs.	
Overhead charges per hour	=	Rs.	

IV. **Running Charges**

Operating staff/labour & wages

	Designation	**No.**	**Wages/month**
i)	Operator		
ii)	Helper		
iii)	Cleaners		
iv)	Misc. expenses		
v)	Overtime, etc.		

(H)	Wages per hr [See note (d)]	=	$\frac{\text{Total wages per month}}{1500}$
		=	Rs.

(I) **Servicing Charges**

	Designation	No.	Expenditure
i)	Mechanic		
ii)	Cleaner		
iii)	POL	Total	Rs.

(J) **Servicing Charges**

	Fuel Lubricants etc. consumption/hr	Rate/lit	Cost/hr
i)	Fuel		
ii)	Lubricant		
iii)	Grease		
iv)	Hyd. oil		
v)	Gear oil, cotton waste, etc.		
vi)	Furnace oil etc. (in case of hot mix plants, etc.)	Total	

(K) **Cost of lub. oil, fuel etc., hr.**

(L) **Total running charges per hr. = H+J+K =**

(V) **Overhead charges @ 5 per cent of the total charges per hour** = $\frac{5}{100}$ x L

Summing up:

Ownership charges	=	I	=
Operational charges	=	II	=
Overhead of I and II	=	III	=
Running charges [as in (5)]	=	IV	=
Overhead charges on IV	=	V	

Hire charges per hour = I+II+III+IV+V

Note: While the hire charges should be calculated on the basis of actual expenditure incurred on each machine, on various items indicated above, as soon as any machine is received, provisional hire charges can be fixed assuming the following :

(a) For Imported Equipments only

i) c.i.f. cost = (F.A.S. or F.O.B. cost) + 10% cost of machine for ocean freight.

ii) Custom duty and clearance charges = 50 per cent of c.i.f. value.
35 per cent custom duty +
10 per cent regulatory duty +
3 per cent clearance charges

(b) i) Diesel consumption = B.H.P. x Load Factor (60 per cent) x LBs. of fuel per H.P. hour x (0.4)]

ii) Lubricating oil = $\frac{\text{H.P. x 0.6 x 0.006}}{7.4} = \frac{C}{l}$

Where C = Crank case capacity 0.06 x H.P. in gallons
l = time for changing oil = 100 hours.

(c) The other lubricants, grease, Hyd. oil, gear oil, cotton waste, etc. may be assumed to cost twice the cost of lubricant oil in case of heavy machinery. In case of rest, it is to cost same as lubricant oil.

(d) Wages of operating staff.

Although the staff will be paid for the whole year, for calculating hourly wage rates of the staff, total wages of one year should be divided by actual working hours per year.

In the above formula uniform depreciation has been assumed for the machines fitted with tyres. As the tyres are costly and wear out fast, separate depreciation can be worked out for the tyres and machines.

(2) **For Equipment given to Contractors & Outside Agencies :**

When the machines are issued to contractors, interest and insurance charges @ 10 per cent of average investment per year will be calculated as under and added.

$$= \frac{A}{1500} \quad \frac{60^*}{100} \quad \frac{10}{100} = \text{Rs.}$$

*on 5 years life.

(M) **Interest and Insurance Charges per Hour :**

Therefore the total charges in that case would be as follows :

Ownership charges (E+F+H)	=	I
Operational charges	=	II
Running charges	=	IV
Overhead charges @ 5 per cent of the total charges per hour	=	$\frac{5}{100}$ (I+II+IV) say V
Hence hire charges per hour	=	I+II+IV+V

5300.6

No.RW/NH-11028/1/93-DO.I *Dated, the 1st December, 1993*

To

The Secretaries of States/Union Territories, Public Works Departments, (dealing with National Highways)

Subject : Intimation regarding commencement and completion of National Highway works

I am directed to refer to this Ministry's letter No.NH-III/P/1/79 dated 3rd January, 1979 regarding furnishing of completion certificates/completion reports for National Highway works and to say that most State Public Works Departments are not following the instructions issued therein. There are a large number of Centrally Financed Works for which these reports have not been furnished so far though these works were completed long back. This may please be looked into and appropriate steps taken by the State Public Works Departments to ensure timely submission of the same. It is requested that a copy of the completion report may also henceforth be sent to the concerned Regional Officer of the Ministry.

