

IRC:SP:73-2007

**MANUAL
OF
STANDARDS & SPECIFICATION**



**FOR
TWO LANING
OF STATE HIGHWAYS
ON
B.O.T. BASIS**

**INDIAN ROADS CONGRESS
2007**

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FOREWORD

There is an urgent need to improve the existing State Highways, at least to 2-lane standards, to ensure balanced road network connectivity in the country. Availability of funds, to undertake this gigantic task, by the States has remained a serious constraint so far. With a view to attracting private investment for the development of State roads, the Planning Commission has recently brought out a “Model Concession Agreement” for Public Private Partnership. Schedule-D of the Model Concession Agreement prescribes for preparation of a Manual of Specifications and Standards by State PWDs for compliance by the Concessionaire. It was felt that a Standard Manual of Specifications and Standards should be brought out by the Indian Roads Congress (IRC) to ensure uniformity of approach and to facilitate easy implementation by various State Governments. Accordingly, the Planning Commission, Govt. of India entrusted the work to IRC.

An Expert Group comprising the following was constituted by the IRC for preparation of the Manual.

- (i) Shri D.P. Gupta : Former Director General (Road Development)
- (ii) Shri S.C. Sharma : Former Director General (Road Development)
- (iii) Shri N.K. Sharma : Technical Advisor, IRC

The first draft document prepared by the Expert Group was submitted to the Project Preparation, contracts Management & Quality Assurance (G-1) Committee of the IRC in September, 2006. The Committee constituted a Sub-Group comprising of S/Shri S.K. Nirmal, K. Venkata Ramana and Pranavant, General Managers, National Highways Authority of India to examine the draft document in greater detail. The Expert Group subsequently modified the draft by incorporating the comments of G-1 Committee. The modified draft was approved by G-1 Committee in its meeting held on 7th January, 2007. This draft was considered and approved by the General Specifications and Standards (GSS) Committee with some observations in its meeting held on 31st January, 2007. The amended draft was approved by the Executive Committee of the IRC on 6th February, 2007 with the direction that the same should be got reviewed by the Stakeholders. The draft was reviewed by the Stakeholders at a Workshop held in the IRC on 12th February, 2007 and a few suggestions were made. Considering the urgency in the matter, a Special Council Meeting of the IRC was convened on 24th February, 2007 for consideration of the draft.

The Council discussed the draft at length and directed the Secretary General, IRC to examine the comments and get the draft modified by the Expert Group. This modified draft was further discussed by a Committee comprising of Shri V.K. Sinha, Secretary General, IRC; Shri G. Sharan, Additional Director General, MOSRTH (Convenor, GSS Committee); Shri Nirmaljit Singh,

Member (Tech.), NHAI (Co-Convenor, GSS Committee); Shri S.K. Puri, Chief General Manager, NHAI (Convenor, G-1 Committee); Shri A.P. Bahadur, Chief Engineer, MOSRTH; along with Shri R.K. Jain, Shri G.S. Khinda, Shri M.V.B. Rao, Technical Advisors, IRC and Shri Sharad Varshney, Additional Director (Tech.), IRC. After detailed deliberations and number of modifications, the above draft was finally approved for publication by IRC.

IRC finally expresses its thanks to all who have taken great pains and contributed in finalisation of this Manual. The efforts made by the officers and staff of IRC are also acknowledged. The efforts put in by Shri D.P. Gupta, Shri S.C. Sharma, Shri R.S. Sharma, former Secretary General, IRC and Shri Gajendra Haldea, Adviser to Deputy Chairman, Planning Commission are acknowledged.

An attempt has been made to adopt a balanced approach to bring in the latest technology and specifications, at the same time, keeping the cost of projects within manageable limits so as to attract more entrepreneurs. A document of this nature cannot remain static in view of the continuous up-gradation of technology over the years. Users of this Manual are going to be the best judge of the deficiencies, if any, in the document. Their feedback and suggestions will be greatly valued by IRC to keep this document updated measuring upto the expectations of the users.

I am confident that this Manual will serve its intended purpose as part of the Model Concession Agreement for Public Private Partnership in State Highways.



(V.K. Sinha)

Secretary General, IRC

August, 2007

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**PERSONNEL OF GENERAL SPECIFICATIONS &
STANDARDS COMMITTEE (GSS)**

(As on 31st January, 2007)

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| 1. | Sharan, G
(Convenor) | Addl. Director General, Ministry of Shipping, Road
Transport & Highways, New Delhi |
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| 4. | Balachandaran, K. | Chief Engineer (General), Highways Department, Chepauk,
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| 22. | Pradhan, B.C. | Chief Engineer (NH), Bhubaneswar |

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| 29. | Sarin, A.K. | Member (Engg.), Delhi Development Authority, New Delhi |
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| 31. | Sharma,G.P. | Chief Engineer, National Highways, Rajasthan PWD, Jaipur |
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| 40. | President, IRC | (Subhash Patel), Secretary, R&B Deptt., Govt. of Gujarat, Gandhinagar |
| 41. | Director General
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| 42. | Secretary General, IRC | (V.K. Sinha), Indian Roads Congress, New Delhi |

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| 43. | Das, Ratnakar | E-in-C-cum-Secy. (Retd.), Bhubaneswar |
| 44. | Lauriya, P.K. | Secretary, PWD, Raj.(Retd.), Jaipur |
| 45. | Merani, N.V. | Principal Secretary, Maharashtra PWD (Retd.), Mumbai |
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**PERSONNEL OF THE PROJECT PREPARATION, CONTRACT
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(As on 7th January, 2007)

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| 6. | Bhatia, A.L. | Vice President, Marketing, Gammon India Ltd., Mumbai |
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List of Symbols and Abbreviations

AASHTO	:	American Association of State Highway and Transportation Officials
ADT	:	Average Daily Traffic
ASTM	:	American Society for Testing and Materials
BI	:	Bump Integrator
BIS	:	Bureau of Indian Standards
CBR	:	California Bearing Ratio
COD	:	Commercial Operation Date
HDPE	:	High Density Polyethylene
HYSD	:	High Yield Strength Deformed (Bars)
IE	:	Independent Engineer
IRC	:	Indian Roads Congress
IS	:	Indian Standards
LCV	:	Light Commercial Vehicle
LL	:	Liquid Limit
MCA	:	Model Concession Agreement
MOSRTH	:	Ministry of Shipping, Road Transport & Highways
NBC	:	National Building Code
NHAI	:	National Highways Authority of India
OMC	:	Optimum Moisture Content
PCC	:	Plain Cement Concrete
PCU	:	Passenger Car Unit
PHPD	:	Peak Hour Peak Direction
PPM	:	Parts per million
PSC	:	Prestressed Concrete
QAM	:	Quality Assurance Manual
QAP	:	Quality Assurance Plan
QS	:	Quality System
RCC	:	Reinforced Cement Concrete
ROB	:	Road over Bridge (Road over railway line)
ROW	:	Right of Way
RUB	:	Road under Bridge (Road under railway line)
TMT	:	Thermo Mechanically Treated
VDF	:	Vehicle Damage Factor