2. It may also be mentioned that vide this Ministry's letter No. RW/NH-11060/1/87-D I dated 28th August, 1992, State Public Works Departments were intimated that the award of contract/commencement of works should be done within one year from the date of sanction. However, the information regarding the commencement of works by the State Public Works Departments is not furnished to the Ministry. It is, therefore, requested that the date of commencement of the National Highway works may also be intimated to the Ministry with copy to the concerned Regional Officer/Engineer-Liaison-Officer of the Ministry.

3. It is requested that the contents of this letter may please be brought to the notice of all the Officers in the PWD dealing with National Highways.

5300.7

No.RW/NH-11028/1/93-DO.I *Dated, the 20th January, 1994*

To

All the Regional Officers/Engineer-Liaison-Officers, Ministry of Surface Transport (Roads Wing)

Subject : Intimation regarding commencement and completion of National Highway works

Please refer to this Ministry's letter of even number dated 1st December, 1993 addressed to State Public Works Departments and copy to Regional Officers/Engineer-Liaison-Officers on the subject mentioned above, wherein the State PWDs have been requested to intimate the date of commencement of NH works and also to ensure timely submission of the completion certificates/completion reports to the Ministry with a copy to the concerned Regional Officer/Engineer-Liaison-Officer.

2. It may be stated that the Audit in their Inspection Report on the accounts of one of the Regional Offices has observed that Ministry as well as Regional Offices do not inform the P.A.O. about the date of commencement and date of completion of NH works, and therefore, the possibility of payment in excess of the actual amount incurred on the completion of work could not be ruled out.

3. In view of the above observation of the Audit, the Regional Officers/Engineer-Liaison-Officers are requested to intimate the date of commencement and data of completion of the National Highway works to the concerned PAOs as soon as the same is received from the State Governments, under intimation to this Ministry.

7450.2

No.RW/NH-31024/26/93-DO II *Dated, the 30th December, 1994*

To

The Secretaries & Chief Engineers (NHs), PWDs of all States and UTs (dealing with NHs); Director General (Works), Central Public Works Department; Secretary, Border Road Development Board

Subject: Follow-up action on the recommendations of the study team constituted by the Institute of Secretariat Training and Management to streamline the procedure for expeditious disposal of Audit paras

I am directed to state that a team of participants of the 45th Advanced Management Services Course of Institute of Secretariat Training and Management (ISTM) conducted a study in the Roads Wing to streamline the procedure for expeditious disposal of Audit Paras. The following recommendations of the study team require action by the executing agencies in respect of National Highway works. You are requested to take necessary action in this regard.

(i) The executing agencies should ensure that the work is carried out strictly in accordance with the approved specifications. In case the State Govt. changes the specifications etc. without prior approval of this Ministry, they are responsible for any adverse effects and will also bear the additional cost themselves on account of the changed specifications. This has already been intimated to the executing agencies in our Policy Guidelines issued from time to time.

(ii) It has been observed that many of the projects are not commenced within the stipulated period mentioned in the NH Rule. Delay in commencement of work has, therefore, been one of the causes for Audit Paras. One of the reasons for delay of work in the non-acceptance of tenders by the State Govt. for a long time. The Ministry has issued instructions to the State PWDs that the award of contract/commencement at works should be done maximum within one year from the date of sanction accorded by the Ministry, otherwise the sanction will automatically lapse. These instructions may strictly be complied with.

(iii) They should watch the position in respect of collection of fees on permanent bridges. In this regard they should send quarterly reports about the collection of fees which may include the progressive amount of fees collected, amount spent on collection and reasons for delay, if any. They should also indicate the capital cost of the bridge including approaches, maintenance cost, interest and the date on which the bridge was opened to traffic etc.

(iv) As per the existing guidlines of Ministry of Finance, all the AGs are required to furnish half-yearly reports on Audit Paras to the Ministry. The State PWDs should also send half-yearly reports to this Ministry about the pendency of Inspection Reports/Audit Paras so that the position is coordinated with the reports received from AGs.